

Appendix A – The Health Case for the East Lancashire Cycleway

The Health case for the East Lancashire Cycleway

The health benefits of walking and cycling

Regular participation in moderately intense activity such as brisk walking and cycling is well known to be associated with numerous health benefits. Such activities offer an effective means of increasing population levels of physical activity and improving health.

According to the National Institute for Clinical Excellence (NICE), the benefits of cycling and walking include:

- Reducing the risk of coronary heart disease, stroke, cancer, obesity and type 2 diabetes.
- Keeping the musculoskeletal system healthy.
- Promoting mental wellbeing.

An increase in walking or cycling can also help:

- Reduce car travel, leading to reductions in air pollution, carbon dioxide emissions and congestion.
- Reduce road danger and noise.
- Increase the number of people of all ages who are out on the streets, making public spaces seem more welcoming and providing opportunities for social interaction.
- Provide an opportunity for everyone, including people with an impairment, to participate in and enjoy the outdoor environment¹.

Local Health Profiles

The most recent District Health Profiles² show us that the health of the people in Hyndburn and Rossendale is generally worse than the England average and in Blackburn the situation is significantly worse. Relatively high levels of socio-economic deprivation in East Lancashire are linked to poor health outcomes.

Though life expectancy has improved, and some indicators are similar to the National average, life expectancy is significantly below the national average in all three districts. There are also wide social inequalities within East Lancashire and between East Lancashire and Nationally. Poor life expectancy is driven by relatively high early death rates from the “big killers” (CVD, cancers and respiratory diseases). The number of people recorded with diabetes and mental illness in Hyndburn and Blackburn is also significantly higher than the national average.

According the recent Lifestyle Joint Strategic Needs Assessment for Lancashire, levels of obesity are high and increasing in East Lancashire. All three districts also have higher levels of excess weight in adults and cardiovascular mortality rates, than both the England and

¹ NICE guidelines [PH41] Published date: November 2012

² Public Health England District Health Profiles

North West average, and in Hyndburn and Blackburn obesity and cardiovascular mortality in the under 75s is significantly higher than the regional average.

Local Health Priorities

In Rossendale, local health priorities include improving mental health and wellbeing, premature mortality from the 'big killers' such as cardiovascular disease and encouraging healthier lifestyles.

Hyndburn's health priorities include reducing deaths from road traffic accidents, increasing physical activity and encouraging healthier lifestyles (including reducing smoking in adults and alcohol harm reduction) and improving mental health and wellbeing (especially amongst the elderly).

The Priorities for Blackburn with Darwen are tackling the social determinants of health and reducing inequalities, including long term conditions, social isolation, and mental health and wellbeing, particularly in children and young people.

It is clear from the priorities of all three local authorities that improving access to greenways through active travel opportunities for both leisure and work for the population in Pennine Lancashire would have a positive effect on the mental wellbeing and physical health priorities of all three districts and therefore health indicators of these three districts

Physical Activity Levels and Obesity

The percentage of physically active adults in all three districts is worse than the regional and national average and significantly lower in both Hyndburn and Blackburn.

In the 2014 Sport England Active People Survey, more than 50% of the adult population of Rossendale and Hyndburn were inactive, this is significantly worse than the England average and in Blackburn the inactivity levels are even higher.

Data for 2010/11 from the National Child Measurement Programme for children in East Lancashire schools indicate that:

almost 1 in 4 (24.1%) Reception year children is overweight or obese;

almost 1 in 3 (31%) Year 6 children is overweight or obese.

The causes of obesity are complex, and include social, economic and environmental factors. However, improving diet and increasing levels of physical activity among adults and children are key objectives in tackling obesity and reducing many of the causes of mortality and morbidity prevalent in Pennine Lancashire.

How will this scheme address the localised health issues?

Inactivity is described by the Department of Health as a 'silent killer' and it is the fourth leading cause of global mortality. Physical activity can contribute to reducing/preventing the incidence of many non-communicable diseases, including the risk of coronary heart disease and stroke, certain cancers, hip fractures and falls, type 2 diabetes, depression, anxiety and other mental health issues, and osteoarthritis. As low physical activity levels and excess weight/obesity levels are high in the communities where the cycleways are planned it is not surprising that the incidence of most of the diseases of physical inactivity are higher in Blackburn with Darwen and East Lancashire.

All these conditions have a massive financial impact on the NHS. In the UK, inactivity has been estimated to directly cost the NHS £1.1billion, with indirect costs to society bringing this to a total of £8.2billion.

The recent Health Behaviours JSNA for Lancashire 2014 found in relation to physical activity:

- ☐ Physical inactivity is the fourth leading cause of global mortality (WHO).
- ☐ Almost half of 6,000 surveyed adults in Lancashire did not take part in any physical activity over the past 28 days (Active People Survey).
- ☐ Nearly all districts in Lancashire have seen a decrease in sports participation.
- ☐ The cost of inactivity to Lancashire is estimated at over £22 million³.

Accurate data for levels of children's Physical Activity is not available. Nationally, the Health Survey for England found for children aged under-five, only 9% of boys and 10% of girls were meeting recognised activity guidelines. This rose to 21% of boys and 16% of girls aged 5-15 years. Children from lower income households are also more likely to have lower levels of activity. These figures demonstrate the need to provide greater opportunities for physical activity for the County's children.

Why this scheme over other solutions?

Evidence for cycle paths and walkways

A recent WHO review of the evidence⁴ shows that the built and natural environment is an important determinant of health. It states that 'a disproportionate burden of ill health associated with the built environment is borne by poorer people living in poor quality built environments. Poorer families have lower mobility but greater exposure to the adverse environmental conditions related to transport such as air and noise pollution and higher traffic'

³ British Heart Foundation/Sport England research:
http://archive.sportengland.org/support__advice/local_government/local_sport_profile_tool/costs_of_physical_inactivity.aspx

⁴ Health inequalities and determinants in the physical urban environment: Evidence briefing

It is also clear that activities that can become part of every day life, such as walking or cycling to work or school, are more likely to be sustained than activities that require attendance at specific venues⁵. The same study found that safe and convenient walkways is positively associated with higher levels of regular walking. Men and women who commute to work by active and public modes of transport are also likely to have significantly lower BMI and percentage body fat than their counterparts who use private transport⁶.

The perceived physical danger posed by motorised traffic has been cited as one of the main barriers to engaging in walking and cycling (Davis 2002). This has had a disproportionate effect on activity levels in both children and older adults. Urban land use pattern is also one of the main influences on levels of physical activity, particularly among lower income groups who get much of their physical activity through active travel rather than recreation⁷.

Lack of facilities such as public toilets impacts on vulnerable groups, for example young children, older people and those with illnesses or chronic disease⁸. Lack of suitable areas for resting for example benches and seating may also limit the ability for certain groups to explore or walk longer distances. With respect to the elderly this impacts negatively on social isolation, one of the priorities of Lancashire's Health and Wellbeing Board. Involvement of these vulnerable groups forms a key part of the planned implementation of this initiative.

National Guidance

The National Institute of Clinical Excellence in 2012 published guidelines for local decision makers stating that 'walking and cycling should become the norm for short journeys and should be encouraged throughout local communities'. The guidance makes clear to local authorities, schools and workplaces should introduce ways to enable their communities to be more physically active and change their behaviours.

NICE recommends coordinated action to identify and address the barriers that may be discouraging people from walking and cycling more often or at all. These include:

- Ensure walking routes are integrated with accessible public transport links to support longer journeys. Signage should give details of the distance and/or walking time, in both directions, between public transport facilities and key destinations.
- Develop and implement school travel plans that encourage children to walk or cycle all or part of the way to school, including children with limited mobility. Pupils should be involved in the development and implementation of these plans.
- Ensure walking and cycling are considered alongside other interventions, when working to achieve specific health outcomes in relation to the local population (such as a reduction in the risk of cardiovascular disease, cancer, obesity and diabetes, or the promotion of mental wellbeing).

⁵ the challenges of evaluating environmental interventions to increase population levels of physical activity. *Journal of Epidemiology and Community Health* 2003;57:96-101 D A Lawlor et al.

⁶ *BMJ* 2014;349:g4887

⁷ RCEP 2007

⁸ Greed, 2006

The key recommendations related to the East Lancashire Strategic Cycleway are Recommendations 2 and 3 which recommend that local decision makers, 'Plan and provide a comprehensive network of routes for walking, cycling and using other modes of transport involving physical activity. These routes should offer everyone (including people whose mobility is impaired) convenient, safe and attractive access to workplaces, homes, schools and other public facilities.

The guidance cites evidence from three studies which suggests that 'multi use trails can lead to increases in levels of walking and cycling in both the short and long term'. It also indicates that there is some evidence to suggest that trails located closer to population centres may be better used.

There is also evidence to suggest that the introduction of cycle infrastructure can lead to long-term increases in levels of cycling within the area of the scheme and that 'cycle infrastructure interventions may result in important positive public health outcomes alongside increasing cycling, notably a reduction in cycle casualties.'

Cost-effectiveness of Cycling Infrastructure

There is consistent and growing evidence that increasing walking and cycling levels in the population also achieves substantial economic return over the long term. Evidence is also emerging that investments in infrastructure that encourages walking and cycling demonstrate greater benefits than interventions that target behaviour change in the population⁹.

Quantified benefits vary widely depending on the range of direct and indirect outcomes considered and the methods used to value them. Outcomes most often considered are savings from reductions in health care costs, absenteeism, air pollution, congestion, and greenhouse gases, as well as gains in fuel savings. Some harms are possible, particularly from increased rates of cycling injury, however, increased walking and cycling is likely to create a safety in numbers effect and offset harms to some extent.

The NICE guidance states:

'Interventions involving the walking and cycling infrastructure could help people to avoid long-term chronic diseases, leading to incremental cost-effectiveness ratios (ICERs) of approximately £130– £25,000 per quality of life year (QALY). When additional, short-term improvements in wellbeing are taken into account, ICER estimates range from £90– £9400.

A cost–benefit analysis **(CBA) of the cycling infrastructure generated a standardised cost–benefit ratio of 1:11** which, from a transport perspective, is very cost effective.

The guidance emphasises that encouraging and enabling people to walk or cycle requires action on many fronts, and from a range of different sectors. An integrated approach is needed to achieve the potential public health benefits.

⁹ NICE 2008

According to Sakthi Karunanithy, Public Health Director for Lancashire, 'The proposed new routes will provide safer local facilities encouraging residents of all ages and abilities to cycle, walk and horse ride. There will be an added benefit of linking communities, enabling residents of all ages to connect with each other, travel to new destinations for leisure and work and bring in tourism all of which will have a positive effect on both physical and mental wellbeing'.

In summary

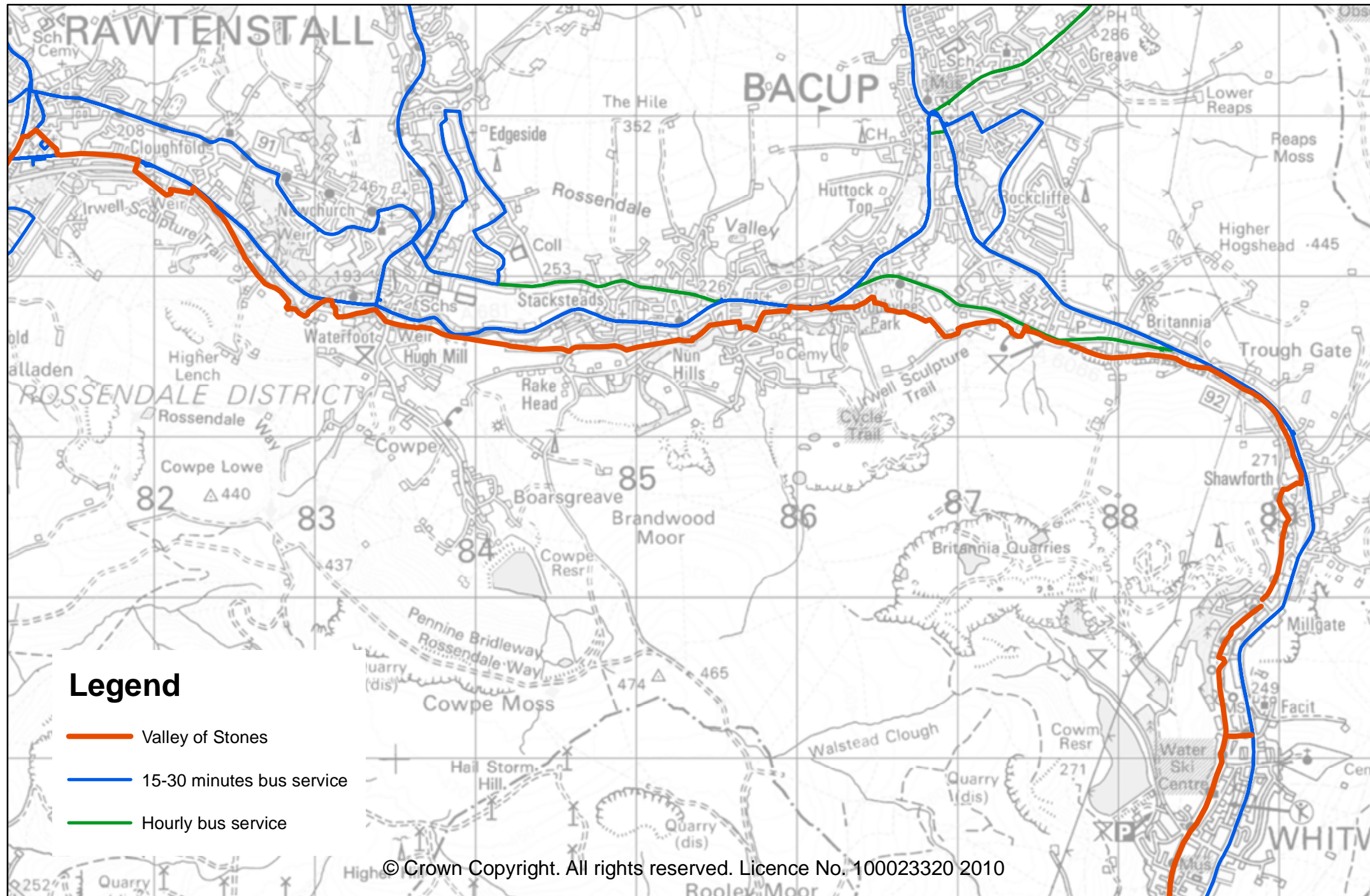
To derive the maximum benefit from such investment, a whole system approach with region-wide integrated policy and planning is needed. In addition to the cycling infrastructure opportunities, Lancashire County Council with Blackburn with Darwen council have been working to develop a 3 year partnership across Pennine Lancashire that will deliver a recreational cycling programme in partnership with British Cycling, Lancashire Sport and Public Health England. The initiative is also supported by all East Lancashire Districts. We intend the programme will increase participation and promote these safe cycling routes. This will involve training local people/partners to become cycle leaders to deliver the Sky Ride programmes across the area, backed up by a local marketing plan and delivered in collaboration with the local population. We intend the programme to be supported by a Lancashire Strategic Leadership group, and a local operational and delivery group with involvement from the local community.

Both the infrastructure and cycling promotion initiatives will link to the existing East Lancashire wide, 'Up and Active' programme that encourages participation and increase of physical activity; aimed at primarily to those who are classed as inactive as well as encouraging those who are already active to continue to utilise local facilities and resources. See: www.upandactive.co.uk for further information.

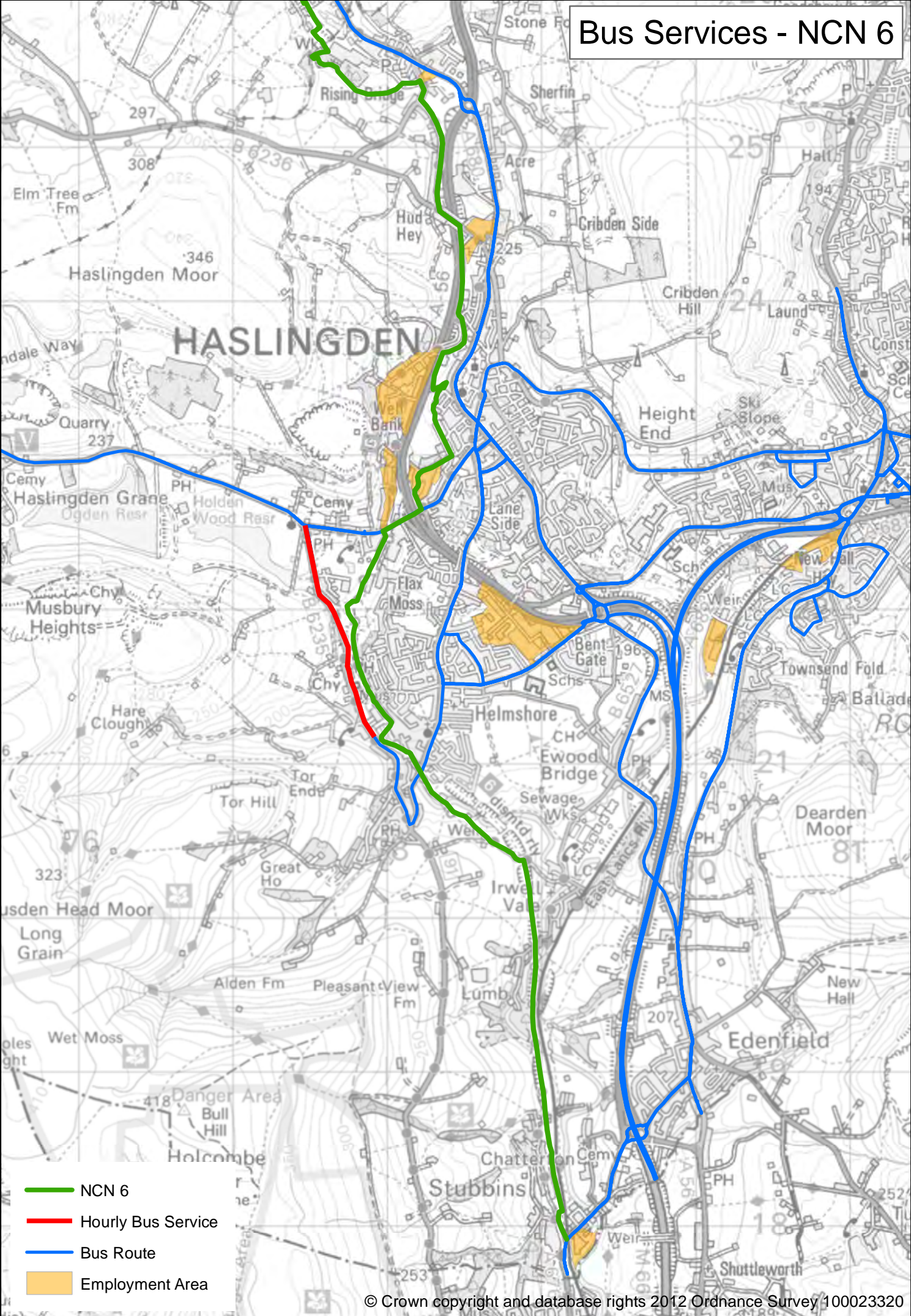
What is clear from the NICE guidelines is that a suitable environment is an essential aspect of encouraging people to cycle and walk. The planned infrastructure routes will enhance the opportunities to improve the local health and wellbeing priorities identified. By opening up greenways for active travel residents will have better access to walking and cycling routes which in addition to increased fitness for the population from such opportunities, there should be a knock on effect of reduced sickness days and better mental wellbeing from those who begin actively travelling to work. In addition we should see knock on effects for climate change of reduced congestion and better air quality. Increasing opportunities for active travel provides measurable benefits to the individual, their family, their employer, the environment and the economy as a whole.

Appendix B – Bus Services in East Lancashire

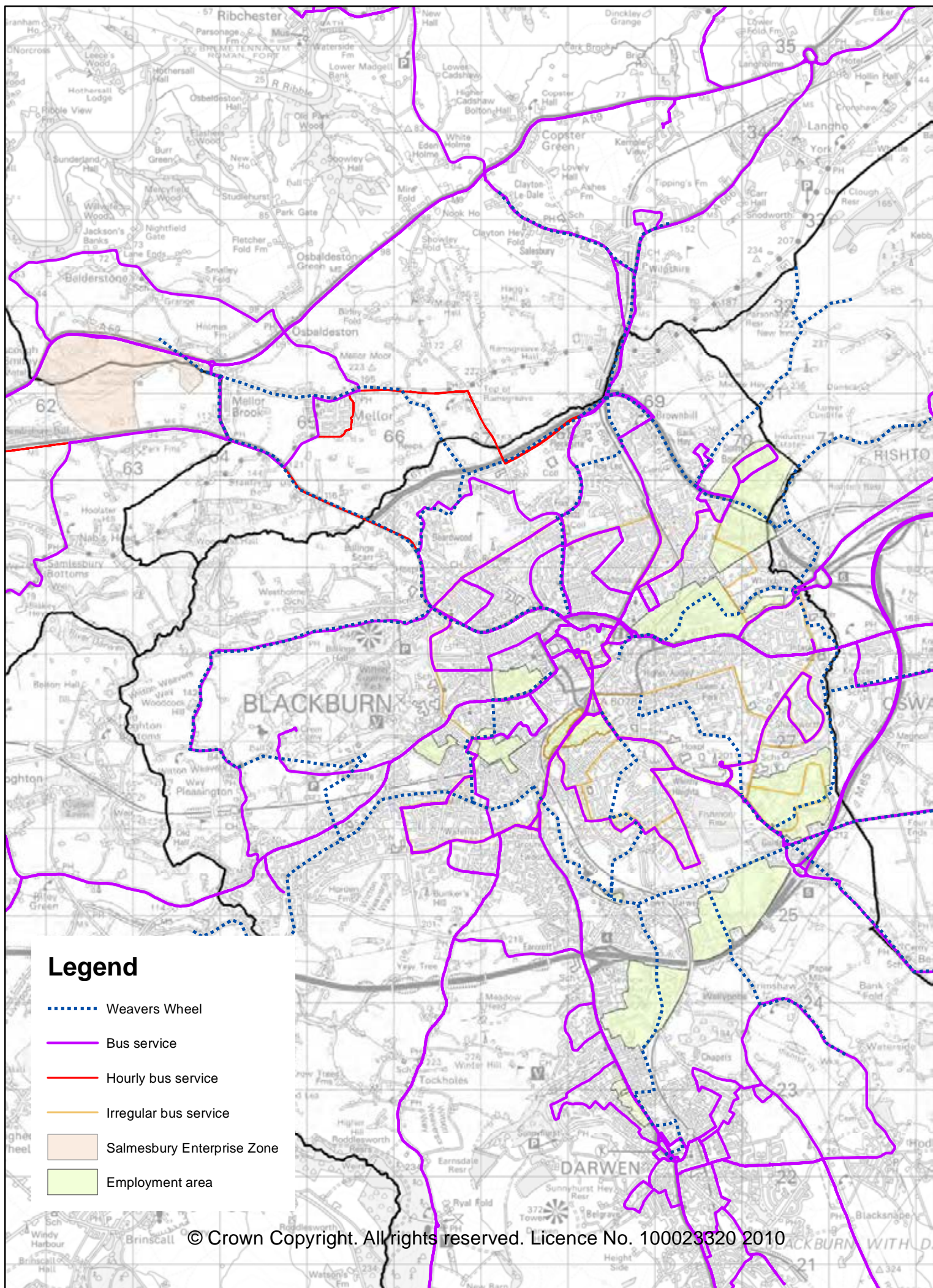
Bus frequency - Valley of Stones



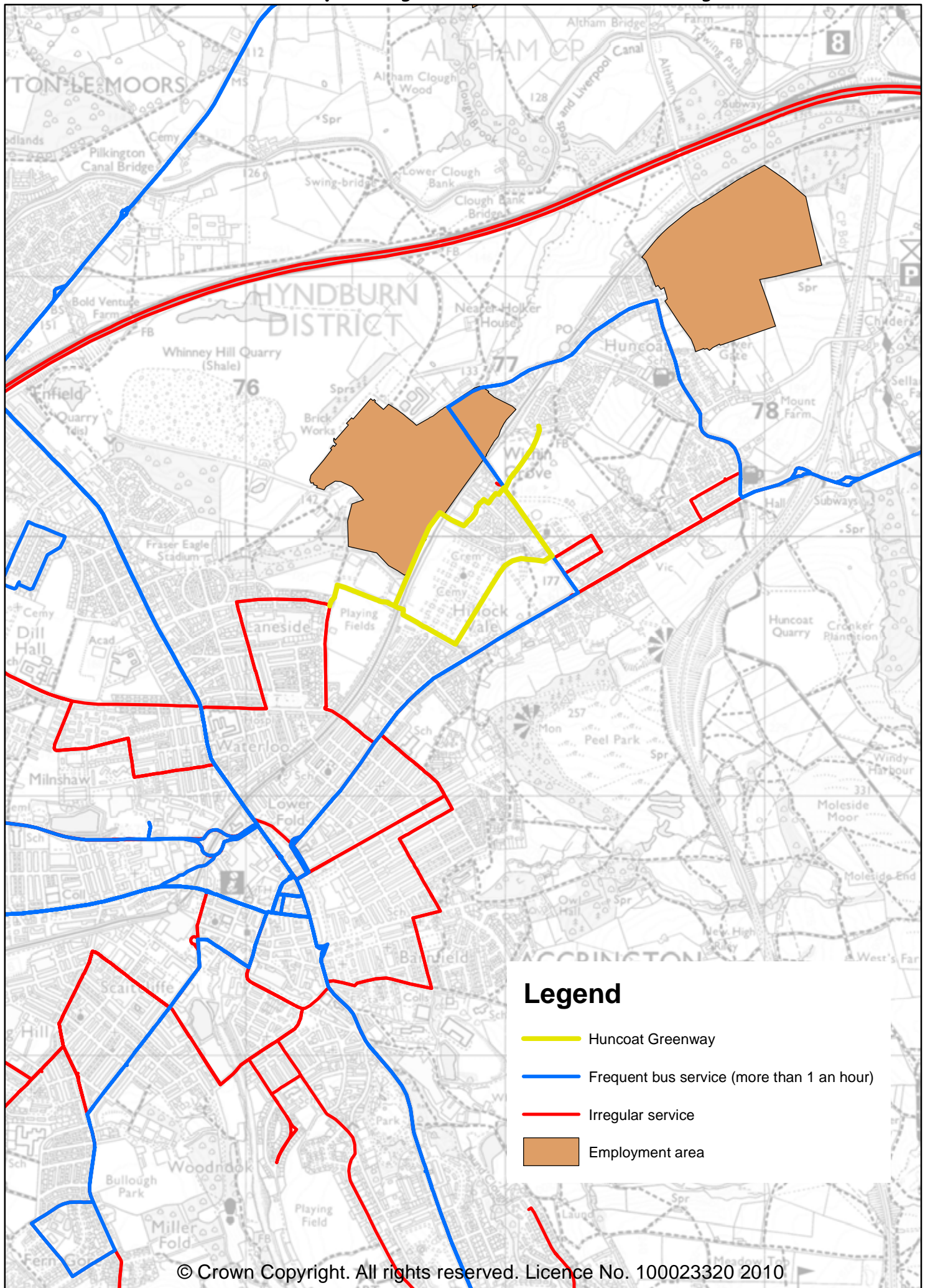
Bus Services - NCN 6



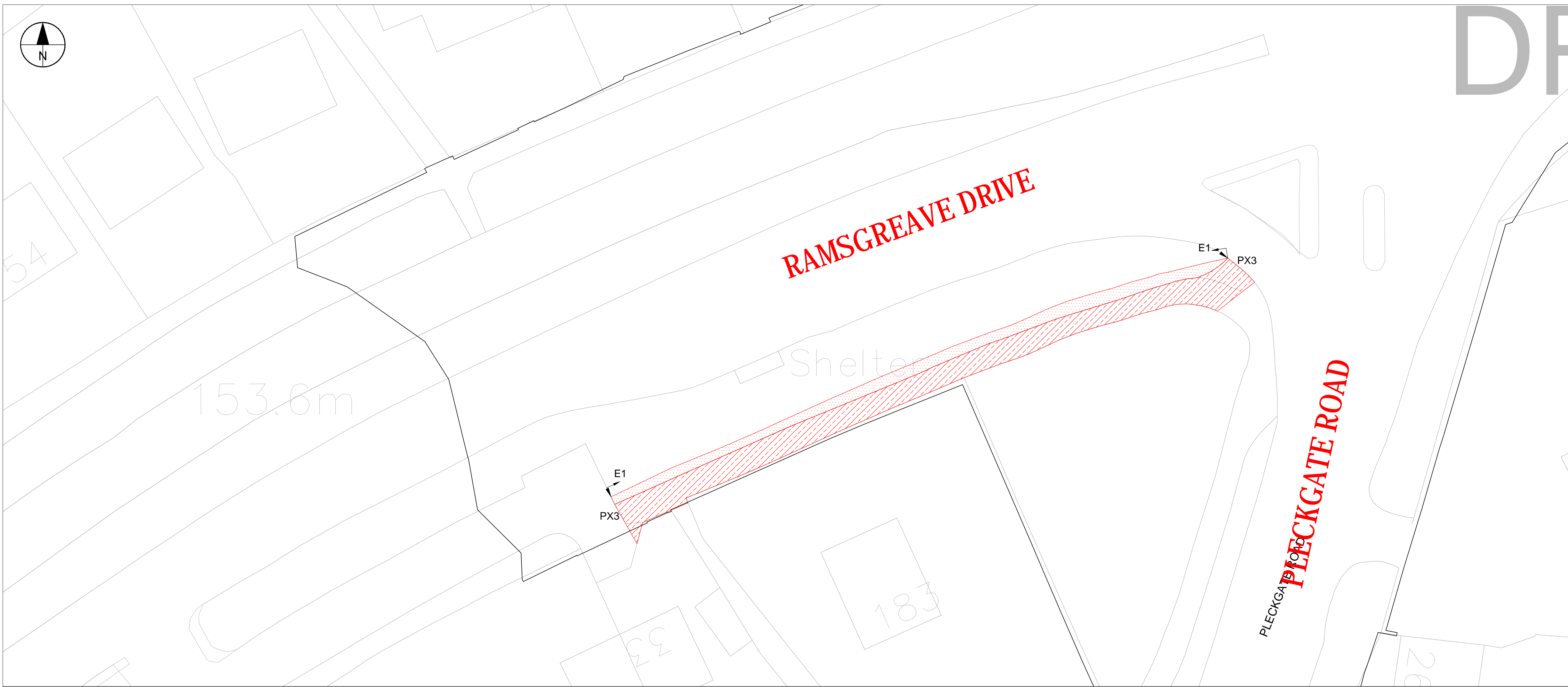
Bus routes - Weavers Wheel



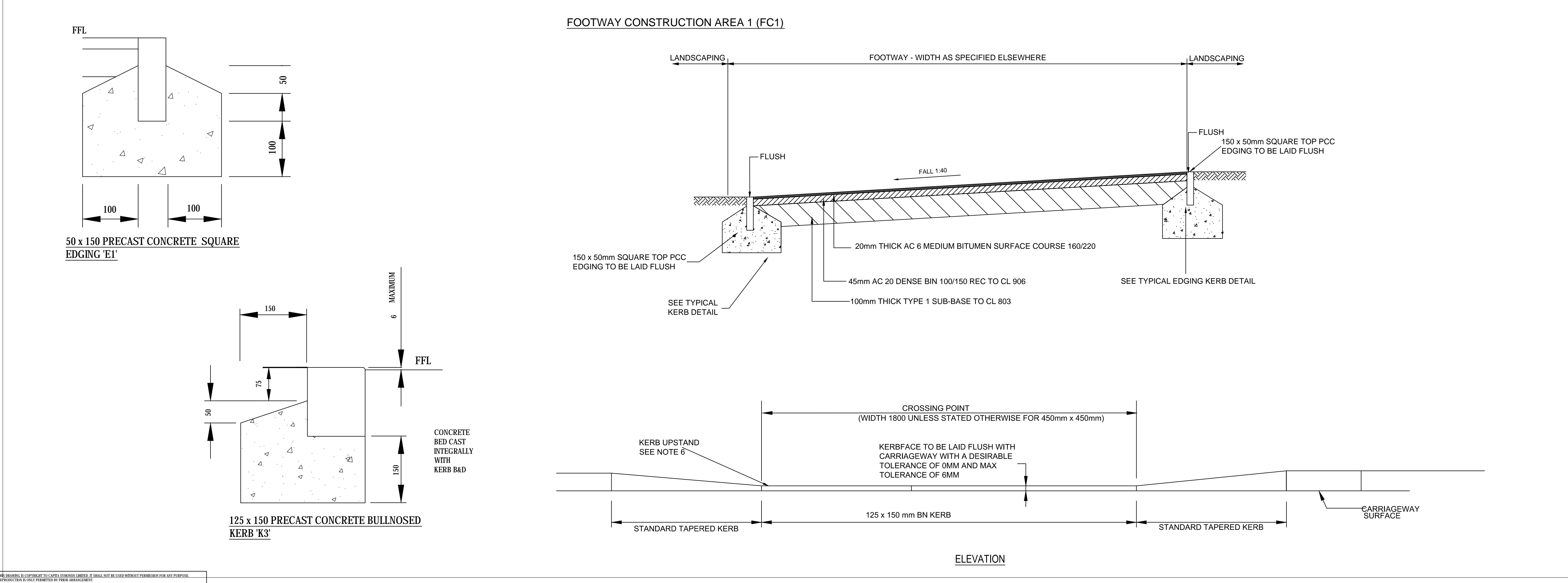
Bus frequency - Huncoat Greenway



Appendix C – Examples of Work Package Drawings



- NOTES:-**
- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS. ANY DISCREPANCIES, ERRORS OR OMISSIONS ARE TO BE BROUGHT TO THE ATTENTION OF CAPITA.
 - ALL DIMENSIONS TO BE CHECKED BEFORE COMMENCEMENT OF WORKS ON SITE.
 - ALL DIMENSIONS IN METERS UNLESS OTHERWISE STATED.
 - ALL SETTING OUT TO BE AGREED WITH THE PROJECT MANAGER.
 - FOR FOOTWAY CONSTRUCTION REFER TO THE SPECIFICATION APPENDIX 11/1
 - DROP KERB ON CROSSING WITH CROSSING ON OPPOSITE SIDE OF ROAD. BLISTERS ON TACTILE PAVING MUST ALIGN WITH BLISTERS ON PAVIORS ON OPPOSITE SIDE OF ROAD.
- KEYS:-**
- EXTENT OF WORKS BOUNDARY
 - PROPOSED FOOTWAY CONSTRUCTION FC 1
100MM DEPTH OF GRANULAR TYPE 1 SUB-BASE.
45MM THICKNESS OF AC 20 DENSE BIN 100 / 150 REC TO EN13108 -1:2006 AS BINDER COURSE 20MM DEPTH OF AC6 MED SURF 160/220 TO BSEN13108-1:2006 AS SURFACE COURSE.
 - PROPOSED FOOTWAY CONSTRUCTION FC 2
REGULATING BINDER COURSE 80MM THICKNESS OF AC 20 DENSE BIN 100 / 150 REC TO EN13108 -1:2006 AS BINDER COURSE 20MM THICKNESS OF AC 6 DENSE SURF 100 / 150 H/S TO EN13108 -1:2006 AS SURFACE COURSE.
 - 50 X 150MM PCC RECTANGULAR SQUARE TOP EDGING WITH 100MM THICK GRADE ST4 CONCRETE BED AND DOUBLE HAUNCH. LAID FLUSH. REFER TO STANDARD DETAIL DRAWING NO. CS073971-01-1100-SD-0001
 - COMPRISING 2 No. TAPER KERBS AND REQUISTE NUMBER OF 125 x 150mm BULLNOSED KERBS 'K3' SET AT 6mm FINISHED FACE.



| REV | DESCRIPTION | DRAWN | CHK | APP | DATE |
|-----|-------------|-------|-----|-----|------|
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project title: **WEAVERS WHEEL Ph1 2014_15**

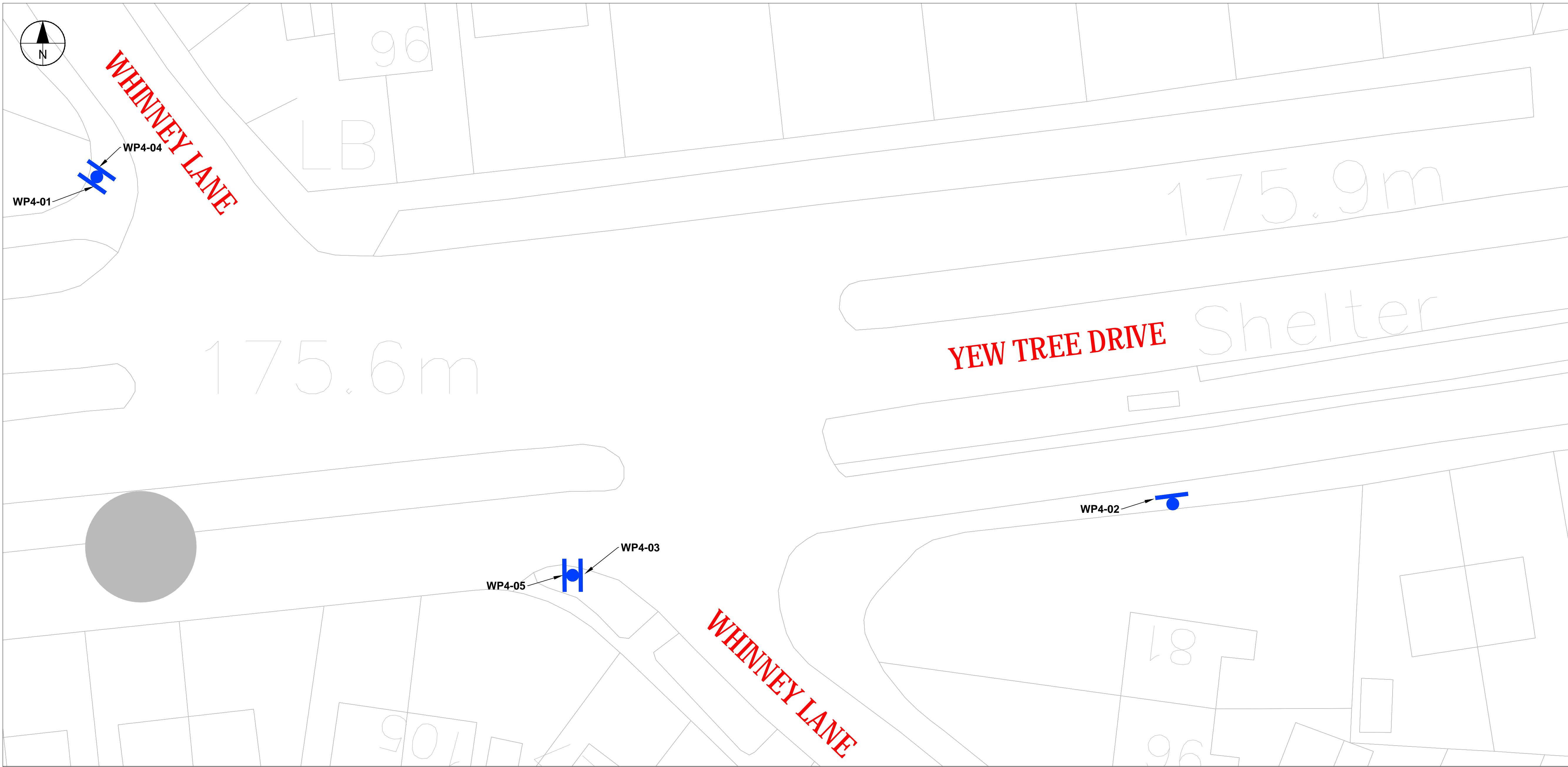
drawing title: **WORKS PACKAGE 4
PROPOSED CYCLEWAY CROSSING**

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| scale @ A1 1:200 | designed by APN | drawn by SCC | checked by | approved by | date drawn NOV 14 |
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project no.
CS076063-01

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| drawing no. H-076063-01-1104-0001 | revision P01 |
|---|------------------------|

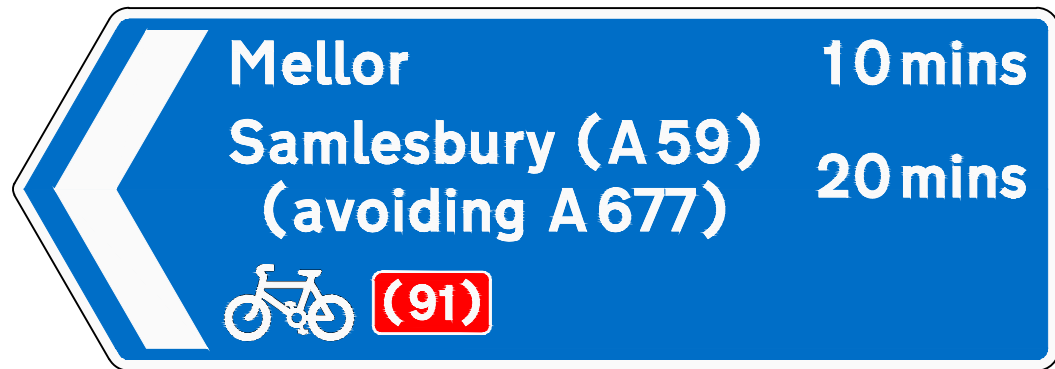
Do Not Scale From This Drawing



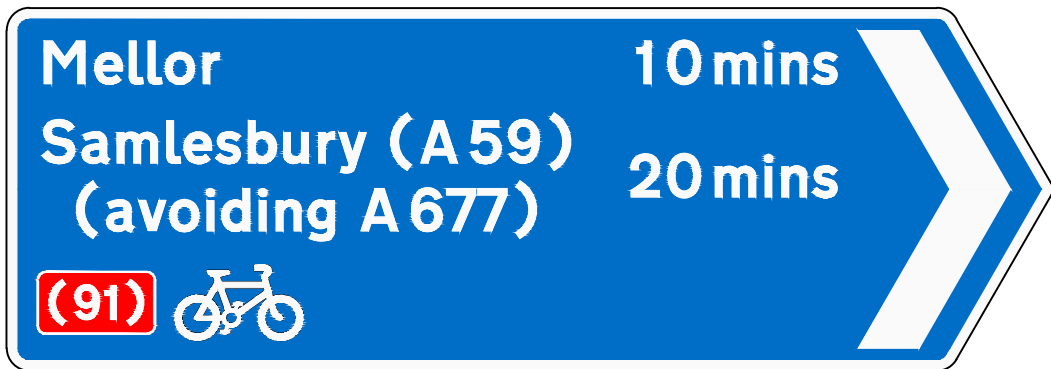
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 - ALL SETTING OUT TO BE AGREED WITH THE PROJECT MANAGER.

KEYS:-

 PROPOSED SIGNAGE LOCATION



| | | | |
|---------------------------|--------------------------|-----------|----------|
| Scheme Ref. Weavers Wheel | | | |
| Sign | Ref. Whinney Lane WP4-01 | x-height | 30.0 |
| Letter colour | WHITE | SIGN FACE | |
| Background | BLUE | Width | 1040mm |
| Border | WHITE | Height | 360mm |
| Material | Class RA2 (12899-1:2007) | Area | 0.37sq.m |



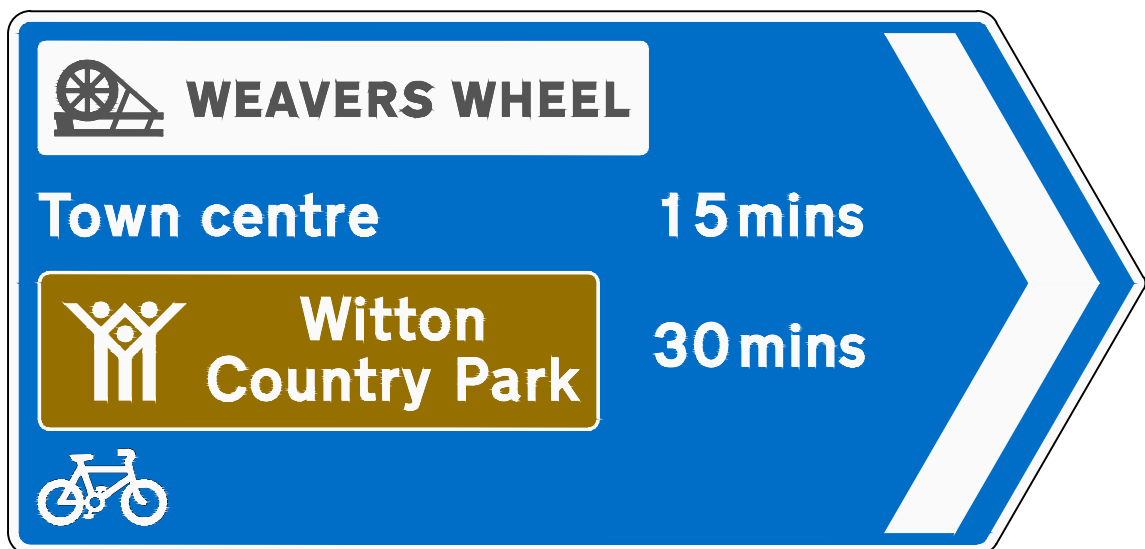
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|---------------------------|--------------------------|-----------|----------|
| Scheme Ref. Weavers Wheel | | | |
| Sign | Ref. Whinney Lane WP4-04 | x-height | 30.0 |
| Letter colour | WHITE | SIGN FACE | |
| Background | BLUE | Width | 1040mm |
| Border | WHITE | Height | 360mm |
| Material | Class RA2 (12899-1:2007) | Area | 0.37sq.m |



| | | | |
|---------------------------|--------------------------|-----------|----------|
| Scheme Ref. Weavers Wheel | | | |
| Sign | Ref. Whinney Lane WP4-02 | x-height | 30.0 |
| Letter colour | WHITE | SIGN FACE | |
| Background | BLUE | Width | 1070mm |
| Border | WHITE | Height | 580mm |
| Material | Class RA2 (12899-1:2007) | Area | 0.62sq.m |



| | | | |
|---------------------------|--------------------------|-----------|----------|
| Scheme Ref. Weavers Wheel | | | |
| Sign | Ref. Whinney Lane WP4-03 | x-height | 30.0 |
| Letter colour | WHITE | SIGN FACE | |
| Background | BLUE | Width | 1125mm |
| Border | WHITE | Height | 535mm |
| Material | Class RA2 (12899-1:2007) | Area | 0.60sq.m |



| | | | |
|---------------------------|--------------------------|-----------|----------|
| Scheme Ref. Weavers Wheel | | | |
| Sign | Ref. Whinney Lane WP4-05 | x-height | 30.0 |
| Letter colour | WHITE | SIGN FACE | |
| Background | BLUE | Width | 1130mm |
| Border | WHITE | Height | 540mm |
| Material | Class RA2 (12899-1:2007) | Area | 0.61sq.m |

| REV | DESCRIPTION | DRAWN | CHK | APP | DATE |
|-----|-------------|-------|-----|-----|------|
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Status: **PRELIMINARY**

Client: BLACKBURN WITH DARWEN B.C.
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BLACKBURN BB1 7DY



Project title: **WEAVERS WHEEL Ph1 2014_15**

Drawing title: **WORKS PACKAGE 4
PROPOSED SIGNAGE LOCATION**

| | | | | | |
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| scale @ A1 1:200 | designed by APN | drawn by SCC | checked by | approved by | date drawn NOV 14 |
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Project no.: **CS076063-01**

Drawing no.: **H-076063-01-1204-0001** P01

revision

Do Not Scale From This Drawing

Appendix D – Cost report on previously completed cycle schemes

Appendix D - Cost Report on Previously Completed Cycle Schemes led by Blackburn with Darwen Council & Lancashire County Council

| Scheme Name | Brief Description | Cost plan at Project | Final Out-turn | % Cost Change | Comment |
|--|--|----------------------|----------------|----------------|--|
| | | Inception | Cost | | |
| The Crescent Cycle Link, Blackburn (BwDBC) | Construction of a new cycle link between the Cycling Hub at Witton Park and the Canal Towpath Cycleway at Cherry Tree, Blackburn. | £48,000.00 | £41,000.00 | -14.60% | The scheme included the full depth construction of 1065m2 of new off road cycleway. The reduction in final cost was due to the omission of works over Network Rail bridge. |
| Whitebirk Drive Phase 1 (BwDBC) | Widening of existing footway to create a shared cycleway linking the Industrial / Retail area at Whitebirk to the local Railway Station. | £170,000.00 | £184,000.00 | 8.20% | The additional costs were due to the inclusion of extra surfacing to footway areas leading onto the route together with an increase in length of the route from the original measured information. |
| Whitebirk Drive Phase 2 (BwDBC) | Amendments to include cycle facilities to the existing signal junctions over the length of new cycleway created in Phase 1. | £120,000.00 | £105,000.00 | -12.50% | Trial holes were carried out to determine exact location of the statutory undertakers' equipment. Modifications were made to the scheme and the £15,000 estimate for diversion works was reduced to £0 |
| Royal Blackburn Hospital to Blackburn Railway Station Cycle Link (BwDBC) | Signing and minor improvements to an existing cycle link between the Royal Blackburn Hospital on Haslingden Road to Blackburn Railway Station on the outskirts of the town centre. | £20,000.00 | £22,000.00 | 10.00% | Slight re-routing of the cycle route through the construction phase resulted in additional signage. |
| River Lune Millennium Park, Lancaster (LCC) | Resurfacing of existing and section of new cycleway along former railway line (5km in total) connecting Lancaster & Glasson Dock | £306,091.00 | £307,326.00 | 0.40% | Scheme largely delivered as planned. Some minor changes in construction phase but offset by savings elsewhere |
| Padiham Greenway, Burnley (LCC) | Creation of new 2.5 km long cycleway along former railway line through centre of Padiham. Involved major earthworks including demolition of bridge and embankment and new access ramps | £1,437,481.00 | £1,457,813.00 | 1.40% | Increase in cost of earthworks and relocation of electricity cables in central area largely offset by changes in boundary treatment and omission of one access point from original design. |
| West Padiham Greenway, Burnley (LCC) | 1km extension to Padiham Greenway connecting to A6068 by pass. Limited earthworks but cattle creep missing in one section of former railway | £109,993.00 | £75,751.00 | -31.13% | Use of Burnley BC direct works team created savings in labour. Sub base material sourced from demolition site adjacent to route generating significant savings on material & transport costs. |

Appendix E – Option appraisal of 'Plan B' routes on the East Lancashire Cycleway

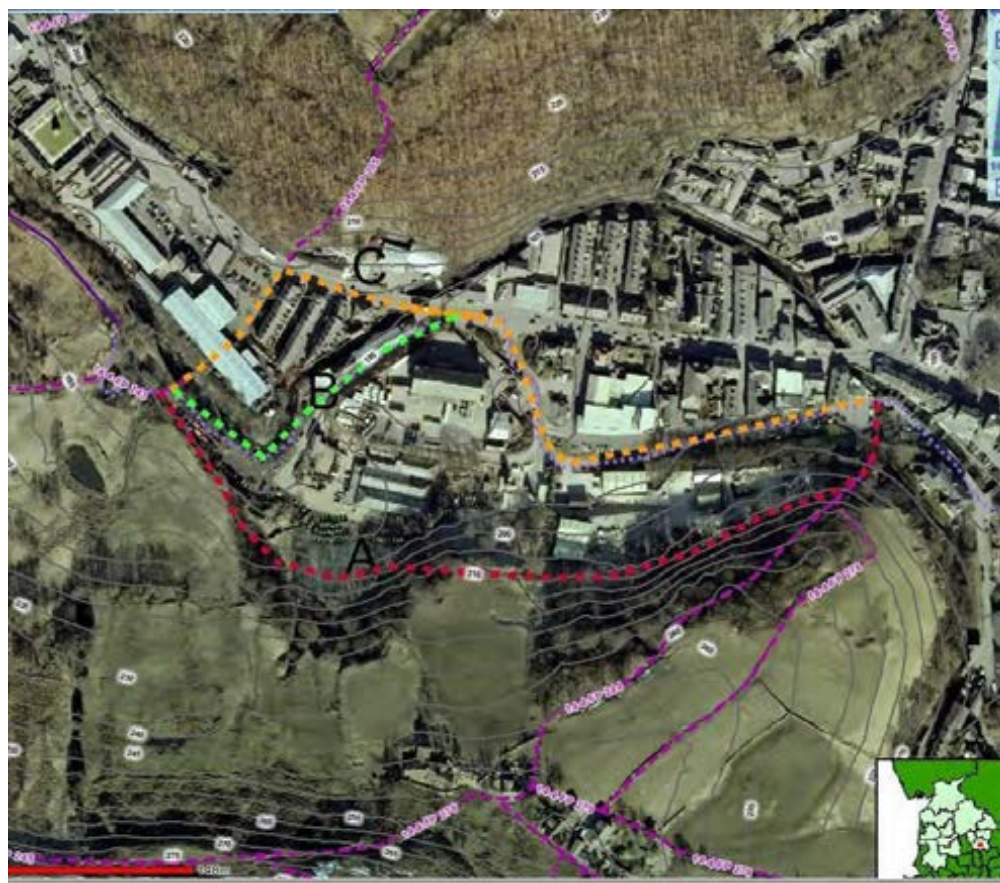
East Lancashire Strategic Cycleway - Option appraisal of 'Higher Risk' sections

Route 1 - Valley of Stone

Section 3 - Buckhurst Gap (0.65km)

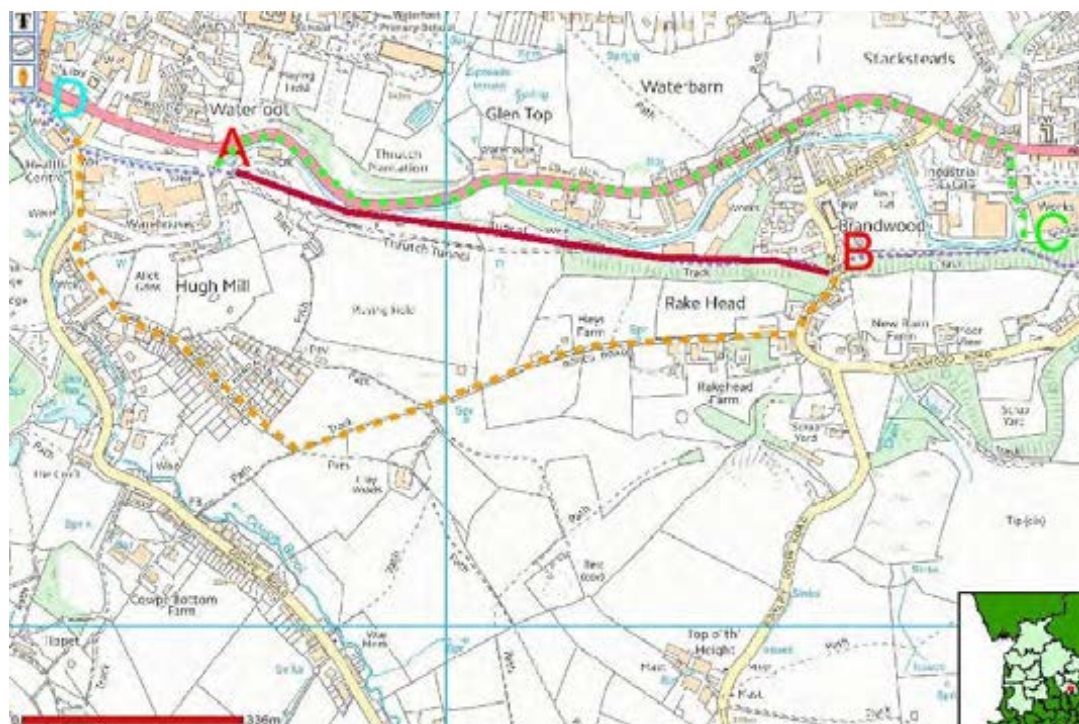
(Mitigated Risk Rating – Green, Proposed Year for delivery 2017/18 & 18/19)

At this section there are three options. The preferred route option A marked in red will involve more engineering work requiring a new bench cut trail following the contours around the factory plant. Option B would involve going through the middle of the factory site. The factory has indicated a desire to expand and remodel the site so there may be an opportunity to incorporate the route if this occurs. Option C follows an existing PROW which passes through the factory. This is probably the least desirable option due to the layout of the factory and movement of vehicles.



Section 5 – Newchurch Tunnels and new bridge (0.56km, Green, 2015/16).

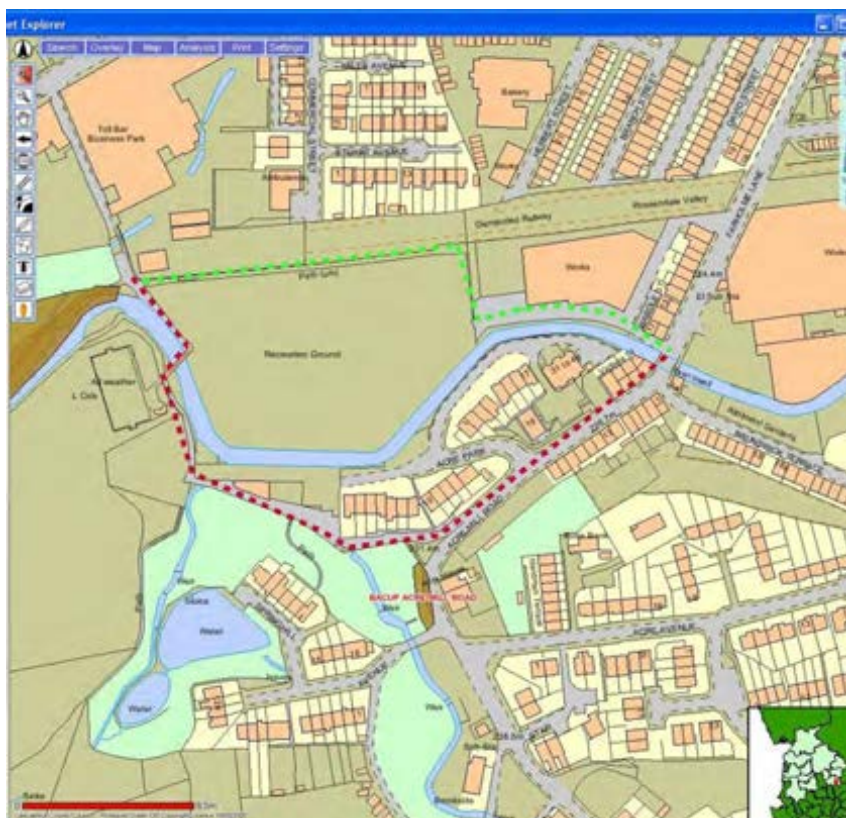
If it is not possible to agree a route through the tunnels (A to B), an on road solution (A to C) may be possible but the road is narrow and quite quick on this section. The footway is relatively quiet but is narrow. A third alternative which is recommended for equestrian users is a route from D to B using Royds Road which is currently being upgraded to a bridleway. The gradients on this are much steeper than is recommended for a cycleway though.



An on road alternative (A to C) to the tunnels might be possible but the A681 is a very busy road and at this point is quite narrow with several bends, as well as a very narrow footway.



The third alternative route from D to B is on relatively quiet lanes but the gradients are very steep and many cyclists will be forced to dismount and walk.

Section 7 - Blackwood Road to Holme Street. (0.87km, Green, 2017/18)

There are two options for the route at this point, the section marked with the red dotted line will be the easiest to achieve as it follows the line of an existing FP which is currently subject to a BW claim. It is a wide, well defined route but the landowners have not yet been approached.

The green dotted line is closer to the original railway line but where it passes the factory to the east it may require a fence line moving to achieve the desirable width.

Section 8 - Ormerods Gap (0.45km, Green, 2017/18).

There are three options here. A to B following the red dotted line would need to cross the river and bench cut a route in to the river bank. A to C would follow quiet lanes up the valley side. The initial climb is quite steep and beyond what would be normally recommended for a cycleway. D to B would have the route back on the A681 crossing in front of a factory which has frequent lorry movements.



A to C uses quiet 20mph roads but would also require using a steep gradient for some of the route.



D to B on plan, A681 normally a busy road, factory on the right has a lot of lorries entering and leaving its premises.

Section 10 - Stubby Lee to New Line Car Park (0.60km, Green, 2018/19)

This section has a number of different options but the situation here is complicated by a DMO which is being made for Heightbarn Lane and Stubby Lee Lane. If these lanes have the status of at least a BW (as our PROW team has assessed them) there is already a route on the ground which just needs resurfacing. It might be possible though to negotiate though a better route for both the public and the landowners though by constructing a route following something along the dotted blue line. This would minimise the disturbance to residents and ensure a safe traffic free route for users. Less desirable but worth considering would be the orange dotted line

following Stubby Lee Lane and then New Line. This might require the current speed limit on New Line to be reduced from 30mph to 20mph.

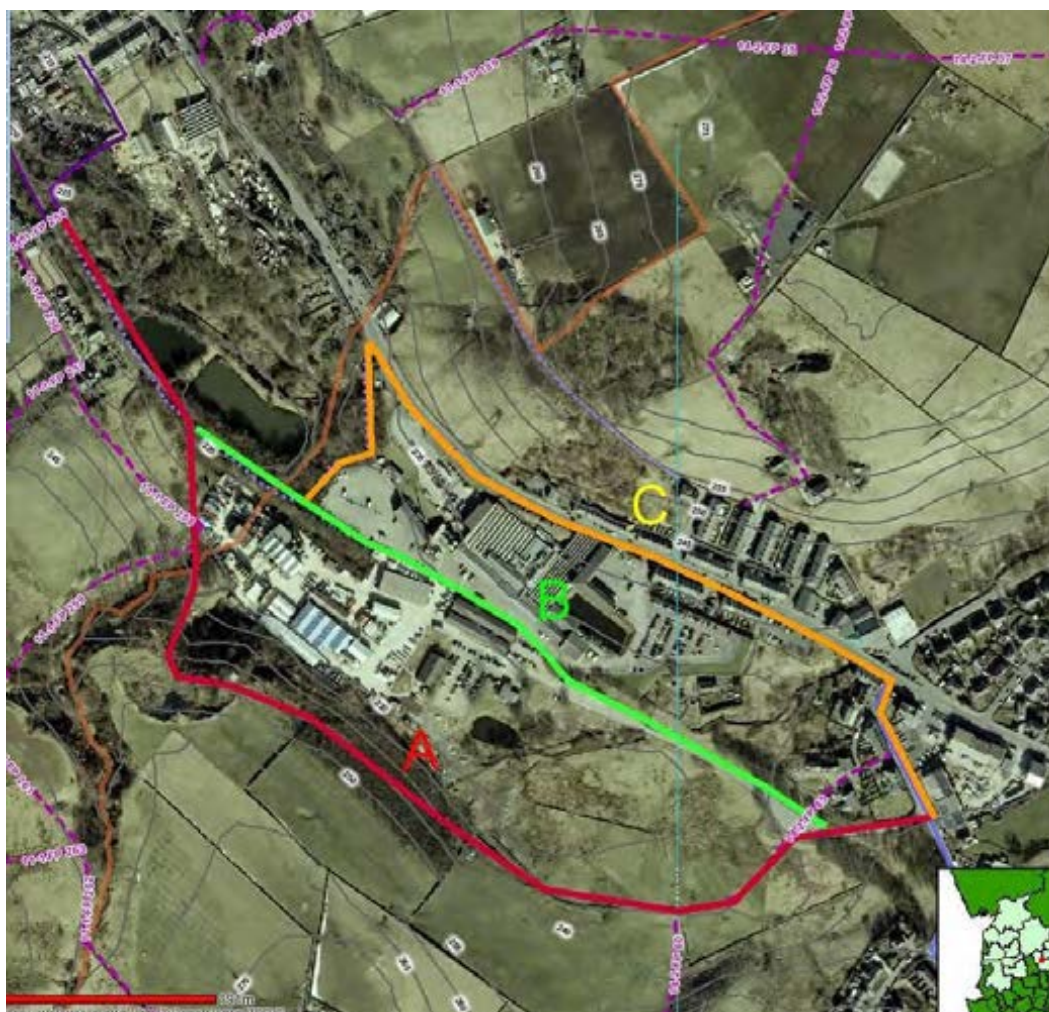


New Line A682 possible alternative route but it would require an on road cycleway marking up and speed limit reduced from 30mph to 20mph.

Route 2 - Accrington - Ramsbottom (Hyndburn & Rossendale)

Section 2 - Baxenden - Rising Bridge (1.09km)

(Mitigated Risk Rating – Amber, proposed year for delivery 2018/19)

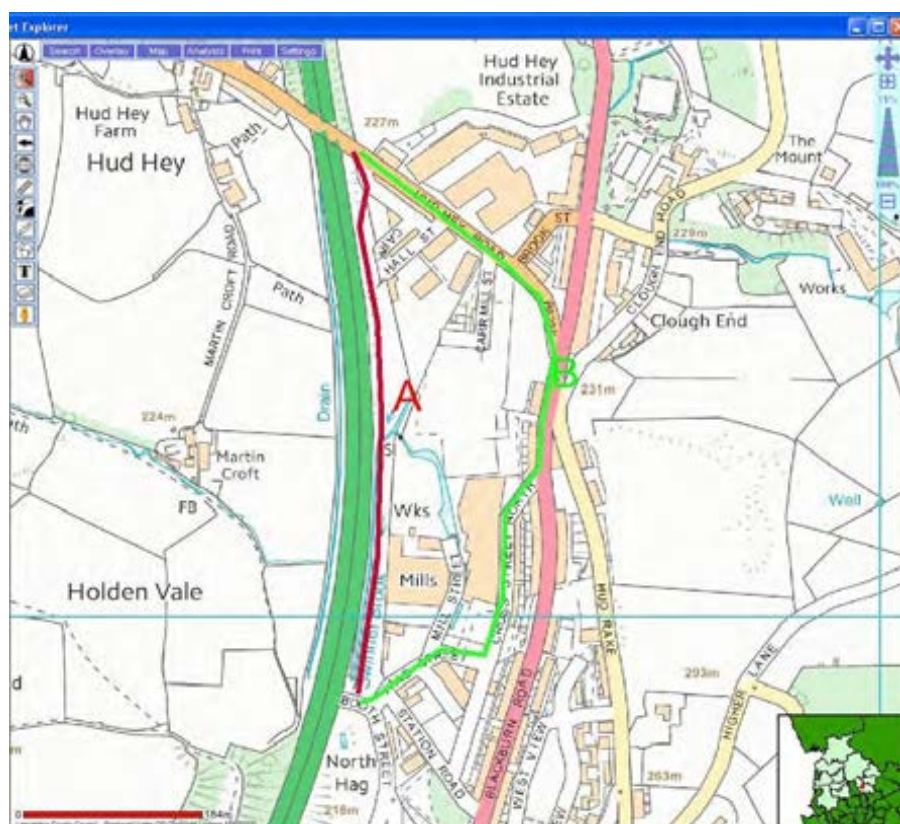


There are three options here. Option A marked in red would be the best solution in terms of delivering an easy to use attractive route. It would involve bench cutting a totally new route through an area of woodland and across some open fields. Option B marked in green may be the easiest option if the factory owners were agreeable. This would involve fencing off a corridor between the two factories along the route of the old railway line. Given the nature of the chemical works however this may not be acceptable from a risk assessment point of view. The third option C marked in orange would involve making use of existing highway.

Section 5 - Hud Hey to Booth Street (0.57km, Amber, 2018/19)

The route marked with the red line (A) is the preferred option. It would require construction of a new route alongside the dual carriageway. This strip of land is

currently unused and a relatively pleasant route could be constructed especially if complimented with some planting. If this route is not achievable, option B in green would be possible following existing highways. The section on Blackburn Road would be far from ideal though, see photo below.



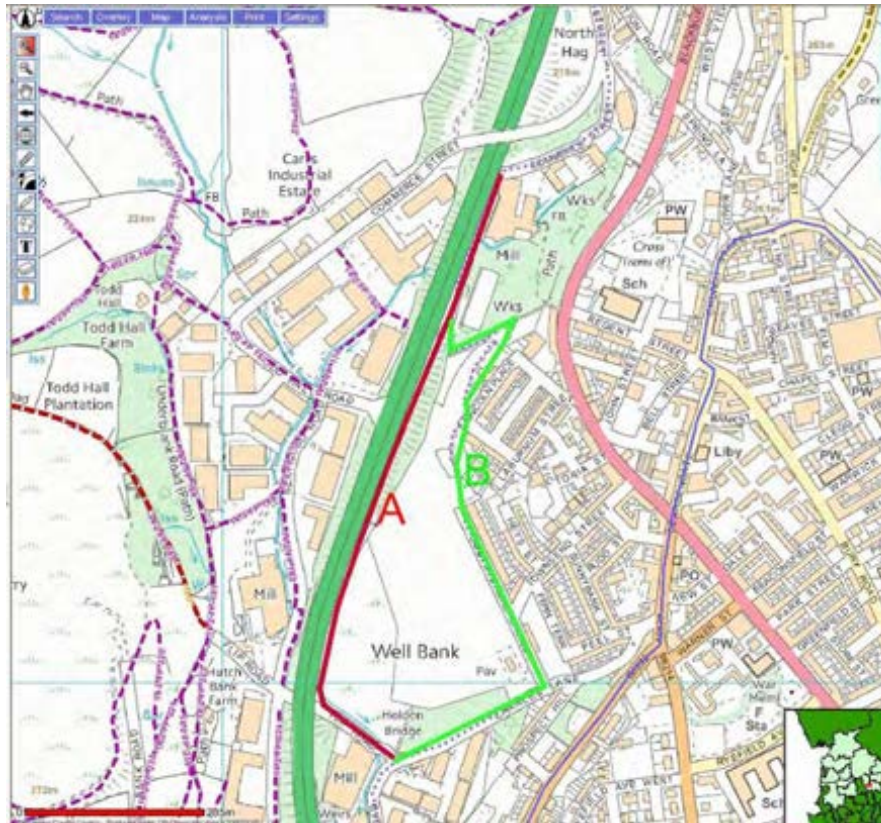
Blackburn Road is narrow with on street parking and can get quite busy.

Section 6 - Booth Street to Commerce Street (0.35km, Amber, 2018/19)

There are two options here. Route A marked in red makes use of existing roads which are relatively quiet. The legal status of the southern section of Commerce Street needs to be investigated and has been disputed in the past, as there is currently no recorded public right of way. Route B would involve constructing a completely new trail across land which is currently owned by the Highways Agency.

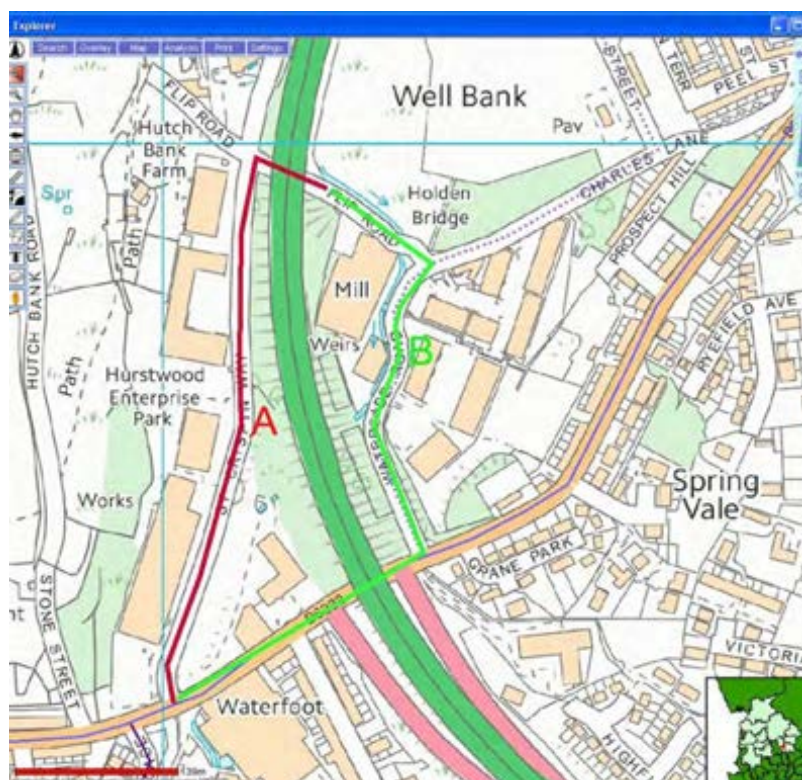


Section 7- Well Bank (0.73km, Amber, 2018/19)



Route A marked in red would involve the construction of a new track alongside the dual carriageway. The land is owned by Highways Agency and RBC. Part of the route would require removal of some trees but this is through an unmanaged overgrown area of woodland so the impact should be minimal. There is also a gradient to overcome as the route nears Holden Bridge but there is enough space to create a suitable ramp. Route B would require users to negotiate a very steep slope although a link here would create a useful connection from nearby housing areas, even if route A is achieved as well.

Section 8 - Flip Rd to Grane Rd (0.51km, Amber, 2016/17)



Route A is the preferred option along a relatively quiet road but there is an issue with on street parking. Route B is on existing roads but they are relatively busy



Route A - quiet road but a lot of on street parking for adjacent workplaces.

There may be opportunity to consult with businesses in this location as part of the Local Sustainable Transport fund work in 2015/16.



Option B would have to run alongside and cross Grane Rd, a very busy route between Blackburn and Haslingden. Finding a safe solution to this section will be challenging.

Section 10 - Helmshore Viaduct (0.37km, Amber, 2016/17)



Route A follows the viaduct which is owned by Railpaths Ltd with the intention of it forming part of a cycleway network. However, there are potential maintenance issues to resolve.

Route B is an option here dropping down to Holcombe Rd for about 320mtrs and then rejoining the disused railway line through the museum grounds although this road is quite narrow and can be busy.

Section 14 – Irongate Lane (0.63, Amber, 2015/16 & 16/17).

The preferred option (A) along this section is to upgrade the existing public footpath from the River Ogden Bridge, through Raven Shore to the former railway line at Irongate Lane. Ideally, this may involve some land acquisition to flatten out gradients on the rise up from the river but in the short term this section could just be resurfaced in as an alternative.



The remainder of Route A is on private land but work could be undertaken under the purpose of maintaining/ improving an existing right of way without necessarily requiring landowners approval.

Route B follows the line of an existing footpath along the River Ogden but could be expensive as it involves widening and surfacing the existing path and in some locations may require works to strengthen the river bank.

Route B would also involve a short, very steep climb up to the former railway line which is likely to require cyclists to dismount so probably not suitable.

Route C involves using the length of the existing railway formation from Bridge End across Ogden Viaduct and then up to Irongate Lane (see photo to left below). This route has the advantage of being relatively flat but would require the construction of access ramps at either end. The western section of the route is in private ownership so an agreement with the landowners would be required including a section where a private, miniature railway line has been constructed (see photo to right below). To the east of Ogden Viaduct along the railway cutting there are current drainage issues which require resolving.



Sections 15 & 16 – Irwell Vale (0.55km, Green, 2016/17 & 17/18) and Lumb Viaduct (0.15km, Amber, 2016/17 & 17/18).

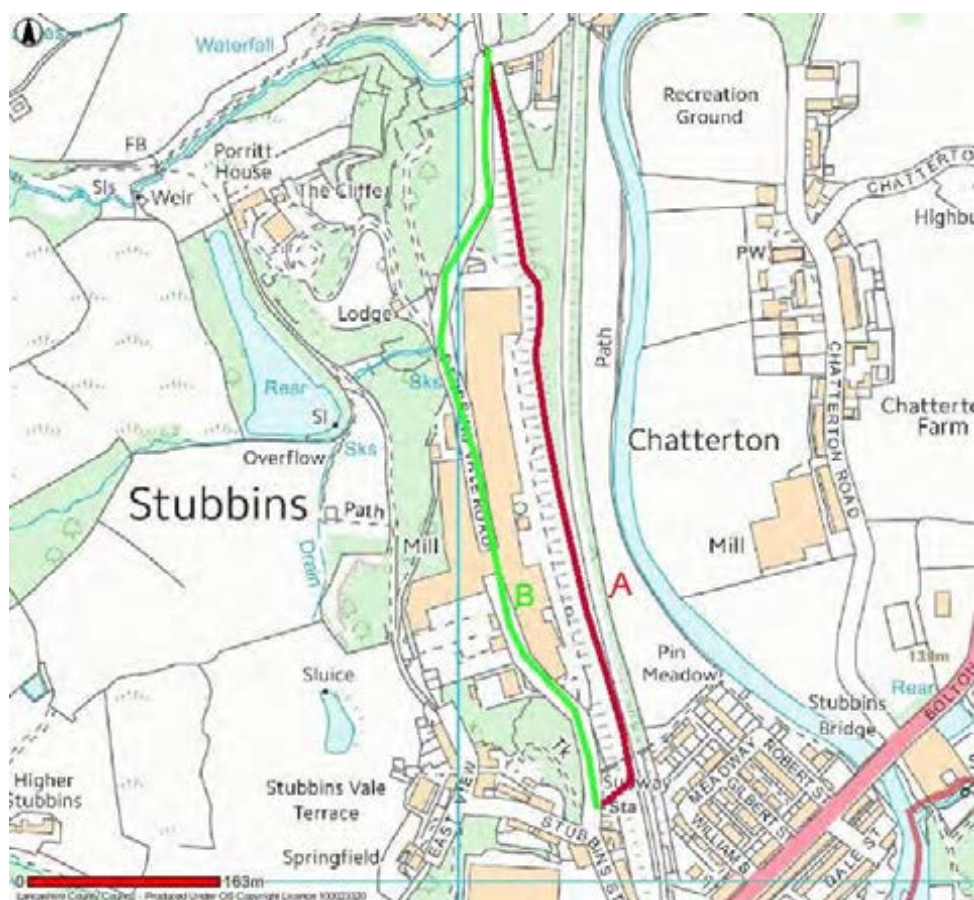


Irwell Vale and Lumb Viaduct are assessed together as one section as there is no viable option for accessing each section individually. The preferred Route A involves the construction of a new ramp down from Irongate Lane to the bottom of the former railway cutting. From here the route is flat along the former railway line and across Lumb Viaduct. There are issues with drainage along this section which will need to be resolved and it is also a designated Biological Heritage Site. The Lumb Viaduct section involves crossing a significant, Grade 2 listed structure where maintenance arrangements will need to be resolved with the owners Railpaths, part of Sustrans.



The alternative Route B uses the existing signed NCN6 route but this has very steep gradients down to Milne Street from the railway line (see image opposite) and back up to the railway from the rear of Meadow Park.

Route B uses some private roads (although they are public footpaths) and the two sections to Milne Street and alongside the River Irwell require resurfacing.

Section 19 - Strongstry – Stubbins (0.66km, Amber, 2018/19).

The preferred option for this section of the route (A) is to continue from the end of the existing cycleway, across the bridge at Strongstry and along the former railway formation which is on an embankment here. An extension to a nearby factory blocks the railway line in one location so ramps down and back up to will be needed. The route is on private land owned by Voith so agreement will be required with the landowners. A muddy desire line already exists along this section but this needs widening and surfacing, with some tree clearance necessary.



The alternative Route B uses the existing signed National Cycle Route 6 along Stubbins Vale Road. The northern section of this road has recently been resurfaced and is relatively quiet but as you head south it passes through the Voith factory yard – (see photo opposite).

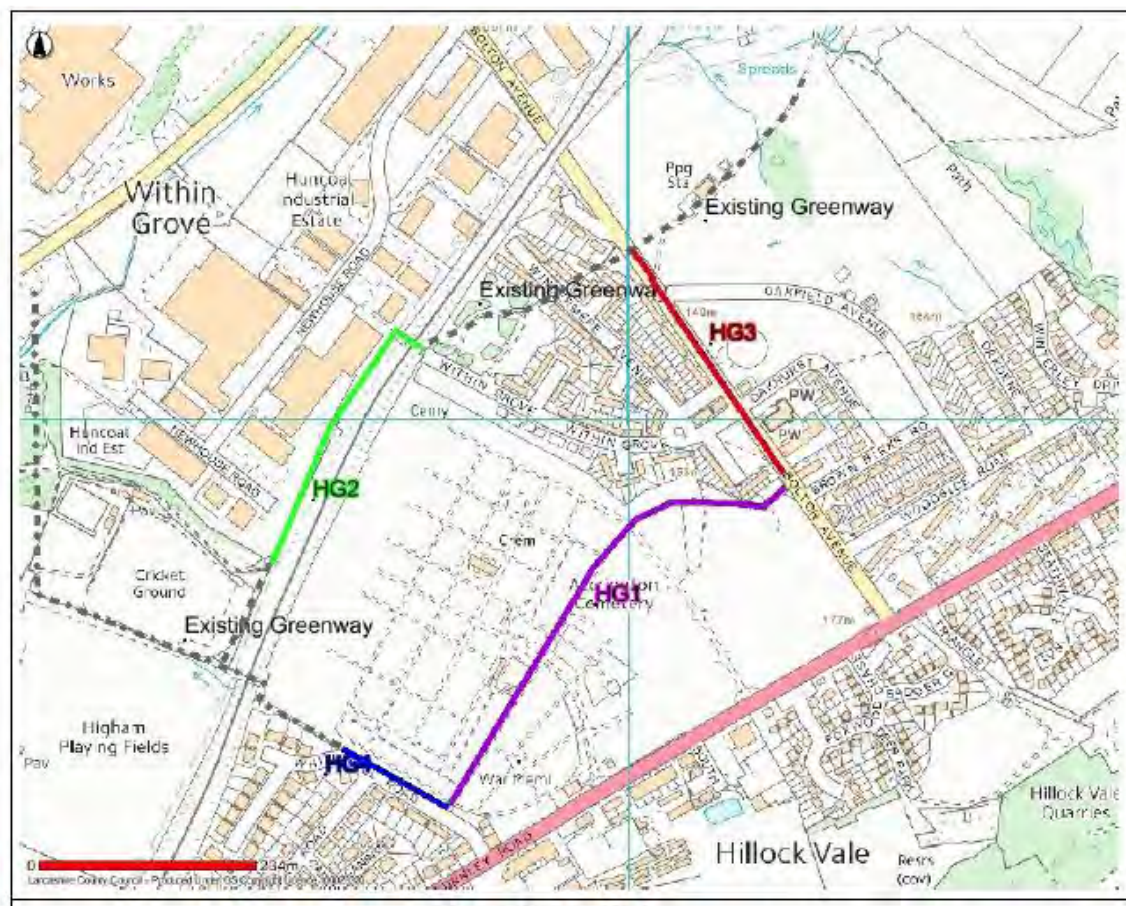
This is far from ideal for cyclists and pedestrians as it is used by HGV's.

Route 3 – Huncoat Greenway (Sections 1-4).

Total length- 1.43km

Mitigated Risk Rating – Green (S1) and Amber (S2, S3 & S4),

Proposed year for delivery 2015/16 (S1) 2016/17 (S3) and 2018/19 (S2 & S4).



An option appraisal has already in effect been undertaken on the whole of this scheme with the green line (HG2) above being the preferred route. However, this route crosses private land and we are aware from previous discussions with landowners that this may not be achievable until the later years of the programme. This is a route that would require a new path construction along its length and there are also construction issues to overcome with overhead powerlines in this location.

In the shorter term, the purple route through Accrington Cemetery (purple route) would connect the missing sections of the greenway via Whitewell Rd to the west (blue route) and Bolton Avenue to the east (red route). This would require some work to create a new entrance onto Bolton Avenue but minor resurfacing of an existing path along the remaining section through the cemetery.



Although this would connect to the existing Greenway, Bolton Avenue (red route) is not ideal for cyclists as it has a gradient and is used by HGV's accessing Whinney Hill and Huncoat Industrial Estate.

An alternative solution in this location could involve a new crossing of Bolton Avenue and then access along the quieter Brown Birks Road and Oakfield Avenue.



To the west of the cemetery, although Whitewell Road (Blue route) is quiet and can currently be used by cyclists, it is poorly surfaced, half of it in private ownership and is not an adopted highway. Ideally this would require improving with new surfacing and drainage but the adoption issues would need resolving.

Appendix F – Revised Economic Appraisal and Value for Money Assessment

Lancashire County Council

East Lancashire Strategic Cycle Network

**Technical Report: Economic Appraisal & Value
for Money Assessment**

May 2015

Document Control Sheet

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Version 15; March 2013

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Client: Lancashire County Council **Project No:** B2237505
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1.1 Background

This report documents the findings of an economic assessment of the East Lancashire Strategic Cycle Network, comprising four packages of cycleway improvements which make up the funding bid prepared on behalf of Lancashire County Council by Jacobs.

This assessment work was commissioned by Lancashire County Council to ascertain the likely Benefit Cost Appraisal and Gross Value Added (GVA) generated by the scheme. This analysis is required to support the formulation of a five case business case submission to the LEP and to assess the value for money of the scheme; along with potential wider economic benefits that could be generated for residents and businesses in the locality.

Whilst Benefit Cost Appraisal is the traditional approach to assessing the merit of transport schemes, GVA analysis seeks to complement standard transport appraisals where these have already been produced. The wider economic impacts of the proposed transport schemes are particularly important to understand in terms of the potential benefits for the locality, and in the context of supporting the funding bid for the scheme from the Local Growth Fund, as well as the Government's economic growth agenda.

Both are included in this assessment, but are kept separate in line with DfT guidance on the Value for Money (VfM) case.

1.2 Overview of Schemes

Four schemes have been appraised which together comprise the wider East Lancashire Strategic Cycle Network, the results of which are outlined in this report. These have been specifically identified to 'fill the gaps' of the existing network, supporting existing infrastructure and providing additional connectivity to the national cycle network. Should the four elements of the wider scheme be given funding, this will provide a strategic 'backbone' network from which future funding will be sort, in stages, to further supplement the network.

The four schemes which have been appraised are:

- *Scheme A:* Cycle access mitigation measures to Huncoat Greenway;
- *Scheme B:* Upgrading of the existing National Cycle Network (NCN6) route between Accrington and Ramsbottom;
- *Scheme C:* Corridor improvements to the Valley of Stone Cycleway; and
- *Scheme D:* The Weaver's Wheel Cycleway Improvement package.

As a recognised priority within the East Lancashire Highway and Transport Masterplan and subsequently Lancashire's Strategic Economic Plan, the Weavers Wheel is being designed to deliver a fully signed, regionally important cycle network around Blackburn. This is aimed at helping to transform the perception of cycling and inspire residents and visitors of all ages to undertake more trips by bike whether for employment, education or leisure purposes. In this regard, the Weaver's Wheel scheme bares many conceptual similarities with the recently approved Preston Guild

Wheel scheme and it is expected that, given the similarities, the Weaver's Wheel scheme will also replicate its success in engaging with the community in its design and continued, ongoing use.

The appraisal methodology adopted has been defined using WebTAG Unit A5-1 'Active Mode Appraisal' and is proportionate to the scheme costs, as per Transport for Lancashire's assurance framework.

The assessments have therefore been undertaken using proven methodologies and utilising the best evidence available at the time of writing.

A plan of each of the package of measures is included in Appendix A, with further details for each scheme provided below.

1.2.1 Scheme A: Huncoat Greenway Mitigation Measures

The Huncoat Greenway scheme aims to connect Huncoat and Accrington to the south west. Three sections are already in place, but the central part of the scheme is currently missing which significantly reduces its usefulness and limits the number of potential users. Completion of the scheme will provide cyclists and pedestrians with a safe, off road route avoiding the busy A679 Burnley Road and will connect housing to Huncoat Industrial Estate, other employment areas and nearby schools.

Proposed improvements included in the scheme are outlined in Table 1-A.

Table 1-A Scheme A: Proposed Improvements

| ID | Section | Distance (m) | Current Provision | Proposed Provision |
|----|--------------------|--------------|--|--|
| 1 | Cemetery Section | 580.0 | Route through Accrington Cemetery from Whitewell Rd connecting to Bolton Avenue. | Some resurfacing of main route, new boundary wall, entrance feature & signage. |
| 2 | Huncoat Ind Estate | 442.0 | Route to rear of Huncoat Industrial Estate on former railway sidings. | Path construction with potential retaining structures, some sections may need to be hand dug because of power lines. |
| 3 | Bolton Avenue | 260.0 | Highway connecting Accrington Cemetery to existing Huncoat Greenway. | New road crossing, white lines, signage, possible acquisition agreement to use adjacent land. |
| 4 | Whitewell Road | 150.0 | Unsurfaced highway between Accrington cemetery and existing cycleway | Surfacing of highway, signage, landscaping. |

1.2.2 Scheme B: NCN6 between Accrington and Ramsbottom

The National Cycle Route 6 scheme runs in a roughly north-south direction from Accrington in the north to the Lancashire border at Ramsbottom in the south. It is 12km in length and is based along the line of a former railway although this no longer exists in large sections, especially around Haslingden.

The completion of the route will help to complete a missing link of the Preston to Manchester longer distance route, but also play an important role in connecting Accrington, Haslingden and Ramsbottom. The route has potential to be used by commuters, especially to significant employment areas to the west of Haslingden. The scheme's linkages with the East Lancashire Railway and Irwell Sculpture Trail to the south mean it could also contribute towards the visitor economy.

Proposed improvements included in the scheme are outlined in Table 1-B.

Table 1-B Scheme B: Proposed Improvements

| ID | Section | Distance (m) | Current Provision | Proposed Provision |
|----|--------------------------|--------------|---|---|
| 1 | Woodnook Greenway | 2,641.0 | Existing off-road cycleway | Resurfacing of existing path, signage, drainage. |
| 2 | Baxenden - Rising Bridge | 1,090.0 | Former Railway now occupied by factory | Section of public footpath could be upgraded. Remainder requires construction of new route, possibly fencing |
| 3 | Rising Bridge Road | 800.0 | Existing residential street, relatively quiet. | New crossing/safe entry required to Baxenden Chemicals section, signage, white lines, possible shared use footway. |
| 4 | Hud Hey Road | 161.0 | Short section of highway including bridge crossing of A56. | New crossing and, signage, white lines, possible work to parapets. |
| 5 | Hud Hey - Booth St | 568.0 | Open field adjacent to A56. | New path construction, some of which is on poorly drained ground. Ramp up to Hud Hey St needed, possible need for a short bridge. |
| 6 | Booth St - Commerce St | 348.0 | Highway within industrial area. | Signage, works to improve highway. Possible alternative off-road route across Highways Agency land |
| 7 | Well Bank | 731.0 | Highway embankment next to A56, woodland area with some steep slopes. | New path construction, bench cutting, retaining walls, tree clearance, potential new bridge connecting to Flip Road. |
| 8 | Flip Rd - Grane Rd | 509.0 | Highways serving St Crispin industrial area. | Signage, segregated cycle lane - could be difficult with existing parking situation. |
| 9 | Swinneel & Ogden Brook | 894.0 | Small section of highway and existing cycle route through open space. | Signage, some resurfacing of existing cycleway especially on embankment slope up to viaduct. |
| 10 | Helmshore Viaduct | 366.0 | Viaduct for former railway past Helmshore Museum. | Works to parapets required, surfacing and potential pointing and other improvements to structures. |
| 11 | Bridge End Close | 464.0 | Existing cycleway behind Bridge End Close. | Surfacing improvements to existing path, signage. |
| 12 | Station Road | 206.0 | Residential Street and busier Helmshore Rd B6214. | Signage, white lines, widening of footway on Station Road, crossing of Helmshore Rd. |
| 13 | Snigg Hole | 274.0 | Access road and existing cycleway through open space | Resurfacing of existing access road, signage, possible new bridge across River Ogden. |
| 14 | Irongate Lane | 633.0 | Existing largely unsurfaced path accessing farms. | Resurfacing required, additional land needed in climb up from River Ogden, signage, drainage works. |
| 15 | Irwell Vale | 546.0 | Former railway cutting with ramp up to Irongate Lane and informal footpath. | Signage, new path construction, drainage works. |
| 16 | Lumb Viaduct | 145.0 | Grade 2 listed Railway Viaduct across River Irwell. | Works to parapets and possibly decking of bridge, new surfacing. |
| 17 | Lumb Mill | 443.0 | Existing Cycleway (part of NCN6) along former railway. | Signage, surfacing improvements, other environmental improvements. |
| 18 | Alderbottom - Strongstry | 536.0 | Existing Cycleway (part of NCN6) along former railway. | Signage, surfacing improvements, drainage works likely, possible works to bridge, other env. Improvements. |
| 19 | Strongstry - Stubbins | 663.0 | Former railway embankment and bridge over highway at Strongstry. | Signage, tree clearance, path construction, works to cast iron bridge, new ramp down embankment. |

1.2.3 Scheme C: Valley of Stone

The Valley of Stone is a 16.5km long route from Rawtenstall in the west to the Lancashire border with Rochdale at Healey Dell. It is a largely off-road route following a former railway line and when completed will provide a viable sustainable travel alternative to the A671, A681 and A6066 main roads which run along the valley. The route will connect the settlements of Rawtenstall, Waterfoot, Bacup and Whitworth as well as many employment sites along the valley.

Proposed improvements included in the scheme are outlined in Table 1-C.

Table 1-C Scheme C: Proposed Improvements

| ID | Section | Distance (m) | Current Provision | Proposed Provision |
|----|--|--------------|---|--|
| 1 | Rawtenstall Station to Hill End Lane | 1,670.0 | Mixture of road and pavement. | Signage, line marking, some minor repairs to surface of road. |
| 2 | Hill End Lane to Visitor Centre | 930.0 | Off-road, existing cycleway. | Resurfacing, road crossings with coloured tarmac. |
| 3 | Buckhurst Plant Gap | 650.0 | New section required to bypass plant hire company which has built on railway line. | Construction of new route; either by moving fence line or bench cutting in to hillside. |
| 4 | Buckhurst to Tunnels | 575.0 | Section on-road. some resurfacing required. | Repairing tarmac on some quiet roads and line marking & signage |
| 5 | Tunnels and Bridge | 560.0 | This section needs a new bridge and two disused railway tunnels restoring in addition to surface tarmacking. | Construction of new bridge, reopening and restoration of tunnels, tarmacking of route. |
| 6 | Thrush Tunnel to Blackwood Road. | 900.0 | Currently stone surfaced track. | Tarmacking of existing route. |
| 7 | Blackwood Road to Holme Street | 870.0 | Two options to be explored. | Dependent on final route chosen. |
| 8 | Ormerods Gap | 450.0 | Two options for this section: one on-road/footway following existing highway; second would involve construction of a new track alongside the river. | Dependent on final route chosen. |
| 9 | Futures Park to Stubby Lee Park | 870.0 | Build new track from Futures Park up to Stubby Lee Park. | Bench cut zig-zag up slope in to park. |
| 10 | Stubby Lee to New Line Car Park | 600.0 | Sections of this route are currently subject of a DMO: entire length of route may have bridleway status. | Assuming DMO is successful, diversion of the route and then new track construction. |
| 11 | Britannia Greenway | 1,200.0 | Currently stone surfaced track which washed out three years ago due to a bank collapse blocking a drain. Well used and very attractive section. | Some drainage works and resurfacing to required standard. |
| 12 | Old Lane to Oak Street | 1,890.0 | Existing cycleway built around 10 years ago to a high standard. Needs some repairs and bringing up to required standard. | Repairs and adding features of interest. |
| 13 | Oak Street to Station Road (Slingco gap) | 1,100.0 | Existing cycleway in need of some improvements. Need to find route through Slingco factory. | Repairs and addressing some issues around adverse gradients. Negotiating route around the Slingco Factory. |

| | | | | |
|----|-----------------------------------|---------|---|--|
| 14 | Station Road to Massey Croft | 1,800.0 | Follows the road which currently has a 20mph limit in place. | Road markings and possibly moving cycleway on to footway if appropriate. Road safety audit required. |
| 15 | Massey Croft to Lancashire Border | 2,400.0 | Follows current concessionary cycleway. Stone surfaced track passes through Healey Dell Nature Reserve. | Resurfacing with tarmac and associated drainage works. |

1.2.4 Scheme D: Weavers Wheel

The Weavers Wheel scheme will be 92km in length in total, offering cyclists, as well as walkers, a fully signed interconnected network of routes crossing rich and varied landscape linking existing and planned employment, retail and residential land use with green open space. The outer 'wheel' will be approximately 25km in length and will provide an attractive and rewarding journey whichever direction is chosen. A series of six 'spokes' into Blackburn town centre will also be fully signed from the 'wheel' enabling people to benefit from direct access to local employment, education, retail and leisure opportunities by bike. Covering all points of the wheel over 15KM of cycling 'spokes' will be fully signed into the town centre.

Further details on the circular, spokes and spurs sections of the Weavers Wheel scheme are included in Table 1-D, Table 1-E and Table 1-F respectively.

Table 1-D Scheme D: Proposed Improvements: Circular Sections

| ID | Section | Distance (m) | Current Provision | Proposed Provision |
|----|----------|--------------|---|---|
| 1A | See Plan | 1,100.0 | Uses the established NCN Route 6 through Witton Park to Tower Road (existing off road non segregated cycleway), the newly completed Crescent Cycle Link within Witton Park (existing off road non segregated cycleway) to link through onto the road network. A short on-road section to the Canal on Cherry Tree Lane. | Signage and line marking some minor repairs to surface of road. Build out provisions to deter parking from key areas |
| 1B | | 5,000.0 | Off road using the Leeds Liverpool canal on surfaced towpath to link from Cherry Tree to Aqueduct Road. A short on road section links onto the off road section of the River Darwen Parkway running from Ewood Cycles building through to Fore Street Lower Darwen. | Minor pot hole repair, signage improvements and anti-skid materials. Less experienced cyclists given directions to use Traffic Signal Controlled Junction at Ewood Cycles. Replacement of sub-standard gates with "K-barriers" at entrance and exit points onto the canal |
| 1C | | 1,000.0 | Short on road section to link to another section of the established off-road non segregated route of the River Darwen Parkway. This section by-passes the steep on road section of Stopes Brow. | Signage and line marking. Surfacing to established off road route. Improved marking layout at the Blackamoor Road junction with the inclusion of Advanced Stopping Area and lead in taper. |
| 1D | | 1,100.0 | On-road section | Signage and line marking |

| | | | | |
|----|----------|---------|--|---|
| 1E | See Plan | 400.0 | On-road section | Guide Roundabout is signalised under a separate scheme - cycle crossing provisions incorporated and off road shared cycleway / footway sections. |
| 1F | | 2,400.0 | A mixture of segregated footway / cycleway and off-road non segregated | Signage and improvements to road markings on segregated sections. The Arran Trail will have vegetation cut back to re-introduce the full width of the cycleway. Improvements will be made to the surface course which is badly damaged over a considerable length. |
| 1G | | 2,900.0 | Short on-road section linking to St Ives Road via a Public Footpath (cycles to be pushed). Long section of on-road non segregated to link Accrington Road through to the red Lion Roundabout at Whitebirk. From Whitebirk Roundabout the Leeds Liverpool Canal Towpath is used to link through to Trident Way. | On-road sections to benefit from road marking and improved signage. Investigations are underway into the upgrading of the existing public footpath to a cycle track. The Red Lion Roundabout will be negotiated using shared footways and new, uncontrolled crossing facilities. Further signage and pothole repairs along the Leeds Liverpool Canal section. |
| 1H | | 1,600.0 | Off-road segregated non segregated cycleway. | Improved signage |
| 1I | | 1,900.0 | On-road section | Improved signage |
| 1J | | 1,800.0 | On-road section | Provision of off road shares, un-segregated cycleway/footway on existing footways and through Service Roads running adjacent to the main road. Improvements to signing, lining and carriageway surfacing repairs. Toucan crossings / cycle signals will be installed at the Pleckgate Road and Lammack Road junctions |
| 1K | | 400.0 | On-road section | Improved signage and road markings |
| 1L | | 6,300.0 | A mixture of on-road section with an off-road non segregated section leading back through Witton Park to the Start point at the hub | Improved signage and road markings. |

Table 1-E Scheme D: Proposed Improvements: Spoke Sections

| ID | Section | Distance (m) | Current Provision | Proposed Provision |
|----|----------|--------------|-------------------|--|
| 1 | See Plan | 2,500.0 | On-road | Anti-skid treatments to steps leaving the canal. Signage and line marking some minor repairs to surface of road. Investigation into incorporating some parts of the route into existing 20mph zones. |
| 2 | | 2,700.0 | On-road | Resurfacing, road crossings with coloured tarmac at Holmbrook Close. Pot hole repairs and cutting back of vegetation |
| 3 | | 2,900.0 | On-road | Improved signs and road markings to link the spoke onto an established off road cycle route leading to Blackburn Railway Station. |
| 4 | | 2,500.0 | Canal towpath | Pothole repairs to canal towpath sections. Edge repairs to be discussed with the Canal Authorities. |
| 5 | | 3,200.0 | On-road | Improved signage and lining to on road sections. Widening of Public footpath linking through from Whalley New Road to the Pleckgate Areas. |
| 6 | | 1,600.0 | On-road | Signing and road marking improvements |

Table 1-F Scheme D: Proposed Improvements: Spurs Sections

| ID | Section | Distance (m) | Current Provision | Proposed Provision |
|----|----------|--------------|-------------------|--|
| A | See Plan | 2800.0 | On-road | Improvements to traffic signal junction at Preston New Road / Yew Tree Drive to introduce cycle facilities. Provision of shared un-segregated cycleway/footways where possible and the introduction of improvements to signing and lining over the on-road sections. |
| B | | 3,800.0 | On-road | Lining and Signing improvements |
| C | | 2,200.0 | On-road | Lining and Signing improvements |
| D | | 2,100.0 | On-road | Lining and Signing improvements |
| E | | 2,000.0 | Canal Towpath | Pothole repairs to canal towpath sections. Edge repairs to be discussed with the Canal Authorities. Improvements to signage. |
| F | | 2,800.0 | On-road | Lining and Signing improvements |
| G | | 2,400.0 | On-road | Lining and Signing improvements. Minor junction improvements to incorporate cycle facilities. |
| H | | 2,900.0 | Canal Towpath | Pothole repairs to canal towpath sections. Edge repairs to be discussed with the Canal Authorities. Signage Improvements. |

1.3 Overview of Approach

An economic assessment has been undertaken to appraise the transport user costs and benefits of the scheme, including potential mode share benefits (determined by the DfT Marginal External Costs (MEC) approach), health benefits and work absenteeism benefits created by the scheme.

A separate GVA assessment has been undertaken on proposed development that the scheme supports, or GVA arising from productivity uplifts, in order to assess the potential wider economic benefits that the transport scheme could generate.

Jacobs has ensured that the GVA calculation undertaken accords with both HM Treasury Green Book guidance on additionality, and the principles and procedures adopted in WebTAG, in line with a traditional economics approach.

As a result, all GVA values presented are net figures (inclusive of locally orientated deadweight, displacement, leakage and substitution factors, where applicable). This ensures that GVA values presented comply with national best practice, only present the **additional** benefits thereby derived for UK Plc, and only focus on the *net change* in overall economic welfare.

All values, whilst presented annually, have also been presented in 2010 prices and values, discounted in line with Treasury and WebTAG standards.

1.4 Report Contents

The remainder of this report is structured as follows:

- Cost Estimates;
- Economic Assessment Methodology;
- GVA Methodology;
- Results; and
- Summary & Conclusion.

2

Cost Estimates

2.1 Introduction

This section of the report outlines the cost estimates included in the assessment provided by the Client, Lancashire County Council.

2.2 Cost Estimates

Costs were provided in January 2015, however are presented in 2014 prices and are summarised in Table 2-A.

Table 2-A Scheme Cost Estimates

| Scheme | Construction | Land | Preparation | Supervision | Totals |
|------------------|-------------------|-----------|-----------------|-------------|-------------------|
| Huncoat Greenway | £391,932 | £0 | £20,628 | £0 | £412,560 |
| NCN^ | £3,434,344 | £0 | £180,755 | £0 | £3,615,099 |
| Valley of Stone | £2,346,968 | £0 | £123,525 | £0 | £2,470,493 |
| Weaver's Wheel | £1,198,241 | £0 | £90,190 | £0 | £1,288,431 |
| Total | £7,371,485 | £0 | £415,098 | £0 | £7,786,583 |

The above scheme costs are inclusive of risk, maintenance and optimism bias, and therefore differ from the total capital funding sought.

The above costs include the following assumptions:

- Scheme costs were provided by the Client, phased over a 3-year spend profile;
- An appropriate level of risk allowance (15%) has been included within the costs provided by Client, reflecting the scope and nature of the scheme;
- A 2% inflation has been applied to the costs, from the 2014 cost base to the first year of spend;
- Costs were adjusted from resource costs to market prices, applying an uplift of 19.1%;
- A 44% optimism bias has been applied to the costs for the purposes of the value for money assessment. This is in line with a Stage 1 scheme of this nature, as outlined in WebTAG Unit A1-2 'Scheme Costs'; Paragraph 3.5.6, Table 8, and highlighted in Table 2-B.
- No maintenance costs are included as part of the 30-year appraisal of the scheme.

Table 2-B Scheme Development Stages¹

| Category | Stage 1 | Stage 2 | Stage 3 |
|--|-------------------------------|--|----------------------------------|
| Local Authority and Public Transport Schemes | Programme Entry | Conditional Approval | Full Approval |
| Highways Agency Schemes | PCF Options Phase | Order Publication/ Works Commitment | Works Commitment |
| Railways | Grip Stage 3: Pre-feasibility | Grip Stage 4: Option selection | Grip Stage 5: Design development |

A full profile of the costs for each scheme is included in Appendix B.

¹ DfT WebTAG Unit A1.2 'Scheme Costs', January 2014

3.1 Introduction

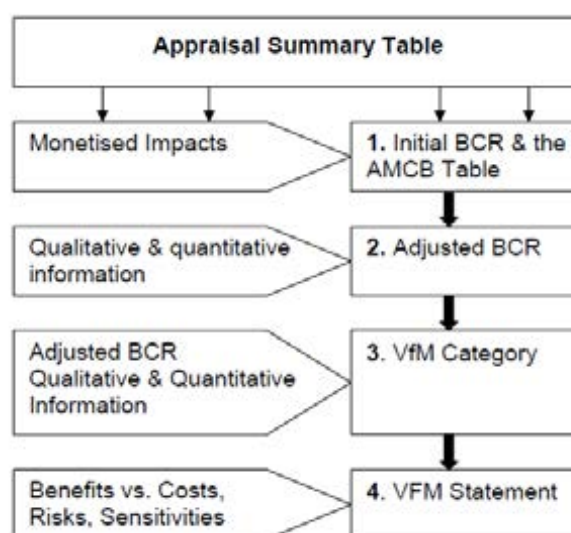
This section of the report outlines the methodology for quantifying transport user benefits arising from the proposed schemes.

3.2 Economic Appraisal and Value for Money

Benefit cost appraisal is the traditional approach to quantifying the costs or benefits of a transport intervention. The output Benefit Cost Ratio (BCR) from the assessment is therefore a prominent input into how a scheme intervention is appraised as part of the business case submission and supporting documentation.

Figure 3-A illustrates how the outputs from the economic assessment feeds into the appraisal process and 'Value for Money (VfM)' categories.

Figure 3-A Economic Assessment & VfM



Costs of the scheme have been provided by Lancashire County Council (the Client), as outlined in the previous section.

The output BCR from the benefit cost appraisal determines the VfM category the scheme falls within, as outlined below:

- poor VfM if the BCR is less than 1.0;
- low VfM if the BCR is between 1.0 and 1.5;
- medium VfM if the BCR is between 1.5 and 2.0;
- high VfM if the BCR is between 2.0 and 4.0; or
- very high VfM if the BCR is greater than 4.0.

3.3 Quantification of Scheme Benefits

The overall approach to economic appraisal has been informed by WebTAG Unit A5.1: *'Active Mode Appraisal'*, which outlines the methodology for appraising walking and cycling schemes.

This guidance is included in Appendix C of this report.

Chapter 3 of the guidance makes reference to the calculation of benefits for the various aspects impacted by a scheme, as is outlined in the following sub-sections. In practical terms, the approach is briefly outlined below:

- Quantification of transport user demand currently using existing cycle infrastructure, calculated from the infrastructure catchment population and local mode share.
- The existing transport user demand has been benchmarked against locally available count data for the area. The scheme's forecasted impact on demand has been benchmarked against other local and similar case studies, which have been subject to monitoring and evaluation over the past 3-4 years. Further details on these existing schemes is included in Section 3.4;
- Quantification of provision of new infrastructure;
- Quantification of per-user time savings;
- Calculation of annual 'Value of Time (VoT)' savings;
- Calculation of demand change/uplift from the package of schemes;
- Quantification of vehicle kilometers (vehKM) abstracted from the highway network;
- Monetisation of VoT and vehicle kilometer savings for design and forecast years;
- Interpolation of monetised benefits (including health benefits) between the forecast years, and then over a 30-year appraisal period, with no demand after the final modelled year; and
- Discounting benefits to a 2010 cost base for comparison in the economic appraisal.

Chapter 4 of the WebTAG guidance outlines the treatment of benefits for reporting, which is generally consistent with other types of transport schemes.

Quantification of the various elements of the cycle scheme is further discussed in the following sub-sections.

3.3.1 Quantification of Demand

In order to quantify the number of potential users of the four proposed schemes, a catchment area population was extracted using Office for National Statistics (ONS) Middle Super Output Areas (MSOA) for each of the four schemes. Population figures are based on the 2011 census geographies and were uplifted using NTEM 2013 growth rates to 2014.

Using ONS population statistics, the population was extracted for the location and the 'Travel to Work' mode share applied to produce the total number of regular travellers within the catchment area travelling by cycle.

Figure 3-B to Figure 3-E illustrates the catchment area identified for each of the four schemes. Catchment areas have been selected based on the surrounding settlement boundary, population centres and origin-destination movements of land uses served by the proposed cycle improvements.

Figure 3-B Scheme A: Huncoat Greenway Demand Catchment Area

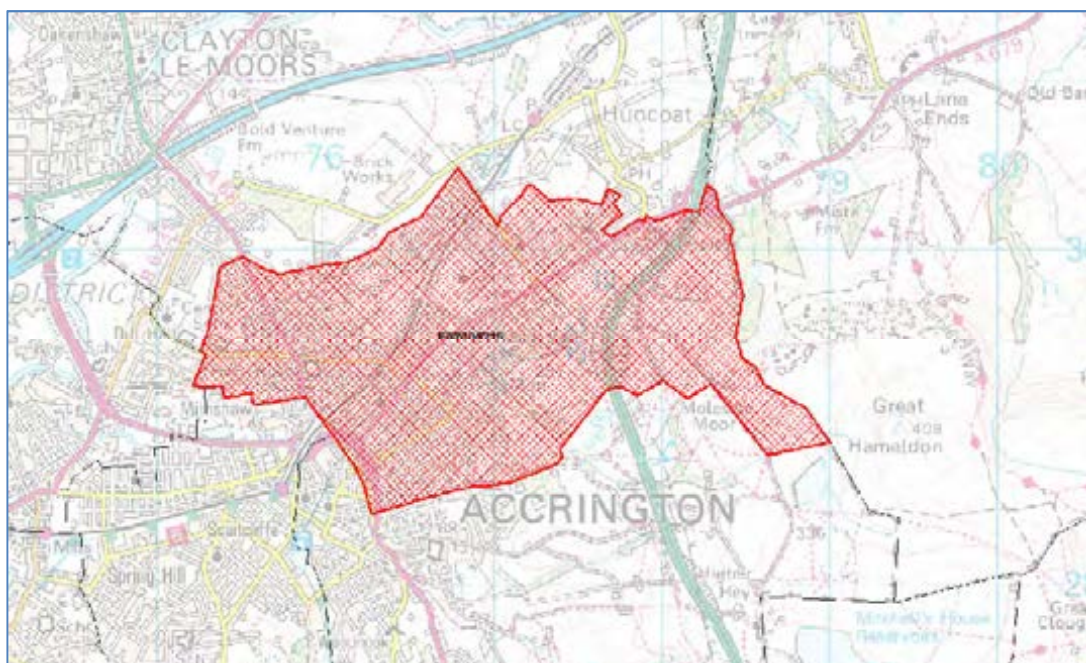


Figure 3-C Scheme B: NCN 6 Demand Catchment Area

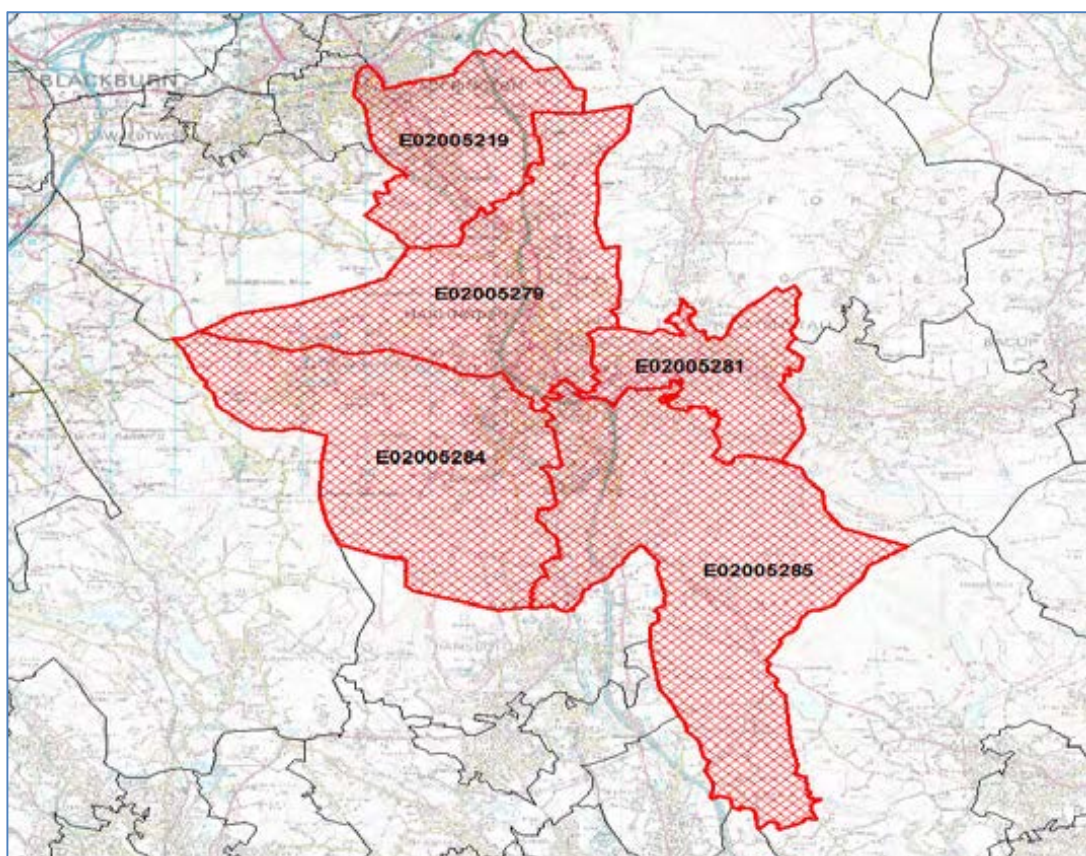


Figure 3-D Scheme C: Valley of Stone Demand Catchment Area

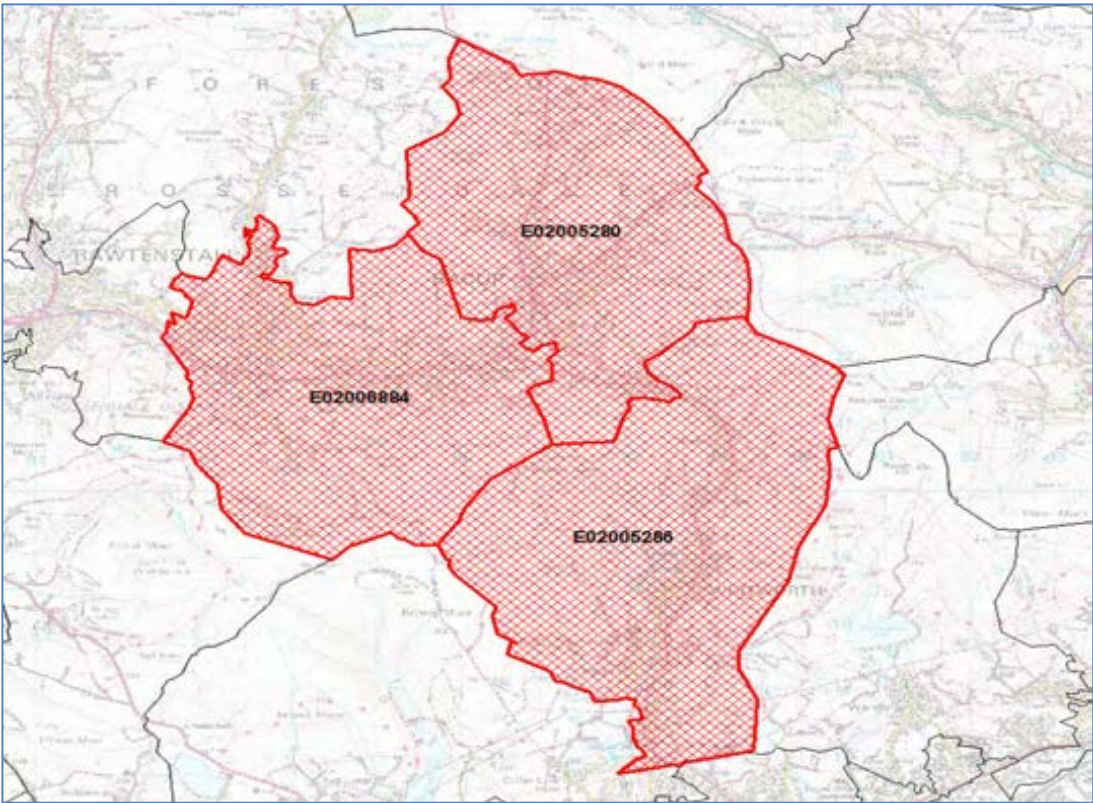
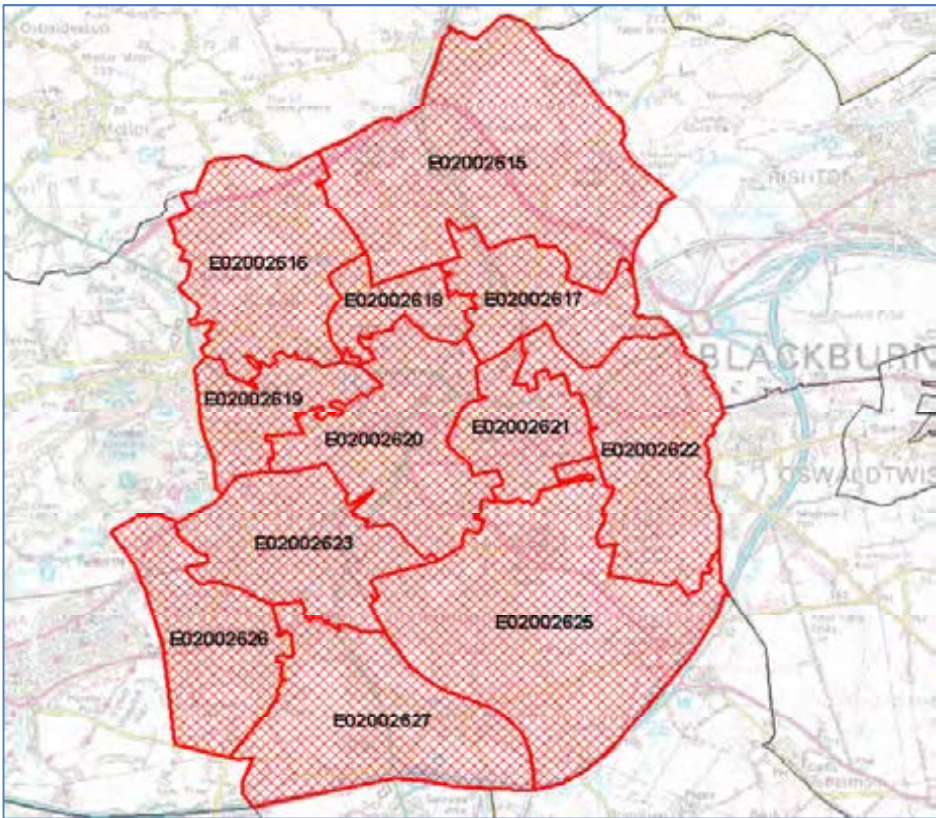


Figure 3-E Scheme D: Weavers Wheel Demand Catchment Area



3.3.2 Calibration of Demand

Whilst the demand extracted from the ONS data provided a base level of cycling demand in the area, additional data was supplied to better estimate the quantum of existing cyclists using actual cycling routes, which was taken from available cycling count data from similar schemes in each area.

To factor the demand calculated from the ONS areas presented in the previous section to the observed demand on existing similar schemes, a 'permeability factor' was used. This factor allows the number of people travelling by cycle in the locality to be adjusted to the number of observed cycle trips, as evidenced from similar cycle schemes.

Table 3-A Calculation of Permeability Factor

| Scheme | Huncoat Greenway | NCN6 | Valley of Stone | Weaver's Wheel |
|---|------------------|--------------|-----------------|----------------|
| Calculated Daily Demand (Trips) | 313 | 403 | 282 | 1,196 |
| Observed trips on similar schemes within locality from count data | 50-160 | 70-385 | 60-95 | 60-550 |
| Averaged, observed Daily Trips | 109 | 101 | 70 | 269 |
| Permeability Factor | 35.0% | 25.0% | 25.0% | 22.5% |

Table 3-A outlines the level of input demand, observed data and calculated permeability factor, utilised to ensure levels of demand on each route are suitable, and evidenced against counts on similar nearby cycling routes; rather than just relying on census data and mode share evidence alone.

3.4 Forecasting Demand Growth

Growth in demand has been forecast based on observed growth in cycle traffic from similar schemes within the locality.

However, given that variation in growth can vary considerably between schemes, several sensitivity tests have been undertaken to ensure the outputs of the economic assessment are robust

Levels of growth have been taken from three similar schemes, including:

- Sustrans Connect2 Bury scheme, where the percentage uplift in cycling was observed as 15% (May/June 2010 to May/June 2012 intercept survey results).
- Sustrans Connect2 Padiham scheme, where the percentage uplift in cycling was calculated as 69%.
- Guild Wheel circular route (Preston), where automatic counters have recorded an increase in daily counts of 129% (over a 5-year period from 2009 to 2013).

Given these levels of observed demand growth in similar ‘hub and spoke’ and corridor routes, the applied uplifts are considered reasonable for the four elements that make up the East Lancashire Strategic Cycle Network.

Table 3-B outlines the growth levels applied and the additional sensitivity tests undertaken. The higher growth rates have been reduced to 60% and 120% respectively, rather than 69% and 129%.

A 30% demand increase test has also been applied; given this is close to the level of demand uplift obtained from the DfT cycling demonstration town evidence, and may be thought of as a nationally evidenced level of demand uplift.

Table 3-B Demand Cycle Growth

| Scheme | Huncoat Greenway | NCN6 | Valley of Stone | Weaver's Wheel |
|--------|------------------|------|-----------------|----------------|
| 15% | ✓ | ✓ | ✓ | ✓ |
| 30% | ✓ | ✓ | ✓ | ✓ |
| 60% | ✓ | ✓ | ✓ | ✗ |
| 120% | ✗ | ✗ | ✗ | ✓ |

To ensure a robust and conservative VfM appraisal has been undertaken, the lowest observed growth figure (i.e. 15%) has been used in the core scenario for deriving the BCR for the East Lancashire Strategic Cycle Network scheme.

Based on the local evidence, additional sensitivity tests have been undertaken in which higher rates of growth have been applied at 30% and 60%. For the Weaver's Wheel scheme, 120% growth has been tested as a third scenario, based on observed demand uplift evidence from the Guild Wheel scheme in Preston.

3.4.1 Quantification of Journey Time savings

Journey time savings have been calculated for existing and new cycle transport users.

In addition, the introduction of the scheme is expected to shift transport users from private car to cycle modes, therefore leading to an increase in available capacity on the highway network.

Where new cycle users are derived as a result of the above, the ‘rule of a half’ has been applied.

3.4.2 Quantification of vehicle kilometre savings

The reduction in car vehicle kilometres travelled, derived from an average trip length (from ONS) for commuting trips for the locality, has been quantified to calculate the savings in terms of ‘Marginal External Cost (MEC)’ savings resulting from the scheme.

The quantified MEC savings follow the guidance outlined in WebTAG Unit A5.4 ‘Marginal External Costs’, which is also included in Appendix D for reference. The

MEC savings provide a series of benefits including decongestion, noise, air quality, carbon, safety and reduced infrastructure investment; each of which can be monetised.

The MEC savings have been calculated for the scheme opening year (2016) and interpolated between then and the scheme forecast year (2031), utilising weighted averages. Weighted average congestion areas have also been used, reflecting the dispersed impact the scheme will have on the wider highway network.

3.4.3 Quantification of Absenteeism and Health/Mortality Benefits

The quantum of existing car users shifting mode to cycle has been calculated and associated health benefits monetised. WebTAG databook (COBALT 1) values have been used (in line with guidance) to monetise health/mortality benefits.

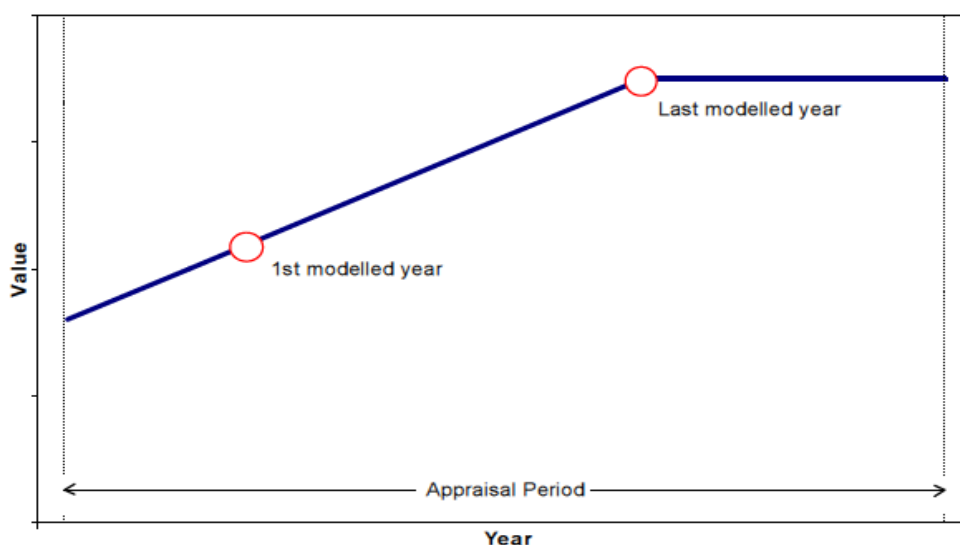
Work absenteeism benefits have also been calculated as a function of the number of new cyclists travelling more than 30 minutes. This methodology reflects research² which has shown that there is a direct, monetised benefit between those cycling more than 30 minutes and a reduction in work absenteeism. This stream of benefits has been calculated based on the proportion of cyclists that travel by bike for more than 15 minutes each way; using ONS data to inform this percentage within the health and absenteeism benefits calculations.

3.5 Forecasting Benefits over the Appraisal Period

The aforementioned journey time savings, MECs, work absenteeism and mortality benefits for the opening and forecast years have been monetised for each time period, using standard WebTAG VoT's, as outlined in guidance and the latest November 2014 (release 1.3b) WebTAG databook.

These benefits were then factored up to an annual period to produce a yearly benefit for the scheme (for the opening and forecast years) and interpolated and projected over a 30-year appraisal period, as illustrated in Figure 3-F. No growth was applied after the 2031 forecast year

Figure 3-F Interpolation & Projection of Benefits



² World Health Organisation (2014) 'Health Economic Assessment Tools for walking and cycling: Methodology and User Guide'

Benefits have then been discounted to 2010 values, as outlined in standard Treasury Green Book appraisal methodology, using standard discounting rates (3.5% for 30 years).

The cost of the scheme in question has then been compared with the projected benefits over 30-years to produce the overall BCR which will inform the VfM category of the scheme.

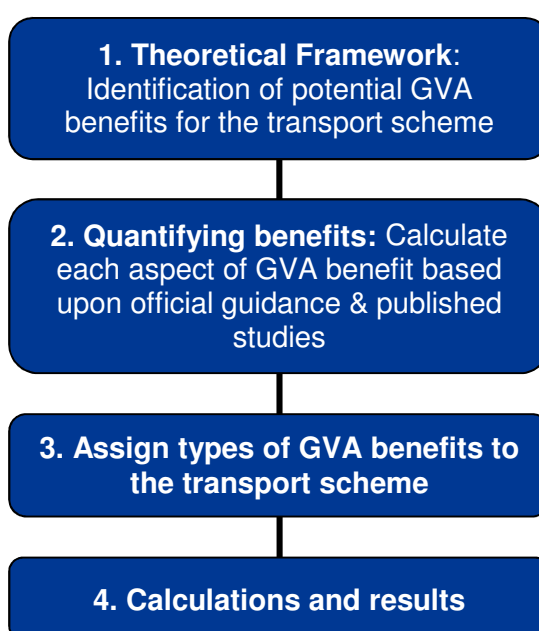
4.1 Introduction

This section of the report outlines the methodology used to quantify the potential GVA benefits of the schemes.

4.2 Methodology

The analysis of GVA impacts has been undertaken in the following stages, as summarised by Figure 4-A below.

Figure 4-A Theoretical Framework



4.3 Theoretical Framework

The GVA analysis seeks to complement standard transport appraisals. The wider economic impacts of the proposed transport schemes are particularly important to understand in terms of the potential benefits for the locality and the Government's economic growth agenda.

GVA measures the total value of goods and services; i.e. economic activity. In its simplest terms, it is therefore GDP at a local/regional level, minus indirect taxation.

There are usually three ways to measure GVA; via an output approach, an income approach, or an expenditure approach. All three methods should provide the same value in theory; however, in a transport context it is very difficult to determine what the expenditure or additional goods produced directly from a transport scheme will be.

Thus, in a transport context, almost all valuations of GVA across the locality are based on an income approach, as we are able to quantify the amount of new development 'unlocked', the net additional jobs created from the introduction of a transport scheme or the productivity uplifts of the scheme.

As a result, there are three key mechanisms by which transport schemes produce GVA benefits; based on the number of new jobs created, the enhanced productivity of existing jobs and the direct cost savings brought about by a transport scheme, as summarised below:

1) More jobs = Additional wages = greater GVA

2) Higher productivity = Higher profits = greater GVA

3) Direct cost savings = greater GVA

In the case of the first mechanism, transport acts as an enabler of growth by allowing additional jobs to be accommodated in a certain location thanks to enhanced transport links and transport capacity. These jobs are therefore not created by the transport scheme itself, but are supported by the increase in accessibility facilitated by the scheme; i.e. the jobs and GVA benefits are (to varying proportions) dependent³ on the transport scheme.

In the case of the second mechanism, transport can make existing jobs more productive by reducing journey times, enhancing connectivity and productivity. The reason for this is that a reduction in journey times increases the accessibility of the employment area, which may lead to a better match in terms of labour supply and demand, allowing greater efficiencies to be made through agglomeration tendencies of entrenched economic actors.

Direct cost savings in terms of travel also provide benefits to residents and businesses.

4.4 GVA Benefit Quantification

Unlike standard transport appraisals, there is not a single methodology for estimating the impacts of a scheme on GVA, employment, or similar measures of the performance of the real economy. In contrast, methodologies vary considerably across studies.

All methods reviewed have particular strengths and weaknesses, and thus there is no single definition of what GVA is or how it should be quantified.

In this context, Jacobs has developed a bespoke methodology based on the above definition and a consistent theoretical framework for assessing additional economic benefits. This ensures that the scheme is subject to a standard process and quantification of benefits; albeit using local variations in GVA per job, and local transport capacity constraints overcome by the implementation of the transport intervention.

Not all benefits outlined are to be applied to each scheme. The GVA components that are to be applied from the framework for the assessments have considered the following sources of benefits, as outlined in the following sub-sections.

³ "Dependent development" for housing is defined using the WebTAG definition as follows:

"New housing is dependent on the provision of some form of transport scheme if, with the new housing, but in the absence of any transport scheme, the transport network would not provide a reasonable level of service on the highway networks to existing and/or new users."

4.4.1 Productivity Impacts & Direct Cost Savings

The first type of GVA benefits, which arise from productivity benefits as a result of reduced journey times, is quantified by estimating productivity uplifts for the affected transport users. Transport users have been divided into two categories: freight and car users. A different methodology is used for each category.

(a) Private Car Movements

In this case, a simple productivity elasticity for reductions in journey time has been used to estimate the percentage productivity uplift⁴.

(b) Freight Movements

Productivity benefits from reduced journey times for vehicles transporting freight have been obtained by applying the reduction in journey time to an average productivity value of time for freight⁵, corresponding to £56/hr. This value is only been applied to heavy goods vehicles.

As part of this assessment, the strategic cycle network is identified to have productivity & direct cost saving benefits from the reduction in vehicle traffic created by the scheme.

However, it should be noted that the values are not generally significant, and are not directly incorporated into the BCR for the scheme.

4.4.2 Development & Regeneration

The second type of GVA benefit, which is generated by unlocked development and employment, is quantified by multiplying the number of jobs expected to be generated by GVA per employee (by district area, and employment sector, using standard industrial categories).

GVA per employee is calculated as a weighted average of employment by industry and GVA per employee in each industry. There are ten industry categories which have been obtained from the ONS.

In line with the HCA guidance, deadweight, leakage displacement, substitution and economic multipliers have been applied to 'net-off' benefits that would otherwise happen, producing the final benefits that occur as a direct result of the transport intervention being appraised. Estimates for these effects have been derived from Ekosgen's analysis of typical values, from a Study undertaken for the SEP in 2014 for the LEP, but typically result in additionality factors reducing the total level of GVA benefit by 70%, on average, across Lancashire.

⁴ ITS(2010) *Review of methodologies to assess transport's impacts on the size of the economy*

⁵ AECOM (2012) *Wider Economic Benefits - Humber Bridge Study*

As part of this assessment, no directly dependent development was identified with the Client.

However, future development and economic growth is accommodated by a reduction in traffic on the network as a result of the scheme. This released capacity is able to support future economic growth by new development trips, unlocking potential additional GVA benefits as a result.

However, this is presented as both net values, and as supporting additional evidence, and is not added directly to the BCR for the scheme.

4.4.3 Conformity with WebTAG

The annual benefits obtained in the GVA analysis have been forecast over a 30-year period to be consistent with the BCR outputs derived, and which already incorporate user benefits of the scheme, and associated cost savings. A 30-year assessment period is also more reflective of the operational lifespan of this type of transport intervention.

The GVA results are streamed over 30-years, and we have applied a 2% per annum GVA growth rate (for the first 30 years of the scheme, from 2016 to 2046) in line with WebTAG and the WebTAG data book on forecast real increases in productivity over time.

The benefits over the 30-year period have then been discounted using a 3.5% discount rate for 30-years hence, as defined in WebTAG, and in line with Treasury Green Book guidance. Displacement, leakage and substitution have then been applied, as previously discussed.

Finally, the accuracy of the results is highly dependent on the assumptions that have been employed in the analysis. As the analysis is to some extent limited by data availability – such as the absence of a full suite of local count data – conservative assumptions have been made where necessary, as outlined in the previous sections of this report.

5.1 Introduction

This section presents the results from the economic appraisal and GVA analysis.

5.2 Economic Appraisal Results

5.2.1 Combined Package

Table 5-A outlines the outputs of the benefit cost analysis for the scheme, split out by each of the three sensitivity tests as outlined in Section 3.4, with benefits calculated over a 30-year appraisal period.

Table 5-A Combined Package Results in £'s

| Combined | Growth Sensitivity | | |
|---|--------------------|------------------|------------------|
| | 15% | 30% ^b | 60% ^c |
| Noise | £68 | £82 | £105 |
| Local Air Quality | £4 | £4 | £6 |
| Greenhouse Gases | £363 | £440 | £564 |
| Journey Quality (Congestion) | £10,412 | £12,595 | £16,135 |
| Physical Activity - Mortality | £17,958,841 | £21,193,487 | £26,535,961 |
| Physical Activity - Absenteeism | £225,456 | £275,291 | £349,390 |
| Infrastructure Maintenance | £61 | £73 | £94 |
| Accidents | £964 | £1,166 | £1,494 |
| Economic Efficiency | £1,826,585 | £2,179,367 | £2,770,399 |
| Wider Public Finances (Indirect Taxation) | -£1,746 | -£2,115 | -£2,711 |
| Present Value of Benefits (PVB) | £20,021,008 | £23,660,390 | £29,671,438 |
| Broad Transport Budget | £7,175,159 | £7,175,159 | £7,175,159 |
| Present Value of Costs (PVC) | £7,175,159 | £7,175,159 | £7,175,159 |
| Net Present Value (NPV) | £12,845,848 | £16,485,231 | £22,496,278 |
| Benefit to Cost Ratio (BCR) | 2.79 | 3.30 | 4.14 |

The economic appraisal results for the combined elements of the scheme show that even with the lowest demand growth rate applied, the overall scheme produces a positive BCR in the **high** VfM category (i.e. BCR >2), as per WebTAG guidance.

Full economic assessment appraisal results for each of the four components of the East Lancashire Strategic Cycle Network scheme are included in Appendix E.

⁶ For the Weaver's Wheel Scheme, growth is 60%

⁷ For the Weaver's Wheel Scheme, growth is 120%

5.3 Low Cost Option Tests

Additional tests were undertaken on a 'Low Cost' option for the schemes. Low cost option testing was undertaken on all schemes, where specific segments of the routes were downgraded from off-road improvements to on-road improvements. These were formulated from reviewing the schedule of improvements within each of the sections, and identifying the elements with the highest risk associated with them.

In most instances, this was where there was the potential for land ownership issues which would mean that the land would not be available, necessitating the need to continue to route on-road.

The following Table 5-B to Table 5-E outlines the cost savings to the scheme capital costs applied for the Low Cost options.

Table 5-B Huncoat Greenway Low Cost option

| Huncoat Greenway | Preferred Option Cost | Low Cost Option Cost | Cost Reduction |
|---------------------------|-----------------------|----------------------|----------------|
| Huncoat Industrial Estate | £188,000 | £100,000 | £88,000 |
| Total | £188,000 | £100,000 | £88,000 |

Table 5-C NCN6 Low Cost option

| National Cycle Route 6 | Preferred Option Cost | Low Cost Option Cost | Cost Reduction |
|--------------------------------|-----------------------|----------------------|-----------------|
| Baxenden - Rising Bridge | £220,000 | £50,000 | £170,000 |
| Hud Hey - Booth Street | £93,000 | £40,000 | £53,000 |
| Booth Street - Commerce Street | £41,750 | £25,000 | £16,750 |
| Well Bank | £206,454 | £50,000 | £156,454 |
| Helmshore Viaduct | £50,000 | £40,000 | £10,000 |
| Irwell Vale | £233,000 | £100,000 | £133,000 |
| Lumb Viaduct | £50,000 | £25,000 | £25,000 |
| Strongstry | £200,000 | £40,000 | £160,000 |
| Total | £1,184,204 | £460,000 | £724,204 |

Table 5-D Valley of Stone Low Cost option

| Valley of Stone | Preferred Option Cost | Low Cost Option Cost | Cost Reduction |
|-------------------------------|-----------------------|----------------------|-----------------|
| Buckhurst Plant Hire | £119,000 | £70,000 | £49,000 |
| Tunnels & Bridge | £290,000 | £100,000 | £190,000 |
| Ormerod's Gap | £47,250 | £30,000 | £17,250 |
| Stubbylee - New Line Car Park | £220,000 | £30,000 | £190,000 |
| Total | £741,250 | £295,000 | £446,250 |

Table 5-E Weaver's Wheel Low Cost option

| Valley of Stone | Preferred Option Cost | Low Cost Option Cost | Cost Reduction |
|---------------------------|-----------------------|----------------------|----------------|
| Stopes Brow/ Rakes bridge | £115,000 | £85,530 | £30,270 |
| Total | £115,000 | £85,530 | £30,270 |

In addition to the cost revisions, to take into account the change in cycleway provision between the preferred and low cost options, demand growth was factored downwards, based on the proportion of distance of the element improvement downgraded from off-road to on-road. It has been assumed that no benefit is derived in terms of demand for the on-road sections, to represent a conservative appraisal.

Table 5-F outlines the adjusted growth rates applied to the low cost option tests.

Table 5-F Low Cost option Growth Rates

| Scheme | Adjusted Growth Rate | | |
|------------------|----------------------|-----------|------------|
| | 15% | 30% / 60% | 60% / 120% |
| Huncoat Greenway | 10.7% | 21.4% | 42.8% |
| NCN6 | 8.2% | 16.3% | 32.6% |
| Valley of Stone | 9.3% | 18.6% | 37.2% |
| Weaver's Wheel | 13.2% | 57.4% | 116.5% |

Table 5-G outlines the outputs of the benefit cost analysis for the low cost option, split out by each of the three sensitivity tests as outlined in Section 3.4, with benefits calculated over a 30-year appraisal period. Results are presented for the combined package as in Section 5.2.1 and therefore directly comparable.

This test also includes revision to the 'Willingness to Pay (WtP)' values for the scheme, where the value of the improvement from downgrading those sections of the East Lancashire Strategic Cycleway from off-road to on-road.

Table 5-G Low Cost Option (with reduced WtP values) Combined Package Results in £'s

| Total | Low Cost +WtP Option | | |
|---|----------------------|-------------|-------------|
| | 15% | 30% / 60% | 60% / 120% |
| Noise | £40 | £49 | £63 |
| Local Air Quality | £2 | £3 | £4 |
| Greenhouse Gases | £218 | £267 | £340 |
| Journey Quality (Congestion) | £6,204 | £7,611 | £9,675 |
| Physical Activity - Mortality | £8,711,974 | £10,245,757 | £12,620,363 |
| Physical Activity - Absenteeism | £130,706 | £160,366 | £203,852 |
| Infrastructure Maintenance | £36 | £44 | £56 |
| Accidents | £577 | £708 | £900 |
| Economic Efficiency | £893,773 | £1,090,024 | £1,379,654 |
| Wider Public Finances (Indirect Taxation) | -£1,053 | -£1,293 | -£1,644 |
| Present Value of Benefits (PVB) | £9,742,477 | £11,503,537 | £14,213,263 |
| Broad Transport Budget | £5,415,155 | £5,415,155 | £5,415,155 |
| Present Value of Costs (PVC) | £5,415,155 | £5,415,155 | £5,415,155 |
| Net Present Value (NPV) | £4,327,322 | £6,088,382 | £8,798,108 |
| Benefit to Cost Ratio (BCR) | 1.80 | 2.12 | 2.62 |

As can be seen, under this test, the appraisal results for the combined elements of the scheme show that under all growth scenarios, the overall scheme remains at a **high** VfM category (i.e. BCR greater than 2.00), as per WebTAG guidance, however this is substantially less than the preferred option. The low growth scenario falls to a medium VfM category, which further reiterates that the preferred option represents the best overall option.

5.4 GVA Results

The results of the assessment are presented in different GVA measures explained in Table 5-H.

Table 5-H Measures of GVA and discounting

| GVA measure | Explanation |
|---|--|
| Total GVA benefits over 30 years (undiscounted) | 30-year values are provided over the lifetime of the scheme and which align with the same period of analysis associated with traditional transport appraisals. This figure shows the total 30-year GVA benefits undiscounted in 2010 prices. |
| Annual GVA benefits averaged over 30-years (undiscounted) | An annual GVA benefit averaged over 30-years is also presented. This is presented in 2010 prices and is undiscounted. |

| | |
|---|--|
| Total GVA benefits over 30 years (discounted) | This figure shows total benefits discounted over 30-years in 2010 prices. Discounting takes into account the effect of inflation at 3.5% for the first 30-years, and then 3% for the remaining 30 years. |
| Annual GVA benefits in 2010 (discounted) | An annual GVA benefit averaged over 30-years is also presented. This is presented in 2010 prices and is discounted. |

The results of the GVA analysis are presented in Table 5-1. It should be noted that the preferred annual measure of GVA is highlighted in the final column.

Table 5-1 GVA Analysis Results

| Scheme | Sensitivity | Undiscounted total GVA (30 yrs, 2010 prices) | Annual GVA (2010 prices undiscounted) | Discounted total GVA (30 yrs, 2010 prices) | Annual GVA (2010 prices discounted) |
|---------------|-------------|--|---------------------------------------|--|-------------------------------------|
| A | 15% | £576,560 | £9,609 | £282,923 | £4,715 |
| | 30% | £632,314 | £10,539 | £182,246 | £3,037 |
| | 60% | £743,821 | £12,397 | £365,000 | £6,083 |
| B | 15% | £37,948 | £632 | £17,091 | £285 |
| | 30% | £44,154 | £736 | £19,886 | £331 |
| | 60% | £57,974 | £966 | £26,110 | £435 |
| C | 15% | £189,223 | £3,154 | £96,060 | £1,601 |
| | 30% | £214,366 | £3,573 | £107,993 | £1,800 |
| | 60% | £269,050 | £4,484 | £133,716 | £2,229 |
| D | 15% | £2,021,785 | £33,696 | £992,107 | £16,535 |
| | 60% | £2,812,918 | £46,882 | £1,380,323 | £23,005 |
| | 120% | £3,867,762 | £64,463 | £1,897,944 | £31,632 |
| Total Package | 15% | £4,787,195 | £79,787 | £2,223,133 | £37,052 |
| | 30/60% | £7,023,553 | £117,059 | £3,320,533 | £55,342 |
| | 60/120% | £10,259,001 | £170,983 | £5,036,232 | £83,937 |

The GVA analysis undertaken has shown that the East Lancashire Strategic Cycle Network scheme could generate an average annual return of **£55,342** in GVA uplift per annum in 2010 discounted prices. This represents a total of **£3.320 million** of GVA uplift over a standard 30-year appraisal period for the most central demand growth scenario.

6.1 Summary

This report documents the findings of an economic assessment of the East Lancashire Strategic Cycle Network, comprising four packages of cycleway improvements which make up the funding bid prepared on behalf of Lancashire County Council by Jacobs.

The economic appraisal is based on a calibrated approach which uses locally available cycle count data which has been benchmarked against the impacts of similar local cycle schemes which have been completed in recent years.

The scheme benefits calculated have followed standard approaches outlined in WebTAG guidance. Benefits calculated have been interpolated between the scheme opening year (2016) and the forecast year (2031). Standard WebTAG and Treasury Green Book approaches have been used to undertake the benefit cost appraisal, discounted to 2010 prices over a 30-year appraisal period.

A scheme cost of **£7.787 million** (in 2014 prices) has been used for the purposes of the economic assessment, which includes a 15% risk allowance, 44% optimism bias, and conversion to market prices. The scheme cost used in the economic assessment therefore differs from the total capital funding sought.

The economic appraisal has shown that the proposed scheme would provide benefits to existing transport users by reducing journey times, as well as having significant monetised health benefits.

In the absence of a singly recognised and adopted methodology for estimating GVA impacts, the GVA analysis has been undertaken using an evidence-led, theoretically consistent framework approach, based on available studies and parameters, as well as collaborative working with the Client.

The GVA analysis has quantified the additional benefits that would be generated from the proposed scheme which are attributable to the level of demand abstracted from the local highway network. The results are presented net of additional components, as required by the Green Book.

The results from the GVA analysis indicate that the scheme will have a positive impact on the local economy by releasing additional capacity on the highway network that could support additional development in the locality.

6.2 Conclusion

The economic appraisal results for the East Lancashire Strategic Cycle Network scheme show that even with the lowest demand growth rate applied, the overall scheme produces a positive BCR in the **high** VfM category (i.e. BCR >2), as per WebTAG guidance.

Low cost option and sensitivity testing has been undertaken on the scheme, to ensure that the VfM for the scheme is robust.

The Present Value Costs (PVC) and Present Value Benefits (PVB) for the package of schemes which constitute the East Lancashire Strategic Cycle Network is outlined in Table 6-A.

Table 6-A Combined Package Results

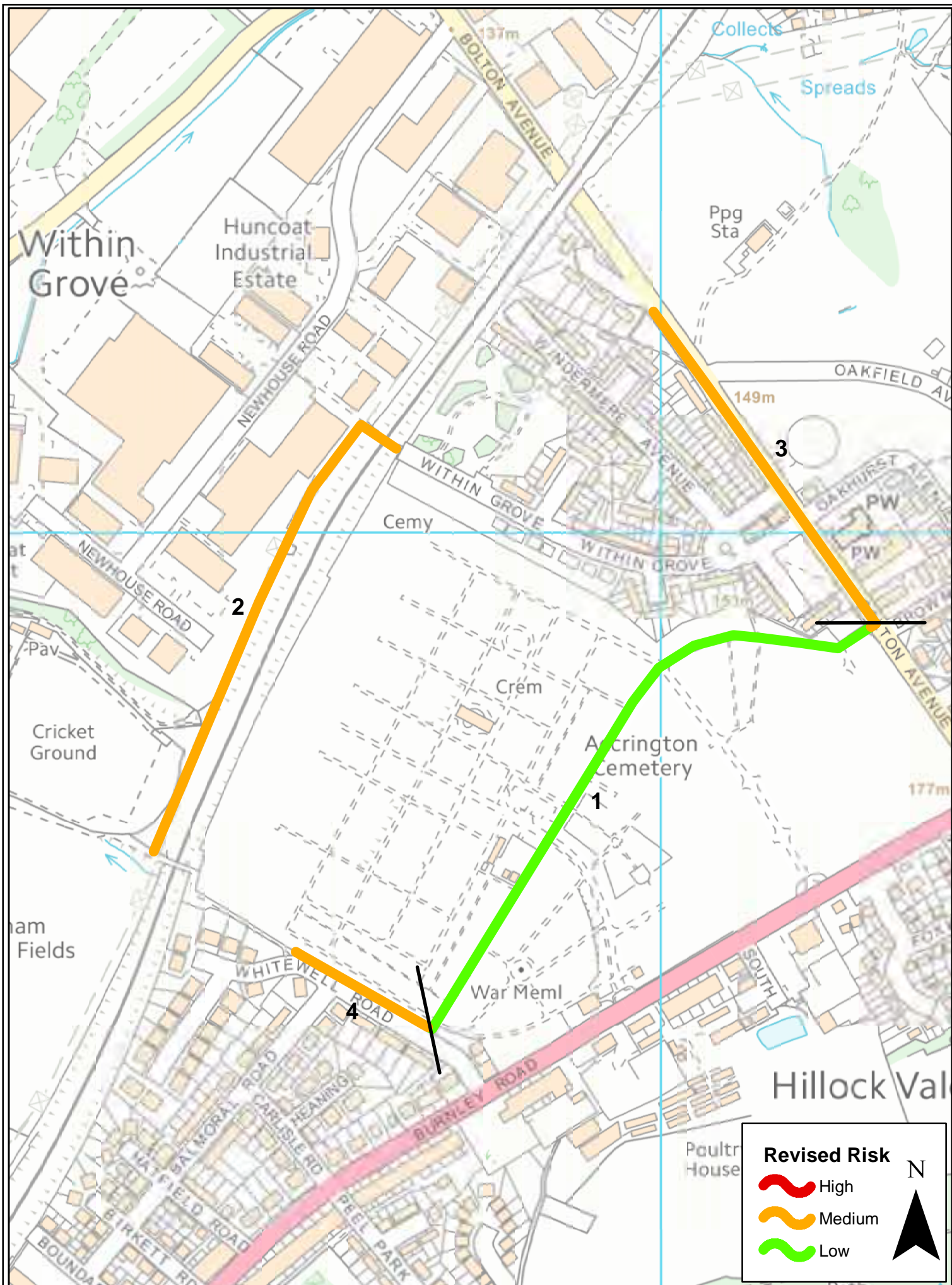
| Sensitivity | 15% | 30/60% | 60/120% |
|----------------------|-------------|-------------|-------------|
| Combined Package PVB | £20,021,008 | £23,660,390 | £29,671,438 |
| Combined Package PVC | £7,175,159 | £7,175,159 | £7,175,159 |
| Combined Package NPV | £12,845,848 | £16,485,231 | £22,496,278 |
| Scheme BCR | 2.79 | 3.30 | 4.14 |

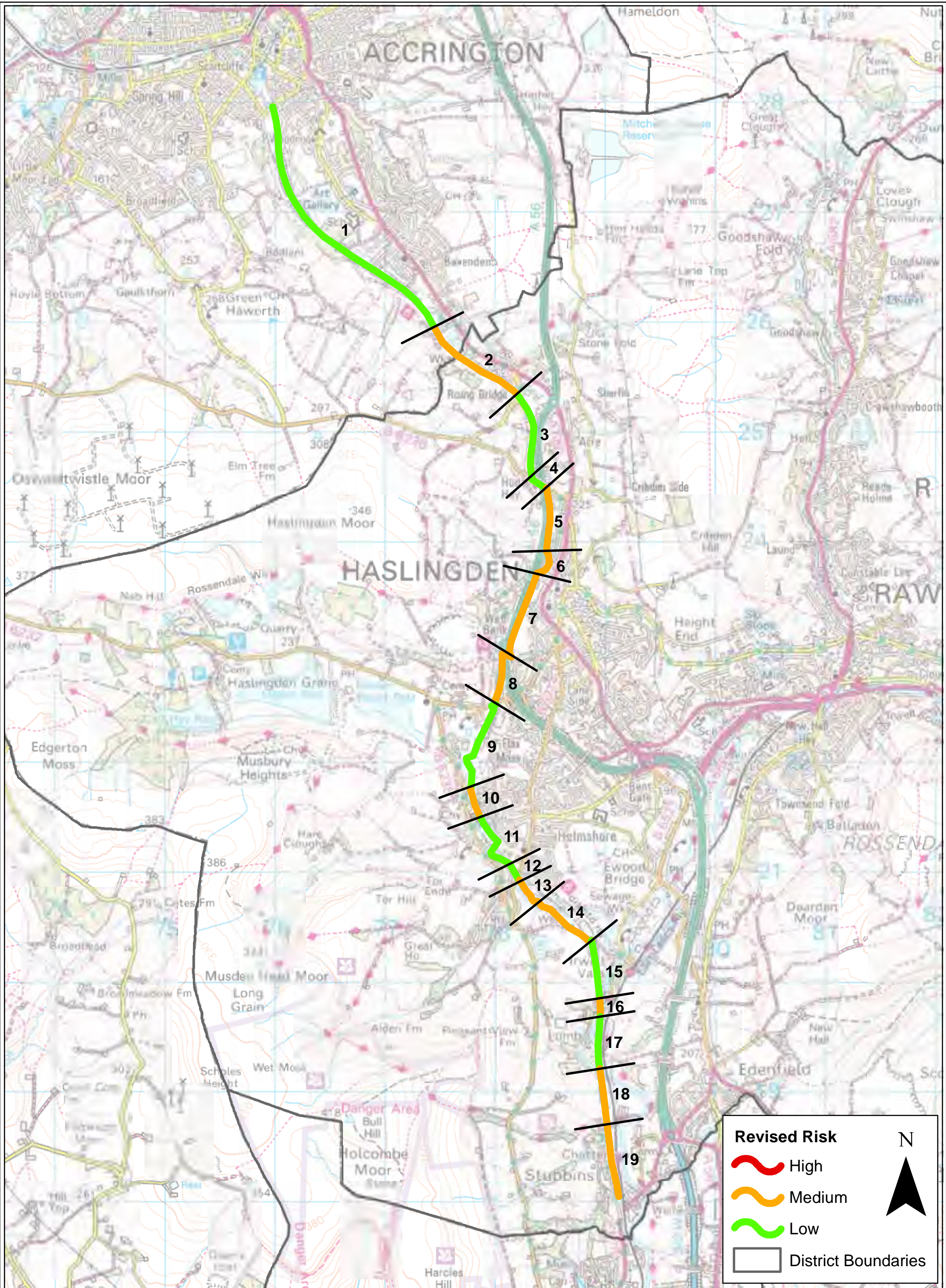
The scheme also provides additional benefits to the local economy. A net GVA benefit over the appraisal period of approximately **£55,342** per annum, averaged over a 30-year appraisal period for the low growth scenario has been calculated based on locally adjusted GVA values (in 2010 discounted prices, adjusting for additionality).

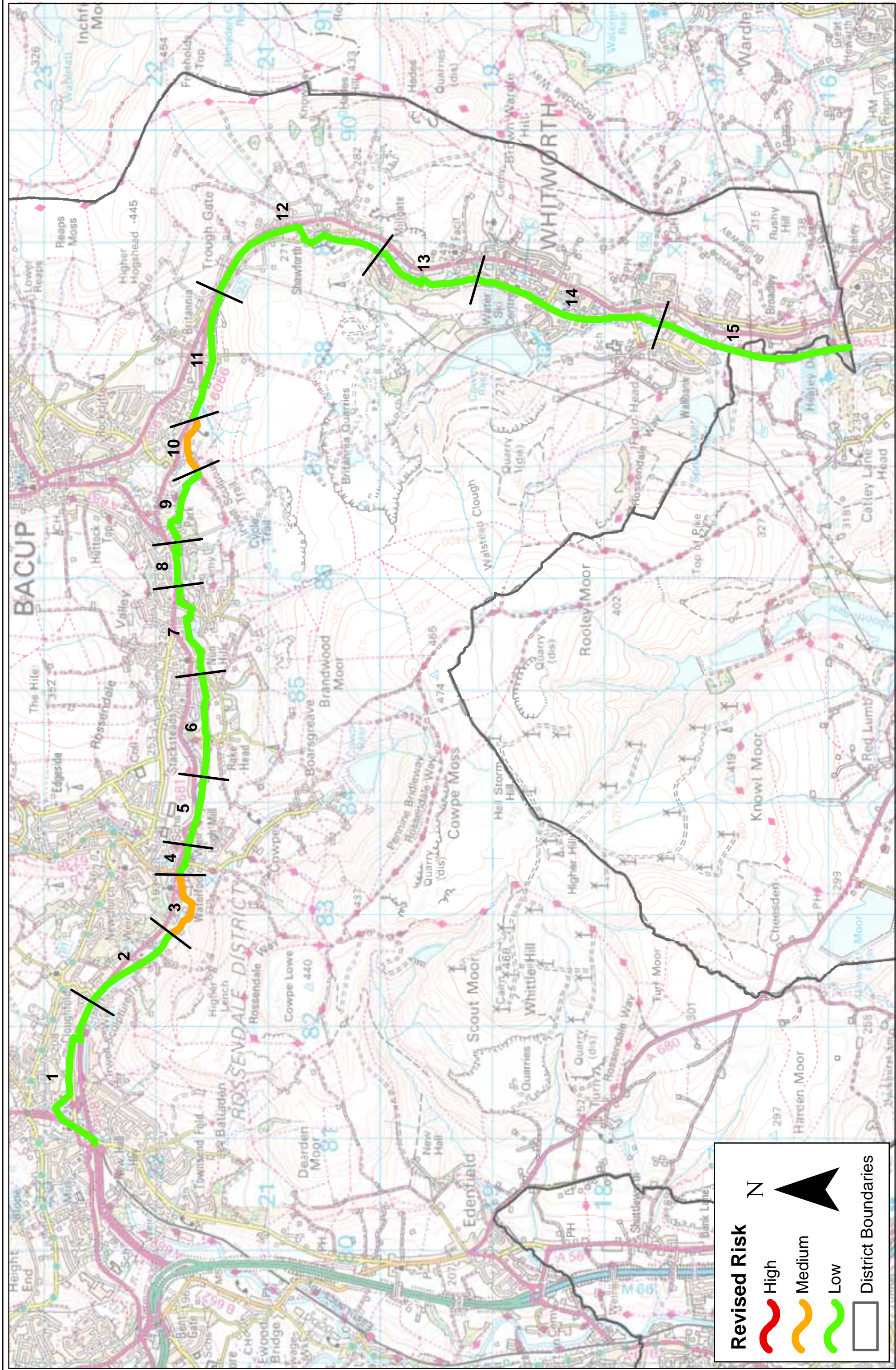
Over the full 30-year assessment period, the total 2010 discounted benefits amount to between **£2.223 million** and **£5.036 million** for the low and high growth scenarios respectively.

Appendix A Plan of Interventions

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Appendix B Scheme Costs and Profile

Scheme A: Huncoat Greenway

| Scheme Costs | Construction | Land | Preparation | Supervision |
|--------------|--------------|------|-------------|-------------|
| | £391,932 | £0 | £20,628 | £0 |
| Total | £412,560 | | | |

| Spend Profile | | | | |
|---------------|-------------|-----------|-------------|-----------|
| 2014 | 0% | 0% | 0% | 0% |
| 2015 | 1% | 0% | 51% | 0% |
| 2016 | 16% | 0% | 52% | 0% |
| 2017 | 24% | 0% | 0% | 0% |
| 2018 | 0% | 0% | 0% | 0% |
| 2019 | 66% | 0% | 0% | 0% |
| 2020 | 0% | 0% | 0% | 0% |
| 2021 | 0% | 0% | 0% | 0% |
| 2022 | 0% | 0% | 0% | 0% |
| 2023 | 0% | 0% | 0% | 0% |
| 2024 | 0% | 0% | 0% | 0% |
| 2025 | 0% | 0% | 0% | 0% |
| 2026 | 0% | 0% | 0% | 0% |
| 2027 | 0% | 0% | 0% | 0% |
| 2028 | 0% | 0% | 0% | 0% |
| 2029 | 0% | 0% | 0% | 0% |
| 2030 | 0% | 0% | 0% | 0% |
| 2031 | 0% | 0% | 0% | 0% |
| 2032 | 0% | 0% | 0% | 0% |
| 2033 | 0% | 0% | 0% | 0% |
| 2034 | 0% | 0% | 0% | 0% |
| 2035 | 0% | 0% | 0% | 0% |
| 2036 | 0% | 0% | 0% | 0% |
| 2037 | 0% | 0% | 0% | 0% |
| 2038 | 0% | 0% | 0% | 0% |
| 2039 | 0% | 0% | 0% | 0% |
| 2040 | 0% | 0% | 0% | 0% |
| 2041 | 0% | 0% | 0% | 0% |
| 2042 | 0% | 0% | 0% | 0% |
| 2043 | 0% | 0% | 0% | 0% |
| 2044 | 0% | 0% | 0% | 0% |
| 2045 | 0% | 0% | 0% | 0% |
| 2046 | 0% | 0% | 0% | 0% |
| TOTAL | 108% | 0% | 103% | 0% |

* Inclusive of inflation increases from 2014 price base, at 2% per annum.

Scheme B: NCN6 Accrington to Ramsbottom

| Scheme Costs | Construction | Land | Preparation | Supervision |
|--------------|-------------------|------|-------------|-------------|
| | £3,434,344 | £0 | £180,755 | £0 |
| TOTAL | £3,615,099 | | | |

| Spend Profile (insert percentage profile) | | | | |
|--|-------------|-----------|-------------|-----------|
| 2014 | 0% | 0% | 0% | 0% |
| 2015 | 1% | 0% | 51% | 0% |
| 2016 | 28% | 0% | 52% | 0% |
| 2017 | 26% | 0% | 0% | 0% |
| 2018 | 9% | 0% | 0% | 0% |
| 2019 | 42% | 0% | 0% | 0% |
| 2020 | 0% | 0% | 0% | |
| 2021 | 0% | 0% | 0% | 0% |
| 2022 | 0% | 0% | 0% | 0% |
| 2023 | 0% | 0% | 0% | 0% |
| 2024 | 0% | 0% | 0% | 0% |
| 2025 | 0% | 0% | 0% | 0% |
| 2026 | 0% | 0% | 0% | 0% |
| 2027 | 0% | 0% | 0% | 0% |
| 2028 | 0% | 0% | 0% | 0% |
| 2029 | 0% | 0% | 0% | 0% |
| 2030 | 0% | 0% | 0% | 0% |
| 2031 | 0% | 0% | 0% | 0% |
| 2032 | 0% | 0% | 0% | 0% |
| 2033 | 0% | 0% | 0% | 0% |
| 2034 | 0% | 0% | 0% | 0% |
| 2035 | 0% | 0% | 0% | 0% |
| 2036 | 0% | 0% | 0% | 0% |
| 2037 | 0% | 0% | 0% | 0% |
| 2038 | 0% | 0% | 0% | 0% |
| 2039 | 0% | 0% | 0% | 0% |
| 2040 | 0% | 0% | 0% | 0% |
| 2041 | 0% | 0% | 0% | 0% |
| 2042 | 0% | 0% | 0% | 0% |
| 2043 | 0% | 0% | 0% | 0% |
| 2044 | 0% | 0% | 0% | 0% |
| 2045 | 0% | 0% | 0% | 0% |
| 2046 | 0% | 0% | 0% | 0% |
| TOTAL | 107% | 0% | 103% | 0% |

* Inclusive of inflation increases from 2014 price base, at 2% per annum.

Scheme C: Valley of Stone

| Scheme Costs | Construction | Land | Preparation | Supervision |
|--------------|-------------------|------|-------------|-------------|
| | £2,346,968 | £0 | £123,525 | £0 |
| TOTAL | £2,470,492 | | | |

| Spend Profile (insert percentage profile) | | | | |
|--|-------------|-----------|-------------|-----------|
| 2014 | 0% | 0% | 0% | 0% |
| 2015 | 3% | 0% | 51% | 0% |
| 2016 | 65% | 0% | 52% | 0% |
| 2017 | 3% | 0% | 0% | 0% |
| 2018 | 15% | 0% | 0% | 0% |
| 2019 | 19% | 0% | 0% | 0% |
| 2020 | 0% | 0% | 0% | 0% |
| 2021 | 0% | 0% | 0% | 0% |
| 2022 | 0% | 0% | 0% | 0% |
| 2023 | 0% | 0% | 0% | 0% |
| 2024 | 0% | 0% | 0% | 0% |
| 2025 | 0% | 0% | 0% | 0% |
| 2026 | 0% | 0% | 0% | 0% |
| 2027 | 0% | 0% | 0% | 0% |
| 2028 | 0% | 0% | 0% | 0% |
| 2029 | 0% | 0% | 0% | 0% |
| 2030 | 0% | 0% | 0% | 0% |
| 2031 | 0% | 0% | 0% | 0% |
| 2032 | 0% | 0% | 0% | 0% |
| 2033 | 0% | 0% | 0% | 0% |
| 2034 | 0% | 0% | 0% | 0% |
| 2035 | 0% | 0% | 0% | 0% |
| 2036 | 0% | 0% | 0% | 0% |
| 2037 | 0% | 0% | 0% | 0% |
| 2038 | 0% | 0% | 0% | 0% |
| 2039 | 0% | 0% | 0% | 0% |
| 2040 | 0% | 0% | 0% | 0% |
| 2041 | 0% | 0% | 0% | 0% |
| 2042 | 0% | 0% | 0% | 0% |
| 2043 | 0% | 0% | 0% | 0% |
| 2044 | 0% | 0% | 0% | 0% |
| 2045 | 0% | 0% | 0% | 0% |
| 2046 | 0% | 0% | 0% | 0% |
| TOTAL | 106% | 0% | 103% | 0% |

* Inclusive of inflation increases from 2014 price base, at 2% per annum.

Scheme D: Weaver's Wheel

| Scheme Costs | Construction | Land | Preparation | Supervision |
|--------------|-------------------|------|-------------|-------------|
| | £1,198,241 | £0 | £90,190 | £0 |
| TOTAL | £1,288,431 | | | |

| Spend Profile (insert percentage profile) | | | | |
|--|-------------|-----------|-------------|-----------|
| 2014 | 0% | 0% | 0% | 0% |
| 2015 | 6% | 0% | 102% | 0% |
| 2016 | 80% | 0% | 0% | 0% |
| 2017 | 6% | 0% | 0% | 0% |
| 2018 | 6% | 0% | 0% | 0% |
| 2019 | 6% | 0% | 0% | 0% |
| 2020 | 0% | 0% | 0% | 0% |
| 2021 | 0% | 0% | 0% | 0% |
| 2022 | 0% | 0% | 0% | 0% |
| 2023 | 0% | 0% | 0% | 0% |
| 2024 | 0% | 0% | 0% | 0% |
| 2025 | 0% | 0% | 0% | 0% |
| 2026 | 0% | 0% | 0% | 0% |
| 2027 | 0% | 0% | 0% | 0% |
| 2028 | 0% | 0% | 0% | 0% |
| 2029 | 0% | 0% | 0% | 0% |
| 2030 | 0% | 0% | 0% | 0% |
| 2031 | 0% | 0% | 0% | 0% |
| 2032 | 0% | 0% | 0% | 0% |
| 2033 | 0% | 0% | 0% | 0% |
| 2034 | 0% | 0% | 0% | 0% |
| 2035 | 0% | 0% | 0% | 0% |
| 2036 | 0% | 0% | 0% | 0% |
| 2037 | 0% | 0% | 0% | 0% |
| 2038 | 0% | 0% | 0% | 0% |
| 2039 | 0% | 0% | 0% | 0% |
| 2040 | 0% | 0% | 0% | 0% |
| 2041 | 0% | 0% | 0% | 0% |
| 2042 | 0% | 0% | 0% | 0% |
| 2043 | 0% | 0% | 0% | 0% |
| 2044 | 0% | 0% | 0% | 0% |
| 2045 | 0% | 0% | 0% | 0% |
| 2046 | 0% | 0% | 0% | 0% |
| TOTAL | 105% | 0% | 102% | 0% |

* Inclusive of inflation increases from 2014 price base, at 2% per annum.

Appendix C WebTAG Unit A5.1: Active Mode Appraisal

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Department
for Transport

TAG UNIT A5.1

Active Mode Appraisal

January 2014

Department for Transport

Transport Analysis Guidance (TAG)

<https://www.gov.uk/transport-analysis-guidance-webtag>

This TAG Unit is guidance for the **APPRAISAL PRACTITIONER**

This TAG Unit is part of the family **A5 – UNI-MODAL APPRAISAL**

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1 Introduction

- 1.1.1 This Unit gives guidance on how to estimate and report impacts on active modes (e.g. walking and cycling). Specific cycling and walking schemes are often relatively small. The amount of effort devoted to the analysis of such schemes should be proportional to the scale of the project or the scale of impact on cycling and walking modes.
- 1.1.2 Section 2 describes methods that can be used to forecast demand for interventions targeting active modes; section 3 describes how the key impacts resulting from an intervention should be monetised; section 4 describes how the results should be reported; section 5 discusses sensitivity testing; and section 6 discusses the importance of monitoring and evaluation.
- 1.1.3 This Unit is most applicable to schemes with a significant active modes focus, but is in principle applicable in all cases. When reading these sections it may help to assume that a scheme aimed at active mode use is being appraised. TAG Guidance on [The Transport Appraisal Process](#) describes the option development process, where a cycling or walking scheme may have emerged as the best transport solution for a given problem. [TAG Unit A5.5 – Highway Appraisal](#) describes a basic method for treating impacts on pedestrians and cyclists where they are not explicitly included in the modelling approach.
- 1.1.4 This Unit follows the standard approach to appraisal as explained in [Guidance for the Technical Project Manager](#) and [TAG Unit A1.1 – Cost-Benefit Analysis](#). However, issues of particular importance to active modes such as physical activity benefits and journey quality are more fully explained.
- 1.1.5 There is significant uncertainty around the use of the techniques and the valuations suggested in this Unit and thorough use of sensitivity testing around core assumptions should be used when presenting results. Therefore this guidance will be most useful in assessing the effectiveness of one cycling and/or walking scheme against another, using similar input assumptions.

2 Active Mode Forecasting

2.1 Introduction

- 2.1.1 [TAG Unit M1.1 – Principles of Modelling and Forecasting](#) provides guidance on how modelling may be used to estimate future demand for transport facilities. Where cycling and walking schemes form part of a larger set of transport proposals, demand models or spatially aggregate models of the types described in that Unit may be appropriate.
- 2.1.2 Where cycling and walking is an integral part of a strategy, for example the imposition of 20mph speed restrictions in urban areas, coupled with other changes to create a more appealing environment for pedestrians and cyclists, then model design should include appropriate representation of the alternatives to cycling and walking.
- 2.1.3 Walking and cycling schemes may be promoted separately from other transport investment proposals and in these circumstances different modelling approaches may be required. This section summarises three possible approaches to forecasting demand for new cycling and walking facilities forecast outside of a formal model. Analysts should also bear in mind the potential impact on the use of other modes.
- 2.1.4 It is of crucial importance to forecast walk and cycle demand as accurately as possible to produce a successful appraisal. Forecasts are the primary indicator of a scheme's effectiveness, along with estimates of the resulting change in use of other modes. Since the cost of walking and cycling schemes is often relatively low and the scale of impact relatively small, the cost-benefit analysis is highly sensitive to the quality of these forecasts. Sensitivity tests will be necessary to examine the potential impacts in the face of uncertainty. On the cost side, optimism bias (at the appropriate rate) should also be included in the scheme costs (see [TAG Unit A1.2 – Scheme Costs](#)).

- 2.1.5 It is important that the without-scheme case includes the impacts of other schemes that may affect the mode share of active modes (e.g. the introduction of town centre pedestrian areas, or a congestion charging system). Where the impacts of a cycling or walking scheme are being considered in the context of another major scheme, it may be appropriate to include the major scheme in the without scheme scenario to identify the incremental effects on cycling and walking. The methods described below are valid for forecasts over and above the without scheme case. Inaccuracies in the base growth forecasts may cause the benefit-cost ratios of the appraised schemes to be inconsistent with those in other areas.
- 2.1.6 It is anticipated that demand management measures such as Smarter Choices initiatives should be assessed with a proportionate application of a full appraisal, which is likely to require a demand model. These schemes can achieve relatively large impacts on mode choice and hence the change in the volume of motorised traffic may be significant enough to warrant a full model. [TAG Unit M5.2 – Modelling Smarter Choices](#) provides further guidance.
- 2.1.7 The existing evidence base on how long the demand impact of active mode schemes will last is relatively sparse. Initial increases in walking and cycling may decline over time and this is likely to be particularly relevant for demand management schemes such as Smarter Choices initiatives. This phenomenon can be represented in forecasts through use of a decay rate, so that demand in the 'with scheme' scenario converges with the 'without scheme' demand forecasts over time.
- 2.1.8 It is important that consistent assumptions are used when comparing schemes and it is advised when undertaking the analysis to include different forecast assumptions to gauge how successful the scheme may be given different forecasts around the core. It may be that some schemes are more sensitive than others, which may affect the decision of which scheme to adopt were outturn forecasts to be more pessimistic, say, relative to the core scenario.

2.2 Approach 1: Comparative Study

- 2.2.1 The least complex and costly approach to estimating future levels of cycling and walking is through comparisons with similar schemes. Larger proposals are likely to have greater demand changes and afford better potential for comparison with existing schemes. Examples could include river crossings or the creation of other significant links in a network that reduce time and distance, or comprehensive urban centre networks that significantly change the balance between motor traffic and walking and cycling generalised costs.
- 2.2.2 The difficulty with this method is the many other transport system and socio-economic differences and changes that may exist between the two study areas. Forecasting and valuing benefits form only part of the decision making process and, depending on other policy aspirations, there may be sufficient confidence in an approach based on comparative study.
- 2.2.3 [Encouraging walking and cycling: Success Stories \(DfT, 2004a\)](#) provides some useful starting points and some indication of potential levels of change for a variety of schemes that have achieved positive outcomes throughout Great Britain. Other sources of data may include monitoring exercises undertaken before and after a similar scheme has been implemented in the local area. The availability of this data is limited, although scheme-specific monitoring is an area that is receiving greater attention and should be encouraged to increase the number of case studies available and hence improve forecasts in future appraisals.

2.3 Approach 2: Estimating from Disaggregate Mode Choice Models

- 2.3.1 A general introduction to the use of bespoke and other mode choice models is in [TAG Unit M2 – Variable Demand Modelling](#).
- 2.3.2 Wardman, Tight and Page (2007) derived a model to forecast the impacts of improvements in the attractiveness of cycling for commuting trips of 7.5 miles or less. The full version of this model gives an expression for the forecast market share for cycling given changes in the utility of the different modes.

- 2.3.3 The example below of the model only applies to changes in the generalised costs of cycling. As such it implies that the utility of all modes except cycling remain unchanged. However, it is fairly straightforward to extend the logit model to include changes in the generalised costs of other modes following the advice given in [TAG Unit M2](#). Given the assumption of no changes in the costs of other modes the logit model used simplifies to:

$$P_y^f = \frac{P_y^b e^{\Delta U_y}}{P_y^b e^{\Delta U_y} + (1 - P_y^b)}$$

Where:

ΔU_y is the change in utility of the cycling mode, in year y

P_y^b is the proportion of those choosing to cycle out of the maximum of those where it is a viable option, without any intervention, in year y

P_y^f is the proportion of those choosing to cycle out of the maximum of those where it is a viable option, with intervention, in year y .

- 2.3.4 This formula applies to those who would consider the cycle mode as an option. In reality, a significant proportion of people will never select cycling as a viable transport option. Therefore, the model here should not be applied to the whole population. The survey used to derive this model found that 60% of commuters (the purpose being tested) would never consider cycling. Therefore the result of the formula only applies to the 40% who might. To give a figure for total mode share, one simply multiplies this result through by 40%.
- 2.3.5 The changes in utility are calculated using the equation below and the coefficients in Table 1. These are empirically-based coefficients of utility derived from the above study that apply to the number of people with short commutes (7.5 miles or less) who could enjoy the benefit provided. Only those coefficients relevant to changes in cycle conditions are shown.

$$\Delta U = t(c_w - c_n)$$

Where:

ΔU is the change in utility of the cycling mode

t is the travel time

c_w is the coefficient of utility on routes with facilities (i.e. the do something, with-intervention case)

c_n is the coefficient of utility on routes with no facilities (i.e. do nothing, without-scheme case)

Table 1 Utility of changes to cycle facilities (Source: Wardman et al, 2007)

| Change | Interpretation | Coefficient |
|--|--------------------------|-------------|
| Change in time on off-road cycle track | Minutes | -0.033 |
| Change in time on segregated on-road cycle lane | Minutes | -0.036 |
| Change in time on non-segregated on-road cycle lane | Minutes | -0.055 |
| Change in time on no facilities | Minutes | -0.115 |
| Outdoor parking facilities | present/not present | 0.291 |
| Indoor cycle parking | present/not present | 0.499 |
| Shower/changing facilities plus indoor cycle parking | present/not present | 0.699 |
| Payment to cycle | one way payment in pence | 0.013 |

- 2.3.6 The most favourable cycling conditions are assumed to be on an off-road cycle track (-0.033 'utils' per minute). favourable when compared to a road with no facilities, which has a higher coefficient of disutility (-0.115 'utils' per minute). However, the coefficient is negative because cycling for a minute still produces a disutility, as does travel time more generally.
- 2.3.7 Using the coefficients supplied in Table 1, the change in utility from ten minutes' use of a road with no facilities to a segregated cycle track is therefore 0.82 (= 10 * (0.115 - 0.033)). Note that zero overall change in travel time is assumed.
- 2.3.8 If the base proportion of the population who cycle is 2% of all travellers and we assume that a maximum of 40% would cycle, we derive p_y^b as 5%. The model predicts that the proportion of this population cycling after the change will be 10.7% of the total mode share:
- $$0.107 = 0.05 * \exp(0.82) / (0.05 * \exp(0.82) + (1 - 0.05))$$
- As discussed, to calculate the total mode share of cycling, should it be required, we can multiply by 40% to get a value of 4.3% of the whole population.
- 2.3.9 Analysts should note that this model only applies to those who could make use of any change to facilities on short commuting journeys. The impact of a variety of different changes can be calculated but these results should be regarded as very approximate in general application.
- 2.3.10 In theory, such models could be extended to cover walking but research in this area is problematic. People do not regard walking as a mode of transport in quite the same way as driving, using a bus or even cycling so studying their reaction to changes in the walking environment is difficult.

2.4 Approach 3: Sketch Plan Methods

- 2.4.1 [TAG Unit M1.2 – Data Sources and Surveys](#) provides guidance on nationally available data sets. Sources that may be useful include Census journey to work trip matrices and distances and [Department for Transport National Trip End Model \(NTEM\)](#) forecasts of trip ends by mode (including cycling and walking), journey mileage, car ownership and population and workforce planning data. NTEM modal split figures only reflect demographic factors and increasing car ownership. Local models will take account of changes in the generalised cost of travel by each mode and other impacts of rising incomes and local policy action to influence travellers' "taste" for different modes.
- 2.4.2 Changes to levels of walking and cycling as evidenced or forecast from these data sources may be approximately estimated by rule-of-thumb calculations. Care needs to be taken when assessing the extent to which a scheme might influence trip making, given the sensitivity of the cost-benefits analysis to the forecasts.

- 2.4.3 Popularity of walking and cycling may also vary from place to place with the acceptability of those modes in those areas, as well as their attractiveness. For example, local walk and cycle initiatives may change the overall attractiveness of these modes without consideration of individual infrastructural schemes. At any rate, background growth, such as that forecast by NTEM, in walking and cycling is required so that the change in demand brought on by a scheme may be compared to the reference case scenario that will experience the background growth.
- 2.4.4 An approximate elasticity estimate for the change in demand for cycling in a district, based on a change in the proportion of route that has facilities for cycle traffic (cycle lanes, bus lanes and traffic free route), is +0.05. This has been derived from models of the variation in cycle use at ward level (specifically a revision of the models used in Parkin, 2004). As an example, a district might have 2,000 trips by bicycle per day with a total road length of 500 kilometres and an existing length of cycle facilities in the district of 50 kilometres. A scheme is proposed to create a new off-carriageway cycle route of 10 kilometres in length. The new cycle facilities increase the proportion of cycle facilities by 20% (from 10% to 12% of total road length). The expected increase in cycle trip numbers would be 1% ($+0.05 * 20\%$), or 20 trips per day ($1\% * 2000$ trips). It should be noted that this is a useful, albeit approximate method for predicting the increase in demand for cycling and the results may differ somewhat from the more multifaceted approach described when estimating from disaggregate mode choice models.

2.5 Other Considerations

- 2.5.1 Forecasting does not usually distinguish between children and adults. In respect of cycling and the journey to school it may be appropriate to explicitly consider the different responses that children may make to schemes.
- 2.5.2 Catchments for new public transport modes are based around distances from existing public transport nodes and the topography of the catchments is also sometimes considered. Where there is a proposal for a significant walking or cycling route, for example a traffic-free route along a previously inaccessible green corridor, it may be appropriate to consider analogous techniques.
- 2.5.3 In comparison to other modes, the choice for walking and cycling is more likely to be influenced by the journey purpose because this affects, for example, the amount of luggage that needs to be carried and the type of clothing that it is appropriate to wear. It may be appropriate to consider modelling techniques that explicitly account for journey end activity.
- 2.5.4 Estimation of the demand for cycling and walking might also need to take into account the different types of user. For example, pedestrians could be characterised as “striders”, who are using walking to get somewhere and might be sensitive to changes in travel time or “strollers”, who might be less concerned about travelling efficiently but more sensitive to environmental factors (Heuman, 2005). DfT (2004b) suggests a number of different types of “design pedestrian types” and “design cyclist types”. These include commuters, utility cyclists and shopper/leisure walkers all of which might be expected to react differently to different interventions in the form of facilities.

3 Calculation of Key Impacts

- 3.1.1 Table 2 below shows the key indicators that govern most of the costs and benefits that need to be measured to undertake an appraisal. Figure 1 in Appendix A shows how the indicators inter-relate to the impacts appraised in schematic form. The subsequent guidance explains these in greater detail.

| Table 2 Indicators used in the economic appraisal of walking and cycling schemes | |
|--|---|
| Indicator | Used to appraise |
| Cycling and walking users | Journey quality |
| New individuals cycling or walking | Physical activity Journey quality |
| Car kilometres saved | Accidents GHG emissions, air quality and noise Indirect tax revenue Travel time (decongestion) |
| Commuter trips generated | Absenteeism |

- 3.1.2 [TAG Unit A1.1 – Cost Benefit Analysis](#) provides guidance on appraisal periods. Most walking and cycling schemes will have finite project lives and/or significant uncertainty around the longevity of impact (particularly for demand management schemes) so that the sixty year appraisal period recommended for large-scale infrastructure projects might not be applicable. The length of appraisal period will have a significant impact on the appraisal and monetised estimates of impacts should be subject to sensitivity tests around the appraisal period (sensitivity testing is discussed further in section 5). Where longer appraisal periods are used it is vital that all maintenance and renewal costs during the appraisal period are included in cost estimates.
- 3.1.3 [TAG Unit A1.1](#) also requires all monetary values in appraisal to be presented in real, discounted values (in the Department's base year) and in the market prices unit of account. This applies to walking and cycling schemes just as it does to other schemes.
- 3.1.4 Appendix B provides a worked example of how to apply this guidance to a case study, including sensitivity tests around key assumptions such as the length of the appraisal period and the decay rate applied to demand impacts.

3.2 Physical Activity Impacts

- 3.2.1 Physical activity impacts typically form a significant proportion of benefits for active mode schemes. The method for calculating these impacts is taken from 'Quantifying the health effects of cycling and walking' (WHO, 2007) and its accompanying model, the Health Economic Assessment Tool (HEAT). The method requires estimates of the number of new walkers or cyclists as a result of the scheme; the time per day they will spend active; and mortality rates applicable to the group affected by the scheme. The economic benefit of reduced mortality should be valued using the value of a prevented fatality given in [TAG Data Book](#). More detailed guidance on estimating these benefits is given in the physical activity section of [TAG Unit A4.1 - Social Impact Appraisal](#).

3.3 Absenteeism Impacts

- 3.3.1 Improved health from increased physical activity (such as walking or cycling) can also lead to reductions in short term absence from work. These benefits can be estimated using the methods in TfL (2004), details of which are given in [TAG Unit A4.1](#). The method requires estimates of the number of new walkers and cyclists who are commuting; the time per day they will spend active; and average absenteeism rates and labour costs.

3.4 Journey Quality Impacts

- 3.4.1 Journey quality is an important consideration in scheme appraisal for cyclists and walkers. It includes fear of potential accidents and therefore the majority of concerns are about safety (e.g. segregated cycle tracks greatly improve journey quality over cycling on a road with traffic). Journey quality also includes infrastructure and environmental conditions on a route. As an impact which is apparent to users, the journey quality benefits should be subject to the 'rule of a half' (see [TAG Unit A1.3 – User and Provider Impacts](#)) – current users of the route will experience the full benefit of any improvements to quality but the benefits for new cyclists/walkers should be divided by two.
- 3.4.2 The evidence in this area is fairly limited. Analysts should use judgment, or potentially a 'sliding scale' approach to value journey quality impacts depending on the perceived quality of an intervention, using published research figures as a guide to the maximum value for an improvement. The journey quality section of [TAG Unit A4.1](#) provides further guidance and the values for estimating journey quality impacts for cyclists and pedestrians are given in [TAG Data Book](#), respectively. Analysts must ensure that when the benefits of schemes are compared against one another, consistent assumptions are made concerning journey quality monetary benefits.

3.5 Accident Impacts

- 3.5.1 Accident benefits (or disbenefits) are calculated from changes in the usage of different types of infrastructure by different modes and the accident rates associated with those modes on those types of infrastructure. Therefore accident analysis should take account of changes in accidents involving pedestrians and cyclists, resulting from changes in walking and cycling and the infrastructure used, and the impact of mode switch on accidents involving other road users.
- 3.5.2 The accidents section of [TAG Unit A4.1](#) provides guidance on forecasting and valuing active mode accidents. Where there is significant mode switch, the marginal external cost (MEC) method ([TAG Unit A5.4 – Marginal External Congestion Costs](#)) can be used as a simplified approach to estimate the change in accidents generated by a change in car kilometres.

3.6 Environmental Impacts

- 3.6.1 The environmental benefits from a walk or cycling scheme are achieved through a reduction in motorised traffic and hence a reduction in the associated externalities. The assessment of disbenefits such as noise, air pollution and greenhouse gases are explained in [TAG Unit A3 – Environmental Impact Appraisal](#) and [TAG Unit A5.4](#) describes how these impacts can be estimated using the MEC method. Other environmental factors such as the impact on landscape and biodiversity should also be considered.
- 3.6.2 Some schemes will have more accurate information through use of a formal transport model. Where information on speeds and types of vehicle affected are available, more accurate estimates of greenhouse gas impacts can be estimated using tables in the [TAG Data Book](#) for fuel consumption ([Table A1.3.11](#)), carbon emissions ([Table A3.3](#)) and carbon values ([Table A3.4](#)).

3.7 Decongestion and Indirect Tax Impacts

- 3.7.1 Mode switch from car to active modes will benefit those who continue to use the highways (decongestion benefit) and impact on indirect tax revenues. The MEC method used to estimate accident and environmental benefits from reductions in car use can also be applied to these impacts (see [TAG Unit A5.4](#)).

3.8 Time Saving Impacts on Active Mode Users

- 3.8.1 While many active mode schemes may aim to increase demand for walking and cycling through improved quality of facilities, they may also result in time savings to pedestrians and cyclists through provision of quicker or shorter routes. In such circumstances the time saving benefits should be

estimated using the 'rule of a half' method described in [TAG Unit A1.3 – User and Provider Impacts](#) and the values in [TAG Data Book](#).

4 Reporting the Impacts of Walking and Cycling Schemes

- 4.1.1 The impacts of a walking and/or cycling scheme should generally be reported in the same way as any other scheme, using the same reporting tables.

4.2 Transport Economic Efficiency (TEE) Table

- 4.2.1 Impacts on walkers and cyclists, in qualitative or monetised form, should be reported in the 'Other' column of the [TEE table](#), split by business, commuting and other journey purposes. Where decongestion benefits for road users are calculated using the MEC method, these should be recorded as time benefits in the 'Road' column¹.

4.3 Public Accounts (PA) Table

- 4.3.1 [TAG Unit A1.2 – Scheme Costs](#) provides guidance on estimating scheme investment and operating costs. Costs of walking and cycling schemes should be treated in the same way as for other schemes; including appropriate adjustments for risk and optimism bias and presented in the market prices unit of account.
- 4.3.2 Where there is significant mode shift and the MEC method has been used, the change in indirect tax should be recorded. Note that costs in the [PA table](#) are recorded as positive values so that a reduction in indirect tax revenue should appear as a positive value.

4.4 Analysis of Monetised Costs and Benefits (AMCB) Table

- 4.4.1 Sub-totals from the TEE and PA tables should be carried over to the [AMCB table](#). Monetised estimates of physical activity (comprising health and absenteeism impacts), journey quality, accidents and environmental impacts following the methods described in this unit should also be included in the AMCB table.

4.5 Appraisal Summary Table (AST)

- 4.5.1 Monetised estimates should also be recorded in the 'Monetary' column of the appropriate rows of the [AST](#). Practitioners should refer to TAG Units relating to specific impacts for guidance on what should be recorded in the 'Summary of key impacts' column and any further quantitative information that should be reported.

4.6 Non-monetised Impacts

- 4.6.1 The appraisal should also consider impacts that it is not possible to monetise. Practitioners should refer to TAG Units relating to the specific impacts for further guidance on how they should be assessed and reported in the AST.

5 Sensitivity Testing

- 5.1.1 A critical issue with the appraisal of walking and cycling schemes is that the above analyses can be highly sensitive to the forecasts and assumptions used. Therefore, in all cases it is advised, to produce as robust an analysis as possible, that sensitivity tests are undertaken on the core assumptions made.
- 5.1.2 Key assumptions to consider in sensitivity testing include the following, but other variables may also be relevant:

¹ The decongestion benefits include both time and vehicle operating cost (e.g. fuel) savings but time savings tend to dominate.

- **Length of appraisal period.** How long will the benefits really last before reinvestment is required? This is especially pertinent if demand management measures are being appraised or considered;
- **Rate of decay of users and benefits.** The existing evidence base is relatively sparse on how long the benefits of active mode schemes last. Therefore the impact of different forecast assumptions on the scale of benefits should be tested (potentially including negative decay rates to represent increased use encouraging others to take up active modes over time). It may be that some schemes are more sensitive than others, which may affect the decision of which scheme to adopt were outturn forecasts to be more pessimistic, say, relative to the core scenario.
- **Quantum of journey quality benefits.** It can be particularly difficult to assess the size of journey quality benefits to apply, not only in terms of the values to adopt, but the applicability of those values to users. The latter will depend on the length of time users are exposed to improvements (e.g. cyclists will often not use a full length of improved infrastructure for their journey). Different unit benefits per user should be tested to better understand how this impacts on the potential scheme benefits.
- **Other key assumptions.** All other assumptions underpinning the appraisal need careful consideration and justification since these will impact on the sensitivity of the scheme assessment and the resulting costs and benefits produced. For example, assumptions concerning average journey length will be important. In the case of a pedestrian bridge, for example, the scheme may encourage more walkers but will result in less health benefits if, say, journey times are reduced as a result of the connectivity benefits derived by the new crossing.

6 Monitoring and Evaluation

- 6.1.1 Monitoring and evaluation are important elements of implementing schemes that affect walking and cycling. Monitoring and evaluation should take place in a timely manner and planning monitoring and evaluation will help to clarify scheme aims and objectives.
- 6.1.2 Data arising from evaluation exercises will add to the current evidence base. This will be of great use when forecasting for subsequent schemes, especially if similar schemes are planned in the future and in light of the importance of sustainable transport options to health and the environment. Since post-scheme monitoring should be an important part of the implementation of a successful scheme, an estimate of the costs to do so should be included in the scheme costs.
- 6.1.3 Monitoring of schemes is **essential** both before and after implementation. A set of 'before scheme' data is required to establish a Without Scheme case against which to compare forecasts. The purpose of collecting post-scheme evaluation data is to ensure that the impact of any scheme is identified to:
- check whether the predictions made about a scheme were correct;
 - determine whether a scheme was a success or not;
 - analyse why it was effective (or otherwise);
 - identify what can be learned from the scheme; and
 - inform the analysis and appraisal of future schemes.
- 6.1.4 Evaluation can also be used to publicise a scheme and make the lessons learned available to the wider transport planning community. Useful guidance on the evaluation of Road Safety Education Interventions is contained in '[Guidelines for Evaluating Road Safety Education Interventions](#)' (DfT, 2004c) and much of this may be applicable to the evaluation of a walking or cycling scheme.

6.1.5 The advent of Smarter Choices Initiatives also make monitoring and evaluation of vital importance. The data collected will assist in quantifying demand shifts through the introduction of softer measures and the propensity for people to change modes having received better information to make more informed choices. There is an evident overlap with the needs of transport models to forecast these changes in demand effectively, requiring relatively large volumes of good quality data.

6.1.6 Table 3 details the potential monitoring requirements of cycling and walking schemes.

| Table 3 Minimum Monitoring Requirements of Cycling and Walking Schemes | |
|---|--|
| | Data to be collected |
| Prior to scheme implementation | Number of cyclists/pedestrians per day Utility/leisure split Journey time Origins and destinations |
| Scheme Details | Length of scheme Environmental improvements (landscaping, vegetation etc) Safety/security improvements (lighting, CCTV etc) Links with other schemes (part of a network, parking, resting places, crossings etc) Information (signage) |
| Following scheme implementation | Number of cyclists/pedestrians per day Utility/leisure split Mode shift (previous journey mode) Previous journey route (if transferred) Journey time Origins and destinations |

6.1.7 Methods of monitoring cycling include the following:

- National Travel Survey, National Traffic Census, National Population Census (National level)
- Automatic Traffic Counters (ATCs) (including pneumatic tube counters, piezoelectric counters and inductive loops)
- Manual Classified Counts (MCC)
- Cordon and Screenline Counts
- Destination Surveys
- Interview Surveys

6.1.8 Monitoring techniques that should be used for walking include:

- Origin/destination surveys
- Household surveys and travel diaries
- Manual counts
- Automatic count methods (including video imaging, infrared sensors, piezoelectric pressure mats).

- 6.1.9 Further information on each of these monitoring techniques; how to select survey sites; and when to undertake surveys is provided in the '[Traffic Advisory Leaflets Monitoring Local Cycle Use](#)' (DETR, 1999) and '[Monitoring Walking](#)' (DETR, 2000).

7 References

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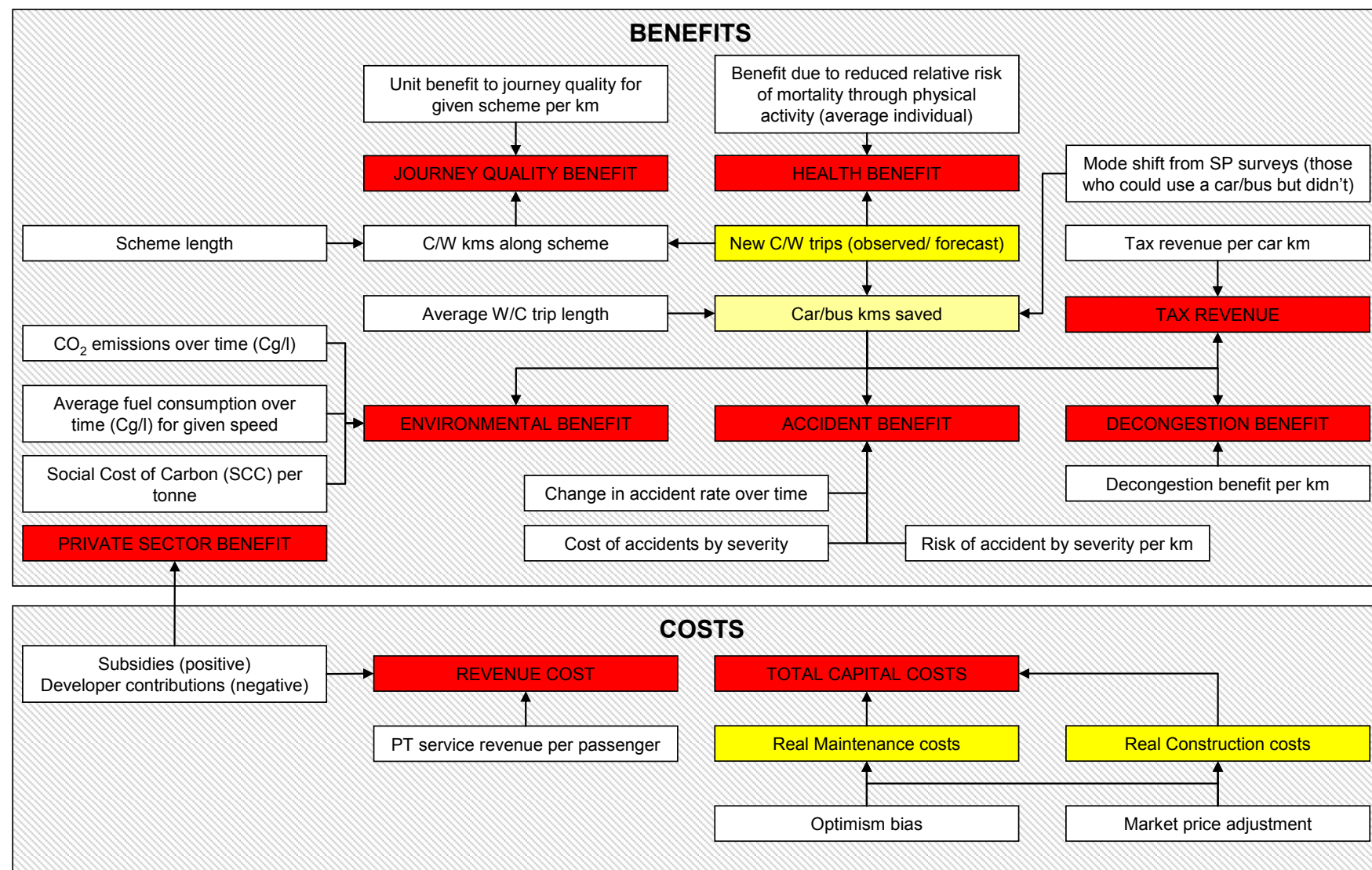
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8 Document Provenance

This TAG Unit forms part of the restructured WebTAG guidance, taking previous TAG Units as its basis. It is based on previous Units 3.14.1 Guidance on the Appraisal of Walking and Cycling Schemes, which became definitive guidance in 2009, and 3.5.5 Impacts on Pedestrians, Cyclists and Others, which was based on Appendix G of Guidance on the Methodology for Multi-Modal Studies. The case study in the appendix has been updated to reflect changes to values in other guidance units.

Appendix A Summary Of Active Mode Scheme Appraisal Process

Figure 1, shows the basic processes used to collect together the various cost and benefit elements for the appraisal of a walking and cycling scheme. This method was used to generate the case studies in Appendix B.



Appendix B Example Walking and Cycling Case Study

B.1 Introduction

- B.1.1 This Appendix applies the guidance to an example hypothetical case study for illustrative purposes. Section B.2 describes the hypothetical scheme and its costs; section B.3 describes the forecasting approach used; section B.4 sets out how the costs and benefits are calculated; section B.5 how the results should be reported; section B.6 describes sensitivity testing; and section B.7 commentary on the case study.

B.2 The Case Study and Scheme Costs

- B.2.1 This appraisal case study considers improvements to a canal towpath in London, providing access to a major industrial business park area. The project consists of upgrades to an existing 6km route carrying relatively high levels of usage from modest to high quality. Improving levels of commuter use is a particular priority.
- B.2.2 Construction of the hypothetical scheme takes place in 2010, with the scheme opening in 2011. The construction cost is estimated at £182,000 with maintenance costs incurred every year and estimated as £18,800 per annum, in 2010 prices.

B.3 Estimating demand for and impacts of cycling and walking schemes

- B.3.1 The demand impact of the scheme is estimated with Approach 1: Comparative Study. The increase in demand is based on user counts and surveys before and after an actual completed scheme, which showed a considerable increase in usage following upgrade to the route surface quality and connectivity.
- B.3.2 In this case study, background growth rates by mode were taken from data from the National Trip End Model (NTEM), specifically growth in trip productions per annum in London. In this case this was assumed to be 0.25% for cyclists and 0.52% for walkers.
- B.3.3 Both the 'without scheme' and 'with scheme' scenarios are based on 2010 counts of walkers and cyclists using the route. The 'without scheme' scenario is then based on the annual NTEM growth rates above. The 'with scheme' scenario is based on counts from the comparative study, which showed a 51% increase in cyclists and 11% increase in pedestrians using a similar canal towpath two years after a similar upgrade (i.e. demand in 2012 in the with scheme scenario is 51%/11% greater than demand in 2010).
- B.3.4 To calculate the number of cycling and walking users generated by the scheme, the number of users expected under the 'without scheme' scenario is subtracted from the forecast number of users under the 'with scheme' scenario. Table B1 below shows the usage in terms of numbers of cyclists and pedestrians based on the 2010 count data collected during the pre-implementation phase and the with and without scheme forecasts.

| Table B1 Cyclists and pedestrians before and after intervention (based on observed counts) | | |
|---|-----------------|----------------|
| | Cyclists | Walkers |
| 2010 (usage per day) | | |
| Trips | 1,085 | 517 |
| Individuals | 597 | 284 |
| 2012 (usage per day) | | |
| Without scheme (trips) | 1,090 | 522 |
| With scheme (trips) | 1,636 | 572 |
| Usage difference (trips) | 546 | 50 |
| Without scheme (individuals) | 600 | 287 |
| With scheme (individuals) | 900 | 315 |
| Usage difference (individuals) | 300 | 27 |

- B.3.5 The number of individual users is based on the assumption that 90% of trips are part of a return journey using the same route, to avoid double counting in the calculation of the number of individuals affected (e.g. $1,085 \text{ trips} \times 90\% / 2 + 1,085 \text{ trips} \times 10\% = 597$ individual users). The number of new individual users is used in the calculation of health benefits and is calculated by subtracting the number of users in the previous year from the number of users during the current year. The proportion of users on commuting journeys (which is relevant to the calculation of absenteeism benefits) is 56.4%, taken from surveys as part of the comparative study.
- B.3.6 Levels of growth beyond 2012 have been estimated using the concept of a rate of decay in use, as discussed in section 2.1. In this case, it has been assumed that after the initial encouragement of active mode users to the intervention, rather than maintaining this increased level of use indefinitely, additional use reduces over time compared to the 'without scheme' case by 10% per annum. This may be seen as conservative in this case study, since the path is built and importantly maintained over time.
- B.3.7 The number of car kilometres saved by the scheme is used in the calculation of decongestion, indirect tax and environmental impacts using the Marginal External Cost method. The total change in walking and cycling kilometres is calculated by multiplying the forecast 'without scheme' and 'with scheme' trips by the average trip lengths, which are assumed to be 3.9kms for cyclists and 1.15kms for walkers (taken from NTS) and subtracting the former from the latter. The proportion of users then reporting that they could have used a car but chose not to (27.3% in this example, based on surveys for the comparative study) is taken as the proportion of the total walking and cycling kilometres that can be described as car kilometres saved. Therefore, this example leads to 596 car kilometres being saved per day in 2012 ($27.3\% \times (546 \text{ cycling trips} \times 3.9\text{kms} + 50 \text{ walking trips} \times 1.15\text{kms})$). Note in this example it is assumed that average journey lengths by mode remain unchanged. As a result, even though the intervention is a 6km length of off-road cycle track, it is not assumed that users will traverse the whole length of that track.
- B.3.8 Figure B1, below, shows the number of walking and cycling trips forecast to use the scheme daily with and without the scheme. This also shows net change in car trips (since total car trips are not known and in fact do not matter as the important element is the reduction in car kilometres). Another assumption in this case is that no account has been made for potential mode shift from public transport.

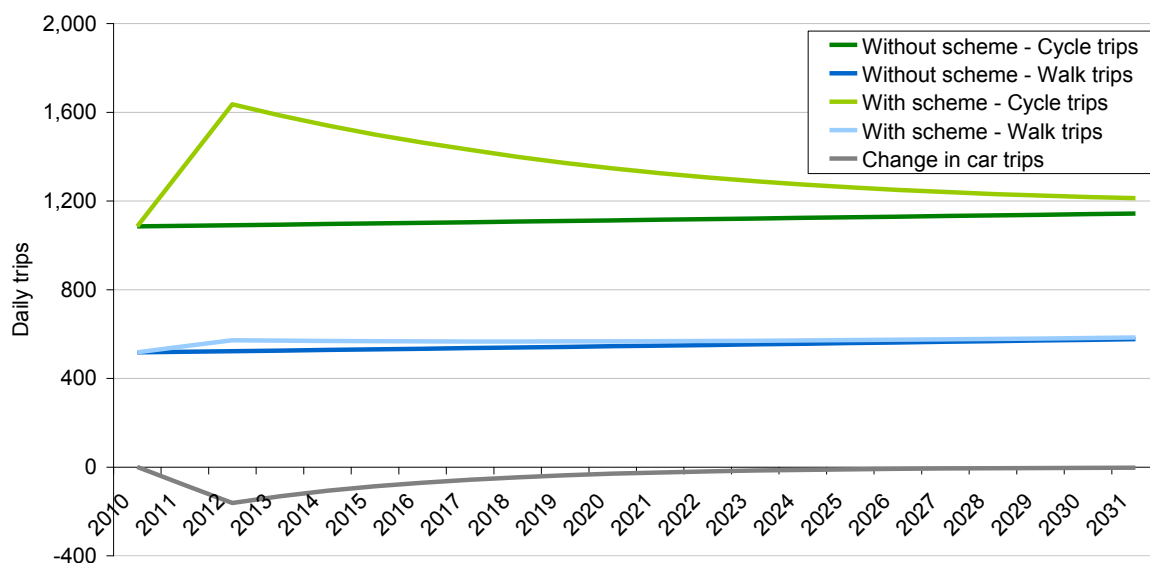


Figure B1 Daily usage forecasts of walking and cycling and net change in car mode

B.4 Calculating the costs and benefits

- B.4.1 The combination of user numbers, growth rates and trip profiling form the basis for the calculation of total trips, numbers of new users, car kilometres saved, and numbers of commuter trips. Each of these is required for the generation of the monetised values for the items listed below. In each case the calculated value is the net present value over the appraisal period.
- B.4.2 As discussed in section 3 the sixty year appraisal period over which most large-scale infrastructure schemes for other modes are assessed is not generally recommended for schemes targeting active modes. In this case study a twenty year appraisal period is used and sensitivity testing of this assumption is discussed in section B6.
- B.4.3 This case study includes the physical activity, absenteeism, journey quality and decongestion (calculated using the Marginal External Cost method) benefits of the upgraded towpath. As it is an upgrade to an existing route, time savings to users are not included.

Scheme costs

- B.4.4 The scheme investment costs (design and construction) and operating costs (maintenance) are required for the appraisal. Construction will take place in 2010 and the construction cost is estimated at £182,000. Maintenance costs will be incurred every year and are estimated as £18,800 per annum, in 2010 prices. The estimated costs have been adjusted by +15% to account for optimism bias (in practice, this varies with the level of development of the scheme – see [TAG Unit A1.2 – Scheme Costs](#)), and a further 19.1% has been added to adjust total capital costs and operating costs to market prices. The maintenance costs presented in Table B2 have been summed and discounted over the twenty year appraisal period to form part of the Present Value of Costs (PVC) (see [TAG Unit A1.1 – Cost Benefit Analysis](#)).

Table B2 Present value costs of the case study after inclusion of optimism bias and adjustment to market prices (2010 prices)

| | Capital costs | Maintenance costs |
|------------------------------|---------------|-------------------|
| Scheme capital cost | £182,000 | £276,545 |
| +15% optimism bias | £209,300 | £318,027 |
| +19.1% market price adjustor | £249,276 | £378,770 |

Physical Activity

- B.4.5 The reduction in the relative risk of premature death due to physical inactivity is calculated for potential new walkers and cyclists along the scheme route, based on the time spent active per day using estimated average length (from the NTS, as above), speed (assumed to be 20kph for cyclists and 5kph for walkers from DMRB 11.8.3) and frequency of new trips encouraged by active modes. The reduction in relative risk for cyclists is 0.28 (relative risk of 0.72) at 36 minutes per day² and for walkers is 0.22 (a relative risk of 0.78) at 29 minutes per day for seven days a week³ (compared to inactive individuals). As the reduction in relative risk is based on time spent travelling it is important to use realistic assumptions about average speeds.
- B.4.6 Table B3 shows the calculation of the reduction of relative risk for walkers and cyclists. The average active time per day across individuals making return and single leg trips is based on the assumption that 90% of trips form part of a return journey. The reductions in relative risk are calculated by interpolating between 0 and the maximum reductions of 0.28 and 0.22 for cyclists and walkers, respectively, on the basis of the average active time per day (for example, for cyclists: 21.3mins / 36mins * 0.28 = 0.17).

Table B3 Calculation of reduction in relative risk of mortality for cyclists and walkers

| | Cyclists | | Walkers | |
|------------------------------------|----------|--------|---------|--------|
| | Return | Single | Return | Single |
| Daily distance (km) | 7.8 | 3.9 | 2.3 | 1.15 |
| Average speed (kph) | 20 | 20 | 5 | 5 |
| Active time per day (mins) | 23.4 | 11.7 | 16.6 | 8.3 |
| Proportion of individuals | 0.82 | 0.18 | 0.82 | 0.18 |
| Average active time per day (mins) | 21.3 | | 15.1 | |
| Reduction in relative risk | 0.17 | | 0.11 | |

- B.4.7 As the evidence on reductions in relative risk for walkers is based on increased activity for 7 days a week, the active time per day is adjusted for the number of days per year (220) the new walkers are assumed to use the upgraded towpath (i.e. for return journeys, Active time per day = 2.3km / 5kph * 60 minutes per hour * 220/365 days = 16.6 minutes per day).
- B.4.8 The calculated reduction in relative risk of death and the number of new walkers and cyclists are used to calculate a figure for the potential number of lives saved based on average mortality rates. For this case study an average mortality rate of 0.0024 is used⁴, the mean proportion of the population of England and Wales aged 15-64 who die each year. It is also assumed that the benefit of using active modes accrues over a five year period, after which new cyclists or pedestrians achieve the full health benefit of their activities.

² Andersen et al (2000) All-Cause Mortality Associated With Physical Activity During Leisure Time, Work, Sports, and Cycling to Work, Archives of Internal Medicine, Vol. 160, pp1621-1628

³ World Health Organisation (2011), Health economic assessment tools, (HEAT) for walking and for cycling, Economic Assessment of Transport Infrastructure and Policies, Methodology and User Guide, Copenhagen.

⁴ Source: ONS 2007

- B.4.9 The number of potentially prevented deaths is then multiplied by the value of a prevented fatality used in accident analysis (see [TAG Data Book](#)) to give a monetary benefit for each year. Table B4 shows the calculation of the physical activity benefits for new cyclists in 2012 when there are 300 new cyclists as a result of the scheme, 150 receiving 20% of the full benefit (as they have been more active for one year) and 150 receiving 40% (as they have been more active for two years).

| Table B4 Calculation of the monetised physical activity cycling benefit in 2012 | | | | | |
|--|--------------|-------------------|-----------------|---|---|
| % of total benefit | New cyclists | Average mortality | Expected deaths | Reduction in RR / potential lives saved | Value of a prevented fatality (2010 prices) |
| Total / average | 300 | 0.0024 | 0.7 | 0.17 | £1,643,572 |
| 100% | 0 | 0.0024 | 0.0 | 0.00 | £0 |
| 80% | 0 | 0.0024 | 0.0 | 0.00 | £0 |
| 60% | 0 | 0.0024 | 0.0 | 0.00 | £0 |
| 40% | 150 | 0.0024 | 0.4 | 0.02 | £38,500 |
| 20% | 150 | 0.0024 | 0.4 | 0.01 | £19,179 |
| Total | | | | 0.04 | £57,679 |

- B.4.10 These calculations are repeated for both cyclists and walkers for each year of the appraisal period, including real growth in the value of a prevented fatality in line with forecast GDP/capita, then summed and discounted to give a total benefit of £1.3m, in 2010 present values. This may also be converted into a unit saving per additional cyclist or pedestrian for ease of calculation across the appraisal period.

Absenteeism

- B.4.11 Absenteeism from work is expected to decrease where more people walk or cycle to work. Moderate physical activity is seen to lead to a reduction in sick days taken from work and hence provides a benefit to the employer. This is not the same as the benefit of better health for the individual.
- B.4.12 Average annual absenteeism rates per person (7.2 days per year, based on London-specific data) are multiplied by the expected reduction in absenteeism from increased cycling and walking (6% based on 30mins activity per day), based on data from a US study (WHO, 2003), resulting in a reduction in sick days of 0.43 days per affected individual ($7.2 \times 6\%$). The employer cost saving of the reduction is then calculated, based on a daily employment cost of £300, resulting in a benefit of £129 per affected individual ($\text{£}300 \times 0.43$). The number of new cyclists and walkers is factored by the proportion of commuting trips on the route (56.4%) to give the number of individuals affected. This results in a value for the reduction in absenteeism per new user of £52 per annum per new cyclist ($\text{£}129 \times 56.4\% \times 21.3\text{mins} / 30\text{mins}$) and £37 per annum per new walker ($\text{£}129 \times 56.4\% \times 15.1\text{mins} / 30\text{mins}$), based on the average time spent active relative to the 30 minutes per day in the US study.
- B.4.13 As with the physical activity benefits, the absenteeism benefits are assumed to accrue over a five year period, are estimated for each year, including real growth in the employment cost in line with forecast GDP/capita, and then summed and discounted to give a total benefit of £77,500, in 2010 present values.

Journey Quality

- B.4.14 Journey quality is calculated on the basis of a 'safety-insecurity' value, as derived from the research studies cited in the relevant section of [TAG Unit A4.1](#). The approach is based on assigning a 'quality value' to each trip made by existing and new users. Separate journey quality values are used for

cyclists and pedestrians. In each case the 'rule of a half' is used whereby current users experience the full benefit of quality improvements but the benefits for new users are divided by 2.

- B.4.15 For cycling trips, the journey quality value is derived from the willingness to pay value of an off-road cycle track (7.03 pence per minute in 2010 prices). The assumption is also made that the average cyclist will use the upgraded towpath for approximately half their journey and that the upgrade from previous conditions represents only half of the full value. Effectively this means that one quarter of this value is used, which converts to a unit benefit of 21 pence per cycle trip ($7.03p / 2 / 2 * 11.7mins/trip$).
- B.4.16 For walkers it has been assumed that the improvements to the towpath will include level kerbs (1.9p/km), information panels (0.9p/km), pavement evenness (0.9p/km), directional signage (0.6p/km) and bench provision (0.6p/km). Again it is assumed that walkers use the route for half their journey and so that full benefits are halved. This gives an approximate unit benefit of 3 pence per walking trip ($(1.9+0.9+0.9+0.6+0.6) / 2 * 1.15$).
- B.4.17 The benefit per trip is applied to the forecast number of trips in the 'without scheme' case and, following the rule of a half, half the benefit per trip is applied to new trips in the 'with scheme' case. In these calculations an annualisation factor of 220 is used, based on the number of working days in a year. Weekend use is therefore not included and this may represent a conservative view. Quality benefits are calculated for each year, including real growth in the values in line with forecast GDP/capita, summed and discounted to give a total quality benefit of £1.0m, in 2010 present values.

Benefits estimated with the Marginal External Cost method

- B.4.18 Decongestion, accident, greenhouse gas, air quality, noise and indirect tax benefits have been estimated using the marginal external cost method using forecasts of reduced car kilometres as a result of the scheme. Reduced highway maintenance costs (which are netted off the construction and maintenance costs in the PVC) are also calculated in the same way. Detail on this method, including a worked example based on this case study, is given in [TAG Unit A5.4 – Marginal External Costs](#).
- B.4.19 Table B5 shows the 2010 present value of the impacts estimated with the marginal external cost method.

| Table B5 Impacts estimated with the marginal external cost method (2010 prices and present values) | |
|--|---------------|
| Impacts | Present value |
| Decongestion | £1,125,217 |
| Accidents | £49,490 |
| Greenhouse gases | £2,117 |
| Air quality | £3,322 |
| Noise | £15,183 |
| Indirect tax | -£89,079 |
| Infrastructure | £1,537 |

B.5 Reporting the results

Transport Economic Efficiency

- B.5.1 The only Transport Economic Efficiency (TEE) impacts estimated in this case study are the road decongestion benefits, estimated from the estimated reduction in car kilometres. The £1.2m benefit represents both time and vehicle operating cost savings and is not disaggregated by journey purpose.

Public Accounts

- B.5.2 Table B6 shows a simplified Public Accounts (PA) table, recording the construction and maintenance costs of the scheme (from Table B2) and the reduced highway infrastructure costs and indirect tax impact estimated with the marginal external cost method (from Table B5).

| Table B6 Public Accounts (PA) table | | |
|--|---------------------|-------------|
| Funding | Walk / cycle | Road |
| Revenue | | |
| Operating costs | £378,770 | -£1,537 |
| Investment Costs | £249,276 | |
| Developer and Other Contributions | | |
| Grant/Subsidy Payments | | |
| Indirect Tax Revenues | | £89,079 |
| Broad Transport Budget | £626,509 | |
| Wider Public Finances | £89,079 | |

Analysis of Monetised Costs and Benefits

- B.5.3 Values from the TEE and PA tables should be carried forward in to the Analysis of Monetised Costs and Benefits (AMCB) table. In addition, values for 'Physical activity' (including absenteeism), 'Journey quality', 'Accidents', 'Greenhouse gases', 'Noise' and 'Local air quality' should also be included in the AMCB table. The scheme 'Present Value of Costs' (PVC) is the impact on the 'Broad Transport Budget' from the PA table. The 'Present Value of Benefits' (PVB) is the sum of all other impacts (including the indirect tax impact). The 'Net Present Value' and the 'Benefit Cost Ratio' are then calculated from the PVC and PVB. Table B7 shows the AMCB table for this example and Figure B2 shows the breakdown of the benefits.

| Table B7 Analysis of Monetised Costs and Benefits | |
|--|------------|
| Noise | £3,322 |
| Local Air Quality | £2,117 |
| Greenhouse Gases | £15,183 |
| Journey Quality | £1,034,576 |
| Physical Activity (including absenteeism) | £1,331,358 |
| Accidents | £49,490 |
| Economic Efficiency (Decongestion) | £1,125,217 |
| Wider Public Finances (Indirect Tax Revenues) | -£89,079 |
| Present Value of Benefits (PVB) | £3,472,183 |
| Broad Transport Budget | £626,509 |
| Present Value of Costs (PVC) | £626,509 |
| OVERALL IMPACTS | |
| Net Present Value (NPV) | £2,845,674 |
| Benefit to Cost Ratio (BCR) | 5.5 |

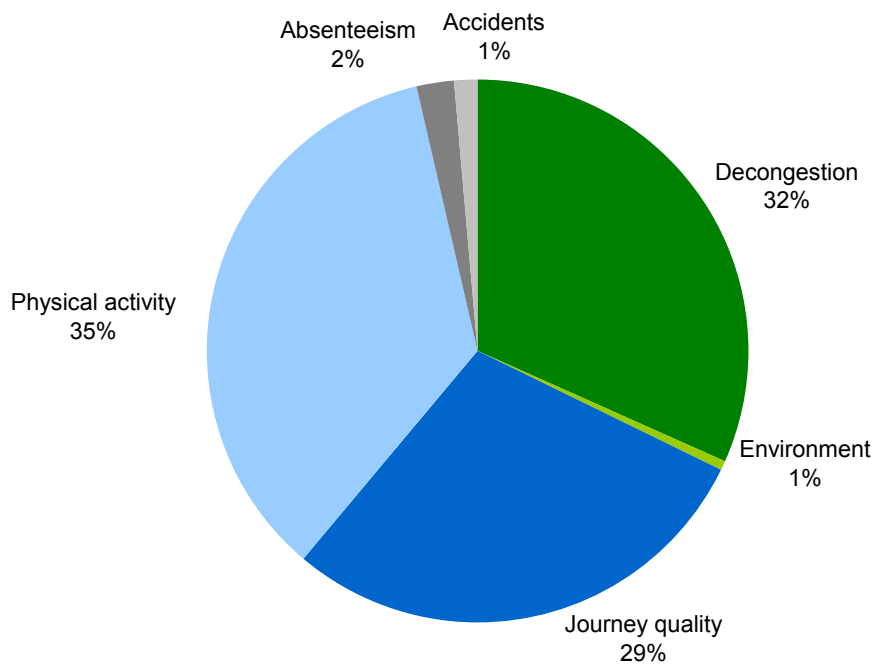


Figure B2 Proportion of benefits attributable to each main impact

B.6 Sensitivity testing

B.6.1 For this case study, assumptions around the decay rate, appraisal period and journey quality benefits were tested. Figure B3 below shows the forecast 'with scheme' cycling trips at each year under different decay rates.

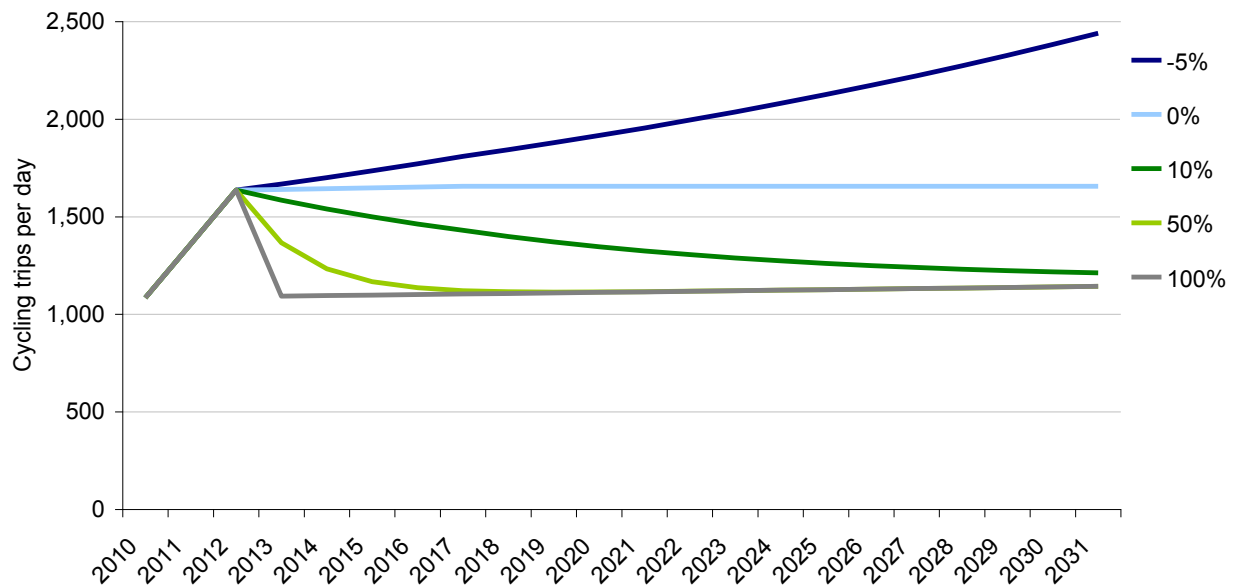


Figure B3 Cycling trips resulting from each decay rate assumption

B.6.2 Figure B4 below shows the impact on the BCR of varying the decay rate and the appraisal period. As is commonly found, the BCR increases with the appraisal period, particularly if a sustained impact is assumed (i.e. under the 0% and -5% decay rate assumptions). Under more conservative assumptions that cycling levels will decline gradually after the intervention, the BCR is less affected by the length of the appraisal period.

B.6.3 It is noteworthy that the more sustained the impact, i.e. the greater the number of new users, the more physical activity will dominate the benefits. With larger decay rates, journey quality benefits will

be proportionately more important, since the number of existing users that continue to receive the quality benefits will be more dominant in the profile of users.

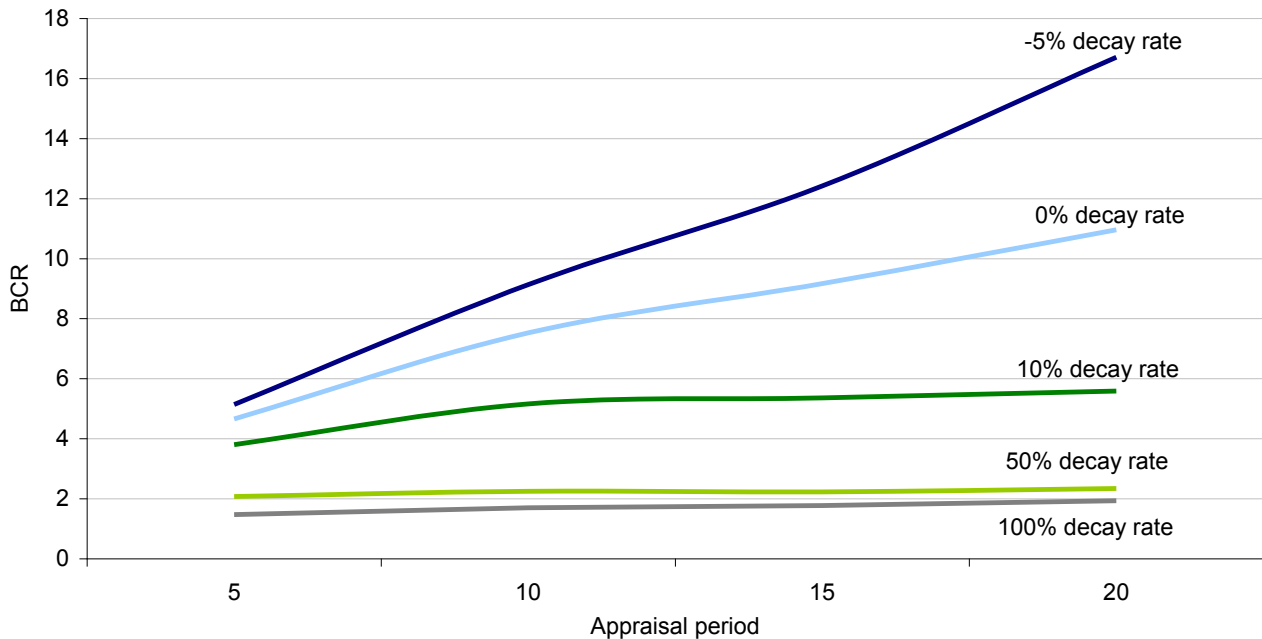


Figure B4 Sensitivity test results comparing the BCR for different decay rates and appraisal periods

B.6.4 Figure B5 shows how the BCR varies with changes to the assumed unit journey quality benefit. The core assumptions of 21p per cycle trip; 3p per walking trip; a decay rate of 10%; and a 20 year appraisal period, result in a BCR of 5.5. Even assuming one eighth of the journey quality benefits gives a BCR around 4 due to physical activity and decongestion benefits. Clearly, raising the level of benefits can have a large impact, with quality benefits of around £1.65 per cycling trip resulting in a BCR of 17. This illustrates the importance of setting quality benefits at a justified level, which are transparently supported by evidence.

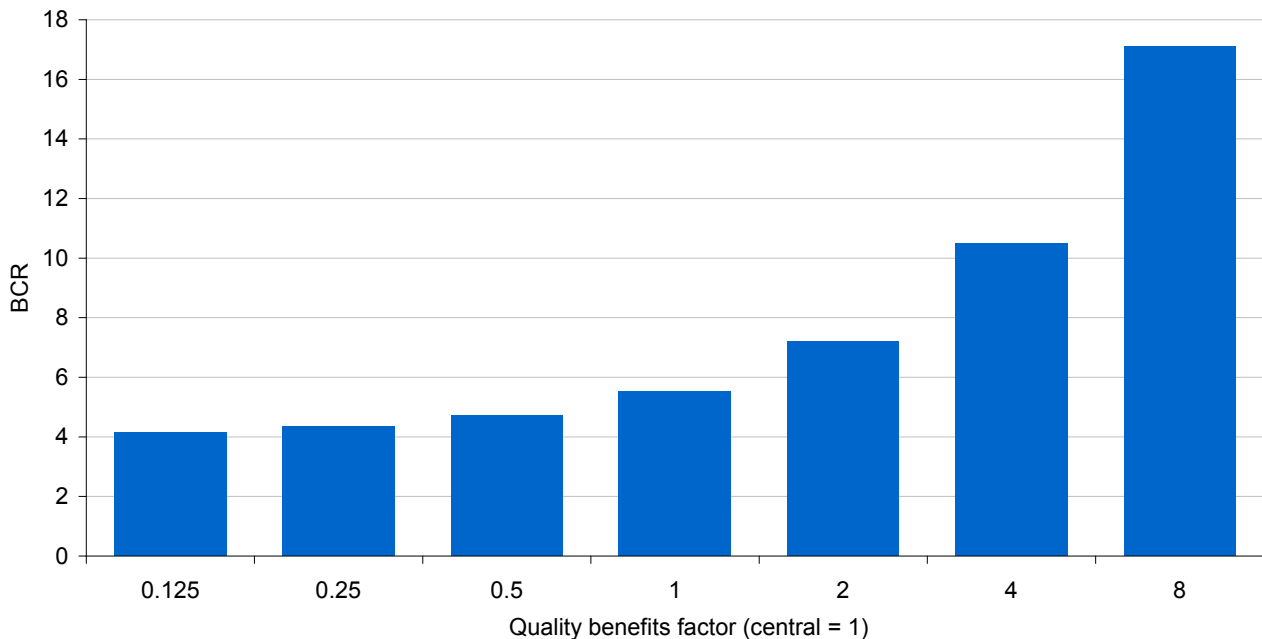


Figure B5 Sensitivity test results showing the impact on the BCR of different journey quality assumptions

B.7 Comments on the case study

- B.7.1 The analysis shows that this scheme is forecast to be successful, with the main benefits resulting from physical activity, journey quality and decongestion. As the scheme is in a highly congested area (Central London) a high marginal external congestion cost is used in the calculation of decongestion benefits. Schemes in less dense and congested urban areas (where lower marginal external congestion costs should be used) are likely to see a lower proportion of decongestion benefits.
- B.7.2 Physical activity benefits tend to dominate due to the relative success of the cycle track in encouraging new users to cycle and to a lesser extent to walk. The increase in demand will be in part due to the increased amenity that the route provides and its attractiveness to users, new and existing.
- B.7.3 Since the route is already in use by a significant number of users, the amenity benefits of improved journey quality are proportionately high, as existing users receive the full benefit and new users receive only half (due to applying the rule of a half). Since it is assumed that the real and perceived quality of the route is sustained across the appraisal period of twenty years, this benefit continues to accrue, even where the decay rate reduces the number of users back towards the levels without the scheme (since existing users are also relatively high in the without-scheme case).
- B.7.4 This case study provides a hypothetical example of the key themes that largely summarise the appraisal benefits of walking and cycling schemes in general:
- Physical activity benefits will tend to dominate where forecasts of new walk and cycle users are relatively large (i.e. significant mode shift occurs);
 - Journey quality will be proportionately greater where there is a relatively large number of existing users;
 - Decongestion benefits will be much more important in congested urban areas of a higher density.
- B.7.5 A significant caveat in this case study is that the comparative study used in the forecasting interacts with the London congestion charge zone. Therefore, forecast usage of walk and cycle modes may piggy-back on the mode shift expected from that major scheme. This case study has been undertaken as a methodological exercise. Clearly this emphasises the need to consider local factors and potential impacts from other schemes, especially where significant mode shift may have occurred. Although difficult, attempts should be made to separate out the potential impacts of other schemes in the locality so that a common realistic reference case can be used when comparing different scheme options. In the example of this case study, the reference case used may inform other schemes in the area on a comparative basis, but must be recognised as potentially biased when appraising schemes in other areas that will not benefit from the same mode shift impact associated with the congestion charge scheme.

Appendix D WebTAG Unit A5.4: Marginal External Costs

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Department
for Transport

TAG UNIT A5.4

Marginal External Costs

January 2014

Department for Transport

Transport Analysis Guidance (TAG)

<https://www.gov.uk/transport-analysis-guidance-webtag>

This TAG Unit is guidance for the **APPRAISAL PRACTITIONER**

This TAG Unit is part of the family **A5 – UNI-MODAL APPRAISAL**

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1 Introduction

- 1.1.1 Road decongestion benefits will arise where significant traffic reductions occur in moderate to congested conditions. In uncongested areas the effects of reduced traffic are likely to be minimal, analogous to moving along the flat part of a traditional speed/flow curve. Fully specified multi-modal models can provide robust estimates of decongestion benefits and should be used where practical and proportionate to do so.
- 1.1.2 However, in some instances alternative models, such as elasticity-based models, are used in forecasting, for example for the majority of rail schemes. Models of this sort are not capable of providing estimates of road decongestion benefits and this TAG Unit provides guidance on how decongestion benefits should be estimated when a multi-modal model is not used.
- 1.1.3 The primary method for estimating decongestion benefits in the absence of a multi-modal model is based on **marginal external costs** (MECs). The use of road vehicles incurs both private costs borne by the individual traveller (such as fuel costs and personal travel time) and external costs borne by others. For car use, these external costs include congestion, air pollution, noise, infrastructure and accident costs. The MEC method is based on the change in these external costs arising from an additional (or removed) vehicle (or vehicle km) on the network. These costs have been estimated from the Department's National Transport Model and **Surface Transport Costs and Charges: Great Britain 1998¹**. More detail on the derivation of the costs, and the definitions of road types, area types and congestion bands, are given in Appendix A.
- 1.1.4 The MEC method is most likely to be used when appraising rail, walking or cycling interventions, where the use of multi-modal models is less common and analysts should refer to [TAG Unit A5.1 – Active Mode Appraisal](#) and [TAG Unit A5.3 – Rail Appraisal](#), as appropriate. The MEC method may also be applicable in other situations, for example for low cost options or where decongestion benefits are small compared to other impacts, but this should be agreed with the Department at an early stage and verified in the Appraisal Specification Report (see [Guidance for the Technical Project Manager](#)).
- 1.1.5 The MEC method does not take into account all of the responses available to those who switch mode (for example changing destinations) or the effect of the initial change in traffic levels on costs and subsequent demand. Sensitivity testing of scheme appraisals to the results of the MEC approach will therefore be expected.
- 1.1.6 Alternative methods for estimating decongestion benefits in the absence of a multi-modal model, but when information on highway flows or trips is available, are discussed in section 3. As above, sensitivity testing is expected of the impact on the scheme appraisal of assumptions made when using these methods.

2 Application of marginal external costs

- 2.1.1 Several steps need to be taken to estimate the change in the external costs of car use from this information. Steps one to three calculate total changes in external costs for the opening year and the future forecast year, and then step four explains how this analysis can be extended to cover the whole appraisal period
- Step 1 – Estimate the change in car kilometres
 - Step 2 – Analyse the characteristics of the car journeys removed

¹ Sansom, T., Nash, C., Mackie, P., Shires, J., & Watkiss, P. (2001) 'Surface Transport Costs & Charges: Great Britain 1998' Department of the Environment, Transport and the Regions, London.

- Step 3 – Calculate marginal external costs for modelled years
- Step 4 – Discount costs over the appraisal period

2.1.2 A worked example of the method is given in Appendix B.

2.2 Step 1 – Estimate the change in car kilometres

2.2.1 The first step is to estimate the change in car kilometres due to the intervention in the opening year and at least one other forecast year. This will be determined by the extent to which car traffic will be diverted off the roads. There will be a diversity of approaches to this assessment depending on the nature of the scheme and its size. The Department should be consulted when new approaches are used or new issues arise when estimating the change in car kilometres.

2.2.2 Diversion factors for schemes can be derived from the experience of previous similar schemes, or may also be estimated from a study undertaken specifically for the scheme. A survey of the intention of road users affected by the scheme will quantify the number of journeys that may move from the road so potentially resulting in decongestion benefits.

Rail diversion factors

2.2.3 Where possible, the change in car kilometres should be estimated using local evidence such as passenger surveys. In the absence of local evidence, diversion factors based on the National Transport Model (NTM) may be used to convert a change in rail passenger kilometres to a change in car kilometres. The diversion factors are presented in Table 1 and show that, for example, for a hypothetical increase in rail travel of 100 kilometres, 46 kilometres (46%) would come from lengthening current rail trips, with the remaining 54 kilometres from diversion from other modes (including 26 kilometres from removed car kilometres²). The diversion factors were estimated by modelling an increase in rail fares and should be subject to sensitivity testing. More detail on their derivation is given in Appendix C.

| Table 1 National average diversion factors from the National Transport Model - Changes in distance travelled as a percentage of a change in rail passenger kilometres | | | | | | |
|--|--------|--------|------------|---------------|-------|---------------------|
| | Walk | Cycle | Car driver | Car passenger | Bus | Total kms travelled |
| Change in distance travelled by mode as % of change in rail passenger kms | -0.47% | -0.46% | -26% | -20% | -7.4% | 46% |

2.2.4 For some schemes these national diversion factors will not be applicable, for example where long distance access trips by car are likely to be affected or where the purpose of a scheme is to encourage mode shift. All scheme appraisals will need to consider whether the nature of the scheme is likely to make the national factors inappropriate, meaning that local evidence will be required to inform the change in car kilometres.

² For the purposes of this unit, the 20% change in car passenger kilometres does not affect the change in car kilometres.

Walking and cycling diversion factors

- 2.2.5 The diversion factors in Table 1 may also be applicable to walking and cycling schemes, although more detailed empirical evidence and forecasting techniques are more relevant (e.g. Evaluation data from the Sustainable Travel Towns³).

2.3 Step 2 – Analyse the characteristics of the car journeys

- 2.3.1 In the absence of a highway model, the techniques described below assign the car kilometres saved to different road types, area types and congestion levels. If feasible and proportionate to the cost of the proposed scheme, local evidence should be sought about the routes that would be used. Likely road routes can be identified using highway models or routing software, while traffic flow data for busy roads is available from the relevant highway authority. If possible an opening year estimate and at least one further forecast year estimate should be produced.
- 2.3.2 Local analysis of the characteristics of the traffic is likely to be most feasible for the opening year estimate. Congestion levels are expected to change over time and routes may also change if, for example, other transport schemes are built. Consideration should be given to how the assignment of traffic might change over time, but this may not be possible in some circumstances. In this case, the same pattern of traffic may be assumed in the future forecast year as the opening year. Advice from the Department should be sought if it is unclear what effort is proportionate.
- 2.3.3 In the absence of, or to support, local evidence, estimates of regional traffic flows derived from the NTM can be used. The proportions of traffic in each congestion level for each road type and area type vary by region and are given in the [TAG Data Book](#):

A5.4.1 – Traffic by region, congestion band, area type & road type

- 2.3.4 Proportions of traffic are given for 2010 and five year intervals to 2035. Proportions for any intermediate year can be obtained by linear interpolation. The proportions for 2035 may be assumed if the future forecast year is beyond that date.
- 2.3.5 If local evidence can provide road and area types but not congestion bands, then the regional traffic tables can provide evidence on likely congestion bands. For example, if the evidence suggests that a road trip which diverts from rail in the East Midlands will use only rural roads, of which half are 'A' and half are 'other', then these two columns of the table for that region can be used to derive the appropriate weights to apply to the diverted car kilometres. These weights will indicate the level of congestion typically encountered by each additional car kilometre in that region for the selected road and area type. Advice should be sought from the Department if the most appropriate method of application is unclear.

2.4 Step 3 – Marginal external costs results

- 2.4.1 Steps one and two should provide the change in car kilometres by road type, area type and congestion level for the opening year and, usually, at least one other forecast year. These can then be used with the marginal external costs given in the TAG databook, disaggregated in the same way, to estimate the decongestion benefits in the opening and forecast year:

A5.4.2 – Marginal external costs by road type and congestion band

³ <https://www.gov.uk/government/publications/the-effects-of-smarter-choice-programmes-in-the-sustainable-travel-towns-full-report>

- 2.4.2 The marginal external costs are presented in pence per kilometre in real, undiscounted market prices. The results change over time as the underlying values of the impacts increase in line with Departmental methodology and factors such as fuel efficiency improve. Also presented are weighted average costs for Great Britain for each element.
- 2.4.3 The values for each future year should be combined with the characteristics of the predicted car traffic changes to give the total external costs of those changes for the scheme opening year and the other forecast year.
- 2.4.4 Care must be taken when using values in congestion band 5. In principle these are conditions where traffic flow has broken down and there is currently little evidence as to how traffic operates in such conditions. Therefore the analyst should consult the Department if considering using values in this band.
- 2.4.5 The method described above assumes that the alternative journeys taken in the without scheme and with scheme scenarios have the same origin and destination area types. This simplifying assumption is necessary in the absence of a trip distribution model.
- 2.4.6 In some instances, particularly some rail interventions which are aimed at a particularly time of day, it is more practical to classify changes in car kilometres by time of day and region, rather than road type and congestion band. The TAG databook also contains proportions of traffic and marginal external costs disaggregated in this way:

[A5.4.3 – Car traffic shares by time of day](#)

[A5.4.4 – Marginal external costs by region and time of day](#)

- 2.4.7 The values in Table A5.4.4 relate only to transport economic efficiency (time and vehicle operating cost) impacts. Therefore, where these values are used to calculate decongestion benefits, values from Table A5.4.2 should be used to estimate other impacts (such as accidents or greenhouse gas emissions). In such circumstances it may be problematic to determine the appropriate road type, congestion band etc so the weighted average values for Great Britain should be used.
- 2.4.8 The choice of which level of disaggregation to use should be based on what is most practicable in view of the scheme and the requirements of the analysis. The reporting should include a justification of the external costs used and where various options are considered (potentially including different modes) it is expected that a consistent approach will be taken.

2.5 Step 4 – Calculation of discounted external costs of car use for whole appraisal period

- 2.5.1 Steps 1-3 will have provided total undiscounted external costs of changes in car use for the scheme opening year and, usually, at least one other forecast year.
- 2.5.2 Interpolation and extrapolation can be used to derive individual values for all other future years to the end of the appraisal period. Analysts should have regard to the advice in [TAG Unit A1.1 - Cost Benefit Analysis](#) on interpolation and extrapolation of benefits.
- 2.5.3 However, it is recognised that defining reasonable growth profiles for traffic may be difficult for many schemes, particularly those that have used the regional traffic proportions provided above. In the absence of other evidence, road demand (and its allocation to the area and road types/congestion levels) in the final year of the appraisal period may be assumed to be the same as in the last modelled year. The standard assumptions about growth in factors such as values of time and fuel efficiency should be assumed to continue to grow over time and these values applied in the last year of the appraisal period.

- 2.5.4 The profile of benefits between the last modelled year and the end of the appraisal period may then be estimated by interpolation between the benefits estimated in the last modelled year and the end of the appraisal period.
- 2.5.5 These results should then be discounted to the Department's standard base year. [TAG Unit A1.1](#) also includes advice on discounting.

3 Alternative approaches

- 3.1.1 Where a highway model is available it can be used to estimate decongestion benefits without using the external costs estimated by the NTM. The alternative approaches below still require an initial estimate of the reduction in car kilometres (Step 1 – Estimate the change in car kilometres) but Step 2 – Analyse the characteristics of the car journeys and Step 3 – Marginal external costs results can be replaced by:
- manual reduction of flows on the affected highway links. As this is a simple link-based approach, the output can be analysed to determine the average cost per vehicle at different flow levels. This approach should only be used where the number of highway trips removed is small and the routing of highway trips can be assumed to be unaffected;
 - manual reduction of trips for the affected cells of the highway trip matrix. Following this, a highway assignment model should be applied and benefits can be assessed using TUBA. This method should be used where re-routing of highway trips is expected, but secondary induced traffic effects can be ignored; or
 - where changes in highway journey times are significant and these benefits become a significant proportion (say, about 10%) of the transport economic efficiency benefits, induced traffic should be taken into account via an augmented application of the method discussed in the preceding bullet. Trips in affected cells of the highway trip matrix may be manually reduced. However, when applying the highway assignment model, elasticities should be included to cater for induced traffic. Further guidance on the use of elasticities to estimate induced traffic is given in [TAG Unit M2 – Variable Demand Modelling](#). The TUBA software programme should be used to assess the decongestion benefits.

4 Presentation of results

4.1 Appraisal tables

- 4.1.1 The results of this analysis should be presented in the standard [Transport Economic Efficiency](#), [Public Accounts](#) and [Analysis of Monetised Costs and Benefits](#) tables. Results should be reported as follows:
- The estimated change in congestion costs should be entered in TEE table as a change in consumer travel time for cars, LGVs and goods vehicles. It should be noted that the calculation of 'congestion' cost includes an estimate of vehicle operating cost changes.
 - The estimated changes in greenhouse gases, local air quality, noise and accident costs should be entered in the relevant boxes of the AMCB table.
 - Road related infrastructure costs will generally accrue to the Highways Agency or Local Government and should therefore appear in the PA table under the central or local government investment costs headings.

- A note should be added to all tables to explain that the methodology in this unit has been applied.

4.1.2 All values estimated using this method should also be included in the [Appraisal Summary Table](#) with a note to explain how they were estimated.

4.2 Spreadsheet of results

4.2.1 It is anticipated that the above method will require the use of spreadsheet software to calculate the total external cost change estimate. A clear spreadsheet of all calculations, assumptions and results must be submitted with any scheme that uses this methodology. The separate totals for each category of benefit calculated using this methodology (e.g. congestion, greenhouse gases, etc.) should be stated clearly in scheme documentation.

5 References

Sansom, T., Nash, C., Mackie, P., Shires, J., & Watkiss, P. (2001) 'Surface Transport Costs & Charges: Great Britain 1998' Department of the Environment, Transport and the Regions, London.

Slooman, L., Cairns, S., Newson, C., Anable, J., Pridmore, A. & Goodwin, P. (2010) 'The Effects of Smarter Choice Programmes in the Sustainable Travel Towns', Report to the Department for Transport, London.

6 Document Provenance

Marginal External Congestion Costs

This TAG Unit forms part of the restructured WebTAG guidance, taking the 'in draft' October 2013 versions of TAG units 3.9.5 – MSA – Decongestion Benefits and 3.13.2 – Guidance on Rail Appraisal – External Costs of Car Use as its basis. This includes adjustments to the decongestion element of the marginal external costs as a result of changes to the values of travel time savings.

Unit 3.9.5 was based on Annex E of **Major Scheme Appraisal in Local Transport Plans: Part 1 Detailed Guidance on Public Transport and Highway Schemes** (DfT, 2003). It was updated in 2007, when rail specific guidance in Unit 3.13.2 was also introduced. Both units were updated again in August 2012.

Appendix A MECS and the National Transport Model

A.1 Derivation of MECs from the National Transport Model

- A.1.1 This section describes how marginal external costs have been calculated using the National Transport Model (NTM). It is a multi-modal model which includes 6 modes of transport - car driver, car passenger, rail, bus, walk and cycle. The model is composed of a series of sub-models, three of which are applied in iteration to produce the main model outputs. More information on the NTM is available on the DfT's website⁴.
- A.1.2 The NTM calculates the marginal costs of congestion using a set of speed-flow curves. These are used to represent the relationship between the volume of traffic on a particular link and the speed of the traffic. Congestion is modelled as non-linear. When a link is relatively free of congestion, an additional vehicle will not have a large impact on speed. As the link becomes more congested, an additional vehicle will have a much larger impact upon average speed.
- A.1.3 Within the NTM, congestion is defined as time lost relative to free flow conditions. The speed at free flow conditions is set at the speed limit, adjusted for junctions. As a link becomes congested (and therefore traffic will be travelling at less than free-flow speed) the implied time penalty is modelled.
- A.1.4 The external costs associated with the time penalty firstly consists of the value of journey time increases due to congestion. The NTM combines the modelled delay of a marginal vehicle with the recommended WebTAG values of time ([TAG Data Book](#)) and then sums these across all users of a road to give the cost of delay of an additional vehicle kilometre.
- A.1.5 In addition, the change in vehicle operating costs are taken into account. The addition of a single car will result in a small change in vehicle operating costs per vehicle caused by a small reduction in average speed for all the vehicles already on the link. Adding these costs to the time costs of delay gives the marginal external congestion costs.
- A.1.6 Estimates of the external costs of accidents, noise, infrastructure damage, local air quality and greenhouse gases (in the form of carbon in carbon dioxide) are calculated in addition to the congestion costs. These are taken from Sansom et al. (2001) which gives these marginal external costs by vehicle-type, road-type and area-type for 1998. Values are adjusted away from Samson et al. (2001) to reflect updated subsequent guidance.
- A.1.7 Overall, both NTM results on congestion and other external costs originating from Sansom et al. are valued in the future given:
- Values of time extrapolated according to [TAG Data Book table 1.3.2](#);
 - DECCs guidance on the current and future cost of a tonne of CO₂ with the NTM accounting for improvements in fuel efficiency;
 - DEFRA guidance on the current cost of NO_x and PM₁₀ (the latter by area type);
 - Current and future fuel duty and VAT from HM Treasury;
 - Accidents, local air pollution, noise and infrastructure costs are all assumed to grow in line with GDP per capita reflecting increases in people's willingness to pay. The NTM accounts for tighter vehicle emissions standards in line with DEFRA guidance.

⁴ <https://www.gov.uk/government/organisations/department-for-transport/series/transport-appraisal-and-modelling-tools#the-national-transport-model>

A.2 NTM road and area types

A.2.1 This section contains information and tables explaining the definitions of terms used in FORGE (Fitting On of Regional Growth and Elasticities) and the marginal external cost outputs. Table A1 shows the codes assigned to different area and road types used in [TAG Data Book tables A5.4.1 and A5.4.2](#). All motorways outside conurbations are assumed to be in rural areas for the purposes of the model.

| Table A1 Specification of Conurbations, Other Urban, Rural, Motorways, A roads and B&C roads in terms of FORGE area and road type codes | | | | | | | | | |
|---|------------------------|---------|-------------|-----------------------|---------|-------------|-------------|---------|-------------|
| FORGE Area Type | Conurbations 1 to 5 | | | Other Urban 6 to 9 | | | Rural 10 | | |
| FORGE Road Type | Motor ways | A roads | Other roads | Motor ways | A roads | Other roads | Motor ways | A roads | Other roads |
| | 1 | 2 to 5 | 6 & 7 | n/a | 2 to 5 | 6 & 7 | 1 | 2 to 5 | 6 & 7 |

A.2.2 Table A2 shows the FORGE area type codes and a detailed definition of the FORGE area types.

Table A2 FORGE area types

| | |
|---------------------------|--|
| 1. Central London | City of London, Westminster south of Westway, and a few adjacent wards of neighbouring boroughs |
| 2. Inner London | Remainder of: Westminster, Camden, Islington, Kensington & Chelsea, Lambeth, Southwark. All of: Hackney, Hammersmith & Fulham, Haringey, Lewisham, Newham, Tower Hamlets, Wandsworth |
| 3. Outer London | Barking & Dagenham, Barnet, Bexley, Brent, Bromley, Croydon, Ealing, Greenwich, Harrow, Havering, Hillingdon, Hounslow, Kingston-upon-Thames, Merton, Redbridge, Richmond upon Thames, Sutton, Waltham Forest. |
| 4. Inner Conurbation | Cities of Birmingham, Manchester, Liverpool, Sheffield, Leeds, Newcastle Upon Tyne and Glasgow |
| 5. Outer Conurbation | Remainder of former Metropolitan counties: i.e. rest of West Midlands, rest of Greater Manchester, rest of Merseyside, rest of South Yorkshire, rest of West Yorkshire, rest of Tyne & Wear and the Greater Glasgow area (including Kirkcintilloch, Airdrie, Wishaw, East Kilbride, Paisley, Erskine and Milngavie) |
| 6. Urban Big (>250,000) | Blackpool, Bournemouth, Brighton, Bristol, Cardiff, Edinburgh, Hull, Leicester, Middlesbrough, Nottingham, Plymouth, Portsmouth, Southampton, Stoke |
| 7. Urban Large (>100,000) | Aberdeen, Basildon, Blackburn, Cheltenham, Colchester, Derby, Dundee, Gloucester, Ipswich, Luton, Milton Keynes, Newport(Gwent) Northampton, Norwich, Oxford, Peterborough, Preston, Reading, Slough, Southend, Swansea, Swindon, Telford, Torbay, Warrington |
| 8. Urban Medium (>25,000) | Abbots Langley, Abingdon, Accrington, Aldershot & Farnborough, Alfreton & Heanor, Amersham & Chesham, Ashford, Ashted, Aylesbury, Ayr, Banbury, Banstead, Bargoed & Newbridge, Barnstaple, Barrow, Barry, Basingstoke, Bath, Bedford, Bedworth, Belper & Duffield, Bexhill, Billericay, Bishop Auckland, Bishop's Cleeve, Blyth & Cramlington, Bognor Regis, Boston, Bracknell, Bradford & Trowbridge, Braintree, Brentwood, Bridgend, Bridgwater, Bridlington, Bromsgrove, Buckhaven & Leven, Burnley & Padiham, Burton upon Trent, Bury St Edmunds, Bushey Heath, Camberley & Frimley, Camborne & Redruth, Cambridge, Cannock, Canterbury, Canvey Island, Carlisle, Caterham & Warlingham, Chatham, Chelmsford, Chertsey, Chester, Chesterfield, Chippenham, Chipping Sodbury, Chorley, Clacton/Frinton/Walton, Cleethorpes, Clevedon & Backwell, Codsall & Wombourne, Congleton, Consett & Stanley, Conwy & Llandudno, Corby, Crawley, Crewe & Nantwich, Cumbernauld, Cwmbran, Darlington, Dartford, Deal, Dover, Dumbarton & Alexandria, Dunfermline, Durham, East Grinstead, Eastbourne, Eastleigh, Egham, Ellesmere Port, Epping/Loughton/Chigwell, Epsom & Ewell, Exeter, Exmouth, Falkirk & Grangemouth, Falmouth, Farnham, Fleet, Gillingham, Glenrothes, Glossop, Grantham, Gravesend, Grays & Ockenden, Great Malvern, Great Yarmouth, Greenock & Port Glasgow, Grimsby, Guildford, Hailsham & Polegate, Harlow, Harpenden, Harrogate, Haslingden & Rawtenstall, Hassocks & Burgess Hill, Hastings, Hatfield & Welwyn, Hartlepool, Haywards Heath, Hemel Hempstead, Hereford, Herne Bay & Whitstable, High Wycombe, Hinckley, Hitchin/Letchworth/Baldock, Hoddesdon/Cheshunt, Horsham, Hucknall, Hythe/Folkestone, Ilkeston, Inverness, Kettering, Kidderminster, Kilmarnock, King's Lynn, Kirkcaldy, Lancaster, Lancing, Leatherhead, Leighton Buzzard, Leyland, Lichfield, Lincoln, Littlehampton, Livingston, Llanelli, Loughborough, Lowestoft, Lymington/New Milton, Macclesfield, Maidenhead, Maidstone, Mansfield, Margate, Marske/Saltburn/Brotton, Merthyr Tydfil, Mold/Buckley, Neath, Nelson/Colne, Newark, Newbiggin/Bedlington, Newbury, Newhaven & Seaford, Newton Abbot, Northwich, Nuneaton, Ormskirk/Skelmersdale, Penarth, Perth, Peterhead, Peterlee, Pontypridd, Port Talbot, Radlett/Elstree/Borehamwood, Rainham/Wigmore, Ramsgate/Broadstairs, Rayleigh/Rochford, Redditch, Reigate, Rhyl/Prestatyn, Rickmansworth, Rochester, Rugby, Runcorn, Salisbury, Sandown & Ventnor, Scarborough, Scunthorpe, Seaham, Sheerness, Shildon/Newton Aycliffe, Shrewsbury, Sittingbourne, South Oxhey, Spennymoor/Coxhoe, St Albans, St Neots, Stafford, Staines/Sunbury, Stanford-le-Hope, Stevenage, Stirling, Stroud/Nailsworth, Sutton/Kirkby, Swadlincote, Tamworth, Taunton, Tonbridge, Tunbridge Wells, Waltham Abbey, Walton/Weybridge/Esher, Warwick & Leamington Spa, Watford, Wellingborough, Weston-super-mare, Weymouth & Portland, Whitehaven, Widnes, Wilmslow, Winchester, Windsor, Winsford, Witham, Woking, Wokingham, Worcester, Worksop, Worthing, Wrexham, Yateley, Yeovil, York |
| 9. Urban Small (>10,000) | |
| 10. Rural | |

A.2.3 Table A3 gives a description of the FORGE road type codes.

| Table A3 FORGE road codes | | | |
|---------------------------|-------------------------|---------------|--------------------|
| Road Type | London and Conurbations | Other Urban | Rural |
| 1 | Motorway | N/A | Motorway |
| 2 | N/A | N/A | Trunk Dual A |
| 3 | N/A | N/A | Principal Dual A |
| 4 | Trunk A | Trunk A | Trunk Single A |
| 5 | Principal A | Principal A | Principal Single A |
| 6 | B and C Roads | B and C Roads | B Roads |
| 7 | Unclassified | Unclassified | C & Unclassified |

A.3 NTM congestion bands

- A.3.1 The congestion bands used in the external costs spreadsheets reflect the volume to capacity ratio of a traffic link. The volume (v) is the actual traffic flow and the capacity (c) is the theoretic maximum traffic flow. These can be expressed in terms of vehicle (or PCU (passenger car unit)) per time period per road (or lane) length. Table A4 shows how the congestion bands relate to the ratios.

| Table A4 Congestion Bands in terms of volume over capacity | |
|--|--------------------|
| Congestion band | Volume / Capacity |
| 1 | $v/c < 0.25$ |
| 2 | $0.25 < v/c < 0.5$ |
| 3 | $0.5 < v/c < 0.75$ |
| 4 | $0.75 < v/c < 1$ |
| 5 | $v/c > 1$ |

- A.3.2 When assigning traffic to the v/c bands the process assumes “average network” lane capacities. However, depending on local conditions, the actual capacity of a link may be somewhat more or less than the capacity assumed at the site. In some cases actual flows may exceed the theoretical capacity of a link and lead to v/c ratios in excess of 1.
- A.3.3 Appraisals should seek to identify the capacities of roads that are used as substitutes for rail, if possible and proportionate for the size of the scheme. In the absence of more local knowledge, Tables A5 and A6 contain suggested capacities for roads in rural and urban areas respectively. Table A7 shows the PCU factors for different vehicle types.

| Table A5 Suggested average capacities (PCU per lane km per hour) for rural roads | | | | | |
|--|----------|------------------------|--------------------------|---------|------------------------|
| Road Type | Motorway | Trunk & Principal Dual | Trunk & Principal Single | B Roads | C & Unclassified Roads |
| Capacity Flow (PCU) | 2330 | 2100 | 1380 | 1150 | 1050 |

Table A6 Suggested average capacities (PCU per lane km per hour) for urban roads

| Road Type | Area Type | Capacity Flow (PCU) |
|-------------------|-----------|---------------------|
| Motorway | 1, 2 & 4 | 2000 |
| | 3 & 5 | 2330 |
| A Road | 1,2 & 4 | 700 |
| | 3 | 1100 |
| | 5 | 1100 |
| | 6,7,8 & 9 | 1100 |
| B&C Road | 1 | 550 |
| | 2 | 550 |
| | 3 | 790 |
| | 4 | 550 |
| | 5 & 6 | 790 |
| | 7 to 9 | 1050 |
| Unclassified Road | 1 | 550 |
| | 2 | 550 |
| | 3 | 790 |
| | 4 | 550 |
| | 5 & 6 | 790 |
| | 7 to 9 | 1050 |

Table A7 PCU Factors by Vehicle Type

| Vehicle Type | PCU Factor |
|------------------------|------------|
| Car | 1.0 |
| Light Goods Vehicle | 1.0 |
| Rigid Goods Vehicle | 1.9 |
| Artic Goods Vehicle | 2.9 |
| Public Service Vehicle | 2.5 |

Appendix B Marginal External Cost worked example

B.1.1 This appendix provides a worked example of how to calculate the benefits of reduced car kilometres resulting from mode switch using the Marginal External Cost (MEC) method. The example is based on the cycling and walking case study of improvements to a canal towpath serving a large industrial estate in London in Appendix B to [TAG Unit A5.1 – Active Mode Appraisal](#).

B.1.2 The example follows the four-step process described in the main body of this Unit:

- Step 1 – Estimate the change in car kilometres
- Step 2 – Analyse the characteristics of the car journeys removed
- Step 3 – Calculate marginal external costs for modelled years
- Step 4 – Discount costs over the appraisal period

B.2 Step 1 – Estimate the change in car kilometres

B.2.1 Forecast demand for walking and cycling kilometres as a result of the scheme are forecast on the basis of before and after intervention trip counts from a comparative study and assumptions about average trip distance. Removed car kilometres are based on user surveys from the comparative study which indicated that 27.3% of users had a car available for the trip but chose not to use it. The length of car trips removed is assumed to be equal to the walking and cycling trips they are replaced with, meaning car kilometres removed are 27.3% of the forecast increase in walking and cycling kilometres.

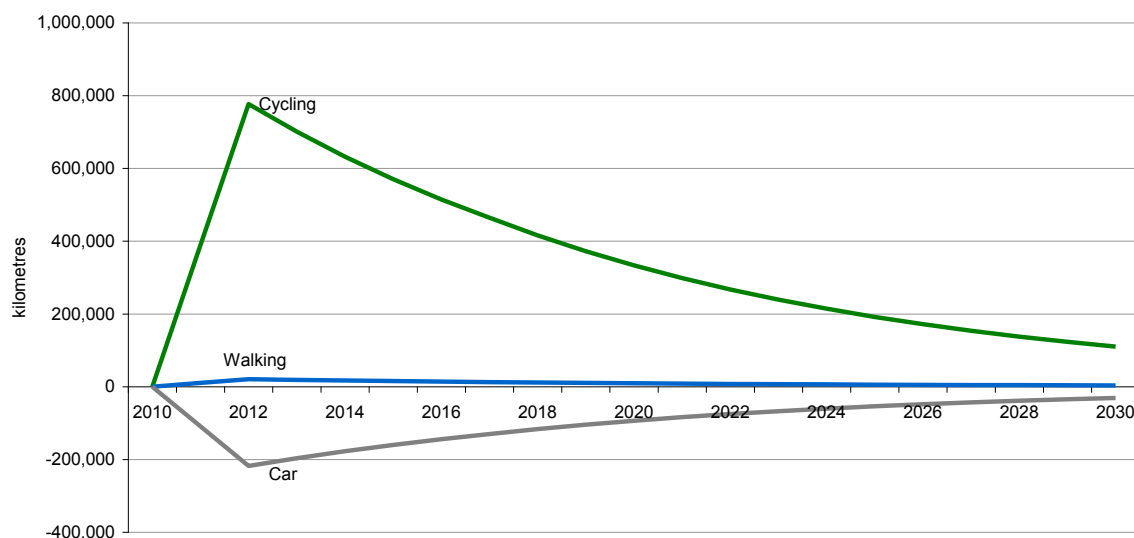


Figure B1 - Forecast increase in annual walking and cycling kilometres and reduction in car kilometres

B.3 Step 2 – Analyse the characteristics of car journeys removed

B.3.1 In the absence of specific information on the car trips being removed, average proportions of traffic by road type for London from [TAG Data Book table A5.4.1](#) have been used.

| Table B1 Proportions of traffic by road type for London (TAG Data Book table A5.1) | | | |
|---|------------------|----------------|--------------------|
| | Motorways | A Roads | Other Roads |
| 2010 | 4.1% | 55.6% | 40.2% |
| 2015 | 4.1% | 55.9% | 40.0% |
| 2020 | 4.2% | 55.8% | 40.0% |
| 2025 | 4.3% | 55.8% | 39.9% |
| 2030 | 4.3% | 55.7% | 40.0% |

B.4 Step 3 – Calculate marginal external costs for modelled years

- B.4.1 The MECs by road type for London, for each category of impact and year, were taken from [TAG Data Book table A5.4.2](#). These were then weighted with the proportions of traffic in Table B1 to produce weighted average marginal external costs for each year and category of impact.

| Table B2 Weighted average marginal external costs for London (pence per kilometre, 2010 market prices) | | | | | |
|---|-------------|-------------|-------------|-------------|-------------|
| | 2010 | 2015 | 2020 | 2025 | 2030 |
| Decongestion | 56.0 | 62.1 | 81.0 | 109.3 | 132.1 |
| Infrastructure | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 |
| Accidents | 2.9 | 3.1 | 3.4 | 3.6 | 4.0 |
| Local Air Quality | 0.3 | 0.1 | 0.1 | 0.00 | 0.00 |
| Noise | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 |
| Greenhouse Gases | 1.1 | 1.0 | 0.9 | 0.9 | 0.9 |
| Indirect Taxation | -6.2 | -6.0 | -5.5 | -4.8 | -4.5 |
| Reduction in car kms | 0 | -159,932 | -93,579 | -53,922 | -31,042 |
| Net impact | £0 | -£96,922 | -£74,947 | -£58,975 | -£41,278 |

- B.4.2 The benefit in each year for which marginal external costs are provided is then calculated as the product of the MECs presented in Table B2 and the number of car kilometres forecast to be removed in that year.

B.5 Step 4 – Discount costs over the appraisal period

- B.5.1 Forecast reductions in car kilometres were produced for each year of the appraisal period. Therefore the MECs for each category were interpolated between the years for which values are given in the TAG databook (for example a decongestion value of 72.4pence per kilometre in 2018). The cost per kilometre for each category was multiplied by the number of car kilometres removed in each year of the appraisal period. The stream of benefits for each category was then discounted to a 2010 base year using the standard HMT Green Book discount rates given in [TAG Data Book table A1.1](#) and described in [TAG Unit A1.1 – Cost Benefit Analysis](#).
- B.5.2 The calculations are set out in Table B3 and the overall results are presented in Table B4 (the figures in Table B4 show the change in marginal external costs, so that negative values represent benefits).

Table B3 Calculation of marginal external costs

| Cost (ppkm) | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|-----------------------------|------|------|-------|-------|-------|------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|
| Congestion | 56.0 | 57.1 | 58.3 | 59.5 | 60.8 | 62.1 | 65.5 | 69.0 | 72.8 | 76.8 | 81.0 | 86.0 | 91.3 | 96.9 | 102.9 | 109.3 | 113.5 | 117.9 | 122.5 | 127.2 | 132.1 |
| Infrastructure | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 |
| Accident | 2.9 | 2.9 | 3.0 | 3.0 | 3.0 | 3.1 | 3.1 | 3.2 | 3.2 | 3.3 | 3.4 | 3.4 | 3.5 | 3.5 | 3.6 | 3.6 | 3.7 | 3.8 | 3.9 | 3.9 | 4.0 |
| Air Quality | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Noise | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| GHG | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| Indirect Tax | -6.2 | -6.1 | -6.1 | -6.1 | -6.0 | -6.0 | -5.9 | -5.8 | -5.7 | -5.6 | -5.5 | -5.4 | -5.2 | -5.1 | -5.0 | -4.8 | -4.8 | -4.7 | -4.6 | -4.6 | -4.5 |
| Car kms (000s) | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| | 0 | -109 | -218 | -196 | -177 | -160 | -144 | -130 | -117 | -104 | -94 | -84 | -75 | -67 | -60 | -54 | -48 | -43 | -39 | -35 | -31 |
| Benefits | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| Congestion | £0 | -£62 | -£127 | -£117 | -£108 | -£99 | -£94 | -£90 | -£85 | -£80 | -£76 | -£72 | -£69 | -£65 | -£62 | -£59 | -£55 | -£51 | -£47 | -£44 | -£41 |
| Infrastructure | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| Accident | £0 | -£3 | -£6 | -£6 | -£5 | -£5 | -£5 | -£4 | -£4 | -£3 | -£3 | -£3 | -£3 | -£2 | -£2 | -£2 | -£2 | -£2 | -£1 | -£1 | -£1 |
| Air Quality | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| Noise | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| GHG | £0 | -£1 | -£2 | -£2 | -£2 | -£2 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 | £0 | £0 | £0 | £0 | £0 | £0 |
| Indirect Tax | £0 | £7 | £13 | £12 | £11 | £10 | £9 | £8 | £7 | £6 | £5 | £4 | £4 | £3 | £3 | £3 | £2 | £2 | £2 | £2 | £1 |
| Discount factor | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| | 1.00 | 0.97 | 0.93 | 0.90 | 0.87 | 0.84 | 0.81 | 0.79 | 0.76 | 0.73 | 0.71 | 0.68 | 0.66 | 0.64 | 0.62 | 0.60 | 0.58 | 0.56 | 0.54 | 0.52 | 0.50 |
| Discounted Benefits (£000s) | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
| Congestion* | £0 | -£60 | -£119 | -£106 | -£94 | -£84 | -£77 | -£71 | -£64 | -£59 | -£54 | -£49 | -£45 | -£42 | -£38 | -£35 | -£32 | -£28 | -£26 | -£23 | -£21 |
| Infrastructure | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| Accident | £0 | -£3 | -£6 | -£5 | -£5 | -£4 | -£4 | -£3 | -£3 | -£3 | -£2 | -£2 | -£2 | -£2 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 |
| Air Quality | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| Noise | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| GHG | £0 | -£1 | -£2 | -£2 | -£2 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 | -£1 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| Indirect Tax | £0 | £6 | £12 | £11 | £9 | £8 | £7 | £6 | £5 | £4 | £4 | £3 | £3 | £2 | £2 | £2 | £1 | £1 | £1 | £1 | £1 |

- B.5.3 The decongestion benefits form part of the Transport Economic Efficiency (TEE) impacts of the scheme and should be reported in the [TEE table](#) in the “Road” column and carried through in to the [Analysis of Monetised Costs and Benefits \(AMCB\)](#) table and [Appraisal Summary Table \(AST\)](#). The MEC approach does not distinguish between journey purposes but the decongestion benefits can be split using the default values in [TAG Data Book table A1.3.4](#). The decongestion benefits represent changes in both travel time and vehicle operating costs. It should be noted in the AST that this is the case and that the benefits have been calculated with the MEC method.
- B.5.4 The indirect tax impacts should be reported in the [Public Accounts \(PA\) table](#), AMCB table and AST. The infrastructure impact represents a reduction in highway maintenance costs and should be included as a negative cost in the PA table, netting off the scheme costs. The accident, local air quality, noise and greenhouse gas impacts should be reported in the AMCB and AST and contribute to the scheme’s Present Value of Benefits (PVB).

| Table B4 Present values of marginal external costs | |
|---|--|
| Category of impact | Present Value (£000s, 2010 market prices) |
| Decongestion | -£1,125 |
| Infrastructure | -£2 |
| Accident | -£49 |
| Local Air Quality | -£2 |
| Noise | -£3 |
| Greenhouse Gases | -£15 |
| Indirect Taxation | £89 |

Appendix C Deriving rail diversion factors from the NTM

- C.1.1 Two scenarios in the NTM were compared to derive the diversion factors in Table C1. The base case has rail fares remaining at 2003 levels until 2025; this is compared to a scenario which introduces RPI+1 per cent per annum increase in fares over the same time period. The results are presented as a percentage of the change in rail kilometres.

| Table C1 National average diversion factors from the National Transport Model - Changes in distance travelled as a percentage of a change in rail passenger kilometres | | | | | | |
|---|--------|--------|------------|----------------------------|-------|---------------------|
| | Walk | Cycle | Car driver | Car passenger ⁵ | Bus | Total kms travelled |
| Change in distance travelled by mode as % of change in rail passenger kms | -0.47% | -0.46% | -26% | -20% | -7.4% | 46% |

- C.1.2 A fall in rail passenger kilometres is observed in the model due to the relative increase in rail costs, and hence an increase in the use of other modes. Overall distance travelled is estimated to fall by 46% of the fall in rail kilometres as the trips replacing rail trips are generally shorter distance. 26% of the decrease in rail passenger kilometres is replaced by car driver kilometres. The information on the mode share of distance travelled in Table C1 is required for estimating the external costs of the rail related change in road use. The use of these factors converts a change in rail passenger kilometres to a change in car kilometres, taking into account car occupancy rates.
- C.1.3 The mode share of all trips in Table C2 is shown for the purpose of illustrating the outputs from the NTM but is not required for estimating the change in car kilometres. In the NTM the total number of trips does not change with a change in costs, hence the total change in trips in Table C2 is zero. However, length of journey and the destination area type choice are possible responses to changing costs.

| Table C2 National average diversion factors from the National Transport Model - Changes in trips as a percentage of a change in rail trips | | | | | | |
|---|------|-------|------------|---------------|------|-------------|
| | Walk | Cycle | Car driver | Car passenger | Bus | Total trips |
| Change in trips as a percentage of a change in rail trips | -13% | -3.7% | -44% | -24% | -16% | 0% |

⁵ For the purposes of this unit, the 20% change in car passenger kilometres does not affect the change in car kilometres.

Appendix E Economic Appraisal Results

Scheme A: Huncoat Greenway Element

The table below outlines the outputs of the benefit cost analysis for the Huncoat Greenway scheme, split out by each of the three sensitivity tests as outlined in Section 3.4, with benefits calculated over a 30-year appraisal period.

Scheme A Results in £'s

| Scheme A | Growth Sensitivity | | |
|---|--------------------|----------|----------|
| | 15% | 30% | 60% |
| Noise | £5 | £6 | £8 |
| Local Air Quality | £0 | £0 | £0 |
| Greenhouse Gases | £29 | £33 | £41 |
| Journey Quality (Congestion) | £833 | £942 | £1,159 |
| Physical Activity - Mortality | £399,191 | £451,260 | £555,396 |
| Physical Activity - Absenteeism | £18,048 | £20,402 | £25,110 |
| Infrastructure Maintenance | £5 | £5 | £7 |
| Accidents | £78 | £88 | £108 |
| Economic Efficiency | £107,632 | £121,670 | £149,748 |
| Wider Public Finances (Indirect Taxation) | -£142 | -£161 | -£198 |

| | | | |
|--|----------|----------|----------|
| Present Value of Benefits (PVB) | £525,679 | £594,245 | £731,379 |
|--|----------|----------|----------|

| | | | |
|------------------------|----------|----------|----------|
| Broad Transport Budget | £375,519 | £375,519 | £375,519 |
|------------------------|----------|----------|----------|

| | | | |
|-------------------------------------|----------|----------|----------|
| Present Value of Costs (PVC) | £375,519 | £375,519 | £375,519 |
|-------------------------------------|----------|----------|----------|

| | | | |
|--------------------------------|----------|----------|----------|
| Net Present Value (NPV) | £150,160 | £218,727 | £355,860 |
|--------------------------------|----------|----------|----------|

| | | | |
|------------------------------------|-------------|-------------|-------------|
| Benefit to Cost Ratio (BCR) | 1.40 | 1.58 | 1.95 |
|------------------------------------|-------------|-------------|-------------|

This highlights that with the lowest growth rate applied, the scheme produces a positive BCR in the **medium** VfM category (of between 1.5 and 2.0 BCR), as outlined in WebTAG guidance. However, the scheme helps provide direct connectivity to the Burnley-Pendle Growth Corridor, identified in the SEP as having the highest GVA of any scheme being promoted by Transport for Lancashire, and in particular provides a safe, off road route avoiding the busy A679 Burnley Road and will connecting housing and employees to Huncoat industrial Estate, other employment areas and nearby schools. These additional benefits are quantified in Table 5-J.

Scheme B: NCN 6 Element

The table below outlines the outputs of the benefit cost analysis for the NCN6 scheme, split out by each of the three sensitivity tests as outlined in Section 3.4, with benefits calculated over a 30-year appraisal period.

Scheme B Results in £'s

| Scheme B | Growth Sensitivity | | |
|---|--------------------|------------|-------------|
| | 15% | 30% | 60% |
| Noise | £27 | £31 | £38 |
| Local Air Quality | £1 | £1 | £1 |
| Greenhouse Gases | £145 | £164 | £202 |
| Journey Quality (Congestion) | £4,223 | £4,774 | £5,876 |
| Physical Activity - Mortality | £8,674,612 | £9,806,083 | £12,069,025 |
| Physical Activity - Absenteeism | £91,362 | £103,279 | £127,113 |
| Infrastructure Maintenance | £25 | £28 | £34 |
| Accidents | £387 | £438 | £539 |
| Economic Efficiency | £873,660 | £987,616 | £1,215,527 |
| Wider Public Finances (Indirect Taxation) | -£690 | -£779 | -£959 |

| | | | |
|--|------------|-------------|-------------|
| Present Value of Benefits (PVB) | £9,643,754 | £10,901,635 | £13,417,396 |
|--|------------|-------------|-------------|

| | | | |
|------------------------|------------|------------|------------|
| Broad Transport Budget | £3,311,860 | £3,311,860 | £3,311,860 |
|------------------------|------------|------------|------------|

| | | | |
|-------------------------------------|------------|------------|------------|
| Present Value of Costs (PVC) | £3,311,860 | £3,311,860 | £3,311,860 |
|-------------------------------------|------------|------------|------------|

| | | | |
|--------------------------------|------------|------------|-------------|
| Net Present Value (NPV) | £6,331,894 | £7,589,775 | £10,105,537 |
|--------------------------------|------------|------------|-------------|

| | | | |
|------------------------------------|-------------|-------------|-------------|
| Benefit to Cost Ratio (BCR) | 2.91 | 3.29 | 4.05 |
|------------------------------------|-------------|-------------|-------------|

This highlights that with the lowest growth rate applied, the scheme produces a positive BCR in the **high** VfM category (of greater than 2.0 BCR), as outlined in WebTAG guidance.

Scheme C: Valley of Stone Element

The table below outlines the outputs of the benefit cost analysis for the Valley of Stone scheme, split out by each of the three sensitivity tests as outlined in Section 3.4, with benefits calculated over a 30-year appraisal period.

Scheme C Results in £'s

| Scheme C | Growth Sensitivity | | |
|---|--------------------|------------|------------|
| | 15% | 30% | 60% |
| Noise | £14 | £16 | £20 |
| Local Air Quality | £1 | £1 | £1 |
| Greenhouse Gases | £77 | £87 | £108 |
| Journey Quality (Congestion) | £2,197 | £2,483 | £3,057 |
| Physical Activity - Mortality | £5,914,689 | £6,686,170 | £8,229,133 |
| Physical Activity - Absenteeism | £47,598 | £53,806 | £66,223 |
| Infrastructure Maintenance | £13 | £14 | £18 |
| Accidents | £205 | £231 | £285 |
| Economic Efficiency | £406,255 | £459,245 | £565,225 |
| Wider Public Finances (Indirect Taxation) | -£375 | -£424 | -£522 |

| | | | |
|--|------------|------------|------------|
| Present Value of Benefits (PVB) | £6,370,674 | £7,201,632 | £8,863,547 |
|--|------------|------------|------------|

| | | | |
|------------------------|------------|------------|------------|
| Broad Transport Budget | £2,287,119 | £2,287,119 | £2,287,119 |
|------------------------|------------|------------|------------|

| | | | |
|-------------------------------------|------------|------------|------------|
| Present Value of Costs (PVC) | £2,287,119 | £2,287,119 | £2,287,119 |
|-------------------------------------|------------|------------|------------|

| | | | |
|--------------------------------|------------|------------|------------|
| Net Present Value (NPV) | £4,083,555 | £4,914,513 | £6,576,428 |
|--------------------------------|------------|------------|------------|

| | | | |
|------------------------------------|-------------|-------------|-------------|
| Benefit to Cost Ratio (BCR) | 2.79 | 3.15 | 3.88 |
|------------------------------------|-------------|-------------|-------------|

This highlights that with the lowest growth rate applied, the scheme produces a positive BCR in the **high** VfM category (of greater than 2.0 BCR), as outlined in WebTAG guidance.

Scheme D: Weaver's Wheel Element

The table below outlines the outputs of the benefit cost analysis for the Weaver's Wheel scheme, split out by each of the three sensitivity tests as outlined in Section 3.4, with benefits calculated over a 30-year appraisal period.

Scheme D Results in £'s

| Scheme D | Growth Sensitivity | | |
|---|--------------------|------------|------------|
| | 15% | 30% | 120% |
| Noise | £21 | £29 | £39 |
| Local Air Quality | £1 | £2 | £3 |
| Greenhouse Gases | £111 | £155 | £213 |
| Journey Quality (Congestion) | £3,159 | £4,396 | £6,044 |
| Physical Activity - Mortality | £2,970,349 | £4,249,973 | £5,682,407 |
| Physical Activity - Absenteeism | £68,449 | £97,804 | £130,945 |
| Infrastructure Maintenance | £18 | £26 | £35 |
| Accidents | £294 | £410 | £563 |
| Economic Efficiency | £439,038 | £610,835 | £839,899 |
| Wider Public Finances (Indirect Taxation) | -£539 | -£750 | -£1,032 |

| | | | |
|--|------------|------------|------------|
| Present Value of Benefits (PVB) | £3,480,901 | £4,962,879 | £6,659,116 |
|--|------------|------------|------------|

| | | | |
|------------------------|------------|------------|------------|
| Broad Transport Budget | £1,200,662 | £1,200,662 | £1,200,662 |
|------------------------|------------|------------|------------|

| | | | |
|-------------------------------------|------------|------------|------------|
| Present Value of Costs (PVC) | £1,200,662 | £1,200,662 | £1,200,662 |
|-------------------------------------|------------|------------|------------|

| | | | |
|--------------------------------|------------|------------|------------|
| Net Present Value (NPV) | £2,280,239 | £3,762,216 | £5,458,454 |
|--------------------------------|------------|------------|------------|

| | | | |
|------------------------------------|-------------|-------------|-------------|
| Benefit to Cost Ratio (BCR) | 2.90 | 4.13 | 5.55 |
|------------------------------------|-------------|-------------|-------------|

This highlights that with the lowest growth rate applied, the scheme produces a positive BCR in the **high** VfM category (of greater than 2.0 BCR), as outlined in WebTAG guidance.

| | | |
|--|-----|----------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £525,679 |
| Scheme Discription: Scheme A: Huncoat Greenway Mitigation Measures | PVC | £375,519 |
| Cycle Improvements to provide new cycle routes and improvements to existing cycle routes around Huncoat Industrial Estate. Costs include 44% OB and allowance for risk. 15% growth applied. 30-year appraisal period. | NPV | £150,160 |
| | BCR | 1.400 |

Parameters & Inputs

| | |
|--|--------|
| Opening Year Total Time Savings (Veh Delay in hrs) | |
| Opening Year time savings | £5,016 |

| | |
|---|--------|
| Forecast Year Total Time Savings (Veh Delay in hrs) | |
| Forecast Year time savings | £5,016 |

| | |
|--|-------|
| Opening YearTotal Distance Saving (Veh KM in KM) | |
| Annualised Total Veh KM | 220.0 |

| | |
|--|-------|
| Design Year Total Distance Saving (Veh KM in KM) | |
| Annualised Total Veh KM | 220.0 |

| | |
|---------------------------|------------------|
| MEC Parameters | |
| Assessment Period (Years) | 30 |
| DM MEC Type: | Weighted Average |
| DS MEC Type: | Weighted Average |
| DM MEC Congestion Band: | Weighted Average |
| DS MEC Congestion Band: | Weighted Average |
| MEC growth post-2035? | 2% |

- Input Values

- Default Values

- Output Values

| | |
|--|------|
| Assessment Parameters | |
| Current year | 2015 |
| Scheme Opening Year | 2016 |
| Scheme Design Year | 2031 |
| | |
| Include VoT growth over time? | Yes |
| Include growth in benefits post-design year? | No |
| | |
| Scheme Cost Estimate Year | 2014 |
| Scheme Cost Discount Factor | 3.5% |
| Discount Factor (0-30 years) | 3.5% |
| Discount Factor (31-75 years) | 3.0% |

Estimation of Discounted Scheme Costs

| | | | | | | |
|--------------|--------------|------|-------------|-------------|-------------|----------|
| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
| | £391,932 | £0 | £20,628 | £0 | £0 | £412,560 |

| | | | | | | | | | | | | | | | | | |
|--|------|----|------|----|----|----------|----|---------|----|----|----------|------------------|-----------------------------------|-----------------|---|--|--|
| Spend Profile (insert percentage profile) | | | | | | C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
| 2014 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| 2015 | 1% | | 51% | | | £4,884 | £0 | £10,520 | £0 | £0 | £15,404 | 0.9289 | £14,309 | 0.842 | £12,048 | 1.19 | £14,337 |
| 2016 | 16% | | 52% | | | £64,047 | £0 | £10,731 | £0 | £0 | £74,778 | 0.9289 | £69,463 | 0.814 | £56,508 | 1.19 | £67,245 |
| 2017 | 24% | | | | | £95,088 | £0 | £0 | £0 | £0 | £95,088 | 0.9289 | £88,330 | 0.786 | £69,427 | 1.19 | £82,618 |
| 2018 | 0% | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.759 | £0 | 1.19 | £0 |
| 2019 | 66% | | | | | £260,541 | £0 | £0 | £0 | £0 | £260,541 | 0.9289 | £242,023 | 0.734 | £177,580 | 1.19 | £211,320 |
| 2020 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| 2021 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| 2022 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| 2023 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| 2024 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| 2025 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| 2026 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| 2027 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| 2028 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| 2029 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| 2030 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| 2031 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| 2032 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| 2033 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| 2034 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| 2035 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| 2036 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| 2037 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| 2038 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| 2039 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| 2040 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| 2041 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| 2042 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| 2043 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| 2044 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| 2045 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| 2046 | | | | | | £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| TOTAL | 108% | 0% | 103% | 0% | 0% | £424,560 | £0 | £21,251 | £0 | £0 | £445,811 | N/A | £414,125 | N/A | £315,562 | N/A | £375,519 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs
N.B. Optimism Bias only applied to Construction costs, not Land

Applying the methodology below produces the discounted scheme cost (PVC):-

a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)
b) Assume land is bought in the first year of construction
c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs
d) All costs discounted to 2010
e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|----------|
| Time Saving benefits (discounted) | £107,632 |
| MEC Discounted (2016 to 2010 Prices) | £808 |
| Mortality Benefits | £399,191 |
| Absentee Benefits | £18,048 |
| | |
| Total Benefits with MEC | £525,679 |
| Total costs (discounted) | £375,519 |
| BCR with Marginal External Costs | 1.39987 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road by the project | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|---|-------|-------|-------|-----------------------|------------|----------|-----------------|--|
| 2010 | 0 | 0 | 5,016 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 5,016 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 5,016 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 5,016 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 5,016 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 5,016 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 5,016 | 5,016 | 5,016 | 5,016 | £5,016 | 1.08 | £5,407 | 0.814 | £4,398 |
| 2017 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.10 | £5,514 | 0.786 | £4,334 |
| 2018 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.12 | £5,619 | 0.759 | £4,267 |
| 2019 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.14 | £5,726 | 0.734 | £4,201 |
| 2020 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.16 | £5,835 | 0.709 | £4,136 |
| 2021 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.19 | £5,945 | 0.685 | £4,072 |
| 2022 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.21 | £6,056 | 0.662 | £4,008 |
| 2023 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.23 | £6,170 | 0.639 | £3,945 |
| 2024 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.25 | £6,288 | 0.618 | £3,884 |
| 2025 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.28 | £6,408 | 0.597 | £3,825 |
| 2026 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.30 | £6,532 | 0.577 | £3,767 |
| 2027 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.33 | £6,660 | 0.557 | £3,711 |
| 2028 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.35 | £6,791 | 0.538 | £3,656 |
| 2029 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.38 | £6,926 | 0.520 | £3,603 |
| 2030 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.41 | £7,065 | 0.503 | £3,551 |
| 2031 | 5,016 | 5,016 | 5,016 | 5,016 | £5,016 | 1.44 | £7,208 | 0.486 | £3,500 |
| 2032 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.47 | £7,355 | 0.469 | £3,450 |
| 2033 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.50 | £7,505 | 0.453 | £3,402 |
| 2034 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.53 | £7,660 | 0.438 | £3,355 |
| 2035 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.56 | £7,819 | 0.423 | £3,309 |
| 2036 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.59 | £7,982 | 0.409 | £3,263 |
| 2037 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.62 | £8,149 | 0.395 | £3,219 |
| 2038 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.66 | £8,320 | 0.382 | £3,175 |
| 2039 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.69 | £8,495 | 0.369 | £3,133 |
| 2040 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.73 | £8,674 | 0.356 | £3,090 |
| 2041 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.77 | £8,857 | 0.344 | £3,049 |
| 2042 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.80 | £9,044 | 0.333 | £3,008 |
| 2043 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.84 | £9,236 | 0.321 | £2,968 |
| 2044 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.88 | £9,432 | 0.310 | £2,929 |
| 2045 | 0 | 5,016 | 5,016 | 5,016 | £5,016 | 1.92 | £9,632 | 0.355 | £3,423 |
| 2046 | 0 | 5,016 | 5,016 | 5,016 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 5,016 | 5,016 | 5,016 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 5,016 | 5,016 | 5,016 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 5,016 | 5,016 | 5,016 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 5,016 | 5,016 | 5,016 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 5,016 | 5,016 | 5,016 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 5,016 | 5,016 | 5,016 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 5,016 | 5,016 | 5,016 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £150,479 | N/A | £216,311 | N/A | £107,632 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | Late veh KM sifore opening - after design y3benefits profile | | | | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|--|-----|-----|-----|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 220 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 220 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.814 | 220 | 220 | 220 | 220 | £29 | £23 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£11 | -£9 |
| 2017 | 0.786 | 0 | 220 | 220 | 220 | £30 | £24 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£11 | -£8 |
| 2018 | 0.759 | 0 | 220 | 220 | 220 | £32 | £24 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£8 |
| 2019 | 0.734 | 0 | 220 | 220 | 220 | £33 | £24 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£7 |
| 2020 | 0.709 | 0 | 220 | 220 | 220 | £35 | £25 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£7 |
| 2021 | 0.685 | 0 | 220 | 220 | 220 | £37 | £25 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£7 |
| 2022 | 0.662 | 0 | 220 | 220 | 220 | £39 | £26 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£6 |
| 2023 | 0.639 | 0 | 220 | 220 | 220 | £41 | £26 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£6 |
| 2024 | 0.618 | 0 | 220 | 220 | 220 | £43 | £27 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£5 |
| 2025 | 0.597 | 0 | 220 | 220 | 220 | £45 | £27 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£5 |
| 2026 | 0.577 | 0 | 220 | 220 | 220 | £47 | £27 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£5 |
| 2027 | 0.557 | 0 | 220 | 220 | 220 | £49 | £27 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£5 |
| 2028 | 0.538 | 0 | 220 | 220 | 220 | £51 | £27 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£4 |
| 2029 | 0.520 | 0 | 220 | 220 | 220 | £53 | £28 | £0 | £0 | £5 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£4 |
| 2030 | 0.503 | 0 | 220 | 220 | 220 | £55 | £28 | £0 | £0 | £5 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£4 |
| 2031 | 0.486 | 220 | 220 | 220 | 220 | £58 | £28 | £0 | £0 | £5 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£4 |
| 2032 | 0.469 | 0 | 220 | 220 | 220 | £60 | £28 | £0 | £0 | £5 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£4 |
| 2033 | 0.453 | 0 | 220 | 220 | 220 | £63 | £29 | £0 | £0 | £5 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£4 |
| 2034 | 0.438 | 0 | 220 | 220 | 220 | £66 | £29 | £0 | £0 | £5 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£3 |
| 2035 | 0.423 | 0 | 220 | 220 | 220 | £69 | £29 | £0 | £0 | £5 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£3 |
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| 2037 | 0.395 | 0 | 220 | 220 | 220 | £71 | £28 | £0 | £0 | £6 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£3 |
| 2038 | 0.382 | 0 | 220 | 220 | 220 | £73 | £28 | £0 | £0 | £6 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£3 |
| 2039 | 0.369 | 0 | 220 | 220 | 220 | £74 | £27 | £0 | £0 | £6 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£3 |
| 2040 | 0.356 | 0 | 220 | 220 | 220 | £76 | £27 | £0 | £0 | £6 | £2 | £0 | £0 | £0 | £0 | £2 | £1 | -£8 | -£3 |
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| 2094 | 0.000 | 0 | 220 | 220 | 220 | £0 | £0 | £0 | £0 | £0 | £0 | £ | | | | | | | |

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| Undiscounted | £1,756 | Discounted | £808 |
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| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £594,245 |
| Scheme Discription: Scheme A: Huncoat Greenway Mitigation Measures | PVC | £375,519 |
| Cycle Improvements to provide new cycle routes and improvements to existing cycle routes around Huncoat Industrial Estate. Costs include 44% OB and allowance for risk. 30% growth applied. 30-year appraisal period. | NPV | £218,727 |
| | BCR | 1.582 |

Parameters & Inputs

| | | |
|--|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£5,670</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£5,670</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM248.6</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM248.6</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|----------|
| | £391,932 | £0 | £20,628 | £0 | £0 | £412,560 |

| Spend Profile (insert percentage profile) | | | | | | |
|--|------|----|------|----|----|--|
| 2014 | | | | | | |
| 2015 | 1% | | 51% | | | |
| 2016 | 16% | | 52% | | | |
| 2017 | 24% | | | | | |
| 2018 | 0% | | | | | |
| 2019 | 66% | | | | | |
| 2020 | | | | | | |
| 2021 | | | | | | |
| 2022 | | | | | | |
| 2023 | | | | | | |
| 2024 | | | | | | |
| 2025 | | | | | | |
| 2026 | | | | | | |
| 2027 | | | | | | |
| 2028 | | | | | | |
| 2029 | | | | | | |
| 2030 | | | | | | |
| 2031 | | | | | | |
| 2032 | | | | | | |
| 2033 | | | | | | |
| 2034 | | | | | | |
| 2035 | | | | | | |
| 2036 | | | | | | |
| 2037 | | | | | | |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | | | | | |
| 2041 | | | | | | |
| 2042 | | | | | | |
| 2043 | | | | | | |
| 2044 | | | | | | |
| 2045 | | | | | | |
| 2046 | | | | | | |
| TOTAL | 108% | 0% | 103% | 0% | 0% | |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|----------|----|---------|----|----|----------|------------------|-----------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £4,884 | £0 | £10,520 | £0 | £0 | £15,404 | 0.9289 | £14,309 | 0.842 | £12,048 | 1.19 | £14,337 |
| £64,047 | £0 | £10,731 | £0 | £0 | £74,778 | 0.9289 | £69,463 | 0.814 | £56,508 | 1.19 | £67,245 |
| £95,088 | £0 | £0 | £0 | £0 | £95,088 | 0.9289 | £88,330 | 0.786 | £69,427 | 1.19 | £82,618 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.759 | £0 | 1.19 | £0 |
| £260,541 | £0 | £0 | £0 | £0 | £260,541 | 0.9289 | £242,023 | 0.734 | £177,580 | 1.19 | £211,320 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £424,560 | £0 | £21,251 | £0 | £0 | £445,811 | N/A | £414,125 | N/A | £315,562 | N/A | £375,519 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs

N.B. Optimism Bias only applied to Construction costs, not Land

Applying the methodology below produces the discounted scheme cost (PVC):-

a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)

b) Assume land is bought in the first year of construction

c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs

d) All costs discounted to 2010

e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|----------|
| Time Saving benefits (discounted) | £121,670 |
| MEC Discounted (2016 to 2010 Prices) | £914 |
| Mortality Benefits | £451,260 |
| Absentee Benefits | £20,402 |
| Total Benefits with MEC | £594,245 |
| Total costs (discounted) | £375,519 |
| BCR with Marginal External Costs | 1.58246 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits (before opening) after design (benefits profile) | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|---|-------|-------|-------|-----------------------|------------|----------|-----------------|--|
| 2010 | 0 | 0 | 5,670 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 5,670 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 5,670 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 5,670 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 5,670 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 5,670 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 5,670 | 5,670 | 5,670 | 5,670 | £5,670 | 1.08 | £6,112 | 0.814 | £4,972 |
| 2017 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.10 | £6,233 | 0.786 | £4,899 |
| 2018 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.12 | £6,352 | 0.759 | £4,824 |
| 2019 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.14 | £6,473 | 0.734 | £4,749 |
| 2020 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.16 | £6,596 | 0.709 | £4,676 |
| 2021 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.19 | £6,720 | 0.685 | £4,603 |
| 2022 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.21 | £6,846 | 0.662 | £4,530 |
| 2023 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.23 | £6,975 | 0.639 | £4,460 |
| 2024 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.25 | £7,108 | 0.618 | £4,391 |
| 2025 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.28 | £7,244 | 0.597 | £4,324 |
| 2026 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.30 | £7,384 | 0.577 | £4,259 |
| 2027 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.33 | £7,529 | 0.557 | £4,195 |
| 2028 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.35 | £7,677 | 0.538 | £4,133 |
| 2029 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.38 | £7,830 | 0.520 | £4,073 |
| 2030 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.41 | £7,987 | 0.503 | £4,014 |
| 2031 | 5,670 | 5,670 | 5,670 | 5,670 | £5,670 | 1.44 | £8,148 | 0.486 | £3,956 |
| 2032 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.47 | £8,314 | 0.469 | £3,900 |
| 2033 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.50 | £8,484 | 0.453 | £3,846 |
| 2034 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.53 | £8,659 | 0.438 | £3,792 |
| 2035 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.56 | £8,839 | 0.423 | £3,740 |
| 2036 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.59 | £9,023 | 0.409 | £3,689 |
| 2037 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.62 | £9,212 | 0.395 | £3,639 |
| 2038 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.66 | £9,406 | 0.382 | £3,590 |
| 2039 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.69 | £9,603 | 0.369 | £3,541 |
| 2040 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.73 | £9,805 | 0.356 | £3,493 |
| 2041 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.77 | £10,012 | 0.344 | £3,446 |
| 2042 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.80 | £10,224 | 0.333 | £3,400 |
| 2043 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.84 | £10,441 | 0.321 | £3,355 |
| 2044 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.88 | £10,663 | 0.310 | £3,310 |
| 2045 | 0 | 5,670 | 5,670 | 5,670 | £5,670 | 1.92 | £10,889 | 0.355 | £3,870 |
| 2046 | 0 | 5,670 | 5,670 | 5,670 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 5,670 | 5,670 | 5,670 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 5,670 | 5,670 | 5,670 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 5,670 | 5,670 | 5,670 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 5,670 | 5,670 | 5,670 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 5,670 | 5,670 | 5,670 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 5,670 | 5,670 | 5,670 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 5,670 | 5,670 | 5,670 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £170,107 | N/A | £246,786 | N/A | £121,670 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | Late veh KM sifore opening : after design y3benefits profile | | | | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|--|-----|-----|-----|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 249 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 249 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.814 | 249 | 249 | 249 | 249 | £32 | £26 | £0 | £0 | £4 | £4 | £0 | £0 | £0 | £0 | £2 | £2 | -£12 | -£10 |
| 2017 | 0.786 | 0 | 249 | 249 | 249 | £34 | £27 | £0 | £0 | £4 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£12 | -£9 |
| 2018 | 0.759 | 0 | 249 | 249 | 249 | £36 | £27 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£12 | -£9 |
| 2019 | 0.734 | 0 | 249 | 249 | 249 | £38 | £28 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£11 | -£8 |
| 2020 | 0.709 | 0 | 249 | 249 | 249 | £39 | £28 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£11 | -£8 |
| 2021 | 0.685 | 0 | 249 | 249 | 249 | £42 | £29 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£11 | -£7 |
| 2022 | 0.662 | 0 | 249 | 249 | 249 | £44 | £29 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£11 | -£7 |
| 2023 | 0.639 | 0 | 249 | 249 | 249 | £46 | £30 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£7 |
| 2024 | 0.618 | 0 | 249 | 249 | 249 | £49 | £30 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£6 |
| 2025 | 0.597 | 0 | 249 | 249 | 249 | £51 | £30 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£6 |
| 2026 | 0.577 | 0 | 249 | 249 | 249 | £53 | £31 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£10 | -£6 |
| 2027 | 0.557 | 0 | 249 | 249 | 249 | £55 | £31 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£5 |
| 2028 | 0.538 | 0 | 249 | 249 | 249 | £58 | £31 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£5 |
| 2029 | 0.520 | 0 | 249 | 249 | 249 | £60 | £31 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£5 |
| 2030 | 0.503 | 0 | 249 | 249 | 249 | £62 | £31 | £0 | £0 | £5 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£4 |
| 2031 | 0.486 | 249 | 249 | 249 | 249 | £65 | £32 | £0 | £0 | £6 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£4 |
| 2032 | 0.469 | 0 | 249 | 249 | 249 | £68 | £32 | £0 | £0 | £6 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£4 |
| 2033 | 0.453 | 0 | 249 | 249 | 249 | £71 | £32 | £0 | £0 | £6 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£4 |
| 2034 | 0.438 | 0 | 249 | 249 | 249 | £74 | £33 | £0 | £0 | £6 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£4 |
| 2035 | 0.423 | 0 | 249 | 249 | 249 | £78 | £33 | £0 | £0 | £6 | £3 | £0 | £0 | £0 | £0 | £2 | £1 | -£9 | -£4 |
| 2036 | 0.409 | 0 | 249 | 249 | 249 | £79 | £32 | £1 | £0 | £6 | £3 | £0 | £0 | £1 | £0 | £3 | £1 | -£9 | -£4 |
| 2037 | 0.395 | 0 | 249 | 249 | 249 | £81 | £32 | £1 | £0 | £6 | £3 | £0 | £0 | £1 | £0 | £3 | £1 | -£9 | -£4 |
| 2038 | 0.382 | 0 | 249 | 249 | 249 | £82 | £31 | £1 | £0 | £7 | £3 | £0 | £0 | £1 | £0 | £3 | £1 | -£9 | -£4 |
| 2039 | 0.369 | 0 | 249 | 249 | 249 | £84 | £31 | £1 | £0 | £7 | £2 | £0 | £0 | £1 | £0 | £3 | £1 | -£9 | -£3 |
| 2040 | 0.356 | 0 | 249 | 249 | 249 | £86 | £31 | £1 | £0 | £7 | £2 | £0 | £0 | £1 | £0 | £3 | £1 | -£10 | -£3 |
| 2041 | 0.344 | 0 | 249 | 249 | 249 | £87 | £30 | £1 | £0 | £7 | £2 | £0 | £0 | £1 | £0 | £3 | £1 | -£10 | -£3 |
| 2042 | 0.333 | 0 | 249 | 249 | 249 | £89 | £30 | £1 | £0 | £7 | £2 | £0 | £0 | £1 | £0 | £3 | £1 | -£10 | -£3 |
| 2043 | 0.321 | 0 | 249 | 249 | 249 | £91 | £29 | £1 | £0 | £7 | £2 | £0 | £0 | £1 | £0 | £3 | £1 | -£10 | -£3 |
| 2044 | 0.310 | 0 | 249 | 249 | 249 | £93 | £29 | £1 | £0 | £7 | £2 | £0 | £0 | £1 | £0 | £3 | £1 | -£10 | -£3 |
| 2045 | 0.355 | 0 | 249 | 249 | 249 | £95 | £34 | £1 | £0 | £8 | £3 | £0 | £0 | £1 | £0 | £3 | £1 | -£11 | -£4 |
| 2046 | 0.345 | 0 | 249 | 249 | 249 | £96 | £33 | £1 | £0 | £8 | £3 | £0 | £0 | £1 | £0 | £3 | £1 | -£11 | -£4 |
| 2047 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2048 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2049 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2050 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2051 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2052 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2053 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2054 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2055 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2056 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2057 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2058 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2059 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2060 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2061 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2062 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2063 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2064 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2065 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2066 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2067 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2068 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2069 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2070 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2071 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2072 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2073 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2074 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2075 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2076 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2077 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2078 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2079 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2080 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2081 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2082 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2083 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2084 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2085 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2086 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2087 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2088 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2089 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2090 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2091 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2092 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2093 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2094 | 0.000 | 0 | 249 | 249 | 249 | £0 | £0 | £0 | £0 | £0</ | | | | | | | | | |

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|--------------|--------|------------|------|
| Undiscounted | £1,985 | Discounted | £914 |
|--------------|--------|------------|------|

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| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £731,379 |
| Scheme Discription: Scheme A: Huncoat Greenway Mitigation Measures | PVC | £375,519 |
| Cycle Improvements to provide new cycle routes and improvements to existing cycle routes around Huncoat Industrial Estate. Costs include 44% OB and allowance for risk. 60% growth applied. 30-year appraisal period. | NPV | £355,860 |
| | BCR | 1.948 |

Parameters & Inputs

| | | |
|--|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£6,979</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£6,979</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM306.0</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM306.0</div> | | |

Estimation of Discounted Scheme Costs

| | | | | | | |
|--------------|--------------|------|-------------|-------------|-------------|----------|
| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
| | £391,932 | £0 | £20,628 | £0 | £0 | £412,560 |

| | | | | | | |
|--|------|----|------|----|----|--|
| Spend Profile (insert percentage profile) | | | | | | |
| 2014 | | | | | | |
| 2015 | 1% | | 51% | | | |
| 2016 | 16% | | 52% | | | |
| 2017 | 24% | | | | | |
| 2018 | 0% | | | | | |
| 2019 | 66% | | | | | |
| 2020 | | | | | | |
| 2021 | | | | | | |
| 2022 | | | | | | |
| 2023 | | | | | | |
| 2024 | | | | | | |
| 2025 | | | | | | |
| 2026 | | | | | | |
| 2027 | | | | | | |
| 2028 | | | | | | |
| 2029 | | | | | | |
| 2030 | | | | | | |
| 2031 | | | | | | |
| 2032 | | | | | | |
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| 2034 | | | | | | |
| 2035 | | | | | | |
| 2036 | | | | | | |
| 2037 | | | | | | |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | | | | | |
| 2041 | | | | | | |
| 2042 | | | | | | |
| 2043 | | | | | | |
| 2044 | | | | | | |
| 2045 | | | | | | |
| 2046 | | | | | | |
| TOTAL | 108% | 0% | 103% | 0% | 0% | |

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|----------|----|---------|----|----|----------|------------------|-----------------------------------|-----------------|---|--|--|
| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £4,884 | £0 | £10,520 | £0 | £0 | £15,404 | 0.9289 | £14,309 | 0.842 | £12,048 | 1.19 | £14,337 |
| £64,047 | £0 | £10,731 | £0 | £0 | £74,778 | 0.9289 | £69,463 | 0.814 | £56,508 | 1.19 | £67,245 |
| £95,088 | £0 | £0 | £0 | £0 | £95,088 | 0.9289 | £88,330 | 0.786 | £69,427 | 1.19 | £82,618 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.759 | £0 | 1.19 | £0 |
| £260,541 | £0 | £0 | £0 | £0 | £260,541 | 0.9289 | £242,023 | 0.734 | £177,580 | 1.19 | £211,320 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £424,560 | £0 | £21,251 | £0 | £0 | £445,811 | N/A | £414,125 | N/A | £315,562 | N/A | £375,519 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs
N.B. Optimism Bias only applied to Construction costs, not Land

- Applying the methodology below produces the discounted scheme cost (PVC):-
- a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)
 - b) Assume land is bought in the first year of construction
 - c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs
 - d) All costs discounted to 2010
 - e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

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|--------------------------------------|----------|
| Time Saving benefits (discounted) | £149,748 |
| MEC Discounted (2016 to 2010 Prices) | £1,125 |
| Mortality Benefits | £555,396 |
| Absentee Benefits | £25,110 |
| Total Benefits with MEC | £731,379 |
| Total costs (discounted) | £375,519 |
| BCR with Marginal External Costs | 1.94765 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits (before opening) after design yearBenefits profile | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|---|-------|-------|-------|-----------------------|------------|----------|-----------------|--|
| 2010 | 0 | 0 | 6,979 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 6,979 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 6,979 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 6,979 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 6,979 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 6,979 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 6,979 | 6,979 | 6,979 | 6,979 | £6,979 | 1.08 | £7,522 | 0.814 | £6,119 |
| 2017 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.10 | £7,672 | 0.786 | £6,030 |
| 2018 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.12 | £7,817 | 0.759 | £5,937 |
| 2019 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.14 | £7,967 | 0.734 | £5,845 |
| 2020 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.16 | £8,118 | 0.709 | £5,755 |
| 2021 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.19 | £8,271 | 0.685 | £5,665 |
| 2022 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.21 | £8,426 | 0.662 | £5,576 |
| 2023 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.23 | £8,585 | 0.639 | £5,489 |
| 2024 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.25 | £8,748 | 0.618 | £5,404 |
| 2025 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.28 | £8,916 | 0.597 | £5,322 |
| 2026 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.30 | £9,088 | 0.577 | £5,241 |
| 2027 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.33 | £9,266 | 0.557 | £5,163 |
| 2028 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.35 | £9,448 | 0.538 | £5,087 |
| 2029 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.38 | £9,636 | 0.520 | £5,012 |
| 2030 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.41 | £9,830 | 0.503 | £4,940 |
| 2031 | 6,979 | 6,979 | 6,979 | 6,979 | £6,979 | 1.44 | £10,028 | 0.486 | £4,869 |
| 2032 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.47 | £10,232 | 0.469 | £4,801 |
| 2033 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.50 | £10,442 | 0.453 | £4,733 |
| 2034 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.53 | £10,658 | 0.438 | £4,668 |
| 2035 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.56 | £10,879 | 0.423 | £4,603 |
| 2036 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.59 | £11,105 | 0.409 | £4,540 |
| 2037 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.62 | £11,338 | 0.395 | £4,478 |
| 2038 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.66 | £11,576 | 0.382 | £4,418 |
| 2039 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.69 | £11,820 | 0.369 | £4,358 |
| 2040 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.73 | £12,068 | 0.356 | £4,300 |
| 2041 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.77 | £12,322 | 0.344 | £4,242 |
| 2042 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.80 | £12,584 | 0.333 | £4,185 |
| 2043 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.84 | £12,851 | 0.321 | £4,129 |
| 2044 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.88 | £13,123 | 0.310 | £4,074 |
| 2045 | 0 | 6,979 | 6,979 | 6,979 | £6,979 | 1.92 | £13,402 | 0.355 | £4,763 |
| 2046 | 0 | 6,979 | 6,979 | 6,979 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 6,979 | 6,979 | 6,979 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 6,979 | 6,979 | 6,979 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 6,979 | 6,979 | 6,979 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 6,979 | 6,979 | 6,979 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 6,979 | 6,979 | 6,979 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 6,979 | 6,979 | 6,979 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 6,979 | 6,979 | 6,979 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £209,362 | N/A | £303,737 | N/A | £149,748 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

| | | |
|--|-----|------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £9,643,754 |
| Scheme Discription: Scheme B: National Cycle Network Route 6 Improvements | PVC | £3,311,860 |
| Cycle Improvements to NCN route between Accrington and Bacup Costs include 44% OB and allowance for risk. 15% growth applied. 30-year appraisal period. | NPV | £6,331,894 |
| | BCR | 2.912 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£41,306</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2017</div> <div>Scheme Design Year2032</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£41,306</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,113.5</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,113.5</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £3,434,344 | £0 | £180,755 | £0 | £0 | £3,615,099 |

| Spend Profile (insert percentage profile) | | | | | | |
|--|------|----|------|----|----|--|
| 2014 | | | | | | |
| 2015 | 1% | | 51% | | | |
| 2016 | 28% | | 52% | | | |
| 2017 | 26% | | | | | |
| 2018 | 9% | | | | | |
| 2019 | 42% | | | | | |
| 2020 | | | | | | |
| 2021 | | | | | | |
| 2022 | | | | | | |
| 2023 | | | | | | |
| 2024 | | | | | | |
| 2025 | | | | | | |
| 2026 | | | | | | |
| 2027 | | | | | | |
| 2028 | | | | | | |
| 2029 | | | | | | |
| 2030 | | | | | | |
| 2031 | | | | | | |
| 2032 | | | | | | |
| 2033 | | | | | | |
| 2034 | | | | | | |
| 2035 | | | | | | |
| 2036 | | | | | | |
| 2037 | | | | | | |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | | | | | |
| 2041 | | | | | | |
| 2042 | | | | | | |
| 2043 | | | | | | |
| 2044 | | | | | | |
| 2045 | | | | | | |
| 2046 | | | | | | |
| TOTAL | 107% | 0% | 103% | 0% | 0% | |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|----------|----|----|------------|------------------|-----------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £48,633 | £0 | £92,185 | £0 | £0 | £140,818 | 0.9289 | £130,809 | 0.842 | £110,138 | 1.19 | £131,064 |
| £975,826 | £0 | £94,029 | £0 | £0 | £1,069,854 | 0.9289 | £993,813 | 0.814 | £808,468 | 1.19 | £962,076 |
| £876,777 | £0 | £0 | £0 | £0 | £876,777 | 0.9289 | £814,459 | 0.786 | £640,157 | 1.19 | £761,787 |
| £325,835 | £0 | £0 | £0 | £0 | £325,835 | 0.9289 | £302,676 | 0.759 | £229,855 | 1.19 | £273,528 |
| £1,459,047 | £0 | £0 | £0 | £0 | £1,459,047 | 0.9289 | £1,355,343 | 0.734 | £994,457 | 1.19 | £1,183,404 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £3,686,117 | £0 | £186,214 | £0 | £0 | £3,872,331 | N/A | £3,597,100 | N/A | £2,783,075 | N/A | £3,311,860 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs

N.B. Optimism Bias only applied to Construction costs, not Land

Applying the methodology below produces the discounted scheme cost (PVC):-

a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)

b) Assume land is bought in the first year of construction

c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs

d) All costs discounted to 2010

e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|------------|
| Time Saving benefits (discounted) | £873,660 |
| MEC Discounted (2016 to 2010 Prices) | £4,119 |
| Mortality Benefits | £8,674,612 |
| Absentee Benefits | £91,362 |
| Total Benefits with MEC | £9,643,754 |
| Total costs (discounted) | £3,311,860 |
| BCR with Marginal External Costs | 2.91188 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road by the project | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|---|--------|--------|--------|-----------------------|------------|------------|-----------------|--|
| 2010 | 0 | 0 | 41,306 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 41,306 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 41,306 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 41,306 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 41,306 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 41,306 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 0 | 0 | 41,306 | 0 | £0 | 1.08 | £0 | 0.814 | £0 |
| 2017 | 41,306 | 41,306 | 41,306 | 41,306 | £41,306 | 1.10 | £45,406 | 0.786 | £35,689 |
| 2018 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.12 | £46,269 | 0.759 | £35,137 |
| 2019 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.14 | £47,154 | 0.734 | £34,598 |
| 2020 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.16 | £48,048 | 0.709 | £34,062 |
| 2021 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.19 | £48,953 | 0.685 | £33,530 |
| 2022 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.21 | £49,870 | 0.662 | £33,003 |
| 2023 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.23 | £50,811 | 0.639 | £32,488 |
| 2024 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.25 | £51,777 | 0.618 | £31,987 |
| 2025 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.28 | £52,770 | 0.597 | £31,498 |
| 2026 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.30 | £53,792 | 0.577 | £31,022 |
| 2027 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.33 | £54,843 | 0.557 | £30,559 |
| 2028 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.35 | £55,923 | 0.538 | £30,107 |
| 2029 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.38 | £57,035 | 0.520 | £29,667 |
| 2030 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.41 | £58,179 | 0.503 | £29,239 |
| 2031 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.44 | £59,355 | 0.486 | £28,821 |
| 2032 | 41,306 | 41,306 | 41,306 | 41,306 | £41,306 | 1.47 | £60,563 | 0.469 | £28,413 |
| 2033 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.50 | £61,805 | 0.453 | £28,015 |
| 2034 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.53 | £63,080 | 0.438 | £27,627 |
| 2035 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.56 | £64,389 | 0.423 | £27,246 |
| 2036 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.59 | £65,730 | 0.409 | £26,873 |
| 2037 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.62 | £67,104 | 0.395 | £26,507 |
| 2038 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.66 | £68,516 | 0.382 | £26,149 |
| 2039 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.69 | £69,957 | 0.369 | £25,797 |
| 2040 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.73 | £71,429 | 0.356 | £25,449 |
| 2041 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.77 | £72,932 | 0.344 | £25,105 |
| 2042 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.80 | £74,479 | 0.333 | £24,771 |
| 2043 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.84 | £76,059 | 0.321 | £24,441 |
| 2044 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.88 | £77,673 | 0.310 | £24,116 |
| 2045 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.92 | £79,321 | 0.300 | £23,795 |
| 2046 | 0 | 41,306 | 41,306 | 41,306 | £41,306 | 1.96 | £81,004 | 0.345 | £27,949 |
| 2047 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 41,306 | 41,306 | 41,306 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 41,306 | 41,306 | 41,306 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 41,306 | 41,306 | 41,306 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 41,306 | 41,306 | 41,306 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 41,306 | 41,306 | 41,306 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 41,306 | 41,306 | 41,306 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 41,306 | 41,306 | 41,306 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £1,239,167 | N/A | £1,834,228 | N/A | £873,660 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | Late veh KM sifore opening - after design y3benefits profile | | | | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|--|-------|-------|-------|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 1,113 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 1,113 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.000 | 0 | 0 | 1,113 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2017 | 0.786 | 1,113 | 1,113 | 1,113 | 1,113 | £153 | £120 | £1 | £1 | £20 | £16 | £1 | £1 | £1 | £1 | £8 | £7 | -£53 | -£42 |
| 2018 | 0.759 | 0 | 1,113 | 1,113 | 1,113 | £160 | £122 | £1 | £1 | £20 | £15 | £0 | £0 | £1 | £1 | £8 | £6 | -£52 | -£40 |
| 2019 | 0.734 | 0 | 1,113 | 1,113 | 1,113 | £168 | £123 | £1 | £1 | £21 | £15 | £0 | £0 | £1 | £1 | £8 | £6 | -£51 | -£38 |
| 2020 | 0.709 | 0 | 1,113 | 1,113 | 1,113 | £176 | £125 | £1 | £1 | £21 | £15 | £0 | £0 | £1 | £1 | £8 | £6 | -£50 | -£36 |
| 2021 | 0.685 | 0 | 1,113 | 1,113 | 1,113 | £186 | £128 | £1 | £1 | £21 | £15 | £0 | £0 | £1 | £1 | £8 | £5 | -£49 | -£33 |
| 2022 | 0.662 | 0 | 1,113 | 1,113 | 1,113 | £197 | £130 | £1 | £1 | £22 | £14 | £0 | £0 | £1 | £1 | £8 | £5 | -£47 | -£31 |
| 2023 | 0.639 | 0 | 1,113 | 1,113 | 1,113 | £207 | £133 | £1 | £1 | £22 | £14 | £0 | £0 | £1 | £1 | £8 | £5 | -£46 | -£29 |
| 2024 | 0.618 | 0 | 1,113 | 1,113 | 1,113 | £218 | £135 | £1 | £1 | £22 | £14 | £0 | £0 | £1 | £1 | £8 | £5 | -£45 | -£28 |
| 2025 | 0.597 | 0 | 1,113 | 1,113 | 1,113 | £228 | £136 | £1 | £1 | £22 | £13 | £0 | £0 | £1 | £1 | £8 | £5 | -£43 | -£26 |
| 2026 | 0.577 | 0 | 1,113 | 1,113 | 1,113 | £238 | £137 | £1 | £1 | £23 | £13 | £0 | £0 | £1 | £1 | £8 | £4 | -£43 | -£25 |
| 2027 | 0.557 | 0 | 1,113 | 1,113 | 1,113 | £248 | £138 | £1 | £1 | £23 | £13 | £0 | £0 | £2 | £1 | £8 | £4 | -£42 | -£23 |
| 2028 | 0.538 | 0 | 1,113 | 1,113 | 1,113 | £258 | £139 | £1 | £1 | £24 | £13 | £0 | £0 | £2 | £1 | £8 | £4 | -£41 | -£22 |
| 2029 | 0.520 | 0 | 1,113 | 1,113 | 1,113 | £268 | £140 | £1 | £1 | £24 | £13 | £0 | £0 | £2 | £1 | £8 | £4 | -£41 | -£21 |
| 2030 | 0.503 | 0 | 1,113 | 1,113 | 1,113 | £278 | £140 | £1 | £1 | £24 | £12 | £0 | £0 | £2 | £1 | £8 | £4 | -£40 | -£20 |
| 2031 | 0.486 | 0 | 1,113 | 1,113 | 1,113 | £292 | £142 | £1 | £1 | £25 | £12 | £0 | £0 | £2 | £1 | £8 | £4 | -£40 | -£19 |
| 2032 | 0.469 | 1,113 | 1,113 | 1,113 | 1,113 | £306 | £144 | £2 | £1 | £26 | £12 | £0 | £0 | £2 | £1 | £9 | £4 | -£40 | -£19 |
| 2033 | 0.453 | 0 | 1,113 | 1,113 | 1,113 | £320 | £145 | £2 | £1 | £27 | £12 | £0 | £0 | £2 | £1 | £10 | £4 | -£39 | -£18 |
| 2034 | 0.438 | 0 | 1,113 | 1,113 | 1,113 | £334 | £146 | £2 | £1 | £27 | £12 | £0 | £0 | £2 | £1 | £10 | £5 | -£39 | -£17 |
| 2035 | 0.423 | 0 | 1,113 | 1,113 | 1,113 | £347 | £147 | £2 | £1 | £28 | £12 | £0 | £0 | £2 | £1 | £11 | £5 | -£39 | -£16 |
| 2036 | 0.409 | 0 | 1,113 | 1,113 | 1,113 | £354 | £145 | £2 | £1 | £28 | £12 | £0 | £0 | £2 | £1 | £11 | £5 | -£40 | -£16 |
| 2037 | 0.395 | 0 | 1,113 | 1,113 | 1,113 | £361 | £143 | £2 | £1 | £29 | £11 | £0 | £0 | £2 | £1 | £12 | £5 | -£41 | -£16 |
| 2038 | 0.382 | 0 | 1,113 | 1,113 | 1,113 | £369 | £141 | £2 | £1 | £30 | £11 | £0 | £0 | £2 | £1 | £12 | £5 | -£41 | -£16 |
| 2039 | 0.369 | 0 | 1,113 | 1,113 | 1,113 | £376 | £139 | £2 | £1 | £30 | £11 | £0 | £0 | £2 | £1 | £12 | £4 | -£42 | -£16 |
| 2040 | 0.356 | 0 | 1,113 | 1,113 | 1,113 | £384 | £137 | £2 | £1 | £31 | £11 | £0 | £0 | £2 | £1 | £12 | £4 | -£43 | -£15 |
| 2041 | 0.344 | 0 | 1,113 | 1,113 | 1,113 | £391 | £135 | £3 | £1 | £31 | £11 | £0 | £0 | £3 | £1 | £13 | £4 | -£44 | -£15 |
| 2042 | 0.333 | 0 | 1,113 | 1,113 | 1,113 | £399 | £133 | £3 | £1 | £32 | £11 | £0 | £0 | £3 | £1 | £13 | £4 | -£45 | -£15 |
| 2043 | 0.321 | 0 | 1,113 | 1,113 | 1,113 | £407 | £131 | £3 | £1 | £33 | £10 | £0 | £0 | £3 | £1 | £13 | £4 | -£46 | -£15 |
| 2044 | 0.310 | 0 | 1,113 | 1,113 | 1,113 | £415 | £129 | £3 | £1 | £33 | £10 | £0 | £0 | £3 | £1 | £13 | £4 | -£47 | -£14 |
| 2045 | 0.300 | 0 | 1,113 | 1,113 | 1,113 | £423 | £127 | £3 | £1 | £34 | £10 | £0 | £0 | £3 | £1 | £14 | £4 | -£48 | -£14 |
| 2046 | 0.345 | 0 | 1,113 | 1,113 | 1,113 | £432 | £149 | £3 | £1 | £35 | £12 | £0 | £0 | £3 | £1 | £14 | £5 | -£48 | -£17 |
| 2047 | 0.335 | 0 | 1,113 | 1,113 | 1,113 | £441 | £148 | £3 | £1 | £35 | £12 | £0 | £0 | £3 | £1 | £14 | £5 | -£49 | -£17 |
| 2048 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2049 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2050 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2051 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2052 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2053 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2054 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2055 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2056 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2057 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2058 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2059 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2060 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2061 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2062 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2063 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2064 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2065 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2066 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2067 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2068 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2069 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2070 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2071 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2072 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2073 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2074 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2075 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2076 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2077 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2078 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2079 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2080 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2081 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2082 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2083 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2084 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2085 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2086 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2087 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2088 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2089 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2090 | 0.000 | 0 | 1,113 | 1,113 | 1,113 | £0</ | | | | | | | | | | | | | |

| | | | |
|--------------|--------|------------|--------|
| Undiscounted | £9,213 | Discounted | £4,119 |
|--------------|--------|------------|--------|

| | | |
|--|-----|-------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £10,901,635 |
| Scheme Discription: Scheme B: National Cycle Network Route 6 Improvements | PVC | £3,311,860 |
| Cycle Improvements to NCN route between Accrington and Bacup Costs include 44% OB and allowance for risk. 30% growth applied. 30-year appraisal period. | NPV | £7,589,775 |
| | BCR | 3.292 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£46,693</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2017</div> <div>Scheme Design Year2032</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£46,693</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,258.7</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,258.7</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £3,434,344 | £0 | £180,755 | £0 | £0 | £3,615,099 |

| Spend Profile (insert percentage profile) | | | | | |
|--|------|----|------|----|----|
| 2014 | | | | | |
| 2015 | 1% | | 51% | | |
| 2016 | 28% | | 52% | | |
| 2017 | 26% | | | | |
| 2018 | 9% | | | | |
| 2019 | 42% | | | | |
| 2020 | | | | | |
| 2021 | | | | | |
| 2022 | | | | | |
| 2023 | | | | | |
| 2024 | | | | | |
| 2025 | | | | | |
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| 2029 | | | | | |
| 2030 | | | | | |
| 2031 | | | | | |
| 2032 | | | | | |
| 2033 | | | | | |
| 2034 | | | | | |
| 2035 | | | | | |
| 2036 | | | | | |
| 2037 | | | | | |
| 2038 | | | | | |
| 2039 | | | | | |
| 2040 | | | | | |
| 2041 | | | | | |
| 2042 | | | | | |
| 2043 | | | | | |
| 2044 | | | | | |
| 2045 | | | | | |
| 2046 | | | | | |
| TOTAL | 107% | 0% | 103% | 0% | 0% |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|----------|----|----|------------|------------------|-----------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £48,633 | £0 | £92,185 | £0 | £0 | £140,818 | 0.9289 | £130,809 | 0.842 | £110,138 | 1.19 | £131,064 |
| £975,826 | £0 | £94,029 | £0 | £0 | £1,069,854 | 0.9289 | £993,813 | 0.814 | £808,468 | 1.19 | £962,076 |
| £876,777 | £0 | £0 | £0 | £0 | £876,777 | 0.9289 | £814,459 | 0.786 | £640,157 | 1.19 | £761,787 |
| £325,835 | £0 | £0 | £0 | £0 | £325,835 | 0.9289 | £302,676 | 0.759 | £229,855 | 1.19 | £273,528 |
| £1,459,047 | £0 | £0 | £0 | £0 | £1,459,047 | 0.9289 | £1,355,343 | 0.734 | £994,457 | 1.19 | £1,183,404 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £3,686,117 | £0 | £186,214 | £0 | £0 | £3,872,331 | N/A | £3,597,100 | N/A | £2,783,075 | N/A | £3,311,860 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs
N.B. Optimism Bias only applied to Construction costs, not Land

- Applying the methodology below produces the discounted scheme cost (PVC):-
- a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)
 - b) Assume land is bought in the first year of construction
 - c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs
 - d) All costs discounted to 2010
 - e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|-------------|
| Time Saving benefits (discounted) | £987,616 |
| MEC Discounted (2016 to 2010 Prices) | £4,656 |
| Mortality Benefits | £9,806,083 |
| Absentee Benefits | £103,279 |
| Total Benefits with MEC | £10,901,635 |
| Total costs (discounted) | £3,311,860 |
| BCR with Marginal External Costs | 3.29170 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road by the user class | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|--|--------|--------|--------|-----------------------|------------|------------|-----------------|--|
| 2010 | 0 | 0 | 46,693 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 46,693 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 46,693 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 46,693 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 46,693 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 46,693 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 0 | 0 | 46,693 | 0 | £0 | 1.08 | £0 | 0.814 | £0 |
| 2017 | 46,693 | 46,693 | 46,693 | 46,693 | £46,693 | 1.10 | £51,329 | 0.786 | £40,344 |
| 2018 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.12 | £52,304 | 0.759 | £39,721 |
| 2019 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.14 | £53,304 | 0.734 | £39,111 |
| 2020 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.16 | £54,315 | 0.709 | £38,505 |
| 2021 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.19 | £55,338 | 0.685 | £37,904 |
| 2022 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.21 | £56,375 | 0.662 | £37,308 |
| 2023 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.23 | £57,438 | 0.639 | £36,726 |
| 2024 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.25 | £58,531 | 0.618 | £36,159 |
| 2025 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.28 | £59,653 | 0.597 | £35,607 |
| 2026 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.30 | £60,808 | 0.577 | £35,068 |
| 2027 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.33 | £61,996 | 0.557 | £34,544 |
| 2028 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.35 | £63,218 | 0.538 | £34,034 |
| 2029 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.38 | £64,475 | 0.520 | £33,537 |
| 2030 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.41 | £65,767 | 0.503 | £33,052 |
| 2031 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.44 | £67,097 | 0.486 | £32,580 |
| 2032 | 46,693 | 46,693 | 46,693 | 46,693 | £46,693 | 1.47 | £68,463 | 0.469 | £32,119 |
| 2033 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.50 | £69,867 | 0.453 | £31,670 |
| 2034 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.53 | £71,308 | 0.438 | £31,230 |
| 2035 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.56 | £72,787 | 0.423 | £30,800 |
| 2036 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.59 | £74,303 | 0.409 | £30,378 |
| 2037 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.62 | £75,857 | 0.395 | £29,964 |
| 2038 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.66 | £77,453 | 0.382 | £29,560 |
| 2039 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.69 | £79,082 | 0.369 | £29,161 |
| 2040 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.73 | £80,746 | 0.356 | £28,768 |
| 2041 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.77 | £82,444 | 0.344 | £28,380 |
| 2042 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.80 | £84,194 | 0.333 | £28,002 |
| 2043 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.84 | £85,980 | 0.321 | £27,629 |
| 2044 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.88 | £87,805 | 0.310 | £27,261 |
| 2045 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.92 | £89,668 | 0.300 | £26,898 |
| 2046 | 0 | 46,693 | 46,693 | 46,693 | £46,693 | 1.96 | £91,570 | 0.345 | £31,595 |
| 2047 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 46,693 | 46,693 | 46,693 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 46,693 | 46,693 | 46,693 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 46,693 | 46,693 | 46,693 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 46,693 | 46,693 | 46,693 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 46,693 | 46,693 | 46,693 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 46,693 | 46,693 | 46,693 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 46,693 | 46,693 | 46,693 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £1,400,797 | N/A | £2,073,475 | N/A | £987,616 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | Late veh KM sifore opening - after design ysebenefits profile | | | | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|---|-------|-------|-------|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 1,259 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 1,259 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.000 | 0 | 0 | 1,259 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2017 | 0.786 | 1,259 | 1,259 | 1,259 | 1,259 | £172 | £136 | £1 | £1 | £22 | £18 | £1 | £1 | £1 | £1 | £10 | £8 | -£60 | -£47 |
| 2018 | 0.759 | 0 | 1,259 | 1,259 | 1,259 | £181 | £138 | £1 | £1 | £23 | £17 | £1 | £0 | £1 | £1 | £9 | £7 | -£59 | -£45 |
| 2019 | 0.734 | 0 | 1,259 | 1,259 | 1,259 | £190 | £139 | £1 | £1 | £23 | £17 | £0 | £0 | £1 | £1 | £9 | £7 | -£58 | -£42 |
| 2020 | 0.709 | 0 | 1,259 | 1,259 | 1,259 | £199 | £141 | £1 | £1 | £24 | £17 | £0 | £0 | £1 | £1 | £9 | £6 | -£57 | -£40 |
| 2021 | 0.685 | 0 | 1,259 | 1,259 | 1,259 | £211 | £144 | £1 | £1 | £24 | £17 | £0 | £0 | £1 | £1 | £9 | £6 | -£55 | -£38 |
| 2022 | 0.662 | 0 | 1,259 | 1,259 | 1,259 | £223 | £147 | £1 | £1 | £24 | £16 | £0 | £0 | £1 | £1 | £9 | £6 | -£54 | -£35 |
| 2023 | 0.639 | 0 | 1,259 | 1,259 | 1,259 | £234 | £150 | £1 | £1 | £25 | £16 | £0 | £0 | £1 | £1 | £9 | £6 | -£52 | -£33 |
| 2024 | 0.618 | 0 | 1,259 | 1,259 | 1,259 | £246 | £152 | £1 | £1 | £25 | £15 | £0 | £0 | £1 | £1 | £9 | £5 | -£51 | -£31 |
| 2025 | 0.597 | 0 | 1,259 | 1,259 | 1,259 | £258 | £154 | £1 | £1 | £25 | £15 | £0 | £0 | £1 | £1 | £9 | £5 | -£49 | -£29 |
| 2026 | 0.577 | 0 | 1,259 | 1,259 | 1,259 | £269 | £155 | £1 | £1 | £26 | £15 | £0 | £0 | £2 | £1 | £9 | £5 | -£48 | -£28 |
| 2027 | 0.557 | 0 | 1,259 | 1,259 | 1,259 | £281 | £156 | £1 | £1 | £26 | £15 | £0 | £0 | £2 | £1 | £9 | £5 | -£48 | -£27 |
| 2028 | 0.538 | 0 | 1,259 | 1,259 | 1,259 | £292 | £157 | £1 | £1 | £27 | £14 | £0 | £0 | £2 | £1 | £9 | £5 | -£47 | -£25 |
| 2029 | 0.520 | 0 | 1,259 | 1,259 | 1,259 | £303 | £158 | £1 | £1 | £27 | £14 | £0 | £0 | £2 | £1 | £9 | £5 | -£46 | -£24 |
| 2030 | 0.503 | 0 | 1,259 | 1,259 | 1,259 | £315 | £158 | £1 | £1 | £28 | £14 | £0 | £0 | £3 | £1 | £9 | £4 | -£45 | -£23 |
| 2031 | 0.486 | 0 | 1,259 | 1,259 | 1,259 | £330 | £160 | £2 | £1 | £28 | £14 | £0 | £0 | £3 | £1 | £10 | £5 | -£45 | -£22 |
| 2032 | 0.469 | 1,259 | 1,259 | 1,259 | 1,259 | £346 | £162 | £2 | £1 | £29 | £14 | £0 | £0 | £3 | £1 | £10 | £5 | -£45 | -£21 |
| 2033 | 0.453 | 0 | 1,259 | 1,259 | 1,259 | £361 | £164 | £2 | £1 | £30 | £14 | £0 | £0 | £3 | £1 | £11 | £5 | -£45 | -£20 |
| 2034 | 0.438 | 0 | 1,259 | 1,259 | 1,259 | £377 | £165 | £2 | £1 | £31 | £13 | £0 | £0 | £3 | £1 | £12 | £5 | -£44 | -£19 |
| 2035 | 0.423 | 0 | 1,259 | 1,259 | 1,259 | £393 | £166 | £3 | £1 | £31 | £13 | £0 | £0 | £3 | £1 | £13 | £5 | -£44 | -£19 |
| 2036 | 0.409 | 0 | 1,259 | 1,259 | 1,259 | £401 | £164 | £3 | £1 | £32 | £13 | £0 | £0 | £3 | £1 | £13 | £5 | -£45 | -£18 |
| 2037 | 0.395 | 0 | 1,259 | 1,259 | 1,259 | £409 | £161 | £3 | £1 | £33 | £13 | £0 | £0 | £3 | £1 | £13 | £5 | -£46 | -£18 |
| 2038 | 0.382 | 0 | 1,259 | 1,259 | 1,259 | £417 | £159 | £3 | £1 | £33 | £13 | £0 | £0 | £3 | £1 | £13 | £5 | -£47 | -£18 |
| 2039 | 0.369 | 0 | 1,259 | 1,259 | 1,259 | £425 | £157 | £3 | £1 | £34 | £13 | £0 | £0 | £3 | £1 | £14 | £5 | -£48 | -£18 |
| 2040 | 0.356 | 0 | 1,259 | 1,259 | 1,259 | £434 | £154 | £3 | £1 | £35 | £12 | £0 | £0 | £3 | £1 | £14 | £5 | -£49 | -£17 |
| 2041 | 0.344 | 0 | 1,259 | 1,259 | 1,259 | £442 | £152 | £3 | £1 | £35 | £12 | £0 | £0 | £3 | £1 | £14 | £5 | -£50 | -£17 |
| 2042 | 0.333 | 0 | 1,259 | 1,259 | 1,259 | £451 | £150 | £3 | £1 | £36 | £12 | £0 | £0 | £3 | £1 | £14 | £5 | -£51 | -£17 |
| 2043 | 0.321 | 0 | 1,259 | 1,259 | 1,259 | £460 | £148 | £3 | £1 | £37 | £12 | £0 | £0 | £3 | £1 | £15 | £5 | -£52 | -£17 |
| 2044 | 0.310 | 0 | 1,259 | 1,259 | 1,259 | £469 | £146 | £3 | £1 | £38 | £12 | £0 | £0 | £3 | £1 | £15 | £5 | -£53 | -£16 |
| 2045 | 0.300 | 0 | 1,259 | 1,259 | 1,259 | £479 | £144 | £3 | £1 | £38 | £12 | £0 | £0 | £3 | £1 | £15 | £5 | -£54 | -£16 |
| 2046 | 0.345 | 0 | 1,259 | 1,259 | 1,259 | £488 | £168 | £3 | £1 | £39 | £13 | £0 | £0 | £3 | £1 | £16 | £5 | -£55 | -£19 |
| 2047 | 0.335 | 0 | 1,259 | 1,259 | 1,259 | £498 | £167 | £3 | £1 | £40 | £13 | £0 | £0 | £3 | £1 | £16 | £5 | -£56 | -£19 |
| 2048 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2049 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2050 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2051 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2052 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2053 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2054 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2055 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2056 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2057 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2058 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2059 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2060 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2061 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2062 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2063 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2064 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2065 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2066 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2067 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2068 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2069 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2070 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2071 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2072 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2073 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2074 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2075 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2076 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2077 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2078 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2079 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2080 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2081 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2082 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2083 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2084 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2085 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2086 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2087 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2088 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2089 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2090 | 0.000 | 0 | 1,259 | 1,259 | 1,259 | | | | | | | | | | | | | | |

| | | | |
|--------------|---------|------------|--------|
| Undiscounted | £10,414 | Discounted | £4,656 |
|--------------|---------|------------|--------|

| | | |
|--|-----|-------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £13,417,396 |
| Scheme Discription: Scheme B: National Cycle Network Route 6 Improvements | PVC | £3,311,860 |
| Cycle Improvements to NCN route between Accrington and Bacup Costs include 44% OB and allowance for risk. 60% growth applied. 30-year appraisal period. | NPV | £10,105,537 |
| | BCR | 4.051 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£57,469</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2017</div> <div>Scheme Design Year2032</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£57,469</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,549.2</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,549.2</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £3,434,344 | £0 | £180,755 | £0 | £0 | £3,615,099 |

| Spend Profile (insert percentage profile) | | | | | | |
|--|------|----|------|----|----|--|
| 2014 | | | | | | |
| 2015 | 1% | | 51% | | | |
| 2016 | 28% | | 52% | | | |
| 2017 | 26% | | | | | |
| 2018 | 9% | | | | | |
| 2019 | 42% | | | | | |
| 2020 | | | | | | |
| 2021 | | | | | | |
| 2022 | | | | | | |
| 2023 | | | | | | |
| 2024 | | | | | | |
| 2025 | | | | | | |
| 2026 | | | | | | |
| 2027 | | | | | | |
| 2028 | | | | | | |
| 2029 | | | | | | |
| 2030 | | | | | | |
| 2031 | | | | | | |
| 2032 | | | | | | |
| 2033 | | | | | | |
| 2034 | | | | | | |
| 2035 | | | | | | |
| 2036 | | | | | | |
| 2037 | | | | | | |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | | | | | |
| 2041 | | | | | | |
| 2042 | | | | | | |
| 2043 | | | | | | |
| 2044 | | | | | | |
| 2045 | | | | | | |
| 2046 | | | | | | |
| TOTAL | 107% | 0% | 103% | 0% | 0% | |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|----------|----|----|------------|------------------|-----------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £48,633 | £0 | £92,185 | £0 | £0 | £140,818 | 0.9289 | £130,809 | 0.842 | £110,138 | 1.19 | £131,064 |
| £975,826 | £0 | £94,029 | £0 | £0 | £1,069,854 | 0.9289 | £993,813 | 0.814 | £808,468 | 1.19 | £962,076 |
| £876,777 | £0 | £0 | £0 | £0 | £876,777 | 0.9289 | £814,459 | 0.786 | £640,157 | 1.19 | £761,787 |
| £325,835 | £0 | £0 | £0 | £0 | £325,835 | 0.9289 | £302,676 | 0.759 | £229,855 | 1.19 | £273,528 |
| £1,459,047 | £0 | £0 | £0 | £0 | £1,459,047 | 0.9289 | £1,355,343 | 0.734 | £994,457 | 1.19 | £1,183,404 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £3,686,117 | £0 | £186,214 | £0 | £0 | £3,872,331 | N/A | £3,597,100 | N/A | £2,783,075 | N/A | £3,311,860 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs
N.B. Optimism Bias only applied to Construction costs, not Land

- Applying the methodology below produces the discounted scheme cost (PVC):-
- a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)
 - b) Assume land is bought in the first year of construction
 - c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs
 - d) All costs discounted to 2010
 - e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|-------------|
| Time Saving benefits (discounted) | £1,215,527 |
| MEC Discounted (2016 to 2010 Prices) | £5,731 |
| Mortality Benefits | £12,069,025 |
| Absentee Benefits | £127,113 |
| Total Benefits with MEC | £13,417,396 |
| Total costs (discounted) | £3,311,860 |
| BCR with Marginal External Costs | 4.05132 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road and after design of the road | | | | Benefits profile | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|--|--------|--------|--------|------------------|-----------------------|------------|------------|-----------------|--|
| 2010 | 0 | 0 | 57,469 | 0 | | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 57,469 | 0 | | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 57,469 | 0 | | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 57,469 | 0 | | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 57,469 | 0 | | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 57,469 | 0 | | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 0 | 0 | 57,469 | 0 | | £0 | 1.08 | £0 | 0.814 | £0 |
| 2017 | 57,469 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.10 | £63,174 | 0.786 | £49,654 |
| 2018 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.12 | £64,375 | 0.759 | £48,887 |
| 2019 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.14 | £65,605 | 0.734 | £48,137 |
| 2020 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.16 | £66,850 | 0.709 | £47,391 |
| 2021 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.19 | £68,109 | 0.685 | £46,651 |
| 2022 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.21 | £69,384 | 0.662 | £45,917 |
| 2023 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.23 | £70,693 | 0.639 | £45,201 |
| 2024 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.25 | £72,038 | 0.618 | £44,504 |
| 2025 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.28 | £73,420 | 0.597 | £43,824 |
| 2026 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.30 | £74,841 | 0.577 | £43,161 |
| 2027 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.33 | £76,303 | 0.557 | £42,516 |
| 2028 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.35 | £77,807 | 0.538 | £41,888 |
| 2029 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.38 | £79,353 | 0.520 | £41,276 |
| 2030 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.41 | £80,944 | 0.503 | £40,680 |
| 2031 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.44 | £82,581 | 0.486 | £40,099 |
| 2032 | 57,469 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.47 | £84,262 | 0.469 | £39,532 |
| 2033 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.50 | £85,990 | 0.453 | £38,978 |
| 2034 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.53 | £87,764 | 0.438 | £38,437 |
| 2035 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.56 | £89,584 | 0.423 | £37,907 |
| 2036 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.59 | £91,450 | 0.409 | £37,388 |
| 2037 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.62 | £93,362 | 0.395 | £36,879 |
| 2038 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.66 | £95,326 | 0.382 | £36,382 |
| 2039 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.69 | £97,332 | 0.369 | £35,891 |
| 2040 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.73 | £99,379 | 0.356 | £35,407 |
| 2041 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.77 | £101,470 | 0.344 | £34,929 |
| 2042 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.80 | £103,623 | 0.333 | £34,464 |
| 2043 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.84 | £105,822 | 0.321 | £34,005 |
| 2044 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.88 | £108,067 | 0.310 | £33,552 |
| 2045 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.92 | £110,360 | 0.300 | £33,105 |
| 2046 | 0 | 57,469 | 57,469 | 57,469 | | £57,469 | 1.96 | £112,702 | 0.345 | £38,886 |
| 2047 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 57,469 | 57,469 | 57,469 | | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | | £1,724,058 | N/A | £2,551,970 | N/A | £1,215,527 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | late veh | KM sfore opening : after design y3 | enefits profil | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|----------|------------------------------------|----------------|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 1,549 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 1,549 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.000 | 0 | 0 | 1,549 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2017 | 0.786 | 1,549 | 1,549 | 1,549 | 1,549 | £212 | £167 | £2 | £1 | £28 | £22 | £1 | £1 | £2 | £1 | £12 | £9 | -£74 |
| 2018 | 0.759 | 0 | 1,549 | 1,549 | 1,549 | £223 | £169 | £2 | £1 | £28 | £21 | £1 | £0 | £2 | £1 | £11 | £9 | -£73 |
| 2019 | 0.734 | 0 | 1,549 | 1,549 | 1,549 | £234 | £172 | £2 | £1 | £29 | £21 | £0 | £0 | £2 | £1 | £11 | £8 | -£71 |
| 2020 | 0.709 | 0 | 1,549 | 1,549 | 1,549 | £245 | £174 | £2 | £1 | £29 | £21 | £0 | £0 | £2 | £1 | £11 | £8 | -£70 |
| 2021 | 0.685 | 0 | 1,549 | 1,549 | 1,549 | £259 | £178 | £2 | £1 | £30 | £20 | £0 | £0 | £2 | £1 | £11 | £7 | -£68 |
| 2022 | 0.662 | 0 | 1,549 | 1,549 | 1,549 | £274 | £181 | £2 | £1 | £30 | £20 | £0 | £0 | £2 | £1 | £11 | £7 | -£66 |
| 2023 | 0.639 | 0 | 1,549 | 1,549 | 1,549 | £288 | £184 | £2 | £1 | £30 | £19 | £0 | £0 | £2 | £1 | £11 | £7 | -£64 |
| 2024 | 0.618 | 0 | 1,549 | 1,549 | 1,549 | £303 | £187 | £2 | £1 | £31 | £19 | £0 | £0 | £2 | £1 | £11 | £7 | -£62 |
| 2025 | 0.597 | 0 | 1,549 | 1,549 | 1,549 | £318 | £190 | £2 | £1 | £31 | £18 | £0 | £0 | £2 | £1 | £11 | £6 | -£60 |
| 2026 | 0.577 | 0 | 1,549 | 1,549 | 1,549 | £332 | £191 | £2 | £1 | £32 | £18 | £0 | £0 | £2 | £1 | £11 | £6 | -£59 |
| 2027 | 0.557 | 0 | 1,549 | 1,549 | 1,549 | £345 | £192 | £2 | £1 | £32 | £18 | £0 | £0 | £2 | £1 | £11 | £6 | -£59 |
| 2028 | 0.538 | 0 | 1,549 | 1,549 | 1,549 | £359 | £193 | £2 | £1 | £33 | £18 | £0 | £0 | £2 | £1 | £11 | £6 | -£58 |
| 2029 | 0.520 | 0 | 1,549 | 1,549 | 1,549 | £373 | £194 | £2 | £1 | £33 | £17 | £0 | £0 | £3 | £1 | £11 | £6 | -£57 |
| 2030 | 0.503 | 0 | 1,549 | 1,549 | 1,549 | £387 | £195 | £2 | £1 | £34 | £17 | £0 | £0 | £3 | £2 | £11 | £5 | -£56 |
| 2031 | 0.486 | 0 | 1,549 | 1,549 | 1,549 | £407 | £197 | £2 | £1 | £35 | £17 | £0 | £0 | £3 | £2 | £12 | £6 | -£55 |
| 2032 | 0.469 | 1,549 | 1,549 | 1,549 | 1,549 | £426 | £200 | £2 | £1 | £36 | £17 | £0 | £0 | £3 | £1 | £13 | £6 | -£55 |
| 2033 | 0.453 | 0 | 1,549 | 1,549 | 1,549 | £445 | £202 | £2 | £1 | £37 | £17 | £0 | £0 | £3 | £1 | £14 | £6 | -£55 |
| 2034 | 0.438 | 0 | 1,549 | 1,549 | 1,549 | £464 | £203 | £3 | £1 | £38 | £17 | £0 | £0 | £3 | £1 | £15 | £6 | -£55 |
| 2035 | 0.423 | 0 | 1,549 | 1,549 | 1,549 | £483 | £205 | £3 | £1 | £39 | £16 | £0 | £0 | £3 | £1 | £15 | £7 | -£54 |
| 2036 | 0.409 | 0 | 1,549 | 1,549 | 1,549 | £493 | £202 | £3 | £1 | £40 | £16 | £0 | £0 | £3 | £1 | £16 | £6 | -£55 |
| 2037 | 0.395 | 0 | 1,549 | 1,549 | 1,549 | £503 | £199 | £3 | £1 | £40 | £16 | £0 | £0 | £3 | £1 | £16 | £6 | -£56 |
| 2038 | 0.382 | 0 | 1,549 | 1,549 | 1,549 | £513 | £196 | £3 | £1 | £41 | £16 | £0 | £0 | £3 | £1 | £16 | £6 | -£58 |
| 2039 | 0.369 | 0 | 1,549 | 1,549 | 1,549 | £523 | £193 | £3 | £1 | £42 | £15 | £0 | £0 | £3 | £1 | £17 | £6 | -£59 |
| 2040 | 0.356 | 0 | 1,549 | 1,549 | 1,549 | £534 | £190 | £3 | £1 | £43 | £15 | £0 | £0 | £3 | £1 | £17 | £6 | -£60 |
| 2041 | 0.344 | 0 | 1,549 | 1,549 | 1,549 | £544 | £187 | £3 | £1 | £44 | £15 | £0 | £0 | £3 | £1 | £17 | £6 | -£61 |
| 2042 | 0.333 | 0 | 1,549 | 1,549 | 1,549 | £555 | £185 | £4 | £1 | £44 | £15 | £0 | £0 | £4 | £1 | £18 | £6 | -£62 |
| 2043 | 0.321 | 0 | 1,549 | 1,549 | 1,549 | £566 | £182 | £4 | £1 | £45 | £15 | £0 | £0 | £4 | £1 | £18 | £6 | -£64 |
| 2044 | 0.310 | 0 | 1,549 | 1,549 | 1,549 | £578 | £179 | £4 | £1 | £46 | £14 | £0 | £0 | £4 | £1 | £19 | £6 | -£65 |
| 2045 | 0.300 | 0 | 1,549 | 1,549 | 1,549 | £589 | £177 | £4 | £1 | £47 | £14 | £0 | £0 | £4 | £1 | £19 | £6 | -£66 |
| 2046 | 0.345 | 0 | 1,549 | 1,549 | 1,549 | £601 | £207 | £4 | £1 | £48 | £17 | £0 | £0 | £4 | £1 | £19 | £7 | -£67 |
| 2047 | 0.335 | 0 | 1,549 | 1,549 | 1,549 | £613 | £205 | £4 | £1 | £49 | £16 | £0 | £0 | £4 | £1 | £20 | £7 | -£69 |
| 2048 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2049 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2050 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2051 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2052 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2053 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2054 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2055 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2056 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2057 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2058 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2059 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2060 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2061 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2062 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2063 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2064 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2065 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2066 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2067 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2068 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2069 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2070 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2071 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2072 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2073 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2074 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2075 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2076 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2077 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2078 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2079 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2080 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2081 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2082 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2083 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2084 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2085 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2086 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2087 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2088 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2089 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2090 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2091 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2092 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2093 | 0.000 | 0 | 1,549 | 1,549 | 1,549 | £0 | £0 | £0 | £0 | £0</ | | | | | | | | |

| | | |
|--|-----|------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £6,370,674 |
| Scheme Discription: Scheme C: Valley of Stone Cycle Improvement | PVC | £2,287,119 |
| Cycle Improvements to provide an improved cycle route between Bacup and Whitworth. Costs include 44% OB and allowance for risk. 15% growth applied. 30-year appraisal period. | NPV | £4,083,555 |
| | BCR | 2.785 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£18,933</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£18,933</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM580.1</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM580.1</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £2,346,968 | £0 | £123,525 | £0 | £0 | £2,470,492 |

| Spend Profile (insert percentage profile) | | | | | | |
|--|------|----|------|----|----|--|
| 2014 | | | | | | |
| 2015 | 3% | | 51% | | | |
| 2016 | 65% | | 52% | | | |
| 2017 | 3% | | | | | |
| 2018 | 15% | | | | | |
| 2019 | 19% | | | | | |
| 2020 | | | | | | |
| 2021 | | | | | | |
| 2022 | | | | | | |
| 2023 | | | | | | |
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| 2036 | | | | | | |
| 2037 | | | | | | |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | | | | | |
| 2041 | | | | | | |
| 2042 | | | | | | |
| 2043 | | | | | | |
| 2044 | | | | | | |
| 2045 | | | | | | |
| 2046 | | | | | | |
| TOTAL | 106% | 0% | 103% | 0% | 0% | |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscount ed prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|----------|----|----|------------|------------------|------------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £72,587 | £0 | £62,998 | £0 | £0 | £135,584 | 0.9289 | £125,947 | 0.842 | £106,044 | 1.19 | £126,193 |
| £1,533,334 | £0 | £64,258 | £0 | £0 | £1,597,592 | 0.9289 | £1,484,041 | 0.814 | £1,207,268 | 1.19 | £1,436,649 |
| £75,519 | £0 | £0 | £0 | £0 | £75,519 | 0.9289 | £70,152 | 0.786 | £55,138 | 1.19 | £65,615 |
| £344,322 | £0 | £0 | £0 | £0 | £344,322 | 0.9289 | £319,849 | 0.759 | £242,897 | 1.19 | £289,047 |
| £455,707 | £0 | £0 | £0 | £0 | £455,707 | 0.9289 | £423,317 | 0.734 | £310,601 | 1.19 | £369,615 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £2,481,469 | £0 | £127,255 | £0 | £0 | £2,608,724 | N/A | £2,423,305 | N/A | £1,921,948 | N/A | £2,287,119 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs

N.B. Optimism Bias only applied to Construction costs, not Land

Applying the methodology below produces the discounted scheme cost (PVC):-

a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)

b) Assume land is bought in the first year of construction

c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs

d) All costs discounted to 2010

e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|------------|
| Time Saving benefits (discounted) | £406,255 |
| MEC Discounted (2016 to 2010 Prices) | £2,132 |
| Mortality Benefits | £5,914,689 |
| Absentee Benefits | £47,598 |
| Total Benefits with MEC | £6,370,674 |
| Total costs (discounted) | £2,287,119 |
| BCR with Marginal External Costs | 2.78546 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road by the project Benefits profile | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|--|--------|--------|--------|-----------------------|------------|----------|-----------------|--|
| 2010 | 0 | 0 | 18,933 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 18,933 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 18,933 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 18,933 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 18,933 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 18,933 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 18,933 | 18,933 | 18,933 | 18,933 | £18,933 | 1.08 | £20,407 | 0.814 | £16,601 |
| 2017 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.10 | £20,812 | 0.786 | £16,358 |
| 2018 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.12 | £21,208 | 0.759 | £16,106 |
| 2019 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.14 | £21,613 | 0.734 | £15,858 |
| 2020 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.16 | £22,023 | 0.709 | £15,613 |
| 2021 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.19 | £22,438 | 0.685 | £15,369 |
| 2022 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.21 | £22,858 | 0.662 | £15,127 |
| 2023 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.23 | £23,290 | 0.639 | £14,891 |
| 2024 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.25 | £23,733 | 0.618 | £14,662 |
| 2025 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.28 | £24,188 | 0.597 | £14,437 |
| 2026 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.30 | £24,656 | 0.577 | £14,219 |
| 2027 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.33 | £25,138 | 0.557 | £14,007 |
| 2028 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.35 | £25,633 | 0.538 | £13,800 |
| 2029 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.38 | £26,143 | 0.520 | £13,598 |
| 2030 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.41 | £26,667 | 0.503 | £13,402 |
| 2031 | 18,933 | 18,933 | 18,933 | 18,933 | £18,933 | 1.44 | £27,206 | 0.486 | £13,210 |
| 2032 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.47 | £27,760 | 0.469 | £13,024 |
| 2033 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.50 | £28,329 | 0.453 | £12,841 |
| 2034 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.53 | £28,914 | 0.438 | £12,663 |
| 2035 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.56 | £29,513 | 0.423 | £12,488 |
| 2036 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.59 | £30,128 | 0.409 | £12,317 |
| 2037 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.62 | £30,758 | 0.395 | £12,150 |
| 2038 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.66 | £31,405 | 0.382 | £11,986 |
| 2039 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.69 | £32,066 | 0.369 | £11,824 |
| 2040 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.73 | £32,740 | 0.356 | £11,665 |
| 2041 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.77 | £33,429 | 0.344 | £11,507 |
| 2042 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.80 | £34,138 | 0.333 | £11,354 |
| 2043 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.84 | £34,863 | 0.321 | £11,203 |
| 2044 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.88 | £35,602 | 0.310 | £11,054 |
| 2045 | 0 | 18,933 | 18,933 | 18,933 | £18,933 | 1.92 | £36,358 | 0.355 | £12,921 |
| 2046 | 0 | 18,933 | 18,933 | 18,933 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 18,933 | 18,933 | 18,933 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 18,933 | 18,933 | 18,933 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 18,933 | 18,933 | 18,933 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 18,933 | 18,933 | 18,933 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 18,933 | 18,933 | 18,933 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 18,933 | 18,933 | 18,933 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 18,933 | 18,933 | 18,933 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £567,984 | N/A | £824,014 | N/A | £406,255 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | Late veh KM before opening - after design y3benefits profile | | | | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|--|-----|-----|-----|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 580 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 580 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.814 | 580 | 580 | 580 | 580 | £75 | £61 | £1 | £0 | £10 | £8 | £0 | £0 | £1 | £0 | £5 | £4 | -£28 | -£23 |
| 2017 | 0.786 | 0 | 580 | 580 | 580 | £79 | £62 | £1 | £0 | £10 | £8 | £0 | £0 | £1 | £0 | £4 | £3 | -£28 | -£22 |
| 2018 | 0.759 | 0 | 580 | 580 | 580 | £84 | £63 | £1 | £0 | £11 | £8 | £0 | £0 | £1 | £0 | £4 | £3 | -£27 | -£21 |
| 2019 | 0.734 | 0 | 580 | 580 | 580 | £88 | £64 | £1 | £0 | £11 | £8 | £0 | £0 | £1 | £0 | £4 | £3 | -£27 | -£20 |
| 2020 | 0.709 | 0 | 580 | 580 | 580 | £92 | £65 | £1 | £0 | £11 | £8 | £0 | £0 | £1 | £0 | £4 | £3 | -£26 | -£19 |
| 2021 | 0.685 | 0 | 580 | 580 | 580 | £97 | £67 | £1 | £0 | £11 | £8 | £0 | £0 | £1 | £0 | £4 | £3 | -£25 | -£17 |
| 2022 | 0.662 | 0 | 580 | 580 | 580 | £103 | £68 | £1 | £0 | £11 | £7 | £0 | £0 | £1 | £0 | £4 | £3 | -£25 | -£16 |
| 2023 | 0.639 | 0 | 580 | 580 | 580 | £108 | £69 | £1 | £0 | £11 | £7 | £0 | £0 | £1 | £0 | £4 | £3 | -£24 | -£15 |
| 2024 | 0.618 | 0 | 580 | 580 | 580 | £113 | £70 | £1 | £0 | £11 | £7 | £0 | £0 | £1 | £0 | £4 | £3 | -£23 | -£14 |
| 2025 | 0.597 | 0 | 580 | 580 | 580 | £119 | £71 | £1 | £0 | £12 | £7 | £0 | £0 | £1 | £0 | £4 | £2 | -£23 | -£14 |
| 2026 | 0.577 | 0 | 580 | 580 | 580 | £124 | £72 | £1 | £0 | £12 | £7 | £0 | £0 | £1 | £0 | £4 | £2 | -£22 | -£13 |
| 2027 | 0.557 | 0 | 580 | 580 | 580 | £129 | £72 | £1 | £0 | £12 | £7 | £0 | £0 | £1 | £0 | £4 | £2 | -£22 | -£12 |
| 2028 | 0.538 | 0 | 580 | 580 | 580 | £135 | £72 | £1 | £0 | £12 | £7 | £0 | £0 | £1 | £0 | £4 | £2 | -£22 | -£12 |
| 2029 | 0.520 | 0 | 580 | 580 | 580 | £140 | £73 | £1 | £0 | £13 | £7 | £0 | £0 | £1 | £1 | £4 | £2 | -£21 | -£11 |
| 2030 | 0.503 | 0 | 580 | 580 | 580 | £145 | £73 | £1 | £0 | £13 | £6 | £0 | £0 | £1 | £1 | £4 | £2 | -£21 | -£10 |
| 2031 | 0.486 | 580 | 580 | 580 | 580 | £152 | £74 | £1 | £0 | £13 | £6 | £0 | £0 | £1 | £1 | £4 | £2 | -£21 | -£10 |
| 2032 | 0.469 | 0 | 580 | 580 | 580 | £159 | £75 | £1 | £0 | £13 | £6 | £0 | £0 | £1 | £1 | £5 | £2 | -£21 | -£10 |
| 2033 | 0.453 | 0 | 580 | 580 | 580 | £167 | £76 | £1 | £0 | £14 | £6 | £0 | £0 | £1 | £1 | £5 | £2 | -£21 | -£9 |
| 2034 | 0.438 | 0 | 580 | 580 | 580 | £174 | £76 | £1 | £0 | £14 | £6 | £0 | £0 | £1 | £1 | £5 | £2 | -£20 | -£9 |
| 2035 | 0.423 | 0 | 580 | 580 | 580 | £181 | £77 | £1 | £0 | £15 | £6 | £0 | £0 | £1 | £0 | £6 | £2 | -£20 | -£9 |
| 2036 | 0.409 | 0 | 580 | 580 | 580 | £185 | £75 | £1 | £0 | £15 | £6 | £0 | £0 | £1 | £0 | £6 | £2 | -£21 | -£8 |
| 2037 | 0.395 | 0 | 580 | 580 | 580 | £188 | £74 | £1 | £0 | £15 | £6 | £0 | £0 | £1 | £0 | £6 | £2 | -£21 | -£8 |
| 2038 | 0.382 | 0 | 580 | 580 | 580 | £192 | £73 | £1 | £0 | £15 | £6 | £0 | £0 | £1 | £0 | £6 | £2 | -£22 | -£8 |
| 2039 | 0.369 | 0 | 580 | 580 | 580 | £196 | £72 | £1 | £0 | £16 | £6 | £0 | £0 | £1 | £0 | £6 | £2 | -£22 | -£8 |
| 2040 | 0.356 | 0 | 580 | 580 | 580 | £200 | £71 | £1 | £0 | £16 | £6 | £0 | £0 | £1 | £0 | £6 | £2 | -£22 | -£8 |
| 2041 | 0.344 | 0 | 580 | 580 | 580 | £204 | £70 | £1 | £0 | £16 | £6 | £0 | £0 | £1 | £0 | £7 | £2 | -£23 | -£8 |
| 2042 | 0.333 | 0 | 580 | 580 | 580 | £208 | £69 | £1 | £0 | £17 | £6 | £0 | £0 | £1 | £0 | £7 | £2 | -£23 | -£8 |
| 2043 | 0.321 | 0 | 580 | 580 | 580 | £212 | £68 | £1 | £0 | £17 | £5 | £0 | £0 | £1 | £0 | £7 | £2 | -£24 | -£8 |
| 2044 | 0.310 | 0 | 580 | 580 | 580 | £216 | £67 | £1 | £0 | £17 | £5 | £0 | £0 | £1 | £0 | £7 | £2 | -£24 | -£8 |
| 2045 | 0.355 | 0 | 580 | 580 | 580 | £221 | £78 | £1 | £1 | £18 | £6 | £0 | £0 | £1 | £1 | £7 | £3 | -£25 | -£9 |
| 2046 | 0.345 | 0 | 580 | 580 | 580 | £225 | £78 | £1 | £0 | £18 | £6 | £0 | £0 | £1 | £0 | £7 | £2 | -£25 | -£9 |
| 2047 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2048 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2049 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2050 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2051 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2052 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2053 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2054 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2055 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2056 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2057 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2058 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2059 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2060 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2061 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2062 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2063 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2064 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2065 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2066 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2067 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2068 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2069 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2070 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2071 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2072 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2073 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2074 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2075 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2076 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2077 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2078 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2079 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2080 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2081 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2082 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2083 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2084 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2085 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2086 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2087 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2088 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2089 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2090 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2091 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2092 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2093 | 0.000 | 0 | 580 | 580 | 580 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |

| | | | |
|--------------|--------|------------|--------|
| Undiscounted | £4,630 | Discounted | £2,132 |
|--------------|--------|------------|--------|

| | | |
|--|-----|------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £7,201,632 |
| Scheme Discription: Scheme C: Valley of Stone Cycle Improvement | PVC | £2,287,119 |
| Cycle Improvements to provide an improved cycle route between Bacup and Whitworth. Costs include 44% OB and allowance for risk. 30% growth applied. 30-year appraisal period. | NPV | £4,914,513 |
| | BCR | 3.149 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£21,402</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£21,402</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM655.8</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM655.8</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £2,346,968 | £0 | £123,525 | £0 | £0 | £2,470,492 |

| Spend Profile (insert percentage profile) | | | | | |
|--|------|----|------|----|----|
| 2014 | | | | | |
| 2015 | 3% | | 51% | | |
| 2016 | 65% | | 52% | | |
| 2017 | 3% | | | | |
| 2018 | 15% | | | | |
| 2019 | 19% | | | | |
| 2020 | | | | | |
| 2021 | | | | | |
| 2022 | | | | | |
| 2023 | | | | | |
| 2024 | | | | | |
| 2025 | | | | | |
| 2026 | | | | | |
| 2027 | | | | | |
| 2028 | | | | | |
| 2029 | | | | | |
| 2030 | | | | | |
| 2031 | | | | | |
| 2032 | | | | | |
| 2033 | | | | | |
| 2034 | | | | | |
| 2035 | | | | | |
| 2036 | | | | | |
| 2037 | | | | | |
| 2038 | | | | | |
| 2039 | | | | | |
| 2040 | | | | | |
| 2041 | | | | | |
| 2042 | | | | | |
| 2043 | | | | | |
| 2044 | | | | | |
| 2045 | | | | | |
| 2046 | | | | | |
| TOTAL | 106% | 0% | 103% | 0% | 0% |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscount ed prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|----------|----|----|------------|------------------|------------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £72,587 | £0 | £62,998 | £0 | £0 | £135,584 | 0.9289 | £125,947 | 0.842 | £106,044 | 1.19 | £126,193 |
| £1,533,334 | £0 | £64,258 | £0 | £0 | £1,597,592 | 0.9289 | £1,484,041 | 0.814 | £1,207,268 | 1.19 | £1,436,649 |
| £75,519 | £0 | £0 | £0 | £0 | £75,519 | 0.9289 | £70,152 | 0.786 | £55,138 | 1.19 | £65,615 |
| £344,322 | £0 | £0 | £0 | £0 | £344,322 | 0.9289 | £319,849 | 0.759 | £242,897 | 1.19 | £289,047 |
| £455,707 | £0 | £0 | £0 | £0 | £455,707 | 0.9289 | £423,317 | 0.734 | £310,601 | 1.19 | £369,615 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £2,481,469 | £0 | £127,255 | £0 | £0 | £2,608,724 | N/A | £2,423,305 | N/A | £1,921,948 | N/A | £2,287,119 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs

N.B. Optimism Bias only applied to Construction costs, not Land

Applying the methodology below produces the discounted scheme cost (PVC):-

a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)

b) Assume land is bought in the first year of construction

c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs

d) All costs discounted to 2010

e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|------------|
| Time Saving benefits (discounted) | £459,245 |
| MEC Discounted (2016 to 2010 Prices) | £2,410 |
| Mortality Benefits | £6,686,170 |
| Absentee Benefits | £53,806 |
| Total Benefits with MEC | £7,201,632 |
| Total costs (discounted) | £2,287,119 |
| BCR with Marginal External Costs | 3.14878 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road by the project | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|---|--------|--------|--------|-----------------------|------------|----------|-----------------|--|
| 2010 | 0 | 0 | 21,402 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 21,402 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 21,402 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 21,402 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 21,402 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 21,402 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 21,402 | 21,402 | 21,402 | 21,402 | £21,402 | 1.08 | £23,069 | 0.814 | £18,766 |
| 2017 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.10 | £23,527 | 0.786 | £18,492 |
| 2018 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.12 | £23,974 | 0.759 | £18,206 |
| 2019 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.14 | £24,432 | 0.734 | £17,927 |
| 2020 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.16 | £24,896 | 0.709 | £17,649 |
| 2021 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.19 | £25,365 | 0.685 | £17,374 |
| 2022 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.21 | £25,840 | 0.662 | £17,100 |
| 2023 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.23 | £26,327 | 0.639 | £16,834 |
| 2024 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.25 | £26,828 | 0.618 | £16,574 |
| 2025 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.28 | £27,343 | 0.597 | £16,321 |
| 2026 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.30 | £27,872 | 0.577 | £16,074 |
| 2027 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.33 | £28,416 | 0.557 | £15,834 |
| 2028 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.35 | £28,976 | 0.538 | £15,600 |
| 2029 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.38 | £29,553 | 0.520 | £15,372 |
| 2030 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.41 | £30,145 | 0.503 | £15,150 |
| 2031 | 21,402 | 21,402 | 21,402 | 21,402 | £21,402 | 1.44 | £30,754 | 0.486 | £14,933 |
| 2032 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.47 | £31,381 | 0.469 | £14,722 |
| 2033 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.50 | £32,024 | 0.453 | £14,516 |
| 2034 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.53 | £32,685 | 0.438 | £14,315 |
| 2035 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.56 | £33,363 | 0.423 | £14,117 |
| 2036 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.59 | £34,058 | 0.409 | £13,924 |
| 2037 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.62 | £34,770 | 0.395 | £13,734 |
| 2038 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.66 | £35,501 | 0.382 | £13,549 |
| 2039 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.69 | £36,248 | 0.369 | £13,366 |
| 2040 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.73 | £37,011 | 0.356 | £13,186 |
| 2041 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.77 | £37,789 | 0.344 | £13,008 |
| 2042 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.80 | £38,591 | 0.333 | £12,835 |
| 2043 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.84 | £39,410 | 0.321 | £12,664 |
| 2044 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.88 | £40,246 | 0.310 | £12,495 |
| 2045 | 0 | 21,402 | 21,402 | 21,402 | £21,402 | 1.92 | £41,100 | 0.355 | £14,606 |
| 2046 | 0 | 21,402 | 21,402 | 21,402 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 21,402 | 21,402 | 21,402 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 21,402 | 21,402 | 21,402 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 21,402 | 21,402 | 21,402 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 21,402 | 21,402 | 21,402 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 21,402 | 21,402 | 21,402 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 21,402 | 21,402 | 21,402 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 21,402 | 21,402 | 21,402 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £642,069 | N/A | £931,494 | N/A | £459,245 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | late veh | KM sfore opening | after design y | benefits profil | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|----------|------------------|----------------|-----------------|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 656 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 656 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.814 | 656 | 656 | 656 | 656 | £85 | £69 | £1 | £1 | £11 | £9 | £1 | £0 | £1 | £1 | £5 | £4 | -£32 | -£26 |
| 2017 | 0.786 | 0 | 656 | 656 | 656 | £90 | £71 | £1 | £1 | £12 | £9 | £0 | £0 | £1 | £1 | £5 | £4 | -£31 | -£25 |
| 2018 | 0.759 | 0 | 656 | 656 | 656 | £94 | £72 | £1 | £0 | £12 | £9 | £0 | £0 | £1 | £0 | £5 | £4 | -£31 | -£23 |
| 2019 | 0.734 | 0 | 656 | 656 | 656 | £99 | £73 | £1 | £0 | £12 | £9 | £0 | £0 | £1 | £0 | £5 | £3 | -£30 | -£22 |
| 2020 | 0.709 | 0 | 656 | 656 | 656 | £104 | £73 | £1 | £0 | £12 | £9 | £0 | £0 | £1 | £0 | £5 | £3 | -£30 | -£21 |
| 2021 | 0.685 | 0 | 656 | 656 | 656 | £110 | £75 | £1 | £0 | £13 | £9 | £0 | £0 | £1 | £0 | £5 | £3 | -£29 | -£20 |
| 2022 | 0.662 | 0 | 656 | 656 | 656 | £116 | £77 | £1 | £0 | £13 | £8 | £0 | £0 | £1 | £0 | £5 | £3 | -£28 | -£18 |
| 2023 | 0.639 | 0 | 656 | 656 | 656 | £122 | £78 | £1 | £0 | £13 | £8 | £0 | £0 | £1 | £0 | £5 | £3 | -£27 | -£17 |
| 2024 | 0.618 | 0 | 656 | 656 | 656 | £128 | £79 | £1 | £0 | £13 | £8 | £0 | £0 | £1 | £0 | £5 | £3 | -£26 | -£16 |
| 2025 | 0.597 | 0 | 656 | 656 | 656 | £134 | £80 | £1 | £0 | £13 | £8 | £0 | £0 | £1 | £0 | £5 | £3 | -£26 | -£15 |
| 2026 | 0.577 | 0 | 656 | 656 | 656 | £140 | £81 | £1 | £0 | £13 | £8 | £0 | £0 | £1 | £0 | £5 | £3 | -£25 | -£15 |
| 2027 | 0.557 | 0 | 656 | 656 | 656 | £146 | £81 | £1 | £0 | £14 | £8 | £0 | £0 | £1 | £1 | £5 | £3 | -£25 | -£14 |
| 2028 | 0.538 | 0 | 656 | 656 | 656 | £152 | £82 | £1 | £0 | £14 | £7 | £0 | £0 | £1 | £1 | £5 | £2 | -£24 | -£13 |
| 2029 | 0.520 | 0 | 656 | 656 | 656 | £158 | £82 | £1 | £0 | £14 | £7 | £0 | £0 | £1 | £1 | £5 | £2 | -£24 | -£12 |
| 2030 | 0.503 | 0 | 656 | 656 | 656 | £164 | £82 | £1 | £0 | £14 | £7 | £0 | £0 | £1 | £1 | £5 | £2 | -£24 | -£12 |
| 2031 | 0.486 | 656 | 656 | 656 | 656 | £172 | £84 | £1 | £0 | £15 | £7 | £0 | £0 | £1 | £1 | £5 | £2 | -£23 | -£11 |
| 2032 | 0.469 | 0 | 656 | 656 | 656 | £180 | £85 | £1 | £0 | £15 | £7 | £0 | £0 | £1 | £1 | £5 | £3 | -£23 | -£11 |
| 2033 | 0.453 | 0 | 656 | 656 | 656 | £188 | £85 | £1 | £0 | £16 | £7 | £0 | £0 | £1 | £1 | £6 | £3 | -£23 | -£11 |
| 2034 | 0.438 | 0 | 656 | 656 | 656 | £196 | £86 | £1 | £1 | £16 | £7 | £0 | £0 | £1 | £1 | £6 | £3 | -£23 | -£10 |
| 2035 | 0.423 | 0 | 656 | 656 | 656 | £205 | £87 | £1 | £1 | £16 | £7 | £0 | £0 | £1 | £1 | £7 | £3 | -£23 | -£10 |
| 2036 | 0.409 | 0 | 656 | 656 | 656 | £209 | £85 | £1 | £1 | £17 | £7 | £0 | £0 | £1 | £1 | £7 | £3 | -£23 | -£10 |
| 2037 | 0.395 | 0 | 656 | 656 | 656 | £213 | £84 | £1 | £1 | £17 | £7 | £0 | £0 | £1 | £1 | £7 | £3 | -£24 | -£9 |
| 2038 | 0.382 | 0 | 656 | 656 | 656 | £217 | £83 | £1 | £1 | £17 | £7 | £0 | £0 | £1 | £1 | £7 | £3 | -£24 | -£9 |
| 2039 | 0.369 | 0 | 656 | 656 | 656 | £221 | £82 | £1 | £1 | £18 | £7 | £0 | £0 | £1 | £1 | £7 | £3 | -£25 | -£9 |
| 2040 | 0.356 | 0 | 656 | 656 | 656 | £226 | £80 | £1 | £1 | £18 | £6 | £0 | £0 | £1 | £1 | £7 | £3 | -£25 | -£9 |
| 2041 | 0.344 | 0 | 656 | 656 | 656 | £230 | £79 | £1 | £1 | £18 | £6 | £0 | £0 | £1 | £1 | £7 | £3 | -£26 | -£9 |
| 2042 | 0.333 | 0 | 656 | 656 | 656 | £235 | £78 | £2 | £1 | £19 | £6 | £0 | £0 | £2 | £1 | £8 | £3 | -£26 | -£9 |
| 2043 | 0.321 | 0 | 656 | 656 | 656 | £240 | £77 | £2 | £0 | £19 | £6 | £0 | £0 | £2 | £0 | £8 | £2 | -£27 | -£9 |
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| 2092 | 0.000 | 0 | 656 | 656 | 656 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2093 | 0.000 | 0 | 656 | 656 | 656 | £0 | £0 | £0</ | | | | | | | | | | | |

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| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £8,863,547 |
| Scheme Discription: Scheme C: Valley of Stone Cycle Improvement | PVC | £2,287,119 |
| Cycle Improvements to provide an improved cycle route between Bacup and Whitworth. Costs include 44% OB and allowance for risk. 60% growth applied. 30-year appraisal period. | NPV | £6,576,428 |
| | BCR | 3.875 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£26,341</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£26,341</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM807.1</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM807.1</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £2,346,968 | £0 | £123,525 | £0 | £0 | £2,470,492 |

| Spend Profile (insert percentage profile) | | | | | | |
|--|------|----|------|----|----|--|
| 2014 | | | | | | |
| 2015 | 3% | | 51% | | | |
| 2016 | 65% | | 52% | | | |
| 2017 | 3% | | | | | |
| 2018 | 15% | | | | | |
| 2019 | 19% | | | | | |
| 2020 | | | | | | |
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| 2044 | | | | | | |
| 2045 | | | | | | |
| 2046 | | | | | | |
| TOTAL | 106% | 0% | 103% | 0% | 0% | |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|----------|----|----|------------|------------------|-----------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £72,587 | £0 | £62,998 | £0 | £0 | £135,584 | 0.9289 | £125,947 | 0.842 | £106,044 | 1.19 | £126,193 |
| £1,533,334 | £0 | £64,258 | £0 | £0 | £1,597,592 | 0.9289 | £1,484,041 | 0.814 | £1,207,268 | 1.19 | £1,436,649 |
| £75,519 | £0 | £0 | £0 | £0 | £75,519 | 0.9289 | £70,152 | 0.786 | £55,138 | 1.19 | £65,615 |
| £344,322 | £0 | £0 | £0 | £0 | £344,322 | 0.9289 | £319,849 | 0.759 | £242,897 | 1.19 | £289,047 |
| £455,707 | £0 | £0 | £0 | £0 | £455,707 | 0.9289 | £423,317 | 0.734 | £310,601 | 1.19 | £369,615 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
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| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £2,481,469 | £0 | £127,255 | £0 | £0 | £2,608,724 | N/A | £2,423,305 | N/A | £1,921,948 | N/A | £2,287,119 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs
N.B. Optimism Bias only applied to Construction costs, not Land

Applying the methodology below produces the discounted scheme cost (PVC):-

a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)
b) Assume land is bought in the first year of construction
c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs
d) All costs discounted to 2010
e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|------------|
| Time Saving benefits (discounted) | £565,225 |
| MEC Discounted (2016 to 2010 Prices) | £2,966 |
| Mortality Benefits | £8,229,133 |
| Absentee Benefits | £66,223 |
| Total Benefits with MEC | £8,863,547 |
| Total costs (discounted) | £2,287,119 |
| BCR with Marginal External Costs | 3.87542 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road by the user class | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|--|--------|--------|--------|-----------------------|------------|------------|-----------------|--|
| 2010 | 0 | 0 | 26,341 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 26,341 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 26,341 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 26,341 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 26,341 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 26,341 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 26,341 | 26,341 | 26,341 | 26,341 | £26,341 | 1.08 | £28,392 | 0.814 | £23,097 |
| 2017 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.10 | £28,956 | 0.786 | £22,759 |
| 2018 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.12 | £29,507 | 0.759 | £22,408 |
| 2019 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.14 | £30,071 | 0.734 | £22,064 |
| 2020 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.16 | £30,641 | 0.709 | £21,722 |
| 2021 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.19 | £31,218 | 0.685 | £21,383 |
| 2022 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.21 | £31,803 | 0.662 | £21,047 |
| 2023 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.23 | £32,403 | 0.639 | £20,718 |
| 2024 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.25 | £33,019 | 0.618 | £20,399 |
| 2025 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.28 | £33,653 | 0.597 | £20,087 |
| 2026 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.30 | £34,304 | 0.577 | £19,783 |
| 2027 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.33 | £34,974 | 0.557 | £19,488 |
| 2028 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.35 | £35,663 | 0.538 | £19,200 |
| 2029 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.38 | £36,372 | 0.520 | £18,919 |
| 2030 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.41 | £37,102 | 0.503 | £18,646 |
| 2031 | 26,341 | 26,341 | 26,341 | 26,341 | £26,341 | 1.44 | £37,852 | 0.486 | £18,380 |
| 2032 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.47 | £38,622 | 0.469 | £18,120 |
| 2033 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.50 | £39,414 | 0.453 | £17,866 |
| 2034 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.53 | £40,228 | 0.438 | £17,618 |
| 2035 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.56 | £41,062 | 0.423 | £17,375 |
| 2036 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.59 | £41,917 | 0.409 | £17,137 |
| 2037 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.62 | £42,794 | 0.395 | £16,904 |
| 2038 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.66 | £43,694 | 0.382 | £16,676 |
| 2039 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.69 | £44,613 | 0.369 | £16,451 |
| 2040 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.73 | £45,552 | 0.356 | £16,229 |
| 2041 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.77 | £46,510 | 0.344 | £16,010 |
| 2042 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.80 | £47,497 | 0.333 | £15,797 |
| 2043 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.84 | £48,504 | 0.321 | £15,587 |
| 2044 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.88 | £49,534 | 0.310 | £15,379 |
| 2045 | 0 | 26,341 | 26,341 | 26,341 | £26,341 | 1.92 | £50,585 | 0.355 | £17,977 |
| 2046 | 0 | 26,341 | 26,341 | 26,341 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 26,341 | 26,341 | 26,341 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 26,341 | 26,341 | 26,341 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 26,341 | 26,341 | 26,341 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 26,341 | 26,341 | 26,341 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 26,341 | 26,341 | 26,341 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 26,341 | 26,341 | 26,341 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 26,341 | 26,341 | 26,341 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £790,239 | N/A | £1,146,454 | N/A | £565,225 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

| | | |
|---|-----|------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £3,480,901 |
| Scheme Discription: Weavers Wheel Improvement | PVC | £1,200,662 |
| Cycle Improvements to provide 6 new 'spoke' and 'spur' cycle routes and improvements to cycle routes around Blackburn. Costs include 44% OB and allance for risk. 15% growth applied. 30-year appraisal period | NPV | £2,280,239 |
| | BCR | 2.899 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£20,461</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£20,461</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM834.2</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM834.2</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £1,198,241 | £0 | £90,190 | £0 | £0 | £1,288,431 |

| Spend Profile (insert percentage profile) | | | | | |
|--|------|----|------|----|----|
| 2014 | | | | | |
| 2015 | 6% | | 102% | | |
| 2016 | 80% | | | | |
| 2017 | 6% | | | | |
| 2018 | 6% | | | | |
| 2019 | 6% | | | | |
| 2020 | | | | | |
| 2021 | | | | | |
| 2022 | | | | | |
| 2023 | | | | | |
| 2024 | | | | | |
| 2025 | | | | | |
| 2026 | | | | | |
| 2027 | | | | | |
| 2028 | | | | | |
| 2029 | | | | | |
| 2030 | | | | | |
| 2031 | | | | | |
| 2032 | | | | | |
| 2033 | | | | | |
| 2034 | | | | | |
| 2035 | | | | | |
| 2036 | | | | | |
| 2037 | | | | | |
| 2038 | | | | | |
| 2039 | | | | | |
| 2040 | | | | | |
| 2041 | | | | | |
| 2042 | | | | | |
| 2043 | | | | | |
| 2044 | | | | | |
| 2045 | | | | | |
| 2046 | | | | | |
| TOTAL | 105% | 0% | 102% | 0% | 0% |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscount ed prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|---------|----|----|------------|------------------|------------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £70,485 | £0 | £91,994 | £0 | £0 | £162,479 | 0.9289 | £150,930 | 0.842 | £127,079 | 1.19 | £151,224 |
| £953,321 | £0 | £0 | £0 | £0 | £953,321 | 0.9289 | £885,562 | 0.814 | £720,405 | 1.19 | £857,282 |
| £74,799 | £0 | £0 | £0 | £0 | £74,799 | 0.9289 | £69,483 | 0.786 | £54,613 | 1.19 | £64,989 |
| £76,295 | £0 | £0 | £0 | £0 | £76,295 | 0.9289 | £70,872 | 0.759 | £53,821 | 1.19 | £64,047 |
| £77,821 | £0 | £0 | £0 | £0 | £77,821 | 0.9289 | £72,290 | 0.734 | £53,041 | 1.19 | £63,119 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £1,252,720 | £0 | £91,994 | £0 | £0 | £1,344,714 | N/A | £1,249,137 | N/A | £1,008,960 | N/A | £1,200,662 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs
N.B. Optimism Bias only applied to Construction costs, not Land

- Applying the methodology below produces the discounted scheme cost (PVC):-
- a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)
 - b) Assume land is bought in the first year of construction
 - c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs
 - d) All costs discounted to 2010
 - e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|------------|
| Time Saving benefits (discounted) | £439,038 |
| MEC Discounted (2016 to 2010 Prices) | £3,066 |
| Mortality Benefits | £2,970,349 |
| Absentee Benefits | £68,449 |
| Total Benefits with MEC | £3,480,901 |
| Total costs (discounted) | £1,200,662 |
| BCR with Marginal External Costs | 2.89915 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road | | | | Benefits profile | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|--|--------|--------|--------|------------------|-----------------------|------------|----------|-----------------|--|
| 2010 | 0 | 0 | 20,461 | 0 | | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 20,461 | 0 | | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 20,461 | 0 | | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 20,461 | 0 | | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 20,461 | 0 | | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 20,461 | 0 | | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 20,461 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.08 | £22,054 | 0.814 | £17,941 |
| 2017 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.10 | £22,492 | 0.786 | £17,678 |
| 2018 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.12 | £22,919 | 0.759 | £17,405 |
| 2019 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.14 | £23,357 | 0.734 | £17,138 |
| 2020 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.16 | £23,800 | 0.709 | £16,873 |
| 2021 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.19 | £24,249 | 0.685 | £16,609 |
| 2022 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.21 | £24,703 | 0.662 | £16,348 |
| 2023 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.23 | £25,169 | 0.639 | £16,093 |
| 2024 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.25 | £25,648 | 0.618 | £15,845 |
| 2025 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.28 | £26,140 | 0.597 | £15,603 |
| 2026 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.30 | £26,646 | 0.577 | £15,367 |
| 2027 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.33 | £27,166 | 0.557 | £15,137 |
| 2028 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.35 | £27,701 | 0.538 | £14,913 |
| 2029 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.38 | £28,252 | 0.520 | £14,696 |
| 2030 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.41 | £28,819 | 0.503 | £14,483 |
| 2031 | 20,461 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.44 | £29,401 | 0.486 | £14,276 |
| 2032 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.47 | £30,000 | 0.469 | £14,074 |
| 2033 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.50 | £30,615 | 0.453 | £13,877 |
| 2034 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.53 | £31,247 | 0.438 | £13,685 |
| 2035 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.56 | £31,895 | 0.423 | £13,496 |
| 2036 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.59 | £32,559 | 0.409 | £13,311 |
| 2037 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.62 | £33,240 | 0.395 | £13,130 |
| 2038 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.66 | £33,939 | 0.382 | £12,953 |
| 2039 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.69 | £34,653 | 0.369 | £12,778 |
| 2040 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.73 | £35,382 | 0.356 | £12,606 |
| 2041 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.77 | £36,126 | 0.344 | £12,436 |
| 2042 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.80 | £36,893 | 0.333 | £12,270 |
| 2043 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.84 | £37,676 | 0.321 | £12,107 |
| 2044 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.88 | £38,475 | 0.310 | £11,946 |
| 2045 | 0 | 20,461 | 20,461 | 20,461 | | £20,461 | 1.92 | £39,292 | 0.355 | £13,964 |
| 2046 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 20,461 | 20,461 | 20,461 | | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | | £613,817 | N/A | £890,507 | N/A | £439,038 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

| | | |
|--|-----|------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £4,962,879 |
| Scheme Discription: Weavers Wheel Improvement | PVC | £1,200,662 |
| Cycle Improvements to provide 6 new 'spoke' and 'spur' cycle routes and improvements to cycle routes around Blackburn. Costs include 44% OB and allance for risk. 60% growth applied. 30-year appraisal period. | NPV | £3,762,216 |
| | BCR | 4.133 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£28,467</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£28,467</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,160.6</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,160.6</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £1,198,241 | £0 | £90,190 | £0 | £0 | £1,288,431 |

| Spend Profile (insert percentage profile) | | | | | |
|--|------|----|------|----|----|
| 2014 | | | | | |
| 2015 | 6% | | 102% | | |
| 2016 | 80% | | | | |
| 2017 | 6% | | | | |
| 2018 | 6% | | | | |
| 2019 | 6% | | | | |
| 2020 | | | | | |
| 2021 | | | | | |
| 2022 | | | | | |
| 2023 | | | | | |
| 2024 | | | | | |
| 2025 | | | | | |
| 2026 | | | | | |
| 2027 | | | | | |
| 2028 | | | | | |
| 2029 | | | | | |
| 2030 | | | | | |
| 2031 | | | | | |
| 2032 | | | | | |
| 2033 | | | | | |
| 2034 | | | | | |
| 2035 | | | | | |
| 2036 | | | | | |
| 2037 | | | | | |
| 2038 | | | | | |
| 2039 | | | | | |
| 2040 | | | | | |
| 2041 | | | | | |
| 2042 | | | | | |
| 2043 | | | | | |
| 2044 | | | | | |
| 2045 | | | | | |
| 2046 | | | | | |
| TOTAL | 105% | 0% | 102% | 0% | 0% |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscounted prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|---------|----|----|------------|------------------|-----------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £70,485 | £0 | £91,994 | £0 | £0 | £162,479 | 0.9289 | £150,930 | 0.842 | £127,079 | 1.19 | £151,224 |
| £953,321 | £0 | £0 | £0 | £0 | £953,321 | 0.9289 | £885,562 | 0.814 | £720,405 | 1.19 | £857,282 |
| £74,799 | £0 | £0 | £0 | £0 | £74,799 | 0.9289 | £69,483 | 0.786 | £54,613 | 1.19 | £64,989 |
| £76,295 | £0 | £0 | £0 | £0 | £76,295 | 0.9289 | £70,872 | 0.759 | £53,821 | 1.19 | £64,047 |
| £77,821 | £0 | £0 | £0 | £0 | £77,821 | 0.9289 | £72,290 | 0.734 | £53,041 | 1.19 | £63,119 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £1,252,720 | £0 | £91,994 | £0 | £0 | £1,344,714 | N/A | £1,249,137 | N/A | £1,008,960 | N/A | £1,200,662 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs
N.B. Optimism Bias only applied to Construction costs, not Land

- Applying the methodology below produces the discounted scheme cost (PVC):-
- a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)
 - b) Assume land is bought in the first year of construction
 - c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs
 - d) All costs discounted to 2010
 - e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|------------|
| Time Saving benefits (discounted) | £610,835 |
| MEC Discounted (2016 to 2010 Prices) | £4,265 |
| Mortality Benefits | £4,249,973 |
| Absentee Benefits | £97,804 |
| Total Benefits with MEC | £4,962,879 |
| Total costs (discounted) | £1,200,662 |
| BCR with Marginal External Costs | 4.13345 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits (before opening of the road) (after design of the road) (Benefits profile) | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|---|--------|--------|--------|-----------------------|------------|------------|-----------------|--|
| 2010 | 0 | 0 | 28,467 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 28,467 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 28,467 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 28,467 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 28,467 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 28,467 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 28,467 | 28,467 | 28,467 | 28,467 | £28,467 | 1.08 | £30,683 | 0.814 | £24,961 |
| 2017 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.10 | £31,293 | 0.786 | £24,596 |
| 2018 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.12 | £31,888 | 0.759 | £24,216 |
| 2019 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.14 | £32,497 | 0.734 | £23,844 |
| 2020 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.16 | £33,114 | 0.709 | £23,475 |
| 2021 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.19 | £33,738 | 0.685 | £23,108 |
| 2022 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.21 | £34,369 | 0.662 | £22,745 |
| 2023 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.23 | £35,018 | 0.639 | £22,390 |
| 2024 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.25 | £35,684 | 0.618 | £22,045 |
| 2025 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.28 | £36,368 | 0.597 | £21,708 |
| 2026 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.30 | £37,072 | 0.577 | £21,380 |
| 2027 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.33 | £37,796 | 0.557 | £21,060 |
| 2028 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.35 | £38,541 | 0.538 | £20,749 |
| 2029 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.38 | £39,307 | 0.520 | £20,446 |
| 2030 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.41 | £40,096 | 0.503 | £20,151 |
| 2031 | 28,467 | 28,467 | 28,467 | 28,467 | £28,467 | 1.44 | £40,906 | 0.486 | £19,863 |
| 2032 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.47 | £41,739 | 0.469 | £19,582 |
| 2033 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.50 | £42,595 | 0.453 | £19,308 |
| 2034 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.53 | £43,474 | 0.438 | £19,040 |
| 2035 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.56 | £44,375 | 0.423 | £18,777 |
| 2036 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.59 | £45,300 | 0.409 | £18,520 |
| 2037 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.62 | £46,247 | 0.395 | £18,268 |
| 2038 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.66 | £47,220 | 0.382 | £18,022 |
| 2039 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.69 | £48,213 | 0.369 | £17,778 |
| 2040 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.73 | £49,227 | 0.356 | £17,539 |
| 2041 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.77 | £50,263 | 0.344 | £17,302 |
| 2042 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.80 | £51,329 | 0.333 | £17,072 |
| 2043 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.84 | £52,418 | 0.321 | £16,844 |
| 2044 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.88 | £53,531 | 0.310 | £16,620 |
| 2045 | 0 | 28,467 | 28,467 | 28,467 | £28,467 | 1.92 | £54,666 | 0.355 | £19,428 |
| 2046 | 0 | 28,467 | 28,467 | 28,467 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 28,467 | 28,467 | 28,467 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 28,467 | 28,467 | 28,467 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 28,467 | 28,467 | 28,467 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 28,467 | 28,467 | 28,467 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 28,467 | 28,467 | 28,467 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 28,467 | 28,467 | 28,467 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 28,467 | 28,467 | 28,467 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £854,006 | N/A | £1,238,967 | N/A | £610,835 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | Late veh KM sfired opening - after design y3benefits profile | | | | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|--|-------|-------|---------|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 1,161 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 1,161 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.814 | 1,161 | 1,161 | 1,161 | 1,161 | £151 | £123 | £1 | £1 | £20 | £16 | £1 | £1 | £1 | £1 | £9 | £7 | -£57 | -£46 |
| 2017 | 0.786 | 0 | 1,161 | 1,161 | 1,161 | £159 | £125 | £1 | £1 | £21 | £16 | £1 | £1 | £1 | £1 | £9 | £7 | -£56 | -£44 |
| 2018 | 0.759 | 0 | 1,161 | 1,161 | 1,161 | £167 | £127 | £1 | £1 | £21 | £16 | £0 | £0 | £1 | £1 | £9 | £7 | -£55 | -£41 |
| 2019 | 0.734 | 0 | 1,161 | 1,161 | 1,161 | £175 | £129 | £1 | £1 | £22 | £16 | £0 | £0 | £1 | £1 | £8 | £6 | -£53 | -£39 |
| 2020 | 0.709 | 0 | 1,161 | 1,161 | 1,161 | £183 | £130 | £1 | £1 | £22 | £16 | £0 | £0 | £1 | £1 | £8 | £6 | -£52 | -£37 |
| 2021 | 0.685 | 0 | 1,161 | 1,161 | 1,161 | £194 | £133 | £1 | £1 | £22 | £15 | £0 | £0 | £1 | £1 | £8 | £6 | -£51 | -£35 |
| 2022 | 0.662 | 0 | 1,161 | 1,161 | 1,161 | £205 | £136 | £1 | £1 | £23 | £15 | £0 | £0 | £1 | £1 | £8 | £5 | -£49 | -£33 |
| 2023 | 0.639 | 0 | 1,161 | 1,161 | 1,161 | £216 | £138 | £1 | £1 | £23 | £15 | £0 | £0 | £1 | £1 | £8 | £5 | -£48 | -£31 |
| 2024 | 0.618 | 0 | 1,161 | 1,161 | 1,161 | £227 | £140 | £1 | £1 | £23 | £14 | £0 | £0 | £1 | £1 | £8 | £5 | -£47 | -£29 |
| 2025 | 0.597 | 0 | 1,161 | 1,161 | 1,161 | £238 | £142 | £1 | £1 | £23 | £14 | £0 | £0 | £1 | £1 | £8 | £5 | -£45 | -£27 |
| 2026 | 0.577 | 0 | 1,161 | 1,161 | 1,161 | £248 | £143 | £1 | £1 | £24 | £14 | £0 | £0 | £1 | £1 | £8 | £5 | -£45 | -£26 |
| 2027 | 0.557 | 0 | 1,161 | 1,161 | 1,161 | £259 | £144 | £1 | £1 | £24 | £13 | £0 | £0 | £2 | £1 | £8 | £5 | -£44 | -£24 |
| 2028 | 0.538 | 0 | 1,161 | 1,161 | 1,161 | £269 | £145 | £1 | £1 | £25 | £13 | £0 | £0 | £2 | £1 | £8 | £4 | -£43 | -£23 |
| 2029 | 0.520 | 0 | 1,161 | 1,161 | 1,161 | £280 | £145 | £1 | £1 | £25 | £13 | £0 | £0 | £2 | £1 | £8 | £4 | -£42 | -£22 |
| 2030 | 0.503 | 0 | 1,161 | 1,161 | 1,161 | £290 | £146 | £1 | £1 | £26 | £13 | £0 | £0 | £2 | £1 | £8 | £4 | -£42 | -£21 |
| 2031 | 0.486 | 1,161 | 1,161 | 1,161 | 1,161 | £305 | £148 | £1 | £1 | £26 | £13 | £0 | £0 | £2 | £1 | £9 | £4 | -£42 | -£20 |
| 2032 | 0.469 | 0 | 1,161 | 1,161 | 1,161 | £319 | £150 | £2 | £1 | £27 | £13 | £0 | £0 | £2 | £1 | £10 | £4 | -£41 | -£19 |
| 2033 | 0.453 | 0 | 1,161 | 1,161 | 1,161 | £333 | £151 | £2 | £1 | £28 | £13 | £0 | £0 | £2 | £1 | £10 | £5 | -£41 | -£19 |
| 2034 | 0.438 | 0 | 1,161 | 1,161 | 1,161 | £348 | £152 | £2 | £1 | £28 | £12 | £0 | £0 | £2 | £1 | £11 | £5 | -£41 | -£18 |
| 2035 | 0.423 | 0 | 1,161 | 1,161 | 1,161 | £362 | £153 | £2 | £1 | £29 | £12 | £0 | £0 | £2 | £1 | £12 | £5 | -£41 | -£17 |
| 2036 | 0.409 | 0 | 1,161 | 1,161 | 1,161 | £369 | £151 | £2 | £1 | £30 | £12 | £0 | £0 | £2 | £1 | £12 | £5 | -£41 | -£17 |
| 2037 | 0.395 | 0 | 1,161 | 1,161 | 1,161 | £377 | £149 | £2 | £1 | £30 | £12 | £0 | £0 | £2 | £1 | £12 | £5 | -£42 | -£17 |
| 2038 | 0.382 | 0 | 1,161 | 1,161 | 1,161 | £384 | £147 | £2 | £1 | £31 | £12 | £0 | £0 | £2 | £1 | £12 | £5 | -£43 | -£16 |
| 2039 | 0.369 | 0 | 1,161 | 1,161 | 1,161 | £392 | £145 | £3 | £1 | £31 | £12 | £0 | £0 | £3 | £1 | £13 | £5 | -£44 | -£16 |
| 2040 | 0.356 | 0 | 1,161 | 1,161 | 1,161 | £400 | £142 | £3 | £1 | £32 | £11 | £0 | £0 | £3 | £1 | £13 | £5 | -£45 | -£16 |
| 2041 | 0.344 | 0 | 1,161 | 1,161 | 1,161 | £408 | £140 | £3 | £1 | £33 | £11 | £0 | £0 | £3 | £1 | £13 | £4 | -£46 | -£16 |
| 2042 | 0.333 | 0 | 1,161 | 1,161 | 1,161 | £416 | £138 | £3 | £1 | £33 | £11 | £0 | £0 | £3 | £1 | £13 | £4 | -£47 | -£16 |
| 2043 | 0.321 | 0 | 1,161 | 1,161 | 1,161 | £424 | £136 | £3 | £1 | £34 | £11 | £0 | £0 | £3 | £1 | £14 | £4 | -£48 | -£15 |
| 2044 | 0.310 | 0 | 1,161 | 1,161 | 1,161 | £433 | £134 | £3 | £1 | £35 | £11 | £0 | £0 | £3 | £1 | £14 | £4 | -£49 | -£15 |
| 2045 | 0.355 | 0 | 1,161 | 1,161 | 1,161 | £441 | £157 | £3 | £1 | £35 | £13 | £0 | £0 | £3 | £1 | £14 | £5 | -£50 | -£18 |
| 2046 | 0.345 | 0 | 1,161 | 1,161 | 1,161 | £450 | £155 | £3 | £1 | £36 | £12 | £0 | £0 | £3 | £1 | £14 | £5 | -£51 | -£17 |
| 2047 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2048 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2049 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2050 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2051 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2052 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2053 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2054 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2055 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2056 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2057 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2058 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2059 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2060 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2061 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2062 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2063 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2064 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2065 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2066 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2067 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2068 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2069 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2070 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2071 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2072 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2073 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2074 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2075 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2076 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2077 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2078 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2079 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2080 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2081 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2082 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2083 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2084 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2085 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2086 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2087 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2088 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2089 | 0.000 | 0 | 1,161 | 1,161 | 1,161 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2090 | 0.000 | 0 | 1,161 | 1,161 | 1,161</ | | | | | | | | | | | | | | |

| | | | |
|--------------|--------|------------|--------|
| Undiscounted | £9,264 | Discounted | £4,265 |
|--------------|--------|------------|--------|

| | | |
|---|-----|------------|
| Scheme Comparison: LCC East Lancashire Cycle Network | PVB | £6,659,116 |
| Scheme Discription: Weavers Wheel Improvement | PVC | £1,200,662 |
| Cycle Improvements to provide 6 new 'spoke' and 'spur' cycle routes and improvements to cycle routes around Blackburn. Costs include 44% OB and allance for risk. 120% growth applied. 30-year appraisal period. | NPV | £5,458,454 |
| | BCR | 5.546 |

Parameters & Inputs

| | | |
|---|---|--|
| <div>Opening Year Total Time Savings (Veh Delay in hrs)</div> <div>Opening Year time savings£39,142</div> | <div>MEC Parameters</div> <div>Assessment Period (Years)30</div> <div>DM MEC Type:Weighted Average</div> <div>DS MEC Type:Weighted Average</div> <div>DM MEC Congestion Band:Weighted Average</div> <div>DS MEC Congestion Band:Weighted Average</div> <div>MEC growth post-2035?2%</div> | <div>Assessment Parameters</div> <div>Current year2015</div> <div>Scheme Opening Year2016</div> <div>Scheme Design Year2031</div> <div>Include VoT growth over time?Yes</div> <div>Include growth in benefits post-design year?No</div> <div>Scheme Cost Estimate Year2014</div> <div>Scheme Cost Discount Factor3.5%</div> <div>Discount Factor (0-30 years)3.5%</div> <div>Discount Factor (31-75 years)3.0%</div> |
| <div>Forecast Year Total Time Savings (Veh Delay in hrs)</div> <div>Forecast Year time savings£39,142</div> | <div>- Input Values</div> <div>- Default Values</div> <div>- Output Values</div> | |
| <div>Opening YearTotal Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,595.9</div> | | |
| <div>Design Year Total Distance Saving (Veh KM in KM)</div> <div>Annualised Total Veh KM1,595.9</div> | | |

Estimation of Discounted Scheme Costs

| Scheme Costs | Construction | Land | Preparation | Supervision | Maintenance | TOTAL |
|--------------|--------------|------|-------------|-------------|-------------|------------|
| | £1,198,241 | £0 | £90,190 | £0 | £0 | £1,288,431 |

| Spend Profile (insert percentage profile) | | | | | | |
|--|------|----|------|----|----|--|
| 2014 | | | | | | |
| 2015 | 6% | | 102% | | | |
| 2016 | 80% | | | | | |
| 2017 | 6% | | | | | |
| 2018 | 6% | | | | | |
| 2019 | 6% | | | | | |
| 2020 | | | | | | |
| 2021 | | | | | | |
| 2022 | | | | | | |
| 2023 | | | | | | |
| 2024 | | | | | | |
| 2025 | | | | | | |
| 2026 | | | | | | |
| 2027 | | | | | | |
| 2028 | | | | | | |
| 2029 | | | | | | |
| 2030 | | | | | | |
| 2031 | | | | | | |
| 2032 | | | | | | |
| 2033 | | | | | | |
| 2034 | | | | | | |
| 2035 | | | | | | |
| 2036 | | | | | | |
| 2037 | | | | | | |
| 2038 | | | | | | |
| 2039 | | | | | | |
| 2040 | | | | | | |
| 2041 | | | | | | |
| 2042 | | | | | | |
| 2043 | | | | | | |
| 2044 | | | | | | |
| 2045 | | | | | | |
| 2046 | | | | | | |
| TOTAL | 105% | 0% | 102% | 0% | 0% | |

| C | L | P | S | M | Total | Deflation Factor | Total Costs (Undiscount ed prices) | Discount Factor | Total Costs (2010 prices, discounted to 2010) | Resource Costs to Market Prices Factor | Total Costs (2010 prices, discounted to 2010) in Market Prices |
|------------|----|---------|----|----|------------|------------------|------------------------------------|-----------------|---|--|--|
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.871 | £0 | 1.19 | £0 |
| £70,485 | £0 | £91,994 | £0 | £0 | £162,479 | 0.9289 | £150,930 | 0.842 | £127,079 | 1.19 | £151,224 |
| £953,321 | £0 | £0 | £0 | £0 | £953,321 | 0.9289 | £885,562 | 0.814 | £720,405 | 1.19 | £857,282 |
| £74,799 | £0 | £0 | £0 | £0 | £74,799 | 0.9289 | £69,483 | 0.786 | £54,613 | 1.19 | £64,989 |
| £76,295 | £0 | £0 | £0 | £0 | £76,295 | 0.9289 | £70,872 | 0.759 | £53,821 | 1.19 | £64,047 |
| £77,821 | £0 | £0 | £0 | £0 | £77,821 | 0.9289 | £72,290 | 0.734 | £53,041 | 1.19 | £63,119 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.709 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.685 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.662 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.639 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.618 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.597 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.577 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.557 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.538 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.520 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.503 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.486 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.469 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.453 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.438 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.423 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.409 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.395 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.382 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.369 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.356 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.344 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.333 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.321 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.310 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.300 | £0 | 1.19 | £0 |
| £0 | £0 | £0 | £0 | £0 | £0 | 0.9289 | £0 | 0.290 | £0 | 1.19 | £0 |
| £1,252,720 | £0 | £91,994 | £0 | £0 | £1,344,714 | N/A | £1,249,137 | N/A | £1,008,960 | N/A | £1,200,662 |

N.B. It is assumed that Preparation and Supervision costs are included within the above costs

N.B. Optimism Bias only applied to Construction costs, not Land

Applying the methodology below produces the discounted scheme cost (PVC):-

a) Assume the Construction costs are spread evenly over the construction period (assumed to be 2 years)

b) Assume land is bought in the first year of construction

c) All costs are in undiscounted Q1 prices, so need to be converted to undiscounted 2010 prices using the industry-standard method of RPIs

d) All costs discounted to 2010

e) All costs need to be converted to Market Prices

Estimation of Benefit to Cost Ratio (BCR) with MEC

| | |
|--------------------------------------|------------|
| Time Saving benefits (discounted) | £839,899 |
| MEC Discounted (2016 to 2010 Prices) | £5,865 |
| Mortality Benefits | £5,682,407 |
| Absentee Benefits | £130,945 |
| Total Benefits with MEC | £6,659,116 |
| Total costs (discounted) | £1,200,662 |
| BCR with Marginal External Costs | 5.54620 |

Estimation of Benefits By User Class Over Appraisal Period

| Year | Single Year Benefits before opening of the road after design of the road by the user class | | | | Total Benefits (2010) | VoT Growth | VoT Adj. | Discount Factor | Total Benefits (2010 prices, discounted) |
|-------|--|--------|--------|--------|-----------------------|------------|------------|-----------------|--|
| 2010 | 0 | 0 | 39,142 | 0 | £0 | 1.00 | £0 | 1.000 | £0 |
| 2011 | 0 | 0 | 39,142 | 0 | £0 | 1.01 | £0 | 0.966 | £0 |
| 2012 | 0 | 0 | 39,142 | 0 | £0 | 1.01 | £0 | 0.934 | £0 |
| 2013 | 0 | 0 | 39,142 | 0 | £0 | 1.02 | £0 | 0.902 | £0 |
| 2014 | 0 | 0 | 39,142 | 0 | £0 | 1.04 | £0 | 0.871 | £0 |
| 2015 | 0 | 0 | 39,142 | 0 | £0 | 1.06 | £0 | 0.842 | £0 |
| 2016 | 39,142 | 39,142 | 39,142 | 39,142 | £39,142 | 1.08 | £42,189 | 0.814 | £34,321 |
| 2017 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.10 | £43,028 | 0.786 | £33,819 |
| 2018 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.12 | £43,846 | 0.759 | £33,297 |
| 2019 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.14 | £44,684 | 0.734 | £32,786 |
| 2020 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.16 | £45,531 | 0.709 | £32,278 |
| 2021 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.19 | £46,389 | 0.685 | £31,774 |
| 2022 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.21 | £47,258 | 0.662 | £31,274 |
| 2023 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.23 | £48,149 | 0.639 | £30,787 |
| 2024 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.25 | £49,065 | 0.618 | £30,311 |
| 2025 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.28 | £50,006 | 0.597 | £29,848 |
| 2026 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.30 | £50,974 | 0.577 | £29,397 |
| 2027 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.33 | £51,970 | 0.557 | £28,958 |
| 2028 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.35 | £52,994 | 0.538 | £28,530 |
| 2029 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.38 | £54,048 | 0.520 | £28,113 |
| 2030 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.41 | £55,131 | 0.503 | £27,707 |
| 2031 | 39,142 | 39,142 | 39,142 | 39,142 | £39,142 | 1.44 | £56,246 | 0.486 | £27,311 |
| 2032 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.47 | £57,391 | 0.469 | £26,925 |
| 2033 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.50 | £58,568 | 0.453 | £26,548 |
| 2034 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.53 | £59,776 | 0.438 | £26,179 |
| 2035 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.56 | £61,016 | 0.423 | £25,819 |
| 2036 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.59 | £62,287 | 0.409 | £25,465 |
| 2037 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.62 | £63,589 | 0.395 | £25,119 |
| 2038 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.66 | £64,927 | 0.382 | £24,780 |
| 2039 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.69 | £66,293 | 0.369 | £24,445 |
| 2040 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.73 | £67,688 | 0.356 | £24,116 |
| 2041 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.77 | £69,111 | 0.344 | £23,790 |
| 2042 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.80 | £70,578 | 0.333 | £23,473 |
| 2043 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.84 | £72,075 | 0.321 | £23,161 |
| 2044 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.88 | £73,605 | 0.310 | £22,852 |
| 2045 | 0 | 39,142 | 39,142 | 39,142 | £39,142 | 1.92 | £75,166 | 0.355 | £26,713 |
| 2046 | 0 | 39,142 | 39,142 | 39,142 | £0 | 1.96 | £0 | 0.345 | £0 |
| 2047 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.00 | £0 | 0.335 | £0 |
| 2048 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.05 | £0 | 0.325 | £0 |
| 2049 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.09 | £0 | 0.316 | £0 |
| 2050 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.14 | £0 | 0.307 | £0 |
| 2051 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.18 | £0 | 0.298 | £0 |
| 2052 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.23 | £0 | 0.289 | £0 |
| 2053 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.28 | £0 | 0.281 | £0 |
| 2054 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.33 | £0 | 0.272 | £0 |
| 2055 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.38 | £0 | 0.264 | £0 |
| 2056 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.43 | £0 | 0.257 | £0 |
| 2057 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.48 | £0 | 0.249 | £0 |
| 2058 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.54 | £0 | 0.242 | £0 |
| 2059 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.60 | £0 | 0.235 | £0 |
| 2060 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.65 | £0 | 0.228 | £0 |
| 2061 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.71 | £0 | 0.221 | £0 |
| 2062 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.77 | £0 | 0.215 | £0 |
| 2063 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.83 | £0 | 0.209 | £0 |
| 2064 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.90 | £0 | 0.203 | £0 |
| 2065 | 0 | 39,142 | 39,142 | 39,142 | £0 | 2.96 | £0 | 0.197 | £0 |
| 2066 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.03 | £0 | 0.191 | £0 |
| 2067 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.09 | £0 | 0.185 | £0 |
| 2068 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.16 | £0 | 0.180 | £0 |
| 2069 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.23 | £0 | 0.175 | £0 |
| 2070 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.30 | £0 | 0.170 | £0 |
| 2071 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.37 | £0 | 0.165 | £0 |
| 2072 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.45 | £0 | 0.160 | £0 |
| 2073 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.52 | £0 | 0.155 | £0 |
| 2074 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.60 | £0 | 0.151 | £0 |
| 2075 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.68 | £0 | 0.146 | £0 |
| 2076 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.76 | £0 | 0.142 | £0 |
| 2077 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.84 | £0 | 0.138 | £0 |
| 2078 | 0 | 39,142 | 39,142 | 39,142 | £0 | 3.92 | £0 | 0.134 | £0 |
| 2079 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.00 | £0 | 0.130 | £0 |
| 2080 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.09 | £0 | 0.126 | £0 |
| 2081 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.18 | £0 | 0.123 | £0 |
| 2082 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.27 | £0 | 0.119 | £0 |
| 2083 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.36 | £0 | 0.116 | £0 |
| 2084 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.46 | £0 | 0.112 | £0 |
| 2085 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.55 | £0 | 0.109 | £0 |
| 2086 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.65 | £0 | 0.106 | £0 |
| 2087 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.75 | £0 | 0.103 | £0 |
| 2088 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.86 | £0 | 0.100 | £0 |
| 2089 | 0 | 39,142 | 39,142 | 39,142 | £0 | 4.96 | £0 | 0.097 | £0 |
| 2090 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.07 | £0 | 0.094 | £0 |
| 2091 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.18 | £0 | 0.091 | £0 |
| 2092 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.30 | £0 | 0.089 | £0 |
| 2093 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.41 | £0 | 0.086 | £0 |
| 2094 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.53 | £0 | 0.083 | £0 |
| 2095 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.65 | £0 | 0.081 | £0 |
| 2096 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.77 | £0 | 0.079 | £0 |
| 2097 | 0 | 39,142 | 39,142 | 39,142 | £0 | 5.90 | £0 | 0.076 | £0 |
| 2098 | 0 | 39,142 | 39,142 | 39,142 | £0 | 6.02 | £0 | 0.074 | £0 |
| 2099 | 0 | 39,142 | 39,142 | 39,142 | £0 | 6.15 | £0 | 0.072 | £0 |
| 2100 | 0 | 39,142 | 39,142 | 39,142 | £0 | 6.29 | £0 | 0.070 | £0 |
| TOTAL | | | | | £1,174,259 | N/A | £1,703,579 | N/A | £839,899 |

Discount factor = 1/(1+Discount Rate)^n where n = year minus 2010. Discount rates are specified in the parameters above.

Marginal External Costs over appraisal period

| Year | Discount Factor | Late veh KM sifore opening - after design ysebenefits profile | | | | Congestion | Discounted | Infrast. | Discounted | Accident | Discounted | Local Air Quality | Discounted | Noise | Discounted | Green Gases | Discounted | Indirect Taxation | Discounted |
|------|-----------------|---|-------|-------|-------|------------|------------|----------|------------|----------|------------|-------------------|------------|-------|------------|-------------|------------|-------------------|------------|
| 2014 | 0.000 | 0 | 0 | 1,596 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2015 | 0.000 | 0 | 0 | 1,596 | 0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 | £0 |
| 2016 | 0.814 | 1,596 | 1,596 | 1,596 | 1,596 | £207 | £169 | £2 | £1 | £28 | £23 | £1 | £1 | £2 | £1 | £12 | £10 | -£78 | -£64 |
| 2017 | 0.786 | 0 | 1,596 | 1,596 | 1,596 | £219 | £172 | £2 | £1 | £28 | £22 | £1 | £1 | £2 | £1 | £12 | £10 | -£77 | -£60 |
| 2018 | 0.759 | 0 | 1,596 | 1,596 | 1,596 | £230 | £175 | £2 | £1 | £29 | £22 | £1 | £0 | £2 | £1 | £12 | £9 | -£75 | -£57 |
| 2019 | 0.734 | 0 | 1,596 | 1,596 | 1,596 | £241 | £177 | £2 | £1 | £30 | £22 | £0 | £0 | £2 | £1 | £11 | £8 | -£73 | -£54 |
| 2020 | 0.709 | 0 | 1,596 | 1,596 | 1,596 | £252 | £179 | £2 | £1 | £30 | £21 | £0 | £0 | £2 | £1 | £11 | £8 | -£72 | -£51 |
| 2021 | 0.685 | 0 | 1,596 | 1,596 | 1,596 | £267 | £183 | £2 | £1 | £31 | £21 | £0 | £0 | £2 | £1 | £11 | £8 | -£70 | -£48 |
| 2022 | 0.662 | 0 | 1,596 | 1,596 | 1,596 | £282 | £187 | £2 | £1 | £31 | £20 | £0 | £0 | £2 | £1 | £11 | £7 | -£68 | -£45 |
| 2023 | 0.639 | 0 | 1,596 | 1,596 | 1,596 | £297 | £190 | £2 | £1 | £31 | £20 | £0 | £0 | £2 | £1 | £11 | £7 | -£66 | -£42 |
| 2024 | 0.618 | 0 | 1,596 | 1,596 | 1,596 | £312 | £193 | £2 | £1 | £32 | £20 | £0 | £0 | £2 | £1 | £11 | £7 | -£64 | -£40 |
| 2025 | 0.597 | 0 | 1,596 | 1,596 | 1,596 | £327 | £195 | £2 | £1 | £32 | £19 | £0 | £0 | £2 | £1 | £11 | £7 | -£62 | -£37 |
| 2026 | 0.577 | 0 | 1,596 | 1,596 | 1,596 | £342 | £197 | £2 | £1 | £33 | £19 | £0 | £0 | £2 | £1 | £11 | £6 | -£61 | -£35 |
| 2027 | 0.557 | 0 | 1,596 | 1,596 | 1,596 | £356 | £198 | £2 | £1 | £33 | £18 | £0 | £0 | £2 | £1 | £11 | £6 | -£60 | -£34 |
| 2028 | 0.538 | 0 | 1,596 | 1,596 | 1,596 | £370 | £199 | £2 | £1 | £34 | £18 | £0 | £0 | £3 | £1 | £11 | £6 | -£59 | -£32 |
| 2029 | 0.520 | 0 | 1,596 | 1,596 | 1,596 | £385 | £200 | £2 | £1 | £34 | £18 | £0 | £0 | £3 | £1 | £11 | £6 | -£58 | -£30 |
| 2030 | 0.503 | 0 | 1,596 | 1,596 | 1,596 | £399 | £201 | £2 | £1 | £35 | £18 | £0 | £0 | £3 | £2 | £11 | £6 | -£57 | -£29 |
| 2031 | 0.486 | 1,596 | 1,596 | 1,596 | 1,596 | £419 | £203 | £2 | £1 | £36 | £18 | £0 | £0 | £3 | £2 | £12 | £6 | -£57 | -£28 |
| 2032 | 0.469 | 0 | 1,596 | 1,596 | 1,596 | £439 | £206 | £2 | £1 | £37 | £17 | £0 | £0 | £3 | £1 | £13 | £6 | -£57 | -£27 |
| 2033 | 0.453 | 0 | 1,596 | 1,596 | 1,596 | £458 | £208 | £3 | £1 | £38 | £17 | £0 | £0 | £3 | £1 | £14 | £6 | -£56 | -£26 |
| 2034 | 0.438 | 0 | 1,596 | 1,596 | 1,596 | £478 | £209 | £3 | £1 | £39 | £17 | £0 | £0 | £3 | £1 | £15 | £7 | -£56 | -£25 |
| 2035 | 0.423 | 0 | 1,596 | 1,596 | 1,596 | £498 | £211 | £3 | £1 | £40 | £17 | £0 | £0 | £3 | £1 | £16 | £7 | -£56 | -£24 |
| 2036 | 0.409 | 0 | 1,596 | 1,596 | 1,596 | £508 | £208 | £3 | £1 | £41 | £17 | £0 | £0 | £3 | £1 | £16 | £7 | -£57 | -£23 |
| 2037 | 0.395 | 0 | 1,596 | 1,596 | 1,596 | £518 | £205 | £3 | £1 | £42 | £16 | £0 | £0 | £3 | £1 | £17 | £7 | -£58 | -£ |

| | | | |
|--------------|---------|------------|--------|
| Undiscounted | £12,739 | Discounted | £5,865 |
|--------------|---------|------------|--------|

Appendix G – Detailed Risk Register and Management Plan

East Lancashire Strategic Cycleway

Risk Register & Management Plan

Abbreviations for Risk Owners

Cabinet Members = CM

Project Board = PB

Project Manager = PM

Technical Manager Highways = TMH

Technical Manager Ecology = TME

Financial Manager = FM

Legal Services Manager = LSM

Property Services Manager = PSM

Development Control = DC

Contractor = C

Chief Ecologist = CE

Technical Manager Structures = TMS

East Lancashire Strategic Cycleway Network

Risk Register and Management Plan

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|-------------|----|------------------------|----|--------|-------------|-----------|---------------------------------|--------------------|---------------------|
| | Emerging | =E | Cost | =C | | | | | | |
| | Current | =C | Time | =T | High=3 | High=3 | Red=5-6 | Accept/ Avoid/ Reduce/ Transfer | | |
| | Anticipated | =A | Environmenta | =E | Med=2 | Med=2 | Amber=3-4 | | | |
| | | | Performance | =P | Low=1 | Low=1 | Green=1-2 | | | |

VALLEY OF STONE - RAWTENSTALL TO ROCHDALE

1. Section 1 – Rawtenstall Station to Hill End Lane.

| | | | | | | | | | | |
|-----|--|---|--|----|---|---|---|--|------------|---|
| 1.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 1.2 | Current proposals don't appear to be the best choice of route. | C | Not popular with and not used by users. | P | 3 | 3 | 6 | <u>Avoid</u> Consider alternative route. | PM TMH | Look at route along Bocholt Way. Explore what is happening with town centre redevelopment and replacement of the bus station. |
| 1.3 | Need to resolve ownership issues with Tesco on section from Rawtenstall Town Centre | C | Access may be restricted outside store opening times. | CT | 2 | 2 | 4 | <u>Avoid</u> Consider alternative route. | PSM | On hold whilst alternatives are considered. |
| 1.4 | Vegetation clearance required on section immediately to the east of Tesco Entrance – need ecological surveys and assessments | C | Ecological survey unlikely to be restrictive due to nature of vegetation (scrub and young trees) | E | 2 | 2 | 4 | <u>Reduce</u> Survey and determine solution based on results. | CE | On hold whilst alternatives are considered. |
| 1.5 | Unknown ownership on same section as 1.4 above | C | Unable to secure permission for route from land owner. | CT | 3 | 3 | 6 | | PSM | On hold whilst alternatives are considered. |
| 1.6 | Land to East of Fall Barn Road – Unknown ownership (currently for sale) | A | Land may be unavailable for use due to desire to sell it as a development site. There is an on road alternative route if required. | CT | 1 | 3 | 4 | <u>Avoid</u> Consider alternative route | PSM | On hold whilst alternatives are considered. |
| 1.7 | Condition of surface of Fall Barn Road and consideration of wall height | C | Safety audit has indicated railings may be required to raise height of wall. | C | 2 | 3 | 5 | <u>Accept</u> Design and cost for railings and surface improvements | TMH LSM | Awaiting design work |
| 1.8 | Condition of surface of Fall Barn Road and consideration of wall height east of union Terrace – Hill End Lane | C | Safety audit has indicated railings may be required to raise height of wall. | C | 2 | 3 | 5 | <u>Accept</u> Design and cost for railings and surface improvements | TMH | Awaiting design work |
| 1.9 | Consider ecological impact upon wildlife if undertaking work to river wall(s) | C | Potential for bat roosts might delay work or require mitigation. | CT | 2 | 2 | 4 | <u>Accept</u> | CE TMH | Ecological survey underway results due June 2015 |

2. Section 2 – Hill End Lane to Visitor Centre

| | | | | | | | | | | |
|-----|--|---|--|---|---|---|---|---------------|----|-------------------------|
| 2.1 | Insufficient funding to complete preferred | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> | PM | Indicative scheme to be |
|-----|--|---|--|---|---|---|---|---------------|----|-------------------------|

East Lancashire Strategic Cycleway Network

Risk Register and Management Plan

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|--|---|----------------|---|----------------------|--------|-------------|---------|--|--------------------|--|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmenta Performance | =C =T =E =P | | | | | | |
| | option. | | | | | | | Prepare robust cost estimate and if necessary look at additional contributions. | TMH | costed by TMH & PM. |
| 2.2 | Existing Cycleway and bridleway has no official status or agreement with Rossendale on their section | C | Minimal as RBC are partners in the project. | T | 1 | 3 | 4 | <u>Reduce</u> Draw up agreement with RBC | PSM LSM | Item on next board meeting in June |
| 2.3 | Concessionary cycleway crosses Lench Road (private unknown ownership) and then across privately owned land | E | Route has been in use for many years so public rights may well exist. | CT | 3 | 1 | 4 | <u>Reduce</u> Formalise status of route. | PSM LSM | Item on next board meeting in June |
| 2.4 | Check acceptability of existing width of path (2m) plus 1m bridleway | C | Negligible | C | 1 | 1 | 2 | <u>Accept</u> | LSM | Awaiting confirmation of status |
| 2.5 | General engineering issues including widths, slopes, drainage and geotechnics on section between Highfield Rd – Lench Rd | E | Additional engineering work | C | 2 | 2 | 4 | <u>Accept</u> Design and cost for | TMH | Awaiting design |
| 2.6 | Consider any ecological issues associated with works in this section including 2.5 above | E | Possible mitigation required | CT | 1 | 2 | 3 | <u>Accept</u> Design and cost for | CE | Survey underway due for completion June 2015 |
| 2.7 | General engineering issues (As 2.5) for section Lench Rd – Visitor Centre | E | Additional engineering work | C | 2 | 2 | 4 | <u>Accept</u> Design and cost for | TMH | Awaiting design work |
| 3. Section 3 – Buckhurst Plant Gap | | | | | | | | | | |
| 3.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 3.2 | Route requires planning permission | A | Potential impact upon programme delivery | T | 1 | 3 | 4 | <u>Reduce</u> Ensure time and costs for planning application to be prepared and determined (8 weeks+) are considered in programme | PM TMH | Planning application to be prepared once preferred route established and outline design completed. |
| 3.3 | Difficulty in creating a connection to an existing highway from end of Section 2 | E | Difficulty completing route | CT P | 2 | 2 | 4 | <u>Avoid</u> Negotiate with landowners | LSM PSM | Investigation underway to identify landowners |
| 3.4 | Difficulty in identifying a realistic alternative option at the moment. Potential solution may be to use existing highway for short section | E | Difficulty completing route | PT | 2 | 2 | 4 | <u>Accept</u> Design and cost for | TMH | Pending |
| 3.5 | May need ecological surveys and assessments | C | Possible delays due to ecological constraints | CT | 1 | 2 | 3 | <u>Accept</u> Design and cost for | PM | Survey underway due for completion June 2015 |
| 4. Section 4 – Buckhurst to Tunnels | | | | | | | | | | |
| 4.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |

East Lancashire Strategic Cycleway Network

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|--|---|----------------|---|----------------------|--------|-------------|---------|---|--------------------------------|---|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmenta Performance | =C =T =E =P | | | | | | |
| 4.2 | Need to resolve parking issues on Stansfield Road – potential use of TRO's | C | Route obstructed by parked cars | P | 1 | 2 | 3 | Reduce | TMH | Pending |
| 4.3 | Need to consider condition of bridge including checking parapet heights on river crossing need checking | C | Possible repairs required to bridge | CT | 3 | 2 | 5 | Accept Survey bridge and make decision based on results. | TMH | Awaiting safety audit |
| 4.4 | Section of unregistered land north of Irwell House | C | Difficulty securing route | CT P | 3 | 1 | 4 | Avoid Negotiate with landowners | PSM | Investigation underway to identify landowners |
| 4.5 | Need to check safety of river wall and bridge parapets on Cowpe Road | C | Possible repairs/modifications required to bridge | CT | 2 | 2 | 4 | Accept Survey bridge and make decision based on results. | TMH | Awaiting safety audit |
| 4.6 | Section of cobbled road to south of coal yard is in unknown ownership (pennine bridleway uses this route) | C | Difficulty securing route | CT P | 2 | 2 | 4 | Avoid Negotiate with landowners | PSM | Investigation underway to identify landowners |
| 4.7 | Check status of using a cobbled street for a cycleway | | Quality of route poor | P | 1 | 2 | 3 | Accept Survey section look at national guidance and make decision based on results. | TMH | THM to check acceptable standards |
| | CHANGE SECTION 4 START TO STANSFIELD RD | | | | | | | | PM | |
| 5. Section 5 – Thrutch Tunnel to Bridge | | | | | | | | | | |
| 5.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 5.2 | Route requires planning permission | C | Potential impact upon programme delivery especially as this section currently in Year 1 Programme | T | 2 | 3 | 5 | Reduce Ensure time and costs for planning application to be prepared and determined (8 weeks+) are considered in programme | PM TMH | Planning application to be prepared once bat and other surveys completed and outline design produced. |
| 5.3 | Rock face/Wall face between tunnels may be safety risk | E | Inspection required with potential increase in cost to provide safe route for users | C | 2 | 2 | 4 | Accept Cost for inspection report and possible future repair works | PM TMH | Safety inspection of vertical face to be carried out |
| 5.4 | Ground investigations and topo survey required of area where bridge may be located | C | Potential to increase original estimate for cost of bridge. | C | 2 | 1 | 3 | Accept Cost for inspection report and possible future repair works | TMH | Awaiting Investigation |
| 5.5 | Maintenance model for tunnels needs to be agreed with Rossendale BC – structure, lighting & surfacing | C | Maintenance not carried out on route | P | 2 | 2 | 4 | Reduce Negotiate with RBC to ensure maintenance is carried out. | PSM LSM PM TMS TMH | Maintenance issues being considered by project board |
| 5.7 | Consider bat issues in tunnels including lighting | C | Light in tunnels unacceptable. | EP | 1 | 1 | 2 | Reduce Survey and design solution based on results. | CE TMH | Survey underway due for completion June 2015 |
| 5.8 | Investigation of sloping masonry/slopes on | C | Line of route requires moving. | C | 1 | 2 | 3 | Accept | TMH | Awaiting inspection |

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|--|--|----|--|---------|-------------|--------|-------------|-----------|--|--------------------|--|
| | Emerging | =E | Cost | =C | Time | | | | | | |
| | Current | =C | Environmenta | =E | Performance | High=3 | High=3 | Red=5-6 | Accept/ Avoid/ Reduce/ Transfer | | |
| | Anticipated | =A | | =P | | Med=2 | Med=2 | Amber=3-4 | | | |
| | | | | | | Low=1 | Low=1 | Green=1-2 | | | |
| | section between tunnels potentially required (consider possible realignment of path, use of rock fence) | | | | | | | | Cost for inspection report and possible engineering works. | | |
| 5.9 | Need for ecological surveys/assessments of proposals including for early site clearance on section in 5.8 | C | Delay due to nesting birds | ET | 1 | 2 | 3 | | <u>Reduce</u> Cost for inspection report and early vegetation clearance | CE | Survey underway due for completion June 2015 |
| 5.10 | Tunnels – Rakehead Lane - consider early site clearance and need for surveys as (5.9) (CHANGE SECTION BOUNDARY AT BEGINNING & END AT BACUP RD (MTLOOP CROSSING) | C | Delay due to nesting birds | ET | 1 | 2 | 3 | | <u>Reduce</u> Cost for inspection report | CE PM | Ecological survey underway results due June 2015 |
| | | | | | | | | | | | |
| 6. Section 6 – Thrutch Tunnel to Blackwood Rd | | | | | | | | | | | |
| 6.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 6.2 | Investigate slope stability, drainage, geotechnics issues on slope to south of path | C | Line of route requires moving. | C | 1 | 2 | 3 | | <u>Accept</u> Cost for inspection report and possible engineering works. | TMH | Awaiting inspection |
| 6.3 | Unknown ownership of triangle of land as the route joins Blackwood Road | C | Difficulty completing route | TC | 2 | 2 | 4 | | Check with Proffits on an agreement, whether they know owners | PSM PM | Ownership under investigation |
| 6.4 | Ecological assessments/surveys required | C | Difficulty completing route | TC | 2 | 2 | 4 | | <u>Reduce</u> Survey and design solution based on results. | CE | Survey underway due for completion June 2015 |
| 7. Section 7 – Blackwood Rd to Holme Street | | | | | | | | | | | |
| 7.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 7.2 | Investigate route along Blackwood rd further – drain on south side of road, potential for crossing, widening of footway, narrowing of road? | C | Quality of route may suffer without a good quality road crossing here. | C | 2 | 2 | 4 | | <u>Reduce</u> | TMH | TMH to design solution |
| 7.3 | Entrance to Stacksteads Country Park to the east of Blackwood Road in unknown ownership | C | Difficulty completing route | CT | 3 | 1 | 4 | | <u>Reduce</u> Survey and design solution based on results. | PSM | PSM to Identify and negotiate with landowners. |
| 7.4 | Existing bridge needs widening/replacing to minimum of 2.5m | C | Difficulty completing route | CT P | 2 | 2 | 4 | | <u>Accept</u> Cost for inspection report and engineering works | TMH TMS | TMH to complete design |
| 7.5 | Existing route through Stacksteads Park | C | Route stays same as it is currently | P | 1 | 2 | 3 | | <u>Accept</u> | TMH | Surveys underway due |

East Lancashire Strategic Cycleway Network

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|------------------------------------|---|----------------|--|----------------------|--------|-------------|---------|---|--------------------|---|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmenta Performance | =C =T =E =P | | | | | | |
| | needs widening – requirement for ecology surveys | | | | | | | Cost for inspection report and possible engineering works | CE | completion June 2015 |
| 7.6 | Section referred to in 7.5 is subject to a lease – needs further investigation | C | No real issues anticipated here community group who hold the lease are very supportive of the project. | T | 1 | 1 | 2 | Accept | PSM LSM | Low risk |
| 7.7 | New preferred route through recreation ground needs agreeing with Rossendale BC | C | Rossendale are project partners so no anticipated problems here. | T | 1 | 1 | 2 | Accept | PSM | Low risk |
| 7.8 | Need agreement with private landowner at eastern end of the path as it joins Wardle Street | C | Difficulty completing route | TC P | 3 | 2 | 5 | Reduce Identify and negotiate with landowners. | PSM | PSM to negotiate with landowners |
| 7.9 | Ecological assessments/surveys required | C | Possible ecological constraints | TC | 2 | 2 | 4 | Accept | CE | Survey underway due for completion June 2015 |
| 8. Section 8 – Ormerods Gap | | | | | | | | | | |
| 8.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 8.2 | Section from Old Kiln / Clough Street needs widening (potentially into land owned by Ormerods) | C | Narrow section and so poorer quality route | CT P | 2 | 2 | 4 | Reduce Negotiate with Landowners. | PSM TMH | May be issue with lorries and safe distances. |
| 8.3 | Footbridge not currently to cycleway standard | C | Difficulty completing route | CT P | 3 | 3 | 6 | Reduce Survey and design solution based on results. | TMH | TMH to design and cost appropriate footbridge |
| 8.4 | Route along river/north of cemetery is through woodland – will need ecological surveys | C | Difficulty completing route | CT PE | 3 | 3 | 6 | Reduce Survey and design solution based on results. | CE TMH | Survey underway due for completion June 2015 |
| 8.5 | Route through cemetery will require slope stability surveys etc., need to ensure that it isn't consecrated ground | C | Difficulty completing route | | 3 | 3 | 6 | Reduce Survey and design solution based on results. | TMH PSM | Survey underway due for completion June 2015 |
| 8.6 | Issues with private land at eastern end of this section as it connects to Lee Road (potential acquisition of property and land at this end) | C | Potential blockage requiring a different option being required for this section (see 8.7 to 8.9) | CT PE | 3 | 3 | 6 | Reduce Negotiate with land owner or use alternative route. | PSM PSL | PSM to negotiate with RBC over viability of this option |
| 8.7 | Alternative route along Newchurch Road goes past front entrances to residential properties. Cyclists may have to use the highway, crossings required? | E | Unattractive route crossing busy road twice. | P | 2 | 3 | 5 | Transfer Use Cutler Lane option? | TMH | TMH to assess design options |
| 8.8 | Alternative Route 2 along Cutler Lane is subject of a DMMO. Need to check status of this order. | C | If DMMO fails or gets delayed this may slow our project down | CT | 3 | 3 | 6 | Reduce Negotiate with land owner | PSM PSL | PSM/PSL to get update on DMMO progress. |
| 8.9 | Ecological assessments/surveys required initially of route through woodland south of River Irwell | C | Survey may result in ecological constraints | CT | 2 | 2 | 4 | Reduce Mitigation | CE | Survey underway due for completion June 2015 |

East Lancashire Strategic Cycleway Network

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|---------------------------------|------------------------------------|----------------|---|----------------------|--------|-------------|---------|---------------------------------|--------------------|---------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmenta Performance | =C =T =E =P | | | | | | |
| Accept/ Avoid/ Reduce/ Transfer | | | | | | | | | | |

| | | | | | | | | | | |
|---|--|---|---|----|---|---|---|---|-----------|---|
| 9. Section 9 – Futures Park to Stubbylee Park | | | | | | | | | | |
| 9.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 9.2 | Route requires planning permission | C | Potential impact upon programme delivery especially as this section currently in Year 1 Programme | T | 2 | 3 | 5 | Reduce Ensure time and costs for planning application to be prepared and determined (8 weeks+) are considered in programme | PM TMH | Planning application to be prepared once ecology surveys completed and outline design produced. |
| 9.3 | Route requires slope/ground stability, drainage and geotechnics survey. May need contaminated land survey/look at existing survey data on level section next to river. | E | May require additional engineering works | TC | 2 | 2 | 4 | Accept Carry out required works | TMH | Survey data from previous investigation being obtained |
| 9.4 | Area requires ecological surveys and assessments | C | Survey may result in ecological constraints | CT | 2 | 2 | 4 | Reduce Mitigation | CE | Survey underway due for completion June 2015 |
| | | | | | | | | | | |

| | | | | | | | | | | |
|--|--|---|--|----|---|---|---|---|-------------------|--|
| 10. Section 10 – Stubbylee Park to New Line Car Park | | | | | | | | | | |
| 10.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 10.2 | Planning permission will be required for at least some of the route | A | Potential impact upon programme delivery | T | 1 | 3 | 4 | Reduce Ensure time and costs for planning application to be prepared and determined (8 weeks+) are considered in programme | PM TMH | Planning application to be prepared once preferred route established and outline design completed. |
| 10.3 | Landowner issues to resolve before preferred route can be determined | C | Alternative route may be required | TC | 3 | 2 | 5 | Reduce Negotiate with landowners | PSM PSL TMH | PSM to set up meeting with land owner |
| 10.4 | Need to consider outcome of current DMMO application | C | Alternative route may be required | TC | 3 | 2 | 5 | Reduce Negotiate with landowners | PSM PSL | PSL to investigate current state of DMMO |
| 10.5 | Potential route option using Height Barn Lane would also require a section on highway at New Line – design issue to consider | C | Alternative route may be required | TC | 3 | 2 | 5 | Reduce Negotiate with landowners | TMH PSM | PSM to negotiate with Land Owner |
| 10.6 | Potential southern route option may require route to cross more than one private land | C | Alternative route may be required | TC | 3 | 2 | 5 | Reduce Negotiate with landowners | PSM | PSM to negotiate with Land Owners |

Last Update 18/05/15

East Lancashire Strategic Cycleway Network

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|--|---|----|---|---------|--------|-------------|-----------|---|--------------------|---|
| | Emerging | =E | Cost | =C | | | | | | |
| | Current | =C | Time | =T | High=3 | High=3 | Red=5-6 | Accept/ Avoid/ Reduce/ Transfer | | |
| | Anticipated | =A | Environmenta | =E | Med=2 | Med=2 | Amber=3-4 | | | |
| | | | Performance | =P | Low=1 | Low=1 | Green=1-2 | | | |
| | owner | | | | | | | | | |
| 11. Section 11 – Britannia Greenway | | | | | | | | | | |
| 11.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 11.2 | Existing path to north of lodge requires widening | C | Land owner consent not given | CT | 2 | 1 | 3 | Accept | TMH | Part of ongoing design |
| 11.3 | Very small section of existing path in private ownership at eastern edge of lodge | C | Land owner consent not given | CT P | 2 | 2 | 4 | Reduce Negotiate with Landowner | PSM | PSM to negotiate with Land Owner |
| 11.4 | Ecological surveys and assessments required | C | Possible ecological constraints | CT | 2 | 3 | 5 | Accept Carry out mitigation works | CE | Surveys underway completed June 2015 |
| 11.5 | Existing Greenway route requires improvement / potential widening. Alternative surface maybe required to accommodate horse use - Flexi Pave | C | Possible additional cost | C | 2 | 2 | 4 | Accept | TMH | Finalise design |
| 11.6 | Drainage input required | C | Possible additional cost | CT | 2 | 2 | 4 | Accept | TMH | TMH arranging for survey |
| 11.7 | Need to agree maintenance / adoption agreement | C | | CT P | 2 | 3 | 5 | Reduce Maintenance issues to be resolved at board level | PSM | On agenda for next board meeting in June 2015 |
| 12. Section 12 – Old Lane to Oak Street | | | | | | | | | | |
| 12.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 12.2 | Small section of route on road connecting to Shore End is in unknown ownership | C | Not able to get landowner consent | TC | 2 | 2 | 4 | Reduce Negotiate with landowner or use creation order | PSM | PSM investigating |
| 12.3 | Drainage issues on northern section of route (path also currently 2m wide) | C | Narrow section of route not up to specification | TC P | 1 | 3 | 4 | Reduce Design acceptable solution | TMH | Awaiting drainage investigation |
| 12.4 | Need to check status of existing cycleway (local route 92) | C | Possible issues over right of access and future maintenance | P | 1 | 2 | 3 | Reduce Investigate legal status, if none negotiate appropriate solution | PSM | Investigating status |
| 12.5 | Consider additional off road section between 2 – 20 Old Lane | C | Route remains as it currently is and so outside of desired specification/standard | C | 2 | 2 | 4 | Reduce Design acceptable solution | TMH | THM to design appropriate solution |
| | | | | | | | | | | |
| 13. Section 13 – Oak Street to Station Rd (Slingco gap) | | | | | | | | | | |
| 13.1 | Insufficient funding to complete preferred | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | Reduce | PM | Indicative scheme to be |

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| | Emerging Current Anticipated | =E =C =A | Cost Time Environmenta Performance | =C =T =E =P | | | | | | |
| | option. | | | | | | | Prepare robust cost estimate and if necessary look at additional contributions. | TMH | costed by TMH & PM. |
| 13.2 | Still need to secure agreement with Slingco | C | Route unobtainable | CT P | 2 | 2 | 4 | <u>Reduce</u> Agree route with Slingco | TMH PSM | PSM to check with RBC as to current state of negotiations. |
| 13.3 | Need to check status of cycleway on LCC land | C | Possible maintenance issues | P | 1 | 2 | 3 | <u>Reduce</u> Check on status and if necessary negotiate appropriate status | PSM | PSM to investigate |
| | | | | | | | | | | |
| 14. Section 14 – Station Rd to Massey Croft | | | | | | | | | | |
| 14.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 14.2 | Need to consider suitability of cyclists using existing highway. Need to consider if new crossing/road markings needed across Tong Lane required? | C | Additional cost to implement acceptable design standard. | CT | 2 | 3 | 5 | <u>Reduce</u> Appropriate design | TMH | TMH to design and get safety audit carried out |
| 14.3 | As 14.2 above. Need to consider crossing across Hall Street? | C | Additional cost to implement acceptable design standard. | CT | 2 | 3 | 5 | <u>Reduce</u> Appropriate design | TMH | TMH to design and get safety audit carried out |
| | | | | | | | | | | |
| 15. Section 15 – Massey Croft | | | | | | | | | | |
| 15.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 15.2 | Need to agree route further south into Rochdale. Agreed current end at the Pennine Bridleway Crossing at Healey Dell. | E | Route may not link in to Rochdale centre as desired | PT | 2 | 2 | 4 | <u>Reduce</u> Negotiate with Rochdale Council and Transport for Manchester | PM | Trying to find appropriate contact at Rochdale Council |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|------------------------------------|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|---------------------------------|--------------------|---------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |

NATIONAL CYCLE ROUTE 6 – ACCRINGTON - RAMSBOTTOM

1. Section 1 – Woodnook Greenway

| | | | | | | | | | | |
|-----|---|---|---|---|---|---|---|--|-----------|--|
| 1.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 1.2 | Check status of farm use at Hurstead Street crossing | C | Could impact upon treatment of cycleway as it crosses Hurstead Street | P | 1 | 1 | 2 | <u>Reduce</u> Further investigation of ownership/access rights on Hurstead Street required | PSM | Land Registry Searches carried out, deeds and access rights currently being investigated |
| 1.3 | Consider slopes down to Hurstead Street – no bridleway strip in this location. Check with Countryside Services about complaints on this section | A | Could impact upon usability by horse riders | P | 2 | 2 | 4 | <u>Avoid</u> Identify alternative material to use on this section | TMH PM | Alternative materials to tarmac being explored for multi-use sections with gradients and limited space |

2. Section 2 – Baxenden – Rising Bridge

| | | | | | | | | | | |
|-----|---|---|---|-------------|---|---|---|--|-----------|--|
| 2.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 2.2 | Preferred option not yet known – need to develop a feasible route | C | Failure to identify potential route could lead to the use of an on-highway solution for this section. | C T P | 3 | 2 | 5 | <u>Reduce</u> Identify feasible route around Baxenden Chemicals & Hollands Pies | TMH | Initial walkover on PROW has taken place, potential route(s) identified. Notice served for design walkover |
| 2.3 | Need to discuss route options with two landowners – Northern Foods (Hollands Pies) & Baxenden Chemicals | A | Failure to secure agreement with landowners could lead to this section being delivered on-highway | C T P | 3 | 2 | 5 | <u>Reduce</u> Early discussions with landowners required once feasible route around Baxenden Chemicals and Hollands Pies identified | PSM | Potential routes identified, contact to be made with landowners. |
| 2.4 | Undertake Ecology Surveys as soon as permission granted from landowners | C | Failure to carry out ecology surveys in time could delay implementation of Programme | T P | 2 | 2 | 4 | <u>Avoid</u> Serve notice on landowners and commission surveys asap | CE | Notices served for access to survey, Bowland Ecology |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|---|--|----------------|---|----------------------|--------------------------|--------------------------|-----------------------------------|--|--------------------|--|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |
| | | | | | | | | | | commissioned 14/05/15 |
| 2.5 | Consider best solution for creating access onto Rising Bridge Road | A | Failure to provide clear, easy to use and safe transition for users between Sections 2 & 3 of the route | P | 2 | 2 | 4 | Reduce Further investigation of design options following walkover of site | TMH | Notice served on Baxenden Chemicals to enable walkover of their land |
| 3. Section 3 - Rising Bridge Road | | | | | | | | | | |
| 3.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget. | C | 3 | 1 | 4 | Accept On road section, could consider minimal road marking and signage solution | TMH | Design options for Rising Bridge Rd currently being explored |
| 4. Section 4 - Hud Hey Road | | | | | | | | | | |
| 4.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget | C P | 2 | 2 | 4 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM. |
| 4.2 | Provision of safe crossing facilities across Hud Hey Road | A | Failure to provide clear, easy to use and safe crossings for users on this section | P | 3 | 1 | 4 | Avoid Design and delivery of suitable crossing in this location. Dependent on final route option for sections 4-8. | TMH | Design options currently being developed |
| 4.3 | Potential increase in parapet height on bridge required | A | Could add significant additional expense to the scheme on this section. | C | 3 | 2 | 5 | Reduce/Avoid Need to use bridge over A56 dependent on final route option for sections 4 -8. Bridge is quite wide so cycleway could potentially be routed away from parapets, early discussions with Highways Agency who own the bridge. | PM TMH | Design options currently being developed, initial approach has also been made to HA. |
| 4.4 | Consider provision of bridleway through Sections 4 – 8 | A | Multi user route not achieved on this section of the route, potential stakeholder and publicity issues | P | 1 | 2 | 3 | Reduce Undertake further work on demand for horse riding in the area –location/number of stables etc. Identify preferred route along these sections | PM TMH | Design options currently being investigated for route either side of A56. |
| 5. Section 5 - Hud Hey Road – Booth Street | | | | | | | | | | |
| 5.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget | C P | 3 | 2 | 5 | Reduce Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|------------------------------------|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|---------------------------------|--------------------|---------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |

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|-----|---|---|--|--------|---|---|---|--|-----------|--|
| 5.2 | Determine preferred route option through discussions with Highways Agency | E | Delay in determining preferred route could impact upon programme delivery | T | 2 | 2 | 4 | Reduce Approach Highways Agency and other private land owners at earliest opportunity | PM TMH | Initial discussions with HA have taken place, awaiting feedback. |
| 5.3 | Need land ownership searches on western side of A56 | C | Route to the west of the A56 may not be a viable option | P | 3 | 1 | 4 | Accept Undertake land searches and once landowners identified and preferred route decided start negotiations. | PSM | Land Registry searches completed, preferred route to be identified. |
| 5.4 | Ecological surveys required on both sides of A56 – dependent on 5.2 above | C | Failure to identify ecological requirements early on could lead to potential delay in the Programme and additional mitigation measures | E T | 2 | 1 | 3 | Accept Commission ecology surveys for both areas at earliest opportunity | CE | Tender process completed, ecology consultants to be appointed in May 15. |
| 5.5 | Consider provision of bridleway through Sections 4 – 8 | E | Multi user route not achieved on this section of the route, potential stakeholder and publicity issues | P | 1 | 2 | 3 | Reduce Undertake further work on demand for horse riding in the area –location/number of stables etc. Identify preferred route along these sections | PM TMH | Consultation and public engagement strategy currently being finalised |

6. Section 6 - Booth Street – Commerce Street

| | | | | | | | | | | |
|-----|---|---|--|--------|---|---|---|--|-----------|--|
| 6.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget | C P | 2 | 2 | 4 | Reduce Prepare robust cost estimate and identify potential alternative on highway solution | TMH | Indicative scheme to be costed by TMH & PM, potential alternative on highway route identified. |
| 6.2 | Determine preferred route option through discussions with Highways Agency | C | Failure to agree route with HA may lead to only one route option in the area | T | 2 | 2 | 4 | Reduce Approach Highways Agency and other private land owners at earliest opportunity | PM TMH | Initial discussions with HA have taken place, awaiting feedback. |
| 6.3 | Consider safety of using route approaching industrial estate | E | Implemented route fails to provide users with satisfactory and safe access | P | 2 | 2 | 4 | Reduce Assess route options in this area and undertake safety audit if required | TMH | Design options currently being developed |
| 6.4 | Section of unregistered land at southern end of Commerce Street | C | Failure to identify owners and reach agreement could lead to gap in route | P C | 3 | 2 | 5 | Reduce Undertake Land Registry searches, investigation of deeds and access rights, approach land owners at earliest opportunity. | PSM | Land Registry searches completed, investigation of deeds/agreements ongoing. |
| 6.5 | Consider provision of bridleway through Sections 4 – 8 | E | Multi user route not achieved on this section of the route, potential stakeholder and publicity issues | P | 1 | 2 | 3 | Reduce Undertake further work on demand for horse riding in the area –location/number of stables etc. Identify preferred route along these sections | PM TMH | Design options currently being investigated for route either side of A56. |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|------------------------------------|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|---------------------------------|--------------------|---------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |

7. Section 7 - Well Bank

| | | | | | | | | | | |
|-----|---|---|--|-------------|---|---|---|---|-----------|---|
| 7.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget, potentially costly section dependent on final route options chosen. | C P | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM, Potential route options and alternative sources of funding being investigated |
| 7.2 | Determine preferred route option through discussions with Highways Agency | E | Failure to agree route with HA may lead to only one route option in the area | T | 2 | 2 | 4 | <u>Reduce</u> Approach Highways Agency and other private land owners at earliest opportunity | PM TMH | Initial discussions with HA have taken place, awaiting feedback. |
| 7.3 | Ecological Surveys required | C | Failure to identify ecological requirements early on could lead to potential delay in the Programme and additional costs | T C E | 2 | 1 | 3 | <u>Avoid</u> Appoint Ecology consultants to undertake survey in Spring 2015 | CE | Tender process for surveys carried out, consultants about to be appointed |
| 7.4 | Consider provision of bridleway through Sections 4 – 8 | E | Multi user route not achieved on this section of the route, potential stakeholder and publicity issues | P | 1 | 2 | 3 | <u>Reduce</u> Undertake further work on demand for horse riding in the area –location/number of stables etc. Identify preferred route along these sections | PM TMH | Design options currently being investigated for route either side of A56. |

8. Section 8 - Flip Road – Grane Road

| | | | | | | | | | | |
|-----|--|---|---|-------------|---|---|---|--|-----------|---|
| 8.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget although final route options still to be determined | C P | 2 | 2 | 4 | <u>Reduce</u> Prepare robust cost estimate and if necessary look at additional contributions. | PM TMH | Indicative scheme to be costed by TMH & PM, potential additional sources of funding being identified, possible on highway solution. |
| 8.2 | Need ecological surveys if using verge and top of former embankment on eastern side of St Crispins Way | E | Failure to commission ecology survey could lead to delay in implementing programme and additional costs associated with potential mitigation. | E C T | 2 | 1 | 3 | <u>Avoid</u> Commission surveys asap to allow for assessment and reporting in summer 2015 | CE | Tender assessments for Ecology consultants completed, consultants about to be appointed |
| 8.3 | Consider TRO's for change of priority at Flip Road and potential parking restrictions & speed limit (possible 20mph limit) | E | Failure to provide clear, easy to use and safe route for users on this section | P | 2 | 2 | 4 | <u>Reduce</u> Early identification of design solutions and use of TRO's required | TMH | Design currently being progressed, potential alternative route using embankment being considered (see 8.3) |
| 8.4 | Consider use of former embankment for taking route off road | A | If this option not pursued could be left with an unsatisfactory on highway solution | C P | 2 | 2 | 4 | <u>Reduce</u> Prepare design solution and robust cost estimates for this option at earliest opportunity | TMH | Design option for this section currently being progressed. |
| 8.5 | Crossing of Grane Road needs to be considered depending on what happens to | E | Failure to provide clear, easy to use and safe transition for users between Sections 8 & 9 of the route | P | 3 | 2 | 5 | <u>Accept</u> Crossing required either using existing or replacement. Identify | TMH | Design option for this section currently being progressed. |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|------------------------------------|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|---------------------------------|--------------------|---------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |

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|-----|--|---|--|---|---|---|---|--|-----------|---|
| | north. Use of Pegasus crossing – enough space? | | | | | | | design and best location for crossing dependent on agreed line of the route | | |
| 8.6 | Consider provision of bridleway through Sections 4 – 8 | E | Multi user route not achieved on this section of the route, potential stakeholder and publicity issues | P | 1 | 2 | 3 | Reduce Undertake further work on demand for horse riding in the area –location/number of stables etc. Identify preferred route along these sections | PM TMH | Design options currently being investigated for route either side of A56. |

9. Section 9 - Swinnel & Ogden Brook

| | | | | | | | | | | |
|-----|---|---|---|--------|---|---|---|---|-----|---|
| 9.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget or to sufficient standard | C P | 2 | 2 | 4 | Reduce Prepare robust cost estimate and identify potential additional sources of funding | TMH | Design options being developed; programme for year 1 sections currently being finalised |
| 9.2 | Ecology surveys required if widening path (currently 2m wide) | C | Failure to undertake surveys could lead to delay in implementing programme and additional costs associated with potential mitigation. | T | 2 | 1 | 3 | Avoid Commission surveys asap to allow for assessment and reporting in summer 2015 | CE | Tender assessments for Ecology consultants completed, consultants about to be appointed |
| 9.3 | Mains gas pipeline runs across path south of Holden Place | A | Additional design time and construction costs could be required to mitigate any impacts upon pipeline | C | 2 | 1 | 3 | Accept Existing path already crosses pipeline, consider as part of design | TMH | Draft designs being progressed, identification of the route of the pipeline currently taking place. |

10. Section 10 – Helmshore Viaduct

| | | | | | | | | | | |
|------|--|---|---|--------|---|---|---|---|-----------|--|
| 10.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget or to sufficient standard | C P | 2 | 2 | 4 | Reduce Prepare robust cost estimate and identify potential additional funding sources | TMH PM | Draft design for works to viaduct completed, S106 funding secured, other sources of funding (RHT) being identified |
| 10.2 | Need to agree land agreement with Railway Paths Ltd for use of viaduct | E | Cycleway across viaduct cannot be built, alternative on highway route considered instead | P | 3 | 2 | 5 | Avoid Start liaison with Railway Paths at earliest opportunity, could use examples of similar agreements in Lancashire as a starting point | PSM | Informal discussions have already taken place, maintenance model to be agreed. |
| 10.3 | Further discussion with Sustrans required regarding Railway Heritage trust funding | E | Delay in establishing scope of works on viaduct could impact upon programme delivery | P | 2 | 2 | 4 | Avoid Start liaison with Railway Paths at earliest opportunity, consider reprogramming of this section if required | PSM PM | Informal discussions have already taken place with Railway Paths/ Sustrans who have been consulting with RHT. |
| 10.4 | Vegetation surveys required if widening existing route. Bat Surveys may be required – dependant on works proposed to viaduct | C | Failure to undertake surveys could lead to delay in implementing programme and additional costs associated with potential mitigation. | T | 2 | 2 | 4 | Avoid Commission surveys asap to allow for assessment and reporting in summer 2015 | CE | Tender assessments for Ecology consultants completed, consultants about to be appointed |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|---------------|------------------------------------|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|------------------------------------|--------------------------|---------------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |

11. Section 11 - Bridge End Close

| | | | | | | | | | | |
|------|--|---|---|--------|---|---|---|---|-----|---|
| 11.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget or to sufficient standard | C | 1 | 2 | 3 | <u>Reduce</u> Prepare robust cost estimate and identify potential additional sources of funding. Most of the cost on this section dependent on widening existing section, already an existing cycleway | TMH | Design options being developed; programme for year 1 sections currently being finalised and widening of this section could be delayed to allow for budget overspend elsewhere |
| 11.2 | Requirement for ecological surveys if widening existing path | C | Failure to undertake surveys could lead to delay in implementing programme and additional costs associated with potential mitigation. | T E | 3 | 1 | 4 | <u>Avoid</u> Commission surveys asap to allow for assessment and reporting in summer 2015 | CE | Tender assessments for Ecology consultants completed, consultants about to be appointed in May 2015. |

12. Section 12 - Station Road

| | | | | | | | | | | |
|------|---|---|--|---|---|---|---|--|-----|---|
| 12.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget | C | 3 | 1 | 4 | <u>Reduce</u> Prepare robust cost estimate and identify potential additional sources of funding. Costs known for crossing, other costs for lining etc could be reduced. | TMH | Design options for this section currently being progressed. |
| 12.2 | Crossing at Helmshore Road needs consideration (table top,etc?) | E | Failure to provide clear, easy to use and safe transition for users between Sections 12 &13 of the route | P | 3 | 2 | 5 | <u>Reduce</u> Work up detailed design to create safe and usable crossing | TMH | Design options for this section currently being progressed. |

13. Section 13 – Snigg Hole

| | | | | | | | | | | |
|------|--|---|---|---|---|---|---|---|-----------|---|
| 13.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget, users may be left with poor quality surfacing along existing access track. | C | 2 | 2 | 4 | <u>Reduce</u> Prepare robust cost estimate and identify potential additional funding sources | TMH PM | Design options for this section currently being progressed. |
| 13.2 | Check nature of existing agreements for residents – access and maintenance along track | C | Access road may remain unsurfaced if agreements cannot be reached with residents | P | 2 | 2 | 4 | <u>Reduce</u> Identify landowners and nature of agreements at earliest opportunity | PSM | Land Registry searches completed, nature of agreements being investigated |

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|------------|------------------------------------|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|---------------------------------|--------------------|---------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |

14. Section 14 – Irongate Lane

| | | | | | | | | | | |
|------|---|---|--|--------|---|---|---|--|------------|---|
| 14.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget, users may be left with current substandard surfacing. | C | 2 | 2 | 4 | <u>Reduce</u> Prepare robust cost estimate, identify potential surfacing options and sources of additional funding. | PM TMH | Design options currently being progressed. |
| 14.2 | Need to widen path up slope from bridge – check status of flag stones | A | Users could be left with substandard surfacing along this section. Not all users will be able to cycle in current condition | P | 2 | 2 | 4 | <u>Reduce</u> Investigate any heritage status of flag stones. Explore design options for route with flag stones remaining in situ/being removed | PSM TMH | Land Registry searches completed, design options currently being progressed |
| 14.3 | Need to widen up slope from bridge – require additional land – negotiations with landowners | A | Users could be left with substandard surfacing along this section. Not all users will be able to cycle in current condition | P | 2 | 2 | 4 | <u>Reduce</u> Explore design options for this section of the route, early discussions with landowners required | TMH PSM | Land Registry searches completed, design options currently being progressed |
| 14.4 | Ecology surveys required if widening path – Biological Heritage Site status | C | Failure to undertake surveys could lead to delay in implementing programme and additional costs associated with potential mitigation. | T E | 2 | 1 | 3 | <u>Avoid</u> Commission surveys asap to allow for assessment and reporting in summer 2015 | CE | LCC Ecologists to lead on surveys of this section |
| 14.5 | Drainage issues along this section need consideration | E | Users could be left with substandard surfacing along this section if drainage issues not resolved. Could also impact upon future maintenance | P | 2 | 2 | 4 | <u>Reduce</u> Develop design options at earliest opportunity including identification of potential drainage solutions | TMH | Design currently being developed to identify issues. |

15. Section 15 – Irwell Vale

| | | | | | | | | | | |
|------|---|---|--|--------|---|---|---|--|-----------|--|
| 15.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget, use of unsatisfactory on-highway solution instead through Irwell Vale and Lumb. | C | 3 | 2 | 5 | <u>Reduce</u> Prepare robust cost estimate and identify potential match funding sources | TMH PM | Design options currently being progressed. |
| 15.2 | Need to agree access for construction | E | Difficult to complete construction on this section and S16 unless agreement for access from the south is secured | C P | 3 | 2 | 5 | <u>Avoid</u> Identify landowners and agreements required at an early stage. Consult with Sustrans on their agreements secured for Lumb Viaduct works. | PSM PM | Landowners identified, initial informal discussions have taken place with Sustrans. |
| 15.3 | Any construction must follow conditions of recent planning permission secured by Sustrans | C | Failure to comply with planning conditions could lead to enforcement action/delay in delivery of this section | T P | 2 | 2 | 4 | <u>Avoid</u> Issue copy of planning conditions to designers, liaise with Sustrans about the extent of their works to satisfy conditions. | PM TMH | Copy of planning permission secured, copied into shared folder. Early discussions have taken place with Sustrans |
| 15.4 | Need agreement with Sustrans / Railwaypaths | E | Cycleway cannot be built along this section, alternative route along Irongate lane, through Irwell Vale on highway route instead | P | 3 | 2 | 5 | <u>Avoid</u> Start liaison with Railway Paths at earliest opportunity, could use examples of similar agreements in Lancashire as a starting point | PSM | Informal discussions have already taken place, maintenance model to be agreed. |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|--------------------------------------|---|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|---|--------------------|--|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |
| 15.5 | Consideration of Ecological – legal issues – badgers sets etc. not covered through planning process | E | Could delay implementation of this section if unexpected ecological issues arise | T C | 2 | 2 | 4 | Avoid Review conditions on planning permission relating to ecology. | TMH CE | Regular design team meetings held to review issues including ecology |
| 15.6 | Site very wet – drainage needs careful consideration – could be impacted upon by ecological issues | E | Could increase costs of delivering this section and overall impact upon the programme. | C T | 2 | 2 | 4 | Reduce Early investigation of drainage issues required to determine impact upon design and ecology. | TMH | Design options currently being progressed. |
| 16. Section 16 – Lumb Viaduct | | | | | | | | | | |
| 16.1 | Insufficient funding to complete preferred option. | A | Section cannot be delivered within budget, poor quality alternative route through Lumb and Irwell Vale. | C | 3 | 2 | 5 | Reduce Prepare robust cost estimate, identify additional funding resources. | TMH | Significant resources already secured by Sustrans and surfacing of viaduct provided (although not final surfacing) |
| 16.2 | Need agreement with Sustrans / Railwaypaths including future liability for structure | E | Cycleway cannot be built along this section, alternative route along Irongate lane, through Irwell Vale and Lumb on highway route instead | P | 3 | 2 | 5 | Avoid Start liaison with Railway Paths at earliest opportunity, could use examples of similar agreements in Lancashire as a starting point | PSM | Informal discussions have already taken place, maintenance model to be agreed. |
| 16.3 | Need to agree access for construction | E | Difficult to complete construction on this section and S15 unless agreement for access from the south is secured | C P | 3 | 2 | 5 | Avoid Identify landowners and agreements required at an early stage. Consult with Sustrans on their agreements for Lumb Viaduct works. | PSM PM | Landowners identified, initial informal discussions have taken place with Sustrans. |
| 16.4 | Risk that viaduct works aren't completed by Sustrans | C | Additional spend incurred on works that aren't currently budgeted for. | C | 2 | 1 | 3 | Reduce Identify extent of proposed works to viaduct with Sustrans and remaining work that needs completing. | PM TMH | Sustrans work to viaduct nearly completed, will be able to check on site in June 15. |
| 17. Section 17 - Lumb Mill | | | | | | | | | | |
| 17.1 | Insufficient funding to complete preferred option. | C | Section cannot be delivered within budget, condition of existing cycleway may deteriorate | C | 1 | 2 | 3 | Reduce Prepare robust cost estimate and identify potential match funding sources. Route already exists if costs are prohibitive. | TMH | Design options for this section currently being progressed. |
| 17.2 | Consideration of power line crossing the track for construction | A | Power line could impact upon the design or works that take place on this section | C P | 1 | 2 | 3 | Reduce Liaise with National Grid at an early stage and assess guidelines and potential impact on working below powerlines | PSM | Design currently being developed to identify issues. |
| 17.3 | Existing path needs sweeping, potential widening | C | Current condition of path deters users especially in autumn / winter. Difficult to assess condition of existing path surface until path is swept | P | 2 | 2 | 4 | Avoid Identify resources for initial sweeping of path in Year 1 programme. | PM | Initial discussions held with Rossendale, need following up to secure resource. |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|--|---|----------------|---|----------------------|--------------------------|--------------------------|-----------------------------------|--|--------------------|---|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |
| 17.2 | Ecology surveys required if widening existing path, some trees may need to be removed? (or this maintenance works?) | C | Could delay implementation of this section if unexpected ecological issues arise | T C | 1 | 1 | 2 | Avoid Current design proposes no widening of existing route so vegetation and habitats unaffected | CE TMH | Reconsider need for surveys is design is amended |
| 17.2 | Agreement needed with Railpaths | E | Cycleway cannot be built along this section, no easily identifiable alternative route at this stage | P | 3 | 2 | 5 | Avoid Start liaison with Railway Paths at earliest opportunity, could use examples of similar agreements in Lancashire as a starting point. | PSM | Informal discussions have already taken place, maintenance model to be agreed. |
| 18. Section 18 – Alderbottom - Strongstry | | | | | | | | | | |
| 18.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget, no easily identifiable alternative route at this stage | C | 1 | 2 | 3 | Reduce Prepare robust cost estimate and identify potential additional sources of funding | TMH | Design currently being developed, work costs on this section likely to be low |
| 18.2 | Need agreement from East Lancs Railway/Bury for access and resurfacing on Alderbottom High bridge | E | Existing section of cycleway cannot be improved | P | 1 | 1 | 2 | Reduce Approach landowners for agreement for access/works when design has been completed. | PSM | Sustrans have previously secured agreement for access for works to viaduct. Design currently being progressed |
| 18.3 | Need agreements with private landowners including Mr Khan and Railpaths | A | Existing section of cycleway cannot be improved | P | 2 | 2 | 4 | Reduce Start liaison with landowners at earliest opportunity | PSM | Initial discussions have already taken place with Sustrans/Railwaypaths, Bury MBC identified as having responsibility for Alderbottom Viaduct |
| 18.4 | Drainage issues need consideration including crossing of culvert towards southern end | A | Failure to address drainage issues could impact upon usability of current and improved cycleway. | E P | 2 | 2 | 4 | Reduce Known problem area for drainage, start to identify solutions asap | PSM | Design process has commenced on this section, potential involvement of LCC drainage engineers to assess further. |
| 18.5 | Ecology surveys required if widening existing path, some trees may need to be removed (or this maintenance works?) | C | Could delay implementation of this section if unexpected ecological issues arise | T C | 1 | 1 | 2 | Avoid Current design proposes no widening of existing route so vegetation and habitats unaffected | CE TMH | Reconsider need for surveys is design is amended |
| 19. Section 19 – Strongstry – Stubbins | | | | | | | | | | |
| 19.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget, may need to consider alternative route using existing highways | C | 2 | 2 | 4 | Reduce Prepare robust cost estimate and identify potential alternative route | TMH | Detailed design and cost estimate prepared as part of previous scheme, design team to check. Assessment of |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|------------------------------------|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|---------------------------------|--------------------|---------------------|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |

| | | | | | | | | | | |
|------|--|---|--|-------------|---|---|---|---|-----|---|
| | | | | | | | | | | alternative on highway route ongoing. |
| 19.2 | Ecology surveys required | C | Failure to undertake surveys could lead to delay in implementing programme and additional costs associated with potential mitigation | E C T | 2 | 1 | 3 | Accept Commission surveys asap to allow for assessment and reporting in summer 2015 | CE | Tender assessments for Ecology consultants completed, consultants about to be appointed |
| 19.3 | Close to existing line of East Lancs Railway – would need to notify them of works. | E | Could potentially delay works if issue arises but unlikely | T | 1 | 1 | 2 | Accept Liaise with East Lancs Railway when progressing this section. | PSM | Detailed design completed as part of previous scheme, LCC designers to check. Section currently in Year 4 of the Programme. |
| 19.4 | Landowner agreements required with Voith | E | Failure to agree route with Voith could lead to cycleway using existing highways (as currently) | P | 2 | 2 | 4 | Reduce Open discussions with Voith at earliest opportunity, move delivery of this section back in the Programme. | PSM | Contacts have been identified at Voith, requests made for access for walkover & ecology surveys |

HUNCOAT GREENWAY

1. Section 1 - Cemetery Section

| | | | | | | | | | | |
|-----|--|---|---|---|---|---|---|---|-----------|--|
| 1.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget or to sufficient standard | C | 2 | 2 | 4 | Reduce Monitor progress on delivery of S2. Secure additional funding sources | PM TMH | Design already prepared for this section. Stage 1 bid to Lancashire Environmental Fund successful. |
| 1.2 | Concerns regarding the principle of establishing a cycleway route through a cemetery | C | Potential issues with users of the cemetery, deters cycleway use of the route | P | 2 | 2 | 4 | Reduce Monitor progress on delivery of S2. Undertake extensive consultation if this section is likely to go ahead | PM | Some initial consultation has taken place – largely positive feedback so far. |
| 1.3 | Potential issues with connecting routes at either end of the cemetery (see sections 3 & 4 below) | E | Route could be compromised as a stand-alone section and be less useful without delivery of S3 & S4. | P | 3 | 2 | 5 | Reduce Monitor progress on delivery of S2 (preferred option). If difficulties with this then S1 needs to be developed at the same time as S3 & S4. | TMH | Design options for all 4 sections currently being progressed |

2. Section 2 – Huncoat Industrial Estate

| | | | | | | | | | | |
|-----|--|---|---|---|---|---|---|--|------------|---|
| 2.1 | Land and Legal issues to negotiate with leaseholders | C | If agreements not reached then this could impact upon programme delivery. | T | 3 | 2 | 5 | Reduce Open discussions with landowner at earliest opportunity, consider use of compulsory powers if agreement can't be reached quickly | PSM LSM | Land Registry plans completed, owners identified. Detailed design already completed, requires |
|-----|--|---|---|---|---|---|---|--|------------|---|

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|--------------------------------------|--|----------------|--|----------------------|--------------------------|--------------------------|-----------------------------------|--|--------------------|---|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |
| | | | | | | | | | | review by LCC designers. |
| 2.2 | Ecology surveys required | C | Failure to undertake surveys could lead to delay in implementing programme and additional costs associated with potential mitigation | E T C | 2 | 1 | 3 | Reduce Commission Ecology surveys as soon as possible | CE | Tender process for ecology consultants completed, to be appointed by end of May 15. |
| 2.3 | Additional design work required on link through to Newhouse Road | E | This section could be built with sub-standard links into Huncoat Industrial Estate | P | 2 | 1 | 3 | Reduce Commence with design work at earliest opportunity to identify the feasibility of this link | TMH | Design team currently preparing options for this link |
| 2.4 | Condition of pylons needs to be confirmed | C | Could impact upon delivery of this section if pylons are in poor condition or need to be replaced | T | 2 | 2 | 4 | Transfer Need to consult with National Grid to see if they are aware of the issue & identify their course of action | PM TMH | Approach being made to National Grid |
| 2.5 | Proximity of working in proximity to power lines | C | Could impact upon delivery of this section, a length of it may have to be hand dug depending on restrictions and make it more expensive to deliver | C | 2 | 2 | 4 | Reduce Power line issue was highlighted as part of previous detailed design – needs to be checked again by LCC design team | TMH | Investigation of guidelines taking place, possible approach to National Grid |
| 3. Section 3 – Bolton Avenue | | | | | | | | | | |
| 3.1 | Insufficient funding to complete preferred option. | E | Section cannot be delivered within budget or to sufficient standard | C | 2 | 2 | 4 | Reduce Consider lower cost option of treatment of Bolton Avenue, identify additional sources of funding. Consider need to go ahead with this section if S2 is delivered | PM TMH | Design options for all 4 sections currently being progressed |
| 3.2 | Workable design option to be identified – Bolton Avenue busy with use by HGV's and limited scope to widen footways | C | Cycleway users cannot move safely between sections 1, 3 & 4. | P | 3 | 2 | 5 | Reduce Consider safety audit of route. Consider need to go with this section if S2 is delivered | PM TMH | Design options for all 4 sections currently being progressed |
| 4. Section 4 – Whitewell Road | | | | | | | | | | |
| 4.1 | Land ownership and status of Whitewell Road needs to be clarified | C | Section may not be built if land ownership issues are not defined | C T | 3 | 1 | 4 | Accept Further investigation of Hyndburn BC deeds of purchase of 'Narrow Meadow' from William peel | PSM PM | Previous research on land ownership undertaken as part of work on previous link created from Whitewell Rd. Western half of Rd believed to be in Hyndburn BC ownership |

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|---------------|--|----------------|---|----------------------|--------------------------|--------------------------|-----------------------------------|--|--------------------------|--|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmental Performance | =C =T =E =P | | | | | | |
| | | | | | High=3 Med=2 Low=1 | High=3 Med=2 Low=1 | Red=5-6 Amber=3-4 Green=1-2 | Accept/ Avoid/ Reduce/ Transfer | | |
| 4.2 | Design, surfacing & drainage issues to resolve if only part of the road is to be surfaced for cycleway | A | Current surfacing of Whitewell Rd not suitable for cycling, would be left with section not fit for purpose | P | 2 | 2 | 4 | Accept Further investigation of these issues if it looks like section is to be progressed. Section delayed in programme to Year 3/4 | TMH | Design options currently being developed |
| 4.3 | Likely objections to cycleway from residential property owners | A | Objections could make securing planning permission more difficult, section may not be as popular with users | P | 2 | 3 | 5 | Accept If this section goes ahead early consultation with residents at draft design may be helpful to potentially alleviate some concerns | PM | Design options currently being developed |
| 4.4 | Construction of the route dependent on route through cemetery being established | A | Section would probably not work/be built as a stand alone section without S1 being implemented | P | 2 | 3 | 5 | Reduce Early discussions with landowners on S2 which will determine overall strategy for Huncoat Greenway | PSM | Leaseholders on Huncoat Ind Estate informed of project, detailed design already completed. |

Blackburn with Darwen Borough Council
Weavers Wheel Cycle Network
Risk Register & Management Plan

Abbreviations for Risk Owners

Cabinet Members = CM

Project Board = PB

Project Manager = PM

Technical Manager Highways = TMH

Technical Manager Traffic = TMT

Technical Manager Ecology = TME

Financial Manager = FM

Legal Services Manager = LSM

Property Services Manager = PSM

Development Control = DC

Contractor = C

Chief Ecologist = CE

Technical Manager Structures = TMS

DRAFT

Blackburn with Darwen Borough Council - Weavers Wheel Cycleway Network

Risk Register and Management Plan

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|-------------|----|------------------------|----|--------|-------------|-----------|---------------------------------|--------------------|---------------------|
| | Emerging | =E | Cost | =C | | | | | | |
| | Current | =C | Time | =T | High=3 | High=3 | Red=5-6 | Accept/ Avoid/ Reduce/ Transfer | | |
| | Anticipated | =A | Environmenta | =E | Med=2 | Med=2 | Amber=3-4 | | | |
| | | | Performance | =P | Low=1 | Low=1 | Green=1-2 | | | |

| WEAVERS WHEEL – BLACKBURN WITH DARWEN BOROUGH COUNCIL | | | | | | | | | | |
|---|--|---|--|--------|---|---|---|--|------------------|--|
| 1. Section 1 – Witton Park to Lower Stopes Brow | | | | | | | | | | |
| 1.1 | Protection of the start of the off road section at Cherry Tree Lane | A | Parked vehicles across the start of this section | P | 1 | 1 | 5 | Accept TRO to be implemented and / or protection provided using build out, signs, bollards, H bar | TMH TMT | TRO to be sought |
| 1.2 | Canal embankment wash wall and tow path in poor condition in places | A | Reduced tow path width resulting in pedestrian / cyclist conflict | E | 2 | 2 | 3 | Transfer Look to transfer to the Canal and River Trust | TMH TMS | Further meeting to be arranged |
| 1.3 | Invasive species along the route from Ewood Viaduct to Lower Darwen Parkway | A | Reduced shared use path width resulting in pedestrian / cyclist conflict | E T | 2 | 2 | 4 | Accept Inform BBwDW Borough Council maintenance | TME | Meeting to be arranged with BBwDW Borough Council |
| 1.3 | <u>Spoke 2</u> Ownership of off road section from Manxman Road to Park Lee Road | E | Alternative route along the local residential roads | E | 2 | 2 | 3 | Accept Part of the path is adopted and part is BBwDW owned. | PM TMH PSM | Meeting to be arranged to confirm route / status of footpath |
| 2. Section 2 – Stopes Brow to Bank Lane | | | | | | | | | | |
| 2.1 | Off road section (preferred route) at Stopes Brow in poor condition | A | Section cannot be delivered within budget Alternative route along Stopes Brow reduces ride ability of the route | C | 2 | 2 | 3 | Reduce Prepare detailed cost estimate and look for additional funding Avoid Alternative route along Stopes Brow | TMH PM | Detailed estimate to be produced |
| 2.2 | Poor condition of the off road Arran Trail section from Duttons Way to Bank Lane | A | Reduced use of the route and possible loss of route due to deterioration | P C | 3 | 3 | 5 | Accept PM to seek additional funding from local businesses | PM TMH | Meeting to be arranged inviting local businesses |
| 2.3 | Invasive species in 2.1 and 2.2 vicinity of the route | A | Reduced shared use path width resulting in pedestrian / cyclist conflict | E T | 3 | 3 | 4 | Accept Inform BBwDW Borough Council maintenance | TME | Meeting to be arranged with BBwDW Borough Council |
| 3. Section 3 – Bank Lane to Trident Way | | | | | | | | | | |

Blackburn with Darwen Borough Council - Weavers Wheel Cycleway Network

Risk Register and Management Plan

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|--|--|----------------|--|----------------------|--------|-------------|---------|---|--------------------|---|
| | Emerging Current Anticipated | =E =C =A | Cost Time Environmenta Performance | =C =T =E =P | | | | | | |
| 3.1 | Poor condition of the off road section from Bank Lane to Accrington Road | A | Reduced use of the route and possible loss of route due to deterioration and insufficient width | P C | 3 | 2 | 3 | Accept Upgrade the footpath to shared use Possible legal issues Avoid Re route along the local roads | PM LSM | Meeting to be arranged with Legal Services |
| 3.2 | Invasive species in 3.1 vicinity of the route | A | Reduced shared use path width resulting in pedestrian / cyclist conflict | E T | 3 | 3 | 4 | Accept Inform BBwDW Borough Council maintenance | TME | Meeting to be arranged with BBwDW Borough Council |
| 3.3 | Crossing of the busy Accrington Road | A | Difficulty in crossing this road presents a barrier to the route | P | 2 | 2 | 3 | Reduce Through detailed design and traffic section input | PM TMH | |
| 3.4 | Pedestrian and cyclist negotiation of the Red Lion Roundabout (high vehicle speed from the Motorway) | A | Difficulty in negotiating this roundabout presents a barrier to the route | P | 3 | 2 | 5 | Reduce Safe crossings need to be provided | PM TMH | |
| 3.5 | Steep ramp down to the canal section | A | Difficulty for the less confident ie under foot / wheel slippage | P | 2 | 1 | 2 | Reduce Inclusion of anti skid surfacing | TMH | |
| | | | | | | | | | | |
| 4. Section 4 – Trident Way to Whinney Lane | | | | | | | | | | |
| 4.1 | Insufficient funding to complete preferred option | | Section cannot be delivered within budget Insufficient width for shared use resulting in pedestrian / cyclist conflict No facility for blind and partially sighted pedestrians | C | 3 | 2 | 5 | Reduce Prepare detailed design cost estimate and look for additional funding to improve existing crossing facility | PM TMH | Detailed estimate to be produced |
| 4.2 | Insufficient crossing facilities at Philips Road / Whitebirk Junction | C | Ditto | C | 3 | 3 | 5 | Ditto | PM TMH | Ditto |
| 4.3 | Insufficient crossing facilities at Brownhill Drive / Whalley New Road Junction | C | Ditto | C | 3 | 3 | 5 | Ditto | PM TMH | Ditto |
| 4.4 | Insufficient crossing facilities at Ramsgreave Drive / Pleckgate Road Junction | C | Ditto | C | 3 | 3 | 5 | Ditto | PM TMH | Ditto |
| 4.5 | Existing path too narrow at the side of 183 Pleckgate Road | A | Insufficient width for shared use resulting in pedestrian / cyclist conflict | P | 1 | 1 | 1 | Reduce Existing path widened to 3 metre | TMH | |
| 4.6 | Existing path too narrow between 133 and | A | Ditto | P | 1 | 1 | 1 | Reduce | TMH | |

Blackburn with Darwen Borough Council - Weavers Wheel Cycleway Network
Risk Register and Management Plan

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|---|---|----|--|--------|--------|-------------|-----------|---|--------------------|----------------------------------|
| | Emerging | =E | Cost | =C | | | | | | |
| | Current | =C | Time | =T | High=3 | High=3 | Red=5-6 | Accept/ Avoid/ Reduce/ Transfer | | |
| | Anticipated | =A | Environmenta | =E | Med=2 | Med=2 | Amber=3-4 | | | |
| | | | Performance | =P | Low=1 | Low=1 | Green=1-2 | | | |
| | 135 Ramsgreave Drive | | | | | | | Existing path widened to 3 metre | | |
| 4.7 | Insufficient crossing facilities at Ramsgreave Drive / Lammack Road Junction | C | Section cannot be delivered within budget Insufficient width for shared use resulting in pedestrian / cyclist conflict No facility for blind and partially sighted pedestrians | C | 3 | 3 | 5 | <u>Reduce</u> Prepare detailed design cost estimate and look for additional funding to improve uncontrolled crossing facility | PM TMH | Detailed estimate to be produced |
| 4.8 | Insufficient crossing facilities at Yew Tree Drive / Whinney Lane Junction | A | Difficulty in crossing this road presents a barrier to the route | P | 1 | 2 | 3 | <u>Reduce</u> New crossing location to be provided over the central reserve | TMH | |
| 5. Section 5 – Whinney Lane to Witton Park | | | | | | | | | | |
| 5.1 | Numerous potholes on Old Hall Lane from the School House to Tower Road | A | Difficulty in negotiating this section of road presents a danger to less experienced riders | E P | 1 | 1 | 2 | <u>Transfer</u> Contact BBwDW Borough Council for inclusion in the maintenance contract | TMH | Meeting to be arranged |
| | | | | | | | | | | |
| 6. Section 6 – Spur A2 Beardwood / Preston New Road to Salmesbury | | | | | | | | | | |
| 6.1 | Insufficient crossing facilities and narrow paths at Whinney Lane / Preston New Road junction | E | Section cannot be delivered within budget Difficulty in negotiating this junction presents a barrier to the route No facility for blind and partially sighted pedestrians | P | 2 | 2 | 3 | <u>Reduce</u> Prepare detailed design cost estimate and look for additional funding for full scheme Consider reduced scheme | PM TMH | Detailed estimate to be produced |
| | | | | | | | | | | |

Blackburn with Darwen Borough Council - Weavers Wheel Cycleway Network

Risk Register and Management Plan

| Risk ID No | Risk Item | | Potential Consequences | | Impact | Probability | Ranking | Risk Strategy & Management Plan | Primary Risk Owner | Current Risk Status |
|------------|-------------|----|------------------------|----|--------|-------------|-----------|---------------------------------|--------------------|---------------------|
| | Emerging | =E | Cost | =C | | | | | | |
| | Current | =C | Time | =T | High=3 | High=3 | Red=5-6 | Accept/ Avoid/ Reduce/ Transfer | | |
| | Anticipated | =A | Environmenta | =E | Med=2 | Med=2 | Amber=3-4 | | | |
| | | | Performance | =P | Low=1 | Low=1 | Green=1-2 | | | |

Appendix H – Detailed Programme

East Lancs Cycleway Network - Programme Summary (April 2015)

| Expenditure Table | 2014/15 £ | 2015/16 £ | 2016/17 £ | 2017/18 £ | 2018/19 £ | Totals |
|---------------------------------|--------------|--------------|--------------|--------------|--------------|-------------|
| Valley of Stone, Rossendale | £ - | £ 915,000 | £ 370,000 | £ 256,250 | £ 305,150 | £ 1,846,400 |
| NCN 6 - Accrington - Ramsbottom | £ - | £ 484,000 | £ 596,000 | £ 277,750 | £ 731,454 | £ 2,089,204 |
| Huncoat Greenway, Hyndburn | £ - | £ 3,500 | £ 146,683 | £ 58,980 | £ 61,000 | £ 270,163 |
| Weavers Wheel, Blackburn | £ 56,000 | £ 304,348 | £ 296,925 | £ 41,383 | £ 40,374 | £ 739,030 |
| Sub total | £ 56,000 | £ 1,706,848 | £ 1,409,608 | £ 634,363 | £ 1,137,978 | £ 4,944,797 |
| Contingency @ 15% | | £ 256,027 | £ 211,441 | £ 95,155 | £ 170,697 | £ 741,720 |
| Sub Total | £ 56,000 | £ 1,962,875 | £ 1,621,049 | £ 729,518 | £ 1,308,675 | £ 5,686,517 |
| Inflation @ 2.5% | £ - | £ - | £ 40,526 | £ 36,932 | £ 100,625 | £ 178,083 |
| TOTAL | £ 56,000 | £ 1,962,875 | £ 1,661,575 | £ 766,450 | £ 1,409,299 | £ 5,856,200 |

SUMMARY SHEET
Route 1 - Valley of Stone,
Rossendale

| No. | Section Name | Section Length (m) | Estimated Cost (Oct 14) | Programme (Oct 14) | Estimated Cost (Apr 15) | Mitigation Measures & revised Risk Rating (Oct14) | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | Section pdf |
|-----|---|--------------------|-------------------------|--------------------|-------------------------|---|---------|-----------|-----------|----------|----------|--|
| 1 | Rawtenstall Station to Hill End Lane | 1,670 | £ 10,000 | 2015/16 | £ 120,000 | Road Saftey Audit | | | £ 60,000 | £ 60,000 | | Valley of Stone Revised Risk Section 1 October14.pdf |
| 2 | Hill End Lane to Visitor Centre | 930 | £ 10,000 | 2015/16 | £ 80,000 | Agreement in place with RBC | | £ 40,000 | £ 40,000 | | | Valley of Stone Revised Risk Section 2 October14.pdf |
| 3 | Buckhurst Plant Gap | 650 | £ 136,000 | 2017 - 2019 | £ 119,000 | Acceptible route negotiated with Buckhurst Plant Hire and Gemini. Fall back position would be to use road. | | | | £ 84,000 | £ 35,000 | Valley of Stone Revised Risk Section 3 October14.pdf |
| 4 | Buckhurst to Tunnels | 575 | £ 20,000 | 2016/17 | £ 20,000 | Status of private road established and access agreement put in place. | | | £ 20,000 | | | Valley of Stone Revised Risk Section 4 October14.pdf |
| 5 | Tunnels and Bridge | 560 | £ 300,000 | 2015/16 | £ 290,000 | Rossendale Borough Council agree to maintain their tunnels. Possible future use of tunnels by bats taken in to account in design and construction. Permissions in place for construction of new bridge. | | £ 150,000 | £ 140,000 | | | Valley of Stone Revised Risk Section 5 October14.pdf |
| 6 | Thrutch Tunnel to Blackwood Road. Install final surface | 900 | £ 120,000 | 2015/16 | £ 115,000 | Agreement in place with Rossendale Borough Council | | £ 80,000 | | | £ 35,000 | Valley of Stone Revised Risk Section 6 October14.pdf |
| 7 | Blackwood Road to Holme Street | 870 | £ 50,000 | 2017/18 | £ 65,000 | Different route options considered and most appropriate selected. | | | £ 30,000 | £ 35,000 | | Valley of Stone Revised Risk Section 7 October14.pdf |
| 8 | Ormerods Gap | 450 | £ 47,500 | 2017/18 | £ 47,250 | Route agreed with landowners | | | | £ 47,250 | | Valley of Stone Revised Risk Section 8 October14.pdf |
| 9 | Futures Park to Stubblelee Park | 870 | £ 150,000 | 2015/16 | £ 150,000 | Agreement in place with Rossendale Borough Council | | £ 150,000 | | | | Valley of Stone Revised Risk Section 9 October14.pdf |

| No. | Section Name | Section Length (m) | Estimated Cost (Oct 14) | Programme (Oct 14) | Estimated Cost (Apr 15) | Mitigation Measures & revised Risk Rating (Oct14) | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | Section pdf |
|--------------|--|--------------------|-------------------------|--------------------|-------------------------|---|---------|-----------|-----------|-----------|-----------|---|
| 10 | Stubby Lee to New Line Car Park | 600 | £ 250,000 | 2018/19 | £ 220,000 | Agree an alternative route with landdowner or use path creation powers. | | | | | £ 220,000 | Valley of Stone Revised Risk Section 10 October14.pdf |
| 11 | Britannia Greenway | 1,200 | £ 200,000 | 2015/16 | £ 215,150 | Agreement in place with Rossendale Borough Council | | £ 150,000 | £ 50,000 | | £ 15,150 | Valley of Stone Revised Risk Section 11 October14.pdf |
| 12 | Old Lane to Oak Street | 1,890 | £ 45,000 | 2015/16 | £ 45,000 | Agreement in place with Rossendale Borough Council | | £ 45,000 | | | | Valley of Stone Revised Risk Section 12 October14.pdf |
| 13 | Oak Street to Station Road (Slingco gap) | 1,100 | £ 55,000 | 2015/16 | £ 65,000 | Agreements in place. | | £ 65,000 | | | | Valley of Stone Revised Risk Section 13 October14.pdf |
| 14 | Station Road to Massey Croft | 1,800 | £ 32,500 | 2015/16 | £ 60,000 | Saftey audit carried out and work agreed. | | £ 60,000 | | | | Valley of Stone Revised Risk Section 14 October14.pdf |
| 15 | Massey Croft to Lancashire Border | 2,400 | £ 53,000 | 2015/16 | £ 53,000 | Agreement in place with RBC and some community consultation with current users. | | £ 53,000 | | | | Valley of Stone Revised Risk Section 15 October14.pdf |
| | Community consultation & associated environmental improvements (mitigation/habitat improvements) | | £ 50,000 | 2014-2018 | £ 50,000 | | | £ 20,000 | £ 15,000 | £ 15,000 | | |
| | Signage/way marking (including asphalt imprinting) | | £ 60,000 | 2014-2018 | £ 60,000 | | | £ 30,000 | £ 15,000 | £ 15,000 | | |
| | Detailed design, legal fees and planning applications | | £ 60,000 | 2014-2016 | £ 70,000 | | | £ 72,000 | | | | |
| Total Length | | | | | | | £ - | £ 915,000 | £ 370,000 | £ 256,250 | £ 305,150 | |

SUMMARY SHEET

Route 2 - Accrington - Ramsbottom (Hyndburn & Rossendale)

| No. | Section Name | Section Length (m) | Estimated Cost (Oct 14) | Programme (Oct 14) | Estimated Cost (April 15) | Revised Risk Rating | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | Section pdf. |
|-----|--------------------------|--------------------|-------------------------|--------------------|---------------------------|---|---------|----------|----------|----------|-----------|--|
| 1 | Woodnook Greenway | 2,641 | £ 22,000 | 2015/16 | £ 22,000 | GREEN | | £ 7,000 | | | £ 15,000 | NCN6 Revised Risk Section 1 October14.pdf |
| 2 | Baxenden - Rising Bridge | 1,090 | £ 230,000 | 2018/19 | £ 220,000 | AMBER - Response of landowner to proposals unknown. Consider CPO if not positive | | | | | £ 220,000 | NCN6 Revised Risk Section 2 October14.pdf |
| 3 | Rising Bridge Road | 800 | £ 40,000 | 2015/16 | £ 40,000 | GREEN | | £ 40,000 | | | | NCN6 Revised Risk Section 3 October14.pdf |
| 4 | Hud Hey Road | 161 | £ 60,000 | 2016/17 | £ 60,000 | GREEN | | | £ 60,000 | | | NCN6 Revised Risk Section 4 October14.pdf |
| 5 | Hud Hey - Booth St | 568 | £ 125,000 | 2018/19 | £ 93,000 | AMBER - Response of landowner to proposals unknown. Could be an alternative; consider a CPO if not positive response. | | | | £ 93,000 | | NCN6 Revised Risk Section 5 October14.pdf |
| 6 | Booth St - Commerce St | 348 | £ 42,000 | 2018/19 | £ 41,750 | AMBER | | | | £ 41,750 | | NCN6 Revised Risk Section 6 October14.pdf |
| 7 | Well Bank | 731 | £ 212,000 | 2018/19 | £ 206,454 | AMBER - Two owners are Highways Agency and Rossendale BC | | | | £ - | £ 206,454 | NCN6 Revised Risk Section 7 October14.pdf |
| 8 | Flip Rd - Grane Rd | 509 | £ 35,000 | 2016/17 | £ 90,000 | AMBER - Parking for existing businesses a current issue; may require investigation of alternative route | | | £ 90,000 | | | NCN6 Revised Risk Section 8 October14.pdf |
| 9 | Swinnel & Ogden Brook | 894 | £ 135,000 | 2015/16 | £ 70,000 | GREEN - LCC land - need to explore options at Grane Rd/Holden Place | | £ 30,000 | | | £ 40,000 | NCN6 Revised Risk Section 9 October14.pdf |
| 10 | Helmshore Viaduct | 366 | £ 75,000 | 2016/17 | £ 50,000 | AMBER - S106 Funding of £75K already secured towards scheme, proposed match | | | £ 50,000 | | | NCN6 Revised Risk Section 10 October14.pdf |
| 11 | Bridge End Close | 464 | £ 15,000 | 2015/16 | £ 15,000 | GREEN | | £ 15,000 | | | | NCN6 Revised Risk Section 11 October14.pdf |
| 12 | Station Road | 206 | £ 95,000 | 2015/16 | £ 95,000 | GREEN | | £ 95,000 | | | | NCN6 Revised Risk Section 12 October14.pdf |

| No. | Section Name | Section Length (m) | Estimated Cost (Oct 14) | Programme (Oct 14) | Estimated Cost (April 15) | Revised Risk Rating | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | Section pdf. |
|------------------|--|--------------------|-------------------------|--------------------|---------------------------|--|---------|-----------|-----------|-----------|-----------|--|
| 13 | Snigg Hole | 274 | £ 95,000 | 2016/17 | £ 60,000 | AMBER | | | £ 60,000 | | | NCN6 Revised Risk Section 13 October14.pdf |
| 14 | Irongate Lane | 633 | £ 338,000 | 2015 - 2017 | £ 329,000 | AMBER - Response of landowner to proposals unknown. Consider CPO if not positive | | £ 209,000 | £ 120,000 | | | NCN6 Revised Risk Section 14 October14.pdf |
| 15 | Irwell Vale | 546 | £ 240,000 | 2016 - 2018 | £ 233,000 | GREEN | | | £ 90,000 | £ 143,000 | | NCN6 Revised Risk Section 15 October14.pdf |
| 16 | Lumb Viaduct | 145 | £ 125,000 | 2016 - 2018 | £ 50,000 | AMBER | | | £ 50,000 | | | NCN6 Revised Risk Section 16 October14.pdf |
| 17 | Lumb Mill | 443 | £ 35,000 | 2015/16 | £ 30,000 | GREEN | | £ 10,000 | | | £ 20,000 | NCN6 Revised Risk Section 17 October14.pdf |
| 18 | Alderbottom - Strongstry | 536 | £ 66,000 | 2017 - 2019 | £ 60,000 | AMBER - Most of route already in place along this section | | £ 30,000 | | | £ 30,000 | NCN6 Revised Risk Section 18 October14.pdf |
| 19 | Strongstry - Stubbins | 663 | £ 270,000 | 2018/19 | £ 200,000 | AMBER - Response of landowner to proposals unknown. Consider CPO if not positive | | | | | £ 200,000 | NCN6 Revised Risk Section 19 October14.pdf |
| | | | | | £ - | | | | | | | |
| | Community consultation & associated environmental improvements (mitigation/habitat improvements) | | £ 15,000 | 2016/17 | £ 15,000 | | 0 | | 15000 | | | |
| | Signage/way marking (including asphalt imprinting) | | £ 15,000 | 2016/17 | £ 15,000 | | 0 | | 15000 | | | |
| | Detailed design, legal fees and planning applications | | £ 80,000 | 2014 -2017 | £ 94,000 | | | £ 48,000 | £ 46,000 | | | |
| | | | | | | | | | | | | |
| Total Length (m) | | 12,018 | £ 2,365,000 | | £ 2,089,204 | | £ - | £ 484,000 | £596,000 | £ 277,750 | £ 731,454 | |

SUMMARY SHEET

Route 3 - Huncoat Greenway

| No. | Section Name | Length (m) | Estimated Cost (Oct 14) | Programme (Oct 14) | Estimated Cost (April 15) | Revised Risk Rating | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 | Section pdf. |
|----------------------------------|--|------------|-------------------------|--------------------|---------------------------|--|---------|---------|-----------|-------------|----------|---|
| 1 | Cemetery Section | 580 | £ 45,000 | 2015/16 | £ 16,535 | GREEN | | | | £ 16,535 | | Huncoat Greenway Revised Risk Section 1 October14.pdf |
| 2 | Huncoat Ind Estate | 442 | £ 105,000 | 2018/19 | £ 188,628 | AMBER - One or more of the leaseholders may object to the proposal | | | £ 146,183 | £ 42,445 | | Huncoat Greenway Revised Risk Section 2 October14.pdf |
| 3 | Bolton Avenue | 260 | £ 65,000 | 2016/17 | £ 36,000 | AMBER - design will inform need for additional land | | | | | £ 36,000 | Huncoat Greenway Revised Risk Section 3 October14.pdf |
| 4 | Whitwell Road | 150 | £ 67,500 | 2018/19 | £ 25,000 | AMBER - Remains an Amber risk until scope of the project is defined. | | | | | £ 25,000 | Huncoat Greenway Revised Risk Section 4 October14.pdf |
| | | | | | £ - | | | | | | | |
| | Community consultation & associated environmental improvements (mitigation/habitat improvements) | | | | £ - | | | | | | | |
| | Signage/way marking (including asphalt imprinting) | | | | £ - | | | | | | | |
| | Detailed design, legal fees and planning applications | | £ 4,000 | 2015 - 2017 | £ 4,000 | | | £ 3,500 | £ 500 | | | |
| | | | | | | | | | | | | |
| Total Length (m) 1,432 £ 270,163 | | | | | | | £ - | £ 3,500 | £ 146,683 | £ 58,980.00 | £ 61,000 | |

Construction Programme 2015/16

| Month | Jun-15 | | | | Jul-15 | | | | Aug-15 | | | | Sep-15 | | | | Oct-15 | | | | Nov-15 | | | | Dec-15 | | | | Jan-16 | | | | Feb-16 | | | | Mar-16 | | | |
|----------------------|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Construction Element | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pricing Period | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WP 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WP1 (Highway) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Construction Programme 2016/17

| Month | | Apr-16 | | | | May-16 | | | | Jun-16 | | | | Jul-16 | | | | Aug-16 | | | | Sep-16 | | | | Oct-16 | | | | Nov-16 | | | | Dec-16 | | | | Jan-17 | | | | Feb-17 | | | | Mar-17 | | | | | | | | | | | | | | | | | |
|--|--|---------|---|---|---|----------|---|---|---|----------|---|---|---|---------|---|---|---|------------------|---|---|---|---------------|---|---|---|---------|---|---|---|--------|---|---|---|--------|---|---|---|--------|---|---|---|--------|--|--|--|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| | | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | | | | | | | | | | | | | | | | | | | | | |
| Construction Element | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WP 1 (Canal Section) WP 2 WP 3 WP 5 WP 6 WP 7 | | £17,510 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | £131,200 | | | | | | | | | | | | Footpath section | | | | Canal Section | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | £104,545 | | | | | | | | £10,300 | | | | £4,740 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | £14,080 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | £61,420 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | £6,205 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Costs inclusive of design and supervision fees