# Full Business Case

## Lydney Cycling Improvements

COGL43055613

26/10/2018

amey consulting

Gloucestershire COUNTY COUNCIL

# Executive Summary

This report represents the Final Full Business Case for the Lydney Cycling Improvements Scheme. The scheme proposed is a series of interlinking cycling and pedestrian routes, and the package is considered to be appropriate to achieve the agreed aims and objectives of the project as defined by GFirst LEP.

The scheme has been developed with the aim of promoting cycle usage and reducing car journeys within Lydney. The scheme will create a pleasant, safe and accessible network of pathways around Lydney linking together Aylburton, Lydney Town Centre, Railway Station, Dean Academy, and residential developments.

It is recognised that the proposal does not address traffic issues in Lydney, as had been previously identified in earlier studies, due to the level of funding now available. However, the scheme does represent a significant investment in the town. By focusing on cycling routes to key destinations, the improvements will provide alternative routes that can be taken by bike, rather than by a motorised vehicle. Lydney and the wider Forest of Dean area can benefit by an overall increase in cycling, both for the local residents and by enhancing the offer for cycling tourism in the area and for longer-distance leisure routes.

The Business Case explains the process of identifying the final scheme and through the defined processes demonstrates that the proposal represents high value for money according to the Department for Transport criteria, and therefore a sound and justified spend of public monies.

The most significant benefit from the scheme is derived from the increase in predicted cycling trips, and the associated health benefits for the users, with the level of benefits far exceeding the cost of the scheme. The scheme generates a Scheme Net Present Value (NPV) of £970,260. It is also important to note that the Economic Case produces a Benefit Cost Ratio (BCR) value of 2.28. The overall budget for the scheme is £1m.

It is concluded that there is a sound justification for the scheme, based on the Economic benefit that can be provided, and that there is a high level of public support for the proposals.

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# 1. Introduction

This document provides information to support the implementation of cycle and pedestrian improvements in Lydney. The scheme is consistent with the core aims of Forest of Dean District Council by supporting a greener, more healthy Forest of Dean that promotes sustainable economic growth, a safer and more secure transport system and providing good access to services. This report is based on the preferred design options and aims to provide the required detail as scoped for the Appraisal Summary Report (ASR).

The evidence gathered as part of the business case preparation process has been prepared using the tools and guidance provided by the Department for Transport (DfT) and set out in the transport appraisal guidance (WebTAG). This approach ensures that the evidence produced is robust and consistent.

## 1.1. Need for Proposed changes

The primary rationale for the scheme is to improve connectivity by the delivery of enhanced walking and cycling links. This is within the context of the Lydney Transport Strategy (LTS).

The most applicable objectives for this revised study are:

- Maximise economic productivity and efficiency;
- Improve access to skills, jobs, goods and services.

In order to satisfy the objectives this scheme will:

- Increase connectivity and reduce congestion within the town;
- Increase connectivity between Lydney town centre and the railway station;
- Improve off-road cycling/walking routes between the town and rail station;
- Improve safety for users of active transportation modes.

## 1.2. Agreed Objectives of the Scheme

The key objectives which have been identified by the Local Enterprise Partnership (LEP) and which also led to the provisional allocations of the funds are listed below:

- Support the regeneration of Lydney an area of suppressed economic potential;
- Maximise economic productivity and efficiency;
- Enabling improved connectivity with the rural west of the County and connections through to Herefordshire, Monmouthshire and the Forest of Dean **(in this instance, to the FOD only via the improved links);
- Improve access to skills, jobs, goods and services.

## 1.3. Study Area

Lydney is a small town (population circa 10,000) and civil parish in the District of The Forest of Dean which is in the county of Gloucestershire as shown in Figure 1.

Lydney is located on the west bank of the River Severn, immediately south of the Forest of Dean Area of Outstanding Natural Beauty (AONB). In addition to attracting visitors for the local scenery, the Forest of Dean is also home to a number of visitor attractions allowing people to enjoy adventure sports, places of historical and cultural importance, walking and cycling trails and family friendly activities.

Lydney itself has fewer visitor attractions; however, it does boast the Forest Railway and picturesque Park Gardens amongst other attractions such as the Harbour and Bathurst Outdoor Swimming Pool.

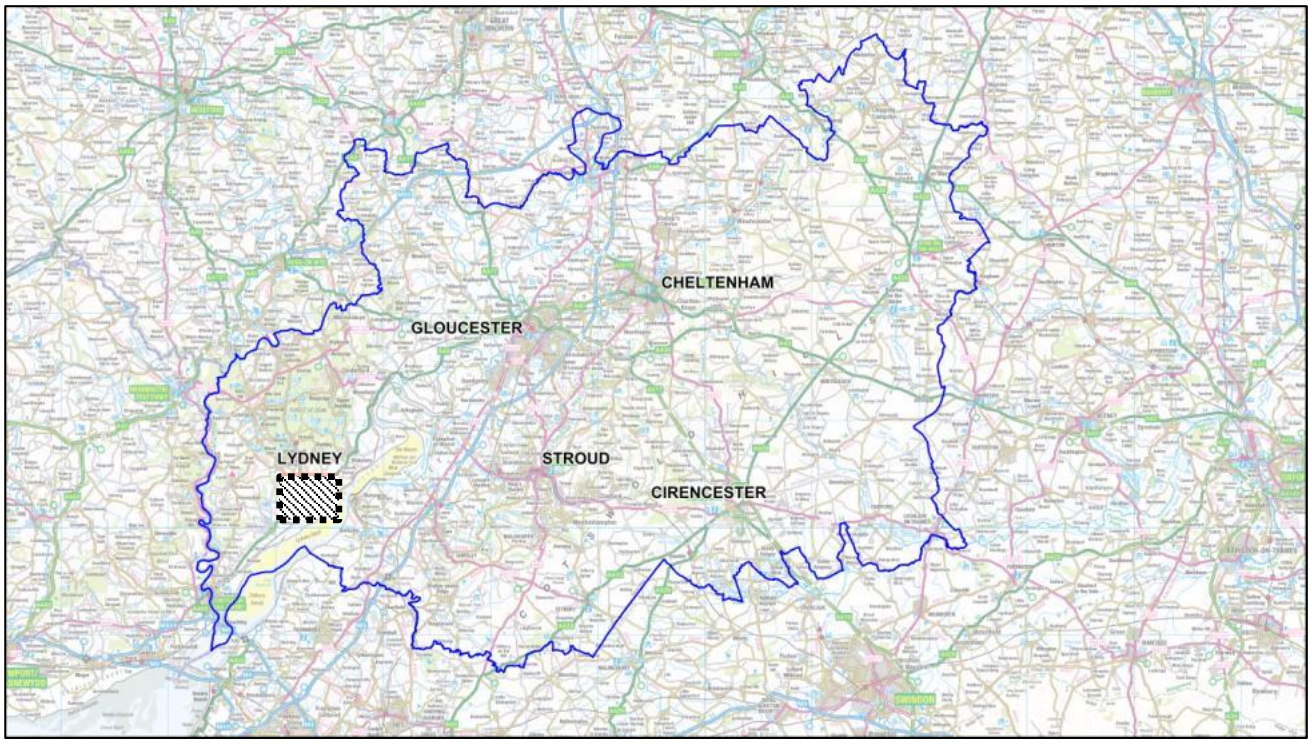


**Figure 1 - Location of Lydney within Gloucestershire**

## 1.4. Transport

Lydney as a destination is reasonably isolated, with its major highway access provided via the A48 between Cardiff and Gloucester. A bypass of the town centre is provided from the Highfield Rd access to the east of the town centre, skirting around the south of the town, ultimately connecting to the east of Taurus Park.

There are two major junctions within the town centre allowing access to villages north of the town. The B4231 Bream Road connects the town centre with Bream village and ultimately the B4228 at Trow Green. The other major junction within the town is located less than 250 metres from the B4231 junction and connects with Whitecroft and Park End via the B4234, snaking through the Forest of Dean until reaching Ross on Wye, 15 miles to the north.

At present, both are priority junctions, experiencing congestion issues. Figure 2 below provides further information on the road network and key stations in the study area.

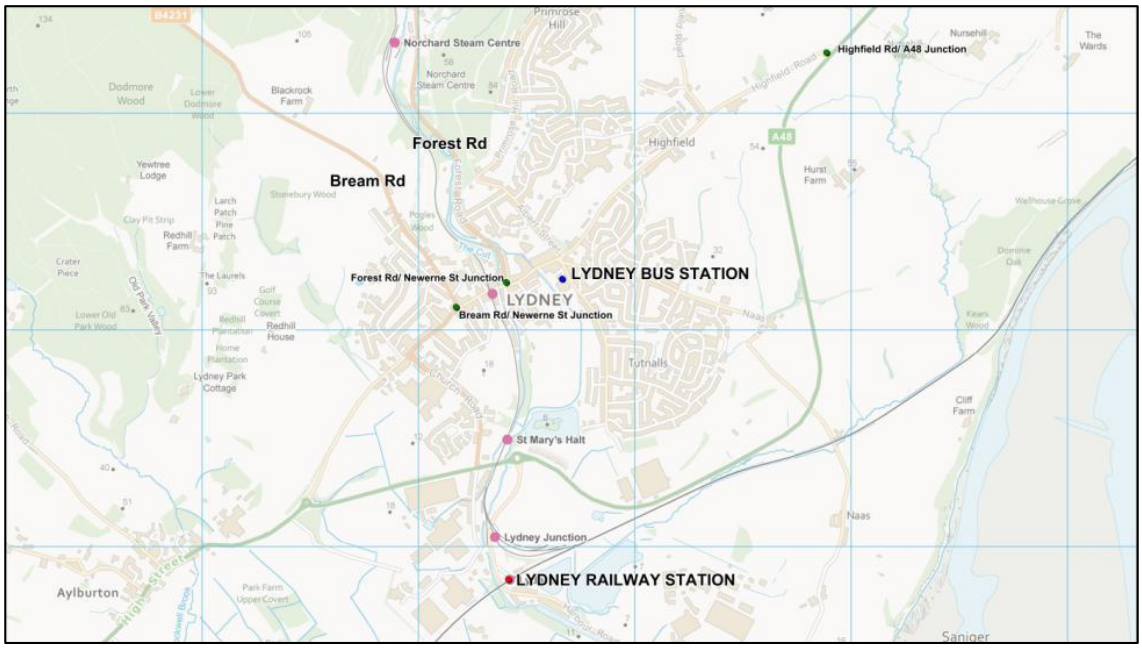


**Figure 2 - Lydney Town Transport Network**

Lydney is the only town within the district of Forest of Dean that is served by rail. The Railway Station is located approximately 1 mile to the south of the town, on the southern side of the A48 bypass along Harbour Road. The station can be accessed easily via the A48 bypass but from the town centre, the most direct route is less clear. Pedestrian and cycling facilities connecting the town centre with the railway station are poor and public transport access is infrequent.

Lydney railway station is operated by Arriva Trains Wales, although the service provider is currently changing. The station is located on the Newport to Gloucester line with the preceding station at Chepstow and following station at Gloucester.

On weekdays, an hourly South Wales-Cheltenham Spa service in each direction is provided. On Sundays, a reduced service provides a two-hourly service each way. Cross Country also serve the station as part of their Cardiff Central to Nottingham route. Monday to Saturday, there are six trains per day in each direction with no Sunday service.

There are 2 platforms at the station with platform 1 serving westbound travel. Facilities at the train station are limited with waiting rooms, toilets, minimal cycle storage but no ticket office. In order to cross from one platform to another, passengers must cross at the level crossing as the existing underpass is not suitable for pedestrians. Parking is available at the station although spaces are limited.

Lydney Bus Station is situated on Hams Rd, just off Highfield Rd near the centre of the town. Bus services connect with local villages along the A48 corridor such as Woolaston, Aylburton, Blakeney and Newnham in addition to larger settlements including Cinderford, Coleford, Gloucester and Chepstow.

**Problems Identified**

In December 2014, consultants AECOM issued an Issues and Options Report for Lydney on behalf of Gloucestershire County Council. The report identified a number of transport problems based on a review of the existing transport infrastructure, policy, technical reports and consultation with key stakeholders. These included:

- Poor connectivity within town – Although much of the town is flat and relatively compact, access from one part of the town to another is constrained and the potential for cycling and walking is not fully realised. This could limit the use of the railway station where parking is a problem, as well as adding to peak time congestion, such as experienced on Bream Road at school travel times;

- Remoteness of railway station from town centre - Lydney train station is located on the periphery of the town, approximately 1 mile from Lydney town centre. Due to a lack of direct and suitable walking links from the town centre and surrounding residential developments, a high proportion of people drive to the station causing it be over-subscribed;

## 1.5. Proposed Cycle Schemes

A summary of the links selected for progression to detail design are illustrated below;

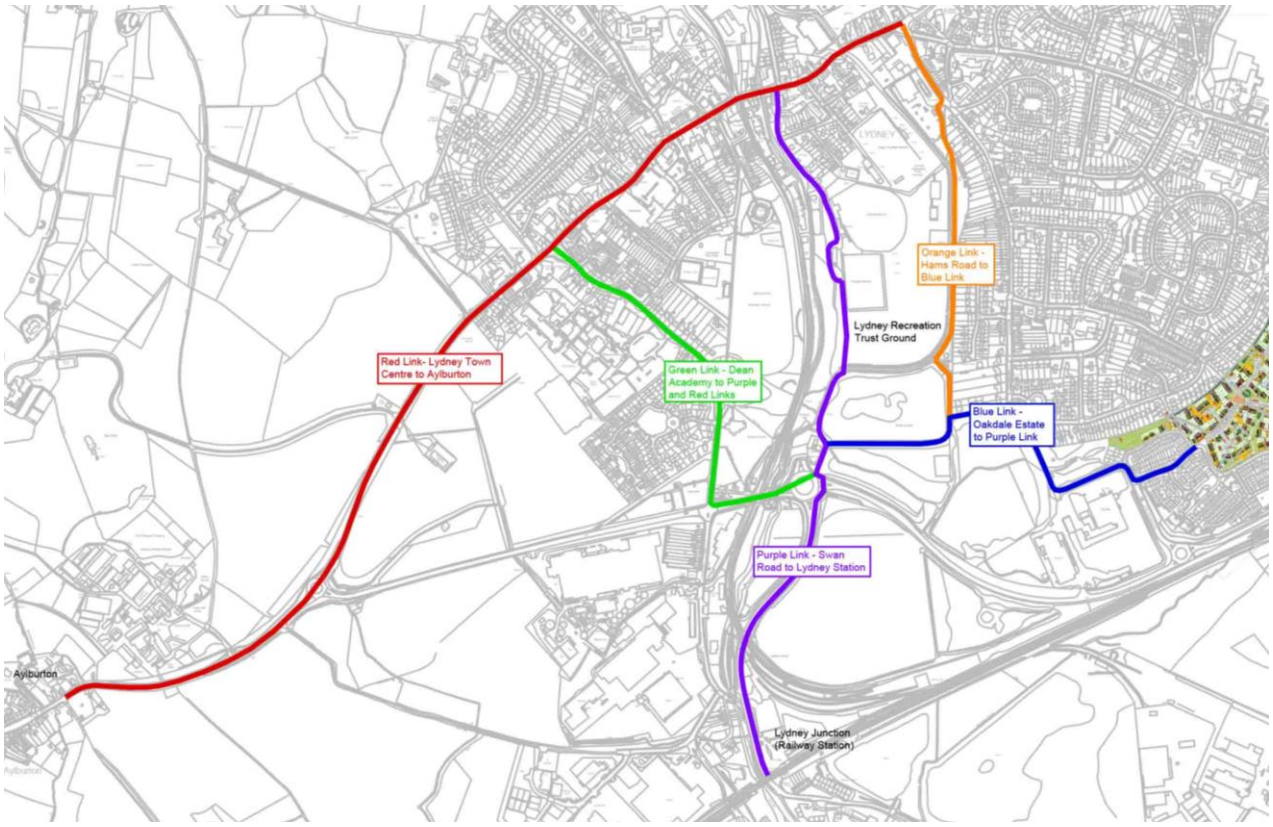


**Figure 3 - Proposed Cycle Links**

| Link Number | Total Length (m) | On Carriageway (m) | Off Carriageway (m) | Recreation Ground (m) |
|---|---|---|---|---|
| **Purple Link** | 1240 | 0 | 640 | 600 |
| **Blue Link** | 930 | 630 | 0 | 300 |
| **Orange Link** | 1675 | 295 | 170 | 250 |
| **Green Link** | 900 | 700 | 600 (Runs Adjacent with on carriageway) | 0 |
| **Red Link - Rural** | 1355 | 0 | 1355 | 0 |
| **Red Link - Urban** | 900 | 900 | 0 | 0 |

**Table 1 - Summary of Links Proposed**

## 1.6. Scope of the Scheme

Full details of the five links being progressed and the route they would take have been detailed in this section (PDF drawings have been provided in the Appendix A). The Appendix also includes consultation material which were used as part of the public consultation which outlines all the changes and improvements being made.

## 1.7. Purple Link: Lydney Railway Station to Swan Road

The proposed cycle way will improve pedestrian and cycle links between the railway station and Lydney Town Centre. The route is approximately 1.5km in length and entirely off carriageway with the exception of a short section on Swan Road that links to the High Street which has low traffic speeds and volumes.

Currently there are limited cycling provisions in place to cycle from the railway station to the high street. Cyclists would either have to use Church Road where the existing cycle lane widths do not meet current standards or cycle through the Recreation Trust Ground to access Cambourne Place and Tutnalls Street. Figure 4 below shows the alternative routes available.

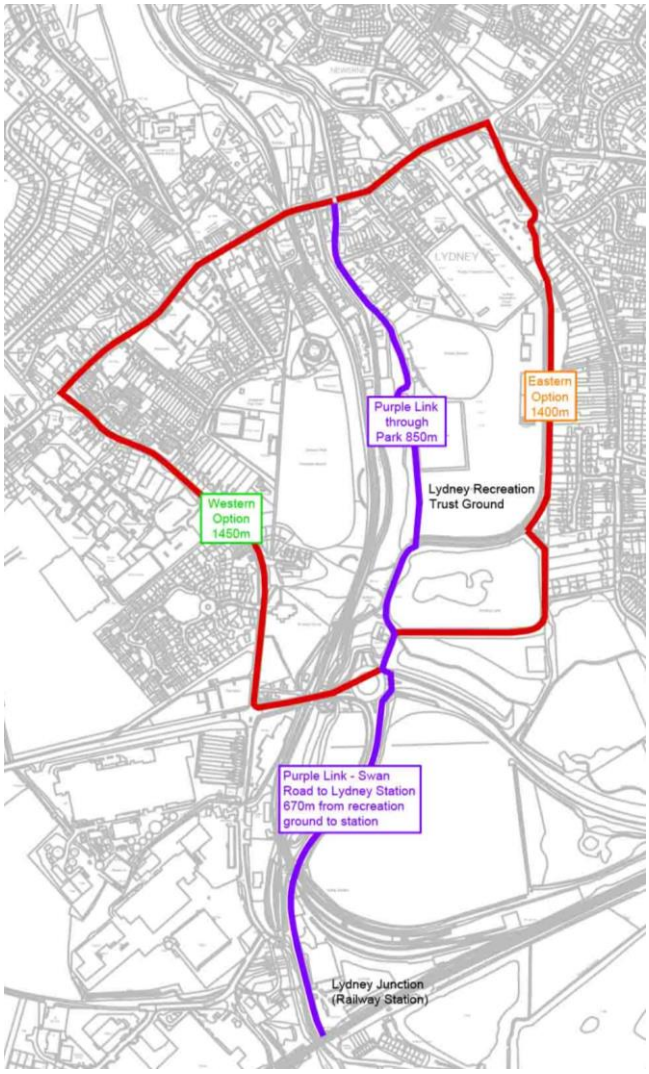


**Figure 4 - Western Alternative Route**

The proposed Purple Link begins at the Railway Station and heads north making improvements to the existing cycle way along Station Road between the railway station and the A48. The existing segregated footway / cycleway along Station road will be converted to shared use as the existing widths do not meet current standards for a segregated facility. The scheme will include improvements to the crossing of the A48 to increase space for cyclist and pedestrians and reduce carriageway crossing widths to maintain safety and journey times. The route then passes around the boating lake and alongside the western perimeter of the Lydney Recreation Trust Ground which will involve the construction of a new footbridge across the River Lyd. The route then passes behind the football ground pavilion and joins Swan Road to the town centre.

The scheme will address the current limitations / problems of the existing cycle infrastructure by improving the condition of the route through re-surfacing and ensuring the width is available for both cyclists and pedestrians to use safely. There is currently no permitted, direct cycle route from the A48 roundabout to the Town Centre so the proposed route is more direct and more desirable for all users concerned.

The development of the route has been designed to link with future proposals for a new cycle route from Lydney to Parkend and it is expected that the link will help raise the profile for Lydney as "The Gateway to the Forest" and increase commuter use.

The drawing of the Purple Link is shown in Figure 5 and also included in Appendix A drawing number LY5.L1.100.001.

**Limitations with Existing Route**

- The existing cycleway markings on Church Road do not meet current standards;
- No direct, off carriageway cycle route from A48 to Town Centre;
- Poor visibility and wide carriageway widths for A48 crossing;
- Existing segregated route from A48 to railway station does not meet current standards for a pedestrian / cycle segregated facility.

**Link Benefits**

- Improve visibility and A48 crossing safety for users;
- Provide an off-carriageway, direct route from Lydney Railway Station to the town centre;
- Existing segregated facility upgraded to shared use to meet current standards.

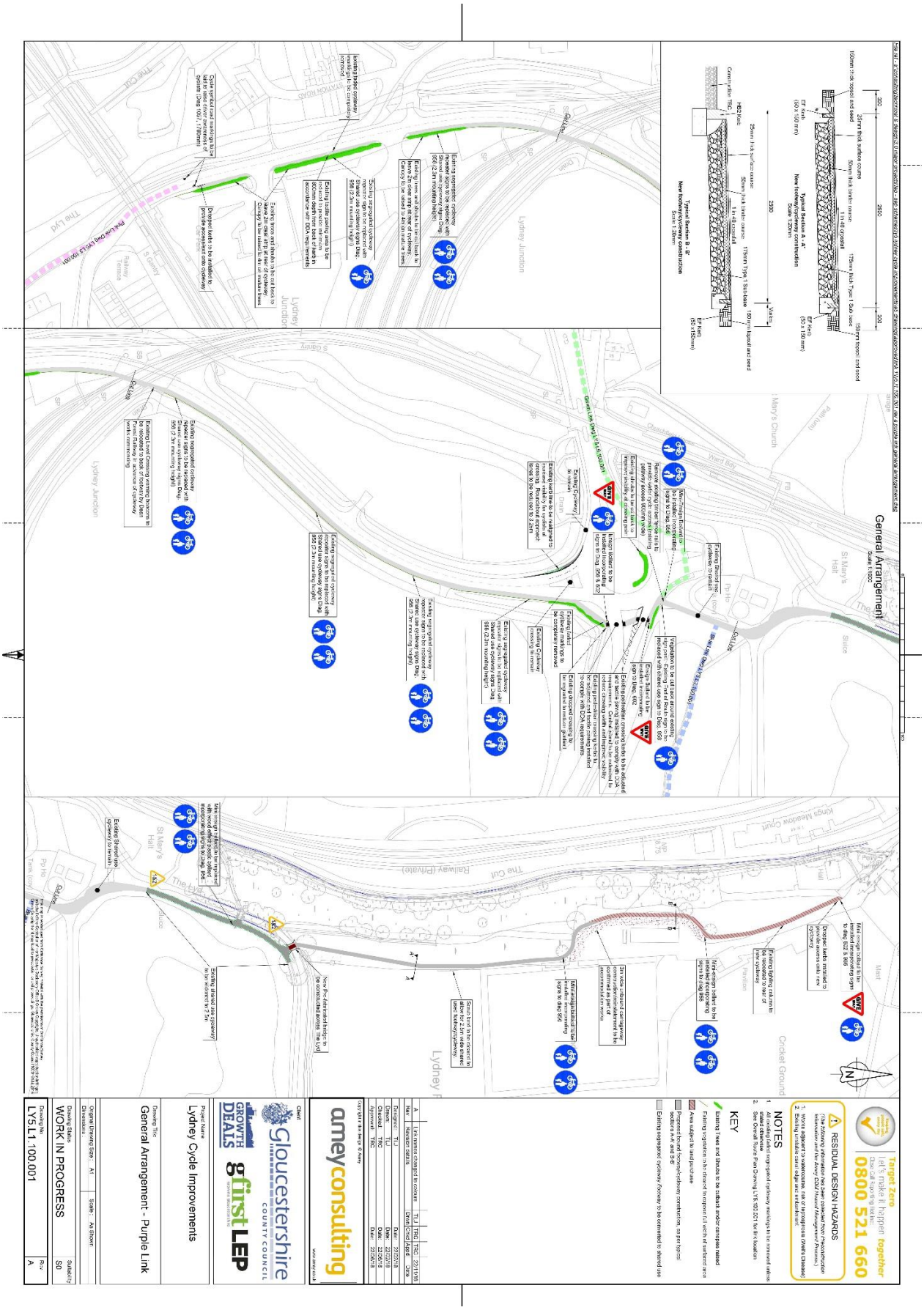


**Figure 5 - Purple Link General Arrangement Drawing**

## 1.8. Blue Link: Oakdale Estate to Purple Link

The proposed Blue Link (Drawing LY5.L2.100.001 Rev B in Appendix A and Figure 6) will connect the Oakdale Estate to the Recreation Trust Ground from where other links can be taken to the Town Centre, Railway Station or the Dean Academy.

The route heads east from the Purple Link around the lake utilising the existing paths within the Recreation Trust Ground. It then connects to Lakeside Gardens and the recently constructed bus / cycle only road (Cambourne Place) and quiet estate roads where traffic speeds and volumes will be low.

The route taken by the Blue Link does already exist as a path, but there is no signage and it is not clear to users whether cycling is permitted.

The key purpose of the proposed link is to allow the future residential developments to the east of the Oakdale Estate will further extend this route to Nass Lane and Highfield Road. The cycleway through the new housing estate will be built by the housing developer as part of the following developments:

- Lydney East A 323 houses planned;
- Lydney East B 750 houses planned;
- Planning for 390 houses expected.

The site falls within the administrative boundary of the Forest of Dean District Council. The council adopted their Core Strategy in February 2012. This document set out a requirement to deliver approximately 5,162 new homes over the plan period to the year 2026, to be distributed across the settlement hierarchy. The Core Strategy identifies Lydney as having the most potential for housing development across the plan period, outlining a requirement for 1,900 homes within the town. The plan also identifies several key employments sites to the east of Lydney, preferred but not limited to B1 (Business), B2 (General Industry) or B8 (Storage or Distribution).

**Limitations with Existing Route**

- Existing route is usable by cyclists but not signed or clear if this is permitted.

**Link Benefits**

- Existing footway through Recreation Trust Ground to be converted to shared use footway/cycleway;
- Clear lining and signing of route;
- Opportunities for utility, commuting and leisure cycling / walking to and from Oakdale development.

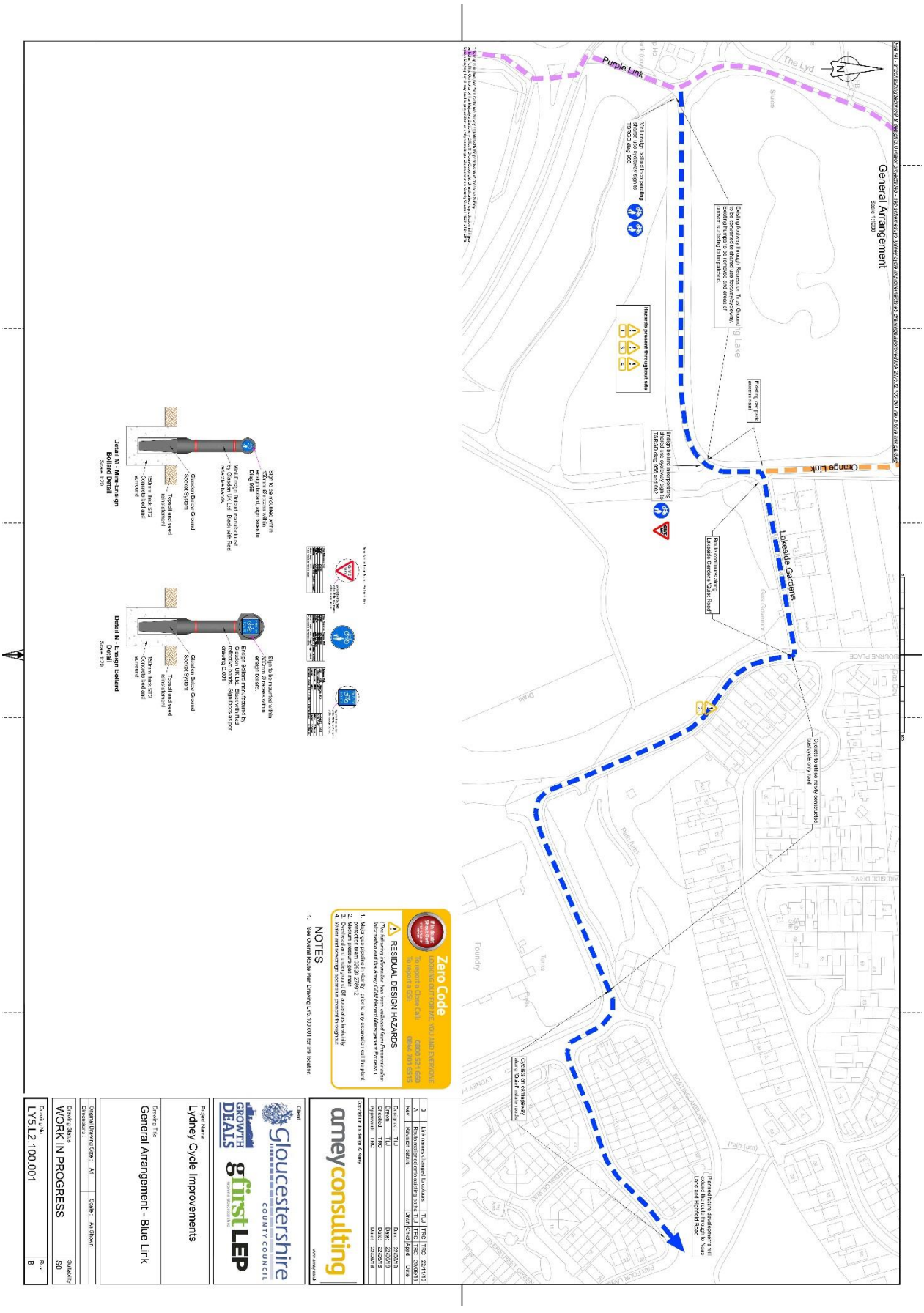


**Figure 6 - Blue Link General Arrangement Drawing**

## 1.9. Orange Link: Blue Link to Hams Road

The proposed Orange Link (Drawing LY5.L4.100.001 Rev B) will provide an off-carriageway route from the Oakdale and Highfield Hill housing developments to the eastern side of the town centre. The route will utilise existing paths along the eastern side of the Recreation Trust Ground before emerging onto Hams Road adjacent to the Bus Station and local shops. The existing route is used on occasions by cyclists, but it is currently footway and not signed for cycle use. Where the route reaches the bus station, the existing Hams Road footway will be widened to create an off-carriageway shared use footway/cycleway extending up to the Newerne Street junction. This will reduce the lane widths of the carriageway but is not expected to have an adverse effect on vehicle traffic.

**The proposed improvements are as below:**

- Footway to the west of recreation trust ground to be improved for use as cycleway;
- Shared use off-carriageway facility from bus station to Newerne Street junction;
- Installation of 6 bike stands to create cycle parking area within existing wide footway;
- Existing Zebra crossing to be realigned to suit new kerb alignment.

**Limitations with Existing Route**

- Limited existing provision for cyclists;
- More divert alternative to current equivalent route via Tutnalls Street;
- The existing footpath widths on Hams Road do not meet current standards for a shared facility.

**Link Benefits**

- Opportunities for utility and leisure cycling/walking from Oakdale and Highfield Hill residential developments;
- New cycle parking facilities;
- Priority given to cyclists and pedestrians on new cycleway and footway;
- Off-carriageway alternative is provided for cyclists who do not wish to manoeuvre the Hams Road / Highfield Road junction.

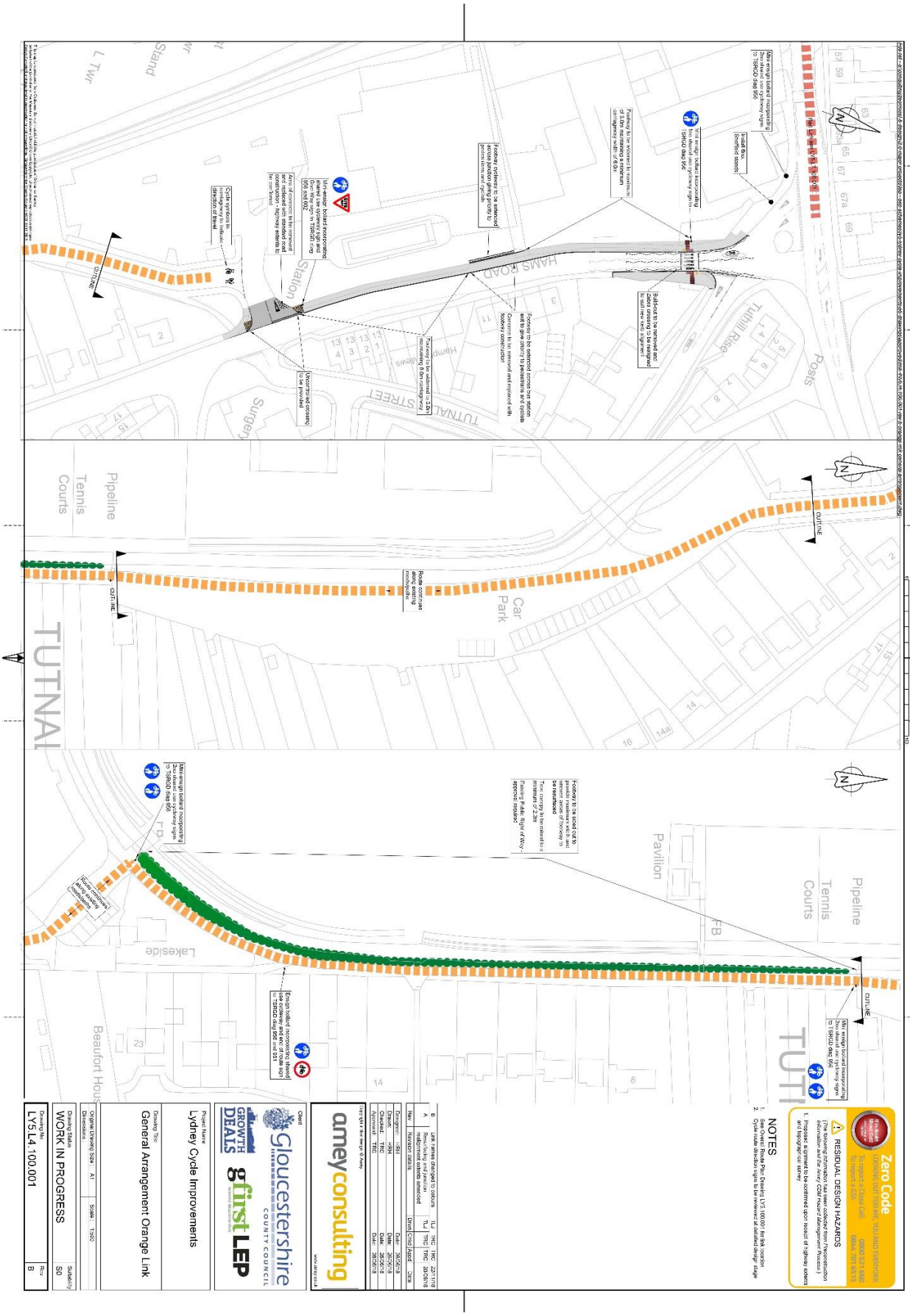


**Figure 7 - Orange Link General Arrangement Drawing**

## 1.10. Green Link: Purple Link to Red Link via Dean Academy

The proposed Green Link (Drawing LYD5.L6.100.001 Rev A) runs between the Recreation Trust Ground and the High Street via The Dean Academy secondary school. The route will improve cycle/walking access to The Dean Academy from residential areas throughout Lydney as well as providing a link from the north west of the town to the railway station (via Purple Link). Between Purple Link 1 and The Dean Academy, the improvements will widen the current footpath to provide a new shared use footway/cycleway heading south from the Dean Academy to the Recreation Trust Ground. North of The Dean Academy, the route will be on carriageway with the centre line road marking along Church Road removed and the advisory cycle lanes widened to comply with the latest design guidance.

**Limitations with Existing Route**

- The width of the existing on-carriageway lined cycle lanes do not comply with latest design guidance;
- Currently no off-carriageway cycle provision for access to The Dean Academy and Leisure Centre.

**Link Benefits**

- Opportunities to increase utility and commuter cycling / walking to and from The Dean Academy School and the Freedom Leisure Centre;
- Improved cycle link to the Railway Station for housing to the West of Lydney;
- Safeguarding vulnerable users, in particular school children on this link.

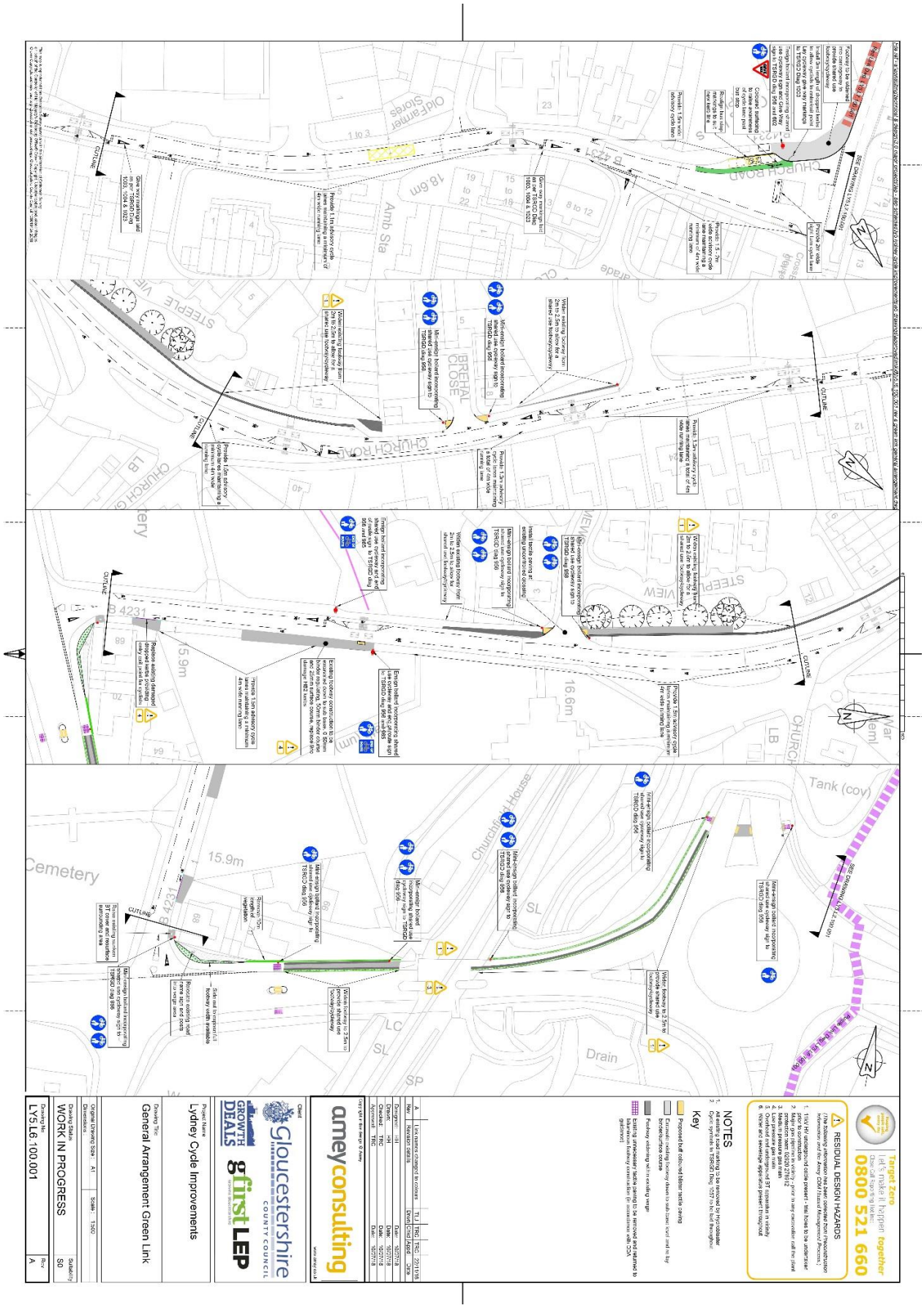


**Figure 8 - Green Link General Arrangement Drawing**

## 1.11. Red Link: Lydney Town Centre to Aylburton

The rural section of the Red Link (Figures 10 and 11) connects the nearby village of Aylburton to Lydney town centre and the cycleway network. The Link will also improve access to Bathhurst pool (outdoor swimming pool) and the garden centre complex with crazy golf and a craft shop. The existing footway along the northern side of the A48 and B4231 will be widened to 3m creating a continuous shared use footway/cycleway. A new parallel cycle and pedestrian zebra crossing will be installed adjacent to the Town Hall to provide a safe connection to the Green Link.

The urban section of the Red Link runs through the town centre along High Street, Hill Street and Newerne Street. The existing building lines mean it is not feasible to provide a dedicated cycle facility along the length of the route, however removal of the centre line road marking will allow advisory uphill cycle lanes to be installed on High Street and Hill Street. These lanes will provide space for cyclists when climbing the hill at lower speeds than passing motorised traffic. Centre line removal and other road marking alterations throughout the remainder of the route will result in reduced vehicle speeds, allowing cyclists to ride more comfortably with motorised traffic. It is also worth noting that within this section of the high street a 20mph speed limit is in force.

**Limitations with Existing Route**

- The existing cycle lane widths in High Street do not meet current standards for a segregated facility;
- No current cycle facilities linking Lydney to Aylburton. Current on-carriageway route is on a busy section of the A48 which would deter many leisure cyclists;
- Length of carriageway linking High Street to A48 is narrow and not cycle friendly.

**Link Benefits**

- Opportunities for utility and leisure cycling / walking and commuting;
- Cycle links to Aylburton, Lydney East and Bathhurst Pool and other leisure facilities;
- Opportunities for tourism, linking the town centre with the Red, Orange and Green Links;
- The removal of centre line markings looks to reduce vehicle speed along the High Street.

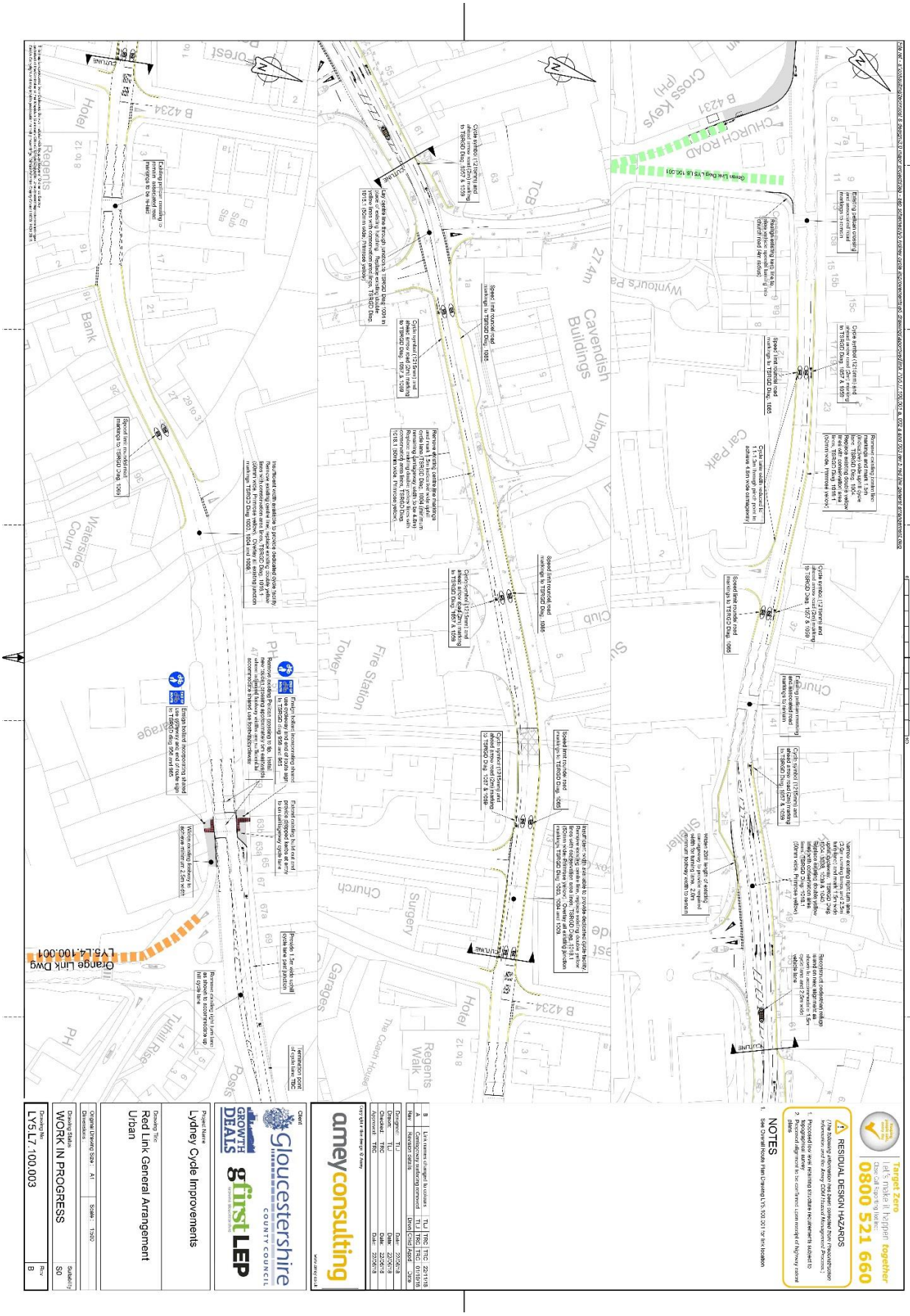


**Figure 9 - Red Link General Arrangement Drawing - Urban**

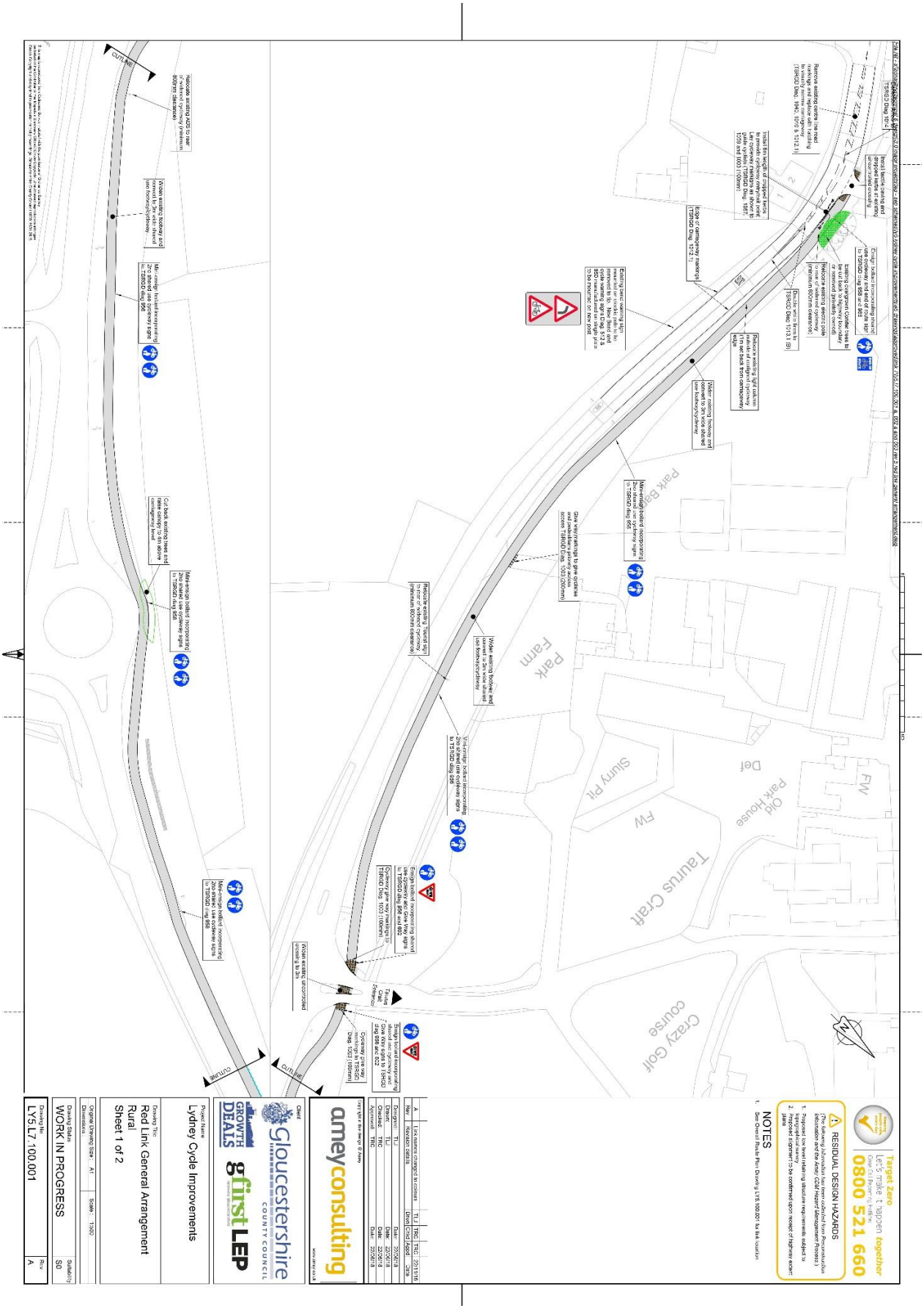


**Figure 10 - Red Link General Arrangement Drawing - Rural Sheet 1 of 2**

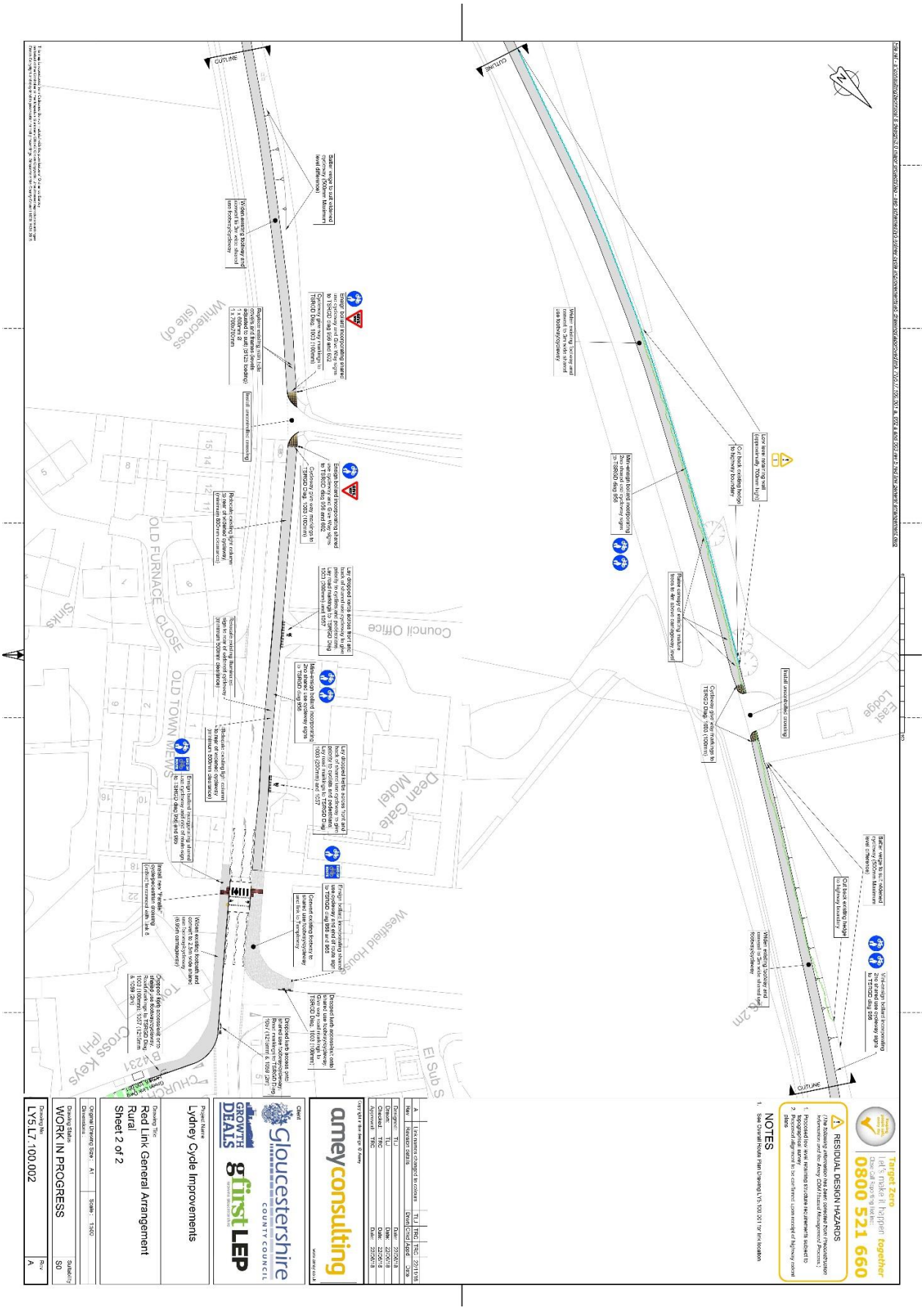


**Figure 11 - Red Link General Arrangement Drawing - Rural Sheet 2 of 2**

## 1.12. Cycling Delivery Plan

The 'Cycling Delivery Plan' (October 2014) is a 10 year plan which provides the necessary tools to achieve a step change in cycling. The plan sets out central Governments vision for walking and cycling to become the natural choice and norm for shorter journeys or as part of a longer journey. The plan sets out the aims for walking and cycling up until 2025:

- Double cycling activity each year, from 0.8 billion bicycle stages in 2013 to 1.6 billion stages; and
- Increase the percentage of children aged 5-10 who normally walk to school from 48% in 2013 to 55%.

This scheme will assist in improving both cycling and pedestrian numbers in the area by providing desirable cycle and pedestrian routes. This scheme will encourage users to choose a sustainable mode of transport or at minimum assess the way they commute in the future.

## 1.13. Lydney Town Centre

The main retail offering in Lydney is provided along Newerne Street and High St between the junctions of Hams Road and Church Road. The highest concentration of stores is located along a short section of approximately 300 metres between Hams Road and Swan Road and Forest Road.

Local shops predominantly occupy the roadside units with Tesco and Co-Operative Food occupying positions at either side of the town centre. A number of charity shops and vacant units are situated along the High Street which increases the perception of a high street in decline.

In 2013/2014, Regeneration Service at Forest of Dean District Council produced a report evaluating how effective the town centre was as a place and how it could be improved.

The report identified that footfall along the High Street had increased which would suggest that the retail offering had improved. The report also highlighted the slight increase in number of cafes and take away establishments in the town centre fulfilling the leisure offering. Whilst there has been a slight increase, leisure facilities in the town are minimal. The evening / night time offering in the town is poor with very few restaurants or public houses.

Lydney has a range of facilities servicing the community of Lydney, for example a library which is managed by Gloucestershire County Council, a Town Hall and Community Centre run by local groups and a sports centre managed by Forest Leisure. There are two doctors' surgeries within the town and a community hospital which provides 21 in-patient beds and also a minor injuries unit.

| Place of work | Number Residing in Lydney |
|---|---|
| Lydney | 1,457 |
| Coleford | 288 |
| Parkend / Pillowell / Bream/ Ellwood | 179 |
| Cinderford | 169 |
| Mitcheldean / Drybrook | 141 |
| Gloucester | 121 |
| Chepstow | 119 |
| Tidenham / Tutshill / E of Chepstow | 106 |
| Blakeney / Newnham/ Northwood Green | 89 |
| Monmouth | 58 |

**Table 2 - Employment Destinations for Lydney Residents**

# 2. Strategic Case

## 2.1. Introduction

This section of the report sets out the 'case for change', by explaining the rationale for investment and presenting evidence on the strategic policy fit of the proposed scheme at a national, regional and local level. This section also sets out the scheme options under consideration, measures for success and scheme objectives.

The Strategic Case establishes the:

- Context for the business case, outlining the strategic aims and responsibilities of Gloucestershire County Council;
- Transport related problems that have been identified, using evidence to justify intervention and examining the impact of not making the investment;
- Specific, measurable, achievable, realistic and time-bound (SMART) objectives that solve the problem, identified through alignment with Gloucestershire County Council's strategic aims and responsibilities;
- Measures for determining successful delivery of the objectives;
- Analysis of constraints and opportunities for investment; and
- Breakdown of interdependencies on which the successful delivery of the scheme depends.

## 2.2. Business Strategy

**National Planning Policy Framework**

The 'National Planning Policy' Framework sets out the Government's planning policies for England and how these are expected to be applied. There are three mutually dependant dimensions; economic, environmental and societal improvements. The strategy sets out that sustainable development is at the forefront of all development plans and determining their applications.

The framework states that Local Planning Authorities (LPA) should adopt proactive strategies to promote sustainable transport solutions which support reductions in greenhouse gas emissions and reduce congestion. Pursuing sustainable development involves seeking positive improvements in the quality of the built, natural and historic environment, including quality of life.

This Full Business Case sets out a proposal to improve local connections, in particular with regards to sustainable transport links in the town of Lydney. This approach is consistent with the Nation Planning Policy Framework.

**Regional Transport Priorities**

Growth Deal and Strategic Economic Plan

Published in March 2014, the Gfirst LEP Strategic Economic Plan (SEP) outlines the investment strategy to drive growth in Gloucestershire's economy to 2020. The plan aims to support businesses and develop skills as well as setting out the strategy to maximise connections and opportunities in the county. This is shown in three key priority areas:

- Providing a highly employable and economically productive workforce that meets the needs of local businesses;
- Attracting, retaining and developing successful businesses;
- Exploiting opportunities to open-up new sites for development and providing the required transport infrastructure to accelerate growth.

The Gloucestershire Growth Deal is a component element of the SEP which sets out plans for public and private investment, combining to create a new total investment package of £142.5m for Gloucestershire. The SEP involves the 'enablers for growth' to unlock the latent potential in the area via supporting and complementing economic growth within the county. Unlocking the potential of growth corridors and sites with plans for 33,000 new jobs, transforming connectivity for businesses and residents aiming for 3,200 new homes and attracting successful businesses, all contribute towards continued and accelerated growth in the area.

The Lydney Cycling Improvements Scheme conforms to the overall aims of the SEP by resolving infrastructure issues in the local area in order to attract businesses, developers and residents.

**Gloucestershire's Local Transport Plan (LTP3)**

The cycling corridors which have emerged through the Barriers to Cycling Study as the top six priorities in Gloucestershire are:

- Cheltenham: Centre to A40 east and to A435 south corridor;
- Lydney: central area barriers;
- Stroud: central area barriers;
- Tewkesbury: A38/A438 junction to A38 south corridor to east of town;
- Gloucester: Outer ring road network linking Walls roundabout to Cole Avenue;
- Cirencester: A429 (south west) corridor and A417 (east corridor).

The plan states that GCC will deliver a functioning cycle network by improving cycle linkages and safeguard quiet highway connections by working with delivery partners, other agencies, and community stakeholders to identify and remove barriers (physical or psychological) to cycling.

GCC will do this by implementing the following policy proposals:

- To improve cycle linkages between and within settlements throughout Gloucestershire by working with delivery partners, other agencies, the community and stakeholders to remove barriers to cycling and consolidate the network;
- To focus investment in cycling in more developed areas and especially where new development is planned;
- To recognise the role and function of the existing quiet lane network and seek to expand this where possible to provide safe cycle linkages;
- To ensure developers assess the needs of all pedestrians and cyclists within their development design and any improvements associated with the development. All cycle infrastructure provided within the county will be in accordance with Manual for Gloucestershire Streets (MfGS) and Cycle Facility Guidelines;
- To ensure all schemes on the local highway network will be subject to appropriate context reports and audits (including Road Safety, Non-Motorised Users, Walking, Cycling and Quality Audits) before design approval;
- To support the development and promotion of the leisure cycle network, and Public Rights of Way Network to encourage greater use linking centres of population;
- To work in partnership with communities in identifying local transport needs and solutions (through e.g. Parish and Neighbourhood Plans);
- To work with district / borough councils to ensure that new development is well connected to the existing transport network.

**Forest of Dean District Core Strategy (FoDDCS)**

In February 2012, the Forest of Dean District Council submitted their Core Strategy.

Within the 15-year period covered by the Core Strategy (2012-2026 inclusive), several developments are planned in Lydney. The development amounts to 30ha of employment along with 1500m2 of retail. In addition, 1,900 residential units are programmed over the same period (see Figure 10 below).

The Core Strategy document outlines the case for the necessary investment to infrastructure that is required in Lydney to support housing and employment growth. Three areas of Infrastructure Investment have been identified within the Core Strategy, namely:

- Town Centre;
- Tourism;
- Recreation.

At the end of the plan period, Lydney will be a larger town with the completion of the expansion to the east, at least as it is currently envisaged. New employment areas and a neighbourhood centre will be an integral part of this. A re-modelled school and other community facilities will complete the new neighbourhood which will be well connected to the existing town, with walking, cycling and bus routes. Increased use will be made of the railway links from the town. As a result of the Area Action Plan major changes will be substantially complete in respect of land along the harbour side and between the town centre and the station. This area will contain a variety of mixed uses with the emphasis on different forms of employment and will cater for recreation and tourism.

Businesses related to the harbour will feature strongly in the overall mixture and the station will be improved. The town centre will be a more attractive one with much of the through traffic being diverted away from the main shopping area.

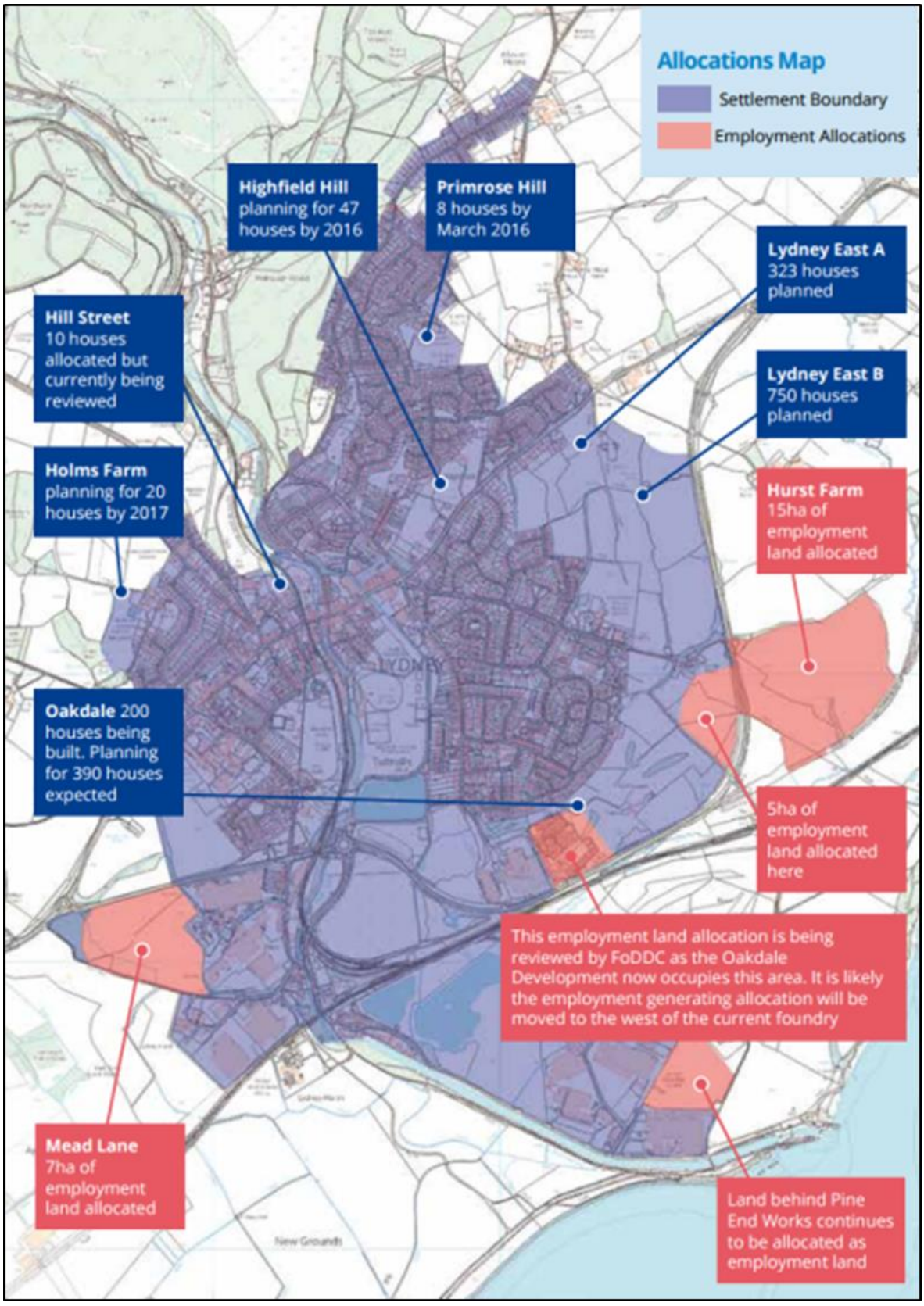


**Figure 12 - Lydney Allocations Plan (Lydney Neighbourhood Plan, October 2015)**

| Settlement and Subject Area | Provision and implementation |
|---|---|
| **Housing** | About 1900 new dwellings on sites already identified and within existing settlement boundary, (37% of district total) with related Housing employment (see below) and neighbourhood centre. To include a new neighbourhood on allocated land and further mixed development elsewhere. The entire new East of Lydney site has outline consent, with contributions agreed. Part commenced (Mar 2011) and completion in 12/ 15 years. |
| **Affordable housing** | 40% affordable housing sought on sites of over 10dwellings/ 0.3ha. Actual delivery now governed by consents that are to be implemented, including one with HCA support |
| **Employment sites** | About 30ha new land (already identified) to be used for employment, in addition to new uses and intensification elsewhere. New allocated Employment sites land all well located for more diverse offer. At least 20ha is linked or adjoins the proposed new neighbourhood, about 5ha is to be provided as an integral part of the neighbourhood. |
| **Town centre additional retail space** | About 1500m2 comparisons, about 600m2 convenience floor space as a part of redevelopment of site(s) in town centre, to be refined through AAP process. |
| **Town centre highway strategy** | Implementation from developer contributions (part agreed delivery phased against East of Lydney new mixed development) |
| **Town centre public realm improvements** | Arising from developer contributions to revised highway strategy but may need additional funding |
| **Tourism** | Additional use of town by tourists is sought from connections which will be improved under AAP proposals between existing attractions Tourism (e.g. Harbour and Dean Forest Railway) and further development based on natural/ historic assets |
| **Recreation** | Increased provision and better connectivity arising from develop contributions and AAP proposals |
| **Area Action Plan** | To co-ordinate the changes to the town and harbour area, and enable a different form of mixed development including Area Action Plan employment. AAP will contain allocations for employment, leisure and recreation, housing and retail (within the town centre). |

**Table 3 - Summary of the Lydney Transport Strategy**

The Lydney Cycling Improvements Scheme is consistent with the core aims of the 'FoDDCS' by supporting a greener, healthier Forest of Dean that promotes sustainable economic growth, a safer and more secure transport system and providing good access to services.

### Lydney Neighbourhood Development Plan 2014-2024

The Lydney Neighbourhood Development Plan (NDP) was introduced through the Localism Act (2011) with a focus on local planning and giving communities the opportunity to become involved in their future.

This NDP provides an economic and socially sustainable vision for the future of the town, and sets out clear planning policies to realise this vision. These policies accord with higher level planning policies; the National Planning Policy Framework (March 2012), the Forest of Dean District Council's Core Strategy (adopted February 2012) and, through discussions with Forest of Dean District Council (FoDDC), has due regard to the draft Allocations Document currently being compiled by the Local Planning Authority.

The Lydney NDP also seeks to enhance pedestrian and cycling connections within and around the town. The NDP steering group has prepared the Lydney Revolutions report which describes the opportunity for

improving cycle connections within the town and safely connecting residential areas to schools, places of work, the town centre, the railway station and the wider Forest cycle track network.

The proposed scheme which this Full Business Case details aligns with the opportunities identified in this report and has been proposed with several of the above objectives in mind. The cycle links proposed will improve cycle connections for both commuters and leisure users in general, but more specifically will address connections to Lydney town centre, the train station and provision for vulnerable users such as school children.

The NDP aims to ensure that local infrastructure of Lydney grows with the expansion of new housing developments and industrial units to make a more connected and successful town; 'one that is more socially and community minded'. The plan also seeks to not only support sustainability of the local population as it continues to grow, but also aims to meet the associated challenges which lie ahead.

In the town centre key junctions are congested and due to their prominent location at the heart of the High Street, the town centre is not a particularly pleasant place to be. This in turn means that potential new businesses are unlikely to establish themselves in the town in the short term. The schemes forming the Lydney Transport Strategy correspond with the Lydney NDP by seeking to address the main problems that Lydney currently faces, for example tackling accessibility in Lydney and the surrounding area:

- Poor air quality in the town centre and also improving the quality of life of its residents and tourists by improving cycle and pedestrian opportunities and links to sustainable transport;

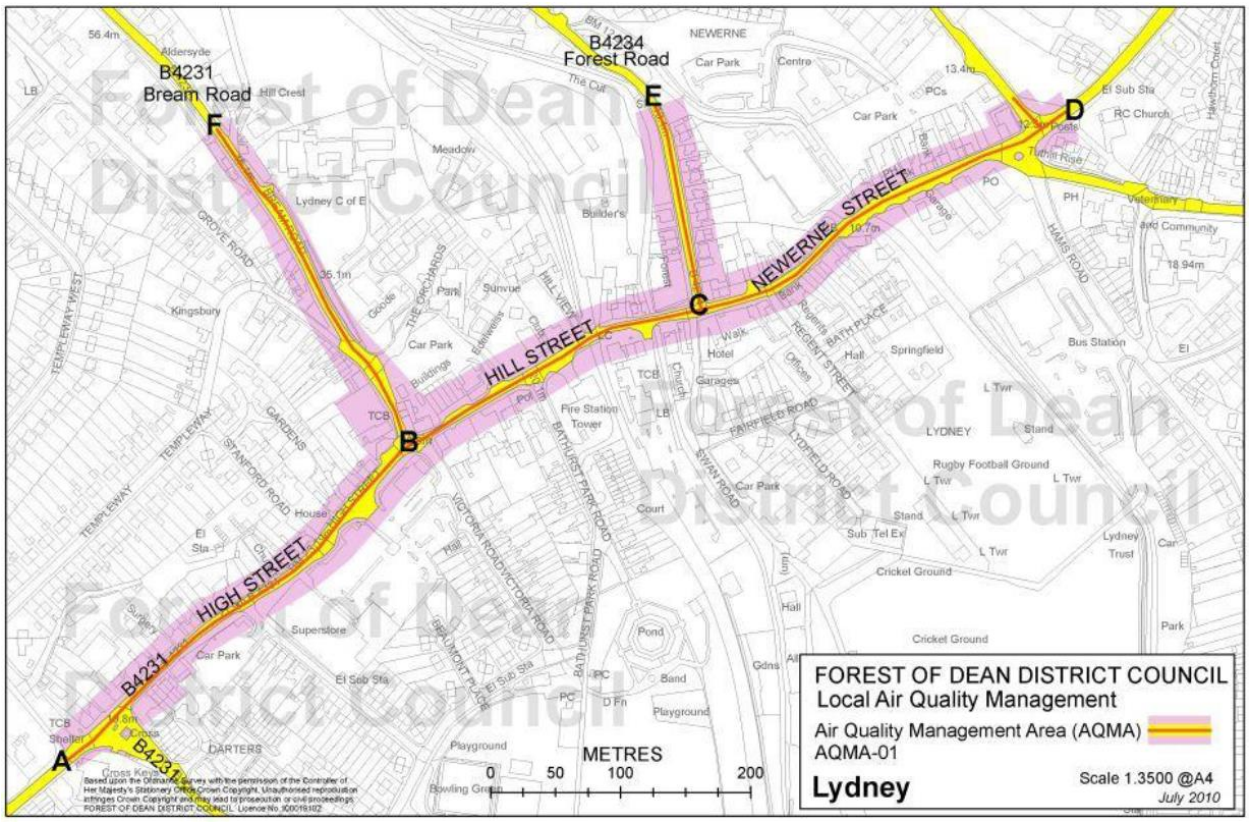


**Figure 13 - Lydney Air Quality Management Area (AQMA)**

- Excessive traffic on Newerne Street - Despite the A48 bypass around Lydney carrying the majority of strategic traffic between Gloucester and Newport, traffic along the High Street is still considered to be high. The B4231 and B4234 both have junctions in the town centre taking traffic from Lydney to the northern gateway villages of the Forest of Dean. Considerable congestion is experienced during peak period conditions at the aforementioned junctions which makes the High Street a less inviting place

for people to visit. Limited crossing facilities along the High Street also have the effect of acting as a barrier for those wishing to cross the street, in particular for vulnerable users;

- Limited scope for cycling and walking opportunities – The cycling offering in Lydney is poor with minimal designated infrastructure. Cycle parking within the town centre and at the railway station is limited with only a small number of cycle parking stands available. The proposal cycle parking included as part of the Blue Link looks to improve on the existing offering. Town Council are aware this still remains limited and plan to try and address this issue in the future. The number of cycle journeys made by students travelling to school is currently suppressed due to the lack of suitable infrastructure. For many students living to the east, Newerne Street is the most direct route which is also the most dangerous and highly trafficked. The barriers to cycling report identifies a number of corridors where a lack of infrastructure is creating a barrier, notably Lydney station to the town centre, St Mary's Halt to Highfield, the East Lydney Development Link and Lydney Harbour to the town centre;
- Public Transport Provision – The coordination between bus and rail timetables is poor with only three services accessing the railway station on a daily basis, this in turn forces people to drive to the station. Services to major urban centres such as Gloucester, Cheltenham, Chepstow and Newport are limited;
- Low educational achievements and aspirations, matched by low job prospects and unemployment in some areas - Much of Lydney's current office accommodation are based in converted buildings within the town. Local businesses and people believe there is a shortage of good quality and primary office space. This is reflected by Forest of Dean Council's studies which highlight the need for modern office accommodation, with demand for small flexible units also requiring consideration;
- Retail Offering – The retail report conducted by Forest of Dean District Council (discussed in section 1.13) identified a rise the number of vacant units and charity shops located in the town which could be perceived negatively by potential investors and visitors. In addition, there is very little in the way of a night-time economy in the town.

It is clear that there are numerous existing challenges facing Lydney that are inter-related and these issues are likely to put a considerable strain on the town in the future unless mitigation is considered.

**Impact of Not Changing**

Considerable development is expected across Gloucestershire in terms of a strategic home building plan and the allocation of employment sites. As previously outlined, Lydney is expected to absorb a large amount of this growth. A graphical representation of the expected developments is provided in Figure 10.

Future development will be located to the east and southeast of the town centre, making use of its proximity to the A48. Due to the location of these developments and them being predominantly residential this is expected to put more demand on the local infrastructure particularly during peak hours causing increasing congestion and longer journey times. These potential issues are important to future transport plans for the town and the impact of these development sites should be considered thoroughly when transport options are being developed for Lydney.

Additionally the plan to remove the Severn Bridge Tolls is expected to remove an existing barrier to commuters and increase the demand for housing in the Forest of Dean. This could have a significant positive impact in Lydney in all aspects from property, leisure and holiday sectors. It is important to note that the removal of the tolls could also exacerbate the existing transport situation increasing congestion in and around Lydney. Therefore this scheme is expected to grow in importance and be the beginning of the bigger picture for Lydney and continue to encourage economic growth.

It is clear that the current transport network within the town is creaking and the expected volume of development is only likely to exacerbate the issues unless mitigated.

Should no investment in transport infrastructure take place, it is anticipated that the following 'real' issues could be expected in and around Lydney:

- Continued reliance on the private car for short journeys;

- Increased instances of traffic congestion - Junctions in the town centre are already congested during peak periods and the expected level of development is likely to render the junctions inoperable;
- Increased journey times - Existing journey times through the town centre are unreliable owing to considerable delays during peak periods at the Bream Rd and Forest Rd junctions;
- Deterioration in air quality - Air pollution levels in most of the district meet national standards, but high levels of traffic in Lydney town centre have led to excessive levels of nitrogen dioxide (NO2). Long term exposure to nitrogen dioxide may decrease lung function and increase the risk of respiratory symptoms. Furthermore, sensitive groups such as young children or people with asthma or other respiratory illnesses are more likely to be affected by elevated nitrogen dioxide levels. These factors have led to the declaration of an AQMA along Newerne St;
- Deterioration in general health and well-being - Existing sustainable facilities in the town are poor, evidenced by the fact that very few (if any) students cycle to school. The Forest of Dean has the highest obesity rate in the county in addition high incidences of coronary heart disease and childhood obesity. Unless safer and practical walking and cycling routes are introduced, it is likely that the general health of residents will deteriorate. Promoting healthy lifestyle habits at a young age as critical as obese children and adolescents are likely to be obese and suffer ill health as adults;
- Lack of connectivity between land uses - The projected level of development in Lydney and its location north of the A48 lends itself to benefit from good connections with the town centre. However, it is expected that employment allocations at Hurst Farm and Mead Lane (south of the A48) will be severed due to considerable increases in traffic along the A48;
- Lack of connectivity with local area and beyond - Lydney is fairly isolated with the A48 being the main artery connecting the town with other major centres in Gloucestershire and South Wales. Rural 'B' roads connect the town with villages to the north and ultimately the Forest of Dean. These roads are likely to become even more congested in the future which will reduce link and junction capacity on key routes to and from the town unless a contingency is adopted;
- Increase in number of collisions - There is an existing safety concern over the A48/ Highfield junction due to high vehicular speeds. Analysis of accidents along Newerne St has also revealed a number of collisions involving pedestrians;
- Increased severance for pedestrians and cyclists - Unless mitigated, increased traffic volumes are likely to discourage pedestrians and cyclists due to a fear for personal safety. As previously discussed, it is anticipated that congested key junctions and the A48 are likely to act as barriers for those wishing to travel more sustainably;
- Increase in parking issues in and around the town and railway station - Existing parking supply at the railway station is limited which causes commuters to park on street. The situation will be aggravated with the expected level of development at Lydney East and employment allocations. This will see a reduction in capacity along Harbour Rd and afford less visibility to drivers and cyclists alike which could see accident rates increase; and
- Limited opportunity to increase tourist offering and economic growth - The tourism industry generates £115 billion for the UK economy per annum and supports over 2.6 million jobs, indeed, 9% of Forest of Dean's workforce is employed in the tourism sector. Should Lydney become gridlocked due to constraints on the highway network, a substantial opportunity to promote the town to visitors will be missed which is likely to manifest itself in competing towns benefiting from increased visitor trips from within and outside Gloucestershire.

There is a considerable opportunity for Lydney to use its proximity to the Forest to take advantage of the economic benefits of tourism, in particular when considering that in 2013 there were 946,000 visitors to the Forest of Dean.

At present the hospitality sector in the town is limited with very few hotels and restaurants to welcome visitors.

The value of tourism is a vital part of the economy for the Forest of Dean District, generating over £141 million in 2012.

## 2.3. Objectives

The overarching goal of the Lydney Cycling Improvements is to contribute to the economic development of the town and beyond. A number of proposed transport objectives have been developed based on LTP3 objectives to provide focus for the strategy. The scheme proposed by this Full Business Case will align with the measures of success outlined by the LTP3 and will address the objectives outlined below:

- A greener, healthier Lydney through reduced transport emissions;
- Enable sustainable economic growth for Lydney;
- A safer and secure multi-modal transport system;
- Good access to services for all transport modes;
- Integrated and improved transport infrastructure;
- Encourage active and healthy lifestyles through transport improvements; and
- Improve public transport provision for commuters and visitors.

## 2.4. Measures for Success

One of the primary goals of the Lydney Cycling Improvements Scheme is to help Lydney to grow and flourish as a town, in a sustainable manner.

The Measures for Success identified by GCC are closely aligned to those appearing in LTP3. In order to assess the performance of each of the links, a pre and post construction monitoring and evaluation exercise will take place to record findings and assess how effective the infrastructure improvements have been.

It is important that the town centre maintains the vitality of local shops and businesses, but also improves sustainable access and local services, promoting more active and healthier lifestyles, ultimately leading to a reduction in CO2 emissions.

As each of the links progresses, SMART (Specific, Measurable, Achievable, Realistic and Timely) objectives will be set to ensure that they meet their stated objectives. The Transport Strategy is still at SOC stage and at this point, it is unclear how well developed each of the component parts of the scheme are.

The following table provides more detailed information for each of the LTP3 objectives and how each will be assessed.

| LTP3 Objectives | Indicator Description |
|---|---|
| **Air Quality** | · CO2 reductions;<br>· Per capita reduction in CO2 emissions;<br>· Children travelling to school – method of transport used (increase in sustainable modes). |
| **A greener, healthier county** | · Increase in annualised index of cycling trips;<br>· Increase in number of walking trips;<br>· Reduction in congestion (changes in peak period flows to urban centres);<br>· Reduction in congestion (vehicle delay). |
| **Sustainable Economic Growth** | · Average journey time per mile reduction (during peak hours);<br>· Number of cycle tourists;<br>· Increase in number of tourists;<br>· Reduction people killed or seriously injured in road traffic accidents; |
| **A Safer, more secure transport system** | · Children travelling to school – method of transport used (increase in sustainable modes);<br>· Improvement in footway/ cycleway condition;<br>· Increase in annualised index of cycling trips;<br>· Improved access to services by sustainable modes. |
| **Good Access to Services** | · Improvement in footway/ cycleway condition;<br>· Increase in rail mode share. |

**Table 4 - LTP Objectives and Assessment**

## 2.5. Scheme Constraints and Dependencies

It is clear that the Lydney Cycling Improvements Scheme conforms to policy objectives at national, regional and local levels. However, there were some constraints and dependencies in which had to be considered at the point of design. It is important to note that the proposed scheme is not located or directly affected by all of the below but all were taken into consideration early in the design process.

**Flooding is an issue for Lydney from both the River Lyd and the tides from the Severn**. Some areas of Lydney are defined as a Flood Zone 3 by the Environment Agency giving it a medium probability of annual flooding. The main area when this affects the proposed cycle routes is around the recreation ground where the purple, blue and orange links pass through the Flood Zone 3.

The key physical constraints surrounding the delivery of the scheme are summarised below:

- Lydney Town Marsh and Sidings are key wildlife sites designated by Gloucestershire Wildlife Trust. The Severn Estuary European Marine Site is designated a Ramsar site, Special Area of Conservation (SAC) and Special Protection Area (SPA). Figure 23 indicates the areas of conservation and the Lydney Town Marsh and Sidings;
- There are 4 Scheduled Ancient Monuments within Lydney; the Harbour, the Village Cross, Little Camp Hill and Lydney Park Camp and Roman remains;
- There are a number of listed structures around Lydney and over 500 entries on the County Historic Environment record in the Lydney NDP area.

The key project dependencies are summarised below:

- Government Transport Policy and potential changes in priority;

- Changes in political will at local level;
- Changes in appraisal guidance;
- Cost changes;
- Issues arising from the consultation process; and
- The development proposed west of the Oakdale Estate.

In addition to the physical constraints on the town, there are a number of other factors that are likely to affect Lydney Transport Strategy scheme delivery.

At this time it is unclear how and through which channels all elements of the Lydney Transport Strategy scheme will be funded. A funding mechanism has yet to be identified which will inevitably affect the project timescale.

The proposed improvements at the railway station will be subject to ongoing discussions with both Network Rail and Arriva Trains.

## 2.6. Scheme Selection and Option Identification

An issues and options report (December 2014) gathered all relevant information of potential schemes in the Lydney area. Information was provided from a number of sources including GCC and Lydney NDP, coupled with feedback from the wider stakeholder engagement meetings. A total of 43 schemes were identified as part of this process and these were subsequently sifted based on:

- Affordability;
- Deliverability;
- Feasibility.

The sifting process identified a number of Lydney Transport Strategy schemes that would not be taken forward for further examination leaving the remaining schemes to be taken forward for further assessment.

A scheme prioritisation exercise was then undertaken on the remaining viable schemes. Figure 14 outlines the scheme selection process that was carried out for Lydney Transport Strategy, with subsequent sections explaining the specific detail of each stage.

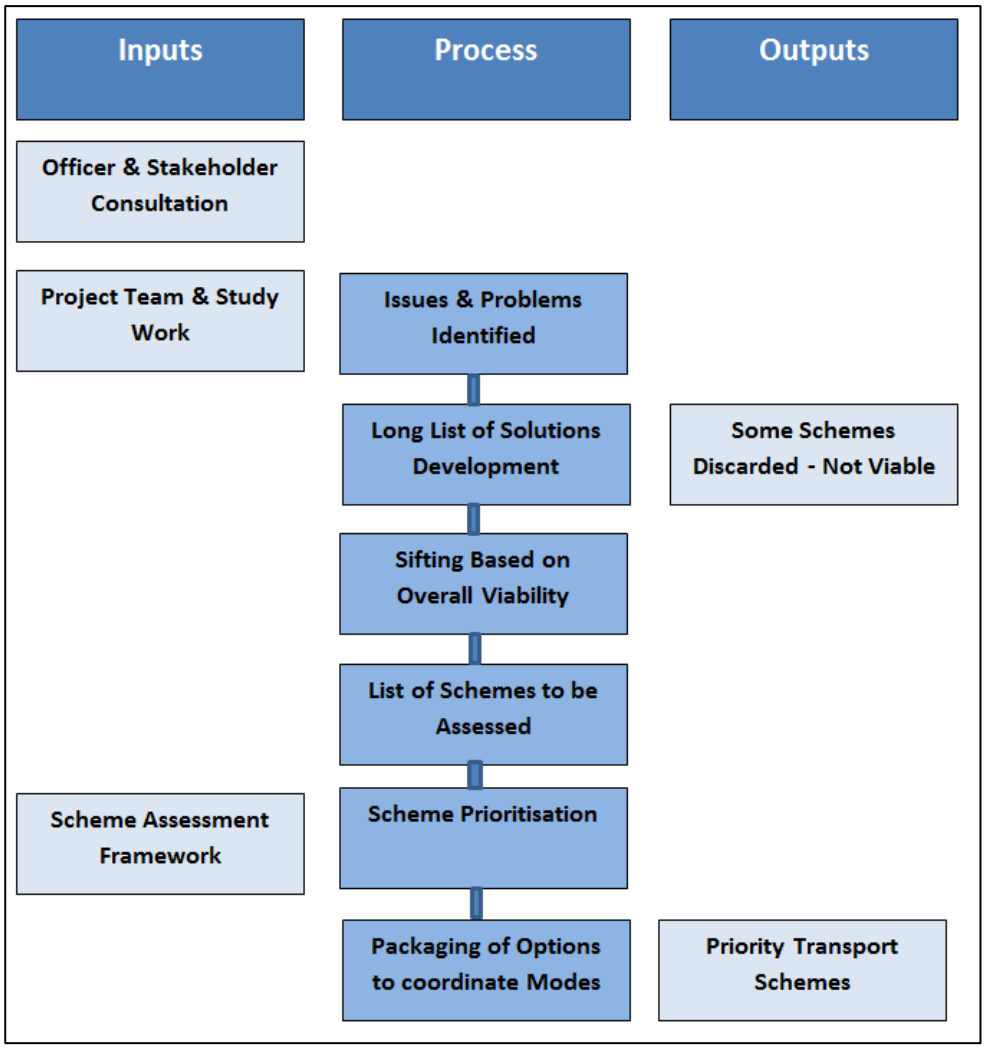


**Figure 14 - Lydney Transport Strategy Scheme Selection Process**

Each of the viable proposed schemes was assessed and prioritised against relevant policy targets and objectives as well as against their capacity to address the issues identified.

After undertaking a Red, Amber and Green (RAG) analysis of all schemes, 3 were deemed to be unfeasible. Of the remaining schemes, 4 were found to have funding in principle with the remaining 36 unfunded and taken forward to the next stage.

Each of the schemes was scored against GCC's LTP core policy and strategy objectives and subsequently scored to reflect how well they aligned with these objectives.

A score was attributed to each of the schemes which were subsequently prioritised.

The table below indicates the schemes selected to form the Lydney Transport Strategy and their ranking based on the aforementioned scoring system.

| Prioritisation Rank | Scheme Name |
|---|---|
| 1 | Bream Road/ High Street Junction Signalisation |
| 2 | Cycle link from Town to Railway station |
| 3 | Roundabout at the North access to Lydney from A48 |
| 4 | New Newerne Street link Road, a replacement route for Newerne Street |
| 5 | New/Extension of the railway station car park |
| 6 | Parkend to Lydney Multi-use track |
| 7 | Lydney Revolutions – Cycle & pedestrian route improvements |
| 8 | Lydney Railway Station Underpass |

**Table 5 - Lydney Transport Strategy Scheme and Priority Rank**

## 2.7. Option Sifting

The prioritisation table above was put together as part of the Lydney Transport Strategy. As illustrated, the number one priority was the signalisation of the Bream Road/ High Street junction. However, after testing various potential options, the scheme was deemed unviable within the LEP budget, given the land constraints at the junction and the likely land acquisition that would be required. There were also concerns as to whether a safe and technically acceptable scheme could be designed, due to the tracking of HGV's required to negotiate the turns and potential vehicle conflict.

After agreement was made to no longer progress Bream Road Junction, the decision was made to go ahead with the second most ranked option - the cycle Link from the town centre to the Railway Station. Whilst this link only requires a proportion of the LEP budget, items 3-6 on the prioritisation list require significantly more than the remaining funding. Therefore, it was decided that number seven on the list could be incorporated as part of the LEP scheme, and to deliver a comprehensive cycling network .

The Links proposed as part of this project were all originally included in the Atkins Barriers to Cycling Report, 2014 and further developed by Lydney Town Council. At the start of preliminary design, it was acknowledged that it may not be possible to deliver all the links within the LEP budget. Therefore, preliminary designs were produced for all links and then a costing and prioritisation exercise took place to prioritise the links to be progressed as part of this scheme.

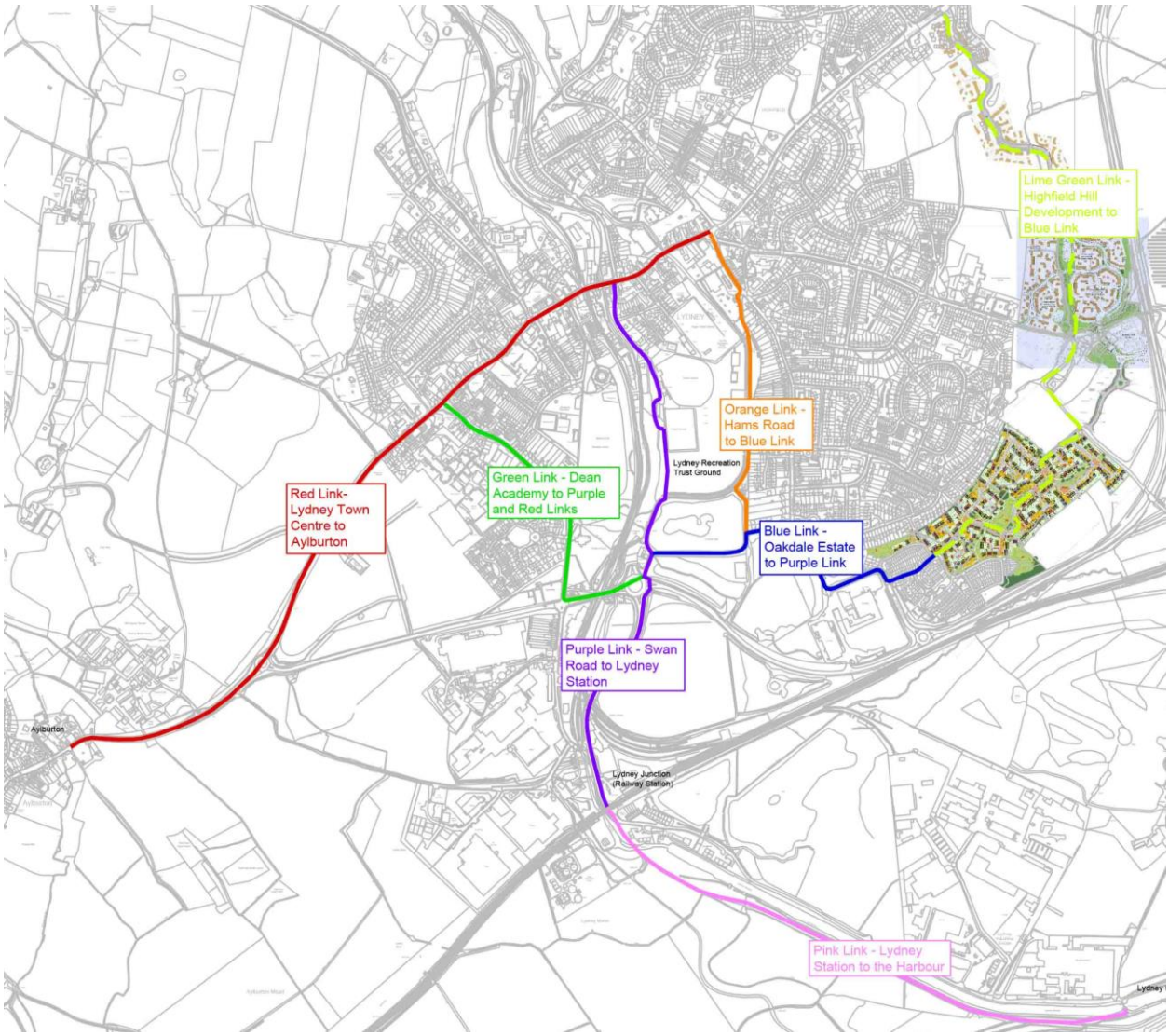


**Figure 15 - Original Lydney Revolutions links identified by Lydney Town Council**

Preliminary designs have been produced for all the links identified in Figure 15. Following a costing exercise, it was established that not all links could be delivered with the LEP budget available. The links that have been chosen to take forward have been selected to remove barriers to cycling, and encourage cycle usage whilst maintaining a coherent and useable network for commuting, utility and leisure cyclists.

The prioritisation exercise concluded that the Lime Green and Pink links have been discounted at this point. In order to further align with the budget, the Blue Link has also been modified to follow the existing Recreation Ground path with minor signing and lining works. For this reason, no benefit for the Blue Link has been included in the assessment of the routes although it does contribute to the overall scheme.

Further details of the prioritisation exercise and details of why these links have been discounted or re-routed have been outlined below;

**Blue Link**

The route proposed in the Lydney Neighbourhood Development Plan passed along the southern boundary of the Recreation Trust Ground, approximately 50m south of the lake. This route cut across the side of a small hill before running parallel with a small watercourse. Existing topography means this route would have followed a number of small inclines and required localised earthworks to provide the desired path width. The

area alongside the watercourse is classified as flood plain and was observed to saturate during winter months meaning drainage works would have been required along with Environment Agency consent.

The revised proposed route utilises the existing paths and quiet roads, and is slightly shorter than the original route (930m current length, 970m original length). The route has the added benefit of being less intrusive and maintains the existing grassed areas for recreational use. The existing footpath route alongside the lake has a width suitable for use as a share cycle way but has the potential to disturb fishermen using the lake.

Due to the minimal changes no benefit has been included for this link in the economical assessment.

**Pink Link**

Pink Link is planned to link Lydney Railway Station to Lydney Harbour. After crossing the level crossing, the route heads right leaving Harbour Road and follows the permissive path down the west side of the Harbour. Following a review and prioritisation exercise, the link has been dropped from the application due to the following:

- Complexities around the current Environment Agency ownership of the land and possible future transfer to a private 3rd party;
- Concerns regarding ongoing legal responsibility for maintenance which would be subject to any land transfer;
- The current route is already accessible for both pedestrians and cyclists;
- At present the demand is low with limited facilities at the harbour;

  Uncertainty around future private investment and development plans for the area.

During correspondence following the share event, the Forest of Dean District Council have recorded disappointment at the link being dropped as it assists them with future funding applications to complete regeneration works to Lydney harbour.

**Lime Green Link**

This cycle link will be included in the Highfield Hill development, and therefore will be privately funded.

**Agreed Links**

Drawings of the selected the Purple, Blue, Orange, Green and Red Links are included in Appendix A.

# 3. Economic Case

## 3.1. Introduction

The Economic Case chapter summarises the outcomes of the economic assessments, presents the Appraisal Summary Tables, and also includes a full review of the Environmental aspects of the assessment and the Value for Money Statement.

## 3.2. Approach to Economic Assessment of the Scheme

The criteria for assessing the likely performance of the scheme have been established in terms of measures for success as will be outlined in the Strategic Case, as they will predict the scheme's ability to achieve its objectives and resolve identified problems. The Economic Case for this scheme is focused on:

- Assessing the monetised direct, localised and economic active mode benefits of the scheme;
- Qualitatively appraising the wider scheme benefits, in terms of enabling planned developments; and
- Offsetting the scheme benefits against the direct scheme capital costs.

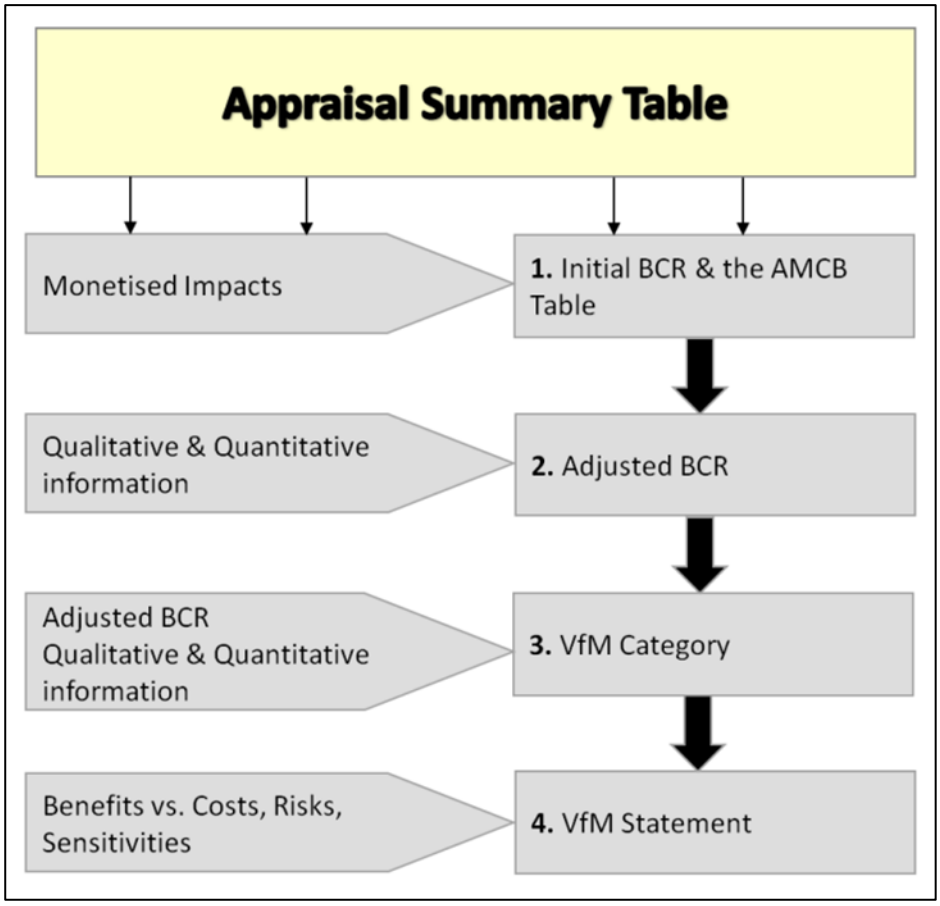


**Figure 16 - Value for Money Process**

**Stage 1 - Initial BCR**

The BCR calculations are based on best practice, and follow the DfT Active Mode Appraisal Toolkit, updated in May 2018. This version of the toolkit is more comprehensive than previous versions in terms of being a 'one-stop-shop' for producing the BCR and also taking in to account additional factors such as route length and quality of the provision and existing proposed on the route. The calculations for the separate links, as generated by the Toolkit are included as Appendix D.

The new version of the toolkit allows for a range of inputs, of which key criteria include the following;

- Average proportion of a trip which uses the scheme infrastructure - this is based on the length of the link as a proportion of the average total length of a trip, for cycling, the average length of trip is 5.6km. For the Orange Link, the length of the scheme is 1675m and therefore 1675 / 5600 equates to 30%.
- New trips as a result of the scheme - we have taken this value from the Active Travel Toolbox Infrastructure Impact Tool and calculated for each link according to its characteristics and checked against case studies - further details in the document below;
- Decay Rate - due to the nature of the schemes, we do not anticipate the impact of the link to diminish year by year following investment, and therefore this is set as 0%;
- Appraisal Period - The appraisal period should correspond to the expected asset life. For all of the links this is assumed to be 20 years, apart from the Red Link Urban as it is primarily a lining scheme, and therefore is assumed to have a shorter asset life of 10 years.

**Stage 2 - Adjusted BCR**

The second stage of a Value for Money assessment would typically build on the initial monetised costs and benefits and considers qualitative and quantitative information on those impacts which can be monetised but where the evidence base used to derive the monetary values is less robust or unavailable.

In this particular case it wasn't deemed proportionate to monetise these impacts, however they have nevertheless been appraised and given an overall qualitative assessment score. Therefore, the Initial BCR is the same as the Adjusted BCR.

**Stage 3 - Qualitative Impacts**

Where a monetary assessment was not feasible, analysis of non-monetised impacts have been undertaken in accordance with the methodology recommended within the relevant WebTAG units and the results have been summarised within this section. These impacts are as follows:

- Impacts on Townscape;
- Impacts on Historic Environment;
- Impacts on Biodiversity;
- Impacts on Water Environment;
- Impacts on Security;
- Impacts on Access to Services;
- Impacts on Affordability; and
- Impacts on Severance.

**Stage 4 – Value for Money (VfM) Statement**

Finally, at Stage 4 a Value for Money conclusion has been drawn considering the evidence pulled together from Stages 1 to 3.

## 3.3. Appraisal Criteria for the Scheme

The economic case for this scheme is focussed on:

- Assessing the direct, localised, monetised economic benefit of the scheme;
- Qualitative appraisal of wider scheme benefits; and
- Assessing the scheme benefits against the scheme costs.

| Appraisal Criteria | Direct / Indirect Impact Appraisal | Approach Adopted |
|---|---|---|
| Social Benefits including; Journey Quality, Accidents and Decongestion | Direct | Calculated using the DfT Active Mode Appraisal Toolkit and based on usage and modal shift projections recommended appraisal approach set out in WebTAG A5.4. |
| Environmental Benefits including; Noise, Local Air Quality and Greenhouse Gas emission savings | Direct | Calculated using the DfT Active Mode Appraisal Toolkit and based on usage and modal shift projections recommended appraisal approach set out in WebTAG A5.4. |
| Active Mode Health Benefits | Direct | Calculated using the DfT Active Mode Appraisal Toolkit |
| Wider economic and social impacts | Indirect | Qualitative Assessment |

**Table 6 - Appraisal Criteria for Assessing Scheme Performance**

The economic case has been developed based on the comparison of a without scheme 'do nothing' scenario and a 'do something' scenario.

The scheme assessment is based on conservative estimates of potential benefits to cyclists and walkers following the implementation of the new cycle link. The primary financial benefits associated with the Lydney Cycle Scheme are:

- The physical activity benefits of cycling and walking in terms of reduced mortality and absenteeism;
- Environmental improvements, a reduction in greenhouse gases and noise pollution and air quality improvements from the transfer of car trips to walk/cycle;
- Journey quality benefits for users of the route;
- Decongestion savings; and
- Accident reduction benefits.

**Existing and Future Demand – Cyclist and Walkers**

Due to proportionality and budget constraints the existing baseline data was limited for this Full Business Case. Consequently only two surveys were carried out on Wednesday, 05 July 2017. Counts were place on B4234 Forrest Road, Newerne Street, Swan Way, and Hill Street and Station Road. The survey was completed between 07:00 & 19:00 and the day was considered a typical representative in terms of weather and timings.

The Location of the surveys can be seen below represented by the stars;

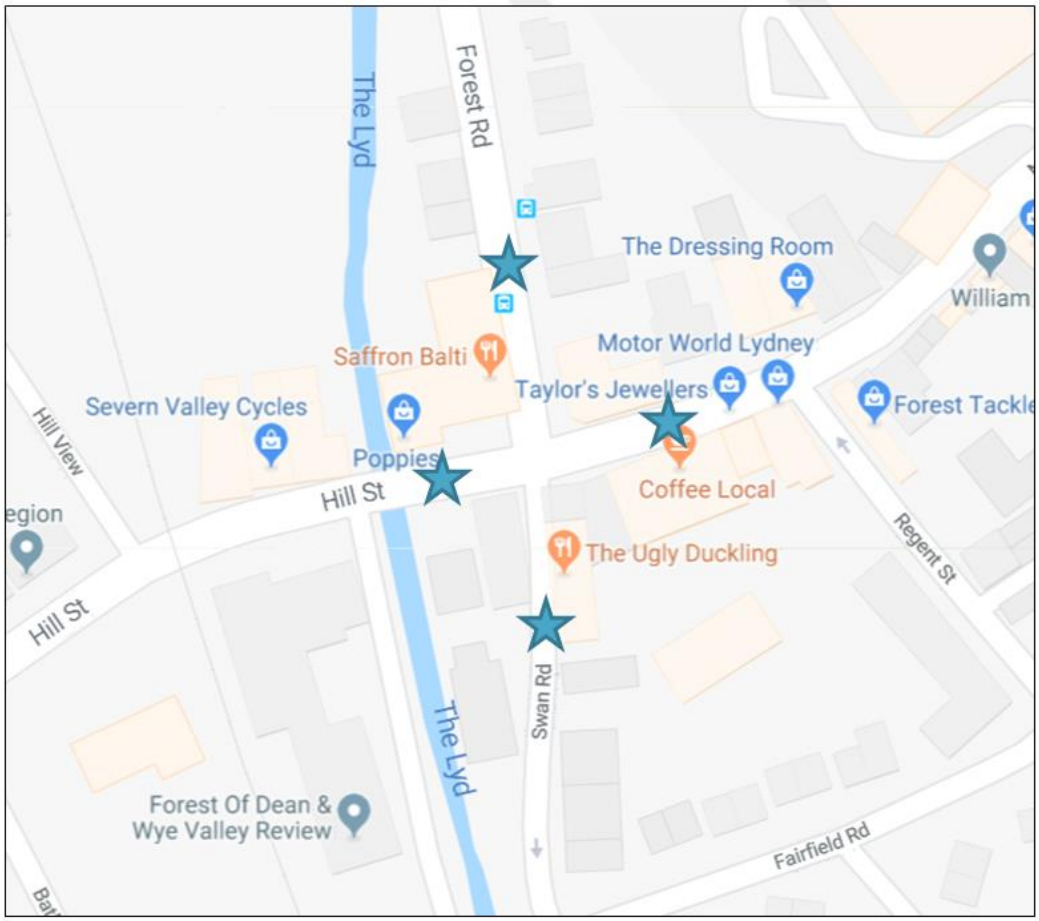


**Figure 17 - Location of Survey Point 1**

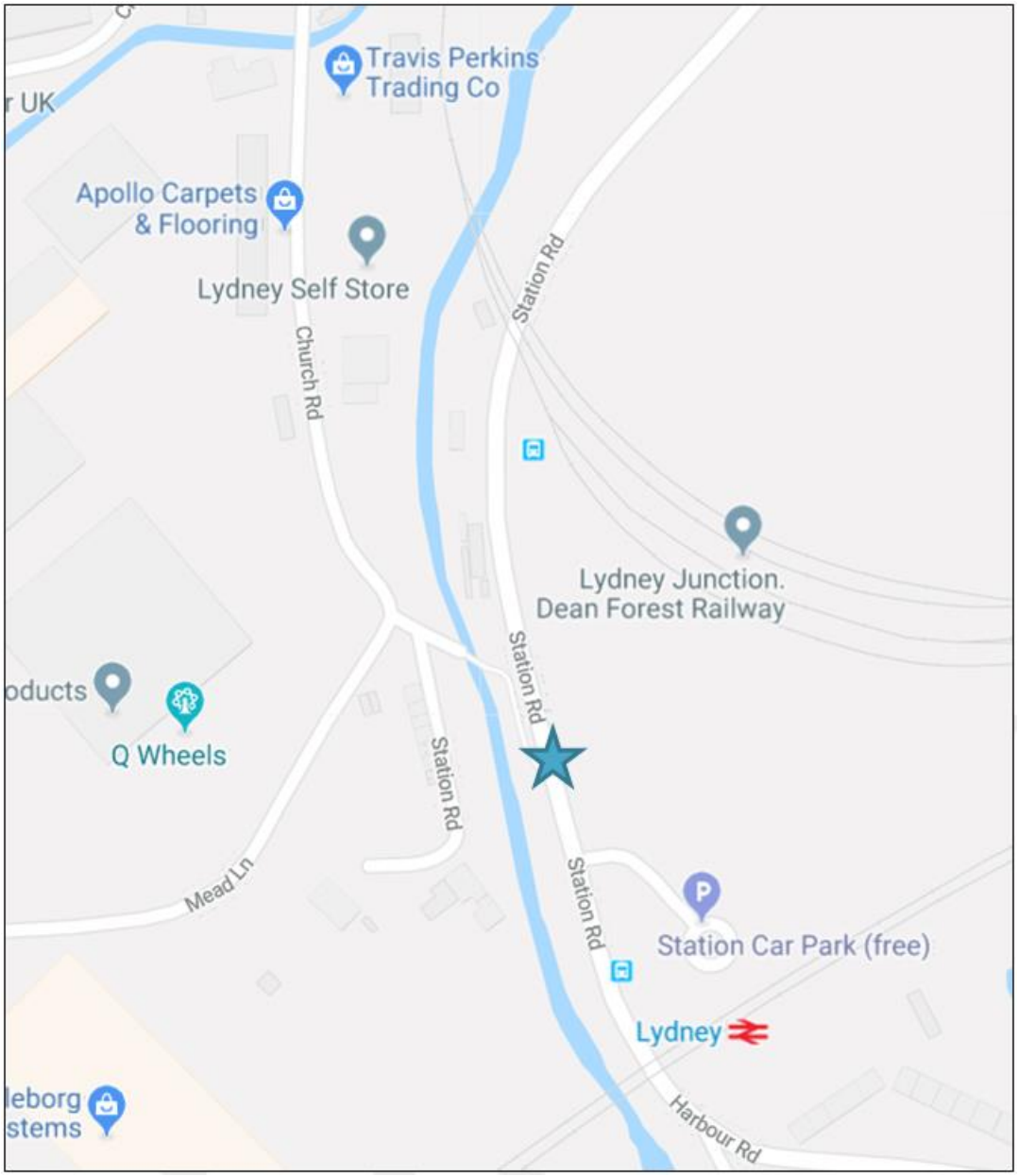


**Figure 18 - Survey Point 2 on Station Road**

Survey Point 1 provides a count for cyclists and pedestrians for the Red Link, and Survey Point 2 provides data for the Purple Link.

### Case Study Evidence and Associated Uplifts

Future year 'with scheme' usage has been calculated by applying a post intervention uplift to the existing 2018 cyclist and pedestrian demand. The section below describes the process used to calculate future demand.

The cycle uplift has been calculated using the Sustrans Infrastructure Impact Tool which forms part of their Active Travel Toolbox. This tool contains a large evidence base dataset for walk and cycle schemes. The toolkit is considered to be robust and the most accurate way to define future cycle demand given extensive and detailed evidence based which incorporates pre and post intervention counts and case studies. Based on the type of intervention (cycle and pedestrian tracks) and the urban classification of the study area the toolkit estimates a 72% increase in pre-intervention cycling trips, 31% of which are estimated to be trips that could have previously been made by car.

Due to the nature of this scheme no pedestrian demand increases have been calculated, although it is anticipated pedestrians will continue to use the route and will benefit from aspects of improved journey quality and health benefits.

**Scheme Performance Results**

**Purple Link**

| Cyclists and pedestrians before and after intervention | | |
|---|---|---|
| | Cyclists | Walkers |
| 2018 (usage per day) Includes 1 years growth from 2017-2018 | | |
| Trips | 83 | 253 |
| Individuals | 46 | 139 |
| 2019 (usage per day) 'without scheme' Includes 2 years growth from 2017-2019 | | |
| Without scheme (trips) | 83 | 252 |
| With scheme (trips) | 142 | 253 |
| Usage difference (trips) | 60 | 0 |
| Without scheme (individuals) | 46 | 139 |
| With scheme (individuals) | 78 | 139 |
| Usage difference (individuals) | 33 | 0 |

**Table 7 -Predicted increase in Walking & Cycling, before and after proposed scheme (Purple Link)**

**Orange Link**

| Scheme Performance - Cyclists and pedestrians before and after intervention | | |
|---|---|---|
| | Cyclists | Walkers |
| 2018 (usage per day) Includes 1 years growth from 2017-2018 | | |
| Trips | 30 | 302 |
| Individuals | 16 | 166 |
| 2019 (usage per day) 'without scheme' Includes 2 years growth from 2017-2019 | | |
| Without scheme (trips) | 30 | 302 |
| With scheme (trips) | 51 | 302 |
| Usage difference (trips) | 21 | 0 |
| Without scheme (individuals) | 16 | 166 |
| With scheme (individuals) | 28 | 166 |
| Usage difference (individuals) | 12 | 0 |

**Table 8 - Predicted increase in Walking & Cycling, before and after proposed scheme (Orange Link)**

**Green Link**

| Cyclists and pedestrians before and after intervention | | |
|---|---|---|
| | Cyclists | Walkers |
| 2018 (usage per day) Includes 1 years growth from 2017-2018 | | |
| Trips | 83 | 253 |
| Individuals | 46 | 139 |
| 2019 (usage per day) 'without scheme' Includes 2 years growth from 2017-2019 | | |
| Without scheme (trips) | 83 | 252 |
| With scheme (trips) | 142 | 253 |
| Usage difference (trips) | 60 | 0 |
| Without scheme (individuals) | 46 | 139 |
| With scheme (individuals) | 78 | 139 |
| Usage difference (individuals) | 33 | 0 |

**Table 9 - Predicted increase in Walking & Cycling, before and after proposed scheme (Green Link)**

**Red Link Rural**

| Scheme Performance - Cyclists and pedestrians before and after intervention | | |
|---|---|---|
| | Cyclists | Walkers |
| 2018 (usage per day) Includes 1 years growth from 2017-2018 | | |
| Trips | 25 | 998 |
| Individuals | 14 | 549 |
| 2019 (usage per day) 'without scheme' Includes 2 years growth from 2017-2019 | | |
| Without scheme (trips) | 25 | 997 |
| With scheme (trips) | 43 | 998 |
| Usage difference (trips) | 18 | 2 |
| Without scheme (individuals) | 14 | 549 |
| With scheme (individuals) | 24 | 549 |
| Usage difference (individuals) | 10 | 0 |

**Table 10 - Predicted increase in Walking & Cycling, before and after proposed scheme (Red Link Rural)**

**Red Link Urban**

| Scheme Performance - Cyclists and pedestrians before and after intervention | | |
|---|---|---|
| | Cyclists | Walkers |
| 2018 (usage per day) Includes 1 years growth from 2017-2018 | | |
| Trips | 50 | 1916 |
| Individuals | 27 | 1054 |
| 2019 (usage per day) 'without scheme' Includes 2 years growth from 2017-2019 | | |
| Without scheme (trips) | 50 | 1913 |
| With scheme (trips) | 57 | 1916 |
| Usage difference (trips) | 8 | 3 |
| Without scheme (individuals) | 27 | 1054 |
| With scheme (individuals) | 32 | 1054 |
| Usage difference (individuals) | 4 | 0 |

**Table 11 - Predicted increase in Walking & Cycling, before and after proposed scheme (Red Link Urban)**

**Present Value Outcomes from Economic Appraisal**

The costs and benefits are calculated based on the following:

- Scheme cost (2018 prices);
- The base costs have been adjusted to incorporate real cost increases (WebTAG A1.2) in construction costs;
- Cost adjusted for quantified risk (10%) and optimism bias (3%);
- Risk and optimism bias adjusted cost converted to 2010 prices;
- Discounted Risk and optimism bias adjusted cost in 2010 prices; and
- Discounted Risk and optimism bias adjusted cost in 2010 market prices.

## 3.4. BCR Calculations

The approach to calculating the Economic Benefit of the scheme, by applying the BCR calculations, was established by agreeing the benefits of the Purple Link.

The following key assumptions need to be taken in to account when assessing the overall benefit for the scheme:

- Present Value Benefit (PVB) for all links is based on the agreed approach for the Purple Link;
- Present Value Costs (PVC) taken from the latest estimate of costs to include all preparatory and design fees;
- The cycling and pedestrian numbers for the Purple and Red Links are based on available counts - an assumption has been made for the Red Link that the usage of the rural section is 50% of the urban section;
- Assumptions have been made in terms of the existing and predicted cycling numbers for Orange and Green Links – assumptions are based on the same predicted numbers as for the Purple Link;
- The Orange and Green Links will attract leisure, commuting and cyclists to and from schools, and therefore justification exists for a 'fair to medium' level of cycling throughout the day.

The overall BCR for the scheme has been calculated by comparing the cumulative costs against the benefits of the component sections of the scheme. This can be summarised as follows, in terms of costs and benefits, with the overall Initial BCR for the scheme calculated as 2.28. The Scheme Net Present Value (NPV) is calculated as £970,260, as shown in the table below.

| Cycle Links | Present Value Benefit (PVB) | Present Value Cost (PVC) | Revised BCR |
|---|---|---|---|
| Red Link - Rural | £ 350,960.00 | £ 300,430.00 | **1.17** |
| Red Link - Urban | £ 67,730.00 | £ 55,970.00 | **1.21** |
| Purple Link | £ 489,210.00 | £ 166,300.00 | **2.94** |
| Orange Link | £ 240,800.00 | £ 119,520.00 | **2.01** |
| Green Link | £ 578,170.00 | £ 114,390.00 | **5.05** |
| | **£ 1,726,870.00** | **£ 756,610.00** | |
| | **Scheme NPV** | **£ 970,260.00** | |
| | **Scheme BCR** | **2.28** | |

**Table 12 - BCR Calculation for the proposed Lydney Cycle Improvement scheme**

## 3.5. Economy

### Business users and transport providers

As the scheme is not a highway based improvement, no appraisal has been undertaken through highway economics software such as PEARS. The analysis that has been undertaken, in accordance with the guidance, is within the cycling Net Present Value calculations.

### Reliability impacts on business users

In accordance with WebTag guidelines this scheme is not expected to have any significant impact on journey time reliability for business users and transport providers. Therefore, the impact is assessed qualitatively as neutral.

### Regeneration

No regeneration areas (as specified in the Web Tag) are expected to be impacted by the implementation of the scheme. Quantitatively the impact is assessed as Moderately Beneficial, as the cycle routes will contribute to the regeneration of Lydney Harbour, residential sites to the east of Lydney, and add to the benefit gained by linking to wider cycle routes throughout the Forest of Dean.

### Wider impacts

There are not considered to be any significant wider impacts of the scheme, due to the local nature of the cycle and pedestrian improvements, and that there will be no impact on traffic flows. Therefore the impact is assessed qualitatively as Neutral.

## 3.6. Environment

### Noise

This section considers the proposed scheme in terms of the potential noise and vibration impacts during both operation and construction. Operational effects are considered permanent in nature while construction effects are considered temporary in nature.

Noise policy in England is managed through the Noise Policy Statement for England (NPSE). The main aims of the policy statement are to:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life;
- Where possible, contribute to the improvement of health and quality of life.

The assessment of permanent effects follows the guidance stated in the Design Manual for Roads and Bridges (DMRB) HD213/11 Noise and Vibration. The DMRB states that 'a change in road traffic noise of 1 dB LA10, 18h in the short term (i.e. when a project is opened) is the smallest that is considered perceptible. In the long term (typically 15 years after project opening), a 3 dB LA10, 18h change is considered perceptible.

As the proposed scheme is a cycleway, no traffic noise changes are expected therefore no adverse or significant adverse noise and vibration impacts are expected. Therefore, the first two aims of the NPSE are met. In fact, the scheme is expected to contribute to a reduction in the use of cars and buses in favour of quieter forms of transport such as cycling and walking. Therefore, the third aim of the NPSE which is to contribute to the improvement of health and quality of life is also met.

The assessment of temporary effects follows the guidance from BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1 Noise and Part 2 Vibration'.

Detail of the construction methodology is not currently known. However, there are noise sensitive receptors within 300m of all the proposed cycle links which have the potential to experience adverse noise impacts

during construction. The following paragraphs describe mitigation measures which are recommended in relation to reducing the impact of noise during construction. These measures are described in detail in BS 5228-1.

Good relations with people living and working in the vicinity of the site operations are of paramount importance. Early establishment of and maintaining good community relations throughout the duration of the contract should help to alleviate people's concerns. It is suggested that the organisation carrying out work on site should appoint a responsible person to liaise with the public. This may include issuing a letter detailing the reason and duration of the works.

Wherever possible, noise should be controlled at source as this limits the spread of noise. Mitigation measures for the proposed scheme should include, in the following order of preference:

- Control of noise at source;
- Control of the spread of noise;
- Provision of additional mitigation at noise-sensitive premises (NSPs).

Control of noise at source includes the following measures:

- Use of best practicable means and best practice methods;
- Reprogramming of concurrent activities;
- Enclosures.

The best practice method for each activity is outlined below and should be adhered to wherever possible during the construction phase:

- All compressors should be sound reduced models fitted with properly lined and sealed covers, which should be kept closed whenever the machines are in use. All ancillary pneumatic percussive tools should be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Plant and machinery in intermittent use shall be shut down in intervening periods of non-use or, where this is impracticable, they shall be throttled down to a minimum.
- Unattended plant outside normal working hours should, if possible, be powered by electricity otherwise acoustic enclosures will be necessary to minimise noise levels.
- Where possible, plant with directional noise characteristics should be positioned in such a way as to minimise noise at adjacent properties.
- Static machines shall be sited as far away as practicable from inhabited buildings (or other noise sensitive premises) and/or behind temporary screens or enclosures.
- Plant should be well maintained and effectively silenced.

Reprogramming of concurrent activities is recommended and the percentage of on times should be reduced if possible to mitigate the significance of effects.

If noise cannot be controlled at source, then alternative methods of reducing the noise impact should be introduced, including noise reducing screens.

For maximum benefit, screens should be positioned close to the source of noise or close to the receiver. For a barrier to be effective, care is needed in its design, siting and construction. For example, by reflecting sound a barrier can simply transfer a problem from one receiving position to another.

It is the responsibility of the Contractor to agree appropriate mitigation measures with the local authority's Environmental Health Officer.

## Air Quality

This section outlines the contribution to the business case from the permanent and temporary effects to air quality arising from the upgrades to the Lydney Cycling Improvements. A qualitative assessment will be undertaken to identify key areas where further assessment may be necessary in order to quantify any impacts.

### European Union Ambient Air Quality Directive

The European Directive 2008/50/EC (Ref. 1) sets the legally binding "limit values" for member states to incorporate into domestic law for concentrations of various air pollutants. This directive replaced nearly all previous pieces of European air quality legislation and includes the requirements for monitoring and reporting of air quality at national and local level.

Relevant to road transport, the directive sets the limits for nitrogen dioxide (NO2), nitrous oxides (NOX), and particulate matter at 10µm (PM10) and 2.5µm (PM2.5).

### Air Quality Standards Regulations

The Air Quality Standards Regulations 2010 (Ref. 2) as amended codify into English law the requirements from the European Union Directive 2008/50/EC.

### Air Quality Strategy

Under the Environment Act 1995 (Ref. 3) the UK Government and devolved administrations are required to produce a National Air Quality Strategy (AQS) (Ref. 4) to include "objective values". The AQS includes objectives for 10 pollutants (benzene, 1, 3-butadiene, carbon monoxide, lead, polycyclic aromatic hydrocarbons, nitrogen dioxide, sulphur dioxide, particulate matter – PM10 and PM2.5 and ozone) and the dates by which they are expected to be achieved.

| Pollutant | Objective/ Limit Value | Measure as | Date to be achieved by and maintained thereafter | | |
|---|---|---|---|---|---|
| | | | AQS | Regs | EU |
| NO2 | 200 µg/m3<br>Not to be exceeded more than 18 times a year | 1-hour mean | 31-Dec-05 | 31-Dec-05 | 1-Jan-10 |
| | 40 µg/m3 | Annual mean | 31-Dec-05 | 31-Dec-05 | 1-Jan-10 |
| NOX | 30 µg/m3 | Annual mean | 31-Dec-00 | 31-Dec-00 | 19-Jul-01 |
| PM10 | 50 µg/m3<br>Not to be exceeded more than 35 times a year | 24-hour mean | 31-Dec-04 | 31-Dec-04 | 1-Jan-05 |
| | 40 µg/m3 | Annual mean | 31-Dec-04 | 31-Dec-04 | 1-Jan-05 |
| PM2.5 | 25 µg/m3 | Annual mean | 2020 | 1-Jan-15 | 1-Jan-15 |
| | 15% reduction at urban background | Exposure Reduction | Between 2010 and 2020 | - | - |
| | 20% reduction at urban background | Exposure Reduction | - | - | Between 2010 and 2020 |

**Table 13 - Air Quality Strategy objective values**

Under Part IV of the Environment Act 1995 local authorities are required to review air quality in their area and report annually. Should it become necessary, local authorities are required to declare an Air Quality Management Area (AQMA) when concentrations of pollutants frequently and regularly exceed the limit values and objective values. Under these circumstances an Air Quality Action Plan (AQAP) must also be put in place to describe how air quality will be improved back to a level of compliance.

### The National Planning Policy Framework

The National Planning Policy Framework (NPPF) (Ref. 5) was published on 24 July 2018 and sets out the Governments planning policies for England and how these are expected to be applied. The purpose of the NPPF is to help achieve sustainable development.

NPPF Section 9 Promoting sustainable transport (paragraph 103), states that significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and

offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.

Section 15 Conserving and Enhancing the Natural Environment states that planning policies and decisions should:

- Contribute to and enhance the natural and local environment by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality (paragraph 170)

- Sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in AQMAs and Clean Air Zones is consistent with the local air quality action plan (paragraph 181).

Further guidance on the NPPF is located in the Planning Practice Guidance Notes (PPGN) (Ref. 6).

### Methodology

No statutory procedure exists for the environmental assessment of air quality impacts; therefore this assessment will make use of numerous pieces of guidance to produce a qualitative assessment using professional judgement.

### Transport Analysis Guidance

The Transport Analysis Guidance (TAG) Unit A.3 Environmental Impact Appraisal chapter 3 (Ref. 7) provides a methodology for the identification and quantification of the financial air quality impacts of transport improvement schemes. This guidance relies on quantitative input from other modelling software designed to predict concentrations of pollutants at specific locations.

The TAG Unit 5.1 Active Mode Appraisal (Ref. 8) provides guidance on a number of methods for the assessment of active travel investment schemes. It states that a number of factors can affect the appraisal of such schemes, with air quality included. Fundamental to the success of active travel schemes is the perceived journey ambience, i.e. fear of potential accidents, which can be a driver to a modal shift to sustainable active transport.

### Design Manual for Roads and Bridges

The Design Manual for Roads and Bridges (DMRB) Volume 11 Section 3 Part 1 HA 207/07 (Ref. 9) and subsequent Interim Advice Notes (IAN) provides guidance on the assessment of air quality as it relates to road improvement schemes. The DMRB provides guidance on levels of assessment: scoping; simple; detailed; mitigation / enhancement and monitoring. Both temporary and permanent air quality effects are addressed within this guidance within the local area and regionally.

### Institute of Air Quality Management

The Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) produced Land-Use Planning and Development Control: Planning for Air Quality v1.1 (Ref. 10). This document provides guidance for undertaking air quality assessments and how they should fit in with the planning requirements at the local planning authority level for both strategic and development level planning.

The IAQM also publishes Guidance on the assessment of dust from demolition and construction v1.1 (Ref. 11) which provides an outline semi-quantitative methodology for the assessment of the impacts on air quality during the construction phase of any development, along with recommended mitigation measures.

### Baseline Conditions

The Forest of Dean District Council 2017 Annual Status Report (Ref. 12) outlines the current air quality in the local authority area. Non-automatic monitoring is undertaken using 30 passive diffusion tubes. No automatic monitoring is undertaken by the Council. An AQMA is declared in the town of Lydney along the main B4231 High Street and Newerne Street, with branches including Bream Road and Forest Road. Following declaration of the AQMA in 2010, monitored levels of NO2 exceeded the limit value in 2012 before falling just below the limit value the following year. In subsequent years, there has been no discernible improvement. Outside of the AQMA, monitored concentrations are below the limit, but have shown a recent deterioration.

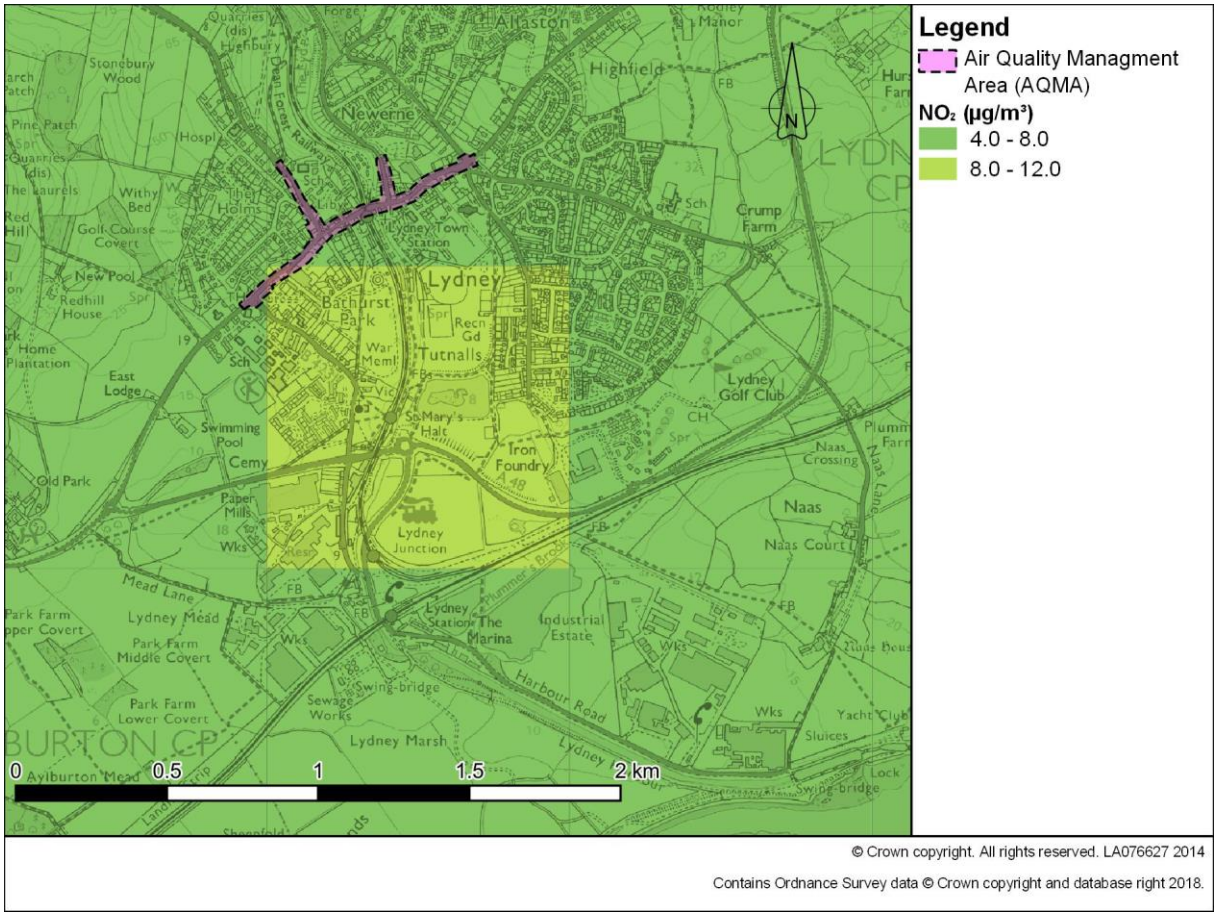


**Figure 19 - Background NO2 concentrations**

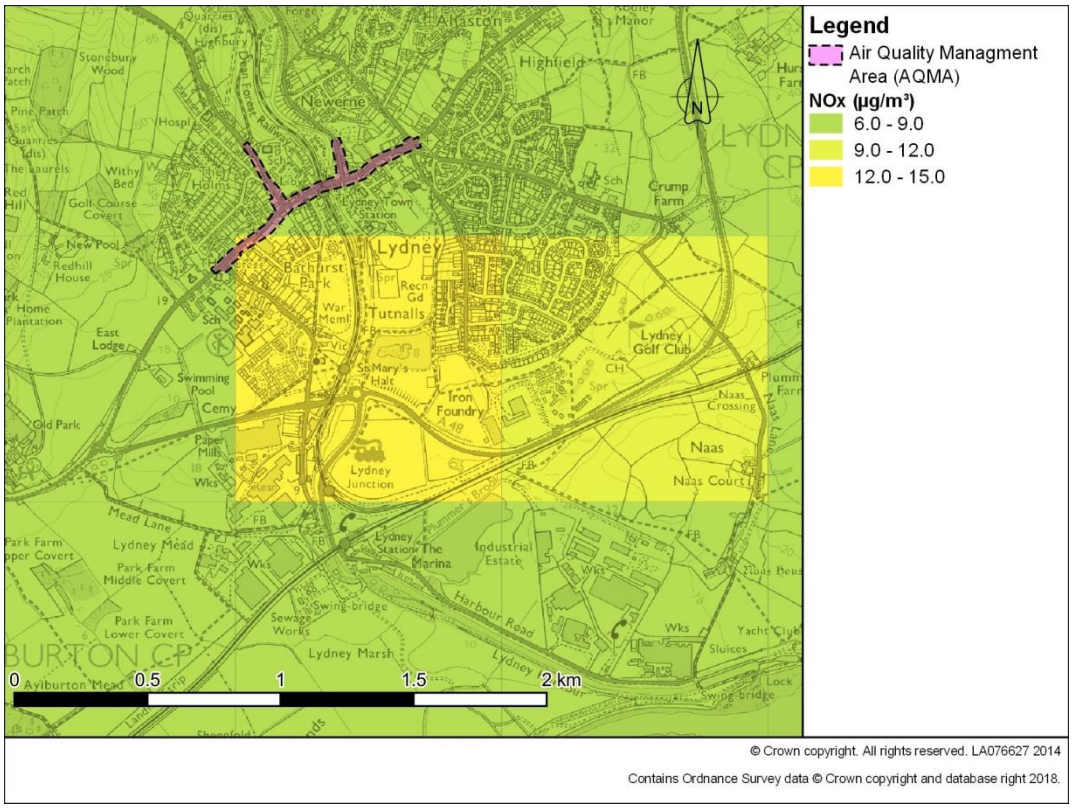


**Figure 20 - Background NOX concentrations**

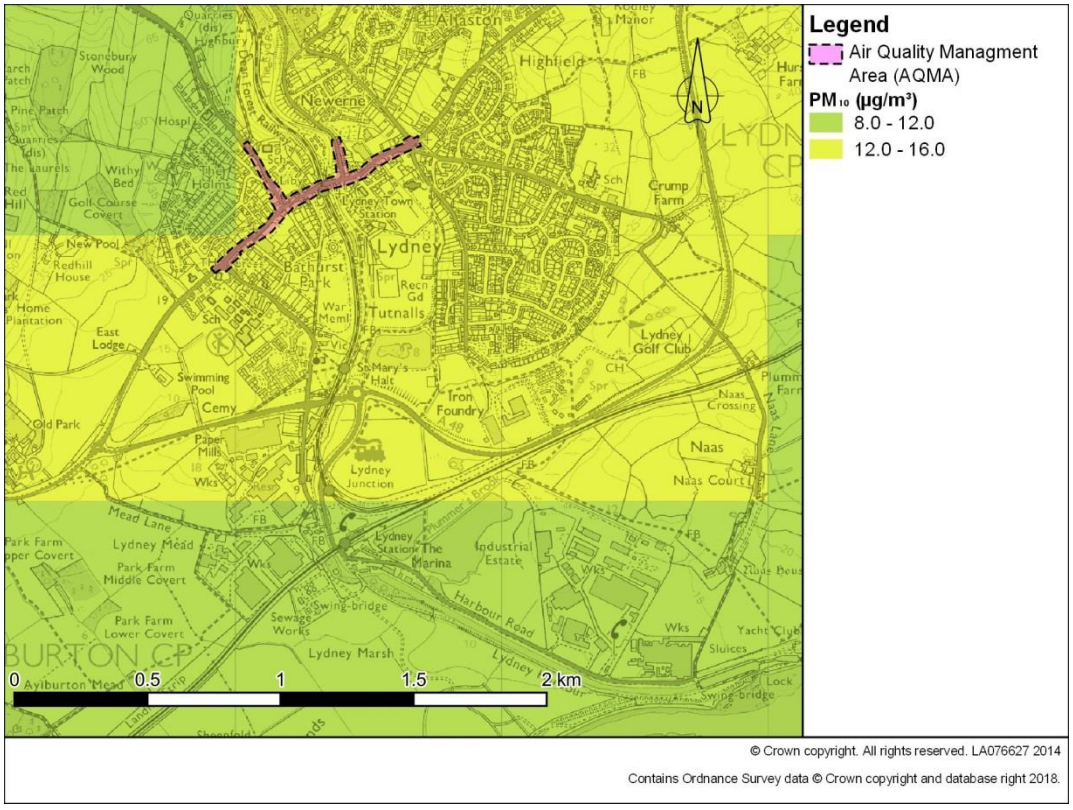


**Figure 21 - Background PM10 concentrations**

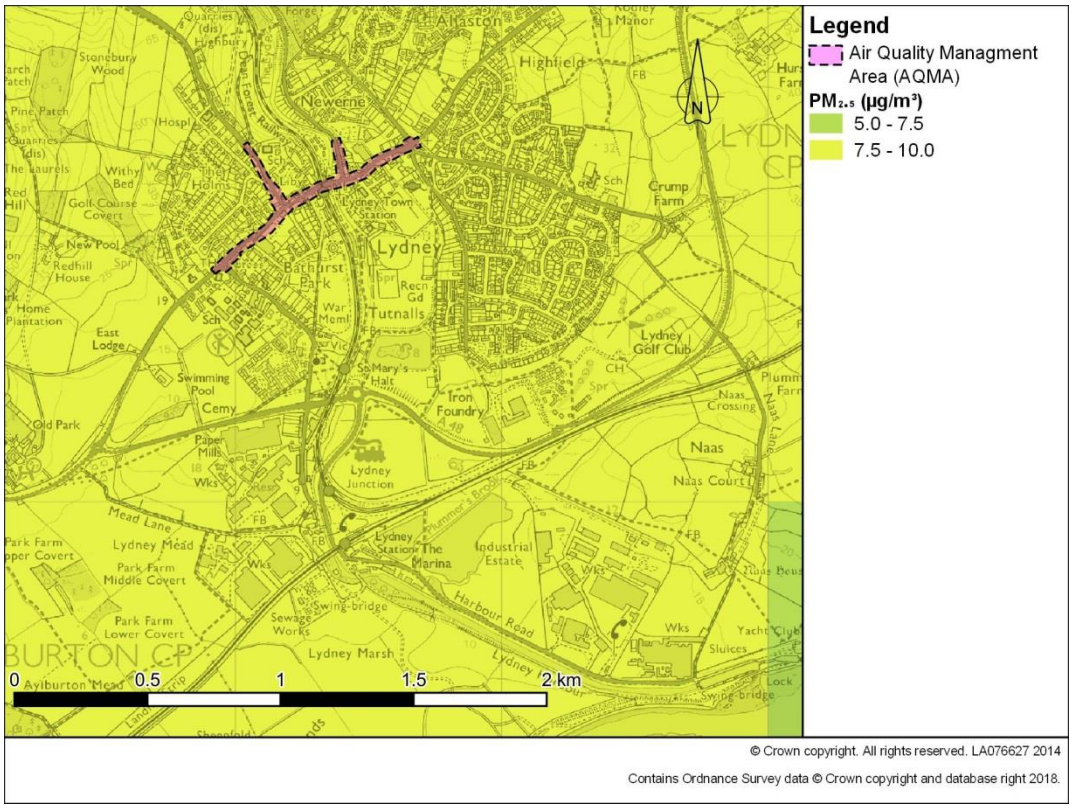


**Figure 22 - Background PM2.5 concentrations**

The figures above show that background air quality concentrations within the study area are all below 50% of the limit values for each pollutant. Figure 11 and 12 show elevated NO2 and NOX levels around the roundabout junction of the A48 and B4231. Figure 13 shows elevated levels of PM10 in the area including Lydney and the A48 corridor. Figure 20 shows concentrations of PM2.5 to be even across the study area.

Lydney is a small town consisting of mainly residential areas with an historic town centre. There are two primary schools and an academy school, and the Lydney and District Hospital in the north-west of the town. All of these are considered sensitive receptors.

Of note is the presence of the historic Dean Forest Steam Railway running through middle of the town.

There are no road links in Lydney used for the purposes of reporting compliance with the EU Air Quality Directive.

## Air Quality Assessment

### Temporary Effects

The majority of works consist of adapting existing facilities and installation of signage at pavement level for which the health and amenity risk from dust is likely to be negligible. The Purple and Blue Links require the construction of new path or excavation and resurfacing of an existing off-road path, which again is likely to present a negligible dust risk.

The Lime Green Link is not assessed as it is to be associated with the planned housing developments.

### Permanent Effects

The five assessed links in concert provide access between Lydney town centre and Lydney railway station, which is a short distance outside of the town. The Green Link passes the Dean Academy in the east, and the Blue Link will connect with future housing developments in the west. The potential for a modal shift to

sustainable active transport for commuting, the school run and utility trips to the town centre will be enhanced with the installation of these routes. However, this may take time to fully materialise.

Taken in the context of committed residential and commercial developments, it is expected that traffic in the town of Lydney will increase with commensurate increases in the concentrations of traffic related air pollutants. Arterial routes in and out of the town are expected to experience the highest concentrations. The additional active travel provision may partially mitigate this effect. It is noted that increases in overall traffic will occur in both scenarios  with and without scheme (Do Nothing and Do Minimum).

The Hill Street and Newerne Street section of the Red Link are within the AQMA and may experience increases in concentrations of pollutants. Newer vehicles with smaller, more efficient engines, and hybrid or electric vehicle technology may mitigate this over time. Hill Street is on a slight incline, and includes areas that could be considered urban canyons where the capacity to disperse air pollutants is low. This is particularly the case for Newerne Street and associated junctions. The changes to traffic flow may dissuade travellers from using their private cars to travel to the town centre; however the presence of the Tesco Superstore within the AQMA is likely to remain a significant generator of motor traffic and thus a source of emissions.

#### Conclusions

The construction activities for the installation of the links are unlikely to affect local air quality in a significant manner.

Considering permanent effects, the committed and planned growth in housing in the town may create significantly more traffic in the area and it is likely that further initiatives, both from the district council and in partnership with local business, may be necessary to provide the incentive to use modes of travel that are seen as inconvenient compared to the private car. The Purple Link to Lydney railway station provides the potential for such incentives.

Air quality in Lydney may not be immediately improved by the installation of these active travel links. As reported by Song et al (Ref. 14), modal shift to sustainable active transport may take two or more years to materialise in a measurable way, and the presence of infrastructure is a significant contributory but not determining factor in this shift. Proximity to infrastructure and demographic group are also significant factors according to Panter and Ogilvie (Ref. 15). As reported in these studies, leisure trips using active transport infrastructure are likely to be a precursor to their use for utility trips. The Red Link to the village of Aylburton is likely to contribute to leisure trips. Leisure links to the north to the Forest of Dean should be considered as a future development. Improvements in vehicle technology are also likely to take a number of years to impact on air quality concentrations. Therefore the scheme has been assessed as neutral on its impact upon air quality.

### Greenhouse gases

This section outlines the contribution to the business case from the changes to emissions of greenhouse gases arising from the upgrades to the Lydney Cycle Ways. A qualitative assessment has been undertaken to identify key areas where further assessment may be necessary in order to quantify any impacts.

#### Legislation and Guidelines

The Transport Analysis Guidance (TAG) Unit A.3 chapter 5 (Ref. 16) provides a methodology for the identification and quantification of the financial greenhouse gas impacts resulting from transport improvement schemes.

#### Climate Change Act

The Climate Change Act 2008 (Ref. 17) sets binding targets on the emissions of key greenhouse gas pollutants so that the UK might respond to the challenge of Climate Change and comply with its international obligations. The main aims of the Act are:

- Improve carbon management which helps the move towards a low-carbon economy;
- Demonstrate international leadership in sharing responsibility for reducing global emissions.

The Act sets a legally binding target of at least 80% reduction in greenhouse gas emissions by 2050 (based on 1990 levels). A target to reduce emissions by 34% by 2020 is also in place. A carbon budgeting system has been put in place to track progress towards these targets as described in the UK Low Carbon Transition Plan.

#### Methodology

No statutory procedure exists for the environmental assessment of greenhouse gas impacts; therefore this assessment will make use of two pieces of guidance to produce a qualitative assessment using professional judgement.

#### Transport Analysis Guidance

The Transport Analysis Guidance (TAG) Unit A.3 chapter 5 provides a methodology for the identification and quantification of the financial air quality impacts of transport improvement schemes. This guidance relies on quantitative calculations for the energy used by each mode of transport and the conversion into tonnes of carbon dioxide equivalent units (tCO2e).

#### Institute of Environmental Management and Assessment

The Institute of Environmental Management and Assessment (IEMA) provide guidance on the assessment of greenhouse gas emissions (Ref. 18) and their significance according to the following principles:

- All projects create GHG emissions that contribute to climate change;
- Climate change has the potential to lead to significant environmental effects; and
- There is a GHG emission budget (issued by the Intergovernmental Panel on Climate Change) that defines a level of dangerous climate change whereby any GHG emission within that budget can be considered significant;
- In the absence of defined criteria for the significance of GHG emissions, all emissions of GHG are considered significant.

#### Greenhouse Gas Assessment

Greenhouse gas emissions are likely to remain unchanged immediately following introduction of the links. As discussed in the air quality assessment, the modal shift to sustainable active transport may take a number of years to impact on greenhouse gas emissions.

The impacts of committed and planned residential and commercial developments may lead to increases in greenhouse gases until such times as a modal shift to sustainable active transport might begin and vehicle technology improves.

#### Conclusion

There are likely to be greenhouse gas impacts from the construction of the scheme and limited initial potential for a reduction in greenhouse gas emissions once operation commences.

Reductions in greenhouse gas emissions could be increased with time and awareness of the presence of the active travel links, and also with the introduction of further incentive schemes by both the district council and local businesses.

### Landscape and Townscape

Desktop assessments have been carried out to understand the likely impact of the cycleway schemes on the local landscape and townscape, in order to inform the emerging business case for the cycling improvements.

Further more detailed work will include consultation with relevant local authority officers to obtain local knowledge and concerns, detailed tree and landscape assessment surveys to fully understand the impact of work on the existing trees and landscape, and inform opportunities for mitigation and new enhancement landscaping strategies. It is recommended that these will be undertaken once the scheme business case is approved.

Regarding the proposed Purple Link, Swan Road to Lydney station, the key concerns are that works close to the A48 roundabout and improvements to the crossing will involve some minimal shrub and canopy loss in line with Gloucestershire County Council's maintenance policy to improve visibility at the crossing points and proposed widening of the cycleway alongside the boating lake, and adjacent to Lydney Cricket Club may result in loss of trees to make space for construction. Careful detailing of hard surfacing, barriers and signage will ensure no adverse townscape impacts, and will provide enhancements over the existing.

The Purple Link would not have any significant long term adverse impact on the landscape or townscape, as the extent of widening is very limited and in some areas it may be possible to use alternative methods of construction to further minimise any impact on existing trees. There is a great opportunity during detailed design of the scheme to consider the benefits of additional planting for local landscape enhancement careful detailing of hard surfacing, barriers and signage will ensure no adverse townscape impacts, and will provide enhancements over the existing.

At proposed Blue Link Oakdale estate to Purple Link, although the cycleway will be principally across open amenity grassland there will be minimal shrub and canopy loss in line with Gloucestershire County Council's maintenance policy at the Camborne Place junction to make way for construction and provide clear visibility splays.

Within Orange Link Hams Road to Blue Link, there is an avenue of mature trees between Lydney Recreation Ground and the rear of residential properties along Beaufort Drive, and these will require selective pruning to raise canopies above the cycle path.

On the Green Link, between Dean Academy School and Purple Link, the route passes alongside trees and bushes that will have to be pruned, within the Forest of Dean Lydney - Conservation Area. There is potential for adverse impacts on the trees in this area.

Red Link, Lydney town centre to Aylburton, the proposed route passes through the town centre, where careful detailing of hard surfacing, and any street furniture barriers or signage will ensure no adverse townscape impacts.

In order to progress a detailed highway design and to develop detailed mitigation, an additional site based Landscape and Townscape Appraisal Assessment should be undertaken after approval of the business case. Further recommendations include that a detailed arboriculture assessment of trees likely to be affected by the construction works and by the long term management of the cycle routes should be undertaken and detailed landscape and townscape design proposals should be undertaken by a suitably qualified landscape professional.

In conclusion, for this Business Case, the potential for impact on The Landscape and Townscape is considered neutral, with enhancement opportunities.

**Historic Environment**

A preliminary desk-top scoping appraisal of the designated cultural heritage resource has been undertaken on the Purple, Blue, Orange, Green and Red Links. Non-designated heritage assets were not including within this appraisal.

Consultation was undertaken with the County Archaeological Service to determine the potential for impacting upon the non-designated archaeological resource. They have confirmed, considering the nature and scale of the proposals, that no further archaeological assessment or mitigation will be required.

The key designated heritage assets which are located within 100m of the five links comprise:

- Scheduled Monument (and Grade II listed building) known as Village Cross located in the roadway at the Church Road/High Street (Green Link);
- Grade I Listed Building (St Mary's Church); two Grade II* Listed Buildings (churchyard monuments); Grade II listed buildings (numerous monuments in churchyard and Vicarage to the north of the church) located off southern section of Church Road (Purple and Green Links);

- Grade II Listed 'Pedestrian Bridge over Disused Rail Line' (Purple and Blue Links)
- Two Grade II listed buildings (Baptist Chapel and Althorpe House) north of the High Street;
- Lydney Conservation Area: Green and Red Links are partly located within and adjacent to the Conservation Area; Purple and Blue Links are partly located adjacent.

During the detailed design phase, it is advised that the Local Planning Authority Conservation Officer and Historic England are consulted to ensure that no negative effects result from the proposals in relation to these designated heritage assets and their settings. Potential concerns which may be raised include the effect of vegetation clearance along the Purple Link upon the setting of the listed buildings associated with St Mary's Church, the line markings proposed immediately adjacent to the Scheduled Monument and surface treatments, road linings and replacement kerbing within the Conservation Area. Where alterations within the Conservation Area are undertaken on a like-for-like basis negligible effect is anticipated.

In terms of the built heritage further assessment will take the form of consultation with the relevant stakeholders (County Archaeology, Historic England and LPA Conservation Officer), who will be invited to determine the level of their on-going involvement and to inform and advise upon appropriate mitigation strategies. The designated heritage assets should form part of the Landscape and Visual Impact Assessment and enhancement of these assets will form part of the landscape design. Where mitigation is in place the effect upon the built heritage is anticipated to be Neutral.

**Biodiversity**

Desktop assessments and surveys have been carried out to understand the likely impact of the cycleway schemes on the local biodiversity and ecology to inform the emerging business case for the cycle and pedestrian improvements.

A desktop study of the scheme extents and the surrounding 2km radius has been carried out and is intended to record relevant habitats, including any that are formally designated and non-designated sites for nature conservation, and to highlight the potential for legally-protected or otherwise notable species. An extended Phase 1 Habitat Survey of the scheme extents was completed at the end of August 2018 to confirm the conservation significance of the scheme area, to assess the potential for impacts on habitat and species likely to be present and to determine the scope and extent of any additional ecological surveys that may be required before such a confirmation can be made.

The scheme at its nearest location is situated approximately 15 metres away from the Severn Estuary Ramsar Site (UK11081), Special Protection Area (UK9015022), Special Area of Conservation (UK0013030) and Site of Special Scientific Interest (1077338). The scheme at its nearest location is situated 2050 metres away from both the Wye Valley and Forest of Dean Bat Special Area of Conservation (UK0014794) and the Devil's Chapel Scowles Site of Special Scientific Interest (1019205). Owing to the proximity to these European statutory sites, it will be required to submit a Habitat Regulation Assessment to Natural England. However, it is anticipated that with the mitigation in place such as pollution prevention measures, there will be no likely significant effects to these sites and so permission should be granted to go ahead with the scheme as planned.

There are several non-statutory sites within and near to the scheme extents. Aylburton Strategic Nature Area, Lydney Town Marsh and Sidings Key Wildlife Site and Unconfirmed (Potential KWS quality only) Lydney Harbour and Dock Site are adjacent to some of the areas where the new cycle links will be created. In addition, Lydney Woods Strategic Nature Area is located 132m away at its nearest location from the Red Link. No further non-statutory sites will be impacted directly or indirectly.

Owing to the proximity to these non-statutory sites, it is recommended that the Owner / Warden is notified of the proposed works. To prevent impact upon these site, no materials or liquids will be stored adjacently or within the Key Wildlife Sites (including unconfirmed Lydney Harbour and Dock Key Wildlife Site) and contractors shall be made aware of its location and aware that no access to this area or storage of materials within this area is allowed without prior approval from an ecologist. Appropriate pollution prevention measures will need to be implemented during works within proximity to these sites and over sensitive aquatic receptors such as the Severn Estuary, Canal and River Lyd; an appropriate pollution prevention strategy will need formulating and implemented post business case. If the scheme area or nature of works is

to change, it is recommended that a consultant ecologist is notified before works are undertaken. If any works enter either of these other non-designated sites, a further assessment may have to be undertaken to determine whether the scheme is likely to have a significant impact upon the site(s) or not.

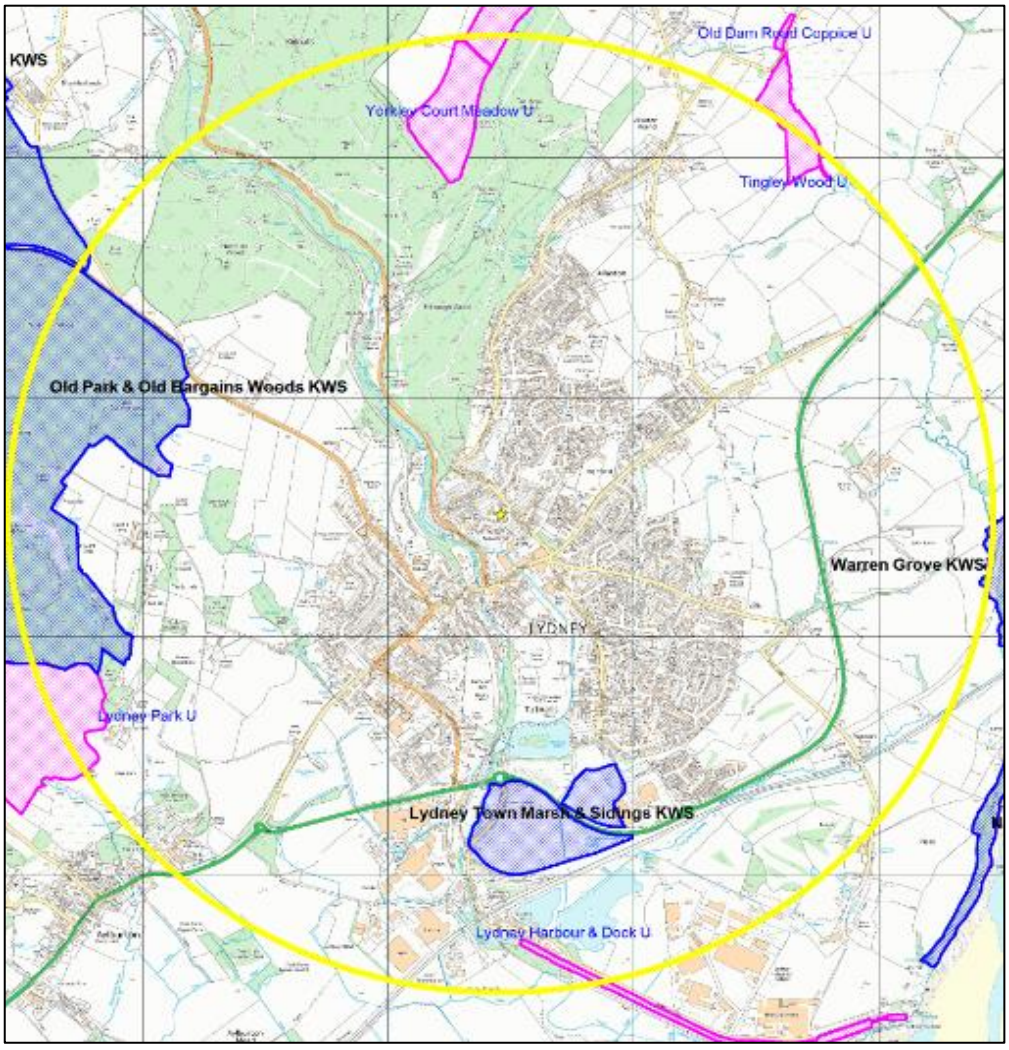


**Figure 23 - Sites of local conservation importance recorded within, or overlapping, the area of search**

The Extended Phase 1 Habitat Survey undertaken end of August 2018 by an Ecologist (BSc., GradIEMA) and Environmentalist (MSc., FGS., GradIEMA) revealed that the scheme has the potential to impact the habitats of birds (e.g. scrub, trees), badgers, bats, otter and water vole.

Unconfirmed badger setts were found within and adjacent to the scheme boundary on the Purple Link. The scheme area, with specific focus given to the Purple, Blue and Red Links, will be re-surveyed through a winter badger survey (when vegetation is not as dense) prior to construction to confirm if the badger setts are active. If the badger sett is confirmed as active, then a license from Natural England may be required to disturb the sett prior to construction. Rabbit burrows were also present adjacent to existing paths and any extension of the path widths may require lawful eradication of rabbits in these areas prior to excavation and construction.

The risk of reptiles and amphibians being present within the scheme area is low. Great Crested Newts are considered absent from the area owing to the lack of any records within 4.5km. However, it is considered prudent for Reasonable Avoidance Measures to be adopted throughout the duration of works for reptiles.

The scheme area and adjacent areas have the potential to support otter and water vole; there are also otter records near to the scheme area and a member of the public has stated that he had seen otters near the train station on the Purple Link. A targeted otter and water vole survey should be undertaken prior to the commencement of works. The survey should be undertaken following best practice guidelines for each species.

There is the potential for roosting, foraging and commuting bats within and immediately adjacent to the scheme extents. In the absence of detailed design information, targeted bat surveys will be required. Initial, scoping surveys of all trees and buildings which may be impacted by the scheme will be required. These surveys will further identify the requirement for additional targeted tree climbing and internal and / or external surveys to identify potential bat roosts and establish potential impacts and therefore requirement of Natural England European Protected Species derogation licence. A detailed mitigation / avoidance strategy will be formulated once detailed design and baseline conditions have been established.

Himalayan balsam, an invasive species, has been located within the scheme extents including along the riverbanks of the River Lyd and adjacent to the boating lake. The injurious species, common ragwort, was also found on site. Therefore, there would be the requirement for an additional invasive / injurious plant survey to establish presence and spread. An Invasive and Injurious Species Eradication Method Statement should be formulated and implemented prior to the commencement of works.

To reduce any impact of the scheme, linear features such as hedgerows and tree lines as well as planted wildflower patches should be retained wherever possible within the proposed scheme. The widening and hard surfacing of the Pink Link may result in loss of amenity grassland as well as young trees and scrub. Unavoidable loss of scrub, trees or wildflower patches within the scheme area should be compensated, as part of the scheme design, with replacement planting using native species of local provenance.

**Figure 24 - Wildflower patches, provide opportunities for insects and invertebrates including bees, butterflies, spiders and millipedes**

It is recommended that the work should be undertaken during the day to negate the use of artificial lighting. If the work needs to be undertaken at night, mitigation measures to minimise impacts on bats will need to be utilised such as directional lighting and louvers; these will need to be detailed through a Reasonable Avoidance Measures document.

The required vegetation clearance should be undertaken between end of September and February. If any vegetation clearance is required during the breeding season (March- end-September) then an inspection for active nests will be made within 48 hours prior to cutting. If an active nest is found in or out of the typical season, a buffer zone will need to be established and works delayed at this location until the chicks have fledged.

As a precaution, any excavations present on site that are left overnight will have graded edges to allow any badgers (and any other mammals) that may fall in the excavation, to leave.

Therefore, the biodiversity impact with regard to the implementation of this scheme is assessed as slightly adverse.

**Water environment**

This section outlines the contribution to the business case from water environmental aspects arising from the upgrades to the Lydney Cycling Improvements. A qualitative assessment will be undertaken to identify key areas where further assessment may be necessary in order to quantify any impacts.

The majority of the proposed routes will not require any formal permission from the Environment Agency as there will be no change in the level of the flood plain and therefore this is not considered a flood risk activity.

The Purple Link will run between the banks of The Lyd (also known as Newerne Stream), which is a designated main river, and The Cut canal. The cycle route will pass through flood zone 3 of The Lyd thereby increasing the impermeable surface area within the floodplain. The works will require the resurfacing and widening of an existing footpath to accommodate the passage of both pedestrians and cyclists, therefore the works will see an increase in the existing impermeable surface area. While there will be an increase in impermeable surface area and therefore surface water runoff into the nearby watercourses, the use of the cycleways as opposed to the roads aims to decrease automotive traffic and therefore the polluted surface water runoff that results. An increase in uncontaminated surface water runoff from the widened pathway is favourable to the current use of roads that results in a higher proportion of polluted runoff.

There are flood defences along the western bank of the "River Lyd" but the cycleway and bridge will not impact upon the defences due to the distance from the works, however measures should be in place during the construction works to ensure that they are not damaged by vehicles or equipment. An environmental permit for a flood risk activity will be required due to the construction of a bridge to cross The River Lyd. There is the potential for the construction of the bridge to raise the flood plain and therefore impact on the flood regime of the River Lyd.

The Cut is one of the few remaining sections of the Pidock's Canal that starts at Middle Forge and terminates at Lydney, as such it is not classed as a main river but due to its proximity to the works it may be impacted. The Environment Agency (EA) acts as a navigation authority for Pidock's Canal, however the watercourse is no longer navigable. It is advised that the EA are consulted with regards to works within close proximity of The Cut Canal.

Appropriate pollution prevention measures will be implemented during works to prevent contamination to the water environment during the works.

Therefore, the impact with regard to the implementation of the schemes is assessed as neutral.

## 3.7. Social

### Commuting and other users

Through providing new and improved cycle links this will encourage members of the public to utilise the route for commuting and leisure purposes as the existing situation does not allow for a safe and efficient journey.

### Reliability impacts on commuting and other users

The cycle routes are expected to encourage the public to use cycling as their primary means of travel or at minimum consider using the links for recreational activities. Through creating a safe and dedicated route for cyclists and pedestrians this has the potential to encourage a modal shift from the private vehicle to a sustainable mode of travel. Consequently this is expected to reduce the number of vehicles on the network and reduce the potential for traffic congestion.

A series of case studies have been benchmarked against the proposed cycle scheme. Case studies have been selected from the Sustrans evidence based on location and type of intervention.

Reliability during the construction phase may be affected, however, it is not anticipated that this will be significant.

### Physical activity

The implementation of dedicated cycle and pedestrian routes is expected to encourage and promote physical activity in Lydney through providing a safe and efficient route for active travel. The dedicated cycle lanes are also expected to reduce severance for users by proving a dedicate route which includes safe crossing points therefore giving members of the public the confidence to use the cycle links.

Through providing these cycle and pedestrian links within close proximity to The Dean Academy is expected to encourage parents and children to use the links as a means to travel to and from school which will increase physical activity for children.

### Journey quality

The implementation of the new dedicated cycle and pedestrian routes is expected to improve journey quality for users by providing an efficient and dedicated route which will be fit for purpose. This means that users will be confident in using the route knowing that the surface is fit for purpose and any obstacles have been removed.

Increasing lane widths and providing dedicated routes will improve overall journey quality and encourage future repeated use. This will also allow for many journeys which are currently made by road transferring to the dedicated cycle links.

It is also important to note that this scheme proposes 2,165m of off-carriageway cycle provision being implemented. This will help to reduce conflict with vehicles and improve overall journey quality.

### Accidents

The north east access to the town via Highfield Road has already been identified as a safety concern with proposed developments. The situation could be aggravated further in the future unless mitigation is considered. A long, 60mph straight along the A48 bypass makes it difficult for people to turn right onto Highfield Road from the northeast of Lydney and traffic exiting Highfield Road also finds it difficult due to the high speeds on the mainline.

In the study area between 2013 and 2017 there were a total of 37 incidents;

- 25 of these incidents were classified as "Slight";
- 12 were classified as "Serious";
- 3 of these incidents included cyclists and all were classified as "Slight";

- 12 involved pedestrians in which 7 were slight and 5 were classified as serious incidents.

These collisions affected 25 people in total with 12 pedestrian casualties which is a concern in such a small area. The majority of accidents were concentrated between Forest Road and Hams Road where the majority of vulnerable users are congregated.

Through providing the cycle links and improving the existing sections this scheme is expected to reduce accidents on these routes by reducing the number of potential conflict points through the segregated provisions for active travel, improving visibility and providing clear lane markings. The impact of the scheme is therefore considered Slightly Beneficial.

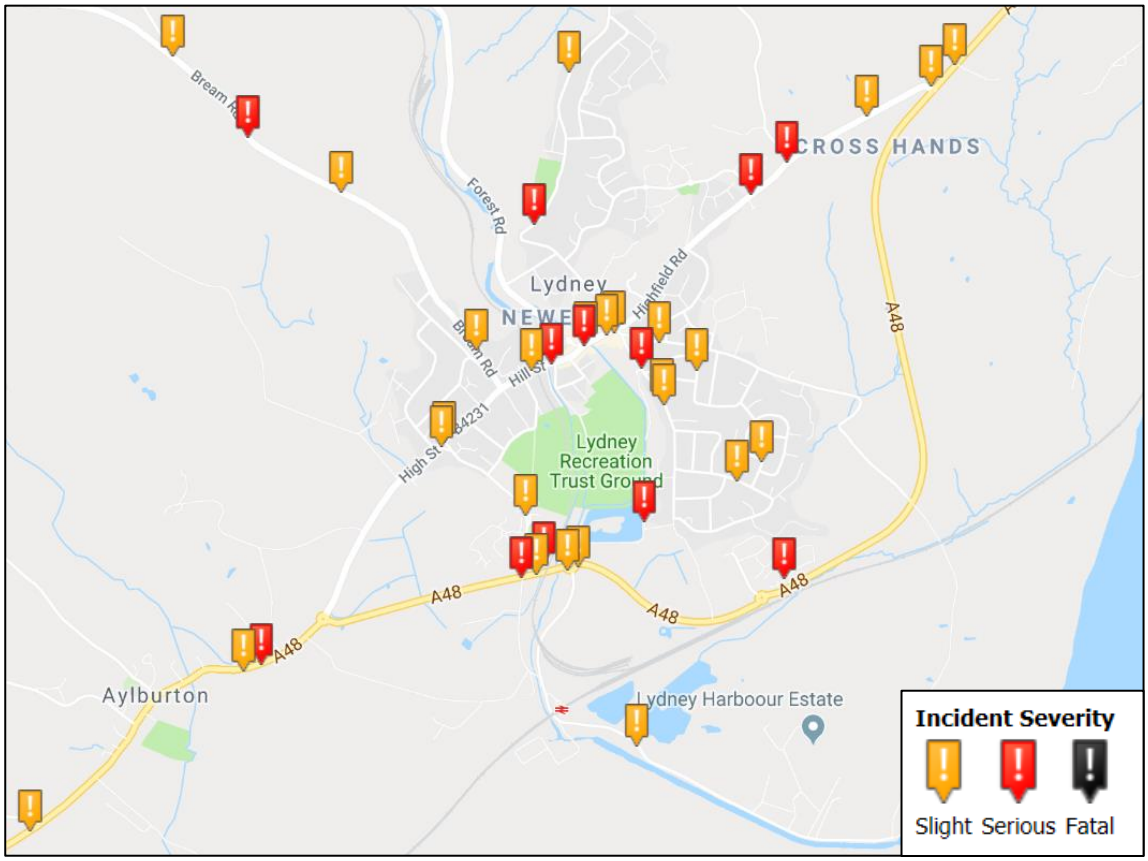


**Figure 25 - Accidents, 5 year period from 2013 to 2017.**

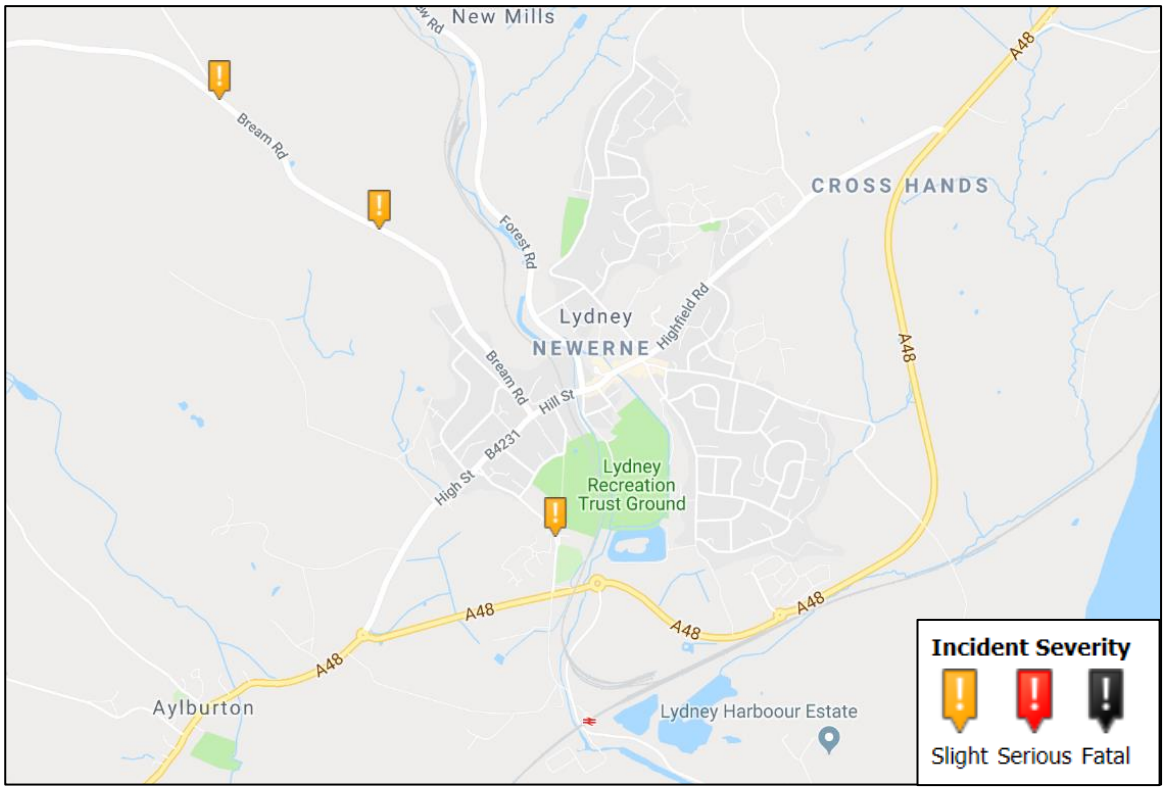


**Figure 26 - Accidents involving cyclists, 5 year period from 2013 to 2017**

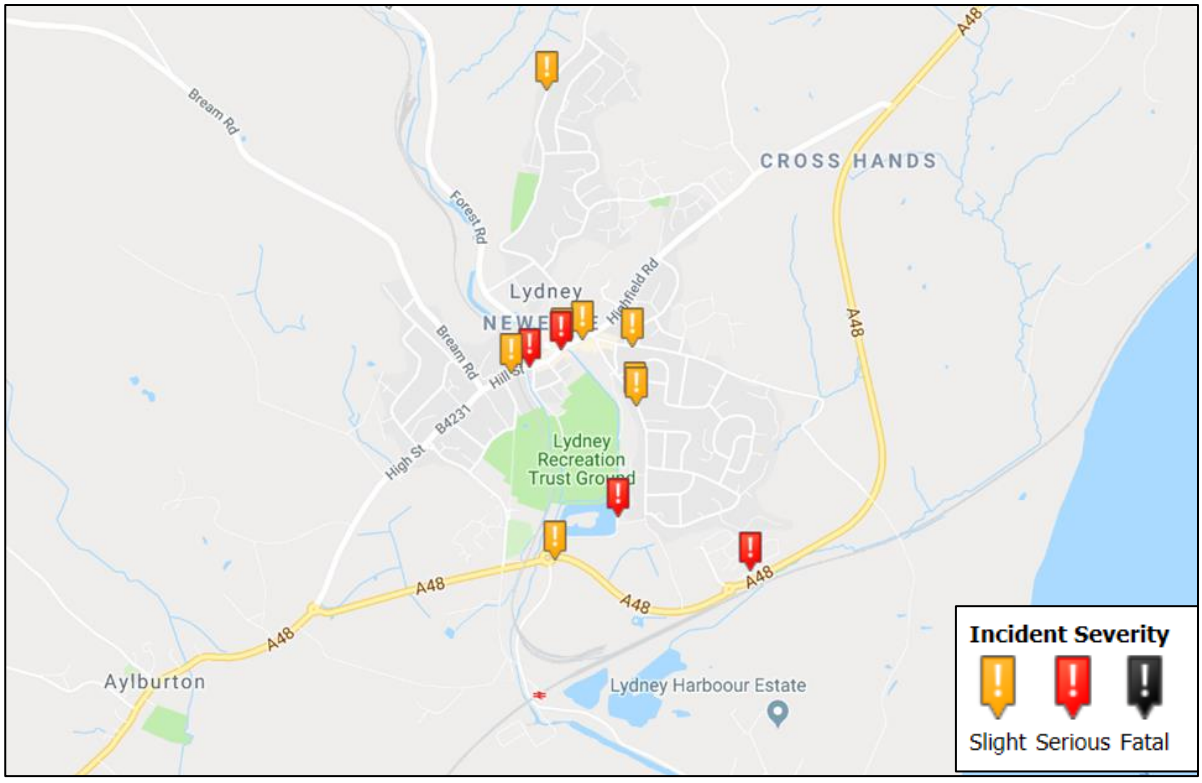


**Figure 27 - Accidents involving pedestrians from 2013-17**

A road safety audit has been completed on the preliminary designs shown in Appendix A. A summary of the main issues highlighted in the audit is as follows:

- Some locations where shared used width does not meet desirable 3m;
- Improvement to directional signage throughout scheme;
- One way restriction on Swan Road narrow for cycle contra-flow cycle lane;
- Width of the on on-road cycle lanes;
- Detail of on road cycle markings across side roads.

A designer's response to the audit has been completed. All items have been responded to and will either be addressed during detailed design or further support and justification has been provided in the designer's response.

**Security**

Moving the cyclists off the carriageway away from potential public surveillance on some of the routes could reduce personal security. However due to the locations of the links this is not expected to be a significant, though in comparison other routes will now have an increased usage meaning that personal security may well increase. Therefore the impact has been assessed as Neutral due to the overall change will be minimal.

**Access to services**

In accordance with WebTag guidance this scheme will not have any relevant impact to accessibility; as there are no proposed changes in routings or timings of current public transport services. Therefore, the impact regarding access to services is assessed qualitatively as Neutral. However it is important to note that in practice it is expected the improvements and creation of new cycle routes will provide the public with an additional option for travel which will improve their access to services significantly Lydney Train Station.

**Affordability**

No impact is expected. Therefore, the impact is assessed qualitatively as neutral.

**Severance**

The introduction of improved and dedicated cycle links will reduce severance for active users including vulnerable members of the public through the creation of a safe and dedicated route as well as decreasing journey times. The addition of improved and new crossing points will also help to contribute to reducing severance details below;

Purple Link - Improvements to the existing crossings on the A48 will increase visibility and aid users when crossing

Red Link - A new parallel cycle and pedestrian zebra crossing will be installed adjacent to the Town Hall to provide a safe connection to the Green Link.

The impact is assessed as Slightly Beneficial.

**Option and non-use values**

No impact expected, not assessed, but assumed qualitatively as neutral.

**Public Accounts**

For both 'Cost to Broad Transport Budget' and 'Indirect Tax Revenues', there is minimal impact, but values are available from the BCR calculations. The summary tables for each link have been provided below.

**Purple Link**

| Analysis of Monetised Costs and Benefits (in £'000s) | |
|---|---|
| Congestion benefit | 12.97 |
| Infrastructure | 0.12 |
| Accident | 3.70 |
| Local Air Quality | 0.02 |
| Noise | 0.25 |
| Greenhouse Gases | 0.67 |
| Reduced risk of premature death | 378.70 |
| Absenteeism | 90.27 |
| Journey Ambience | 5.41 |
| Indirect Taxation | -2.69 |
| Government costs | 166.43 |
| Private contribution | 0.00 |
| PVB | 489.29 |
| PVC | 166.30 |
| **BCR** | **2.94** |

| Benefits by type: | | |
|---|---|---|
| Mode Shift | 15.04 | 3.1% |
| Health | 468.96 | 95.8% |
| Journey Quality | 5.41 | 1.1% |

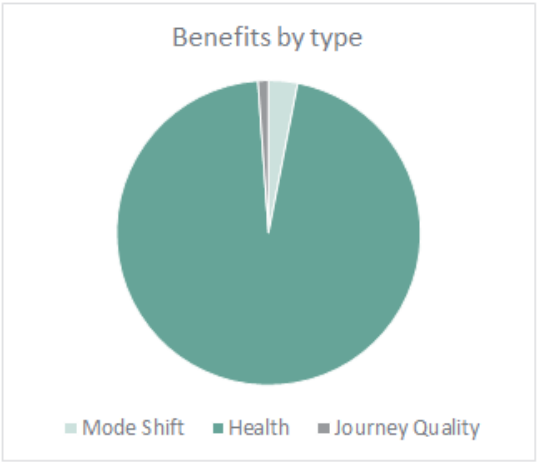


**Table 14 - Analysis of Monetised Costs and Benefits (Purple Link)**

**Orange Link**

| Analysis of Monetised Costs and Benefits (in £'000s) | |
|---|---|
| Congestion benefit | 4.60 |
| Infrastructure | 0.04 |
| Accident | 1.31 |
| Local Air Quality | 0.01 |
| Noise | 0.09 |
| Greenhouse Gases | 0.24 |
| Reduced risk of premature death | 133.87 |
| Absenteeism | 31.79 |
| Journey Ambience | 69.85 |
| Indirect Taxation | -0.95 |
| Government costs | 119.56 |
| Private contribution | 0.00 |
| PVB | 240.80 |
| PVC | 119.52 |
| **BCR** | **2.01** |

| Benefits by type: | | |
|---|---|---|
| Mode Shift | 5.33 | 2.2% |
| Health | 165.66 | 68.8% |
| Journey Quality | 69.85 | 29.0% |

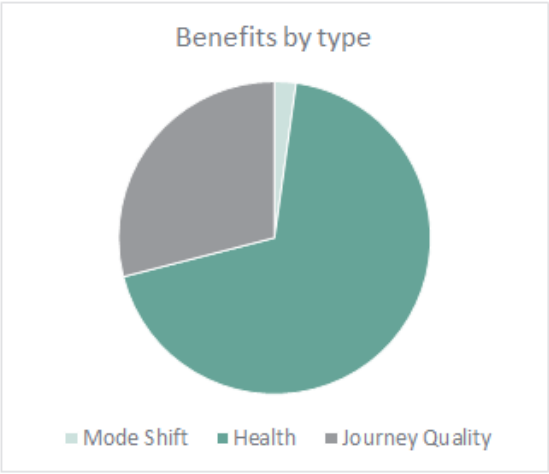


**Table 15 - Analysis of Monetised Costs and Benefits (Orange Link)**

### Green Link

| Analysis of Monetised Costs and Benefits (in £'000s) | |
|---|---|
| Congestion benefit | 12.97 |
| Infrastructure | 0.12 |
| Accident | 3.70 |
| Local Air Quality | 0.02 |
| Noise | 0.25 |
| Greenhouse Gases | 0.67 |
| Reduced risk of premature death | 378.70 |
| Absenteeism | 90.27 |
| Journey Ambience | 94.29 |
| | |
| Indirect Taxation | -2.69 |
| Government costs | 114.49 |
| Private contribution | 0.00 |
| | |
| PVB | 578.17 |
| PVC | 114.37 |
| | |
| **BCR** | **5.06** |

| Benefits by type: | | |
|---|---|---|
| Mode Shift | 15.04 | 2.6% |
| Health | 468.96 | 81.1% |
| Journey Quality | 94.29 | 16.3% |

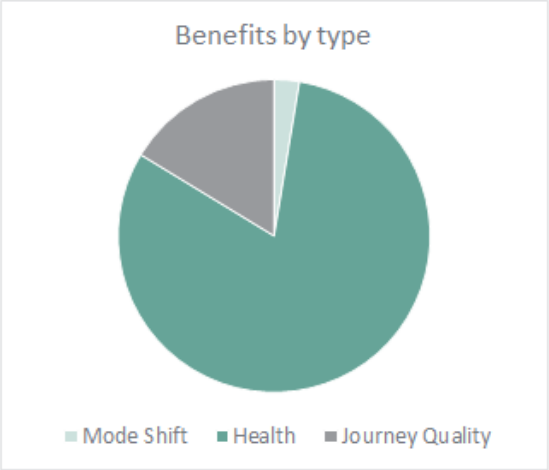


**Table 16 - Analysis of Monetised Costs and Benefits (Green Link)**

### Red Link Rural

| Analysis of Monetised Costs and Benefits (in £'000s) | |
|---|---|
| Congestion benefit | 3.99 |
| Infrastructure | 0.04 |
| Accident | 1.14 |
| Local Air Quality | 0.01 |
| Noise | 0.08 |
| Greenhouse Gases | 0.21 |
| Reduced risk of premature death | 117.32 |
| Absenteeism | 28.20 |
| Journey Ambience | 200.85 |
| | |
| Indirect Taxation | -0.83 |
| Government costs | 300.47 |
| Private contribution | 0.00 |
| | |
| PVB | 350.96 |
| PVC | 300.43 |
| | |
| **BCR** | **1.17** |

| Benefits by type: | | |
|---|---|---|
| Mode Shift | 4.63 | 1.3% |
| Health | 145.53 | 41.5% |
| Journey Quality | 200.85 | 57.2% |

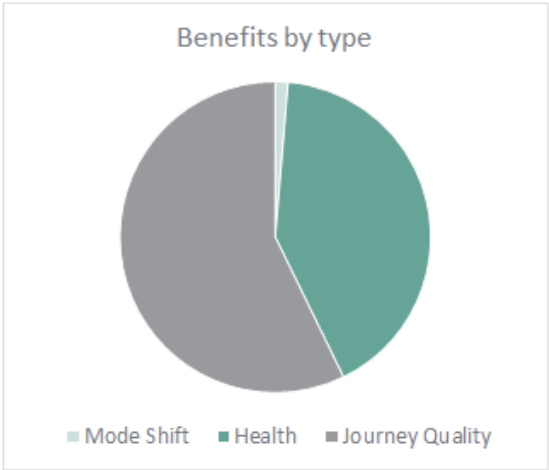


**Table 17 - Analysis of Monetised Costs and Benefits (Red Link Rural)**

**Red Link Urban**

| Analysis of Monetised Costs and Benefits (in £'000s) | |
|---|---|
| Congestion benefit | 0.89 |
| Infrastructure | 0.01 |
| Accident | 0.26 |
| Local Air Quality | 0.00 |
| Noise | 0.02 |
| Greenhouse Gases | 0.05 |
| Reduced risk of premature death | 25.73 |
| Absenteeism | 7.99 |
| Journey Ambience | 33.02 |
| Indirect Taxation | -0.23 |
| Government costs | 55.98 |
| Private contribution | 0.00 |
| PVB | 67.73 |
| PVC | 55.97 |
| **BCR** | **1.21** |

| Benefits by type: | | |
|---|---|---|
| Mode Shift | 1.00 | 1.5% |
| Health | 33.72 | 49.8% |
| Journey Quality | 33.02 | 48.7% |

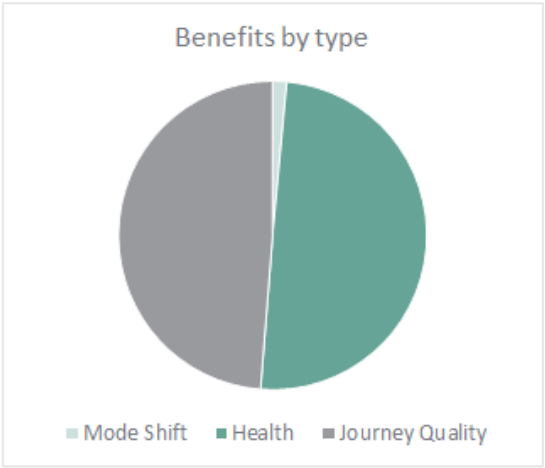


**Table 18 - Analysis of Monetised Costs and Benefits (Red Link Urban)**

## 3.8. Value for Money Statements

The full Appraisal Summary Table is included as Appendix E.

The scheme has produced an overall BCR of 2.28 which corresponds to a high value for money, from the quantitative assessment of the sub-impacts; the scheme will have positive benefits from journey quality, increase in physical activity, reduced congestion and improved safety. This will primarily involve commuters and leisure users.

From the qualitative assessment, other positive impacts are produced on severance and access to services. The scheme is expected to improve severance for active users through the introduction of improved footways and cycle tracks will improve the link and flow of movement for non-motorised transport.

It is expected the introduction of the cycle links will reduce severance for these users through the creation of a safe and dedicated route as well as decreasing journey times.

The improvements and creation of new cycle routes will provide the public with an additional option for travel which may improve their access to services.

This Economic Case has quantitatively assessed that the implementation of the scheme will have A High Value for money return and no qualitative assessment was considered significant enough to adjust the initial BCR score, therefore the scheme will remain in the High category for value for money.

## 3.9. Critical Success Factors

There are several 'Critical Success Factors' (CSF) that will determine if the scheme can be introduced satisfactorily. These CSF are essentially a combination of performance, finance and delivery assurances, as suggested in HM Treasury's 'The Green Book' and which can be assessed qualitatively and broadly aligned under the five criteria of the Business Case. The CSFs for the Over scheme are as follows:

**CSF1: Strategic Fit (Strategic Case)**

- Enables development (housing; employment) to take place, where residents or employees have access to an improved highway network, particularly for cyclists and pedestrians ;
- Improve road safety, for cyclists and pedestrians;
- Improvement in quality and reduction in travel time for cyclists.

**CSF 2: Value for Money (Economic Case)**

- Will maximise return on investment, striking a balance between the cost of delivery and the cost to the economy of non-delivery;

**CSF 3: Achievability (Commercial Case)**

- Deliverable utilising current engineering solutions;
- Limits long-term maintenance liabilities.

**CSF 4: Affordability (Financial Case)**

- Deliverable within the capital funding available;
- Revenue liabilities for the option are affordable within current budgets.

**CRF 5: Timescale for Implementation (Management Case)**

- Can be delivered within the time frame of available funding.

# 4. Commercial Case

## 4.1. Commercial Issues

The scheme will generate no direct income for the County Council or any other organisation.

## 4.2. Scheme Procurement

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

**A. Full OJEU tender (Schemes greater than OJEU limit of £4,322,012)**

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

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

**B. Open Tender (Schemes greater than £500,000 but less than OJEU limit)**

GCC would opt for an 'open' tender, where anyone may submit a tender. The tender would include a set of eligibility criteria and a quality submission. Depending on the assessment method chosen the contractors would be required to meet a quality threshold score or selected using a quality / price evaluation.

Schemes will be procured via ProContract and this would include prior notifications of the tender approximately 4 weeks before the formal tender. Depending upon the complexity of the scheme supplier engagement presentations will be arranged.

The minimum tender period is 6 weeks but could be longer for more complex schemes. All suppliers that meet the eligibility criteria will be assessed and a preferred supplier identified.

**C. Delivery through Amey Highways Term Maintenance Contract (HTMC) (Schemes < £500k).**

This option is strictly not procurement as the HTMC is an existing contract. The HTMC is based on a Schedule of Rates agreed at the inception of the contract. The price for each individual scheme is determined by identifying the quantities of each required item into a Bill of Quantities. The Contractor may price 'star' items if no rate already exists for the required item. If the scope of a specific scheme is different from the item coverage within the HTMC contract a new rate can be negotiated. It is worth noting that the current HTMC contract is coming to an end on 31 March 2019. The new contractor is to be appointed shortly by GCC with a mobilisation process running up until the contract start date in April 2019.

**Preferred Procurement Option**

The preferred procurement route for the Lydney Cycling Improvements scheme is Option B Open Tender.

This option has been selected due to the estimated value of the scheme with the contract value being below the OJEU threshold. The type of works and relatively low contract value does mean the scheme lends itself to delivery through the HTMC, but at this time this route is not preferred as there are uncertainties around the limit of works to be delivered through the contract and the mobilisation of a new contractor to start in 1st April 2019 which could impact on the delivery programme.

For budget certainty, the preferred procurement route is an open tender lump sum contract ECC Option A contract (Lump Sum with Activity schedule). This option is preferred as the scheme will be fully designed with a clear specification of works which allows for a greater transfer of risk to the Contractor through a priced contract. The Activity Schedule used in this form of contract also gives greater confidence in the Contractor's price. This is as a result of the importance given to the Contractor's programme, as tenderers

have to plan the scheme whilst preparing their Activity Schedule. This also means the programme is realistic and more likely to be adhered to as payments to the Contractor are linked to their activity schedule.

The ECC Option A contract is Gloucestershire County Councils preferred method of delivery for this size and type of highway scheme. This ensures consistency with internal processes, staff members, supply chain, benchmarking, performance etc. which should all aid successful delivery.

## 4.3. Commercial Risk Assessment

The table below provides a summary of the identified commercial risks surrounding the scheme.

| Qualitative Commercial Risk Assessment | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Scheme Commercial Risk Item | Likelihood of Risk Arising | | | Impact Severity | | | Predicted Effect on Scheme Procurement, Delivery and Operation | | | Immediate Bearer of Risk and Suggested Mitigation |
| | Low | Medium | High | Slight | Moderate | Severe | Slight | Moderate | Severe | |
| Scheme construction is delayed and/or costs increase. For example, from unexpected engineering difficulties or additional land / legal costs. | | X | | | | X | | X | | Under lump sum contract, the contractor bears the risk of any event that is not a compensation event. GCC bears this risk of any increase in costs resulting from compensation event. Ensure that scheme design, procurement and construction supervision procedures are sufficiently robust to minimise likelihood of construction difficulties. |
| Ongoing maintenance costs of scheme higher than expected | X | | | X | | | X | | | GCC, as scheme promoter, bears the risk. Ensure that scheme design and construction procedures are sufficiently robust to minimise likelihood of maintenance issues. Where applicable, formal maintenance agreement to be put in place with Lydney Town Council. |

**Table 19 - Qualitative Commercial Risk Assessment**

# 5. Financial Case

## 5.1. Project Costs

This section considers the capital costs associated with the proposed scheme investment.

## 5.2. Breakdown and Time Profile of Project Costs

| Scheme Cost Breakdown and Profile | | | | | | |
|---|---|---|---|---|---|---|
| **Project Cost Components** | **Capital Cost Items** | *** Cost Estimate Status (O/P/D/T)** | **Costs by year (£) Year of Estimate:** | | | |
| | | | **2017/18 (Inc. previous)** | **2018/19** | **2019/20** | **Total** |
| Design and Management | Design fee, site surveys, legal costs | P | £55,000 | £175,000 | | £230,000 |
| Construction | Estimated contractor tender price for the whole works. | P | | | £633,904 | £633,904 |
| Site Project Management and Supervision | Consultancy hours for support during the construction period. | P | | | £53,688 | £53,688 |
| ** Risk / Contingency | Risk 10%<br>Contingency 3% | P | | | £82,408 | £82,408 |
| Total Cost | Including Risk Adjustment | | £55,000 | £175,000 | £770,000 | £1,000,000 |
| *O = Outline estimate, P= Preliminary estimate, D = Detailed estimate, T = Tender price | | | | | | |
| ** Risk 10% / contingency 3% allowed due to well defined scheme scope and low risk nature of cycle works. | | | | | | |

**Table 20 - Scheme Capital Cost Breakdown and Profile**

## 5.3. Project Funding

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

**Sources of Funding**

| | 2018/19 | 2019/20 | Totals |
|---|---|---|---|
| **LEP Total** | £230,000 | £770,000 | £1,000,000 |

**Table 21 - Scheme LEP Funding Profile (£)**

The proposal is to use the LEP funding to construct improvements to create the Purple, Blue, Orange, Green and Red Links as shown in Section 5.1. The scheme has been developed to align with the LEP budget allocation with the scheme design drawings shown in Appendix A.

The construction cost estimates have been produced based on the preliminary designs. The estimates are considered robust as the design drawings are well developed due to the low risk nature of the works.

Within the works estimate an allowance of £10,000 has been allocated for the diversion of utilities apparatus across all links. Currently, the only known diversion is the relocation of a Western Power electricity pole which can be achieved within the estimate provided. The detailed design estimate for relocating the electricity pole will not be known until the detailed design stage following the approval of the Full Business Case.

Within the costs shown in Table, a 10% construction risk allocation and 3% contingency has been included. These values are considered appropriate for the scheme for the following reasons:

- Low risk nature of cycleway works;
- Well-developed scheme scope with accompanying preliminary design drawings that have sufficient detail to carry out an accurate works cost estimate;
- Cost estimate considered robust. Other GCC schemes proven to be within budget estimates;
- Low risk of further utility diversions required as broadly levels are unchanged;
- Worst case ground conditions for bridge allowed for in cost estimate;
- Security and Earliest Availability of Funds.

| Security of Scheme Funding Sources and Earliest Availability | | | | | | |
|---|---|---|---|---|---|---|
| | | Security of Funding Contribution | | | Earliest Available Date for Securing Fund Contribution | |
| Funding Source | Fund Details | Low | Medium | High | Part Funding Date | Full Funding Date |
| LEP | LEP | | | X | | 2018/19 |

**Table 22 - Security and Availability of Scheme Funding Contributions**

## 5.4. Financial Risk Management Strategy

This section examines the risks associated with the costs and financial requirements of the onsite infrastructure and engineering works. It considers the mitigation that may be needed to handle the identified risks, if they arise.

**Risks to the Scheme Cost Estimate and Funding Strategy**

| Qualitative Financial Risk Assessment | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Scheme Financial Risk Item | Likelihood of Risk Arising | | | Impact Severity | | | Predicted Effect on Scheme Delivery and Outcome | | | Suggested Mitigation |
| | Low | Medium | High | Slight | Moderate | Severe | Slight | Moderate | Severe | |
| Earmarked / secured funds do not cover current scheme capital cost | | X | | | X | | | X | | Amend preferred scheme design content to reduce scheme cost in a way that does not impact on delivery of agreed scheme details. Eg Scope of resurfacing proposals.<br>Additional funding secured from GCC or S106 funds. |
| Design changes during Detailed design lead to increase in scheme cost. | | | X | | X | | | X | | Amend preferred scheme design content to reduce scheme cost.<br>Additional funding secured from GCC or S106 funds. |

**Table 23 - Shows the financial risks and suggested mitigation measures associated with this scheme**

## 5.5. Ongoing Maintenance

Gloucestershire County Council will be responsible for the maintenance of the cycle ways post construction. Many of the links are within the highway boundary and are existing footpaths that are already the responsibility of GCC to maintain.

Where the links are on land owned by others, legal agreements will be put in place with, for example Lydney Recreation Trust (Purple Link) to ensure the responsibilities for maintenance are clear. An alternative would be for the Recreation Trust to maintain the links with a contribution towards their upkeep made by GCC.

The following information is from the GCC Maintenance contract which is used to provide an estimate of the cost of maintenance over a 30 year period.

To cover one surface treatment, the cost of the ongoing maintenance is estimated as £11.07 per m2. Over a 30 year design life this would equate to £0.37 per m2 per year. The scheme will construct additional Gloucestershire County Council shared use footway area of 7,118 m2**.**

The additional maintenance liability would therefore equate to £2,627 per year and GCC will include for this in maintenance budgets. It is worth noting the following would impact on the future cost of maintenance:

- Size of contribution from GCC to Lydney Recreation Trust for upkeep;
- Costs included for works in future highways term maintenance contract.

# 6. Management Case

## 6.1. Overview

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

## 6.2. Project Governance, Roles and Responsibilities

**Project Governance**

GCC have set up a clear and robust structure to provide accountability and an effectual decision making process for the management of the LEP funded schemes. Each scheme will have a designated project manager who will be an appropriately trained and experienced member of GCC staff.

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

**Project Board Meetings (PBM)**

Project Board Meetings are held monthly to discuss individual progress on each scheme and are chaired by Gloucester County Council term contractor Project Managers (PMs). Attendees include representatives for different aspects of LEP management (i.e. Communication, Traffic, Risk Management, and GCC Consultants design and/or construction team). Progress is also discussed in technical detail raising any issues or concerns for all to action. A progress report, minutes of meeting and an update on programme dates are provided ahead of the meeting for collation and production of the LEP Progress and Highlight Report.

**LEP Progress and Highlight Report**

The Progress and Highlight Reports sent by the GCC PMs comprise of the following updates; general progress, project finances, issues, risks and meeting dates. The report also identifies any areas of concern or where decisions are required by the PBM. An agreed version of the latest Progress and Highlight Report is issued to the PB meeting attendees during the meeting.

## 6.3. Project Management Structure

Gloucestershire County Council and their Consultants have agreed a project management structure for the project, as shown in the table below.

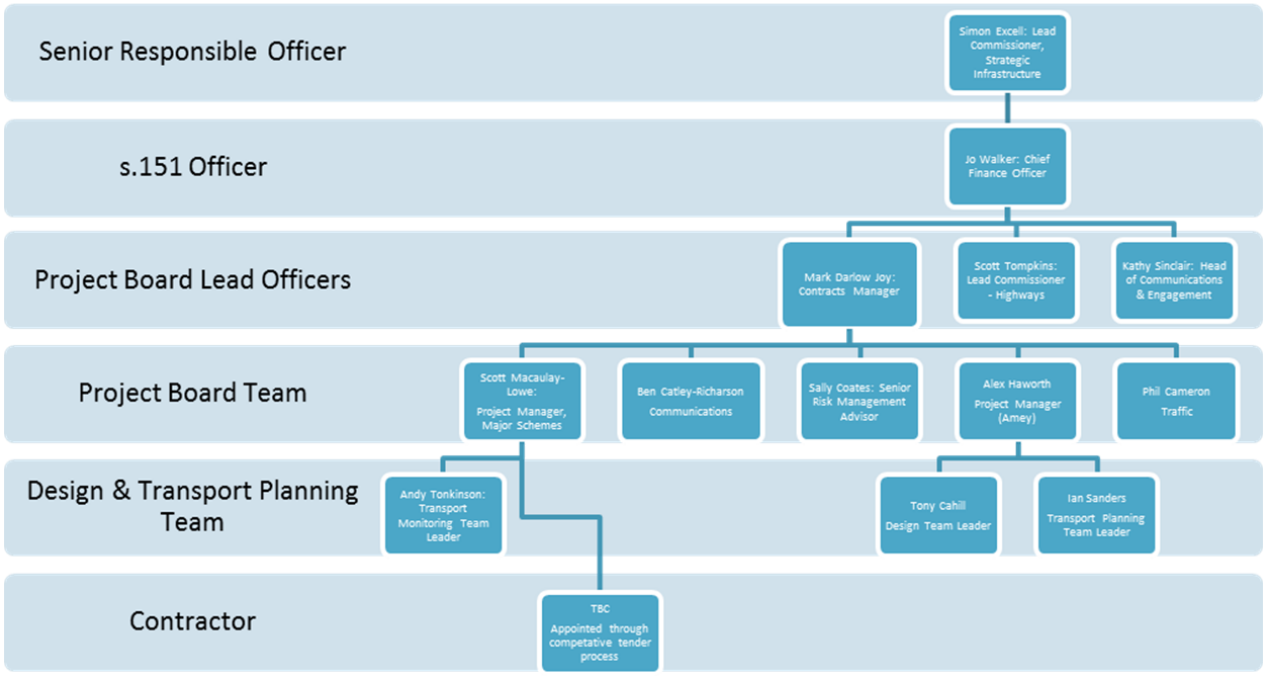


**Table 24 - Project Management Structure**

## 6.4. Communications and Engagement Management

GCC have a tried and tested Communication and Engagement Management Plan which is used on all major projects. Effective use of the plan has resulted in limited adverse feedback from the public and ensured successful delivery of schemes both from a project management and public relations perspective. This section will provide further information on how stakeholders are identified, how they are communicated to and the methods/ techniques used to communicate.

### Aims and Objectives

The main aim of the Communication and Engagement Plan is to ensure that stakeholders and members of the general public are kept informed throughout the development and implementation of a scheme. This can range from keeping key stakeholders updated with critical information, (essential to the successful delivery of the scheme) to providing information to the general public.

| Stakeholder Category | Stakeholder Characteristics |
|---|---|
| Beneficiary | Stakeholders who will receive some direct or indirect benefit from the scheme. |
| Affected | Stakeholders who are directly affected by the scheme in terms of its construction and/ or operation |
| Interest | Stakeholders who have some interest in the scheme, although not affected directly by its construction or operation |
| Statutory | Stakeholders who have a statutory interest in the scheme, its construction, operation or wider impacts |
| Funding | Stakeholders who are involved in the funding of the construction or operation of the scheme |

**Table 25 - Stakeholder Categorisation Approach**

### Engagement Categories

The information supplied to stakeholders can vary depending on their involvement with the scheme. The following table indicates the level of engagement that the variety of stakeholders can expect in relation to this scheme.

| Engagement Category | Details of Engagement Method |
|---|---|
| Intensive consultation | Stakeholders who are directly affected by the scheme and whose agreement is required in order for the scheme to progress. Consultation throughout the design and implementation. |
| Consultation | Stakeholders who are affected by the scheme and can contribute to the success of its design, construction or operation. Consultation at key stages. |
| Information | Stakeholders with some interest in the scheme or its use. Information to be provided at appropriate stages. |

**Table 26 - Stakeholder Engagement Levels**

## 6.5. Stakeholder Communication

Table 27 below summarises the strategy for managing engagement with stakeholders for the scheme. It itemises the relevant stakeholders and interests and indicates the stakeholder category with which each is associated.

Liaison has taken place with the following stakeholders:

| Name of Stakeholder / Interested Group | Stakeholder Category | Engagement and Consultation Level | Engagement Method |
|---|---|---|---|
| Lydney Town Council | Beneficiary | Consultation | Pre-exhibition briefing<br>Public share event |
| Lydney Recreational Trust | Affected | Intensive Consultation | Scheme meetings<br>Pre-exhibition briefing<br>Public share event |
| Forest of Dean District Council | Interest | Consultation | Email communications<br>Meeting<br>Pre-exhibition briefing |
| Local MP | Interest | Consultation | Pre-exhibition briefing<br>Public share event |
| Elected Members | Interest | Consultation | Pre-exhibition briefing<br>Public share event |
| Scheme Users | Beneficiary | Consultation | Public share event |
| Local Press | Interest | Information | Pre-exhibition briefing |
| Local Enterprise Partnership | Beneficiary Funding | Information | LGF Business Cases and progress reporting |
| Lydney Railway Station | Beneficiary | Information | Email<br>Public share event |
| The Dean Academy | Beneficiary | Information | Email<br>Public share event |

| | | | |
|---|---|---|---|
| Coastal Communities Fund | Interest | Information | Email<br>Public share event |
| Dean Forest Railway | Interest | Information | Email<br>Public share event |
| Lydney Leisure Centre | Interest | Information | Email<br>Public share event |
| Charity Craft Centre | Interest | Information | Email<br>Public share event |
| JD Norman Industries | Interest | Information | Email<br>Public share event |
| Lydney District Hospital | Interest | Information | Email<br>Public share event |
| Bathurst Pool | Interest | Information | Email<br>Public share event |
| Lydney Cycle Centre | Interest | Information | Email<br>Public share event |
| Severn Valley Cycles | Interest | Information | Email<br>Public share event |

**Table 27 - Stakeholder Management Strategy and Method**

**Statutory Consultees**

The following list details the statutory consultees who were contacted by email and provided with an overview of the scheme and copies of the current plans:

- Gloucestershire Constabulary;
- Gloucestershire Fire and Rescue Service;
- South Western Ambulance Service;
- Road Haulage Association;
- Freight Transport Association;
- GCC Highway Records;
- GCC Local Highway Manager;
- Parish/Town/District Council.

## 6.6. Public Consultation

The Public Share Event was held at Tesco in Lydney on Tuesday 4th September 2018. The event was held in a display trailer in the car park outside the store entrance between 11:00 - 20:00 on a drop-in basis. The public were notified of the event using posters in the town centre and in shops. Copies of the event poster were shared via GCC website, twitter accounts and Lydney Town Council website. In addition, any property that has a frontage onto one of the proposed routes was sent a letter notifying them of the event.

Presentation boards were provided with large scale plans and graphics together with scheme introduction, background and FAQs.

The event was manned by scheme designers and engineers together with GCC project manager. Attendees were offered a personal tour of information available and in depth discussions about issues, concerns,

improvements etc. Most attendees took the opportunity to ask questions and give their own views of the scheme using feedback forms that were available for people to leave comments.


**Figure 28 - Lydney Public Share Event at Tesco Lydney**

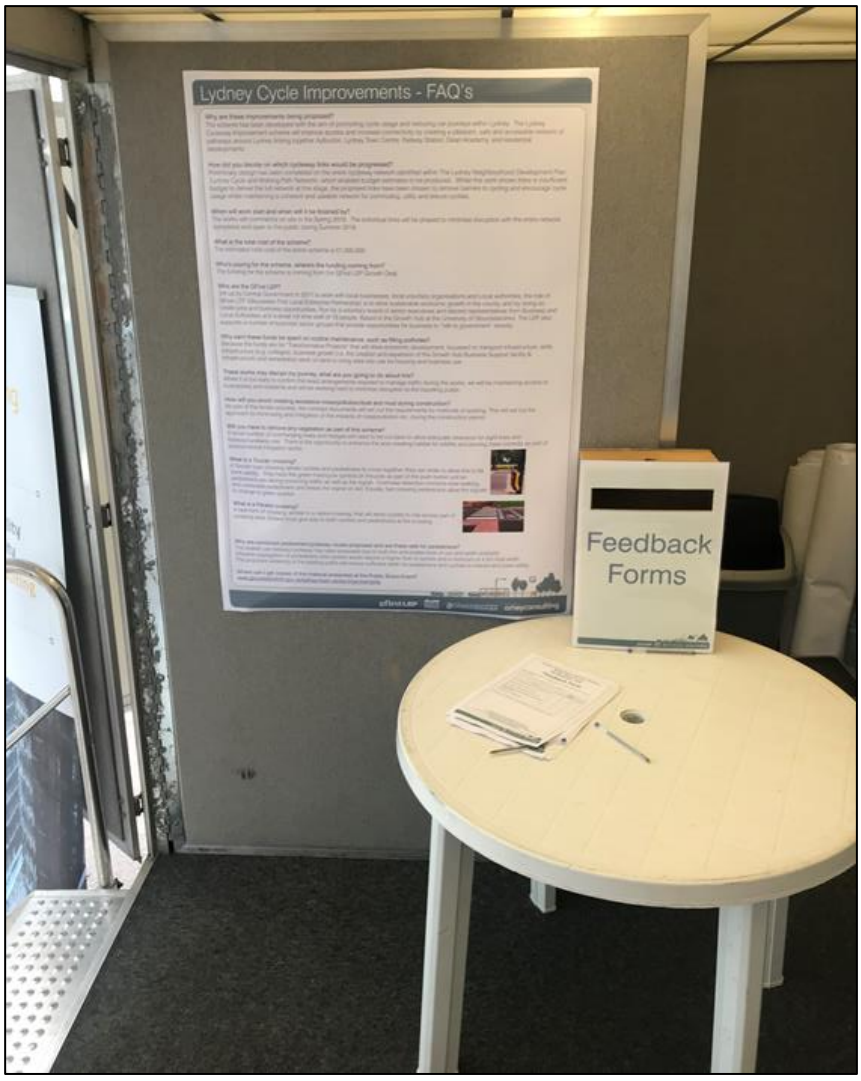


**Figure 29 - Lydney Public Share Event Feed Back Facility**

During the day there were an estimated 70 attendees. A feedback form (Included in Appendix F) was provided and many visitor chose to answer the questions and leave comments using the forms provided or via email to the GCC major projects E-mail inbox.

Among the attendees was the Head-teacher of The Dean Academy who commented "As head of the school at Dean Academy I fully support this scheme. This will encourage an active lifestyle for the young people of Lydney and surrounding areas".

On the feedback form the attendees were asked if they agreed or disagreed with the following statements and the results were as follows:

| Statements | Agree | Neither Agree or Disagree | Disagree |
|---|---|---|---|
| **Encourage walking and cycling for commuting/travel to school.** | 89% | 11% | 0% |
| **Encourage walking and cycling as recreation.** | 89% | 11% | 0% |
| **Improve journey quality and safety for cyclists in Lydney.** | 94% | 6% | 0% |
| **Improve access to Lydney Railway Station and the Town Centre (Walking and cycling).** | 89% | 5% | 6% |
| **Represent good use of public monies.** | 89% | 5% | 6% |

**Table 28 - Summary of the feedback provided by the public**

A summary of the feedback is as follows:

- Just under 90% of people agreed with all of the statements detailed;
- Only 6% of feedback disagreed that the scheme would improve connectivity to the Railway station and the Town Centre;
- 11% had neutral feelings that the scheme would "encourage walking and cycling for commuters, School Travel and recreation" but 89% Agreed this scheme would encourage this;
- Overall consensus from the public was very positive from the majority of visitors including those who did not want to leave a formal comment or feedback.

There was also space on the form for people to leave any further comments, queries or recommendations. The level of feedback was good and provided a range of comments on the scheme. The key themes identified within the comments are shown in the table below.

| Comments | How we responded to and / or addressed |
|---|---|
| Additional Cycle Route required to link with Parkend | Due to budget constraints this length of route could not be considered. However this would connect the Orange & Red Link. |
| Important that new housing developments are included in the future. | This cycle link will be included in the Highfield Hill development and therefore will be privately funded and is not required to be completed as part of this scheme. |
| Please think about all abilities including those that need 2 to 1 support to use a bike. | The routes will take in to account safety comments and safety reviews. Also note that the improvements also improve the pavements and pedestrian facilities. |
| This scheme provides a core but needs to extend to include link to the Harbour. | Due to potential private investment a cycle route is still expected. However this was not taken forward by this scheme due to concerns with land ownership and potential future demand. |
| Could Church Road have a 20mph speed limit? | No speed limit changes were considered as part of this scheme. Existing traffic calming measures on the route. |
| Extra bike storage required at the train station. | This has been looked at independently by Network Rail as part of a separate study. Cannot confirm if Network Rail will progress. |
| Concern over the route through Lydney town centre from a safety point of view | The routes will take in to account safety comments and safety reviews. |

**Table 29 - Summary of feedback from public share event**

In summary, the overall consensus from the feedback at the share event was very positive and an acknowledgement that cycle improvements are welcome. The main points raised were that the cycle proposals should be the beginning of a larger plan for Lydney and link to future developer and Forest of Dean / Parkend routes. Whilst we are unable to accommodate any further links within the budget, the way in which the scheme ties into future housing developer or Parkend routes will be considered during detailed design.

## 6.7. Evidence of Previously Successful Management Strategy

GCC have delivered a range of highway schemes which provide evidence of successful delivery. The following examples are selected from a range of schemes to demonstrate GCC delivery capability and success and support the success of the management strategy used.

The Walls Roundabout, C & G roundabout and Elmbridge roundabout schemes are good examples of schemes previously completed by GCC which had a very similar management structure to the proposed Lydney Cycling Improvement Scheme.

The WC&G scheme, completed in October 2014, was designed to support economic development, job creation and social regeneration, improving access with high quality connections between the urban centres, transport hubs and development sites. The overall scheme details were to unlock the development potential of the area, attract inward investment and maximise job opportunities for local people. The extent of the scheme is shown on the two layout plans below.

The scheme was successfully delivered within budget and on programme through the adoption of a robust management approach. The total value of the scheme was £3.1M of which £0.5M was funded by Central Government. The scheme was procured through an open tender process using the NEC 3 Option A contract which will also be used for the Lydney scheme.

GCC and Amey also worked in partnership with Griffiths contractors Ltd on the Elmbridge Court Roundabout major scheme. This is a £6.4m contract to improve capacity and reduce journey times on the A40 at the busiest roundabout in the County. This scheme follows the management strategy set out in this business case, and was completed on time (September 2017) and on budget.

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

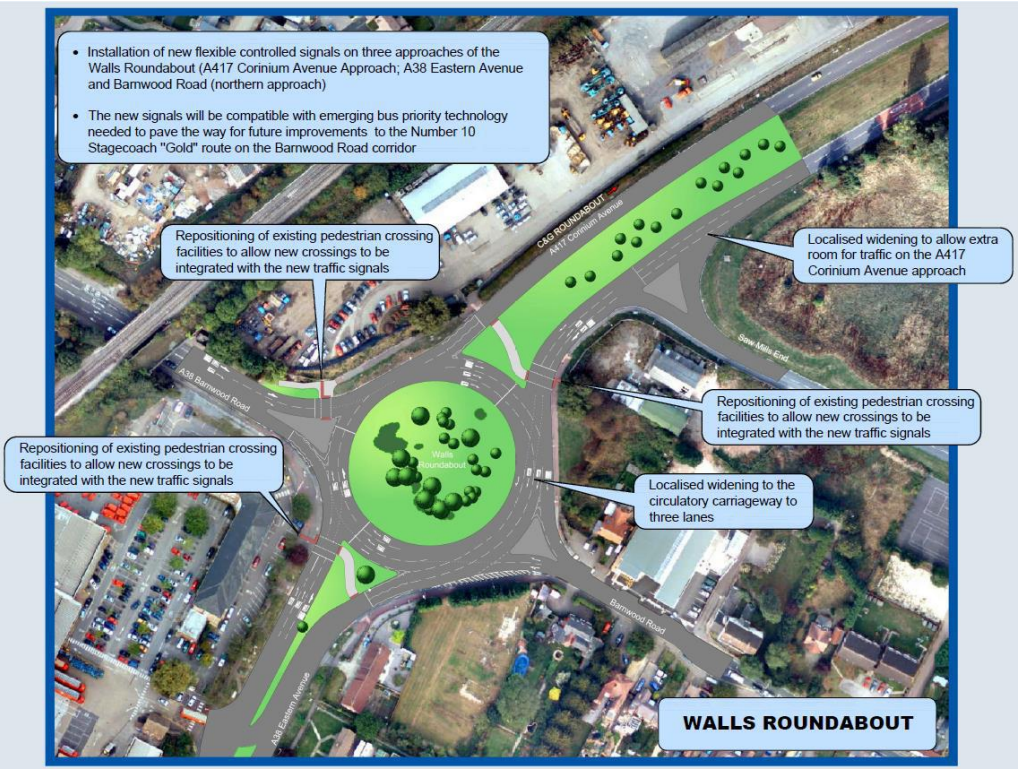


**Figure 30 - Walls Roundabout Improvement Project Overview**


**Figure 31 - C & G Roundabout improvement description**

**Previous Cycle Improvements**

In addition to the major projects above, Gloucestershire County Council has a proven track record of delivery of cycle infrastructure schemes. The largest scheme of this type is Metz Way Improvements, Gloucester which is currently on site. The cost of the scheme is £1.5M and it is funded from two main sources. Around £1M is being provided from the Coopers Edge Development with a £500,000 contribution from the GFirst LEP. The scheme includes cycle improvements which are part of a package of works delivering the objectives:

- Improving link between Coopers Edge and Gloucester City Centre
- Improving local junctions on the route
- Provide a better opportunity for modal shift from car use to walking, cycling and public transport

The scheme has been designed by Gloucestershire County Councils Professional Services Consultant and a competitive tender process was used to appoint North Midland Construction as the Contractor. This is the same design and procurement route that is proposed for the Lydney Cycling Improvements Scheme.

The Metz Way scheme also included a prioritisation exercise where various enhancement measures were considered and then prioritised to align the scheme with the budget available. They key improvements were identified as the area around the Coney Hill roundabout and the proposed package of works was selected as offering the greatest improvements within the budget available. The budget estimate provided to GCC pre-tender was proven to be robust and the Contract price was within the budget available.

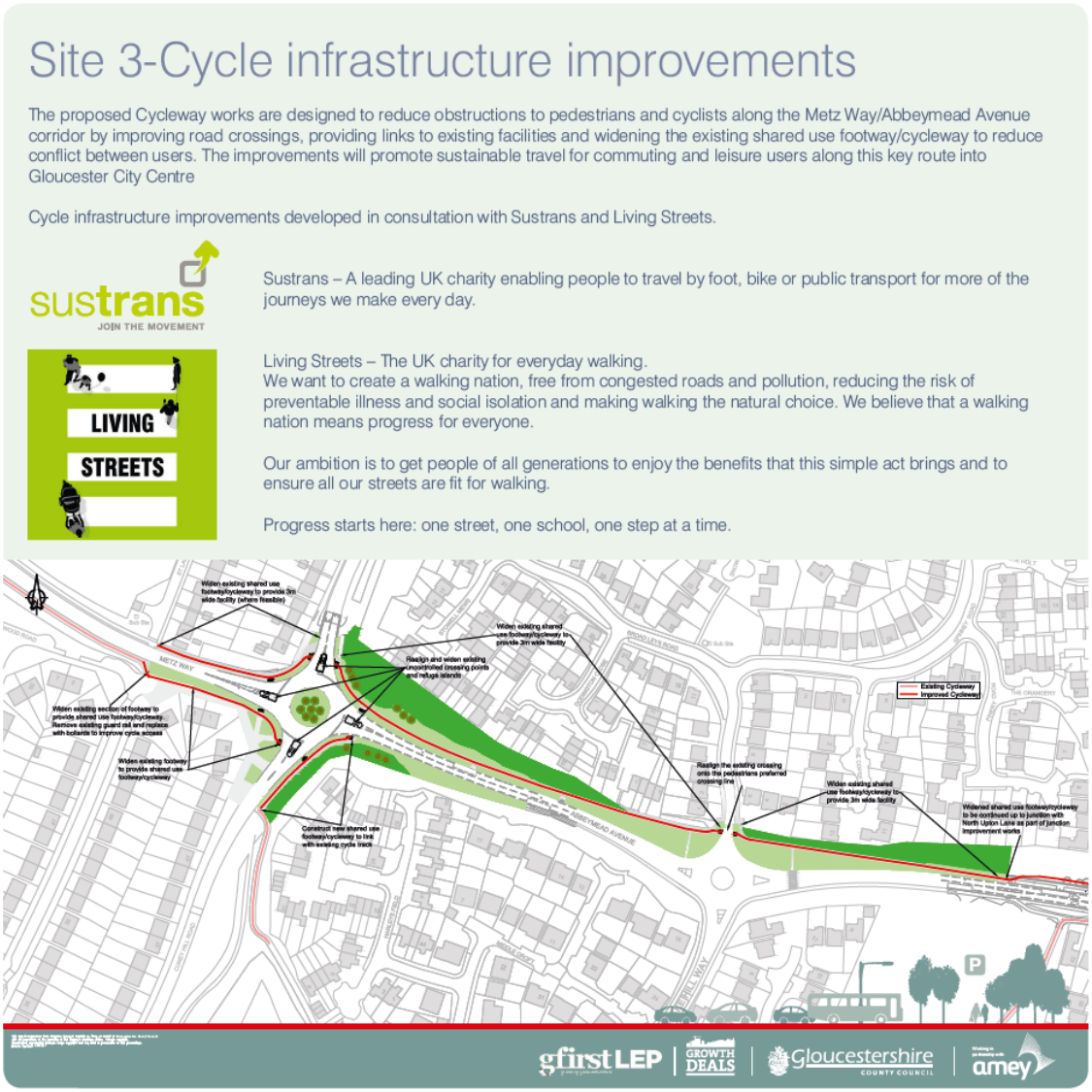


**Figure 32 - Metz Way Cycle Improvements overview**

Throughout the County many of the cycle improvement works undertaken by GCC are below £500k in value and are therefore delivered by the Term Maintenance Contractor. Whilst this represents an alternative procurement route, the works further demonstrate the ability to deliver cycle improvement works of this nature.

An example of a scheme delivered through the current term maintenance Contractor is the Cheltenham Barriers to Cycling scheme. The scheme included a range of improvements to cycling across Cheltenham which are very similar in nature to this Lydney scheme.

One area that received significant improvement was A40 Sandford Mill Road in Cheltenham. This road is one-way to vehicle traffic and the scheme installed a contra-flow cycle lane providing a convenient, safe and more direct cycle route to the east of Cheltenham.

The Figures below show two sections of the newly installed cycle route.

**Figure 33 - A40 / A40 Sandford Mill Road Roundabout Cycle Lane, Cheltenham**

**Figure 34 - A40 Sandford Mill Road Contra-Flow Cycle Lane, Cheltenham**

## 6.8. Availability and Suitability of Resources

The scheme is intended to be delivered using a collaborative approach between GCC staff and their appointed support organisation. GCC have identified appropriately trained and experienced staff that will be the responsible for the management of the scheme. The identified staff fulfilling the GCC Project Manager and Amey Project Manager roles, have been ring-fenced to support the scheme throughout its duration, from design through scheme procurement and onto construction supervision. They will have more junior staff available to support them as required.

GCC will utilise dedicated Professional Services Consultant resource through an existing contract to undertake design and also provide early contractor involvement (ECI), where appropriate, to the design process to ensure best value.

Gloucestershire County Council is re-tendering the professional services contract with the Consultant appointed to start work in April 2019. This will not impact on the delivery of the scheme as the design and procurements will be complete prior to this date.

The supervision of the works on site will be undertaken by Amey or a new Consultancy appointed to the Professional Services Contract in April 2019.

## 6.9. Design and Construction Methodology

**Design Methodology**

The scheme design is standard detail and in accordance with current issues of:

- Gloucestershire County Council's Manual for Gloucestershire Streets;
- Design Manual for Roads and Bridges;
- Local Transport Notes;
- Inclusive Mobility;
- Traffic Signs Manual and Traffic Signs Regulations and General Directions 2016;
- Sustrans Handbook for Cycle Friendly Design.

**Construction Methodology**

The proposed works all involve standard construction methodology in accordance with Specification for Highway Works. The proposed works do not require special construction techniques and could be wholly carried out by conventional methods.

The Contractor selected for the works will have a proven track record in carrying out similar works.

The cycle links are largely off carriageway and construction is not expected to have a significant impact on traffic. However, some elements of the works at crossings and through the town centre will have an impact on traffic. Works that require lane closures or temporary traffic signals will be completed during off peak hours to minimise delays. Detailed phasing requirements will be developed during detailed design and these constraints will be included within the contract documents.

## 6.10. Legal Powers Required for Construction

**Land/Access**

The majority of the works proposed are within the highway boundary with no requirement for land acquisition. However, there are two areas where land not owned by GCC is affected by the proposals. These areas are summarised under the following headings:

### Purple Link - Land Adjacent to Lydney Recreation Ground

The area of land is shown in drawing LY5.L1.100.001 Lydney Park Estate Land-A3 Frame in Appendix A.

The land shown is owned by Lydney Park Estate. The land is currently scrub land behind the back of the football club pavilion. In initial correspondence with Lydney Park Estimate, they have indicated that they are happy to work with GCC to ensure the land can be used by GCC for use as a shared use cycleway.

GCC legal team will agree the exact detail of the agreement which will be finalised following approval of the full business case. The most likely approach is for an agreement to be made with Lydney Park Estate to dedicate the land specifically to be used as a cycle track.

The risks associated with the 3rd party land are shown in the risk register in Appendix C. If issues are encountered, there is an alternative option available which is to run the cycle route through the football ground car park. This is not the preferred option, but would allow the Purple Link to be completed without the need for 3rd party land.

### Purple, Blue and Orange Links - Lydney Recreation Trust Ground

Sections of the Purple, Blue and Orange Links around the boating lake and Lydney Recreation Trust Ground (cricket, football, rugby and tennis clubs) are on land owned by the Lydney Recreation Trust (Appendix A drawing A1_LY5.100.009 Lydney Recreation Ground Land-009). There has been ongoing correspondence with the Trust during scheme development, they are aware of the plans and a full supporter of the scheme.

The current proposal is for Gloucestershire County Council to be responsible for ongoing maintenance of the cycle ways. This agreement will be formalised in a similar way to the agreement with Lydney Park Estate. GCC legal team will agree the exact detailed of the agreement which will be finalised following approval of the full business case. The most likely approach is for the land to be dedicated to be used as a cycle track or leased to the County Council.

### Traffic Regulation Orders (TRO)

When creating new shared use cycle ways, Gloucestershire County Councils policy is not to implement a formal traffic regulation order for the cycle way. Instead, a consultation exercise is undertaken where statutory consultees and affected stakeholders are invited to comment on the proposals. The consultation responses are then summarised in a report which is then signed off by a Gloucestershire County Council Senior Officer.

This process will be followed for the Lydney Cycling Improvement Scheme. Much of the required consultation has now taken place during preliminary design and at the share event. For many GCC cycle schemes there would not be a public share event as it is considered over and above the usual level of consultation for a scheme of this nature. During preliminary design no feedback has been received to date that would indicate any future problems with the authorisation for the cycleways.

The only element of the scheme that will require a legal process to be followed is for the crossing notice for the toucan crossing and zebra crossing on the Red Link. Producing a crossing notice is a legal process that must be followed, but the outcome is an authorisation for the crossing not a formal traffic regulation order. An outline of the crossing notice process is detailed in the bullets below:

- Informal consultation;
- Formal consultation;
- Formal advertising;
- Summary report;
- Sign off for authorisation of crossing.

The exact type of crossing of the A48 on the Purple Link is yet to be finalised, but currently this is shown as an informal crossing which does not require a crossing notice. If the type of crossing is changed during detailed design to a controlled crossing then a formal crossing notice will be necessary.

**Environmental Restraints**

As part of the preliminary design, environmental site walkovers have been carried out and desktop environmental scoping reports.

Where further detailed design work or environmental surveys are required, any mitigation or identified risk will be included in the Risk Register and costed for.

## 6.11. Project Programme

The following milestone dates are from the Scheme's delivery programme which is shown as a Gantt chart is included as an Appendix B:

| Activity | Target Date |
|---|---|
| Submit Full Business Case for Approval | 26 Oct 18 |
| Detailed Design Start | 10 Sept 18 |
| Detailed Design End | 21 Dec 18 |
| Approve Full Business Case | 04 Dec 18 |
| Issue Supplier Engagement Notice | 07 Dec 18 |
| Issue Tender Documents | 23 Jan 19 |
| Tenders Return | 01 Mar 19 |
| Complete Tender assessment and award | 16 Apr 19 |
| Construction Start | 15 May 19 |
| Construction End | 01 Oct 19 |

**Table 30 - Programme Key Dates**

The approval of the business case is expected on 04 December 2018. However, in a commitment to the scheme which allows the programme to be delivered in accordance with Table 22, GCC will engage Amey to complete the detailed design phase of the project in advance of the approval of the business case.

Following approval of the business case, a contractor will then be appointed via a competitive tender process. There will then be a Contract mobilisation period in advance of the Construction start date.

## 6.12. Benefit Realisation Strategy

### Scope of the Plan

The Benefits Realisation Strategy is designed to allow benefits that are expected to be derived from the scheme to be planned for, tracked and realised.

### Expected Benefits

The outputs and benefits are those expected to be derived from the scheme:

- Outputs – tangible effects that are funded and produced directly as a result of the scheme; and/or
- Outcomes – final impacts brought about by the scheme in the short, medium and long term.

### Benefit Measurement Methods

To determine whether the scheme benefits are being realised, the desired outputs and associated outcomes have been converted into measurable indicators of scheme benefits, as set out in the table below. Outcomes have been classified as 'Quantitative' (Qn) or 'Qualitative' (Ql).

Quantitative benefits are those which can be measured in terms of specific numerical values on a continuous scale, whether in absolute or percentage terms, whereas qualitative benefits are measured in category-based or descriptive terms.

| Ref | Benefit (Desired Output / Outcome) | Benefit Indicator | Target | Type | Specific Data Requirements | Owner |
|---|---|---|---|---|---|---|
| **Desired Outputs** | | | | | | |
| 1 | New and Improved Cycleways | Completion of project | 6.42 km (2.23km new and 4.19km improved) | Improvement | n/a | GCC |
| 2 | New and Improved Crossings | Completion of project | 2 (1 new parallel zebra , 1 upgraded pelican to toucan) | 1 new and 1 upgraded | 1. Link 7, Church Road. 2. Connects Link 7 to Link 4 | GCC |
| **Desired Outcomes** | | | | | | |
| 3 | Increase in cycling for Lydney | Number of cyclists | Increase % | Qn | Cycling Counts | GCC |
| 4 | Minimal accidents for pedestrians and cyclists in Lydney | Number of cycling and pedestrian accidents | No increase | Qn | Accident Data | GCC |
| 5 | Regeneration within Lydney | Number of new cycling schemes completed by private developers | | Ql | Monitor completed developer schemes | GCC |

**Table 31 - Outputs and Outcomes.**

### The One Year after Study

The One Year after Study will be carried out no less than one year after the completion of the scheme. It will include assessment against scheme details / desired Outcomes. Cycling and pedestrian surveys will be completed on each of the new cycle links. The type of survey is yet to be confirmed i.e. permanent or temporary count.

The locations of the proposed surveys are illustrated below, represented by the stars in the below figures:

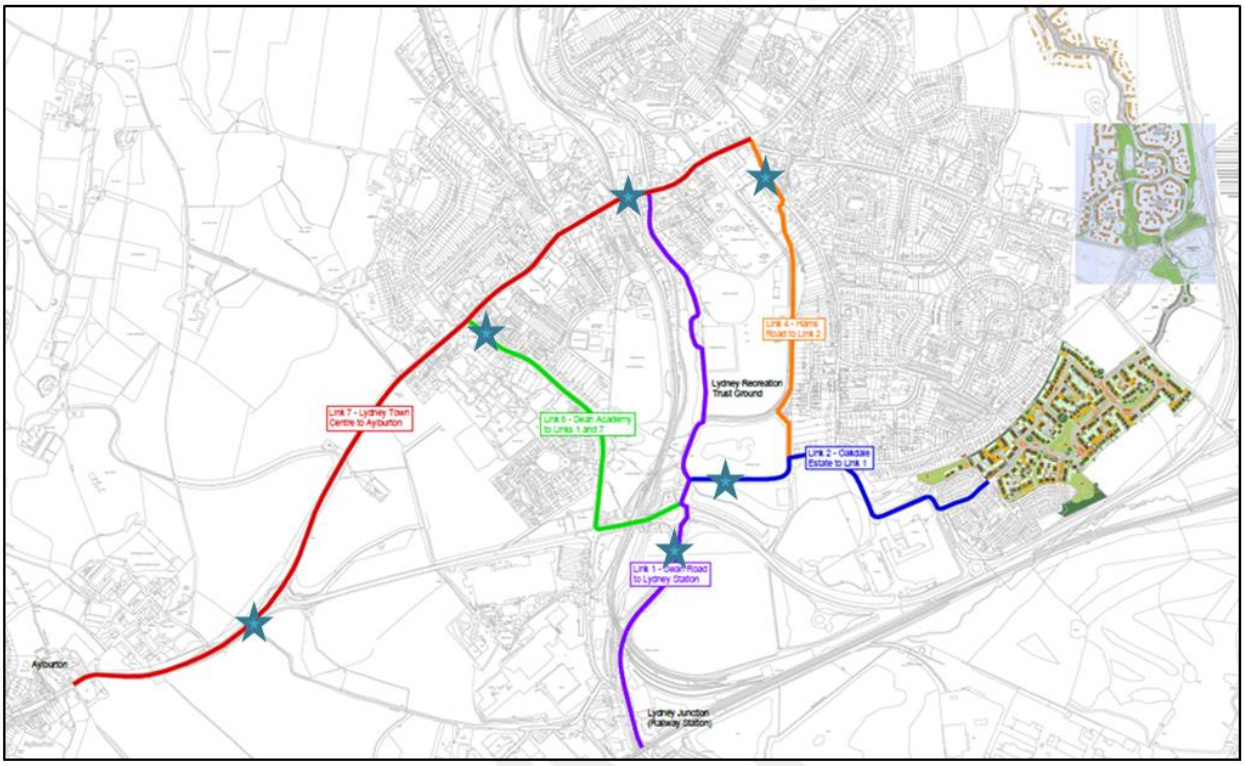


**Figure 35 - Proposed future Cycle Surveys to be completed**

### The Five Year after Study

The Five Year after Study will follow the same format as the One Year after Study but it will be able to provide a final appraisal of the scheme that includes all benefits. The Evaluation Summary Table will be updated to include five year results. A further consultation exercise to consult on the views of stakeholders and the public would be possible if required.

### Actions to be undertaken for Benefit Realisation Strategy

Tracking of the scheme benefits will be a key element in understanding the success of the scheme. The scheme details have been used to develop the desired outputs and outcomes. The table below links the Benefit Realisation for specific measures with responsibility. It is also important to refer to the Risk Register for specific risks and associated controls throughout the project.

| | Monitoring | Benefits Realisation | Responsible for Delivery |
|---|---|---|---|
| Delivery on time | Through contract management | Through contract management | Amey/Contractor/GCC |
| Delivery on budget | Through contract management | Through contract management | Amey/Contractor/GCC |
| Economic Growth (housing, jobs) | Derived from qualitative assessment | Realisation involves other schemes, including non-transport (e.g. Lydney Harbour Regeneration, completion of housing developments | Third parties |

**Table 32 - Benefits Realisation and Monitoring**

# 7. Conclusion

## 7.1. Summary

The Scheme package proposed for the funding application comprises of a series of interlinking cycling and pedestrian routes, and the package is considered to be appropriate to achieve the agreed aims and objectives of the project.

The most significant benefit from this option is derived from an increase in predicted cycling trips, and the associated health benefits for the users of the links, with the level of benefits far exceeding the cost of the scheme.

The scheme generates a Scheme Net Present Value (NPV) of £970,260. It is also important to note that the Economic Case produces a Benefit Cost Ratio (BCR) value of 2.28. The overall budget for the scheme is £1m. Further justification for the approval of the schemes is detailed throughout the report, and in the results of the Business Case.

Further justification for this proposed scheme is detailed throughout the report significantly in the qualitative analysis via the Business Case.

## 7.2. Recommended Next Steps

Development and delivery of the scheme should be approved. Due to the outcomes reported in this study, and the anticipated return on the proposal, it is advised that the scheme represents high value for money, meets the criteria of schemes for the LEP, and therefore should be approved for funding.

# Appendix A: Scheme Drawings

- A1_Cycle Links Consultation Material
- A1_LY5.100.008 Lydney Park Estate Land-A3 Frame;
- A1_LY5.100.009 Lydney Recreation Ground Land-009;
- A1_LY5.L1.100.001 Rev A Purple Link General Arrangement
- A1_LY5.L2.100.001 Rev B Blue Link General Arrangement
- A1_LY5.L4.100.001 Rev B Orange Link General Arrangement
- A1_LY5.L6.100.001 Rev A Green Link General Arrangement
- A1_LY5.L7.100.001 Rev A Red Link General Arrangement Rural Sheet 1 of 2
- A1_LY5.L7.100.002 Rev A Red Link General Arrangement Rural Sheet 2 of 2
- A1_LY5.L7.100.003 Rev B Red Link General Arrangement Urban

# Appendix B: Programme

- B1_ LYDNEY CYCLING IMPROVEMENTS - FBC PROGRAMME

# Appendix C: Risk Register

- C1_LYDNEY CYCLING IMPROVEMENTS - FBC RISK REGISTER.

# Appendix D: Economic Outputs

- D1_ACTIVE MODE APPRAISAL TOOLKIT

# Appendix E: Appraisal Summary Table

- E1_APPRAISAL SUMMARY TABLE

# Appendix F: Public Share Event Feedback Form

- F1_SHARE EVENT FEEDBACK FORM

# Appendix G: Environmental References

- G1_ENVIRONMENTAL REFERENCES