Usk to Pontypool Economic Impact Study

Wales Rural Development Programme

February 2019

About Sustrans

Sustrans yw'r elusen sy'n ei gwneud yn haws i bobl gerdded a beicio. Rydym yn cysylltu pobl a llefydd, yn creu cymunedau byw, yn trawsnewid y daith i'r ysgol ac yn hwyluso taith hapusach ac iachach i'r gwaith.

Ymunwch â ni ar ein siwrne. www.sustrans.org.uk

Sustrans is the charity making it easier for people to walk and cycle. We connect people and places, create liveable neighbourhoods, transform the school run and deliver a happier, healthier commute. Join us on our journey. www.sustrans.org.uk

Sustrans Cymru
123 Bute Street
Cardiff Bay
Cardiff
CF10 5AE

Head Office
Sustrans
2 Cathedral Square
College Green
Bristol
BS1 5DD

Circulation status:	First draft for internal QA
Date issued:	14 February 2019
Authors:	Emma Lindsay and Holly Musgrove with direction from Anjali Badloe
Quality assurance:	Anjali Badloe (4 January 2019)
Sign off:	Anjali Badloe (14 February 2019)

Table of contents

Usk to Pontypool – Economic Impact Study

The following document provides an assessment of the economic benefits of developing a walking and cycling route connecting Usk and Pontypool. The route covers 13km and mostly follows a disused railway line.

The route will connect Usk and Pontypool, providing both a commuter route and leisure trail. It will join to NCN route 42 on the East side (Usk) and with NCN route 49 to the West (Pontypool). The route will provide an alternative, all users route to the existing NCN route 423, which covers steep inclines making it suitable to only experienced cyclists.

This document provides economic evidence to accompany wider feasibility study of the proposed developments that is being undertaken by Sustrans Cymru as part of the Wales Rural Development Programme.

1 Executive Summary

Key outputs from the economic appraisal

The economic benefits of the Usk to Pontypool route have been appraised based on expected annual cyclist and pedestrian usage on the proposed route after construction is completed. The economic benefits of this annual usage have been appraised as if observed for the next 20 years (i.e. a 20-year appraisal period has been used).

The following figures are key outputs related to the estimated current and future usage on the route, and the associated economic benefits from the economic appraisal. For a full description of these outputs, including the methodology used to arrive at these values, please see the main body of the report.

This analysis estimates a baseline level of annual cycling and walking usage by local users before estimating usage on the constructed route based on uplift seen in previous infrastructure projects. The post-construction usage estimates are derived from the Infrastructure Impact Tool (IIT, see section 3 for more details on tools), local data from past schemes in the surrounding area and other comparable sites. The post-construction usage scenarios include an estimated annual number of trips and are presented as low, middle and high scenarios.

Current annual usage estimate

Current usage on the route is estimated using data from a Route User Intercept Survey (RUIS) conducted in 2013 and uplifted for current estimations. The estimated Annual Usage Estimates (AUEs) are:

- 44,289 cycling AUE
- 75,185 walking AUE

Forecasted/future annual usage estimate (cyclists)
These estimated values are based on scenarios that have been developed around the cyclist Infrastructure Impact Tool (IIT) output.

Table 1 *Cyclist usage scenarios (Executive Summary)*

Baseline AUE	Percentage increase in cyclist usage	Post-scenario AUE
44,289	52%	67,319
	72%	76,177
	92%	85,035

Forecasted/future annual usage estimate (pedestrians)

These estimated values are based on scenarios that have been developed around the pedestrian Infrastructure Impact Tool (IIT) output.

Table 2 *Pedestrian usage scenarios (Executive Summary)*

Baseline AUE	Percentage increase in pedestrian usage	Post-scenario AUE
75,185	21%	90,974
	26%	94,733
	31%	94,492

Estimated economic benefits (including health)
The following economic benefits have been estimated using the Benefit-Cost Ratio tool, and using the usage information in the previous tables as inputs.

Table 3 *Estimated economic benefits (Executive Summary)*

	Post-scenario AUE (cycling)	Post-scenario AUE (pedestrian)	Economic benefits	Benefit-cost ratio
Low usage change	67,319	90,974	£2,519,106	0.56:1
Medium usage change	76,177	94,733	£3,157,503	0.99:1
High usage change	85,035	94,492	£3,814,479	1.19:1

The following illustrates the estimated economic benefits (including those as a result of health benefits) of the middle usage scenario in greater detail. A full breakdown of the estimated benefits for all scenarios is provided in Section 4 of the report.

Under the middle scenario, where the shared use route sees a 72% increase in cycling and 26% increase in walking trips above baseline, the benefits are estimated as:

- A total of 94,733 walking trips and 76,177 cycle trips being made on the route each year
- Total economic benefits (PVB) of £ £3,157,503
- Health benefits of £ £1,163,137
- Overall tourism-related economic benefits (i.e. expenditure) of £352,091 (walking and cycling combined)

Given the estimated costs of construction and maintenance, this level of usage results in a Benefit-Cost ratio of 1.19:1 for the average cost scenario.

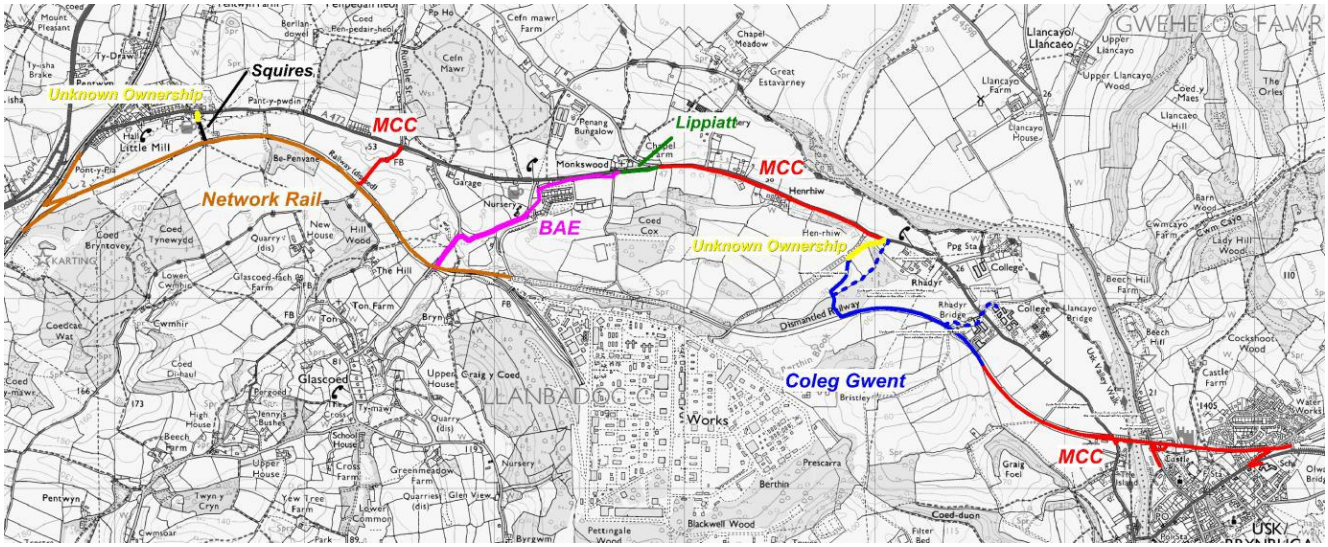
2 Background

Sustrans' Research and Monitoring Unit (RMU) have undertaken economic analysis for three scenarios for the proposed development of a route between Usk and Pontypool.

This document outlines the economic benefits of the proposed route for three usage scenarios.

2.1 Study Area

Figure 1: Map overview of proposed route and the land ownership



The proposed route development will align with an old railway line and connect Usk to Pontypool via Little Mill. The new path would be suitable for walking, cycling and horse riding. It would be 13km and is hoped to increase tourism in the area as well as providing a commuter route between Usk and Pontypool. It will run parallel to National Cycle Network route 423, providing an alternative to all users as NCN 423 covers steep inclines making it suitable to only experienced cyclists. The route deviates from the railway for a length due to BAE operational issues. The final stretch of route to Pontypool will then run adjacent to the A4042 – Usk Road on a segregated path.

The economic benefits of this route have been evaluated from usage estimates calculated using historic Route User Intercept Survey's (RUIS) and National Travel Survey trends. This was then appraised using the Infrastructure Investment Tool (IIT) for cyclists and pedestrians, the Benefit-Cost Ratio tool and the Leisure Cycling and Leisure Walking Expenditure Models (LCEM and LWEM) to determine the economic benefits for both cyclist and pedestrians.

3 Methodology

3.1 Economic Appraisal Tools

Infrastructure Investment Tools (IIT)

The cycling IIT (CIIT) and the pedestrian IIT (PIIT) are based on a database of past infrastructure scheme interventions delivered across the UK. This approach adopts a forecasting approach based on comparable schemes, as recommended by the Department for Transport (DfT) in their WebTAG

Unit A5.1 for Active Mode Appraisal[1]. This approach is also consistent with the Welsh government Transport Appraisal Guidance (WelTAG). In adopting a case study approach, assumptions have been made that infrastructure developments are likely to perform similar to what was observed in the past. This approach is not specific to the local context evaluated here and may not fully integrate all of the unique aspects of the proposed development. It is a generalised approach based on evidence from past schemes and as such should not be considered a definitive calculation of the expected outcomes of a scheme.

The IIT's are used to estimate a potential increase in usage from any currently observed usage (i.e. a baseline estimate) to any change that results after a scheme has been constructed. This post-construction estimate is based on evidence of observed cyclist and pedestrian usage pre- and post-infrastructure delivery in the past. The PIIT is a new tool, which was created based on the CIIT model. The data that the PIIT draws on for reference is not as extensive as the number of schemes which feed into the CIIT. The tools do not give estimates in reference to a specific time period over which this usage change is observed or occurs. All outputs from the IIT's are in the form of an annual number of cyclist or walking trips.

Benefit-cost ratio (BCR) Tool

Sustrans RMU have developed an economic appraisal tool which is used to estimate the economic benefits of capital investments in walking and cycling based on information provided about the location and usage of the investment .The tool was initially developed to comply with the Department for Transport (DfT)'s guidance, WebTAG (Web-based Transport Appraisal Guidance). In Wales, the Welsh government's Transport Appraisal Guidance (WelTAG) is used, as this is adapted to Welsh-specific objectives and the outcomes and strategic priorities of the Wales Transport Strategy. There are no specific adaptations to the Sustrans RMU BCR tool mandated in the latest version of WelTAG, therefore the BCR tool developed in accordance with WebTAG is compatible for the Welsh context.

The BCR tool requires the following inputs:

- Trip frequency
- Journey purpose
- Trip distance
- Proportion not using a car for any part of their journey
- Proportion who could have used a car for their journey but have chosen not to

The BCR tool provides an estimate of the monetised economic benefits for the following impact areas related to cycling and walking:

- Health (using the WHO HEAT tool)
- Absenteeism

[1] WebTAG Unit A5.1 for Active Mode Appraisal. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/427098/webtag-tag-unit-a5-1-active-mode-appraisal.pdf

- Amenity
- Greenhouse Gas Emissions Reduction
- Accidents Savings
- Decongestion
- Air Quality Improvement
- Noise Pollution Reduction
- Infrastructure Development
- Indirect Taxation (disbenefit)

All economic benefits appraised through the BCR tool are based on a 20 year appraisal time period. This provides an estimate of the economic benefits of a specific level of scheme usage being observed over the next 20 years. All benefits are discounted over the 20-year time period to provide a present-day value.

Health Economic Assessment Tool (HEAT)

The (WHO) Health Economic Assessment Tool (HEAT) is used to evaluate the health-related economic benefits of walking and cycling. The benefits calculated through HEAT relate to the reduced mortality generated through a specific number of walking and cycling trips. All health-related economic benefits are calculated over a 20 year appraisal time period, to maintain compatibility with the economic outputs generated from the BCR tool.

The World Health Organisation issued HEAT 4.0 in November 2017 as an update to the previous tool. HEAT 4.0 is currently under review by the WHO and likely to be reissued with further amends.

As a result, the version of HEAT used in this appraisal is the previous version of HEAT, available at: http://old.heatwalkingcycling.org

Leisure Expenditure Model Tools: Cycling and Walking

Sustrans RMU has developed two models which calculate the economic benefit to an area from recreational cycling and walking in terms of 'spend per head' and the job roles these activities create.

The **Leisure Cycling Expenditure Model**[2] was originally developed in 2007 in association with the University of Central Lancashire (UCLAN) to estimate the impact of cycle tourism. It has been iteratively updated, most recently in 2017.

The model was developed based on an extensive data collection exercise undertaken between 2001 and 2006 on long-distance routes in the North of England, using user surveys, automatic counter data and travel diaries. The model can be used to estimate the economic impact of cycle tourism based on an estimate of annual 'spend per head' for all recreational cyclist users on the route. This estimate of cycle tourism-related expenditure is differentiated according to home-based and recreational tourist

[2] Previously titled the Recreational Expenditure Model (REM)

users. The outputs are indicative, rather than precise, estimates of the potential direct economic impact of investing in recreational cycling and give an estimate of the annual tourism-related economic benefits of recreational cycling usage on a proposed route. This is in terms of tourism expenditure and the social value of tourism per year.

The **Leisure Walking Expenditure Model** (LWEM) is a tool for estimating the economic benefit of leisure walking in terms of the expenditure it contributes to the local economy. This model originated from the Recreation Expenditure Model (now the LCEM) and builds on expenditure data collected from route users over a number of years.

It is based on data collected from Route User Intercept Surveys (RUIS) across the UK (though mainly in Wales and Scotland). The model estimates the total annual spend for all home- and holiday-based based leisure walkers. It also calculates the number of full time equivalent (FTE) roles this spend would support. In order to further understand the effect of the expenditure, spend and FTE roles are split by sector.

4 Assessment of Economic Benefits

This section outlines the economic benefits of the proposed **Usk to Pontypool route,** including:

- The economic value of congestion, greenhouse gas (GHG) emissions, noise pollution and amenity benefits accrued through mode shift encouraged by the route
- Health-related benefits of increased walking and cycling on the proposed routes
- Direct and indirect job creation from infrastructure works and increased recreational walking on the routes
- Overall positive return on investment

4.1 Annual Usage Estimate

An Annual Usage Estimate (AUE)[3] is required to calculate the expected economic benefits from a proposed route development. This came from a RUIS conducted in Pontymoel in 2013 and applying an extrapolation to the usage values based on trends shown in the 2017 National Travel Survey.

As shown in figure 2 below, the Pontymoel RUIS site is at the end of the Pontypool side of the proposed route. An additional RUIS was conducted further from the proposed route as shown in **Figure 2**. As there are more options for users at this RUIS site it was not used to calculate the AUE of the route. Additionally a counter is located to the north west of the site that was not used. This was decided as the data available from the counter was from ten years ago, in 2007-2008.

The Pontymoel site has RUIS conducted in August of each year from 2009 to 2013. Over these five years the usage by cyclists and pedestrians varied. Pedestrian usage varied year on year, increasing and decreasing. Cycling was stable from 2009 to 2011 with a sharp increase over 2011 and 2012. To

[3] An Annual Usage Estimate (AUE) refers to the number of individual cycling trips made annually on a route

ensure the cycling increase seen towards the end of this monitoring was not lost only 2013 AUE's have been used to calculate current estimates.

Figure 2 AUE data sources for the Usk to Pontypool route

To account for the 5 years since the Pontymoel Basin RUIS was conducted figures were extrapolated using the changes reported in the National Travel Survey 2017[4].

Table 4: AUE baseline calculations for cyclist and pedestrians

	Pontymoel Basin 2013 RUIS AUE's	NTS Uplift Trends (2002-2017)	Baseline AUE's Used
Cycling AUE	44,289	Stable	44,289
Pedestrian AUE	71,604	Increased 5%	75,185

The baseline is an estimation of 'current usage' relevant to the proposed route i.e. usage that exists but is not currently facilitated due to route not existing. Therefore it is an estimation of the current number of journeys which may be occurring in the local area that could be using the proposed route.

4.2 AUE increase scenarios

To forecast the expected economic benefits of the route, a range of post-intervention scenarios where usage has increased above the baseline are set.

These scenarios are based on outputs from the **Infrastructure Investment Tools (IIT)** for cyclists and pedestrians, which provides an estimate of the expected cycling and pedestrian usage increases based on a database of past schemes, where infrastructure of a similar type has been delivered. The IIT models were run using the baseline AUE and the infrastructure category 'Cycle and pedestrian track' for the urban rural classification of 'Urban town and city'.

The IIT provides an indication of usage increase that is likely to be expected from construction of the route. This is the estimate of annual usage once the scheme has been constructed, accounting for mode shift and growth in cycling usage that is encouraged through the route development. To account

[4] National Travel Survey 2017 DfT report: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/729521/national-travel-survey-2017.pdf

for potential uncertainty and the possibility that usage change may be higher or lower than what has been observed in the past, a range of three post-usage scenarios are used.

The three scenarios for cycling uplift are shown in **Table 5** . Given the conservative estimate set on the cycling baseline AUE which kept it the same as the 2013 estimate, in line with the NTS trend rather than the increase seen at the site from 2009 to 2013, the IIT scenario has been used as a low scenario. The middle and upper scenarios have been set above the IIT percentage increase at 20% intervals, as shown. The IIT scenario is represented in green.

Table 5 *Post-scenario cycling AUE scenarios*

Baseline AUE	Percentage increase in cyclist usage	Post-scenario AUE
44,289	52%	67,319
	72%	76,177
	92%	85,035

In order to formulate the post-usage scenarios for pedestrians, the pedestrian Infrastructure Impact Tool (IIT) has been used. In this instance the IIT scenario was used as a middle scenario due to the fluctuations in levels of walking seen from 2009 to 2013. The lower and upper scenarios have been set at a 5% difference either side of this usage estimate.

Table 6 *Post-scenario pedestrian AUEs*

Baseline AUE	Percentage increase in pedestrian usage	Post-scenario AUE
75,185	21%	90,974
	26%	94,733
	31%	98,492

Together, the post-scenario cycling and pedestrian usage calculations represent the three scenarios that are appraised.

4.3 WelTAG and monetised economic benefits

The BCR tool provides an appraisal of the economic benefits of an infrastructure development and requires specific inputs in order to provide a monetised value for the expected benefits under the three post-construction usage scenarios.

For this route, the BCR appraisal tool has been used to calculate the expected economic benefits based on the post-scenarios for both pedestrians and cyclists. All economic benefits presented have been calculated using the WelTAG appraisal tool over a 20-year time period.

In addition to the baseline and post-scenario AUEs, all necessary BCR tool inputs were taken from the commissioned RUIS data.

No variation in these additional inputs has been made between the baseline and post-scenario cases as it is not possible to predict how these might change as a result of the development.

Depending on what occurs in practice and how these variables change in reality, the valuations obtained through WelTAG using these fixed inputs may reflect an economic value that is either higher or lower than the reality.

4.4 Health-related economic benefits

The health-related economic benefits of the Penarth Headland shared use path have been estimated using the World Health Organisation's (WHO's) Health Economic Appraisal Tool (HEAT)[5]. All health-related economic benefits are calculated over a 20 year appraisal period.

The BCR tool includes health-related economic benefits that have been generated using HEAT. The HEAT outputs that have been calculated are outlined in **Table 7** HEAT outputs**.**

Table 7 *HEAT outputs*

	Post-scenario cycling AUE	Post-scenario pedestrian AUE	HEAT output (cyclists)	HEAT output (pedestrians)	HEAT output (combined)
Lower Scenario	67,319	90,974	£638,028	£84,338	£722,366
Middle Scenario	76,177	94,733	£ 1,029,764	£ 133,373	£1,163,137
High Scenario	85,035	98,492	£ 1,421,160	£ 199,320	£1,620,479

The combined HEAT output for both pedestrian and cyclist usage is used as the health economic benefit input in the WelTAG tool.

4.5 Overall economic benefits

The overall economic benefits of the proposed route include both the BCR tool and HEAT outputs.

Table 8 displays the range of economic benefits that could be expected under all possible combinations of the three cycling and pedestrian usage scenarios that have been examined.

Table 8 *WebTAG and HEAT – Economic benefit*

		Walking AUE increase		
		21%	26%	31%
Cycling AUE increase	52%	£2,519,106	£1,815,869	£1,893,577
	72%	£2,278,100	£3,157,503	£2,413,850
	92%	£2,797,742	£2,855,782	£3,814,479

As well as viewing the estimated economic benefits as an array of possible scenarios, these economic benefits can be displayed as three scenarios: a low usage change scenario, a middle usage change scenario and a high usage change scenario. This corresponds with how the economic benefit outputs for the Usk to Pontypool route are presented.

[5] The WHO HEAT tool is available at: http://old.heatwalkingcycling.org/

These three scenarios will be input into the LCEM and LWEM. The three scenarios are outlined in **Table 9** below.

Table 9 *WebTAG and HEAT – Multi-scenario economic benefits*

	Cycling AUE increase	Pedestrian AUE increase	Post-scenario AUE (cycling)	Post-scenario AUE (pedestrian)	Economic benefits
1: Low usage change	52%	21%	67,319	90,974	£2,519,106
2: Medium usage change	72%	26%	76,177	94,733	£3,157,503
3: High usage change	92%	31%	85,035	98,492	£3,814,479

4.6 Benefit-cost ratios

The total construction cost of the proposed Usk to Pontypool route is estimated at £2,500,000. Annual (routine) maintenance costs for the route length of 13km are estimated to be £10,158 per year. Over the 20 year appraisal time period, the total scheme costs (construction and maintenance) are estimated at £3,198,709 for the middle usage scenario.

Table 10 below shows the estimated economic impact, including health benefits from HEAT, for each of the different increase scenarios over a 20 year appraisal period. The benefit to cost ratio for each scenario is included under the 'BCR' column.

Table 10 *Estimated economic benefits*

	Cycling	**Walking**	**Total Benefits**	**Cost (incl. maintenance over 20 years)[6]**	**BCR**
1: Low (52% cycling, 21% walking)	£2,419,007	£100,099	£2,519,106	£3,198,541	0.56:1
2: Middle (72% cycling, 26% walking)	£3,000,263	£157,240	£3,157,503	£3,198,709	0.99:1
3: High (92% cycling, 31% walking)	£3,580,714	£233,765	£3,814,479	£3,198,871	1.19:1

Any BCR above 1 signifies that the economic benefits of constructing the route are greater than the provided cost. All scenarios have positive BCRs, signifying strongly that the economic benefits of this route are such that they outweigh the costs. The range of scenarios is intended to provide an indication of potential outcomes, which in this instance all have strongly positive outcomes.

[6] The present-value cost varies across scenarios because of the infrastructure benefit variation across scenarios. The infrastructure benefit is deducted from costs to the government (as this is government spending that is directly saved as a result of the scheme).

4.7 Tourism-related economic benefits

The Leisure Cycling Expenditure Model (LCEM) and Leisure Walking Expenditure Model (LWEM) tools have been used to generate an estimate of the combined tourism-related economic benefits of the proposed Usk to Pontypool route.

The LCEM and LWEM tools have been run using the recreational usage inputs from Pontymoel Basin RUIS results conducted in August of 2013, in line with the results used for the usages used in calculating the economic benefits of the route. The economic benefits captured are excluded from appraisals of cycling and walking usage according to WebTAG and therefore, can be considered to be additional to those benefits outlined in. These tourism-related economic benefits are derived from a different approach to the economic benefits generated through the RMU Benefit-Cost Ratio tool and therefore, should not be combined.

The LCEM and LWEM tools provide an estimate of the annual recreational spend by both home-based and tourist leisure cyclists on accommodation, food and drink, retail, car costs, cycle costs and public transport. This provides an estimate of the direct contribution that leisure cycling and walking generated through the proposed route development will make on the local economy on a yearly basis.

The tools also provide an estimate of the annual social value of recreational trips made by home-based or tourist leisure users on the Usk to Pontypool route. This is a measure of the 'public good' or value placed on the route by leisure users that is not captured in their expenditure.

Table 11 *Leisure Cycling Expenditure Model (LCEM)*

	Annual recreational spend - HOME	Annual recreational spend - HOLIDAY	Overall tourism economic benefits
1: Low usage change	£123,136	£ -	£123,136
2: Medium usage change	£139,338	£ -	£139,338
3: High usage change	£155,541	£ -	£155,541

Table 12 *Leisure Cycling Expenditure Model (LCEM)*

	Annual recreational spend - HOME	Annual recreational spend - HOLIDAY	Overall tourism economic benefits
1: Low usage change	£198,954	£5,357	£221,195
2: Medium usage change	£207,175	£5,579	£212,753
3: High usage change	£215,396	£5,800	£204,311

The LCEM and LWEM tools also provide an estimate of the direct and indirect full-time equivalent (FTE) jobs supported in the local economy through recreational cycling. Details of this are provided in **Table 13** and **Table 14**.

Table 13 *Leisure cycling usage and employment support*

	Direct employment (FTEs)	Indirect employment (FTEs)	Total employment (FTEs)
1: Low usage change	1.65	0.94	2.59
2: Medium usage change	1.87	1.06	2.93
3: High usage change	2.09	1.19	3.27

Table 14 *Leisure walking usage and employment support*

	Direct employment (FTEs)	Indirect employment (FTEs)	Total employment (FTEs)
1: Low usage change	2.74	1.56	4.30
2: Medium usage change	2.85	1.63	4.48
3: High usage change	2.97	1.69	4.66

Considerations

There are a number of considerations relevant to the assessment of economic benefits that has been carried out for the Usk to Pontypool route**.**

Baseline AUE Data Selection

- The most recent data source for area usage is from 2013. To get around the age of this data National Travel Survey trends were used to extrapolate the data to estimate a current usage at the site.
- The data used to calculate the baseline AUE used only accounts for potential usage from the Pontypool (West) side of the route.

Analysis – Recreational Expenditure Model

- Due to the age of the data and the improved processes of RMU over the last 5 years the inputs for the Leisure Expenditure Models have been calculated manually, rather than through R. This means that all surveys are treat with equal measure, with no weighting applied. There is also no redistribution of user's recreational journeys that do not originate from 'home' or a 'holiday base'. Due to this, 3% of the surveys used to calculate these inputs are excluded.