

Conwy Estuary Trail Economic Impact Study

Wales Rural Development Programme

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Table of contents

Conwy Estuary Trail- Economic Impact Study.....	4
1 Executive Summary	4
1.1 Key outputs from the economic appraisal.....	4
2 Background	7
2.1 Study Area.....	7
3 Methodology.....	8
3.1 Economic Appraisal Tools	8
4 Conwy Estuary RUIS data.....	10
5 Assessment of Economic Benefits.....	11
5.1 Annual Usage Estimate.....	11
5.2 AUE increase scenarios	11
5.3 WeTAG and monetised economic benefits	12
5.4 Health-related economic benefits	13
5.5 Overall economic benefits.....	13
5.6 Benefit-cost ratios.....	14
5.7 Tourism-related economic benefits.....	15
Considerations.....	16

Conwy Estuary Trail– Economic Impact Study

The following document provides an assessment of the economic benefits of upgrading a 3km walking and cycling route along the Conwy estuary.

The route links Deganwy and the West shore of Llandudno. The upgrade is being planned in conjunction with a beach management plan being carried out by Conwy County Borough Council (CCBC) and Llandudno Coastal Forum (LCF) and would address the issues of windblown sand on the path which prevents usage of the route most of the year. The upgrade will also bring the route section up to current design standards.

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

1.1 Key outputs from the economic appraisal

The economic benefits of the Conwy Estuary route upgrade 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. 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 on site in August/September 2017. The estimated Annual Usage Estimates (AUEs) are:

- 48,337 cycling AUE
- 381,534 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*

Baseline AUE	Percentage increase in cyclist usage	Post-scenario AUE
48,337	152%	73,472
	172%	83,140
	192%	92,807

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*

Baseline AUE	Percentage increase in pedestrian usage	Post-scenario AUE
381,534	121%	461,656
	126%	480,733
	131%	499,809

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*

	Post-scenario AUE (cycling)	Post-scenario AUE (pedestrian)	Economic benefits	Benefit-cost ratio
Lower scenario	73,472	461,656	£964,275	0.52
Middle scenario	83,140	408,733	£1,320,739	0.71
Higher scenario	92,807	499,809	£1,724,306	0.93

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 5.5** of the report.

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

- A total of 480,733 walking trips and 83,140 cycle trips being made on the route each year
- Total economic benefits (PVB) of £ 1,320,611
- Health benefits of £ 767,819
- Overall tourism economic benefits of £ 4,072,674 (walking and cycling combined)

Given the estimated costs of construction and maintenance, this level of usage results in a Benefit-Cost ratio of 0.71 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 the route between Deganwy and Llandudno along the Conwy Estuary.

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



The proposed upgrade will follow a 3km section of the Conwy Estuary, North towards the West shore of Llandudno. The work would be done in conjunction with the Beach Management Plan currently being developed by Conwy County Borough Council (CCBC) and Llandudno Coastal Forum (LCF). It would address the issues of windblown sand from the dunes which blocks the path for most of the year as well as bringing the section up to current standards.

The upgrade is expected to help tourism in the area due to the appeal of the coastal scenery, Conwy castle and existing NCN links in the area.

The economic benefits of this route have been evaluated from usage estimates from local counter data and Route User Intercept Survey's (RUIS). 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 Appraisal¹. This approach is also consistent with the Welsh government Transport Appraisal Guidance (WeTAG). 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

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

government's Transport Appraisal Guidance (WeITAG) 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 WeITAG, therefore the BCR tool developed in accordance with WeITAG 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
- 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 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 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 Conwy Estuary RUIS data

Baseline AUE

An Annual Usage Estimate (AUE) is required to calculate the expected economic benefits from the proposed route construction. This shows the potential number of trips that we would expect to be using the route if it were approved and constructed.

² Previously titled the Recreational Expenditure Model (REM)

This was calculated from Route User Intercept Surveys conducted on the Conwy site on four days in August (3rd and 5th) and September (5th and 9th), between 0700h and 1900h.

5 Assessment of Economic Benefits

This section outlines the economic benefits of the proposed Conwy Estuary Trail, 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

5.1 Annual Usage Estimate

An Annual Usage Estimate (AUE)³ is required to calculate the expected economic benefits from a proposed route development. This comes from the RUIS conducted on the route in August/September 2017.

The AUE calculation draws on historical data, automatic counter data and takes into account seasonality. Results are shown in **Table 4**.

Table 4 RUIS annual Usage Estimate (AUE) data

Site	Region	Year	Cycling AUE	Walking AUE
Conwy Estuary RUIS	Wales	2017	48,337	381,534

5.2 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

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

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

The upper scenario is set above the IIT percentage increase and the lower scenario is set below the IIT percentage increase scenario. The IIT scenario is in green. The three scenarios for cycling uplift are shown in **Table 5**.

Table 5 Post construction cycling AUE scenarios

Baseline AUE	Percentage increase in cyclist usage	Post-scenario AUE
48,337	52%	73,472
	72%	83,140
	92%	92,807

In order to formulate the post-usage scenarios for pedestrians, the pedestrian Infrastructure Impact Tool (IIT) has been used.

Table 6 Post construction pedestrian AUE scenarios

Baseline AUE	Percentage increase in pedestrian usage	Post-scenario AUE
381,534	21%	461,656
	26%	480,733
	31%	499,809

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

5.3 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.

5.4 Health-related economic benefits

The health-related economic benefits of the Conwy Estuary route upgrade have been estimated using the World Health Organisation's (WHO's) Health Economic Appraisal Tool (HEAT)⁴. 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**.

Table 7 HEAT outputs

	Post-scenario cycling AUE	Post-scenario pedestrian AUE	HEAT output (cyclists)	HEAT output (pedestrians)	HEAT output (combined)
Lower scenario	73,472	461,656	£285,916	£195,246	£481,162
Middle scenario	83,140	480,733	£459,089	£308,730	£767,819
Higher scenario	92,807	499,809	£ 632,103	£461,393	£1,093,496

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

5.5 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. All of these economic benefits include the HEAT outputs displayed in **Table 7**.

Table 8 WebTAG and HEAT - Economic benefits

		Walking AUE increase		
		21%	26%	31%
Cycling AUE increase	52%	£964,275	£1,103,198	£1,289,497
	72%	£1,181,817	£1,320,739	£1,507,039
	92%	£1,399,084	£1,538,007	£1,724,306

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, the change predicted from the IIT and a high usage change scenario. This corresponds with how the economic benefit outputs for the Conwy Estuary are presented.

⁴ 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
Lower scenario	52%	21%	73,472	461,656	£964,275
Middle scenario	72%	26%	83,140	480,733	£1,320,739
Higher scenario	92%	31%	92,807	499,809	£1,724,306

5.6 Benefit-cost ratios

The total construction cost of the proposed Conwy Estuary route upgrade is estimated at £1,500,000. Annual (routine) maintenance costs for the route length of 3km are estimated to be £2,344 per year. Over the 20 year appraisal time period, the total scheme costs (construction and maintenance) are estimated at £1,854,867 for the middle usage scenario.

Table 10 below show 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 (inc. maintenance over 20 years)	BCR
Lower scenario (52% Cycling, 21% Walking)	£684,044	£ 280,232	£964,275	£1,854,909	0.52:1
Middle scenario (72% Cycling, 26% Walking)	£901,585	£ 419,154	£1,320,739	£1,854,867	0.71:1
Higher scenario (92% Cycling, 31% Walking)	£1,118,852	£ 605,453	£1,724,306	£1,854,811	0.93:1

Any BCR above 1 signifies that the economic benefits of constructing the route are equal or greater than the provided cost. All scenarios have positive BCRs, signifying strongly that the economic benefits are such that they outweigh the costs. It is not possible to select any one scenario as the most likely to materialise. The range of scenarios is intended to provide an indication of potential outcomes.

5.7 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 Conwy Estuary route.

The LCEM and LWEM tools have been run using the recreational usage inputs from the Conwy Estuary RUIS conducted in August/September 2017. 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 **Table 10**. 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 developments 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 upgraded 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) outputs

	Annual recreational spend - HOME	Annual recreational spend - HOLIDAY	Overall tourism economic benefits
Lower scenario	£84,746.2	-	£ 84,746.2
Middle scenario	£95,897.7	-	£ 95,897.7
Higher scenario	£107,048.3	-	£ 107,048.3

Table 12 Leisure Walking Expenditure Model (LWEM) outputs

	Annual recreational spend - HOME	Annual recreational spend - HOLIDAY	Overall tourism economic benefits
Lower scenario	£1,193,008.52	£2,625,960.22	£3,818,968.75
Middle scenario	£1,242,305.89	£2,734,469.87	£3,976,775.77
Higher scenario	£1,291,603.52	£2,842,980.09	£4,134,583.61

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)
Lower scenario	1.1	0.7	1.8
Middle scenario	1.3	0.7	2.0
Higher scenario	1.4	0.8	2.3

Table 14 Leisure walking usage and employment support

	Direct employment (FTEs)	Indirect employment (FTEs)	Total employment (FTEs)
Lower scenario	51.2	30.7	82.0
Middle scenario	56.1	33.6	89.7
Higher scenario	55.5	33.3	88.7

Considerations

There are a number of considerations relevant to the assessment of economic benefits that has been carried out for Conwy Estuary route upgrade.

Analysis – Benefit-Cost Ratio Tool

- The BCR included here is incomplete. Full route construction costs will need to be added into the BCR tool once confirmed to calculate the final BCR value. As such, values that are likely to change have been left in red.

Analysis – Recreational Expenditure Model

- The LCEM inputs were taken from the 2017 RUIS data, as such no holiday cyclists were included. The number of holiday (overnight) cyclist in the area may be affected by the route upgrade, as the area become more desirable and suitable for cycling. **Table 11** should not be taken to indicate that it is not feasible that holiday cyclists would not contribute significantly to the local economy.