

# Narberth to Haverfordwest Impact Study

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Wales Rural Development Programme

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Authors:	Elisabeth Muller under the direction of Anjali Badloe
Quality assurance	Anjali Badloe (20 July 2018, 5 September 2018)
Sign-off	Matt Dawes (27 July 2018)

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## Sustrans Cymru

123 Bute Street  
Cardiff Bay  
Cardiff  
CF10 5AE

## Head Office

Sustrans  
2 Cathedral Square  
College Green  
Bristol  
BS1 5DD

# Table of contents

Narberth to Haverfordwest - Economic Impact Study .....	4
1 Executive Summary .....	4
1.1 Key outputs from the economic appraisal.....	4
2 Background .....	6
2.1 Study Area.....	6
3 Methodology.....	7
3.1 Economic Appraisal Tools .....	7
3.1.1 Infrastructure Investment Tools (IIT).....	7
3.1.2 Health Economic Assessment Tool (HEAT).....	7
3.1.3 Leisure Expenditure Model Tools: Cycling and Walking.....	8
4 Assessment of Economic Benefits.....	8
4.1 Annual Usage Estimate.....	9
4.1.1 Baseline AUE .....	9
4.2 AUE increase scenarios .....	9
4.3 Health-related economic benefits .....	10
4.4 Overall economic benefits.....	11
4.5 Tourism-related economic benefits.....	12
5 Considerations.....	14

# Narberth to Haverfordwest – Economic Impact Study

*The following document provides an assessment of the economic benefits of developing a new multi-user route between Narberth and Haverfordwest in Pembrokeshire. The route will be approximately 19km long.*

The project is supported by Pembrokeshire County Council and aims at developing a multi-user route connecting Narberth to the existing NCN route 4 in Haverfordwest. The route is currently existing in parts and goes along small (one lane) countryside roads, a steep path in Canaston Wood, bridleways, a walking gravel path and highways. The existing path is more suitable for mountain bike users. The route has potential for leisure and commuting use.

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 Narberth to Haverfordwest, Pembrokeshire scheme 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 on site. The estimated Annual Usage Estimates (AUEs) are:

- 6,207 cycling AUE
- 5,012 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
6,207	153%	15,703
	173%	16,944
	193%	18,185

### 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
5,012	141%	12,079
	161%	13,082
	181%	14,084

### 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 (Cyclist)	Post-Scenario AUE (Pedestrian)	Economic Benefits
Low usage change	15,703	12,079	£810,296
Medium usage change	16,944	13,082	£907,471
High usage change	18,185	14,084	£1,004,581

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 4.5 of the report.

Under the middle scenario with average costs, where the shared use route sees a 173% increase in cycling and 161% increase in walking trips above baseline, the benefits are:

- A total of 13,082 walking trips and 16,944 cycle trips being made on the route each year
- Total economic benefits (PVB) of £ 907,471
- Health benefits of £ 532,789
- Overall tourism economic benefits of £ 253,472 (walking and cycling combined)

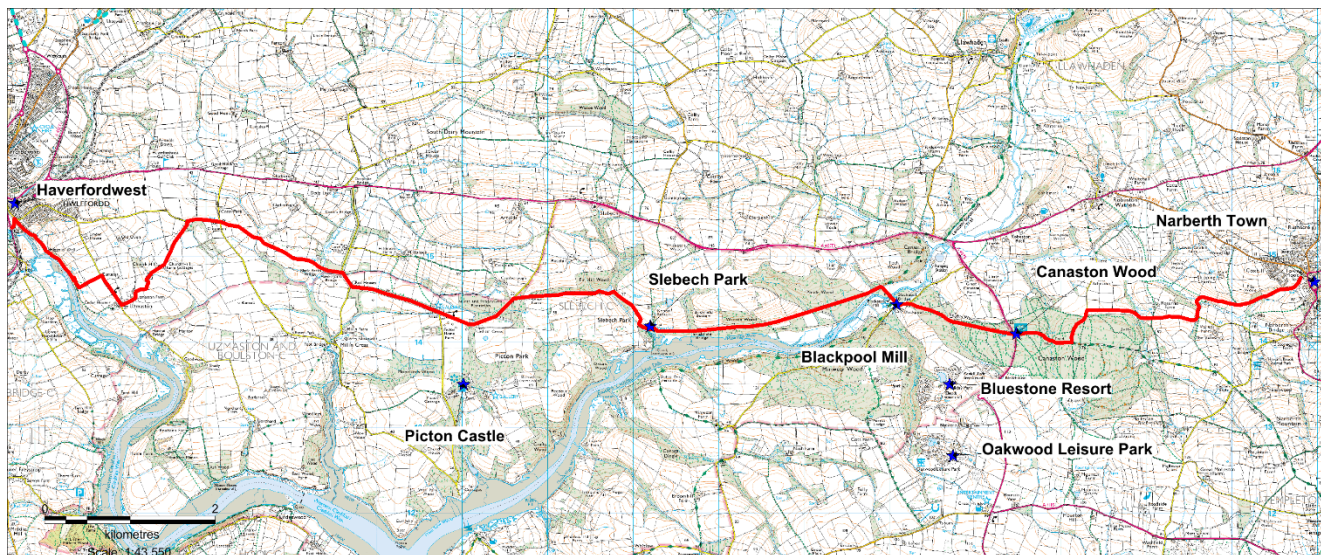
## 2 Background

Sustrans' Research and Monitoring Unit (RMU) have undertaken economic analysis for three post-construction usage scenarios for the proposed development of a route between Narberth and Haverfordwest, Pembrokeshire.

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

### 2.1 Study Area

*Figure 1: Map overview of proposed route*



The proposed new route will run from Narberth to Haverfordwest in Pembrokeshire. The new multi-user path would be 19km long and run along a small (one lane) countryside road, up a steep path in Canaston Bridge, bridleways and walking gravel path. Currently the route is more suitable for mountain bike (MTB) users but has the potential for leisure and commuting use. The route is part of a

larger project by Pembrokeshire County Council to connect Narberth and Haverfordwest to the existing NCN route 4 **Figure 1**.

The economic benefits of this route have been evaluated using usage estimates from local counter data and Route User Intercept Survey's (RUIS). This usage was 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 estimate the economic benefits for both cyclist and pedestrians.

## **3 Methodology**

### **3.1 Economic Appraisal Tools**

#### **3.1.1 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<sup>1</sup>. 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.

#### **3.1.2 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.

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<sup>1</sup> 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](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/427098/webtag-tag-unit-a5-1-active-mode-appraisal.pdf)

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

### 3.1.3 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**<sup>2</sup> 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 Assessment of Economic Benefits

This section outlines the economic benefits of the proposed Narberth to Haverfordwest route, Pembrokeshire, 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

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<sup>2</sup> Previously titled the Recreational Expenditure Model (REM)



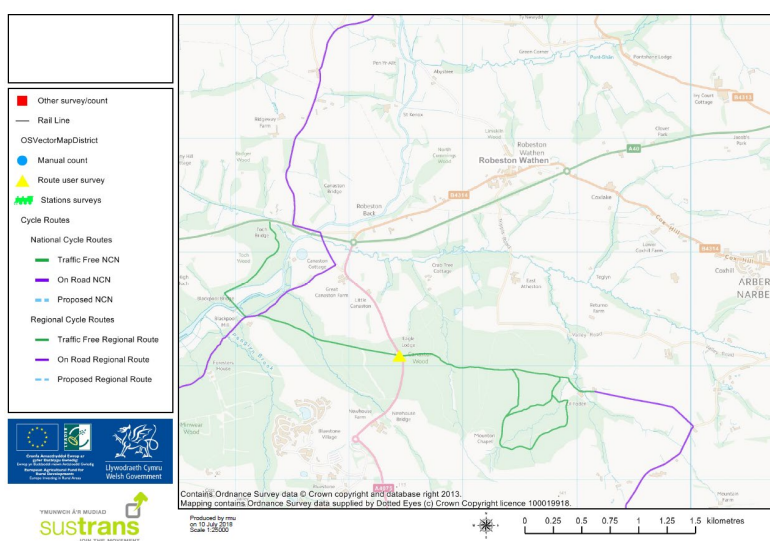
## 4.1 Annual Usage Estimate

An Annual Usage Estimate (AUE)<sup>3</sup> is required to calculate the expected economic benefits from the proposed route. This shows the potential number of trips that we would expect to be using the route if it were approved and constructed.

### 4.1.1 Baseline AUE

The baseline AUE was calculated from a Route User Intercept Survey (RUIS) carried out in the location identified in **Figure 2** (yellow triangle).

*Figure 2: Location of Route user intercept survey*



The baseline pedestrian and cyclist AUEs for Narberth, Pembrokeshire are as follows (**Table 4**):

*Table 4: RUIS Annual Usage Estimate (AUE)*

Site	Region	Year	Baseline Cycling AUE	Baseline Walking AUE
Narberth, Pembrokeshire	Wales	2017	6,207	5,012

The baseline is an estimation of ‘current usage’ relevant to the proposed route. 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

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

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 ‘All rural’.

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 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 three scenarios are as follows: the upper scenario is set 20% above the IIT percentage increase and the lower scenario is set 20% below the IIT percentage increase scenario. The IIT scenario is represented in green (Table 5).

*Table 5 Post-scenario cycling AUE scenarios*

Baseline AUE	Percentage increase in cyclist usage	Post-scenario AUE
6,207	153%	15,703
6,207	173%	16,944
6,207	193%	18,185

In order to formulate the post-usage scenarios for pedestrians, the pedestrian Infrastructure Impact Tool (IIT) has been used Table 6.

*Table 6: Post-scenario pedestrian AUEs scenarios*

Baseline AUE	Percentage increase in pedestrian usage	Post-scenario AUE
5,012	141%	12,079
5,012	161%	13,082
5,012	181%	14,084

Together, the post-scenario cycling and pedestrian usage calculations represent the three scenarios that are appraised in conjunction with two cost scenarios.

### 4.3 Health-related economic benefits

The health-related economic benefits of the Pembrokeshire shared use path have been estimated using the World Health Organisation’s (WHO’s) Health Economic Appraisal Tool (HEAT)<sup>4</sup>. All health-related economic benefits are calculated over a 20 year appraisal period.

The BCR tool includes health-related economic benefits, as a result of the increased physical activity from walking and cycling trips, generated using HEAT. The HEAT outputs that have been calculated are outlined in Table 7.

<sup>4</sup> The WHO HEAT tool is available at: <http://old.heatwalkingcycling.org/>

*Table 7: HEAT outputs*

	Post-scenario cycling AUE	Post-scenario pedestrian AUE	HEAT output (cyclists)	HEAT output (pedestrians)	HEAT output (combined)
Post-scenario 1: Low cyclist and low pedestrian usage	15,703	12,079	£ 312,218	£ 149,289	£ 461,506
Post-scenario 2: Middle cyclist and middle pedestrian usage	16,944	13,082	£ 358,975	£ 173,815	£ 532,789
Post-scenario 3: High cyclist and high pedestrian usage	18,185	14,084	£ 405,724	£ 198,312	£ 604,036

The scheme cost did not influence the HEAT output. The combined HEAT output for both pedestrian and cyclist usage is used as the health economic benefit input in the WeITAG tool.

#### 4.4 Overall economic benefits

The overall economic benefits of the proposed route include the HEAT outputs.

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 Narberth to Haverfordwest route improvements are presented in **Table 8**. All of these economic benefits include the HEAT outputs displayed in **Table 7**. These three scenarios will be input into the LCEM and LWEM (section 4.7).

*Table 8: WebTAG and HEAT – Multi-scenario economic benefits*

	Cycling AUE increase	Pedestrian AUE increase	Post-scenario AUE (cycling)	Post-scenario AUE (pedestrian)	Economic benefits (PVB <sup>5</sup> )
1: Low usage change	153%	141%	15,703	12,079	£ 810,196
2: Medium usage change	173%	161%	16,944	13,082	£ 907,358
3: High usage change	193%	181%	18,185	14,084	£ 1,004,453

**Table 10** and **Table 8** below show the estimated economic impact, including health benefits from HEAT, for each of the different increase scenarios and the two cost scenarios over a 20 year appraisal period. The benefit to cost ratio for each scenario is included under the ‘BCR’ column.

<sup>5</sup> The Total Present Value of Benefits (PVB) represents the total benefits of the route, appraised over a 20-year time period.

## 4.5 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 Narberth to Canaston Bridge route, Pembrokeshire.

The LCEM and LWEM tools have been run using the recreational usage inputs from the Narberth RUIS conducted in April 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** and **Table 11**.

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 Narberth to Canaston Bridge section of the Pembrokeshire Shared Use path. This is a measure of the ‘public good’ or value placed on the route by leisure users that is not captured in their expenditure. The RUIS results showed that the home based users of the path are making short circular trips which are deemed to result in no expenditure.

*Table 9 : Combined Leisure Cycling Expenditure Model (LCEM) outputs*

	<b>Annual recreational spend - HOME</b>	<b>Annual recreational spend - HOLIDAY</b>	<b>Overall tourism economic benefits</b>
Baseline	N/A	£8,143	£ 8,143
1: Low usage change	N/A	£ 20,601	£ 20,601
2: Medium usage change	N/A	£ 22,229	£ 22,229
3: High usage change	N/A	£ 23,858	£ 23,858

*Table 10: Combined Leisure Walking Expenditure Model (LWEM) outputs*

	<b>Annual recreational spend - HOME</b>	<b>Annual recreational spend - HOLIDAY</b>	<b>Overall tourism economic benefits</b>
Baseline	£ 15,609	£ 72,986	£ 88,595
1: Low usage change	£ 37,620	£ 175,903	£ 213,523
2: Medium usage change	£ 40,742	£ 190,501	£ 231,234
3: High usage change	£ 43,864	£ 205,099	£ 248,962

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 and walking. Details of this are provided in [Table 14](#) and [Table 15](#).

*Table 11: Leisure cycling usage and employment support*

	<b>Direct employment (FTEs)</b>	<b>Indirect employment (FTEs)</b>	<b>Total employment (FTEs)</b>
Baseline	0.11	0.07	0.19
1: Low usage change	0.29	0.18	0.47
2: Medium usage change	0.31	0.19	0.51
3: High usage change	0.34	0.21	0.54

*Table 12: Leisure walking usage and employment support*

	<b>Direct employment (FTEs)</b>	<b>Indirect employment (FTEs)</b>	<b>Total employment (FTEs)</b>
Baseline	1.25	0.76	2.01
1: Low usage change	3	1.83	4.83
2: Medium usage change	3.26	1.98	5.24
3: High usage change	3.51	2.13	5.64

## 5 Considerations

There are a number of considerations relevant to the assessment of economic benefits that has been carried out for Narberth to Haverfordwest route, Pembrokeshire.

### Route User Survey

The Route User Survey (RUIS) were conducted over four days in early April 2017 at Eagle Lodge. The count of users over those dates was low which might be different now since the new car park has opened.

Additionally, a RUIS was carried out at one site along the proposed route between Narberth and Haverfordwest. It is a strong assumption that the usage observed at this location will hold along the length of the 19 mile route.

### Post-scenario AUEs and analysis

- The high and low usage scenarios were calculated as +/- 20% of the mid usage scenario, determined by the IIT output for both modes. The 20% increase and decrease were calculated around the 173% increase calculated by the cyclist IIT and a 161% increase calculated by the pedestrian IIT. 20% was used as there is no other evidence to suggest you should vary substantially from the IIT output but there is a need to illustrate that a range of scenarios is possible.
- The IIT applies a proportional increase to the baseline AUE. In this example a cycling increase of 173% is applied to a baseline AUE of 5003. The level of uplift is therefore highly dependent how high the baseline AUE is, if the baseline AUE is very low the uplift will only be very low. The tool does not take into consideration the characteristics of the route at baseline (forest track in this case) which is likely to have an influence on the baseline AUE.

### Analysis – Recreational Expenditure Model

- The inputs for the Leisure Cycling Expenditure Model were based on a sample of eight non-home based recreational cyclists and five non-home based recreational walkers surveyed at the Narberth RUIS. This is a small sample and may not represent the post-construction sample of users in terms of their journey purpose and travel behaviour.