



DEE VALLEY MULTI-USER PATH

TREVOR BASIN TO CARROG ROUTE OPTIONS REPORT

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1.0 INTRODUCTION

- 1.1 The section from Trevor Basin to Carrog is 22.3km in length and links the settlements of Acrefair, Trevor, Llangollen, Berwyn, Glyndyrfdwy and Carrog.
- 1.2 Throughout this section of the Study area the Dee Valley has a classic 'V' shape, familiar to geography students. Consequently, the options for linear routes along the valley are limited.
- 1.3 At a typical point between Trevor Basin and Berwyn (ch13.2km to ch22.9km) the valley has historically been occupied by four transportation routes. On the south side of the valley is Telford's A5 road, while the north side is occupied by the Llangollen Canal, the former Ruabon to Barmouth Railway and a County road.
- 1.4 Between Llangollen (ch20.1km) and Carrog (ch35.5km) the old railway track bed is occupied and used by the Llangollen Railway for their Heritage Railway operation.
- 1.5 From Berwyn to Carrog (ch22.9km to ch35.5km), there is no canal. The railway runs with the A5 on the south side of the valley and the sole transport link on the north side of the River Dee is provided by a narrow single track road.
- 1.6 At the present time British Waterways allow the canal towpath to be used as an off-road cycle route between Trevor Basin and Llangollen. While the canal towpath is not currently advocated as a cycleway between Llangollen and Berwyn, this is an opportunity which is explored in this report.
- 1.7 The Sustrans website does not show any route for cycling between Llangollen and Carrog.
- 1.8 For reasons that will become apparent, to appraise this section of the route a decision has been made to divide it into three sections as follows:
 - Trevor Basin to Llangollen (ch13.2km to ch20.1km)
 - Llangollen to Berwyn (ch20.1km to ch22.9km)
 - Berwyn to Carrog (ch22.9km to ch35.5km)
- 1.9 A route map for the section of the proposed multi-user path between Trevor Basin and Carrog is included in **Appendix A** in the Strategy Report. This includes the chainage system used to record the various features described in subsequent sections of this report.

2.0 METHODOLOGY

- 2.1 The objective of the route sections report is to quantify the challenges each section of the route faces and identify the solutions required to ensure that the project is achievable.
- 2.2 A variety of challenges need to be considered which include the following:
- Current and Future Land Use
 - Links to Destinations
 - Topography
 - Land Ownership
 - Suitable Engineering Standards
 - Environmental and Ecological Issues
 - Historical Features
- 2.3 Within this report each of the above headings are considered in turn and the issues which need to be considered are tabulated.
- 2.4 Once all of the issues have been established they are considered as a whole within the 'Route Considerations' section, where the challenges are assessed, solutions identified and options for routes defined.
- 2.5 The 'Discussion' section of the report reviews the viability of the route options identified and contains a prioritised action list for project delivery.
- 2.6 The route options to be developed from the 'Discussion' section are priced in the 'Project Budget' section.
- 2.7 A final 'Summary' presents the findings of the previous sections of the report into context, highlighting opportunities, challenges, options and likely costs.
- 2.8 Information from the 'Discussion' section is reproduced in the global strategy report for the complete Wrexham to Barmouth route, where ultimate decisions on the route, costs and implementation strategies are considered.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km)

3.1 Current and Future Land Use

- 3.1.1 Two routes readily exist between Trevor and Llangollen; the Llangollen Canal and a section of the old railway track bed. The towpath of the Llangollen Canal, between Trevor Basin and Llangollen, is currently identified as an off-road route on the Sustrans mapping. The canal towpath however is not the only potential route between Acrefair and Llangollen. The old railway track bed is available for much of this length also. Given that the towpath is currently recognised as an off-road route this is considered first.
- 3.1.2 The Canal is owned by British Waterways and is navigable for narrow boats for its full length, with a towpath existing for the majority of the route along its southern bank.
- 3.1.3 The Canal is part of a World Heritage Site and is also a scheduled ancient monument. This protected status provides stringent controls on future land use along the length of the Canal. Use of the Canal into the foreseeable future is as a linear transport route with carefully controlled development to enhance its cultural status and potential as a leisure amenity.
- 3.1.4 At Trevor Basin (ch13.2km) the Old Wharf buildings are leased by British Waterways to Anglo-Welsh Waterway Holidays, a narrow boat hire company.
- 3.1.5 Between Trevor (ch13.0km) and the currently disused River Lodge Hotel in Llangollen (ch19.3km) the railway track bed is clearly identifiable on the ground.
- 3.1.6 The Council's Unitary Development Plan 1996-2011 specifically refers to the need for the former railway track bed between Llangollen and Trevor to be safe guarded for a walkway and cycleway (Policies REC 8 and TRA 11 are included in **Appendix H** in the Strategy Report).
- 3.1.7 The Llangollen Railway have made statements in the past regarding an aspiration to extend their railway from Llangollen to Ruabon and create an interchange with the Network Rail Line. While preparing this report the specific question of extending to Ruabon has been put to the Llangollen Railway who have responded that, from their perspective, recent development in Llangollen means that this desire is no longer viable. The Unitary Plan (Policy TRA 1 included in **Appendix H** in the Strategy Report) makes global reference to supporting the re-opening of abandoned lines, without making specific reference to the Llangollen to Trevor section of the route.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.2 Links to Destinations

- 3.2.1 The Llangollen Canal was awarded World Heritage Site status in 2009. The most significant attribute of the site is the Pontcysyllte aqueduct, located adjacent to Trevor Basin.
- 3.2.2 Having been awarded the international status of World Heritage Site, one of the challenges recognised by UNESCO (the overseeing organisation) is the need to draft a plan for tourism development and site interpretation. The provision of sustainable transport links to the site can assist in developing the tourism agenda.
- 3.2.3 Given that the Llangollen Canal is an important destination in its own right, links and access to the canal need to be provided even if the former railway route is used.
- 3.2.4 The tables below summarise the location of the principal points of access to and from the proposed routes, together with the key destinations accessible at each location.
- 3.2.5 Access to and from the canal route is available at the following locations:

Chainage	Feature	Access to/from
13.3km	Trevor Basin	<ul style="list-style-type: none"> Pontcysyllte aqueduct, Residential areas, Telford Hotel, Anglo-Welsh boat hire
13.7km	Bridge 33	<ul style="list-style-type: none"> Offas Dyke long distance path, link to railway footpath
14.7km	Bridge 34	<ul style="list-style-type: none"> Unclassified road, Access to Plas yn Pentre, Circular route from Trevor via road and old railway track bed
15.0km	Bridge 35	<ul style="list-style-type: none"> Unclassified road
16.1km	Bridge 38	<ul style="list-style-type: none"> Access to Bryn Howel Hotel
16.3km	Bridge 39	<ul style="list-style-type: none"> Access to old railway track bed
17.2km	Bridge 41	<ul style="list-style-type: none"> Access to A539, Trevor Uchaf, Sun Inn
17.7km	Bridge 42	<ul style="list-style-type: none"> Access to A539
18.2km	Bridge 43	<ul style="list-style-type: none"> Access to unclassified road
20.0km	Steps	<ul style="list-style-type: none"> Pedestrian access to Llangollen (poor)
20.1km	Llangollen Wharf	<ul style="list-style-type: none"> Café, toilets, boat trips, access to Llangollen, access to Ysgol Dinas Bran

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.2 Links to Destinations (continued)

3.2.6 Access to and from the old railway route is available at the following locations:

Chainage	Feature	Access to/from
13.3km	Bridge over	• Residential areas in Trevor
13.5km	Kissing Gate	• Residential areas in Trevor, Community Centre, on-road link to Trevor Basin
13.7km		• Offas Dyke long distance path, link to canal towpath
14.3km	Bridge under	• Unclassified road, access to Plas yn Pentre, circular route via road and canal towpath
15.8km	Bridge over	• Unclassified road
15.9km		• Potential access to Bryn Howel Hotel
16.3km	Bridge under	• Access to canal towpath
17.2km		• Access to A539, Trevor Uchaf, Sun Inn
17.9km		• Access to employer (sewage works)
19.3km		• Access to A539

3.3 Topography

3.3.1 The previously engineered routes of the canal towpath and the former railway provide primarily contour hugging routes along the valley, which are ideally suited for routes to be used by cyclists.

3.3.2 The towpath follows the canal and is essentially level (rises 10 m over 7 km). In some places the canal is set in gently sloping open countryside, in others it is cut into the side of hills or on high embankments.

3.3.3 While the canal is primarily flat, descriptions of the railway describe it falling at a gradient of 1:75 from Trevor to Trevor Uchaf (ch13.3km to ch17.2km), with the gradient rising from Trevor Uchaf to Llangollen (ch17.1km to ch19.3km), but not exceeding 1 in 110.

3.3.4 Given that the railway starts at a higher level than the canal, passes over it at ch16.1km and is lower than the canal in Llangollen the overview in 3.3.3 above is plausible. All of the gradients encountered are within the design criteria for cycleways.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.4 Land Ownership

- 3.4.1 The canal towpath is owned by a single body, British Waterways, who already provide access for cyclists between Trevor Basin and Llangollen (ch13.5km to ch20.0km). They are supportive of the proposals to create a multi-user path, but have reservations regarding equine use.
- 3.4.2 At the present time British Waterways allow cyclists to use the towpath between Trevor Basin and the Wharf in Llangollen.
- 3.4.3 It is British Waterways policy to require cyclists using canal towpaths to be permit holders (except in London). The issue of permits provides an opportunity to remind users of the hazards associated with canal towpath use and reinforce the message contained in 'The Waterways Code' (included in **Appendix I** in the Strategy Report). The system is not policed and a permit can be printed off from the internet. There is thus no restriction on access.
- 3.4.4 The ownership of the former railway track bed between Trevor Basin and Llangollen has not been confirmed.

3.5 Engineering Challenges

- 3.5.1 A summary of documents providing guidance on current good practice for the design of multi-user paths is contained in Section 5.0 of the Strategy Report. The tables below have been compiled following an inspection of the length of route under consideration and summarise those locations which ideally require work to enable the design criteria to be achieved.
- 3.5.2 It is recognised that, at some locations, other considerations may act as constraints, preventing the design criteria to be fully met. The 'Listed Building' status of many of the canal bridges, for instance, together with their design mean that the headroom and path width criteria cannot be met while the canal remains in use. On some bridges it may be practical to create a route "over the top", but this is dependant on the levels of use of the bridge by road vehicles.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.5 Engineering Challenges (continued)

3.5.3 The engineering challenges facing the two route options are considered independently below, with a review of the canal towpath route being undertaken first.

Canal Towpath

Chainage	Location	Issue
13.4km	Trevor Basin	<ul style="list-style-type: none"> Canal passes below the B5434 immediately outside the Basin. Canal bridge is too narrow to accommodate the towpath. A road crossing of the B5434 is required.
13.4 to 13.6km	Towpath	<ul style="list-style-type: none"> Towpath is on north side of canal.
13.6km	Bridge 32	<ul style="list-style-type: none"> Footbridge over the canal is sufficiently wide to accommodate bikes but not to the recommended cycleway width. Parapet is too low for cycle or equestrian use. Gradient of the approach ramp on the south side is steeper than recommended for cycleways. Changes in direction at the top and bottom of the north side approach are too tight for use by cyclists.
13.7km	Bridge 33	<ul style="list-style-type: none"> Footbridge over canal. Too narrow for cycle or equestrian use. Access to north side via 3 steps. Approach ramp on south side too narrow and too steep for cyclist use. Changes in direction at top and bottom of ramp are too tight for use by cyclists.
14.7km	Bridge 34	<ul style="list-style-type: none"> Masonry arch bridge over the canal and towpath. Path is approximately 1.4m wide. Width and headroom not to current standards for cyclists or equestrians
15.0km	Bridge 35	<ul style="list-style-type: none"> Masonry arch bridge over the canal and towpath. Path is approximately 1.4m wide. Width and headroom not to current standards for cyclists or equestrians
15.5km	Bridge 36	<ul style="list-style-type: none"> Masonry arch bridge over the canal and towpath. Path is approximately 1.4m wide. Width and headroom not to current standards for cyclists or equestrians
15.7km	Bridge 37	<ul style="list-style-type: none"> Masonry arch bridge over the canal and towpath. Path is approximately 1.4m wide. Width and headroom not to current standards for cyclists or equestrians
16.3km	Bridge 39	<ul style="list-style-type: none"> Concrete beam bridge over canal and towpath carrying railway track bed. Path approx. 1.4m wide with approx. 2.1m headroom, not to current standards for cyclists or equestrians. Tight bend on north side of bridge, which may not meet current standards, with poor visibility.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.5 Engineering Challenges (continued)

3.5.3 (continued)

Chainage	Location	Issue
16.4km	Pipe Bridge	<ul style="list-style-type: none"> 'U' shaped pipe over canal and towpath. Headroom for equestrians may not meet current standards.
16.5km		<ul style="list-style-type: none"> Towpath narrows to between 2-3m for a short distance, with fence on southern side. Towpath on small embankment above access road.
16.5km	Bridge 40	<ul style="list-style-type: none"> Masonry arch bridge over the canal and towpath. Path is approximately 1.4m wide. Width and headroom not to current standards for cyclists or equestrians
17.2km	Bridge 41	<ul style="list-style-type: none"> Masonry arch bridge over the canal and towpath. Path is approximately 1.4m wide. Width and headroom not to current standards for cyclists or equestrians
17.7km	Bridge 42	<ul style="list-style-type: none"> Concrete beam bridge over canal and towpath carrying A539. Path approx. 1.3m wide with approx. 2.9m headroom, not to current standards for cyclists or equestrians. Tight bend on north side of bridge, which may not meet current standards, with poor visibility.
18.1km	Llanddyn Cottage	<ul style="list-style-type: none"> Towpath narrows to between 2-3m as it passes the cottage.
18.2km	Bridge 43	<ul style="list-style-type: none"> Masonry arch bridge over the canal and towpath. Path is approximately 1.4m wide. Width and headroom not to current standards for cyclists or equestrians.
19.6 to 20.0km	Llangollen Moorings	<ul style="list-style-type: none"> Path narrows to approx. 1m wide to pass N^{os} 1 & 2 Royal View, which back onto the canal. Does not meet current standards. Towpath passes between the wall of the house and the canal and does not provide adequate clearance to meet current standards.
20.0km	Wharf Cottage	<ul style="list-style-type: none"> Path narrows to approx. 1.8m wide to pass Wharf Cottage, which backs onto the canal. Does not meet current standards. Towpath passes between the canal and the tall boundary wall and does not provide adequate clearance to meet current standards.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.5 Engineering Challenges (continued)

3.5.3 (continued)

Chainage	Location	Issue
20.1km	Bridge 45	<ul style="list-style-type: none"> Iron/steel beam bridge carrying Wharf Hill over the canal and towpath. Path is 1.4m wide with 2.0 headroom. Does not meet current standards for cyclists and equestrians. Bend on path through bridge gives poor visibility.
20.1 to 20.2km	Llangollen Wharf	<ul style="list-style-type: none"> Path passes along the Wharf with tea rooms/boat trip booking office. At some points path narrows and may not be wide enough to meet current standards for cyclists and equestrians. Path passes through area used for car parking. Potential for vehicles driving on path at this location.

3.5.4 The importance of Trevor Basin as a destination on the path has been highlighted previously. If the former railway route is to be used there are two potential routes between the Basin and the old railway track bed (see Drawing 201 in **Appendix A** in the Strategy Report). An on-road link is available via George Avenue and Heol Penderyst (both are urban cul-de-sacs), at ch13.3km, or by the Offa's Dyke footpath at ch13.7km. In the latter case, there will be a need to change the status of the public footpath to bridleway usage and this change of status will need to be negotiated with the landowner.

3.5.5 Once on the old railway route the following engineering challenges need to be addressed:

Old Railway

Chainage	Location	Issue
13.5km	Kissing Gate	<ul style="list-style-type: none"> Replace with more suitable access control.
13.7km	Offa's Dyke Path	<ul style="list-style-type: none"> Improve access control.
14.3km	Bridge Under	<ul style="list-style-type: none"> Improve access to unclassified road.
15.8km	Bridge Over	<ul style="list-style-type: none"> Provide access to unclassified road.
15.9km	Bryn Howel Hotel	<ul style="list-style-type: none"> Provide access.
16.3km	Bridge Under	<ul style="list-style-type: none"> Provide access to canal towpath.
17.2km	-	<ul style="list-style-type: none"> Provide access to canal towpath and Sun Inn, Trevor Uchaf.
17.9km	-	<ul style="list-style-type: none"> Crossing of access road to sewage works.
19.3km	-	<ul style="list-style-type: none"> Provide access route to A539.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.5 Engineering Challenges (continued)

- 3.5.6 Between ch19.3km and ch20.1km, the Dee Bridge in Llangollen, the old railway track bed is occupied by various building developments. These include the currently vacant River Lodge Hotel, the Heol Escob/Bishops Walk housing estate and the Lower Dee Mill development.
- 3.5.7 There are physical opportunities to develop a route but this will require negotiations with a variety of landowners.
- 3.5.8 There is an existing path between the River Lodge Hotel and the A539. This appears to be on the Hotel land.
- 3.5.9 Bishops Walk is a cul-de-sac which includes a footpath link to the A539. There is also an access to the next plot of land which appears to be a garden.
- 3.5.10 The Lower Dee Mill development does not appear to provide any through route.
- 3.5.11 After Lower Dee Mill there is an opportunity to complete the off-road route to the Dee Bridge using the path which links the long stay car park to the bridge.
- 3.5.12 While arrival at the bridge delivers users into the centre of Llangollen, the potential to create and extend the path west of this location are constrained by the urban environment and the use by the Llangollen Railway of the railway track bed and arch. Space at the eastern end of the Llangollen Station site is extremely constrained for railway operations which prevents use for other purposes. Drawing 202 in **Appendix A** in the Strategy Report shows the links between the Wharf and the town.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.6 Environmental and Ecological Issues

3.6.1 The table below summarises the data sets reviewed for potential environmental and ecological impacts as described in Section 6.0 of the Strategy Report.

3.6.2 Those items identified as providing a potential impact in the table are explored in greater detail below.

Environmental Data Description	Potential Impacts	
	Yes	No
National landmap information system	✓	
Conservation Areas	✓	
Biodiversity Action Plans (BAPs)		x
Ramsar Sites		x
Biosphere reserves		x
Sites hosting habitats/species of (European) community interest – international designation		x
Areas of Outstanding Natural Beauty		x
Special Areas of Conservation (SACs)		x
Special Protection Areas (SPAs)		x
Sites of Specific Scientific Interest (SSSIs)		x
CORINE Biotopes		x
Limestone Pavements		x
Regionally Important Geological Sites (RIGS)		x
Marine Nature Reserves (MNRs)		x
National Nature Reserves (NNRs)		x
Sites hosting Red Data Book species		x

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.6 Environmental and Ecological Issues (continued)

3.6.2 (continued)

Environmental Data Description	Potential Impacts	
	Yes	No
National Parks		x
Local Nature Reserves (LNRs)		x
Sites of Importance to Nature Conservation (SINCs)		x
Ancient Woodlands		x
Flood Warning & High Flood Levels		x
Welsh Fisheries		x
RSBP Reserves		x
Potential Spread of Plant Pathogens (P.Ramorum)		x

3.6.3 The information obtained from the various data sources relating to the potential environmental and ecological issues which need to be considered between Trevor Basin and Llangollen Moorings is contained in **Appendix D** in the Strategy Report, summarised in the table below and considered in more detail subsequently.

Chainage	Environment Data Description
13.2 to 20.0km	<ul style="list-style-type: none"> Landmap Assessment
13.1 to 13.2km	<ul style="list-style-type: none"> Pontcystylle Aqueduct Conservation Area
19.7 to 20.1km	<ul style="list-style-type: none"> Llangollen Conservation Area

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.6 Environmental and Ecological Issues (continued)

3.6.4 The national landmap information scheme records an assessment of the value of the environment against five categories. These are:

- Geological landscape
- Landscape habitats
- Visual and sensory
- Historic landscape
- Cultural landscape

The evaluation criteria applied to each category are:

Unknown	
Low	of little or no importance
Moderate	of local importance
High	of regional or county importance
Outstanding	of international or national importance

3.6.5 **Appendix E** in the Strategy Report contains a table summarising the landmapping categorisation for the area between Trevor Basin and Llangollen Moorings. Ten categories are identified, five are evaluated as being of 'high' value, while the remaining five are considered to be 'outstanding'. The categories identified relate primarily for their cultural and landscape value. The canal is cited for its cultural and tourism value, while the Vale of Llangollen is also considered to have an outstanding sense of place.

3.6.6 The Trevor Basin to Llangollen Moorings section of the route passes through two conservation areas, Pontcystylle Aqueduct (ch13.2km to ch13.5km) and Llangollen (ch19.9km to ch20.2km).

3.6.7 Clearly the area between Trevor Basin to Llangollen is of considerable value to the community and the contribution that the canal makes its value is large. The strength of the area is provided by its environment rather than its ecology and the creation of a multi-user path on either the canal towpath or the former railway track bed is unlikely to have an impact on the ecology.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.7 Historical Features

3.7.1 The table below summarises the data sets reviewed for potential historic impacts as described in Section 5.0 of the Strategy Report.

Historical Data Description	Potential Impacts	
	Yes	No
Scheduled Ancient Monuments/Listed buildings	✓	
National Monuments Record of Wales (Coflein)	✓	
National Trust Asset Boundaries		x
World Heritage Sites (WHS)	✓	
Heritage Coasts		x

3.7.2 The Llangollen Canal is part of the Pontcysyllte Aqueduct and Canal World Heritage Site. Between Trevor Basin and Llangollen the towpath is already used by cyclists (as described previously) and any work carried out to maintain or improve this section of the route needs to be carefully considered to ensure that it does not affect the sensitive nature of the site.

3.7.3 The National Monuments Record (NMR) contains 72 buildings or structures in the 6.9km section of the route between Trevor Basin and the Wharf in Llangollen. A table summarising these features is contained in **Appendix F** in the Strategy Report.

3.7.4 Eleven of the thirteen bridges on the canal in the section under review are listed structures (all Grade II). The impressive Gothic House of Siamber-wen in Llangollen, at ch20.1km, is also Grade II listed.

3.7.5 Passage for cyclists beneath bridges over canals is a common problem where canal towpath are developed as multi-user paths. Typically the path is narrow beneath the bridge, with an unfenced fall into water and restricted headroom.

3.7.6 The protected status the site enjoys for its historic interest means that the constraint provided by the bridges can only be mitigated by appropriate signage.

3.7.7 While the creation of a multi-user path along the canal may be considered to be constrained by the large number of historic structures, a converse view is that the route is enhanced by the historic nature of the site and improving access is of benefit in providing an opportunity to visit and enjoy the World Heritage Site.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.7 Historical Features (continued)

3.7.8 Developing a multi-user path along the canal needs to be integrated into the tourism development and site interpretation plan for the World Heritage Site.

3.7.9 On the former railway route there are only two NMR's, as summarised in the table below.

Chainage	Location	Feature	Status
16.3km	Bryn Howel	Bridge over canal.	Contained on NMR.
17.2km	Sun, Trevor	Remains of railway halt	Contained on NMR.

3.7.10 Neither of the structures listed on the NMR are likely to be affected by a proposal to create a multi-user path.

3.7.11 While the constraints on the former railway route are considerably less than the canal towpath option, the historic nature of the canal adds to the appeal of the latter option.

3.8 Route Considerations

3.8.1 There are two viable route options between Trevor Basin and Llangollen, using either the canal towpath or the former railway route.

3.8.2 Trevor Basin is identified as a key destination and needs to be served by the route irrespective of whether the canal towpath or railway track bed option is used to reach Llangollen.

3.8.3 Given that the canal towpath is already being used by cyclists this option is considered first. The support of the landowner, British Waterways (BW) to permit cyclist use is a considerable advantage, but BW do not consider the towpath suitable for use by equestrians.

3.8.4 Recently the towpath between Trevor and Llangollen has been improved to provide a granular surfaced path with a typical width of 2.0m.

3.8.5 There is a need to create a road crossing of the B5434 immediately outside Trevor Basin (ch13.3km) as there is no towpath below the bridge which carries this road over the canal (see Drawing 201 in **Appendix A** in the Strategy Report).

3.8.6 From the Basin, the first 200m of the towpath are on the north side of the canal. In general the towpath is on the south side. Two bridges provide canal crossings to the south side towpath, Bridge 32 (ch13.6km) and Bridge 33 (ch13.7km). Neither bridge complies with the engineering standards required for use by a multi-user path and Bridge 33 is too narrow for bicycle handle bars. Both bridges are contained on the National Monuments Record but neither is listed. Both appear to date from the latter part of the twentieth century but are supported by old abutments.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.8 Route Considerations (continued)

- 3.8.7 Typically the canal towpath is wide (sufficient for 3.0m wide shared use path), but it has not been surfaced and many sections were muddy when the inspection was carried out. Options for improving the path surface need to recognise the restrictions which the World Heritage Site and Scheduled Ancient Monument status place on change and formal consent is likely to be required if improvements are to be made.
- 3.8.8 There are thirteen bridges over the canal between Trevor Basin and Llangollen Wharf, in every instance the towpath is too narrow and too low for current good practice for multi-user paths. Nine of these bridges are listed structures, and there is little or no opportunity for improvement to meet current standards.
- 3.8.9 The towpath width from Llangollen Moorings to Llangollen Wharf (ch19.4km to ch19.8km) is very narrow and will clearly be busy with other users when the moorings are in use during the tourist season. The topography of the site (the canal is situated on a ledge in an urban environment) means that there is no effective alternative route.
- 3.8.10 Llangollen Wharf is situated approximately 20m higher than Abbey Road and the Dee Bridge into the town centre. There are several routes from the Wharf down to Bridge Street, but none meet the requirements for cyclist or disabled use (see Drawing 202 in **Appendix A** in the Strategy Report).
- 3.8.11 Road access to the Wharf is via Wharf Hill, a steeply sloping unclassified road. There is also a flight of steps down to Abbey Road.
- 3.8.12 The best access route is a ramp which leads down to the east side of Cwrt Glan y Gamlas, but the final section of the path is narrow and fenced out from the Cwrt Glan y Gamlas road access. This is an opportunity to improve the access.
- 3.8.13 A traffic light controlled pedestrian crossing has recently been installed across Mill Street near Llangollen Bridge. This facility is well placed to serve a link to the canal via Wharf Hill. The footway between the pedestrian crossing and Cwrt Glan y Gamlas is, however, very narrow and unsuitable for use other than by pedestrians.
- 3.8.14 If the railway route option is to be pursued there are two potential link routes from Trevor Basin.
- 3.8.15 An on-road route exists using George Avenue and Heol Penderyst, two quiet housing estate roads.
- 3.8.16 An off-road link may be created if the short section of the Offa's Dyke footpath can be upgraded to bridleway status.

3.0 TREVOR BASIN TO LLANGOLLEN MOORINGS (ch13.2km to ch20.1km) (continued)

3.8 Route Considerations (continued)

3.8.17 On paper the railway route has fewer constraints and has the ability to serve equestrians as well as pedestrians and cyclists, however the canal is part of the attraction of the area and is already served by the existing towpath.

3.8.18 There are challenges facing both routes as they enter Llangollen:

- The canal towpath is narrow and heavily used, which may require cyclists to dismount.
- The former railway route does not offer any advantages at this location. The old track bed has been incorporated into various developments and it will be extremely difficult to create an off-road route as far as the Dee Bridge.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km)

4.1 Current and Future Land Use

- 4.1.1 Between ch20.1km and ch21.0km the nature of the Dee Valley is predominantly urban and the options for routes are limited. The canal towpath continues on the north side of the River Dee to Berwyn (ch23.0km).
- 4.1.2 Also on the north side of the river is the A542, the road which leads over the Horseshoe Pass to Ruthin.
- 4.1.3 On the south side of the River Dee there is a riverside public footpath to Park Avenue (ch20.5km) from the Dee Bridge, together with the A5. The existing footways on the A5 are too narrow to provide an adequate off-road route.
- 4.1.4 Also on the south side of the valley there are a number of unclassified roads and footpaths providing access onto Barbers Hill and Vivod Mountain and, while there is an "over the tops" link through to Y Bwythyn on the A5 (ch28.2km). The topography of these routes is such that they are unsuitable for the development of a path to be used by cyclists.
- 4.1.5 The Llangollen Railway uses the railway track bed between Llangollen and Berwyn, while the strip of railway land is quite wide it is also congested with numerous sidings and other operational features between Llangollen Station (ch20.1km) and Pentrefelin (ch21.4km).
- 4.1.6 At Pentrefelin (ch21.4km) the railway crosses over the River Dee and runs on a narrow strip of side-long ground between the river and the A5 to Berwyn Station (ch22.9km).
- 4.1.7 The nature of the railway between Pentrefelin and Berwyn is such that the creation of a parallel multi-user path is impractical.
- 4.1.8 The Llangollen Canal extends from the Wharf in Llangollen (ch20.1km) to Horseshoe Falls, just to the west of Berwyn. This is an effectively level route with a towpath on the south side and presents the best opportunity for the creation of the long distance path.
- 4.1.9 Some sections of the towpath between Llangollen and Berwyn are used to provide vehicular access to a variety of buildings. The issues associated with this use is considered in more detail in Section 4.5.
- 4.1.10 This section of the canal is used for horse-drawn barge trips and there is a need to ensure that path users are aware of this hazard and the action required to safely pass the horse and the tow rope of the barge.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.2 Links to Destinations

4.2.1 Access to and from the route is available at the following locations.

Chainage	Feature	Access to/from
20.1km	Llangollen Wharf	<ul style="list-style-type: none"> • There is vehicular and pedestrian access from the canal to Llangollen town centre and railway at this point. • A long flight of stairs for pedestrian access. • A long ramp with some steps for pedestrian access. • Wharf Hill, which climbs from Llangollen Bridge, over the canal and also provides access to Llangollen Leisure Centre and Ysgol Dinas Bran. • Footpath to Castell Dinas Bran (1km away).
20.2km	RAFA Club	<ul style="list-style-type: none"> • Ramped access from RAFA Club to canal towpath.
20.3km		<ul style="list-style-type: none"> • Informal access path heading to tennis courts.
20.3km		<ul style="list-style-type: none"> • Private access from houses off Tregoran.
20.6km	Llangollen Pavillion	<ul style="list-style-type: none"> • Access to entrance at Llangollen Pavillion, caravan site and football ground.
21.0km	Bridge 47	<ul style="list-style-type: none"> • Access to A542 Abbey Road from both sides of bridge.
21.7km	Pentre Felin	<ul style="list-style-type: none"> • Towpath is widened and tarmac surfaced and used as access road to Llangollen Motor Museum. • Terminus of the closed Oernant/Llantysilio tramway. • Sign board at site with photos and route map.
22.4km		<ul style="list-style-type: none"> • Access to B5103 via bridge. • Towpath widened and used as access road to Chain Bridge hotel (ch22.6km)
22.5km		<ul style="list-style-type: none"> • Stepped access to river below. May only be used as access to river monitoring equipment.
22.8km	Chain Bridge Hotel	<ul style="list-style-type: none"> • Access to Hotel/Bar/Restaurant • Access to suspension bridge over River Dee to Berwyn Station (currently closed due to condition) • Small steel footbridge over canal to car park off B5103 at high level.
22.8km	Chain Bridge Hotel	<ul style="list-style-type: none"> • Small steel truss footbridge over road to B5103 at high level. • B5103 crosses river on brick viaduct and allows access to Berwyn Station.
22.9km	Horseshoe Falls	<ul style="list-style-type: none"> • Towpath terminates at Horseshoe Falls (head of canal feeder). • Onward public footpaths to unclassified road. • Picnic area, public toilets and car park at top of hill.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.3 Topography

4.3.1 The canal follows the contours of the valley and is essentially level.

4.3.2 The canal follows the Vale of Llangollen, a steep sided glaciated valley.

4.4 Land Ownership

4.4.1 At several locations the canal towpath has been surfaced and is used to provide vehicular access to a variety of dwellings, facilities and attractions. It is assumed that the towpath is owned by British Waterways and that the various users enjoy a right of access.

4.4.2 British Waterways own and maintain the intake and the associated buildings at Horseshoe Falls (ch22.9km).

4.5 Engineering Challenges

4.5.1 The engineering challenges facing the route are considered below.

Chainage	Location	Issue
20.1km	Llangollen Wharf	<ul style="list-style-type: none"> Llangollen Town is located below the canal and adjacent to the river. Access to the canal is via steps, a stepped ramp or a steep road which are unlikely to meet current standards for cyclists. Towpath is used for horse drawn boat rides from here to the Horseshoe Falls (ch22.9km) which will create conflict between some users.
20.1 to 20.3km	Access paths onto canal	<ul style="list-style-type: none"> Several public/private accesses onto the towpath with poor visibility due to hedges.
20.7km	Bridge 46	<ul style="list-style-type: none"> Stone arch bridge carrying road over canal. Footpath reduces in width to 1.7m and gives 2.0 headroom. Does not meet current standards for cyclists and equestrians.
20.9km	Approach to Bridge 47	<ul style="list-style-type: none"> Towpath narrows to under 2.0m wide adjacent to retaining wall for A543. Does not meet current standards.
21.0km	Bridge 47	<ul style="list-style-type: none"> Concrete beam bridge carrying A542 over canal at skew. Path is 1.4m wide and there is 2.1m headroom. Does not meet current standards. A railing is provided to the path which restricts clearance but does offer protection against falling into the canal. Sign asking cyclists to slow down and give way to horses.
21.6km	Ivywood	<ul style="list-style-type: none"> Towpath narrows to approx. 1.75m wide to pass Ivywood. Does not meet current standards.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.5 Engineering Challenges (continued)

Chainage	Location	Issue
21.6km	Bridge 48	<ul style="list-style-type: none"> Stone arch bridge carrying road over canal. Towpath narrows to 1.4m and gives 2.1m headroom. Does not meet current standards. Alternative route currently exists around the bridge, but width, gradient and visibility need to be considered.
21.6 to 21.7km	Access Road to Pentre Felin	<ul style="list-style-type: none"> Access road to Motor Museum and houses at Pentre Felin runs up against the side of the canal (<i>ie</i> there is no distinct towpath).
21.7 to 21.8km	Pentre Felin Aqueduct	<ul style="list-style-type: none"> Towpath at eastern approach is approx. 2.0m wide on steep embankment (handrail along top of embankment). Retained earth embankment with culverted Eglwyseg River below. Towpath is approx. 2.0m wide. Does not meet current standards. Stone parapet to aqueduct, approx. 1.0m high. Does not meet current standards for cyclists and equestrians. Signs warning of low parapet walls.
21.8 to 22.2km		<ul style="list-style-type: none"> Towpath is approx. 2.2m wide. Does meet current standards. Towpath is largely on an embankment above the River Dee and appears to have been recently re-surfaced to make use of the full crest width. 21.9 km
21.9km	Sluice	<ul style="list-style-type: none"> Towpath runs over outfall from weir/sluice from canal to River Dee. Masonry walls on either side of the towpath (2.2m clear width between walls).
22.4km	Ty Craig/ Bridge 49	<ul style="list-style-type: none"> Towpath narrows to 1200mm on approach to Ty Craig and narrows further to 600mm as it passes adjacent to Ty Craig. Does not meet current standards. Towpath rises on embankment above canal to reach bridge deck level (no path below Bridge 49).
22.4 to 22.8km		<ul style="list-style-type: none"> Access road to Chain Bridge Hotel incorporates towpath. Road is used by other vehicles and approx. 3m wide.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.5 Engineering Challenges (continued)

Chainage	Location	Issue
22.4 to 22.8km	Chain Bridge Hotel	<ul style="list-style-type: none"> • Access road terminates in turning area and car park. Possible conflict with vehicles. • Access to Chain Bridge appears to be through Hotel patio, which includes steps. • Path to rear of Hotel is 1.5m wide and against the walls of the hotel. Does not meet current standards. • Path is used by the Hotel for storage of trolleys, bins, beer kegs, etc and air condition units protrude into the available space. • Two steel footbridges provide access to the B5103 and a car park but are approx. 1.0m wide and include many steps.
22.9km	King's Bridge (Bridge 49A)	<ul style="list-style-type: none"> • King's Bridge potentially provides a means of crossing the River Dee. However, it is approximately 10m above the path with limited space for construction of a means of access which can meet current standards for cyclists and equestrians.
22.8 to 23.0km	Chain Bridge Hotel to Horseshoe Falls	<ul style="list-style-type: none"> • Towpath has recently been re-surfaced and edged with timber boards. However, it is only 1.5m wide and does not meet current standards for cyclists and equestrians.
23.0km	Horseshoe Falls	<ul style="list-style-type: none"> • Towpath terminates. • Footpath continues through a gate over narrow bridge (approx. 900mm wide) crossing the canal. • A public footpath continues onwards, however it is eroded and narrow in places. • No formal access exists between the car park/picnic area/toilets and the canal towpath.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.6 Environmental and Ecological Issues

4.6.1 The table below summarises the data sets reviewed for potential environmental and ecological impacts as described in Section 6.0 of the Strategy Report.

4.6.2 Those items identified as providing a potential impact in the table are explored in greater detail below.

Environmental Data Description	Potential Impacts	
	Yes	No
National landmap information system	✓	
Conservation Areas	✓	
Biodiversity Action Plans (BAPs)		x
Ramsar Sites		x
Biosphere reserves		x
Sites hosting habitats/species of (European) community interest – international designation	✓	
Areas of Outstanding Natural Beauty		x
Special Areas of Conservation (SACs)	✓	
Special Protection Areas (SPAs)		x
Sites of Specific Scientific Interest (SSSIs)	✓	
CORINE Biotopes		x
Limestone Pavements		x
Regionally Important Geological Sites (RIGS)		x
Marine Nature Reserves (MNRs)		x
National Nature Reserves (NNRs)		x

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.6 Environmental and Ecological Issues (continued)

4.6.2 (continued)

Environmental Data Description	Potential Impacts	
	Yes	No
Sites hosting Red Data Book species		x
National Parks		x
Local Nature Reserves (LNRs)		x
Sites of Importance to Nature Conservation (SINCs)		x
Ancient Woodlands	✓	
Flood Warning & High Flood Levels	✓	
Welsh Fisheries	✓	
RSBP Reserves		x
Potential Spread of Plant Pathogens (P.Ramorum)		x

4.6.3 The information obtained from the various data sources relating to potential environmental and ecological issues which need to be considered between Llangollen and Berwyn is contained in **Appendix B** in the Strategy Report, summarised in the table below and considered in more detail subsequently.

Chainage	Environment Data Description
20.1 to 22.9km	<ul style="list-style-type: none"> Landmap assessment
20.1 to 20.2km	<ul style="list-style-type: none"> Llangollen Conservation Area
20.2 to 22.9km	<ul style="list-style-type: none"> Site hosting habitats/species of (European) Community interest - international designation. Special Area of Conservation Site of Special Scientific Interest Flood Risk Zone Welsh Fisheries
22.2 to 22.9km	<ul style="list-style-type: none"> Ancient Woodland

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.6 Environmental and Ecological Issues (continued)

4.6.4 The national landmap information scheme records an assessment of the value of the environment against five categories. These are:

- Geological landscape
- Landscape habitats
- Visual and sensory
- Historic landscape
- Cultural landscape

The evaluation criteria applied to each category are:

Unknown	
Low	of little or no importance
Moderate	of local importance
High	of regional or county importance
Outstanding	of international or national importance

4.6.5 **Appendix C** in the Strategy Report contains a table summarising the landmapping categorisation for the area between Llangollen Moorings and Berwyn. Five categories are identified, four are evaluated as being of 'high' value, while the other is considered to be 'outstanding'. The canal again is evaluated as 'outstanding', while the Llangollen urban mosaic and the tourism potential of the Llangollen railway are also recognised.

4.6.6 The designation of Llangollen town centre as a conservation zone consolidates the impression obtained from a review of the landmap data that the landscape between Berwyn and Llangollen is considered to be regionally important, with the canal making a specific contribution with its 'outstanding' cultural importance considered to be in an international context.

4.6.7 The various conservation status listings between ch20.1km and ch22.9km are associated with the River Dee, as both a habitat and the species this habitat supports.

4.6.8 Clearly there is a need to ensure that any proposed works will not have an adverse impact on this particular environment. The Site of Special Scientific Interest (SSSI) listing makes specific reference to "numerous bryophytes" in the section of river below Corwen. Bryophytes are a land-based plant group.

4.6.9 Otters have been recorded along the whole length of the River Dee, especially at locations where appropriate bank side cover exists to provide secure holts and lying up areas.

4.6.10 The SSSI criteria also refers to the Water Voles being recorded in the middle and lower reaches of the River Dee.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.6 Environmental and Ecological Issues (continued)

- 4.6.11 The River Dee is an Environment Agency Index Salmon river which supports several other fish species and there will be a need to ensure any proposed works do not adversely affect the river.
- 4.6.12 Invertebrates noted in the SSSI criteria include the nationally scarce Freshwater Pearl Mussel (which is only recorded in nine Welsh rivers) and the Water Beetle which inhabits the reaches of the middle River Dee.
- 4.6.13 The Forestry Commission on-line mapping includes a category 'broadleaf core networks' which shows the potential extents for ancient and broadleaf woodland. Between Llangollen Moorings and Berwyn the proposed multi-user path passes through broadleaf woodland between ch22.0km to ch23.0km.
- 4.6.14 The EAW flood mapping shows the predicted extent of flooding along the Dee Valley. Between Llangollen Moorings and Berwyn the proposed route of the path is above the flood level.

4.7 Historical Features

- 4.7.1 The table below summarises the data sets reviewed for potential historic impacts as described in Section 5 of the Strategy Report.

Historical Data Description	Potential Impacts	
	Yes	No
Scheduled Ancient Monuments/Listed buildings	✓	
National Monuments Record of Wales (Coflein)	✓	
National Trust Asset Boundaries		x
World Heritage Sites (WHS)	✓	
Heritage Coasts		x

- 4.7.2 The Llangollen Canal is part of the Pontcysyllte Aqueduct and Canal World Heritage Site. While the towpath between Llangollen and Berwyn is not presently used for cycling, as noted previously, the towpath provides an excellent opportunity to create an effectively level route through the urban and geographically challenging area of Llangollen.
- 4.7.3 Any work to improve the towpath to allow it to be used as a multi-user path needs to consider and respect the special nature of the site.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.7 Historical Features (continued)

4.7.4 The historical features summary in **Appendix D** in the Strategy Report records that the NMR contains 30 buildings or structures in the 2.8km section between Llangollen and Berwyn.

4.7.5 There are five listed structures along this section of the route. These are summarised in the table below.

Chainage	Location	Feature	Status
20.5km	Pen y Ddol, Llangollen	Bridge over canal	Grade II Listed
21.6km	Pentrefelin, Llangollen	Bridge over canal	Grade II Listed
21.8km	Afon Eglwyseg	Aqueduct	Grade II Listed
22.2km	Ty Craig	Bridge over canal	Grade II Listed
22.9km	Berwyn Station	Railway Station	Grade II Listed
22.9km	Kings Bridge, Berwyn	Road bridge over River Dee	Grade II Listed
22.9km	Berwyn	Railway viaduct	Grade II Listed

4.7.6 The three bridges over the canal provide a constraint where the towpath is narrow and the headroom is restricted, as described in 2.7.6 above.

4.7.7 The aqueduct over the Afon Eglwyseg has parapet walls which are low in comparison to current standards for all users, including pedestrians.

4.7.8 The complex relationship between the Railway Station at Berwyn, the railway viaduct and also the Kings Bridge (which crosses the River Dee before passing beneath the railway viaduct) is fascinating.

4.7.9 The potential need to cross the River Dee at Berwyn is considered in Section 5.5 of this report and illustrated on Drawing 203 in **Appendix A** in the Strategy Report. Any new path or structure in the vicinity of Berwyn Station/Kings Bridge will need to be carefully considered to integrate it into an area with three listed structures, whose inter-relationship is an important aspect of the site.

4.0 LLANGOLLEN TO BERWYN (ch20.1km to ch22.9km) (continued)

4.8 Route Considerations

- 4.8.1 The congested urban environment of Llangollen, which is in part derived from its situation within a steep sided valley means that there is only one effective route for the multi-user path; along the canal towpath.
- 4.8.2 Welsh Canal Holiday Crafts Ltd operate horse-drawn barges from Llangollen, which operate as far as Horseshoe Falls on 2 days/week during the high season and shorter trips on other days. Encouraging cyclist use of the towpath needs to respect and interface with other canal activities, including the horse-drawn barge operation.
- 4.8.3 The towpath route provides links to a number of facilities and attractions in Llangollen, including the secondary school, leisure centre, Eisteddfod Pavilion and Motor Museum.
- 4.8.4 While the route is effectively level, the bridges over the canal do not allow current design standards to be achieved. Bridge 47 at ch22.7km in particular has narrow approaches with poor visibility and a long length of restricted headroom.
- 4.8.5 There are several locations at which the towpath is narrower than the 2.0m minimum contained in the design standards.
- 4.8.6 The aqueduct at Pentrefelin has low parapet walls and options for providing alternative protection will need to consider the potential impact on the historic nature of the site.
- 4.8.7 There are two locations where the towpath is used by motor vehicles to gain access to adjacent buildings, including the Motor Museum and the Chain Bridge Hotel.
- 4.8.8 The various ecological and environmental issues identified are unlikely to impose a significant constraint on the proposed development of the multi-user path.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km)

5.1 Current and Future Land Use

- 5.1.1 Between Berwyn and Carrog the Sustrans mapping does not recommend any routes for cyclists and the options available are limited. There are three transportation routes in the valley; the A5 and the Llangollen Railway on the south side of the river and an unclassified road on the north side.
- 5.1.2 For the majority of its length the A5, in the section under review, is constructed on side-long ground, frequently with a retaining wall supporting the road on the downhill face and with a low retaining wall supporting the ground above the carriageway level.
- 5.1.3 The carriageway is comparatively narrow by current standards and paths on verges on both sides of the road rarely exceed 1.0m wide.
- 5.1.4 While there are some locations where it may be possible to create an off-road path, within the A5 corridor these locations are few and far between and are unable to contribute to the objectives of the Strategy.
- 5.1.5 On the north side of the River Dee there is an unclassified road which runs from Berwyn to Carrog. The road is primarily single track, with no formal passing places. Boundaries are frequently formed of hedges which restrict visibility. The horizontal alignment is erratic. Traffic volumes and speeds however are low as summarised in 5.5.17.
- 5.1.6 If the road was untrafficked it would form an attractive part of the route, however it is the only means of access serving the numerous farms and cottages on the north side of the river, including the hamlet of Rhewl. There are two short sections of road which the Ordnance Survey Explorer map annotates as steeper than 1 in 7.
- 5.1.7 On the south side of the River Dee there is an unclassified road which serves Rhysgog Farm (ch24.0km) and Pendre (ch25.1km) which is only lightly trafficked.
- 5.1.8 Pendre is on a promontory on the River Dee and a public footpath continues west around the promontory to Dôl Fawr (ch26.5km) along a track which has the potential to become part of the off-road route.
- 5.1.9 Beyond Dôl Fawr there is a track with public access leading up to the A5. Other tracks (currently without public access) exist, running parallel with the River Dee, leading into the woodland at Bwlch Rhysgog. This route has the potential to create a link to Llangollen Railway on the west side of Berwyn Tunnel (ch27.6km).
- 5.1.10 The old railway track bed is owned by Denbighshire County Council but leased to the Llangollen Railway. Access to the railway land offers great potential for the creation of an off-road route as there is a linear strip from Berwyn Tunnel (ch27.6km) to Carrog (ch35.3km) and on to Corwen (ch39.4km). There are considerable benefits, particularly from an engineering and landowner negotiation perspective, if this route can be shared.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.1 Current and Future Land Use (continued)

5.1.11 If the railway route does not prove to be viable then options exist to create either a riverside route on farmland along the north bank of the River Dee or by widening the unclassified road. The engineering implications of both options are considered further below.

5.2 Links to Destinations

5.2.1 To the west of Berwyn the Dee Valley is rural with land used for farming. There are small communities at Glyndyfrdwy, Carrog and Llidiart-y-Parc, together with numerous farms and cottages.

5.2.2 Bridges over the River Dee exist at Berwyn, Glyndyfrdwy and Carrog.

5.2.3 The table below lists destinations on the section accessible from the south side railway route option.

South Side Route

Chainage	Feature	Access to/from
22.9km	Berwyn Station	<ul style="list-style-type: none"> Heritage Railway trains to Llangollen and Carrog.
24.2km	Rhysgog Farm	<ul style="list-style-type: none"> Farm
25.3km	Pendre	<ul style="list-style-type: none"> House
26.6km	Dôl Fawr	<ul style="list-style-type: none"> House
28.9km	Deeside Halt	<ul style="list-style-type: none"> Heritage Railway trains to Llangollen and Carrog. Level crossing on public bridle-way to A5 at Ty-isa'r-plwyf
30.2km	Bridge 20 under railway	<ul style="list-style-type: none"> Field access Potential link to house and unclassified road.
30.5km	Bridge 21 under railway	<ul style="list-style-type: none"> Field access Potential link to house (Garth y Dŵr) and unclassified road.
31.8km	Level Crossing (field access)	<ul style="list-style-type: none"> Potential to link to playing field or sewage works track to avoid railway sidings.
31.9km	Glyndyfrdwy	<ul style="list-style-type: none"> Community with shops, garage, school (under threat of closure). Heritage Railway Station - trains to Llangollen and Carrog. Bridge crossing over River Dee.
35.4km	Carrog Station	<ul style="list-style-type: none"> Heritage Railway Station with café and toilets and trains to Llangollen. Caravan and camping site. Bridge crossing over River Dee to Carrog (village with school, post office, public house). Llidiart y Parc Village, (garage/shop), access to A5.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.2.4 If the unclassified road on the north side of the River Dee is used, or an off-road riverside path is created, it will provide access to the following destinations.

North Side Route

Chainage	Feature	Access to/from
23.0km	Horshoe Falls	<ul style="list-style-type: none"> • Tourist destination. • Clwydian Way (long distance path).
23.2km	Llantysilio	<ul style="list-style-type: none"> • Church • Clwydian Way
25.1km	Llidiart Annie	<ul style="list-style-type: none"> • Hamlet, school
25.4km	Rhewl	<ul style="list-style-type: none"> • Hamlet
26.4km	Footpath	<ul style="list-style-type: none"> • Public footpath to Rhydonnen Isaf. • Potential off-road route (not walked).
28.9km	Footpath	<ul style="list-style-type: none"> • Public footpath to Rhydonnen Isaf. • Potential off-road route (not walked).
30.2km	Footpath	<ul style="list-style-type: none"> • Efenechtyd. High level public footpath via Hafod-Rhisg to Rhewl. • Not surveyed.
32.9km	Bridge over River Dee	<ul style="list-style-type: none"> • Link to Glyndyfrdwy village. • Heritage Railway trains to Llangollen and Carrog.

5.3 Topography

5.3.1 From Berwyn to Carrog the multi-user path climbs from 101m OD to 138m OD over 12.5km, an average gradient of 1:338, this however does not mean that the gradient will not be a constraint on route options.

5.3.2 If the south side railway route is to be used there is a need to climb from the valley floor up to railway level at the western portal of Berwyn Tunnel.

5.3.3 The Ordnance Survey 1:25,000 Explorer map shows gradients steeper than 1:7 on roads. An on-road route using the unclassified road on the north side of the valley would encounter steep gradients at Hafod Rhisg (ch26.5km) and ch30.3km.

5.3.4 The option of creating a riverside path adjacent to the River Dee offers opportunities for a path with easy gradients in open farmland. There are, however, locations where the river bank is steeply sloping, notably ch25.8km to ch26.1km.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.4 Land Ownership

5.4.1 The land ownership issues associated with the three possible route options between Berwyn and Carrog vary considerably from option to option. Potential land ownership in each case is summarised below.

5.4.2 *South Side Route*

Chainage	Feature	Assumed Owner
22.9km	Canal	British Waterways
22.9km	River Dee & South Bank	Unknown
22.9 to 23.1km	River Bank	Unknown
23.1 to 25.3km	Unclassified Road	Denbighshire County Council
25.3 to 26.6km	Public Footpath/Track	Unknown
26.6 to 27.0km	Track	Unknown
27.0 to 27.9km	Woodland Track	Unknown
27.9 to 31.8km	Railway	Denbighshire County Council (Lessee: Llangollen Railway)
31.8 to 31.9km	Sewage Works	Dŵr Cymru-Welsh Water (north side)
31.8 to 31.9km	Play Area	Glyndyfrdwy Community Council (south side)
31.8 to 32.3km	No obvious route	
32.3 to 35.5km	Railway	Denbighshire County Council (Lessee: Llangollen Railway)

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.4 Land Ownership (continued)

5.4.3 North Side Route (off-road)

Chainage	Feature	Assumed Owner
22.9 to 23.2km	Public Footpath	Unknown
23.2 to 25.0km	Farmland	Unknown
25.0 to 26.4km	Public Road	Denbighshire County Council
26.4 to 28.8km	Public Footpath	Unknown. Footpath may be on existing track.
28.8 to 29.2km	Public Road	Denbighshire County Council
29.2 to 30.2km	Farmland	Unknown. Possible route along edge of field adjacent to woodland.
30.2 to 30.7km	Public Road	Denbighshire County Council
30.7 to 31.6km	Farmland	Unknown. Potential for riverside path.
31.6 to 31.9km	Public Road	Denbighshire County Council
31.9 to 34.7km	Farmland	Unknown. Potential for riverside path.
34.7 to 35.2km	Public Footpath	Unknown
35.2 to 35.5km	Farmland	Unknown. Potential for riverside path.

5.4.4 North Side Route (on-road)

Chainage	Feature	Assumed Owner
22.9 to 23.2km	Public Footpath	Unknown
23.2 to 35.3km	Public Road	Denbighshire County Council Land for road widening: Unknown.

5.4.5 All three options will inevitably involve the need for liaison with various landowners. This is a significant challenge for this section of the route.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.5 Engineering Challenges

5.5.1 *South Side Route* - a summary of the engineering challenges facing the south side route are contained in the table below.

Chainage	Location	Issue
22.9km	Berwyn	<ul style="list-style-type: none"> Crossing of River Dee (as 5.5.2 to 5.5.14 below).
27.8km	Bwlch Rhysgog	<ul style="list-style-type: none"> Link from forest track to railway level. Path on north side of railway.
27.9 to 28.2km	Bwlch Rhysgog	<ul style="list-style-type: none"> Railway land too narrow for inclusion of path. Batter between railway and river very steeply sloping.
28.6km	Bridge 19	<ul style="list-style-type: none"> Bridge over public bridle-way too narrow for shared railway/path use.
28.7 to 28.9km	Deeside Loop	<ul style="list-style-type: none"> Passing loop on railway. Space to boundary fence restricted.
30.2km	Bridge 20	<ul style="list-style-type: none"> Bridge over field access. Too narrow for shared railway/path use. Possible use of bridge to transfer path to south side of railway.
30.5km	Bridge 21	<ul style="list-style-type: none"> Bridge over field access too narrow for shared railway/path use. South east wing wall failing. Possible use of bridge to transfer path to north side of railway.
31.2 to 31.4km	Ty Newydd	<ul style="list-style-type: none"> Railway land too narrow for inclusion of path. Old railway fence collapsing into river due to erosion.
31.4km	Bridge 22	<ul style="list-style-type: none"> Bridge over field access too narrow for shared railway/path use. Possible use of bridge to transfer path to south side of railway.
31.8km	Occupation Crossing	<ul style="list-style-type: none"> Take path from railway land to play area to avoid railway sidings.
31.9km	Glyndyfrdwy	<ul style="list-style-type: none"> Crossing of unclassified road.
32.1 to 32.3km	River Wall	<ul style="list-style-type: none"> Railway supported by retaining wall adjacent to river. South side of railway in steeply sloping cutting.
32.3 to 32.5km		<ul style="list-style-type: none"> Railway land too narrow for inclusion of path. Rock armour installed recently at ch32.5km.
32.5 to 34.1km		<ul style="list-style-type: none"> Space for path on north side of railway at toe of low embankment.
33.4km	Bridge 25	<ul style="list-style-type: none"> Bridge over field access too narrow for shared railway/path use.
34.1 to 34.5km		<ul style="list-style-type: none"> Railway land too narrow for inclusion of path. River erosion at toe of batter.
34.5km		<ul style="list-style-type: none"> Recent ground stabilisation of cutting face by Cadw (Owain Glyndwrs Mount).

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.5 Engineering Challenges (continued)

- 5.5.2 Clearly the crossing of the River Dee is a significant challenge. The options available are summarised below and also presented on Drawing 203 in **Appendix A** in the Strategy Report.
- 5.5.3 There are two existing river crossings at Berwyn, the chain bridge (ch22.8km) and the Kings Bridge (ch23.0km) which carries the B5103.
- 5.5.4 The chain bridge is a pedestrian suspension bridge. It has been derelict since 1984. If restored the form of the bridge is unlikely to be suitable for equestrians and may not be suitable for cyclists. On the south bank a zig-zag path leads up to a subway below the railway, where the path provides access onto the railway platform and also on to the A5.
- 5.5.5 The B5103 crosses over the Llangollen Canal (and its towpath) on the Kings Bridge at high level, before passing over the River Dee. The road then continues under the viaduct carrying the railway before turning east. As the road climbs steeply to the A5 it crosses over a stream.
- 5.5.6 The unclassified road, which is proposed for use in the off-road path, forms a junction with the A5 approximately 150m west of the B5103 junction. Immediately after the junction the unclassified road crosses over the railway by an overbridge before dropping steeply to river level.
- 5.5.7 Between the river bank and the A5 runs the Llangollen Railway, carried in part on a single track width viaduct.
- 5.5.8 Ideally, the route for the multi-user path needs to cross the river but avoid the steep climb up to the level of the A5 and the safety issues associated with using part of the A5 at a location which is narrow, with road junctions and a footway width which is too narrow for use as an off-road path.
- 5.5.9 If the chain bridge can be refurbished and used as part of the path then ideally a link path needs to be formed on the steeply sloping side-long ground parallel with the railway, between the bridge and the unclassified road. This would include a crossing of the stream/waterfall which descends the south bank of the River Dee.
- 5.5.10 The link path from the chain bridge to the unclassified road will need to cross the B5103.
- 5.5.11 Use of the Kings Bridge also provides a number of challenges. It crosses over the canal at high level and there is a need to create a link from the towpath up to road level. The site adjacent to the towpath is significantly constrained by the presence of the Chain Bridge Hotel.
- 5.5.12 The Kings Bridge is narrow and does not have any footpaths. Visibility on the bridge however is good.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.5 Engineering Challenges (continued)

- 5.5.13 If the Kings Bridge is used there is still a need for a link path to the unclassified road, as described in 5.5.8, albeit without the need to cross the waterfall.
- 5.5.14 A third option is to create a new bridge across the River Dee from the canal towpath direct to the unclassified road. While this approach may appear radical, the engineering challenges associated with such a crossing are considerably reduced.
- 5.5.15 It is difficult to assess the engineering requirements of the north side options. Access is not possible to the off-road route, which primarily runs on land with no current public access.
- 5.5.16 The majority of the north side on-road route is along a lane which is frequently narrow and bounded by hedges. Visibility along the road is poor and passing places are limited to the informal use of field gateways.
- 5.5.17 Data available on traffic speeds and volumes on the north side on-road route at ch23.0km and ch34.8km are summarised in the table below.

	ch23.0km	ch34.8km
Daily Traffic Volume	476	101
Average Traffic Speed	23mph	16mph
85 %ile Speed	28mph	18mph

- 5.5.18 The above data was recorded in March 2011 and traffic volumes may be increased in summer months. The volume and speed of the traffic are sufficiently low to suggest that use of an on-road route may be acceptable, particularly between Glyndyfrdwy and Carrog.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.6 Environmental and Ecological Issues

5.6.1 The table below summarises the data sets reviewed for potential environmental and ecological impacts as described in Section 6.0 of the Strategy Report.

5.6.2 Those items identified as providing a potential impact in the table are explored in greater detail below.

Environmental Data Description	Potential Impacts	
	Yes	No
National landmap information system	✓	
Conservation Areas		✗
Biodiversity Action Plans (BAPs)		✗
Ramsar Sites		✗
Biosphere reserves		✗
Sites hosting habitats/species of (European) community interest – international designation	✓	
Areas of Outstanding Natural Beauty		✗
Special Areas of Conservation (SACs)	✓	
Special Protection Areas (SPAs)		✗
Sites of Specific Scientific Interest (SSSIs)	✓	
CORINE Biotopes		✗
Limestone Pavements		✗
National Nature Reserves (NNRs)		✗
Sites hosting Red Data Book species		✗
National Parks		✗
Local Nature Reserves (LNRs)		✗
Sites of Importance to Nature Conservation (SINCs)		✗

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.6 Environmental and Ecological Issues (continued)

5.6.2 (continued)

Environmental Data Description	Potential Impacts	
	Yes	No
Ancient Woodlands		x
Flood Warning & High Flood Levels	✓	
Welsh Fisheries	✓	
RSBP Reserves		x
Potential Spread of Plant Pathogens (P.Ramorum)		x

5.6.3 The information obtained from the various data sources relating to potential environmental and ecological issues which need to be considered between Berwyn to Carrog is contained in **Appendix D** in the Strategy Report, summarised in the table below and considered in more detail subsequently.

Chainage	Environment Data Description
22.9 to 35.5km	<ul style="list-style-type: none"> • Landmap assessment • Site hosting habitats/species of (European) Community interest - international designation. • Special Area of Conservation • Site of Special Scientific Interest • Flood Risk Zone • Welsh Fisheries

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.6 Environmental and Ecological Issues (continued)

5.6.4 The national landmap information scheme records an assessment of the value of the environment against five categories. These are:

- Geological landscape
- Landscape habitats
- Visual and sensory
- Historic landscape
- Cultural landscape

The evaluation criteria applied to each category are:

Unknown	
Low	of little or no importance
Moderate	of local importance
High	of regional or county importance
Outstanding	of international or national importance

5.6.5 **Appendix E** in the Strategy Report contains a table summarising the landmapping categorisation for the area between Berwyn and Carrog. Three categories are identified, two are evaluated as being of 'high' value, while the Carrog upland valley slope is assessed as being 'outstanding'.

5.6.6 The various conservation status listings between ch22.9km and ch35.5km are associated with the River Dee, as both a habitat and the species this habitat supports.

5.6.7 Clearly there is a need to ensure that any proposed works will not have an adverse impact on this particular environment. The Site of Special Scientific Interest (SSSI) listing makes specific reference to "numerous bryophytes" in the section of river below Corwen. Bryophytes are a land-based plant group.

5.6.8 Otters have been recorded along the whole length of the River Dee, especially at locations where appropriate bank side cover exists to provide secure holts and lying up areas.

5.6.9 The SSSI criteria also refers to the Water Voles being recorded in the middle and lower reaches of the River Dee.

5.6.10 The River Dee is an Environment Agency Index Salmon river which supports several other fish species and there will be a need to ensure any proposed works do not adversely affect the river.

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.6 Environmental and Ecological Issues (continued)

5.6.11 Invertebrates noted in the SSSI criteria include the nationally scarce Freshwater Pearl Mussel (which is only recorded in nine Welsh rivers) and the Water Beetle which inhabits the reaches of the middle River Dee.

5.6.12 The EAW flood mapping shows the predicted extent of flooding along the Dee Valley. The north side off-road option for the path adjacent to the river bank may be susceptible to flooding.

5.7 Historical Features

5.7.1 The table below summarises the data sets reviewed for potential historical impacts as described in Section 5.0 of the Strategy Report.

5.7.2 The items identified as providing a potential impact in the table are explored in greater detail below.

Historical Data Description	Potential Impacts	
	Yes	No
Scheduled Ancient Monuments/ Listed Buildings	✓	
National Monuments Record of Wales (Coflein)	✓	
National Trust Asset Boundaries		✗
World Heritage Sites (WHS)		✗
Heritage Coasts		✗

5.7.3 The information obtained from the various data sources relating to potential historical issues which need to be considered between Berwyn and Carrog is contained in **Appendix F** in the Strategy Report, summarised in the table below and considered in more detail subsequently.

Chainage	Location	Feature	Status
24.2km	Rhysgog Farm	Farmhouse	Contained on NMR
25.3km	Pendre Farm, Rhysgog	Barn	Grade II listed
30.6km	Garthdwr, Glyndyfrdwy	Cottage	Grade II listed
32.0km	Glyndyfrdwy	Railway Station	Contained on NMR
32.1km	Glyndyfrdwy	Barmouth South Signal Box	Contained on NMR
35.5km	Carrog	Railway Station	Contained on NMR

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.7 Historical Features (continued)

5.7.4 The proposed multi-user path passes close to, but should not affect, the farmhouse contained on the NMR at Rhysgog Farm (ch24.2km), nor the listed Barm at Pendre Farm (ch25.3km) or the cottage at Garthydwr (ch30.6km).

5.7.5 At Glyndyfrdwy (ch31.8/32.1km) there is insufficient space within the railway boundary for the multi-user path and while there is the potential for the path to be in close proximity to both the Station and the Barmouth South Signal Box (both contained on the NMR) they are unlikely to disturb the sites.

5.8 Route Considerations

5.8.1 The three tables below summarise the forms of land over which the three route options cross.

South Side Route

Land Type	Distance (km)	Distance (%)
Railway Land	6.9	55
Public Highway	2.2	18
Public Footpath	1.4	11
Other	2.0	16
Total	12.5	100

North Side (off-road) Route

Land Type	Distance (km)	Distance (%)
Public Highway	2.6	21
Public Footpath	3.3	26
Other	6.6	53
Total	12.5	100

North Side (on-road) Route

Land Type	Distance (km)	Distance (%)
Public Highway	12.1	97
Public Footpath	0.4	3
Total	12.5	100

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

- 5.8.2 The on-road elements of both the south side and north side (off-road) route options are similar, although the perception gained was that the level of traffic on the road section in the south side route is considerably lighter as it only serves a few farms and is a no-through road for much of its length.
- 5.8.3 The main advantage of the south side route is that 55% of the route length is in the control of a single organisation, the Llangollen Railway, which should simplify the negotiations with landowners.
- 5.8.4 The challenges in crossing the River Dee at Berwyn are significant, use of the two existing bridges is not ideal and introducing a new river crossing has many challenges on all fronts, including engineering, historical, landscape, environmental and ecological.
- 5.8.5 There are several sections of the railway route where spatial constraints introduce particular challenges.
- 5.8.6 The table below summarises the key issues associated with the south side route.

Chainage	Location	Issue
22.9 to 23.0km	Berwyn	<ul style="list-style-type: none"> Crossing of River Dee
23.1 to 25.3km	Rhysgog	<ul style="list-style-type: none"> Use of unclassified road
25.3 to 26.6km	Pendre - Dol Fawr	<ul style="list-style-type: none"> Upgrade of footpath to bridleway
26.6 to 27.0km	Dol Fawr	<ul style="list-style-type: none"> Use of private access track by route
27.0 to 27.8km	Bwlch Rhysgog (woodland)	<ul style="list-style-type: none"> Use of woodland track Forming link to railway land at high level
27.8 to 28.2km	Bwlch Rhysgog	<ul style="list-style-type: none"> Railway land too narrow for inclusion of path Batter between railway and river very steeply sloping
28.6km	Bridge 19	<ul style="list-style-type: none"> New span over bridleway. Possible link to bridleway.
28.7 to 28.9km	Deeside Loop	<ul style="list-style-type: none"> Space inadequate for full width path
30.2km	Bridge 20	<ul style="list-style-type: none"> Use of bridge to transfer path to south side of railway
30.5km	Bridge 21	<ul style="list-style-type: none"> Bridge wing walls in poor condition Transfer path to north side of railway
31.2 to 31.4km	Ty Newydd	<ul style="list-style-type: none"> Railway land too narrow for path on north side River erosion has removed railway boundary fence River protection works to create space for path and to protect railway to be considered
31.4km	Bridge 22	<ul style="list-style-type: none"> Use bridge under railway to transfer path to south side of line

5.0 BERWYN TO CARROG (ch22.9km to ch35.5km) (continued)

5.8 Route Considerations (continued)

5.8.6 (continued)

Chainage	Location	Issue
31.8 to 32.0km	Glyndyfrdwy	<ul style="list-style-type: none"> Take path through play area to avoid railway sidings
32.0km	Glyndyfrdwy	<ul style="list-style-type: none"> Crossing of unclassified road
32.0 to 32.5km	Glyndyfrdwy	<ul style="list-style-type: none"> Presence of railway station and subsequent section of railway supported on riverside wall make use of railway corridor impractical
32.5 to 34.1km		<ul style="list-style-type: none"> Space for path on north side of railway
33.4km	Bridge 25	<ul style="list-style-type: none"> Bridge span required for path over field access
34.1 to 34.5km		<ul style="list-style-type: none"> Railway land too narrow for path on north side River protection works to create space for path and to protect railway to be considered

- 5.8.7 Both of the north side routes ideally need the footpath between Llantysilio and Horseshoe Falls upgrading to bridleway status (ch22.9km to ch23.2km). This would be of benefit to both the new path users and also visitors to the Horseshoe Falls.
- 5.8.8 Creating a north bank riverside route is practical from an engineering perspective, but the number of landowners, whose consent is required for the envisaged 6.6km of off-road route to be created in areas where no public access exists, is unknown.
- 5.8.9 The north side off-road route uses several on-road sections. There are eight off-road sections, measuring in length between 100m and 2.8km.
- 5.8.10 Use of a north side option avoids the need to create a river crossing at Berwyn and also presents an opportunity to create an off-road path incrementally by focussing effort on specific sections between areas where use of the road cannot be avoided.
- 5.8.11 There is only one opportunity to 'mix and match' between the north side and south side routes, using the bridge at Glyndyfrdwy.
- 5.8.12 The low traffic volumes and speeds, particularly between Glyndyfrdwy and Carrog suggest that an on-road route is feasible if an off-road route cannot be created.

6.0 DISCUSSION

- 6.1 Between Trevor Basin (ch13.2km) and Llangollen (ch20.1km) there are two very good options for the development of an off-road multi-user path, the canal towpath and the former railway route.
- 6.2 The towpath is already used by cyclists and, in several areas, the surface has recently been improved. Use of the towpath provides an opportunity to access part of the Pontcysyllte World Heritage Site in a landscape considered to be 'outstanding' on several counts by the CCW Landmap Scheme.
- 6.3 Use of the canal towpath by cyclists and equestrians has a risk of conflict of interest with pedestrians, particularly in areas where the towpath is narrow.
- 6.4 The use of the former railway will allow the creation of a route which enables the design standards for shared use to be easily met. However, the presence of the route provided by the canal side environment will be lost.
- 6.5 While the creation of a new route on the railway has some advantages, the canal is an established attraction of world class importance and, no matter how good a route can be created on the old railway line, the majority of leisure users are likely to prefer the ambience and presence of the canal towpath route.
- 6.6 The entry of both route options into Llangollen is difficult. The former railway route has been developed in the urban area and, while it may be possible to develop some off-road sections, this route will almost inevitably involve the use of a section of the A539 which is clearly undesirable.
- 6.7 On the canal route the towpath width is very narrow between ch19.6km and ch20.0km. This area is used to moor boats during the tourist season and, consequently, is frequently congested, with no viable alternative route practical due to the topography of the site and its urban nature.
- 6.8 There are several routes linking Llangollen Wharf to Abbey Road and the Dee Bridge. That from the west end of the Wharf provides the easiest grades, although the access to Abbey Road adjacent to Cwrt y Gamlas would benefit from improvement.
- 6.9 From Llangollen to Berwyn (ch20.1km to ch22.9km) the combination of topography and the urban environment, together with intensive use of the railway land, means that there is only one effective off-road route, along the canal towpath.
- 6.10 The towpath is well placed to serve a number of important destinations in Llangollen, including the Eisteddfod Pavilion, Ysgol Dinas Bran and the leisure centre.
- 6.11 There are several areas which do not meet current design standards, including Bridge 47 at ch21.0km which has narrow approaches with poor visibility, and the aqueduct at Pentrefelin, a listed structure with very low parapet walls.

6.0 DISCUSSION (continued)

- 6.12 From Berwyn to Carrog three options have been considered, a south side route (which runs adjacent to the Llangollen Railway for much of its length) and two north side routes (one on-road and one off-road).
- 6.13 The complex interlacing of bridges at Berwyn does much to define the character of the site. Neither of the existing crossings of the River Dee are ideal for use by a multi-user path. If the south side route is to be developed the best option appears to be to create a further bridge span. The design and location of this new bridge will need to respect the sensitive and historic value of the environment at Berwyn.
- 6.14 One of the significant benefits of the south side route is that negotiations for the use of the land are confined to a single organisation, the Llangollen Railway.
- 6.15 The proposed south side route would largely be between the railway and the River Dee and in several locations, where river erosion has occurred, there is insufficient room for a route to be created. It is anticipated that engineering works will be required at these locations to prevent further erosion in the near future.
- 6.16 There is an opportunity for DCC and the Llangollen Railway to work in partnership to jointly address the threat of river erosion to the railway while providing an opportunity to create a route for the multi-user path.
- 6.17 Immediately to the west of Glyndyfrdwy the railway is situated on a retaining wall immediately adjacent to the river, with a steep batter on the south side of the line. Creating a corridor for a multi-user path at this location will be challenging.
- 6.18 The easiest option is the use of the north side (on-road) route. While vehicle speeds and traffic volumes are low, the road is single track for much of its length with boundaries formed of hedges which obscure visibility.
- 6.19 Achieving agreement with landowners to create a riverside route may not be easy. At several locations the topography forces the route back onto the road. This, however, does provide an opportunity to allow an off-road route to be created incrementally, between on-road sections, an advantage not shared by the south side route which has few links to existing roads and footpaths.

7.0 PROJECT BUDGET

- 7.1 The method and rates used to establish the project budget are outlined in Section 10.0 of the Strategy Report.
- 7.2 Spreadsheets deriving the budget costs are included in **Appendix J** in the Strategy Report and are summarised in the tables below:

Section	Section 2.1: Trevor Basin to Llangollen (13.2 to 20.1km)	Section 2.2: Llangollen to Berwyn (20.1 to 22.9km)	Section 2.3: Berwyn to Glyndyfrdwy (22.9 to 31.9km)	Section 2.4: Glyndyfrdwy to Carrog (31.9 to 35.5km)
Landowner Search	Existing	Existing	19,000	8,000
Feasibility Study	Existing	Existing	81,000	33,000
Public Consultation	Existing	Existing	21,000	10,000
Landowner Negotiation	Existing	Existing	37,000	15,000
Land Purchase	Existing	Existing	184,000	90,000
Planning Application	Existing	Existing	7,000	4,000
Detail Design	34,000	14,000	85,000	66,000
Contract Management	21,000	9,000	68,000	60,000
Construction	276,000	112,000	897,000	788,000
Section Total	331,000	135,000	1,399,000	1,074,000

Project Budget £2,939,000

- 7.3 Three options are considered for sections 2.3 and 2.4 between Berwyn, Glyndyfrdwy and Carrog. Budget costs have been prepared for each case.
- 7.4 Between Berwyn and Glyndyfrdwy the south route option has been selected, as this provides the most cost effective off-road route.
- 7.5 Between Glyndyfrdwy and Carrog there is a significant engineering challenge in taking the southern route option over the 200m section of river wall immediately to the west of Glyndyfrdwy Station (ch32.1km to 32.5km). While a financial allowance has been made in the budget costings for this area, a pragmatic view has been taken and the budget for this section is based on the most expensive north side off-road route option.

7.0 PROJECT BUDGET (continued)

7.6 Budget comparisons for the route options between Berwyn and Carrog are summarised in the tables below.

Section 2.3: Berwyn to Glyndyfrdwy (ch22.9km to ch31.9km)

Section	South Side	North Side (off-road)	North Side (on-road)
Landowner Search	19,000	19,000	19,000
Feasibility Study	81,000	81,000	81,000
Public Consultation	21,000	21,000	21,000
Landowner Negotiation	37,000	37,000	37,000
Land Purchase	184,000	173,000	9,000
Planning Application	7,000	7,000	7,000
Detail Design	85,000	111,000	46,000
Contract Management	68,000	94,000	29,000
Construction	897,000	1,244,000	378,000
Section Total	£1,399,000	£1,787,000	£627,000

Section 2.4: Glyndyfrdwy to Carrog (ch31.9km to ch35.5km)

Section	South Side	North Side (off-road)	North Side (on-road)
Landowner Search	8,000	8,000	8,000
Feasibility Study	33,000	33,000	33,000
Public Consultation	10,000	10,000	10,000
Landowner Negotiation	15,000	15,000	15,000
Land Purchase	98,000	98,000	0
Planning Application	4,000	4,000	4,000
Detail Design	36,000	71,000	18,000
Contract Management	30,000	64,000	11,000
Construction	388,000	846,000	144,000
Section Total	£622,000	£1,149,000	£243,000

8.0 SUMMARY


- 8.1 There are two good options for the creation of a multi-user path between Trevor Basin and Llangollen, using either the canal towpath or the old railway track bed.
- 8.2 The canal towpath is currently being offered by Sustrans and British Waterways for use by cyclists and there has recently been investment to improve the quality of the towpath surface.
- 8.3 The canal is part of the Pontcysylte World Heritage Site and is an attraction in its own right. The canal towpath is currently used by cyclists and, while the former railway route provides an opportunity to create a path engineered to current standards and with a reduced risk of rider/pedestrian conflict, the charm of the canal route together with its present usage suggests that the benefits of relocating the route to the old railway are minimal and leisure use of the canal is likely to remain.
- 8.4 In Llangollen the canal moorings and Wharf can become congested at busy times, but the constraints imposed by the topography of the site and its urban nature limit the opportunities for alternative routes.
- 8.5 There are several links from the Wharf down to the Dee Bridge. The link adjacent to Cwrt y Gamlas onto Abbey Road is the most suitable for cyclists and it may be capable of improvement if agreement can be reached with the relevant landowners.
- 8.6 From Llangollen to Berwyn much of the route is urban and the canal towpath provides the only opportunity for the creation of an off-road path.
- 8.7 Three routes have been considered between Berwyn and Carrog, a south side route which largely follows the route of the Llangollen Railway and on-road/off-road options on the north side of the river.
- 8.8 There are significant engineering issues if the south side route is adopted, including the potential need for a new bridge over the River Dee at Berwyn.
- 8.9 Between Berwyn and Carrog there are two locations where erosion of the river bank adjacent to the railway is such that there is insufficient space for the creation of a multi-user path between the railway and the river. Erosion control measures are likely to be required in the near future to protect the railway. It may be possible to create space for a cycleway at these locations if DCC and the Llangollen Railway work in partnership.
- 8.10 Immediately to the west of Glyndyfrdwy there is a short length where the railway runs on top of a retaining wall adjacent to the river. Creating a multi-user path at this location will be challenging.

8.0 SUMMARY (continued)

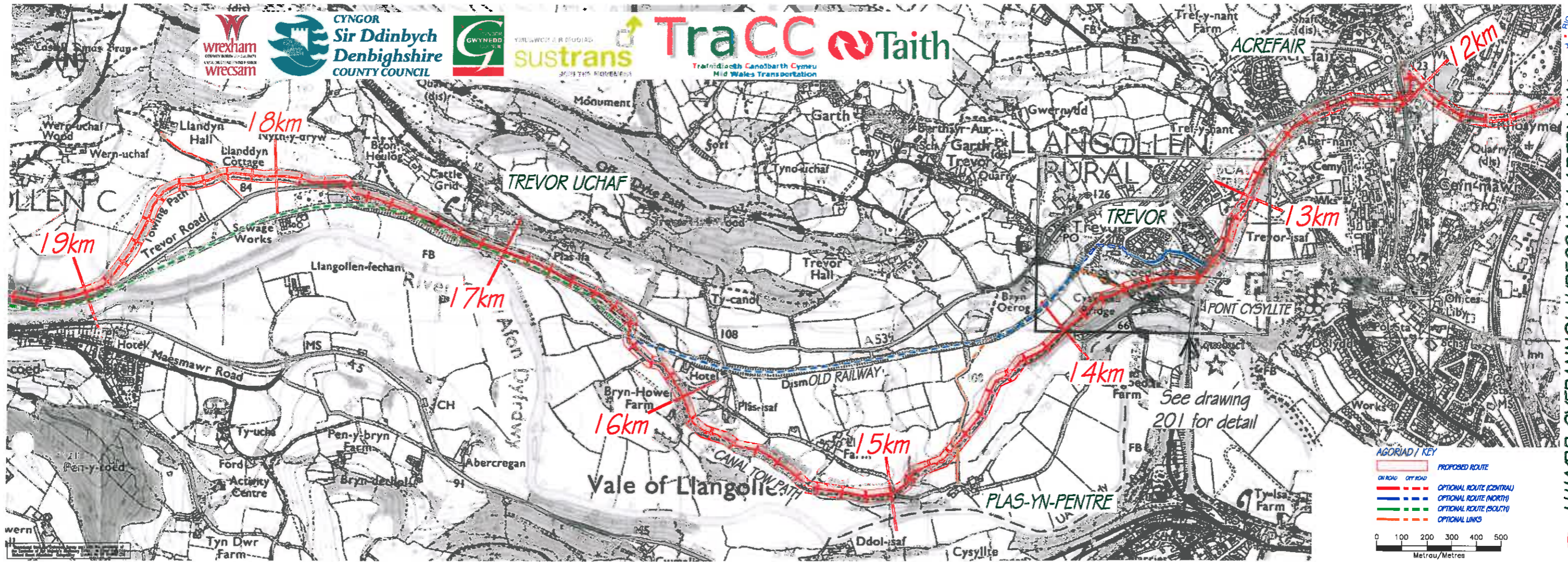
- 8.11 From an engineering perspective, the option of creating an off-road route on the north bank of the River Dee is feasible, but there is no current public access to this area and creating a right of way may be difficult.
- 8.12 Another north side option is to place the route on the existing unclassified road.
- 8.13 There are opportunities to 'mix and match' all three routes. At several locations the north side off-road route has to go on-road due to topographic constraints and there is an opportunity to divide the south side route at Glyndyfrdwy where there is a bridge over the River Dee.
- 8.14 It is envisaged that the creation of a multi-user path between Trevor Basin and Carrog will be formed of four stages. These are listed below, together with the appropriate budget costs:

Section No.	Chainage	From	To	Budget Cost
2.1	13.2 to 20.1km	Trevor Basin	Llangollen	331,000
2.2	20.1 to 22.9km	Llangollen	Berwyn	135,000
2.3	22.9 to 31.9km	Berwyn	Glyndyfrdwy	1,399,000
2.4	31.9 to 35.5km	Glyndyfrdwy	Carrog	1,074,000

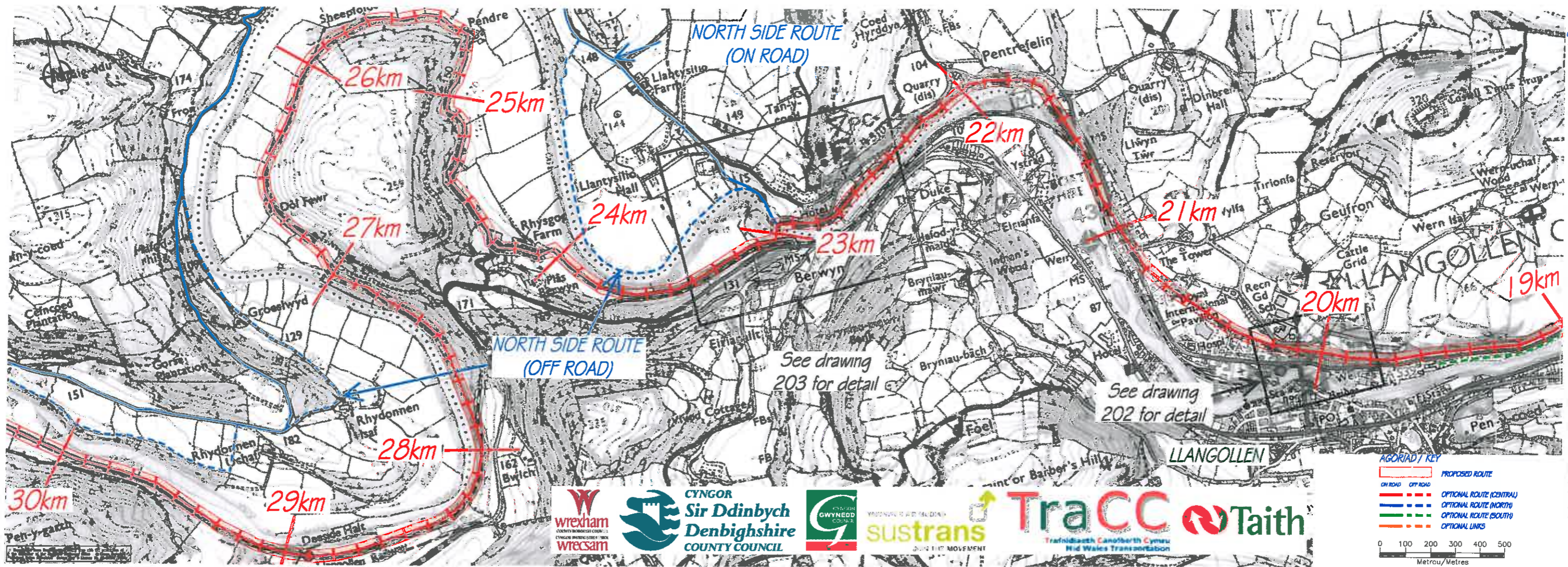
- 8.15 The total project budget to create a multi-user path between Trevor Basin and Carrog is £2,939,000.


RICHARD BROUN ASSOCIATES
August 2011

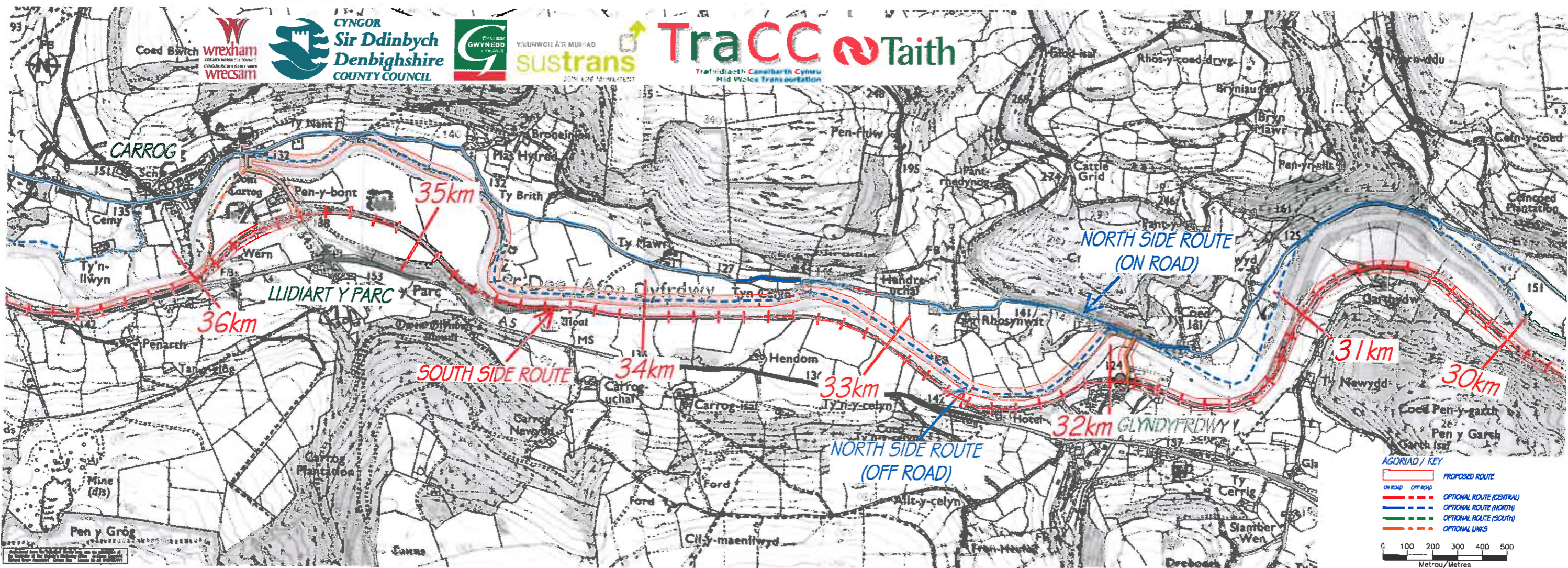
APPENDIX A:
Route Drawings



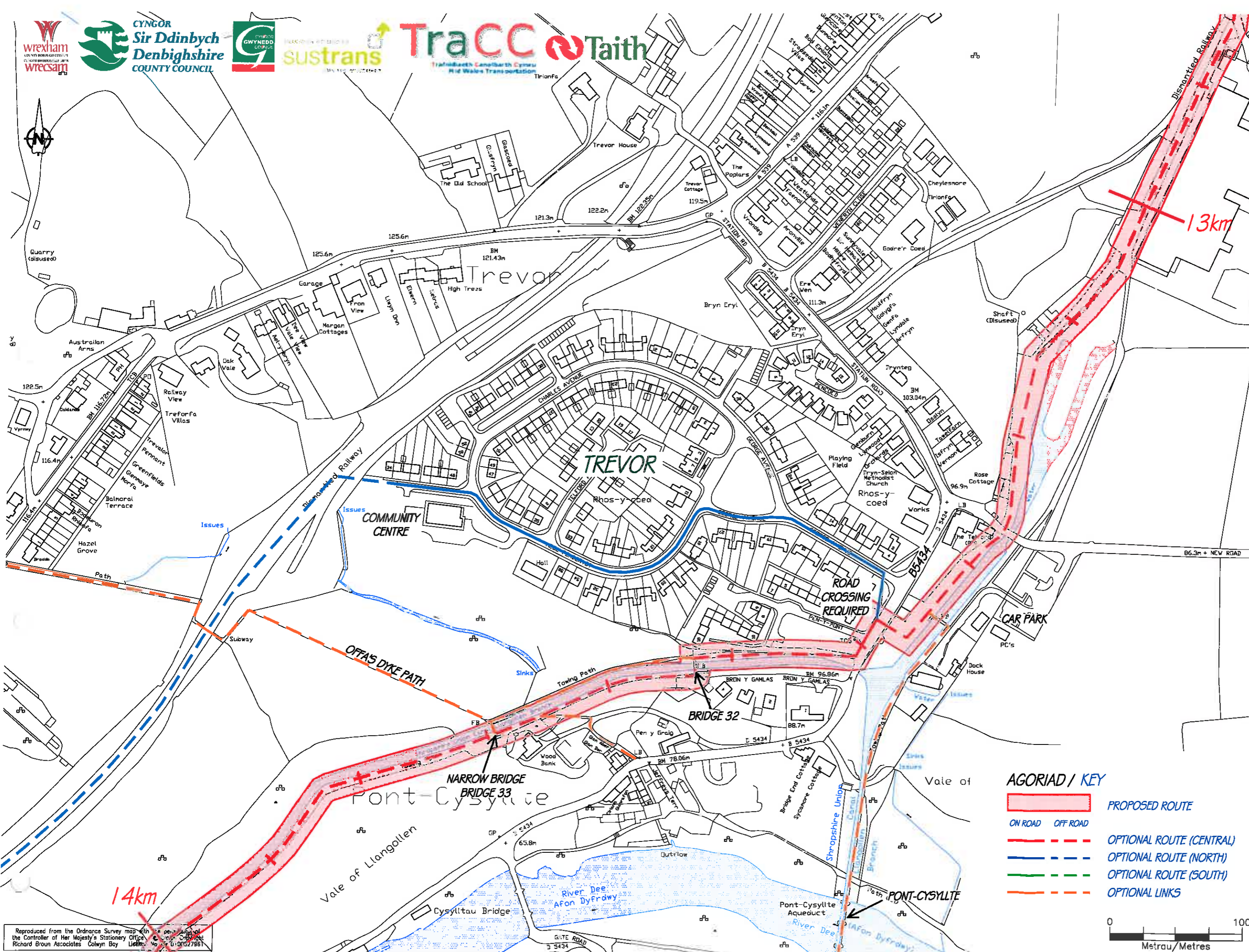
RICHARD BRUN ASSOCIATES
 LLWYBR CYFRANNOL WRECSAM I ABERMAW
 SHARED PATH WREXHAM TO BARMOUTH
 03



RICHARD BROWN ASSOCIATES
 LLWYBR CYFRANNOL WRECSAM I ABERMAW
 SHARED PATH WREXHAM TO BARMOUTH
 04



RICHARD BROWN ASSOCIATES
 LLWYBR CYFRANNOL WRECSAM I ABERMAW
 SHARED PATH WREXHAM TO BARMOUTH
 05



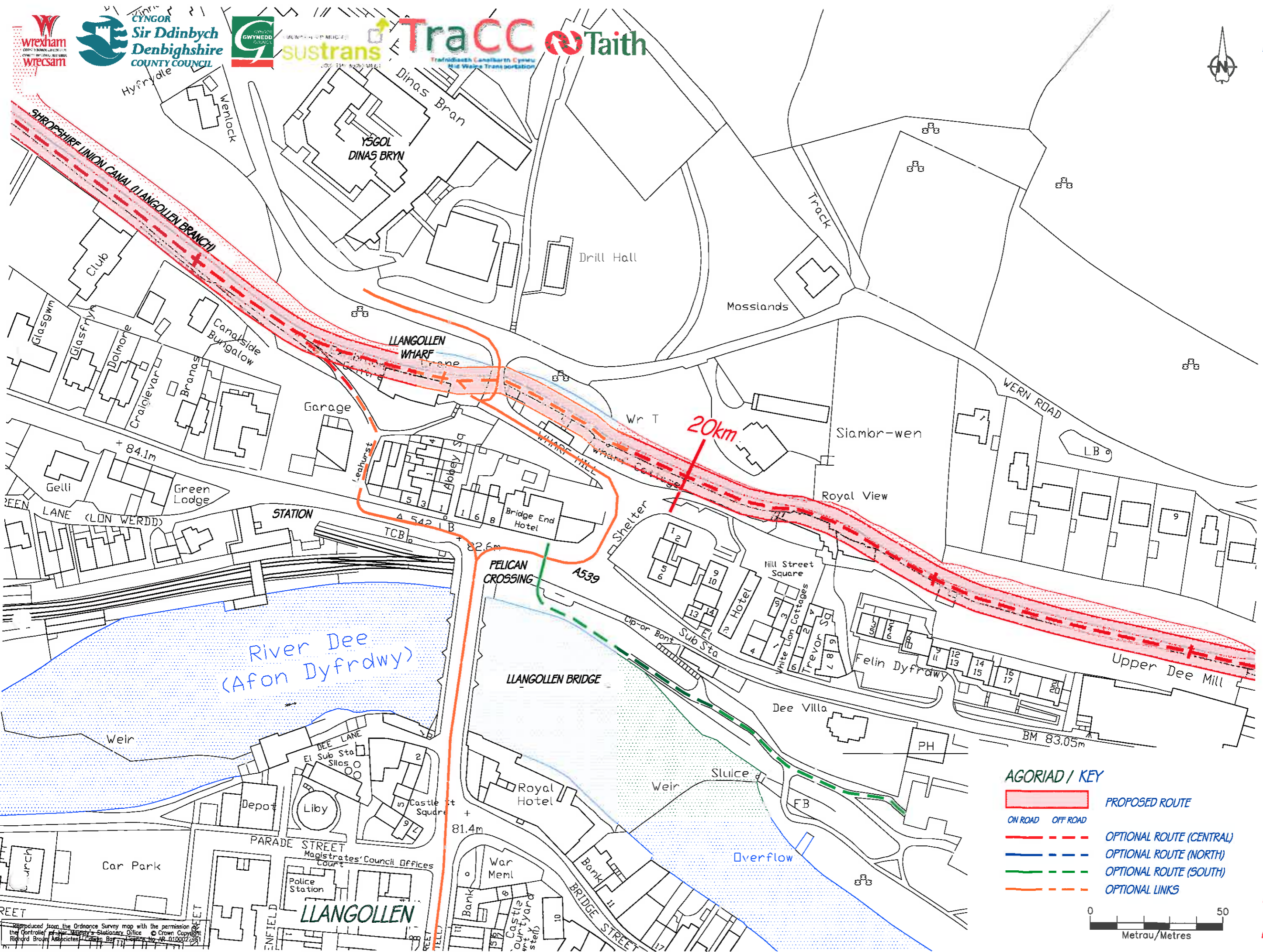
LLWYBR CYFRANNOL WRECSAM I ABERMAW
SHARED PATH WREXHAM TO BARMOUTH

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- AGORIAD / KEY**
- PROPOSED ROUTE
 - ON ROAD OFF ROAD
 - OPTIONAL ROUTE (CENTRAL)
 - OPTIONAL ROUTE (NORTH)
 - OPTIONAL ROUTE (SOUTH)
 - OPTIONAL LINKS



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LLWYBR CYFRANNOL WRECSAM I ABERMAW
 SHARED PATH WREXHAM TO BARMOUTH

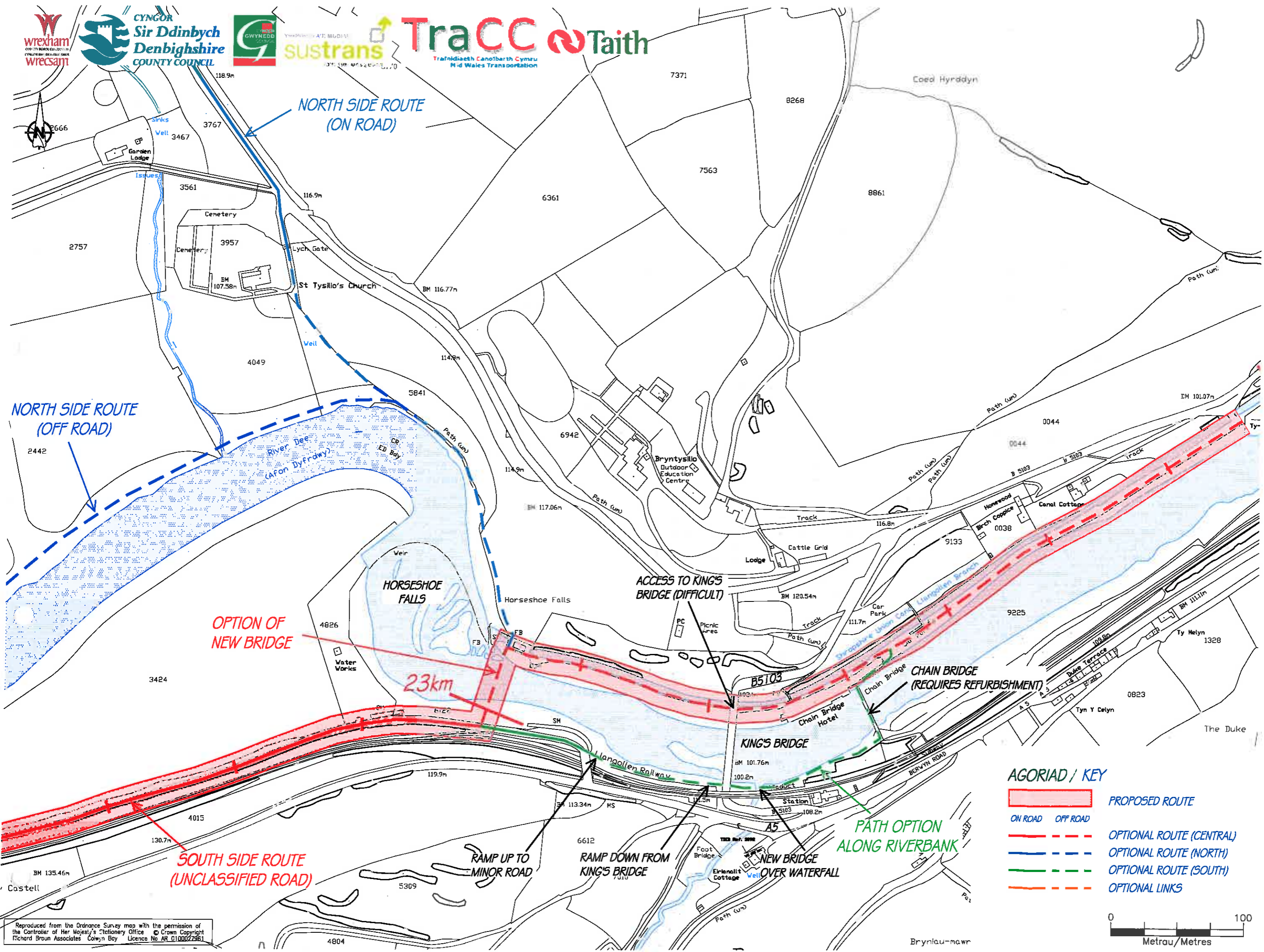
AGORIAD / KEY

	PROPOSED ROUTE
	OPTIONAL ROUTE (CENTRAL)
	OPTIONAL ROUTE (NORTH)
	OPTIONAL ROUTE (SOUTH)
	OPTIONAL LINKS
	ON ROAD
	OFF ROAD



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NORTH SIDE ROUTE
(OFF ROAD)

NORTH SIDE ROUTE
(ON ROAD)

OPTION OF
NEW BRIDGE

23km

SOUTH SIDE ROUTE
(UNCLASSIFIED ROAD)

AGORIAD / KEY

- PROPOSED ROUTE
- ON ROAD OFF ROAD
- OPTIONAL ROUTE (CENTRAL)
- OPTIONAL ROUTE (NORTH)
- OPTIONAL ROUTE (SOUTH)
- OPTIONAL LINKS

LLWYBR CYFRANNOL WRECSAM I ABERMAW
SHARED PATH WREXHAM TO BARMOUTH

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