



This concept document shows how the Windborne Gate is the key to the regeneration of the economy of Cefn & Cefn Mawr at the centre of the Pontcysyllte World Heritage Site and can play a practical role in the implementation of the WAG FGA 2015.

Windborne Gateway Interchange Concept 2017

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Revision 5

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Introduction

The concept of the Windborne Gate-way interchange (WBG) is to provide a multipurpose facility for the Cefn, Cefn Mawr and the Aqueduct at the center of the Pontcysyllte World Heritage Site while simultaneously achieving goals of the Welsh Assembly Government (WAG) in both the national Planning Policy for Wales (PPW) and the Future Generations Act 2015, (FGA 2015). The WBG will assist regeneration of our community's economy on a fully Sustainable Tourism Development basis that will allow the switch to be made from depressed postindustrial. The WBG Interchange will also assist in practical ways towards a lower carbon economy and the transition from private to public transport with more environmentally friendly forms of transport as opposed to the car and internal combustion engine. WBG can and will do this in the following ways:

1. WBG will help enable the Cefn & Cefn Mawr, a postindustrial community to move to Sustainable Tourism Development
2. WBG will help encourage people to explore the wider area of the Cefn & Cefn Mawr rather than *"Moving On"*
3. WBG will help correct the *"limited dwell"* time for which the aqueduct is criticized
4. WBG will address the *"Lack of facilities"* at the aqueduct by linking in with Cefn Mawr Village Centre
5. This will remove the desire for new build at the aqueduct in unfair competition to the community and villages of the Cefn & Cefn Mawr
6. This will help preserve the aqueduct in its natural setting, rather than surrounding it with new build for commercial gain
7. WBG will reuse a suitable Brownfield site and negate the need for new build, so reducing unnecessary related CO2 emission
8. This will save a Greenfield site being lost at the Trevor Basin (2014 Master Planning by WCBC & CRT)
9. WBG will provide a direct interchange facility to get people out of cars and into more environmentally friendly forms of transport
10. WBG will promote walking, cycling and horse drawn hackney carriage services as opposed the internal combustion engine
11. This will reduce CO, NOx and Palladium emissions and comply with WAG SDC aspirations for tourist management
12. WBG will reduce traffic congestion at the Trevor Basin which becomes problematic at the high season
13. WBG will reduce traffic congestion in Trevor while providing far larger parking capacity
14. WBG will reduce the detrimental traffic flow across the Cysyllte Bridge, a Grade 1 listed structure
15. WBG will negate the need for traffic flow through a residential area reducing noise and air pollution in our community
16. WBG will stop a children's play area from being exposed to raised levels of CO, NOx and Palladium emission (and exposure of our children)
17. WBG can provide a central location at Cefn Mawr, the second largest community in Wrexham County for a local monthly market
18. This will further redress the economic hardship of the Cefn & Cefn Mawr while promoting the sales of local produce by local people
19. This will promote further sustainable retail growth within the community of Cefn & Cefn Mawr in compliance with WAG WPP & LDP2 by WCBC
20. WBG can provide an open air venue for events that promote the Welsh Culture and Language on the Borders in NE Wales.

Current Situation & What's Wrong

General Economy of Cefn Mawr

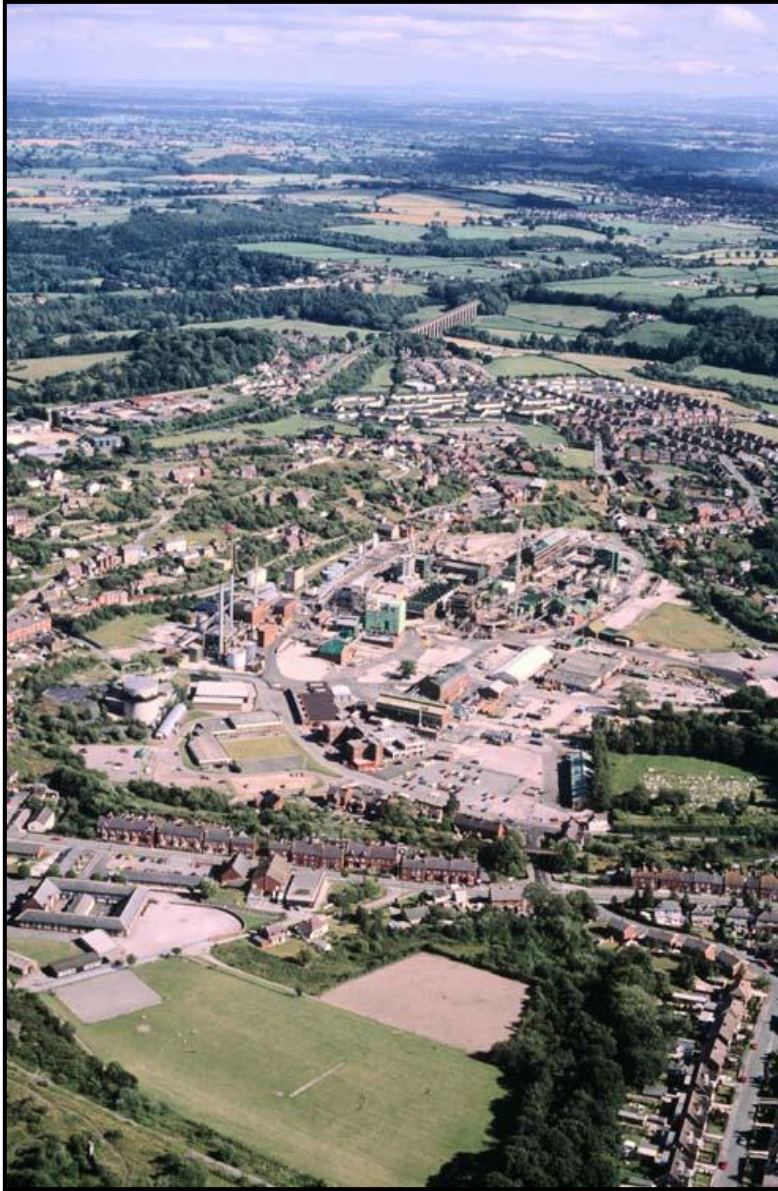
INDUSTRY AND EMPLOYMENT:	
<p>The original industries - quarries, iron-works, coal mines - have all closed. The area is now dominated by two employers - Monsanto Chemical works and Air Products, Acrefair. Dominated not only in terms of numbers but to some extent socially with the respective works' social clubs and pensioners groups being vital elements in the social fabric of the area. Monsanto's sprawling development is the passer-by's main impression of the area, indeed the chemical fall-out from the plant frequently fills the whole area with a pungent and unpleasant smell. A wide range of products is manufactured including aspirins, synthetic carpet fibres and agricultural fertilisers. Air-Products, like Monsanto an American owned concern, produces large scale industrial plant.</p>	
<p>Other than these two substantial employers, there are a number of small engineering concerns, but the majority have to look elsewhere for employment. Because of the area's social make-up, Cefn is always vulnerable at times of economic recession to high levels of unemployment, for instance at the present time the majority of local 16 year old school-leavers are resigned to being unemployed. (The only relief being limited temporary employment dependent upon the tourist trade of Llangollen).</p>	

The Economy of Cefn Mawr is extremely depressed since the closure of the only two main employers in the area, Monsanto and Air Products. This extract from a paper titled "Cefn Mawr Community Profile" by the Clwyd Library Service dated 1981 clearly shows what the employment situation was. However, what is not so obvious from the text is that many of if not all the small engineering concerns were largely dependent on the two main manufacturing plants for contract work. Hence when Monsanto and Air Products closed, 2008 to 2014 so did the smaller works. Cefn Mawr is now a post-industrial community after losing the only two main employers Monsanto and Air Products, who moved manufacturing operations elsewhere in the world.

Appendix 4 - Settlement Function and Development Potential spreadsheet																
	Acrefair/Cefn Mawr	Bangor	Bersham	Bettistid	Bradley	Broughton	Brynbo	Burton	Bwlchgwyn	Chirk	Croes Lanes	Dolwyn/Llwynmawr	Francysyllte	Garth	Glyn Ceirlog	Gresford/ Marford
Settlement Function																
Employment/ Economic Opportunities & Function																
Labour Force (% of population economically active)																
Unemployed (% of economically active population out of work)																
Employment Area Located in the settlement limit / distance to nearest employment area																
Employment Land Review																
Employment function conclusion																

This table extract is taken from the WCBC LDP2 2013 -2028 document called "Settlement Hierarchy and Development Potential" and shows the conclusions that the WCBC has formed about our community in Cefn Mawr & Acrefair. The red indicates the current position of our community in comparison with other areas.

The green sector for the employment area is referring to the proximity of the Rhosymedre Industrial Estate; however the employment opportunities available are low and reducing. As of 2017 part of the former Rhosymedre (Advanced Park) Industrial Estate has been built on with more new housing.

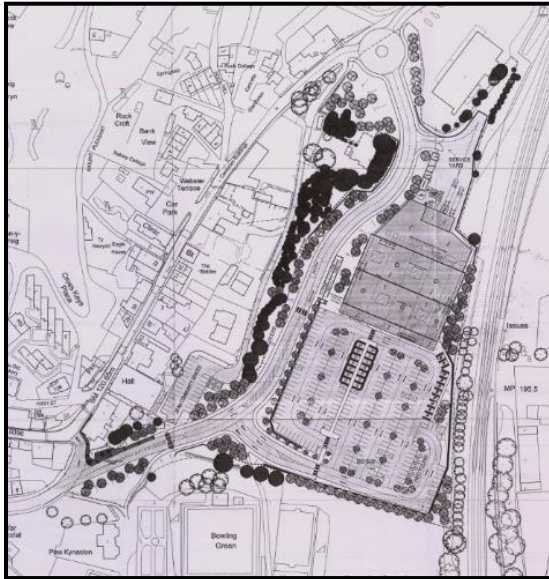


The 1970's Monsanto Chemical Works in Cefn Mawr when the plant was in full production and a major employer. This was a time when there was plenty of work and it was expected that guys would serve an apprenticeship to become a skilled worker. At that time the plant was leading the word in the production of chemicals for LED manufacture, at the forefront of science. Having a job at Monsanto was something to be proud of and there was a strong social binding. The plants contributed significantly to the local economy due the large number of local people employed by Monsanto and Air Products, or companies working for them.



Another view of the Ex Monsanto site in 2012 with most of the works demolished.

Retail Sector



The retail sector of Cefn Mawr, once a thriving community in South Wrexham has also been hard hit and especially so in the past 3 years. In addition to the loss of the only main employers for the area and the income of the local community through wages etc. the traditional shopping centre of Cefn Mawr, Crane Street and Well Street has been virtually bypassed by a new road built to serve the new Tesco.

Furthermore in 2014 Cefn Mawr Village Retail Centre lost its bus service which was moved to serve Tesco. The combined economic impact of all this on our community has left it without a bank (all three have closed) and virtually no retail shops other than hair dressers and nail and beauty parlours and the comical nick name for Crane Street is Cranium Street!

We hear of talk of unfair competition in official publications but wonder if this is ever considered when it comes to local communities, or does the term only apply to large multinational retail chains?

Well Street is now so quiet that even the Chinese are looking to sell up and the disused bus stop can be seen

below the for sale sign.

Our retail economy is so fragile it will collapse when commercial rates are reintroduced. The introduction of rates will be self-defeating exercise.

However this is totally unnecessary if this proposal for WBG and the other connected proposals by the PKC Group are implemented. Cefn Mawr can switch its economy to Sustainable Tourism Development in practical ways that will enable the recovery of our community if WCBC and other bodies will work with us. There has been some good work done through the THI Scheme but this needs to be backed up by reuniting Cefn Mawr and the Aqueduct and WBG is an essential facility to make it work. Please see the Business Case for [Cefn Mawr and the Aqueduct.](#)



Holly Bush Inn, Cefn Mawr, LL14 3RA


Poor Planning

Element of the Product	Product Assessment	Relative strengths / opportunities
World Heritage Site	<p>Within WCB the main element of the WHS is the Pontcysyllte Aqueduct / Trevor Basin (attracting approximately 200k visits). Other elements are the canal corridor to Chirk and the Chirk Aqueduct.</p> <p>The Trevor Basin has an information centre, cafe and gift shop, boat trips, and walks.</p>	<p>The WHS is potentially a key motivator for a visit to the area and represents one of the CB's outstanding assets. At present, elements of its presentation need addressing and the constraints of the site means that capacity and approaches are potentially problematic and visitor management is challenging.</p> <p>However, the WHS offer significant potential to be a major attraction in the future but key priorities are to commercialise the site and increase dwell time, and increase its capacity.</p> <p>Attractor strength: 3 (current), 4.5 (potential)</p>

This extract from the WCBC DMP 2012-17 shows some of the current problems that WBG will answer and rectify with the given DMP planning. However the main problem with this extract is that it does not even mention Cefn Mawr, which is the problem. This is a persistent factor unfortunately for Cefn Mawr by WCBC & the WHS Steering Group.

The Cefn & Cefn Mawr represents the second largest community in the County of Wrexham and the largest in the Pontcysyllte World Heritage Site. Yet it has been segregated since the creation of the WHS which is highlighted in the document [“Where is Cefn Mawr”](#) and this exclusion of our community from the WHS must be stopped. The net result of this segregation is illustrated by the lead project of the THI being a white elephant in our community. The Ebenezer, despite £1.5M pounds being spent on the building, has been an economic disaster unable to remain open since refurbishment in 2008 without significant council funding. The [Ebenezer](#) closed for 4 years as of 2017 cannot be called anything else other than poor planning and shows the net result of not including Cefn Mawr in the WHS. The WCBC DMP extract above also mentions commercialising the Trevor Basin. The PKC Group objects to this as further negative planning, which will no doubt be dominated by retail chains rather than our local people and businesses.

TO LET



Ebenezer Chapel
Crane Street, Cefn Mawr LL14 3AB



Limited Dwell Time & Moving On

This extract from WCBC DMP 2012-17 (page 44) estimates the average dwell time to be around 45 minutes. This is a very short time in the area and accounts for why so little is seen from the relatively high tourist count. GBDVS recommends that the average day visitor dwell time should exceed 3 hours to qualify as a day trip visitor and be able to apply the expected financial return criteria for tourism. GBDVS also state that walking is one of the most popular activities for people making a day visit. However at the

aqueduct this is minimized and curtailed, i.e. current parking is very close to the aqueduct and limited. Furthermore there is not a great deal of provision for informing the tourist of all the other immediately surrounding attractions that they can walk to in the area. Hence people are NOT encouraged to explore the wider area of the Cefn & Cefn Mawr, but are physically urged to move on due to the limited layout of the site and lack of information regarding the area they are in i.e. the Cefn & Cefn Mawr. For clear evidence of this in 2016 please see [“Where is Cefn Mawr”](#) which highlights the issue of the total lack of information on or miss representation of the Cefn & Cefn Mawr.

- **The Trevor Basin and Pontcysyllte Aqueduct** is currently not fulfilling its potential – something recognised largely in its **Tourism Development Plan**. Site improvement work is in evidence. However, aside from the WHS status and initial wow factor of the Aqueduct, product depth is currently relatively limited with few commercial opportunities. Dwell time could be as little as a quarter of an hour or the best part of a day. **A guess at an average would be approximately half an hour to an hour.** There are a number of issues:
 - *Poor road signing. While accepting the capacity of the site is limited, WoB signing is primarily about traffic management (not advertising) and, in this sense, signing is inadequate.*
 - *Site capacity (in terms of parking) is an issue and there are some management issues (toilets, litter) to address.*
 - *There is a confusion of styles and content among information signs (the Dee valley Tour, in particular, does not work well in isolation). The WHS status is not currently particularly prominent*
 - **Connections** to other areas (such as Ty Mawr Country Park and Cefn Mawr) are poor and the Flexys site is a major eyesore.

Connections:

The area is fragmented and aqueduct is not connected to Cefn Mawr and connection with Ty Mawr is poor. A simple answer is to connect Cefn Mawr to the aqueduct because it is in the middle. By connecting Cefn Mawr to the Aqueduct this would also improve the connection between Ty Mawr and the Aqueduct, simple and practical. By connecting Cefn Mawr to the aqueduct as we are proposing, WBG acts as a central Gateway for exploring the wider area of Cefn & Cefn Mawr as well as visiting the Aqueduct and the average “dwell time” will increase and the urge to “move on” will subsequently decrease. This is plain common sense, simple and cost effective in terms of both financial expenditure and environmental consequence. It removes the “*supposed need for new build*” at the Trevor Basin by reusing the existing buildings and facilities of Cefn Mawr which are an equal distance from the center of WBG as the aqueduct. Once people have finished their stroll over the Aqueduct and come back to the WBG, they would have the opportunity to also frequent Cefn Mawr with all facilities already built. A simple YOU ARE HERE sign at the WBG would read:

← Pontcysyllte Aqueduct 500mts - YOU ARE HERE - Cefn Mawr 500mts →

This would then link in the traditional retail center of Cefn Mawr, and still something to be proud of following the THI work in the village along with Tesco, Ty Mawr Country Park, Splash Magic and Cefn Druids Rock Park Stadium as well as Cefn’s Host of Historical pubs etc. The current limited stay visitors are missing all this simply because they do not know it is there. There is no promotion of the Cefn & Cefn Mawr at the aqueduct and the central point of parking needs to be moved to a central location as in WBG for this to be effective.

Lack of Facilities

To date WCBC and partners have spent £108,954.52 on Master Plans that have not included the Cefn & Cefn Mawr:

- | | |
|-------------------------------------|------------|
| • 2010 Ecology Land & People Report | £28,990.00 |
| • 2011 ARUP Master Plan | £59,983.00 |
| • 2014 PLS Master Plan | £19,981.00 |

As of 2017 WCBC and partners have allocated another £45,000.00 for another Master Plan? Furthermore a further £15K was recently wasted on consultants (Arcadis) who advised WCBC & the CRP to let the Ebenezer as a B&B!

What is disconcerting about all these “*Master Plans*” is that they all promote new build of cafes, restaurants, bars, shops and hotels at the Trevor Basin while ignoring our community. This is obviously of some concern to the existing businesses of the Cefn & Cefn Mawr that are literally struggling to survive and is one of the main reasons for this and other Documents by the PKC group on this issue.

So to negate the “*supposed need*” for new build because of the lack of facilities, simply move the main parking to a central location and encourage people to explore the wider area, instead of moving on. Cefn Mawr has all the facilities that are needed including a hotel. Reconnecting Cefn Mawr and the Aqueduct will literally save millions in new build capital expenditure and the subsequent environmental degradation though unnecessary CO2 emission and loss of Greenfield land. The “*supposed need*” is an illusion created by limited thinking and very poor land usage and parking arrangements at the Trevor Basin. Continuing along that road will only result in the current problems persisting and the eventual collapse of the Cefn Mawr economy. Cefn Mawr in Welsh means big ridge which it is built on, so if you build new café’s shops, bars and restaurants and a hotel at the bottom of the hill, why should anyone walk up it?

From this extract of the Tourism Development Plan 2011 by WCBC, “Cefn Mawr was ripe for the influx of visitors from the WHS”. However this has not realized and Cefn Mawr and the aqueduct remain separated. The idea of a bus service bringing people that have driven for an hour or more to see the aqueduct into Cefn Mawr is nonsense. What is required is to put both Cefn Mawr and the aqueduct within a reasonable walking distance and this is exactly what WBG will do saving millions of pounds on unnecessary building.

ii) Cefn Mawr

The village of Cefn Mawr is intrinsically linked to the building of the Aqueduct and Canal through the location of the Plas Kynaston Foundry (where the iron troughs were made) and the local Cefn quarry which provided stone for the piers. The good work that has and is being delivered through Phase 1 of the Cefn Mawr Townscape Heritage Initiative (Wrexham Council working with local landowners to upgrade shop frontages/buildings within the designated THI area and funded predominantly by Heritage Lottery Funding), has made a major impact on the feel and environment along the High Street. This work will also continue through a Phase 2 THI scheme from April 2011 onwards. In addition to this Wrexham Council has supported the Dee Valley Community Partnership to redevelop key buildings within Cefn Mawr such as the Ebenezer Chapel on Crane Street. As a result of this work and investment Cefn Mawr is now ripe for the influx of visitors which WHS designation could bring in order to consolidate the potential which has been created by improvements to the physical realm and streetscape. Cefn Mawr could so easily be turned into a thriving village and tourism hub, akin to Ironbridge village and Blists Hill at Ironbridge. Trails, car and coach parking and branded bus routes could spread visitors from the hub at Trevor Basin in to the village.

Greenfield Site Preservation



The Pontcysyllte Aqueduct is set in a Greenfield site and the temptation to build on this site should be avoided. This will not comply with UNSECO inscription and is short sighted. The site should be preserved in accordance with the natural surroundings. One of the reasons it is still in such good condition is that there was little commercial interest before UNESCO inscription. The Pontcysyllte Aqueduct Conservation area also abuts the Dee Valley AONB and is adjacent to the Cefn Mawr Conservation area.

So why did Consultants PLS promote the idea of a £1.5 million pound café to be built virtually on top of the aqueduct in 2014?

Furthermore in the same “*Master Plan*” of 2014 they also promoted the idea of ploughing up the field next to the existing Trevor Basin Car Park for a car park extension at a cost of £200,000.00?

The WBG just to the north east of the Trevor Basin will provide a much greater capacity on an existing Brownfield site that has previously been hard surfaced with block paving, tarmac and concrete and is only 500mts from the aqueduct. This is a short walk that is an equal distance from Cefn Mawr which was once the leading commercial center for the area.

So if the WBG was used as we propose here in this document, why would it be necessary to lose Greenfield land at such a sensitive location?

Commercialization sprawl into a Greenfield land will have a negative impact in the long run and will be counterproductive.

Emissions & Carbon dioxide

CO₂ is a colourless and odourless gas. This naturally occurring chemical compound is composed of a carbon atom covalently double bonded to two oxygen atoms.

Natural sources include volcanoes, hot springs and geysers, and it is freed from carbonate rocks by dissolution in water and acids. Please note our area of the Dee Valley is rich in Lime Stone which is this type of rock. Because carbon dioxide is soluble in water, it occurs naturally in groundwater, rivers and lakes, in ice caps and glaciers and also in seawater. Atmospheric carbon dioxide is the primary source of carbon for life on Earth and its concentration in Earth's pre-industrial atmosphere since late in the Precambrian period was regulated by photosynthetic organisms and geological phenomena.

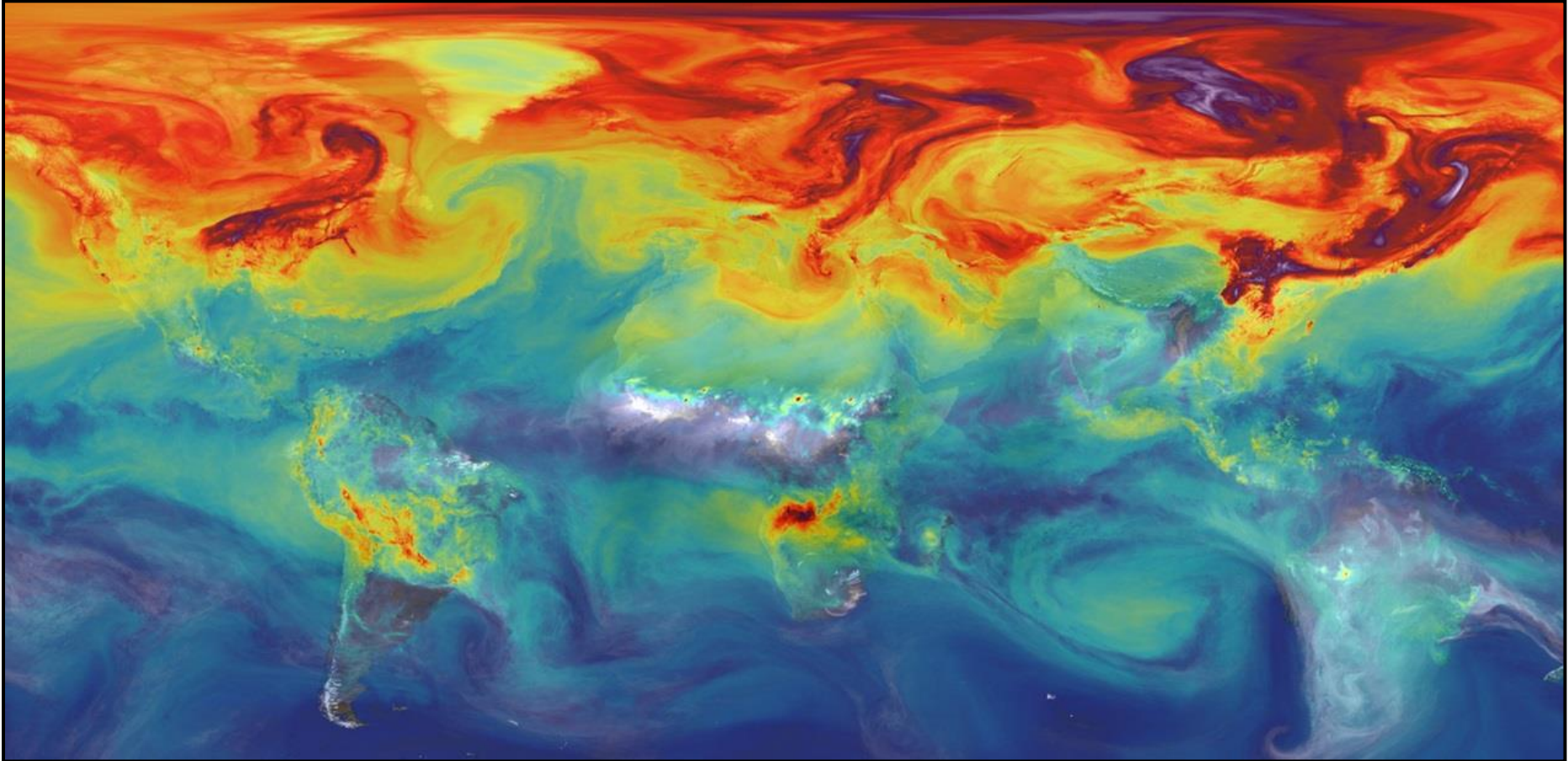
As part of the carbon cycle, plants, algae, and cyanobacteria use light energy to photosynthesize carbohydrate from carbon dioxide and water, with oxygen produced as a waste product. Carbon dioxide (CO₂) is also produced by organisms when they metabolize carbohydrate during respiration and is returned to water via the gills of fish and to the air via the lungs of air-breathing land animals, including humans. Carbon dioxide is produced during the processes of decay of organic materials and the fermentation of sugars in bread, beer and winemaking.

It is produced by combustion of wood, carbohydrates and fossil fuels such as coal, peat, petroleum and natural gas.

Carbon dioxide in the Earth's atmosphere is a trace gas, currently (early 2016) having an average concentration of 402 parts per million by volume (or 611 parts per million by mass). Atmospheric concentrations of carbon dioxide fluctuate slightly with the seasons, falling during the Northern Hemisphere spring and summer as plants consume the gas and rising in autumn as plants become dormant over the winter months.

Combustion of fossil fuels and deforestation have caused the atmospheric concentration of carbon dioxide to increase by about 43% since the beginning of the age of industrialization, (1800). This is a 43% increase in 200 years and the majority of the increase has been since 1950. Most carbon dioxide from human activities is released from burning coal and other fossil fuels. Other human activities, including deforestation, biomass burning, and **cement production** also produces carbon dioxide. Hence CO₂ emission reductions can be made by avoiding un-necessary building. Plants and buildings are damaged by acid rain which is caused by elevated levels of CO₂. Concentrations vary on a regional basis and are usually strongest at ground level and in urban areas where concentrations are generally higher.

Carbon dioxide is a greenhouse gas, absorbing infrared radiation. This process causes carbon dioxide to warm the surface and lower atmosphere, while cooling the upper atmosphere. The increase in atmospheric concentration of CO₂ and thus in the CO₂-induced greenhouse effect, is one reason for the rise in average global temperature since the mid-20th century. Although carbon dioxide is the primary greenhouse gas responsible for the rise, methane, nitrous oxide, ozone, and various other long-lived greenhouse gases also contribute. Carbon dioxide is of greatest concern because it exerts a larger overall warming influence than all of the other gases combined, and has a long atmospheric lifetime.



NASA simulation of CO2 dispersion in the Earth's atmosphere

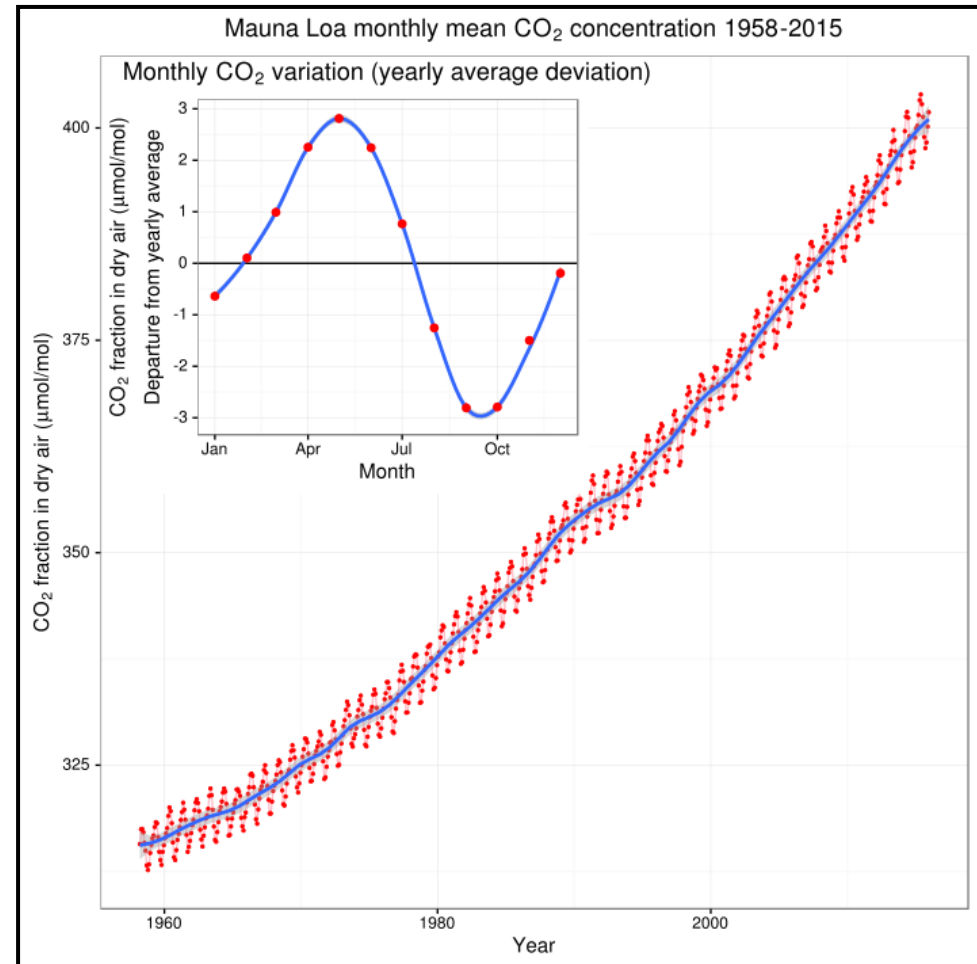
On November 12, 2015, NASA scientists reported that human-made carbon dioxide CO₂ continues to increase above levels not seen in hundreds of thousands of years and currently, about half of the carbon dioxide released from the burning of fossil fuels remains in the atmosphere. Carbon dioxide dissolves in the oceans to form carbonic acid (H₂CO₃), bicarbonate (HCO₃⁻) and carbonate (CO₃²⁻). There is about fifty times as much carbon dissolved in the oceans as exists in the atmosphere. The oceans act as enormous carbon sinks and have taken up about a third of CO₂ emitted by human activity. This increased uptake of carbon dioxide in the oceans is causing a measurable decrease in the pH of the oceans, which is referred to as ocean acidification. This reduction in pH affects biological systems in the oceans, primarily oceanic calcifying organisms.

As ocean pH levels fall, structures made of calcium carbonate are vulnerable. A growing number of studies have demonstrated adverse impacts on marine organisms, including:

- The rate at which reef-building corals produce their skeletons decreases, while production of numerous varieties of jellyfish increases.
- The ability of marine algae and free-swimming zooplankton to maintain protective shells is reduced.
- The survival of larval marine species, including commercial fish and shellfish, is reduced."

Local concentrations of carbon dioxide can reach high values near strong sources, especially those that are isolated by surrounding terrain. Although not officially classified as a toxic gas, it has adverse side effects to human respiration and can be fatal in high enough concentrations. In concentrations up to 1% (10,000 ppm), it will make some people feel drowsy and give the lungs a stuffy feeling. Concentrations of 7% to 10% (70,000 to 100,000 ppm) may cause symptoms of hypercapnia, even in the presence of sufficient oxygen, manifesting as dizziness, headache, visual and hearing dysfunction, and at higher concentrations unconsciousness and eventual death. Because it is heavier than air, without the dispersing effects of wind, it can collect in sheltered or pocketed locations causing animals or people therein to be exposed.

Adaptation to increased concentrations of CO₂ occurs in humans, including modified breathing and kidney bicarbonate production, in order to balance the effects of blood acidification (acidosis). Several studies suggested that 2.0 per cent inspired concentrations could be used for closed air spaces (e.g. a submarine) since the adaptation is physiological and reversible. Yet, other studies show a decrease in cognitive function even at much lower levels. Also, with on-going respiratory acidosis, adaptation or compensatory mechanisms will be unable to reverse such condition. CO₂ production is one of foremost reasons for the WAG writing the Welsh Sustainable Development Charter to help combat and take a lead in reducing global emission.



Nitrogen Oxide NO_x,

NO_x is produced as a byproduct from the combustion reaction involving hydrocarbons at high temperatures, since air contains 79% nitrogen it is impossible to exclude it from the normal aspiration cycle of combustion. In areas of high motor vehicle traffic, such as in large cities, the amount of nitrogen oxides emitted into the atmosphere as air pollution can be significant. NO_x gases are formed whenever combustion occurs in the presence of nitrogen. Oxygen and nitrogen do not react at ambient temperatures but at high temperatures, they undergo an endothermic reaction producing various oxides of nitrogen. Such temperatures arise inside internal combustion engines, power station boilers and jet engines, during the combustion cycle of the air / fuel mixture, and naturally in a lightning flash. When NO_x and volatile organic compounds (VOCs) react in the presence of sunlight, they form photochemical smog, a significant form of air pollution, especially in the summer. NO_x also readily reacts with common organic chemicals, and even ozone, to form a wide variety of toxic products and nitrate radicals some of which may cause biological mutations and acid rain.

Children and people with lung diseases such as asthma, and people who work or exercise outside are particularly susceptible to adverse effects of smog such as damage to lung tissue and reduction in lung function. NO_x reacts with ammonia, moisture, and other compounds to form nitric acid vapour and related particles. Small particles can penetrate deeply into sensitive lung tissue and damage it, causing premature death in extreme cases. Inhalation of such particles may cause or worsen respiratory diseases, such as emphysema or bronchitis, or may also aggravate existing heart disease.

Palladium

More than half the world's supply of palladium is used in catalytic converters to convert as much as 90% of raw automobile exhaust (hydrocarbons, carbon monoxide, and nitrogen dioxide) into less harmful substances (nitrogen, carbon dioxide and water vapour). For compression-ignition i.e., diesel engines, the most commonly used catalytic converter is the diesel oxidation catalyst (DOC). DOCs contain palladium, platinum and aluminium oxide, all of which serve as catalysts to oxidize the hydrocarbons and carbon monoxide with oxygen to form carbon dioxide and water. Palladium is a metal with low toxicity when ingested as it is poorly absorbed by the human body. Plants such as the water hyacinth are killed by low levels of palladium salts, but most other plants tolerate it, although tests show that at levels above 0.0003% affect growth. High doses of palladium are poisonous and tests on rodents suggest it is carcinogenic. After intravenous administration of different palladium compounds, palladium was detected in several tissues of rats, rabbits and dogs. The highest concentrations were found in kidney, liver, spleen, lymph nodes, adrenal gland, lung and bone.

Exposure at ambient air levels of palladium 110pg/m³ can be expected in urban areas where palladium catalysts (Catalytic Converters) are used. Although in-hilative uptake is low, road side dust, soil and grass samples show an accumulation has been detected correlating with traffic density and distance from the road. See the 2002 paper "Environmental Health Criteria 226 Palladium" by WHO, the World Health Organisation.

Air Pollution

Internal combustion engines produce air pollution emissions, due to incomplete combustion of carbonaceous fuel. The main derivatives of the process are carbon dioxide CO₂, water and some soot, also called particulate matter (PM) after catalytic conversion. The effects of inhaling particulate matter have been studied in humans and animals and include asthma, lung cancer, cardiovascular issues, and premature death. There are, however, some additional products of the combustion process that include nitrogen oxides and sulphur and some un-combusted hydrocarbons, depending on the operating conditions and the fuel-air ratio.

Not all of the fuel is completely consumed by the combustion process; a small amount of fuel is present after combustion, and some of it reacts to form oxygenates, such as formaldehyde or acetaldehyde, or hydrocarbons not originally present in the input fuel mixture. Incomplete combustion usually results from insufficient oxygen. The flame is "quenched" by the relatively cool cylinder walls, leaving behind un-reacted fuel that is expelled with the exhaust. When running at lower speeds, quenching is commonly observed in diesel (compression ignition) engines that run on natural gas. Quenching reduces efficiency and increases knocking, sometimes causing the engine to stall. Incomplete combustion also leads to the production of carbon monoxide (CO). Further chemicals released are benzene and butadiene that are also hazardous air pollutants.

Increasing the amount of air in the engine reduces emissions of incomplete combustion products, but also promotes reaction between oxygen and nitrogen in the air to produce nitrogen oxides (NO_x). NO_x is hazardous to both plant and animal health, and leads to the production of ozone (O₃). Ozone is not emitted directly; rather, it is a secondary air pollutant, produced in the atmosphere by the reaction of NO_x and volatile organic compounds in the presence of sunlight. Ground-level ozone is harmful to human health and the environment. Though the same chemical substance, ground-level ozone should not be confused with stratospheric ozone, or the ozone layer, which protects the earth from harmful ultraviolet rays. Carbon fuels contain sulphur and impurities that eventually produce sulphur monoxides (SO) and sulphur dioxide (SO₂) in the exhaust, which promotes acid rain.

Idling

Internal combustion engines continue to consume fuel and emit pollutants when idling so it is desirable to keep periods of idling to a minimum. Many bus companies now instruct drivers to switch off the engine when the bus is waiting at a terminal. In England, the Road Traffic Vehicle Emissions Fixed Penalty Regulations 2002 introduced the concept of a "*stationary idling offence*". This means that a driver can be ordered "*by an authorised person ... upon production of evidence of his authorisation, require him to stop the running of the engine of that vehicle*" and a "*person who fails to comply ... shall be guilty of an offence and be liable on summary conviction*". Only a few local authorities have implemented the regulations, one of them being Oxford City Council.

Noise Pollution

Significant contributions to noise pollution are made by internal combustion engines. Automobile and truck traffic operating on highways and street systems produce noise, as do aircraft flights due to jet engine noise. The highest noise levels in our area are now produced by the road traffic on the A483.

Conservation of Mass



Law of conservation of mass was stated by Antoine Lavoisier in 17th century. Lavoisier conducted experiments on combustion with oxygen. He found that oxygen was an essential element for the combustion reaction and also found that during combustion reaction mass was conserved. In other words the mass of reactants and products were equal and mass is neither generated nor destroyed during a chemical reaction. This simply means that although the fuel in a vehicle may run out in the tank, it has not disappeared; it has been converted to another form of matter by the combustion cycle, i.e. that fuel has now become predominantly a gas, and the major component of that gas is CO₂ plus the other trace gases such as NO_x.

The simple answer here is to get more people to switch off their engines for longer and use greener and healthier forms of transport in our community which is what this WBG document and concept proposal is all about. It is a practical solution.

Current Access at Trevor Basin



Current main access to the Trevor Basin and the Pontcysyllte Aqueduct is via the residential area of Trevor from the A539 as can be seen above. This has caused many problems in the height of the season and if the true visitor potential is to be realized for the aqueduct this will have to be addressed or the situation will get worse and therefore a better answer has to be found such as WBG which can be accessed directly without transiting a residential area.

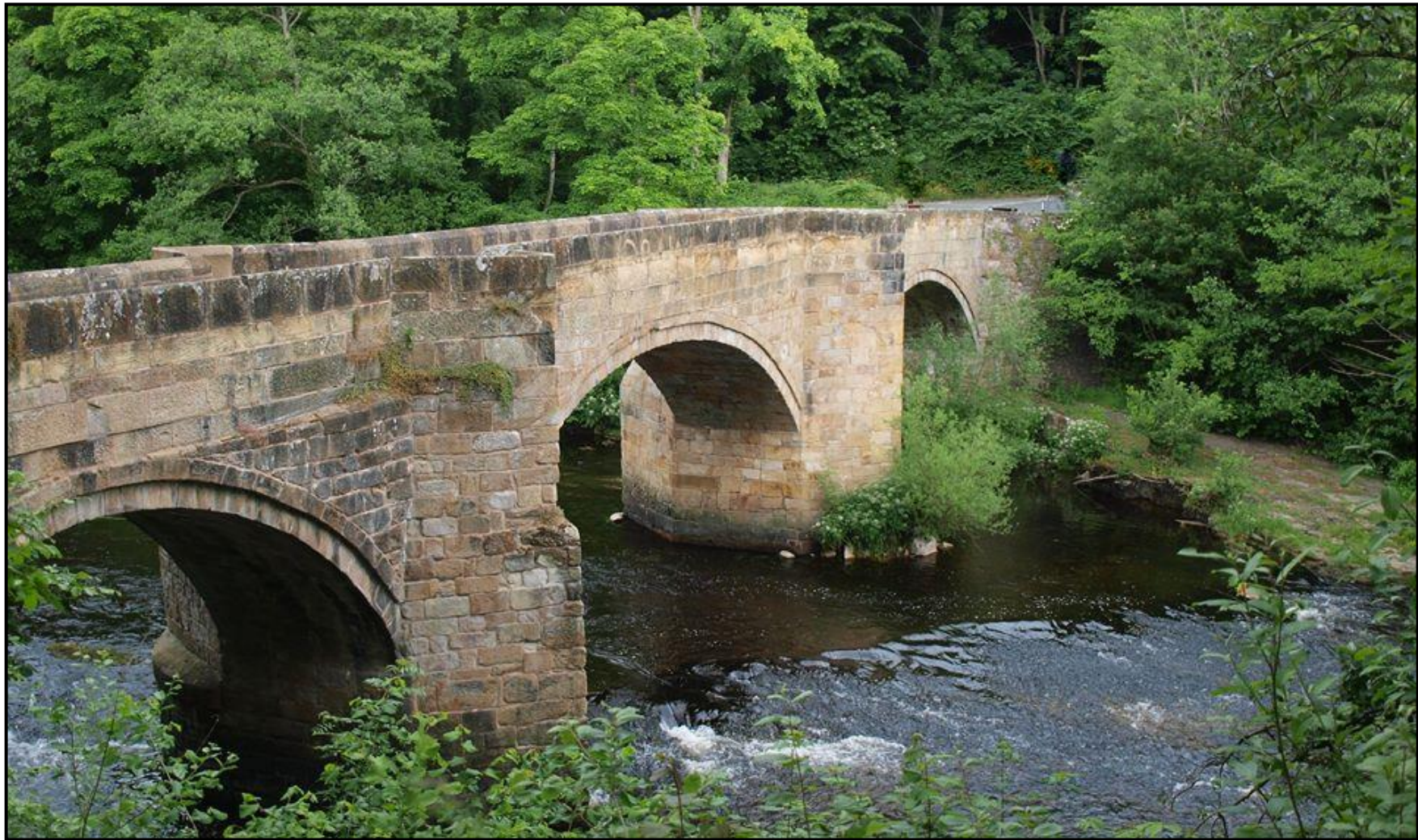


Access to the Trevor Basin parking lots along Station Road in Trevor, this road not only leads through a residential area, it is also literally leading to other problems, the destruction of our heritage, the Cysyllte Bridge, with people coming to see the much new structure of the aqueduct!



By encouraging the bulk of the traffic follow and use the B5434 through Trevor to access the aqueduct this is also encouraging increased use of the Cysyllte Bridge which is far older than the aqueduct built around 1600 it is almost twice the age of the aqueduct and is a grade one listed structure.

Cysyllte Bridge



The Cysyllte Bridge over the River Dee originally constructed in the 1600s, traffic flow over here needs to be kept to a minimum, not promoted as in the current signage scheme for the aqueduct!



Increased traffic flow is destroying the Cysyllte Bridge and costing a fortune in repairs. The total cost of WBG will be far less than the continued repair of this bridge. WBG will alleviate this problem by not encouraging people to use the B5434. WBG is a very simple, practical and cost effective answer to a current and continued problem for both Denbighshire and Wrexham County Councils.

Children's Play Area



Please note the children's play area in the above Aerial photograph on a quiet day, it is immediately next to Reads Yard which now forms the main coach parking for the aqueduct at the height of the season which is usually during the school holidays. Note the larger slots in the parking area for the coaches. This is a busy parking area in an enclosed area due to the surrounding housing and the PKC Group ask WCBC again is this a wise idea?



Here the children caged in behind the 4mt high fence at the back of Reds Yard, car & coach park at the Trevor Basin. At peak times during the summer holidays in the height of the season this parking lot is often full with the high turnaround of vehicles due to limited dwell time and the urge to move on. A considerable volume of exhaust emission can be generated in this area enclosed by housing. This picture was taken in late afternoon in June 2016 after the peak period of the day. Since Reeds Yard was allocated to parking in 2012 by WCBC, the PKC Group have been concerned about a toddler being involved in a vehicular accident and the levels of pollution exposure. We ask is this situation right? WBG will correct this.



The children's playground in January 2012 when the PKC Group first questioned the idea of a main parking area at Reads Yard with WCBC. At this time the fence was in poor condition and the immediate concern by the PKC Group was if an RTA should occur, however new fencing does not stop the air pollution our children are being exposed to. This is a cross cutting theme that is detrimental to our community and does not consider the overall picture.

We ask why will WCBC, CRT and Eastman's not work with us any rectify this situation?

Trevor Basin Car Park Extension?



According to WCBC the parking facility at Trevor Basin is limited and that was the reason for setting up Reads Yard as an alternative parking lot. However in 2014 PLS Consultants working for CRT & WCBC proposed extending this car park into the field at a cost of £200,000.00. The PKC Group strongly opposed the idea of losing more Greenfield Land when there is such a better alternative available. Note use at present indicated by the track marks in the field caused by road traffic. However this is not a reason to build another car park, it is just poor traffic management. Answer, move the parking.....to WBG.



The Trevor Basin and present car park from Bowens Lane in Cefn Mawr, do we really want to build a car park extension on this field?

Windborne Gate Area



The suggested area is approximately 1.77 hectares most of which just needs weeding. The fencing can be moved at a moderate cost and tree screen planted. This would give direct access to both Trevor Basin and the Pontcysyllte Aqueduct. This parking lot is also accessed without having to drive through a residential area, and if it needs to be increased in size, this is not a problem.

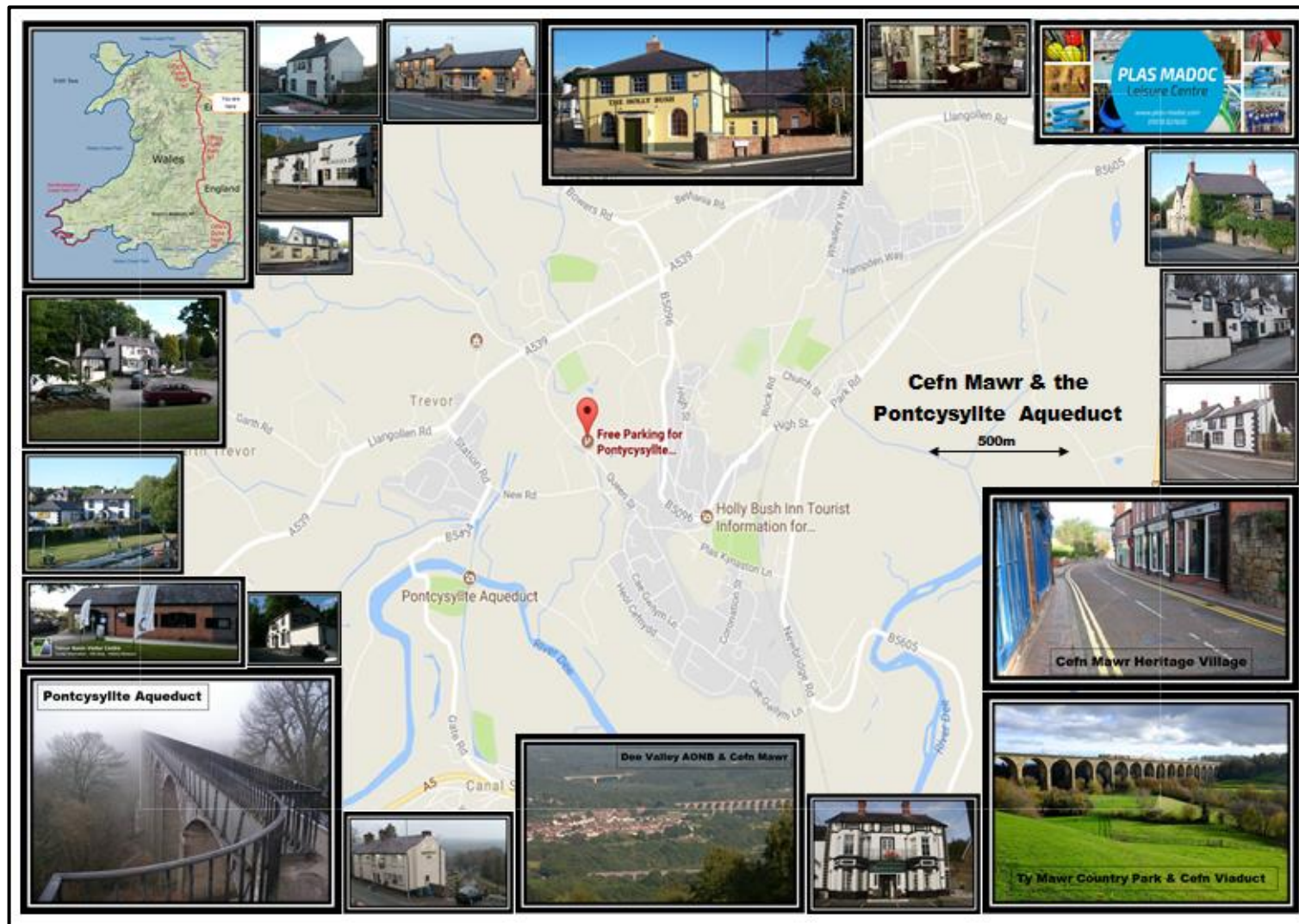


Consider this, with direct access from the WBG parking area to the aqueduct this will encourage more people to use this parking area. Furthermore these people will also then be encouraged to visit the wider area of Cefn Mawr rather than just walk over the aqueduct and move on. The short duration of stay is the current trend and one that the aqueduct is criticized for. By centralizing the parking Cefn Mawr Village center can provide what is perceived as lacking at the aqueduct without having to build new. On an environmental basis, by reusing the WBG as proposed here this will save the pristine field next to the current parking lot which has been proposed for a car park extension. Therefore this proposal by the PKC Group helps save a Greenfield site by reusing a Brownfield site. This makes sense both environmentally and economically and will help to promote tourism in Cefn Mawr at the center of the World Heritage Site on a sustainable basis for generations to come.



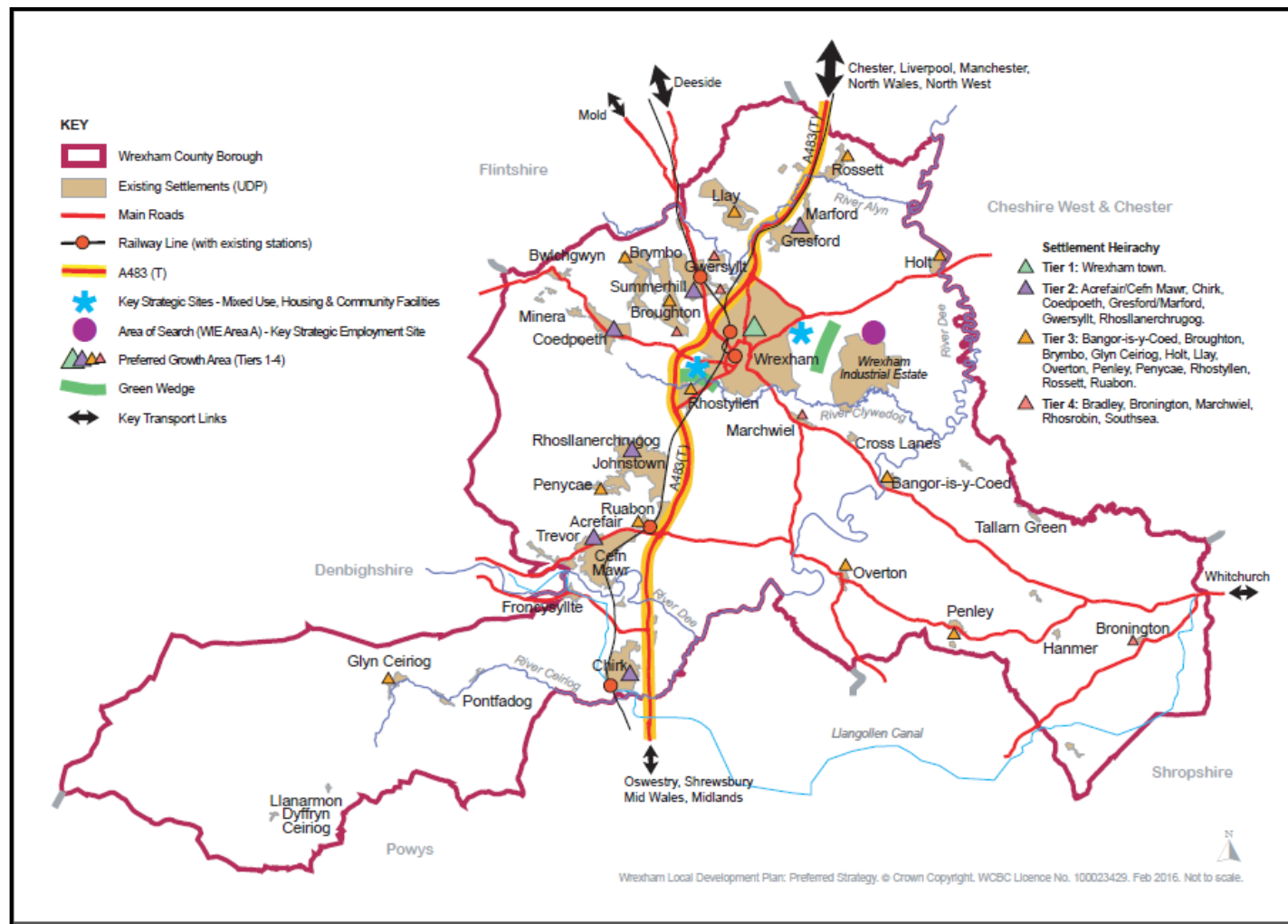
The Windborne Gate is hard surfaced and ready to go apart from weeding and basic landscaping, this will save both financially and environmentally. This makes sense and if not implemented the people responsible for not doing so need questioning, as they will not be complying with WAG Welsh Planning Policy, or the new LDP2 by WCBC which is based on the WAG WPP which in turn reflects the aspiration of the FGA 2015, which is very good and shows a responsible attitude towards the environment, our children and our grandchildren.

Tourist Information Map for the Cefn & Cefn Mawr by the PKC Group



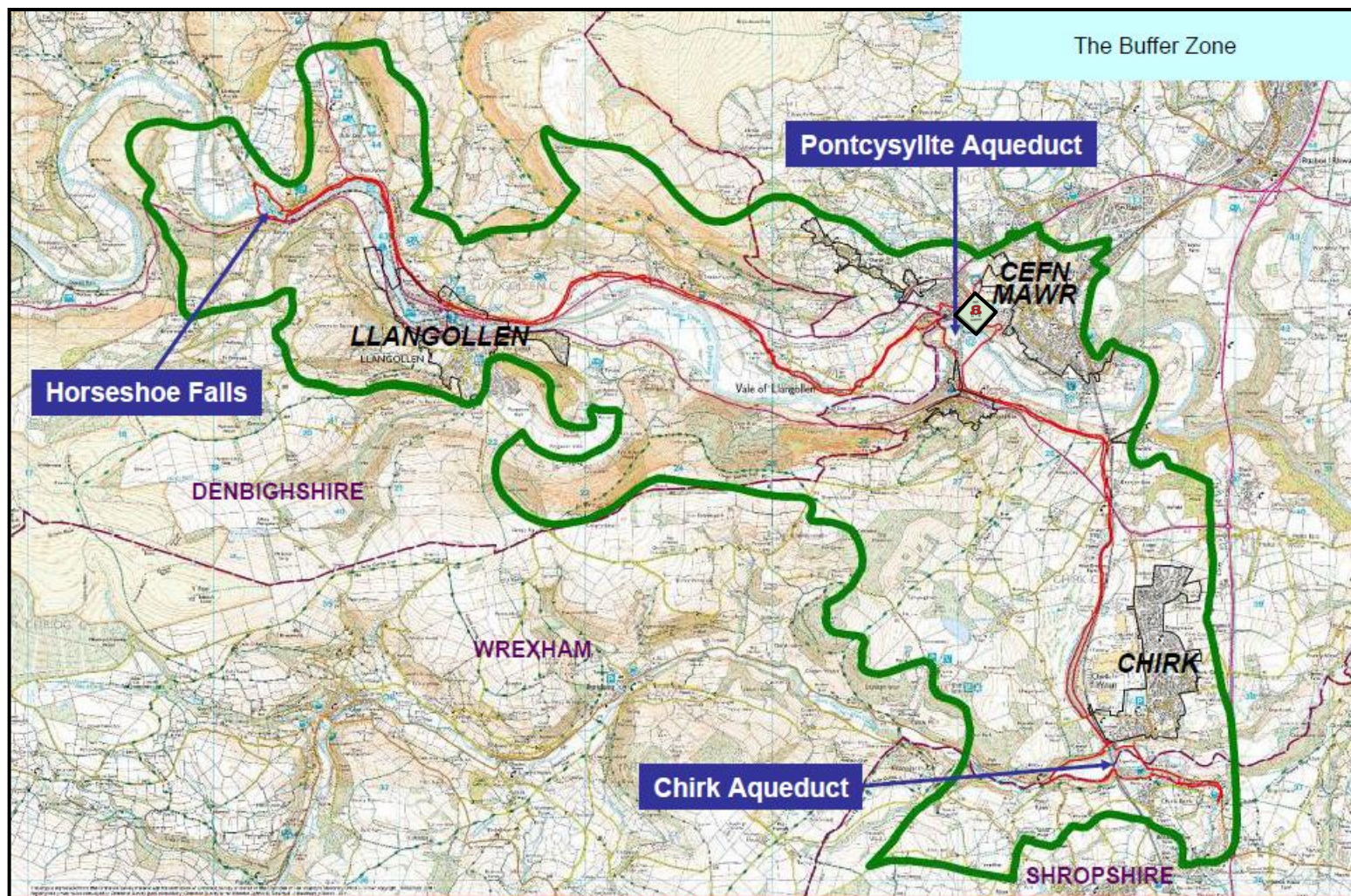
A simple tourist information map produced by the PKC Group to try and help promote our area showing WBG as a central focus.

Cefn Mawr & Transport Infrastructure



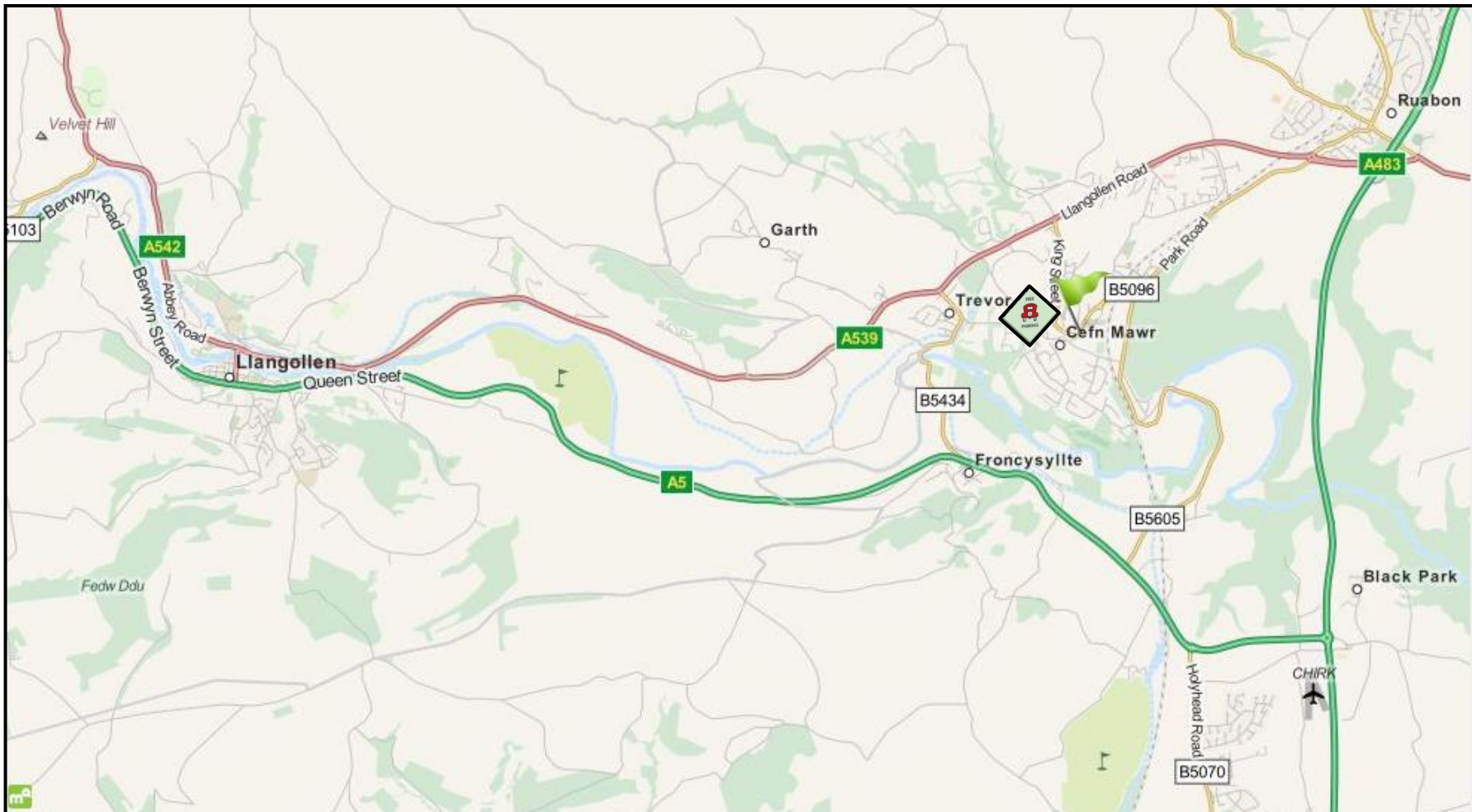
Cefn Mawr on the main Chester to Shrewsbury line and surrounded by the A5, A539 and the A483 and the Llangollen Canal

Cefn Mawr and the World Heritage Site



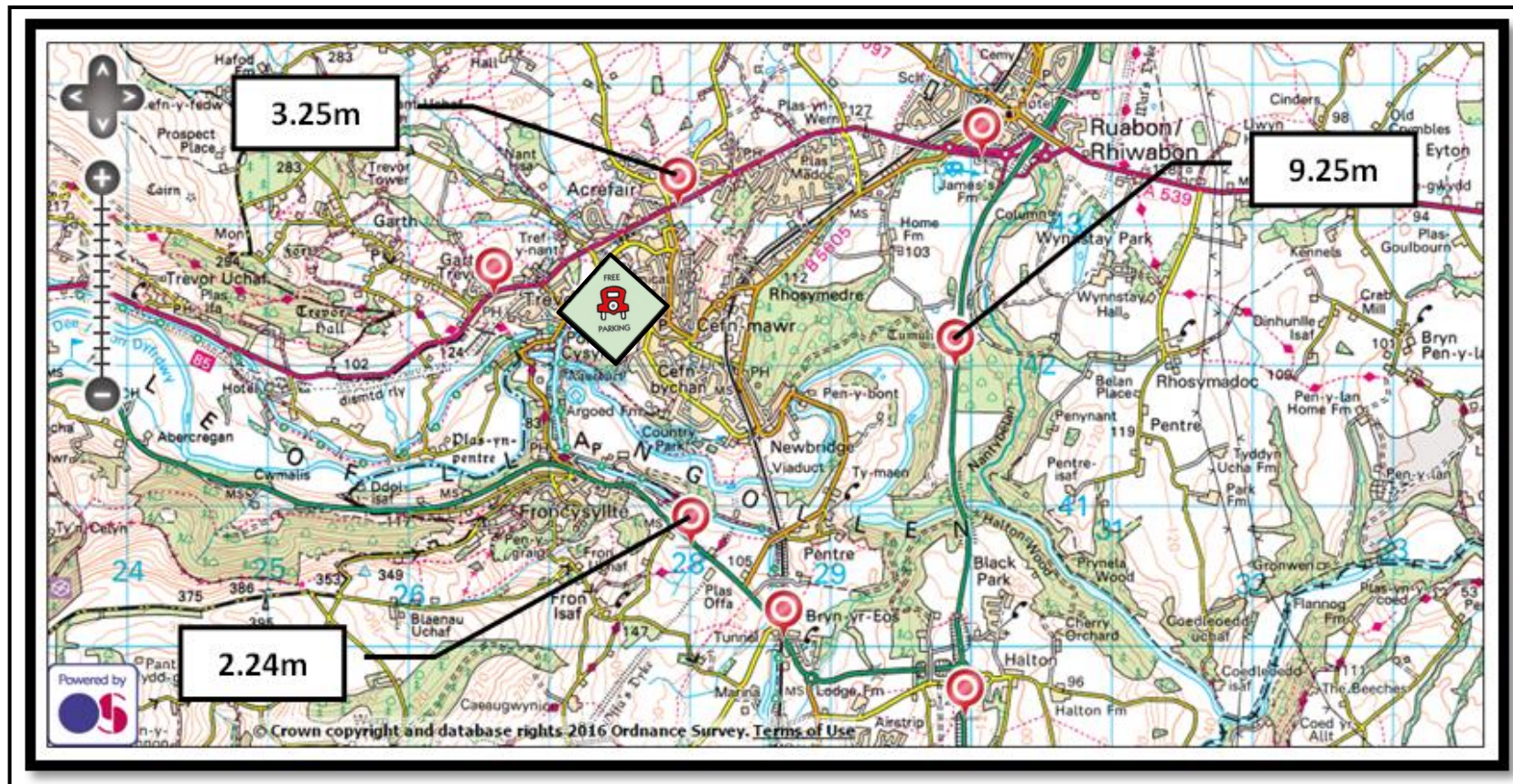
This map clearly shows the central location of the Cefn which is the largest community the WHS Corridor

Main Roads A5, A539 & A483



Cefn Mawr has the advantage of NOT being bisected by main roads and continuous traffic flow but lies at a central location to the three main roads in the area, the A5, A539 and A483 and can be easily accessed from all three. However this has not been realised to date and Cefn Mawr is currently the worst signed community in the whole of the WHS corridor. Please see the document “Where is Cefn Mawr” for the current state of affairs in 2016.

Road Traffic Volumes



Motorised vehicular traffic counts passing our community are phenomenal and amount to over 14 million annually according to the Department of Transport. With the right main road brown & white tourist information traffic signage scheme there is no reason why our community should remain in the state that it is currently in. WBG will simply give a large capacity holding area where traffic can be directed to and people are persuaded to get out of their cars for the day and enjoy the Cefn & Cefn Mawr at the centre of the Pontcysyllte World Heritage Site.

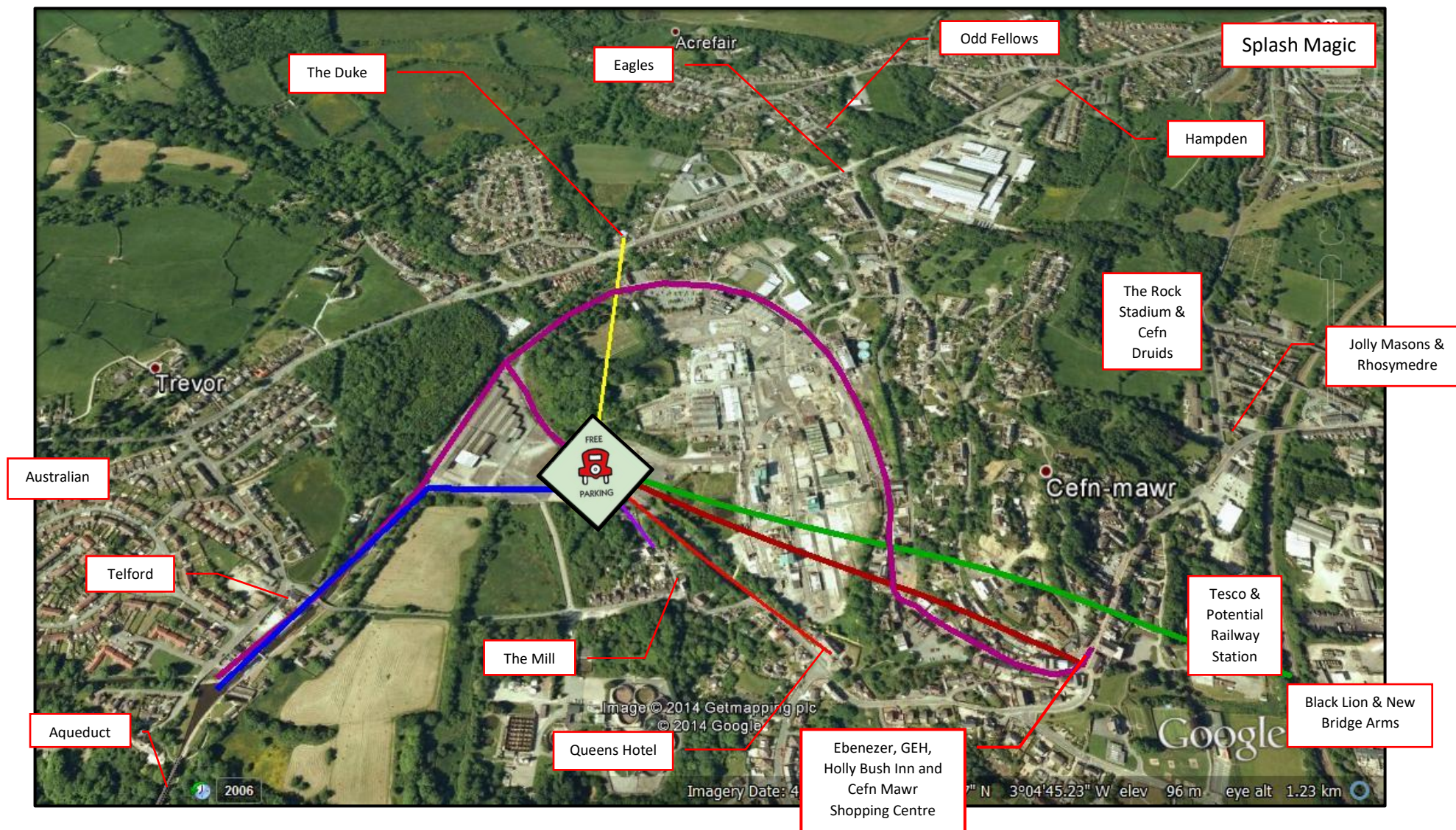
<http://www.dft.gov.uk/traffic-counts/cp.php?la=Wrexham>

The Cefn & Cefn Mawr



The Cefn & Cefn Mawr at the centre of the Pontcysyllte World Heritage Site and note the central location to all the villages of the Cefn.

WBG Central Location



Key Distances from WBG

Distances and times from Windborne Gate Interchange to **some of the attractions** around the Cefn

- Trevor Basin 200mts or 2.5 minutes' walk
- Pontcysyllte Aqueduct 540mts or 6.75 minutes' walk
- Mill Inn, the former home of William Hazeldine the Iron Master who made the Iron Work for the Pontcysyllte Aqueduct, 165mts or 2 minutes' walk
- The Queens Hotel, the Cefn's only hotel dating back to 1820, 390mts or 5 minutes' walk
- The Duke of Wellington another 150 year old pub, 433mts or 6 minutes' walk
- Cefn Square, the center of Cefn Mawr and the Ebenezer, the Gorge Edwards Hall and Cefn Historical Society Museum, The Holly Bush Inn and the Cartographic Museum for the Pontcysyllte World Heritage Site, the Plas Kynaston Hall, the shops of Crane Street and Well Street i.e. the traditional shopping center of the Cefn, 632mts or 10 minutes' walk
- Tesco and a potential Railway Station for the Cefn, 838mts or 12.5 minutes' walk
- Cefn Druids football ground, 600mts or 10 minutes' walk
- Ty Mawr Country Park, 1.3 km and Splash Magic, approximately 1.5km

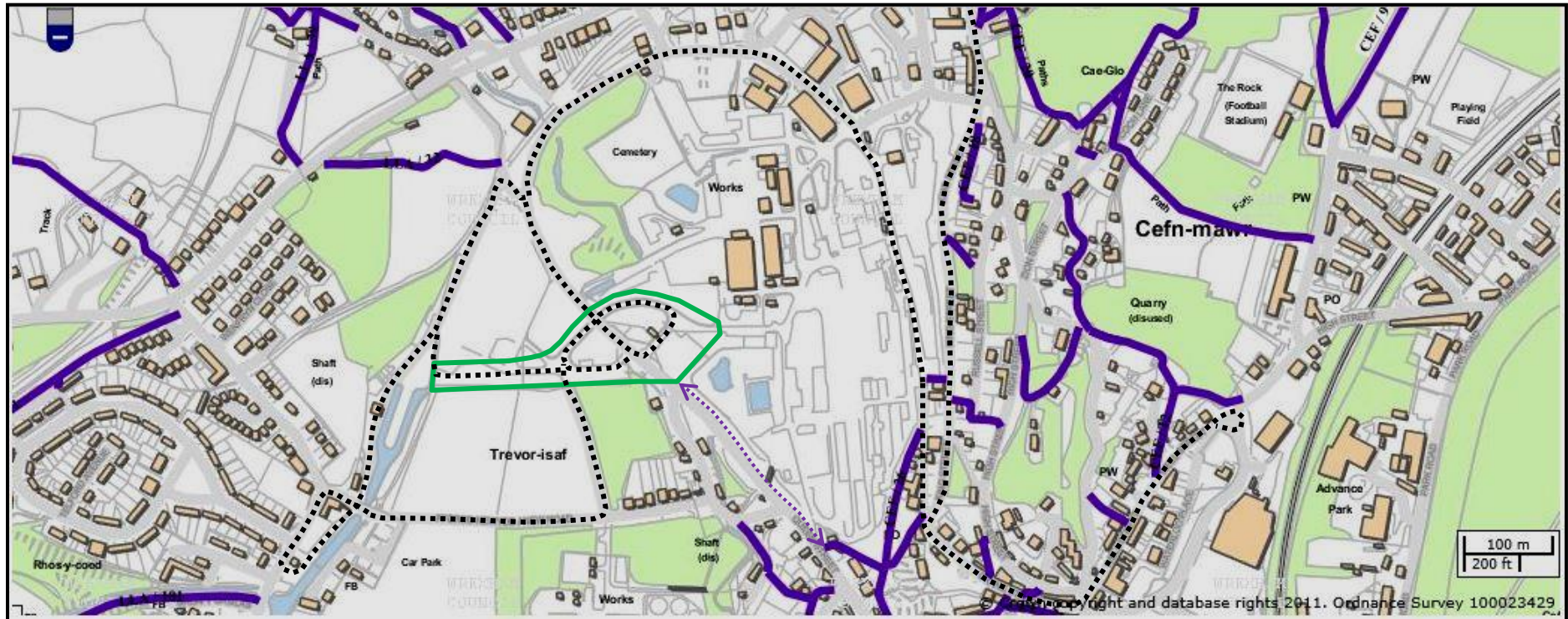
Note: distances are given in straight lines from the centre of the parking area as shown whereas the walking times allow for extra length following the roads and are calculated at 3mph average walking speed.

The curved **Magenta** line is the route of Jessop's Tramway with a link into the Windborne Gate Parking area. The length of route from the Trevor Basin outside the Telford Inn to the centre of Cefn Mawr and Cefn Square outside the Ebenezer is approximately 1.7 km or 20 minutes' walk. This is an ideal route for a horse drawn hackney service linking the centre of Cefn Mawr to the Pontcysyllte Aqueduct with a transport system that would add to the tourist appeal. Please see the document, [Jessop's Tramway](#).

The idea that the Cefn & Cefn Mawr lacks in facilities is promoted by third party groups that do not live in the area such as WCBC, the WHS Steering Group, CRT and consultants working for them and is not true, the Cefn and Cefn Mawr has a lot to offer and unless it is used it will be lost. We need to get the tourist trade into Cefn Mawr or we will continue to lose our heritage and all the good work of the THI.

WBG Interchange for Cefn Mawr & the Aqueduct

The WBG represents an important point of interchange between modes of transport. It is proposed that the WBG literally be used as a park and ride facility for Cefn Mawr and the Aqueduct. Where people will be encouraged to park their cars, turn off the engines and travel by alternative forms of transport to explore the local area. These forms of transport will include walking, cycling, horse riding and hackney carriages.



This map extract is taken from the Definitive Map Statement by WCBC for the County of Wrexham showing the public footpaths and bridle ways etc as of 2016. These are shown in Purple. WBG is shown with the green outline and the black dotted lines indicate routes that are suitable for horse drawn carriage service, such as Jessop's Tramway connecting Cefn Mawr and the Aqueduct. What is not shown on this map is the important Cefn Mawr Heritage Trail which will also link in to the footpaths shown and the proposed hackney service routes. WBG and the proposed carriage routes will also work well with the eventual full reinstatement of the PKC all the way to the Queens Hotel and remediation of the ex-Monsanto site, while still operating and supporting the community at the centre of the WHS. This is how to encourage people to get out of cars and explore the local area and bring tourism to Cefn Mawr.



Crane Street, Cefn Mawr 1900



Crane Street, Cefn Mawr 2016, and please note the cyclist as well

Whether you choose to walk the whole trail or a small section, do wear comfortable shoes and be aware that some of the footpaths can be muddy. As a guide to distances the riverside path is approximately 1.5 kilometres or 1 mile. Here are some interesting features to look out for on the way to the important heritage sites.

- 1 High Street, the old main shopping area.
- 2 George Edwards' Hall, founded by J.C. Edward's brother in 1911. Has been a market hall, a cinema and is now a concert venue.
- 3 The Vaults Public House was an outlet of Wrexham's Island Green Brewery.
- 4 The American Hill - named after a shop at the bottom of this hill known as the American Shop. The owner of this shop had gone to America and made a significant sum of money with which she bought the shop.
- 5 Trevor Basin, where the Ellesmere Chester Canal terminated and goods unloaded onto the Pontcysyllte Tramway. The Kynaston Canal extension, now filled in and built over continued into the Kynaston estate.
- 6 The Darkie is the local nickname for a tunnel that crosses a stream. It is believed that a brickworks was once based nearby.

★ The path is usually muddy and may be difficult to follow at this point.

- 7 The Ballast - slag heaps.
- 8 Prince's Bridge so called after the Prince of Wales. Its local nickname however is Pont-y-Cuttin as it crosses a railway gorge cut into Cefn Stone.
- 9 Site of Zion Chapel founded by social



Os ydych yn dewis cerdded ar hyd y llwybr i gyd neu ddim ond ar hyd rhan fechan ohono, gwisgwch esgidiau cyfforddus a chofiwch fod rhai o'r llwybrau troed yn medru bod yn fwdlyd. Fel canllaw i'r pellteroedd, mae'r llwybr glan afon tua 1.5 cilomedr neu 1 milltir. Dyma rai nodweddion diddorol i gadw llygad amdanynt ar y ffordd i'r safleoedd treftadaeth o bwys.

- 1 Stryd Fawr, yr hen brif ardal siopa.
- 2 Neuadd George Edwards, a sefydlwyd gan frawd J.C. Edwards yn 1911. Bu'n neuadd farchnad, yn sinema, ac erbyn hyn mae'n fan lle cynhelir cyngherddau.
- 3 Roedd tafarn y Vaults yn un o dafarnau Bragdy Island Green Wrecsam.
- 4 Y Bryn Americanaidd - a enwyd ar ôl siop ar waelod y bryn yma a alwyd yn Siop Americanaidd. Roedd perchennog y siop wedi mynd i America ac wedi gwneud ei ffortiun yno, a hyn wnaeth ei galluogi i brynu'r siop yma.
- 5 Basn Trefor, lle roedd Camlas Ellesmere a Chaer yn dod i ben a nwyddau'n cael eu dadlwytho ar Dramffordd Pontcysyllte. Roedd estyniad Camlas Kynaston, sydd wedi'i lenwi a'i godi drosto erbyn hyn, yn cario yn ei flaen i Ystad Kynaston.
- 6 The Darkie yw'r llysenw lleol am dwnnel sy'n croesi nant. Credir fod yna weithfeydd brics wedi'u lleoli gerllaw ar un adeg.

★ Mae'r llwybr fel arfer yn fwdlyd ac efallai y bydd hi'n anodd ei ddilyn.

- 7 Y Balast - tomenni sorod.
- 8 Pont y Tywysog - fe'i gelwir yn hyn am iddi gael ei hagor gan Dywysog Cymru. Ei llysenw lleol fodd bynnag yw Pont-y-Cuttin gan ei bod yn croesi ceunant rheilffordd wedi'i dorri i mewn i Garreg Cefn.
- 9 Safle Capel Seion a sefydlwyd gan y diwygiwr cymdeithasol a'r pregethwr, Edward Evans.
- 10 Capel Ebenezer.
- 11 Eglwys Rhosymedre - wedi'i chodi o Garreg Cefn.
- 12 Siop yr Ysgub, pencadlys Siop Gydweithredol Cefn a'r Cyffiniau.







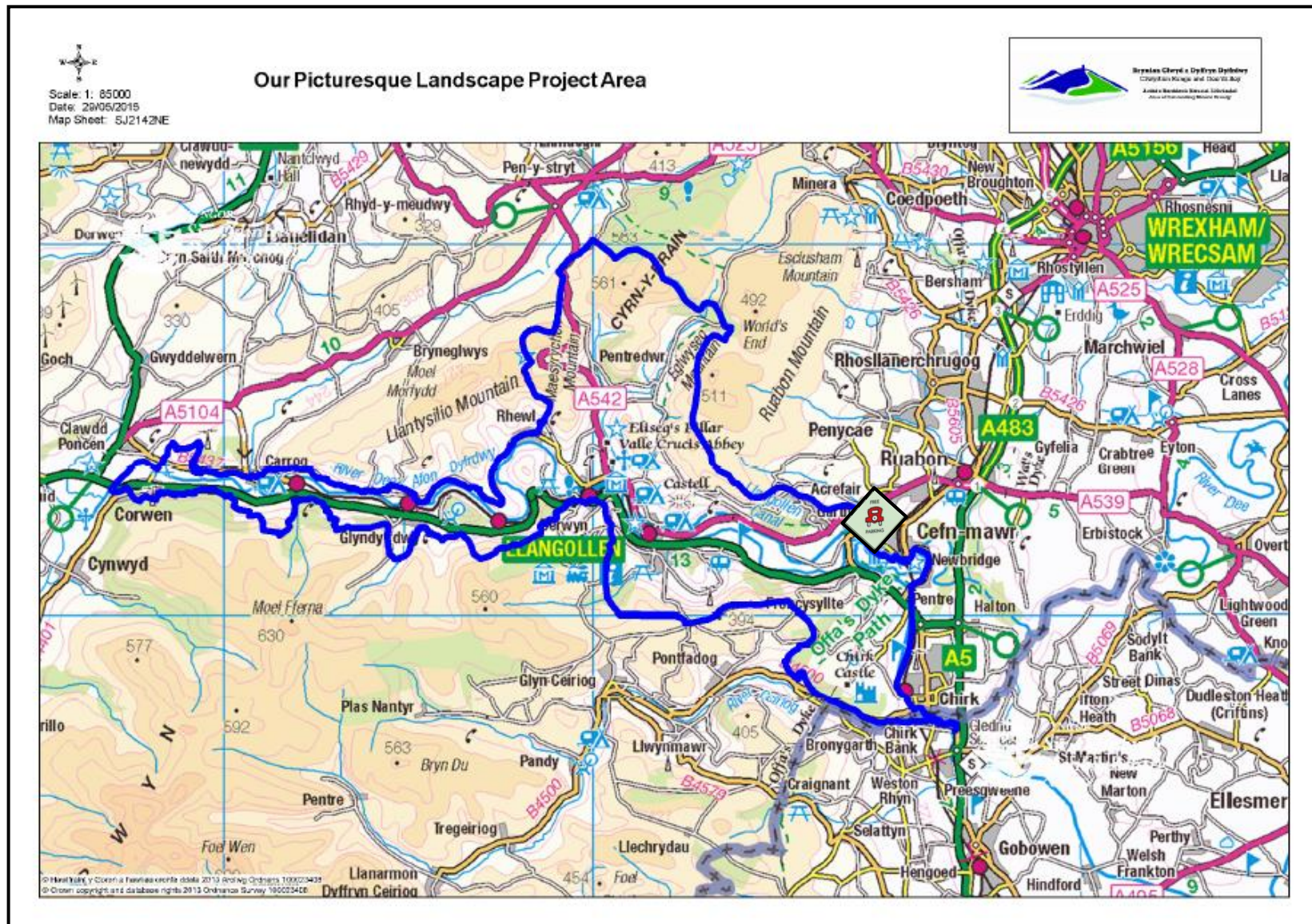
Cycling routes from the Sustrans route map tying in with the Llangollen Canal and please note the addition of [Jessop's Tramway](#) route in black dotted line will prove very popular with cyclists because of the gradients.



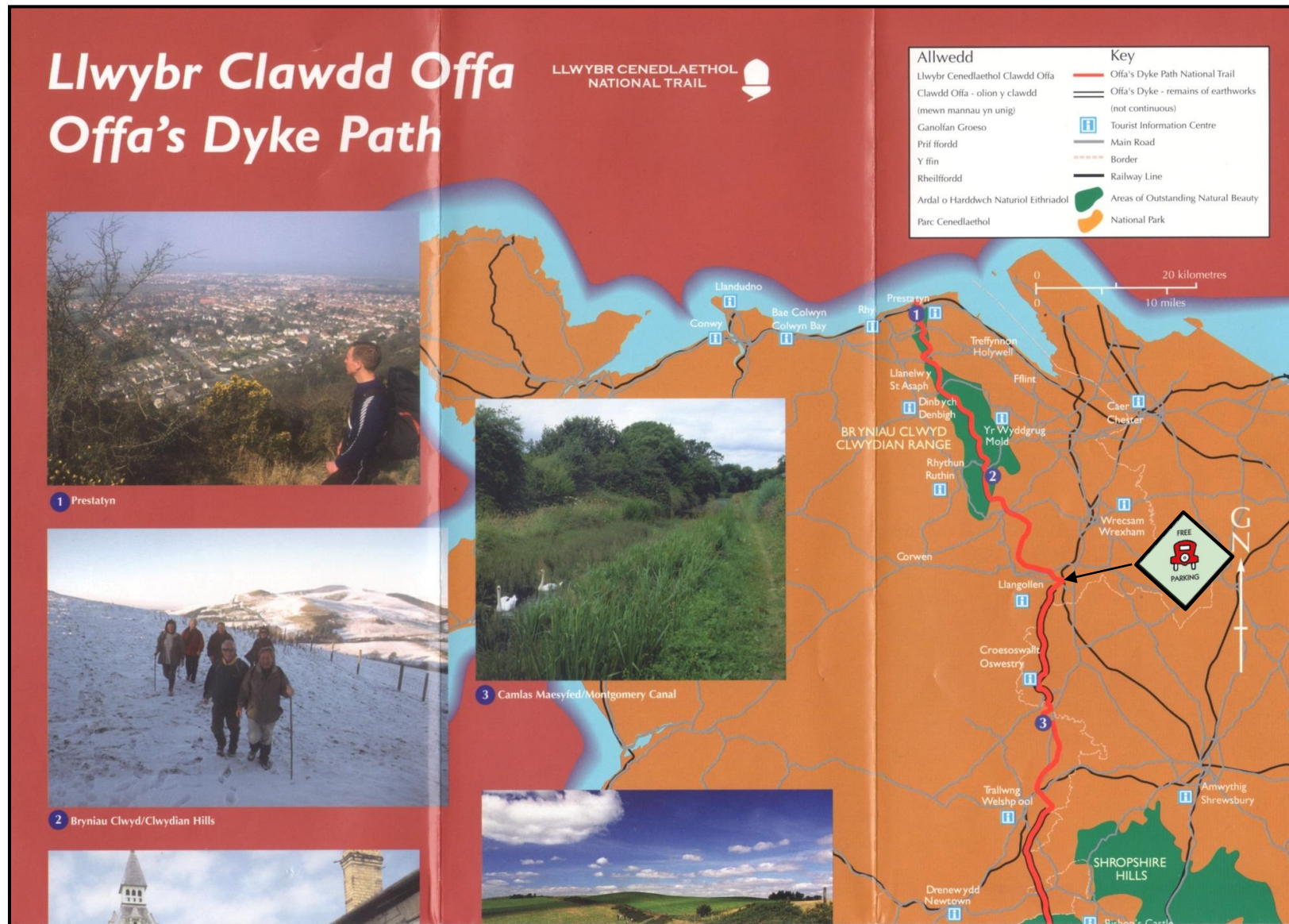
Wrexham Café Hoppers outside the Holly Bush Inn Cefn Mawr in 2013 before the start of renovation works



Please note the gradients of the routes indicated in this document for tying in WBG to Cefn Mawr & the Aqueduct are all suitable for both horse drawn vehicles and cyclists. This section of Jessop's Tramway, 300mts seen in the ex Monsato site 2013, before final demolition in 2015, is an ideal example and will be very popular with cyclists when reopened as a restricted byway for either hill climbing or decent.



The Dee Valley AONB and WBG offers ideal parking for people exploring the area.



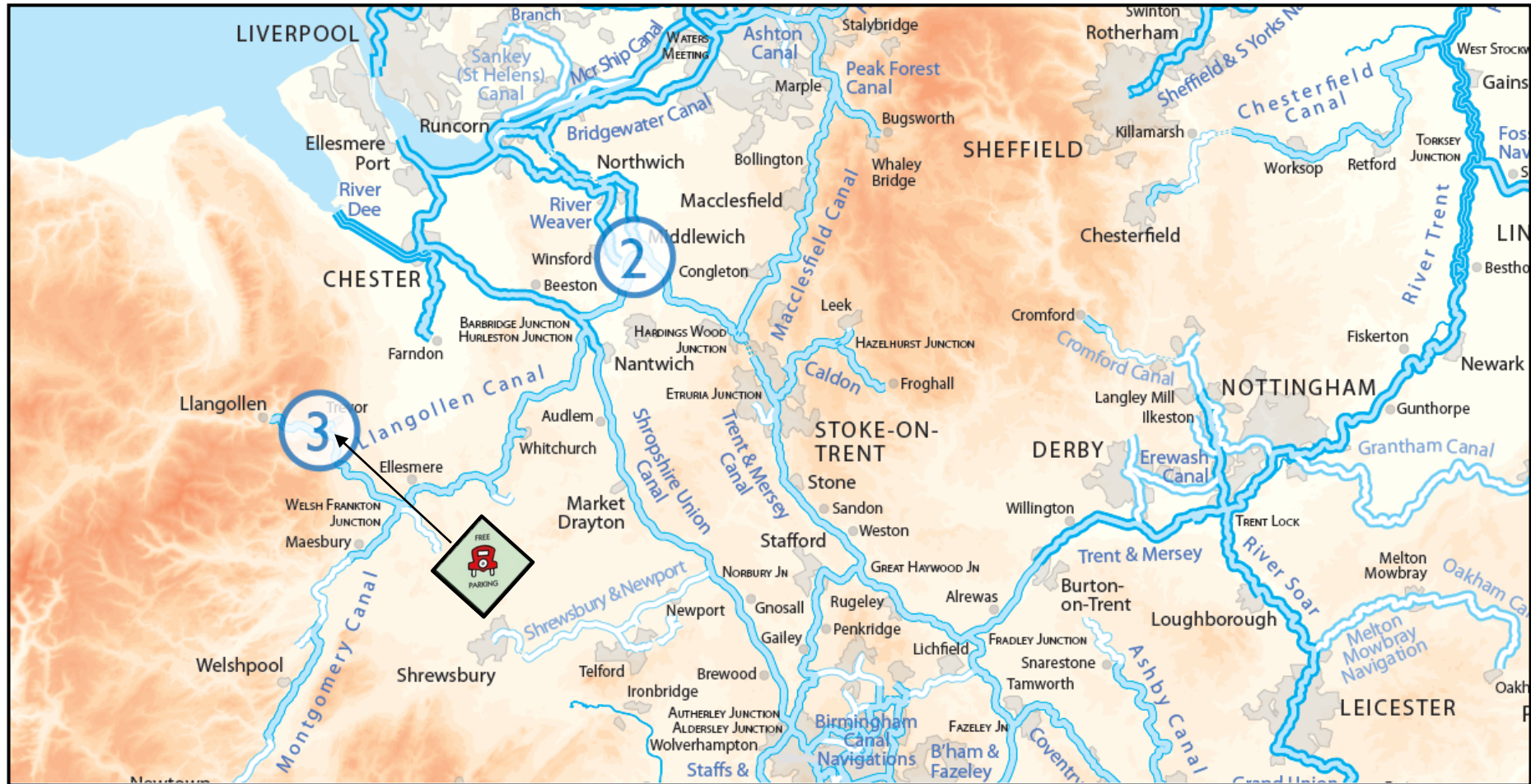
WBG offers strategic parking for people walking Offers Dyke.



The aqueduct before UNESCO inscription and the segregation of our community

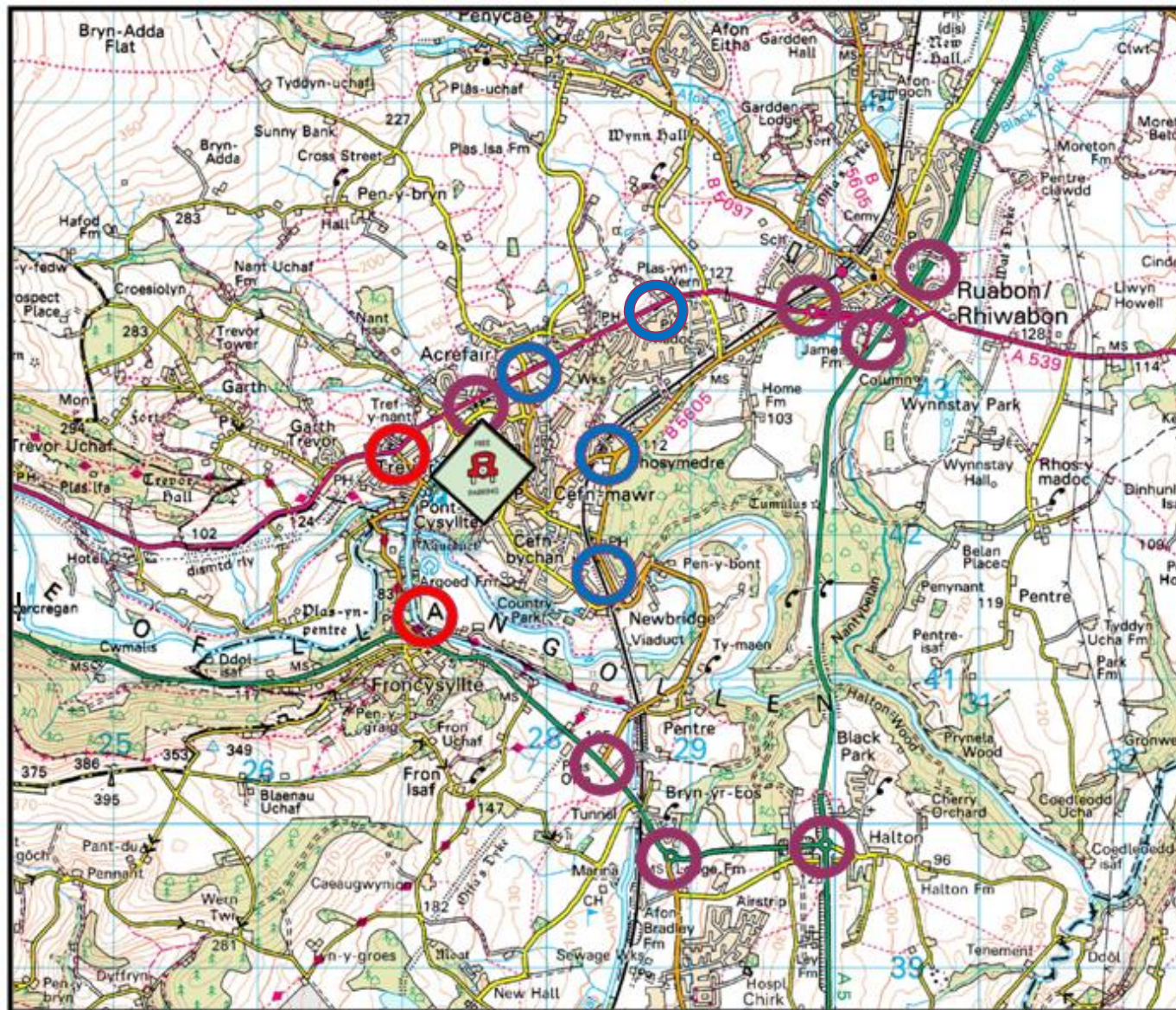


Cefn Mawr & the Aqueduct 2014 why does our community have to be segregated?






This extract from the IAW Inland Water Way Association Map for the UK shows the canal routes that the Llangollen Canal connects to across the UK. The Llangollen Canal is one of the UK's busiest canals according to CRT Canal & River Trust and their statistics show 15,000 boat movements annually on the canal. The canal has more marine traffic in 2016 than when it was being operated as a commercial trade route prior to the railway era. All this marine traffic is now people orientated and therefore generates a considerable volume of associated road traffic. The theme of the WBG concept is to reduce impact while encouraging people to stay longer in our area of the Cefn & Cefn Mawr without the need to drive off and WBG can provide ample parking for marine related traffic.

Main Road Signage Scheme



Map Key

-  Brown Heritage Main Road Signs for Cefn Mawr, Pontcysyllte Aqueduct, Splash Magic, Cefn Druids' and Ty Mawr Country Park
-  Secondary sign posting for Cefn Mawr, Splash Magic, Cefn Druids and Ty Mawr Country
-  Restricted access to prevent further traffic damage to the Cysyllte Bridge, a Grade 1 listed Structure and far older than the Aqueduct.



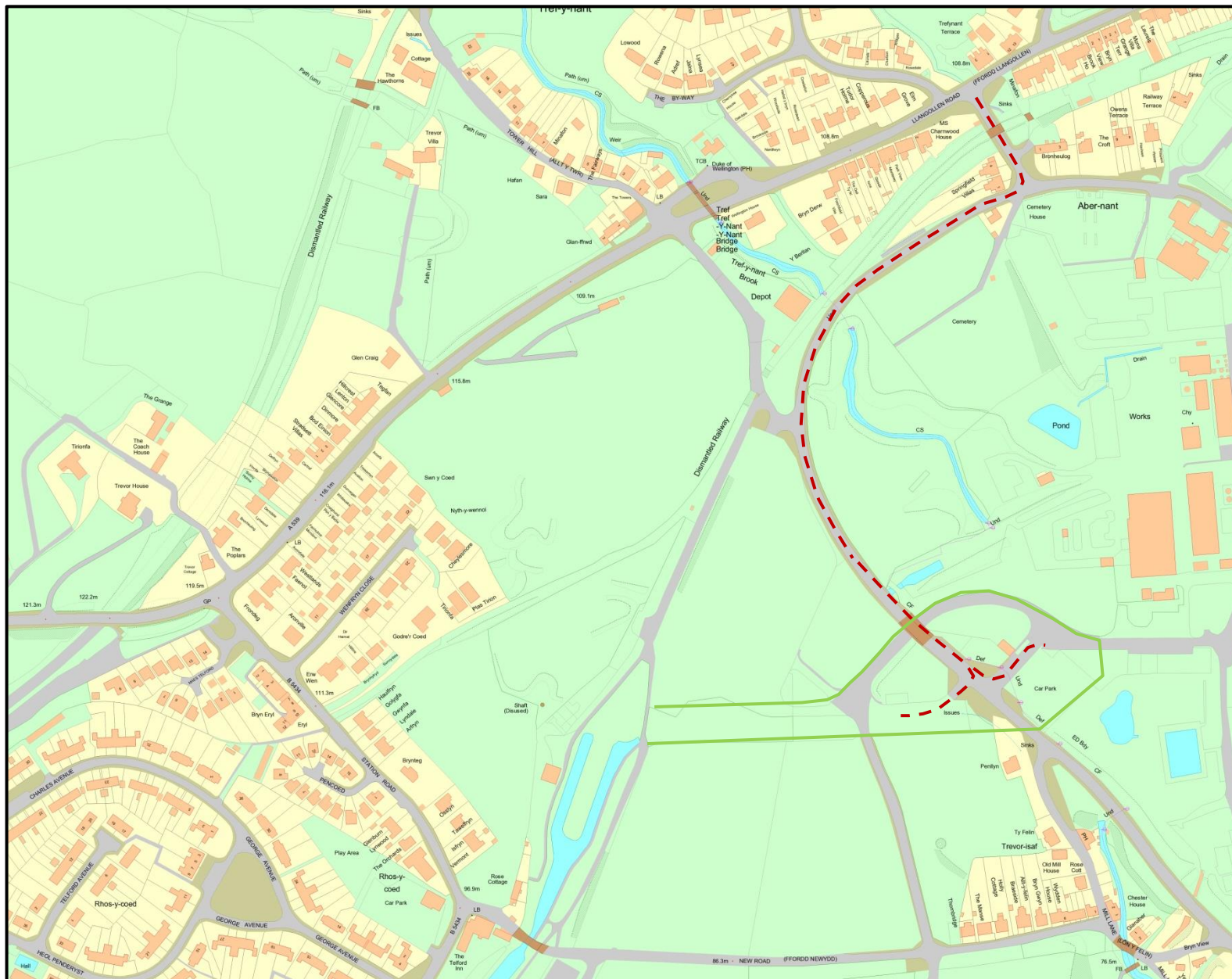
The Windborne Gate Area for the Aqueduct & Cefn Mawr can be accessed easily without having to go through a residential area. This will alleviate parking problems at Trevor and is not sighted next to a children's play area. It is on a Brownfield site and will comply with all LDP2, WPP and FGA 2015 WAG aspirations.

WBG Access

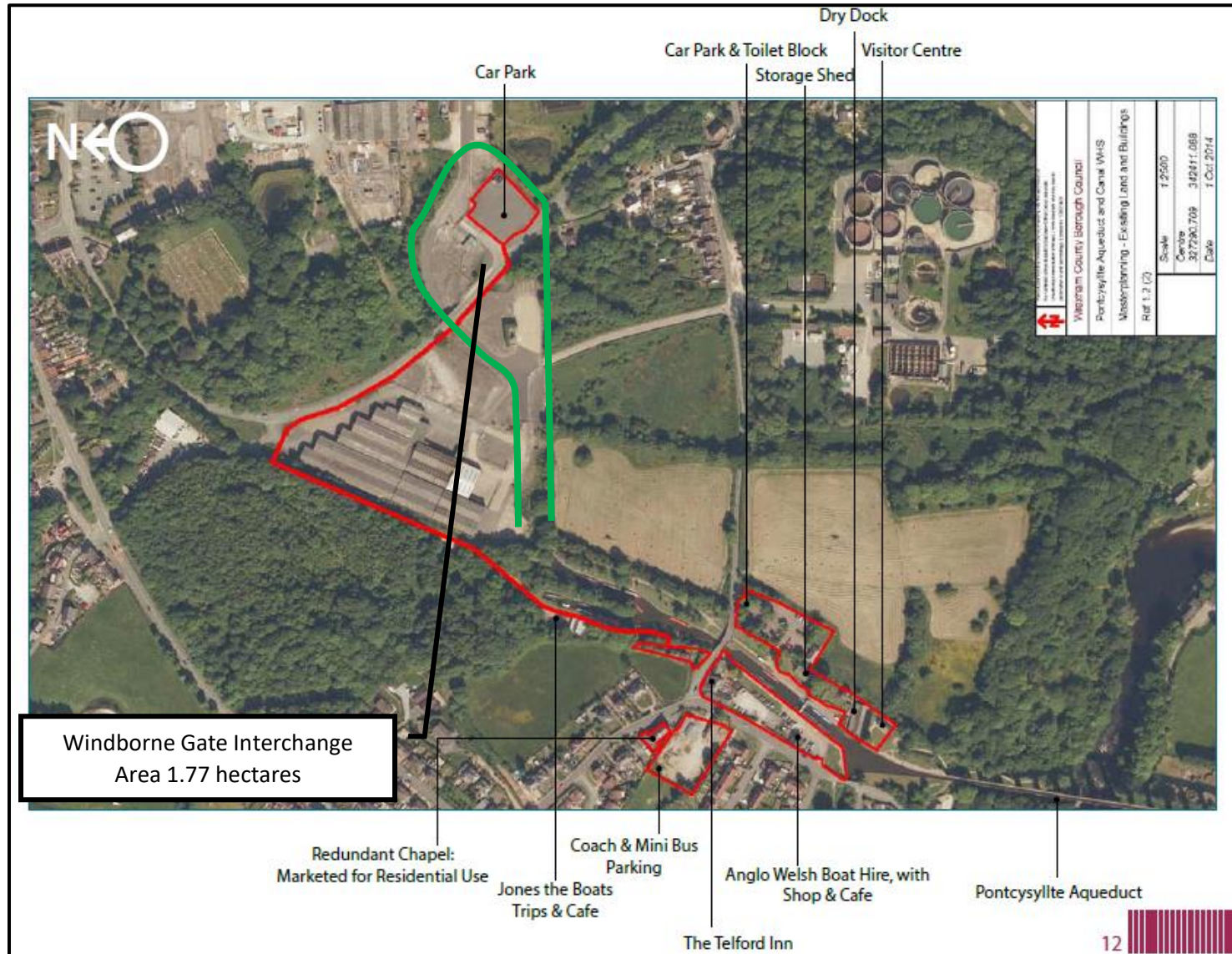
Windborne Gate can be accessed directly from the A539 without having to negotiate a residential area and would minimise the current problems associated with parking at the Trevor Basin for both tourists and residents alike. Also there is a relatively easy driving route from the Windborne Gate Parking Area to both the Trevor Basin Car Park for DDA provision and Ty-Mawr Country Park which would work well and complement each other.

Please note the Windborne Gate Parking Area can be accessed from 5 separate directions which is more than Reeds Yard and Trevor Basin parking combined. Therefore Windborne Gate will simply provide a more than adequate facility at a minimal cost that is central to the Cefn and will help radiate the tourism trade around the whole area while minimising the current problems associated with the Trevor Basin.





Existing Parking Lots vs WBG



Note that the proposed new boundary for the Windborne Gate Central Parking Area is significantly bigger than the combined areas of the current WBG, Reeds yard and Trevor Basin parking lots combined.

The actual area is approximately 1.77 hectares and is hard surfaced for the majority. Therefore this would provide suitable parking without wasting green fields adjacent to the Trevor Basin at a far greater expense.

The capacity of such clearly exceeds the present provision and all that is required is appropriate fencing, tree screening and some basic landscaping.

Not that hard really, and saves ploughing up a preside Greenfield adjacent to the aqueduct.

Picnic Area



GBDVS clearly state that a third of the people visiting a site do not spend any money and one of the favourite pass times is walking. This simply means they want to go out for a nice day out at minimal expense. Therefore providing a covered seating area such as this, it does rain in the UK will make the site more popular where people can have a flask of coffee and a couple of sandwiches without feeling obliged to buy something which can be very off putting and why commercialization of the aqueduct should be avoided if it is to be developed properly, and if people want shops Cefn Mawr is only 500mts away.

Public Toilets

A simple public toilet block should be provided. This would then supplement the exiting public toilet facilities at the Trevor Basin and the planned public toilets at the Holly Bush Inn, Cefn Mawr.

If kept clean and run properly they would help encourage repeat visits and use of the Windborne Gateway Interchange facilities encouraging more people to visit Cefn Mawr and the Aqueduct.

A simple block such as this is favoured by the PKC Group which has DDA access and provision. It is of a traditional style of stone and render with a slate roof. In the case of the WBG Toilet Block the stone would most likely be Cefn Sandstone. See the Windborne Gateway Interchange Technical Document for more information.

The PKC Group particularly like this example because it is simple, traditional and has a notice board showing information on the local area. These places are ideal for display boards as they are well used and a focal point for people to come to so display boards here can be very effective to inform people of what is available in the local area.



YOU ARE HERE SIGNAGE

Signage is extremely important and the Windborne Gateway Interchange will have prominent YOU ARE HERE signage showing Cefn Mawr and the aqueduct as well as the rest of the World Heritage Site.

This sign is unfortunately a typical example the current state of affairs as regards the representation of our community, Cefn Mawr, the largest community in the World Heritage Site. Cefn Mawr has been positively excluded from the WHS in most material produced for the tourist industry to date.

Given the good guidance by the WAG through the SDC, FGA 2015 and the PPW 2016 there is no excuse for omitting our community and hindering our ability to switch form post-industrial to that of Sustainable Tourism Development.

This needs to change and Cefn Mawr should to be included in the WHS instead of being ignored, excluded and segregated. To see what is wrong with the current signage and tourist information situation see [“Where is Cefn Mawr”](#)

We big display signs saying:

← Pontcysyllte Aqueduct 500mts - YOU ARE HERE - Cefn Mawr 500mts →



The Three Markets

There are three potential retail markets available in the Cefn, and each should be addressed to improve the general economy of our community.

1. The first market is our local market serving our local people that live within our community. The community of Cefn is approximately 6000 and the Holly Bush Inn and other traders in the local community are addressing this as best we can.
2. The second market is the wider area that the Tesco Supermarket is attracting. A large number of these shoppers have been drawn from other areas to our village and we need to look at ways we can tap into this market for our local traders. This was a foremost reason for the PKC Group taking on the restoration of the Holy Bush Inn in Cefn Mawr at what has now become the primary gateway into our traditional shopping centre. Furthermore the PKC Group are seeking planning permission from WCBC for local trader signage to tell the traffic now driving along the Tesco Bypass of Cefn Mawr, that our traditional shopping centre is still open for business.

This second market is very important and has a head count of almost half a million annually while the traditional shopping centre in Cefn Mawr sees very little. The catchment area for the Tesco Supermarket, within a 20 minute drive radius represents, in the region of 75,000 people, and one of the main reasons for the success of the store is its central location and ease of access, as compared to going into Wrexham Town. However it should be remembered that a lot of the head count at Tesco will be repeat customers doing their weekly shopping which is confirmed by the local taxi drivers who now earn the majority of their wages running people to and from Tesco.

3. The third market is the tourist industry which Cefn as a whole has not achieved a great deal in so far, despite having one of North East Wales's top tourist attractions on our door step. We need to get the WCBC and Eastman's to work with us and set up the Windborne Gate as the main **FREE PARKING** area for the Pontcysyllte Aqueduct. This can simply have a parking capacity of 2 – 300 cars plus coaches and would be central to the whole area. This would then put Cefn Mawr within reasonable walking distance from the car park, and help us bring tourism into Cefn Mawr. The key to doing so is getting the **Windborne Gate Parking** area set up as the main central parking area for the aqueduct and the Cefn, at the central section of the World Heritage Site. This will encourage visitors to stay longer and explore the whole site of Cefn Mawr and the Aqueduct, which will eventually become a "Hebden Bridge or Blists Hill" of the Pontcysyllte WHS.

Great Britain Day Visitor Statistics (GBDVS) 2013

Day visits are a key audience, whether they are people travelling from home or from a holiday location. The results of the Great Britain Day Visitors Statistics (GBDVS) 2013 provide insight into this market. During 2013, a total of 1,588 million tourism day visits were made by UK residents. During which they spent around £54 billion.

Based on these figures, with an annual visitor count of 200,000 the Pontcysyllte accounts for 0.012% of the GB Day visitor market and as a moot point here, 0.012% of £54 billion = £6,480,000.00

In summary the GBDVS shows that:

- (1) Day trips are seasonal, peaking in June - August with a secondary peak in December over the Christmas period.
- (2) Visiting family or friends is the most popular with eating out as the most frequently undertaken activity.
- (3) 1 in 5 tourism day trips include a person with a disability.
- (4) 44% of day trips in Wales last between 3 and 4 hours, which is higher than the GB average of 39%, (100% higher than the aqueduct).
- (5) 27% of day trips in Wales are to “small towns” and 28% to the “countryside”, (the Cefn & Cefn Mawr are rural urban villages).
- (6) 78% of visitors taking day trips in Wales are from Wales with 2% from England, (this ratio will be significantly different for Cefn since we are on the borders). The distance people are prepared to travel for a day trip is key to understanding the potential catchment area for the site. The GBDVS 2013 found that 45% of journeys to visitor attractions in Wales are between 0 and 11 miles, and an average journey for “going to visitor attractions is 52 miles”.

Transport to the site is also key, 64% of trips within GB and 75% within Wales use their own car to reach the destination of their visit. With excess of 200,000 people visiting the aqueduct, this means that in excess 150,000 people arrive by car. So they do need some where to park.

Expenditure, GBDVS 2013 findings report that only two thirds of visitors will spend money on a day visit to Wales, and the average expenditure is £34, which reduces to £29 in North Wales. When considering the data associated with “going to visitor attractions” the average spend increases to £41. This expenditure includes travel to and from the site, alongside expenditure within the site itself.

Potential, If GBDVS figures are correct this represents a potential value to the tourist market visiting our area of $300,000 / 3 \times 2 = 200,000$ visitors, and £29 - £14 for transport = £15 potential per person to spend, so $15 \times 200,000 = \text{£}3,000,000.00$. This can make a very significant improvement to our local economy if it is managed correctly which it currently is NOT. This potential can initiate and provide Sustainable Tourism Development for our community.

Regular and Frequent Visitors

These are visitors who live within a 30 minute drive time of The Cefn, & Cefn Mawr & the aqueduct and catchment data shows 253,349 people.

Occasional Visitors

This group is within a 60 minute drive time of The Cefn, Cefn Mawr & the aqueduct and represents 1.8 million people.

Day Trip Visitors

The population based on a 90 minute drive time to The Cefn, Cefn Mawr & the aqueduct is approximately 7.5 million people.

Visitors on Day Trips and Overnight Stay

Over 8 million people live within 2 hours drive of the Cefn and the aqueduct, which equates to 12.5% of the UK population.

International Visitors

Visit Britain's Inbound Tourism to Britain's Nations and Regions (2013) presents a profile and activities of international holiday visitors. Within the document is a breakdown of the inbound tourism market for Wales. Wales has a relatively high proportion of overseas visitors with children and is especially popular in spring and early summer. Data shows visitors to Wales are likely to visit the coast, countryside, national parks and go walking, with Snowdonia attracting many. These people visiting Wales are keen to socialise with locals and go the pub as well as go shopping for souvenirs. These are activities that can so easily be offered in the Cefn & Cefn Mawr working with the aqueduct.

The Cefn is adjacent to the main A5 trunk road from London and Birmingham to Snowdonia. Therefore with the correct **BROWN AND WHITE TOURIST INFORMATION MAIN ROAD SIGNAGE** scheme this can deliver a large numbers of additional tourists to The Cefn, Cefn Mawr & the aqueduct. Furthermore if the weather is bad, as can be the case in Snowdonia then Cefn Mawr & the aqueduct can make a very suitable alternative. Visitors to Wales are not particularly likely to visit heritage related attractions but 46% of those who do will go to "famous monuments & buildings" such as the Aqueduct. Countryside activities are popular with visitors to Wales with 50% participating in "walks in the countryside", compared to 24% across Great Britain.

GB DV Statistics 2013 and results of the Canal & River Trust visitor survey clearly show that walking routes can attract visitors and increase dwell time.

The Windborne Gateway Interchange makes a great starting point not only for The Cefn & Cefn Mawr and the Pontcysyllte Aqueduct but also some other very good local walks such as the Cefn Heritage Trail, the Ruabon Brook Railway, Offa's Dyke and Dee Valley ANOB without causing any additional parking problems in the locality as well as the cycling routes available. PKC Group along with others will be promoting all the walking and cycling routes in our area and will produce a number of pocket guides on such. These can be down loaded from our website free of charge!

Public Transport, National & International Tourism

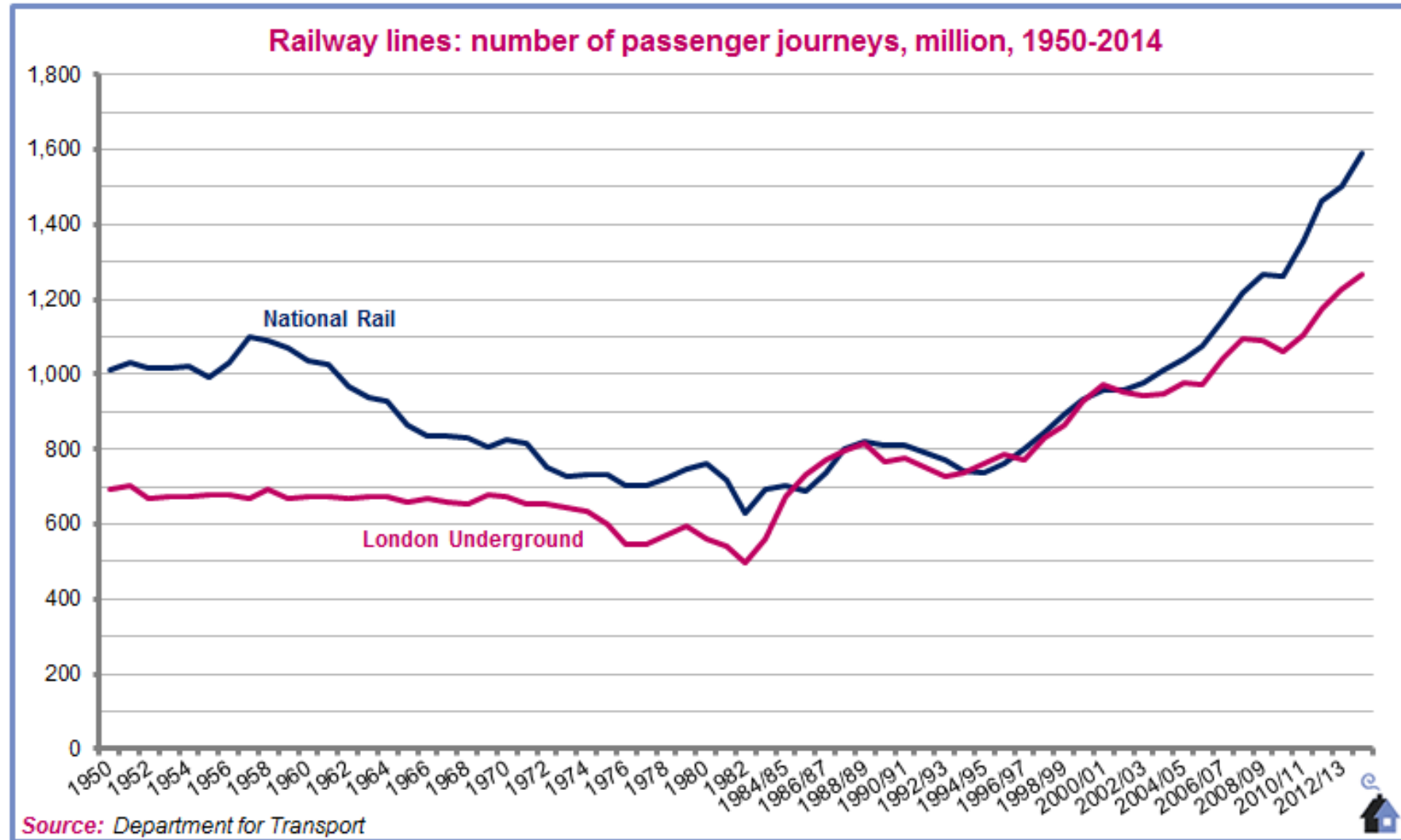
One of the positive aspects of the public transport bus service being moved from our village centre to serve Tesco is that it also now passes the limited parking at Windborne Gate on lease to WCBC. However there is no bus stop at the WBG and the visitor count there remains very low because of the poor signage scheme, and no direct connection with the aqueduct. At the present moment people parking there have to walk all the way around the old warehouse site which was demolished a number of years ago. This is off putting and nonsense although WCBC did spend £40K on an Art project in 2013 to try and brighten the place up, but this has failed and fallen off the fence, and is now a mess.

Public transport is necessary for a sustainable future. A bus stop could be started at WBG so that the bus service linked into Ruabon and the planned railway station for Cefn Mawr. This service could be used by people using the train, much like the MRT system in Singapore, and all that is required is a bus stop at WBG. When the proposed Cefn Railway Station adjacent to Tesco Supermarket is built, the bus service can be directly linked in to the Chester to Shrewsbury line in Cefn Mawr. A Railway Station will establish Cefn Mawr as a Rural / Urban Transport Hub for the World Heritage Site, South Wrexham and Dee Valley, again satisfying SDC and LDP2 aspirations on a long term basis.

Public transport represents a very important key to the International Tourist Market as they all arrive by plane. The railway offers access to and connections with Liverpool, Manchester and Birmingham International airports as well as the largest tourist market in the UK, London.

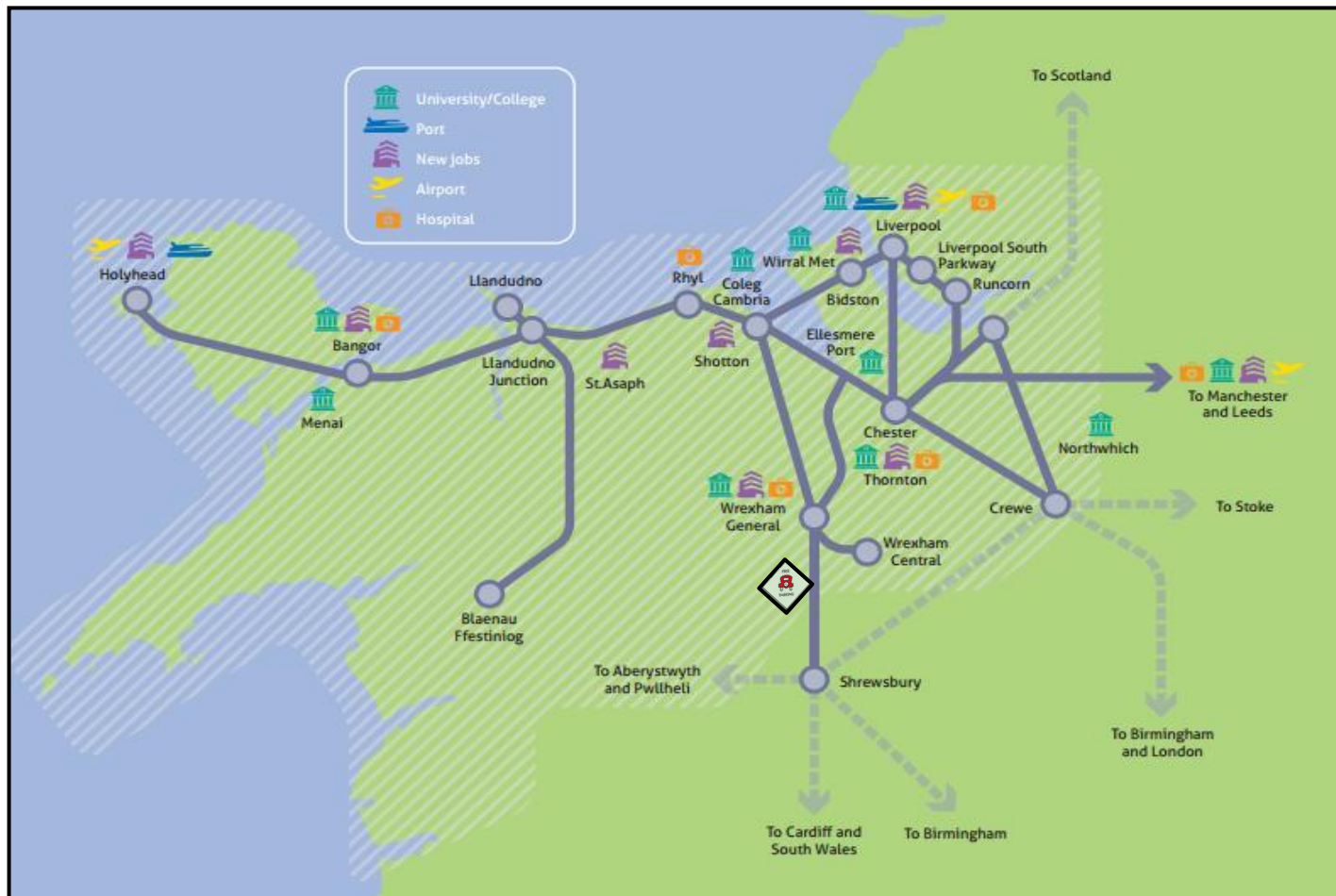
Note: a 2.5 hours journey by train covers 50% of the UK population for potential visitors, i.e. +30 million people.





The importance of rail transport for future sustainable development cannot be ignored and with a 5% annual increase in passenger numbers on trains this should be factored into all planning for Cefn Mawr and the aqueduct. Furthermore the PKC Group is now taking an active role with Growth Track 360 for the 1 Billion Pound Investment in our railways, and we are the leading group for a new Railway Station at Cefn Mawr. Please see [Cefn Station](#) and [LDP2](#)

Cefn Station & Growth Track 360



This extract from Growth Track 360 clearly shows why Cefn Mawr should have a railway station as a part of the £1B upgrade which will give major access to the WHS at Cefn Mawr from all the regional airports and major cities of the UK. Bringing Cefn Mawr online as a tourist destination with the WBG at the centre of the WHS is an essential step in the road to becoming a Tourist Destination and Rural / Urban Transport Hub for the Pontcysyllte WHS, Dee Valley and South Wrexham. We need to link in, not be left out.

Passengers asked for views to keep Shropshire to London rail link on track

The direct railway service from Shrewsbury to London has been hailed an outstanding success during its first year of service.



Virgin's extended train services launched from Shrewsbury railway station in December



With the £44M upgrade of the line between Wrexham and Chester nearing completion and the planned service frequency increase trains are going to offer The Cefn & Cefn Mawr and the WHS a serious potential visitor count. This is why the PKC Group are advocating a new railway station for Cefn Mawr on the Chester to Shrewsbury line. The service to London will no doubt be extended at some point in the not too distant future and will run from Chester via Wrexham once again. Furthermore there is no good reason with today's technology, double ended trains, why the Irish Ferry Trains cannot be routed along our line. This would relieve congestion on the main West Coast line and all that is really required is rescheduling to accommodate once the track improvements are completed. Cefn Mawr needs a Railway Station that will serve the central section of the WHS.

Monthly Market

Cefn Mawr is the second largest community in the county of Wrexham and occupies a central location for the area as can be seen from the mapping in this document. These are important facts for business marketing and form two main reasons for Tesco investment of £20M pounds at Cefn Mawr. This is reflected in the success that the store is enjoying with the highest head count in our community.

Local Markets have an important role to play in the future of Wales in its ability to become a Sustainable Nation in that they allow local people to promote and sell local produce to local people with the

minimum of transportation costs. This is what local markets are about and if correct opportunity is available our people can participate. The WBG with the ample parking facilities and good road access combined with Cefn Mawr's traditional shopping centre connected together by horse drawn hackney services along Jessop's Tramway can provide an ideal venue for such if implemented and promoted in the correct fashion to support the local community. Therefore this could provide additional income for our local people at a local level in the local area again helping to alleviate need for motorised transport and further production of CO₂. Local Markets are about local people trading, either selling or buying and have been with us for a long time, serving us well since the beginnings of civilisation, and no doubt will be making an even bigger comeback in the not too distant future as we move to a lower carbon economy.



Car Boot Sales



This is the truest form of a circular economy and directly recycles goods, which again helps reduce waste and leads to a greener economy.



Car boot sales are extremely popular form another opportunity for the WBG with its central location at The Cefn & Cefn Mawr if it is explored and promoted correctly. Car boot sales give local people the chance to participate in a sales and purchasing and have proved very successful. They are another form of open air market and can provide an additional income for people, and an alternative to buying new at a far cheaper price, this really is recycling.



The WBG with +1.77 hectares available can provide an ideal venue for this that is not liable to get water logged or churned up as the majority of the site is hard surfaced already. This then can provide another good use to what is currently a disused Brownfield site adjacent to the Aqueduct in Cefn Mawr. This is in the true sense, Back to the future for Cefn Mawr.

Short Term CO2 Emission Reduction

Of the 300,000 visitors to the aqueduct over two thirds arrive by car (GBDVS). This therefore represents 200,000 people. Assuming conservative figures for the sake of the exercise, a third of the people arriving by car are assumed to be families of four, a third of the people as couples and the remaining third as single people, so how many cars?

- Families = 66,666 people @ 4 people per car = 16,666 cars
- Couples = 66,666 people @ 2 people per car = 33,333 cars
- Singles = 66,666 people @ 1 person per car = 66,666 cars

Therefore total number to serve the visitor figure is approximately 116,665 cars or thereabouts.

If we will assume for the sake of the calculation:

- The average fuel saving per vehicle is 2lts, for a vehicle that remains stationary at the WBG Interchange rather than “*moving on elsewhere after a limited dwell time*” and;
- Only 10% of people arriving by car can be encouraged to spend the day exploring the wider area of the Cefn & Cefn Mawr.

This would represent 11,666.5 cars remaining stationary with engines switched off. Therefore if the average fuel saving is 2lt per vehicle this would then equate to $11,666.5 \times 2 = 23,333\text{lts}$ or 23.3m³ of less fuel burnt.

Since the agreed average density of diesel fuel oil (for example) is 0.832kg per litre – $23,333\text{lt} = 19,413\text{kg}$ or 19.4 metric tonnes.

Table 4: World Heritage Visitor Numbers

World Heritage Site	Visitor No's	Size of site	Date inscribed
Pont du Gard, France	2million		1985
Ironbridge	750,000	550ha	1986
Giant's Causeway, Ireland	751,693	70,000 ha	1986
Stonehenge	800,000	4,985 ha	1986
Edwardian Castles of Wales:			
Beaumaris	78,131		
Caernarfon	193,683		
Harlech	94,340		
Conwy	181,947		
Total for the WH site	548,101	6 ha	1986
Canal du Midi (France)	N/A	1,172ha	1996
Blaenavon Industrial Landscape	165,000	3290ha	2000
Derwent Valley Mills	135,000	1,228 ha	2001
New Lanark Works	400,000	146 ha	2001
Rideau Canal (Canada)	N/A	21,454ha	2007
Pontcysyllte Aqueduct and Canal	200,000 est	4,250	2009

Source: UNESCO and individual WHS websites

Table from the WCBC WHS Tourism Draft Plan 2010 based on UNESCO estimates that predated the WCBC TDP. The visitor count is now estimated at 300,000 annually by WCBC.

So how much CO₂, the calculation is performed on the table shown from the International Carbon Bank & Exchange and gives a value of 63.70 tonnes of CO₂. Please remember that the mass increases due to the O₂ consumed from the atmosphere.

This then represents a saving of 36,071m³ of CO₂ gas being liberated into our atmosphere according to the table which may not be that much in the overall picture but it is a start and a move in the right direction towards reducing our CO₂ production in accordance with the FGA 2015 Act.

<http://www.icbe.com/carbondatabase/volumeconverter.asp>

Furthermore if the number of people persuaded to stay longer at Cefn Mawr & the Aqueduct can be increased the reductions will be increased likewise, it is a win/win situation in that it helps regenerate the economy of Cefn Mawr while reducing the CO₂ production.

WBG and encouraging people to stay longer in our area instead of driving off elsewhere is a very simple and practical way of reducing CO₂ emission and the bonus is this also helps us restore our communities economic base at the same time.

This is a Win-Win opportunity and we hope all will join in with us (WCBC, CRT & Eastman's) as this is exactly what the Welsh Government wants as well as our local community.

INTERNATIONAL CARBON BANK & EXCHANGE

BETA SITE

Account Login Carbon Exchange Expanded Site Map

about ICBE carbon exchange about emissions trading account management investors

ICBE> CarbonDatabase> tCO₂ in Gaseous Volume and Quantity of Fuel Type

Creates: 63.70785 tonnes of CO ₂			
Volume of CO ₂ :	m ³	ft ³	Height in m ³ units
	36071.385	1273848.685	36071.385

Yellow table above displays results

Liquid Fuels	Liters	Gallons	
Gasoline <i>i</i>	0 <-Calc!	0 <-Calc!	
Conventional Diesel <i>i</i>	23333 <-Calc!	0 <-Calc!	
Reformulated Diesel <i>i</i>	0 <-Calc!	0 <-Calc!	
Bio Diesel (B-20) <i>i</i>	0 <-Calc!	0 <-Calc!	
Aviation Gas <i>i</i>	0 <-Calc!	0 <-Calc!	
Kerosene (Jet A-1) <i>i</i>	0 <-Calc!	0 <-Calc!	
LPG <i>i</i>	0 <-Calc!	0 <-Calc!	
			m ³
LNG <i>i</i>	0 <-Calc!	0 <-Calc!	0 <-Calc!

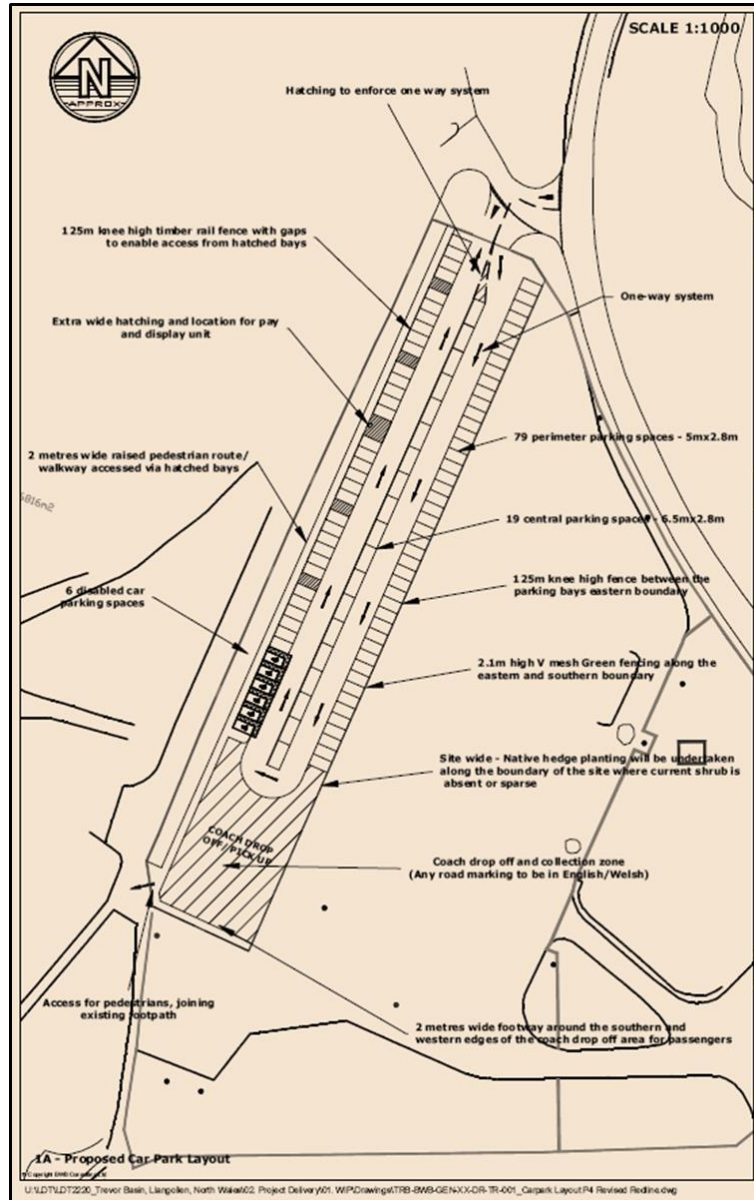
Long Term CO2 Reduction

The long term reduction of CO2 in turning the economy of Cefn Mawr around to Sustainable Tourism Development will come in two main stages.

1. **Private Transport:** Firstly as the Cefn & Cefn Mawr and the aqueduct develop further as a tourist attraction, the number of people attracted into the wider area of the Cefn will increase. This will increase the number of stationary vehicles parked with their engines turned off. Subsequently as the percentage of people visiting the aqueduct and wider area of the Cefn & Cefn Mawr increases supporting the local economy, this directly reduces the volume of CO2 production. Therefore as the economy of Cefn Mawr grows on a Sustainable Tourism Development basis this will sponsor a subsequent reduction in CO2 emission as a matter of course. However this will take time and therefore reductions above 10% are medium to long term goals and will form an important part of establishing the Cefn & Cefn Mawr as a tourist destination in its own right and reunifying the fragmented area. However even this practical example can be used as a tourist feature in our community to attract more people driving past.

The Cefn & Cefn Mawr is in a unique position for this which has to be realised. Cefn Mawr is at a central location for three major trunk roads and intersection of major north south and east west traffic flows. The A5 and A539 and the A483. What is extremely important is that the A483 which is a north south route carries more traffic than the A5 and A539 combined. Therefore Cefn Mawr has a far higher potential road catchment figure than Llangollen with the right main road brown and white Tourist Information Signage Scheme. Realising this is another crucial step in rebuilding the economy of the Cefn & Cefn Mawr.

2. **Public Transport:** is the one of the main answers to the long term future of establishing Cefn Mawr as Tourist Destination and Rural / Urban Transport Hub for the Pontcysyllte World Heritage Site, Dee Valley and South Wrexham. Cefn Mawr is on the main Chester to Shrewsbury Railway line, something that Llangollen is not. Furthermore Llangollen Railway will most likely remain isolated from the main rail network due to unfortunate and short sighted building programs on the former Ruabon to Barmouth line between Ruabon and Llangollen. However a new Railway Station as proposed by the PKC Group and widely supported by the local community in Cefn Mawr offers connection to the main rail network at a central location in the WHS. A railway station between Tesco and the Rhosymedre Industrial Estate would form the basis for a transport Hub where local bus services could be coordinated with to provide onward connection with Wrexham, Chester and Shrewsbury or further afield if required. Rail connection gives access to all the major cities, airports and tourist markets and is another key in the long term Sustainable Tourism Development of our community. By traveling by train rather than car this will in turn reduce CO2 emissions again. Setting up the Cefn & Cefn Mawr and the aqueduct as a place easily visited via public transport will support other main trade routes such as the Llangollen and future restoration of the Plas Kynaston Canal Canals, Offa's Dyke long distance foot path and cycle routes bisecting the Cefn & Cefn Mawr. If public transport is available and a viable alternative to private transport people will use it, it is that simple, and largely accounts for the annual increase in passenger counts on our trains in the UK as our roads become ever more clogged.



Detrimental Planning for the Cefn & Cefn Mawr

In 2017 despite the PKC Group campaigning for the WBG since 2012 and talking to all parties, WCBC, CRT and Eastman's, the CRT, Canal & River Trust submitted a planning application to WCBC for a so called temporary car park on the former Monsanto Warehouse Site now belonging to Eastman's.

Wrexham.com 4th November 2017

Additional car park proposed to help meet tourism demand at Trevor Basin

<http://www.wrexham.com/news/additional-car-park-proposed-to-help-meet-tourism-demand-at-trevor-basin-139578.html>

This planning application is for a narrow parking lot that is designed to feed people to the Trevor Basin and aqueduct. It does not really offer our community any direct benefit and involves yet more security fencing, which we should be reducing not increasing.

This planning application is again extremely worrying as unless our community is allowed to follow the road to Sustainable Tourism Development it is going to collapse. The retail economy of the Cefn & Cefn Mawr is extremely fragile and simply walking through the village centre will show this with the number of unoccupied shops and those that are let as hair dressers and nail and beauty outfits competing with each other will show.

With the scheduled introduction of commercial rates in the years to come, unless the economic base of our community is improved with Sustainable Tourism Development our retail sector will collapse and the Cefn & Cefn Mawr will sink further into depression and higher unemployment.

So planning applications like this are extremely dangerous for our community and we are very disappointed in the CRT, WCBC and Eastman's in this proposal.

Appeal

Here we have an opportunity if we chose to use it, to turn the Cefn & Cefn Mawr around, from a presently deprived community with one of the highest unemployment rates in Wrexham of a post-industrial community, as indicated in the LDP2, into a shining example for NE Wales, of an economy restructured in accordance with the Welsh Assembly Government's Sustainable Development Charter and the guide lines of the WCBC in the Local Development Plan for 2013 to 2028, i.e. the LDP2.

This proposal is for both the Pontcysyllte Aqueduct and the former industrial villages of the Cefn & Cefn Mawr having been identified by a number of sources as of particular significance, because of their historic relationship with the World Heritage Site, and the Aqueduct and as a relatively well preserved example of an unplanned early industrial settlement. Cefn Mawr contains the Grade 2 listed Plas Kynaston House and the Plas Kynaston Hall, both of which were linked to the Kynaston family that owned the Plas Kynaston Foundry from where the Aqueduct's ironwork was cast. Several of the central streets trace the line of the old industrial tramway network. The old quarries provide visual evidence of the area's past, and the built heritage comprises a mixture of Cefn stone and Ruabon brick and Terra Cotta, living records that preserve the historic evolution and development of these very important local industries, which are themselves of regional, national and even international significance.

However if this opportunity is wasted, through no participation and bad planning that leaves the community of the Cefn out and in a poor depressed state, this will cost all in the end. We therefore ask you to join us, for all our sakes, in this the first step in the regeneration of the economy of Cefn Mawr in accordance with WAG SDC Principles and LDP2 guidelines.

So we ask yet again for WCBC, CRT and Eastman's to work with us, the people that live in the Cefn & Cefn Mawr on a plan that will help us all rather than continue to submit plans that are detrimental to us through segregation and ignorance of our community.

Please use this as a reference and quote our small print if you like!

REFERENCES

The Free Press 28th November 2014 “Joe Bickerton, project manager at *Wrexham Council’s destination management*, said since it was named a World Heritage Site in 2009, the aqueduct has seen visitor numbers double. Last year, *more than half a million visitors* from around the world visited the Trevor Basin – where the main Pontcysyllte Aqueduct arrival point is.” <http://www.denbighshirefreepress.co.uk/news/141344/visitors-double-at-pontcysyllte-aqueduct-since-earning-heritage-honour.aspx>

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<http://chemistry.tutorvista.com/inorganic-chemistry/law-of-conservation-of-mass.html>

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https://en.wikipedia.org/wiki/Carbon_dioxide

See the 2002 paper “Environmental Health Criteria 226 Palladium” by WHO, the World Health Organisation for more information on this.

https://en.wikipedia.org/wiki/Carbon_dioxide