
**WRITTEN STATEMENT
JAMES BYRNE**

**ON BEHALF OF

GWENT WILDLIFE TRUST**

**In the matter of:

Public Local Inquiry into the M4 relief road around Newport:
Well-being of Future Generations**

February 2017

WITNESS INFORMATION

I am a Chartered member of, and Assessor for, the Chartered Institute of Ecology and Environmental Management (CIWEEM).

In my current role, as Head of Living Landscapes for Wildlife Trusts Wales (WTW), I lead our [Living Landscapes engagement programme in Wales](#). Wildlife Trusts Wales is one of the largest landowners in Wales (200 nature reserves, covering 8000ha). Our nature reserves form a key part of our Living Landscapes approach.

I worked with colleagues, civil servants, Assembly Members and Ministers on the development of both the

- Well-being of Future Generations (Wales) Act 2015 [WFG Act] and
- the Environment (Wales) Act 2016

I also advise the Future Generations Commissioner on nature based solutions to implement the WFG Act. Prior to the setting up of the Future Generations Office, I was the Wales Environment Link (WEL) member of the [Climate Change Commission for Wales](#).

I authored/co-authored the following evidenced-based publications:

- [Living Landscapes Cymru 2020](#) which highlights what nature does for the economy and society of Wales including adapting and mitigating the effects of climate change.
- The [Green Infrastructure: A Catalyst of Well-being of Future Generations in Wales](#) brochure.
- [Wild Wales](#) - An online interactive brochure to all the best places in Wales to see Wildlife.
- UK Natural Ecosystem Assessment Follow-on project [Synthesis Report](#)
- The [Clocaenog Statement of Environmental Master-planning Principles](#)

Prior to working Wildlife Trust Wales, I was

- A Senior Conservation Officer for RSPB Cymru – dealing with major planning applications throughout Wales.
- County Ecologist at both Herefordshire County and Bristol City Councils – dealing with planning applications within the Councils jurisdiction
- A Senior Ecologist with Cresswell Associates/Hyder, an independent environmental consultancy

I have an undergraduate degree in Geography and Biology from St Marys University College, Strawberry Hill and a Masters in Rural Environmental Management from the University of Aberdeen.

INTRODUCTION

Wildlife Trusts Wales (WTW) represents the six Wildlife Trusts in Wales – Brecknock, Gwent, Montgomeryshire, North Wales, Radnorshire and South and West Wales (hereafter referred to as the 'Wildlife Trusts') working together in partnership to achieve common aims. The Wildlife Trusts collectively speak on behalf of more than 24,000 members and manage over 200 nature reserves, covering more than 8,000 hectares of prime wildlife habitat, from rugged coastline to urban wildlife havens.

Nature is fundamental to everyday life; it provides the air we breathe, the food we eat, the fuel we use for warmth, and the resources we consume for shelter and modern life. Nature and people are not separate; nor is nature separate from our economy. Without a healthy environment, society cannot be resilient but for nature to look after us, we need to look after nature.

Wildlife Trusts Wales object to the plans to build a section of motorway which would concrete over 8kms and 125 hectares of SSSI despite them being legally protected as a nationally important site for wildlife. This constitutes one of the largest losses of SSSIs in the UK.

Gwarchod **Bywyd Gwyllt** ar gyfer y Dyfodol
Protecting **Wildlife** for the Future

I want to base out objection on the Well-being of Future Generations Act Well-being Goals. These goals were used Sustainable Development Report by the Welsh Government in relation to the M4 which concluded that *“whilst acknowledging the potential impacts of the Scheme, these are balanced with opportunities which align with the well-being goals, as far as they are currently developed, and therefore the Scheme is considered to align with the Welsh Government’s principles of sustainable development”*.

However, as stated by the Future Generation Commissioner, amongst her many criticisms, in her letter to the Minister responsible, Ken Skates AM, *“the standard of evidence provided under each of the goals, for justifying the project, is not comprehensive or as robust as I would expect of this legislation”*. However, I would go further and say that the any objective analysis of how the Scheme would fit the Black Route would conclude that it is the wrong development in the wrong place and in the wrong time.

Therefore, it is our evidence that Scheme is contrary to Welsh Government legislation and is not fit for purpose.

The Well-being of Future Generations (Wales) Act

The Well-being Goals are

- a) **A prosperous Wales** - An innovative, productive and **low carbon society** which recognises the limits of the global environment and therefore uses resources efficiently and proportionately (**including acting on climate change**); and which develops a skilled and well-educated population in an economy which generates wealth and provides employment opportunities, allowing people to take advantage of the wealth generated through securing decent work
- b) **A resilient Wales** - A nation which **maintains and enhances a biodiverse natural environment** with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example **climate change**)
- c) **A healthier Wales** - A society in which people’s physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood
- d) **A more equal Wales** - A society that enables people to fulfil their potential no matter what their background or circumstances (including their socio economic background and circumstances).
- e) **A Wales of cohesive communities** - Attractive, viable, safe and well-connected communities
- f) **A Wales of vibrant culture and thriving Welsh language** - A society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts, and sports and recreation
- g) **A globally responsible Wales** - A nation which, when doing anything to improve the economic, social, environmental and cultural well-being of Wales, takes account of whether doing such a thing may make a **positive contribution to global well-being**

Climate Change

Climate Change – Acting on climate change is embedded within three of the Well-being goals. **Please see the evidence from Professor John Whitelegg and Kevin Anderson and others which highlight that building a new motorway will only add to carbon emission’s.** Therefore, due to the above the Road scheme cannot be considered to adhere to the Well-being of Future Generations Act.

Resilient Wales

Please see my other proof on section 7 species, legislation and mitigation – as well as that of

- Gwent Wildlife Trust
- RSPB,
- NRW
- Woodland Trust
- Buglife

All of which highlight that building a motorway through 8kms of nationally important nature reserve will not 'maintain and enhance' the statutory nature reserve.

Introduction to the Gwent Levels

The Gwent Levels SSSIs are vital to the people of south Wales as they provide a range of important ecosystem services. The UK Government's own studies show a benefit to cost ratio of SSSIs overall is almost 9:1. Also, using default figures from the UK National Ecosystem Assessment (NEA), the Gwent Levels SSSIs create £67m pounds worth of 'free' ecosystem services such as flood control and air quality regulation. However, it has been estimated that around 4000ha of the Gwent Levels have already been lost through industrial, housing and infrastructure development.

The Gwent Levels is one of the largest surviving areas of ancient grazing marshes and reed (drainage ditch) systems in Britain. They have been present since Roman times. It is the largest and most important area of its kind in Wales, of acknowledged UK-wide significance for its wildlife and archaeology.

The Levels, which stretch from East Cardiff to Chepstow, provide a home to an astonishing array of wildlife including rare birds, mammals and 25 rare plants (including wolffia – the smallest flowering plant in the world) and at least, 144 rare invertebrates.

The Gwent Levels qualify as Site of Special Scientific Interest (SSSI) on the basis of their rare plants and invertebrate assemblages and as a representative of grazing marsh / reed habitat, with Gwent Wildlife Trusts Magor Marsh having additional significance for its fen vegetation.

The Gwent Levels are important for both submerged plant species associated with open water, such as the hairlike pondweed *Potamogeton trichoides*, and emergent plants such as arrowhead *Sagittaria sagittifolia*. The Gwent Levels SSSIs are particularly important for water beetles and dragonflies found in the reeds.

The Gwent Levels are also well-known for their particular importance for soldier-flies (Stratiomyidae), with further known interest from other fly and beetle groups, moths and snails. Furthermore, our sparse knowledge of invertebrates makes it certain that further interest remains to be discovered – indeed a horsefly apparently new to science and as yet un-named (and thus additional to the total of 144 species known already) has recently been found at Gwent Wildlife Trusts Magor Marsh Nature Reserve, part of the Gwent Levels SSSI series.

Adding further value to this wetland complex is its proximity of the site to the internationally important Severn Estuary Special for Conservation (SAC), Special Protection Area (SPA) and Ramsar Site, as well as the River Usk SAC. The River Usk is designated as a Special Area for Conservation (SAC) under European legislation. The main features of River USK SAC are the river's migratory and resident fish species, including twaite and allis shad, sea, river and brook lamprey, Atlantic salmon and bullhead. Other species features of the SAC are the water crowfoot beds and the European otter which breeds along its banks and hunts for fish in the river and its tributaries – as well as using the Gwent Levels.

The Severn Estuary, as well as being a SAC is also designated as a Ramsar site. The Severn Estuary is of particular importance for migratory fish. The estuary is one of the most important British estuaries for rare species - river lamprey, sea lamprey and twaite shad which are designated features of the SAC.

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These species together with salmon, sea trout, allis shad and the Critically Endangered (IUCN Red List) eel are also a designated feature of the Ramsar Site.

Therefore, as species such as otter and eel use the Gwent Levels, this means that the Gwent Levels are functionally linked to the River Usk and Severn Estuary.

The RSPB and Gwent Wildlife Trust have identified the area as a Futurescape and Living Landscape respectively, meaning that both organisations recognise the significance of the landscape for people and wildlife, and are committed to its protection and enhancement at a landscape scale.

The Gwent Levels SSSIs are vital to the people of south Wales as they provide a range of important ecosystem services. The UK Government's own studies show a benefit to cost ratio of SSSIs overall is almost 9:1. Also, using default figures from the UK National Ecosystem Assessment (NEA), the Gwent Levels SSSIs create £67m pounds worth of 'free' ecosystem services such as flood control and air quality regulation.

However, it has been estimated that around 4000ha of the Gwent Levels have already been lost through industrial, housing and infrastructure development. Information presented in 'The Gwent Levels' (Martin Wragg 1995) showed that to date 50% of the Wentloog Levels had been lost to development as have 30% of the Caldicot Levels.

SSSIs have been selected to ensure a stock of representative biological resources for future and current generations. Therefore, if we are to fulfil our legal requirements to halt the loss of biodiversity by 2020, we cannot afford to lose these sites or suffer deterioration in their quality.

The Lawton Review, National Ecosystem Assessment and Welsh Governments Environmental Act, draft Nature Recovery Plan and emerging Natural Resources Policy emphasise the importance of connected, functioning, landscape-scale ecological networks in sustaining biodiversity, ecosystem services and the communities and economies which depend on them.

We know that currently the Gwent Levels SSSIs are not in 'favourable condition'. Further development can only compound this situation whether it is within or adjacent to the SSSI network. Over time these **cumulative impacts** will lead to further unacceptable losses of invertebrate and plant communities. Should development pressure not cease the Gwent Levels SSSI network will be unable to support its valuable and unique natural history.

This view has been accepted by the Welsh Governments Statutory Nature Conservation advisor. A Countryside Council for Wales (CCW) (now Natural Resources Wales) consultation document entitled '*Towards a Strategy for the Gwent Levels into the Next Millennium*' (1998) included the statement that: ***'It is increasingly apparent that physical development on and around the Gwent Levels has reached the point where there is little or no scope for further land take without an unacceptable erosion of the species interests of the Gwent Levels SSSIs.'***

What SSSIs will the motorway impact

The motorway would directly affect a total of 8kms and 125 hectares of SSSI habitats including grazing marsh and reedbed lost or permanently damaged as well as the loss of 2568m of SSSI reed and 9136m of SSSI field ditch. This is one of the largest losses of SSSI habitat within the UK. This loss will include the following SSSIs:

- Gwent Levels: Redwick and Llandeenny SSSI
- Gwent Levels: Whitson SSSI
- Gwent Levels: Nash and Goldcliff SSSI
- Gwent Levels: St Brides SSSI

- Magor Marsh SSSI

The following sites could be subject to indirect impacts

- Gwent Levels: Magor and Undy SSSI
- Gwlyptiroedd Casnewydd/ Newport Wetlands SSSI
- Gwent Levels: Rumney and Peterstone SSSI

Building a motorway through the middle of the Gwent Levels SSSIs will have a number of significant and long term effects that cannot be adequately mitigated for or compensated. The main three issues include;

- a) **Habitat loss** – the M4 Relief Road will directly take 8kms and 125 ha of SSSI habitat, **this is one of the largest, if not the largest loss, of SSSIs in the UK.**

Habitat loss is probably the greatest threat to the variety of life on this planet today. It is identified as a main threat to 85% of all species described in the IUCN's Red List (those species officially classified as "Threatened" and "Endangered"). **Where a site is lost to development, the nature conservation value of the surrounding area is also diminished, especially if the lost habitat within the site played a critical role in the life cycle of invertebrate species.** The road could therefore have other indirect impacts over a much larger area than the physical footprint of the road.

- b) **Habitat fragmentation** - Adverse effects of habitat fragmentation to both wildlife populations and species include:

- Increased isolation of populations or species, which leads to:
 - i. **Adverse genetic effects;** i.e. inbreeding depression (depressed fertility and fecundity, increased natal mortality) and decreased genetic diversity from genetic drift and bottlenecks;
 - ii. **Increased potential for extirpation of localised populations or extinction** of narrowly distributed species from catastrophic events such as pollution incidents
- Changes habitat vegetative composition, often to weedy and **invasive species** (invasive species are seen as the second biggest threat to biodiversity);
- Changes the type and quality of the food base;
- Changes microclimates by altering temperature and moisture regimes,
- Changes flows of energy and nutrients;
- Changes availability of cover and increased edge effect, bringing together species that might otherwise not interact, potentially increasing rates of predation and competition. Edge effects refer to the changes in population or community structures that occur at the boundary of two habitats. Areas with small habitat fragments exhibit especially pronounced edge effects (such as disturbance, pollution) that may extend throughout the range.

Also, when animals cross roads, mortality is often the result. In fact, road mortality is one of the leading sources of mortality to many wildlife populations. Rates of mortality are closely linked with movement patterns, as more movement generally incurs a greater chance of coming into contact with a road. Animals with large home ranges, such as bats or otters have a high chance of encountering roads as they traverse such large distances. Specific factors that influence mortality can also result in demographic shifts in the population when particular segments of the population are killed. These types of shifts can further exacerbate population declines and threaten population viability. In some populations, the presence of roads has been

identified as a component in the “**extinction vortex**” by amplifying the threats animals already face.

For scarce, weakly dispersing species, fragmentation and isolation can be catastrophic. Invertebrates and plants have low powers of dispersal, therefore the correct balance of habitats must be maintained each year to avoid extinctions. **Fragmentation also means smaller, isolated populations which are more likely to suffer from stochastic events** such as oil spills.

- c) **Habitat degradation** - These interrupt and modify natural processes, altering community structures and population dynamics – this is even more evident in interconnected wetland habitats such as the Gwent Levels designated for their aquatic plant and invertebrates.

Construction and operation of the road will have a profound effect on the **hydrology** of the Gwent Levels which in turn will impact upon the species that rely on it.

Roads can also be a conduit for pollutants into the interconnected drainage system of the Gwent Levels SSSI network. Vehicles emit a variety of pollutants, including heavy metals, carbon dioxide, and carbon monoxide, all of which may have serious cumulative effects on biota associated with the reens. For example,

- Pollution can cause either stunted plant growth or algal blooms both of which adverse impacts on the SSSI
- Pollution can cause changes in ecological community composition through changes in aquatic pH.
- Lead concentrations in tadpoles living near highways can be high enough to cause **physiological and reproductive impairment** in birds and mammals that prey on tadpoles.
- Less is known about the effects of other **heavy metals**, such as zinc, cadmium, and nickel. Motor oil and tires contain zinc and cadmium; motor oil and petrol and diesel can contain nickel. These metals, like lead, have been found to increase with proximity to roads, and with increasing traffic volume and decreasing soil depth. Earthworms have been found to accumulate all these metals, in concentrations high enough to kill earthworm-eating animals. These roadside contaminants can be carried far from roads by wind and water.
- The **debris from tires on the road and de-icing salts** that run off from roads into adjacent ponds can decrease survivorship of wetland animals for example frogs have been shown to have higher **skeletal abnormalities** closer to roads and de-icing salts (saline pollution – introducing salt into freshwater habitats) can alter the behavior of frogs and decrease locomotor performance. This can impact fitness, as they may be less adept at catching prey or eluding predators¹².
- Drainage of salt-laden water from roads into aquatic ecosystems may stimulate growth of blue-green algae.
- Pollution from roads extends beyond just chemicals, as **light and noise pollution** from roads can be detrimental. Noise from cars can impact birds by disrupting acoustic communication and interfering with warning signals, leading to bird population declines in the proximity of roads³.
- When land is cleared for roads, it often facilitates the spread of **invasive species**. Roads can facilitate invasions because these plants face less competition from plants in a newly cleared area.
- hydrological issues such as fluctuations in water level during and following development can have profound effects on invertebrate populations. This is

¹ Reeves, M.K., et al., *Road proximity increases risk of skeletal abnormalities in wood frogs from National Wildlife Refuges in Alaska*. Environmental health perspectives, 2008. **116**(8): p. 1009-1014.

² Denoël, M., et al., *Cumulative effects of road de-icing salt on amphibian behavior*. Aquatic Toxicology, 2010. **99**(2): p. 275-280

³ Rheindt, F.E., *The impact of roads on birds: does song frequency play a role in determining susceptibility to noise pollution?* Journal für Ornithologie, 2003. **144**(3): p. 295-306

especially so when ditches are drained or rapid run off occurs from large impervious surfaces such as roads.

Road building over sensitive ecological habitats leads to a triple jeopardy, at the same time that development reduces the total amount of habitat, squeezing remaining wildlife into smaller and more isolated patches, the high-speed traffic and/or pollution can cause more and more of impacts on the remaining populations – compounding the **extinction vortex**.

It is worth noting that most studies and research on road problems has only ever looked at one ecological impact at a time, be it lead pollution, roadkill, edge effects, or access. In real ecosystems, however, these factors interact in complex ways, with long-term effects at several levels of biological organisation. **In particular, secondary impacts to nature conservation from roads and road transport are on the whole poorly understood.**

SPECIES IMPACTS

The list of affected species is impressive by its sheer volume and their conservation status, including many globally, European and UK protected and/or threatened species, including

- Otter,
- Dormouse,
- Bats,
- Water vole,
- Great crested newt,
- Breeding and over-wintering birds,
- Freshwater and migratory fish including Sea lamprey, River lamprey, Twaite shad, Allis shad, Atlantic salmon, European eel, Sea trout,
- Invertebrates such as the freshwater aquatic invertebrates for which the Gwent Levels has been notified, as well as the Shrillex carder bee and other terrestrial invertebrates.

As mentioned above, many of these species will be impacted both directly and indirectly. The Environmental Statement has not given an adequate evaluation of these impacts or on the mitigation and compensation required. For example;

- **Aquatic Invertebrates** – Buglife, the Invertebrate Conservation Trust has analysed the aquatic survey reports and provided the following comments.

The reports state that the quality of the reems and ditches was lower than expected with lower species richness when compared to other similar habitat, for example the Somerset Levels. Despite this, there are still a number of specialist species found that have particular habitat preferences, including the beetles *Hydrophilus piceus*, *Peltodytes caesus*, *Hydaticustransversalis*, *Agabus conspersus* and the soldierflies *Odontomyia ornata* and *Odontomyia tigrina*. These are species characteristic of grazing marshes and rarely occur outside ditch systems.

A desk based aquatic environmental study was also been carried out. This included data from a considerable number of sources and additional time is required to look at these data sets in detail and understand the impacts of the road on the aquatic invertebrate populations. The assessment identified the Great silver water beetle (*Hydrophilus piceus*) as of interest. This species has been classified as **Near Threatened by the IUCN**. However, it is unclear how the loss of this amount of habitat will affect this species which could easily be tipped into the next threat category of Vulnerable. **We have little understanding across the whole SSSI complex and what impact there will be as a result of the habitat losses.** For example, if the Great silver water beetle is found in the majority of ditches and reens across all of the SSSIs, the loss for the M4 will have much less of an impact than if it is in a small proportion of the ditches to be lost. Invertebrates tend to have specialist habitat requirements and are often found in one small area of suitable habitat. As a result **even small losses of habitat can have disproportionately large impact on a species population.**

The terrestrial invertebrate survey work was inadequate. They identified the areas to be lost to the route as of at least regional importance. This is from only a few visits to the sites during July and August. This misses out the survey months of May, June and September. **Incorporating these months could significantly increase the importance of these sites.** For a meaningful mitigation strategy it is vital to fully understand the rare and endangered invertebrates that are using the site. Without this it is impossible to design an effective mitigation strategy.

As a result the mitigation strategy is inadequate and we are not confident that the impacts of the road would be mitigated and compensated. Of particular issue is the fact that replacement habitat is only at a ratio of 1:1. This is extremely low, particularly for sites of national importance.

- **European Eels** - - the following commentary has been provided by one of Wales leading eel experts, Julian Jones, CEO of Radnorshire Wildlife Trust.

Eels are the only European fish to leave the coast to spawn in the sea, they migrate to their spawning grounds in the Sargasso Sea, off the coast of North America. Travelling eastwards on ocean currents, the returning young change into transparent 'glass eels' as they reach the shallow waters close to the continent, eventually arriving on the Atlantic coast of Europe, after a journey that can take as long as three years. They enter inshore waters as young 'elvers', where they live under rocks, in crevices, or in the mud on the bed of estuaries, coastal lagoons, rivers, lake ponds and the reens of the Gwent Levels.

The Environmental Statement and Statement to Inform an Appropriate Assessment (due to eels being a feature of the Severn Estuary Ramsar site) acknowledge the parlous state of the European eel and the dramatic declines it has faced over the last few decades. However, little acknowledgement is given to the fact that a major reason for this decline has been habitat loss and fragmentation?

The proposals do not take adequate account Severn estuary is effectively used as a main repository for the re-stocking of eels across the EU and EEA. Many EU member states rely upon the eel population of the Severn estuary to successfully meet their obligations under the Eel Management Plans that most member states have to follow.

We know that European Eels are in real trouble and need our help. Therefore, a significant infrastructure development such as a new motorway in one of the most important places for the species needs a greater degree of scrutiny. However, because of the lack of data, **there is an insufficient degree of certainty in relation to the effectiveness of the proposed mitigation measures.** For example, when it comes to the impact of noise during the construction phase, could the temporary damage to eels lead to problems after their escapement from freshwater and eventual return to the Sargasso?

- **Bats** - In the view of the **Bat Conservation Trust** the ES fails to take sufficient account of the impact on the operational phase of the motorway. The ES lacks any assessment of the impact on bats from noise, traffic and lighting. There are accredited published academic studies that show that roads have a negative impact on bats and displace bats (and other wildlife) up to 1.5 kilometres away from where bats forage. The most recent report was undertaken by The University of Leeds as part of a report to Defra⁴.

⁴ Development of a cost-effective method for monitoring the effectiveness of mitigation for bats crossing linear transport infrastructure - WC1060 – which can be accessed [here](#)

The bat surveys have identified less common species and in particular the lesser horseshoe bat for which there were some 68 records from the Magor and Pye Corner areas. This bat is a key species for Wales and it is particularly sensitive to disturbance and therefore greater consideration should be given to the impact of the road scheme on this bat species. We note that in Environmental Statement Volume 3 Appendix 10.7 Bat Survey 20.14, Chapter 4 a recommendation was made for further survey work to establish the location of their roosts, foraging areas and flight paths but we are unable to find any report on this work.

Given the likelihood for displacement of all bats arising from the operation of this new road, and the presence of lesser horseshoes bats close to the proposed route, **BCT would suggest that the ES is deficient in assessing the impact of the operational phase of the scheme on bats, and lesser horseshoe bats in particular.**

A PROSPEROUS WALES

Please see Prof Calvin Jones Proof of Evidence.

Any reading of Sustainable Development or the Well-being of Future Generations Act would be similar to the *This Common Inheritance* (1990) which states that ***economic development should be planned in a way that they do not reduce the environmental capital for future generations***. This can be interpreted as not reducing the nation's non-creatable ecological resources either by destruction or by more indirect means such as various forms of pollution or '*not sacrificing tomorrows prospects for a largely illusory gains today*'. However, as highlighted above, this is not the case.

Many objectors to the 'black route' highlight the economic impact both locally, in South Wales and to the rest of Wales. The Association of British Ports (ABP) object to the black route due to the significant impact the motorway will have on their operations and therefore the economy of South Wales. The Federation of Small Business (FSB) and others highlight that spending billions on a stretch of motorway in South Wales is not the best way to promote economic growth in Wales, in fact it could detractor from other regions in Wales.

In addition, as mentioned above, **the Prosperous Wales goal states that to be sustainable you must act 'on climate change'**. However, as highlighted above, the scheme will increase Wales's greenhouse gases and lock Wales into a carbon intensive future.

The SD Report states that the Scheme would provide greater benefits than its costs, providing good value for money. However, this is based upon Welsh Government figures that the motorway would cost £1.1 billion. It is unclear whether the £1.1 billion cost includes the cost of the compulsory purchase of 650 parcels of land including Gwent Wildlife Trusts Magor Marsh Nature Reserve and Association of British Ports Land. However, this estimate does not include VAT, construction inflation and maintenance of the road which would bring the cost of the motorway to over £2.3 billion. This significantly affects the Welsh Government Cost: Benefit analysis.

All the economic projections regarding benefits to the economy are only little more than conjecture. The current approach to road projects gives excessive weighting to the economic component, in particular journey time saving. This can give misleading representation of the worth of the scheme, differences between schemes or the economic loss of avoiding sites of nature conservation. This approach also allows schemes to be justified on the basis of relatively small time savings even if this involves environmental damage or destruction of resources that many be unique and irreplaceable.

In addition, it has been shown although highway projects are often justified for the sake of economic development, highway capacity expansion now provides little net economic benefit (Boarnet 1997⁵). An

⁵ Marlon Boarnet (1997), Direct and Indirect Economic Effects of Transportation Infrastructure, UCTC (www.uctc.net).

expert review concluded “*The available evidence does not support arguments that new transport investment in general has a major impact on economic growth in a country with an already well-developed infrastructure*” (SACTRA 1997⁶). However, Melo, Graham and Canavan (2012⁷) found a positive relationship between U.S. urban highway expansion and economic output between 1982 and 2009, but conclude **that other types of transportation system improvements could provide greater net benefits.**

The Welsh Governments draft Plan stated that there was “*a perception that traffic congestion is a constraint to economic development in South East Wales*”. We believe that it is essential that the Welsh Government duty on sustainable development must mean that policies and plans are based on evidence not perceptions.

Therefore, due to the above the Road scheme cannot be considered to adhere to the Well-being of Future Generations Act.

⁶ SACTRA (1997), Transport Investment, Transport Intensity and Economic Growth: Interim Report, Standing Committee on Trunk Road Assessment, Dept. of Environment, Transport and Regions (www.roads.detr.gov.uk/roadnetwork/heta/sactra98.htm).

⁷ Patricia C. Melo, Daniel J. Graham and Shane Canavan (2012), “Effects of Road Investments on Economic Output and Induced Travel Demand: Evidence for Urbanized Areas in the United States,” *Transportation Research Record* 2297, Transportation Research Board (www.trb.org), pp. 163-171, <http://pubsindex.trb.org/view.aspx?id=1129323>; at www.esrc.ac.uk/my-esrc/grants/ES.J007382.1/outputs/read/febdcf47-01ff-4c0a-930f-6f4d8e905424.