Future Generations Commissioner for Wales
Comisiynydd Cenedlaethau'r Dyfodol Cymru

Full Proof of Evidence

of the

Future Generations Commissioner for Wales

For the

Public Local Inquiry into the M4 Corridor around Newport

February 2017

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1. Introduction

i. Witness introduction

Sophie Howe – Future Generations Commissioner for Wales

I was appointed as the first Future Generations Commissioner for Wales in February 2016. Prior to this I was the Deputy Police and Crime Commissioner for South Wales, and have served as a Special Adviser to two First Ministers in the Welsh Government (providing advice on communities, local government, regeneration and equality) and a Cardiff County councillor for 9 years. I am also a member of the Wales Committee of the Equality and Human Rights Commission.

The **Well-being of Future Generations (Wales) Act**[1] (2015) came into force on the 1st April 2016 and my statutory role as **Future Generations Commissioner for Wales** is to promote sustainable development by acting as guardian of the ability of future generations to meet their needs and to encourage public bodies, including the Welsh Government, to take greater account of the long term impact of the things that they do.

Large scale infrastructure projects such as the M4 relief road are significant given both the proposed level of expenditure, the need for proposals to balance economic, environmental and social considerations, and also their impact on future generations.

[1] http://gov.wales/topics/people-and-communities/people/future-generations-act/?lang=en

Under the new legislation there is a clear expectation that proposals, including the decision-making process itself, will embed the **five ways of working** and maximise contribution to all of the **seven well-being goals.**

ii. Scope of evidence

I would like to offer evidence, within the framework of the Well-being of Future Generations Act, on the following elements of the public inquiry, building on initial concerns raised with the Cabinet Secretary (in a letter dated 8th June 2016[2]):

- The need for the scheme,
- Potential social and environmental impacts
- The cost and business case

2. Building a new road is not in the best interests of future generations

The proposed scheme is not consistent with Wales' commitment to future generations – building roads is what we have been doing for the last 50 years and is not the solution we should be seeking in 2017 and beyond.

The rationale for a new road was conceived over 25 years ago with the main purpose of addressing congestion in the area. I do not agree with the basic premise that this is the "most sustainable, long-term solution to current social, environmental and economic problems associated with this route". Whilst recognising the congestion issues on this road (which also exist on other roads across south Wales), I believe, and in fact the Well-being of Future Generations Act arguably requires, the Government to explore other ways to address the problem giving greater consideration to the aspirations contained within the National well-being goals, their own well-being objectives and the five sustainable development principles. Consideration of long-term trends, for instance in technology, car usage and working patterns, are particularly important in ensuring that the solution they develop is fit for current and future generations.

2.1 Future trends in transport

According to the Parliamentary Office of Science and Technology there are a number of established and **emerging trends in the transport sector**. An understanding of these trends can be used to make projections into the future which can inform transport policy, including planning decisions and public spending[3]. The trends they have identified include

i. De-carbonisation of transport and emission reduction policies which are driving adoption of several lower emission technologies such as electrification, alternative fuels and more energy-efficient vehicles;
ii. Increased demand for energy and materials globally will lead to increases in the price of certain commodities;
iii. Commuting patterns will continue to change as location of work and need to travel adapts to future demands;
iv. Technology in transport systems and the availability of data through smartphones, GPS devices and digital ticketing can be used to improve the way transport networks are planned.

[2] http://futuregenerations.wales/wp/2016/06/08/sophie-howe-writes-ken-skates-regarding-m4-scheme/
[3] http://researchbriefings.files.parliament.uk/documents/POST-PN-0496/POST-PN-0496.pdf

In addition to these, when looking at transportation trends, and how they will influence how and why we move around – others have identified **six key technologies** converging on the transportation industry[4].

Technology	Impact
Autonomous vehicles	The elderly will regain mobility, traffic congestion will decline, safety and fuel efficiency will improve, on-demand services and deliveries will become commonplace, cities can reclaim public spaces that they currently must devote to parking, drivers will also save hundreds of hours a year.
Connected vehicles	Connections with other vehicles and with infrastructure reduces congestion and vehicle fatalities.
Collaborative Consumption	Millennials own fewer cars than previous generations. We are already seeing "peak car" in some developed countries. Services like Uber and ZipCar enable someone to have what they want (on-demand mobility) without having to purchase what they don't need.
Electric vehicles	An electric drivetrain is more powerful, compact, and efficient than the fossil-fuelled alternative and produces zero local air emissions.
Efficient multimodal network	Where cars integrate into an efficient intermodal public transport network enabling truly integrated transport.
New materials & manufacturing technologies	Such as lightweight carbon fibre with new automotive manufacturing technologies (including 3d printing) will change the way vehicles are designed and assembled to enable higher performance, lighter weight, and novel design.

2.2 How do you build transport infrastructure that's fit for the future?

A recent article for NESTA (an innovation think tank) summarises the challenge well: "*For most of its history, transport has remained largely unchanged, characterised by slow incremental innovation and costly infrastructure. While trying to overcome these issues and cope with increasing stress on the system the industry has largely forgotten the users".* But the transport industry is undergoing a potentially major shift in the way it thinks. We are about to see what happens when 'the unstoppable force of digital innovation meets the immovable force of transport innovation'. Enter the concept of 'Mobility as a Service', or 'Intelligent Mobility'. **Intelligent mobility** sees transport as a user orientated service designed to provide an integrated reactive multimodal service. New technology is partially driving this movement, making it possible to utilise real time information and create a joined up transport service[5].

It is clear that we are in a period where rapid developments are being made in **autonomous vehicles.** This has led to some experts suggesting that children born today will never get to drive a car[6] and their wider roll-out could lead to accommodation of higher traffic volumes and less accidents. Promoting **e-mobility and the shift to electric vehicles** is also on the increase - one out

[4] http://www.forbes.com/sites/valleyvoices/2015/01/26/six-transportation-trends-that-will-change-how-we-move/#4a512c3438fb
[5] http://www.nesta.org.uk/blog/transport-mobility-innovation-transport-sector
[6] https://www.weforum.org/agenda/2017/01/having-a-baby-this-year-a-robotics-expert-thinks-theyll-never-drive-a-car

of five cars sold in Norway is now battery-driven, and the Norwegian government hopes that by 2025 cars with gasoline and diesel engines will not be sold anymore. Financial (and spatial) investment in public transport, cycling and walking infrastructure has led to a modal shift of between 40 and 70% in many cities in the Netherlands[7].

In order to address air pollution issues[8], the largest contributor being traffic, many progressive cities are taking action – Paris, Madrid and Athens are ready to completely ban diesel cars from city streets by 2025, whilst London's mayor has announced the phasing out of diesel buses to be replaced by low-emission hydrogen buses[9] with a further eleven other major cities (including New York, Los Angeles, San Francisco, Amsterdam, Copenhagen and Cape Town) phasing out their procurement of pure diesel buses by the end of 2020.

Future work - more flexible working: experts forecast that it is far more likely that companies will negotiate more flexible hours with their employees in future. This will lead to many people being able to choose their start and finish times for the working day, plus the days they spend at their company office[10]. The advantages of flexible working are undeniable - productivity and efficiency savings, a reduced carbon footprint, and employee wellbeing - for both companies and their workers." Another developing trend is of a 'third space' of office 'hubs' between home and the workplace. As technology advances, experts spot an opportunity for transport and its infrastructure to adapt to meet future flexible working needs.

Traffic modelling should also be a key factor in terms of informing decisions based on future predictions. A report[11] published in 2012 considers recent and current trends in travel behaviour and why neither road traffic levels nor rail patronage were behaving as the forecasting models had predicted. This concluded that Rail passenger numbers have increased more rapidly than envisaged, while the rate of growth in total car traffic had showed signs of slowing some time before the recession and oil price spike of the late 2000s. The report also shows how car ownership is falling for men in their 20's.

The conclusion of a recent FSB report[12] is that while car usage may not have peaked, the rate of growth has slowed down considerably and to an extent where major new roads (and in particular motorways) cease to be justified on current traffic forecasting grounds. The evidence also indicates that impact of road infrastructure on business may not be as great suggested by many.

Capacity relevant to current projections, combined with potential reduction in demand for travel due to changing work patterns, along with modal shift to other modes of transport, risks the proposed M4 scheme being an out-dated solution.

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[7] See Prof. Stuart Cole's Evidence

[8] http://www.eea.europa.eu/highlights/stronger-measures-needed; air pollution poses a serious health risk in many European cities[8]; the European Environment Agency (EEA) says air pollution is the single largest environmental health hazard in Europe, causing around 467,000 premature deaths in Europe in 2013

[9] https://www.london.gov.uk/press-releases/mayoral/sadiq-to-stop-buying-dirtiest-diesel-buses

[10] https://www.transportfocus.org.uk/key-issues/future-of-transport/my-future-life-micro-trends-in-how-well-live/

[11] http://www.racfoundation.org/assets/rac_foundation/content/downloadables/on_the_move-le_vine_&_jones-dec2012.pdf

[12] http://www.fsb.org.uk/docs/default-source/fsb-org-uk/transport-report.pdf?sfvrsn=0

3. The decision making process has not adequately taken into account the five ways of working (SD principle)

The Well-being of Future Generations Act puts in place a **statutory duty to carry out sustainable development** when making decisions. To assess whether the adoption of the (then draft) Plan is the most sustainable solution to traffic congestion and capacity issues on the M4 around Newport, the application of the sustainable development principle (the five ways of working, see Appendix 1 for detail) is intended to help public bodies, in this case the Minister who took the decision to progress the scheme (in 2014), to take better decision when considering potential alternative solutions.

In Welsh Government's Proof of Evidence on Sustainable Development[13] the witness states "*I am satisfied that the actions of the Welsh Government when developing and adopting the Plan for the M4 around Newport were in line with the 5 ways of working now set out in the 2015 Act and hence in accordance with the principle of sustainable development, which was also integral to the subsequent development of the Scheme for delivery of the Plan".*

Whilst the Scheme has been developed in consultation with various interest groups I don't feel this amounts to sufficient **collaboration**, nor that it adequately considers the **long-term**, or has properly applied the principles of **integration** and **involvement**. I am not convinced that the Welsh Government evidence does not adequately reflect the requirements of the Act and I would like to see detailed evidence of how the five ways of working have been applied at the outset of the decision making process rather than being retrofitted to justify a decision already taken.

Within the Proof of Evidence statement, the witness has covered some elements of these principles but not the full interpretation that we would expect, as illustrated below:

Principle (ways of working)	**WG Proof of Evidence**	**Wider interpretation**
Long-term	Refers to the scheme having a design year of 20 years, assessment of flooding issues considers a 100-year period, whilst the economic impact considers a 60 year period. The ES assesses short and long-term environmental impacts	A key issue is the lack of consideration of future trends in technology and automation (see point 2 above) which suggests that this has only been considered after the decision to proceed has been taken. A further consideration should be about how the scheme is helping to address other long-term challenges such as climate change (reducing emissions and impacts). Given that climate change is a key challenge for future generations, and following the passing of its own Environment Act the Welsh Government will be setting, and subsequently operating within, carbon budgets, it is critical to assess all the evidence available to ensure that this would not lead to an increase in total

[13] http://bailey.persona-pi.com/Public-Inquiries/M4-Newport/C%20-%20Core%20Documents/1.%20Proofs/1.23.1%20John%20Davies%20PoE.pdf

		emissions, as suggested by scientists from the Tyndall Centre[14].
Integration	States that the 3 pillars of SD (economic, social, environmental) are integral to the WelTAG assessment process, and to the consideration of alternatives. Also it was concluded that new or improved public transport services would not, of themselves, solve the identified problems associated with the M4.	The Government must be able to demonstrate how the latest thinking on the M4 (which is based on proposals put forward 25 years ago) reflect recent developments in delivering the Metro and electrification of the main rail line particularly in terms of the extent to which these schemes could reduce demand. Has the scheme considered how Community transport (CT) services, which play a vital role in supporting individuals and communities across Wales by offering accessible and inclusive transport for people who don't have access to other forms of transport for a multitude of reasons, could be funded or improved to reduce the need to travel on the M4?
Involvement	Refers to extensive engagement and consultation with relevant stakeholders between 2010-2013.	The Act is seeking a change in the way that citizens (and service users) are involved in public body decision making. It encourages public bodies to move away from the traditional approach of public consultation exercises, to more innovative engagement techniques where ideas and views of citizens, or communities, can inform the development of solutions from the start. Again it doesn't appear that the proposed scheme has allowed this full engagement with the local community; indeed the evidence from Magor with Undy community council demonstrates considerable lack of involvement with local residents as well as local politicians. The wider issue of investing a significant amount of public resources in a scheme which has limited geographical and wider policy benefits has also, as far as I am aware, not been subject to wider public debate and involvement by the Government. We do however welcome the Cabinet Secretary's decision to hold a Public Inquiry so this debate can be held.
Collaboration	Welsh Government has worked closely with other public sector bodies and interested organisations to assess the various	Building on above, there appears to be considerable lack of integration and collaboration with other regional initiatives which are being developed at the same time e.g. Metro. A truly integrated transport

[14] http://www.wtwales.org/news/2015/03/24/m4-relief-road-will-increase-carbon-emissions-say-experts

	options to solve the problems associated with the M4 around Newport. Extensive consultation has been carried out on several different occasions in the course of seeking a solution to these problems. Also refers to Early Contractor Involvement in the procurement process.	system with a clear vision for public transport (rail, bus), walking, cycling and road traffic could be developed for Cardiff capital region along with the current investment in the Cardiff Capital Region City Deal. Evidence to the City Deal Growth & Competitiveness Commission demonstrates how the region functions as a substantially self-contained space but that connectivity between places within its borders is lacking[15]. The report also recognises that the Metro acts as more than simply a transport project and understand how it can act as a catalyst for the city-region. A clear vision for integrated transport along with sustained level of investment, in the Netherlands has led to 40-70% commuters now travelling by methods other than road.
Prevention	Concludes that Welsh Government is investing in order to prevent the existing problems associated with the M4 around Newport from getting worse.	In my view the Government should be able to provide analysis of the consideration they have given to how an integrated transport solution, encompassing projects such the south Wales Metro and other public transport options, and new walking/cycling routes, encourage and support modal shift, encouraging people out of their cars and preventing traffic congestion in this area. I would expect to see an analysis of how the Metro could be developed in a way that prevents or eases congestion along particular pinch-points on the M4? Air pollution is estimated to cost the UK around £16 billion a year (2014 figs), largely through health costs[16], and there is much that could be done through better planning (land use and transport) to prevent this from getting worse.

4. The proposed scheme does not adequately support the seven well-being goals

The Well-being of Future Generations Act puts in place seven well-being goals (Appendix 2) and together they provide a shared vision for public bodies in Wales to work towards.

[15] http://www.cardiffcapitalregioncitydeal.wales/report/growth_&_comp_com_process_web.pdf
[16] http://researchbriefings.parliament.uk/ResearchBriefing/Summary/POST-PN-458

Public bodies across Wales, including Welsh Government, are required to maximise their contribution to all seven goals to ensure we are moving towards becoming a more prosperous, resilient and equal Wales, with healthier, more cohesive communities and a vibrant culture that is globally responsible.

The Sustainable Development (SD) Report[17] published by Welsh Government considers how the proposed scheme aligns to the seven well-being goals, concluding that the "*Scheme is considered to align with the Welsh Government's principles of sustainable development*".

Again within the Welsh Government's Proof of evidence on Sustainable Development[18] the witness states "*I conclude that the Scheme would contribute to the Welsh Government's well-being objectives and hence to achievement of the well-being goals defined in the 2015 Act".*

I disagree with this analysis and do not believe that the evidence sufficiently demonstrates how the scheme will contribute to a more resilient or healthier Wales, supporting cohesive communities or being globally responsible. There is evidence to suggest that the M4 is likely to contribute to inequality as it will not benefit the quarter of mostly poorer households (in the south east of Wales) who do not even have access to a car[19].

The definition of a more Prosperous Wales is quite distinctive, specifying 'an **innovative, productive, low carbon society which recognises the limits of the global environment**, **using resources efficiently and proportionately including acting on climate change'.** It also refers to developing 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**. Again I do not believe that the economic assessments have taken this wider definition into consideration. They also fail to incorporate the Government's own objectives on Green Growth (Well-being Objectives[20] published in November 2016) and I am not clear how the proposals will support their Decarbonisation agenda (as required in the Environment Act).

To support public bodies in using the Act as a framework for better decision making, we have worked with the New Economics Foundation (NEF) to develop a framework which can be used to assess infrastructure projects (using the five ways of working and seven well-being goals). Along with NEF we have has used this framework to assess the proposed M4 relief road, and the key findings conclude that **the Scheme does not appear likely to deliver well-being for future generations in Wales, when considered in relation to the goals and ways of working set out in the Act.** There is insufficient evidence and inadequate analysis of the actual long term impact of the Scheme as proposed, particularly with regards to critical concerns such as:

- Ecological resilience

[17] http://gov.wales/docs/det/report/160310-m4-sustainable-development-report.pdf
[18] http://bailey.persona-pi.com/Public-Inquiries/M4-Newport/C%20-%20Core%20Documents/1.%20Proofs/1.23.1%20John%20Davies%20PoE.pdf
[19] http://poverty.org.uk/w75/index.shtml?2
[20] http://gov.wales/docs/caecd/publications/161104-well-being-a-en.pdf - Support the transition to a low carbon and climate resilient society; Foster conditions for sustainable economic development and employment, whilst stimulating innovation and growth for a modern low carbon economy

- Sustainable and appropriate economic growth (in line with the definition of a "Prosperous Wales" in the Act, given above)
- Infrastructure that supports improved public health
- Proportionate and responsible resource use
- Wales' ecological footprint and carbon emissions

In their view, the potential risks and harms of the Scheme have been understated, while the potential benefits are both narrower than the Act demands and are unlikely to be progressively distributed (see Report for full analysis[21]).

The Sustainable Development Proof of Evidence specifically refers to how the proposed Scheme supports three of the Welsh Government's 14 well-being objectives, however the analysis undertaken with NEF does not entirely support this view as illustrated below:

a) Objective 4: Improve prosperity for all across Wales, helping people into employment and sustaining jobs

The proposals fail to achieve this because:

- There is little evidence provided to support the argument that improved connectivity, where there is already reasonable provision, can resolve the economic difficulties currently facing Wales[22]
- The Scheme's Economic Appraisal Report forecasts economic growth (Gross Domestic Product) that will result from improved connectivity by lowering the costs of commuting and thus widening the potential pool of workers for employers. This theoretical argument can only be substantiated when you are connecting potential workers to existing or potential jobs, and not when there is a more general problem of a lack of available jobs in the area[23]
    - The route will not be opening up new employment opportunities, for example bringing new business parks. Rather, the employment sites that it connects to in South Wales are already accessible through the existing M4.
    - Of the estimated employment, 700 jobs per month over the course of construction, it is unclear how many of these are additional as a result of the Scheme, and how many are diffused through the supply chain

- Infrastructure projects can support local economies by sourcing their materials locally. Government spending generates demand for local businesses, who can increase the local economic multiplier through increased local employment and local supply chains.

[21] NEF Report - This report provides a high level interpretation of the Scheme in relation to the Well-being of Future Generations (Wales) Act. It highlights areas where the traditional approach to infrastructure projects could better support the well-being of future generations, and provide a useful example of how the Well-being of Future Generations (Wales) Act could be applied in practice.

[22] Jones, C. (2016). In the matter of: Public Local Inquiry into the M4 relief road around Newport, Section B.

[23] See New Economics Foundation (2013), *Towards a Welsh industrial strategy*

- Previous Welsh infrastructure schemes such as the ARBED Grant have successfully addressed building into programmes an intention to generate local economic impact.[24] The Scheme should be able to clearly articulate how it could support skills and jobs development in the Newport area, and work with Wales based suppliers to increase the economic impact of this Scheme for the Welsh economy.
- The Scheme's Sustainable Development Report states: *"[the] project team has also expressed a commitment to local procurement policies where possible and appropriate, with opportunities considered on a case by case basis."* [25]
- The Scheme's commitment to local procurement is contingent upon the capacity of the local market to respond to this opportunity. It has been recognised that currently Wales does not have enough large 'Tier 1' contractors to bid for the Scheme's most valuable construction or design lots.[26] Without a planned intervention to develop this market, it is likely that much of the Government's approximate £1bn of construction spending on the Scheme will leak out of Wales and fail to stimulate the local economy.

b) Objective 7: Connect communities through sustainable and resilient infrastructure

- The Scheme has failed to show how it will support communities with opportunities for residents to connect with each other.
- The Scheme will disrupt existing relations by demolishing houses and commercial buildings and replacing land in community use. It is unclear where replacement land will be, and whether it will offer the same or better opportunities for community life.
- The demolition and re-location of public life will be very disempowering for local communities, with whom, it appears, the Scheme has failed to adequately engage thus far.

c) Objective 10: Foster conditions for sustainable economic development and employment, whilst stimulating innovation and growth for a modern low carbon economy

- The Scheme fails to support low carbon economic growth in Wales. It actively discourages people from low carbon lifestyles which, in transport terms, mean active and public transport. It is widely accepted that increasing supply in transport induces demand: where it becomes easier to drive, people are more likely to drive. [27] The Downs-Thomson paradox suggests that when investment/improvements make roads/private travel more appealing, demand for public transport falls and the quality/frequency of services then falls.[28]

[24] See http://gov.wales/topics/environmentcountryside/energy/efficiency/warm-homes/?lang=en
[25] See Welsh Government (2016). *M4 Corridor around Newport: Sustainable Development Report,* section 4.2.21.
[26] See Written Representation by Professor Calvin Jones (2016), *In the matter of: Public Local Inquiry into the M4 relief road around Newport,* Section F.
[27] See Preston, J. (2014). Moving Forwards: Improving Strategic Transport Planning in Wales. Public Policy Institute for Wales, page 18
[28] See Preston, J. (2014). Moving Forwards: Improving Strategic Transport Planning in Wales. Public Policy Institute for Wales, page 5

- The Government's Sustainable Development Report sets out environmental objectives for the Scheme, including to: *"Reduce greenhouse gas emissions per vehicle and/or person kilometre."* [29]
    - A focus on reducing emissions per kilometre ignores the overall effect of increasing the amount of journeys that people take. To meet the Government's target is to reduce the size of Wales' ecological footprint by 2050, the overall volume of journeys need to be reduced. [30]
    - Reference should be made to *The Wales Transport Strategy* which has the following outcome *"Greenhouse gas emissions – Reduce the impact of transport on greenhouse gas emissions"*[31]
- The Scheme's Economic Appraisal Report claims an unsubstantiated £4,431,000 of monetised greenhouse gas benefits.[32] The report fails to provide an explanation of how this figure is derived, or where these benefits accrue. The Scheme should detail the net benefits, taking into consideration the volume of materials needed for the Scheme and their embedded carbon, and the probability of increasing demand for car journeys. [33]

Finally, the Welsh Transport Planning Appraisal Guidance and its sustainability objectives were developed in 2008 – and whilst it considers social, economic and environmental issues it doesn't appear to have been updated to reflect the current thinking that went into the Well-being of Future Generations Act such as wider impacts on health, culture and communities.

5. I believe there are alternative ways to spend £1bn that will have greater benefits for future generations

Following on from point (2) there is little evidence within the Sustainable Development report[34] of whether there has been a comprehensive consideration of alternative options to addressing the congestion problems such as introducing new technology to better control traffic flows, investing in more integrated public transport solutions alongside the M4 corridor to reduce demand at peak times. Although I understand that the scope of the Public Inquiry is focussed on the scheme and regulations, and alternative road schemes, it is my view that in meeting the Well-being of Future Generations Act there is an expectation that the Government should be able to demonstrate comprehensive consideration of alternative schemes which would have a greater impact on meeting the National well-being goals and their own well-being objectives.

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[29] See Welsh Government (2016). *M4 Corridor around Newport: Sustainable Development Report,* section 3.3.3
[30] See http://www.oneplanetcouncil.org.uk/welsh-government-confirms-commitment-to-ecological-footprinting/
[31] See Welsh Government (2016), *M4 Corridor around Newport, Revised Traffic Forecasting Report,* section 1.3.5
[32] See Economic Appraisal Report, Table 8.3
[33] The disclaim noted on the analysis table fails to clarify how this figure is determined *"Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions."* (Economic Appraisal Report, Appendix B, 1.3)
[34] http://gov.wales/docs/det/report/160310-m4-sustainable-development-report.pdf

I believe that using the Welsh Government's borrowing powers to finance one scheme that will, at best, result in geographically, economically and socially disproportionate benefits to one part of Wales is ill conceived. In 2009 it was stated that the scheme was not affordable, whilst by 2013 it had been deemed affordable due to changes in Borrowing powers. Whilst decisions on investment are a matter for politicians, the legislation requires me to be an advocate for future generation.

5.1 What are the alternatives?

If the Well-being of Future Generations Act is used as a lens to stimulate thinking about alternative ways to invest £1.1bn, that would result in far greater benefits to the well-being of future generations, the following range of ideas was generated:

Transport-based package of alternatives:

Evidence of a **strategic, long-term vision for sustainable integrated transport system** for south east Wales appears to be lacking. The most successful national transport plans are those that are integrated with other areas of planning - for example, the Netherlands is seen as having the clearest integration of transport, land-use and environmental policy and planning[35]. Copenhagen's comprehensively tendered bus system, integrated public transport system and transit oriented development, where over 50% of the population cycle to work every day, might also be beneficially replicated in the Cardiff City Region[36].

I believe that Welsh Government could develop a package of transport-based solutions to address the issue of congestion on the M4 including:

- Better use of technology to control traffic flows (especially at peak times) and improving / remodelling junctions,
- Large scale investment in public transport including the Metro;
- Better integration between rail and bus services including integrated ticketing;
- Encouraging local traffic (approx. 40% of total) to use other roads or local public transport;
- Create park-and-ride facilities on the outskirts of the city;
- Development of a tram route to cross Cardiff and Newport.

Friends of the Earth Cymru has proposed that a package of measures including public transport improvements, marketing of active travel and sustainable transport, electrification of mainline plus the Metro and partial closure of the junction leading to/from the Brynglas tunnels – together could **reduce traffic by as much as 22%**[37]. The Welsh Government's public transport assessment demonstrated that up to 3% traffic reductions could be realized on the M4 around Newport with a set of public transport improvement measures with a capital cost of £300 million[38]. Given that around 40% of M4 traffic is due to 'local journeys' there is a clear rationale to focus on measures which will encourage these journeys to be made on alternative local routes or public transport to reduce traffic levels even further.

[35] http://ppiw.org.uk/files/2014/11/Approaches-to-strategic-transport-planning.pdf
[36] http://www.c40.org/case_studies/city-of-cyclists-reduces-approximately-90000-tons-of-co2-emissions-per-year-and-has-over-50-of-the-citys-population-cycling-to-work-everyday
[37] http://foe.cymru/sites/default/files/Submission%20to%20the%20Public%20Inquiry.pdf
[38] http://www.m4cem.com/downloads/reports/Issue%20Public%20Transport%20Overview%2012.03.12%20revised.pdf

As outlined in Professor Stuart Cole's evidence[39] an integrated approach to public transport (trams, buses and trains) along with a connected network of cycleways and footways in the urban areas of the Netherlands urban areas has resulted in between 40 - 70% of commuters travelling by those modes.

The lack of inclusion of 'softer' measures to influence people's travel behaviours seems to be missing from the assessment/evidence on the M4 proposal. Research commissioned by the Department for Transport on "smarter choices" examined the impact and effectiveness of 'soft' transport measures[40] and showed that there has been growing interest in their role within transport policy initiatives. They are aimed at helping people to choose to reduce their car use while enhancing the attractiveness of alternatives, and include:

- Workplace and school travel plans;
- Personalised travel planning, travel awareness campaigns, and public transport information and marketing;
- Car clubs and car sharing schemes;
- Teleworking, teleconferencing and home shopping.

Following this review, they concluded that "sufficient evidence now exists to have confidence that soft factor interventions can have a significant effect on individual travel choices." For example, workplace travel plans can typically reduce commuter car driving by between 10% and 30%.

I understand that work to identify a wide range of potential measures including public transport improvements was developed between 2010-2012 as part of the M4 Corridor Enhancement Measures Programme (M4CEM). These were appraised using WelTAG guidance and criteria, and as a result of this process a number of these public transport alternatives and wider measures were disregarded. As already mentioned although these consider social, economic and environmental issues they don't sufficiently reflect the current thinking that went into the Well-being of Future Generations Act such as wider impacts on health, culture and communities. If these were re-assessed using wider criteria it is possible that they would have been considered more favourably.

5.2 Benefits of integrated sustainable transport

Social	**Environmental**	**Economic**	**Cultural**
25% of Welsh families have no car. Designing services to be accessible only by car excludes some of the most vulnerable people in society. Investment in public transport, as opposed to road transport, will have	Displacing car journeys has a major impact on climate changing emissions. Passenger cars account for more than half of all CO_2 emissions from the road transport sector. Reducing traffic would reduce	Improved productivity of workers with faster journeys and greater mobility; with potential to create new economic and job opportunities. Public transport will benefit those on low income to find work. Evidence nationally	Providing wider access and participation to sports and cultural activities, especially for those without access to a car (23-29% households in south wales area)

[39] Professor Stuart Cole's Evidence to the M4 Public Inquiry

[40] http://webarchive.nationalarchives.gov.uk/20100304134509/http://dft.gov.uk/pgr/sustainable/smarterchoices/ctwwt

greater social benefits especially for those on low income as transport is a key enabling service that allow them access to work[41]. Benefits to health from active travel and better air quality - people who walk and cycle on a regular basis are healthier, more productive and take less time off work.	emissions and carbon footprint, contributing to Welsh Government's Decarbonisation programme and climate change targets, and improved air quality.	and internationally is clear that new road building is just as likely to drain jobs away from a local economy as it is to attract them. High quality transport infrastructure is not a "magic bullet" cure for deeply rooted economic and social problems[42].	

The New Economics Foundation (NEF) considered how the £33bn committed by UK Government to the high speed rail (HS2) project could be spent on alternative options to achieve greater benefits due to Department for Transport failing to explore alternatives. They concluded that other investments could outstrip HS2 on value for money and perform better against the scheme's objectives. They came up with a total of 88 costed investments under the categories below, showing that it's possible to spread the capital across many diverse projects to reap much wider economic, social and environmental dividends[43].

Alternative	**Cost (£bn)**
Major upgrades to the East Coast and West Coast Mainlines	10
Regional rail enhancements to improve rail connections between towns and cities	10
Mass transit projects and bus network funding and introducing smart integrated ticketing systems	6
Cycling and walking infrastructure to support active transport	2
Super-fast broadband rollout to boost growth and reduce demand for business travel	5.5
Total cost	£33.5 bn

I would expect to see a similar analysis being undertaken by the Welsh Government in order to identify all potential sustainable solutions for the M4 congestion.

Leadership

Cities across the world are taking action to invest in low carbon, public and non-motorized transportation which also contributes to significant co-benefits[44], such as improved productivity of workers with faster journeys and greater mobility; and improved air local quality, which has positive impacts on citizens' health. By investing in or creating incentives for new transportation

[41] https://www.bevanfoundation.org/commentary/public-transport-will-drive-growth-not-roads/
[42] Prof. John Whitelegg's Evidence to the M4 Public Inquiry on the economic case
[43] http://neweconomics.org/2013/06/high-speed-2-the-best-we-can-do/?sf_action=get_results&_sf_s=HS2&_sft_latest=research
[44] http://www.c40.org/blog_posts/spotlight-on-the-c40-transportation-initiative

systems, cities also create new economic and job opportunities. By setting out clearly the obligations on public bodies to consider the social, environmental, economic and cultural well-being of Wales in their decision making process, and the aspirations contained within the national well-being goals, I consider that the Well-being of Future Generations Act creates an expectation that the Welsh Government should be working towards the creation of a low carbon transport strategy that matches the aspirations in leading cities and states across the world.

Some examples of transportation actions in C40 Cities[45] globally (as already mentioned in Section 2 under future trends) include:

- **New transportation infrastructure**: such as bus rapid transit corridors in Bogota, Buenos Aires and Jakarta; and bike sharing programs in Changwon, Mexico City, London, Paris, New York, Washington DC
- **Demand management measures**: including congestion pricing in London, Singapore, Milan and Stockholm; parking policies in San Francisco; and successful information campaigns used in the London 2012 Games
- **Cleaner vehicle programs**: including the Hybrid Electric Bus Test programme in Bogota, Rio de Janeiro, Sao Paulo, and Santiago de Chile; Autolib, the electric car sharing program in Paris; and electric taxi programs in Amsterdam and Bogota

Wider benefits of this approach:

What	Ambition / achievement	Social	Environmental	Economic	Cultural
Integrated public transport in Zurich, Switzerland	Aim is to reduce CO_2 emissions per person to 1 tonne by 2050	Approach to integrated land use and transport planning has led to Zurich being ranked amongst the top cities in the world for quality of life	6th greenest city in Europe - emissions amongst the lowest in Europe at 5 tonnes per person	Integrated public transport makes Zurich an attractive city for business, reducing air pollution and saving on health spending	Wider benefits from access to cultural opportunities, and also tourism
City of Oulu, Finland - 613km network of paths	17km of bicycle paths built per year since the 1980's	Cycling rates have increased to an average of 22% throughout the year; increased life expectancy and improved	32% reduction in carbon emissions from 2010-2015	Cycling infrastructure, maintenance and promotion supports quick, low cost commuting, avoiding congestion costs and provides	Providing greater access to tourism and cultural opportunities

[45] C40 Cities is a network of the world's megacities taking action on climate change

		health (resulting in savings to NHS)		tourist attraction	
Electric vehicles, Norway	22% of all new cars sold are Electric Vehicles	EV owners give their cars a 90% satisfaction rating; with behavioural spillover resulting in owners becoming more energy conscious. 6600 public charging points across the country	29% reduction in CO_2 from new cars, 2010-2015. Target to reduce by 50% by 2030	EV incentives have resulted in a price drop of nearly of nearly 60% since 2008; lower operating costs (eg free toll roads)	Despite large and sparsely populated rural area, and very cold winters, infrastructure and incentives developed in a way to support people to switch to EV

5.3 Wider Alternatives

Whilst the proposed spending is specifically related to addressing a transportation problem and there is clearly an expectation that the solution to this problem should be the most sustainable taking into account the various aspirations and obligations within the Act there is arguably a bigger question of intergenerational equity at stake.

The scheme proposes to use all available borrowing capacity and the burden of repayment will be met by future generations. Whilst decisions on investment are a matter for politicians, the legislation requires me to be an advocate for future generations. With this in mind an expectation that the Government should set out clearly how this investment will maximise the benefit across the social, economic, environmental and cultural well-being of Wales for current and future generations would not be unreasonable.

I would expect that in allocating this substantial investment the Government should demonstrate that their proposal is the most sustainable solution in the long term and that it is the most effective way of maximising the contribution to tackling long term intergenerational challenges such as climate change and the shift to a low carbon economy, poverty and ill health. It is my view that the case has not been made.

6. Conclusions

My legal duty as Future Generations Commissioner for Wales is to promote sustainable development and act as guardian of future generations. The Well-being of Future Generations (Wales) Act came into force in April 2015 and any new decisions about the scheme need to demonstrate how they have complied with the Act.

I do not believe that the proposed scheme appropriately applies the principle of taking decisions in a way which meets today's need without compromising the ability of future generations to meet their own needs. It does not adequately take into account future trends, it is not a good example of how the five ways of working (sustainable development principle) should be applied and the case for investing in this scheme from the perspective of future generations has not been made.

7. APPENDICES

Appendix 1: Five Ways of Working

The Act puts in place a 'sustainable development principle' which tells organisations how to go about meeting their duty under the Act.

Taking a long term view: The importance of balancing short-term needs with the need to safeguard the ability to also meet long-term needs. We need to build insight as to what the future might look like if we achieve the goals, or fail to tackle the biggest threats, to help public bodies to plan for the future.

Prevention: How acting to prevent problems occurring or getting worse may help public bodies meet their objectives. Ensuring progress is made on the concepts of prevention and early intervention to improve the lives of citizens, and to help public services manage challenges now and in the future.

Taking an integrated approach: Considering how the public body's well-being objectives may impact upon each of the well-being goals, on their other objectives, or on the objectives of other public bodies. When one organisation or department takes a decision, there is a knock on impact for another; public bodies must work together to understand their collective contribution to all seven of the well-being goals, avoiding the temptation to simply focus on one or two.

Collaboration: Acting in collaboration with any other person (or different parts of the body itself) that could help the body to meet its well-being objectives. We need to create a better understanding of what true partnership looks and feels like, along with breaking down barriers and building understanding of the benefits.

Involvement: The importance of involving people with an interest in achieving the well-being goals, and ensuring that those people reflect the diversity of the area which the body serves. I firmly believe real and meaningful dialogue between communities, individuals and their public services is crucial if we are to meet the needs of the current generation, without compromising the ability of future generations to meet their needs.

Appendix 2: Well-being Goals

Goal	Description of the goal
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**.
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).**
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.
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).
A Wales of cohesive communities	**Attractive, viable, safe and well-connected communities**.
A Wales of vibrant culture and thriving Welsh language	Promotes and protects **culture, heritage** and the **Welsh language,** and which encourages people to **participate in the arts, and sports and recreation**.
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 wellbeing.**