



Alternative transport options for South Wales

**An options re-appraisal in light of the
Well-being of Future Generations
(Wales) Act 2015**



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Contents

Contents.....	3
1. Introduction	4
Research questions.....	4
2. The previous appraisal.....	6
Issues with the 2013 and 2014 appraisals	8
3. Appraisal in light of the FGWA	9
4. The Black Route’s performance against FGWA criteria	12
Performance on well-being criteria: Local well-being objectives.....	12
Performance on well-being criteria: Impact on inequality.....	13
Performance on well-being criteria: Mental health.....	16
5. Conclusions.....	17
References	18

1. Introduction

Alternative approaches to enhancing the transport system of South Wales have been the subject of ongoing debate for over 20 years. The last round of strategic appraisal of alternatives concluded in 2014 (M4CAN) and followed the Welsh Government's official transport appraisal guidance at the time (WelTAG, 2008). It has since been clear that the Welsh Government's favoured option is a new motorway bypass around Newport following what has been termed "the Black Route".

In 2015 the Welsh Government passed the Well-being of Future Generations (Wales) Act (FGWA). Subsequently the formal guidelines for appraisal of transport projects in Wales have been updated to reflect the FGWA (WelTAG, 2017). The new guidelines emphasise:

"It [the revised WelTAG framework] has been developed by the Welsh Government to ensure that public funds are invested in a way that ensures they maximise contribution to the well-being of Wales, as set out in the Well-being of Future Generations (Wales) Act 2015 and to deliver the Act's vision of the Wales we want: a more prosperous Wales, a resilient Wales, which supports healthy, functioning ecosystems and recognises the limits of the global environment, a healthier Wales, a more equal Wales, a Wales of more cohesive communities, a Wales of Vibrant culture and a globally responsible Wales." (WelTAG, 2017)

The Black Route is significant both in terms of its potential impact on the future generations of Wales (as demonstrated in the [evidences](#) submitted to the Government inquiry that concluded in 2018) and its cost (potentially rising to £1.4 billion). Questions have arisen regarding the compatibility of the previous options appraisal process with the FGWA and the extent to which the chosen option (the Black Route) meets the revised appraisal requirements set out in the 2017 Welsh Transport Appraisal Guidance (WelTAG).

The Future Generations Commissioner for Wales commissioned research to consider alternatives to the Welsh Government's M4 proposals, and evidence how £1.4 billion could be spent on a combination of measures such as road improvements, improved public transport infrastructure and active travel. This report is one of three reports commissioned from NEFC, the University of West England (UWE) and Sustrans addressing different aspects of this research.

Research questions

This paper addresses the following research questions:

- To what extent was the well-being of future generations taken into account in the last round of options appraisal for South Wales?
- What additional assessment criteria might reasonably be required of a transport appraisal to comply with the FGWA?

- What would have been the outcome of applying FGWA assessment criteria to an appraisal of the Black Route and a public transport alternative?
- Are there reasonable grounds for a review and re-appraisal of the proposed scheme in light of the FGWA?

2. The previous appraisal

In 2014 (M4CAN) the Black Route was awarded a set of scores against WelTAG criteria and appraised against a set of alternative motorway routes (the blue routes). The scores awarded to the Black Route and to the best performing variant of the blue route are shown in **Table 1**. The Black Route was subsequently selected as the preferential route by the Welsh Government.

Also shown in **Table 1** are the scores awarded in 2013 (M4CEM) to a public transport alternative. While the public transport option cannot be considered a directly comparable investment to the Blue and Black Routes as it cost only £330 million, it should be noted that it was awarded the same score (assuming equal weighting of criteria) as the Black Route in 2014. The reason given for the dismissal of the public transport alternative were:

“Studies have shown that new or improved public transport services would only have minimal impact in terms of reducing traffic on the M4. Investment in public transport measures is more likely to be aimed at achieving wider benefits to the region than relieving motorway traffic. The studies indicate that for the Newport area, an approximate 50% increase in the use of public transport, with an increased mode-share to approximately 11% (compared to a present day mode share of around 7%) is likely to achieve a reduction of less than 3% of traffic volumes on M4 sections between J23 and J29. [...]

On the basis of the appraisal, public transport enhancement measures are not considered a reasonable alternative to the draft Plan. The draft Plan is cognisant of potential future public transport enhancement measures and these are considered complementary to a motorway solution. The public transport enhancement measures are being progressed separately by a group set up by the Welsh Government to examine proposals for a Cardiff Capital Region Metro system” (M4CEM, 2013)

In summary, the public transport option was dismissed for its poor performance reducing traffic congestion on the M4 between junctions 23 and 29. In appraisal terms, we might interpret this as a decision to weight the criteria representing the benefits of congestion reduction (Transport Economic Efficiency) more highly than other criteria.

Given that the overall scores attributed to the public transport option and the Black Route are equal, but the Black Route’s score on the Transport Economic Efficiency (TEE) criterion (+++) is significantly better than that of the public transport option (-), any preferential weighting of TEE would deliver the Black Route as the preferred option.



Table 1: Scores awarded on WelTAG criteria to the Black Route and to a public transport alternative.

("+++” = Large Beneficial, “++” = Moderate Beneficial, “+” = Slight Beneficial, “N” = Neutral, “-” = Slight Adverse, “--” = Moderate Adverse, “---” = Large Adverse). Below, scores awarded during indicative reappraisal (including highlighted cells where scores have been modified).

	Transport Economic Efficiency (TEE)	Economic Activity and Location Impact (EALI)	Noise	Local Air Quality	Greenhouse Gas Emissions	Landscape and Townscape	Biodiversity	Heritage	Water Environment	Soils	Transport Safety	Personal security	Permeability	Physical fitness	Social Inclusion	Equality, Diversity & Human Rights
Draft plan: Black Route (M4CAN, 2014)	++	++	+	++	+	--	--	--	--	--	+++	+	+	+	+	+
Public transport option (M4CEM, 2013)	-	+	+	+	+	N	-	N	-	N	+	N	+	+	++	N
Blue route scenario 2 (M4CAN, 2014) for reference	--	+	N	N	N	--	-	--	--	-	+	+	+	N	N	-
Re-appraisal scores																
Black Route revised scoring	+++	+++	+	++	---	---	---	--	--	--	+++	+	+	+	+	+
Alternative transport package (see UWE and Sustrans, 2018)	-	+	+	++	++	N	-	N	-	N	+	N	+	+++	+++	N

Issues with the 2013 and 2014 appraisals

Our review of the options appraisal processes conducted in 2013 and 2014 identified a number of issues and inconsistencies that provide reasonable cause for a review and re-appraisal. First on the general approach:

- The public transport option analysed in 2013 did not represent a comprehensive alternative transport package, elements necessary to develop an efficient integrated public and active transport system were absent. Representing an investment of only £330 million, the public transport option appraised in 2013 significantly underestimated the benefits which might be delivered had an investment equivalent to the Black Route (£1.1-1.4 billion) been designed. As part of this research, the University of West England and Sustrans have set out a comprehensive alternative transport package that represents a more comparable investment.
- Neither the public transport option nor the Black Route were scored against criteria that align to the seven well-being goals set out in the Well-being of Future Generations (Wales) Act 2015, nor were they measured against indicators aligned with the Government's 46 national indicators of well-being. In section 3 we discuss this in greater detail and suggest FGWA consistent assessment criteria.

On the scores attributed to individual criteria of relevance to the FGWA:

- The Black Route and the public transport option were given equal scores for their contribution to the physical fitness of the public, despite the Black Route increasing motorway traffic by close to 50% and causing mode shift towards the car and the public transport option encouraging forms of active transport.
- The Black Route and the public transport option were given equal scores (+) for their contribution to climate change mitigation. This is despite the Black Route resulting in an emission of more than 500,000 tonnes of Carbon Dioxide Equivalents during construction. These emissions would not be removed from the atmosphere until at least 2072. The Black Route would make a net contribution to UK emissions in 2030 (456,000 CO₂e additional tonnes) and 2050 (197,000 CO₂e additional tonnes) our national target points, and as such it is incorrect to allocate a score of "slight beneficial" impact. While a precise figure is difficult to estimate for the public transport alternative, it is reasonable to assume that a scheme could be designed which would offer a net reduction in emissions at both national target points.



3. Appraisal in light of the FGWA

Welsh Transport Appraisal Guidance (2017) specifies the following action by the end of stage two:

“Determine whether there are any transport options that can address the issues identified, contributes positively to the well-being goals and objectives, and can be delivered within technical and financial constraints”

A review of the previous appraisal process, the FGWA, the national indicators of well-being, WelTAG 2017 (revised to incorporate the FGWA), and the Future Generations Framework for Projects published by the Office of the Future Generations Commissioner has been conducted as part of this research. A number of assessment criteria have been identified which explicitly address well-being policy but were not included in the 2013/2014 appraisal process, these are shown in **Table 2**.

The transport options were re-appraised using a revised set of FGWA-compatible appraisal criteria. Modifications to the scores awarded to the 2013 and 2014 criteria are highlighted in grey in **Table 1**. Scores awarded to the additional criteria are shown in **Table 3**. **Figure 1** summarises the overall performance of the two schemes on a variety of criteria subsets. These scores should be taken as indicative prior to undertaking a full WelTAG 2017-compliant analysis.

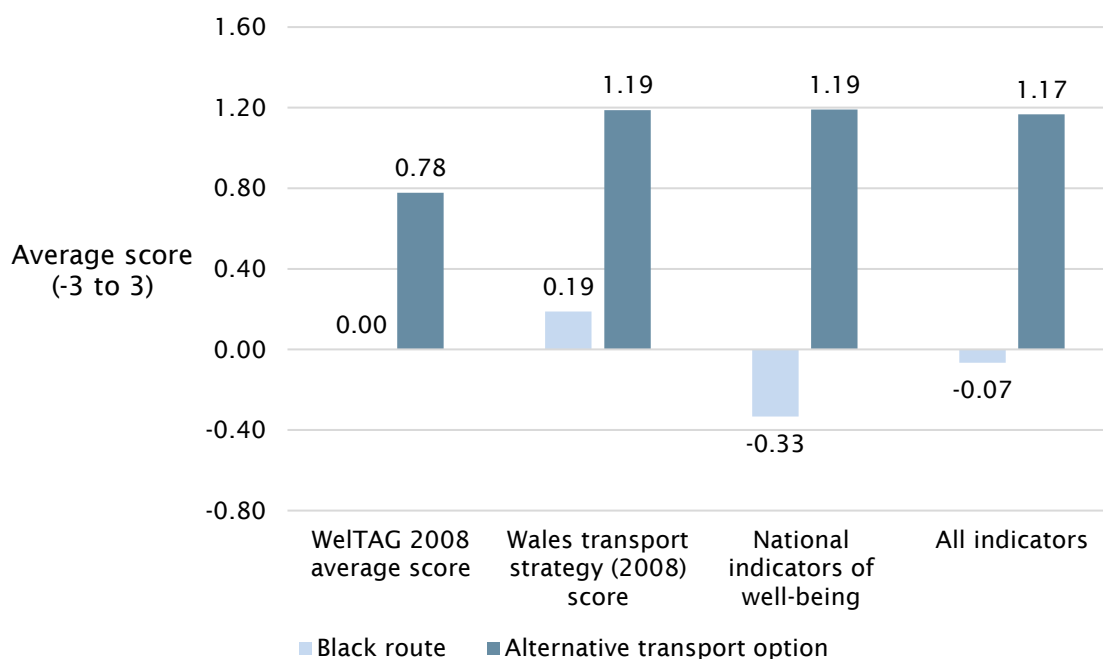
Table 2: Criteria cited by well-being policy but not included in the 2013 and 2014 appraisal processes

Primary criteria		
Criteria	Background	National indicator no.
Health and resilient ecosystems	The FGWA explicitly distinguishes biodiversity (captured in 2008 WelTAG criteria) and “healthy functioning ecosystems that support social, economic and ecological resilience”	43
Climate Change Adaptation	The FGWA cites climate change adaptation in its description of a resilient Wales	31 (hazards) 32 (floods)
Compatibility with local well-being objectives	WelTAG (2017) stage one and two explicitly cite local well-being objectives as a criteria against which a project’s strategic case should be judged	
Implications for public mental health and well-being	The FGWA explicitly distinguishes physical well-being (captured in 2008 WelTAG criteria) and mental well-being	29
Implications for socioeconomic inequality	2008 WelTAG criteria on social inclusion and inequality link to the equality impact assessment, this assesses equality primarily on grounds of race, disability, and gender. The FGWA is explicit in including grounds of “socioeconomic background and circumstances” which are not currently articulated and mandate a criteria of their own.	18
Provision of access to training and education	The FGWA explicitly targets a skilled and well-educated population under its goal for a prosperous Wales	8 (education levels) 22 (people in education / training)
Provision and access to sport, art, and recreation	The FGWA explicitly targets “people to participate in arts, and sports and recreation”	35 (arts, culture) 38 (sport)
Secondary criteria (potentially functioning as sub-criteria under WelTAG 2008 criteria or those above)		
Support for local economy and innovation	The FGWA targets “allowing people to take advantage of the wealth generated”. The WelTAG 2008 scoring mechanism packages local benefits with wider external benefits. These should be disaggregated for clarity.	Cross-cutting
Accessibility of the natural environment	The FGWA targets well-connected communities. Access to the natural environment also underpins mental health and well-being, as well as sense of place and belonging.	Cross-cutting
Access to services and amenities	The FGWA targets well-connected communities	24
Provision and access to jobs for local people	The FGWA targets well-connected communities and generates employment opportunities	16 (contracts) 21 (employment)
Impact on features of cultural heritage and sense of place/belonging	The packaging of ‘heritage’ under WelTAG 2008 criteria involves an unclear divide between “landscape” and “heritage” and under recognition of issues of belonging and sense of place	26 (satisfaction) 27 (belonging)

Table 3: Indicative scoring on additional criteria derived from the FGWA

Primary criteria		
Criteria	Black Route	Alternative transport package
Health and resilient ecosystems	-	N
Climate Change Adaptation	-	+
Compatibility with local well-being objectives	---	+++
Implications for public mental health and well-being	N	+++
Implications for socioeconomic inequality	--	++
Provision of and access to training and education	+	++
Provision and access to sport, art, and recreation	+	+++
Secondary criteria (potentially functioning as sub-criteria under WelTAG 2008 criteria or those above)		
Support for local economy and innovation	+	+
Accessibility of the natural environment	N	++
Access to services and amenities	+	++
Provision and access to jobs for local people	++	+
Impact on features of cultural heritage and sense of place/belonging	-	+

Figure 1: Average scores across all criteria for three subsets of criteria (those represented in WelTAG 2008, those represented in the Wales Transport Strategy 2008 – see UWE, 2018 – and those represented in the National indicators of well-being) and across all criteria



4. The Black Route's performance against FGWA criteria

The results of the revised assessment show that an investment, at a level equivalent to that proposed for the Black Route, made in alternative transport options would score higher than the Black Route both overall and on a large majority of the assessment criteria.

The performance of the Black Route is particularly weak (in comparison to an alternative transport option) on the criteria set out in the Future Generations Act, specifically:

- Compatibility of the plans with local well-being objectives (as defined in local well-being plans)
- Impact on inequality
- Impact on public mental health
- Impact on public access to sport and recreation

Performance on well-being criteria: Local well-being objectives

Local authorities in Wales have developed local well-being objectives. This research reviewed the objectives set by Cardiff, Newport, and Monmouthshire which highlighted a preference for, or prioritisation of, active travel, engagement with the outdoors, and accessing the health benefits of outdoor exercise and recreation:

“Create an environment where public transport, walking and cycling is prioritized” (Newport Public Service Board, 2018)

“A 50:50 modal split will be needed by 2021 (50% of journeys to be by sustainable transport) and an even more challenging 60:40 modal split by 2026. Meeting these ambitious targets will require investment in public transport systems, cycling infrastructure and cleaner vehicles, alongside support for behaviour change, supported by major employers and public services” (Cardiff Public Service Board, 2018)

“Enabling active travel and sustainable transport to improve air quality and give other health benefits.” (Monmouthshire Public Service Board, 2018)

By encouraging a modal shift to the car (as evidenced in the government's predictions of a 42,000 increase in motorway trips) the Black Route directly contradicts these local objectives.

Performance on well-being criteria: Impact on inequality

The majority of the benefits of the alternative transport scheme accrue within the local area where the intervention is implemented, the benefits are accessible to every group in the community, and are expected to be of proportionately higher value to lower income groups. On buses, IWA (2018) states:

"Despite the problems of the bus industry, buses continue to play a vital social and economic role and make a particularly important contribution to the equalities goal, providing vitally important transport for the one third of households who do not have access to a car."

In the case of the Black Route almost none of the direct benefits accrue to local people who do not use a car. The equality impact assessment gives scores to the Black Route across a number of WelTAG equality sub-criteria. The criterion titled "Lone Parent, Economic Inactivity, Social and Multiple Deprivation" is perhaps the broadest criterion, assessing the scheme's impacts for individuals living with multiple deprivation. The Black Route is awarded a "++" score, meaning it will deliver a "moderate beneficial" outcome for individuals in this category. This score should be challenged in light of the statements in the 2014 M4CAN equality impact assessment:

"Half of households in the bottom income bracket do not own a car, compared to a national average of 25%."

"This figure is even higher for individuals on benefits: nearly two-thirds of people claiming income support or jobseeker's allowance do not have access to a car"

In its justification for the awarding of a "++" score, despite the high number of individuals without access to a car, the 2014 M4CAN cites benefits deriving from "complementary" public and active transport measures. Such measures constitute an almost insignificantly small proportion of the benefits of the Black Route which are monetised in the government's economic assessment. A comprehensive alternative transport package would overwhelmingly outperform the Black Route on this criterion.

Conversely, there are strong arguments that the Black Route would increase inequalities in the South Wales region, as the benefit is captured by higher income groups. Groups in Wales which are less likely on average to own a car according to the 2011 census include:

- All ethnic minorities (Asian, black, mixed and multiple, other)
- Single parents
- Social renters
- Private renters
- One person households

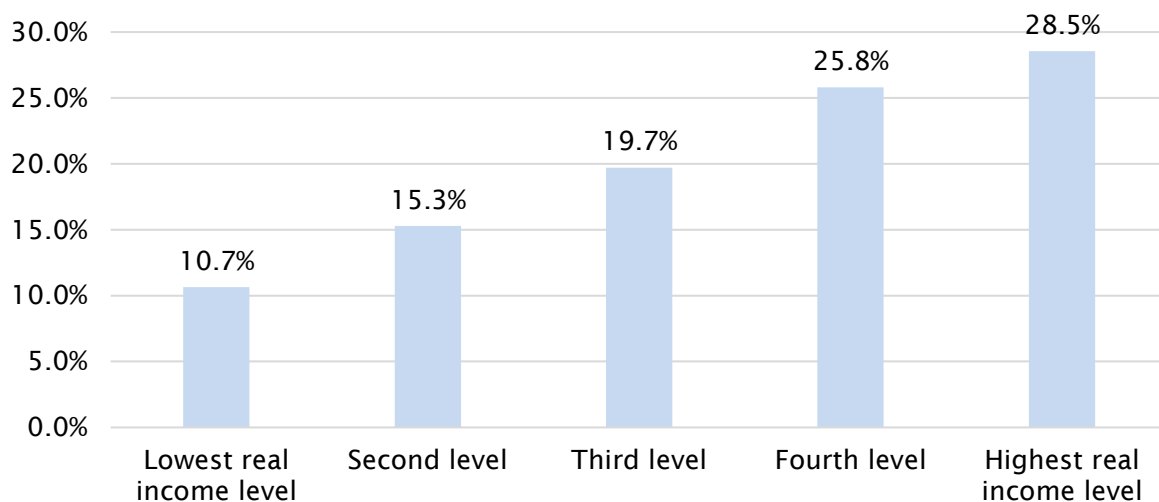
The proportion of non-car owning households in the area is significant:

- Newport: 27.9% (17,651 households)
- Monmouthshire: 15.2% (5,993 households)
- Cardiff: 29% (43,860 households)
- The Vale of Glamorgan: 19.4% (10,735 households)

The economic case for the Black Route investment depends upon the monetised personal (or “consumer”) travel time savings, which are estimated at £622 million (M4CAN, 2014), or £850-£883 million based on the later evidence from Stephen Bussell¹. Across the four most directly affected local authorities we estimate that 119,490 adults (26% of the adult population) will be excluded from these benefits due to living in a household without a car². A further 12% of the population will receive a reduced level of benefit as they are classed as “non-drivers” (but live in a household with a car).³

The National Travel Survey (for English residents) demonstrates that lower income groups in society drive considerably shorter distances both in general and for work. The estimated distribution of individual (consumer) travel time savings (valued at £605 million) for non-commuter travel, is illustrated in **Figure 2** using data from the National Travel Survey (2015). As shown in **Figure 2** the top income quintile receive almost three times the benefits received by the lowest income quintile. In monetary terms this equates to benefits of £64 million accruing to the bottom 20% of earners, and £173 million to the top 20%.

Figure 2: Benefit distribution of individual/consumer travel-time savings across income quintiles for non-commuter travel. Estimate based on the National Travel Survey for English residents



Data in the National Travel Survey of Great Britain (2009) on distance travelled for commuting purposes by different income groups can be used to estimate how the individual

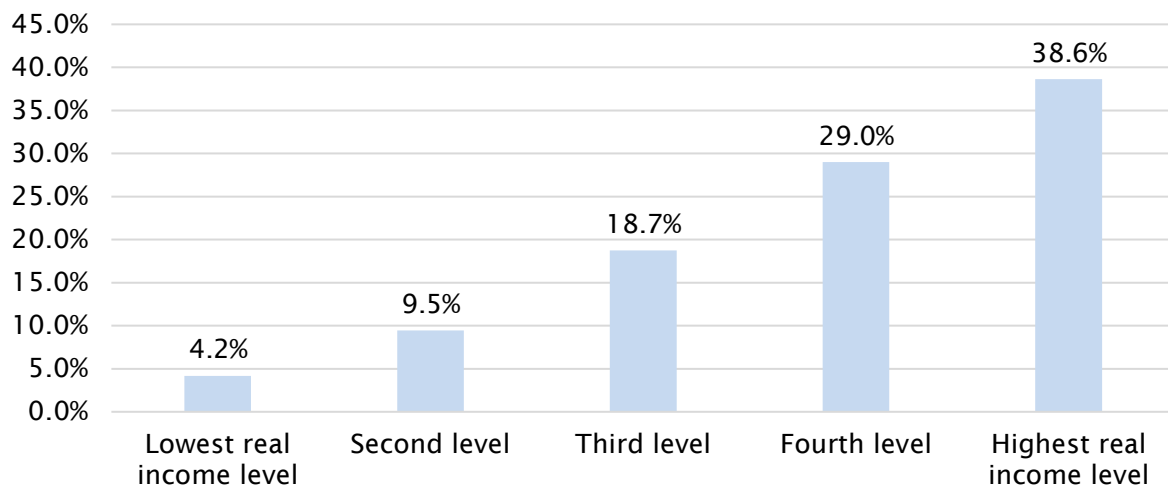
¹ Insufficient description on this analysis is provided to fully understand the assumptions in the model.

² Estimate based on 2018 population data and 2011 Census data on car ownership.

³ Estimate based on data from the National Transport Survey for England.

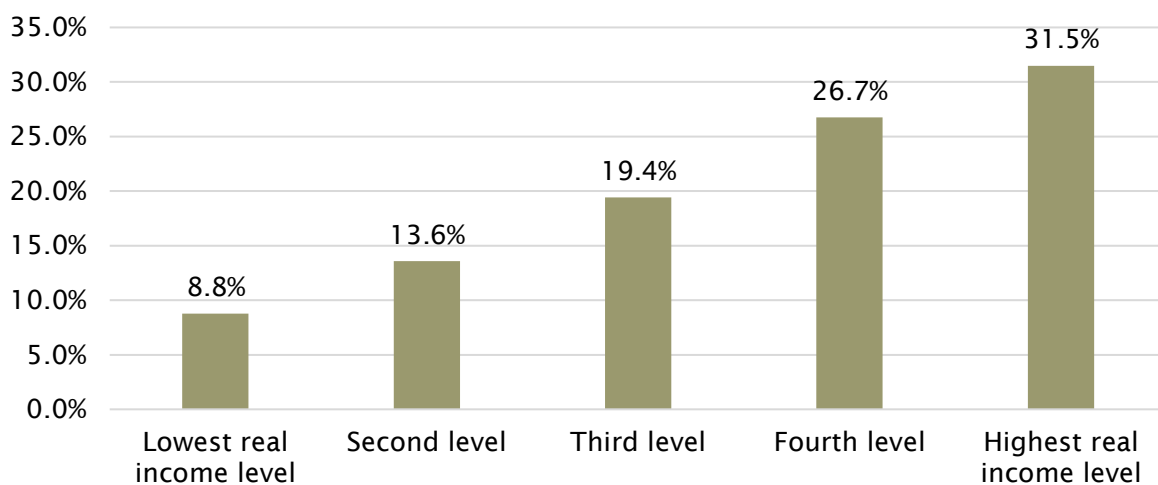
(consumer) travel time savings benefits (estimated at £250 million in Stephen Bussell's evidence case for the Government) for commuting are distributed across income levels. As shown in **Figure 3** the top quintile receive nine times the benefits received by the lowest quintile. In monetary terms this equates to benefits of £10 million accruing to the bottom 20% of earners, and £97 million to the top 20%.

Figure 3: Benefit distribution of commuter travel-time savings across income quintiles. Estimate based on the National Travel Survey of Great Britain (2009)



Combining these two estimates for an overall estimate of the distribution of the individual/consumer travel-time benefits, as shown in **Figure 4**, the top income quintile receive 3.6 times the benefits received by the bottom income quintile from the Black Route. In monetary terms, this equates to benefits of £74 million accruing to the bottom 20% of earners, and £269 million to the top 20%.

Figure 4: Modelled benefit distribution of all personal (consumer) travel-time savings according to income quintile (based on data from the National Travel Survey)



Performance on well-being criteria: Mental health

Jarret et al. (2012) publishing in the Lancet report that 2.5 hours per week of moderate physical activity can reduce the incidence of depression in the population by around 4.1% per year. By encouraging a modal shift towards the car (creating 42,000 new motorway trips per day), the Black Route reduces the activity levels of the population which is contrary to supporting mental well-being in Wales through physical activity.

The revised alternative transport option, as shown by Sustrans (2018), delivers increased physical activity through more walking and cycling trips per year and modal shift away from car use. The revised alternative transport option should be expected to deliver considerable benefit in terms of public mental health and well-being.

5. Conclusions

The Black Route remains a preferable option if the sole objective of this investment is to achieve a set percentage reduction in traffic congestion on the existing M4 (disregarding any net increase in the total number of car trips being taken). However, the FGWA is clear in stating that decision-making should take an integrated approach considering impacts on all of the well-being goals.

Given our initial findings it seems reasonable to conclude that, when seen in comparison with how a £1.4bn transport investment might alternatively be directed, the Black Route may fail to deliver against goals (ii) A resilient Wales, (iii) A healthier Wales, (iv) A more equal Wales, and (vii) A globally responsible Wales.

We conclude that the previous WelTAG options appraisal, conducted in 2013 and 2014, was not compatible with WelTAG 2017, nor the FGWA. Issues not comprehensively addressed in the previous appraisal, but of particular significance in light of FGWA, include:

- The Black Route's comparatively poor performance supporting the mental health and well-being of the Welsh public.
- The evidence that the Black Route will entrench socioeconomic inequalities.
- The evidence that the Black Route works counter to the local well-being objectives set by the three local authorities likely to be most directly affected by its introduction.

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