Welsh Government

M4 Corridor Enhancement Measures (M4 CEM)

Health Impact Assessment

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1 Introduction

The M4 Corridor Enhancement Measures (CEM) Programme is at a strategy level and aims to create a package of measures to deal with resilience, safety and reliability issues on the M4 around Newport.

The M4 motorway between Magor and Castleton falls well short of modern motorway design standards, particularly in relation to capacity and safety. Problems with congestion and unreliable journey times have been a fact of life on the M4 around Newport for many years.

Whilst early solutions to transport related problems on the M4 around Newport looked at relieving the demand on the M4 by providing an alternative motorway route to the south, the Deputy First Minister Ieuan Wyn Jones announced that the New M4 scheme was unaffordable in an oral statement in July 2009. The statement accepted *"the need to urgently address safety and capacity issues on the existing route"* through introducing *"a range of measures"* and as such, the M4 CEM initiative was set up by the Welsh Government to develop a package of measures to provide lasting solutions to the issues of capacity, safety and resilience along the M4 Corridor, Magor to Castleton. This is a Welsh Government commitment, as included in both the National Transport Plan (March 2010) and Prioritised National Transport Plan (December 2011).

1.1 Purpose of this Report

This report provides the preliminary Health Impact Assessment (HIA) for the transport measures outlined in the M4 CEM Programme. The completion of an HIA is a mandatory requirement of the Welsh Transport Planning and Appraisal Guidance (WelTAG)[1]. The preliminary HIA will help to inform the preparation of the WelTAG Stage 1 appraisal of the M4 CEM programme. WelTAG is an iterative process and as such, the preliminary HIA will need to be updated following completion of WelTAG Stage 1.

The Wales Health Impact Assessment Support Unit (WHIASU) was consulted on the proposed scope of the HIA and provided comments and advice on the preparation of the HIA. This report has been prepared in accordance with new guidance on the HIA process that has recently been prepared by WHIASU in conjunction with Public Health Wales and Cardiff University entitled, "Health Impact Assessment: A Practical Guide." In accordance with the guidance issued by WHIASU, this preliminary report is considered to be a "Prospective HIA", that is it is being undertaken at the start of the M4 CEM proposal, and has been undertaken as a "Desktop HIA" exercise. The geographical extent of the HIA specifically refers to the M4 CEM measures along the M4 corridor at Newport between Magor and Castleton.

[1] Welsh Transport Planning and Appraisal Guidance (WelTAG), June 2008.

2 M4 CEM Programme

The M4 in South Wales forms part of the Trans-European Transport Network (TEN-T), which provides connections throughout Europe by road, rail, sea and air. The M4 plays a key strategic role in connecting South Wales with the rest of Europe, providing links to Ireland via the ports in South West Wales and England and mainland Europe to the east. It is a key east-west route being the main gateway into South Wales and also one of the most heavily used roads in Wales. Providing a facility for transporting goods, linking people to jobs and employment sites as well as serving the Wales tourism industry, the M4 is critical to the local South Wales economy. Cardiff and Newport have ambitious regeneration strategies and Monmouthshire is developing areas around Junction 23a of the M4. Congestion on the M4 could hamper these plans.

The M4 between Junctions 28 and 24 was originally designed as the 'Newport Bypass' with subsequent design amendments in the 1960s to include the first motorway tunnels to be built in the UK. The M4 Motorway between Magor and Castleton falls well short of modern motorway design standards. This section of the M4 has many lane drops and lane gains, resulting in some two-lane sections, an intermittent hard shoulder and frequent junctions. It is congested during weekday peak periods resulting in slow and unreliable journey times and stop- start conditions with frequent incidents causing delays.

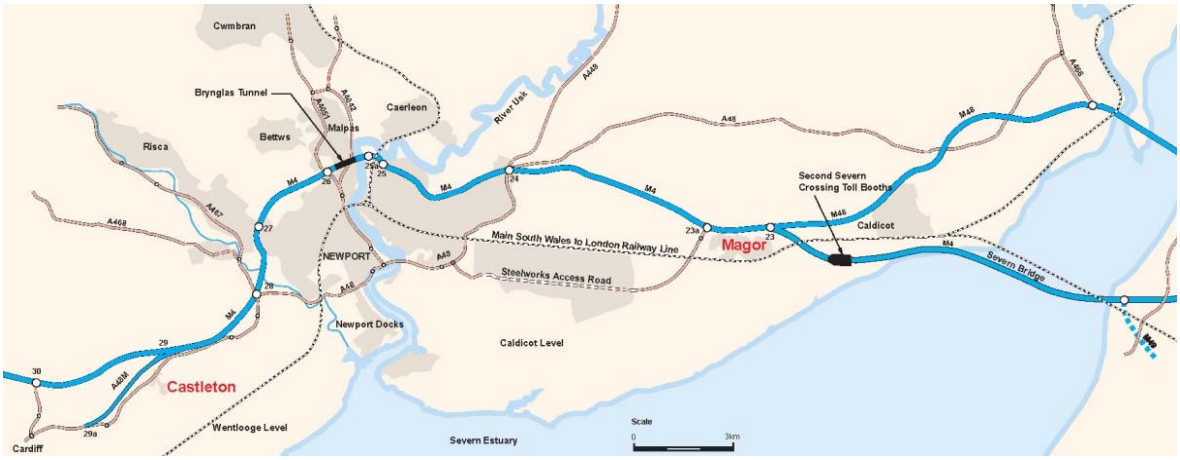
This together with increasing traffic, is why problems with congestion and unreliable journey times have been a fact of life on the M4 around Newport for many years. The motorway and surrounding highway network does not cope with sudden changes in demand or operation, as a result of accidents or extreme weather events for example. These issues are worse at times of peak travel and, as the number of users on the network increase, they are set to worsen.

To address these issues, the feasibility of developing the M4 relief road was studied in significant detail. In July 2009, the Welsh Government announced that the project had become unaffordable. However, the Welsh Government recognised that important improvements should be made to the existing transport network. The M4 Magor to Castleton, Corridor Enhancement Measures Programme (M4 CEM) was set up to explore ways of making such improvements.

Practical measures to make travel safer and easier on the M4 between Junctions 23a and 29 began in 2008. Early work to improve safety included replacing sections of steel central barriers with concrete ones, the introduction on Variable Speed Limit systems and the deployment of traffic officers. To ease congestion, improvements have been made to the roundabout at Junction 24 Coldra.

Further details of the M4 CEM Programme and its evolution are available at www.m4cem.com.

Figure 1: The Location and Strategic Importance of the M4



2.1 Problems on the M4 Corridor

The Welsh Government has looked in detail at what travel related problems exist on the M4 Corridor Magor to Castleton, and asked people and those involved in managing transport in and around Newport what they thought the problems amount to. The problems have been defined as:

Capacity

1. A greater volume of traffic uses the M4 around Newport than it was designed to accommodate, resulting in regular congestion at peak times over extended periods.
2. The M4 around Newport is used as a convenient cross town connection for local traffic, with insufficient local road capacity.
3. HGVs do not operate efficiently on the motorway around Newport.
4. There is insufficient capacity through some of the Junctions (e.g. 3 lane capacity drops to 2 lane capacity).
5. The 2-lane Brynglas tunnels are a major capacity constraint.
6. The M4 cannot cope with increased traffic from new developments.

Resilience

7. Difficulties maintaining adequate traffic flows on the M4 and alternative highway routes at times of temporary disruption; alternative routes are not able to cope with M4 traffic.
8. The road and rail transport system in and around the M4 Corridor is at increasing risk of disruption due to extreme weather events.
9. When there are problems on the M4, there is severe disruption and congestion on the local and regional highway network.
10. The M4 requires essential major maintenance within the next 5-10 years; this will involve prolonged lane and speed restrictions, thus increasing congestion problems.

11. There is insufficient advance information to inform travel decisions when there is a problem on the M4.

Safety

12. The current accident rates on the M4 between Magor and Castleton are higher than average for UK motorways.
13. The existing M4 is an inadequate standard compared to modern design standards.
14. Some people's driving behaviour leads to increased accidents (e.g. speeding, lane hogging, unlicensed drivers).

Sustainable Development

15. There is a lack of adequate sustainable integrated transport alternatives for existing road users.
16. Traffic noise from the motorway and air quality is a problem for local residents in certain areas.
17. The existing transport network acts as a constraint to economic growth and adversely impacts the current economy.

2.1.1 Aims of the M4 CEM Programme

The aims of the M4 CEM Programme are to:

1. Make it easier and safer for people to access their homes, workplaces and services by walking, cycling, public transport or road.
2. Deliver a more efficient and sustainable transport network supporting and encouraging long-term prosperity in the region, across Wales, and enabling access to international markets.
3. To produce positive effects overall on people and the environment, making a positive contribution to the overarching Welsh Government goals to reduce greenhouse gas emissions and to making Wales more resilient to the effects of climate change.

2.1.2 Goals of the M4 CEM Programme

The Welsh Government has identified the following goals, which the M4 CEM Programme should aim to achieve, in order to ease the flow in the M4 Corridor between Magor and Castleton:

"When the M4 CEM Programme is concluded we will benefit from:

1. Safer, easier and more reliable travel east-west in South Wales.
2. Improved transport connections within Wales and to England, the Republic of Ireland and the rest of Europe on all modes on the international transport network.
3. More effective and integrated use of alternatives to the M4, including other parts of the transport network and other modes of transport for local and strategic journeys around Newport.
4. Best possible use of the existing M4, local road network and other transport networks.
5. More reliable journey times along the M4 Corridor.
6. Increased level of choice for all people making journeys within the transport Corridor by all modes between Magor and Castleton, commensurate with demand for alternatives.
7. Improved safety on the M4 Corridor between Magor and Castleton.
8. Improved air quality in areas next to the M4 around Newport.
9. Reduced disturbance to people from high noise levels, from all transport modes and traffic within the M4 Corridor.
10. Reduced greenhouse gas emissions per vehicle and/or person kilometre.
11. Improved travel experience into South Wales along the M4 Corridor.
12. An M4 attractive for strategic journeys that discourages local traffic use.
13. Improved traffic management in and around Newport on the M4 Corridor.
14. Easier access to local key services and residential and commercial centres.
15. A cultural shift in travel behaviour towards more sustainable choices."

2.2 Developing an M4 CEM Programme

Having established the problems and the need to tackle them, the Welsh Government has involved others in exploring a very wide range of possible ways of solving these problems and of delivering the goals of the M4 CEM Strategy. A long list of possible solutions has been explored.

No single solution delivers all the goals, but through this methodology, measures that contribute towards a combination of compatible options, or 'Packages', have been identified. The Packages combine public transport, highway and other travel solutions.

The strategic approaches adopted by the Welsh Government to reduce congestion and to delivering the M4 CEM Goals all involve creating some new highway capacity on the M4, and /or elsewhere in the highway network between Magor and Castleton. However traffic congestion will not simply disappear as a result of capacity increase. This is because the development of new or up-graded, convenient and reliable roads tends to encourage more people on to them. This results in additional vehicles using additional road capacity (not a stable volume of vehicles using more/emptier roads).

To avoid this and to curb the rising demand for more highway capacity and to put transport onto a carbon reduction pathway, the M4 CEM Programme proposes increasing and improving the opportunities for access, and for travel and transport using alternatives modes, such as trains and buses (public transport), cycling and walking. It is also proposed to minimise the need for certain types of journey.

To enable the sustained productivity and competitiveness of Wales, and the South East Wales region in particular, highway infrastructure must also be developed; several alternative approaches are possible, each with particular advantages and challenges. In addition, some other common measures can enhance the effectiveness of each of the possible strategies we are considering.

The approach the Welsh Government may take is summarised below:

Public Transport Measures	+	**Highway Infrastructure option A or B or C or D**	+	**Common Measures**	=	**M4 CEM Strategy (Package of measures)**

As shown in the diagram, a possible strategy will comprise a range of the following measures, full details of which are provided within the Consultation Document:

- Public transport measures.
- Highway infrastructure measures:
  - Highway Option A: additional high quality road to the south of Newport.
  - Highway Option B: at grade junction improvements to the A48 Newport Southern Distributor Road (SDR).
  - Highway Option C: grade separated junction improvements to the A48 SDR.
  - Highway Option D: online widening on the M4 between Junctions 24 and 29, including an additional tunnel at Brynglas.
- Common measures: these are additional measures being considered to support the strategic public transport and highway capacity measures in addressing travel related problems within the M4 Corridor between Magor and Castleton. They comprise a mix of highway infrastructure, demand management, alternative modes and smarter sustainable choices.

This report considers the HIA for the Public Transport Measures, Highway Options A-D and the Common Measures.

3 What is Health Impact Assessment?

3.1 Introduction

The WHIASU guidance refers to HIA as a process that considers how the health and well-being of a population may be affected by a proposed action, be it a policy, programme, plan or a change to the organisation or delivery of a particular public service. The guidance states that,

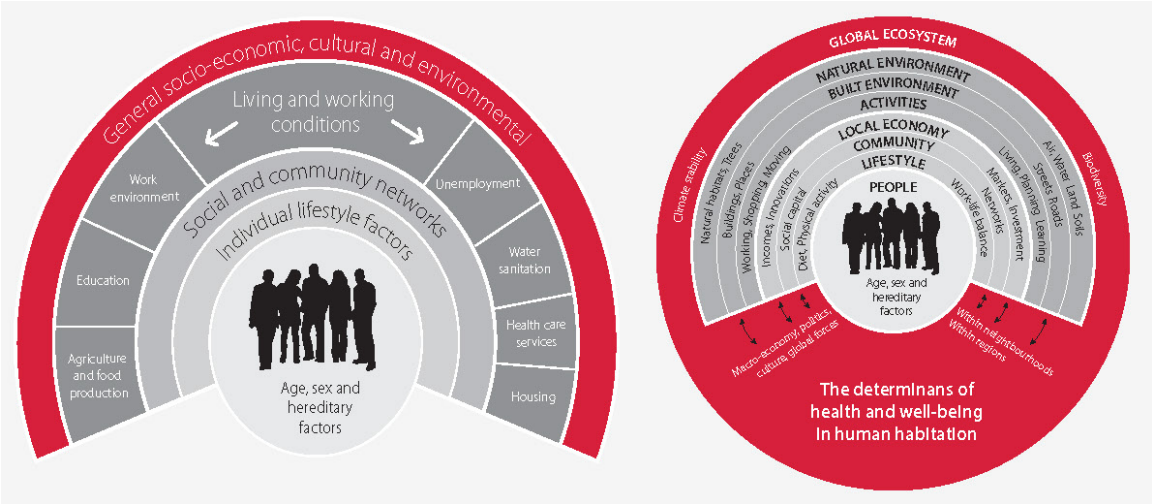
"Within HIA, health is understood as a positive concept which encompasses mental, physical and social well-being. It is difficult to understand the concept of health as something distinct from the ways in which we live and the society of which we are a part. This implies two things - firstly, that health means different things to different people living in particular times and places and secondly, that health outcomes, however we may understand and/or measure them, are shaped by wider social and economic processes."

The best known definition of the social model of health is one that was produced by the World Health Organisation (WHO) in 1948 which stated that:

'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. (WHO, 1948)

The WHIASU guidance notes that health is shaped by wider social processes and that the policies, programmes and projects are likely to be important opportunities or threats to the health of individuals, groups, communities and whole populations. Whilst the availability and quality of health services are likely to be important, the quality and distribution of social and economic resources are likely to be more important to the health of a population. The chart below[2] provides an illustration of how a proposal may impact in different ways on different groups of people.

Figure 2: WHIASU guidance: how a proposal may impact on different groups of people



[2] Source: Health Impact Assessment. A Practical Guide, WHIASU. Page 3. Figures: Dahlgren and Whitehead (1991) & Barton and Grant (1998)

WHIASU advise that some impacts on health determinants may be direct, obvious and/or international, whilst others may be indirect, difficult to identify and unintentional. HIA tries to anticipate and mitigate for these effects.

3.2 Definitions of HIA

The European Centre for Health Policy (1999) Gothenburg Consensus is the most widely accepted definition of HIA. This defines HIA as,

"A combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population".

An alternative definition, which is referenced in the WHIASU guidance, is[3]:

'...a process through which evidence (of different kinds), interests, values and meanings are brought into dialogue between relevant stakeholders (politicians, professionals and citizens) in order imaginatively to understand and anticipate the effects of change on health and health inequalities in a given population'.

The consideration of health impacts is becoming an increasingly important aspect of any new proposal, programme or project in the UK. The purpose of carrying out a HIA is to assess the potential impacts to human health from a policy, programme or project and then to use this information to influence the decision making process. This should help to maximise the positive health outcomes and minimise the negative health outcomes of a proposal. However, WHIASU note that HIA is a tool to support decision making, but is not, in itself, the means of making a decision on whether a policy, proposal or programme should proceed.

3.3 Determinants of Health and Vulnerable Groups

WHIASU advise that HIA is a systematic, objective, flexible and practical way of assessing both the potential positive and negative impacts of a proposal on health and well-being. It can suggest ways in which opportunities for health gain can be maximized and risks to health minimised. HIA looks at health in its broadest sense, using the wider determinants of health as a framework. The health and well-being determinants checklist provided in Appendix 1 of the WHIASU guidance is reproduced in Table 1.

[3] Elliott E, Harrop E, and Williams GH (2010) Contesting the science: public health knowledge and action in controversial land-use developments, in P. Bennett, K Calman, S Curtis and D Fischbacher-Smith (eds) Risk Communication and Public Health (second edition), Oxford: Oxford University Press.

Table 1: Health and Well-Being Determinants and Checklist

1. Lifestyles	
Diet	Sexual activity
Physical activity	Other risk-taking activity
Use of alcohol, cigarettes, non-prescribed drugs	
2. Social and community influences on health	
Family organisation and roles	Social isolation
Citizen power and influence	Peer pressure
Social support and social networks	Community identity
Neighbourliness	Cultural and spiritual ethos
Sense of belonging	Racism
Local pride	Other social exclusion
Divisions in the community	
3. Living/environmental conditions affecting health	
Built environment	Green space
Neighbourhood design	Community safety
Housing	Smell/odour
Indoor environment	Waste disposal
Noise	Road hazards
Air and water quality	Injury hazards
Attractiveness of area	Quality and safety of play areas
4. Economic conditions affecting health	
Unemployment	Type of employment
Income	Workplace conditions
Economic activity	
5. Access and quality of services	
Medical services	Public amenities
Other caring services	Transport including parking
Careers advice	Education and training
Shops and commercial services	Information technology
6. Macro-economic, environmental and sustainability factors	
Government policies	Biological diversity
Gross Domestic Product	Climate
Economic development	

WelTAG considers the interaction between factors that determine health and WelTAG criteria. These are listed in Table 2. Although the health determinants listed in WelTAG and the WHIASU guidelines are not identical, they are broadly similar. As the HIA for the M4 CEM strategy is being prepared in accordance with WelTAG requirements, the criteria listed in WelTAG have been used for the appraisal summary tables for the preliminary HIA. Paragraph 9.2.6 of WelTAG also states that the interactions between health determinants and the WelTAG criteria confirm how WelTAG performs the HIA, thus negating the need to generate new analysis.

Table 2: Interaction between WelTAG Criteria and Health

Factors that determine health	WelTAG appraisal criteria
Individuals lifestyle/capacities affecting health Smoking, nutrition and healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education	Physical fitness
Social and community influences affecting health Family: structure and function, parenting Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos	Social Inclusion Heritage
Living conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces	Noise Local air quality Landscape and townscape Water environment Transport safety Personal safety
Working conditions Employment, workplace conditions, occupation, income	Economic activity and Location impacts (EALI)
Services (access to and quality of) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	Permeability Transport Economic Efficiency (TEE)
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	Bio-diversity Greenhouse Gas emissions

HIA also highlights the uneven way in which health impacts may be distributed across a population and seeks to address existing health inequalities as well as avoiding the creation of new ones. In addition to the general adult population, the guideline target groups for HIA listed by WHIASU are:

Age related groups:

- Children and young people;
- Older people.

Income related groups:

- People on low income;
- Economically inactive;
- Unemployed/workless;
- People who are unable to work due to ill health.

Groups who suffer discrimination or other social disadvantage:

- People with physical or learning disabilities/difficulties;
- Refugee groups;
- People seeking asylum;
- Travellers;
- Single parent families;
- Lesbian and gay and transgender people;
- Black and minority ethnic groups;
- Religious groups.

Geographical groups*:

- People living in areas known to exhibit poor economic and/or health indicators;
- People living in isolated/over-populated areas;
- People unable to access services and facilities.

* With regard to the geographical groups, it is important to note that the geographical context for the HIA specifically refers to the M4 CEM measures along the M4 corridor at Newport between Magor and Castleton.

4 Health and Well-Being Context

Newport City Council and the Aneurin Bevin Local Health Board have prepared a health, social care and well-being strategy for Newport for the period 2011-2014[4]. One Newport has also prepared a community strategy for the period 2010-2020[5]. The population and health status of Newport are considered in the strategies and is summarised as follows:

4.1.1 Population

In 2008, the population of Newport was estimated at 139,662 with 51.4% being female and 48.6% being male. The age structure of the population broadly reflects wider trends evident in Wales and the UK. Newport has an ageing population and increased life expectancy. Overseas immigration has resulted in moderate population growth which is likely to continue in the foreseeable future. Most recent figures indicate that 21.6% of the Newport population are living with a long term limiting illness and 7.9% of people are permanently sick or disabled. As life expectancy grows, the incidence of limiting long term illness is likely to increase with age.

At the last census in 2011, the population of Newport was made up of 95.2% of people from a white background. With 4.8% of people from a non-white background, Newport has the second largest number of people from a non-white background in Wales, second to Cardiff only. This is a higher proportion of people from a non-white background than for Wales as a whole (3.1% in 2008). The number of people from a minority ethnic background in Newport has also continued to increase with an estimated 11,000 people in the city (comprising around 7.9% of the population).

4.1.2 Wealth and Deprivation

In Newport, neighbourhoods with some of the country's highest levels of social deprivation sit next to some of those with the greatest affluence. The Wales Index of Multiple Deprivation (WIMD) is the official measure of deprivation of small areas in Wales. The WIMD 2008 is made up of eight separate kinds of deprivation: income, employment, health, education, housing, access to services, environment and community safety. 15% of the Lower Super Output Areas (LSOA) in Newport fall within the 10% most deprived LSOAs in Wales, and 52% of LSOAs fall within the 50% most deprived LSOAs in Wales.

Newport has a labour catchment population of 479,000 people living within 30 minutes' drive and 1.6 million people, over a third of the population of Wales, live within an hour of the city. In 2008, 31,400 people commuted to work in the city making Newport the second biggest destination for commuters in Wales after Cardiff.

Newport has a significant section of its working age population that are either unemployed or economically inactive. The unemployment rate as a whole for Newport at the end of December 2009 was 10.4% compared to 8.3% in Wales, whilst the economic inactivity rate of 27.3% is the same as the Welsh average.

[4] Health, Social Care and Wellbeing Strategy 2011-2014. Newport's Healthy Future, Newport City Council Aneurin Bevin Local Health Board, One Newport, Healthy Newport.
[5] Newport's Community Strategy 2010-2020. Feeling Good about Newport. One Newport

4.1.3 Health

Poor air quality can impact on people's health. The main source of air pollution within Newport is from traffic emissions, and primarily from the M4 motorway that crosses the City area from east to west. The motorway cuts through several residential areas, notably St Julian's, Brynglas, Crindau, Glasllwch and High Cross. Newport has a total of nine Air Quality Management Areas (AQMAs), which were declared because assessments of air quality predicted that the annual mean objective for nitrogen dioxide (NO_2) was not likely to be met. Four of the AQMAs have been declared as a result of emissions from traffic on the M4 motorway (Shaftesbury/Crindau, St Julians, Royal Oak Hill, and Glasllwch). The major contributor to the pollution in these areas was found to be road traffic.

The overall health status of the people in Newport is generally comparable to that in the rest of Wales. Currently in Newport, the prevalence of obesity, coronary heart disease, strokes and respiratory disease are marginally lower than the Welsh average, but are still high compared to the rest of the UK. The number of deaths from cancer is following the national trend and reducing slightly.

Newport lies within the area of the Aneurin Bevan Health Board, which covers the local authority areas of Caerphilly, Blaenau Gwent, Torfaen, Monmouthshire and Newport. The Aneurin Bevan Health Board provides an overview of the local health context among the population in this area. The overview provided in the latest demography profile (2009) includes the following key points in relation to health of the local population[6].

- The under 75 age standardised mortality rate has dropped by 16% between 1998 and 2007. However it remains slightly higher than the average Wales rate.
- The greatest causes of death in people under 75 are cancer, circulatory disease and respiratory disease, accounting for 39%, 28% and 9% of approximately 2,200 deaths respectively during 2007[7].
- Within the area there are areas of deprivation, particularly the valley areas of Caerphilly, Blaenau Gwent and Torfaen.
- 88 of the 369 Lower Super Output Areas in the area (24%) are among the most deprived in Wales, with 72 (20%) in the least deprived fifth. However, within the less deprived areas there are often pockets of hidden deprivation.
- Current projections see a rise in the older population (75 years and over) of Aneurin Bevan residents from 45,000 (8% of the total population) to 82,000 (13% of the total population) in 2031.
- The increase in the number of older people is likely to cause a rise in chronic conditions such as circulatory and respiratory diseases and cancers.
- The relative (and absolute) increase in economically dependent and in some cases care-dependent populations will pose particular challenges to communities.

[6] Aneurin Bevan – Local Health Board – Demography Profile (2009) available online at: http://www.wales.nhs.uk/sitesplus/922/page/49938

[7] Office for National Statistics, Annual District Deaths Extract (Cited in Aneurin Bevan – Local Health Board Demography Profile 2009).

5 Approach to HIA Appraisal

5.1 Screening and Scope of the HIA

WelTAG states that HIA is a mandatory requirement of transport appraisal. As a result, the Welsh Government acknowledges that HIA is required for the M4 CEM strategy. A scoping report for the HIA has been prepared and was issued to WHIASU for comment on 20 September 2012. WHIASU provided comments on the proposed scope for the HIA on 4 October 2012.

The HIA has been developed to be proportionate to the M4 CEM Programme. In accordance with the guidance issued by WHIASU, this preliminary report is considered to be a "Prospective HIA", that is it is being undertaken at the start of the M4 CEM proposal, and has been undertaken as a "Desktop HIA" exercise. The geographical extent of the HIA specifically refers to the M4 CEM measures along the M4 corridor at Newport between Magor and Castleton.

The impact of possible M4 CEM measures on health and well-being has been considered with reference to relevant WelTAG criteria. A substantial evidence base has been prepared as part of the preliminary WelTAG appraisal of the M4 CEM programme. It provides a summary of baseline conditions as well as an appraisal of social, economic and environmental criteria. This evidence base has informed the preparation of this initial HIA. An extensive public consultation exercise on the proposals has also been undertaken. Further information on the M4 CEM consultation is available online at www.m4cem.com.

As recommended by WelTAG, an HIA appraisal summary table has been prepared for each option to qualitatively assess the potential effects on health and well-being. In order to make the appraisal information easier to understand, each measure has been assessed using a 7 scale colour coding system technique that is adopted in WelTAG. (Table 3).

Table 3: WelTAG Appraisal Guidance

Large Positive Impact	(+++)
Moderate Positive Impact	(++)
Slight Positive Impact	(+)
No (or Minimal) Impact	N
Slight Negative Impact	(-)
Moderate Negative Impact	(--)
Large Negative Impact	(---)

In preparing the HIA, a consideration of the following potential impacts has been undertaken in accordance with WHIASU best practice:

1. What do you consider to be the potential health impacts and will the impact be positive or negative?
2. Is the likelihood of the impact of the proposal definite, probable or speculative?
3. What do you consider to be the scale of the impact and what proportion of the population is likely to be affected?
4. What do you consider to be the timing of these impacts and will the impact be in weeks, months or years?
5. What will the distribution of the effects be and will the proposal affect different groups of people in different ways?
6. Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?

5.2 Stakeholder Consultation

Recognising the potential level of public interest in transport related issues within the M4 corridor around Newport and beyond, and the numbers of people potentially affected by any new plans resulting from possible options presented as part of the M4 CEM Programme, the Welsh Government has undertaken wide-ranging and focussed engagement with stakeholders and local people since September 2010.

During the engagement process, the Welsh Government and its project team has conducted dialogue and deliberative sessions both with internal and external specialists and expert stakeholders, encompassing local health boards, local authorities and other organisations with an interest in the likely health and community impacts of transport measures. This input has helped shape the M4 CEM Programme and influenced the technical appraisal process. Further information about the M4 CEM engagement and consultation process is available at www.m4cem.com.

Specifically to this HIA, the Welsh Government consulted with the Wales Health Impact Assessment Support Unit (WHIASU) on its approach to assessment and reporting. Following WHIASU advice and guidance, telephone interviews on the potential health effects of the M4 CEM measures have been undertaken with health professionals and other local stakeholders. Stakeholders have been identified with the assistance of WHIASU.

The consultees contacted for interview included:

Organisation
Aneurin Bevan Health Board
Countryside Council for Wales
House of Commons
National Assembly for Wales
Newport Council
Newport Local Public Health Team
Newport, Gwent Association of Voluntary Organisations (GAVO)
Public Health Wales
Wales Health Impact Assessment Support Unit (WHIASU)

A number of the identified stakeholders (above) declined to take part or were unavailable for the telephone interviews during the preparation of this HIA. In total three telephone interviews were undertaken, including:

- Health and Wellbeing representative from the Countryside Council for Wales;
- MP for Newport West; and
- Public health consultant representing both Public Health Wales and the Aneurin Bevan Health Board.

A summary of stakeholder responses is provided below:

Topic	Summary of responses
Public Transport Measures	Will create positive health impacts, encouraging physical activity, a potential reduction in emissions and social connectivity. Getting people to use public transport is challenging. Changing people's behaviour is vital, which may take a long time and so there may need to be some sort of intervention to make people use public transport. Benefits are likely to be long term but the impact limited and mainly to those without access to a car. Systematic promotion of public transport to increase awareness would increase the benefits. Clean technology for buses would also help to reduce pollution.
Highway Option A: Additional high quality road to the south of Newport	It is the favoured option. It would only impact on a small population, so it would be the least polluting option. It directs traffic away from the most populated areas of Newport; the winds blow from west to east and the pollution from this option will spread over the channel and not the local population. A sizable population (the Duffryn area) will experience positive benefits; the negative impacts will be experienced by the least number of people in comparison to the other options. There is the potential that it could bring congestion and pollution to new areas. There may be negative impacts during construction (noise, air quality, visual impact). Although the frequency of accidents may be reduced the increased road space may mean that accidents are more serious. It may widen the gap in health inequality between the north and south of Newport. The impact will be limited but long term and the most affected will be people with vehicles and people who will occupy the new housing at the steelworks. In the long term it could affect larger proportion if flood mitigation measures are not implemented. This option has been designed in a positive way, it avoids nature reservations etc. but the damage to the landscape has to be managed; there is a lot that can be done to minimise the damage.

Highway Option B: At grade junction improvements to the A48 Newport Southern Distributor Road (SDR)	It is an unfavourable option. It would direct traffic nearer to the local population. The road borders some of the most deprived areas so negative health impacts will have a disproportionate effect. As a through route it is very polluting. There might be impacts with regards to taking traffic away from the M4 but there wouldn't be a significant health difference. There would be negative impacts during construction. Driver stress is likely to be adversely affected. There may be increased potential for collisions with the changed junctions when people are not used to them. If the junctions change, and people are not used to it, the changes could actually cause issues. There is potential for more severe accidents and increased frequency of accidents. It may reduce the amount of walking and cycling that people do. It would affect a moderate proportion of the population and have a long term impact. For the cost, disruption and negative impacts, it should not be taken forward. If it did progress as a project, Welsh Government should ensure that there is awareness among the users, and give people an idea of the length of time that people will be inconvenienced by the changes that could be put in place.
Highway Option C: Grade separated junction improvements to the A48 Strategic Distributor Road	This option is unfavourable. It would cause severe negative impacts. In particular, Junction 28 is already at maximum capacity at peak times and this problem would be exacerbated. The option should not be progressed. It could cause increased potential for collisions with the modified junctions. Positive impacts could include improved access, reduction of noise levels on the M4. Negative impacts could include increased noise levels on the SDR. It is preferable to Option B but will still cause negative impacts on health. Increased potential for community severance. The impacts will be moderate, long term and will affect the general population, but mainly those living around the SDR – therefore it will affect more deprived areas most. Should the option be progressed, Welsh Government should ensure that there is awareness among the users, and give people an idea of the length of time that people will be inconvenienced by the changes that could be put in place.

Highway Infrastructure Option D: Online Widening of the M4 between Junctions 24 and 29, including an additional tunnel at Brynglas	This is the most challenged option Health impacts will be large and negative. It will direct additional traffic and associated pollution into the heart of the city. This is the most disruptive option to the local area and there would be fierce public opposition. This will have a discernible and measurable negative effect on the health. During construction, it would cause issues with regards to reduced access, and increased traffic issues – leading to additional stress and noise pollution. Once it is completed, then potentially it could reduce congestion, so potentially it could reduce driver stress. Positive impacts from reduced congestion are only likely to be short term as it attracts increased usage over time. It will affect a large proportion of residents of Newport and impacts will be long term. The most affected will be communities around the M4 corridor and those living in the least deprived areas. If this option is progressed, consultation should be undertaken with the users of the route and the communities that could be affected.
Common Measures	Common measures are supported. Positive impacts could be realised from noise pollution reduction measures and improved incident management and event management. All common measures are desirable and could have positive impacts. In particular, walking and cycling infrastructure will potentially have a positive effect on physical activity levels, and alternative route promotion could be beneficial with regards to access to services. There is also potential for a reduction in noise and an improvement in local air quality. Common measures would affect the general population and benefits would be realised over the long term. The measures might exclude young and elderly people as it may be more challenging for them to utilise public transport, walking and cycling options. A well planned and tested series of interventions to encourage the use of alternative methods of transport would be needed. Changes should take into account local consultation to ensure limited disruption and maximum benefit of any measures that could be progressed further.

Comments made by the stakeholders have been incorporated into the Health Impact Assessment appraisal (Section 6).

An account of their responses is provided in Appendix A.

For any options that are progressed as part of an M4 CEM Strategy, it is likely that depending on their scale and location, they will require further Health Impact Assessment at a project level, to avoid, reduce and, if possible, remedy significant adverse health impacts. Further consultation with WHIASU (and other bodies identified by WHIASU) will be considered by the Welsh Government on a possible M4 CEM Strategy in the future.

6 HIA Appraisal of the M4 CEM Measures

A summary of each of the proposed transport measures is provide in the following sections and is accompanied by a qualitative assessment of potential impacts on health and well-being in an appraisal summary table. A summary appraisal summary table is provided in Section 7 in order to provide a comparison of the preliminary HIA results for the M4 CEM package of measures.

6.1 Public Transport Measures

Studies show that new or improved public transport services are likely to have only minimal impact with respect to reducing traffic on the M4. Generally, investment in public transport measures is more likely to be aimed at achieving wider benefits than relieving motorway traffic. These should encourage modal shifts and reduce the reliance on the private vehicle in the Newport area, by increasing choice. They could specifically target journeys in the M4 corridor between Magor and Castleton.

The Welsh Government's priorities for delivering improvements in sustainable travel and improved public transport in the period to 2015 are set out in the prioritised National Transport Plan[8]. They include improvements to the Valley Lines rail network, which will increase the frequency of services possible from Pontypridd, Rhymney, Caerphilly, Maesteg and the Vale of Glamorgan line from Bridgend to Cardiff, enabling increased rail journey opportunities to the network beyond, including Newport, Bristol and beyond. They are not thought likely to deliver a major impact in reducing traffic on the M4.

The Welsh Government has welcomed the announcement by the Secretary of State for Transport, in July 2012, that the Great Western Main Line to Swansea and the Valley Lines network will be electrified during the investment period 2014-2019.

The Public Transport Measures under consideration as part of the M4 CEM proposals include:

- Additional mainline train services between Swansea, Cardiff, Newport and Bristol;
- Additional train services on local routes;
- More stations with park and ride facilities;
- More bus/train connecting services;
- Additional express bus/coach services between Cardiff, Newport and Bristol;
- Additional local bus services around and across Newport.

The HIA appraisal summary table for the public transport measures is provided in Table 4.

[8] Prioritised National Transport Plan, December 2011

Table 4: HIA Appraisal of Public Transport Measures

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education	Public transport trips often include a walk or cycle to or from the public transport start and end point. An increase in public transport should increase this physical activity.	General population, Income related groups, Age related groups, Geographical groups	**(+)**
Social and Community Influences affecting health Family: structure and function, parenting Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos	Local rail and bus services will be improved, benefitting those without access to a vehicle. Measures may also improve access to local support services and community facilities. The impact on historic and cultural identity as a result of public transport measures is likely to be minimal.	All groups	**(+)**
Living Conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces	As modal shift trends to public transport are realised, noise nuisance and air pollution would reduce along the M4 and local road network, leading to improvement in air quality in the Air Quality Management Areas in particular. Possible new stations could be close to the River Usk SAC and SSSI, but would not impact on potable water supplies although may have an adverse impact on landscape. The public transport measures could improve road safety providing that the modal shift resulted in reduced general traffic levels, but are not be expected to impact upon personal security.	General population, Geographical groups	**(N)**
Working Conditions Employment, workplace conditions, occupation, income	Ill health is often associated with economic deprivation. The public transport measures may have a positive impact on the local and regional economy as local accessibility within Newport is enhanced, together with improvements being made to longer distance travel by public transport. This would lead to improved economic outcomes which might be considered to contribute to health and wellbeing.	General population, Income related groups. Groups who suffer discrimination or other social disadvantage	**(+)**
Services (access to and quality) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	The public transport measures aim to encourage modal shift onto public transport. An increase in public transport provision should enhance access to local medical services, education, shops and other facilities.	All groups	**(+)**
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	Investment in additional public transport infrastructure and services may help support local economic development and would be in accordance with local and national policy for sustainable development. Should new infrastructure be needed, this may require additional land take with associated possible adverse impacts on the environment. Wherever possible, existing infrastructure will be utilised to its full potential. The public transport measures will help to reduce congestion, which should have some benefit in reducing vehicle emissions, thereby improving local air quality and secondary benefits on soil and biodiversity.	General population, Income related groups.	**(+)**

6.2 Highway Option A: Additional High Quality Road to the South of Newport

Option A would involve the construction of an additional high quality road to the south of Newport. This would be delivered alongside other traffic management and smarter choice measures. The additional road would provide significant increased capacity in the highway network around Newport. It would also relieve traffic on the existing M4 motorway by offering an alternative route for longer distance journeys, especially for those using the Severn Crossings, thereby improving the resilience of the highway network. The route has been appraised as a dual carriageway and is shown in red on the Highway Option A diagram overleaf. The route has been planned to minimise negative impacts on local communities and the environment, whilst seeking to support economic development in South East Wales.

The HIA appraisal summary table for Highway Option A is provided in Table 5.

Highway Option A

Table 5: HIA Appraisal of Highway Option A

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health & care services, skills & knowledge, training & education	An additional high quality road to the south of Newport could improve accessibility to health, care, training and education facilities and services. However this may primarily benefit those with access to a private vehicle.	General population with access to a car	**(+)**
Social and Community Influences affecting health Family: structure and function, parenting Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos	This measure could improve access to local support services and community facilities. Whilst east-west transport connections would be enhanced, this measure may potentially create severance between communities located to the north and south of the new road. The Gwent levels are defined by Cadw as a landscape of Outstanding Historical Interest. There are limited means by which the effects of construction of the new road on the Historic Built Environment can be mitigated.	General population, Geographical groups	**(N)**
Living Conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces	Noise impacts would be reduced along the route of the existing M4. New noise impacts would arise along the new road route. A new route to the south of Newport would help to reduce air pollution along the route of the current M4 in the AQMAs. However, air quality would be expected to deteriorate in the area around the new road – although the surrounding area is less populated than the urban areas of Newport and thus the impact on human health would be less. The new road would cross the River Usk SAC and SSSI and the Gwent Levels and is likely to impact adversely on the landscape. The new road would help improve safety. On completion of the new road, it is forecast that the total number of accidents on major roads in Newport would fall.	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton, and the new road)	**(+)**
Working Conditions Employment, workplace conditions, occupation, income	Ill health is often associated with economic deprivation. The construction of a new high quality road to the south of Newport would aim to support regional economic development, through enhanced accessibility to employment centres and improving the movement of people and freight. This would lead to improved economic outcomes which might be considered to contribute to health and wellbeing.	General population, Income related groups	**(+)**
Services (access to and quality of) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	Whilst east-west transport connections would be enhanced, this measure may potentially create severance between communities located to the north and south of the new road. The new road will help reduce problems of congestion on the highway network, thus leading to journey time savings and improved journey time reliability. Although there is no direct link between journey time saving and health, a new and modern road would improve the driver experience and reduce driver stress.	General population, Geographical groups	**(+)**
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	The new road would improve transport conditions and accessibility and support aspirations for economic development in South East Wales and beyond. The new road would cross the River Usk SAC, SSSI and the Gwent Levels SSSI and thus care will be required during construction. Mitigation/enhancement measures could help ensure that adverse impacts on the environment and biodiversity are compensated for. Wildlife corridors could be disrupted. The new road will help to reduce congestion, which should have some benefit in reducing vehicle emissions. However it is not clear whether the additional road capacity would lead to an overall increase in emissions in the long term.	General population, Geographical groups, Income related groups	**(N)**

6.3 Highway Option B: At Grade Junction Improvements to the A48 Newport Southern Distributor Road (SDR)

Option B would involve a series of at-grade junction improvements to the Newport A48 Southern Distributor Road (SDR) in addition to other traffic management and smarter choice measures. An “at-grade improvement” to a junction is made at the same level as the main road. For example, improvements to roundabouts are at grade; adding flyovers or underpasses are not at-grade improvements.

Traffic flows on the SDR are currently lower than was predicted prior to opening. In part, this is due to the number of roundabouts disrupting mainline flows. The roundabouts tend to disrupt main carriageway traffic flows by giving priority to circulating traffic. More efficient control of the entry of traffic from minor routes would reduce this disruption. The SDR would be a more attractive alternative east-west traffic route if the main carriageway flows were given greater priority by signal control at all junctions. However, the prioritisation of east-west movements along the SDR could potentially cause delays on the local road network. The location for the proposed junction improvements are shown in red on the diagram below.

The HIA appraisal summary table for Highway Option B is provided in Table 6.

Highway Option B

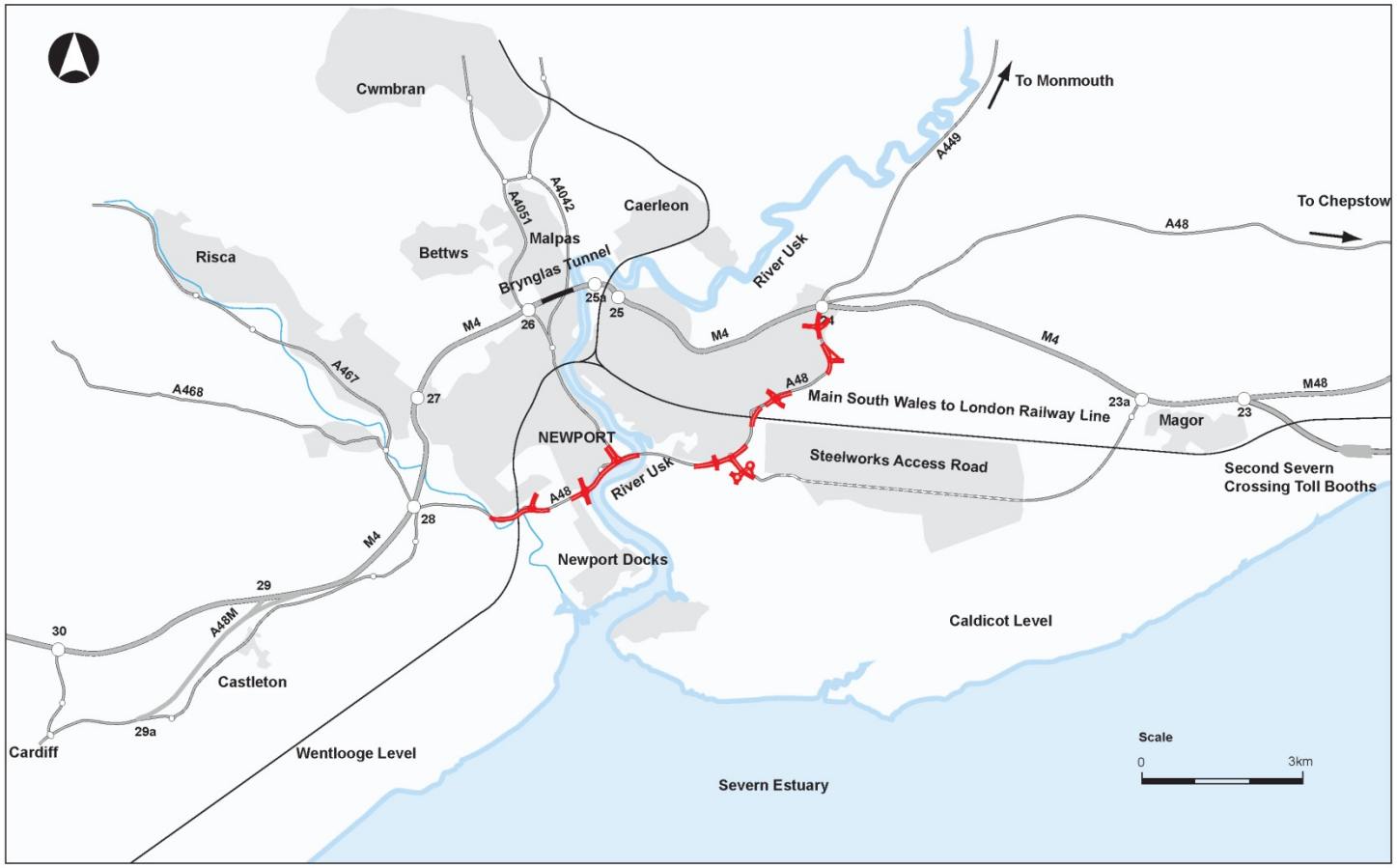


Table 6: HIA Appraisal of Highway Option B

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education	At-grade junction improvements along the SDR could cause severance with greater east-west traffic flows along the SDR. This may adversely impact on local journeys and thus have a negative impact on local accessibility.	General population, Geographical groups	**(-)**
Social and Community Influences affecting health Family: structure and function, parenting Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos	At-grade junction improvements along the SDR could cause severance with greater east-west traffic flows along the SDR. This may adversely impact on local journeys and thus have a negative impact on local accessibility.	General population, Geographical groups	**(-)**
Living Conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces	Noise impacts could be reduced along the M4 route. Noise levels would be expected to increase along the SDR. Alternative use of the SDR by local traffic would reduce air pollution along the route of the M4, improving conditions in the AQMAs. Pollution levels may increase along the SDR. The SDR is situated within TAN15 Flood Zones. Some junctions would need to accommodate flood mitigation works. Option B will help improve road safety. It is forecast that the total number of accidents on major roads in Newport would fall as a result of these improvements.	General population, Geographical groups	**(-)**
Working Conditions Employment, workplace conditions, occupation, income	This measure may disrupt local traffic movements, potentially affecting access to employment opportunities on the local road network to a limited extent. However, this option is assessed as having a neutral impact on economic activity and location. Therefore, health impacts are expected to be negligible.	General population, Income related groups	**(N)**
Services (access to and quality of) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	At-grade junction improvements along the SDR could cause severance with greater east-west traffic flows along the SDR. This may adversely impact on local journeys and thus have a negative impact on local accessibility to services.	General population, Geographical groups	**(-)**
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	At-grade junction improvements along the SDR could cause severance with greater east-west traffic flows along the SDR. This may adversely impact on local journeys and thus have a negative impact on local accessibility to services. At-grade improvements would require realignment of the SDR at Church Street which crosses the River Usk SAC mudflats, an ecologically sensitive area, which may require mitigation.	General population, Geographical groups	**(-)**

6.4 Highway Option C: Grade Separated Junction Improvements to the A48 SDR

Option C would involve the grade separation of some junctions and partial or full closure of other junctions on the Newport A48 Southern Distributor Road (SDR) in addition to other traffic management and smarter choice measures. Grade separation of a junction involves aligning a junction at different heights (e.g. development of a flyover), so that a junction will not disrupt the traffic flow on routes when they cross. Some demolition of existing properties is likely to be necessary to accommodate grade separation at some junctions.

Grade separated junctions would aim to provide free flowing traffic movements allowing for more efficient movement of people and freight along the SDR, as an alternative route to the M4. Grade separation would also reduce delays for traffic wanting to cross the SDR. The proposed changes are highlighted in red on the diagram below.

The HIA appraisal summary table for Highway Option C is provided in Table 7.

Highway Option C

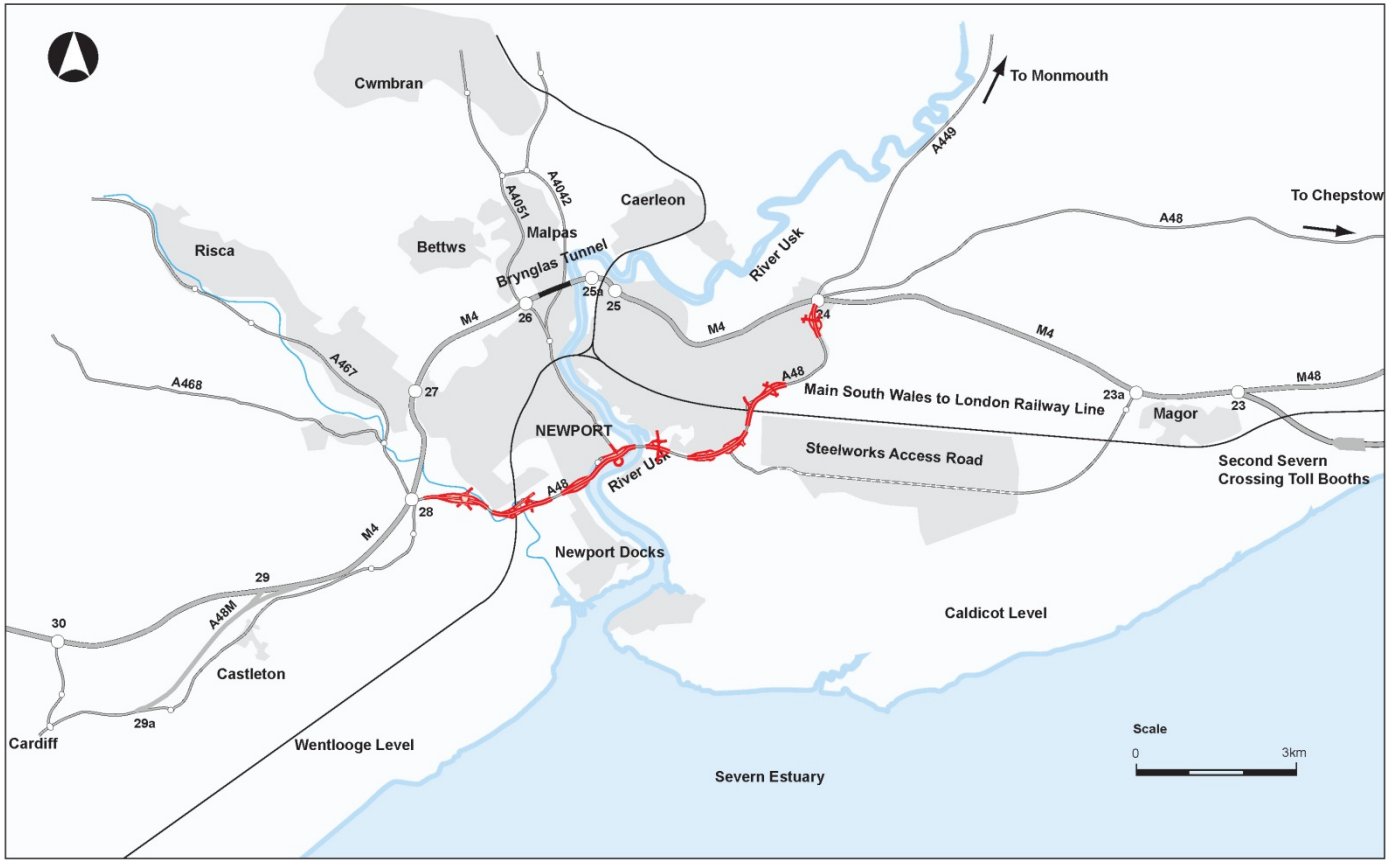


Table 7: HIA Appraisal of Highway Option C

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training and education	Grade separated junction improvements would improve east-west traffic flows along the SDR without disrupting local traffic movements. This measure could therefore improve access to local health, care, training and education services.	General population	(+)
Social and Community Influences affecting health Family: structure and function, parenting. Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural and spiritual ethos	This measure could improve access to local support services and community facilities. Grade separated junction improvements along the SDR could cause an adverse impact on Tredegar House Historic Park and Garden, Grade I Listed Building and conservation area, and Grade II Listed Buildings with possible adverse effects on historical and cultural identity.	General population, Geographical groups	(N)
Living Conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces	Noise impacts could be reduced along the M4 route. Noise levels would be expected to increase along the SDR. Alternative use of the SDR by local traffic would reduce air pollution along the route of the M4, improving conditions in the AQMAs. Pollution levels may increase along the SDR. The changes proposed will result in adverse visual impacts including some within an historic landscape area, green wedge, and the Tredegar House Historic Park and Garden. Some properties may need to be demolished at some junctions. The SDR is situated within TAN15 Flood Zones. Some junctions would need to accommodate flood mitigation works. Option C will help improve road safety. It is forecast that the total number of accidents on major roads in Newport would fall as a result of these improvements.	General population, Geographical groups	(--)
Working Conditions Employment, workplace conditions, occupation, income	This option is assessed as having a neutral impact on economic activity and location. Therefore, health impacts are expected to be negligible.	General population, Income related groups	(N)
Services (access to and quality of) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	Once complete, grade separation of the SDR will improve network resilience without disrupting local traffic. Access to essential services would be maintained.	General population	(N)
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	The measure would improve transport conditions and accessibility and support aspirations for economic development in the south of Newport. Grade separated junction improvements would require realignment of the SDR at Church Street which crosses the River Usk SAC and SSSI, an ecologically sensitive area, which may require mitigation. Improved operating conditions along the SDR will help to reduce congestion, which will have some benefit in reducing vehicle emissions.	General population, Geographical groups, Income related groups	(N)

6.5 Highway Option D: Online Widening on the M4 between Junctions 24 and 29, including an Additional Tunnel at Brynglas

Option D would involve a programme of major online widening of the existing M4 Corridor between Junctions 24 and 29 to dual 4 lane motorway standard with hard shoulders. This would see four lanes of traffic in each direction along this section of the M4, including an additional tunnel at Brynglas. Some demolition of existing properties is likely to be necessary to accommodate the online widening and additional tunnel. As part of the works Junction 25 would be closed to motorway access whist the east facing slips of Junction 26 would be removed in order to prioritise the M4 for long distance journeys. Online widening would also be supported by other traffic management and smarter choice measures. The location for the proposed online widening is shown in red on the diagram overleaf.

The HIA appraisal summary table for Highway Option D is provided in Table 8.

Highway Option D

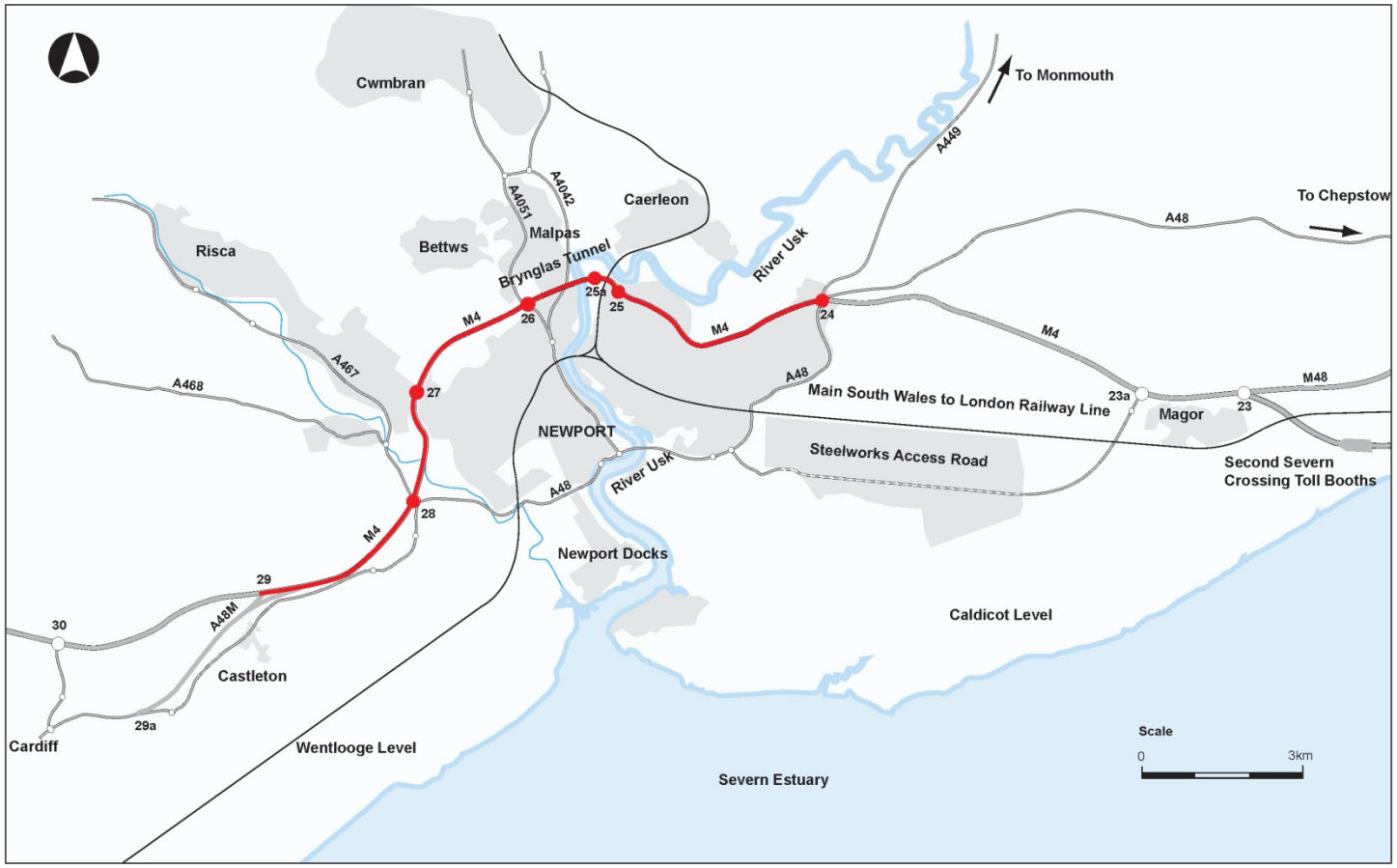


Table 8: HIA Appraisal of Highway Option D

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training & education	Once completed, this measure would help improve access to health, care, training and education services by reducing congestion. However, during construction, access would be significantly disrupted.	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton)	**(N)**
Social and Community Influences affecting health Family: structure and function, parenting. Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural & spiritual ethos	Once completed, this measure would help improve access to community facilities by reducing congestion. However, during construction, access would be significantly disrupted. Widening of the motorway could adversely affect a number of sites of historic and archaeological interest with possible adverse effects on cultural and historical identity. Some properties may be demolished on the Brynglas Ridge.	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton)	**(--)**
Living Conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces	Reduced congestion would reduce noise impacts along the M4. The new capacity may attract additional vehicles, leading to additional noise. Noise levels affecting residential properties will increase during construction works. Reduced congestion will help to reduce air pollution along the route of the current M4, improving conditions in the AQMAs. Should on-line widening attract additional vehicles, it is likely that emissions may increase around Newport. The changes proposed will result in adverse visual impacts, affecting Tredegar House, Beechwood Park and areas of rural landscape. The visual impact of the motorway and the impact on properties through the built up area of Newport would be substantially increased. Some properties may be demolished on the Brynglas Ridge. Online widening will help improve road safety. It is forecast that the total number of accidents on major roads in Newport would fall as a result of these improvements.	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton)	**(--)**
Working Conditions Employment, workplace conditions, occupation, income	Ill health is often associated with economic deprivation. Once complete, the M4 would be more attractive for strategic long distance users and improved traffic flows and accessibility would have positive economic impacts for South East Wales. This would lead to improved economic outcomes which might be considered to contribute to health and wellbeing.	General population, Geographical groups, Income related groups	**(+)**

Assessment Criteria	Assessment	Distribution	Significance
Services (access to and quality of) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	Once completed, this measure would help improve access to local services by reducing congestion. However, during construction, access would be significantly disrupted. Although there is no direct link between journey time saving and health, improved capacity and reduced congestion on the M4 would improve the driver experience and reduce driver stress.	General population, Geographical groups (specifically communities located along the route of the existing M4 between Magor and Castleton)	**(N)**
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	Once complete, the M4 would be more attractive for strategic long distance users and improved traffic flows and accessibility would have positive economic impacts for South East Wales. Improved transport conditions and accessibility could support aspirations for economic development in South East Wales. On-line widening would entail works and potential increased traffic which may adversely affect the River Usk SAC, the Monmouthshire and Brecon Canal and the Allt-yr-Yn LNR. On-line widening will help to reduce congestion, which should have some benefit in reducing vehicle emissions; however it is not clear whether the additional road capacity would lead to an overall increase in emissions in the long term.	General population, Geographical groups, Income related groups	**(N)**

6.6 Common Measures

The Common Measures are additional measures being considered to support the strategic public transport and highway capacity measures in addressing travel related problems within the M4 Corridor between Magor and Castleton. They comprise a mix of highway infrastructure, demand management, alternative modes and smarter sustainable choices. The Common Measures are listed in Table 9 and the HIA appraisal summary table is provided in Table 10.

Table 9 List of Common Measures

Common Measure	Description
Promote A465 Heads of the Valleys road as an alternative route	Promoting the A465 Heads of the Valleys road as an alternative route to the M4 for long distance east-west travel.
J23a improvements	Adding capacity to J23a by widening roundabout entry and possibly introducing traffic signals.
Widening of west facing slip roads at J26	Adding an additional lane to the west facing slips at J26.
J27 safety improvements	Reconfigure slip roads into a conventional diamond shape.
J28 improvements (in addition to baseline)	A connection dedicated to providing free-flow eastbound traffic from the M4 to Forge Road.
Manage speed of traffic	The development of a revised speed management strategy for the study area.
Improve traffic monitoring	Introducing and improving intelligent transport systems to assist traffic monitoring and incident management.
Promote use of electric vehicles	Long term phased introduction of Electric Vehicle Infrastructure in Wales.
Improve aesthetics along the M4 Corridor	Natural and physical environment enhancements along M4.
Noise pollution reduction process	Introducing noise reducing technology.
Improve incident management	Utilising new technologies to tackle traffic congestion.
Better event management	Preparation and implementation of event management plans.
Encourage use of alternative routes to M4	Actively promoting use of alternative east- west routes to M4.
Improve road management during times of poor weather	Preparation and implementation of revised weather management plans.
Manage HGV traffic	Preparation and implementation of a HGV management plan.
Use of ramp metering	Controlling access to M4 through use of traffic signals on slip roads.
Provide better transport mode integration	Taking steps to improve the integration between different sustainable transport modes.
Provide cycle friendly infrastructure	Promoting the use of cycling as an alternative to the car for journeys of up to three miles.
Provide walking friendly infrastructure	Promote the use of walking as a primary modal choice for car users undertaking journeys of up to two miles.

Table 10: HIA Appraisal of Common Measures

Assessment Criteria	Assessment	Distribution	Significance
Lifestyle/capacity affecting health Smoking, nutrition, healthy eating, physical activity, alcohol/drug misuse, sexual health, propensity to use health and care services, skills and knowledge, training & education	The Common Measures include the provision of walking and cycling infrastructure and improved integration between sustainable transport modes. These measures should increase physical activity and fitness. Improved traffic management, junction improvements and the promotion of alternative routes to the M4 may help to improve local accessibility to health, care, training and education services.	General population	(+)
Social and Community Influences affecting health Family: structure and function, parenting. Community: social support mechanisms, social networks, neighbourliness, peer pressure, community divisions, degree of isolation, historical identity, cultural & spiritual ethos	Improved traffic management, junction improvements and the promotion of alternative routes to the M4 may help to improve local accessibility to community services. Improved walking and cycling infrastructure and other sustainable transport modes may also help to improve accessibility within local communities.	General population	(+)
Living Conditions Built environment, civic design and planning, housing, noise, smell, air and water quality, physical view and outlook, public safety, waste disposal, road hazards, injury hazards, safe play spaces	The Common Measures promote more sustainable forms of transport emitting lower noise intensities, including electric vehicles, walking and cycling, which will help to improve local air quality and reduce noise. Natural and physical enhancements along the M4 will improve the environment along the M4 corridor. Improving traffic monitoring, incident management and managing speed of traffic could also help to bring safety benefits on the highway network.	General population	(+)
Working Conditions Employment, workplace conditions, occupation, income	Improved traffic management, junction improvements and the promotion of alternative routes to the M4 may help to reduce congestion and improve accessibility to local employment opportunities, which may be considered to contribute to health and well-being.	General population	(+)
Services (access to and quality of) Medical services, caring services, careers advice and counselling, shops and commercial services, public amenities, transport, education and other services. Access to information technology.	Improved traffic management, junction improvements and the promotion of alternative routes to the M4 may help to improve local accessibility to local services. Reduced congestion on the existing M4 may also improve access to regional services and facilities. Improved walking and cycling infrastructure and other sustainable transport modes may also help to improve accessibility to services within local communities.	General population	(+)
Socio-economic, cultural and environmental Sustainability factors: biological diversity, efficient use of resources, pollution, diversity/local distinctiveness, climate Macro-economic factors: political climate, GDP, economic development, policy climate	Junction improvements and traffic management along the M4 will improve safety and provide additional capacity and will make better use of the existing motorway infrastructure. Improved transport conditions and accessibility could support aspirations for economic development in South East Wales. Promoting the use of electric vehicles and encouraging more use of sustainable travel modes will help reduce pollution. The Common Measures also promote sustainable modes of transport and the provision of walking and cycling infrastructure which are in accordance with national policy on encouraging sustainable development.	General population	(+)

7 HIA Appraisal Summary

Table 11 provides a comparative summary of the HIA appraisal of the public transport measures, highway infrastructure schemes Options A-D and the Common Measures based on the existing WelTAG evidence. The appraisal summary tables and the comparative summary table will be updated following the completion of the telephone interviews with stakeholders.

Table 11: HIA Appraisal Comparative Summary

WelTAG Criteria	Appraisal of CEM Measures					
	Public Transport Measures	Highway Infrastructure Option A	Highway Infrastructure Option B	Highway Infrastructure Option C	Highway Infrastructure Option D	Common Measures
Lifestyle/capacity affecting health	(+)	(+)	(-)	(+)	(N)	(+)
Social and Community Influences affecting health	(+)	(N)	(-)	(N)	(--)	(+)
Living Conditions	(N)	(+)	(-)	(--)	(--)	(+)
Working Conditions	(+)	(+)	(N)	(N)	(+)	(+)
Services (access to and quality of)	(+)	(+)	(-)	(N)	(N)	(+)
Socio-economic, cultural and environmental	(+)	(N)	(-)	(N)	(N)	(+)

8 Glossary

The following terms are referred to in the HIA:

AQMA	Air Quality Management Area
GDP	Gross Domestic Product
HIA	Health Impact Assessment
LNR	Local Nature Reserve
M4 CEM	M4 Corridor Enhancement Measures
SAC	Special Area of Conservation
SDR	Southern Distributor Road
SSSI	Site of Special Scientific Interest
WelTAG	Welsh Transport Planning and Appraisal Guidance
WHIASU	Wales Health Impact Assessment Support Unit

Appendix A: Stakeholder Consultation Responses

Question	Responses
Topic: Public Transport Measures	
What do you consider to be the potential health impacts? Will the impact be positive or negative?	• Very positive health impacts • Positive impacts – physical activity, potential reduction in emissions • Positive impacts. Should help to increase physical activity and social connectiveness. • Could also provide some longer term jobs.
Is the likelihood of the impact of the proposal definite, probable or speculative?	• Unlikely to be successful, other proposals have failed. It's worth a try but it's unlikely to change people's behaviour. It's unlikely we're going to change people's travelling habits so it's more likely to be speculative • Speculative as people won't necessarily start using public transport, there needs to be some sort of intervention to make people use public transport • Probable
What do you consider to be the scale of the impact? What proportion of the population is likely to be affected?	• Small proportion, again people unlikely to get out of their cars • Difficult to answer, so could really only say what came out of the WelTAG appraisal on that • Fairly limited
What do you consider to be the timing of these impacts? Will the impact be in weeks, months or years?	• Long term • Timing of impacts depends on whether there are interventions in place to get people to use it, so it will be a slow burner more than anything • Months or years – it will take time for people to change their behaviour

Question	Responses
What will the distribution of the effects be? Will the proposal affect different groups of people in different ways?	• Positive impact on those without access to a car • It will affect different people in different ways, it's really difficult to answer. It depends, given the geography that we're looking at. It will be the sorts of people that are using it to get to work more than anything. But I found that one really difficult to answer. • Only likely to affect people with free access to public transport. Those with private vehicles are unlikely to change their behaviour.
Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?	• Looking at the interventions that can be put in place to encourage people to use public transport, so looking at cost/benefit and that kind of thing for individuals, along with ensuring some kind of targeted consultation with the people that are likely to use the public transport. • Systematic promotion of public transport to increase awareness would increase the benefits. • Clean technology for buses would help to reduce pollution.

Question	Responses
Topic: Highways Option A - Additional high quality road to the south of Newport	
What do you consider to be the potential health impacts? Will the impact be positive or negative?	• This would be the most sensible option, possibly the best. • Damage to the unique Fenland landscape, but avoids the Magor nature reservation to the north of Magor and it's the one that's in contact with the smallest population, because it's a rural area, so it looks likes the most sensible and least polluting option • The only real health impacts I could see for it are with regards to access, other than that, given the area it's going through, there's not a lot there. So physically human wise, there's not a lot there. There's quite a lot there environmentally. • There may be negative impacts during the building of the road (noise, air quality, visual impact) and environmental (but covered in the environmental assessment). • Negative: • Potential to bring congestion and pollution to new areas. • Steel works site – extensive housing planned which would be affected by the congestion from the new road. • Negative impact on natural flood defences • Although the frequency of accidents may be reduced the higher road space may mean that accidents are more serious. • May widen the gap in health inequality between the north and south of Newport
Is the likelihood of the impact of the proposal definite, probable or speculative?	• No comment • Speculative • Probable

Question	Responses
What do you consider to be the scale of the impact? What proportion of the population is likely to be affected?	• A sizable population (the Duffryn area) will experience positive benefits, the negative impacts will be experienced by the least number of people in comparison to the other options. • Access wise, I don't think there will be a massive impact. It's only going to be people with vehicles anyway and as I say there's not a lot of from what I've seen so far anyway. There's not a lot to access. • Fairly small proportion • In the long term it could affect larger proportion if flood mitigation measures are not implemented.
What do you consider to be the timing of these impacts? Will the impact be in weeks, months or years?	• No comment • It will probably be weeks more than anything, just after it's opened. There could possibly be negative impacts from the actual building of the road (noise, air quality, visual impact) and environmental (but covered in the environmental assessment). • Years
What will the distribution of the effects be? Will the proposal affect different groups of people in different ways?	• It's avoiding pollution for the majority of the population. The damage to the landscape has to be managed, there is a lot that can be done to minimise the damage. It's minimising pollution for the largest number of people. It's away from the most populated areas of Newport, the winds blow from west to east and the pollution from this option will spread over the channel and not the local population. • General population, but only specific to that area, neutral impacts (negative during construction, and then once in place probably neutral to positive. • Likely to affect whoever occupies the housing at the steelworks.

Question	Responses
Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?	• I think the line seems to be a sensible one which does reduce pollution. This option has been designed in a positive way, it avoids nature reservations etc. • Not too sure, I can't think of any actual measures to link in with it
Topic: Highways Option B - At grade junction improvements to the A48 Newport Southern Distributor Road (SDR)	
What do you consider to be the potential health impacts? Will the impact be positive or negative?	• It's got merit but it takes traffic nearer to the population. It's not the ideal solution, cost and disruption, it's not worthwhile. As a through route – very polluting. • I don't see there being many health impacts for it, just because I can't see there being with that road specifically any real positive impacts. There might be impacts with regards to taking traffic away from the M4 but I don't think that there would be a massive health difference. Probably not any real negative impacts, I think there would be negative impacts when it comes to the actual construction, on whatever is done to the junctions, as that will have a big impact on traffic, and then stress more than anything. • Also negative impact, with regards to road traffic, in terms of increased potential for collisions with the changed junctions as people are not used to them. • Potential for more severe accidents and increased frequency of accidents. • Road borders some of the most deprived areas so negative health impacts will have a disproportionate effect. • May reduce the amount of walking and cycling that people do.

Question	Responses
Is the likelihood of the impact of the proposal definite, probable or speculative?	• Definite • Speculative – negative impact of potential increase in collisions, if the junctions change, and people are not used to it, the changes could actually cause issues. • Definite
What do you consider to be the scale of the impact? What proportion of the population is likely to be affected?	• Communities nearby would be impacted by pollution, and it would lose its value as a distributor road by promoting its use as an east-west route. • Negative impact of construction – stress for local commuters during the construction. • Moderate proportion of the population
What do you consider to be the timing of these impacts? Will the impact be in weeks, months or years?	• Long term - would provide considerable pollution • During construction – negative impacts • Months-years
What will the distribution of the effects be? Will the proposal affect different groups of people in different ways?	• I don't see these divisions between groups. The area most affected, the plain of Newport is where most of the council houses are built and so it would have an increased impact on these populations. Increased effect on the poorest people in Newport. • Impact of stress and potential increased collisions on local commuters • Taking traffic away from the M4 – users of the M4 • More deprived areas.

Question	Responses
Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?	• For the cost, disruption and negative impacts, it's not worth taking it forward. • Ensuring there is awareness among the users, and giving people an idea of the length of time that people will be inconvenienced by the changes that are being put in place. • Limited
Topic: Highways Option C - Grade separated junction improvements to the A48 Strategic Distributor Road	
What do you consider to be the potential health impacts? Will the impact be positive or negative?	• Severe negative impacts, is madness, it can't work, junction 28 is already taking the maximum traffic and is under stress at peak times. It would have significant traffic impacts, as junction 28 is already a bottleneck and it would make this problem worse. The option should be dropped and forgotten about. • Negative impact – increased issue with regards to road traffic, in terms of increased potential for collisions with the changed junctions. • Positive impacts – improved access, reduction of noise levels on the M4, but then that could increase noise levels on this road • Preferable to Option B but will still cause negative impacts on health. • Increased potential for cutting off bits of the community. • Demolition of housing could be a mixed blessing as much of it is not in a good state. Depends on where they are relocated to.

Question	Responses
Is the likelihood of the impact of the proposal definite, probable or speculative?	• Definite • Speculative – negative impact of potential increase in collisions, if the junctions change, and people are not used to it, the changes could actually cause issues. • Speculative for the other impacts • Probable
What do you consider to be the scale of the impact? What proportion of the population is likely to be affected?	• Negative impacts on local communities • General population, those that use the A48 Strategic Distributor Road • Moderate
What do you consider to be the timing of these impacts? Will the impact be in weeks, months or years?	• Long term • Timing – impacts during construction, e.g. increased risk of accidents • Within weeks of opening – positive impacts of improved access, reduction of noise levels on the M4 • months
What will the distribution of the effects be? Will the proposal affect different groups of people in different ways?	• The area most affected is where most of the council houses are built and so it would have an increased impact of these populations. • General distribution of the effects • It will affect more deprived areas most.

Question	Responses
Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?	• The traffic bottleneck at junction 28 is a problem that can't be solved. • Ensuring there is awareness among the users, and giving people an idea of the length of time that people will be inconvenienced by the changes that are being put in place. • The demolition of housing offers the opportunity to bring some measurable benefit to the previous inhabitants. • Need to ensure that access on to the road is easy and safe. • Need to ensure that communities continue to function as they did before.

Question	Responses
Topic: Highway Infrastructure Option D - Online Widening of the M4 between Junctions 24 and 29, including an additional tunnel at Brynglas	
What do you consider to be the potential health impacts? Will the impact be positive or negative?	• Very negative, this is the worst of all options. It brings the pollution into the heart of the city and it should be put in a box with a concrete slab on top of it. There would be fierce public opposition, and sensible public opposition. We don't put new roads inside the city now, we take them outside of the city. This is the most disruptive option to the local area. This is the worst option extra traffic, increasing pollution, impacts on the population of Newport. I don't think there will be a positive impact either for the people of Newport. • This certainly has a discernible and measurable negative effect on the health. • In the process of it happening, it would cause issues with regards to reduced access, and increased traffic issues – stress, noise, and everything else • Once its completed, then potentially it could reduce congestion, so potentially it could reduce stress • Major congestion and associated impacts during construction. • Potentials for short term local jobs. • Some benefit to health but only minimal. • Positive impacts from reduced congestion are only likely to be short term as it attracts increased usage over
Is the likelihood of the impact of the proposal definite, probable or speculative?	• Definite • Probable impacts • probable

Question	Responses
What do you consider to be the scale of the impact? What proportion of the population is likely to be affected?	• Large proportion of residents of Newport • General population would be affected, large proportion of the population as it's the main entry to Wales • small
What do you consider to be the timing of these impacts? Will the impact be in weeks, months or years?	• Years • Timing – the negative impacts would be throughout the whole construction period, and then the increased access would be as soon as its open, and then a long term impact • Weeks, months
What will the distribution of the effects be? Will the proposal affect different groups of people in different ways?	• Large proportion of residents of Newport, in terms of the impacts of noise, air quality, disruption • General population – in terms of the positive impacts in terms of access. • The negative impacts in terms of construction – would be the regular users of the M4, and communities around the M4 corridor. • Mainly affect people in the least deprived areas.
Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?	• During construction phase, it would be the appropriate rediversion of traffic but it would be important to define appropriate to avoid negative impacts on the areas that the diverted traffic would be going through. • Consultation with the users of the route and the communities that are affected. • Presumably this is the most expensive option so perhaps the money would be better spent elsewhere.

Question	Responses
Topic: Common Measures	
What do you consider to be the potential health impacts? Will the impact be positive or negative?	• Positive impacts e.g. of noise pollution reduction measures and improved incident management, and event management. • All common measures – desirable and positive impacts • Walking and cycling infrastructure will potentially have a positive effect on physical activity levels, and alternative route promotion could be beneficial with regards to access to services. There is also potential for a reduction in noise and an improvement in local air quality to be beneficial. • Respondent did not want to appraise the common measures
Is the likelihood of the impact of the proposal definite, probable or speculative?	• Speculative • Speculative • No comment
What do you consider to be the scale of the impact? What proportion of the population is likely to be affected?	• No comment • General population • No comment
What do you consider to be the timing of these impacts? Will the impact be in weeks, months or years?	• No comment • Timing, I would suggest would be months - years, due to the need for initiatives to encourage the use of alternative routes/methods of transport. Better event management could potentially have immediate effect, but there may be a need for time allowance for trial and error approaches. • No comment

Question	Responses
What will the distribution of the effects be? Will the proposal affect different groups of people in different ways?	• The measures exclude young and elderly as it's harder for them to use public transport, walking and cycling options. • Local communities will be more likely to make use of walking ad cycling infrastructure. The general population will experience the effects of other common measures. • No comment
Are there any opportunities to maximise the potential improvements in health and to minimise the potential risks to health?	• Motorway art, e.g. like the French motorways. • Encourage petrol to be more expensive, as otherwise people will not be incentivised to leave their cars. • Still an impression that improvements can be made in managing accidents. More can be done, in terms of warning people about incidents, so better use of the warning signs, so that people can make decisions. • Public transport integration – great theory never works in practice, very difficult to persuade people to get out of their comfortable car seats • A well planned and tested series of interventions to encourage the use of alternative methods of transport would be needed. Changes should take into account local consultation to ensure limited disruption and maximum benefit. • No comment