Llywodraeth Cymru
Welsh Government

Welsh Government

M4 Corridor Around Newport

The Plan

Strategic Appraisal of Alternatives Considered During Consultation





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Purpose of this report

The purpose of this report is to appraise, at a strategic level alternatives put forward during the draft Plan Consultation. During the consultation, alternatives arising to address the transport related problems of the M4 Corridor around Newport were put forward for the Welsh Government's consideration.

These have been appraised to determine whether they are reasonable alternatives. To constitute a reasonable alternative; the proposal for the M4 corridor around Newport must be able to meet the objectives for the draft Plan for the M4 Corridor around Newport. Alternatives are rejected where they did not meet the objectives of the draft Plan, in line with Strategic Environmental Assessment (SEA) requirements to be a 'reasonable alternative'.

Alternatives suggested during the draft Plan Consultation

Alternatives have been considered within this document because they have been suggested during consultation events, including public drop-in exhibitions and workshops[1] or as a response to consultation. These included some alternatives that the Welsh Government has previously considered as part of the development of its preferred strategy. Appraisal of these alternatives is provided within the M4 Corridor Enhancement Measures (CEM) Alternatives Considered Workbook and other associated M4 CEM workbooks, available at www.m4cem.com.

A list of the alternatives put forward in responses to the consultation is provided in Appendix A. The alternatives considered in this report are as follows:

- Grade-separated A48 Southern Distributor Road (SDR) and upgraded A4810 Steelworks Access Road (SAR) also known as the 'Blue Route';

  This measure would see a combination of at-grade and grade separated junction improvements to the A48 Newport Southern Distributor Road and Steelworks Access Road to create an upgraded dual carriageway 'expressway' route through Newport.

- Alignment of the Motorway to the south of Magor;

  This would see a new motorway to the south of Newport involving an alignment to the south of Magor, rather than to the north of Magor as shown in the current TR111 Notice and Black Route proposal.

- Alignment of the Motorway to the west of Wilcrick Hill;

  This proposes an alternative alignment of a new motorway to the south of Newport, where the eastern section of the Black Route might divert west of Wilcrick Hill, Llanwern, before merging with the existing motorway on the western side of Magor junction (J23A).

- Tunnel under the River Usk;

  This would see the Black Route involve a tunnel under the River Usk, as an alternative to a bridge crossing.

[1] For details, see http://m4newport.com/events---publicity.html

- Barrage across the River Usk;

  This would see the Black Route involve a barrage crossing across the River Usk, as an alternative to a bridge crossing.

- Tunnel widening at Brynglas;

  Direct widening of the two existing bores.

- Motorway to the north of Newport;

  This would see a new motorway aligned to the north of Newport, rather than the south.

- Public Transport;

  This option proposes investment in public transport infrastructure and services as an alternative to additional motorway capacity. This also considers how public transport investment might be complementary to additional motorway capacity, as well as the potential impact of a Cardiff Capital Region Metro and rail electrification.

- Do Nothing Strategy;

  This would involve doing nothing above what is already planned or committed, known as the Do Minimum Scenario.

Each of these alternatives has been appraised at a strategic level. Other alternatives raised during consultation, but not considered capable of meeting the objectives of the draft Plan, have been rejected during consideration of all alternatives raised.

The outcomes of the appraisal of individual alternatives are summarised in the following sections.

Appraisal

The 'Blue Route'

Appraisal indicates that:

- It would provide some local accessibility benefits and a degree of increased network resilience, particularly at times of accidents and delays on the M4;
- It would not address the problems (i.e. the need for the scheme) or achieve the objectives for the M4 around Newport, whilst it performs poorly compared to the draft Plan (Black Route) appraisal;
- The cost of a Blue Route that aims to be attractive to motorway users is likely to cost more than £600m, whilst an optimal solution would cost more than £800m, excluding any allowance for land and compensation;
- Legal agreements between the Welsh Government and Tata Steel and St Modwen require access points to their land and operational areas. Therefore to upgrade the SAR to "expressway" or motorway standard would require a completely new scheme to be developed that would involve land and property acquisition to provide the necessary motorway standard and the necessary service roads and junctions to serve existing and planned residential and employment land developments;

- Forecasts of future traffic volumes show even with the optimal Blue Route in place, operational problems would continue to be experienced around Newport;
- The Blue Route in combination with public transport measures would still not provide sufficient relief to the M4 Corridor around Newport;
- The risks of the Blue Route compared to the Black Route include greater economic, environmental and social impacts on communities, property and future development land allocations in the urban area of Newport, also resulting in possible job losses and potentially substantial claims for compensation; and
- The Blue Route would not provide a long term solution to the identified (and acknowledged) problems associated with traffic congestion and journey time variability on the motorway around Newport;

The Blue Route, either as a stand-alone measure or in combination with public transport measures, is not considered to be a reasonable alternative to the draft Plan. The Blue Route, as considered within this document, should not be taken forward for further appraisal.

Alignment of the Motorway to the south of Magor

During the draft Plan consultation, some stated a preference for a Black Route with an alignment to the south of Magor, rather than to the north of Magor.

As part of the development of the M4 Relief Road scheme in the 1990s, route options were identified and analysed to the south and north of Magor, which led to the preference of a route to the north of Magor, which is currently protected for planning purposes. Reviews of the alignment have been undertaken since the 1990s and in summary:

- In comparison with routes to the south of Magor, a route to the north reduces the length of the new motorway across the Levels;
- There has been opposition received from local individuals and local and national environmental groups to the road options crossing the SSSIs to the south of Magor, and adjustments to the route alignment to move it north of Magor address local environmental concerns. The environmental protection of the Gwent Levels and River Usk remains an important consideration in terms of legislative requirements under the Strategic Environmental Assessment Regulations[2] and Habitats Regulations[3], as well as public and stakeholder acceptability. The route to the north would have less impact on the SSSIs and therefore is favourable over a route to the south;
- A route to the north of Magor offers landscape and noise benefits to local properties;
- A route to the north of Magor would be compatible with the allocations of land for commercial, retail and industrial development as indicated in the relevant local planning policy documents and could provide a coherent boundary between such development and the major part of the Caldicot Levels to the south. A route to the north of Magor would also provide increased

[2] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment
[3] Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

accessibility to the Gwent Europark and Quay Point developments west of Junction 23A, compared to a route to the south of Magor;

- There are likely to be increased construction costs but a route to the north of Magor would provide increased flexibility of movements between the existing M4, M48, A4810 Steelworks Access Road and the proposed new motorway, compared to a route to the south of Magor. This would also provide resilience benefits and maintain access to the Magor motorway service station;
- Overall, a route to the north of Magor offers the greatest economic, environmental and safety benefits.

On the basis of the appraisal, a route to the south of Magor, as considered within this document, should not be taken forward for further appraisal.

Alignment of the Motorway to the west of Wilcrick Hill

During the draft Plan consultation, an alternative was put forward, that the draft Plan's eastern section of the Black Route might divert west of Wilcrick Hill, Llanwern, before merging with the existing motorway on the western side of Magor junction (J23A).

Appraisal indicates:

- An alternative route west of Wilcrick Hill could reduce the environmental impact on the Gwent Levels SSSI and would make greater use of brownfield land;
- It would divert the alignment further away from properties on the Gwent Levels and west of Magor, although properties to the north of the route would then be closer to the new motorway, which would offset this potential benefit;
- It would have a significant physical impact on the Tata steelworks and Eastern Expansion Area, potentially including the strategic Glan Llyn development site. This would have a significant adverse impact on the local economy and could pose a significant risk to the viability of the planned residential and commercial development in this area. Compensation payments would likely make the scheme unviable;
- Due to potential significant adverse impacts on this strategic employment area, this alternative is likely to be strongly opposed by key stakeholders; and
- Reduced network resilience and increased network management risks, when compared to the Black Route, make this a less attractive solution to the transport related problems.

On the basis of this appraisal, a route to the West of Wilcrick Hill, as considered within this document, should not be taken forward for further appraisal.

Tunnel under the River Usk

Responding to comments made during the draft Plan consultation, the Welsh Government considered the potential development of a tunnel under the River Usk and Newport Docks along the approximate alignment of the Black Route, as an alternative to a bridge crossing.

In summary:

- A cut and cover/immersed tube tunnel is not considered to be feasible in light that it would significantly impact on the River Usk SAC and would not be justifiable where other reasonable alternatives exist (in the context of the Habitats Regulations).
- A bored tunnel is considered to a feasible alternative to a bridge crossing of the River Usk and Newport Docks area, although it would have significantly greater capital construction costs, maintenance costs and operations costs than a bridge, acknowledging that it could save on land purchase and compensation costs; and
- Although tunnelling options are feasible, the engineering risks are high. The costs are estimated to be some £300M more than the bridge options.
- With a tunnel option, it would not be possible to provide a junction in the Docks area.

On the basis of the appraisal, an alignment that includes a tunnel option as considered within this document should not be taken forward for further appraisal and is not considered a reasonable alternative.

Barrage across the River Usk

During the draft Plan consultation, the Welsh Government was asked to consider the potential development of a barrage across the River Usk along the alignment of the Black Route, as an alternative to a bridge crossing. In summary:

- A barrage could facilitate the regeneration of land around the Newport Docks and River Usk and benefit tourism in the area;
- The commercial operations at the Newport Docks and along the River Usk would be likely to be in conflict with a barrage across the River Usk. This could lead to significant compensation requirements, or even closure of businesses reliant on the River Usk for its trade;
- A barrage could improve accessibility within Newport (in particular to the East Usk area), reduce community severance, and provide health and wellbeing benefits. The scheme could facilitate recreational development along the banks of the river, supporting tourism and leisure uses; and
- The construction of a barrage across the River Usk SAC is very likely to result in significant effects on the integrity of the European protected site. Any barrier constructed across the Usk is likely to affect the hydrological, geomorphological, riparian habitats and habitat connectivity characteristics of the designation. In terms of the feasibility and deliverability of a barrage in combination with a new motorway, there is likely to be significantly more risk of failure at public inquiry compared to a new motorway involving a bridge crossing of the River Usk.

On the basis of the appraisal, an option to develop a barrage across the River Usk, as considered within this document, should not be taken forward for further appraisal.

Tunnel widening at Brynglas

Online widening with an additional tunnel at Brynglas was assessed as part of the M4 CEM Programme. During the draft Plan consultation, an alternative was put forward, involving online improvements with widening of the tunnels at Brynglas.

An M4 CEM WelTAG assessment[4] recommended that an option involving online widening with an additional tunnel at Brynglas should not be progressed due to it not providing network resilience, and its likely significant impacts on the local community. In summary, it was also recognised that it would not provide sufficient capacity in the longer term, with severe operational problems continuing to be experienced on some sections, whilst it would have adverse impacts on people and the economy during construction. Furthermore, the measure was expected to increase traffic flows along the motorway, which would have adverse impacts on noise and air pollution to the north of Newport, where there are many receptors (people and properties).

Taking into account the responses to the draft Plan consultation, appraisal has indicated that both an additional tunnel and widening of the existing tunnels at Brynglas would be likely to:

- Require property demolition and attract significant public opposition;
- Raise significant local social and health issues;
- Create large adverse impacts on people and the economy during construction; and
- Not resolve capacity problems and network resilience issues on the M4 Corridor around Newport.

An additional tunnel or widening of the tunnels at Brynglas should not be taken forward for further appraisal, as the solution to the identified problems.

Motorway to the north of Newport

A motorway route to the north of Newport was considered as part of development work in 2006 and then again as part of the M4 CEM Programme. It has been suggested again as an alternative, as part of the draft Plan consultation.

A re-examination of route corridors in 2006 considered a northern route, compared to a route to the south of Newport, would be longer, would create a major impact on the landscape, would not attract sufficiently high levels of traffic, and performed worse in economic terms. It was also considered that it presents high technical risks, requiring significant numbers of crossing structures and substantial earthworks (cuttings and embankments). The M4 CEM development work suggested that road to the north of Newport would not meet the objectives for the M4 Corridor around Newport because it would cause significant impacts on land take and property.

The northern corridor would not involve the crossing of SSSIs, with the exception of the River Usk, which is a SAC. However, significant demolition of properties would be needed to accommodate the route. There would be significant impact on local communities during construction. Local communities would experience greater noise and air pollution levels. Depending on where a feasible connection

[4] M4 CEM WelTAG Stage 1 (strategy level) Report (2013)

could be made to connect a route to the north of Newport with the existing M4, traffic congestion could be redistributed to the west of Newport and Cardiff. It would offer less opportunity to provide accessibility benefits to Newport.

On the basis of the appraisal, a motorway to the north of Newport, as considered within this document, should not be taken forward to address the problems on the M4 around Newport.

Public Transport

During the draft Plan consultation, some respondents put forward public transport measures or investment in regional public transport services, as an alternative solution to address the problems of the M4 around Newport. Some specifically mentioned the Cardiff Capital Region Metro and/or rail electrification in their responses, and suggested that improved public transport services could reduce the need for a new motorway to the south of Newport.

It was recommended by the M4 Corridor around Newport Stage 1 (strategy level) WelTAG report[5] that public transport enhancements should be considered by the delivery team(s) set up for the purpose by the Welsh Government. As such, the draft Plan, whilst being supportive of and complementary to public transport enhancement measures, recognises that the Welsh Government has commissioned separate studies of proposals to develop a Cardiff Capital Region Metro.

Studies have shown that new or improved public transport services would only have minimal impact in terms of reducing traffic on the M4[6]. Investment in public transport measures is more likely to be aimed at achieving wider benefits to the region than relieving motorway traffic. The studies indicate that for the Newport area, an approximate 50% increase in the use of public transport, with an increased mode-share to approximately 11% (compared to a present day mode share of around 7%) is likely to achieve a reduction of less than 3% of traffic volumes on M4 sections between J23 and J29.

The impact on the M4 between Magor and Castleton of an integrated regional public transport network based on rail electrification and the Cardiff Capital Region Metro has also been considered at a strategy level. It is considered that if an approximate 100% increase in public transport usage occurred across the Newport area, this likely to equate to a 5% reduction in traffic flows on the M4 around Newport, which would not be sufficient to address the transport related problems, or achieve the goals for the M4 Corridor around Newport.

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

[5] Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), June 201, available at www.m4newport.com
[6] M4 CEM Public Transport Overview (2012) and M4 CEM Public Transport Overview Update (2013), both available at www.m4cem.com

Do Nothing Strategy

During the draft Plan consultation, an alternative to the draft Plan was supported by some respondents, suggesting that doing nothing was their preferred strategy. Some respondents questioned the validity of the identified problems and thus queried the need for a solution at all, whilst others opposed any highway intervention (without suggesting alternative measures).

The Do-Minimum scenario, as outlined within the draft Plan Consultation Document, means doing nothing above what is already planned or committed. As part of the draft Plan consultation, both the Do-Minimum scenario and the Consequences of Doing Nothing were explored and assessed. Appraisal shows that:

- The Do-Minimum scenario performs poorly against the objectives for the M4 Corridor around Newport;
- Increasing congestion resulting from capacity and resilience problems means that it performs particularly poorly against economic criteria, posing a significant constraint to the economy of South Wales;
- Impacts on social criteria are largely neutral or minor adverse, apart from where increased traffic congestion adversely impacts on safety; and
- Whilst the Do-Minimum scenario performs poorly against noise and local air quality criteria due to predicted increase in traffic and congestion on the existing M4 Motorway around Newport, the impact on the environment remains largely neutral.

On the basis of the appraisal, there is a strong need to do something to address the identified problems. Doing nothing other than initiatives already planned or committed, as considered within this document, is not considered to be a reasonable alternative to the draft Plan.

Conclusions and Next Steps

The alternatives, revised during draft Plan consultation, are not considered to be reasonable alternatives in line with the SEA requirements. Therefore no additional alternatives are recommended to be taken forward for further appraisal.

The Welsh Government will use the responses to the draft Plan Consultation to decide whether to adopt the draft Plan, with or without amendments, taking into account the responses to the associated assessments.

An M4 Corridor around Newport SEA Statement will be published, should the draft Plan be adopted, to demonstrate how the Welsh Government has taken suggested alternatives into consideration as part of its decision making.

The Welsh Government may then decide to announce a preferred route, which would protect a corridor for planning purposes.

1 Introduction

1.1 Context

The Welsh Government has prepared and consulted upon its draft Plan to address transport related problems on the M4 around Newport[7]. Section 2 of this report presents the identified problems, aims and goals (transport planning objectives) for the M4 Corridor around Newport.

The draft Plan presented the Welsh Government's preferred strategy, alongside two reasonable alternatives to that preferred strategy. The Welsh Government has also considered a Do Minimum scenario[8]. In identifying reasonable alternatives, the Welsh Government has taken into account the identified problems, objectives and geographical scope of the draft Plan.

The draft Plan and its reasonable alternatives emerged following a phased engagement and transport appraisal process involving a March 2013 M4 Corridor Enhancement Measures (CEM) WelTAG[9] Stage 1 (Strategy Level) Appraisal[10] and a June 2013 M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Appraisal[11].

The main elements of the draft Plan are as follows:

- Provision of a new section of three lane motorway between Junctions 23 and 29 on an alignment to the south of Newport;
- Re-classification of the existing motorway route to the north of Newport as trunk road, facilitating operational management, safety and revised access measures;
- Connection between M4, M48 and B4245 east of Magor. This would potentially provide relief to Junction 23A and to the local road network. It would also provide improved access to park and ride facilities at Severn Tunnel Junction, which may be extended as part of the South East Wales Metro concept;
- Promoting the use of cycling as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure; and
- Promoting the use of walking as an alternative to the car for journeys of up to three miles by providing new infrastructure or improving existing infrastructure.

[7] M4 Corridor around Newport draft Plan (23 September 2013), available at www.m4newport.com
[8] This is a scenario where intervention includes doing nothing above what is already planned or committed. The Do Minimum, in this case, includes all recent network modifications (such as the Junction 24 improvement, the Variable Speed Limit system and the Steelworks Access Road) and any committed schemes (such as the Junction 28/Bassaleg Roundabout/Pont Ebbw Roundabout improvement).
[9] Welsh Transport Planning and Appraisal Guidance, available at http://wales.gov.uk/topics/transport/publications/weltag/?lang=en
[10] Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), WelTAG Appraisal Report Stage 1 (Strategy Level), March 2013, available at www.m4cem.com
[11] Welsh Government, M4 Corridor around Newport, WelTAG Appraisal Report Stage 1 (Strategy Level), June 201, available at www.m4newport.com

The draft Plan's two reasonable alternatives included the Red Route, which is a dual carriageway; and the Purple Route which is a three lane motorway. Both routes would also have complementary measures.

The draft Plan does not preclude public transport measures, but does not include them because the Welsh Government has commissioned a separate study and report on proposals to develop a metro system for South East Wales. That report will focus on how a metro system could support economic growth and regeneration at key locations across South East Wales. It is assumed that public transport enhancement will be progressed separately by a group set up by the Welsh Government to examine proposals for a Cardiff Capital Region Metro system. The draft Plan is cognisant of metro proposals and the proposed new motorway and its complementary measures will aim to complement public transport improvements wherever possible.

A draft Plan Consultation, open to all, ran for 12 weeks, commencing on 23 September 2013 and closing on 16 December 2013. The Welsh Government sought views on the draft Plan and its associated assessments[12], which included:

- Strategic Environmental Assessment (SEA);
- Habitats Regulations Assessment (HRA);
- Health Impact Assessment (HIA); and
- Equality Impact Assessment (EqIA).

For further information about the draft Plan, please visit www.m4newport.com. For more information about the development of the draft Plan, please visit www.m4cem.com.

1.2 Treatment of Alternatives

During the draft Plan consultation, some respondents put forward alternatives to address the transport related problems of the M4 Corridor around Newport, for the Welsh Government's consideration.

Strategic Environmental Assessment (SEA) requires an SEA Environmental Report to be published alongside a draft plan, for public consultation. This is to describe and assess reasons for the selection of a preferred strategy and reasonable alternatives to that preferred strategy, compared to doing nothing above what is already planned or committed.

Engagement and public consultation were undertaken during development work to inform the draft Plan, providing sufficient opportunity for stakeholders and the public to propose alternatives[13]. Alternatives were rejected where they did not meet the objectives of the draft Plan, in line with SEA requirements to be a 'reasonable alternative'. The draft Plan Consultation Document and SEA Environmental Report therefore present what the Welsh Government considers to

[12] All available at www.m4newport.com

[13] Schedule 2 (8) of the SEA Regulations require the Environmental Report to outline the reasons for selecting the alternatives dealt with; this is outlined at sections 2.6.1 and 2.6.2 of the 2013 M4 Corridor around Newport SEA Environmental Report. Section 2.6.1 outlines the process by which the alternatives were refined in the 2012 M4 CEM Environmental Report. Section 2.6.2 outlines the reasons for expanding on the chosen alternative to include motorway options. This work was informed by the M4 CEM and M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) reports to which references and hyperlinks to the publically available reports were included. See www.m4cem.com and www.m4newport.com for development work.

be its preferred strategy to address the problems of the M4 Corridor around Newport, alongside what it considers to be reasonable alternatives to that preferred strategy.

A summary of the engagement and consultation process associated with the draft Plan, including consultation responses, is provided within the M4 Corridor around Newport Consultation Participation Report. Alternatives suggested in responses to the draft Plan consultation are considered by the Welsh Government within this report, which is referenced within the Participation Report.

It is important to note that to constitute a reasonable alternative; a proposal must be able to meet the objectives for the draft Plan. The plan proposer is responsible for determining whether an alternative to its preferred strategy is reasonable or not.

Alternatives put forward during the draft Plan Consultation are appraised in this report at a strategic level.

An M4 Corridor around Newport SEA Statement will be published should the draft Plan be adopted, to demonstrate how the Welsh Government has taken suggested alternatives into consideration as part of its decision making. Depending on the outcome of the analysis of the draft Plan consultation responses received, taking into account its associated assessments, the Welsh Government could accept or modify the draft Plan and then publish it as an adopted Plan for the M4 Corridor around Newport in accordance with the SEA Regulations[14].

[14] Under the SEA Directive (2001/42/EC), SEA is a legal requirement for certain plans and programmes. In Wales, this is implemented through the Environmental Assessment of Plans and Programmes (Wales) Regulations 2004, referred to as the SEA Regulations in this report.

2 Problems, Aims and Transport Planning Objectives

2.1 Problems on the M4 Corridor around Newport

Identified transport related problems are listed below. Problems shown in bold italics were those selected the most times during earlier consultation[15].

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.

[15] Problems shown in bold were most frequently identified by M4 CEM respondents. See Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013.

Safety

12. The current accident rates on the M4 between Magor and Castleton are higher than average for UK motorways[16].
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.

2.2 Aims for the M4 Corridor around Newport

The aims of the Welsh Government for the M4 Corridor around Newport 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.

The draft Plan aims to help to achieve or facilitate these aims as part of a wider transport strategy for South East Wales, as outlined within the Prioritised National Transport Plan[17].

[16] The Variable Speed Limit (VSL) system was introduced in June 2011 between Junctions 24 and 28, in order to improve safety conditions and traffic flow in the short term. The first year of operation has shown a reduction in accidents.
[17] National Transport Plan (2010) & Prioritised National Transport Plan (2011) Welsh Government.

2.3 Transport Planning Objectives for the M4 Corridor around Newport

The Welsh Government, with the help of others, identified the following 15 goals or 'transport planning objectives' (TPOs)[18] for the M4 Corridor around Newport:

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.

[18] TPOs shown in bold were most frequently identified by M4 CEM respondents. See Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013.

3 Alternatives Raised during draft Plan Consultation

During the draft Plan consultation, a number of alternatives were suggested for the Welsh Government's consideration.

Some respondents to the draft Plan Consultation suggested alternatives to be considered as alternatives to the draft Plan's preferred strategy. Other alternatives have been considered within this document because they have been suggested during consultation events, including public drop-in exhibitions and workshops[19].

These included some alternatives that the Welsh Government has previously considered as part of the development of its preferred strategy. Appraisal of these alternatives is provided within the M4 CEM Alternatives Considered Workbook and other associated M4 CEM workbooks, available at www.m4cem.com.

Each alternative put forward is described below and is appraised in Section 4 on their likely economic, social and environmental impacts, and judged against an ability to achieve the goals for the M4 Corridor around Newport (for the goals, see section 2.3).

Alternatives have been appraised at the appropriate strategic level, comparable to the appraisal of the draft Plan preferred strategy, its two reasonable alternatives and the Do Minimum Scenario. Where appropriate, appraisal is in accordance with the criteria recommended by Welsh Transport Planning and Appraisal Guidance (WelTAG) (see Section 4).

A list of the alternatives put forward in responses to the consultation is provided in Appendix A. It is considered that these can be grouped into common themes and those appraised further are summarised in Table 3.1.

Suggested alternatives that are not addressed as part of further appraisal (as outlined below) have not been further considered within this document for one or more of the following reasons:

- The suggested alternative has been considered in full or as part of previous development work where it was considered that it was unable to address the objectives for the M4 Corridor around Newport; and/or
- Based on professional judgement, the suggested alternative would have significant acceptability, deliverability, feasibility and/or risk issues; and/or
- Professional judgement indicates that the suggested alternative would be unable to address the objectives for the M4 Corridor around Newport.

[19] For details, see http://m4newport.com/events---publicity.html

Table 3.1: Alternatives suggested during the draft Plan Consultation

Measure	Description	Source
Grade-separated A48 Southern Distributor Road (SDR) and upgraded A4810 Steelworks Access Road (SAR) also known as the 'Blue Route'	This measure would see a combination of at-grade and grade separated junction improvements to the A48 Newport Southern Distributor Road and Steelworks Access Road to create an upgraded dual carriageway 'expressway' route through Newport	• Institute of Welsh Affairs/Chartered Institute of Logistics and Transport • Wildlife Trusts Wales • RSPB • Campaign Against Levels Motorway (CALM) • Non-organisational responses, similar or identical to campaign responses[20]
Alignment of the Motorway to the south of Magor	This would see a new motorway to the south of Newport involving an alignment to the south of Magor, rather than to the north of Magor as shown in the current TR111 Notice and Black Route proposal.	• Visitors to public exhibitions, predominantly residents of Magor
Alignment of the Motorway to the west of Wilcrick Hill	This proposes an alternative alignment of a new motorway to the south of Newport, where the eastern section of the Black Route might divert west of Wilcrick Hill, Llanwern, before merging with the existing motorway on the western side of Magor junction (J23A).	• Visitors to public exhibitions, predominantly residents of Magor
Tunnel under the River Usk	This would see the Black Route involve a tunnel under the River Usk, as an alternative to a bridge crossing.	• Visitors to public exhibitions
Barrage across the River Usk	This would see the Black Route involve a barrage crossing across the River Usk, as an alternative to a bridge crossing.	• Visitors to public exhibitions
Tunnel widening at Brynglas	Direct widening of the two existing bores. This is different from the previous new bore consideration considered as part of the M4 Corridor Enhancement Measures Programme[21].	• Non-organisational responses
Motorway to the north of Newport	This proposes an alternative alignment of a new motorway to the north of Newport.	• Non-organisational responses

[20] Campaign Against Levels Motorway (CALM) members include Friends of the Earth, Wildlife Trust and RSPB, who encouraged their members to respond to the consultation using template responses (see M4 Corridor around Newport Participation Report for more information)
[21] See www.m4cem.com

Measure	Description	Source
Public Transport	This option proposes investment in public transport infrastructure and services as an alternative to additional motorway capacity. This also considers how public transport investment might be complementary to additional motorway capacity, as well as the potential impact of a Cardiff Capital Region Metro and rail electrification.	• Various transport and environment focused interest groups • Non-organisational responses • Visitors to public exhibitions
Do Nothing Strategy	This would involve doing nothing above what is already planned or committed, known as the Do Minimum Scenario.	• Non-organisational responses

4 Appraisal

The draft Plan Consultation Document provides a strategic level appraisal of the draft Plan, two reasonable alternatives to the draft Plan, and the Do Minimum scenario. This considers their likely economic, social and environmental impacts, and judged against their ability to achieve the 'goals' or 'Transport Planning Objectives' (TPOs) for the M4 Corridor around Newport, in accordance with the criteria recommended by Welsh Transport Planning and Appraisal Guidance (WelTAG)[22]. In this section, a strategic level of appraisal assesses the alternatives put forward during the draft Plan Consultation to consider their merit as potential reasonable alternatives to the draft Plan preferred strategy. Where appropriate, assessment is provided in accordance with WelTAG criteria.

WelTAG recommends that the significance of impact for each criterion is assessed using a seven point scale:

Large beneficial	(+++)
Moderate beneficial	(++)
Slight beneficial	(+)
Neutral	(0)
Slight adverse	(-)
Moderate adverse	(--)
Large adverse	(---)

WelTAG also requires that the distribution of impacts is carefully considered. This part of the assessment refers to how impacts might be experienced geographically and how they might affect different groups in society.

As the draft Plan is at the strategy, plan, or programme stage (as defined within WelTAG), the alternatives raised during consultation have been appraised at a strategic level. It should be noted that this strategic level appraisal has been undertaken on the basis of the information that is currently available.

Appraisal Summary Tables (ASTs) form part of WelTAG appraisal. For purposes of comparison, the AST of the draft Plan is provided in the following pages, as provided within the M4 Corridor around Newport draft Plan.

[22] http://wales.gov.uk/topics/transport/publications/weltag/?lang=en

Appraisal of the draft Plan

Criteria	Assessment	Distribution	Significance
Transport Economic Efficiency (TEE)	The draft Plan could help to significantly reduce problems of congestion on the highway network, thus leading to journey time savings and improved journey time reliability. The new motorway would also provide significant resilience to the network and would be likely to result in lower accident rates. This measure is expected to deliver high to very high value for money.	All road users	(+++)
Economic Activity and Location Impact (EALI)	The draft Plan would deliver significant travel time savings and reliability benefits for businesses and commuters, leading to lower production costs and contributing to the competitiveness of transport dependent business in Wales. Improved accessibility within South Wales and to areas of England would lead to significant agglomeration benefits and higher productivity and/or employment in some sectors. The draft Plan could significantly improve perceptions of access to South Wales, potentially making Wales a more attractive place to do business. Additional junctions to the south of Newport would increase the potential of employment sites. Improved network resilience would greatly reduce the economic costs of incidents of congestion or maintenance on the existing M4.	All road users	(+++)
Noise	Noise impacts would be reduced along the route of the existing M4, which would reduce the noise nuisance to nearby residential properties. The majority of new noise impacts would be largely in areas where there are few noise-sensitive areas (e.g. where there are properties or sites of frequent human use).	Properties along the M4	(+)
Local Air Quality	The draft Plan would provide reductions in the levels of atmospheric pollution to a large number of local noise-sensitive areas (e.g. where there are properties or sites of frequent human use) alongside the existing M4 through Newport, by removing traffic from areas where the existing motorway is frequently congested. There would, however, be increased emissions and deterioration in air quality near the Black Route. The effects of this, however, would be of limited significance given the low number of properties affected. National Air Quality Standards would not be exceeded along the new route.	Properties along the M4	(++)
Greenhouse Gas Emissions	The draft Plan 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 longer term.	No significant distributional impacts	(+)

Criteria	Assessment	Distribution	Significance
Landscape and townscape	The draft Plan Black Route is predominantly located within the low lying Gwent Levels. The major part of the route would be constructed on low embankment, cutting across the current grain of the landscape and disturbing the visual experience. Proposed planting can only partially mitigate the adverse visual impact. Taking into account the historic importance of the landscape and its ecological value, the significance of the impact, at opening year, would be large adverse. However, this would moderate over time when proposed planting matures. At either end of the Black Route, the hillier topography is more capable of screening the road and planting schemes are likely to be more effective. In these areas, the significance of the impact of landscape and visual amenity would be 'moderate adverse'. The line of the Black Route is protected in the adopted Newport local planning policy. The Black Route would also run through a number of other land use designations including the Newport Dock Employment Zone and the Eastern Expansion Area.	Local landscape impacts	(---)
Biodiversity	The Black Route would cross approximately 8.5km of SSSI land resulting in the loss of up to 60ha (less than 1.5%) of the total SSSI. The principal ecological interest of the Gwent Levels SSSI lies in the reen drainage system. The SSSI is an important wildlife corridor, an essential migration route and key breeding area for many nationally and internationally important species. Other designated sites along or within the vicinity of the Black Route includes the River Usk (SAC) and (SSSI), the River Severn Special Protection Area (SPA), the River Severn Ramsar Site, and Local Nature Reserves (LNR).	Potential impact on River Usk SAC and SSSI	(---)
Heritage	The Black Route crosses a number of distinct topographic zones, the cultural heritage of which is characterised by particular attributes related to landform and historic land use. Much of the Black Route would cross the marginal wetlands of the Gwent Levels, which is identified as a Historic Landscape of Outstanding Historic Interest. The area is also designated as being archaeologically sensitive in the adopted Newport UDP. The built heritage of the area includes the historic Newport Docks, a number of individual listed buildings and structures and a range of buildings characteristic of the vernacular architecture of the area. A Grade II listed building, Magor Vicarage, would need to be demolished and a standing stone Scheduled Ancient Monument (SAM) at Llanfihangel would have to be relocated in order to accommodate the scheme.	Distribution assessment not required (Para. 7.10.7 of WelTAG June 2008)	(--)
Water environment	A new motorway along the alignment of the Black Route could lead to adverse effects on water quality, hydrological regimes, flood plains and areas of flood risk. Possible adverse effects on water resources could include changes to the water table, increased flood risk due to run off, pollution due to accidental spillages and changes to the existing hydrology of the catchments through which the road passes. Although the Black Route would be constructed on the floodplain of the Severn Estuary, the Gwent Levels are protected by a sea wall from inundation. The presence of the Usk Bridge would lead to a slight increase in flood levels upstream, particularly during construction, but these would be of negligible significance.	No significant distributional impacts	(--)

Criteria	Assessment	Distribution	Significance
Soils	A major cutting would be required at Castleton to accommodate a new interchange for the Black Route. The overall effect on surface geological features is of negligible significance. However, the proposed development would result in permanent loss of approximately 60ha of Best and Most Versatile Agricultural Land (i.e. land within Grade 1, 2 or 3a). There are some areas of contamination along the route.	No significant distributional impacts	(--)
Transport safety	The new motorway, which would be designed to modern standards, would provide a significant improvement in transport safety for users of the new route, located south of the urban area of Newport. Reduced congestion and delays on the existing M4 route would also provide benefits to transport safety. Walking and cycling infrastructure would also utilise modern construction techniques and safety guidance to benefit the security of its users.	All road users	(+++)
Personal security	Improved traffic flow and less congestion would reduce the potential for delays, which may reduce travellers' perceptions of vulnerability to crime.	All road users	(+)
Permeability	The Black Route could affect a number of existing public rights of way and local routes, which cross or adjoin the route, to which continuity of access should be maintained by means of footpath diversions and appropriate crossing facilities. However, the new motorway would help reduce congestion on the existing motorway and local road network, to benefit connectivity around Newport. Walking and cycling infrastructure would also help to improve connectivity within the corridor.	All road users	(+)
Physical fitness	The new motorway to the south of Newport could reduce congestion on the existing M4 motorway, thereby helping to reduce noise nuisance and air pollution. The new motorway is unlikely to lead to any changes in travel by active modes. Walking and cycling infrastructure would aim to encourage modal shift for local trips and benefit health and wellbeing.	Car users and pedestrians	(+)
Social inclusion	Relieving congestion and improved traffic flows would lead to improvements in the reliability and journey times of strategic bus services, which use the motorway network, offering an opportunity to improve accessibility to key centres. Re- classification of the existing M4 around Newport could increase accessibility along the northern fringe of Newport.	Distribution assessment not required (Para. 8.6.31 of WelTAG June 2008)	(+)
Equality, Diversity & Human Rights	A new motorway and walking and cycling infrastructure could improve access to key facilities and employment opportunities for all groups. However, issues of safety and personal security will be considered at the detailed design stage.	All road users	(+)
TPOs			
1	An additional high quality road is likely to create a significantly safer, easier and more reliable transport link along the M4 between Magor and Castleton.	All	(+++)
2	The new motorway would form part of the European transport network and provide increased accessibility along the M4.	All	(+++)

Criteria	Assessment	Distribution	Significance
3	The new motorway would provide an alternative route to the existing M4 around Newport with capacity to reduce congestion along the existing route and provide increased resilience on the network.	All	(+++)
4	A new motorway would improve traffic conditions on the existing network.	All	(+++)
5	A new motorway would provide increased network resilience and could significantly improve journey time reliability.	All	(+++)
6	The new motorway would provide an additional route between Magor and Castleton.	All	(++)
7	A new section of motorway would provide a safe alternative route.	All	(+++)
8	A new route to the south of Newport would help reduce air pollution along the route of the current M4, improving conditions in the Air Quality Management Areas.	All	(++)
9	Noise impacts would be reduced along the route of the existing M4, which would reduce the noise nuisance to nearby residential properties.	All	(+)
10	The new motorway would help to reduce congestion and vehicle emissions; however it is not clear whether the additional road capacity would lead to an overall increase in emissions in the longer term.	All	(+)
11	A new motorway would provide a high quality and free flowing highway to the south of Newport.	All	(+++)
12	A new motorway would provide a high quality route for strategic journeys.	All	(+++)
13	A new motorway would improve traffic conditions on the existing network.	All	(+++)
14	A new motorway, walking and cycling infrastructure could improve access to key facilities and employment opportunities.	All	(+++)
15	Whilst walking and cycling infrastructure will encourage modal shift for local trips, a new motorway would not support a behavioural change towards more sustainable modes but may encourage additional car use on a free flowing route.	All	(--)
Public acceptability	There is co-ordinated opposition largely from local interest groups and national groups such as Friends of the Earth and RSPB. Most comments arising from the 2006 series of public exhibitions were made on the topic of the environment, with a third of these concerning noise. The location attracting the most comments was Magor/Undy. The acceptability of the new motorway will be tested at public inquiry.		
Acceptability to other stakeholders	Newport City Council and Newport Unlimited are supportive of the provision of a new motorway. Business interests are generally supportive, while environmental groups generally oppose the scheme. The CBI strongly promotes the scheme which is included in South East Wales Transport Alliance's (SEWTA's) Regional Transport Plan. Further engagement is likely to be needed with specific land owners who may be affected directly by the scheme, including Associated British Ports (ABP). The acceptability of the new motorway will be tested at public inquiry.		
Technical and operational feasibility	The new motorway is a challenging scheme with a potential large estuarial crossing, major earthworks, soft ground, contamination, motorway interchanges and potential intermediate junctions. It would considerably improve network resilience by providing a new strategic route to the south of Newport.		

Criteria	Assessment Distribution Significance
Financial affordability and deliverability	A revised assessment of the ability to finance a new motorway enhances its deliverability in a shorter timescale.
Risks	There is a risk of a protracted public inquiry for any of the options progressed through the draft Plan, should it be adopted (with or without amendments).

4.1 Grade-separated A48 Southern Distributor Road (SDR) and upgraded A4810 Steelworks Access Road (SAR) also known as the 'Blue Route'

During the draft Plan consultation, an alternative was put forward in a paper entitled "*The Blue Route ~ A cost effective solution to relieving M4 congestion around Newport*"[23]. This alternative was also proposed and/or supported by some respondents to the draft Plan Consultation. The Blue Route Paper described the alternative as *"a combination of the A48 Southern Distributor Road upgrade (as in Option C* [of the M4 CEM Programme Consultation Document][24]*) together with the Steelworks road, linking together at the present Queensway Meadows Junction."*

The Wildlife Trusts Wales first referred to the Blue Route in letters to Welsh Ministers in the summer of 2013, indicating that they intended to explore an alternative, but did not provide any detail on a proposal. On 9 December 2013, a copy of the published Blue Route paper was sent to Welsh Minister Edwina Hart, MBE CStJ AM by Wildlife Trusts Wales, signed jointly by representatives of Wildlife Trusts Wales, FoE Cymru, Gwent Wildlife Trust and RSPB Cymru.

The option to upgrade the A48 Southern Distributor Road (SDR) and Steelworks Access Road to a "Newport Expressway" was first considered by the Welsh Government in 2010 in the report 'M4 CEM Strategy, Appraisal and Monitoring'[25]. The purpose of that report was to outline a strategy to emerge from investigation of other potential schemes to improve the operation of the existing M4 around Newport, when the M4 Relief Road was considered as unaffordable in 2009. It focused on three themes:

- Making Best Use of Existing Capacity;
- Improving the Resilience of the Network; and
- Improving Public Transport.

The report described and illustrated on a plan, a 'Newport Expressway', stating that:

"During incidents/maintenance works on the motorway, the SAR, SDR upgrading and J28 improvements would provide increased network resilience."

The scheme was appraised against a set of Strategic Performance Indicators as well as Scheme Specific Objectives, which focused on encouraging the use of the SDR. The report went on to state:

"*Limited reductions in traffic flows on the motorway around Newport may occur, especially during periods of congestion…Unless travel behaviour were to change significantly, even with corridor enhancement measures in place, traffic congestion and capacity problems could be expected to occur during weekday peak travel times with increasing frequency sometime during the period 2018-2024 on the approaches to Brynglas Tunnels."*

[23] From here forward referred to as the 'Blue Route Paper', authored by Professor Stuart Cole, see http://www.iwa.org.uk/en/publications/view/227
[24] See www.m4cem.com
[25] M4 CEM Draft Strategy, Appraisal and Monitoring Report (May 2010)

The Welsh Government then decided to progress the M4 CEM Programme, to consider a range of possible measures, as part of a package to address the problems on the M4 around Newport.

During the March 2013 M4 CEM WelTAG Stage 1 (Strategy Level) Appraisal (to which section 2.6.1 of the M4 Corridor around Newport Environmental Report[26] cross-refers) an option, known as M4 CEM Highway Option C, was considered. This option involved the upgrading of the A48 Southern Distributor Road (SDR) with the inclusion of a number of grade separated junctions. This option was ruled out as a reasonable alternative to the draft Plan because of it being considered not to be able to sufficiently achieve the objectives for the M4 Corridor around Newport. Furthermore, it attracted many comments of opposition during the M4 CEM public consultation, whilst those who did offer support or qualified support often favoured its potential to improve resilience but there were concerns about it not increasing road capacity on the highway network [27].

Measures to upgrade the A4810 SAR to dual 3 lanes were considered as part of the M4 CEM Programme, as part of the development of a packages of measures[28]. A high level appraisal of this option is provided in a Discarded Measure Appraisal Summary Worksheet, provided at Page 27 of the M4 CEM Alternatives Considered Workbook, publicly available at www.m4cem.com.

Whilst the upgrading of the A48 SDR and the upgrading of the A4810 SAR have previously been ruled out as individual solutions as they separately did not fulfil the objectives set for the draft Plan, the combined effect of these proposals has now been re-examined as the Blue Route.

4.1.1 Published details

The Blue Route Paper[29] was first mentioned in letters to the Welsh Government from environmental groups[30] dated 12 July 2013 and 19 August 2013. In their letter of 12 July 2013, Wildlife Trusts Wales stated that they had commissioned Professor Stuart Cole to produce a paper. At this initial stage of correspondence, no detail of the suggested alternative was provided but a cost of £380m was suggested. Some further information on the proposal was presented in Professor Stuart Cole's evidence to the Environment and Sustainability Committee on 6 November 2013 (See Section 4.1.3).

The Blue Route Paper was published by the Institute of Welsh Affairs (IWA) and Chartered Institute of Logistics and Transport (CILT) on 7 December 2013. This was before the public consultation closed on 16 December 2013.

The Blue Route was referred to in responses to the draft Plan Consultation by members of the public dating back to 19 October 2013 and has been actively promoted as an alternative option by members of the Campaign against Levels

[26] M4 Corridor around Newport Strategic Environmental Assessment (SEA) Environmental Report, September 2013
[27] See M4 CEM Participation Report (2013)
[28] For further details of options considered as part of the development of the draft Plan and the reasons why they were not progressed, please refer to the M4 Corridor Enhancement Measures (CEM) WelTAG Stage 1 (Strategy Level) Report, M4 Corridor around Newport WelTAG Stage 1 Appraisal (Strategy Level) Report and M4 CEM Alternatives Considered Workbook. The M4 CEM documents can be found at www.m4cem.com and the WelTAG reports are available at www.m4newport.com.
[29] http://www.iwa.org.uk/en/publications/view/227
[30] Including Friends of the Earth Cymru and Gwent Wildlife Trust

Motorway (CALM) on their websites and other publicity material as "*a cost-effective alternative, with far less economic and environmental impacts*", since 16 October 2013[31].

Newport City Council's Cabinet met shortly after publication of the Blue Route and voiced opposition to the Blue Route[32]. This view was presented in Newport City Council's response to the public consultation.

As described in the published paper, "*the Blue Route is a combination of the A48 Southern Distributor Road upgrade (as in M4 CEM Highway Option C) together with the Steelworks road re-constructed as a four-lane dual carriageway road at expressway standard."* The Blue Route paper also suggests that there is no impediment to prevent the construction (by 2018) of a grade-separated strategic east/west route along the SDR and SAR.

4.1.2 Key considerations

Although the term "expressway standard" does not benefit from a designation in the UK, it is assumed that this intends to mean a road that is attractive to users of the motorway. However, the primary function of the existing Steelworks Access Road (SAR) is to provide access to existing and new development areas in East Newport. When the ownership of the land required to build the SAR was transferred from TATA and St Modwen to Welsh Government, the provision of access was stipulated in the legal agreements. Legal obligation has thus been placed on the Welsh Government to continue to provide access to designated development areas. As a consequence, between Junction 23A and the Queensway Meadows Roundabout on the A48 SDR, there are the following at-grade junctions along the A4810 SAR:

- 5 roundabouts;
- 5 signal-controlled junctions;
- 2 all movements priority junctions;
- 2 left in left out junctions;
- 3 emergency/maintenance access points to TATA; and
- Agricultural field access points.

With such a proliferation of junctions along the route, the SAR is not currently intended to be (or could conceivably be practically employed as) a route for longer distance through traffic that would ordinarily use the motorway.

It is assumed that the Blue Route intends to provide a route attractive to users of the motorway, as well as being required to continue to provide access to designated development areas. As such, to form part of the Blue Route, the SAR would require to be completely re-built to provide a through route, whilst maintaining the above level of local access to both existing and planned residential, industrial and commercial areas.

[31] https://www.facebook.com/campaignagainsthelevelsmotorway

[32] http://www.southwalesargus.co.uk/news/gwentnews/10878016.SDR_idea_is__lsquo_crazy_rsquo__as_Newport_M4_relief_road/?ref=rss#

A motorway standard alignment cannot be achieved along the Blue Route (this was recognised in M4 CEM Highway Option C when speed restrictions needed to be included because of the alignment of the A48 SDR). A route with speed restrictions is required on the SDR and therefore is unlikely to be attractive to existing or future motorway traffic, except in times of severe operational difficulties on the motorway. Furthermore, Arup analysis has shown that with the Blue Route in place, traffic flows on the M4 would exceed capacity in the design year. This would result in on-going congestion, delays and unreliable journey times on the motorway around Newport.

The cost of providing grade-separated junctions on the A48 SDR alone has previously been estimated at in excess of £300 million as part of the M4 CEM Programme. In addition to this, extensive further work would be required at Queensway Meadows to achieve free flow connection between the A48 SDR and the SAR. This would require significant land-take with property demolition and job losses; the costs of which have not been included in the Blue Route Paper analysis. In order to provide a free flowing route between Queensway Meadows and Junction 23A, a complete re-design of the route and the access arrangements will be required. This will involve land acquisition and diversion of major gas pipelines associated with the industrial activities (Air Products) at a COMAH (control of major hazards)[33] site with Major Accident Hazard Pipelines. In light that the development of a transport link is for use by the general public, this development type would pose a high risk of challenge during the planning process if it is advised against by the Health and Safety Executive (HSE)[34]. A further COMAH site is present at Solutia.

Whilst the Blue Route paper does not identify how access to existing businesses will be maintained, the likely impact on Newport's development plan, bearing in mind that East Newport is one of its main expansion areas, is likely to be significant. The Blue Route's deliverability and likely cost is dependent on a complete re-design of the SDR/SAR route and the access arrangements required. The Blue Route has gained credence in the media and with those who have historically opposed building a new section of motorway to the south of Newport. This has demonstrated tacit support that a highway solution is needed and that a highway solution should aim to limit the potential impact on the Gwent Levels. Past and current analysis shows that a new section of motorway to the south of Newport is the optimal and long term solution to address the transport related problems around Newport and that every effort should be made to minimise the impact of this road on the environment. This is the basis of the draft Plan for the M4 Corridor around Newport.

[33] Control of Major Accident Hazards Regulations 1999 (as amended 2006) implement the Seveso II Directive (96/82/EC) as amended by Directive 2003/105/EC in Great Britain. Their aim is to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any accidents which do occur. Further guidance is provided in National Assembly for Wales Circular 20/01Planning Controls for Hazardous Substances.

[34] HSE's advice on land use planning, in the majority of cases, is delivered through PADHI – planning advice for developments near hazardous installations, see http://www.hse.gov.uk/landuseplanning/padhi.pdf

4.1.3 Comments on Professor Stuart Coles' Evidence to the Environment and Sustainability Committee

The National Assembly for Wales Environment and Sustainability Committee began an inquiry into the Welsh Government's proposals for the M4 around Newport on 6 November 2013.

In Professor Stuart Cole's evidence to the Environment and Sustainability Committee on 6 November 2013[35], his submission describes the Blue Route proposal as *"an upgrade of the whole route from Junctions 23a and J24 in the east to Junction 28 or 29 in the west. This would involve upgrading the current A48 SDR whose traffic flows are lower than were expected. This it has been suggested was largely a consequence of the number of at grade intersections which disrupt the free flow of east west traffic. Grade separated junctions would give these flows greater priority."*

Professor Stuart Cole suggested a cost of the Blue Route at £380m. However, Arup considers that the cost of the Blue Route has been grossly underestimated, as there would be substantial costs associated with re-constructing the A4810 SAR to provide a strategic through route (the standard proposed by Professor Stuart Cole), as well as compensation costs for the necessary land take and property demolition. A cost, based on Arup analysis (2014) suggests that the Blue Route would be likely to cost more than £600m (excluding any allowance for land and compensation).

In Professor Stuart Cole's same submission of evidence to the Environment and Sustainability Committee, the following points were also made (Arup comments are also provided in response to Professor Cole's statements:

Statements made regarding the Blue Route in Professor Cole's submission to the Environment and Sustainability Committee	Arup Comment
Its [the current M4] resultant capacity is insufficient for current traffic volumes;	Agreed.
The resilience of the M4 at times of temporary traffic disruption requires an alternative route;	Agreed.
The stock of vehicles and the number of new registrations has fallen;	Agreed.
Policy impacts and lifestyle change has also reduced car usage and is not restricted to an economic downturn;	Agreed.
The draft Plan Consultation Document suggests that the Black/Purple Route is estimated to divert up to 40% of traffic away from the existing M4. This is more (far more?) than adequate. The proposed Blue Route is expected to divert 6%-10% but this may be an underestimate and 15% might be more appropriate;	Analysis[36] has forecast that, with the Blue Route in place, the M4 around Newport would continue to experience severe operational problems.

[35] Environment and Sustainability Committee Meeting 6 November 2013 Minutes http://senedd.assemblywales.org/ieListDocuments.aspx?CId=225&MId=1897
[36] Arup analysis 2014

Statements made regarding the Blue Route in Professor Cole's submission to the Environment and Sustainability Committee	Arup Comment
The consultation paper takes no account of the impact of rail electrification or the Metro developments under consideration by the Government along the M4 corridor…an expected 20%-30% transfer of peak traffic would be a conservative assessment;	Analysis[37] does not support such levels of transfer. A maximum transfer of around 5% of traffic off the M4 has been forecast as a result of major investment in public transport.
Rail electrification alone could reduce M4 peak traffic flows by 15%;	This is not supported by analysis that considers the potential impact of public transport investment, including rail electrification, on M4 traffic flows around Newport. The Outline Business Cases for rail electrification in South Wales[38] have been based on modest decongestion benefits, i.e. transfer from road to rail, which accounts for only 4% of total benefits of electrification.
Car usage is likely to grow following economic recovery or increased consumer confidence but at a declining rate but in proportion to population change through the 30 year forecasting period;	This is not in line with government predictions informed by Department for Transport and Welsh Government guidance[39].
The Blue Route is likely to solve the congestion issue on the M4 as it arises;	Analysis[40] has forecast that, with the Blue Route in place, the M4 around Newport would continue to experience severe operational problems.
The scheme could be constructed by 2018;	The Blue Route is unlikely to be able to be delivered any earlier than the draft Plan as it would need to follow similar due process, including land and property acquisition, whilst the Black Route already benefits from mainly following a TR111 route protecting it for planning purposes.
At the western end of the A48 north of Tredegar House conservation area and entering the M4 at J28 there is currently a confluence of high peak traffic flows. There are Government proposals for redesigning this largely at grade junction;	Analysis[41] has forecast that, with the Blue Route in place, severe operational problems would be experienced on the approaches and at J28, even when taking into account the planned improvements.
Any financial agreement between the Welsh Government and HM Treasury is unlikely to contain a road with no revenue stream such as tolls (or shadow tolls with revenue account expenditure consequences) to cover its costs;	In May 2013, Wales' first minister reinforced his position that neither the Treasury nor the Welsh Government would impose a toll on the new road if it went ahead.
The option would improve the resilience of the network (including the M4) and could be phased to spread investment costs;	It is considered that phasing would further reduce its limited benefits until fully completed.

[37] See Public Transport Overview Update, available at www.m4cem.com
[38] Valley Lines Electrification Outline Business Cases (2012)
[39] See M4 Corridor around Newport WelTAG Stage 1 (Strategy Level) Report, available at www.m4newport.com
[40] Arup 2014
[41] Arup 2014

Statements made regarding the Blue Route in Professor Cole's submission to the Environment and Sustainability Committee	Arup Comment
The benefits to the A48 corridor upon scheme completion would be realised through journey time improvements, accessibility gains for southern Newport (including some of the city's most disadvantaged wards), and benefits for the movement of people and freight to key employment areas and services;	There is limited potential for journey time improvements along the A48 corridor as the alignment of the A48 SDR requires there to be a speed restriction of 50 mph[42]. Any potential increase in speed limit is likely to be subject to great scrutiny taking into account the route's requirement to provide local access, its urban location and potential impact on community safety.
The negative impacts would include the possibility of some minor demolition of buildings, visual adverse impacts, and some biodiversity losses associated with the River Usk SAC (though the biodiversity rating for the scheme is more positive than the motorway;	Analysis[43] has shown that in order to improve the alignment of the A48 SDR and/or create grade-separated junctions, there would be significant property demolition and land acquisition needed, as well as loss of employment at existing businesses. The provision of a motorway standard road along the SAR, whilst maintaining access to the existing steelworks, developments and proposed development sites, would result in major disruption to the East Newport regeneration programme and could have a major impact on Newport City Council's Local Development Plan, see Appendix B.
There is woodland to the north adjacent to Tredegar Park sports facilities which could be affected;	Agreed.
An improved A48 passes through important retail, distribution and manufacturing areas;	Agreed.
The Blue Route will touch the Gwent Levels SSSI at Barecroft Common and is therefore not free of any adverse environmental impact;	Agreed.
The grade separated junction construction would create some issues but this could coincide with the proposed construction of 4000 houses on the adjacent land;	Agreed.
The resultant more freely flowing traffic could be expected to reduce emissions and noise;	Agreed.
There will be some increase in traffic noise along the A48 SDR and SAR;	Agreed.
Present land use is largely industrial or commercial with some housing where amelioration measures can be taken while levels of emissions and noise which are reducing as the age profile of the private car 'fleet' falls;	Agreed.

[42] See M4 Corridor Enhancement Measures WelTAG Stage 1 (Strategy Level) Report, available at www.m4cem.com
[43] Arup 2014

Statements made regarding the Blue Route in Professor Cole's submission to the Environment and Sustainability Committee	Arup Comment
This should improve accessibility to the [Glan Llyn] sites and provide greater connectivity to other parts of Newport and the M4 both east bound and west bound. The planning of these access points should have been (or should now be) considered to be compatible with the land use activities (e.g. cement works and new housing, steelworks, HGV operations to/from distribution centres and the Magor Brewery);	As referred to previously, the SAR would need to be completely re-built to accommodate both a strategic through route and the necessary access arrangements that will be compatible with existing and proposed land uses.
Any adverse effects on cyclist and pedestrian movements will need to be taken into account. Alternative routes can be provided so that any increased traffic volumes on the proposed corridor do not increase hazards or community severance.	Agreed.

4.1.4 Appraisal

An Arup appraisal of the Blue Route has built on that previously undertaken as part of the M4 CEM Programme. This included analysis of grade separated junction improvements to the A48 SDR (see M4 CEM WelTAG Stage 1 Report) and appraisal of a measure to upgrade the SAR to dual 3 lanes (as included within the preceding M4 CEM Alternatives Considered Workbook)[44].

Any appraisal work reported here is based on Arup's interpretation of the description provided in the submitted Blue Route Paper and evidence to the Environment and Sustainability Committee on 6 November 2013, as no detailed plans of the Blue Route have been provided by its proposers. Arup's interpretation includes a grade separated A48 SDR (based on M4 CEM Option C), and a re-constructed A4810 SAR, as a 2 lane dual carriageway all–purpose road with free flow junctions. However, the Blue Route Paper has also placed a cost estimate of £380m on the Blue Route. The description and the cost do not appear to be consistent with each other. Therefore a range of options for the Blue Route have been considered[45] and three scenarios have been developed for appraisal:

Scenario 1: A Blue Route that aims to be attractive to motorway users.

It has been assumed that a 70mph speed limit could apply along the SAR should it be developed to "expressway standard". However, the SDR would continue to exercise a 50mph speed limit, as described further in this appraisal. This arrangement is considered to maximise its potential ability to attract users of the motorway and therefore maximise its capability to alleviate the transport related problems on the M4 around Newport.

This scenario has been estimated to cost more than £600m, excluding VAT. It should be acknowledged that a reduced arrangement with 50mph speed restrictions throughout would reduce the Blue Route's performance. Whilst it is appreciated that the cost of construction could be greater for an "expressway standard" SAR compared to a reduced standard road, it is considered that this best fits the description and intentions of the Blue Route as put forward in the Blue Route Paper, which refers to this terminology.

[44] Both are available at www.m4cem.com
[45] Arup analysis 2014

Scenario 2: An optimal Blue Route that aims to be most attractive to motorway users.

This scenario builds on Option 1 by including free-flow grade separated junctions at the interchanges either end of the Blue Route; at Junction 28 to the west, and Junction 23A to the east. This would do most to attract traffic off the M4 and onto the Blue Route, also helping to avoid potential congestion issues at either end of the Blue Route where it meets with the existing M4.

This scenario has been estimated to cost more than £800m, excluding VAT.

Scenario 3: A Blue Route that aims to provide a low cost alternative to the Black Route.

It has been assumed for this lower cost alternative scenario, that improvement works to the A48 SDR and A4810 SAR should be in the order of £380m, as stated in the Blue Route Paper.

This level of funding would be likely to limit the scope of improvements when compared to the "expressway standard" that has been targeted in Scenario 1 and to an even greater extent in Scenario 2. This scenario would involve a combination of A48 SDR grade separated junction improvements (as in Option C of the M4 CEM Programme) linking together with the A4810 SAR at the present Queensway Meadows Junction, together with at-grade junction improvements along the A4810 SAR.

Such an arrangement could lend itself to the application of the "green wave" principle to progress platoons of mainline traffic during peak flows[46], which could provide limited resilience benefits but would not provide additional capacity on the network.

4.1.5 Appraisal Summary Tables (ASTs)

ASTs form part of WelTAG appraisal and have been applied here in light that Professor Cole's Blue Route Paper provides an AST for his Blue Route.

The ASTs for the two reasonable alternatives to the draft Plan, of which the main elements are a dual carriageway (Red Route) and motorway along an alternative alignment (Purple Route), are shown in the draft Plan Consultation Document (see www.wales.gov.uk/consultations or www.m4newport.com).

Comparative performance against the draft Plan is then summarised against WelTAG criteria and against the transport planning objectives (TPOs).

[46] This technology was considered as part of the preparation of a draft Plan when considering the potential benefits of at-grade improvements to the A48 SDR. See M4 CEM Package 2 Workbook, available at www.m4cem.com

Appraisal of the Blue Route Scenario 1 (a Blue Route that aims to be attractive to motorway users)

Criteria	Assessment	Distribution	Significance
Transport Economic Efficiency (TEE)	Once complete, grade separation of the SDR would improve network resilience should there be an accident or incident on the M4 around Newport. The route is unlikely to transfer journeys onto it that currently use the M4. Journey time reliability would be improved and there would be journey time savings along the SDR apart from the approaches to and at J28. The value for money in upgrading the SAR further than completed is poor, with benefits failing to cover investments costs. This scheme does not provide a long term solution to the transport related problems on the M4 around Newport and sections of the M4 would continue to experience severe operational problems. It would however, provide some local accessibility benefits to Newport.	All road users	(--)
Economic Activity and Location Impact (EALI)	Providing additional network resilience would help limit the negative economic impact caused by disruption during incidents and delays on the M4. There would be improvements to accessibility in southern Newport if local accesses are maintained. There would be adverse impacts on businesses along the SDR and SAR corridor due to land take and property demolition. Properties, including businesses, would be directly affected by land take requirements in order to facilitate grade separated junctions. The Blue Route could also compromise the access arrangements and viability of certain employment and residential land allocations as outlined in local planning policy (see Appendix B). In particular, this could have an adverse impact on the Glan Llyn development. Increased traffic flows along the SDR would increase traffic congestion around Junction 28, even taking account of planned improvements to this junction. Disruption during construction would be significant and disrupt the movement of people and freight in Newport until the upgraded route is operational.	All road users	(0)
Noise	Traffic transfer onto the upgraded SDR and SAR could result in limited reduction of noise levels along the route of the existing M4, which would reduce the noise nuisance to nearby residential properties along the M4. The majority of new noise impacts would be in areas around the SDR and SAR where there are also noise-sensitive areas including the existing and planned residential development at Glan Llyn. During construction, noise pollution could increase temporarily, which would affect residential and commercial properties located near to the SDR and SAR.	Properties along the M4 and SDR/SAR	(0)

Criteria	Assessment	Distribution	Significance
Local Air Quality	The Blue Route could provide reductions in the levels of atmospheric pollution to AQMAs by providing an alternative route for traffic when the motorway is congested. There would, however, be increased emissions and deterioration in air quality near the SDR and SAR should traffic volume increase along the Blue Route. The effects of this would impact on existing properties and planned residential/employment development. During construction, air quality could be reduced temporarily with dust impacts and construction vehicles, which would affect residential and commercial properties located near to the SDR and SAR.	Properties along the M4 and SDR/SAR	(0)
Greenhouse Gas Emissions	There would continue to be severe operational problems on sections of the M4 and A48 SDR. It is not clear whether the additional road capacity created would lead to an overall increase in emissions in the longer term.	No significant distributional impacts	(0)
Landscape and townscape	Grade separated junction improvements to the A48 would result in adverse visual impacts, including some within a Historic Landscape Area, Green Wedge and the Tredegar House Historic Park and Garden. Some properties may need to be demolished to accommodate grade separation at some junctions.	Local landscape impacts	(--)
Biodiversity	Junction improvements to the A48 would require additional land take and the realignment of the SDR at Church Street which crosses the River Usk SAC and SSSI. This could lead to direct and indirect adverse effects on biodiversity – including from direct physical impacts on habitats, hydromorphology and flow in the river and construction effects on species features of the European Site. A widened SAR alignment or footprint would run through or be directly adjacent to the Gwent Levels SSSI. Increased land take and additional traffic could have significant negative impact on biodiversity to the northern extent of the Gwent Levels in particular. Increased traffic would also have an adverse impact on biodiversity in these locations.	Potential impact on River Usk SAC and SSSI	(-)
Heritage	Assuming that the improvements are outside of the Tredegar House Historic Park and Garden, Grade I Listed Building and Conservation Area, the works would still have an adverse effect on the setting of the area due to increased structures and traffic flows at and around Junction 28. The works could also affect Grade II Listed Buildings along the route, as well as disrupt access to the Newport Transporter Bridge. This option could also affect the Castell Glas Scheduled Monument if the improvements were to take place outside the existing highway footprint.	Distribution assessment not required (Para. 7.10.7 of WelTAG June 2008)	(--)
Water environment	Grade separated junction improvements to the A48 would require additional land take within TAN15 Flood Zones and could lead to adverse effects on water quality, flood plain connectivity and areas of flood risk. Some junctions of the SDR run close to the Ebbw River. Therefore, improvements could cause adverse effects such as increased flood risk due to run off and pollution due to accidental spillages. Any junction improvements or additional land take along the SAR could impact on the water management of the Tata Steelworks, River Usk surrounds, and impact on the Gwent Levels SSSI.	No significant distributional impacts	(--)

Criteria	Assessment	Distribution	Significance
Soils	Grade separated junction improvements to the A48 and SAR would require additional land take.	No significant distributional impacts	(-)
Transport safety	The junction improvements would help to improve road safety, as it is forecast that, on completion, the total number of accidents on major roads in Newport would fall as a result of these improvements. Vehicle trips could increase on the SDR and SAR, potentially leading to an increase in accidents in this area.	All road users	(0)
Personal security	Grade separated junction improvements would improve east-west traffic flows along the SDR. Reduced potential for delays may reduce travellers' perceptions of vulnerability to crime and this could have the effect of improving the perception of personal security for drivers and other road users.	All road users	(+)
Permeability	Grade separated junction improvements would improve east-west traffic flows along the SDR. This measure could therefore improve access to local health, care, training and education services.	All road users	(+)
Physical fitness	This measure could have a neutral impact on physical fitness.	Car users and pedestrians	(0)
Social inclusion	Once complete, grade separation of the SDR would improve network resilience. Access to essential services would be maintained. However, upgrades to the SAR would result in additional severance and reduction in accessibility to the Glan Llyn development area by road, which could have adverse impacts, particularly for pedestrians and cyclists, if no alternative routes for access are provided.	Distribution assessment not required (Para. 8.6.31 of WelTAG June 2008)	(0)
Equality, Diversity & Human Rights	Improved resilience and journey time reliability along the SDR would benefit those users with access to a car. Some property demolition is required, which will adversely impact on local communities and employment.	All road users	(-)
TPOs			
1	Grade separation of the SDR and upgrade to the SAR would improve network resilience.	All	(+)
2	The nature of the improvement is local rather than regional or national.	All	(0)
3	Grade separation of the SDR and upgrade to the SAR would improve network resilience and would provide an alternative route to the M4 for longer distance journeys around Newport.	All	(++)
4	Grade separation of the SDR and upgrade to the SAR could reduce congestion on the existing M4 and improve east-west travel at times of accident and delays. Local accessibility around the SAR would be reduced.	All	(0)
5	Grade separation of the SDR and upgrade to the SAR would improve network resilience	All	(+)
6	No additional cycle/pedestrian infrastructure is included with the Blue Route, acknowledging that this proposes a scheme rather than a package of measures.	All	(0)

Criteria	Assessment	Distribution	Significance
7	The junction improvements would help to improve road safety, as it is forecast that, on completion, the total number of accidents on major roads in Newport would fall as a result of these improvements. Vehicle trips could increase on the SDR and SAR, potentially leading to an increase in accidents in this area.	All	(0)
8	The Blue Route could provide reductions in the levels of atmospheric pollution to AQMAs by providing an alternative route for traffic when the motorway is congested. There would, however, be increased emissions and deterioration in air quality near the SDR and SAR should traffic volume increase along the Blue Route. The effects of this would impact on existing properties and planned residential/employment development. During construction, air quality could be reduced temporarily with dust impacts and construction vehicles, which would affect residential and commercial properties located near to the SDR and SAR.	All	(0)
9	Traffic transfer onto the upgraded SDR and SAR could result in limited reduction of noise levels along the route of the existing M4, which would reduce the noise nuisance to nearby residential properties along the M4. The majority of new noise impacts would be in areas around the SDR and SAR where there are also noise-sensitive areas including the existing and planned residential development at Glan Llyn. During construction, noise pollution could increase temporarily, which would affect residential and commercial properties located near to the SDR and SAR.	All	(0)
10	There would continue to be severe operational problems on sections of the M4 and A48 SDR. It is not clear whether the additional road capacity created would lead to an overall increase in emissions in the longer term.	All	(0)
11	Grade separated junction improvements to the SDR and upgrade to the SAR has the potential to improve the driver experience and reduce driver stress, leading to an improved travel experience into South Wales along the M4 corridor.	All	(+)
12	The nature of the improvement is local rather than regional or national.	All	(0)
13	Improved travel conditions on the SDR and upgrade to the SAR could provide better strategic traffic management in and around Newport.	All	(+)
14	Once complete, grade separation of the SDR and upgrade to the SAR would improve network resilience although there could be disruptions to local traffic, particularly around the new development sites near the SAR. Access to essential services would be maintained.	All	(+)
15	Improved east-west travel on the SDR and SAR could benefit public transport services that use the route but is likely to increase traffic use of the SDR. The measure would not promote a cultural shift in travel behaviour to more sustainable choices.	All	(--)

Criteria	Assessment Distribution Significance
Public acceptability	Improved operating conditions along the SDR and SAR could provide network resilience, which could be supported by the public. Closure of some existing junctions could be detrimental to local travel patterns, whilst demolition of properties and impact on residential and employment development is an emotive issue and could attract significant public opposition. Increased traffic volumes along the SDR and SAR could increase air and noise pollution, which could be met with opposition from local communities in this area.
Acceptability to other stakeholders	Improved resilience and accessibility on the network could be supported by business groups, whilst adverse impacts on local communities and the environment may be met with opposition from stakeholder groups. The scheme is likely to be unacceptable to stakeholders in that grade separation of junctions along the SAR would also require a rationalisation of a number of junctions, reducing local access to the industrial area and Glan Llyn development site, which to resolve would need parallel local access roads further impacting upon a tight corridor. Impact on property could be significant with additional land take required. Increased traffic volumes along the SDR could increase congestion at Junction 28, which could be met with opposition from commuters and businesses accessing employment sites in this area.
Technical and operational feasibility	The existing roundabouts on the SDR and accesses onto the SAR are closely spaced and to comply with highway design standards, some of these roundabouts and junctions could require full or partial closure. These proposals would be challenging to implement as the corridor is constrained by development sites on each side, and would most likely result in significant impact upon the Air Products site to the south side of the SAR, which is a COMAH (control of major hazards) site. There is also existing ground contamination along the corridor, which would need to be remediated. Any works to the SDR would require contractual negotiations with the SDR concessionaire.
Financial affordability and deliverability	Land acquisition and property demolition would result in CPO and likely compensation as well as negotiations with SDR concessionaires. Construction of the works could be delivered in phases, which could improve affordability.
Risks	The option is at a strategy level and therefore the risks require further exploration. Any works to the SDR would require contractual negotiations with the SDR concessionaire.

Appraisal of the Blue Route Scenario 2 (an optimal Blue Route that aims to be most attractive to motorway users)

Criteria	Assessment	Distribution	Significance
Transport Economic Efficiency (TEE)	Once complete, grade separation of the SDR and SAR interchanges would improve network resilience. The route would transfer a limited number of journeys onto it that currently use the M4. Journey time reliability would be improved and there would be journey time savings along the SDR. This scheme does not provide a long term solution to the transport related problems on the M4 around Newport and some sections of the M4 would continue to experience severe operational problems. It would however, provide some local accessibility benefits to Newport and J28 in particular. The cost of the scheme is very high compared to the accessibility benefits it could provide. The cost of the scheme greatly outweighs the benefits.	All road users	(--)
Economic Activity and Location Impact (EALI)	Providing additional network resilience would limit the negative economic impact caused by disruption during incidents and delays on the M4. There would be improvements to accessibility in southern Newport if local accesses are maintained. There would be adverse impacts on businesses along the SDR and SAR corridor due to land take and property demolition. Properties, including businesses, would be directly affected by land take requirements in order to facilitate grade separated junctions. The Blue Route could also compromise the access arrangements and viability of certain employment and residential land allocations as outlined in local planning policy (see Appendix B). In particular, this could have an adverse impact on the Glan Llyn development. Grade separation of the SDR and SAR interchanges would reduce potential traffic congestion around Junction 28 and 23A. Disruption during construction would be significant and disrupt the movement of people and freight in Newport until the upgraded route is operational.	All road users	(+)
Noise	Traffic transfer onto the upgraded SDR and SAR could result in limited reduction of noise levels along the route of the existing M4, which would reduce the noise nuisance to nearby residential properties along the M4. The majority of new noise impacts would be in areas around the SDR and SAR where there are also noise-sensitive areas including the existing and planned residential development at Glan Llyn. During construction, noise pollution could increase temporarily, which would affect residential and commercial properties located near to the SDR and SAR.	Properties along the M4 and SDR/SAR	(0)

Criteria	Assessment	Distribution	Significance
Local Air Quality	The Blue Route could provide reductions in the levels of atmospheric pollution to AQMAs by providing an alternative route for traffic when the motorway is congested. There would, however, be increased emissions and deterioration in air quality near the SDR and SAR should traffic volume increase along the Blue Route. The effects of this would impact on existing properties and planned residential/employment development. During construction, air quality could be reduced temporarily with dust impacts and construction vehicles, which would affect residential and commercial properties located near to the SDR and SAR.	Properties along the M4 and SDR/SAR	(0)
Greenhouse Gas Emissions	There would continue to be severe operational problems on sections of the M4 and A48 SDR. It is not clear whether the additional road capacity created would lead to an overall increase in emissions in the longer term.	No significant distributional impacts	(0)
Landscape and townscape	Grade separated junction improvements to the A48 would result in adverse visual impacts, including some within a Historic Landscape Area, Green Wedge and the Tredegar House Historic Park and Garden. Some properties may need to be demolished to accommodate grade separation at some junctions.	Local landscape impacts	(--)
Biodiversity	Junction improvements to the A48 would require additional land take and the realignment of the SDR at Church Street which crosses the River Usk SAC and SSSI. This could lead to direct and indirect adverse effects on biodiversity – including from direct physical impacts on habitats, hydromorphology and flow in the river and construction effects on species features of the European Site. A widened SAR alignment or footprint would run through or be directly adjacent to the Gwent Levels SSSI. Increased land take and additional traffic could have significant negative impact on biodiversity to the northern extent of the Gwent Levels in particular. Increased traffic would also have an adverse impact on biodiversity in these locations.	Potential impact on River Usk SAC and SSSI	(-)
Heritage	Assuming that the improvements are outside of the Tredegar House Historic Park and Garden, Grade I Listed Building and Conservation Area, the works would still have a significant adverse effect on the setting of the area due to increased structures and traffic flows with a grade separated Junction 28. The works would also affect Grade II Listed Buildings along the route, as well as disrupt access to the Newport Transporter Bridge. This option could also affect the Castell Glas Scheduled Monument if the improvements were to take place outside the existing highway footprint.	Distribution assessment not required (Para. 7.10.7 of WelTAG June 2008)	(---)
Water environment	Grade separated junction improvements to the A48 would require additional land take within TAN15 Flood Zones and could lead to adverse effects on water quality, flood plain connectivity and areas of flood risk. Some junctions of the SDR run close to the Ebbw River. Therefore, improvements could cause adverse effects such as increased flood risk due to run off and pollution due to accidental spillages. Any junction improvements or additional land take along the SAR could impact on the water management of the Tata Steelworks, River Usk surrounds, and impact on the Gwent Levels SSSI.	No significant distributional impacts	(--)

Criteria	Assessment	Distribution	Significance
Soils	Grade separated junction improvements to the A48 and SAR would require additional land take.	No significant distributional impacts	(-)
Transport safety	The junction improvements and grade separated interchanges at J28 and J23A would help to improve road safety, as it is forecast that, on completion, the total number of accidents on major roads in Newport would fall as a result of these improvements. Vehicle trips could increase on the SDR and SAR, potentially leading to an increase in accidents in this area.	All road users	(+)
Personal security	Grade separated junction improvements would improve east-west traffic flows along the SDR. Reduced potential for delays may reduce travellers' perceptions of vulnerability to crime and this could have the effect of improving the perception of personal security for drivers and other road users.	All road users	(+)
Permeability	Grade separated junction improvements would improve east-west traffic flows along the SDR. This measure could therefore improve access to local health, care, training and education services.	All road users	(+)
Physical fitness	This measure could have a neutral impact on physical fitness.	Car users and pedestrians	(0)
Social inclusion	Once complete, grade separation of the SDR would improve network resilience. Access to essential services would be maintained. However, upgrades to the SAR would result in additional severance and reduction in accessibility to the Glan Llyn development area by road, which could have adverse impacts, particularly for pedestrians and cyclists, if no alternative routes for access are provided.	Distribution assessment not required (Para. 8.6.31 of WelTAG June 2008)	(0)
Equality, Diversity & Human Rights	Improved resilience and journey time reliability along the SDR would benefit those users with access to a car. Some property demolition is required, which would adversely impact on local communities and employment.	All road users	(-)
TPOs			
1	Grade separation of the SDR and upgrade to the SAR would improve network resilience.	All	(++)
2	The nature of the improvement is local rather than regional or national, but it would provide a more attractive east-west route compared to Option 1 or 3.	All	(+)
3	Grade separation of the SDR and upgrade to the SAR would improve network resilience and would provide an alternative route to the M4 for longer distance journeys around Newport.	All	(++)
4	Grade separation of the SDR and upgrade to the SAR could reduce congestion on the existing M4 and improve east-west travel. Local accessibility around the SAR would be reduced.	All	(+)
5	Grade separation of the SDR, J28 and upgrade to the SAR and grade separation of J23A would improve network resilience.	All	(++)

Criteria	Assessment	Distribution	Significance
6	No additional cycle/pedestrian infrastructure is included with the Blue Route, acknowledging that this proposes a scheme rather than a package of measures.	All	(0)
7	The junction improvements would help to improve road safety, as it is forecast that, on completion, the total number of accidents on major roads in Newport would fall as a result of these improvements. Vehicle trips could increase on the SDR and SAR, potentially leading to an increase in accidents in this area.	All	(+)
8	The Blue Route could provide reductions in the levels of atmospheric pollution to AQMAs by providing an alternative route for traffic when the motorway is congested. There would, however, be increased emissions and deterioration in air quality near the SDR and SAR should traffic volume increase along the Blue Route. The effects of this would impact on existing properties and planned residential/employment development. During construction, air quality could be reduced temporarily with dust impacts and construction vehicles, which would affect residential and commercial properties located near to the SDR and SAR.	All	(0)
9	Traffic transfer onto the upgraded SDR and SAR could result in limited reduction of noise levels along the route of the existing M4, which would reduce the noise nuisance to nearby residential properties along the M4. The majority of new noise impacts would be in areas around the SDR and SAR where there are also noise-sensitive areas including the existing and planned residential development at Glan Llyn. During construction, noise pollution could increase temporarily, which would affect residential and commercial properties located near to the SDR and SAR.	All	(0)
10	Whilst network resilience would be improved, there would continue to be operational problems on some sections of the M4. It is not clear whether the additional road capacity created would lead to an overall increase in emissions in the longer term.	All	(+)
11	Grade separated junction improvements to the SDR and upgrade to the SAR has the potential to improve the driver experience and reduce driver stress, leading to an improved travel experience into South Wales along the M4 corridor.	All	(+)
12	The nature of the improvement is local rather than regional or national, albeit it would provide a more attractive east-west route than Option 1 or 3. It is likely to only redistribute a limited volume of strategic traffic using the M4, except at times of incident and delay.	All	(+)
13	Improved travel conditions on the SDR and upgrade to the SAR could provide better strategic traffic management in and around Newport.	All	(+)
14	Once complete, grade separation of the SDR and upgrade to the SAR would improve network resilience although there could be disruptions to local traffic, particularly around the new development sites near the SAR. Access to essential services would be maintained.	All	(+)

Criteria	Assessment	Distribution	Significance
15	Improved east-west travel on the SDR and SAR could benefit public transport services that use the route but is likely to increase traffic use of the SDR. The measure would not promote a cultural shift in travel behaviour to more sustainable choices.	All	(--)
Public acceptability	Improved operating conditions along the SDR and SAR could provide network resilience, which could be supported by the public. Closure of some existing junctions could be detrimental to local travel patterns, whilst demolition of properties and impact on residential and employment development is an emotive issue and could attract significant public opposition. Increased traffic volumes along the SDR and SAR could increase air and noise pollution, which could be met with opposition from local communities in this area.		
Acceptability to other stakeholders	Improved resilience and accessibility on the network could be supported by business groups, whilst adverse impacts on local communities and the environment may be met with opposition from stakeholder groups. The scheme is likely to be unacceptable to stakeholders in that grade separation of junctions along the SAR would also require a rationalisation of a number of junctions, reducing local access to the industrial area and Glan Llyn development site, which to resolve would need parallel local access roads further impacting upon a tight corridor. Impact on property could be significant with additional land take required. The significant impact on the setting of Tredegar House Historic Park and Garden is likely to be unacceptable.		
Technical and operational feasibility	The existing roundabouts on the SDR and accesses onto the SAR are closely spaced and to comply with highway design standards, some of these roundabouts and junctions could require full or partial closure. Major works would be required at Junction 28 and Junction 23A. These proposals along the route would be challenging to implement as the corridor is constrained by development sites on each side, and would most likely result in significant impact upon the Air Products site to the south side of the SAR, which is a COMAH (control of major hazards) site. There is also existing ground contamination along the corridor, which would need to be remediated. Any works to the SDR would require contractual negotiations with the SDR concessionaire.		
Financial affordability and deliverability	Land acquisition and property demolition would result in CPO and likely compensation as well as negotiations with SDR concessionaires. Construction of the works could be delivered in phases, which could improve affordability.		
Risks	The option is at a strategy level and therefore the risks require further exploration. Any works to the SDR would require contractual negotiations with the SDR concessionaire. Planned improvements at Junction 28 would be compromised by this proposal, which would redevelop Junction 28 with a grade separated junction onto the SDR.		

Appraisal of the Blue Route Scenario 3 (a Blue Route that aims to provide a low cost alternative to the Black Route)

Criteria	Assessment	Distribution	Significance
Transport Economic Efficiency (TEE)	Once complete, grade separation of the SDR would improve network resilience should there be an accident or incident on the M4 around Newport. The route is unlikely to transfer journeys onto it that currently use the M4. Journey time reliability would be improved and there would be journey time savings along the SDR apart from the approaches to and at J28. The value for money in upgrading the SAR further than completed is very poor with benefits failing to cover the investment costs. This scheme does not provide a solution to the transport related problems on the M4 around Newport. Most sections of the M4 would continue to experience severe operational problems. It would however, provide some local accessibility benefits to Newport.	All road users	(---)
Economic Activity and Location Impact (EALI)	Providing additional network resilience would help limit the negative economic impact caused by disruption during incidents and delays on the M4. There would be adverse impacts on businesses along the SDR due to land take and property demolition. Properties, including businesses, would be directly affected by land take requirements in order to facilitate grade separated junctions. The Blue Route with a prioritised mainline flow along the A4810 could also compromise the access arrangements of certain employment and residential land allocations as outlined in local planning policy (see Appendix B). In particular, this could have an adverse impact on the Glan Llyn development. Increased traffic flows along the SDR would increase traffic congestion around Junction 28, even taking account of planned improvements to this junction. Disruption during construction would be significant and disrupt the movement of people and freight in Newport until the upgraded route is operational.	All road users	(-)
Noise	Traffic transfer onto the upgraded SDR and SAR could result in limited reduction of noise levels along the route of the existing M4, which would reduce the noise nuisance to nearby residential properties along the M4. The majority of new noise impacts would be in areas around the SDR where there are also noise-sensitive areas including the existing and planned residential development at Glan Llyn. During construction, noise pollution could increase temporarily, which would affect residential and commercial properties located near to the SDR and SAR.	Properties along the M4 and SDR/SAR	(0)

Criteria	Assessment	Distribution	Significance
Local Air Quality	The Blue Route could provide reductions in the levels of atmospheric pollution to AQMAs by providing an alternative route for traffic when the motorway is congested. There would, however, be increased emissions and deterioration in air quality near the SDR and SAR should traffic volume increase along the Blue Route. The effects of this would impact on existing properties and planned residential/employment development. During construction, air quality could be reduced temporarily with dust impacts and construction vehicles, which would affect residential and commercial properties located near to the SDR and SAR.	Properties along the M4 and SDR/SAR	(0)
Greenhouse Gas Emissions	There would continue to be severe operational problems on sections of the M4 and A48 SDR. It is not clear whether the additional road capacity created would lead to an overall increase in emissions in the longer term.	No significant distributional impacts	(0)
Landscape and townscape	Grade separated junction improvements to the A48 would result in adverse visual impacts, including some within a Historic Landscape Area, Green Wedge and the Tredegar House Historic Park and Garden. Some properties may need to be demolished to accommodate grade separation at some junctions.	Local landscape impacts	(--)
Biodiversity	Junction improvements to the A48 would require additional land take and the realignment of the SDR at Church Street which crosses the River Usk SAC and SSSI. This could lead to direct and indirect adverse effects on biodiversity – including from direct physical impacts on habitats, hydromorphology and flow in the river and construction effects on species features of the European Site. Increased traffic would also have an adverse impact on biodiversity in these locations.	Potential impact on River Usk SAC and SSSI	(-)
Heritage	Assuming that the improvements are outside of the Tredegar House Historic Park and Garden, Grade I Listed Building and Conservation Area, the works would still have an adverse effect on the setting of the area due to increased structures and traffic flows at and around Junction 28. The works could also affect Grade II Listed Buildings along the route, as well as disrupt access to the Newport Transporter Bridge. This option could also affect the Castell Glas Scheduled Monument if the improvements were to take place outside the existing highway footprint.	Distribution assessment not required (Para. 7.10.7 of WelTAG June 2008)	(--)
Water environment	Grade separated junction improvements to the A48 would require additional land take within TAN15 Flood Zones and could lead to adverse effects on water quality, flood plain connectivity and areas of flood risk. Some junctions of the SDR run close to the Ebbw River. Therefore, improvements could cause adverse effects such as increased flood risk due to run off and pollution due to accidental spillages. Any at-grade junction improvements along the SAR could impact on the water management of the Tata Steelworks, River Usk surrounds, and impact on the Gwent Levels SSSI.	No significant distributional impacts	(-)
Soils	Grade separated junction improvements to the A48 would require additional land take.	No significant distributional impacts	(-)

Criteria	Assessment	Distribution	Significance
Transport safety	The junction improvements would help to improve road safety, as it is forecast that, on completion, the total number of accidents on major roads in Newport would fall as a result of these improvements. Vehicle trips could increase on the SDR and SAR, potentially leading to an increase in accidents in this area.	All road users	(0)
Personal security	Grade separated junction improvements would improve east-west traffic flows along the SDR. Reduced potential for delays may reduce travellers' perceptions of vulnerability to crime and this could have the effect of improving the perception of personal security for drivers and other road users.	All road users	(+)
Permeability	Grade separated junction improvements would improve east-west traffic flows along the SDR. This measure could therefore improve access to local health, care, training and education services.	All road users	(+)
Physical fitness	This measure could have a neutral impact on physical fitness.	Car users and pedestrians	(0)
Social inclusion	Once complete, grade separation of the SDR would improve network resilience. Access to essential services would be maintained. However, upgrades to the SAR could result in additional severance and reduction in accessibility to the Glan Llyn development area by road, which could have adverse impacts, particularly for pedestrians and cyclists, if no alternative routes for access are provided.	Distribution assessment not required (Para. 8.6.31 of WelTAG June 2008)	(0)
Equality, Diversity & Human Rights	Improved resilience and journey time reliability along the SDR would benefit those users with access to a car. Some property demolition is required, which would adversely impact on local communities and employment.	All road users	(-)
TPOs			
1	Grade separation of the SDR and at-grade junction improvements to the SAR would have a limited impact on reducing congestion on the existing M4 but could improve safety along the SDR.	All	(+)
2	The nature of the improvement is local rather than regional or national.	All	(0)
3	This would make better use of the SDR.	All	(+)
4	This would make better use of the SDR but this combined with at-grade junction improvements to the SAR would have a limited impact on reducing congestion on the existing M4.	All	(0)
5	Grade separation of the SDR and at-grade junction improvements to the SAR would have a limited impact on reducing congestion on the existing M4.	All	(0)
6	No additional cycle/pedestrian infrastructure is included with the Blue Route, acknowledging that this proposes a scheme rather than a package of measures.	All	(0)
7	The junction improvements would help to improve road safety, as it is forecast that, on completion, the total number of accidents on major roads in Newport would fall as a result of these improvements. Vehicle trips could increase on the SDR and SAR, potentially leading to an increase in accidents in this area.	All	(0)

Criteria	Assessment	Distribution	Significance
8	The Blue Route could provide reductions in the levels of atmospheric pollution to AQMAs by providing an alternative route for traffic when the motorway is congested. There would, however, be increased emissions and deterioration in air quality near the SDR and SAR should traffic volume increase along the Blue Route. The effects of this would impact on existing properties and planned residential/employment development. During construction, air quality could be reduced temporarily with dust impacts and construction vehicles, which would affect residential and commercial properties located near to the SDR and SAR.	All	(0)
9	Traffic transfer onto the upgraded SDR and SAR is likely to be limited and therefore this would result in limited reduction of noise levels along the route of the existing M4, The majority of new noise impacts would be in areas around the SDR and SAR where there are also noise-sensitive areas including the existing and planned residential development at Glan Llyn. During construction, noise pollution could increase temporarily, which would affect residential and commercial properties located near to the SDR and SAR.	All	(0)
10	There would continue to be severe operational problems on sections of the M4 and A48 SDR. It is not clear whether the additional road capacity created would lead to an overall increase in emissions in the longer term.	All	(0)
11	Grade separated junction improvements to the SDR has the potential to improve the driver experience and reduce driver stress, leading to an improved travel experience into South Wales along the M4 corridor.	All	(+)
12	The nature of the improvement is local rather than regional or national.	All	(0)
13	Improved travel conditions on the SDR could provide better strategic traffic management in and around Newport.	All	(+)
14	Once complete, grade separation of the SDR would improve local accessibility in southern Newport, although there could be disruptions to local traffic around the new development sites near the SAR. Access to essential services would be maintained.	All	(+)
15	Improved east-west travel on the SDR and SAR could benefit public transport services that use the route but is likely to increase traffic use of the SDR. The measure would not promote a cultural shift in travel behaviour to more sustainable choices.	All	(--)
Public acceptability	Improvements to operating conditions along the SDR and SAR are likely to be limited, but could provide some network resilience, which could be supported by the public. Closure of some existing junctions could be detrimental to local travel patterns, whilst demolition of properties and impact on residential and employment development is an emotive issue and could attract significant public opposition. Increased traffic volumes along the SDR and SAR could increase air and noise pollution, which could be met with opposition from local communities in this area.		

Criteria	Assessment Distribution Significance
Acceptability to other stakeholders	Improved resilience and accessibility on the network in southern Newport could be supported by business groups, although the benefits are likely to be limited. Adverse impacts on local communities a may be met with opposition from stakeholder groups. Impact on property along the SDR could be significant with additional land take required. Increased traffic volumes along the SDR could increase congestion at Junction 28, which could be met with opposition from commuters and businesses accessing employment sites in this area. Prioritisation of mainline traffic along the SAR could adversely impact on local access to the industrial area and Glan Llyn development site.
Technical and operational feasibility	The existing roundabouts on the SDR are closely spaced and to comply with highway design standards, some of these roundabouts and junctions could require full or partial closure. These proposals would be challenging to implement as the corridor is constrained by development sites on each side. There are many accesses onto the SAR and at-grade junction improvements with “greenwave” technology is likely to be feasible but would demand good traffic management to limit accessibility problems to the accesses along the SAR. There is also existing ground contamination along the corridor, which would need to be remediated. Any works to the SDR would require contractual negotiations with the SDR concessionaire.
Financial affordability and deliverability	Land acquisition and property demolition would result in CPO and likely compensation as well as negotiations with SDR concessionaires. Construction of the works could be delivered in phases, which could improve affordability.
Risks	The option is at a strategy level and therefore the risks require further exploration. Any works to the SDR would require contractual negotiations with the SDR concessionaire.

4.1.6 Comparative Performance of the Alternative

The comparative performance of the draft Plan and the assessed Blue Route options is summarised below against WelTAG criteria and against the goals (TPOs), acceptability, feasibility, deliverability and risk criteria. The Blue Route report provided the proposer's WelTAG scoring of the Blue Route (without more detailed associated comments). This is also shown in the comparative table below.

Comparative performance of the Blue Route to the draft Plan against WelTAG criteria

Criteria	Draft Plan	Blue Route Paper	Arup Blue Route Scenario 1	Arup Blue Route Scenario 2	Arup Blue Route Scenario 3
Economy					
Transport Economic Efficiency (TEE)	(+++)	(++)	(--)	(--)	(---)
Economic Activity and Location Impact (EALI)	(+++)	(++)	(0)	(+)	(-)
Environment					
Noise	(+)	(+)	(0)	(0)	(0)
Local Air Quality	(++)	(+)	(0)	(0)	(0)
Greenhouse Gas Emissions	(+)	(+)	(0)	(0)	(0)
Landscape and townscape	(---)	(0)	(--)	(--)	(--)
Biodiversity	(---)	(-)	(-)	(-)	(-)
Heritage	(--)	(0)	(--)	(---)	(--)
Water environment	(--)	(0)	(--)	(--)	(-)
Soils	(--)	(0)	(-)	(-)	(-)
Social					
Transport safety	(+++)	(++)	(0)	(+)	(0)
Personal security	(+)	(+)	(+)	(+)	(+)
Permeability	(+)	(+)	(+)	(+)	(+)
Physical fitness	(+)	(+)	(0)	(0)	(0)
Social inclusion	(+)	(0)	(0)	(0)	(0)
Equality, Diversity & Human Rights	(+)	(+)	(-)	(-)	(-)

Comparative Performance of the Blue Route to the draft Plan against Objectives, Acceptability, Feasibility, Deliverability and Risk[47]

Goals	Draft Plan	Arup Blue Route Scenario 1	Arup Blue Route Scenario 2	Arup Blue Route Scenario 3
1	(+++)	(0)	(+)	(0)
2	(+++)	(0)	(+)	(0)
3	(+++)	(++)	(++)	(+)
4	(+++)	(0)	(+)	(0)
5	(+++)	(+)	(++)	(0)
6	(++)	(0)	(0)	(0)
7	(+++)	(0)	(+)	(0)
8	(++)	(0)	(0)	(0)
9	(+)	(0)	(0)	(0)
10	(+)	(0)	(+)	(0)
11	(+++)	(+)	(+)	(+)
12	(+++)	(0)	(+)	(0)
13	(+++)	(+)	(+)	(+)
14	(+++)	(+)	(+)	(+)
15	(--)	(--)	(--)	(--)

[47] The Blue Route Paper does not assess the Blue Route against the objectives

Goals	Draft Plan	Arup Blue Route Scenario 1	Arup Blue Route Scenario 2	Arup Blue Route Scenario 3
Public acceptability	The new road could create economic and social benefits. However, the environmental impact of the new motorway along the alignment of M4 CEM Option A is likely to attract opposition from those who prioritise a need to protect the environment over the possible economic benefits of the scheme. The new route would be in close proximity to properties in Duffryn, which may attract opposition in light of noise and air pollution increases in this area.	Improved operating conditions along the SDR and SAR could provide network resilience, which could be supported by the public. Closure of some existing junctions could be detrimental to local travel patterns, whilst demolition of properties and impact on residential and employment development is an emotive issue and could attract significant public opposition. Increased traffic volumes along the SDR and SAR could increase air and noise pollution, which could be met with opposition from local communities in this area.	Improved operating conditions along the SDR and SAR could provide network resilience, which could be supported by the public. Closure of some existing junctions could be detrimental to local travel patterns, whilst demolition of properties and impact on residential and employment development is an emotive issue and could attract significant public opposition. Increased traffic volumes along the SDR and SAR could increase air and noise pollution, which could be met with opposition from local communities in this area.	Improvements to operating conditions along the SDR and SAR are likely to be limited, but could provide some network resilience, which could be supported by the public. Closure of some existing junctions could be detrimental to local travel patterns, whilst demolition of properties and impact on residential and employment development is an emotive issue and could attract significant public opposition. Increased traffic volumes along the SDR and SAR could increase air and noise pollution, which could be met with opposition from local communities in this area.

Goals	Draft Plan	Arup Blue Route Scenario 1	Arup Blue Route Scenario 2	Arup Blue Route Scenario 3
Acceptability to other stakeholders	The new road could help address many of the problems caused by congestion on the M4 and thus could attract support and be acceptable to other stakeholders, particularly business groups. However, possible adverse impacts on the environment could attract opposition from environmental groups and the wider public who prioritise a need to protect the environment over the possible economic benefits of the scheme. Further engagement is likely to be needed with specific land owners who may be affected directly by the scheme, including ABP.	Improved resilience and accessibility on the network could be supported by business groups, whilst adverse impacts on local communities and the environment may be met with opposition from stakeholder groups. The scheme is likely to be unacceptable to stakeholders in that grade separation of junctions along the SAR would also require a rationalisation of a number of junctions, reducing local access to the industrial area and Glan Llyn development site, which to resolve would need parallel local access roads further impacting upon a tight corridor. Impact on property could be significant with additional land take required. Increased traffic volumes along the SDR could increase congestion at Junction 28, which could be met with opposition from commuters and businesses accessing employment sites in this area.	Improved resilience and accessibility on the network could be supported by business groups, whilst adverse impacts on local communities and the environment may be met with opposition from stakeholder groups. The scheme is likely to be unacceptable to stakeholders in that grade separation of junctions along the SAR would also require a rationalisation of a number of junctions, reducing local access to the industrial area and Glan Llyn development site, which to resolve would need parallel local access roads further impacting upon a tight corridor. Impact on property could be significant with additional land take required. The significant impact on the setting of Tredegar House Historic Park and Garden is likely to be unacceptable.	Improved resilience and accessibility on the network in southern Newport could be supported by business groups, although the benefits are likely to be limited. Adverse impacts on local communities a may be met with opposition from stakeholder groups. Impact on property along the SDR could be significant with additional land take required. Increased traffic volumes along the SDR could increase congestion at Junction 28, which could be met with opposition from commuters and businesses accessing employment sites in this area. Prioritisation of mainline traffic along the SAR could adversely impact on local access to the industrial area and Glan Llyn development site.

Goals	Draft Plan	Arup Blue Route Scenario 1	Arup Blue Route Scenario 2	Arup Blue Route Scenario 3
Technical and operational feasibility	The option is at a strategy level and therefore the technical and operational feasibility risks require further exploration. The new road could include a crossing of the River Usk and could also pass through the Docks Way landfill site. This would require consideration of suitable structures and land contamination issues.	The existing roundabouts on the SDR and accesses onto the SAR are closely spaced and to comply with highway design standards, some of these roundabouts and junctions could require full or partial closure. These proposals would be challenging to implement as the corridor is constrained by development sites on each side, and would most likely result in significant impact upon the Air Products (and COMAH) site to the south side of the SAR. There is also existing ground contamination along the corridor, which would need to be remediated. Any works to the SDR would require contractual negotiations with the SDR concessionaire.	Major works would be required at Junction 28 and Junction 23A. The existing roundabouts on the SDR and accesses onto the SAR are closely spaced and to comply with highway design standards, some of these roundabouts and junctions could require full or partial closure. These proposals along the route would be challenging to implement as the corridor is constrained by development sites on each side, and would most likely result in significant impact upon the Air Products site to the south side of the SAR, which is a COMAH (control of major hazards) site. There is also existing ground contamination along the corridor, which would need to be remediated. Any works to the SDR would require contractual negotiations with the SDR concessionaire.	The existing roundabouts on the SDR are closely spaced and to comply with highway design standards, some of these roundabouts and junctions could require full or partial closure. These proposals would be challenging to implement as the corridor is constrained by development sites on each side. There are many accesses onto the SAR and at-grade junction improvements with “greenwave” technology is likely to be feasible but would demand good traffic management to limit accessibility problems to the accesses along the SAR. There is also existing ground contamination along the corridor, which would need to be remediated. Any works to the SDR would require contractual negotiations with the SDR concessionaire.

Goals	Draft Plan	Arup Blue Route Scenario 1	Arup Blue Route Scenario 2	Arup Blue Route Scenario 3
Financial affordability and deliverability	The implementation of a motorway would be dependent upon the availability of funding. Therefore, affordability is an important issue both in terms of timescale and the amount of capital required.	Land acquisition and property demolition would result in CPO and likely compensation as well as negotiations with SDR concessionaires. Construction of the works could be delivered in phases, which could improve affordability.	Land acquisition and property demolition would result in CPO and likely compensation as well as negotiations with SDR concessionaires. Construction of the works could be delivered in phases, which could improve affordability.	Land acquisition and property demolition would result in CPO and likely compensation as well as negotiations with SDR concessionaires. Construction of the works could be delivered in phases, which could improve affordability.
Risks	The option is at a strategy level and therefore the risks require further exploration. The new route could need to negotiate a landfill site requiring legal processes to be successfully considered. Challenge from public and/or stakeholders who may oppose the scheme on grounds of likely environmental or social impact may also require consideration.	The option is at a strategy level and therefore the risks require further exploration. Any works to the SDR would require contractual negotiations with the SDR concessionaire. Challenge from public and/or stakeholders who may oppose the scheme on grounds of likely social impact may also require consideration.	The option is at a strategy level and therefore the risks require further exploration. Any works to the SDR would require contractual negotiations with the SDR concessionaire. Planned improvements at Junction 28 would be compromised by this proposal, which would redevelop Junction 28 with a grade separated junction onto the SDR.	The option is at a strategy level and therefore the risks require further exploration. Any works to the SDR would require contractual negotiations with the SDR concessionaire.

When assessed against the WelTAG criteria, the draft Plan performs very strongly against economic criteria, strongly against social criteria and has moderate to large adverse impacts on the environment (biodiversity, landscape and townscape in particular). When assessed at a strategic level, the draft Plan performs well against the objectives of the M4 Corridor around Newport, although there is an adverse impact against one objective; achieving a cultural shift in travel behaviour towards more sustainable choices.

The provision of a new section of motorway to the south of Newport would provide the opportunity to change the function of the current M4 route around Newport to better integrate it into Newport's road network. For example, this could enable better access to/from residential areas such as Caerleon and St Julians by potentially facilitating the re-opening the western approaches to Junction 25.

Provision of a road link between the M4, M48 and the B4245 would result in benefits to users of the local road network and relief to Junction 23A. Provision of additional cycling and walking infrastructure within the M4 corridor around

Newport will help encourage healthy lifestyle choices for local trips, as well as potentially supporting social interaction.

It is worth noting that the Black Route mainly follows and thus has benefits from planning protection as a result of the publication of the TR111 in 2006 whereas the other options represent a new line of investigation. Whilst early dialogue with key stakeholders such as Natural Resources Wales has taken place, it is clear that the draft Plan will impact on affected interests and operations in different ways, depending on the eventual route and design of the Black Route motorway. These are considerations for scheme rather than strategy level appraisal. However, they would be assessed in more detail at the next stage of assessment, should the draft Plan be adopted (with or without amendments taking into account the responses to the associated assessments).

The 'Blue Route' includes upgrades to the SDR and SAR to create an alternative route to the existing M4 through Newport. Appraisal indicates that the impact of additional land take on property and businesses, and the restriction of local accessibility around the SAR, would limit the economic performance of this option. The impact on the environment would be negative overall, with adverse impacts on townscape and heritage in particular. Air and noise pollution would be largely redistributed from the existing M4 to the SDR/SAR area, having a neutral impact overall. Impacts on the community would be largely neutral or minor positive, although impact on local accessibility, property demolition and loss of employment land could attract opposition from the public and stakeholders.

Overall, Arup's appraisal of the Blue Route indicates that it performs neutral or slightly positively for most objectives, acknowledging that it would not achieve Goal 15: a cultural shift in travel behaviour towards more sustainable choices. Whilst the Blue Route Paper did not appraise the alternative against the goals for the M4 Corridor around Newport, Arup's appraisal also suggests that the Blue Route performs poorly when compared to the Black Route, acknowledging that Scenario 2 performs slightly better than Scenario 1 and better than Scenario 3.

It is important to note that transport modelling has indicated little or very little relief to motorway congestion as a result of the Blue Route. Whilst Scenarios 1 and 2 would be likely to result in benefits to traffic flow, these would not be focused on long term relief to the motorway. By 2035, analysis has shown that the traffic levels on the motorway around Newport, with the Blue Route Scenario 1 in place, would exceed theoretical capacity, resulting in severe operational difficulties. With Scenario 3 in place, there would continue to be severe operational problems on most sections of the M4. Even with Scenario 2, which aims to provide an optimal Blue Route to target motorway users, there would still be operational problems on the M4 at the time of opening. This indicates that the Blue Route would not provide a long term solution to traffic-related problems on the M4 around Newport.

4.1.7 Potential interface with public transport measures

Some respondents to the draft Plan consultation suggested a combination of the Blue Route with public transport improvements, including the Cardiff Capital Region Metro.

Consideration of public transport measures is provided in more detail in Section 4.7 of this document. It concludes that significant investment in public transport measures will lead to positive accessibility benefits across South East Wales, but would not address the objectives for the draft Plan, and would provide limited relief to the M4 around Newport.

Transport modelling has indicated little or very little relief to motorway congestion as a result of the Blue Route. Even in combination with significant investment in public transport measures, the Blue Route would not provide sufficient relief to the M4 Corridor around Newport.

4.1.8 Concluding remarks

Professor Stuart Cole stated in his submission of evidence to the Environment and Sustainability Committee, the primary reasons for putting forward the Blue Route includes:

- *"The uncertainty of current traffic forecasts generally;*
- *Therefore the need to consider if the size of construction (and its cost) is justified;*
- *If it is not justified then unnecessary environmental dis-benefits and damage are incurred;*
- *The opportunity cost of construction if excessive financial allocation is made to this one scheme. It can through either direct (revenue account) expenditure terms or borrowing limits preclude other transport projects;*
- *All motorways of the M4's age will require major maintenance over the next 5-10 years; and*
- *The proposition is a 2-lane Expressway standard dual carriageway matching lengths of the A470, A48 Carmarthenshire and the A55 will provide the required resilience."*

In summary, the evidence presented within the M4 Corridor around Newport Consultation Document and appraisal of the Blue Route indicates that:

- It would provide some local accessibility benefits, particularly around the A48 SDR but could exacerbate problems at Junction 28 in particular unless there is a free flow junction created;
- An upgraded A48 SDR and A4810 SAR would provide a degree of increased network resilience, particularly at times of accidents and delays on the M4;
- It would not address the problems (i.e. the need for the scheme) or achieve the objectives for the M4 around Newport, whilst it performs poorly compared to the draft Plan (Black Route) appraisal;
- The cost of a Blue Route that aims to be attractive to motorway users is likely to cost more than £600m, whilst an optimal solution would cost more than £800m, excluding any allowance for Land and Compensation;

- The provision of a Newport Expressway was first considered in May 2010, when the A4810 SAR was then included as a measure to improve access to the Newport Eastern Expansion Area[48]. As part of its development, and following meetings with the landowners/developers, the Welsh Government included roundabouts and intermediate signal controlled junctions to provide access to existing and planned development sites. In particular, the legal agreements between the Welsh Government and Tata Steel, and the Welsh Government and St Modwen, included drawings that identified the required roundabouts and junctions for access points to the Tata Steel land and operational areas and to the St Modwen development areas. Therefore to upgrade the SAR to "expressway" or motorway standard would require a completely new scheme to be developed that would involve land and property acquisition and major expenditure to provide the necessary motorway standard and the necessary service roads and junctions to serve existing and planned residential and employment land developments;
- The optimal way to achieve the delivery of a through route and a route that provides for local access is by separating out these functions and thus displacing a through route in order to achieve an acceptable alignment to motorway standard. The draft Plan achieves this by providing a new motorway to the south of Newport and allows the SDR to function as a road that provides local accessibility to residential areas and key employment/regeneration sites;
- Forecasts of future traffic volumes show that in the Do Minimum scenario, severe operational problems will be experienced on the M4 around Newport on most links by 2022. By 2037 the motorway around Newport will be heavily congested. With the optimal Blue Route in place, operational problems would continue to be experienced around Newport;
- The risks of the Blue Route include greater economic, environmental and social impacts on communities, property and future development land allocations in the urban area of Newport, also resulting in possible job losses and substantial claims for compensation;
- Compared to the draft Plan (Black Route), the Blue Route would not provide a long term solution to the identified (and acknowledged) problems associated with traffic congestion and journey time variability on the motorway around Newport; and
- The Blue Route in combination with public transport measures would still not provide sufficient relief to the M4 Corridor around Newport.

The Blue Route, either as a stand-alone measure or in combination with public transport measures, is not considered to be a reasonable alternative to the draft Plan. The Blue Route, as considered within this document, should not be taken forward for further appraisal.

[48] M4 CEM Draft Strategy, Appraisal and Monitoring Report (May 2010)

4.2 Alignment of the Motorway to the south of Magor

During the draft Plan consultation, an alternative to the draft Plan was put forward by some respondents suggesting alternative alignments to the Black Route at Magor. Some stated a preference for an alignment along a route to the south of Magor, rather than to the north of Magor (as shown within the draft Plan Consultation Document[49]). In a letter to Welsh Ministers from Jessica Morden MP (Newport East) on 16 December 2013, a concern was raised over the suggested lack of clarification by the Welsh Government on why routes that avoided going through part of Magor have been discounted. Responses to the consultation provided a number of comments associated with potential impacts for the Magor area and a range of comments is provided below:

- *"Properties will be affected at Magor and Castleton [sic], where the new motorway would connect into the existing M4. Whilst as few properties as possible should be affected by any preferred route, mitigation measures should be implemented to reduce the potential impact on these properties, whilst the Welsh Government should help to purchase properties likely to be significantly effected at a high compensation value with support provided for relocation";*
- *"As this route is further North, its impact on the Magor area is less";*
- *"This area [Magor and Undy] is already hemmed in by the M4, this road would close it in further. We are already face an MCC [Monmouthshire County Council] plan to build over 300 new houses on one side of the village, now this plan is to build a motorway on the other side of the village";*
- *"The daily congestion from magor [sic] on to J26 gets worse on a day to day basis, I think the black route would ease this";*
- *"I'm particularly enthusiastic regarding the new junction between the M48 and the B4245. I live in Caldicot and even though we are very close to the M4 and M48 (to the point that noise is a concern), we have to travel several miles to Magor to join the M4, on the B4245 which suffers from high traffic (joining the M48 in Chepstow is equally bad). This new junction would greatly improve life of Caldicot inhabitants commuting east and west".*
- *"The impact to the environment and disruption to the people of Magor, Newport and Dyffryn will be high";*
- *"The effect on Magor needs to be mitigated, in particular by (i) not coming too close and (ii) new access to the M4/M48 to the east of Magor".*

4.2.1 Background

For many years, concerns have been raised regarding the potential for delays on the motorway and trunk road network in South Wales. In March 1989, the Secretary of State for Wales commissioned the South Wales Area Traffic Survey (SWATS) to review traffic patterns over part of the trunk road network in South Wales in order to identify problem areas and propose possible solutions. The SWATS Report (1990) identified the need for substantial improvement to the M4 to address a growing capacity issue on the motorway, in particular the section between Magor and Castleton. As a consequence, a proposal for a new dual 3-

[49] See www.m4newport.com

lane motorway (to be known as the M4 Relief Road) was included in the Welsh Trunk Road Forward Programme in 1991.

This proposal was the subject of public consultation during 1993 and 1994, following which the Preferred Route for the M4 Relief Road was announced in 1995. The Preferred Route was subsequently modified in 1997 to allow for development of the LG site at Duffryn.

In 2002, the proposal for an M4 Relief Road was put "On Hold" in the Trunk Road Forward Programme, pending the conclusion of the Wales Spatial Plan.

In November 2004, "People, Places, Futures – The Wales Spatial Plan" was published. It included the intention to:

"*…increase the transport capacity of the corridors and gateways to Europe and beyond. This will include capacity enhancements on the M4 and A465 corridors through the Trunk Road Forward Programme as well as development of routes from Cardiff International Airport*".

In December 2004, the Minister for Economic Development and Transport reported on the outcome of his review of transport programmes, which he had undertaken to ensure a good strategic fit with 'Wales: A Better Country' and the Wales Spatial Plan. One of the conclusions of the review was that additional capacity was required on the M4 motorway in South East Wales, in order to reduce congestion, improve resilience and remove an obstacle to greater prosperity along the whole corridor through to Swansea and West Wales.

In addition to widening the motorway north of Cardiff, the Minister announced proposals to develop a New M4 south of Newport between Magor and Castleton.

Following the Ministerial Review in November 2004, the New M4 Project was the subject of a thorough re-examination in order to ensure fit with current policies and to take account of physical and legislative changes. Three key activities were undertaken:

- A re-examination of route corridors considering, in particular, the implications and consequences of legislative changes and physical developments within the original project study area;
- An holistic review of the previously published Preferred Route (published 1997); and
- A review of the junction strategy.

The conclusion of these studies confirmed the route to the south of Newport as the optimal solution.

Following the Preferred Route and Junction Strategy Review, a TR 111[50] (April 2006) was published to protect a revised route corridor. The modifications were:

- In the Duffryn area, where a route up to 200m further north was proposed. This was in response to the deletion of the Duffryn Link from the Newport Unitary Development Plan; and

[50] Once a preferred route is announced, Welsh Government serves a *statutory notice* (TR 111) on the local planning authorities requiring the line (land within 67m from the centre line of the proposed road) to be protected from development. The statutory blight rules come into play. This is enacted under Article 15 of the Town & Country Planning General Development Order 1995.

- South of the Corus Steelworks at Llanwern, where the route was moved some 400m further north. This was in response to the cessation of steelmaking activities at the steelworks and to minimise impacts on the Gwent Levels.

A series of public exhibitions were held in April and May 2006 to explain the changes to the public and other stakeholders.

4.2.2 Consideration of Route Options to the South of Magor

As outlined above, route options for a proposed new motorway to the south of Newport have been subject to assessment and consultation for over two decades. As part of the development of the M4 Relief Road scheme in the 1990s, a staged process identified and analysed route options to the south and north of Magor, which ultimately led to the preference of a route to the north of Magor, as currently protected for planning purposes by the 2006 TR 111 route.

Previous work has considered the route alignment and junction revisions from the options developed in the 1990s. Extensive public and stakeholder engagement and consultation has informed the decision making not to progress a route to the south of Magor as part of the current TR 111 route. In summary:

- Route options to the south and north of Magor were recommended for public consultation as part of the development of the M4 Relief Road preferred route;
- In comparison with routes to the south of Magor, a route to the north reduced the length of the new motorway across the Levels;
- There was relatively high level of protest received from local individuals and local and national environmental groups to the road options crossing the SSSIs, which would be sustained and perhaps reinforced at Public Inquiry;
- A route to the north of Magor would be compatible with the allocations of land for commercial, retail and industrial development as indicated in the relevant Local Development Plan documents and could provide a coherent boundary between such development and the major part of the Caldicot Levels to the south;
- In economic terms, the increased construction costs of an option to the north of Magor, compared to south of Magor, are balanced by increased traffic benefits. There is also increased flexibility of traffic movements between the existing M4, M48 and the new motorway;
- A number of alternative routes were suggested at Magor during public consultation including that undertaken in 2006, utilising in varying degrees the existing M4 corridor. Adjustments to route alignment were made, particularly to the north of Magor, to address environmental concerns whilst retaining a positive economic performance, which was a feature of the public consultation routes;
- Routes to the north of Magor were considered on balance to be the mostly favourable in relation to the M4 Relief Road Brief, which stated the objective to promote schemes which offer the greatest economic, environmental and safety benefits;
- Whilst it was accepted that the options north of Magor reduced the effects on the SSSIs of the Gwent Levels, some concern was expressed over effects on people and property. As a result, a review was undertaken into alternative junction layouts to mitigate effects on people, property and landscape. An option that significantly reduced visual and noise effects on property at Magor

was taken forward for further public consultation, including that undertaken in 2006 and in subsequent consultations including the M4 CEM Programme in 2012. The estimated cost was greater than the option passing to the south of Magor, but traffic benefits balanced this dis-benefit; and

- Further public consultation indicated an overall preference for the route to the north of Magor that significantly reduced visual and noise effects on property, although some local responses still favoured a route to the south;

It is considered that the issues above remain relevant for the draft Plan and a new motorway to the south of Newport for the following reasons:

- The environmental protection of the Gwent Levels and River Usk remains an important consideration in terms of legislative requirements under the Strategic Environmental Assessment Regulations[51] and Habitats Regulations[52], as well as public and stakeholder acceptability. The route to the north would have less impact on the SSSIs and therefore is favourable over a route to the south;
- The current M4 Corridor around Newport draft Plan proposes to reclassify the existing M4 and make best use of existing highway infrastructure as part of the potential construction of a new motorway to the south of Newport. A route to the north of Magor would provide increased flexibility of movements between the existing M4, M48, A4810 Steelworks Access Road and the proposed new motorway, compared to a route to the south of Magor. This would also provide resilience benefits and maintain access to the Magor motorway service station;
- Should the existing M4 be reclassified, as the draft Plan proposes, a motorway to motorway junction would not be required. This means that a junction layout could be progressed to mitigate effects on people, property and landscape at Magor. An option that reduces visual and noise effects on property at Magor, compared to the current TR 111 route and junction strategy, could therefore be achieved; and
- The local development planning process at Newport and Monmouthshire has been progressed within the context of local planning policy protecting the TR 111 alignment (of which the draft Plan Black Route mainly follows) of the M4 Relief Road. A route to the north of Magor would provide increased accessibility to the Gwent Europark and Quay Point developments west of Junction 23A, compared to a route to the south of Magor.

On the basis of this appraisal, a route to the south of Magor, as considered within this document, should not be taken forward for further appraisal.

[51] Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment
[52] Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

4.3 Alignment of the Motorway to the west of Wilcrick Hill

During the draft Plan consultation, an alternative was put forward, that the draft Plan's eastern section of the Black Route might divert west of Wilcrick Hill, Llanwern, before merging with the existing motorway on the western side of Magor junction (J23A). In a letter to Welsh Ministers from Jessica Morden MP (Newport East) on 16 December 2013, a concern was raised over the suggested lack of clarification by the Welsh Government on why routes that avoided going through part of Magor have been discounted.

It has been suggested that this alternative might aim to:

- Reduce the impact on the Gwent Levels SSSI;
- Increase the use of brownfield land; and
- Increase the separation between the New M4 motorway and the western side of the Magor conurbation (this has historically and continues to be an important issue raised during public consultation in the Magor area).

4.3.1 Consideration of a Route West of Wilcrick Hill

Residents of Magor have suggested that an alternative route alignment that would divert west of Wilcrick Hill could reduce adverse environmental impacts, as a result of greater use of brownfield land and reduced direct impacts on the Gwent Levels SSSIs. It would also divert the alignment further away from rural properties within the Gwent Levels as well as properties to the west of Magor, which would reduce impacts on the existing local community. This was supported during the 2013 consultation by Jessica Morden MP. As such, the alternative route might reduce the potential for objections to the Black Route on environmental and social grounds, particularly from residents of Magor.

Whilst the alternative option would align the road further away from properties on the Gwent Levels and at Magor, some properties to the north of the route would then be closer to the new motorway, for example at Bishton, but the overall number of properties within 300m of the new motorway would be reduced.

The alternative option would have a significant physical impact on the Tata steelworks and Eastern Expansion Area, including the St Modwen development sites (existing and planned). At the least, increases in noise and air pollution would be expected from increased traffic passing in close proximity to the sites. It would navigate through the Tata site and thus would result in significant disturbance on the steelwork's operations, or could possibly extinguish its operations altogether. The alternative route would also impact upon existing businesses in the Llanwern area, potentially including Air Products (depending on a selected alignment). As such, the construction of this route, west of Wilcrick Hill, would have a significant impact on businesses and commercial property, leading to the loss of jobs. The route could also compromise the access arrangements and viability of certain employment and residential land allocations. There is therefore great potential for higher levels of objection and significant financial compensation with the alternative option, due to the potential for significant adverse impact on the operations of Tata and St Modwen Developments.

A route west of Wilcrick Hill would be likely to encroach onto the boundary of the Tata main tipping area, and as such result in risks to delivery including the

impact on the Waste Management Licence and incumbent risks associated with contaminated land, which would be at increased cost to the scheme. The alternative route represents a strategic shift of alignment compared to the Black Route, and due to its further encroachment into the Llanwern site would result in an un-investigated new line of enquiry.

There would also be reduced network resilience offered by the alternative route, as it would merge to the west of J23A. There is the potential for this to increase network management risks. However, the Black Route could provide a junction to the east of J23A at Magor that offers increased network resilience.

4.3.2 Concluding Remarks

An alternative route west of Wilcrick Hill could reduce the environmental impact on the Gwent Levels SSSI and would make greater use of brownfield land. It would divert the alignment further away from properties on the Gwent Levels and west of Magor, although properties to the north of the route would then be closer to the new motorway, which would offset this potential benefit.

The alternative route option would have a significant physical impact on the Tata steelworks and Eastern Expansion Area, potentially including the strategic Glan Llyn development site. This would have a significant adverse impact on the local economy and could pose a significant risk to the viability of the planned residential and commercial development in this area. Compensation payments would likely make the scheme unviable. Due to potential significant adverse impacts on this strategic employment area, this alternative is likely to be strongly opposed by key stakeholders.

Reduced network resilience and increased network management risks, when compared to the Black Route, also make this alternative route less attractive as a long term solution to the transport related problems on the M4 around Newport.

On the basis of this appraisal, a route to the West of Wilcrick Hill, as considered within this document, should not be taken forward for further appraisal.

4.4 Tunnel under the River Usk

During the draft Plan consultation, the Welsh Government considered the potential development of a tunnel under the River Usk and Newport Docks along the approximate alignment of the Black Route, as an alternative to a bridge crossing. Relevant comments received include:

- *"Should a tunnel be used it would mitigate the noise and environmental issues any increase in traffic will bring and be considerably less damaging to the Gwent levels and Newport city";*
- *"Has a tunnel from the Malpas Straight to Llanwern, to carry the eastbound traffic, been seriously considered? The current market in the UK has built significant experience in tunneling as well as the acquisition of suitable equipment, making tunneling more affordable now than ever before";*
- *"There are usually always alternative routes-even underground tunnels in especially sensitive areas. E.G. Switzerland,Madeira etc"; and*
- *"While vising my brother in Vienna recently, we learned of a new road planned from the airport to the east of the city crossing the Danube. There was fierce opposition to this as the road would cross the Lobau which is a large nature reserve on the eastern side of the river. The solution is a tunnel which will be built right under this protected area and the Danube. It will cost more but it is more environmentally friendly and all seem happy with this."*

4.4.1 Background

Tunnel options have been considered as part of previous studies[53], but were not progressed for appraisal due to initial high level cost estimates deeming tunnelling options financially unviable. The sections below present current consideration of tunnel options.

4.4.2 Key considerations

The relevant above ground constraints include the Ebbw and Usk river channels, the Newport Docks (with associated dock wall structures), Docks Way landfill, Stephenson Street industrial estate, Uskmouth railway line (and Docks railway lines) and the PCB[54] cell associated with the Solutia chemical works. The degree of impact on these features depends on the alignment of the tunnel adopted. If an alignment that is straightened and located to the south of the Black Route is adopted, this could limit or remove any impact on the Docks Way Landfill and PCB cell at Solutia, depending on the type of tunnel adopted.

A number of the constraints for a tunnel option have features that are present below the ground surface. A description of the below ground features and approximate depths are summarised below:

[53] Initial Assessment of Structures Report (2007) & Initial Improvement Option Report Addendum (2011)
[54] Polychlorinated biphenyl

Constraint	Description	Approximate depth[55]
River Ebbw	Base of river channel	0 mOD
Docks	Dock walls – generally mass gravity walls (masonry) or masonry lined cut slopes. Southern dock wall North, junction and south walls	-8 mOD -12 mOD
River Usk	Base of river channel	-5 mOD
PCB cell (Solutia Chemical Works)	Base of PCB cell	0 mOD

The ground level through the docks area is generally flat and varies in elevation, from 7 mOD to 10 mOD. The docks area is slightly higher in elevation compared to the Gwent Levels (located to the east and west) that is approximately 7 mOD.

The Ebbw and Usk rivers have associated banks that have been cut into the estuarine deposits. The banks are potentially unstable as a result of the large tidal range within these rivers.

Considering the Black Route as the basis for the preferred alignment, a tunnel would not be constrained to the same alignment. A tunnel alignment could be straightened through the docks area to provide an optimum line for engineering purposes.

The listed habitat types and species are those considered to be most in need of conservation at a European level. The legal requirements relating to the designation, protection and management of SACs are set out in the Conservation of Species and Habitat Regulations (2010). The Habitats Regulations require that any plans, projects or activities which are proposed and require a permission of some kind and may significantly affect a SAC must be subject to special scrutiny and first require a detailed 'appropriate assessment'. The decision-making authority may only permit or undertake the proposals if the assessment concludes that there would no adverse effect on the integrity of the SAC. Where it cannot reach this conclusion, the project can then only proceed in particular circumstances where the competent authority are satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (these may be of a social or economic nature)[56].

4.4.3 Options

The following tunnel options have been considered:

- Cut and Cover/Immersed Tube Tunnel

  For the combinations of highway alignment and existing physical constraints, a cut and cover/immersed tube tunnel option is not considered practical because it would:

  a) significantly disrupt the River Usk SAC and would not be justifiable where other reasonable alternatives exist that would have reduced impacts on this European Site (in accordance with the Habitats Regulations);

[55] MOD stands for Metres Above Ordnance Datum (UK sea level measurement)
[56] In this case, the appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected.

b) significantly disrupt the docks, severing the site completely during construction, including the operational impounded water areas;

c) significantly disrupt both the Uskmouth and Docks railway lines; and

d) significantly disrupt the River Ebbw.

- Bored Tunnel

  A bored tunnel is considered a feasible alternative to a bridge crossing of the River Usk and Newport Docks area, although it would not be able to deliver a junction on the west side of the River Usk in the docks area.

  The tunnel would be bored within the Mercia Mudstone at depth. Approaches to the bored section, through the superficial deposits, would be constructed using cut and cover construction. The key geometric constraints for the tunnel are as follows:

  a) A diameter of 15m for a 3 lane highway;

  b) Minimum cover below surface of 2 x diameters;

  c) Minimum spacing between the two tunnels is 1 x diameter; and

  d) Cut and cover to the base of the soft alluvial materials.

  The principal approximate tunnel dimensions would be:

  a) Maximum depth below ground: -50mAOD to tunnel invert;

  b) Length of bored section: 3,000m;

  c) Total length: 4,500m; and

  d) Length of open cut approaches: Eastbound Approach = 820m; Westbound Approach = 680m.

For a vertical alignment along either the draft Plan's Black Route or a straightened Black Route with a tunnel, several constraints apply. At the River Usk it is required that the crown of the tunnel be at two tunnel diameters beneath the river bed (-35mAOD), coupled with a maximum highway gradient of 3% on the approach to this point. As a result of these constraints, the location at which the descent into the tunnel would occur would be approximately 500m east of the South Wales Railway Mainline (travelling eastbound) and 1400m east of the Uskmouth Railway (travelling westbound).

In summary, a tunnelled section would be required to be in excess of 3,000m in length[57]. This removes the potential for a junction within the docks area, which could be provided with a bridge crossing.

It has been estimated that the capital works cost of a bored tunnel under the River Usk would be approximately £570m, excluding risk and preliminaries. The net operations and maintenance cost of the tunnel may be between £2.5m and £5m per annum (or between £75m and £145m when expressed as a present day value commuted maintenance sum for a 120 year design life).

[57] Excluding standard cut approaches

This compares unfavourably to an estimated cost of a like for like length of the Black Route proposals, including a bridge crossing the River Usk, of £295m capital works cost, excluding risk and preliminaries. The net operations and maintenance cost of a bridge may be between £1m and £3m per annum (or between £30m and £80m when expressed as a present day value commuted maintenance sum for a 120 year design life).

The tunnel does have the potential to avoid impacts on the Newport Docks, which may result in savings in land purchase and compensation.

4.4.4 Concluding remarks

A cut and cover/immersed tube tunnel is not considered to be feasible in light that it would significantly impact on the River Usk SAC and would not be justifiable where other reasonable alternatives exist (in the context of the Habitats Regulations). It would also significantly disrupt the docks, severing the site completely during construction, including the operational impounded water areas. This would have a significant adverse economic impact with high risk of compensation payments being required. A cut and cover/immersed tube tunnel would significantly disrupt both the Uskmouth and Docks railway lines, the River Ebbw, and be incompatible with a docks area junction. The cut and cover/immersed tunnel option is not, therefore, considered to be a viable alternative to a bridge crossing of the River Usk.

A bored tunnel is considered to a feasible alternative to a bridge crossing of the River Usk and Newport Docks area, although it would not be able to deliver a junction on the west side of the River Usk in the docks area.

A bored tunnel would have significantly greater capital construction costs, maintenance costs and operations costs than a bridge (some £300M), although it could save on land purchase and compensation costs.

If a tunnel option was progressed, then it would also need to be considered as part of a Habitats Regulations Assessment (HRA). If a tunnel option was progressed as part of a scheme, should it form part of an adopted Plan, then it would need to be assessed as part of an Environmental Impact Assessment (EIA), in accordance with the EIA Regulations. It is considered that a bored tunnel crossing type is not necessarily an environmentally less damaging than a bridge option, in line with the Habitats Regulations and DEFRA guidance. In particular, the potential for vibration effects on migratory fish arising from the construction of a tunnel persists.

Although tunnelling options are feasible, the engineering risks are high. The potential environmental effects would be dependent on further detail regarding design and construction methods of bridge and tunnel options. If it were possible to design a bored tunnel that was cost effective and avoided direct effects on the SAC, the indirect effects of vibration would still remain a key risk. Therefore, a tunnel option does not present a reasonable alternative option to a bridge crossing.

On the basis of this appraisal, an alignment that includes a tunnel option as considered within this document should not be taken forward for further appraisal and is not considered a reasonable alternative.

4.5 Barrage across the River Usk

During the draft Plan consultation, the Welsh Government was asked to consider the potential development of a barrage across the River Usk along the alignment of the Black Route, as an alternative to a bridge crossing. Relevant comments received include:

- *"Future potential projects, i.e. barrage or major airport etc, could best be tied into the black route and present a joined up approach to future infrastructure improvements";*
- *"Black route is ideal for the Barrage"; and*
- *"The spoil recovered could be used to build a barrage across the Usk for power generation and for building tidal lagoons, coastal flood defences etc".*

4.5.1 Background

A River Usk Barrage Private Bill was subject to debate in a Lords Sitting on 13 March 1991[58]. On Question, the Bill was read a second time, and committed to a Select Committee. An Instruction to the Committee to whom the Bill was committed was that it should pay particular attention:

a) to whether the economic development of Newport and the adjacent areas could be better achieved by other means than building a barrage;

b) to the prospects of such development in the light of the proposed Cardiff Bay development which may be competing in trying to attract investors;

c) to the effect of the Bill on the community charge in Gwent and Newport;

d) in considering questions of water quality, to the draft EC Municipal Waste Water Treatment Directive (COM (89) 518 final);

e) to the need for a road crossing over the barrage in the light of the possible extension to the south of Newport of the proposed second crossing over the River Severn; and

f) to the impact of the proposed barrage on the economy of the Usk Valley.

It should be noted that the debate took place prior to the introduction of the Habitats Regulations Assessment Regulations (2010).

It was stated that the Usk river barrage was intended, first, to provide a flexible tidal barrier which would play a vital long-term role in protecting the people of Newport and Caerleon from the effects of high tide levels, including any which may result from the effects of global warming. It was also proposed as part of an Usk regeneration scheme, where Newport Council intended to clean up and enhance the water quality of the river by, among other things, removing the raw sewage outlets. It was suggested that this would be a great benefit for Newport and its tourist industry. By maintaining a high level of water at low tides, the scheme was proposed to revitalise the river front and enable housing and industrial and recreational development to be undertaken along the banks of the river.

[58] http://hansard.millbanksystems.com/lords/1991/mar/13/river-usk-barrage-bill-hl

It was stated that it aimed to enrich the quality of life for the communities of Newport by opening up public access to the river front and bringing positive social benefits to the local community. At the time, it was estimated that over £200m of private investment was expected to be attracted to the Usk river front, with the potential for the creation of over 2,000 jobs in light industry, offices, tourism and leisure, and in construction associated with the various projects. An additional 8,000 jobs were estimated to be likely to be created as a result of the proposed extensive river front walks, a new sports complex using the river and the adjacent glebe lands, new recreational facilities, and better road access to the East Usk area. The total economic benefit was expected to generate an increase in regional income of no less than £90m per annum in 1991 estimates, of which over one third was expected to benefit neighbouring districts.

It was discussed that although the scheme enjoyed widespread local support, it was opposed strongly by groups further up the Usk valley as evidenced by the number of petitions (22 in all) that were deposited in opposition to the Bill. It was raised that the promoters had an obligation to convince the National Rivers Authority that statutory obligations would be met by their plans to ensure water quality standards and that the design for the proposed fish lock facilitates the passage of migratory fish.

The scheme was put forward in 1993 by Newport and Gwent Councils and led to a public inquiry, which began in January 1994. The plans for a barrage across the River Usk at Newport were turned down by Welsh secretary William Hague, following the three-month public inquiry[59]. The Welsh Office decision letter concluded that the scheme would cause irreversible and harmful effects to the landscape and fish. The decision letter said Mr Hague concluded that the case for the barrage as an economic catalyst for the area had not been made. There were other ways that could improve the appearance of the riverfront to make it more attractive for development. In addition, the loss of the huge tidal range of the river would have a material effect on the landscape upstream of Newport. The letter states: 'The secretary of state concludes that there is doubt as to the extent of additional development and economic benefit that a barrage would bring compared to other alternatives." He also concludes that there would be irreversible and harmful effects on the landscape of the river upstream of the barrage and on the fish population. "In the secretary of state's judgement, these effects would be such that they outweigh the uncertain additional benefits of the proposed barrage compared to what might be achieved by the regeneration of the riverfront in other ways."

In 2006, fresh calls were made for the scheme's reconsideration as part of the M4 Relief Road proposals[60], but a bridge crossing was preferred by the Welsh Government as part of its preferred route, as published in its revised TR111 Notice).

[59] http://www.lgcplus.com/welsh-secretary-turns-down-plan-for-usk-barrage/1589072.article and http://www.independent.co.uk/news/joy-in-the-country-as-barrage-plan-is-rejected-1600956.html
[60] http://www.walesonline.co.uk/business/business-news/engineer-backs-call-revive-barrage-2359656

Whilst the scheme was not progressed further, this concept has attracted media attention in more recent years, with calls for the building of a barrage associated with the potential investment opportunities linked to the regeneration of the area around the River Usk[61]. Some stakeholder and members of the public have suggested that a barrage could lead to renewable energy generation, lead to the enhancement of the townscape and result in the potential development of a Newport Marina.

4.5.2 Consideration of a barrage across the River Usk

This section considers the merits of a River Usk barrage crossing as part of the M4 Corridor around Newport draft Plan Black Route proposals. It is outside of the scope of this appraisal to consider the merits of a barrage scheme in isolation.

In economic terms, a barrage could facilitate the regeneration of land around the Newport Docks and River Usk. By maintaining a high level of water at low tides, the scheme could revitalise the river front and enable development along the banks of the river, should an environmental enhancement scheme make the site more attractive to developers. This could also benefit tourism in the area. The economy of Newport could benefit significantly as a result of commercial development in this area, although a detailed economic appraisal of the costs and benefits should be undertaken if this option is processed further. The commercial operations at the Newport Docks and along the River Usk would be likely to be in conflict with a barrage across the River Usk, whilst the impact on the operation of these businesses that are reliant on movement of goods along the River Usk could be significantly adverse. This could lead to significant compensation requirements, or even closure of businesses reliant on the River Usk for its trade. It should be acknowledged that at this time, no strategic development sites are identified by Newport City Council in this area, and so a significant change in local planning policy would be required. The potential impact of increased development around the River Usk on the viability of the Glan Llyn strategic development site at Llanwern has not been considered.

In terms of the potential impact on society, a barrage could improve accessibility within Newport (in particular to the East Usk area), reduce community severance, and provide health and wellbeing benefits. The scheme could facilitate recreational development along the banks of the river, supporting tourism and leisure uses. The interface of a barrage with a new motorway would need to be considered further, in particular the potential implications for pedestrian access and community safety, which could be limited if the accessibility and recreational benefits were compromised as part of a motorway/barrage crossing.

A key concern throughout the barrage's consideration during the 1990s was its likely impact on the environment. The River Usk is considered to be one of the best areas in the UK for sea lamprey, river lamprey, twaite shad and Atlantic salmon[62]. It is one of only four sites in the UK with a known breeding population of twaite shad. As such, it is designated a Special Area of Conservation (SAC), and is a protected site designated under the Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

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61 http://www.southwalesargus.co.uk/news/letters/9593242.Build_a_barrage__the_Usk_is_an_eyesore/

62 Joint Nature Conservation Committee http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0013007

The listed habitat types and species are those considered to be most in need of conservation at a European level. The legal requirements relating to the designation, protection and management of SACs are set out in the Conservation of Species and Habitat Regulations (2010). The Habitats Regulations require that any plans, projects or activities which are proposed and require a permission of some kind and may significantly affect a SAC must be subject to special scrutiny and first require a detailed 'appropriate assessment'. The decision-making authority may only permit or undertake the proposals if the assessment concludes that there would no adverse effect on the integrity of the SAC. Where it cannot reach this conclusion, the project can then only proceed in particular circumstances where the competent authority are satisfied that, there being no alternative solutions, the plan or project must be carried out for imperative reasons of overriding public interest (these may be of a social or economic nature)[63].

The River Usk SAC consists of the following unique characteristics:

- Hydrological processes, in particular river flow (level and variability) and water chemistry, determine a range of habitat factors of critical importance to the SAC features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature;
- Geomorphological processes of erosion by water and subsequent deposition of eroded sediments downstream create the physical structure of the river habitats. Whilst some sections of the river are naturally stable, especially where they flow over bedrock, others undergo constant and at times rapid change through the erosion and deposition of bed and bank sediments as is typical of meandering sections within floodplains (called 'alluvial' rivers);
- Riparian habitats, including bank sides and habitats on adjacent land, are an integral part of the river ecosystem. Diverse and high quality riparian habitats have a vital role in maintaining the SAC features in a favourable condition;
- Habitat connectivity is an important property of river ecosystem structure and function. Many of the fish that spawn in the river are migratory, depending on the maintenance of suitable conditions on their migration routes to allow the adults to reach available spawning habitat and juvenile fish to migrate downstream; and
- External factors, operating outside the SAC, may also be influential, particularly for the migratory fish and otters. For example, salmon may be affected by barriers to migration in the Severn Estuary, inshore fishing and environmental conditions prevailing in their north Atlantic feeding grounds.

The construction of a barrage across the River Usk SAC is very likely to result in significant effects on the integrity of the European protected site. Any barrier constructed across the Usk is likely to affect the hydrological, geomorphological, riparian habitats and habitat connectivity characteristics of the designation.

If significant effects on the integrity of the European protected site cannot be ruled out beyond reasonable scientific doubt, the Habitats Regulations require that:

"Under article 6(4) a plan or project can only proceed provided three sequential tests are met:

- There must be no feasible alternative solutions to the plan or project which are less damaging to the affected European site(s);

[63] In this case, the appropriate authority must secure that any necessary compensatory measures are taken to ensure that the overall coherence of Natura 2000 is protected.

- There must be "imperative reasons of overriding public interest" (IROPI) for the plan or project to proceed; and
- All necessary compensatory measures must be secured to ensure that the overall coherence of the network of European sites is protected[64]."

DEFRA guidance states that: "An alternative should not be ruled out simply because it would cause greater inconvenience or cost to the applicant. However, there would come a point where an alternative is so very expensive or technically or legally difficult that it would be unreasonable to consider it a feasible alternative. The competent authority is responsible for making this judgement according to the details of each case.[65]"

The tests must be applied sequentially i.e. IROPI cannot apply if the alternative test has not been passed. For the objectives defined for the M4 Corridor around Newport draft Plan there are viable alternatives for crossing the River Usk, such as a bridge, and therefore a proposed barrage would be very likely to fail the requirements of the Habitats Regulations. When compared to a bridge crossing, a barrage is also likely to have the following impacts:

- Noise - more intensive construction activity may be associated with the construction of a barrage in comparison with bridge alternatives, resulting in a greater noise impact. Noise during operation is likely to be comparable across both options;
- Local Air Quality - more intensive construction activity may be associated with the construction of a barrage in comparison with bridge alternatives, resulting in a greater local air quality impact. Noise during operation is likely to be comparable across both options;
- Landscape and townscape - the construction of a barrage is likely to have significant local landscape and townscape impacts, as would alternatives such as a bridge crossing;
- Biodiversity - the proposed barrage across the River Usk SAC and SSSI is likely to have significant adverse effects on the habitats and therefore the integrity of the designation. A bridge crossing would also have to satisfy that it can limit the effects on the designation, but there is significantly less risk involved with a bridge than a barrage;
- Heritage - a barrage may have a negative impact on cultural and historical assets. Construction has the potential to uncover unrecorded archaeological assets. The potential is likely to be greater in comparison with bridge alternatives;
- Water environment - the proposed barrage across the River Usk SAC and SSSI is likely to have significant adverse effects on the water environment and therefore the integrity of the designation; and
- Soils - the magnitude of impact on soils from the construction of a barrage, compared to other river crossing options is likely to be greater.

[64] DEFRA (2012), Habitats and Wild Birds Directives, Guidance on the application of Article 6(4)
[65] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69622/pb13840-habitats-iropi-guide-20121211.pdf

In terms of the feasibility and deliverability of a barrage in combination with a new motorway, there is likely to be significantly more risk of failure at public inquiry compared to a new motorway involving a bridge crossing of the River Usk. The alignment of a motorway to combine with a barrage would need to be low, which would significantly compromise the operation of the Newport Docks. This would be likely to require significant compensation payments and could cause loss of employment for businesses operating at the Docks and wharfs.

A high level crossing, which may reduce the impact of the Newport Docks, would then be likely to require additional structures to elevate the motorway on top of the barrage (which would be at a lower level) along most of its alignment. This would create additional cost to the scheme.

The public and stakeholder acceptability of a barrage could be limited by the likely significant adverse impact on the River Usk ecology. Furthermore, the European level legislative constraint on development affecting the River Usk SAC would significantly increase risk of failure at public inquiry.

On the basis of this appraisal, the draft Plan preferred strategy, which includes the Black Route that is likely to involve a bridge crossing of the River Usk, should be taken forward to address the problems on the M4 around Newport. An option to develop a barrage across the River Usk, as considered within this document, should not be taken forward for further appraisal.

4.6 Tunnel widening at Brynglas

During the draft Plan consultation, an alternative was put forward, involving online improvements with widening of the tunnels at Brynglas. A range of relevant comments is provided below:

- *"I do not see why the existing Motorway cannot be widened (including the tunnels)";*
- *"It would seem ideal to widen the Brynglas tunnels as this is the 'bottle neck' problem";*
- *"My vote would be to build another tunnel at Brynglas this is the main bottle neck within the area and as such needs widening to cope with current traffic levels";*
- *"I accept improvements are required to the existing M4 and that is exactly what should be done i.e the existing route improved by a full widening of the existing motorway and removal of bottlenecks like the Malpas tunnel via compulsory purchase and excavation of the tunnel\hill to provide the required amount of lanes"; and*
- *"The existing roads sould [sic] just be widened especially the tunnels".*

4.6.1 Background

As set out in the M4 Corridor around Newport Consultation Document[66], the previous M4 Corridor Enhancement Measures (M4 CEM) programme[67] assessed and consulted on a long list of possible solutions between 2010 and 2012. Assessment covered the overarching Welsh impact areas of economy, society and environment, and considered online improvements to the M4 between Magor and Castleton.

Online widening of the existing M4, with an additional tunnel at Brynglas, attracted strong concern over its impact on property or land take (with 200 to 300 homes and businesses directly affected). Traffic modelling also showed that if the tunnel bottleneck was removed, severe operational problems would continue to be experienced, and would be particularly experienced further west between Junction 26 and Junction 27. For reasons including these, online widening of the M4 with an additional tunnel at Brynglas was not taken forward for further appraisal.

4.6.2 Previous work that considered an additional tunnel at Brynglas

As outlined above, online widening with an additional tunnel at Brynglas was assessed as part of the M4 CEM Programme. It formed 'Option D', which was subject to public consultation between March and July 2012. This built on earlier stakeholder engagement on a measure that would have seen three-lane online widening through the Brynglas Tunnels[68]. This considered a new bore tunnel (3 lane plus hard shoulder carriageway width), whilst converting the existing bores to carry the opposite carriageway in (2 lane) + (1 lane + hard shoulder) formation.

[66] See www.m4newport.com
[67] See www.m4cem.com
[68] M4 Corridor Enhancement Measures: Appraisal Summary Workbook (July 2011), see www.m4cem.com

The outline cost estimate for a new tunnel through Brynglas with its associated other works was £380m (2010 Q3 prices).

As illustrated at public drop-in exhibitions that were held as part of the M4 CEM Consultation[69], the new tunnel as considered in M4 CEM Option D, would have been north of the existing motorway, to carry 3 lanes of eastbound traffic with a hard shoulder. This option also included widening the existing motorway in both directions, to dual 4 lanes. The estimated cost of this option was £580m (2010 Q3 prices[70]).

An M4 CEM Participation Report was published in August 2012, which summarised the associated engagement and consultation process.

An M4 CEM WelTAG assessment[71] recommended that this option should not be progressed due to it not providing network resilience, and its likely significant impacts on the local community. In summary, it was also recognised that it would not provide sufficient capacity in the longer term, with severe operational problems continuing to be experienced on some sections, whilst it would have adverse impacts on people and the economy during construction. Furthermore, the measure was expected to increase traffic flows along the motorway, which would have adverse impacts on noise and air pollution to the north of Newport, where there are many receptors (people and properties).

4.6.3 Options for the maintenance of the Brynglas Tunnels

Whilst an additional tunnel or the widening of the Brynglas Tunnels was not recommended for further appraisal during the M4 CEM Programme, this document reconsiders potential alternatives.

As outlined in the M4 Corridor around Newport WelTAG Stage 1 Report and Consultation Document, significant maintenance works (that may be over a long period of time) are needed at the Brynglas Tunnels[72]. As such, any alternatives for widening of the Brynglas Tunnels should be considered as part of the major maintenance works planned for the tunnels over the next two years[73].

Potential widening options that could be complementary to the planned refurbishment of the Brynglas Tunnels, which attempt to maintain some traffic flow, include:

- Progressive Lining Removal - cutting out to one side of each bore and installing a new lining whilst maintaining live traffic; and
- Intact Lining - excavating above the existing lining, with live traffic continuing underneath, and then installing a new lining before removing the old one.

[69] M4 CEM Exhibition Display Boards, page 18 (March 2012), see www.m4cem.com
[70] High level cost estimates based on preliminary designs for each of the M4 CEM highway options included allowance for risk and Optimism Bias but excluded VAT
[71] M4 CEM WelTAG Stage 1 (strategy level) Report (2013)
[72] M4 Corridor around Newport Consultation Document, see www.m4newport.com
[73] http://wales.gov.uk/about/cabinet/cabinetstatements/2014/m4/?lang=en

4.6.4 Consideration of options for widening the Brynglas Tunnels

The widening options that could be complementary to the planned refurbishment of the Brynglas Tunnels, as outlined above, would provide a limited increase in capacity, with no or very limited improvement to network resilience.

In comparison to the new tunnel option considered as part of the M4 CEM Programme (Option D), it is considered that neither of the options would resolve the issues that discounted M4 CEM Option D. Furthermore, the costs for the tunnel element continue to represent poor or limited value for money compared to that already considered.

Following the public consultation and completion of the strategy level M4 CEM WelTAG assessment, it was recommended that the online widening and an additional tunnel at Brynglas should not be progressed for the following reasons:

- It attracted the most opposition and/or challenge from respondents to the M4 CEM consultation and many of these expressed strong concerns about its impact on property or land take;
- Traffic modelling showed that if the tunnel bottleneck was removed, the critical link on the motorway would then be further west between J26-J27, where flows would exceed capacity even before the design year;
- Motorway capacity and network resilience issues would only be partially addressed, not to mention major disruption to traffic flow;
- Health impacts, particularly during construction, would be large and negative, and strong public opposition would be likely; and
- This option would not address the existing Noise Action Planning Areas (NAPPAs) and Air Quality Management Areas (AQMAs) in the area, of which the latter Newport City Council have a legal obligation to address[74].

The options considered in this section would also have a significant impact on the local community during construction and operation. During the construction phase, local communities are likely to experience considerable disturbance over long periods due to additional noise and air pollution, and periodic night-time working.

A number of properties will require demolition, although the exact numbers will depend on its layout. For M4 CEM Option D, the feasibility of an additional tunnel was challenged by respondents to the M4 CEM consultation because of the problems experienced back in the 1960s when the original tunnels were constructed. A local community group, the ‘New Life Trust’, which has been based at Christchurch since 1998, considers it would have serious adverse impact on local communities and facilities. There was also a Facebook page ‘Campaign Against Additional Tunnel’ (CAAT) and a petition website ‘Newport Oppose £550m Plans of New Brynglas Tunnel and demolition of Homes’, which contained 165 names. Both were set up in opposition to Option D, on the grounds that it would require property demolition and/or would adversely impact on the quality of life for residents of Brynglas[75].

[74] Part IV of the Environment Act, 1995, places a statutory duty on local authorities to periodically review and assess the air quality within their area.
[75] M4 CEM Participation Report (August 2013), see www.m4cem.com

Alongside the motorway at Newport there are NAPPAs and AQMAs that need to be addressed. Widening the tunnels at Brynglas could limit stop-start conditions and therefore provide benefits to air and noise pollution in the short term. However, in the longer term, traffic forecasts anticipate further traffic growth, which will lead to severe operational problems on the M4 around Newport. In this case, the widening of the tunnels will not provide a long term solution to the problems of the M4 between Magor and Castleton[76]. The lack of an alternative route will thus result in motorway capacity problems and network resilience issues. As such, air and noise pollution will continue to worsen over time.

4.6.5 Concluding remarks

In summary, both an additional tunnel and widening of the existing tunnels at Brynglas would be likely to:

- Require property demolition and attract significant public opposition;
- Raise significant local social and health issues;
- Create large adverse impacts on people and the economy during construction; and
- Not resolve capacity problems and network resilience issues on the M4 Corridor around Newport.

On the basis of this appraisal, an additional tunnel or widening of the tunnels at Brynglas, should not be taken forward for further appraisal, as the solution to the identified problems.

[76] Traffic forecasts for M4 CEM Option D have indicated that, by the design year (2035), the section of motorway between Junction 26 and Junction 27 is likely to be operating some 6% above capacity in the westbound direction during the weekday PM peak. This would result in severe operational problems.

4.7 Motorway to the north of Newport

During the draft Plan consultation, an alternative was put forward, involving a motorway located to the north of Newport, rather than to the south of Newport. A range of relevant comments is provided below:

- *"A relief road for traffic in one direction to the north of the existing M4 should be considered, leaving the existing lanes through both of the brynglas tunnels to take the flow in the other direction";*
- *"If a new M4 is needed in the future it should go north outside of the City boundary to intercept traffic from the north rather than just act as a bypass to the south with little catchment area";*
- *"I believe an alternative route from J27 to J25, ie north of Newport should be included in these considerations"; and*
- *"M4 Relief Road to the North of Newport?"*

4.7.1 Previous work that considered a motorway to the north of Newport

A motorway route to the north of Newport was considered as part of development work in 2006[77]. Then as part of the M4 CEM Programme, a route further north was considered, as a mid-valleys link road (involving the upgrading of the A470 to the west of Nelson and the A449 to the east of Usk to dual-2 motorway standards). In addition, the M4 CEM workbooks, available at www.m4cem.com, presented an option involving the promotion of the use of alternative routes, including the A465 to the north of Newport, to help reduce traffic congestion on the M4 around Newport.

A re-examination of route corridors in 2006 considered a northern route for a motorway alignment around Newport. Initial appraisal identified that the best route option north of Newport was found to perform worse than those to the south. It was nearly 4 miles longer, would cause major impacts on the landscape where it crossed the valleys and hillsides north of Newport and would not attract sufficiently high levels of traffic from the existing M4 motorway. In economic terms it performed much less well than the southern routes. For these reasons it was discarded.

In addition, the 2006 development work appraised an option which combined widening of the west section of the existing M4 motorway up to Malpas with a new alignment passing to the north of Caerleon. This option was considered to require extensive property demolition (approximately 70 residential properties) and have a considerable impact on Caerleon. This was combined with high cost and poor economic performance. For these reasons it was also discarded.

Building on the 2006 development work, it was considered during the development of the M4 CEM Programme that a motorway or road to the north of Newport would not meet the objectives for the M4 Corridor around Newport because it would cause significant impacts on land take and property, with adverse impacts on communities.

[77] Re-examination of route corridors (2006), where a full range of possible routes was identified both to the north and south of Newport. Together with all the sub options, the total number of options identified was in excess of 2,000 and was aimed at an exhaustive selection process that would leave no feasible opportunity unexplored. Route options and sub-options were assessed on the basis of environment, cost, traffic, engineering and economics.

It was also considered that a route to the north of Newport presents high technical risks with a number of engineering challenges.

4.7.2 Consideration of a motorway to the north of Newport

A northern route corridor would be characterised by hills and valleys to the north of Newport and options within that corridor would require an alignment through or around settlements occupying the river valleys and slopes.

It occupies land in the administrative districts of Newport, Monmouthshire and Torfaen. With the exception of an option which joins the existing route around Junction 26, west of the Brynglas Tunnels, thereafter becoming part of the on-line widening corridor; the northern corridor would be lengthy so as to avoid built-up areas. Key features of a road along a northern corridor would thus require significant numbers of crossing structures and substantial earthworks (cuttings and embankments), necessitated by the topography. Significant demolition of properties would likely be necessary to create a cutting for the road.

The northern corridor generally avoids nationally designated environmental areas, although it occupies land benefiting from local levels of protection. The northern corridor would not involve the crossing of SSSIs, with the exception of the River Usk, which is a SAC.

The physical constraints along the northern corridor include built development, particularly in valley locations where the road would need to pass through on structure; and development along the line of these structures would exacerbate the complexity and potential social impact of road development in the northern corridor.

Properties would need to be demolished, which would attract opposition from the local residents and communities affected. There would also be significant impact on local communities during the construction phase. An increase in greenhouse gas emissions would occur and nearby receptors to the route corridor could experience greater noise and air pollution. Visual impacts would be quite high along sections of the new highway. In addition, a new Usk crossing would affect the setting of the River Usk corridor at a location where there are many receptors.

Depending on where a feasible connection could be made to connect a route to the north of Newport with the existing M4, traffic congestion could be redistributed to the west of Newport and Cardiff. There is also likely to be less opportunity to provide accessibility benefits to Newport and its key economic development areas.

4.7.3 Concluding remarks

Whilst limiting potential impacts on the environment, a route to the north of Newport would have a significant impact on people and property.

On the basis of this appraisal, a motorway to the north of Newport, as considered within this document, should not be taken forward to address the problems on the M4 around Newport.

4.8 Public Transport

During the draft Plan consultation, some respondents put forward public transport measures or investment in regional public transport services, as an alternative solution to address the problems of the M4 around Newport. Some specifically mentioned the Cardiff Capital Region Metro and/or rail electrification in their responses, and suggested that improved public transport services could reduce the need for a new motorway to the south of Newport. A range of relevant comments is provided below:

- *"Instead of building the M4 relief road the Assembly should implement the South Wales Metro as promised by Mark Barry and SEWTA. Many journeys on the M4 around Newport are short and if the South Wales Metro was implemented this would take many of these journeys from the M4. The existing M4 would then cope with the lower level of usage";*
- *"The planned expenditure should be spent on improved existing public transport solutions and/or an east west metro";*
- *"I have no objection to the draft plan, but it should not have priority over the proposed metro for the South east Wales area";*
- *"Almost half of traffic journeys assessed were of less than 20 miles which supports the case for a local integrated solution such as the long talked about Metro system when this goes live and is in existence will attract a large proportion of local traffic away from the existing M4 further reducing the need to spend 1.2 billion pounds."*
- *"Traffic congestion around Newport will not be addressed without significant investment in public transport and culture changes, which will not be achievable in the next 10-20 years";*
- *"The Welsh Government would better spend tax-payers' money by taking radical action to improve public transport and make it a viable alternative to the car"; and*
- *"Adequate public transport links negate the need for cars because people can get to where they want. Most people who work in London use public transport and that's the scenario we should be aiming for."*

4.8.1 Background

Following publication of the Preferred Route for the M4 Relief Road in 1995, as well as pursuing the new road proposal as a possible solution to predicted traffic problems on the M4, a more broadly-based study of solutions was also undertaken, known as the Common Appraisal Framework Study (CAF). This study was undertaken between 1997 and 1999, and sought to assess the advantages and disadvantages of alternative solutions to the congestion problem against acceptable environmental, financial, economic and safety criteria.

The fundamental requirements used for the evaluation were whether:

- The solution could provide relief to the M4 around Newport; and
- The costs were commensurate with the likely benefits of the scheme.

The CAF study concluded that there were two main ways in which relief could be provided from the effects of increasing traffic on the M4 around Newport whilst minimising any disbenefits:

- The construction of the M4 Relief Road; and
- A hybrid strategy which combined some car restraint (i.e. tolling the existing M4) with significantly improved public transport.

The National Assembly for Wales Local Government and Environment (LGE) Committee considered the findings of the CAF study in February 2000. Given the LGE committee did not support the introduction of tolls, a second Hybrid scenario was developed (Hybrid 2). Hybrid 2 provided additional capacity at the Brynglas Tunnels (and associated widening of the motorway to the west of the Tunnels) replacing the tolling measure in the previous Hybrid scenario (Hybrid 1). The assessment of this Hybrid 2 scenario showed that it would provide a lesser degree of congestion relief compared to the M4 Relief Road.

In considering the overall conclusions of the CAF Study, the then Transport Directorate found that none of the alternatives investigated would relieve the M4 around Newport to the same degree as the M4 Relief Road. The conclusion was to:

- Discard Hybrid 2;
- Discard widening of the existing M4 around Newport as a means of increasing capacity; and
- Accept that the M4 Relief Road would be the appropriate scheme to implement if increased capacity is needed.

In 2002, the proposal for an M4 Relief Road was put "On Hold" in the Trunk Road Forward Programme, pending the conclusion of the Wales Spatial Plan. In November 2004, "People, Places, Futures – The Wales Spatial Plan" was published. In addition to widening the motorway north of Cardiff, the Minister announced proposals to develop a New M4 south of Newport between Magor and Castleton.

Following the Ministerial Review in November 2004, the New M4 Project was the subject of a thorough re-examination in order to ensure fit with current policies and to take account of physical and legislative changes. The conclusion of these studies confirmed the route to the south of Newport as the optimal solution. Following the Preferred Route and Junction Strategy Review, a TR 111[78] (April 2006) was published to protect a revised route corridor. A series of public exhibitions were held in April and May 2006 to explain the changes to the public and other stakeholders.

In July 2009, a written statement by the then Deputy First Minister Ieuan Wyn Jones announced that the New M4 was not affordable. The statement, however, accepted "*the need to urgently address safety and capacity issues on the existing route"* through the introduction of *"a range of measures"*. The M4 Corridor Enhancement Measures (CEM) Programme was thus initiated and this aimed to create a package of measures to deal with resilience, safety and reliability issues within the M4 corridor between Magor and Castleton.

Under the M4 CEM Programme, a long list of possible solutions was explored. No single solution was seen to deliver all the objectives for transport provision along the M4 Corridor. However, packages that combine public transport,

[78] Once a preferred route is announced, Welsh Government serves a *statutory notice* (TR 111) on the local planning authorities requiring the line (land within 67m from the centre line of the proposed road) to be protected from development. The statutory blight rules come into play. This is enacted under Article 15 of the Town & Country Planning General Development Order 1995.

highway and other travel solutions were identified for appraisal. These included on line widening of the M4 between Junctions 24 and 29 as well as improvement to the existing road network to the south of the city centre and a new all-purpose road to the south of Newport.

As part of the M4 CEM Programme, a comprehensive engagement process was launched in September 2010 culminating in a Consultation, open to all, held between March and July 2012. During the engagement process, the Welsh Government and its project team conducted dialogue and deliberative sessions both with internal and external specialists and expert stakeholders, encompassing a diverse range of views and interests relating to transport in South East Wales, as well as with people likely to be interested in and affected by any transport measures potentially adopted and implemented by Welsh Government. This has resulted in public support for the provision of an additional high quality road to the south of Newport. An M4 CEM WelTAG[79] Stage 1 Appraisal concluded that the following measures were worthy of further consideration:

- a new dual carriageway route to the south of Newport;
- public transport enhancement; and
- common measures (including walking and cycling).

Recent initiatives including discussions between Welsh Government and HM Treasury/Department for Transport, as well as the work of the Silk Commission[80], have created potential funding opportunities for Welsh Government infrastructure projects. As a consequence, the decision was taken to further reconsider solutions to resolve capacity issues on the M4. Thus, in order to inform the strategy for the M4 Corridor around Newport, a further WelTAG Stage 1 Appraisal has been undertaken of options that include M4 CEM short-listed measures, provision of new motorway capacity routed to the south of Newport, public transport enhancement and complementary measures.

Studies have shown that new or improved public transport services are likely to have only minimal impact with respect to reducing traffic on the M4[81] but the WelTAG appraisal outlines that public transport improvements should continue to be developed and/or promoted, as supported by the public and stakeholder engagement process. It was thus recommended by the M4 Corridor around Newport WelTAG report that any further public transport enhancements should be considered by the delivery team(s) set up for the purpose by the Welsh Government. As such, the draft Plan, whilst being supportive of and complementary to public transport enhancement measures, it recognises that the Welsh Government has commissioned separate studies of proposals to develop a metro system for South East Wales. These will focus on how a metro system might support economic growth and regeneration at key locations across South East Wales.

The Welsh Government, in preparing a draft Plan for the M4 Corridor around Newport, considers that the Cardiff Capital Region Metro would be complementary to that draft Plan in improving transport provision in South Wales.

[79] Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), WelTAG Appraisal Report Stage 1 (Strategy Level), Arup, March 2013
[80] The Commission on Devolution in Wales which is reviewing the case for the devolution of fiscal powers and reviewing the powers of the National Assembly for Wales due to report in Spring 2014
[81] M4 CEM Public Transport Overview (2012) available at www.m4cem.com

4.8.2 Consideration of public transport as an alternative to additional motorway capacity

A published study as part of the M4 CEM Programme was updated in 2013[82], which identified illustrative public transport measures that aimed to contribute towards alleviating traffic congestion on the M4 around Newport. The study, titled 'M4 CEM Public Transport Overview Update' provides illustrative public transport measures that specifically aim to:

- Attract passengers from vehicles currently routed along the M4 around Newport onto public transport;
- Reduce traffic flow on the M4 between J23 and J29 in order to address many of the draft Plan objectives;
- Have the potential to be phased; and
- Be compatible with wider objectives for public transport expressed in National and Regional strategies.

Whilst the context of the outlined illustrative measures relates to easing the congestion issues on the M4, it is recognised that any public transport initiatives will have broader aims, and in order to be viable also need to attract passengers from car movements not currently using the M4 around Newport. Taking this into account, the illustrative measures were developed to be broadly in line with wider objectives for public transport as expressed in existing national, regional and local strategies.

The study process included:

- Reviewing existing national and regional public transport policies and proposals;
- Assessing travel demand;
- Identifying and costing appropriate public transport measures for the M4 CEM Programme; and
- Identifying the potential impacts of public transport on M4 traffic levels.

The study illustrates the scale of car trips on the M4 between Junctions 23 and 29 for a range of broad origin-destinations. The origin-destination areas were designated as Newport, Cardiff, or External (outside Newport and Cardiff). For the purposes of the study, Newport includes Malpas/Bettws and Caerleon to the north of the M4.

The analysis was broken down to origin-destination categories as follows:

- Internal to internal (within Newport and Cardiff);
- External to internal (i.e. from outside Newport/Cardiff to inside Newport/Cardiff); and
- External to external (i.e. trips which travel on the M4 but with both trips ends outside Newport or Cardiff)[83].

[82] M4 CEM Public Transport Overview Update (2013) available at www.m4cem.com
[83] Traffic matrices on which the desire lines were based, in addition to the zoning system for the traffic matrices (which were been grouped and simplified from the original M4 traffic model zone data) are shown in the study report.

The study identified and aimed to maximise the 'target' car journeys that might switch to public transport, if appropriate services were in place. The target car journeys were identified to include those that could switch to public transport in the following circumstances:

- Improved opportunities for travel across Newport by bus;
- Improved connectivity from/to non-central Cardiff and non-central Newport;
- Improved attractiveness of bus and train services from areas north and east of Newport;
- For long distance traffic, improved connectivity of the M4 corridor to attractive train services; and
- Improved interchange/optimise mode transfer opportunities.

A series of illustrative public transport measures were considered based on these target journeys which, when combined, would form the basis of an improved public transport network. The aim of these improvements would be to attract a proportion of car users currently making journeys by car on the M4 and other parts of the Newport road network. Such improvements are summarised as follows:

High level public transport strategy	Public transport strategy elements
Improve opportunities for travel across Newport by bus	Modify the predominantly radial Newport bus services to cross-city operation, to enhance connectivity across the city, and to provide cross-city alternative to M4.
Improve connectivity of the M4 corridor to public transport services	Introduce rail-based Park & Ride (P&R) facility to the east and west of Cardiff / Newport; Enhance east-west coach services.
Improve connectivity from/to non-central Cardiff and non-central Newport	Introduce improved bus-based links between non-central Cardiff and non-central Newport; Improve radial routes in Cardiff to improve opportunities for travel from non-central Cardiff to Newport via Central Station (and rail link to Newport).
Improve attractiveness of bus and rail services from areas north and east of Newport	Introduce train services between Newport and Ebbw Vale; Increase frequency of train services on Abergavenny rail line; Increase railway capacity on Chepstow line; Introduce new urban stations in Newport area on Abergavenny rail line and Ebbw Vale rail line; Introduce rail P&R facility to the east of Newport to intercept journeys generated in South Monmouthshire / A449.
Improve interchange opportunities and facilities	Introduce cross-ticketing across modes and operators; Establish non-central interchange points on the bus and rail network where routes cross, and to provide focal points for feeder buses.

Each of the illustrative public transport strategy elements could be addressed by a number of possible public transport measures. These are outlined in the study and include measures that form a combination of:

- Bus Rapid Transit services, mainly on radial routes, across Newport and Cardiff;
- New local railway stations in Newport and Cardiff;
- Park & Ride facilities to enable car drivers to switch to rail across the M4 corridor around Newport;
- Increased frequency of InterCity and local commuter railway services on the South West Main Line and Valley Lines; and
- Specific provision for improving the attractiveness of interchange between modes/services by provision of cross-ticketing, co-ordination between services, and high quality interchange facilities.

An overall infrastructure capital cost of a collection of schemes is estimated at just over £300m. It should be emphasised however that the measures have not been designed at a scheme level, and thus the current cost estimate is only for purposes of identifying the likely scale of costs. The costs noted are for infrastructure only, and do not include operational and rolling stock or vehicle costs or allowance for fare income. On-going subsidy costs totalling approximately £200m to £300m could also be expected over a typical sixty year period.

For each of the measures, further work is necessary to establish viability prior to inclusion in any potential future implementation programme.

Over the longer-term, attracting more car users currently using the M4 to public transport would require major integrated interventions across the whole of South East Wales and surrounding areas. The following issues would need to be taken into account:

- Public transport is most attractive to new users when a fully integrated network is in place, with full co-ordination of public transport services and common ticketing across all modes and routes. The Welsh Government's long planned Welsh Transport Entitlement Card (for bus and rail services), or similar, will be a key to achieving an integrated network; and
- Development of regional network improvements (e.g. rail upgrades, rapid transit) would not necessarily be targeted at Newport, but would be based on building a region-wide grid network giving accessibility across all origins and destinations. The Welsh Government's Metro Task Force is currently investigating options for South East Wales.

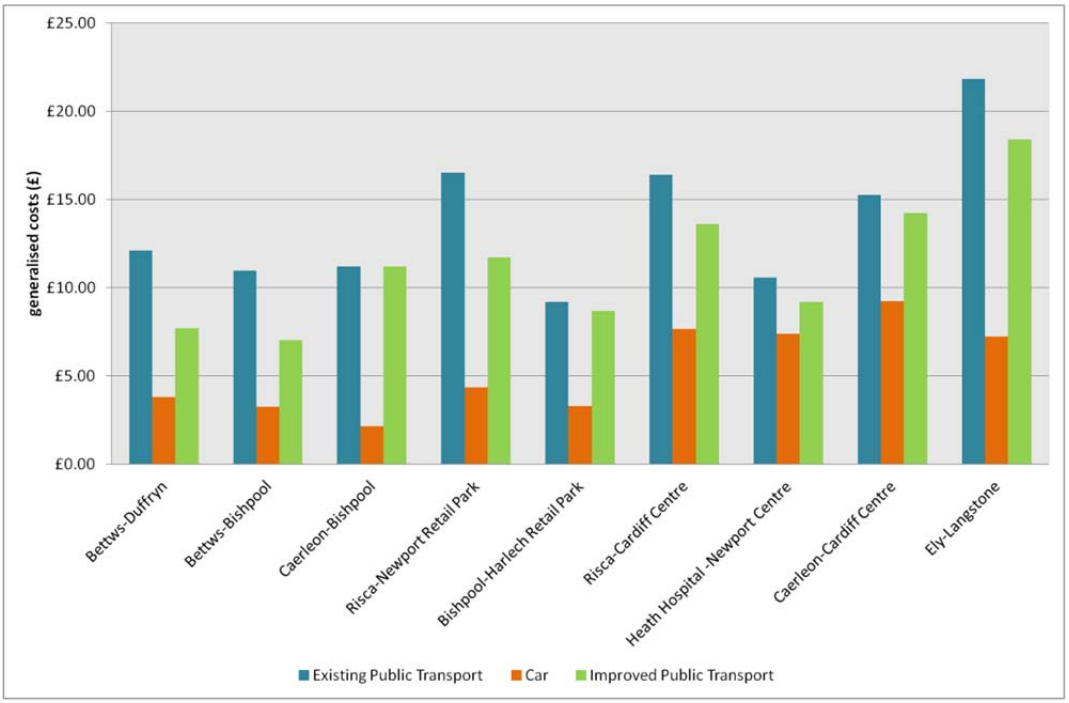
The benefits of an upgraded regional public transport network would mainly accrue in urban areas and on radial routes. The possible impact on M4 conditions of an upgraded regional public transport system (such as the Cardiff Capital Region Metro) has been appraised at a strategy level within the M4 CEM Public Transport Overview (2013 Update) study and M4 CEM WelTAG report. A summary is provided below.

4.8.3 Potential Increased Mode Share for Public Transport

A key aspect of attracting car users to public transport is the relative travel time and cost to the traveller of the competing modes. As outlined within the M4 CEM Public Transport study, a preliminary assessment has been made of the 'generalised cost' of travel for a cross-section of journeys across the network, to enable a comparison to be made between car and public transport modes. Generalised costs are costs incurred by the traveller and assume standard monetary values for time of travel and waiting time, as well as cost of fuel and tickets.

An extract from the M4 CEM Public Transport Overview report below shows the relative generalised cost of travel for the three cases; by car and by public transport, and with improved public transport in place.

Figure 4.1: Extract from the M4 CEM Public Transport Overview



The assessment of generalised cost indicates that car travel has the lowest cost for travel for each of the example journeys considered. When improvements to public transport are assumed (as per the targeted M4 CEM public transport measures), the generalised cost for public transport reduces; however, car travel still has the lowest generalised cost in all cases[84].

[84] It should be noted that, for purposes of this preliminary assessment, the generalised cost of car travel does not include parking charges, or any delay due to incidents on the M4 (the inclusion of which could in some cases result in public transport having a lower generalised cost than car travel). A more detailed assessment, with origin-destination data broken down into a significantly finer grain, would be necessary to fully consider the impact of parking charges on generalised cost.

Typically, mode share for public transport is generally less than 20% for smaller cities in the UK such as Newport and Cardiff[85]. The indicative level of public transport use in Newport is estimated to be approximately 32,000 trips per day. The mode share of public transport in Newport is estimated to be around 7%. This proportion can be compared to Cardiff, where mode share for public transport in Cardiff is around 15%.

Using the generalised cost of travel for the future scenario with public transport improvements in place, a preliminary estimate has been made of the likely increase to public transport usage[86].

The study estimates that around 6,400 M4 motorway car trips could potentially transfer to public transport. This is equivalent to around 2.5% reduction in traffic using sections of the M4 between Junction 23 and 29. However, some 15,100 non-M4 car trips could also potentially transfer to public transport. Looking at trips with an origin and/or a destination in Newport, the increase in public transport trips could be around 20,000 person-trips per day. This would be equivalent to around a 4% increase of the overall public transport mode-share (i.e. increasing the mode-share in Newport from 7% to 11%). This would be a challenging achievement, representing just over a 50% increase in public transport patronage in Newport.

4.8.4 Potential Impact of Rail Electrification and a Cardiff Capital Region Metro

The likelihood of car travel on the M4 switching to public transport is largely influenced by the origin-destination characteristics of car journeys.

Great Western Mainline Electrification (GWMLE) will provide benefits for public transport users along the M4 corridor from east to west, with potential service frequency and journey time enhancements. The enhancements are likely to attract passengers to rail. The electrification of the main line is expected to lead to a limited transfer (< 1%) of car journeys from the M4 motorway to rail[87]. The Valley Lines Electrification (VLE) will include service frequency and journey time benefits, but the broader benefits are dependent on signalling and other infrastructure improvements. The published Outline Business Case[88] for VLE has been based on benefits of reduced car use accounting for only 3% of the total benefits of electrification, which again suggests that mode transfer will be limited.

The Cardiff Capital Region Metro is a concept that would brand a range of public transport schemes as part of a regional integrated transport system. In light that the M4 CEM public transport strategy outlined measures compatible with wider objectives for public transport expressed in National and Regional strategies, these could potentially form a significant part of an overall regional Cardiff Capital Region Metro system. The Welsh Government has established a task force to consider developing the Metro and at a strategy level, this task force is developing a set of public transport measures that aim to improve connectivity and modal

[85] Planning for Sustainable Travel, Background Technical Report -Table 15,Commission for Integrated Transport, 2009.
[86] Using an industry-standard logit equation approach –as outlined in DfT guidance ref. Unit 3.10.3 Variable Demand Modelling
[87] Mode switching effects have been controlled to the National Diversion Factor for Rail Demand of 26% of rail passenger kms in accordance with WebTAG unit 3.13.2
[88] http://wales.gov.uk/topics/transport/rail/electrification/valley lines electrification

shift in the region. These measures are likely to include some of those included within the M4 CEM Programme options.

In respect of additional switching of M4 car journeys to public transport due to network improvements in the region, the scale of mode transfer is likely to be modest; on the basis that journeys in other parts of the South East Wales region have limited influence on car traffic levels on the M4 at Newport. As such, in respect of the potential scale of impact, it is estimated that if an approximate 100% increase in public transport usage occurred across the Newport area, this is likely to equate to a 5% decrease in traffic flows on the M4 around Newport. This would have a limited impact on addressing the problems on the M4 around Newport, albeit with a significant increase in overall public transport mode share in South East Wales (equivalent to a doubling of public transport use in Newport).

Thus on the basis of the outline assessment, it is considered that, even with a major upgrade of public transport across the South East Wales region, this would not address the transport related problems, or achieve the goals of the M4 Corridor around Newport draft Plan.

4.8.5 Concluding remarks

Public transport investment could encourage modal shift in South East Wales by increasing choice, and the Welsh Government has established a task force to consider developing an integrated transport system in South East Wales, known as the Metro. This is likely to include some of those measures included within the M4 CEM Programme options, as previously considered as part of the development of the Welsh Government's preferred strategy for addressing the transport related problems on the M4 around Newport. The electrification of the South Wales Main Line railway from Paddington to Swansea and the electrification of the Valley Lines railway will also be a catalyst for increased use of public transport. As such, public transport improvements should continue to be developed and/or promoted, as supported by the M4 CEM public and stakeholder engagement process.

However, studies have shown that new or improved public transport services are likely to have only minimal impact in terms of reducing traffic on the M4. Investment in public transport measures is more likely to be aimed at achieving wider benefits to the region than relieving motorway traffic.

An illustrative series of measures have been considered at an approximate capital cost of around £300m[89]. The key conclusion in respect of these illustrative public transport measures is that if they were progressed, whatever their wider benefits, only a relatively small reduction in M4 traffic levels is likely to be achieved. For the Newport area, the indicative public transport measures are estimated to produce up to an approximate 50% increase in the use of public transport, with an increased mode-share to approximately 11% (compared to a present day mode share of around 7%). However, this is likely to only achieve a reduction of less than 3% of traffic volumes on M4 sections between J23 and J29.

[89] The costs noted are high level calculations for infrastructure only, and do not include operational and rolling stock or vehicle costs or allowance for fare income. On-going subsidy costs totalling approximately £200m to £300m could be expected over a typical sixty year period.

The impact on the M4 between Magor and Castleton of an integrated regional public transport network based on rail electrification and the Cardiff Capital Region Metro has also been considered at a strategy level. It is considered that if an approximate 100% increase in public transport usage occurred across the Newport area, this likely to equate to a 5% reduction in traffic flows on the M4 around Newport, which would not be sufficient to address the transport related problems, or achieve the goals for the M4 Corridor around Newport.

On the basis of this appraisal, public transport enhancement measures are not considered to be a reasonable alternative to the draft Plan. The draft Plan is cognisant of potential future public transport enhancement measures and these are considered to be complementary to a motorway solution. It is assumed that public transport enhancement will be progressed separately by a group set up by the Welsh Government to examine proposals for a Cardiff Capital Region Metro system.

4.9 Do Nothing Strategy (Do Minimum Scenario)

During the draft Plan consultation, an alternative to the draft Plan was supported by some respondents, suggesting that doing nothing was their preferred strategy. Some respondents questioned the validity of the identified problems and thus queried the need for a solution at all, whilst others opposed any highway intervention (without suggesting alternative measures).

A range of relevant comments is provided below:

- *"Object. The current motorway is perfectly adequate, and countryside should be protected."*
- *"We already have an excellent infrastructure of roads and need no more."*
- *"I select the Do-Nothing option on the grounds of cost and necessity of the project."*
- *"Ideally, I would prefer that nothing was done."*
- *"I do NOT support or want any new route to the M4 around Newport."*

4.9.1 The Do-Minimum Scenario

The Do-Minimum scenario, as outlined within the draft Plan Consultation Document, means doing nothing above what is already planned or committed. This scenario therefore comprises minimum intervention but in this case does include a number of highway schemes, which are currently committed to be completed between 2020 and 2035 as follows:

Welsh Government Schemes

- Junction 28 roundabout, enlarged signalled gyratory scheme including associated improvements to A467 Bassaleg roundabout and A48 Pont Ebbw; and
- A465 Heads of the Valleys Dualling (Gilwern to Hirwaun).

Newport City Council Scheme

- Link through Newport Eastern Expansion Areas between Steelworks Access Road and A48 SDR (Cot Hill junction, signalised with full movements).

Alongside these schemes, the Do Minimum scenario also consists of a number of development proposals throughout South East Wales, which are committed through the planning process and are due to be completed at various stages.

As part of the draft Plan consultation, both the Do-Minimum scenario and the Consequences of Doing Nothing were explored and assessed and the results are provided below.

4.9.2 The Consequences of Doing Nothing

As described in the draft Plan consultation document, the consequences of doing nothing relate to four identified problems; capacity, resilience, safety and issues of sustainable development.

Capacity

Capacity means the ability for the M4 Corridor around Newport to accommodate traffic. Arup has developed a traffic model[90], on behalf of the Welsh Government, to analyse capacity. Analysis shows that in 2012 during week day peak periods, traffic flows approached 100% of capacity[91]. Once flows exceed 80% of capacity, traffic can expect operational problems. The more congested road conditions become, the greater the risk of incidents and accidents occurring. People may undertake their journey earlier or later, leading to the morning and afternoon peak traffic being experienced or exceeded over longer periods. Traffic speeds also vary over short periods of time, with an inconsistent pattern from day to day. This means that journey times, particularly for commuters, are unreliable.

Whilst capacity is a problem now, the situation is expected to deteriorate further with traffic growth. As shown in Figure 2, forecasts of future traffic volumes show that traffic congestion will be severe on most links by 2022 and by 2037 the motorway around Newport will be heavily congested, with all sections between J24 and J29 experiencing flows above 100% of capacity during weekday peak periods[92].

Figure 2: Observed and Forecast Week Day Peak Period Flow to Capacity[93].

Section of M4	2012	2022	2037
J28 – J29	90%	105%	114%
J27 – J28	98%	106%	112%
J26 – J27	89%	100%	106%
Brynglas Tunnels	80%	91%	102%
J25 – J25A	74%	86%	101%
J24 – J25	77%	89%	106%
J23A – J24	62%	75%	92%
J23 – J23A	61%	71%	87%

Flow to capacity	Operational conditions
< 80%	Operating within capacity
80% to 100%	Operational problems occurring
> 100%	Severe operational problems

[90] M4 Corridor around Newport Local Model Validation Report (2013)
[91] Source: Arup analyses 2012
[92] Source: Arup analyses 2012, based on the Do Minimum scenario, which means doing nothing above what is already planned or committed
[93] Based on values of time and vehicle operating costs published by the DfT in October 2012 and growth rates published in the National Transport Model (NTM) in 2013

Resilience

Resilience means the ability of the transport network to respond to incidents including accidents, roadworks and other causes of delays. Issues associated with resilience on the M4 Corridor around Newport include:

- There is limited capacity on alternative routes when traffic needs to be diverted off the M4 around Newport. There is also a lack of capacity generally on alternative routes, which limits the ability for people to avoid the M4 around Newport at times of congestion;
- Temporary decreases in highway capacity due to incidents or essential road works result in significant delays and adverse effects, particularly on local roads when they are used as diversions;
- Major maintenance works to the M4 will be required within the next 5-10 years, which could cause significant disruption. Significant maintenance works (that may be over a long period of time) are needed at the Brynglas Tunnels in order to meet current safety standards; and
- Adverse weather conditions can cause disruption to the transport network. This problem is perceived to be worse when compared to other UK motorways in light that this problem is exacerbated given the lack of capacity on alternative routes to the M4 around Newport.

Safety

Issues with safety on the M4 Corridor around Newport include:

- Some sections have alignments (gradients and bends) that are below current motorway standards and in some places there is no hard shoulder. In addition to this, there are frequent junctions, resulting in many weaving movements with vehicles accelerating, decelerating and changing lanes over relatively short distances. These weaving movements reduce the capacity of the road and can also result in accidents;
- The most common type of accidents on the M4 between Junctions 23 and 29 are rear-end shunts on both the westbound and eastbound approaches to the Brynglas tunnels. This is largely due to the stop-start conditions that occur during peak periods caused by the motorway reducing from 3 lanes to 2 lanes; and
- The Variable Speed Limit (VSL) system was introduced in June 2011 between Junctions 24 and 28, in order to improve safety conditions and traffic flow in the short term. The first year of operation showed a reduction in accidents.

Sustainable development

Traffic congestion adversely impacts on the local environment, community and economy around Newport.

Congestion on the M4, particularly around Cardiff and Newport, is cited by the business community in South Wales as a barrier to economic growth.

Where congestion increases, the cost of transport for businesses, commuters, consumers and economic performance can be affected. Increased congestion can also result in longer journey times for commuters, reducing the effective travel to work area.

In terms of the environment, local authorities in the UK work towards meeting the national air quality objectives. If a local authority finds any places where the objectives are not likely to be achieved, it must declare an Air Quality Management Area. Out of Newport's seven Air Quality Management Areas (AQMAs), four are associated with the M4.

Should traffic volumes increase along the M4, this would likely contribute not only to poor air quality, but also noise pollution, compromising the amenity of neighbouring residential communities. Assuming no improvements to vehicle emissions technology, increased flows and stop start conditions would give rise to more vehicle emissions along these routes. It is important to note that stop-start congested traffic can result in higher CO_2 emissions than free-flowing traffic. Alongside the motorway at Newport, there are also Noise Action Planning Priority Areas (NAPPAs), which investigate where noise levels are high and help create noise action plans to address the issue.

The AQMAs in Newport are available to view on the Newport City Council website[94], whilst recently published Wales Noise Maps are being used to help the Welsh Government to develop and implement a noise action plan for Wales, which is due to be published shortly. These are also available on the Welsh Government website[95].

Other issues relating to sustainable development on the M4 Corridor around Newport include:

- For a significant number of journeys, there are no convenient public transport alternatives to the car;
- In areas adjacent to the M4, noise levels generally exceed 55 decibels. This means that some communities around Newport are subjected to 'moderate' noise levels that are at least equivalent to normal conversation, or background music. In areas in close proximity to the existing motorway, noise levels generally exceed 70 decibels. This means that communities adjacent to the existing motorway around Newport are subjected to 'loud' noise levels that are at least equivalent to a vacuum cleaner[96];
- It is acknowledged that traffic emissions contribute towards air pollution in the Newport area; and
- There is a perception that traffic congestion is a constraint to economic development in South East Wales[97].

[94] See http://www.newport.gov.uk/_dc/index.cfm?fuseaction=environmentalhealth.homepage&contentid=cont446709
[95] See http://data.wales.gov.uk/apps/noise/
[96] The Land Compensation Act 1973 and the Noise Insulation Regulations 1975 (amended 1988) and 1996 allows for grants for the cost of sound insulation in premises subjected to noise from new or upgraded roads which result in excessive noise levels beyond stated thresholds
[97] Welsh Government, M4 Corridor Enhancement Measures (M4 CEM), Participation Report, Arup, August 2013

4.9.3 Appraisal

The results of WelTAG appraisal and the Do Minimum's ability to achieve the TPOs of the M4 Corridor around Newport are presented below.

Assessment of Do Minimum against WelTAG Criteria and objectives for the draft Plan

Criteria	Assessment	Distribution	Significance
Transport Economic Efficiency (TEE)	Congestion on the M4 between junctions 24 and 29 is already thought to be impacting on business performance and the level of congestion is expected to increase. Cardiff and Newport have ambitious regeneration strategies and Monmouthshire is developing areas around Junction 23a of the M4. Traffic congestion on the M4 could hamper these plans and impact negatively on regional economic development.	All	(---)
Economic Activity and Location Impact (EALI)	Congestion on the M4, particularly around Cardiff and Newport, is sighted by the business community in South Wales as a barrier to economic growth. Where congestion increases, the cost of transport for businesses, commuters and consumers and economic performance can be affected. Increased congestion will adversely impact on the movement of commuters. The M4 is heavily used by commuters and there are already significant movements of commuters between Wales and England over the Severn Crossings. Increased congestion will result in higher journey times for commuters, reducing the effective travel to work area.	All	(---)
Noise	High traffic volumes along the M4 contribute to noise pollution, compromising the aural amenity of neighbouring residential communities.	Properties along the M4	(--)
Local Air Quality	High traffic volumes along the M4 contribute to poor air quality, compromising the aural amenity of neighbouring residential communities. This will affect the condition s of four out of Newport's seven Air Quality Management Areas (AQMAs) that are associated with the M4.	Properties along the M4	(--)
Greenhouse Gas Emissions	Traffic conditions are expected to deteriorate and slow-moving, stop/start driving conditions can lead to higher CO2 emissions than free-flowing traffic.	No significant distributional impacts	(-)
Landscape and townscape	There would be no or limited change as a result of the Do Minimum scenario.	No significant landscape impacts	(0)
Biodiversity	There would be no or limited change as a result of the Do Minimum scenario.	No significant distributional impacts	(0)
Heritage	There would be no or limited change as a result of the Do Minimum scenario.	No significant distributional impacts	(0)
Water environment	There would be no or limited change as a result of the Do Minimum scenario.	No significant distributional impacts	(0)

Criteria	Assessment	Distribution	Significance
Soils	There would be no or limited change as a result of the Do Minimum scenario.	No significant distributional impacts	(0)
Transport safety	The more congested road conditions become, the greater the risk of incidents and accidents occurring. The most common accidents on the M4 between junctions 25 and 28 are rear-end shunts on both the westbound and eastbound approaches to the Brynglas Tunnels. This is largely due to the stop-start conditions that occur during peak periods.	All road users	(--)
Personal security	The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. There would be limited improvements to infrastructure which would negatively impact on many vulnerable groups who rely on transport modes other than the car to access activities and services.	No significant distributional impacts	(0)
Permeability	The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. This would bring negative impacts to those reliant on the car to access facilities, services and employment opportunities, as well as those utilising public transport for this purpose, with traffic diverting to local roads during peak periods.	No significant distributional impacts	(-)
Physical fitness	Air quality and noise issues could also continue to increase along the existing motorway corridor, impacting on residential areas to the north of Newport.	No significant distributional impacts	(0)
Social inclusion	The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which would impact on journey time reliability. This would adversely impact on access to services, facilities and employment opportunities for all those with access to a car, and who rely on public transport due to continued problems associated with motorway traffic diverting onto local roads to avoid peak congestion. The continuing problems would further hamper economic growth and prosperity in the region.	No significant distributional impacts	(-)
Equality, Diversity & Human Rights	The Do Minimum scenario would lead to continuing traffic congestion on the existing motorway which will impact on journey time reliability. This would impact those vulnerable groups reliant on the car to access services, facilities and employment opportunities. This continuation of reported problems would also continue to hamper economic growth potential of the region, restricting the movement of people and freight, particularly at peak periods.	No significant distributional impacts	(0)
TPOs			
1	As congestion increases, safety conditions and journey time reliability will deteriorate.	All	(---)
2	Travel conditions on the M4 are forecast to worsen over time, reducing accessibility on the transport network.	All	(--)
3	There would be no or limited impact.	All	(0)
4	There would be no or limited impact.	All	(0)

Criteria	Assessment	Distribution	Significance
5	Increased levels of congestion will reduce journey time reliability, particularly at peak travel times.	All	(--)
6	There would be no or limited impact.	All	(0)
7	Increased congestion will exacerbate the risk of incidents and accidents occurring.	All	(--)
8	Increased traffic volumes and stop/start conditions will exacerbate poor air quality, particularly in the AQMAs along the route of the M4 around Newport.	All	(--)
9	Higher traffic volumes along the M4 will contribute to noise pollution.	All	(--)
10	Traffic conditions are expected to deteriorate and stop/start driving conditions will lead to higher emissions.	All	(--)
11	Traffic conditions are expected to deteriorate and stop/start driving conditions will create an adverse travel experience, leading to higher levels of driver stress.	All	(---)
12	Increased congestion on the M4 may lead to severe disruption and congestion on the local and regional highway network, with significant delays and adverse effects on local roads being used as diversions.	All	(---)
13	There would be no or limited impact.	All	(0)
14	There would be no or limited impact.	All	(0)
15	There would be no or limited impact.	All	(0)
Public acceptability	Traffic congestion during peak periods results in unreliable journey times, which impacts on the ability of individuals to take up job opportunities and discourages investment from high value businesses. Transport congestion also has environmental impacts affecting local communities. Increasing levels of congestion are unlikely to be acceptable to the public.		
Acceptability to other stakeholders	The M4 motorway plays the vital role in providing the east/west strategic road link that underpins the economy of South Wales and facilitates the mass movement of people and goods to stimulate economic and social activity within the region and beyond. Any disruption to the operation of the motorway in South Wales has a negative impact upon economic development, particularly around Cardiff, Newport and beyond. Congestion is sighted by the business community in South Wales as a barrier to economic growth and increasing levels of congestion are unlikely to be acceptable to stakeholders.		
Technical and operational feasibility	Planned or committed schemes as part of the Do Minimum scenario have demonstrated their feasibility as part of their associated planning stages.		
Financial affordability and deliverability	Planned or committed schemes as part of the Do Minimum scenario have demonstrated their affordability and deliverability as part of their associated planning stages.		
Risks	There are no or limited risks associated with Planned or committed schemes as part of the Do Minimum scenario.		

The Do-Minimum scenario performs poorly against the goals of the M4 Corridor around Newport. Furthermore, increasing congestion resulting from capacity and resilience problems means that it also performs particularly poorly against economic criteria, posing a significant constraint to the economy of South Wales. Impacts on social criteria are largely neutral or minor adverse, apart from where increased traffic congestion adversely impacts on safety. Whilst the Do-Minimum scenario performs poorly against noise and local air quality criteria due to predicted increase in traffic and congestion on the existing M4 Motorway around Newport, the impact on the environment remains largely neutral.

On the basis of this appraisal, there is a strong need to do something to address the identified problems. Doing nothing other than initiatives already planned or committed, as considered within this document, is not considered to be a reasonable alternative to the draft Plan.

5 Conclusions and Next Steps

Alternatives suggested during the M4 Corridor around Newport draft Plan consultation have been considered and appraised within this document, at an appropriate strategic level. The alternatives, as considered within this document, are not considered to be reasonable alternatives in line with the SEA requirements. Therefore no additional alternatives are recommended to be taken forward for further appraisal.

In addition to appraisal already undertaken as part of the development of the draft Plan, public transport measures, either in isolation or in combination with the Blue Route alternative, do not provide a reasonable alternative to meet the objectives for the draft Plan.

Public transport measures under consideration as part of the Cardiff Capital Region Metro are considered to be complementary to a motorway solution. Public transport enhancement will be progressed separately to the draft Plan by the Welsh Government. In this respect, proposals for a Cardiff Capital Region Metro system are under examination.

The Welsh Government will use the responses to the draft Plan Consultation to decide whether to adopt the draft Plan, with or without amendments, taking into account the responses to the associated assessments.

The Welsh Government then may decide to announce a preferred route, which would protect a corridor for planning purposes.

Should the draft Plan be adopted, with or without amendment, the Welsh Government would in due course further engage with local people and other interested parties.

Appendix A

List of alternatives put forward during the draft Plan Consultation

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	4 lane relief motorway	I think that a 3-lane relief motorway (with a potential 4th lane if ever needed) south of Newport is urgently needed, and that anything less than this would be wholly inadequate in terms of what is needed for the next several decades at least.
	4 lane relief motorway	I can only hope that the new motorway is a four lane highway, or at least has provision for expansion built in from the outset.
	4 lane relief motorway	Instead of 3 lanes , I believe it should carry 4 lanes in each direction, as does the widened M1 around Nottingham, which I find is a pleasure to drive along , and must be extremely safe .
	A48 (SDR) Upgrade	Why don't you just widen the A48 and have the new motorway going from the coldra to the tredegar park interchange?
	A48 (SDR) Upgrade	Viable alternatives, such as upgrading the A48 distributor road or expanding the motorway along its current route exist that would not result in significant and large scale damage to the Gwent Levels. These alternative options also require significantly less capital expenditure provide
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Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	A48 (SDR) Upgrade	which could be better spent on upgrading other aspects of transport in the area - improve existing roads, including Southern Distributor road to deal with traffic diverted from M4 in the event of problems there
	A48 (SDR) Upgrade	I think you should extend the existing M4 motorway to 4 lanes and possibly extend the SDR to 3 lanes
	A48 (SDR) Upgrade	Can the SDR not be developed further from the bottom of the new Llanwern section out to Junction 28? This surely would too be cheaper to the tax payer and not disrupt Welsh Businesses.
	A48 (SDR) Upgrade	The A48 / Southern Distributor Road should be completed to a high standard and all exits to the existing M4 around Newport should be closed except for the junction at the Coldra roundabout. Internal routes within Newport should be upgraded so feeding the SDR. This would result in removing nearly 50% of the traffic on the M4. The remaining journeys on the M4 would result in less lane swapping and slowing down, thus reducing accidents.
	A48 (SDR) Upgrade	True some investment in local roads would be useful eg A48
	A48 (SDR) Upgrade	The A48 / Southern Distributor Road should be completed to a high standard and all exits to the existing M4 around Newport should be closed except for the junction at the Coldra roundabout. Internal routes within Newport should be upgraded so feeding the SDR. This would result in removing nearly 50% of the traffic on the M4. The remaining journeys on the M4 would result in less lane swapping and slowing down, thus reducing accidents.
	A48 (SDR) Upgrade	I don't understand why the second option in your previous consultation is not included, which is upgrading the Southern Relief Road, which was much cheaper.
	A48 (SDR) Upgrade	Join the SDR to M4 at Coedkernow
	A48 (SDR) Upgrade	Upgrading of the A48 docks way and work on junctions 28 and 29 to ensure local traffic is attracted off the motorway seem a better option.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	A48 (SDR) Upgrade	I feel the A48 from junction 24 gives ample extra capacity to relieve the pressure on the M4 but the appears to be some reluctance to make use of it. This should be encouraged or even enforced prior to spending millions on an unwanted new piece of road.
	A48 (SDR) Upgrade	Upgrading the Southern Distributor Road will provide sufficient, more valuable capacity at a fraction of the cost and a fraction of the environmental damage
	A48 (SDR) Upgrade	Current SDR resources are under-utilised. This could be an option to augment the current M4. How many road users know of this travelling on the M4? At peak times, this road is often clear even when the M4 between Magor and the BrynGlas tunnels!
	A48 (SDR) Upgrade / build Duffryn Link Road	the SDR route will be a more cost effective solution than a new M4 with less impact on the environment as it will utilise mostly existing infrastructure. It will divert traffic off the existing M4 which need to access areas of Newport south of the existing M4, relieving pressure on the Brynglas tunnels. It can be introduced in phases thus providing continuous improvements over time. It will provide a continuous free flowing route for traffic diverted off the existing M4 in times of emergency. Junction improvements and the completion of the missing Duffryn Link will benefit local traffic all the time which the proposed duplicate M4 will not.
	A48 (SDR) Upgrade / public transport	The A48 could be upgraded and there could be better public transport links by bus, rail and Metro which would get traffic reduced on the roads rather than increase traffic by providing more roads.
	A48 (SDR) Upgrade / widen existing M4	Thirdly there are much cheaper alternatives: enhancing the A48 and expanding the Brynglas Tunnels

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	A48 (SDR) Upgrade /A4810	I would suggest that the key objective of providing a diversionary route avoiding the Brynglas tunnels in the event one is closed could be met at far lower cost if the 'Steelworks Access Road' was used as part of the solution. The proposed duplicate motorway is totally unaffordable. The aim, in my opinion, should be to make best use of existing infrastructure to tackle the problem of alternative highway routes at times of temporary disruption to the M4, such as closure of one of the Brynglas tunnels. The 'Steelworks Access Road' plus enhancements to the A48 between Liswerry and M4 junction 28 (for example grade-separation works) may well resolve these issues without the huge financial and environmental costs of entirely new roads.
	A48 (SDR) Upgrade /A4810	This is because the enhancement of the exisiting Llanwern A4160 and A48 Southern distributor road will relieve the congestion at a fraction of the cost, without destroying a large portion of the Gwent Levels and costing over a billion pounds.
	A48 (SDR) Upgrade / public transport	The A48 could be upgraded and there could be better public transport links by bus, rail and Metro which would get traffic reduced on the roads rather than increase traffic by providing more roads.
	A48 (SDR) Upgrade	Complete the missing section of the SDR (Saracens Rugby club to Coedkernow) and signpost Newport South Central/Docks from Jt23a.
	A4810 (SAR) Upgrade	In my opinion the best way forward would be to utilise the new dual carriageway that has been constructed on the Llanwern Steelworks site and to connect this road directly to the M4 at junction 23. Then where this road currently ends at Queensway to construct a new dual carriageway to link to the A46 Southern Distributor road. The part of this road (A48) which is not dual carriageway across the front of the Statistics Office could be easily upgraded to a dual carriageway as there is land on the park side of this road which could be used to widen the road and this road would then join the M4 at junction 28. Since there are works planned for the Tredegar Park roundabout any additional works could be planned to be carried out at the same time
	Alternative routes for lorries	Providing alternative routes for Lorries and other chosen vehicles would help alleviate some of the volume of traffic around the M4 corridor, however unless it in enforced as mandatory, drivers of these vehicles may decide the M4 is their chosen route so the existing problems still remain.
	Alternative routes for lorries	Put lorries on trains around Newport like is done in Europe

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Barrage across Severn River	The real solution is to build a Barrage across the Severn to take a road and a railway line and to incorporate a generating system for the good of the country as our current systems are too far behind as replacement. We have the second largest current flow in the World in the Severn and we are not taking advantage of it in the way that France has already done there. I realise that this would be very costly but would provide a real answer for generations to come.
	Barrage across Severn River	in my view the best solution is for a motorway and tidal barrage scheme across the Severn estuary linking the existing M4 motorway west of Cardiff and the M5 motorway at Bristol. In my view this would not only significantly reduce traffic congestion around Newport and Bristol, but also presents the opportunity for Wales to demonstrate its green energy credentials, provide key road infrastructure to Cardiff (Wales) airport, reduce the financial burden on West Wales road haulage by providing the opportunity to travel to the South of England by a shorter distance and without bridge tolls (although I'm not adverse to a toll on the motorway barrage), and finally I believe that business and consequently employment prospects would be shifted further along the M4 corridor than are currently enjoyed
	Barrage across Severn River	Build a barrage across the seven and combine a road to link up with the m5 and the welsh government charge a toll.
	Blue Route (A48 and A4810 Upgrades)	Traffic levels are static and the blue route upgraded is perfectly adequate. The blue route also causes less damage to the environment.
	Blue Route (A48 and A4810 Upgrades)	"The Blue Route: a cost effective solution to relieving M4 congestion around Newport" which is a viable alternative.
	Blue Route (A48 and A4810 Upgrades)	This is despite of the fact that a viable alternative exists (the blue route), which will cost a third of the proposed scheme, avoid most of the environmental impacts and still achieve the transport aims!
	Blue Route (A48 and A4810 Upgrades)	Please adopt the recommendations published by Professor Cole and use the savings to revitalise areas of Newport such as Maindee High St which is an eyesore

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Blue Route (A48 and A4810 Upgrades)	There is no evidenced based economic or transport rational for the road (see Prof Stuart Coles Blue Route report) and thus there are significant concerns about the traffic modelling and cost benefit appraisal.
	Blue Route (A48 and A4810 Upgrades)	The Assembly Government is obliged to have regard to the environmentsl impact of its proposals and it seems to me that this project is spectacularly capable of an alternative route for the road which I would propose, namely the so-called "blue route" suggested by Professor StuartCole. This alternative would provide the necessary relief of the bottleneck of the Brynglas Tunnels while better protecting the Levels and saving a huge amount of public money. I would propose that the "blue" route be included in an extended period of consultation (with any such additional work on the "blue" route as may be deemed necessary being carried out prior to such extended consultation)
	Blue Route (A48 and A4810 Upgrades)	5. If an additional transport route is inevitable to relieve M4 congestion and resilience problems I believe that Professor Cole's (of Cardiff University) "Blue Route" provides a cost-effective alternative and MUST be considered in any proposal
	Blue Route (A48 and A4810 Upgrades)	The environmental impacts also look unacceptably high - especially when there is an alernative blue route which is cheaper and with far less environmental impact.
Bethan Jenkins AM	**Blue Route (A48 and A4810 Upgrades)**	I would like to offer my support for an alternative plan, which proposes that a new dual carriageway could be built using the A48 Newport Southern Distributor Road and the former Steelworks Road on the eastern side of the city. The report was prepared by Professor Stuart Cole, a transport expert who has advised Welsh and UK governments. This "blue route" is outlined by the campaign group CALM in their website: http://www.savethelevels.org.uk/. They state that: "CALM do not support any of the options in the draft plan, we advocate a cost effective sustainable option; upgrading the Southern Distributor Road and Steelworks Road and providing a new link to the Magor 23A motorway junction. CALM call this the blue route. "
	Blue Route (A48 and A4810 Upgrades)	The alternative not proposed improvement to the A48 & the new road to Magor will be a cheaper, quicker improvement.
	Blue Route (A48 and A4810 Upgrades)	Having studied the plans and looked at the argument of The Institute for Welsh Affairs (IWA). I agree with them that the upgrading of the A48 and the road through the city's former steelworks is an "affordable" £380m alternative.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Blue Route (A48 and A4810 Upgrades)	Existing roads could be upgraded such as the A48 and a new route sited through old steelworks sites.
	Blue Route (A48 and A4810 Upgrades)	An upgrade of the A48/Southern Distributor Road
	Blue Route (A48 and A4810 Upgrades)	There could be further development to the newly opened link between Magor and Newport through the old Llanwern Steelwork site- SDR route.
	Blue Route (A48 and A4810 Upgrades)	A cheaper way to achieve the goals of the M4 relief road, by reducing congestion and causing far less of a negative impact on the environment, would be to improve the current infrastructure - namely to create a new dual carriageway between the A48 Newport Southern Distributor Road and the road which runs through the former Steelworks Road.
	Blue Route (A48 and A4810 Upgrades)	The case for an upgraded A48, around the South of Newport is equally strong (and cheaper) and together with traffic management information (French style) the two roads can certainly handle the minimal further increase in traffic volumes which have been projected. See alll Wales comments on Questions 4 and 9.
	Blue Route (A48 and A4810 Upgrades)	Please consider, instead, an upgrade to the A48 Newport Southern distributor road with the Llanwern Steelworks Road to create a dual carriageway route, avoiding large scale damage to the Gwent Levels.
	Blue Route (A48 and A4810 Upgrades)	We ought to make best use of the roads we have, the new Llanwern Access road could be more effectively linked to the SDR and with the SDR improved, some of the traffic currently using the M4 could be directed this way.
	Blue Route (A48 and A4810 Upgrades)	An alternative route has recently been opened up via the Llanwern Steel works dual carriageway that will avoid such substantial disruption as that seen when there was a fire closing the Brynglas Tunnels. This road, together with the A48, could be readily adapted at a fraction of the cost of a new motorway. I consider that this is a much better way in which to ultilise public money, and as people become aware of this alternative route then it should ease pressure on the existing M4 around Newport.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Blue Route (A48/A4810 Upgrades)	I am convinced that upgrading the Southern Distributor Road and Steelworks Road and providing a new link to the 23A junction of the M4 would be a far better use of the money - traffic problems would be alleviated and the habitats of the Gwent Levels would be safeguarded.
	Blue Route (A48/A4810 Upgrades)	If for political reasons a £1.2 billion toll motorway is not deemed to be an option, then you should build the £350 million alternative through the old steelworks site. (Not given as an option here.)
	Blue Route (A48/A4810 Upgrades)	If another road is inevitable, Professor Cole's "Blue Route" provides a cost-effective alternative, with far less economic and environmental impacts.
	Blue Route (A48/A4810 Upgrades)	A cheaper way to achieve the goals of the M4 relief road, by reducing congestion and causing far less of a negative impact on the environment, would be to improve the current infrastructure - namely to create a new dual carriageway between the A48 Newport Southern Distributor Road and the road which runs through the former Steelworks Road.
	Blue Route (A48/A4810 Upgrades)	Can the SDR not be developed further from the bottom of the new Llanwern section out to Junction 28? This surely would too be cheaper to the tax payer and not disrupt Welsh Businesses.
	Blue Route (A48/A4810 Upgrades)	In my opinion the best way forward would be to utilise the new dual carriageway that has been constructed on the Llanwern Steelworks site and to connect this road directly to the M4 at junction 23. Then where this road currently ends at Queensway to construct a new dual carriageway to link to the A46 Southern Distributor road. The part of this road (A48) which is not dual carriageway across the front of the Statistics Office could be easily upgraded to a dual carriageway as there is land on the park side of this road which could be used to widen the road and this road would then join the M4 at junction 28. Since there are works planned for the Tredegar Park roundabout any additional works could be planned to be carried out at the same time. This surely would be the cheapest, less disruptive and quickest way to provide a relief road to the M4 and thus would cut down on the bottle neck which traffic created by the Malpas Tunnels
	Blue Route (A48 and A4810 Upgrades)/ traffic management	The case for an upgraded A48, around the South of Newport is equally strong (and cheaper) and together with traffic management information (French style) the two roads can certainly handle the minimal further increase in traffic volumes which have been projected. See alll Wales comments on Questions 4 and 9.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Blue Route (A48 and A4810 Upgrades)/ upgrade existing roads	The A48 / Southern Distributor Road should be completed to a high standard and all exits to the existing M4 around Newport should be closed except for the junction at the Coldra roundabout. Internal routes within Newport should be upgraded so feeding the SDR. This would result in removing nearly 50% of the traffic on the M4. The remaining journeys on the M4 would result in less lane swapping and slowing down, thus reducing accidents.
	Blue route (A48 and A4810 Upgrades)/ community investment	Please adopt the recommendations published by Professor Cole and use the savings to revitalise areas of Newport such as Maindee High St which is an eyesore.
	Bridge	Bridge over the top of the Brynglas Tunnels
	Caldicot designated junction	The M48 / B4245 link is a good idea though: people in Caldicot should have a designated junction and this would also open up the possibility of developing Severn Tunnel Junction into a regional transport hub.
	Car sharing	Car Sharing Encouraging car sharing will reduce single occupancy of vehicles.
	Closure of J25 & J26	the current M4 is the pinch points at J25 and 26 where lane switching at speed across the carriageway, Perhaps the closure of these junctions and placement on both J 23a.28 of Newport East and West signage to direct traffic down the new link roads and relieve current traffic volumes Newport has more exits Off the M4 than Cardiff closing the above where alternatives already exist would be far more cost effective and sensible than the huge expense of a new build across the flat where in addition to cost ,severe weather conditions would be encountered (As A12 Ipswitch fog etc)
	Community investment	We need investment in our communities.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Community investment	I ask the question too as to the £1 billion that is proposed and what better ways that could be spent for the benefit of the the community.
	Complementary measure	The effect on Magor needs to be mitigated, in particular by (i) not coming too close and (ii) new access to the M4/M48 to the east of Magor.
	Complementary measure	With a little thought you could establish an unbroken M48 from the M4 just outside Bristol to the centre of Cardiff. This should remove a significant amout of traffic from the M4 through route and help aleviate congestion around Cardiff in peak periods
	Complementary measure	I also like the idea of more cycle ways. I believe no road should be able to be built unless a cycle way is included.
	Complementary measure	Will the new proposed road also have a cycle route near to it ? I feel that this is important to allow people to cycle around Newport too.
	Complementary measure	Additional cycle / walking routes on the edge of SSI would enhance this area and give better access to these areas, hopefully attracting a wider audience.
	Complementary measure	Also, the route will cut across the National Route 4 cycle route which goes from the Transporter Bridge (or along the SDR when bridge is shut), north of the proposed route, to Goldcliff and Redwick, south of the proposed route. Some provision for cyclists to retain access to this route should be made.
	Complementary measure	introduce additional supplementary measure for cycle/ pedestrian path on B4245 from Undy to Svern Tunnel.
Urban Condition	**Complementary measure**	The creation of green and safe and efficient corridors for travel over longer distances (not just the 3 miles stipulated in this report) by bike, away or separated from cars should be given a high priority, as well as good public transport routes.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Complementary measure	The new intersection off M48 around Caldicot would also be a good way of eleviating local traffic
	Complementary measure	the route needs to be extended to the South of Cardiff as well in order to connect with the Bay link road as originally proposed 15-20 years ago - this would then enable easy access from the Severn bridge to Cardiff / Swansea as well.
	Complementary measure	Provide resilience to the highway network providing an alternate route past Newport allowing urgent repairs to carriageway and structure on the existing route
	Complementary measure	I'm particularly enthusiastic regarding the new junction between the M48 and the B4245. I live in Caldicot and even though we are very close to the M4 and M48 (to the point that noise is a concern), we have to travel several miles to Magor to join the M4, on the B4245 which suffers from high traffic (joining the M48 in Chepstow is equally bad). This new junction would greatly improve life of Caldicot inhabitants commuting east and west.
	Complementary measure	The M48 needs a link from the B4245 and has done for years. Providing access to and from the motorway in both directions in Rogiet would ease traffic in Magor and Undy considerably, this in turn would create more support for the overall project
	Complementary measure	The M48 / B4245 link is a good idea though: people in Caldicot should have a designated junction and this would also open up the possibility of developing Severn Tunnel Junction into a regional transport hub.
	Complementary measure	Newport residential areas, cycling, pedestrian routes and also the much needed M48 - B4245 link road are required in the complimentary measures to improve living areas all around.
	Complementary measure	Careful consideration should be given to unrestricted access from Magor/Undy/Rogiet (B4245). - In particular, it would be positive for unlimited access to M48 from a new junction near Rogiet, where B4245/M48 are closely adjacent.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Complementary measure	The idea of a park and ride at Severn Tunnel Junction is a welcome one
	Complementary measure	However, I would also like to see a direct motorway link from the black route to Cardiff Bay. This would therefore provide a fast alternative route between the seven bridges and J33 should the M4 be closed by an accident. It would also gentley enhance access between the seven bridge and penarth/ Cardiff city centre.
	Complementary measure/ remove Severn Bridge tolls	and if this was to be co-ordinated with a reduction in the M4 bridge toll
	Complementary measure/ remove Severn Bridge tolls	It is essential the new route is created to alleviate the traffic problems around the Brynglas tunnels and once the tolls on the Severn bridges are removed or significantly reduced will no doubt bring an increase in prosperity to the Newport and wider South Wales area.
	Complementary measure/ upgrade A4810	new M4 corridor which is now in more (environmentally) important areas. The problems on M4 corridor area are only rush hour issues and could be resolved by complementary measures during those periods. This could be the upgrade of the steelwork roads around Newport.
Severn Tunnel Action Group	**Complementary measure/ public transport**	Whatever route is adopted the use of current Public Transport must be taken into consideration. At Severn Tunnel Junction we have the opportunity to create a huge Park n Ride with space for over 1,000 cars. At this time Severn Tunnel Junction has one of the fastest growing passenger uses of anywhere in Wales. Research indicates that passengers come here for onward travel and from as far away as Ross-on-Wye and Coleford in the Forest of Dean. Indeed over 25 per cent of all passengers travel there from the Chepstow and Dean Forest area. At one time Wales Government were also looking at the viabililty of a link from before the tolls on the M4 Severn Crossing, into the station, as a means of reducing rooad vehicle traffic flows. Rail and bus is not the total answer: but nor is road. With an increasing number of males under age 30 unable to afford car insurance it is essential, in our view, that the viability of Public Transport is again re-considered.
	Complementary measure/ public transport	The creation of green and safe and efficient corridors for travel over longer distances (not just the 3 miles stipulated in this report) by bike, away or separated from cars should be given a high priority, as well as good public transport routes.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Complementary measure/ public transport	Far from encouraging yet greater car use,more funds should be put to public transport & more cycling/walking.
	Complementary measure/ public transport	I object to the plan for the Black Route because I believe that traffic growth has levelled off, and that we should be improving public transport measures including cycling for local traffic, which will mean that there is no need for a new motorway at the cost of £1 billion.
	Complementary measures/ public transport	Clearly there is congestion on the M4 around Newport at certain times, but much of this this is created by local traffic, which could be readily transferred onto public transport and to walking and cycling
	Complementary measures/ public transport	Far better to invest the money in a sustainable scheme by investing in world class public transport, excellent cycle lanes and safer walking zones.
	Complementary measures/ public transport	The cost of building the black route is high in comparison to any measures to increase the use of public transport, cycling and in particular to enhance existing infrastructure.
	Complementary measures/ public transport	Reducing congestion can only be attained by a modal shift away from cars to public transport,cycling and walking.
	Complementary measures/ public transport	I agree with the concerns about the environmental impact on the Gwent levels and would wish to see more concern to develop public transport and links to public transport - thinking about bicycle and public transport combinations and developing rail infrastructure - the Severn railway tunnel seems a significant limiting factor
	Complementary measures/ public transport	Effort must also be made to reduce journeys. eg. M4 shuttle buses for people between Newport and Cardiff, Cardiff and Swansea, train use incentives etc. Cycle paths etc.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Complementary measures/ public transport	I agree with the concerns about the environmental impact on the Gwent levels and would wish to see more concern to develop public transport and links to public transport - thinking about bicycle and public transport combinations and developing rail infrastructure - the Severn railway tunnel seems a significant limiting factor.I have commuted using the motor way more than I do now and my partner commutes - and we haven't found it a huge problem - the railway problem though is significant to us and to visitors.
	Complementary measures/ public transport	Effort must also be made to reduce journeys. eg. M4 shuttle buses for people between Newport and Cardiff, Cardiff and Swansea, train use incentives etc. Cycle paths etc.
	Complementary measures/ public transport	Far better to invest the money in a sustainable scheme by investing in world class public transport, excellent cycle lanes and safer walking zones.
	Complementary measures/ public transport	Far from encouraging yet greater car use,more funds should be put to public transport & more cycling/walking.
	Complementary measures/ public transport	Effort must also be made to reduce journeys. eg. M4 shuttle buses for people between Newport and Cardiff, Cardiff and Swansea, train use incentives etc. Cycle paths etc.
Sustrans	**Complementary measures/ public transport**	The consultation highlights that 43% of the journeys made on this part of the M4 are under 20 miles, that is to say they are local journeys. With improved public transport services and safe cycling & walking routes, The Welsh Government's priority should be the displacement of much of this local traffic from the M4, reducing congestion and increasing available capacity for longer journeys. This could be achieved with improved public transport services and local safe cycling and walking routes.
	Complementary measures/ residential areas	Newport residential areas, cycling, pedestrian routes and also the much needed M48 - B4245 link road are required in the complimentary measures to improve living areas all around.
Welsh Liberal Democrats	**Funding used for a range of projects**	The Welsh Government has suggested that this would be funded by new borrowing powers granted by the UK Government. We have concerns that the Welsh Government would be disproportionately and excessively using their borrowing powers to fund a single project in a single region, rather than a range of projects across Wales to improve infrastructure.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Further options needed	the plan so far , has been neglect of the wildlife this area provides for , further options need to be explored , im against this development
	High speed rail tracks on motorway	I would be more than happy for example to see the inner lanes of motorways used for high speed rail tracks, confining the outer lanes to the left over traffic. Motorway service areas could become changeover/boarding points...and what ever happened to 'green stock' carpools ideas? Don't these need funding and building?
	High speed rail tracks on motorway/ green car pools	We must work, in every aspect of our lives towards a sustainable future and everything else, outcomes considered, should be avoided with criminal consequences for blinded or defiant ignorance. I would be more than happy for example to see the inner lanes of motorways used for high speed rail tracks, confining the outer lanes to the left over traffic. Motorway service areas could become changeover/boarding points...and what ever happened to 'green stock' carpools ideas? Don't these need funding and building?
	Implement slip road	My personal problem, is that which ever route is decided upon, will split Magor/Undy from Rogiet & Caldicot. As I can see no provision for slip roads/roundabouts, on the draft plans, for that part of the routes.
	Improve A48M/A48 Cardiff	I would prefer to see the government considering the difficulties of getting into Cardiff via the A48M/A48 as this always appears to be more disruptive than the traffic around Newport.
	Improve signage	how about 'do not slow down for tunnels' signs? You also need to have 'get in lane' signs for about a mile before the Caerleon exit westbound and the Coldra exit eastbound, and generally 'no unnecessary lanes changes' instructions when traffic is heavy.
	Improve signage	If road signage indicated congestion myself and other road users can seek an alternative route rather than join the queue.
	Improve signage	11. So improve advance warning signage/use modern technology to provide info before setting out on journeys

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Improve signage	The road past the steelworks should all ready provide relief and good access to south newport, so why the need to waste more money on another road? Put a sign up and people will use it!
	Improve signage to B4810	The road past the steelworks should all ready provide relief and good access to south newport, so why the need to waste more money on another road? Put a sign up and people will use it!
RSPB	**Improve signage to B4810**	In respect of existing measures designed partly to reduce the impact of incidents, the Welsh Government has failed to take proper advantage of those measures already in place. For example there is little or no signage directing traffic to the former steelworks road in the event of an incident, or congestion.
	Inner city parking/ park and ride	not forgetting the huge need for inner city car parking in strategic positions and or park and ride schemes on the perifery .
	Invest in economy	In addition, much more needs to be done to enhance the economy of the south east of Wales to put us on even footing with our English neighbours, developing a enterprise zone for the Newport and Monmouthshire area and making Newport a more attractive city to do business and live in.
	Invest in economy	we should not be doing anything to encourage more travel, either of people or goods but rather focus on local enterprises creating local jobs
	Invest in economy	Also the cost is massive - money that could be used elsewhere to regenerate the economy, support new businesses, technologies and people's behaviour around transport.
	Invest in economy	and there are far better ways to spend £1billion on improving life in Wales and strengthening the Welsh economy.
	Invest in economy	focus on the need for economic prosperity

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Investment in community	Hideously expensive, when Wales should be spending money (if it had any) on the creaking NHS, leaking schools, and problems that affect the whole Principality.
	Investment in community	Better to spend the money on Education and hospitals and puplic transport than another road.
	Investment in community	Hideously expensive, when Wales should be spending money (if it had any) on the creaking NHS, leaking schools, and problems that affect the whole Principality.
	Investment in community	Better to spend the money on Education and hospitals and puplic transport than another road.
	Investment in community	Hideously expensive, when Wales should be spending money (if it had any) on the creaking NHS, leaking schools, and problems that affect the whole Principality.
	Junction closures	It is possible to close some existing junctions.
	Junction closures	Local buses between Newport junctions 26 to 28 and close junctions 25 & 27.
	Junction improvements	We need junction improvements more than we do a new motorway.
	Junction opening	The decision to close J25 into Caerleon was clearly a flawed decision when it was made and has provided significant local disruption forcing local traffic into the town area to the detriment of everyone re-opening J25 should be done without having the black route ploughed through a SSSI

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Link A4810 with Purple Route	This would be cheaper if the steelworks access road was used and veered off before reaching the A48 but joining up with the red or purple route to cross the river Usk and railway. This minimises encroachments at this time but also allows for future access requirements.
	Link A4810 with Red or Purple Route	This would be cheaper if the steelworks access road was used and veered off before reaching the A48 but joining up with the red or purple route to cross the river Usk and railway. This minimises encroachments at this time but also allows for future access requirements
	Link M48 to Severn Tunnel Junction	The linking of Severn Tunnel Junction to the M48 as proposed in my mind a step in the right direction.
	Mitigate effects on Magor	The effect on Magor needs to be mitigated, in particular by (i) not coming too close and (ii) new access to the M4/M48 to the east of Magor.
	Modal shift	I am certain that the extremely high cost per mile would be better spent on measures to provide modal shifts away from car travel
	Modal shift	Get people out of their cars and either onto public transport or into car sharing - either or both will go a long way to solving the congestion problems.
	Modal shift	Traffic congestion will not be solved by more roads only by a transport policy, that actually gets people off the roads
	Modal shift	My concern would be building onto virgin land when measures could and should be taken to reduce vehicle usage.
	Modal shift	We need a sustainable transport strategy which aims to reduce growth in car transport and promote non-car alternatives.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Modal shift	Reducing congestion can only be attained by a modal shift away from cars to public transport,cycling and walking.
	More options	This unique environment is too precious to be sacrificed especially when there are better and cheaper alternatives available
	More options	I consider that the desired benefits of the programme could be achieved more effectively and cheaply by other means.
	More options	It is reputed that traffic around Newport is not increasing, so more intelligent solutions should be sought to resolve the problem.
	More options	The alleged problems on the existing M4 have been exaggerated and, insofar as they exist, can be addressed by other measures.
	Motorway along line of the coast	It would kill two birds with one stone. Improve the sea defenses which are needed & provide the byepass.
	Motorway along line of the coast	why can't a motorway be considered that takes the line of the coast accessed closer to the second Severn Crossing? This would skirt the SSSIs and not go through them and minimise the human impact on residents.
	Motorway tolling	There is only one solution to stem the increase in traffic and that is to toll the M4 and use the proceeds to improve the public transport system in the area
	New M4 the Valleys (north of Newport)	Far better to Link a new M4 the valleys by going North of Newport if one was needed

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	New road designs	These problems need to be put corrected in their own right, for example well designed smooth running roundabouts instead of traffic lights which hold up traffic.
	Noise barrier constructed	If I can't prevent this route being chosen then I'd like an effective noise baffle constructed such as big trees planted along it where it passes across the levels West of Newport
	Park and ride	Promotion of park and ride services with free parking (as they have in the valleys) would be a way of doing this
Seven Tunnel Action Group	**Park and ride/ public transport**	Whatever route is adopted the use of current Public Transport must be taken into consideration. At Severn Tunnel Junction we have the opportunity to create a huge Park n Ride with space for over 1,000 cars. SEWTA have a study available that was drawn up by Capita Symonds and may be found at: http://www.sewta.gov.uk/uploads/documents/74/original/Severn_Tunnel_Junction_Final_Report_April_2011.pdf?1323427469
	Place recovery vehicles on the M4	Have you not considered putting recovery vehicles in place either side of the M4 in rush hour or peak times? this would mean any broken down vehicles or crashes could be cleared more efficiently.
	Public transport	It must also consider other means of managing traffic congestion besides the addition of road capacity. These would include: - Restraining local access onto the existing M4; - Investments in public transport; and, - Investments in a high intensity programme of smarter choice measures.
	Public transport	For once think of alternatives such as improved public transport (bus and rail) and improving existing road networks.
	Public transport	I feel that better public transport and use of new road going to Spytty is sufficient!

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	Traffic congestion around Newport will not be addressed without significant investment in public transport and culture changes, which will not be achievable in the next 10-20 years.
	Public transport	The Welsh Government would better spend tax-payers' money by taking radical action to improve public transport and make it a viable alternative to the car.
	Public transport	reduce the traffic by increasing the public transport links. I may choose to go by bus to visit my poorly neighbour in hospital if it didn't take over an hour to get 10 miles! Don't make a new road - enhance what you've got.
	Public transport	Please consider carefully whether this new road would address in the long term the causes of the problem, in this instance too many vehicles which given suitable alternatives could turn into public transport journeys
	Public transport	Adequate public transport links negate the need for cars because people can get to where they want. Most people who work in London use public transport and that's the scenario we should be aiming for
	Public transport	Money spent on fuel leaves the economy - where as money spent on public transport benefits the local economy. - Nottingham Tram Business Plan shows that real access to jobs and growth and social inclusion is created by public transport routes, not through private car networks. 3 million car journeys were taken off the road when the tram network was implemented.
	Public transport	Spend the money on improving public transport
	Public transport	Other alternatives to try to ease congestion is to encourage the use of public transport, by making it more convenient and affordable to travel by train and bus.
South Wales Mammal Group	**Public transport**	More public transport is what is needed.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	Improvements to CURRENT public transport are paramount, including reduced costs and increased services.
	Public transport	For once think of alternatives such as improved public transport (bus and rail) and improving existing road networks.
	Public transport	Get people out of their cars and either onto public transport or into car sharing - either or both will go a long way to solving the congestion problems
	Public transport	Improve existing transport!
	Public transport	The planned expenditure should be spent on improved existing public transport solutions and/or an east west metro
	Public transport	In particular, enhancing public transport through improved commuter bus provision from centres in monmouthshire and enhanced use of rail capacity and a park and ride system from severn bridge/chepstow.
	Public transport	The legitimate aspirations of the people of Newport for travel and employment opportunities can be met by better public transport.
	Public transport	The money should be spent on improving public transport and other green transport solutions
	Public transport	it would be better to improve public transport in South Wales, and thus ameliorate traffic flow around Newport

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	Having excellent public transport and improving town/city facilities is.
	Public transport	Spending a fortune on a new motorway through an environmentally sensitive area such as the Gwent levels to try and solve a problem which exists for only 2 hours out of every 24, without improving the minor roads traffic uses to reach the M4 is a gross misuse of public funds, better spent on improving public transport (eg a Newport branch of the Ebbw Vale - Cardiff railway) or dissipating the rush hour traffic.
	Public transport	We should be bold and put forward a pioneering transport system , make it so much easier and cheaper to use public transport that no one wants to take the car! £1.25 billion will solve the problem this way and preserve the countryside for generations to come.
	Public transport	Invest in transport alternatives, and we are more likely to have people use alternatives. I note in the consultation document that it says there are no satisfactory public transport alternatives - there's your clue to a solution - please invest in meeting the public transport deficiencies identified.
	Public transport	There is only one solution to stem the increase in traffic and that is to toll the M4 and use the proceeds to improve the public transport system in the area. I work in Llandaff in Cardiff using the M4 on a daily basis which takes me 25 minutes to get to work. By using a combination of car trains and bus it would take over 2 hours. Public transport in Magor is disjointed and does not link to the commutable areas of work
Sustrans	**Public transport**	The focus solely on a new M4 and a road based system would reduce transport choice. A world class public transport system is crucial to attracting inward investment, yet is not dealt with by this consultation. The consultation highlights that 43% of the journeys made on this part of the M4 are under 20 miles, that is to say they are local journeys. With improved public transport services and safe cycling & walking routes, The Welsh Government's priority should be the displacement of much of this local traffic from the M4, reducing congestion and increasing available capacity for longer journeys. This could be achieved with improved public transport services and local safe cycling and walking routes.
	Public transport	We should also be making railway and bus improvements so that the necessity for journeys along the congested part of the M4 are reduced.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	One option would be to improve the public transport infrastructure which would enable more commuters to seek alternative methods of travelling whilst also relieving traffic congestion on this particular section of the m4.
	Public transport	Figure 8 indicates 43% of journeys on the M4 around Newport are less than 20 miles, 40% between 5-20 miles. Figure 7, supports my own view which is that M4 use peaks around the "rush hour" at the beginning and end of the working day. So it seems commuter traffic must account for a significant element of the traffic volume. It is these journeys that should be the target for public transport operations and sustainable transport options and they could have a significant part to play in reducing the traffic volumes on the M4 during peak hours.
	Public transport	Instead of another road which, as has been found in many parts of the UK, will only increase the amount of traffic, it would be more environmentally friendly and more sustainable to increase the amount, regularity and connectivity of the public transport system. This includes bus, rail, ferry etc.
	Public transport	Given that 47% of motorway traffic travels less than 20 miles it makes better economic sense to improve local transport services.
	Public transport	This consulation, in my view, is deeply flawed as public transport has been ignored. The volume of traffic on the M4, especially at rush hours, is boosted by local people, if there was a viable public transport alternative many people might prefer to use that.
	Public transport	I don't agree with the draft Plan as I think the best way to address the problems of the M4 around Newport is with improved local public transport which will have no damaging effect on the environment, water quality and natural habitats.
	Public transport	Instead of building more roads to ease congestion more should be done to improve public transport and encourage people to use it.
	Public transport	improvements in local railway and other public transport is more in tune with the need for environmental protections.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	It would be far better to improve the existing road and increase access and efficiency of public transport.
	Public transport	fully support Gwent Wildlife Trust's position in favour of: - Public transport improvements
	Public transport	Furthermore, the consultation documents fail to make the case for a proposal that promotes more car use, and do not explain why public transport and 'smarter choices' programmes of personal travel planning have been ignored when - as the documents themselves state - 43% of the journeys on this part of the M4 are local journeys under 20 miles and especially amenable to these methods of congestion relief.
	Public transport	There is little evidence to suggest that any additional road is needed at all anyway - traffic levels have plateaued and there will always be additional traffic and longer journey times during rush hour (unless better public transport is provided and encouraged!).
	Public transport	We need to think about the future and provide more public transport. It is now too expensive to own a car for many young people and the Welsh Government needs to provide us with alternatives to and from where we live to where we work and where we meet our friends.
	Public transport	I would like to see greater investment into public transport e.g. rail networks and bus routes. If small stations that once functioned like Llanwern train station, for instance, could be made available for use between Magor and Newport, people would be more likely to opt for easier local commutes.
	Public transport	Improvements in public transport and rail are not part of this plan- a transport overview is needed not merely a plan for more roads being built.
	Public transport	and ultimately a useless solution to the issue of motor congestion. The real focus should be on improving public transport and providing an alternate solution to the immediate issue of traffic congestion.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	We are particularly concerned about the lack of consideration given to an improved public transport network, such as the South Wales Metro, in alleviating the issue of traffic on the M4 Corridor around Newport.
	Public transport	The consultation was not a consultation in the true sense as the options were extremely limited. The options were focussed on "do nothing or build a road". There was little opportunity for alternative solutions, such as integrated public transport. I conclude that there is an element of predetermination, which is unacceptable. • Invest in integrated public transport and deliver some short term gains such as improvements to existing stations and development of some of the rail proposals along the M4 corridor, such as Severn Tunnel Junction Park and Ride, development of business cases for Magor station, Llanwern etc.
	Public transport	The emphasis should be on getting people to use public transport rather than continue to use roads. Public transport makes sense both environmentally and economically.
	Public transport	We need to be moving people off the roads and investing in public transport and more sustainable modes of travel.
	Public transport	In between, there are a range of perspectives that include the need to strengthen public transport
	Public transport	This coupled with decent investment in public transport infrastructure will in my opinion be a much better option.
	Public transport	It is better public transport, bus & rail, which will solve the problem, not more tarmac and concrete
	Public transport	More emphasis needs to address sustainable transport and reduction of overall traffic on existing road network.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	We need to upgrade and improve what we have to encourage the use of public transport. The money would be better spent in ths way, not devouring more of our precious ecosystem and generating more pollution.
	Public transport	we need better public transport links.
Sustrans	**Public transport**	A world class public transport system is crucial to attracting inward investment, yet is not dealt with by this consultation. The consultation highlights that 43% of the journeys made on this part of the M4 are under 20 miles, that is to say they are local journeys. With improved public transport services and safe cycling & walking routes, The Welsh Government's priority should be the displacement of much of this local traffic from the M4, reducing congestion and increasing available capacity for longer journeys. This could be achieved with improved public transport services and local safe cycling and walking routes.
Welsh Liberal Democrats	**Public transport**	We are particularly concerned about the lack of consideration given to an improved public transport network, such as the South Wales Metro, in alleviating the issue of traffic on the M4 Corridor around Newport.
Champion C2 Newport Cycling and Walking	**Public transport**	5. There is no appraisal of Public Transport Alternatives - this could have a profound effect on the need for such extensive new highway construction.
	Public transport	I feel that better public transport and use of new road going to Spytty is sufficient!
	Public transport	Subsidise public transport
	Public transport	Local buses between Newport junctions 26 to 28

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport	The proposed new M4 is not a sustainable option as it will cause damage to the environment. We should be bold and put forward a pioneering transport system , make it so much easier and cheaper to use public transport that no one wants to take the car! £1.25 billion will solve the problem this way and preserve the countryside for generations to come.
	Public transport	We need to be moving people off the roads and investing in public transport and more sustainable modes of travel. There needs to be investment in sustainable transport measures to combat the problem of traffic at peak times.
	Public transport	We need to link public transport. You cannot get to a station easily from Magor and if you take the car the car park is often full. Start encouraging the use of public transport by fully integrating it. We need carefully sited park and ride with only a nominal charge. We need these linked to Severn Tunnel and Newport and Cardiff centres. In addition, we need a station at Magor.
	Public transport	We need to be moving people off the roads and investing in public transport and more sustainable modes of travel.
	Public transport	The planned expenditure should be spent on improved existing public transport solutions and/or an east west metro
	Public transport	Far from encouraging yet greater car use,more funds should be put to public transport & more cycling/walking.
	Public transport	The cost of building the black route is high in comparison to any measures to increase the use of public transport, cycling and in particular to enhance existing infrastructure
	Public transport (railways)	an expansion of seven tunnel junction and the rail network is much needed.
	Public transport (railways)	Encouraging use of the railways for commuters could reduce traffic

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport (railways)	I do not support the building of any new motorways in the Newport area when the rail network which travels in the same direction is so poor. I would recommend the huge investment planned for this motorway is invested in the railways. If there was a station in Magor the I and many of my friends and colleagues would not need to use the motorway.
	Public transport (railways)	Removing an existing motorway and providing "walking-friendly infrastructure" will not effect modal shift. What the Newport area needs is a network of local railway stations as there is ample scope to use existing freight-only lines and relief mainline tracks, for example the Machen and Uskmouth lines.
	Public transport (railways)	Better to spend the money on reducing traffic. Why not use a fraction of this money to open railway stations at Caerleon and Magor. Link Ebbw Vale station directly to Newport. These would help reduce traffic on the M4.
	Public transport (railways)	We already have a railway line which could be developed to attract more use by commuters and businesses.
	Public transport (railways)	To see this work destroyed for the sake of the motor car culture would be severely retrograde, when upgrading of the rail network, which is already very well used and could well be increased, could achieve the same aims of reducing congestion in the M4 corridor.
	Public transport (railways)	More stations could be created on the main railway line, the Ebbw vale line could be linked to Newport , a station could be provided at Caerleon
	Public transport (railways)	The massive cost of the scheme is money that should be spent elsewhere in the infrastucture. If we invested this level of money in the railways we would have an excellent system of public transport
	Public transport (railways)	The money saved, by avoiding the destruction of SSI's, can be invested in the improvement of the existing rail link and a possible light railway system.
	Public transport (railways)	improvements in local railway and other public transport is more in tune with the need for environmental protections.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport (railways)	Options upgrading existing modes of transport should also be explored including local railway stations with free parking and better use of traffic information to encourage vehicles to use the SDR link and new dual carriageway through Llanwern
	Public transport (railways)	Improved rail services and additional stations
	Public transport (railways)	I would like to see greater investment into public transport e.g. rail networks and bus routes. If small stations that once functioned like Llanwern train station, for instance, could be made available for use between Magor and Newport, people would be more likely to opt for easier local commutes
	Public transport (railways)	New railway stations (at Llanwern,Magor and to the west of Newport),would help take traffic away from the current M4.
	Public transport (railways)	11) Travel experience can be improved by travelling by train.
Wildlife Trust Wales	**Public transport (railways)**	However, we are aware that there are several major opportunities to increase capacity. These include; - Electrification of the South Wales mainline - Valleys Vale/Cwmfro rail network - Cardiff Regional Metro including new rail stations, a rapid transit bus solution around M4 corridor communities - Active Travel Bill - The Blue Route (see Annex 2)
	Public transport (raiways)	We need to get people and freight out of cars and off lorries and onto the railways instead. Upgrading the rail network and increasing capacity should be the priority. I

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport (railways)/ park and ride	I believe the money should be spent on sustainable transport projects in particular improved railway infrastructure, more stations, and park and ride at stations. Train use is increasing dramatically in this country, partly due to the high cost of owning and running a car. Wales must move with the times and improve its railway network. If only there was a railway to Raglan I would use it. However the 1000's of car commuters in Caldicot, Bristol, Magor and parts of Newport using the East-West route along the M4 could be provided with rail services which would convince many of them to ditch their car and take a train.
	Public transport (railways)/ park and ride	I believe the money should be spent on sustainable transport projects in particular improved railway infrastructure, more stations, and park and ride at stations. Train use is increasing dramatically in this country, partly due to the high cost of owning and running a car. Wales must move with the times and improve its railway network.
	Public transport (railways)/ park and ride	I believe the money should be spent on sustainable transport projects in particular improved railway infrastructure, more stations, and park and ride at stations. Train use is increasing dramatically in this country, partly due to the high cost of owning and running a car. Wales must move with the times and improve its railway network.
Frances Taylor - Councillor Mill Ward, Magor	**Public transport (railways)/ park and ride**	Invest in integrated public transport and deliver some short term gains such as improvements to existing stations and development of some of the rail proposals along the M4 corridor, such as Severn Tunnel Junction Park and Ride, development of business cases for Magor station, Llanwern etc.
	Public transport (railways)/ remove Severn Bridge tolls	Any method of economic growth, promotion of business and ease of commuting is a complete nonsense until rail links and parking (Magor and severn tunnel) are improved/invested in and until something is done about the severn bridge tolls!
	Public transport (railways)/ Remove Severn Bridge Tolls	Public money would be better spent relieving the overall burden on the South Wales economy of the Severn Bridge tolls and by developing the commuter rail infrastructure around Newport.
	Public transport / traffic management	I feel that a lot of Newport's traffic problems could be resolved by better public transport, enforcement of the current variable speed limits, and better organisation and design of the current city main roads (better flowing inner traffic, might reduce the number of local drivers using the motorway to get to different areas of Newport).

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport/ community facilities	Better to spend the money on Education and hospitals and puplic transport than another road.
	Public transport/ improve existing roads	I feel that a lot of Newport's traffic problems could be resolved by better public transport, enforcement of the current variable speed limits, and better organisation and design of the current city main roads (better flowing inner traffic, might reduce the number of local drivers using the motorway to get to different areas of Newport).
	Public transport/ investment in community	Having excellent public transport and improving town/city facilities is.
	Public transport/ park and ride facilities (railways)	We need to link public transport. You cannot get to a station easily from Magor and if you take the car the car park is often full. Start encouraging the use of public transport by fully integrating it. We need carefully sited park and ride with only a nominal charge. We need these linked to Severn Tunnel and Newport and Cardiff centres. In addition, we need a station at Magor.
Cardiff Council	**Public transport/ Smarter choice measures**	It must also consider other means of managing traffic congestion besides the addition of road capacity. These would include: - Restraining local access onto the existing M4; - Investments in public transport; and, - Investments in a high intensity programme of smarter choice measures.
RSPB	**Public transport/ Smarter choice measures**	a public transport and SMART measures option, and any combinations thereof, including all programmed and permitted measures, both acknowledged and unacknowledged. The consultation documentation shows that much of the vehicle usage on this stretch of the M4 is short distance traffic, for which lower carbon alternatives-bus, bicycle and walking-should be identified and provided for. There is evidence to show that good public transport leads to a fall in car usage. Following an investment in low carbon transport solutions in London car use in the city has fallen by 35% over the past 15 years.
	Public transport/ sustainable development	The money should be spent on improving public transport and other green transport solutions.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Public transport/ traffic management	I dont feel that the road is necessary, and could be managed in other, more appropriate and less damaging ways such as sustainable transport and traffic management.
	Public transport/ variable speed limits/ improve existing roads	I feel that a lot of Newport's traffic problems could be resolved by better public transport, enforcement of the current variable speed limits, and better organisation and design of the current city main roads (better flowing inner traffic, might reduce the number of local drivers using the motorway to get to different areas of Newport).
	Reduce Severn Bridge tolls	avoid funding it from Severn Bridge tolls at ALL costs - these tolls NEED to be reduced to <£1.50 soon for the sake of the welsh economy.
	Reduce Severn Bridge tolls/ introduce small ones on new road	COMMENT -If the Toll on the Severn Bridge was held for ever at £1:00 per vehicle AND -If the toll on the new road was held for ever at £1:00 per vehicle, THEN: you would have a chance
	Reintroduce speed limits	I see no reason to change the existing M4 except to reintroduce the average 50pmh limit from the Coldra to Tredegar Park.
	Reintroduce speed limits	While the Brynglas Tunnels are a bottleneck, the serious delays occur when there are accidents along the Newport stretch of the M4 and as a daily user of the road I seem to recall that the incidence of accidents was markedly less during the period a few years ago when the speed limit was limited to 50mph. While a speed limit of that nature is in one way regrettable ie. it lengthens journeys - though only really marginally - nevertheless reducing the number of accidents has obvious financial benefits not to mention the avoidance of the misery, pain and suffering of those unfortunate enough to be caught up in them. So a permanent speed reduction would I believe assist.
	Remove Severn Bridge tolls	3. To have free entry to Wales
	Remove Severn Bridge tolls	Funding - Surely we need to get rid of the tolls not use them to fund this road

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Remove Severn Bridge tolls	also on how the road will be paid for I do feel that we already pay far too much to cross the bridge so would not want any more increase on the bridge fee, in fact I feel that the fee should now be reduced to inspire more business into Wales.
	Remove Severn Bridge Tolls	My friends in Bristol are put off from spending money in Wales by the bridge charges, and do not come shopping in Wales because of this. Get rid of the toll to get to Wales and you improve visitor numbers for shopping and tourism to Wales
	Remove Severn Bridge Tolls	Public money would be better spent relieving the overall burden on the South Wales economy of the Severn Bridge tolls
	Remove Severn Bridge Tolls	Remove Severn Crossing tolls to ease flow into Wales and to make area more attractive for business and leisure travellers.
	Remove Severn Bridge tolls	Business will not flourish in SE Wales until the Severn Bridges are free to use by everyone.
	Remove Severn Bridge tolls	If the Assembly truelly wants to improve economic growth in Wales then maybe they should remove the economic barriers that are the Severn Bridges, as the cost to a business of supporting the tolls payable would be prohibative to a business settting up in Wales
	Remove Severn Bridge tolls	Better uses include abolition of the Severn Crossing tolls, the toll booths are a much greater cause of delay than Newport M4, abolition would open up Wales more for economic development and use of Cardiff airport,
	Remove Severn Bridge tolls	If we want to spend some money to develop this area I'm sure better ways can be found for direct investment into Newport. Elimination of the outrageous Severn Bridge tolls would be an excellent place to start.
	Route south of A48	I prefer to have a route running at the south of A48 to be more direct and to advoid picking up the traffic from the existing M4 and nearby towns.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Sea wall motorway	Probably the best option although I believe that going on the sea wall would be preferrable. It would kill two birds with one stone. Improve the sea defenses which are needed & provide the byepass.
	Severn bridge tolls/ public transport (railways)/ parking	Open station at Magor. Any method of economic growth, promotion of business and ease of commuting is a complete nonsense until rail links and parking (Magor and severn tunnel) are improved/invested in and until something is done about the severn bridge tolls!
	Slip road for people travelling to Newport and east of Cardiff	I think its the best route but will it have slip roads for people who are travelling to the majority of Newport and the east of Cardiff that do not need or want to get back onto the M4?
	South Wales Metro	the Assembly should implement the South Wales Metro as promised by Mark Barry and SEWTA. Many journeys on the M4 around Newport are short and if the South Wales Metro was implemented this would take many of these journeys from the M4. The existing M4 would then cope with the lower level of usage.
	South Wales Metro	I request the Welsh Government to act on their report of the City Regions Task & Finish Group and create a South East Wales/Cardiff authority, who can decide on the future transport infrastructure. I recognise that this will delay the process, however a report has been commissioned on the Cardiff Capital Region Metro and there are limited funds for Welsh infrastructure improvements.
	South Wales Metro	Your consultation takes no account of the work the government has already commissioned on proposals for a South Wales Metro creating more rail links and many more stations,the electrification of the South Wales main line railway and the government's own Active Travel Bill which requires local authorities to create linked cycle and walking routes.
	South Wales Metro	Almost half of traffic journeys assessed were of less than 20 mles which supports the case for a local intergrated solution such as the long talked about Metro system when this goes live and is in existence will attract a large proportion of local traffic away from the existing M4 further reducing the need to spend 1.2 billion pounds.
	South Wales Metro	For example,the proposed South Wales Metro could take a lot of this traffic,as could properly intergrated public transport interchanges (but not like the current example of the redeveloped Newport Bus Station).

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	South Wales Metro	We are particularly concerned about the lack of consideration given to an improved public transport network, such as the South Wales Metro, in alleviating the issue of traffic on the M4 Corridor around Newport.
	South Wales Metro	Equally, this consultation seems ill timed, if we are unable to see the predicted impacts of improved public transport and the South Wales Metro
	South Wales Metro	Improve rail links including a SE Wales metro rail network.
Welsh Liberal Democrats	**South Wales Metro**	We are particularly concerned about the lack of consideration given to an improved public transport network, such as the South Wales Metro, in alleviating the issue of traffic on the M4 Corridor around Newport.
	South Wales Metro	The WG investigation of a S Wales transport 'metro' is also not brought into the assessment. 1.3 The praiseworthy aim of improving life for South Wales residents will not be achieved by improving the eastern length of the M4, but by an initiative such as the S Wales metro, which would then allow better management of the M4 as a longdistance route, not as a Newport ring road.
	South Wales Metro/ A4810	The draft plan has not taken into account the effect a South Wales metro system would have on vehicle numbers on the existing stretch of the M4 around Newport. Nor has it taken into account the effect of recent network improvements, including the newly opened A4810 Eastern Distributor Road (EDR) on the old Steelworks Access Road. I fail to understand how a proper consultation can be carried out when the evidence provided for a relief road has not taken into account the impact of such major relief projects
Sustrans	**South Wales Metro/ Active Travel Plan**	Schemes such as the Cardiff Capital Region Metro and new routes arising from the Active Travel Act could play in a key role in reducing peak hour congestion caused by single occupant car use this

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
RSPB	**South Wales Metro/ Blue Route**	The Reasonable Alternatives referred to above could include inter alia any of the following, in any combination :- 8.1. Completely New Measures/Proiects not Referred to in the draft Plan: Examples of these include inter alia :- - The South Wales Metro, and - The Blue Route
Newport Local Access Forum	**Suggested new alignment of route**	It is suggested that the motorway route be slightly adjusted to allow only one crossing of the coastal path, as indicated on the map below.
	Suggested new alignment of route	(Black route) is the furthest from Duffryn housing estate and surrounding new developments. I feel however that it could still be moved further away than planned as there is an abundance of disused land to the south of the proposed route.
	Suggested new alignment of route	I would like to see the route varied to go north of the current services, then taken through between 'quay point' (planned development) and then anywhere to the east end of Tata Steel Works, thus also avoiding any further infringement into the Reedwick and Llandevenny SSSi
	Suggest new alignment of route	Move Jt 23a to a new junction 1 – 11/4 miles towards Newport and siting the new M4 between Bishton and Underwood going through the old Llanwern plant – would save much of the destruction on the Gwent levels.
	Suggest new alignment of route	Extend through the docks, don't join at Castleton but follow the main line railway towards Cardiff, particularly serving Cardiff Docks, Bay and Park and Ride
	Suggest new alignment of route	Motorway alongside main railway line from Tredegar Park direct to A4232 extension of Cardiff Bay Link.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Suggest new alignment of route	A4232 Jt 33 across Rover way across Rhymney through Wentloog following B4239 to the south of Newport crossing the Usk near Pye Corner linking up with the M4 at Jt23a
	Sustainable alternatives	Instead, the Government must look at sustainable alternatives. It must take account of the most recent traffic and population data available, and realise the full environmental value of the Levels to the wildlife and people of Wales.
	Sustainable alternatives	The estimated cost of over £1bn for the motorway could be better spent on providing the above measures. This would generate more jobs,produce less pollution and carbon emissions and be more sustainable.
	Sustainable alternatives	As the the cost of the new motorway would be over £1billion. and won't be fully operational until 2031, why is the black route the primary option? More sustainable and cheaper alternatives could be implemented in the next few years, and would help alleviate the precieved congestion around Newport.
RSPB	**Sustainable alternatives**	The RSPB urges the Minister to delete the draft Plan, and pursue a strategy which is aligned with the Welsh Government's adopted vision for sustainable development, viz a strategy which does not have material adverse impacts on the Gwent Levels SSSI and Coastal and Floodplain Grazing Marsh We must look to invest in low carbon sustainable alternatives to reduce road use and our emissions across Wales.
Gwent Wildlife Trust	**Sustainable alternatives**	The Welsh Government has pledged it will put sustainable development at the core of Welsh Government. In our view the consultation should have offered sustainable public transport options as reasonable alternatives in the consultation in order to allow these to be considered fully alongside the motorway proposal.
	Sustainable alternatives	High public cost of the project: The cost of the new motorway would be astronomical - over £1billion. What's more, the new motorway wouldn't be fully operational until 2031, whereas more sustainable and cheaper alternatives could be implemented in the next few years. Instead, the Government must look at sustainable alternatives. It must take account of the most recent traffic and population data available, and realise the full environmental value of the Levels to the wildlife and people of Wales.
RSPB	**Sustainable alternatives**	We must look to invest in low carbon sustainable alternatives to reduce road use and our emissions across Wales.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Sustainable alternatives (video conferencing/high speed broadband)	Long term we should be looking at ways in which journeys become unnecessary through video conferencing backed up by a high speed broadband roll-out. The sooner we move onto a sustainable agenda the easier it will be for our descendants.
	Sustainable development	Firstly it seems ludicrous to waste funds on a project that at best will have a minimal return for Wales. We have a great opportunity to be trail blazers for a sustainable ecological future, and investing in props for further carbon generated destruction should not be one of them. Lastly as the world approaches peak oil situation, it would be embarrassing that Wales would be opening a new motorway to coincide with the rest of world waking up to global warming.
	Sustainable development	I believe more sustainable and cheaper alternatives could be implemented sooner rather than later. I don't think building the Black Route will address the problems around Newport, and believe the Welsh Government should look at more sustainable solutions and work with the environment and not against it. I hope you will take my concerns on board.
	Sustainable development	The sooner we move onto a sustainable agenda the easier it will be for our descendants.
	Sustainable development	Furthermore the level of damage that the Gwent Levels and associated SSSIs would sustain as a result of the proposed measures is totally incompatible with any form of sustainable development Protection of these natural resources, especially where alternative and technically and economically viable solutions are readily available should be paramount in decisions of this nature.
	Sustainable development/ options	It will not serve the poor. It will suck up what could be used for investment elsewhere, be it in more sustainable and equitably available transport options, environmental improvements which would also provide social and economic benefits.
	Sustainable transport	I do not believe enough has been done in regards to work on prospective sustainable transport options,

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Sustainable transport	It appears very much as an afterthought when surely the need to achieve a cultural shift in travel behaviour to more sustainable choices should be at the heart of WG policy.
	Sustainable transport	and that the full scope of sustainable transport options must be exhausted before new roads are promoted.
	Sustainable transport	I would like to see a cost effective sustainable option.
	Sustainable transport	Instead of destroying the unique, special and beautiful landscape and habitats of the Gwent Levels and all its associated wildlife, we should be ALWAYS looking at sustainable forms of transport, not providing more concrete roads for more vehicles & more pollution. The black route proposals will destroy 5 Sites of Special Scientific Interest, ancient woodland and important & unique habitats for declining species such as the water vole.
	Sustainable transport	I think sustainable transport alternatives are more important than a motorway which will contribute to global warming whilst badly damaging a vital wetland wildlife habitat.
	Sustainable transport	I do not believe enough has been done in regards to work on prospective sustainable transport options, and to cut through an area of such rich habitat is morally reprehensible. There are other ways and means of addressing congestions problems, and I do not believe enough has been done to explore those options, or prospects of less damaging road routes.
	Sustainable transport	More emphasis needs to address sustainable transport and reduction of overall traffic on existing road network.
	Traffic management	Relieving the traffic around the B4245 road is a local concern. A lot of HGV vehicles travel through from Caldicot to Magor which is putting a lot of pressure on minor road networks which were never designed to take the volume of traffic.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Traffic management	we should be looking to more carefully manage the flow of traffic, to promote alternative options, upgrade rail and freight options, eliminate lane confusion/ speeding/ lane hopping on the existing road and accept that all roads get congested - its the natural way of a) keeping the speed down and b) incentivising travel outside peak hours.
	Traffic management	• Traffic management on the M4 would reduce congestion, eg. introduce an average speed check.
	Traffic management	Additionally it fails to address the issues affecting the existing M4 motorway and will not benefit the residents and commuters around Newport that utilise the junctions 24 - 27 and frequently held up by poor traffic management, not traffic volumes
	Traffic management	The case for an upgraded A48, around the South of Newport is equally strong (and cheaper) and together with traffic management information (French style) the two roads can certainly handle the minimal further increase in traffic volumes which have been projected. See alll Wales comments on Questions 4 and 9.
	Traffic management	The Government should investigate alternative measures such as traffic control through the Brynglas tunnels during peak periods rather than wasting £1 billion on this unecessary project.
	Traffic management	5)the existing Southern Distributor Road is frequently quiet while Cardiff Road in Newport is solid with cars taking the former route over George Street Bridge. If motorists are educated to use the SDR this congestion will disappear.
	Traffic management / demand management	There are cheaper and less damaging options including integrated traffic management, investment in sustainable transport as well as improvements to junctions and existing alternative routes.
	Traffic management/ public transport	Spending a fortune on a new motorway through an environmentally sensitive area such as the Gwent levels to try and solve a problem which exists for only 2 hours out of every 24, without improving the minor roads traffic uses to reach the M4 is a gross misuse of public funds, better spent on improving public transport (eg a Newport branch of the Ebbw Vale - Cardiff railway) or dissipating the rush hour traffic.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Traffic management/ public transport	Figure 8 indicates 43% of journeys on the M4 around Newport are less than 20 miles, 40% between 5-20 miles. Figure 7, supports my own view which is that M4 use peaks around the "rush hour" at the beginning and end of the working day. So it seems commuter traffic must account for a significant element of the traffic volume. It is these journeys that should be the target for public transport operations and sustainable transport options and they could have a significant part to play in reducing the traffic volumes on the M4 during peak hours.
	Traffic management/ public transport/ existing roads	There are cheaper and less damaging options, including integrated traffic management, investment in sustainable transport, as well as improvements to junctions and existing alternative routes
	Traffic management/ public transport/ existing roads	There are cheaper and less damaging options, including integrated traffic management, investment in sustainable transport, as well as improvements to junctions and existing alternative routes
	Traffic management/ upgrade existing roads	There are cheaper and less damaging options, including integrated traffic management, investment in sustainable transport, as well as improvements to junctions and existing alternative routes.
	Traffic management/ upgrade existing roads/ sustainable transport	There are cheaper and less damaging options including integrated traffic management, investment in sustainable transport as well as improvements to junctions and existing alternative routes.
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Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Traffic management/ upgrade existing roads/ sustainable transport	There are cheaper and less damaging options, including integrated traffic management, investment in sustainable transport, as well as improvements to junctions and existing alternative routes.
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Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Traffic management/ upgrade existing roads/ sustainable transport	There are cheaper and less damaging options, including integrated traffic management, investment in sustainable transport, as well as improvements to junctions and existing alternative routes.
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	Traffic management/ upgrade existing roads/ sustainable transport	There are cheaper and less damaging options, including integrated traffic management, investment in sustainable transport, as well as improvements to junctions and existing alternative routes.
	Traffic management/ sustainable transport	I dont feel that the road is necessary, and could be managed in other, more appropriate and less damaging ways such as sustainable transport and traffic management.
	Tunnel	construction of a tunnel from Van Road, Caerphilly to the M4 at Thornhill opening up the Rhymney valley and relieving pressure on the Tredegar House and Coryton junctions,
	Tunnel	Underground tunnel across the Gwent Levels
	Upgrade A48 (SDR)/A4810	I am convinced that upgrading the Southern Distributor Road and Steelworks Road and providing a new link to the 23A junction of the M4 would be a far better use of the money - traffic problems would be alleviated and the habitats of the Gwent Levels would be safeguarded.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Upgrade A4810	An alternative route has recently been opened up via the Llanwern Steel works dual carriageway that will avoid such substantial disruption as that seen when there was a fire closing the Brynglas Tunnels. This road, together with the A48, could be readily adapted at a fraction of the cost of a new motorway. I consider that this is a much better way in which to ultilise public money, and as people become aware of this alternative route then it should ease pressure on the existing M4 around Newport
	Upgrade A4810	2. Why is there no plan to create an additional relief through Llanwern on the link road. This could be turned into a higher speed dual carriageway rarer than a full motorway.
	Upgrade A4810	Why can't the recently opened up Steelworks road be further upgraded, extended, with a new bridge over the Usk and joined up at Tredegar park. This would provide a good alternative for Newport South and Cardiff East and take load off the existing M4. Has this been considered?
	Upgrade A4810	Instead, consideration should be given to the maintenance and enhancement of the new route through Llanwern steelworks.
	Upgrade existing infrastructure	I object, as I feel we could achieve a resolve to the present problems by giving more consideration to improvement to our current infrastructue
	Upgrade existing M4	Any improvements to the M4 regarded as absolutely essential (and CPRW notes the uncertainty, and downright contradiction of this 'need' by others) should be limited to the existing M4 corridor, to avoid destruction of these limited and irreplaceable Welsh rural areas
	Upgrade existing M4	All you need to do is improve the existing road and bottlenecks, thus reducing the accidents and road closures and the amount of road works.
	Upgrade existing M4	The only acceptable proposal is to improve the existing carriageway.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Upgrade existing M4	The proposal underestimate improvements that can be made to the existing M4.
	Upgrade existing M4	Any improvements to the M4 regarded as absolutely essential (and I note the uncertainty, and downright contradiction of this 'need' by others) should be limited to the existing M4 corridor, to avoid destruction of theses limited and irreplaceable Welsh rural areas.
	Upgrade existing M4	Double deck motorway
	Upgrade existing M4/ public transport	I recognise that congestion on the M4 needs addressing but we to support the development of sustainable public transport and enhancement of the EXISTING network.
	Upgrade existing M4/ public transport (railways)	we should be looking to more carefully manage the flow of traffic, to promote alternative options, upgrade rail and freight options, eliminate lane confusion/ speeding/ lane hopping on the existing road and accept that all roads get congested - its the natural way of a) keeping the speed down and b) incentivising travel outside peak hours.
	Upgrade existing M4/ variable tolls on Severn	Improvements to current road and phasing the Severn crossings by variable tolls will alleviate the problem.
	Upgrade existing M4/A48	Seriously consider looking into upgrading the existing M4 or look hard at upgrading the A48 distributor road
	Upgrade/widen existing M4	the three lanes into two lanes from the tolls to the tunnels need sorting out, the tunnel lighting needs sorting out or get rid of the tunnels all together then you could go three lanes(yes dig a big cutting through the hillside).
	Upgrade existing road/ inform people of A4810	The draft plan is EXPENSIVE. There are cheaper less drastic options such as improving local roads, telling people about the new A4810.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Upgrade existing roads	The money could be used updating other routes, which are more enviromentaly friendly,
	Upgrade existing roads	a much less damaging option should be considered developing the existing roads.
	Upgrade existing roads	Why can refinements/enhancements be made to the current existing roads, there is clearly space for it tone done and should be completed to sustain, environmental and habitatual issues.
	Upgrade existing roads	I would object to land being taken up for completely new roads - upgrading existing roads is less impactive and better use of capital funding.
	Upgrade existing roads	This is due to the destruction of the sensitive ennvironment, and the fact that most of the time the existing network is adequate, however could be improved
	Upgrade existing roads	also i believe there are existing routes that could be enhanced for half the cost and the same benefit to commuters
	Upgrade existing roads	improve existing roads, including Southern Distributor road to deal with traffic diverted from M4 in the event of problems there
	Upgrade existing roads	I support the improvement of the roads to the east and west of Newport for economic, environmental and social reasons.
	Upgrade existing roads	I am impressed by the fact that, in addition to numerous environmental, wildlife preservation and transport sustainability groups, the FSB has expressed strong dissatisfaction with the Welsh government's proposals, as not balancing economic, environmental and affordability concerns, and believes that the easing of congestion on the existing road system could be alleviated in ways which would leave finance available for improvement projects across Wales.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Upgrade existing roads/ public transport	I would be in favour of other options, or a combination of them, i.e. an improvement of the existing road network and improvements to public transport. The latter would be more sustainable and compatible with the government's stated aim of improving the public transport system.
	Upgrade existing roads/ public transport	It would be far better to improve the existing road and increase access and efficiency of public transport.
	Upgrade existing roads/ public transport	there are other, better and cheaper ways to address the transport problems in South Wales by the improvement of public transport and existing routes
	Upgrade existing roads/ public transport	Enhancement of existing road networks and improved forms of public transport is surely a better option.
	Upgrade existing roads/ public transport	I would be in favour of other options, or a combination of them, i.e. an improvement of the existing road network and improvements to public transport. The latter would be more sustainable and compatible with the government's stated aim of improving the public transport system.
	Upgrade existing roads/ public transport	I recognise that congestion on the M4 needs addressing but we to support the development of sustainable public transport and enhancement of the EXISTING network. The only sensible option is to match fund the cost of the new road proposal instead into public transport infrastructure, an extremely exciting prospect
	Upgrade existing roads/ public transport	there are other, better and cheaper ways to address the transport problems in South Wales by the improvement of public transport and existing routes;
	Upgrade existing roads/public transport	Enhancement of existing road networks and improved forms of public transport is surely a better option.
	Upgrade existing roads/ public transport (railways)	15. So - improve rail links, local roads, for a fraction of this cost!

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Use A48 (SDR)	I find it deeply concerning that instead of making enhancements to the southern distributor road (which ironically also attemped to relieve traffic) you instead deem it appropriate to waste an utterly atonishing amount of money (billions of pounds-paid for by taxpayers) on a road
	Use A48 (SDR)	Problems of the M4 were supposed to have been addressed by the creation of the SDR road.
	Use A48 (SDR)	Problems of the M4 were supposed to have been addressed by the creation of the SDR road.
	Use existing A4810	A new road system has recently been opened south of the M4 which joins up to an existing 'southern ring road' around Newport. So, as an alternative already exists to the M4 I see no need to pave over more countryside.
	Use existing A4810	This proposed route should shadow existing road from J23A and new road on steelworks site with elevated carriageway thus minimum interference to first four SSSI sites. On west of river find a more direct route on elevated carriageways if needed to J.29 - not on SSSI. This route will have no exits and be eastbound only.
	Use existing A4810	We do not need this development! We haven't even seen how the A4810 would reduce traffic queues in an accident in Brynglas Tunnel yet.
	Use existing roads	it is not necessary. The congestion is partly caused by many people using the tunnels rather than using alternative routes that are already available and even then the congestion is no where near as bad as it once was
	Use existing roads	juncton 29, which is an elevated section of motorway which can be congested with the existing traffic pending the flow on the A48(M) and has only just been re-modified to cope with these existing traffic issues which should help alleviate traffic and queues in Newport.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Use existing roads	The traffic projections are also incredibly dismissive of the planned work and work already undertaken to improve traffic levels - are we to believe that the variable speed limits, improvements to the A465 etc are to have no impact on the M4 (and have therefore been a waste of public money)?
	Use existing roads	Alternative solutions that are already proving effective should be extended including slowing speeds further & perhaps limiting cross town connection traffic at peak times
	Use existing roads	We are not using the existing routes we have like the steelworks and distríbutor roads and Wales cannot afford over one billion pounds when councils are short of cash to do health and education.
	Use existing roads	I don't believe that it is necessary to spend a huge amount of money on yet another road, when there are already a number of routes available i.e. current M4, A48 and Llanwerns Queensway which is now open to the public. Also available are the country roads and railway
	Use existing roads	By utilising the exsisting but underused SDR and Queensway routes feeding traffic into Newport city thus assisting with its revival at teh same time as reducing congestion at the Brynglas tunnels. In conclusion Implementation of the SDR route will be a more cost effective solution than a new M4 with less impact on the environment as it will utilise mostly existing infrastructure. It will divert traffic off the existing M4 which need to access areas of Newport south of the existing M4, relieving pressure on the Brynglas tunnels. It can be introduced in phases thus providing continuous improvements over time. It will provide a continuous free flowing route for traffic diverted off the existing M4 in times of emergency
	Use existing roads	Options upgrading existing modes of transport should also be explored including local railway stations with free parking and better use of traffic information to encourage vehicles to use the SDR link and new dual carriageway through Llanwern.
	Variable Severn Bridge tolls	Improvements to current road and phasing the Severn crossings by variable tolls will alleviate the problem.

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Variable speed limits	The effective use of the existing variable speed limit system is required.
	Variable speed limits	i cannot for the life of me understand why this has come up again, after the last time i suggested having overhead signs with the speed showing every 200/300 yards as the motorway around birmingham with cameras on each one, you have put up the overhead gantries but where is the cameras
	Variable speed limits	It needs to have an actively variable speed limit depending on the current volume of traffic. It provides then a free alternative to the toll motorway.
	Variable speed limits	Simply making that entire area a 50 mph permanent limit (which the variable speed limits do pretty much the whole time anyway) banning lane changes and prosecuting tailgaters would fix the whole issue for about £1.75.
	Variable speed limits	No real positive statements or predictions have been made regarding the impact of variable speed limits to minimising stationary or slow traffic in peak times and this could be a large part of the solution.
	Variable speed limits	The traffic projections are also incredibly dismissive of the planned work and work already undertaken to improve traffic levels - are we to believe that the variable speed limits, improvements to the A465 etc are to have no impact on the M4 (and have therefore been a waste of public money)
	Widen existing M4 at Brynglas	As an alternative to the new route I would also support the widening, tunnelling and straightening of the current route although this would clearly cause immense disruption. I cannot understand why the option of widening the tunnels by demolition, cutting and covering is not assessed.
	Widen existing M4 at Brynglas	I conclude it will be much better to revisit Bryn Glas tunnel wilderness, or smaller scale improvements on A48 southern distribution. This coupled with decent investment in public transport infrastructure will in my opinion be a much better option.
	Widen existing M4 at Brynglas	The reason why the congestion occurrs is because of the Bryn Glas tunnels being of only 2 lanes. Why is there no proposal to modify the junctions and tunnels to make the road 3 lanes reducing the impact on cost and having a full new motorway

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Widen existing M4 at Brynglas	The existing roads sould just be widened especially the tunnels.
	Widen existing M4 at Brynglas	As an alternative to the new route I would also support the widening, tunnelling and straightening of the current route although this would clearly cause immense disruption. I cannot understand why the option of widening the tunnels by demolition, cutting and covering is not assessed.
	Widen existing M4 at Brynglas	expansion of the capacity of the Bryn Glas tunnels.
	Widen existing M4 at Brynglas	If the issue of the Brynglas tunnel was addressed ie widen then the existing motorway could remain in place without disruption.
	Widen existing M4 at Brynglas	The only real pinch point is the brynglass tunnel. Opening that up would cure the problem at a fraction of the cost.
	Widen existing motorway	I accept improvements are required to the existing M4 and that is exactly what should be done i.e the existing route improved by a full widening of the existing motorway and removal of bottlenecks like the Malpas tunnel via compulsory purchase and excavation of the tunnel\hill to provide the required amount of lanes.
	Widen existing motorway	My own view would be to widen the existing section of the M4
	Widen existing motorway	expanding the motorway along its current route exist that would not result in significant and large scale damage to the Gwent Levels. These alternative options also require significantly less capital expenditure provide
	Widen existing motorway	The existing roads sould just be widened especially the tunnels

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Widen existing motorway	As an alternative to the new route I would also support the widening, tunnelling and straightening of the current route although this would clearly cause immense disruption. I cannot understand why the option of widening the tunnels by demolition, cutting and covering is not assessed.
	Widen existing motorway	the three lanes into two lanes from the tolls to the tunnels need sorting out, the tunnel lighting needs sorting out or get rid of the tunnels all together then you could go three lanes(yes dig a big cutting through the hillside)
	Widen existing motorway	Widen Jt 24 to Jt 23a to three lanes in each direction
	Widen existing motorway	I accept improvements are required to the existing M4 and that is exactly what should be done
	Widen existing motorway and A48 (SDR)	I think you should extend the existing M4 motorway to 4 lanes and possibly extend the SDR to 3 lanes
	Widen existing motorway and A48 (SDR)	Viable alternatives, such as upgrading the A48 distributor road or expanding the motorway along its current route exist that would not result in significant and large scale damage to the Gwent Levels. These alternative options also require significantly less capital expenditure provide
	Widen existing motorway and A48 (SDR)	Viable alternatives, such as upgrading the A48 distributor road or expanding the motorway along its current route exist that would not result in significant and large scale damage to the Gwent Levels. These alternative options also require significantly less capital expenditure provide
	Widen existing motorway and A48 (SDR)	Viable alternatives, such as upgrading the A48 distributor road or expanding the motorway along its current route exist that would not result in significant and large scale damage to the Gwent Levels. These alternative options also require significantly less capital expenditure provide
	Widen existing motorway and A48 (SDR)	Thirdly there are much cheaper alternatives: enhancing the A48 and expanding the Brynglas Tunnels

Organisation (blank if not provided)	Category of Suggestion	Example of Participant's Response (text is as entered as provided in a participant's original response)
	Widen existing motorway and A48 (SDR)	Thirdly there are much cheaper alternatives: enhancing the A48 and expanding the Brynglas Tunnels

Appendix B

Impact of the Blue Route on Local Planning Policy Allocations

Adopted Development Plans: Newport Unitary Development Plan

The following relevant policies are allocated within Newport Council's adopted Unitary Development Plan (1996-2011) along the alignment of Professor Stuart Cole's Blue Route:

SP14: Major Road Schemes

Land will be safeguarded for the following strategic highway schemes:

- M4 relief road;
- Eastern extension to the southern distributor road along Queensway through the Llanwern Steelworks site.

SP16: Employment Sites

New industrial and business development will be located mainly in the following areas:

- Duffryn/Cleppa Areas;
- South-East Newport;
- Riverside, dock and urban areas.

SP26: Eastern Expansion Area

An expansion area is allocated to the east of the city, to include the redundant part of the Llanwern Steel Works and land to the north between the steelworks and the M4 motorway, to provide for 1,700 dwellings and a mix of business, commercial, leisure and community uses in accordance with a masterplan. Peripheral expansion elsewhere will not be permitted. The development of greenfield sites must not be allowed to do harm to the regeneration of inner urban sites.

H1: Housing Sites

UDP ref	Site Name	Hectares	Total capacity of the site	Units delivered within plan period	Affordable Housing
2	Spytty Pill/Corporation Road	3.20	120	120	-
53	Former Llanwern Steelworks	24.00	600	600	-

H1(53): Former Llanwern Steelworks

The western end of the former Llanwern Steelworks provides a major regeneration opportunity with the potential to provide a sustainable urban extension incorporating a variety of uses within a Transport Development Area. Residential uses will be part of the redevelopment, with these expected to be at the western end of the site. 600 dwellings are included for the plan period, and with an area of 240 hectares of brownfield land on the steelworks site, further development is likely to be considered for the period after 2011.

ED1: Employment Land Allocations

Site Name	Hectares	Comments
Tatton Farm and east of Queensway Meadows	88	Approximately 20 hectares should be for large scale projects of national interest sufficient to outweigh clearly the environmental impacts on the Nash and Goldcliff Sites of Special Scientific Interest (SSSI)
Newport Docks	30.5	Class B1, B2 and B8 uses

ED2: Urban Regeneration Sites

In the following areas appropriate redevelopment schemes will be encouraged:

Site Name	Hectares	Comments
Old Town Dock/George Street	10.6	For a combination of B1 and other commercial, leisure and residential uses
Llanwern steelworks	240	For a combination of business, commercial, distribution leisure, residential and community uses

WD1: Landfill or landraising requirements for general household and commercial waste will continue to be accommodated at the docks way waste disposal site

At current tipping rates it is estimated that approximately 15 years remain before the levels of the landfill site are raised to a maximum 32 metres Above Ordnance Datum. However, indications seem to suggest that rates of tipping have reduced following the introduction of the Landfill Tax.

It is therefore acknowledged that various factors during the Plan Period may contribute to uncertainty about the operational duration of the Docks Way site. Such factors could also include the alignment of the proposed M4 Relief Road, its timing and final design solution. The situation thus needs to be monitored closely and, if appropriate, considered in a future review of the Plan in conjunction with an emerging waste disposal strategy for the local authority area.

WD2: Land at Greenmoor is allocated for the tipping and storage of steelworks waste

Major industrial waste producers in the County Borough have their own licensed sites. These include Corus (British Steel) whose established disposal area is situated to the south-east of the works. This is a mixed landfill and storage site with the storage of material being undertaken to make provision for future recycling. Particular care is required with this site in order to minimise adverse effects on the SSSI. The site is affected by the Secretary of State's preferred line for the M4 Relief Road which would effectively reduce the operational area. Following the discontinuance of steel making at Llanwern, the Welsh Government has notified the Council of an increased width corridor for the line of the proposed M4 Relief Road, allowing movement of the road to the north, away from the Gwent Levels SSSI. This would further reduce the potential tipping area.

Adopted Development Plans: Monmouthshire Unitary Development Plan

The following relevant policies are allocated within Monmouthshire Council's adopted Unitary Development Plan (2006-2011) along the alignment of Professor Stuart Cole's Blue Route:

E1: Industry and Employment

The following sites are identified for new industrial and business development (classes B1, B2 and B8 of the Town and Country Planning Use Classes Order 1987):

Site Ref.	Site Name	Hectares	Use Class	Planning permission
E1j	Magor Business Park (Denotes a Prestige employment site)	6.9	B1 (B2,B8)	No
E1k	Quaypoint, Magor	19.2	B1, B2, B8	Yes

Emerging Development Plans: Newport Local Development Plan

The following relevant policies are allocated within Newport Council's emerging Local Development Plan (2011-2026) along the alignment of Professor Stuart Cole's Blue Route:

SP16: Major Road Schemes

Land will be safeguarded for the following strategic highway schemes:

- M4 motorway junction 28 Tredegar Park interchange improvement;
- Eastern extension of the Southern Distributor Road along Queensway through the Glan Llyn regeneration and Llanwern steelworks sites.

H1: Housing Sites

LDP ref	Site Name	Hectares	Total capacity of the site	Units delivered within plan period	Affordable Housing
16	Penmaen Wharf	0.83	160	160	0
23	Transton Lane	0.76	21	21	0
28	Church Street	0.15	16	16	16
38	Lysaghts Village (Orb Works)	-	549	549	25
45	Lysagths	-	176	176	0
47	Glan Llyn (Former Llanwern Steelworks)	-	4000	2794	800
52	Old Town Dock Remainder	13.9	300	300	0

EM2: Regeneration Site

Site Name	Hectares	Comments
Llanwern Former Steelworks eastern end	39.5	For B1, B2 and B8 uses
Llanwern Former tipping area south of Queensway	122	For B1, B2 and B8 uses

EM3: Newport Docks

An employment land allocation of 206 hectares is made for the existing employment site of Newport Docks for B1, B2 and B8 uses.

R7: Retail Proposals in Newport Retail Park District Centre

Newport Retail Park is a district centre to provide local shopping facilities for the eastern expansion area. The scale of the existing retailing and other facilities in and around the Newport retail park has the capacity to perform a much wider role.

CF13: School Sites

New or enlarged schools are required at Duffryn High.

W1: Waste Site Allocations

Land is safeguarded for waste disposal purposes at the Docks Way waste disposal site.

Emerging Development Plans: Monmouthshire Local Development Plan

The following relevant policies are allocated within Monmouthshire's Council's emerging Local Development Plan (2011-2021) along the alignment of Professor Stuart Cole's Blue Route:

SAE1: Identified Industrial and Business Sites

Site ref.	Site Name	Hectares	Jobs potentially created	Comments
SAE1b	Quay Point, Magor	19.6	1,962	For B1, B2 and B8 uses

SAE2: Identified Mixed Use Sites

Site ref.	Site Name	Hectares	Jobs potentially created	Comments
SAE2c	Rockfield Farm, Undy	4.0	516	For B1 uses

SAE3: Protected Employment Sites

The following existing sites as indicated on the Proposals Map are protected for industrial and business development (classes B1, B2 and B8 Town and Country Planning Use Class Order 1987):

Site ref.	Site Name	Comments
SAE3o	Magor Brewery	Protected for industrial and business development (for B1, B2 and B8 uses)
SAE3x	Wales One, Magor	Protected for industrial and business development (for B1, B2 and B8 uses)

SAW1: Identified Potential Waste Management Sites

Site ref.	Site Name	Hectares
SAW1b	Quay Point, Magor	19.2

SAH5: Rockfield Farm, Undy

10.4 hectares at Rockfield Farm, Undy site are allocated for mixed use residential and employment development. Planning permission will be granted provided that:

a. No more than 200 new dwellings are provided during the LDP period;

b. Provision is made within the site for four hectares of land for industrial and business development (Class B1 of the Town and Country Planning (Use Classes) Order);

c. The master plan for the development takes account of the SINC at the site;

d. A Section 106 Agreement has been signed that, in addition to standard requirements, includes provision of any necessary off-site highway improvements to the highway network through Magor/Undy;

e. A Section 106 Agreement has been signed that, in addition to standard requirements includes provision for making an enhanced financial contribution to community facilities in the Magor/Undy area;

f. A Section 106 Agreement has been signed that, in addition to standard requirements, include provision for making and enhanced financial contribution to community facilities in the Magor/Undy area;

g. It is ensured that safeguarding routes for a potential Magor/Undy by-pass and for a potential M4 Relief Road are not prejudiced by the development.

MV10: Transport Routes and Schemes

The following transport routes and schemes will be safeguarded from development that would be likely to prejudice their implementation:

Welsh Government Road Schemes:

- M4 Corridor enhancement scheme Magor to Castleton (length in Monmouthshire to be safeguarded indicated on Proposals Map)

Monmouthshire County Council Road Schemes

- B4245/M48 Link Road.