Y PWLLGOR AMGYLCHEDD A CHANALIADWYEDD v5
CYNYLLIAD CENEDLAETHOL CYMRU
CYNIGION LLYWODRAETH CYMRU AR GYFER YR M4 YN ARDAL CASNEWYDD

YMATEB O: Yr Athro Stuart Cole, CBE BA MSc FCILT FICE, Athro Emeritws mewn Trafnidiaeth, Canolfan Ymchwil Trafnidiaeth Cymru, Prifysgol De Cymru

NATIONAL ASSEMBLY FOR WALES
ENVIRONMENT AND SUSTAINABILITY COMMITTEE
GOVERNMENT PROPOSALS FOR THE M4 AROUND NEWPORT

SUBMISSION FROM: Professor Stuart Cole CBE BA MSc FCILT FICE,
Emeritus Professor of Transport, Wales Transport Research Centre, University of South Wales

INTRODUCTION

This submission presents the traffic and economic aspects of schemes for reducing congestion on the M4 corridor around Newport. It draws attention to the assumptions made in respect of future traffic expectations and refers briefly to environmental consequences. The submission proposes an alternative lower cost, more environmentally sensitive route, based on the lower road capacity which could be needed.

Integrated Transport Policy Context

The draft plan for the project *M4 Corridor around Newport'* published by the Government (23 September 2013) itself says 'it does not include public transport measures because the Welsh Government has commissioned a separate study and report on proposals to develop a Metro system for south east Wales'

Over the longer term the Sewta Rail Strategy proposes over twenty new stations at for example Llanwern and Coedkernew; increased capacity on the Ebbw Valley line, and a new line to Creigiau and Beddau. The objective is to attract car commuters away from the M4, A470 and other key routes and onto the railway.

The Sewta plan concludes: 'several of its recommendations should be packaged to form an M4 corridor corporate strategy to provide realistic alternatives to car use in this congested corridor'. The forthcoming M4 public consultation should include the Cardiff Regional Metro, electrification of the SWML, the Sewta plan and the omitted A48 / steelworks road upgrade option. If it does not, then there is no integrated

transport element; it would be contrary to Government transport policy and it would be a mistake.

Causes of congestion on the current M4 - Summary

- Its original design as the Newport northern by pass / northern distributor road later linked in to the M4. It has design faults resulting from that including the lack of a hard shoulder for some of its length. Its resultant capacity is insufficient for current traffic volumes.
- The Brynglas Tunnels and adjacent structures (Usk bridge; steep climbing structure to the east; canal bridge to the west) which reduce a six lane motorway to four lanes
- The M4 is used by local traffic as a local distributor road for short journeys within the local urban area.

In addition the resilience of the M4 at times of temporary traffic disruption requires an alternative route

Traffic requirements and transfers

The consultation paper *M4 Corridor around Newport* forecasts a need for 20% more traffic capacity by 2035

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 (based on Option C figures) to divert 6% - 10% but this may be an underestimate and 15% might be more appropriate. This paper suggests a rationale and forecast reassessment be carried out.

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. On the basis of for example the Newcastle upon Tyne Metro (1990's) and the Bordeaux Tram network (2004) then an expected 20% - 30% transfer of peak traffic would be a conservative assessment.

Rail electrification alone could reduce M4 peak traffic flows by 15%. This level of modal change and rail increased demand would justify the total investment in track, stations, train / tram train / tram rolling stock, buses and interchange hubs and obtain an acceptable benefit cost ratio (BCR).

The Blue Route is likely to solve the congestion issue on the M4 as it arises. It will match forecast flows as they progress over the evaluation period and could provide congestion relief earlier than the Black / Purple Routes. The combined project with Metro / rail electrification could provide more than adequate relief to congestion over the period to 2035 based on the potential outputs of the re-run forecasts and actual growth

The construction logic also fits in that the congestion solution can be part – completed within five years and part over the following ten to fifteen years. This also runs in parallel with Welsh Government funding options

GOVERNMENT OPTIONS / ANOTHER OPTION

Additional capacity is required to reduce peak period traffic congestion on the M4 to the west, north and east of the Newport urban area of Newport. This is not in question.

The Government's proposals initially included four options including a section of the A 48 Newport Southern Distributor Road (SDR) now along with the Steelworks Road included in the Blue Route and put forward in this submission. The Government options referred to are:

- **Option C**: existing A48 with grade separated junctions (WelTAG, March 2013) Now discontinued from the range of options by the Government
- **Red route**: all – purpose new dual 2 – Lane road (WelTAG, 24 June 2013)
- **Purple route** / **Black Route** – the full motorway standard proposals

The completion date of 2033 was based on affordability if borrowing powers were not available. This remains the case currently. 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. All borrowing would have to be within the PSBR cap set by HM Treasury.

The transfer of the Severn Bridge tolls by England's Department for Transport thus foregoing a lucrative 'cash cow' when facing budget cuts is unlikely unless maintenance costs escalate post concession.

- **Blue Route** (proposed in this submission)
  The issue is whether the Black / Purple Routes proposed by the Government provide an unnecessary increase in capacity and in consequence unnecessary expenditure. The analysis considers whether the options on the basis of traffic forecasts a lower cost lower capacity and lower environmental impact option (called in this submission the Blue Route) would be more appropriate. A detailed description is shown below. Mapping of the route is shown in *M4 Corridor around Newport* (p8; p27-28).

The Blue Route proposal is a combination of the A48 Southern Distributor Road upgrade (as in Option C) together with the Steelworks road re-constructed as a 2 lane dual carriageway all – purpose road at motorway standard. The land acquired was sufficient for widening to a 3 – lane motorway standard at a future date.

The Blue Route involves 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.

Cost Estimates – M4 Corridor Options

Cost estimates of the various schemes are available[1], based on existing Department for Transport and Welsh Government guidance, and subject to caution. The cost estimates assumed each scheme to have an opening year of 2020, and include construction costs, land and property costs, preparation and supervision costs, and traffic-related maintenance costs.

A48 Grade-Separated Junctions as "Option C" -	£345m
Dual Carriageway on the Red Route -	£830m
Motorway on the Black Route -	£936m
Blue Route (A48 / SWRd) -	£380m

TRAFFIC FORECASTS – *M4 CORRIDOR AROUND NEWPORT*

UK Government road traffic forecasts continue to show traffic growth but other research shows that car usage has fallen since 2006 and plateaued with slow future growth.

There is sufficient uncertainty therefore to question whether what is needed is a major new motorway (£936 m) (based on older forecasts and not taking account of recent car flow trends) or a considerably lower cost alternative (£380m) – The Blue Route.

This option rebuilds, with grade-separated inter-sections, the A48 south of Newport and the Steelworks road (A 4810) the latter purchased from Tata Steel by the Welsh Government to increase east – west road capacity and reduce M4 congestion. The lower cost scheme could be constructed by 2018.

The Steelworks Road was purchased by the Government from Tata Steel in 2006 to provide land to build a 7 km long section of the M4 relief motorway from J 23A. It was intended to link into the A 48 between J 24 and J 28. Both roads would then

[1] http://wales.gov.uk/docs//det/publications/130626m4weltagcemen.pdf

have grade separated junctions constructed. This scheme has been developed into the Blue Route

The primary reasons for putting forward the Blue Route are:

- 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 disbenefits 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.
- 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.

Traffic forecasts – discussion

The traffic forecasts in the consultation document *M4 Corridor around Newport* (Fig 5 page 11) indicate an increase in traffic of 20% over the period to 2035.

This forecasting model (TEMPRO) uses assumptions on projections for the following variables

- Population
- Household
- Workforce
- Employment

As indicated above it excludes public transport proposals and their possible impacts on traffic flows

The traffic flows on the M4 north of Newport over the period 2006 – 2013 has been relatively level as shown in the Government's own publication *The M4 Corridor around Newport* (Fig 3 and Fig 4 page 10)

There was substantial growth in the late 1990's but a levelling off from 2001 with a slight fall to 2012. There is therefore limited traffic evidence to suggest any change from the traffic flow plateau which has been in evidence since 2001 and a falling mean line from 2005.

The underlying trends for traffic over the last eight years have been affected by:

- The economic downturn with static wages falling in real terms or unemployment reducing work journeys
- Traffic congestion on strategic routes resulting in a transfer to train
- Improvements in rail service capacity and reliability following investment by the Government in rail services since the new franchise took effect in 2004 / 05.
- The increase in petrol costs compared with rail fares has resulted in a cross price elasticity effect with a modal shift from car to rail
  (Please see Integrated Transport Policy Context above)

In his paper to recent conferences Professor Peter Jones (CILT(UK) Public Policies Committee, London/ TUSG (UK) Conference Cardiff, 2013) suggests possible causal variables for the flattening of car usage

- Increases in car costs
- Income and GDP effects
- Deterioration in road conditions
- Improvements to the rail network
- Spatial planning policies
- Smarter choices
- Improved mobile and internet Communications
- Company car ownership and free fuel taxation regulations relating to payment in kind, have cut the number (in Great Britain) of taxpayers claiming both car and free fuel

The company car change and income and GDP are only two variables which will be counteracted by the others having a negative effect on car usage

Professor Phil Goodwin (UK Transport Statistics Users Group Conference, Cardiff, May 2013) suggested non – transport trends as causal variables in the plateauing of car use.

- Rise in mobile phone computing
- Cultural and attitude changes
- Health, and environment as motivational factors to cut down on car use
- Demographic changes – aging population; more single person households; women having children at a later age; young people and ‘empty nesters’ going back to live in city centre locations
- Changing images of contemporary life idyllic living and travelling lifestyle
- Projected revenue growth of online shopping and the growth in internet access, e-mails etc. from mobile phones has, and will increasingly reduce work and retailing journeys

There are other developments in urban transition, transport and taxation policy:

Urban Policy and Transition – economically wealthy cities with high incomes and growing population show the greatest reduction in car use. There have been reductions in car use in medium sized towns and in 'sustainable travel towns' (2004 – 08) and lower car use in high density new urban develop. This is the case in Cardiff and Newport. Thus policy impacts and lifestyle change has also reduced car usage and is not restricted to an economic downturn.

Some evidence suggests that the cumulative effects to discourage car use and encourage walk/cycle/public transport also have bigger impacts on car use than income and prices. The recent Active Travel Act should have that effect

Tax revenue from the transport sector especially fuel excise duty had little effect on car usage until the mid – 2000's

Demand Management e.g. parking and road charging by usage; access quantity limits or prohibition

Position in Wales

Between 2007 and 2011 Wales saw reductions in traffic of

- Cars - 4%
- Motorcycles - 11%
- Buses/coaches - 14%
- Goods vehicles - 16%
- Pedal cycles + 26%
- All motor vehicles - 4%

The stock of vehicles and the number of new registrations has fallen

There could be several reasons for this change in Wales:

- A modal shift to other forms of transport
- buoyancy of the economy or high fuel prices
- Longer term influences such as demographic change or behavioural change such as concern for the environment; geographical travel patterns;
- short term influences on car use are fuel prices (price elasticity) and incomes
- In the longer term population growth will give a rise in average car usage. Wales, population projections for the under 29 and 30 – 69 age groups (the biggest car users) are fairly constant from 2010 to 2034.

Traffic forecast conclusion

The conclusions to be drawn on future trends not peculiar to this project but applicable to most British and European Union road projects are:

- The presumption that car mileage has peaked arises from contrasting trends of reduced car usage in London; increases in rural areas. It might be suggested therefore that an area such as the Cardiff, Newport (and Valleys / Vale) and Bristol could be in between those two extremes
- After the recession ends, will there be a lower level of car usage in absolute terms and will the rate of increase be similar to that in the immediate pre – recession
- The forecast outcome (in *M4 Corridor around Newport*) does not reflect the recent trend and show a sharp uplift from 2012 to 2030 of 20%. An average growth of just over 1%
- The assumptions are based on economic activity and car ownership rather than projected changes in modal split with no interpretation of the impact of major rail investment.
- It is the uncertainty of the projections as suggested here and by the President of the Institution of Civil Engineers (ICE) Professor Brian Clarke. Professor Clarke made two key points at the National Transport Conference in Cardiff (September 2013) – (a) we are not sure if private motoring has peaked and (b) we are not sure if the trend in reduced driving by young males will continue
- It is uncertain if the peak of car usage has been reached; that situation is contested, as the discussion over the Blue and Black / Purple Route options shows. A resolution needs to be achieved before the decision to build the Black / Purple Route or the Blue Route
- The main drivers of the growth on car use – income, prices (e.g. fuel, competing public transport), population size and projections have not changed in any major way.
- 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
- Two large, respected business groups in Wales the FSB and the CBI both recognise the need for additional road capacity around Newport. The CBI refers to a M4 relief road being their first priority. The FSB specifies a grade-separated A48 / Steelworks Road as being sufficient capacity and investing a large proposition of borrowing in one scheme is not in the best interests of the Welsh economy

BLUE ROUTE ALTERNATIVE OPTION

Description of the scheme

As this option is not set out in the consultation document *M4 Corridor around Newport* a summary of the WelTAG Stage 1 analysis is set out here. A comparison of WelTAG Stage 1 scores for the Government proposals and this alternative are shown in Appendix 1. A map is also provided showing all options.

Up to March 2013 the Government Option C proposal had been assessed against the WelTAG criteria. The option would 'improve the resilience of the network (including the M4) and could be phased to spread investment costs. 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*". 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' – extract from WelTAG Stage 1analysis (March 2013)

The Blue Route proposal is a combination of the A48 Southern Distributor Road upgrade (as in Option C) together with the Steelworks road re-constructed as a 2 lane dual carriageway all – purpose road at motorway standard. The land acquired was sufficient for widening to a 3 – lane motorway standard at a future date.

The Blue Route involves 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.

The junctions where this may be feasible are Pont Ebbw, Maesglas West / East, Docks Entrance, Usk Way, Corporation Road, Nash Road, Queensway Meadows, Hartridge and Beatty Road. The intersection at Queensway Meadows could also be the link onto the A4801 Steelworks Road. This would facilitate two links onto the M4 at J24 and J23a respectively.

At the western end of the A48 north of Tredegar House conservation area and entering the M4 at J 28 there is currently a confluence of high peak traffic flows. The present A48 becomes a single carriageway 4 lane road between the Pont Ebbw junction and J28 on the M4. Currently there are traffic flow constraints at peak periods. There are Government proposals for redesigning this largely at grade junction.

The 4 lane single carriageway road will require dualling to be able to carry the anticipated additional traffic particularly from the A487 and the M4 There is woodland to the north adjacent to Tredegar Park sports facilities which could be affected. To the south are UK Government and Agency offices with car parking and some recent tree plantings immediately adjacent to the highway. The National Trust property at Tredegar House is not compromised by this scheme.

Land take

This is best shown on a map of the area which can be made available to the Committee.

The Blue and Purple motorway options will take considerably more greenfield land than the proposed Blue Route which concentrates construction on using the existing road footprint, ex industrial land at Llanwern Steelworks with some limited areas of greenfield land

Economic impact

The upgrade of the A48 / SWRd could improve journey time reliability on the existing M4 corridor around Newport by offering an alternative route to the M4 in general and also in the event of major incidents on the present M4. This relief of traffic could improve the efficiency of long distance traffic (freight and people) thus providing improved connectivity to / from England and thus contribute to employment. An improved A48 passes through important retail, distribution and manufacturing areas.

Initial traffic modelling showed that travel time on the network could be reduced as a result but there would be delays during construction. This last issue has been a consideration on the improvement of for example the M4 at Cardiff Gate but has in such cases been put aside as a reason for not proceeding with construction.

Environmental impact

The Red Route and the Purple / Black Routes (new M4) cross the River Usk SAC and SSSI and the Gwent Levels SSSI.

The Blue Route will touch the Gwent Levels SSSI at Barecroft Common and is therefore not free of any adverse environmental impact. However the Steelworks Road extension has now been constructed (see below) with a single carriageway link to J23a.

The Blue Route should give by far the lowest environmental impact for any road network improvement. As the new Steelworks road has largely been constructed as an at - grade roadway this would militate against any further adverse environmental consequences.

The grade separated junction construction would create some issues but this could coincide with the proposed construction of 4000 houses on the adjacent land. However the resultant more freely flowing traffic could be expected to reduce emissions and noise.

This route should reduce traffic congestion on the M4 and thus environmental impacts there; there will be some increase in traffic noise along the A48 / SWRd. 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.

Social impact

North of the Steelworks Road section of the proposal, south of the GWML railway and west of the Llanwern Steelworks, the Glan Llyn and other developments will result in 4,000 houses and 40 ha of employment land. This site will be accessed by the Steelworks Road.

At present, the access junctions are at grade controlled by traffic lights or roundabouts. This proposal would see these changed to grade–separated junctions. This should improve accessibility to the 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).

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. This applies particularly to the Purple/Black routes because as motorway options they would not include any provision for cyclists and walkers.

CONCLUSION

- Review the current forecast assumptions bringing in those causal variables suggested above
- Consider the wider context includes recognition of the benefits of avoiding construction on environmentally sensitive sites south of Newport
- Consider the substantial cost savings that would be made in pressing ahead with the Blue Route (A48 Southern Distributor Road and the Steelworks Road) proposal set out below rather than a new M4,
- Consider the wider financial context and significant spare borrowing capacity being available to the Welsh Government for measures to complement the A48, including bringing forward the plans for a Metro system and other transport infrastructure projects in south-east Wales.

Professor Stuart Cole
October 2013

(Appendix 1 follows)

Appendix 1

M4 Corridor around Newport WelTAG Stage 1 Comparison of Option Scores

Criteria	Doing Nothing	Red Route All-Purpose Road	Purple Route Motorway	Black Route new M4	Blue Route
Economy					
Transport Economic Efficiency (TEE)	(---)	(++)	(+++)	(+++)	(++)
Economic Activity and Location Impact (EALI)	(---)	(++)	(++)	(+++)	(++)
Environment					
Noise	(--)	(0)	(0)	(+)	(+)
Local Air Quality	(--)	(+)	(+)	(++)	(+)
Greenhouse Gas Emissions	(-)	(0)	(+)	(+)	
Landscape and Townscape	(0)	(---)	(---)	(---)	(0)
Biodiversity	(0)	(---)	(---)	(---)	(-)
Heritage	(0)	(--)	(--)	(--)	(0)
Water environment	(0)	(--)	(--)	(--)	(0)
Soils	(0)	(---)	(---)	(--)	(0)
Social					
Transport safety	(--)	(++)	(+++)	(+++)	(++)
Personal security	(0)	(+)	(+)	(+)	(+)
Permeability	(-)	(+)	(+)	(+)	(+)
Physical fitness	(0)	(+)	(0)	(0)	(+)
Social inclusion	(-)	(0)	(+)	(+)	(0)
Equality,	(0)	(+)	(+)	(+)	

Diversity & Human Rights					