

Adran yr Economi a'r Seilwaith
Department for Economy and Infrastructure



Llywodraeth Cymru
Welsh Government

This document is an update to the ‘Proof of Evidence – Chief Witness’ document WG 1.1.1. It contains an update following the addition of the bridge protection measures in the DRAFT AMENDMENT (NO.2) SCHEME ORDER and a general update on the works to address the allegation of serious detriment upon Newport Docks by Associated British Ports (ABP).

Scheme Evidence Update

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Welsh Government, Economics

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Contents

1.	Author	3
2.	Scope and Purpose of this Scheme Evidence Update	4
3.	SCHEME EVIDENCE UPDATE	6
3.1.	Works within Newport Docks	6
3.2.	Economic Appraisal	7
3.3.	Scheme Costs	7
3.4.	Scheme Benefits	10
3.5.	The Severn Crossing Tolls	11
3.6.	Economic Appraisal Results	12
3.7.	Wider Economic Impact Assessment	15
4.	Conclusion	18
4.1.	Economic Appraisal	18
4.2.	Wider Economic Impact Assessment	19

1. AUTHOR

- 1.1 My name is Stephen Bussell. I am an Associate at Ove Arup and Partners Ltd, a multi-disciplinary consultancy. My professional qualifications are set out in my main Proof of Evidence (WG 1.3.1) and are not repeated here.

- 1.2 The evidence which I have prepared and provide in this Scheme Evidence Update is true and I confirm that the opinions expressed are my true and professional opinions.

2. SCOPE AND PURPOSE OF THIS SCHEME EVIDENCE UPDATE

- 2.1 This Scheme Evidence Update provides updated evidence for the Welsh Government's Scheme as modified by the August 2017 draft amendment to the Scheme Order to include proposals for bridge protection measures in the vicinity of the Junction Cut and the works required to address the impact upon Newport Docks.
- 2.2 The Scheme Evidence Update also takes into account the UK Government's decision to remove the tolls from the Severn Crossings from December 2018.
- 2.3 The following sections of my main Proof of Evidence are thus withdrawn to be replaced with this Scheme Evidence Update:
- Stephen Bussell Economics Proof of Evidence (WG 1.3.1)
- 2.4 Section 4.3 (Appraisal Period)
- 2.5 Section 4.13 and 4.14 (Severn Crossing Tolls)
- 2.6 Section 4.54 (Calculation of Scheme Costs)
- 2.7 Sections 4.55 to 4.62 (Investment Costs) and Table 1 (Scheme Budget)
- 2.8 Sections 4.6.5 to 4.7.2 (Economic Appraisal Results: Core Scenario, Sensitivity Analysis Severn Crossing Tolls)
- 2.9 Section 5.90 to Section 5.9.5 (Other Impacts – Impacts on Newport Docks)
- 2.10 Section 7 (Conclusions)
- Stephen Bussell Economics Summary Proof of Evidence (WG 1.3.2)
- 2.11 Sections 4.16 to 4.19 (Results of the Economic Appraisal) Sections 6.2 and 6.3 (Conclusions)

2.12 Aspects of my evidence interface with the evidence of other witnesses including Mr Matthew Jones, Mr Jonathan Vine, Mr Andrew Meaney and Mr John Davies in respect of Newport Docks, and Mr Bryan Whittaker in respect of the Severn Crossing Tolls.

2.13 My evidence is presented in the following structure, with a detailed contents provided at the start of the document.

1. Author
2. Scope and Purpose of this Scheme Evidence Update
3. Scheme Evidence Update

3. SCHEME EVIDENCE UPDATE

3.1. Works within Newport Docks

- 3.1.1. Since the publication of the original draft Orders for the M4CaN Scheme, the Welsh Government has held discussions with ABP regarding the impact of the proposed Scheme on the water and land based operations that ABP carry out at Newport Docks. The Welsh Government are proposing to provide the following works to address the impact of the proposed Scheme on Newport Docks:
- a) The phased creation of approximately 303m of new quay on the north side of South Dock;
 - b) Refurbishment of 250m of quay on the south side of South Dock (at the eastern end of the Coal Terminal);
 - c) Provision of a moveable bridge to facilitate mobile harbour cranes, other port equipment and HGVs to cross the extended junction cut from west to east (and vice versa) of South Dock; and
 - d) Preparation of areas of land and provision of premises to facilitate the relocation of ABP, tenants and occupiers of the port that are affected temporarily and permanently by the scheme, including site preparation, new buildings, hardstandings and infrastructure.
- 3.1.2. The Welsh Government has also worked with ABP to develop a solution that reduces the level of residual risk of a ship impact to the River Usk Crossing, where it passes over the Junction Cut. The current proposal is to narrow and extend the Junction Cut (within the South Dock only) and revise the entry parameters and protocols for the North Dock.

3.2. Economic Appraisal

3.2.1. The Welsh Government has updated its cost estimate for the Scheme to account for the costs of the proposed mitigation measures described in Section 3.1. The construction programme and Scheme opening date has also been revised to take account of the timescales of the above works. The Revised Economic Appraisal Report Supplement No. 2 (Document 2.8.7) updates the results of the economic appraisal of the Scheme for the revised cost estimates. It builds on and updates Revised Economic Appraisal Report Supplement March 2017 (WG 2.5.3) which related to the March 2017 Supplement to the draft Orders (Easbound Off-slip).

3.3. Scheme Costs

- 3.3.1. The capital cost of the Scheme has been updated to account for additional works at Newport Docks in respect of the creation of new quayside, the provision of a moveable bridge to facilitate the movement of vehicles across the Junction Cut, costs related to the relocation of tenants and other facilities and bridge protection works.
- 3.3.2. The construction costs (excluding optimism bias) of the bridge protection measures are estimated at £17.5m. The costs of the other works within Newport Docks, over and above existing allocations within the land and compensation allowance, are estimated at £167.5m. This includes specific allowances for risk and contingencies of £31.2m.
- 3.3.3. The costs associated with the current design stage (Key Stage 4) have been increased by £22m which reflects the extended Public Local Inquiry process. Although some of this expenditure is effectively a 'sunk cost', costs already incurred during Key Stage 4 have been included in the appraisal in order to retain consistency with previous iterations.

- 3.3.4. In accounting for these costs, the Welsh Government has undertaken a review of the risk allowances in the project cost estimate. A number of risk items, which had previously been identified in the Employers Risk budget, have now been realised and further work has been undertaken on developing the design of the proposed Scheme.
- 3.3.5. An uplift of 4% has been applied to the project cost estimate to account for the potential for Optimism Bias in the estimation of Scheme costs. This amount is derived from the default uplifts provided in WebTAG for a highway scheme at a mature stage of development. Specific and additional Optimism Bias allowances are included in the costs for the bridge projection works, the eastbound off-slip (added to the Scheme subsequent to the appointment of the ECI contractor) and the proposed reclassification works (which sit outside the ECI contract). The net result of these changes is a reduction in the Risk and Optimism Bias allowances of £17.5m, although this does not take into account the additional £31.2m of risk associated with the Docks.
- 3.3.6. The net effect on the capital costs of the Scheme is an increase in total Scheme costs of £189.5m from £1.131bn to £1.321bn. The expenditure profile has also been updated to take account of delays in the Public Local Inquiry process and the requirement to undertake additional works in Newport Docks in advance of the construction of the proposed Usk Crossing.

Table 1: Scheme Investment Cost (Q4 2015 prices, £millions)

Component	Scheme Costs (December 2016 Revised Economic Appraisal Report)	Eastbound off-slip net additional costs	Updated Scheme Costs (March 2017 Revised Economic Appraisal Report Supplement)	Newport Docks Mitigation and Bridge Protection Works net additional costs	Updated Scheme Costs (December 2017 Revised Economic Appraisal Report Supplement No.2)
Preliminaries including Traffic Management	£212.0	+£1.1	£213.1	-	£213.1
Roadworks	£268.0	+£1.2	£269.2	-	£269.2
Structures	£296.9	+£0.1	£297.0	£17.5	£314.5
Landscaping and environmental works	£44.8	+£0.1	£44.9	-	£44.9
Works by other authorities	£38.3	+£0.5	£38.8	-	£38.8
Land and Compensation costs	£92.0	+£0.3	£92.3	-	£92.3
Risk and Optimism Bias	£141.3	(+£1.5 less £4.8) = - £3.3	£138.0	-£17.5	£120.4
Project Estimate excluding VAT and Inflation	£1,093.2	-	£1,093.2	-	£1,093.2
Key Stage 4 Costs	£22.0	NA	£22.0	+£22.0	£44.0
Reclassification and reconfiguration of Caerleon Junction ¹ (including OB)	£16.2	NA	£16.2	-	£16.2
Newport Docks Works	-	-	-	+£136.3	£167.5
Newport Docks Works – Risk and Contingencies	-	-	-	+£31.2	
Total Costs	£1,131.3	-	£1,131.3	+£189.5	£1,320.8

¹ These costs are not being delivered as part of the contract to construct the proposed new motorway.

3.4. Scheme Benefits

- 3.4.1. Scheme benefits are calculated over a 60-year period from the scheme opening year. The December 2016 Revised Economic Appraisal Report assumed an opening year of 2022 and as such benefits were calculated for the period 2022 to 2081. Due to the additional works within the Newport Docks, the new section of motorway will not be open to traffic until December 2023. In view of this, the appraisal period has been revised such that it spans the period 2024 (the first full year of operation) to 2083. This change has been applied to impacts occurring during operation. Given that they have a lesser impact on the overall appraisal, no equivalent adjustment has been applied to impacts occurring during the construction of the Scheme and the costs and benefits of periods of maintenance. Similarly, no changes have been applied to the monetised benefits of reducing accidents.
- 3.4.2. The calculation of Scheme benefits is based on outputs from the M4CaN Transport Model. The changes outlined in Section 3.1 have no impact on the alignment of the proposed Scheme or on traffic conditions. Therefore, apart from the change in appraisal period, the calculation of Scheme benefits is unchanged from the December 2016 Revised Economic Appraisal Report, as amended by the March 2017 Revised Economic Appraisal Report Supplement.

- 3.4.3. The modelled years are 2022 (scheme opening year), 2037 (scheme design year) and 2051 (the last year for which NTEM² traffic growth forecasts are available). The M4CaN Transport Model has not been updated to account for the change in Scheme opening year from 2022 to 2024. Impacts occurring in intervening years – including for 2024 – are calculated using straight-line interpolation of the outputs of the 2022, 2037 and 2051 model years. This is considered a proportionate approach given that the implications for traffic conditions of a single year of additional traffic growth are likely to be slight.
- 3.4.4. Forecast growth in traffic and therefore congestion on the existing M4 means that the benefits of the Scheme in the period 2024 to 2083 are higher than the benefits of the Scheme in the period 2022 to 2081. Whilst the benefits of the Scheme will be realised later than anticipated (and thus will be discounted more heavily³), this is more than offset by the effect of traffic growth. Therefore, the net effect of postponing the scheme opening year is a very slight increase in user benefits.

3.5. The Severn Crossing Tolls

- 3.5.1. The December 2016 Revised Economic Appraisal Report (and the March 2017 Supplement) was based on an assumption that the Severn Crossing Tolls will be reduced to approximately half their current level. This assumption was adopted following the March 2016 Budget, within which the UK Government announced its intention to retain tolls on the Severn Crossings at half their current levels.

² National Trip End Model

³ In accordance with transport appraisal guidance, costs and benefits are discounted to a base year of 2010. Discounting is a technique used to compare costs and benefits that occur in different time periods. Therefore, the economic appraisal places greater weight on costs and benefits that occur in earlier years of the appraisal than impacts which occur in later years.

- 3.5.2. Subsequently, in January 2017, the UK Government published a Consultation Document on the future of the Severn Crossing Tolls. This document set out the UK Government's proposals for the future of the Severn Crossing Tolls and continued to suggest that the tolls would be halved. However, during the run up to the 8th June General Election, most of the major political parties in the UK indicated their intention to remove the tolls from the Severn Crossings.
- 3.5.3. The final outcome and UK Government response to the Severn Crossing Tolls consultation was released on 15th September 2017. This stated that the Severn crossings will be given over to public control on 8th January 2018 and the tolls will be removed no later than 31st December 2018.
- 3.5.4. To retain consistency with previous iterations of the economic appraisal of the Scheme I have presented the results of the appraisal under both the half toll and no toll scenarios. However, in view of the UK Government's position, I have based my assessment of value for money on the assumption of no tolls which now represents the most likely scenario.

3.6. Economic Appraisal Results

- 3.6.1. The results presented in Table 2 are based only on direct transport benefits and do not take account of the expected wider economic benefits (termed 'Wider Impacts') that are an indirect impact of the scheme. The BCR calculated on this basis is referred to as the 'Initial BCR' for the Scheme.
- 3.6.2. With tolls removed, the Scheme shows an Initial Net Present Value (NPV) of £0.8bn and an Initial BCR of 1.70. This compares to an Initial NPV of £0.5bn and a BCR of 1.50 under a half toll scenario.

Table 2: Summary of Economic Appraisal (Excluding Wider Impacts)

		Results (£m)	
		(2010 prices, discounted to 2010)	
		Half Tolls	No Severn Crossing Toll
User Benefits During Operation	Consumers	883	1,008
	Business	713	815
Construction Phase Impacts	Consumers	-21	-22
	Business	-14	-16
Maintenance Impacts	Consumers	28	32
	Business	10	11
Accident Benefits		4	4
Greenhouse Gas Benefits		6	-1
Indirect Tax Revenues		-16	-0.4
Initial Present Value of Benefits, PVB		1,592	1,830
Present Value of Costs, PVC		1,059	1,075
Initial Net Present Value, NPV		533	755
Initial Benefit-to-Cost Ratio, BCR		1.50	1.70

- 3.6.3. Table 3 sets out the results of the appraisal if Wider Impacts are included in the analysis to give an 'Adjusted BCR' for the Scheme. The assessment of Wider Impacts is associated with a higher degree of uncertainty than the assessment of direct impacts on users. However, by excluding Wider Impacts, the Initial BCR fails to capture a range of important economic benefits of the Scheme. Therefore, the Adjusted BCR provides a better measure of the overall balance of costs and benefits and therefore the value for money of the Scheme.
- 3.6.4. When Wider Impacts are included, under the no toll scenario, the NPV of the Scheme increases to £1.4bn (2010 prices and values) and the BCR increases to 2.29. Under the half toll scenario, the Adjusted BCR for the Scheme is 2.06.

Table 3: Summary of Economic Appraisal: Including Wider Impacts

	Results (£m) (2010 prices, discounted to 2010)	
	Half Tolls	No Severn Crossing Toll Scenario
Initial Present Value Benefits, PVB	1,592	1,830
Wider Impact 1: Agglomeration Impacts	519	542
Wider Impact 2: Increased Output in Imperfectly Competitive Markets	71	81
Wider Impact 3: Labour Market Impacts	5	5
Total Wider Impacts, PVB	595	628
Adjusted Present Value of Benefits, PVB	2,186	2,458
Present Value of Costs, PVC	1,059	1,075
Adjusted Net Present Value, NPV	1,128	1,383
Adjusted Benefit-to-Cost Ratio, BCR	2.06	2.29

Comparison with the March 2017 Economic Appraisal

3.6.5. The March 2017 Revised Economic Appraisal Report Supplement showed an Initial BCR of 1.66 and an Adjusted BCR of 2.27. This assumed that the Severn Tolls would be retained. The increased costs of the Scheme have a negative effect on the BCR although this has been offset by the increase in Scheme benefits now predicted following the UK Government's decision to abolish the Severn Crossing tolls. As a result, the updated BCR for the Scheme is broadly unchanged at 1.70 (Initial) and 2.29 (Adjusted).

3.7. Wider Economic Impact Assessment

- 3.7.1. The proposals for the M4CaN Scheme include a new bridge crossing of the River Usk, which has several commercially operated wharfs. The bridge and approach viaducts also cross the Newport Docks, owned and operated by Associated British Ports (ABP), between North and South Dock. ABP is a Statutory Undertaker and has objected to the Scheme to the Secretary of State under section 16 of the Acquisition of Land Act 1981, alleging that the scheme would cause serious detriment to the carrying on of the undertaking.
- 3.7.2. The December 2016 Revised Wider Economic Impact Assessment Report made clear that the Docks plays an important direct and indirect role in the economies of Newport and South Wales. Therefore, the positive economic benefits of the Scheme need to be balanced against any negative economic impacts of the Scheme on the Docks.
- 3.7.3. The December 2016 Report noted that detailed assessment of the impact of the Scheme on the Docks was ongoing but that analysis of shipping data suggests that, taking account of the opportunity for alternative charter arrangements and the potential for shipping to be reallocated to the South Dock, a minority of shipping movements could be prevented from using Newport Docks as a result of the proposals. It was also identified that discussions with ABP were underway to understand how Newport Docks could be re-organised to maintain land-side operations. It was further noted that operational considerations need to be balanced against the benefits of improved transport links to Newport Docks.
- 3.7.4. Since the publication of the Revised Wider Economic Impact Assessment (WG 2.4.11), the Welsh Government has undertaken further detailed analysis of the impact of the Scheme on shipping, on port operations, and on ABPs commercial performance. This analysis has been presented as evidence to the Public Local Inquiry for the Scheme.

- 3.7.5. The analysis of impacts on Newport Docks has subsequently been updated to take account of the Welsh Government's proposals for mitigating the impact of the Scheme on the Docks. A supplement to the Revised Wider Economic Impact Assessment (Document 2.8.8) has been produced to take account of these changes.
- 3.7.6. In respect of shipping, updated analysis suggests that the provision of new and upgraded quay space in the South Dock will, when combined with port estate reallocations, provide sufficient capacity to cater for shipping displaced from the North Dock because of the proposed Usk Crossing. The delivery of new quay space and associated facilities will be phased in a manner intended to minimise disruption to the Docks during the construction phase. Whilst there may be a small impediment to shipping in the short term (between 2022 and 2024), in the long term (assuming continuation of current trends in shipping movements) it will be possible to accommodate all of the displaced vessels in the South Dock. Therefore, there would be no impediment to shipping.
- 3.7.7. In respect of landside operations, through engagement with ABP, the Welsh Government has developed plans for the relocation of a range of port assets and port tenants to reduce or offset adverse impacts of the construction or operation of the Scheme. Whilst construction of the new bridge and motorway would cause short-term disruption, the Welsh Government's relocation proposals would ensure that ABP and its existing tenants could continue to operate and that the Docks could continue to function properly.
- 3.7.8. Commercial analysis (detailed in the Supplementary Evidence of Mr Andy Meaney) suggests that, in the long run, there would be no detrimental impact of the Scheme on the commercial performance of ABP Newport as a result of the Welsh Government's proposals. In fact, because of the improvement in access afforded by the Scheme and the proposed Docks Junction, the financial modelling shows an overall net financial betterment as a result of the Scheme.

- 3.7.9. It should be noted that the quantitative commercial analysis is undertaken on the basis of the current tenants at the site. It does not take into account any impacts of the port relocation plan on ABPs Master Plan for the port. However, ABPs Master Plan is aspirational and the plans contained within it are subject to varying degrees of certainty.
- 3.7.10. It should also be borne in mind that the Welsh Government's proposals, whilst dealing with the potential detrimental impact of the scheme, are in line with ABPs Master Plan and would allow ABP to attract and accommodate new occupiers in the future⁴. Furthermore, by providing a direct connection to the motorway network, the Scheme would make Newport Docks more attractive for future investment for the betterment of the local economy.
- 3.7.11. Taking this into account, there is no reason to conclude that the impact of the Scheme on Newport Docks would have any offsetting effect on the overall economic impact of the Scheme.

⁴ The compatibility of the Welsh Government's proposals and ABP's Master Plan is explored in detail in the evidence of Mr John Davies (WG 1.23.6)

4. CONCLUSION

4.1. Economic Appraisal

- 4.1.1. The economic appraisal compares the costs of constructing and maintaining the Scheme with the benefits of the proposed Scheme in relation to user benefits (travel time savings, vehicle operating costs and user charges), indirect taxation, accident benefits, greenhouse gas emissions and wider economic benefits (termed Wider Impacts).
- 4.1.2. The economic appraisal considers only those costs and benefits that can be quantified and monetised. In this respect, the analysis is focussed on, but not limited to, impacts on the economic efficiency of the transport sectors. There may be other costs and benefits that cannot be quantified in monetary terms. Therefore, the economic appraisal is only one aspect of the overall case for investment and needs to be balanced against other environmental and social costs and benefits. Equally, it should be recognised that the economic appraisal excludes a range of transport related benefits related to improved network resilience and reliability.
- 4.1.3. The results of the economic appraisal are summarised in the benefit-cost ratio (BCR) for the Scheme. A BCR (benefits divided by costs) in excess of 1 indicates that the benefits of the Scheme outweigh the costs. The higher the BCR, the more efficient the transport investment and the greater the value for money.
- 4.1.4. The BCR for the Scheme is presented both including and excluding Wider Impacts. Where Wider Impacts are excluded from the analysis, the BCR for the Scheme is referred to as the 'Initial BCR'. Where Wider Impacts are included in the analysis, the BCR is referred to as the 'Adjusted BCR'.

- 4.1.5. In view of the recent UK Government announcements, I have assessed the value for money of the Scheme on the basis that the Severn Crossing Tolls will be removed in advance of the opening of the Scheme. Under this scenario, the Initial BCR for the Scheme – updated to include the costs of mitigation works at Newport Docks – is 1.70. When Wider Impacts are included in the assessment, the Adjusted BCR for the Scheme is 2.29.
- 4.1.6. The economic appraisal demonstrates that, if wider economic benefits are included, the benefits of the Scheme outweigh its costs by a ratio substantially in excess of 2 to 1.
- 4.1.7. The quantification of Wider Impacts is subject to a greater degree of uncertainty than the assessment of direct economic benefits relating to travel time savings and vehicle operating costs. However, by excluding Wider Impacts, the Initial BCR fails to capture a range of important economic benefits of the Scheme. Therefore, the Adjusted BCR provides the more realistic measure of overall value for money.
- 4.1.8. In my opinion, the economic appraisal continues to demonstrate that the benefits of the Scheme will substantially outweigh its costs and therefore confirms that the Scheme represents value for money.

4.2. Wider Economic Impact Assessment

- 4.2.1. The M4 is the main route in and out of the country for over 70% of Wales' population and economy. The M4 facilitates the movements of goods and people between Wales and the rest of the UK, enabling firms in South Wales to access domestic and international markets. The M4 is the most heavily used transport link between the main urban centres in the Severn Estuary of Swansea, Bridgend, Cardiff, Newport and Bristol. The M4 Corridor around Newport also plays a key role in facilitating the movement of commuters through South Wales. For many users, there is no feasible alternative to the M4.

- 4.2.2. Traffic congestion on the M4 Corridor around Newport results in longer journey times for users. Traffic incidents can exacerbate delays and cause disruption to businesses and other users, resulting in poor journey time reliability. Given the reliance on the M4, any disruption to the smooth operation of the motorway in South Wales imposes costs on individuals and businesses and has a negative impact on the economy. Furthermore, as the primary route in and out of South and South West Wales, the current state of the M4 has negative impacts on the perceptions of Wales as a place to visit and do business.
- 4.2.3. Whilst removing the Severn Crossing tolls will have a positive impact on the Welsh economy, in the absence of any intervention, this will also have the effect of worsening traffic conditions on the M4 around Newport.
- 4.2.4. The M4CaN proposals will improve the functioning of the road network by providing a faster and more reliable route for strategic journeys, whilst also strengthening the resilience of the road network in South Wales. Under the no toll scenario, demand for the new motorway will be higher and the impact that the Scheme will have on journey times and accessibility will be greater.
- 4.2.5. Once operational, the Scheme will have a strongly positive economic impact in the following ways:
- a) Reducing transport costs for businesses in the study area by providing faster and more reliable transport for business travellers and for the movement of goods
 - b) Improving the functioning of the labour market in South Wales by increasing access to employment opportunities for workers and improving access to a suitable workforce for firms
 - c) Improving productivity by fostering agglomeration effects within South Wales and the South West of England and reducing travel times to London and other UK regions

- d) Stimulating land use change and new investment by improving access to key employment sites in the south of Newport
- e) Improving perceptions of South and South West Wales as a place to visit and do business

4.2.6. Each of the above ultimately derive from the effect that the Scheme will have on improving traffic conditions, reducing journey times, improving accessibility and facilitating new trip patterns. It is therefore the case that each of the above wider economic impacts is reinforced by the decision to remove the tolls from the Severn Crossings.

4.2.7. There is no reason to consider that the positive economic impacts of the Scheme would be offset by the impact of the Scheme on Newport Docks.