

Maintaining strategic roads in Wales

The Lugg review

June 2023



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Executive Summary

Introduction

In December 2021 the Deputy Minister for Climate Change, Lee Waters MS, requested an independent review of current annual maintenance programmes on the Strategic Road Network (SRN) in Wales. That review was to consider whether these programmes are suitably designed and specified to meet Welsh Ministers' statutory duties as highway authority for the SRN, whilst not incurring more expenditure than necessary and demonstrating value for money.

A team of independent experts led by Matthew Lugg OBE conducted the Review (the Lugg Review). The Review Team considered information supplied by the Welsh Government, held several question-and-answer sessions with staff within the SRN Division, Government advisors and the Welsh Roads Review Panel. A draft report was completed in May 2022. Since then, the report has been updated to take account of developments since that date, notably the publication of the Roads Review Panel's report 'the Future of Road Investment in Wales' and the Welsh Government's response including the publication of the National Transport Delivery plan 2022-2027 in February 2023.

The Review Team would like to thank Welsh Government officials for their co-operation and support in producing this Report.

Key findings

Adopting a comprehensive asset management approach

An essential part of the Review was to assess the appropriateness of the 43 maintenance programmes of the SRN that included the Major Asset Renewal (MAR) programme (referenced as the CMA – Major Asset renewals programme) to determine the effectiveness of how schemes and programmes of work are identified and prioritised. In this context adopting a comprehensive asset management approach is considered crucial in delivering the optimal outcomes.

Priority therefore should be given to completing the Asset Management Policy, updating the Strategy, and producing a Plan.

The review of the Asset Management Policy and Strategy identified the same areas in the processes and systems requiring strengthening as those identified in a report produced by Atkins in 2021. The Atkins report provided a clear pathway that would enable the Welsh Government to adopt an asset management approach to managing the SRN. This would require a commitment and endorsement of the Atkins' report's recommendations.

It should be noted that since undertaking this Review the Welsh Government is in the process of finalising the SRN Asset Management Policy and Strategy prior to publication.



Standards - The need to review the character of a section of highway

Welsh Ministers have statutory duties and responsibilities in relation to the motorway and trunk roads network (the Strategic Road Network (SRN)). The Review Team have found, by understanding and exploring potential opportunities in the interpretation and application of the legislation and taking account of Welsh transport policies, a different approach to the maintenance and/or operation of the trunk roads network could be considered.

Before the scope and detail of any planned intervention is determined, it would be useful to review, and if appropriate change the character and the subsequent usage of the highway which may change the nature and level of the planned intervention. For example, a change in the character of a highway via the restriction of capacity, reduction in speed limit or reallocation of road space to public transport or active travel may reduce the maintenance requirements (and contribute to achieving other policy objectives) – bridge deck loads and requirement for vehicle restraining systems etc. may become less onerous. Conversely, cyclists' lower tolerance of surface defects may increase the maintenance need for surfacing. This 'review of character' could be included in the definition of future programmes.


Risk Management - Implications of the Corporate Manslaughter Act

The Review has considered the Corporate Manslaughter Act. This is a complex area which does have relevance for Ministers, senior civil servants and managers involved in the maintenance, operation and improvement of the trunk roads and motorways network in Wales. Whilst commentary is provided in this Report, Ministers and officials should obtain formal legal advice. However, it is the case that general application of the exemptions from liability under this act will usually apply.

The Welsh Government should be commended in its 'safety first' principles in relation to the maintenance and operation of the network. Throughout the review it was made clear that safe operation of the SRN was paramount and if there were issues with the network, then the areas of concern would be closed or subject to restricted access. At no stage were the Review Team made aware of sections that were 'open' despite being considered unsafe or were there any reports of instructions from Ministers or senior managers to keep sections or elements of the network open despite there being advice or recommendations to close/restrict access to the section. It is unlikely in this context that corporate manslaughter would be an issue given the approach demonstrated by the department, provided that this approach continues to be taken.

Scheme Identification and Prioritisation

Given the age of the trunk road network and the reported deterioration it is considered inevitable that a programme of asset renewal works is required, the exact scope and extent of the works and their relative ranking within the other priority and policy areas should be clearly established.



At present, the MAR and the other 42 programmes of work have been developed separately although it could be considered that they represent the business of the division and should be arranged in one programme ranked in terms of an agreed prioritisation method. It could be concluded that the 'MAR' was an adjunct to the routine plans of the SRN Division with activities included in the MAR prioritised separately.

In terms of how the MAR is arranged, a corridor approach to intervention may have some merit but the aggregation of schemes along a number of corridors will undoubtedly lead to significant levels of investment being required which could be undeliverable in the present funding circumstances. This could lead to a reluctance to begin to develop the designs for the works required to rectify the principal issue.

The Review Team were provided with details of the Structures Asset Valuation and Investment Tool (SAVI) system which has produced information in relation to the potential state of repair of structure assets (bridges, retaining walls, large culverts etc.) throughout the network. This is a comprehensive and detailed system but would benefit from refining and confirming input data in terms of known risk elements and actual condition scoring rather than the assumed state of waterproofing that forms a system input. The processes associated with the development of the repair programme should be completely defined.


The Review Team concluded that the structures element of the MAR has been based upon the output of SAVI, other relevant data and then finalised using 'professional judgement.' The non-structures corridor renewal works in the MAR have been generated without the benefits of the same level of rigour. The process and judgements should be detailed to provide transparency and enable the Welsh Government to demonstrate rigour or compliance. This would allow additional assessments to be included in the determination of output solution and allow oversight and audit by others such as accredited assessors.

In reviewing the MAR in the context of the 43 programmes it is likely that the 'do-minimum' elements of the MAR would have, in general, a greater socio-economic impact than similar elements within the other 42 programmes and a review and ranking system should be applied across the whole of the MAR and 42 Programmes of the SRN to ensure programme activities are correctly prioritised.

A single method of prioritisation, a 'RAG (Red, Amber, Green) review' should be developed, and this should include considerations such as:

- Consequences of and associated risk with not doing the work,
- Can the character and/or use of the asset be changed, and would this change be the required intervention e.g., can space be reallocated?

The Review Team concluded that the MAR and the other programmes have been derived from two different perspectives with the MAR being a 'top-down' view of the network and the other programmes being a 'bottom-up' collection of schemes. Allocation of funding to supplementary maintenance and improvements to be carried out at the same time as other works in advance of dealing with priority, asset condition issues could mean that sufficient funding will be available to deal with priority asset repair/remediation. Consideration of the programme elements put forward by asset managers should recognise the potential for them to be influenced by the desire to retain budgets and workload for their areas of responsibility.



There is some overlap between some MAR schemes and programmes with schemes and corridors considered by the Roads Review Panel. The recommendations of the Panel and the Welsh Government's response should be considered in developing the asset management approach.

The need for a Zero-based Review

Any supplementary improvements to the SRN carried out at the same time as asset renewals should be subject to a careful appraisal to ensure the works are in line with the Welsh Government's wider statutory duties and policy objectives, e.g., the Welsh Transport Strategy.

A 'one-plan' approach and associated assessment should be applied to all the SRN Division's capital schemes. An initial step in this process should be a Zero-based review of all the programmes with funding then allocated in accordance with the outcome of the 'RAG review' of the schemes. A Zero-based review would challenge all planned expenditure and confirm investments are considered against the agreed prioritisation method and are being made in accordance with priorities and in accordance with policy.

The Zero-based review would also enable SRN Divisional staff resources to be re-assigned/redeployed where possible to the priority areas, leading to a capital programme that represents greater value for money in delivering Welsh Government policy objectives.

Resources

The Review Team recognised that technical resources within Welsh Government are limited. There is too much reliance on individuals, and this raises concerns about resilience. However, the Review Team also noted that discussions on the best model to discharge Welsh Ministers' duties for the SRN, (including a potential transfer of staff to Transport for Wales (TfW), which caused issues with recruitment and retention, have been concluded. Consequently, recommendation 15 of this report is already being actioned. This is being taken forward in two parts. The first a review of the resources required for the delivery model in Welsh Government. The second establishing the changes required to build resilience through cross departmental working and greater collaboration with the Trunk Road Agents and Transport for Wales.

Conclusion

The Review has identified the following 15 Recommendations to address the issues raised in this Report and if adopted the next stage would be to develop and implement an improvement plan.

Summary of Recommendations

Recommendation 1

When developing and delivering maintenance programmes priority should be given to discharging Welsh Ministers statutory duty to maintain network safety and also maximising the investment's contribution to achieving Wales Transport Strategy priorities and objectives by adopting a minimum whole life carbon approach, improving resilience to climate change and taking any opportunities to enhance biodiversity and promote a shift to more sustainable forms of transport such as active travel and public transport.

Recommendation 2

A set of investment criteria for road maintenance and other work to the existing asset, similar to that adopted by the Welsh Government for investment in new roads following the recommendations of the Roads Review, should be developed. This should prioritise the safety and long-term integrity of the network but also ensure opportunities to deliver wider Welsh Transport Strategy priorities and objectives are taken.

Recommendation 3

Priority should be given to completing the overarching Asset Management Policy and Strategy which are being developed and having them "signed off" by Ministers to achieve high level organisational support and commitment. This will ensure, along with the new road maintenance investment criteria, that there is a rigorous approach to achieving compliance with statutory duties and delivering Welsh Transport Strategy priorities on the ground, while demonstrating value for money.

Recommendation 4

A review should be conducted into the "character" of all sections of the SRN and in particular those that will be subject to a change in speed limit with the objective of establishing the appropriate standard of maintenance.

Recommendation 5

The Trunk Road Maintenance Manual (TRMM) is revised to move to a risk-based system of inspection and repair. The TRMM should be aligned through the Asset Management Policy and Strategy to the Welsh Government's policy commitments, and the potential changes to the function of the SRN that these and other policies will bring. An updated version of the document should be implemented in 2023/24 and kept continually under review.

Recommendation 6

The Welsh Government should consider how best to apply and where appropriate modify the standards and guidance in the Design Manual for Roads and Bridges (DMRB) through the use of National Application Annexes (NAA) and new Procedure and Advice (PAG) Guidance so that it is fully aligned to the delivery of Welsh Ministers' statutory duties and Welsh Government policies.

Recommendation 7

Training is provided on a regular basis to all staff, including senior officials, on Welsh Ministers' statutory duties for the SRN as highway authority contained in the Highways Act and other legislation. The training should also include an appreciation of the Police Road Death Investigation Manual (PRDIM) and legislation relating to Corporate Manslaughter.

Recommendation 8

A review of the current risk management regime is undertaken to ensure that there is a robust process for identifying and recording all relevant risks, that they are assigned to those best placed to manage them, there is a clear procedure for escalating risks from the Trunk Road Agents to Welsh Government and all risks are kept under continual auditable review.

Recommendation 9

Subject to recommendations 1 and 2, all current safety critical programmes should continue. Particular attention should be paid to Major Asset Renewal and the Tunnel Programme which the Review Team consider the areas Welsh Ministers are exposed to the greatest risk.

Recommendation 10

A do-minimum list of asset renewals/repairs (those works required to meet the Welsh Government's duty to maintain) should be created, and designs progressed to 'shovel-ready.'

Recommendation 11

The development of the asset repair/renewal list should be a defined, transparent process based on maintaining network safety with particular regard to the risk of catastrophic structural failure.

Recommendation 12

Programmes across all disciplines should be prioritised on the basis of the recommended investment criteria set out in recommendation 2 and maintained as a single auditable programme.



Recommendation 13

All asset condition data used in the prioritisation of SRN programmes and work, should first be verified as accurate by Welsh Government officials. Officials should also ensure that any models used to predict the deterioration of assets and the cost of their repair are based on realistic assumptions and are subsequently verified over time.

Recommendation 14

It should be ensured that Welsh Government officials have full access to Structures Asset Valuation and Investment Tool (SAVI) to allow them to amend the data themselves as currently analysis is prevented by information technology restrictions within the Welsh Government.

Recommendation 15

A review of the resources available to Welsh Government should be conducted to establish whether it has the technical capability and capacity to discharge Welsh Ministers' statutory duties and deliver Welsh Transport Strategy priorities and objectives. A Zero-based review of programmes should be undertaken to assist in identifying priority areas and resources that might be re-deployed.

1. Introduction

1.1 The Policy Content in Wales

Following Devolution, Welsh Ministers became the Highway Authority for the SRN. This included many duties and powers in respect to transport in Wales and importantly in the context of this report, the responsibility for the management and maintenance of highways. Welsh local authorities have the direct responsibility for the management of their local roads and the Welsh Government is the Highway Authority for the SRN. This report is concerned with the SRN in Wales.

Whilst the division of responsibilities for the strategic and local roads in Wales between Welsh Government and local authorities mirrors England, there are some distinct differences in the approach that is being taken. This difference is a product of devolution and the path that the Welsh Government are treading, in recognition of the distinct character of Wales, its roads, and the communities that use its highways.



Fig.1 Active Travel Wales Guidance

In England, the UK Government has formed a Strategic Highway Company (National Highways) and in doing so has transferred Highway Authority functions and duties to it. In Wales, the Welsh Ministers are the Highway Authority and as such they hold the various duties and responsibilities to protect the rights of the public to use and enjoy the SRN in Wales. They also have a duty to maintain it at public expense, future-proof it to adapt to climate change and facilitate more sustainable transport choices.

Through legislation such as the Active Travel (Wales) Act 2013 the Welsh Government has placed additional duties on highway authorities which its own Ministers and local highway authorities must follow. All highway authorities in Wales must therefore take reasonable steps to enhance the provision made for walkers and cyclists in their creation, maintenance and improvement of highways, as far as it is practicable to do so.

The Well-being of Future Generations (Wales) Act 2015 has defined seven well-being goals and five ways of working to help public services meet the needs of the present without compromising the ability of future generations to meet their own needs. The introduction of the 20mph default urban speed limit across Wales is further example of the application of a different way of thinking. Legislative drivers such as these are leading to real differences in the solutions delivered in Wales.


Furthermore, the clear commitment to decarbonisation in Wales, to take front-loaded action and avoid the cumulative emissions which later action would incur, is driving how the Welsh Government is shaping transport in Wales over the next 20 years, as set out in Llwyr Newydd, (The Wales Transport Strategy). Llwyr Newydd literally means a new path and the Welsh Government are treading a different path in their approach to roads to that currently followed in England.



Fig.2 Llwybr Newydd – The Wales Transport Strategy

The policy context in Wales sets out a new way of thinking that seeks to place people and climate change firmly at the front and centre of the transport system. This new path has led to a hierarchy of users that targets lower car use as opposed to the perpetuation of strategies that actively accommodate, and consequently encourage growth in travel by car, by making public transport and active travel viable alternatives.

In September 2021 Welsh Ministers established a Roads Review Panel, to make recommendations in relation to road schemes in the pipeline and to advise on when new roads are the right solutions for transport problems, applying the principles set out in Llwybr Newydd. The Roads Review Panel submitted its Final Report 'The Future of Road Investment in Wales' to the Welsh Government in September 2022.



The Welsh Government responded to that Final Report from the Roads Review Panel in February 2023 and published the National Transport Delivery Plan. That response reaffirms the Welsh Government's view that the transport system is one of Wales' most important national assets. It connects people, binds communities and enables business. The Welsh Government recognises that they must continue to invest in roads. However, road investment must be consistent with the prioritisation of public transport and active travel and support decarbonisation, modal shift and improve safety.

The general scope of the Roads Review included all proposed road investment, whether funded directly by Welsh Government on the Strategic Road Network or indirectly on the Local Road Network. Whilst that review recommended the continuation of all routine operational and maintenance work needed to ensure the safety and serviceability of the Strategic Road Network, there is a clear relationship between the implementation of road schemes, the maintenance and management of the road network and the changes in direction sought by the Welsh Government.

The Welsh Government is thus committed to achieve a change in travel patterns across Wales, with fewer car trips and more people using public transport, walking and cycling. The aim is to allow people and goods to move easily from door to door by accessible, sustainable and efficient transport services and infrastructure. In addition, the infrastructure needs to adapt to become resilient to the impact of climate change.

This new approach must penetrate all aspects of highway management for the network. The highway network in Wales is seen by communities as a shared resource that is safe, accessible and well-maintained, and one that is future-proofed to adapt to climate change. The Welsh Government's management of the Strategic Road Network must follow this new path as a beacon for the change sought by Welsh Ministers, whilst ensuring that the duties set in statute, and commitments made through policy and their delivery contracts are met in full.

As part of the UK Public Sector the Welsh Government must handle public funds with probity and in the public interest. They must ensure that public money and other resources are used properly and efficiently in the pursuit of their various commitments.

The Welsh Government recognise that they are seeking a big change in overall approach. The path they are on is a challenging one, the outcomes sought will not be achieved overnight, and it requires all to work collaboratively.

This report is an independent review of current annual maintenance programmes on the SRN in Wales. It considers whether those programmes meet the Welsh Government's policy framework and statutory duties as highway authority, whilst not incurring more expenditure than necessary and demonstrating value for money.

1.2 Background

The Welsh Government is responsible for management and maintenance over 1,000 miles of Trunk Roads and 75 miles of motorways in Wales (the Strategic Road Network). The SRN accounts for only 5% of the total Welsh road network but carries more than one third of all traffic and as such it is one of country's most important national assets. The SRN connects people and communities, businesses and customers and enables access to vital social, economic, and cultural services. The character of the SRN varies considerably across Wales from sections of six lane motorway on the M4 to narrow two lane roads through local communities. Welsh Ministers are directly responsible for the operation, maintenance and improvement of the SRN and have a statutory duty to maintain its safety.

WALES

STRATEGIC ROAD NETWORK

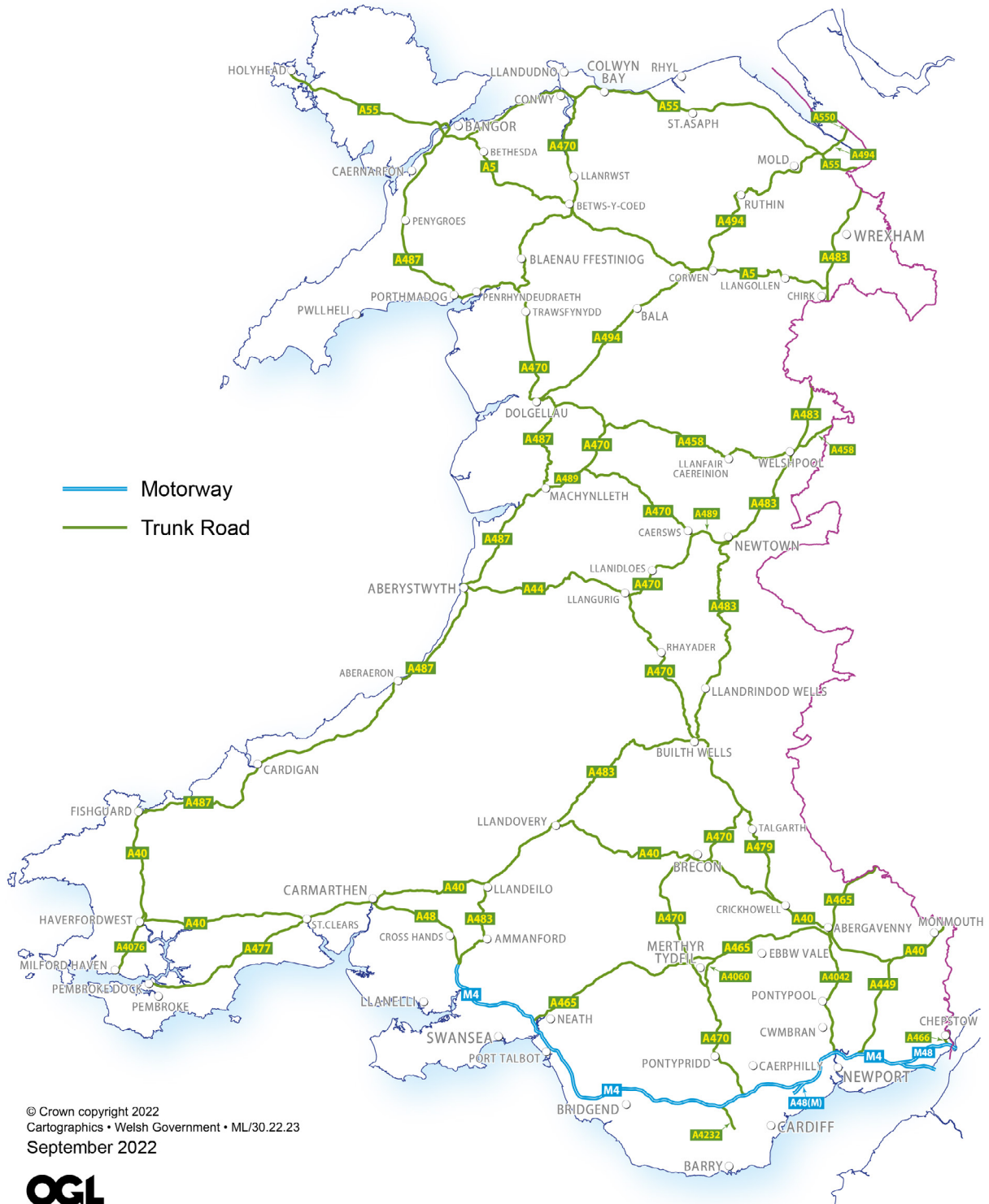


Fig.4 Map showing the Strategic Road Network in Wales

The SRN is a deteriorating infrastructure asset with a rising number of defects being identified and recorded. The level of investment in maintenance has not been sufficient to keep up with the rate of deterioration. This has been problematic, with priorities generally focused on being reactive to identified defects to maintain serviceability and ensure public safety rather than planned timely interventions to prevent defects or minimise their occurrence.



Fig.3 Example of the deteriorating condition of the SRN

The Reason for this Review

In December 2021 the Deputy Minister for Climate Change requested an independent review of current annual programmes on the SRN in Wales to consider whether they are suitably designed and specified to meet Welsh Ministers' statutory duties as highway authority for the network whilst not incurring more expenditure than necessary and demonstrating value for money.

The Requirements of the Review

Were specified as follows to: -

- Gain a good understanding of the nature, extent and objective of each of the relevant annual maintenance programmes on the SRN;
- Review proposals for a Major Asset Renewal (MAR) Programme in response to the approximately £1bn of capital maintenance backlog on the SRN and explore the legal risks facing highway authorities, including corporate manslaughter;
- Apply specialist knowledge of statutory highway authority duties in order to provide an independent view on which programmes are required to meet them (including the MAR) and whether those programmes are correctly defined to meet those duties;

- Assess the degree to which the fulfilment of statutory responsibilities can be interpreted differently or more widely to demonstrate value for money and meeting statutory obligations; and
- Assess the degree to which maintenance and asset renewal programmes could be optimised by adopting a more flexible approach to specification.

And to produce a report detailing the conclusion for each programme with reasons including: -

- An interpretation of the term ‘safety critical’ and how that might influence current and future work programmes;
- A view on what routine maintenance activity is ‘essential’ to maintain the day-to-day safety of the network, including an assessment of the approach, in the light of potential changes to the function of the SRN, set out in the Trunk Road Maintenance Manual (TRMM);
- Alternative options for the MAR allowing a more “flexible” approach to allow a comparison of delivery mechanism and timescales; and
- A recommendation on the appropriate standards to be adopted in order to avoid over specification, and whether the Design Manual for Roads and Bridges (DMRB) should be used in every case.

1.3 The Review Process

The Independent Panel

Consisted of the following three technical experts: -



Jeff Collins

A Company Director with 30 plus years’ experience at senior levels in highly regulated industries including nuclear, rail, oil and gas. A former Senior Civil Servant holding a number of roles in Wales including the Economy and Transport departments within the Welsh Government.



Phil Jones

A Chartered Civil Engineer with over 35 years’ experience in traffic engineering, transport planning and urban design. He founded Phil Jones Associates in 2003. His experience includes advising Welsh Government on default urban 20mph and tackling pavement parking.



Matthew Lugg OBE

A Chartered Engineer with over 45 years’ experience in local and central government as well as the private sector. Currently Director of Local Transport for WSP UK Ltd. An internationally recognised expert in Highway Infrastructure Asset Management.



Mobilisation

The Review Team were mobilised in early December 2021 after receiving the first version of the brief from the Welsh Government which was finalised later that month. In January 2022 the Review Team were asked to provide a methodology on how they would undertake the review. This was finalised in February. The agreed methodology covered the following aspects in line with the requirements of the review: -

- Statutory Duties
- Corporate Manslaughter
- Review of the Major Asset Renewal (MAR) and the 43 programmes of the SRN
- Recommendations

Information gathering phase

This was undertaken from January into March 2022 with a draft version of the report submitted to the Welsh Government in May.

Final Report

In order to provide an update on the publication of this report at the time of the publication of the Roads Review in February the Deputy Minister for Climate Change Lee Waters MS in a written statement announced the following: -

My officials are considering the recommendations of the Lugg Report and how they can be applied to ensure that best use is made of existing infrastructure by adopting more rigorous asset management planning. The response to the recommendations will inform the asset management policy and strategy for the strategic road network and be at the heart of an emerging programme of renewals to major assets which will be designed to address the backlog of essential maintenance on the SRN. I will publish the recommendations of the review and the response to those recommendations once this exercise has been completed.

2. The Welsh Government's Commitments to the Strategic Road Network in Wales

2.1 The Key Commitments as the Highway Authority

The Welsh Ministers are directly responsible for the SRN in Wales. The SRN consists of the Motorways and Trunk Roads in Wales, including all bridges, tunnels, retaining walls, footways and cycleways that form part of those roads.



Fig.5 Maintenance of the M4 Usk Viaduct

Many of the Welsh Ministers' responsibilities towards the SRN are established by the law, their Statutory duties. In addition, Welsh Ministers have taken policy decisions that impact the management of the SRN in Wales. The majority of the maintenance and improvement plans are delivered through delegation agreements with two public sector Agents, the North and Mid Wales Trunk Road Agent (Gwynedd County Council) and the South Wales Trunk Road Agent (Neath Port Talbot County Borough Council).

The relationship between the Welsh Ministers and their Agents is established through delegation under Section 6 (1) of the Highways Act 1980. Welsh Ministers remain the Highway Authority and the Agents carry out certain delegated functions for the day-to-day operation, maintenance and improvement of the SRN on their behalf. The Welsh Government Statutory Duties towards the SRN are as follows:-

Duty to Maintain

- To take such care as in all the circumstances was reasonably required to secure that the part of the highway to which the action relates was not dangerous for traffic (Highways Act 1980).
- To ensure, as far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice (Highways Act 1980).
- Further to have regard to the needs of walkers and cyclists in the exercise of their functions (The Active Travel (Wales) Act 2013).

Network Management

- To have regard to the needs of walkers and cyclists in the exercise of their functions (The Active Travel (Wales) Act 2013).

Decarbonisation

- To achieve a net zero by 2050 (The Environment (Wales) Act 2016).

Equality

- The right to travel, the right to information in an accessible form, the requirement that disabled people should not be treated less favourably and the need to make reasonable adjustments (The Equality Act 2010).

Approach to Strategy Development

- The duty to prepare and publish a strategy setting out policies and how they will be discharged (The Transport (Wales) Act 2006).

Fiduciary Duty

- To handle public funds with probity and in the public interest, as set out in Managing Welsh Public Money, which accounts for the specific aspects of financial management arising from the Government of Wales Act 2006 and Devolution. This to ensure that public money and other resources are used properly and efficiently (The Government of Wales Act 2006).

Welsh Government Policy Commitments in relation to the SRN

Llwybr Newydd, The Wales Transport Strategy 2021 establishes the following commitments:

Network Management

- Maintain and operate the SRN in a way that meets statutory obligations, minimises adverse environmental impacts, promotes active travel, sustains and creates employment in Wales and reduces the backlog of maintenance;
- Keep traffic moving by dealing rapidly with incidents and through efficient forward planning of maintenance to avoid disruptions; and
- To plan for and manage road use and congestion in and around major cultural and sporting events in Wales.



Fig.6 Lane closures for maintenance work M4 Malpas

Approach to Strategy Development

- All renewal and improvement projects will be supported by Welsh Transport Appraisal Guidance (WelTAG) appraisals, which will be in place before final approvals are given;
- The use of WelTAG to identify and appraise the likely effectiveness of proposed measures in delivering site specific objectives, such as reduction in NO₂;
- To involve people, including people who share protected characteristics, in the design of road upgrades through WelTAG and also consult and engage stakeholders on maintenance works;
- To take an integrated approach to investment decisions, guided by WelTAG appraisals and the priorities in Llwybr Newydd;
- To collaborate with colleagues in planning, health, and education to ensure that new developments give priority to walking, cycling and public transport; and
- To monitor our five-year priorities and review them as needed as well as the contribution of roads, streets, and parking to Llwybr Newydd.

Asset Management

- Transport infrastructure is safe and well-maintained;
- To continue to make best use of existing transport infrastructure by maintaining it and managing it effectively and efficiently and to upgrade our existing infrastructure to meet legal obligations on safety;
- Adopt more rigorous asset management planning so that minor issues are dealt with before they require major capital investment;
- The overall aim is to reduce the maintenance backlog target to sustainable levels by 2030; and
- To make better use of our existing infrastructure – looking for opportunities to reallocate road space to sustainable modes as we do so. To design new infrastructure interventions with maintenance in mind – taking account of the whole lifecycle.

Climate Change Adaptation



Fig.7 Carriageway flooding A4042 Llanellen

- Transport infrastructure is future-proofed, to adapt to climate change. This is achieved by adapting existing infrastructure to climate change by addressing issues such as flooding; and
- To work with Natural Resources Wales to manage the impact of climate change on road infrastructure by improving surface water drainage, managing flood risks and ensuring that new developments do not create harmful surface water discharges.

Biodiversity

- Maintain and enhance biodiversity and increase ecosystem resilience through transport operations and infrastructure projects. In line with our Natural Resources Policy, through the way the soft estate associated with transport networks is managed and, in the design, and delivery of transport interventions including upgrading infrastructure and new infrastructure schemes; and
- To also ensure that day-to-day transport operations maintain and enhance biodiversity and ecosystem resilience.

Waste Minimisation and Recycling

- To make better use of existing infrastructure in order to reduce waste associated with transport;
- To also avoid the need for new infrastructure to help meet ambitions to produce roughly 65% of the waste produced, as set out in Towards Zero Waste; and
- To use recycled materials if possible.

Employment

- Maintain and operate the SRN in a way that sustains and creates employment in Wales;
- To support the Wales supply chain;



Fig.8 Example of rural section of the SRN A470 at Bwlch Oerddrws

Economy

- Upgrade, improve and future-proof our road network, addressing congestion pinch points and investing in schemes that support road safety, journey time reliability, resilience, modal shift and electric bike, motorbike and vehicle charging; and
- To prevent future problems by reducing congestion in order to drive modal shift to active travel and public transport.



Road Safety

- Upgrade, improve and future-proof our road network making roads and streets safer for all users and fewer people are killed or are seriously injured using them.

Heritage

- That the historic environment is protected in road projects.

Adequate Fundings for the Welsh Government's Agents' in relation to the SRN

- To satisfy itself that all its obligations are met, the Welsh Government must ensure that adequate funds are provided to Agents.

Adequate Funds for Demand Led Statutory Services

- Adequate funds are provided to the Welsh Government's Agents to enable them to meet the demand for all services required by statute.

Adequate Funds to Implement Policy Requirements

- Adequate funds are provided to the Welsh Government's Agents to enable them to do the minimum that is reasonably required to implement the policy requirements set by the Welsh Government when delivering all SRN programmes.

Other Welsh Government Commitments towards the SRN


Whole System Budget Impact

- The consequences of any substantial change in the levels of major capital maintenance has an impact on the revenue budget required to ensure that statutory duties are met. Depending on the approach that can be taken to the repair of defects, the demand on the proportion of capital budgets that is directed towards works that might have been funded by revenue budgets will also change. The risk to the Welsh Government's revenue budgets that will escalate over time should any of the SRN Capital Programmes be reduced.

2.2 The Consideration of Corporate Manslaughter and the Context of the Strategic Road Network in Wales

Corporate Manslaughter and the management of the Strategic Road Network in Wales

All Highway Authorities, including the Welsh Ministers with regard to the SRN, should be aware of the potential risk of the offence of corporate manslaughter. A charge of Corporate Manslaughter is a serious offence and in this section of this Report the Review sets out our understanding, based on guidance issued by the Crown Prosecution Service and our experience of claims against highway authorities, of how such a charge would be considered in relation to the management of the SRN Programmes in Wales.



Corporate Manslaughter is an offence under Section 1 of the Corporate Manslaughter and Corporate Homicide Act 2007. For an organisation to be guilty of Corporate Manslaughter, five points need to be proved:

1. The defendant is a qualifying organisation
2. The organisation owed a relevant duty of care to the deceased
3. There was a gross breach of that duty by the organisation
4. The way in which its activities were managed or organised by its senior management was a substantial element in the breach
5. The gross breach of the organisation's duty caused or contributed to the death

The following paragraphs describe the finding of this review following consideration of the guidance issued by the Crown Prosecution Service on Corporate Manslaughter and its applicability to the Welsh Government's management of the SRN in Wales in relation to the five points that need to be proved.

1) The Defendant is a Qualifying Organisation

It is the case that both the Welsh Government and its Agents, who are Local Authorities, their contractors, and sub-contractors (assuming they are an employer) are qualifying organisations under the Corporate Manslaughter and Corporate Homicide Act 2007. Any or all may be subject to prosecution for corporate manslaughter in relation to a death that could/may happen on the SRN in Wales.

2) The Organisation Owed a Relevant Duty of Care to the Deceased

Considering the general application of the exemptions from liability under Sections 3 to 7 of the Corporate Manslaughter and Corporate Homicide Act 2007 in respect to the activities of the Welsh Government and their Agents toward the SRN in Wales, certain exemptions will apply. The Welsh Government, or its Agents who are local authorities cannot be prosecuted for corporate manslaughter:

- On the basis of the policy decision, particularly the decision to allocate public funds towards the maintenance of the SRN in Wales versus all other demands placed on the public purse in Wales;
- In respect to the care taken when undertaking the construction or maintenance of the highway;
- In respect to the care taken when undertaking statutory inspection of the SRN; and
- In respect to the care taken when responding to an emergency.

It should be noted that this does not exempt the Welsh Government, or its Agents from all prosecution in the event that a death on the SRN in Wales was alleged to have been caused by them.

3) There was a Gross Breach of That Duty by the Organisation

In the event that a charge of Corporate Manslaughter was applicable, it would be key to the defence that, a reasonable system of work in respect to the duty in question was proven to be in operation. To do this the system of work should be:

- Documented as Welsh Government policy or in operational procedures;
- Can be seen to be one that can address relevant matters; and
- Is enabled through an appropriate level of resource being made available for it to operate so that action can be taken to mitigate against the exposure of highway users to high risk of death.

As expert evidence would be critical to establishing whether or not there was a gross breach of duty, it is relevant to consider whether the Welsh Government and its Agents are conducting its activities in accordance with published guidance and recognised Industry standards. If they choose to conduct any of its activities outside such guidance or practice, the Welsh Government and its Agents should record that difference and the rationale for it.

4) The Way in Which its Activities Were Managed or Organised By its Senior Management was A Substantial Element in the Breach

In the event that a charge of Corporate Manslaughter were applicable, the Senior Management may include Ministers, Welsh Government Officers and Agency Staff, particularly those in senior management positions.

Given that the test is whether senior management failings made a substantial contribution to a state of affairs within the organisation which, when taken as a whole, was a gross breach of the duty of care owed to the deceased, it is important that the Welsh Government are able to prove the operation of a reasonable system of work in respect to its statutory duties.

5) The Gross Breach of the Organisation's Duty Caused or Contributed to the Death

The answer to if the gross breach was a cause of death would very much depend on the particular circumstances. A failure to meet duty in respect to the SRN in Wales can be a cause of death. However, no reasonable system can nullify the risk of death occurring on the highway. In spite of a reasonable system of work being in place, it is possible that a gross breach of duty is a cause of death.

The public interest test may apply, and if a case passed the evidential test then it is almost certain that Corporate Manslaughter would be pursued by the Crown Prosecution Service given the wider community impact and public interest as a consequence of the extent of usage of the SRN in Wales. The fact that a charge is more likely in the event of a generalised failing within the corporate management processes, places further importance on having reasonable systems of work in place in respect to duties held.

Finally, on the related subject of Gross Negligence Manslaughter, the senior management are not immune from prosecution as individuals for gross negligence manslaughter in respect to a gross failing in their management of the SRN in Wales. This is regardless of whether a charge of Corporate Manslaughter is made, or not, the decision to charge being fact specific.



Key Findings

The Review Team identified that a safety-first approach to the management of the network was demonstrated and closure or restriction of parts of the highway network is considered and implemented when required to maintain a safe environment.

Although a complex area where specialist legal (privileged) advice may be beneficial it is unlikely that Corporate Manslaughter will be an issue given the approach demonstrated by the Welsh Government. However, given the limits of the current maintenance programmes further restrictions to the operation of the SRN in Wales may need to be introduced.

In conclusion no evidence of instruction to operate unsafely was found.

Training

There is evidence of formal SRN Divisional training having taken place in respect to the subject of Corporate Manslaughter and the duties of a Highway Authority.

Welsh Government Policy strongly supports that there is an awareness of all commitments set by the Government itself through legislation made specifically for Wales. Welsh Government policies do recognise the duty held for the maintenance of the SRN in Wales and the various other duties and commitments set by other legislation applicable to England and Wales.

Interviews with Welsh Government Officials confirm that they are aware of all applicable highway legislation and of the changes in approach that are being advocated as best practice by industry codes. However, the extent to which such practice has been consistently embedded into highway policy is variable. Whilst Wales is closer to the forefront of best practice in some regards, the Welsh Government lacks a finalised overarching asset management policy or strategy.

A common set of highway standards do exist in the form of national standards applicable throughout the UK and the Welsh Government does publish associated guidance documents which support the UK Highway Standards.

The Trunk Road Maintenance Manual (TRMM) sets out a system of inspection and repair, however the version in operation (Issue 2 – dated 9 August 2016) predates the publication of the latest industry Code of Practice, Well Maintained Highway Infrastructure in October 2016. The TRMM is being reviewed. An updated version of the document should be implemented in 2023/24 and kept continually under review.

3. Review of Current Approach

3.1 SRN Delivery Model

The Current Arrangements in Wales

Welsh Ministers have appointed staff to carry out the Government's functions and the majority of the maintenance and improvement plans are delivered through delegation to the two Agents.

- North and Mid Wales Trunk Road Agent NMWTRA (Gwynedd Council)
- South Wales Trunk Road Agent SWTRA (Neath Port Talbot CBC)

3.2 Current Programmes

There are 43 lines in the current programme of works to the Strategic Road Network in Wales. These are listed in Appendix C.



Fig.9 Example of Street Lighting Maintenance on the SRN

In reviewing these programmes, the Review Team sought to:

- Reach a valid interpretation of what is 'safety critical' and how that might influence current and future work programmes;
- Form a view on what routine maintenance activity is 'essential' to maintain the day-to-day safety of the network;
- Include an assessment of the approach, in the light of potential changes to the function of the SRN, set out in the Trunk Road Maintenance Manual (TRMM);
- Provide alternative options for the MAR allowing a more "flexible" approach to allow a comparison of delivery mechanism and timescales; and

- Recommendation on the appropriate standards to be adopted in order to avoid over specification, and whether the Design Manual for Roads and Bridges (DMRB) should be used in every case.

In doing so it was essential that the Review Team sought to understand the relationship between the 43 lines of the programme, the nature of any potential risk to which highway users are exposed, and as a consequence the risk to which the Welsh Government is exposed. This took into account the various statutory, contractual and other commitments held by the Welsh Government towards the SRN in Wales. The extent to which the activity delivered by each line of the programme is safety critical, or essential, is directly related to the scale and nature of the risk exposure if that activity was removed from the programme of works. Hence the importance of understanding risk.

Where the Risk Sits in the System

Understanding where that risk sits is also important. Who (Ministers, Welsh Government Officials, or their Agents, contractors, and sub-contractors) holds risk will depend upon the extent to which risk is transferred from the Welsh Government to others, particularly given the delegation of functions under Section 6(1) of the Highways Act 1980. The extent of delegation has an influence on the nature and extent of the Welsh Government (and others) liability in the event that any particular risk materialises.

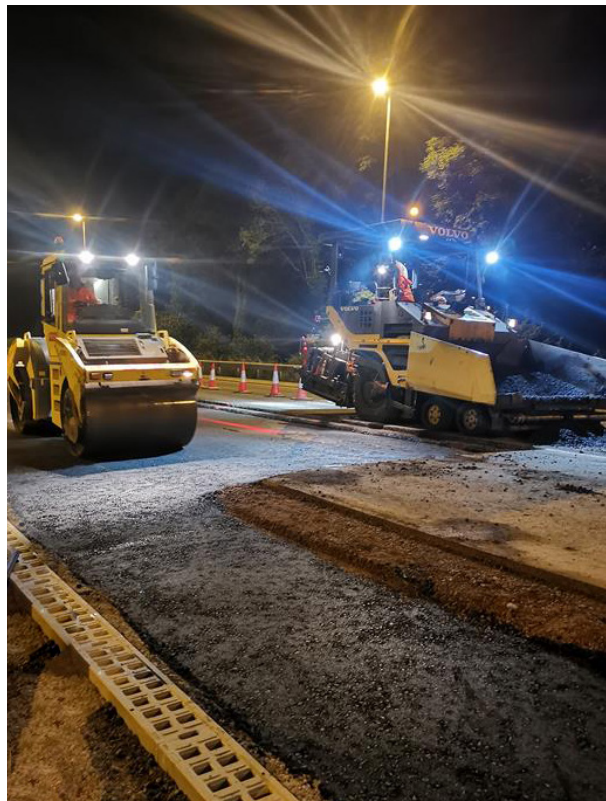


Fig.10 Example of major carriageway maintenance A4042 Penperllenni

The Memorandum of Delegation dated 6 August 2012 in respect to the delegation to Neath Port Talbot County Borough Council was reviewed by the Team. This confirms that the Welsh Government delegates to the Agent the functions of maintenance and improvement of trunk roads and land, as described in the Agreement Documents. No doubt the same extent of delegations will apply equally in respect to other Agents.



The Agreement Documents are:

- The Memorandum of Delegation;
- The Conditions of Delegation;
- The Service Information; and
- The Area Information.

The memorandum of Delegation allows the Welsh Government to arrange for any part of the functions delegated to be carried out by itself or Others.

The Conditions of Delegation

The Conditions of Delegation establishes that the Agent provides the services in accordance with the Service Information. In providing the services the Agent does what is reasonably necessary to achieve the safe, economic and efficient operation, maintenance and improvement of the Agency area. Importantly this requirement is conditioned on whether the Welsh Government provides sufficient resources and funding to enable the Agent to observe and perform such obligations. An equivalent limitation on the obligations of the Agent is also established on compliance with the TRMM. In the event that the Allocated Budget does not allow for the Agent to comply fully with the TRMM, they are to notify the Head of Network Operations. Amendment can be made to the TRMM with not less than six months' notice to the Agent unless both parties (Welsh Government and Agent) agree otherwise.

The Delegated Functions are further described in the Conditions of Delegation. The delegated functions include the statutory functions of the Welsh Minister as specified in Annex S2 of the Service Information.

Given that no powers or duties associated with those functions have been transferred to the Agents, it may also be that case that some contractual requirements set by the Agents (in accord with Welsh Government requirements) in their contracts with providers will reflect upwards as contractual requirements on the Welsh Government. The Conditions of Delegation also covers the procurement of Works and Services, in essence it requires the Agent to present a Procurement Strategy to the Agency Steering Group for approval and then to agree any changes to that strategy with the Agency Steering Group prior to its implementation.

The Conditions of Delegation also covers the subject of Risk Management. Notably, the Agent is to maintain a Risk Management process which gives consideration to the identification, assessment, prioritisation, and mitigation of risks. The Agent is to complete and submit to the Welsh Government an annual Risk Register. This register should identify key risks and the procedures for managing them, and it relates to the agreement period and also where risk sits (between the Agent of Welsh Government) and actions to be taken by either party to manage such risks. The Agency Steering Group has a role in approving the Risk Register, its ongoing review and update at every meeting of the Group and also the ongoing communication of risk to the Welsh Government. There are also arrangements for dealing with risk at a scheme level. Finally, and importantly the Conditions of Delegation establishes that a statement in the Risk Register or any Scheme Risk Register that a risk is to be carried by the Welsh Government or the Agent overrides any other provision of this Agreement. Consequently, the Risk Register becomes a very important document, it is not only record of risk as assessed, but an overriding agreement between the Welsh Government and its Agents as to whom is to carry risk.



Fig.11 Risk Landslip Caused by heavy rainfall blocking the SRN


Risk Register

A copy of the risk register held by the NMWTRA has been supplied. The Review Team have undertaken a high-level review of the register, which contains 103 entries. The findings of that review are as follows:

- The true currency of the register is potentially a concern, this as entries in the 'Last Reviewed' column of the register range from (earliest) 13/12/2019 to (most recent) 15/11/21. It is probable that the Last Reviewed column is being used to record when entries were last amended, as opposed to last reviewed. The minutes of the Agency Steering Group meeting may confirm that the register was reviewed as a whole at the last meeting of the Agency Steering Group, which is understood to have been the 23 November 2021. It is recommended that the register is adjusted to clearly record when an entry was last reviewed and when last amended, this to clearly demonstrate its history of both review and amendment;
- 20 entries are rated as 'Red', 75 as 'Amber' and seven 'Green'. One entry is not rated. The NMWTRA is identified as the Risk Owner of seven entries, six of which are rated as 'Amber', one as 'Green'. The Welsh Government are identified as Risk Owner of the remaining 96 entries, including all of the 'Red' rated risks;
- The register appears to rate the risk as initially identified; the register would benefit from a rating of the residual risk that remains as a consequence of the actions taken in mitigation. It is recommended that the structure of the register is amended to include the rating of residual risk; and
- 10 entries relate to 'Scheme Type = Major Maintenance'. All are rated 'Red' and the risk owned by the Welsh Government. In all cases, bar one, the hazard associated with these entries is Category 1 carriageway defects. The exception expands on this to also include surface water, off slip containment and delivery of construction phase elements. Controls are identified in all instances as being in place, all bar one case. That case relates to an ongoing temporary repair / regular inspection and patrol.

This raises two concerns: the first being that the risk as described appears to be one that is being managed by the Agents and as such is a matter that should be owned by them, as opposed to the Welsh Government. This particularly if the Welsh Government continues to provide the funds that enable the ongoing inspection and repair.

The second concern is that the risk is not adequately described. It is probable that the risk is actually that the scale of the works required to keep the route safe by inspection and temporary repair becomes one that is beyond the capability / capacity of the system of inspection and repair that is in place; and/or that the asset fails (as it is reaching the end of its lifecycle).



The risk as described in this second concern is one that would sit with the Welsh Government in respect to the decision to fund a programme of major maintenance works. It is recommended that a detailed review of the risk register is undertaken to ensure that all risks are adequately described and assigned to those who are best placed to manage them, regardless of their rating.

Risk and Insurance

Section 9 of the Conditions of Delegation covers Risk and Insurance. The various risks held by the Welsh Government are described and notably the point made above in regard to additional risks being those agreed to be Welsh Government risks by the Agency Steering Group is confirmed. Further, risks associated with any historical underfunding of the TRMM functions will remain with the Welsh Government until such time as a full programme of compliance has been achieved in line with TRMM, this provided that the Agent has done everything reasonably practicable to mitigate risk within available funding.

The Conditions of Delegation also covers indemnity. In essence the Welsh Government indemnifies the Agent against claim and expense in connection with claims against the Agent, with few exceptions. Those exceptions are typically limited by the provision that the Welsh Government provides sufficient resources and funding to enable the Agent to perform their obligations. Requirements in regard to procedure in the event of a third-party claim are also set.

Extent of Delegations

Annex S2 of the Service Information confirms the delegation of the duty to maintain as section 41 of the Highways Act 1980 along with a range of powers under this Act.

There are no specific delegations made in respect to the Active Travel (Wales Act) 2013, though the requirement of that legislation to have regard to the needs of walkers and cyclists in the exercise of their functions will equally apply to the function, whether they are delegated or not.

Role of the Agency Steering Group

Annex S3 of the Service Information covers the objectives, term of reference, and methodology of the Agency Steering Group. This group has a key role to play in the approval of the Risk Registers and as a consequence the allocations of risk between the Welsh Government and its Agents. The group is to operate by consensus, its composition includes three Welsh Government officers, one of whom is the Head of Network Operations, and three representatives from the Agent, one of whom is the Trunk Agency Manager. This composition can be changed, but only with the Group's agreement.

Agent's Advice and Assistance to Enable the Exercise of Statutory Powers

The Service Information requires the Agent to advise the Head of Network Operations of any statutory power, which it is essential or beneficial for the Welsh Government to use to fulfil its duty and the Agent is to provide assistance to enable the Welsh Government to exercise its statutory powers.

Tunnels




Fig.12 Undertaking maintenance in the M4 Brynglas Tunnel

The Agents are to fulfil the role as Tunnel Manager for specific named tunnels under the Road Tunnel Safety Regulations 2007 and the Road Tunnel safety (Amendment) Regulations 2009.

The Road Tunnel Safety Regulations relate to the appointment of various bodies and individuals for the safe operation of tunnels. These regulations do place a duty on the administrative authority for each tunnel. Clause 2.1.9 (2) does not make the Agent the administrative authority, but they do have the duties, as this regulation, that are placed with the Tunnel Manager.

Notably this Act requires that the administrative authority also appoints an inspection entity (Annex S6 confirms that the Agent is required to provide a functionally independent Chartered Engineer to be the competent Inspection Entity). This said, during the Review, it was confirmed that this part of Annex S6 requires amendment to reflect the fact that the Welsh Government currently fulfils the role of Tunnel Manager directly, as opposed to by appointment through the Agent.

Further, where the safety requirements specify a structural requirement that can only be satisfied by means of a technical solution that is not possible to achieve, or only achievable at disproportionate cost, the Tunnel Manager may apply to the administrative authority for authority to use a risk reduction measure. If such risk reduction measures are proposed the administrative authority shall not permit the use of a risk reduction measure unless a risk analysis demonstrates that the measure will result in equivalent or improved protection for users of the road tunnel, compared to the relevant structural requirement in the safety requirements.



The Act requires risk analysis to be carried out by a person that is functionally independent from the Tunnel Manager, so this cannot be the Agent, but may be arranged for through the Agent, as is the case for the inspection entity. The Road Tunnel Safety (Amendment) Regulations 2009 adjusts the 2007 regulations, but not fundamentally in regard to the above points. In addition, Annex S6 expands on Tunnel management. The Area Information confirms the relevant Agency Area for which each Agent is responsible. However, given that the role of Tunnel Manager is no longer fulfilled through the Agent, Annex S6 should be amended to reflect the extent to which roles and responsibilities for Tunnel Management do now sit with the Agent.

3.3 Major Asset Renewal (MAR) Programme

The Need for a MAR

Given the need to consider replacement or renewal when an asset is reaching the end of its lifecycle, the programme of maintenance works will need to include for Major Asset Renewals (MAR). This is an essential part of a whole system of works given that no routine/reactive system of inspection and repair can hope to keep an expired asset in safe use. The obvious alternative to renewal (and indeed major repair) is the closure of the asset, or in some cases restriction on ongoing use. In most cases, closure cannot be a permanent solution, unless the route in question no longer has any purpose as a highway, which is highly unlikely in the case of the SRN in Wales.

Any person can allege that a highway is out of repair and following the procedure set by Section 56 of the Highways Act 1980. The complainant may apply to the Crown Court for an order requiring, if the court finds that the way or bridge is a highway which is out of repair, to put it in proper repair within such reasonable period as may be specified in the order made.

Given the various commitments made by the Welsh Government regarding the management of the SRN in Wales, it would be best to avoid the circumstance of a Section 56 Notice, as the timescale for returning the highway to use will be governed by the Court. Such timescale may not allow for the proper consideration of the influence of both current and anticipated usage, and the opportunity that a renewal presents to adapt the character or accommodate change, may well be lost.

As an alternative to closure, the Welsh Government may, where circumstances allow, choose to restrict or discourage the use of a section of the highway as it reaches the end of its lifecycle whilst repairs are put in place. This may be an approach that is available when the anticipated mode of failure is a progressive one. The response may be accompanied by a monitoring regime that is designed to understand when the risk posed to highway users becomes too great for a responsible highway authority to tolerate. Alongside, the public may be warned of the deteriorated condition of the highway asset.

The final component of sub-section (2) of Section 58 of the Highways Act 1980 confirms that it is not sufficient to just warn of the deterioration in condition, but to give proper instructions to a competent person (the Agents and their contractors) and that those instructions are carried out.



Fig.13 Example of major carriageway maintenance A4042 Penperllenni

The Major Asset Renewal (MAR) Programme was developed to address the growing risk of aging assets requiring the closure of traffic lanes or whole routes in order to maintain network safety. Whilst the MAR programme is an essential part of a whole system, the way that the MAR has emerged has been subject to a different set of financial parameters and policy drivers to the rest of the works programme. This difference has driven an unintended set of behaviours in respect to the development of the MAR Programme that are not conducive to sound asset management.

The absence of an overarching asset management policy and strategy has tended to encourage such behaviours. The product of this is a MAR programme that is not focused on addressing the renewal of assets that have reached a critical state of repair.

These major schemes do address the renewal of the critical asset within a route, but they go further. In some cases, it makes sense to adopt the whole route approach as that approach can offer best value in whole life cost. But in other cases, the approach is building a programme that contains a number of unaffordable programmes of work. This means that the critical (quite possible affordable) elements of each of these major schemes will not be progressed as part of the programme of works. Further, it is possible that some elements of safety critical work should be considered in the other areas of the maintenance programme. It is possible that such works are not considered elsewhere in the programme, as the solutions are not of the type that is routinely deployed as part of those annual programmes. In any case the matter will be best addressed by a mature asset management approach to a whole system of work.

Key Findings from Review of Current Approach and Programmes

Having reviewed these arrangements in detail, the key findings are as follows:

- Welsh Ministers have various duties and responsibilities to protect the rights of the public to use and enjoy the SRN. They also have a duty to maintain it at public expense, future-proof it to adapt to climate change and facilitate more sustainable transport choices.
- A range of functions, including the duty to maintain, are delegated to the Welsh Government's Agents. This delegation is not the transfer of powers or duty from the Welsh Government to its Agents.
- Delegations are limited by the sufficiency of the resources and funding provided by the Welsh Government to enable the Agent to observe and perform their obligations. This also limits the Agent's obligation to comply with the Trunk Roads Maintenance Manual (TRMM).
- The Agreement Documents between the Welsh Government and their Agents establish risk management processes. These processes require the production and approval of Risk Registers. The Risk Register is a very important document as entries in those registers define what risks are carried by the Welsh Government or the Agent. This overrides any other provision of the Agreement. Consequently, these registers are not only a record of risk but an overriding agreement between the Welsh Government and its Agents as to who carries risk. These Risk Registers are the subject of approval by Agency Steering Groups, the composition of which is (unless altered and agreed by the group itself) evenly split between Welsh Government and Agency staff. These groups operate by consensus.
- The management of risk through the established process needs to be strengthened. The Review Team recommend that the register is adjusted to clearly record when an entry was last reviewed and amended. The Review Team also recommend that the register includes the rating of residual risk and that a detailed review of the risk register is undertaken to ensure that all risks are adequately described and assigned to those who are best placed to manage them, regardless of risk rating.
- Particular regulations apply to Tunnels. If risk reduction measures are proposed for Tunnels the Welsh Government cannot permit the use of such measures unless a 'functionally independent' risk analysis demonstrates that the measure will result in equivalent or improved protection for users of the road tunnel. Annex S6 of the Service Information should be amended to reflect the extent to which roles and responsibilities for Tunnel Management do now sit with the Agent.
- A Major Asset Renewal programme (MAR) should be considered as part of the whole system.
- The current approach to the MAR is not consistent with the way that other parts of the programme of works are considered. An overarching asset management policy and strategy is required to move behaviours from the inconsistent processes, that tend to perpetuate historical resource levels, to an approach that addresses need and risk as a whole system of work.
- Most of the 25 schemes in the MAR Programme are large scale. The total estimated spend requirement is £0.8bn.

- Nine of the 25 MAR schemes are on corridors where improvement schemes were considered by the Roads Review Panel. The findings of the Panel on these schemes and the Welsh Government's response may have a bearing on the scope, specification and timing of any asset renewal schemes.



Fig.14 Severe concrete deterioration on the M4 Maplas Viaduct

- Three of the schemes – M4 Junction 44-46 (Tawe River Bridge), A48 Briton Ferry (River Neath and Briton Ferry Dock Viaduct) and M4 Junction 28-28 (Malpas Viaduct) include works to structures that are in urgent need or repair. The total cost of these three schemes is £225m, but the structures work themselves are much less costly at £155m.
- Most of the schemes as formulated in the MAR programme are much less costly – only seven schemes have an estimated cost of more than £25m, [four of which coincide with schemes that were considered by the Roads Review Panel].
- There are a number of primary reasons for these schemes in addition to defects in major structures, including flooding, earthworks, and vehicle restraint systems deficiencies.
- Officials from the Welsh Government and their Agents have investigated significant complementary works in these schemes. The rationale for these parallel activities would be to take advantage of the traffic management needed for the primary works, and so reduce outturn costs. The scope and specification of these works would need to be rigorously tested against current policies.
- While there may be a reduction in the overall costs through this approach, the Review Team have not seen any analysis which reflects the finance costs of bringing forward non-critical spending.
- The corridor approach to asset renewal/repair may have potential for whole life benefits but it will undoubtedly lead to high and potentially unsustainable investment levels being needed.

-
- The 43 lines that make up the Welsh Government's programme of work include the MAR programme. The budget allocated to the other programmes varies considerably; 29 have a typical budget of less than £5m and only five have a budget of more than £10m. The latter include geotechnical works budget £11m and maintenance of the structures with a budget of £19m. The budget allocated to Intelligent Transport Systems (ITS) of £18m appears high.
 - The SRN programmes did include 'Pinch Point Schemes' and 'Upgrades', (In both cases some of the schemes in the programmes were considered by the Roads Review Panel).
 - Several references are made in the Programme to the application of WelTAG, the Welsh Transport Appraisal Guidance. An updated version of this guidance reflecting the ambitions and objectives of the new Wales Transport Strategy, was published for consultation in August 2022 and the final published version is likely to have a bearing on the design and specification of these schemes.
 - The Welsh Government and their Agents apply the Design Manual for Roads and Bridges (DMRB) when designing and specifying works. The DMRB has been developed by the four national highway authorities of the UK to reflect the typical functional requirements of major highways and is therefore generally a suitable standard for the SRN in Wales.
 - However, some aspects of DMRB may not fully reflect the priorities and policies now set out in the Welsh Transport Strategy, in particular the Sustainable Transport Hierarchy. In addition, some sections of the SRN pass through settlements and the needs of through traffic should be balanced with the needs of the local community, both in terms of travel on foot and cycle and the quality of the place itself.
 - Taking a more flexible approach to the application of standards also has the potential to reduce the cost of schemes – for example reducing speeds through the introduction of effective speed limits may reduce the need for vehicle restraint systems and could permit the use of narrower lanes, creating opportunities for road space reallocation when maintenance schemes are carried out.
 - The Welsh Government is not bound by DMRB as published and is able to produce 'National Application Annexes' also Procedure and Advice Guidance (PAGS) to 'complement, supplement or replace requirements in the main document.
 - Furthermore, the DMRB does not in itself set objectives for trunk road schemes. The Welsh Government can produce policy and guidance which informs designers how to apply the DRMB.

3.4 Alignment with the Wales Transport Strategy, National Transport Delivery and Welsh Government Response to Roads Review

In September 2021 Welsh Ministers established a Roads Review Panel, to make recommendations in relation to road schemes in the pipeline and to advise on when new roads are the right solutions for transport problems, applying the principles set out in Llwybr Newydd.




Fig 15 The Roads Review - The Future of Road Investment in Wales

The Roads Review Panel submitted its Final Report 'The Future of Road Investment in Wales' to the Welsh Government in September 2022. The Welsh Government responded to that Final Report from the Roads Review Panel in February 2023 and published the National Transport Delivery Plan 2022 - 2027. That response reaffirms the Welsh Government's view that the transport system is one of Wales' most important national assets. It connects people, binds communities and enables business.

The Welsh Government recognises that they must continue to invest in roads. However, road investment must be consistent with the prioritisation of public transport and active travel and support decarbonisation, modal shift and improve safety. The following is our consideration of that report in the context of this review.

Scope of the Roads Review

The Initial Panel report set out the rationale for schemes scoped in or out of that review. The general scope of the Roads Review included all proposed road investment, whether funded directly by Welsh Government on the SRN or indirectly on the Local Road Network, subject to the following:

- 
1. Routine operational and maintenance work to ensure the safety and serviceability of the Strategic Road Network will continue during the period of the Review. All statutory duties and existing contractual obligations will continue to be adhered to.
 2. Schemes funded in whole or part by Welsh Government where construction work is too advanced to cease will be out of the scope of the review; and
 3. Access roads with the primary purpose of linking a site or premises for heavy industry to the public highway, or within the boundary of a heavy industry development site, will be excluded from the Review. Access roads with the primary purpose of serving residential, retail, and light office / light industrial developments should be paused at the next decision gateway to allow them to be considered by the Review Panel.

Further, Projects were considered by the Road Review Panel to be outside the scope of the Review if one or more of the following reasons was met:

1. Construction is advanced or contractually committed.
2. The project involves public transport or active travel only and private vehicle capacity is not increased.
3. Investment is solely for the purposes of air quality or noise mitigation, or community safety and speed management.
4. Investment is for preliminary investigations into issues on the Strategic Road Network, with no scheme yet defined.
5. Ministers have already made a specific statement that the project would not be subject to the Review.

Given these criteria the Roads Review presented no barrier to the pursuit of the recommendations the Review Team have made in this review as all are founded in the delivery of the Welsh Government's commitments towards the management of the SRN in Wales. Hence there was no conflict or overlap with that of this review and so there has been no issue in taking the two reviews forward together.

Whilst the wording of the rationale for schemes scoped in or out of the Roads Review points specifically to routine operational and maintenance work, to ensure the safety and serviceability of the SRN, continuing during the period of that Review, this did not mean that it is only routine works that can continue during the review period. This is particularly the case when considered alongside all other criteria for what is outside the scope of the Roads Review. As highlighted previously, works for the purposes of air quality or noise mitigation, or community safety and speed management could progress, as can, preliminary investigations into issues on the SRN.

Recommendation 1

When developing and delivering maintenance programmes priority should be given to discharging Welsh Ministers statutory duty to maintain network safety and also maximising the investment's contribution to achieving Wales Transport Strategy priorities and objectives by adopting a minimum whole life carbon approach, improving resilience to climate change and taking any opportunities to enhance biodiversity and promote a shift to more sustainable forms of transport such as active travel and public transport.

Recommendation 2

A set of investment criteria for road maintenance and other work to the existing asset, similar to that adopted by the Welsh Government for investment in new roads following the recommendations of the Roads Review, should be developed. This should prioritise the safety and long-term integrity of the network but also ensure opportunities to deliver wider Welsh Transport Strategy priorities and objectives are taken.

Asset Management

An essential part of this review in assessing the appropriateness of the 43 programmes of the SRN and the MAR is to assess the effectiveness of the approach on how schemes and programmes of work are identified and prioritised. In this context following a comprehensive asset management approach is crucial in delivering the right outcomes. What is meant by asset management and what are the key benefits? Under International Standard ISO 55000 asset management is defined as:

“The systematic and co-ordinated activities through which an organisation optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditure over their life cycles for the purposes of achieving its organisational strategic plan”

The key benefits in this context include:

- Aligning asset management practices to Welsh Government objectives, creating a clear ‘line of sight’;
- Evidence-based decision making;
- Achieving sustainability and cost effectiveness through considering the ‘whole life’ cost of managing our road assets;
- Focusing on the needs of users and the wider public interest in determining levels of service; and
- Managing risks effectively.

What is the evidence that there is an effective asset management regime being applied to the Welsh SRN?

To determine this the following documents were reviewed:

- 2021 Draft Asset Management Policy;
- 2017 Draft Asset Management Strategy entitled - Prosperity for all Managing a Vital Transport Asset; and
- 2021 Asset management Improvement Programme (produced by Atkins).

The first notable issue is that neither of the first two of these documents have ever been published and as a consequence not formerly signed off or adopted. The Asset Management Policy is up to date whereas the Asset Management Strategy is now five years old requires further review and updating before it can be published (it should be noted this now has been updated). The Asset Management Improvement Programme is still very relevant and reflects many of the issues that have been identified during this Review and to date few of the recommendations have been progressed.



ASSET MANAGEMENT STRATEGY
Welsh Strategic Road Network

Fig.16 The Welsh SRN - Asset Management Strategy

The Welsh SRN Asset Management Policy (Draft 2021)

To assess the appropriateness of this document a high-level gap analysis was undertaken comparing the content of the document with the current best practice guidance in the 2015 UKRLG Highway Infrastructure Asset Management Guidance.

The gap analysis identified that this Asset Management Policy when compared with the good practice guidance is reasonably comprehensive however there are four areas that are not referenced:

1. Context with regard to service levels
2. Risk based approach
3. Whole Life value
4. Internal and external Communications

The one-page document also has a cramped presentational style and may benefit from being in the same format as the Welsh Government's Corporate Asset Management Policy 2021-2026. (It should be noted this has now been updated but not published.

The Welsh SRN Asset Management Strategy (2017 Draft)

A similar gap analysis was undertaken for the Asset Management Strategy. In comparison with the best practice guidance this document is lacking some fundamental information such as:

- Alignment to policy objectives
- Condition indicators
- Stakeholder engagement
- Linkage to AM Policy and Plan
- Information on decision making process

- Financial information
- Condition information modelling
- Life cycle plans
- Strategies for each asset type

(It should be noted this again has now been updated but not published)

The 2021 Asset Management Improvement Programme (produced by Atkins)

In 2021 Atkins were commissioned by the Welsh Government to undertake an assessment to review the current asset management practices and identify areas for improvement to further develop Asset Management within the SRN Division. The assessment was undertaken through a series of workshops with the relevant stakeholders and led to identification of the significant gaps in the asset management processes and systems which was then used to inform the development of an Asset Management Improvement Plan. This report is very useful in the context of this review as it confirms much of the areas have already been identified in how management of the SRN can be strengthened.

The Atkins Review measured the SRN Division's asset management capacity against ISO 55001 principles and sector best practices. Findings from this process supported the improvement plan which included over 34 recommendations which were consolidated into eight groups and then prioritised as follows.

1. Clear roles and responsibilities
2. Leadership commitment to asset management principles
3. Understanding the current and future demands on assets and resources verses risks
4. Update of Welsh Government MAMA, TRMM and DRMB
5. Risk and performance management supporting the delivery of asset management objectives
6. Understanding current/future data and software needs to enable asset management decision making
7. Understanding stakeholder groups and their needs
8. SRN Quality Management System

To date there has been limited progress in delivering these recommendations many of which have been identified during this Review.

It appears that the ultimate decision on the allocation of resources across the programme lines is being taken without reference to the Highway service, as such it is uncertain if those decision makers fully reflect risk when taking those decisions. This also tends to reinforce budget setting on the basis of history as opposed to need. These issues are something that should be addressed through the implementation of an effective Asset Management Policy and Strategy. This should provide the link between the wider policy objectives of the Welsh Government, such as decarbonisation and active travel to the maintenance and management of the SRN in Wales. Currently, there is a mismatch, and the drivers for each (in duty and policy) are not being implemented as a whole system.

Summary

The gap analysis of the asset management policy and strategy undertaken identified similar weaknesses in the asset management processes and systems that were captured in the Atkins Report. The Atkins Report provides a clear pathway to how the Welsh Government could fully adopt an asset management approach to managing the SRN but to achieve this the following is required:

- A high-level commitment and endorsement of the Report's recommendations
- That pathway needs to be fully resourced
- A maximum 12-month timescale of delivery of the above

From the documents shared with the Review Team it is acknowledged that progress is being made implementing the Asset Management Improvement Plan with the completion of the Asset Management Policy and Strategy however these documents will require approval by Ministers and Senior Officials and published.

Recommendation 3

Priority should be given to completing the overarching Asset Management Policy and Strategy which are being developed and having them "signed off" by Ministers to achieve high level organisational support and commitment. This will ensure, along with the new road maintenance investment criteria, that there is a rigorous approach to achieving compliance with statutory duties and delivering Welsh Transport Strategy priorities on the ground, while demonstrating value for money.

3.5 Standards

Highway Standards

The Welsh Government manages the Highway Standards and associated guidance used in Wales. The Highway Standards identify the administrative and technical requirements for the planning, preparation, design and construction of highway works.

The Highway Standards which apply in Wales are contained in the Design Manual for Roads and Bridges (DMRB) and the Manual of Contract Documents for Highways Works (MCHW).

Both the DMRB and the MCHW are national standards applicable throughout the UK, produced by Highways England (now National Highways) in conjunction with the governments of Wales, Scotland and Northern Ireland.



Fig.17 Participating Highway Authorities to the UK Design Manual for Roads and Bridges

The Welsh Government publishes associated guidance documents which support the UK Highway Standards defined in both the DMRB and the MCHW. This guidance takes the form of Procedure and Advice Guidance, or 'PAGs' and National Application Annexes (NAAs). NAAs provide national requirements for the application of a DMRB standard and PAGs provide additional advice and guidance. The Welsh Government is permitted to 'complement, supplement or replace the requirements and advice contained in the main DMRB document.' Consequently the Welsh Government is not bound by DMRB.

The day-to-day safety of the network is maintained by the Welsh Government through the annual inspection and routine maintenance activities in the Trunk Road Maintenance Manual (TRMM). It is understood that the latest version of TRMM will be implemented for the 2023/24 financial year. In the meantime the document is intended to be kept under continual review and improvement by the Welsh Government.

The Influence of Policy on Character and Usage Over Time

It is also important to understand the influence that the passage of time will have on risk exposure. This particularly in regard to how the instigation of Policy (or other internal or external influences) may change the use to which the SRN is put, and as a consequence the impact of those Policy commitments on how the Statutory commitments of the Welsh Government towards the SRN, are met over time.



Fig.18 Shows the different character of the SRN in Wales - A470/A487 Gellilydan

To illustrate this interrelationship and the influence that time has on it, the Review Team have examined this in regard to the duty to maintain and the statutory defence afforded by Section 58 of the Highways Act 1980. This duty is of particular interest in the context of this report as by meeting the duty to maintain the Highway Authority must prove that it had taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which the action relates was not dangerous for traffic. In doing so, all reasonable 'safety critical' action should have taken place alongside what routine maintenance activity is 'essential' to maintain the day-to-day safety of the network.

As stated in Section 58 of the Highways Act 1980, subsection 2, for the purposes of a defence the court shall in particular have regard to (amongst other things) the:

- Character of the highway, and the traffic which was reasonably to be expected to use it; and
- Standard of maintenance appropriate for a highway of that character and used by such traffic.

Put simply, the Highways Act places importance on the character of any highway and usage to which it is being put, when considering what is a reasonable system of inspection and repair.

In order to affect change through Policy, the Welsh Government has made many commitments in respect to the SRN in Wales (these are examined in detail the section of this report titled Statutory Commitments of the Welsh Government to the SRN in Wales).

If the reasonable system of inspection and repair fails to adapt to account for the influences that are intended to drive change, it will tend to adversely affect the pace of change. By way of example, transport policy seeks to encourage cycling as a sustainable transport mode, if cyclists are presented with a highway that is in a hazardous condition for them, but one that presents no significant risk to cars, cycling will be discouraged (indeed cyclists may well be harmed).


This illustrates that it is essential to consider the Welsh Government's intended usage of the highway alongside its current usage, if the reasonable system of work is to fulfil all statutory commitments i.e., those established by Welsh Government Policy as well as statute. It is likely that a 'do minimum' will not aid the achievement of the Welsh Government's policy objectives, or manage risk appropriately across all the Government's commitments, as made.

Therefore, it is vital that the Trunk Road Maintenance Manual (TRMM) is revised to move to a risk-based system of inspection and repair in the light of the Welsh Government's policy commitments, and the potential changes to the function of the SRN that these and other influences will bring, to ensure that the statutory defence (as Section 58 of the Highways Act 1980) remains valid. Most importantly, such a move should also mean that that all who use the SRN can do so in relative safety. Without such revision, the Trunk Road Agents are required (by the agreements that defined their relationship with the Welsh Government) to cling to a set of service levels that are defined by historical use (when they may have been valid). To do otherwise would see them having to act outside of their Agency agreements and expose themselves to financial risk.

As described, the ongoing operation of the TRMM in its current form will tend to disable or delay the realisation of the benefits that the Welsh Government seeks to deliver for the people of Wales. Further, by holding onto past standards the level of risk to which highway users and the Welsh Government will be exposed will tend to escalate with time. It is noted that the TRMM is under review.

The current Tunk Road Maintenance Manual (TRMM)

The current TRMM (dated 2016) sets out the Welsh Government's requirements of its Service Providers and others by defining the standards to which the SRN in Wales should be inspected and maintained (Part 0.2). Figure 0.2 of the TRMM shows that it sits as part of Asset Management Policy.



Part 0.4 clause 1, states that the TRMM is the baseline requirement for inspection and maintenance, that requirement then adopts the Welsh Government's risk management policy dated October 2006 and Part 0.4 contains several further points of particular interest in regard to this review. At Part 0.4 clause 5 states that the Service Providers are expected to find opportunities to deliver multiple requirements concurrently (though it is unclear as to how these opportunities may be evaluated and taken forward in the design and delivery of the Service Provider's programmes of work), arguably it is this expectation that has driven the approach being taken to the MAR schemes.

Part 0.4 clause 6 requires formal amendment of the TRMM when modification is deemed consistent with the discharge of the Welsh Minister's duties under the Highways Act 1980. Further, Part 0.4 clause 8 sets out in bold text that if allocated budget does not allow Service Providers to fully comply with TRMM or do what is necessary to perform services then the Service Provider shall notify the Welsh Government immediately.


Despite what is set in Part 0.4, the TRMM at Part 1 (see 1.0.2.1 clause 2 in particular) introduces flexibility to vary the TRMM to accommodate strategic and local network needs in delivering value for money whilst maintaining both robust and transparent service delivery standards. This calls into question as to if what is set by the TRMM is actually a baseline standard i.e., Service Providers may flex to adopt lower standards to achieve better value for money. Part 1.0.2.1 clause 5 states:

'Rather than adopt the Performance Requirements in the Code for all or part of the Network, risk, and business case based alternative performance levels may be proposed by the Service Provider. This may be for a variety of reasons that may or may not be directly related to traffic using the Network (e.g., availability of funding). The Service Provider may develop methods for achieving higher targets for a particular activity and this may be offered to Welsh Government if the Service Provider can demonstrate the provision of better value for money.'

Clause 6 then provides that 'All changes to baseline levels of service must be authorised by Welsh Government as described in Part 0 of WGTRMM.' and Clause 7 encourages the Service Provider to be proactive and innovative in the ways the service is delivered.

In essence the current TRMM neither fully provides a formal framework within which a Service Provider can operate on the basis of risk, or a prescribed framework that is defined by an assessment of risk. The TRMM is a 'halfway house' that is only partially adopts a risk-based approach towards the inspection and repair of the SRN in Wales. Given the way that risk is allocated between the Welsh Government and its Service Providers, it is probable that changes to baseline provision will tend to only be sought at the point where allocated budget does not allow Service Providers to fully comply with TRMM.

In regard to asset management planning, the TRMM states at Part 1.1 (1.1.26.2) that the performance requirements reflect the Asset Management Plan which is currently in place or being developed. However, no asset management processes are established by the TRMM beyond those relating to inventory and record keeping.



Part 2.2 of the TRMM sets particular conditions that are likely to prevent the achievement of the performance requirements, for example at clause 2.2.7.5 for carriageways dimensions of 40mm depth and 20mm width are stated. It is these dimensions that are likely driving what is considered to be a defect during inspection of the network for safety. As a result, defects are likely identified on the basis of these dimensions, as opposed to the risk that any defect might truly present to all highway users, this given the character and usage of the part of the SRN that is being inspected.

The Review Team were advised that the latest update on the TRMM is that an interim “2023” version has been released to the Trunk Road Agents while further work is ongoing implementing the changes required to move to risk-based approaches across all assets. The Review Team were advised that many of the assets are apparently already using risk based approaches such as structures, and discussion on other asset types are yet to be progressed.

The Influence of Asset Lifecycle

Policy drivers can have an influence on both the character and the usage of the highway over time. The resultant change should be accommodated within any reasonable system of inspection and repair. However, time not only brings with it changes to the character and usage of the highway, but also change in its condition. Section 58 of the Highways Act 1980 also says, in subsection 2) that:

- For the purposes of a defence against any claim that a highway authority has failed in its duty to maintain, the court shall also have regard to the state of repair in which a reasonable person would have expected to find the highway; and
- Whether the highway authority knew, or could reasonably have been expected to know, that the condition of the part of the highway to which the action relates was likely to cause danger to users of the highway.

In the context of this report, two key points arise from these sections of the Act:

- First is that no reasonable person could expect to find the highway in a pristine condition throughout its entire life, all physical assets deteriorate; and
- Secondly, given that the highway asset will deteriorate, certain components will reach the end of its lifecycle at some time.

Both of these points acknowledge that deterioration in the asset over time leads to an increase in the likelihood of defectiveness, and those defects can cause danger to highway users. Whilst defects in the highway can exist at any time over the lifecycle of the asset, a highway authority can reasonably be expected to know that assets fail when they reach the end of their life. A failed asset is likely to cause danger to users of the highway.

The severity of the danger caused by the failure of an asset is influenced by the failure mode. As such it is important to understand the likely failure mode for any main component of the highway asset, when considering how to intervene to restore the asset to a safe and serviceable condition. Failure can be instantaneous and catastrophic. Failure can also be progressive. The former tends to lead to the most severe impact on highway users, as immediately prior to failure the asset will present in a normal, serviceable condition and they will continue to use it as such. This does not mean that highway users are immune from danger in the event of a progressive failure.

Maintenance interventions that restore safety during the lifecycle take the form of a repair. However, replacement or renewal must be considered when an asset is reaching the end of its lifecycle. It is likely that any repair is not viable, on technical grounds, financial grounds, or both as the asset reaches the end of its life. The fiduciary responsibilities of the Welsh Government mean that it must contemplate what possible intervention will ensure that public money, and other resources, are used properly, efficiently and as such represent value for money to the taxpayer.



Fig.19 shows an effective maintenance intervention as bridge joint replacement
M4 Usk Bridge

Effective asset management can include preventative maintenance as part of lifecycle planning. Through a regime of well-planned maintenance interventions, the whole life cost of maintaining the asset can be optimised, given the limitations of affordability.

Further Procedure and Advice (PAG) guidance may be required to enable the use of some treatments and approaches to highway works which is not contained in DMRB, the Welsh Government's Highway Standards. This as part of a mature approach to asset management which can also assist the Welsh Government in securing its other policy commitments.

A prime example of this is in the commitment to decarbonisation, to achieve a net zero by 2050. The deployment of lifecycle planning on the basis of whole life carbon, will help the Welsh Government develop its programmes of work on the basis of a least, or optimal carbon footprint and understand the investment and changes in approach that are needed to achieve net zero. A lifecycle plan for a carriageway that contains a number of preventative treatments such as surface dressings (each of which have a smaller carbon footprint than a renewal) may have a lower overall carbon footprint than a lifecycle plan that sees the more regular renewal of the carriageway surface alone.

By investing in the lifecycle plan that has an optimal balance between the carbon footprint of planned maintenance works and the retention of the carbon that is embodied in the existing road construction, the whole life carbon footprint can be minimised.

Key Findings

The ‘Character’ of a highway can be redefined requiring the system of maintenance to be altered.

The Trunk Road Maintenance Manual needs to be revised to move to a risk-based system of inspection to ensure that the statutory defence (as Section 58 of the Highways Act 1980) remains valid. A new a risk-based system of inspection and repair is required. The TRMM should be updated and aligned with the Welsh Government’s objectives through the Asset Management Policy and Strategy.

An effective regime of well-planned maintenance interventions is also needed. This will not only meet the Welsh Government’s statutory commitments toward the SRN, but a mature approach to asset management can also assist in securing other policy commitments. For example, the deployment of lifecycle planning on the basis of carbon will help the Welsh Government develop its programmes and understanding of the investment needed to achieve net zero. Further Procedure and Advice (PAG) guidance may be required to enable the use of some highway treatments that are not contained in the Welsh Government’s current Highway Standards.

Recommendation 4

A review should be conducted into the “character” of all sections of the SRN and in particular those that will be subject to a change in speed limit with the objective of establishing the appropriate standard of maintenance.

Recommendation 5

The Trunk Road Maintenance Manual (TRMM) is revised to move to a risk-based system of inspection and repair. The TRMM should be aligned through the Asset Management Policy and Strategy to the Welsh Government’s policy commitments, and the potential changes to the function of the SRN that these and other policies will bring. An updated version of the document should be implemented in 2023/24 and kept continually under review.


Recommendation 6

The Welsh Government should consider how best to apply and where necessary modify the standards and guidance in the Design Manual for Roads and Bridges (DMRB) through the use of National Application Annexes (NAA) and new Procedures and Advice (PAG) Guidance so that it is fully aligned to the delivery of Welsh Ministers’ statutory duties and Welsh Government policies.

3.6 Risk Management

The Changing Character of the Strategic Road Network in Wales

The Welsh Government has made many commitments to the SRN in Wales. The focus of many of these commitments is on changes to the character of the SRN, by the reallocation of the available road space, for active travel and public transport. These changes are designed to affect the character of the SRN and consequently encourage a shift to travel by sustainable modes of travel.



In the main, changes in character of the SRN do not lead to short term change in the usage of the SRN. However, well designed schemes, along with other influences on human behaviour, lead to the desired change in overall usage of the SRN. Such changes in the character of the SRN present risk to operation of the reasonable system of inspection and repair. Consequently, any system of inspection and repair must adapt to take account of the risk that comes with change, particularly if the statutory defence, as Section 58 of the Highways Act 1980 is to be upheld.

Similarly, the change in usage that comes as a consequence of other factors (such as the cost of fuel) can have an overriding 'positive' or 'negative' impact people's behaviours and must be accommodated in the reasonable system of inspection and repair. That system must continue to address risk well by delivering all safety critical action and maintenance activity that is essential to maintain the day-to-day safety of the network over time.

Consequently, the reasonable system of inspection and repair must take account of the change in risk over time.

The Welsh Government's Risk in Respect to the SRN

The Review Team have assessed the level of risk to the Welsh Government from the Programme of works that it has established for the maintenance and management of the SRN Network in Wales.

Our assessment reveals that the Welsh Government is exposed to some form of high risk against its various statutory and policy commitments across the majority of the works programme. The exceptions to this relate to Fences and Boundary Walls, Intelligent Transport Systems (ITS) Infrastructure, the Electrical Upgrade of Lighting, Noise, the Bulk Purchase of Equipment, Property Maintenance and Upgrades, Small Schemes, Core Costs Capital and Internal Invoices, although none of these lines in the programme are without risk.

Considering all statutory and policy commitments, the greatest area of risk for the Welsh Government is in their programme of Major Asset Renewals and the Tunnel Programme.

Considering these high-risk lines in the programme further:

Major Asset Renewals

A failure to deliver a planned programme of Major Asset Renewals or necessary Tunnel works will result in high-risk exposure against the following Statutory and Policy Commitments:

- Duty to maintain.
- Network management.
- Approach to Strategy Development.
- Asset Management.
- Climate Change Adaptation.
- Employment.
- Economy.
- Road Safety.
- Fiduciary Duty;

Also, the following contractual or other commitments:

- Adequate funds for demand led statutory services; and
- Whole system budget Impact.

This high-risk exposure is driven by the high likelihood, in the absence of funding and resources, that a severe impact will result in significant harm to highway users and prolonged severance of the SRN in Wales, should these aged assets fail.

Recommendation 7

Training is provided on a regular basis to all staff, including senior officials, on Welsh Ministers' statutory duties for the SRN as highway authority contained in the Highways Act and other legislation. The training should also include an appreciation of the Police Road Death Investigation Manual (PRDIM) and legislation relating to Corporate Manslaughter.

Recommendation 8

A review of the current risk management regime is undertaken to ensure that there is a robust process for identifying and recording all relevant risks, that they are assigned to those best placed to manage them, there is a clear procedure for escalating risks from the Trunk Road Agents to Welsh Government and all risks are kept under continual auditable review.

Recommendation 9

Subject to recommendations 1 and 2, all current safety critical programmes should continue. Particular attention should be paid to Major Asset Renewal and the Tunnel Programme which the Review Team consider the areas Welsh Ministers are exposed to the greatest risk.

3.7 Scheme Identification and Prioritisation

The MAR has been described to the Review Team through interviews with Welsh Government officers as a plan to address the maintenance backlog by taking a planned preventative maintenance approach. The UK National Roads Authorities Asset Valuation System (RAAVS) is used by Welsh Government to establish asset valuation. This is the main financial tool using simple depreciation models and assumptions which have a limited relationship to the condition of current assets. The valuation document (produced by Atkins on behalf of Welsh Government) highlights the depreciation of cyclically renewable elements as elements that depreciate over 20 years and account for 15% of the serviceable elements of the structure (e.g bridge bearings, joints). Welsh Government officials have highlighted that very few cyclically renewable elements have been replaced in the recommended period. This fact, therefore, filters into the Sustainable Asset Valuation and Investment Tool (SAVI) input data which will be discussed in the following section.

SAVI background



Fig.20 M4 Malpas example of severe concrete deterioration on a bridge pier

The SAVI was released in 2020 as a new decision support tool for asset owners, operators and managers to help encourage wider use of lifecycle planning and whole life costing, assess risk and direct funds more effectively for their structure stock.

It can be used to:

- Carry out the valuation of structures stock
- Develop prioritised short-term programmes of work (five years)
- Determine long-term intervention strategies
- Model variable budget scenarios against performance and whole life cost
- Carry out both gross and depreciated valuation of structure stock
- Develop long-term asset management plans (up to 120 years)

It is important to note that SAVI is designed to work with asset owners' wider asset management policies, and it only covers risk concerning deteriorating elements i.e., condition.

Key Findings

The use of SAVI has helped to further support and quantify elements of the maintenance backlog that exists on the (SRN). If further refinement of SAVI is to take place it would be advantageous to utilise some of the additional features within SAVI such as the five-year forward works programme or bespoke priorities based on element types for example, but this would require a greater input from the already under resourced Welsh Government structures team. Refinement of SAVI to include a defined risk profile would add further substantiation behind the MAR programme. As previously highlighted the whole route approach to the MAR is building a programme that contains a number of elements that could not be accommodated within the available funding envelope and may be deemed as undeliverable. The Review Team do however agree that early intervention can be significantly cheaper than only targeting high-risk elements and structures.

The SAVI analysis also concludes that an annual budget of £50m is required to maintain a steady state for the bridge stock alone. This figure is further supported by the County Surveyors Society Bridge Group document released in 2000 titled 'Funding for Bridge Maintenance', which concluded that the annual funding required for bridge maintenance (to cover essential work and prevent long-term deterioration) should be 1.1% of the replacement cost. The SAVI output highlights that £50m is 1.14% of the asset value and so correlates with the CSS report.

At present the approach to the development of the MAR complemented with data from SAVI lacks a process flow chart or documented programmes. As recognised by Welsh Government officials, the programme needs to be developed further using criteria that encompass risk, WelTAG, Llywbr Newydd and the sustainable transport hierarchy. One further recommendation is to ensure Welsh Government officials have full access to SAVI to allow them to amend the data themselves as currently analysis is prevented by I.T. protections within Welsh Government.

Inspection regimes and accredited assessors

From the evidence presented to the Review Team, there is record data for 3974 structures extracted from the Welsh Government Structures Management System (SMS). Further discussions with Welsh Government officials indicated that there is good practice in place with routine monitoring, Principal and General Inspection programmes which are predominately carried out by the trunk road agents. There is also clear guidance on the frequency and service requirements for the asset stock provided in the Welsh Government Trunk Road Maintenance Manual (WGTTRM). In addition, engineering consultants are brought in when required for specialist services such as underwater surveys or Post Tension Special Inspection (PTSI) for example.

The record data outlined above has been input into SAVI for analysis. However, the SAVI report highlighted 'significant data quality issues,' which led to several assumptions being made for the input data, such as material types, missing structures, or elements. The record data also highlights missing scoring information including 175 structures with missing BCI (Bridge Condition Index) scoring.

Data quality issues are commonplace for asset owners within the industry with challenges gaining consistency and quality in large data sets. The Welsh Government is no different having over 70,000 elements entered into SAVI for the structure's asset stock alone. Obviously, data quality issues can lead to risk scores or programmes with scoring that does not reflect the actual condition of structures.

A number of standards are often referenced when discussing asset management and stored data. Fundamentally the standards centre on whether the information is fit for purpose and the data is relevant, accessible and able to be updated. One such reference document is the Code of Practice – Management of Highway Structures (2013) that states:

‘Information requirements for implementing good management practice should be established and gaps in current information identified. A prioritised programme should be put in place to capture missing information. Condition data from previous inspections should be retained as the evolution of this data over time gives a clear indication of the rate of deterioration and residual service life.’


From the Review Team discussions with Welsh Government officials, one-off exercises are taking place, looking into gaps in the information, such as the Mott MacDonald review prior to SAVI analysis. However, the officials agree that the next step needs to be a continuous ongoing process of reviewing the data which feeds into the programmes of work and would see continuous data improvement each year. This must be tied into an overarching policy and strategy.

One of the most common problems the Review Team found in reviewing client data is an inconsistency in defects between Principal and General Inspections. General Inspections comprise a visual inspection of all parts of the structure that can be inspected without the need for additional access equipment. Therefore, elements that cannot be inspected generally receive a score of 1A (Very good condition) or 6F (not inspected) which leads to a yo-yo effect in BCI scoring when inspected at Principal Inspection (PI) stage with access equipment. This was discussed with Welsh Government officials who accepted that it is an issue with the data they hold.

Waterproofing



Fig.21 Example of waterproofing failure on the SRN causing surfacing breakdown



The decision to assume the waterproofing BCI score to be 5E (failed) is having an adverse influence on funding. This assumption has the effect of increasing the deterioration rates and intervention levels for materials and components. In the experience of Review Team members, un-inspected elements such as waterproofing would be scored as 6F (not inspected) so that they do not influence the scoring. Signs of damage to waterproofing would be evident in other areas of the bridge, such as damp patches along the bridge soffit and leaking joints which would be scored accordingly for those elements.

It also highlights the need for engineering judgment when programmes are reviewed relating to design life versus service life of renewable elements of structures. Waterproofing systems generally have a design life of 25 years, but the service life is such that the system can maintain functionality for two or three times this length of time. This is of course dependent on the overseeing organisation's acceptability of risk, but in general, the defects that result in concerns for public safety are relating to deck elements and load bearing substructure elements within the BCI scoring.

To illustrate the potential data quality impacts; of the 1195 bridge structures stored on the SMS, 996 (83%) are based on BCI scores established in the General Inspection (GI). The GI may be the latest inspection, but a clear review process to monitor the evolution of the data is lacking. Again, this comes back to having policies and guidance in place for dealing with elements that cannot be inspected.

Accredited assessors

The Wales National Application Annex to CS 450 (the DMRB standard for the Inspection of highway structures) states that all personnel carrying out inspections on Welsh Government owned structures shall be certified (or working towards certification) in accordance with the Bridge Inspector Competency Scheme (BICS), which has been developed in accordance with National Highway sector scheme 31. Discussion with WG officials indicated that this is reflected in the current status of the inspection teams within the trunk road agencies with the majority working towards accredited status.

There has been a poor uptake of BICS accreditation for inspectors, with only 70+ BICS qualified in the whole of the UK currently. The poor uptake of BICS was highlighted by the Association of Directors of Environment Economy Planning and Transport (ADEPT) National Bridge Group due to the complexity and cost associated with becoming accredited. Alternative schemes have been developed by members of ADEPT, CSS Wales, and the Society of Chief Officers of Transportation in Scotland (SCOTS), which may be an option if funding or complexity is hindering the certification of the agency inspection teams.

A high-level review carried out on sample Principal Inspections (PI) and General Inspections (GI) reports found them to be in line with the guidance set out in the DMRB.

Hidden defects

The line of questioning from the Review Team within this section centred on the following statement within the MAR programme:

'The M4 Ebbw River Bridge is the latest example of this where previously unidentified corrosion of critical steel reinforcement has led to restriction of abnormal load movements over the bridge'

Initially, this raised concerns on whether risk was being identified and managed correctly across the network as set out in the Well-Managed Highway Infrastructure: Code of Practice.

Through our discussion with the Welsh Government officials and the evidence provided it became clear that a risk-based approach is being taken and managed as a series of individual programmes utilising the support of engineering consultancies to carry out gap reviews, produce the programmes and recommendations. The defects on Ebbw bridge were hidden by the nature of the structure (hinge bridge), which was proactively identified as a vulnerable structure and investigated accordingly along with other similar vulnerable structures. From the evidence presented to the Review Team there are programmes in various stages of maturity for the following:



Fig.22 M4 Tawe River Bridge showing severe corrosion of bridge reinforcement

- Principal and General Inspection (see the previous section on inspection regimes)
- Structural review and assessment of Highway Structures: As highlighted by Welsh Government, they have identified a lot of gaps in SMS data that we will instruct the Agents to fill. There is no programme of assessments under CS 451 (BD 101) but Welsh Government are considering this in relation to the gaps identified. Assessments have been carried out in the BMS programmes where the Welsh Government's consultants have recommended them.
- Scour: An investment case document with a series of recommendations including production of a five-year programme
- Special Investigations: PTSI, Hinge, Half Joint etc
- Individual Bridges: M4 Usk Bridge, M4 Malpas Viaduct, M4 Tawe River Bridge, A465 Usk River Bridge, A48 River Neath Bridge and Briton Ferry Dock Viaduct
- Sub-standard structures: a CS 470 tracker spreadsheet

Key Findings

The Welsh Government are confronted by several different sources of information with each information source producing potential works for each structure. All assets will carry a level of risk. What needs to be understood and is currently lacking is the level of current risk and the level of risk the Welsh Government are comfortable with for each risk source. Development of a clear risk prioritisation approach would allow works to be planned appropriately based on a likely blend of the individual programmes.

The Review Team recommend the introduction of an auditable RAG review process that incorporates the source of risk, probability and potential consequence across multiple programmes.

Recommendation 10

A do-minimum list of asset renewals/repairs (those works required to meet the Welsh Government's duty to maintain) should be created, and designs progressed to 'shovel-ready.'

Recommendation 11

The development of the asset repair/renewal list should be a defined, transparent process based on maintaining network safety with particular regard to the risk of catastrophic structural failure.

Recommendation 12

Programmes across all disciplines should be prioritised on the basis of the recommended investment criteria set out in recommendation 2 and maintained as a single auditable programme.

Recommendation 13

All asset condition data used in the prioritisation of SRN programmes and work, should first be verified as accurate by officials. Officials should also ensure that any models used to predict the deterioration of assets and the cost of their repair are based on realistic assumptions and are subsequently verified over time.

Recommendation 14

It should be ensured that Welsh Government officials have full access to Structures Asset Valuation and Investment Tool (SAVI) to allow them to amend the data themselves as currently analysis is prevented by information technology restrictions within the Welsh Government.

3.8 Resources

The Review Team recognised that technical resources within Welsh Government are limited. There is too much reliance on individuals, and this raises concerns about resilience. This also means that a high degree of dependency is placed on the Trunk Road Agents, and whilst it is good that the Welsh Government works collaboratively with its Agents this could detract from establishing and maintaining a healthy challenging environment with respect to the delivery of Welsh Government policies. Another consequence of the limitations on technical resources within Welsh Government is the ability to make timely progress with respect to reviewing and implementing key policies and strategies, such as the Asset Management documents and The Trunk Road Maintenance Manual (TRMM).

Work investigating different models for discharging Welsh Minister's duties for the SRN included the potential transfer of executive functions to Transport for Wales. As a consequence, the Review found that while staff were aware of what needs to be done to maintain the safety and serviceability of the SRN and deliver the Welsh Government's wider policy objectives, lack of resources has been a major factor slowing progress. The Review Team were advised that the review advocated in Recommendation 15 has commenced and is ongoing and that there are two parts to this, one being the functions review of the potential changes and resources required for the delivery model within the Welsh Government SRN Division and Trunk Road Agents, and the other is the changes and resources required to work more closely inter-departmentally and externally with organisations such as TfW. This is intended to include a measure of resilience as referred to in Recommendation 15 and is likely to be provided by Trunk Road Agents, supply chain and TfW.

Recommendation 15

A review of the resources available to Welsh Government should be conducted to establish whether it has the technical capability and capacity to discharge Welsh Ministers' statutory duties and deliver Welsh Transport Strategy priorities and objectives. A Zero-based review of programmes should be undertaken to assist in identifying priority areas and resources that might be re-deployed.

Appendix A

Glossary



Appendix A - Glossary

Term	Definition
Active Travel	Making journeys by physically active means, like walking or cycling.
ADEPT	The Association of Directors of Environment Economy Planning and Transport, formerly the County Surveyors Society. An organisation representing Local Government 'Directors of place' who are responsible for providing day-to-day services including local highways, recycling, waste and planning as well as the strategic long-term planning and delivery of sustainable places.
Arup	A firm of Consulting Engineers.
Asset Management	The systematic and co-ordinated activities through which an organisation optimally and sustainably manages its assets and asset systems, their associated performance, risks and expenditure over their life cycles for the purposes of achieving its organisational strategic plan. The systems and processes through which that lead to programmes of maintenance work.
Atkins	A firm of Consulting Engineers.
BCI	Bridge Condition Indicator. A performance indicator for the overall condition of bridges, calculated using the results of inspection.
BICS	Bridge Inspector Competency Scheme. An international certification scheme for bridge inspectors. The scheme is operated on behalf of the United Kingdom Bridges Board and is supported by the Bridge Owners Forum. The Bridge Inspector Certification Scheme covers detailed competencies around the inspection of common structure forms and materials, focusing largely on bridge, retaining wall and culvert assets constructed from masonry, steel and concrete, as well as awareness of other less common materials and assets.
CMA	Capital Major Asset renewals. A programme of works aimed at renewing highway assets that are reaching the end of their useful life. This programme is funded from Capital Budgets.

Term	Definition
CPS	The Crown Prosecution Service. The Crown Prosecution Service prosecutes criminal cases that have been investigated by the police and other investigative organisations in England and Wales. The CPS is independent, and we make our decisions independently of the police and government.
CS 451 (BD 101)	Part of the Design Manual for Roads and Bridges covering Structural review and assessment of highway structures (formerly BD 101/11)
CSS	County Surveyors Society (now ADEPT), see ADEPT. Also see CSS Wales.
CSS Wales	County Surveyors Society Wales. A professional association of local authority chief officers who operate at the strategic tier of local government in Wales. They work closely with the Association of Directors of Environment, Economy, Planning and Transport (ADEPT), the Society of Chief Officers of Transport in Scotland (SCOTS) and the Northern Ireland Road Service.
CTP	Capital Tunnel Programme. A programme of works to tunnels funded from Capital Budgets.
DMRB	Design Manual for Roads and Bridges. A manual setting out standards for the design of roads and bridges in the UK.
GI	General Inspection of Bridges. A General Inspection is essentially a visual inspection not requiring specialist access, typically carried out every 2 years.
ITS	Intelligent Transport Assets.
MAR	Major Asset Renewal.
MAA	Managing Agent Agreement.
MCHW	Model Contract for Highway Works.
Mott MacDonald	A firm of Consulting Engineers.
National Highway sector scheme 31	National Highway Sector Schemes are bespoke integrated quality management schemes. They aim to make sure that work is carried out to the highest standards of professionalism, using properly trained and competent staff. They also place a strong emphasis on health, safety and environment. National Highway Sector Scheme 31 is the Bridge Inspector Certification Scheme.

Term	Definition
National Highways	A Strategic Highway Company who are the Highway Authority for the Strategic Road Network in England.
NMWTRA	North and Mid Wales Trunk Road Agent (Gwynedd Council). The body contracted to deliver the functions of the highway authority across the strategic road network in the relevant geographical area.
Overseeing Organisations	<p>In the Design Manual for Roads and Bridges the term “Overseeing Organisation” refers to the following organisations (or their successors):</p> <p>Highways England Company Limited</p> <p>Transport Scotland</p> <p>The Welsh Government</p> <p>The Department for Regional Development (Northern Ireland)</p> <p>Where a local highway/road authority decides to use the DMRB in whole or in part for development of its own highway/road network, the Overseeing Organisation is defined in accordance with their own procedures.</p>
PAG	Procedure and Advice Guidance.
PI	Principal Inspection of Bridges. A Principal Inspection comprises of a close examination, within touching distance, of all accessible parts of a structure. It is typically carried out every 6 years.
Pinch Point Schemes	Road projects aimed at easing congestion. Projects would typically include road widening, additional traffic lanes to reduce congestion. A scheme may be on a specific site, at one junction, or it may be a point-to-point improvement along a length of existing highway. Projects might also provide access to sites earmarked for development.

Term	Definition
PRDIM	Police Road Death Investigation Manual. A manual produced by the Professional Practice Unit of the National Policing Improvement Agency (NPIA) setting out operating procedures for the investigation of road deaths and life threatening/changing collisions.
PTSI	Post Tension Special Inspection. Post-tensioning is a technique for reinforcing concrete. Once in place, post-tension tendons can be susceptible to corrosion and deterioration. This inspection should be undertaken from within touching distance of the post-tensioned elements of bridges and other relevant highway structures.
RAAVS	The UK National Roads Authorities Asset Valuation System. A system of accounting requirements for the valuation of highway assets.
RAG	Red, Amber, Green. Traffic light style system for rating risk.
SAVI	Structures Asset Valuation and Investment Tool. SAVI is a multi-functional, condition-based decision support tool. It can be used to: carry out valuation of structures stock, develop prioritised short-term programmes of work, and develop long-term asset management plans.
SCOTS	Society of Chief Officers of Transportation in Scotland. It is a strategic body comprising of transportation professionals from all councils and the seven regional transport partnerships in Scotland. The society's work involves improving performance and innovation in the design, delivery and maintenance of transportation systems.
SMS	Structures Management System. A system (usually an IT system) that supports the management of maintenance activities for highway structures.

Term	Definition
SRN	Strategic Road Network. The network of highways comprising of routes designated as Motorways and Trunk Roads.
Strategic Highway Company	A company appointed under the Infrastructure Act 2015 by the Secretary of State for Transport as a highway authority. In England National Highways are a Strategic Highway Company. No Strategic Highway Company is appointed for Wales.
SWTRA	South Wales Trunk Road Agent (Neath Port Talbot County Borough Council). The body contracted to deliver the functions of the highway authority across the strategic road network in the relevant geographical area.
TfW	Transport for Wales. A company wholly owned by the Welsh Government, set up in 2016 to oversee public transport in Wales.
TRMM	Trunk Road Maintenance Manual. A manual setting out the various highway maintenance processes to be followed by those delivering highway functions across the strategic Road network. Particularly, in the context of this review, the safety inspection and recording procedures.
UKRLG	United Kingdom Roads Liaison Group. A body that brings together national and local government from across the UK to consider roads infrastructure engineering and operations matters. It comprises a number of Boards: Bridges, Lighting & Technology, Roads, Network Management Board, Asset Management, and Adaptation, Biodiversity and Climate Board. There is also the Footways & Cycletrack Management Group, Winter Service Research Group, Road Condition Information Group and Bridge Owners Forum that support the UKRLG.

Term	Definition
Welsh Roads Review Panel / Roads Review Task Force	<p>Panel of independent experts in transport policy, climate change, highway engineering, and the freight and logistics sector. Appointed by Welsh Ministers, to:</p> <p>ensure road investment is fully aligned to the delivery of the Wales Transport Strategy ambitions and priorities, Welsh Government Programme for Government commitments and Net Zero Wales.</p> <p>develop a set of criteria which identify appropriate circumstances for expenditure of Welsh Government funds on roads.</p> <p>use these criteria to recommend which of current road projects should be supported, modified, or have support withdrawn.</p> <p>provide guidance on reallocating road space on parts of the road network which might in future benefit from enhancement.</p> <p>consider how any savings might be allocated, in order to ensure problems on the road network are addressed, and in particular to make recommendations on how to tackle the backlog of road maintenance.</p>
WeITAG	<p>Welsh Transport Appraisal Guidance. produced by the Welsh Government for use in the development, appraisal and evaluation of any proposed transport intervention. It is a framework for thinking about proposed changes to the transport system and is compatible with the sustainable development principle and guidance on the development of business cases.</p>
WG	The Welsh Government.
WGTRMM	Welsh Government Trunk Road Maintenance Manual, see TRMM.

Appendix B

List of Published Information Reviewed supported by sharing of technical information by Welsh Government Officials (not including Legislation)



Appendix B - List of Published Information Reviewed supported by sharing of technical information by Welsh Government Officials (not including Legislation)

- Wales Transport Strategy 2021 Llwybr Newydd A New Wales Transport Strategy 2021.
- Managing Welsh Public Money WG24091.
- National Assembly for Wales Public Accounts Committee Value for Money of Motorway and Trunk Road Investment June 2015.
- National Assembly for Wales Public Account Committee Inquiry into Value for Money of Motorway and Trunk Road Investment South Wales Trunk Road Agent Written Response 19th February 2015.
- Flintshire County Council Report to: Executive Date: 27 March 2012 Report By: Director of Environment Subject: North Wales Trunk Road Agency.
- North and Mid Wales Trunk Road Agency Partnership Agreement 2012 – Draft 14.2.12 (following suggested revisions from Powys and Ceredigion).
- National Assembly for Wales Public Account Committee Inquiry into Value for Money of Motorway and Trunk Road Investment North and Mid Wales Trunk Road Agent (NMWTRA) Written Response 19th February 2015.
- The Road Review Panel ‘The Future of Road Investment in Wales’. Final report. First published 14th February 2023.
- WGTRMM 2016.
- Funding for Bridge Maintenance CSS 2000.

Appendix C

The Current SRN Programme



Appendix C

Table 3-1 - The 43 lines of the current SRN Programme

Ref. No.	Programme	Brief Description of Programme
1	CTC - Capital TRMM - Cyclic Maintenance	Annual cyclic maintenance activities in accordance with Trunk Road Maintenance Manual (TRMM)
2	CTD - Capital TRMM – Category 1 Defects	High priority safety related defects that are identified and must be mitigated as soon as practicable
3	CTI - Capital TRMM - Inspections	Trunk road Inspection programme - all assets in accordance with TRMM and DMRB
4	CAD - Ash Dieback	Proactive programme of identification and removal of diseased Ash trees on the SRN network
5	CAM - Asset Management	Surveys, trials, inventory collection, studies that inform and assist with the asset management of all trunk road infrastructure
6	CAQ - Air Quality	Programme of mitigation measures in response to air quality issues from traffic emissions on the SRN.
7	CBR - Capital Brexit Spend	Measures that are required to assist with HGV issues at ports causing trunk road problems
8	CC2 - Category 2 Defects	Programmes of work for all trunk road assets to reduce maintenance backlog from defects observed from inspections
9	CCR - Climate Change/Resilience and Carbon Reduction	Future programme to undertake studies, trials, etc. to reduce effects of emissions and climate change.
10	CCS - Community Safety Programme	Proactive programme of safety improvements raised by the Speed and Safety review and community raised issues in accordance with Setting Local Speed Limits in Wales guidance. Programme for 20mph rollout on the SRN for delivery in communities.

Ref. No.	Programme	Brief Description of Programme
11	CDR - Drainage	Capital programme for maintenance schemes to repair and improve the SRN drainage asset
12	CEA - Engineering Advice	Programme to engage resources from the Trunk Road Agent wider supply chain frameworks to assist on specialist matters
13	CFB - Fences and Boundary Walls	Capital programme for maintenance schemes to repair and improve the SRN highway boundary asset
14	CHI - Highway Structures Management Improvement	Capital programme for assessment and studies to inform repair and improvement of the SRN structures assets
15	CHR - Highway Structures Capital Renewals	Capital programme for the delivery of maintenance and improvement to the SRN structures assets
16	CHS - Highway Structural Renewals	Capital programme for maintenance and improvement of the SRN geotechnical assets
17	CIS - Invest to Save Lighting	Capital programme for maintenance and improvement of the SRN ITS assets
18	CIT - ITS Infrastructure	Capital programme for maintenance and improvement of the SRN ITS assets
19	CLC - Lighting. Electrical Upgrades	Capital programme for maintenance and improvement of the SRN Lighting. Electrical assets
20	CLR - Lighting Renewals	Capital programme for changing lamps to low energy types for the SRN Lighting assets
21	CMA - Major Asset renewals	Capital programme for major maintenance schemes to address complex and costly high priority repairs to mainly structures assets and to ensure the long-term connectivity of the SRN

Ref. No.	Programme	Brief Description of Programme
22	CMM - Major Maintenance and Renewals	Capital programme for complex and costly surfacing schemes on the SRN
23	CMU - Agent Management Unit Cost	Capital management unit costs for the Trunk Road Agent
24	CNO - Noise	Capital programme for mitigation of noise issues on the SRN in accordance with the Noise and Soundscape Action Plan for Wales 2018-23
25	CPE - Bulk Purchase of Equipment	Capital purchase of vehicles for the maintenance of the SRN - gritters, Traffic Officer vehicles, etc.
26	CPI - Preliminary Investigations	Studies and investigations into issues on the SRN
27	CPS - Pinch Point Schemes	Programme of safety, sustainable, major and minor improvements to the SRN focused on corridors and junctions aligned with WTS goals and objectives.
28	CPT - Preventative Treatment Programme	Proactive programme of surface dressing (cold applied ultra-thin surfacing - CAUTS) systems that extend the life of the pavement, reducing the number of maintenance interventions and lowering costs and carbon.
29	CPU - Property Maintenance and Upgrade	Management of all SRN property and depot assets.
30	CRS - Traffic Signs, Road Studs and Markings	Capital programme for maintenance and improvement of SRN traffic signs, studs and markings assets.
31	CSC - Small Schemes	Various small items of improvement to trunk road assets

Ref. No.	Programme	Brief Description of Programme
32	CSE - Soft Estate	Capital programme to manage the trunk road soft estate
33	CSF - Safety Fencing	Capital programme for maintenance and improvement of the SRN safety fence and VRS assets
34	CSI - Signals, Comms and ITS	Capital programme for maintenance and improvement of the SRN traffic signals assets
35	CST - Capital Strategic Salt	Capital management of salt stocks for the SRN
36	CTP - Tunnel Programme	Capital programme for maintenance and improvement of SRN tunnel assets
37	CUP - Upgrade	Capital programme of asset upgrades in line with WTS goals and objectives.
38	Core Costs Capital	Core Costs
39	WGR - Internal Invoices	Internal Invoices
40	CLS - Local Safety Schemes	Programme of evidence-based studies, road safety audits and safety improvements on the SRN
41	CSR - Skid Resistance Measures	Programme of anti skid schemes from annual survey data
42	CSS - Safe Routes to Schools	Programme of safety improvements to school routes along trunk roads
43	CWC - Walking and Cycling	Capital programme of maintenance, enhancement and provision of active travel routes along the SRN, tying into LA active travel nodes.



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ISBN - 978-1-83504-218-2