



STRATEGIC TRANSPORT PROJECTS REVIEW

PROTECTING OUR CLIMATE
AND IMPROVING LIVES



Appendix I: Recommendation Appraisal Summary Tables

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1. Detailed Appraisal Summary

An 'Appendix I: Recommendation Appraisal Summary Tables (ASTs) Explanatory Note' accompanies this AST.

1.1. Recommendation 32 - Trunk road and motorway renewal for reliability, resilience and safety

Recommendation Description

The overall purpose of this recommendation is to effectively and efficiently remove the maintenance backlog in order to achieve a steady state condition and sustain investment to maintain this level of condition. General routine, cyclic and winter maintenance are out of scope of STPR2 and not included in this recommendation, leaving preventative and programmed renewals of carriageways and structures as well as ancillary assets for consideration over and above current maintenance levels. An additional feature of this recommendation is to address two reliability and resilience issues on the trunk road network that had been identified within the North West Trunk Road operating area (Fort William) and North East Trunk Road operating area (Dundee Kingsway).

There are interdependencies between this recommendation and other STPR2 recommendations relating to widening/alignment; junction improvements; road safety including the delivery of safe system outcomes; flood mitigation and also active travel and Intelligent Transport Systems (ITS) schemes. The related STPR2 recommendations are outlined in the next section.

It would be most cost-effective and less disruptive to the road user to carry out works for all assets (structures, pavements and ancillary assets) at the same time on any section of trunk road or motorway. The renewal of a range of assets on a specific section of the trunk road or motorway at one time is referred to as a one-time fence-to-fence approach. A coordinated and packaged approach of taking forward the different types of schemes covered by this recommendation (and other related STPR2 recommendations) is therefore important to maximise opportunities to address the maintenance backlog and associated benefits while minimising the impacts of doing so on users of the trunk road and motorway network. Stakeholders also support a more strategic approach to trunk road maintenance with fewer maintenance schemes which have a larger scope.

[As detailed in the Road Asset Management Plan for Scottish Trunk Roads](#)¹, a statutory obligation exists for Transport Scotland to maintain the trunk road asset in a safe condition. Asset management activities are designed to maintain and improve on high standards of road safety.

The scheme examples below show the types of trunk road and motorway renewal schemes under consideration through this recommendation. Options would be determined by local circumstances but are expected to include:

- Carriageway Schemes – including road surface inlays, crack schemes, concrete replacement and skid resistance (as additions to carriageway schemes);
- M8 Renewals Programme (structure elements refurbishments) – the M8 Maintenance Strategy including Bridges, Footbridges, Gantries, Walls, High Mast Lights, Culverts, Electrical Upgrades;
- Structures Schemes – Parapet Replacements, Structural Concrete Repair,

Environmental Improvements - culvert replacements (where there are known water capacity issues flooding etc). Fish Ladders, Access Improvements - underpass refurb/replacement, Maintenance – including scour, waterproofing, painting, bearing replacement, Vehicle Restraint Systems, Replacement of Structure (where sub-standard for load carrying capacity; have poor alignment or beyond repair) / Strengthening Work (where cost effective to do so);

- Major Bridge Schemes - Strengthening of major bridges (including the Forth Road/ Erskine/Kessock/Kincardine Bridges);
- Ancillary Assets – Renewal of road markings, safety barriers, traffic signs, signals, road lighting, drainage, fences, landscaping, pedestrian and cycle facilities;
- Removal of Accessibility Barriers Schemes - for example, tactile paving, dropped kerbs, bus shelter and bus stop improvements that include improved footway widths and crossfall;
- Integrated Transport Plan for the A90 Kingsway through Dundee to improve reliability on the trunk road and deliver improvements for local active travel and public transport journeys. This could potentially include online improvements to enable sustainable transport provision.
- Integrated Transport Plan for Fort William to increase resilience and reliability on the trunk road to improve sustainable transport and enhance the sense of place in the local community. This could potentially include improvements online and/or a new link road to enable enhanced sustainable transport provision.

1.2. Relevance

Relevant to all areas served by the Trunk road and motorway network

The trunk road and motorway network renewal recommendation aims to address the problems and opportunities related to renewals on the trunk road and motorway network across Scotland highlighted in the STPR2 National Case for Change report. These include the considerable maintenance backlog and the need for significant investment to ensure the network is appropriately maintained, [as identified by Audit Scotland in 2016ⁱⁱ](#). In doing so, this recommendation would support the provision of a safe, resilient and reliable trunk road and motorway network.

The maintenance of a safe and resilient trunk road and motorway network plays a vital part in the daily lives of all communities, businesses and visitors to Scotland. This is likely to be relevant to all mainland areas across Scotland where the network is located. This recommendation is also relevant to island communities with the trunk road network directly serving Skye. It also connects with ferry terminals that serve the Inner and Outer Hebrides as well as Orkney.

Audit Scotland recognised in their 2016 report on Maintaining Scotland's Roads that 87% of trunk roads are in an acceptable condition, despite severe winters and significant financial constraints. The necessary investment is, though, currently not available to support a move towards a trunk road network in line with international best practice condition targets. However, Transport Scotland's strong asset management approach is ensuring best value from available funding.

The trunk road and motorway asset must be strengthened or renewed after years of permanent use to avoid failure. Like any piece of infrastructure, the network has a design life that can be extended by regular maintenance but that would also require significant

renewal to keep up the integrity and protect the asset for continued use.

Trunk road and motorway renewal is undertaken by adopting a lifecycle planning approach to the three main asset types of carriageways, structures and ancillary assets. Programmed budgets are not currently able to address all of the work that is required. Each scheme in the one-year maintenance programme is scored against a range of criteria: safety, journey time reliability, environment/sustainability and value for money in terms of whole life cost to determine which schemes should remain in the current year and which can be deferred until the following year. This ensures that those parts of the network with the greatest need are addressed.

The delivery of safe system outcomes, as described in the Road Safety Framework to 2030, would require a sustained continuation and enhancement of current investment, with a wider appreciation of risk management embedded within it. The safe system takes consideration of roadsides in its approach, where infrastructure measures can include removal of roadside strike hazards and hard strip provision to provide a more forgiving environment. Opportunities can be taken to address roadside safety risk locations in combination with general road renewals to provide efficiency.

The trunk road and motorway network has some specific reliability issues that have been identified in STPR2. The A90 in Dundee is causing regular delays to public transport services and significant severance for people travelling actively. Some specific resilience issues are also seen on the A82 within Fort William, which is particularly susceptible to seasonal congestion and when major events are taking place, discouraging walking, wheeling and cycling within the town and limits.

Notwithstanding the approach to address the greatest need, further investment is required to fully address the existing renewals backlog and achieve a steady-state condition, and also to consider some targeted reliability, resilience and safety issues on the trunk road network. Addressing the current maintenance backlog and sustained longer term investment would bring a number of benefits: safety, economic, connectivity, resilience, reliable journey times and customer satisfaction. A high quality, well maintained and efficient network also supports other Scottish Government programmes for active travel, connected and autonomous vehicle infrastructure and bus priority investment, and thereby contributes to the low carbon economy.

1.3. Estimated Cost

£2,501 million - £5,000 million Capital

Addressing the maintenance backlog to achieve a steady-state condition and maintain this level of condition falls within the STPR2 cost banding of £2,501 million - £5,000 million. Individual scheme costs would depend on the scope of the packaging of works to effectively and efficiently address the maintenance backlog and other specific schemes related to reliability, resilience, and safety.

1.4. Position in Sustainable Investment Hierarchy

Maintaining and safely operating existing assets

This recommendation would contribute to five of the 12 NTS2 outcomes:

- Adapt to the effects of climate change;
- Promote greener, cleaner choices;
- Be reliable, efficient and high quality;
- Use beneficial innovation; and
- Be safe and secure for all.

1.5. Summary Rationale

Summary of Appraisal

	TPO					STAG					SIA				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Low Scenario	0	+	+	+	+++	0	+	+++	+	+	0	+	+	+	+
High Scenario	0	+	+	+	+++	0	+	+++	+	+	0	+	+	+	+

Continued investment in strengthening the trunk road and motorway asset to address the maintenance backlog is required to maintain and safely operate the network to support accessibility, inclusive growth, casualty reduction targets and safe system delivery, and to keep the network reliable and resilient for all road users. The condition of the trunk road and motorway network is also integral to wider priorities, such as other Scottish Government programmes for active travel, development of connected and autonomous vehicle infrastructure and bus priority investment, and thereby contributes to the low carbon economy.

It is also recognised by stakeholders that a co-ordinated programme of planned renewal work is less disruptive and more cost-effective than addressing network failure. This also removes the need for multiple visits to the same location to address issues.

Within the Sustainable Investment Hierarchy, this recommendation sits in maintaining and safely operating existing assets. This recommendation would have a positive impact against most STPR2 Transport Planning Objectives (TPOs), STAG criteria and Statutory Impact Assessment criteria. Delivery is readily feasible, making use of interventions for which there is already significant experience of implementation in Scotland and elsewhere.

2. Context

2.1. Problems and Opportunities

This recommendation could help to tackle the following problems and opportunities identified in the National Case for Change:

Relevant Problems & Opportunity Themes identified in the National Case for Change

- **Adapting to Climate Change:** climate change directly affects the transport sector through the increasing number of more severe and frequent extreme weather events and the disruption they cause to the transport system. Disruption often disproportionately impacts vulnerable communities with fewer and less resilient transport options and can lead to significant disruption and high economic costs.
- **Productivity:** whilst Scotland's productivity level is not solely driven by the efficiency of its transport system, improvements in transport connectivity between businesses reduces costs and increases productivity, thus generating higher levels of economic growth.
- **Labour Markets:** people often need transport to access employment, education and training and therefore help reduce the numbers out of work and support Scotland's ambitions for growth. Transport can ensure that the skills and experience of those in the labour force are effectively matched with the needs of businesses, helping to increase incomes and improve productivity.
- **Trade and Connectivity:** transport is crucial for trade and competitiveness, within Scotland, across the UK and internationally.
- **Tourism:** transport plays a vital part in supporting tourism. It enables people to get to, and travel within, Scotland and allows them to explore the many sights and experiences the country has to offer. Whilst tourism benefits are recognised, tourists should be encouraged to travel using sustainable modes.
- **Funding and Resources:** the way in which the transport system is paid for and funded needs to be fair and sustainable and support wider outcomes. A key challenge relates to managing transport assets effectively and investing efficiently in the resources needed to maintain and safely operate them and make better use of existing capacity.
- **Reliability:** without intervention, forecast increases in traffic volumes on the road network will impact negatively on reliability through increased congestion and more roadworks as greater pressure is placed on the operational efficiency of the network.
- **Safety and Security:** Scotland's transport system needs to be safe. Whilst the [number of road accident casualties reduced by 11% between 2017 and 2018](#)ⁱⁱⁱ, the number of fatalities has increased. Women and disabled people in particular feel vulnerable when using public transport – particularly at bus stops, train stations or other transport interchanges.
- **Resilience:** a key challenge is providing a transport system that is resilient and speedily recovers from disruption, thus minimising impacts of delayed journeys on networks and users.

2.2. Interdependencies

This recommendation has potential overlap with other STPR2 recommendations and would also complement other areas of Scottish Government activity.

Other STPR2 Recommendations

- Access to Argyll (A83) (29);
- Trunk road and motorway safety improvements to progress towards ‘Vision Zero’ (30);
- Trunk road and motorway climate change adaptation and resilience (31);
- Future Intelligent Transport Systems (33);
- Traffic Scotland System renewal (34);
- Intelligent Transport System renewal and replacement (35); and
- Access to Stranraer and the ports at Cairnryan (40).

Other areas of Scottish Government activity

- [Revised Draft Fourth National Planning Framework](#) (Revised Draft NPF4)^{iv};
- [Climate Change Plan 2018-32 Update](#)^v;
- [Infrastructure Investment Plan 2021/22 – 2025/26](#)^{vi};
- [Circular Economy Strategy for Scotland](#) (2016)^{vii};
- [Scotland’s Road Safety Framework to 2030](#)^{viii};
- [Bus Partnership Fund](#) (BPF)^{ix};
- [Future Intelligent Transport Systems Strategy](#) (2017)^x; and
- [CAV Roadmap for Scotland](#) (2019)^{xi}.

In some instances, infrastructure improvements may require reallocation of road space away from other modes. Where this is the case, design stages would require balancing the sometimes-conflicting aspirations for improved active travel routes with those for bus priority, local access and servicing, and aspirations to reduce traffic pollution and congestion.

3. Appraisal

This section provides an assessment of the recommendation against:

- STPR2 Transport Planning Objectives (TPOs);
- STAG criteria;
- Deliverability criteria; and
- Statutory Impact Assessment Criteria.

The seven-point assessment scale has been used to indicate the impact of the recommendation when considered under the ‘Low’ and ‘High’ Transport Behaviour Scenarios (which are described in Appendix F of the Technical Report).

3.1. Transport Planning Objectives

1. A sustainable strategic transport system that contributes significantly to the Scottish Government’s net-zero emissions target

Low Scenario	High Scenario
0	0

[The carbon footprint of roads maintenance renewals and the contribution to net zero emissions targets has been the subject of research^{xii}](#). This found that the condition of road surfaces impacts fuel consumption and that as the more a surface deteriorates, a greater amount of fuel is required but this can be balanced by reduced speeds that consume less fuel.

Diversions from closures resulting from road renewals can increase the length of a journey and vehicle kilometres travelled on the trunk road network resulting in an increase in transport-based emissions. It is, however, preferable to repair at the optimum intervention time rather than let the asset deteriorate to the point that replacement is required. Where going past the point of optimum repair occurs, this can lead to further disruption and may require additional materials, both of which could potentially increase carbon emissions, which is further considered in the Strategic Environmental Assessment (SEA) sub-section. It is also preferable to address all issues at a location at the same time to prevent further visits with associated emission impacts as well as disruption to road users and related diversions in some instances.

A high quality, resilient and reliable trunk road and motorway network is also important to support public transport and active travel. For example, bus operators that use the trunk road and motorway network require a reliable and resilient network to maintain journey times and provide a reliable service to passengers to support sustainable travel choices.

Further environmental assessment is required to fully determine impacts on net zero emissions, but on initial balance the recommendation is scored to have a neutral impact on this objective in both the Low and High scenarios.

This objective specifically focuses on the impact of emissions from transport, however it should be noted that [‘Sustainability to reduce carbon and waste and enhance environments’ is a Trunk Road Asset Management Objective^{xiii}](#). Please see the SEA section below which considers carbon emissions relating to construction and materials.

This recommendation has a neutral impact on this TPO in both the Low and High scenarios.

2. An inclusive strategic transport system that improves the affordability and accessibility of public transport.

Low Scenario	High Scenario
+	+

A well-maintained trunk road and motorway network supports public transport services which operate on the network through providing consistent journey times. This can, in turn, provide bus operators with the opportunity to review the timetable/frequency of existing services and/or introduce additional services to extend public transport coverage in an area.

While this recommendation would not directly impact on the accessibility or affordability of public transport, it is expected to have a minor positive impact through the trunk road and motorway network being important to the operation of bus services which use the strategic network. It would also remove accessibility barriers on the network, including where these relate to bus stops which would help to improve mobility and inclusion, recognising the specific needs of disadvantaged and vulnerable users. It is envisaged that benefits would be similar in the Low and High travel demand scenarios.

This recommendation has a minor positive impact on this TPO in both the Low and High scenarios.

3. A cohesive strategic transport system that enhances communities as places, supporting health and wellbeing.

Low Scenario	High Scenario
+	+

The trunk road and motorway network are important for all road users and have a direct impact on those living in communities, particularly where the network passes through towns and villages. A well-maintained network can help contribute to a sense of place through surrounds that feel safe and which are in a good condition.

The condition of the network can also support more sustainable travel choices. [In 2018 the active travel asset on the trunk road network comprised around 872 kilometre of footways,](#)

[155 footbridges and 65 kilometre of cycle facilities](#)^{xiv} which combine to help support active travel choices. Effective asset management can support active travel through improvements in road safety in terms of reductions in the number of accidents and also the perception of safety and security in relation to, for example, suitable lighting, adequate and accessible crossing points and maintenance/condition of dedicated active travel routes that form part of the trunk road network.

Further expansion of the active travel network that is the responsibility of Transport Scotland would also require to be kept in good condition through an ongoing renewals programme to support an increase of the mode share of active travel.

The importance of a reliable and resilient trunk road and motorway network in serving more rural and remote communities and the connectivity it brings to access healthcare as well as leisure and recreational activities can also promote the health of communities.

Overall, this recommendation is expected to have a minor positive on this objective in both the Low and High travel demand scenarios with improvements anticipated to be important in facilitating greater individual safety and security. Furthermore, the enhanced reliability of the trunk road network is expected to support accessibility to amenities, including for more vulnerable users and communities that are more rural for whom the trunk road network can also serve an important local function.

This recommendation has a minor positive impact on this TPO in both the Low and High scenarios.

4. An integrated strategic transport system that contributes towards sustainable inclusive growth in Scotland.

Low Scenario	High Scenario
+	+

The maintenance and improvement of key transport links provided by the trunk road and motorway network can help enable a greater number of people to enter the labour market due to improved and more reliable access to employment opportunities. This in turn also supports the operation of existing businesses to access end markets and can help to attract future inward investment as a result of the [trunk road and motorway network being less susceptible to road closures, diversions or lengthy maintenance works, especially if unplanned](#), that could particularly impact on rural routes^{xv}. [The trunk road and motorway network](#) is 3,507 kilometre (2,179 miles) long, including slip roads and roundabouts. It has a gross asset value of over £20.8 billion and represents 6% of the total Scottish road network. It carries 35% of all traffic and 60% of heavy goods vehicles^{xvi}.

[The trunk road network](#)^{xvii} extends across mainland Scotland and across Skye in the Inner Hebrides and is integral to the tourism sector. For example, there are a number of tourist routes on the trunk road network, including [North Coast 500](#)^{xviii}, [South West Coastal 300](#)^{xix} and [North East 250](#)^{xx}. In 2019, it was [reported that the North Coast 500 contributed £22.8 million to the North Highland economy while creating 180 new jobs](#) and a 42% increase in visitor numbers to paid admission attractions along the route^{xxi}.

The trunk road network also provides connectivity to ferry terminals and airports to access services to the islands of Scotland as well as the wider UK and internationally.

Overall, this recommendation is scored to have a minor positive impact on this objective in both the Low and High travel demand scenarios with current evidence suggesting that a well-maintained trunk road and motorway network is important to connect people and businesses as well as transporting freight (including to access ports and rail terminals) and facilitating tourist spend.

This recommendation has a minor positive impact on this TPO in both the Low and High scenarios.

5. A reliable and resilient strategic transport system that is safe and secure for users.

Low Scenario	High Scenario
+++	+++

A lack of resilient and reliable trunk road and motorway connections can act as a constraint for communities, business and freight operations due to the impact of maintenance works and associated road closures/diversions in some instances on connectivity, journey times and social isolation. Poor road conditions can also increase the risk of accidents to both motorised and non-motorised users.

The deteriorating condition of ancillary assets can also pose an increased risk to the number of safety defects such as electrical faults, worn road markings and safety fences/barriers that require immediate or urgent attention. These assets are fundamental to a safe network alongside the condition of carriageways and structures.

[Safety statistics from 2019^{xxii}](#) indicate that 90% of all reported accidents (on all roads i.e. local as well as the trunk road and motorway network) had driver/rider errors as a contributory factor, while 26% and 13% slight and serious accidents respectively had contributory factors of the 'road environment'. Among the sub-factors for the road environment is a 'poor or defective road surface' being a contributory factor in 1% of reported accidents on all roads. However, for fatal accidents feedback Transport Scotland has received from site meetings suggests road condition is seldom, if ever, a defined contributory factor of the accident.

In terms of integration with new technologies in use on roads now or in the future the importance of maintenance of the road network is clear in order to ensure the safe and efficient operation of vehicles, it has been found that the deterioration or unusual use of road markings may confuse Connected and Autonomous Vehicles (CAVs) and in turn increase the risk of an accident^{xxiii}, therefore investing in trunk road and motorway renewal supports integration with new and emerging technologies, such as CAV, as described in the CAV Road Map for Scotland.

Maintenance of the carriageways, structures and ancillary assets also contributes to the resilience of the network from the impacts of climate change (STPR2 Climate Change

Adaptation and Resilience recommendation 31 specifically addresses the impacts of climate change on the network).

Overall, this recommendation is scored to have a major positive impact on this objective in both the Low and High travel demand scenarios with an anticipated significant increase in the reliability of the trunk road and motorway network which, in turn, would facilitate more efficient connectivity to communities and freight associated with businesses. Moreover, an improvement to the condition of existing assets is expected to have benefits to the safety and security of all trunk road users.

3.2. STAG Criteria

1. Environment

Low Scenario	High Scenario
0	0

See Strategic Environmental Assessment (SEA) below.

This recommendation is expected to have a neutral effect on this criterion in both the Low and High scenarios.

2. Climate Change

Low Scenario	High Scenario
+	+

This recommendation would help maintain active modes for short journeys in urban areas where trunk road and motorway active travel facilities are maintained or made more accessible supporting a reduction in greenhouse gas emissions.

Having a well-maintained network also assists in the resilience of the existing network to the impacts of climate change, such as severe rainfall events, and so supporting the vulnerability to effects of climate change

Potential measures to address the greatest risks of climate change to vulnerable areas of the trunk road and motorway network are detailed in the recommendation trunk road and motorway network climate change adaptation and resilience (31).

This recommendation is expected to have a minor positive on this criterion in both the Low and High scenarios.

3. Health, Safety and Wellbeing

Low Scenario	High Scenario
+++	+++

- Across all types of roads in Scotland (i.e. local as well as the trunk road and motorway network) [Reported Road Casualties Scotland 2019](#) ^{xxiv} has found:
- Driver/rider errors or reactions were reported in 90% of all reported accidents with ‘failed to look properly’ the most common type (involved in 30%).
- Travelling too fast for the conditions or excessive speed was reported in 9% of all reported accidents and 20% of fatal accidents.
- Pedestrian-only factors were reported in 20% of fatal accidents whilst ‘loss of control’ and ‘failed to look properly’ were the most frequently reported driver/rider factors (involved in 32% and 25% of fatal accidents respectively).
- Poor or defective road surface, was the contributory factor in 1% of fatal, serious and slight accidents in 2019. However overall 11% of fatal, 13% of serious and 26% of slight accidents were attributed to the road environment in general.

A review of the main contributory factors to personal injury accidents on the trunk road and motorway network over the five-year period from 2015 - 2019 also indicated similar contributory factors; that the road environment contributed to around 14% of accidents and a poor and defective road surface contributed to less than 1% of accidents. Pedestrian-only factors accounted for half the proportion of fatal accidents compared with all roads, but still contributed to around 10% of fatalities on trunk roads.

This recommendation contributes to safety of the road environment, though, for example, keeping the road surface free from defects and in good condition for all road users. Sudden asset failure is also a safety hazard and the greater the backlog the more the risk increases. [Properly maintained roads can reduce the probability of road traffic accidents, while “forgiving” roads \(roads laid out on Safe System principles e.g. with the protection of roadside hazards to ensure that driving errors do not need to have serious consequences\) can reduce the severity of accidents that do happen.](#) ^{xxv}

The recommendation is not expected to have an impact on security or health but would support access to health and wellbeing infrastructure where barriers to accessibility are addressed, and support road safety through safe system approaches to roadside hazards. There is potential for negative environmental effects on visual amenity during construction and operation of any new infrastructure. Further assessment would be required to identify potentially significant location-specific environmental effects and mitigation where appropriate.

Overall, this recommendation is anticipated to have a major positive impact on Safety in both the low and high travel demand scenarios with maintenance activities raising the road standard and reducing the risk of asset condition and defects being a contributory factor to accidents on the trunk road and motorway network.

4. Economy

Low Scenario	High Scenario
+	+

The maintenance and improvement of key transport links, such as those provided by the trunk road and motorway network, can enable a greater number of people to enter the labour market and access employment opportunities as well as education. Businesses that use the trunk road and motorway network also benefit through improved access to domestic and international markets. [The trunk road network adds £1.38 billion to the economy annually through the activities of road freight, public transport and road construction and maintenance on that part of the road network](#)^{xxvi}. [Research into how Scotland’s transport network supports the growth sectors](#) highlighted the road network was felt to have an impact on the economic viability of businesses that participated in the research with key issues identified including the condition and resilience of the road surface^{xxvii}, demonstrating Wider Economic Impacts.

The economic worth of capital maintenance was recently highlighted in research undertaken for the [Scottish Government’s Infrastructure Plan Investment Plan 2021-22 to 2025-26](#). This indicated there is limited quantitative evidence on the relative economic impact of capital maintenance as compared to building new infrastructure, but available evidence suggests that capital maintenance does have as high a rate of return as building new infrastructure and reductions in maintenance have a cost to the wider economy^{xxviii}. [The report highlights other studies which estimated that for every £1 reduction in road maintenance there is a cost of £1.50 to the wider economy \(including accident costs\)](#),^{xxix} demonstrating Transport Economic Efficiency.

The Infrastructure Investment Plan 2021-22 to 2025-26 suggests it is expected that spend on capital maintenance has the potential to impact on the economy through the same five channels identified for overall infrastructure investment as shown below. Supporting the foundations of economic activity is particularly important, but the relative impact of other channels may vary depending on the current condition of existing infrastructure:

- Supporting the Foundations of Economic Activity – infrastructure underpins economic resilience, provision of lifeline services and the effective operation of the economy.
- Demand Side Economy Impacts – the construction phase of infrastructure projects is an important source of employment and can provide wider supply chain benefits that support economic activity across the country in the short- to medium-term.
- Supply Side Economic Impacts – infrastructure spending can enhance the productive potential of the economy, if investment is effective, through improving its supply side.
- Market Impacts – facilitating the development of key sectors and technologies; improving private sector competitiveness; and unlocking private sector capital.
- Social and Environmental Impacts – reducing regional disparities; reducing emissions and improving environmental quality; and improving health and wellbeing.

Overall, this recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

5. Equality and Accessibility

Low Scenario	High Scenario
+	+

A well-maintained trunk road and motorway network supports access to the facilities communities need and to employment, education and leisure opportunities.

A well-maintained trunk road and motorway network would support longer distance and local bus services that use the network across Scotland. This would in turn benefit the connectivity provided to various groups, including those on low incomes and others who do not drive or have access to a car or who live in rural areas where the trunk road network performs a local network function as well as strategic role.

Lifeline roads, where there is usually only one route for access to a community, would be strongly affected if the condition of the route significantly deteriorates. Road maintenance management approaches inevitably focus funding where risks and traffic are most significant, therefore it is expected that geographically remote communities would suffer a bigger disadvantage if maintenance funding is reduced, and less used routes are not prioritised^(xi).

Removal of accessibility barriers, through the provision of tactile paving, dropped kerbs, bus shelter and bus stop improvements, improved footway widths and crossfall, would help improve equality of access for all through assisting walking and wheeling on the trunk road pedestrian network and for access to public transport. [Previous audits^{xxx} have highlighted issues to be addressed concerning accessibility barriers on the trunk road and motorway network.](#) Public transport network coverage, active travel network coverage or affordability of public transport are not impacted by this recommendation but comparative access by people group, particularly those with accessibility, needs would benefit.

Also refer to EqlA/ICIA/FSDA/CRWIA Assessment in the next section.

Overall, this recommendation is expected to have a minor positive impact on the Accessibility and Social Inclusion Criterion as, while all users of the trunk road network could be expected to benefit, this would likely be felt to a lesser extent by individuals who do not own or have access to a private car as well as those unable to drive. This is expected to occur to a similar extent in both the Low and High scenarios.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

3.3. Deliverability

1. Feasibility

Delivery of this recommendation is largely feasible, subject to the assessment of specific schemes. Trunk road and motorway renewal measures are common and involve known delivery approaches, so raise no major concerns regarding overall feasibility. There would, however, be a need to take consideration of supply chain availability/capacity with this requiring forward visibility of future investment to expand provision/capability.

The co-ordination and packaging of schemes is beneficial to support a fence-to-fence approach where all issues at a location are addressed at the one time, maximising opportunities to address the maintenance backlog, deliver a safe system and other associated benefits.

2. Affordability

Asset management provides good value for money, as evidenced in the Infrastructure Investment Plan 2021-22 to 2025-26 and supported by the Sustainable Investment Hierarchy framework where maintaining and safely operating existing assets is advocated. Furthermore, Transport Scotland is the first UK trunk road authority to reach the ISO 55001 Asset Management standard (for road asset management) demonstrating that public funds are being spent in the most efficient and effective manner.

Prioritising maintaining and enhancing assets as part of the ‘investment hierarchy’ framework would help protect the environment, and drive value for money as described in the Infrastructure Investment Plan 2021-22 to 2025-26 for Scotland Specific environmental attributes of this option require further assessment as described in the SEA section.

A co-ordinated and packaged approach is beneficial so all issues at a location can be addressed at once, removing the need for multiple visits – costs associated with packages would be dependent on the scope and complexity of the work involved at specific locations.

3. Public Acceptability

[The STPR2 online survey](#)^{xxx1} demonstrates levels of public satisfaction across different aspects of travel. Across all responses, between 33% and 68% of respondents were dissatisfied with different aspects of road travel and between 18% and 36% were satisfied with the road network in their area. Dissatisfaction was highest in relation to quality of the road infrastructure (68%), highlighting that efforts to improve the road condition through enhanced maintenance would likely be well-received publicly. After the quality of the road network, dissatisfaction was then greatest around the distance to electric vehicle charging points (53%), then safety (49%), whilst safe overtaking (45%) and resilience features (45%) had a similar level of dissatisfaction as traffic congestion (49%). The respondents had been asked to keep in mind the focus of STPR2 as an appraisal of strategic transport options when answering the survey but may have answered also in relation to all roads in their area.

Transport Scotland's trunk road maintenance team collate public satisfaction surveys each year to support performance measurement that is fed into a Performance Management Framework to monitor service delivery. The surveys have found that there is a general trend of decreasing satisfaction with the overall quality of the service, the condition of road surfaces, footways and cycle lanes. For example, [between 2017 and 2018 customer satisfaction with the condition of trunk road surfaces went from a Fair \(50%\) to Poor rating \(39%\)](#)^{xxx2}.

In the STPR2 National Road workshop, stakeholders identified a need to address a maintenance backlog on the trunk road and motorway network and increase funding for delivery of maintenance. Some stakeholders stressed the importance of adopting a 'maintenance before failure' approach, recognising that a co-ordinated programme of planned maintenance is less disruptive and more cost-effective than dealing with network failure. Some stakeholders also supported a more strategic approach to trunk road maintenance with fewer maintenance schemes which had a larger scope, that would also be less disruptive and more cost-effective. The proposed M8 Renewals Programme (Junctions 10-27) is an example of this approach. This recommendation also includes accessibility measures to provide equality of access that are likely to have public support.

Renewal activities would require careful planning and communication to road users to provide sufficient warning of activities and manage public satisfaction while workings are being undertaken. Requirements and processes would be followed in line with specific considerations relating to the scale of schemes.

3.4. Statutory Impact Assessment criteria

1. Strategic Environmental Assessment (SEA)	
Low Scenario	High Scenario
0	0

This recommendation is likely to result in significant positive effects on the safety of the trunk road and motorway network and access to essential services (SEA Objectives 4 and 7). It is also likely to improve climate change adaptation (SEA Objective 2), by increasing the resilience and adaptation of the road network to the effects of climate change.

While this recommendation is not expected to have a notable effect on modal shift, a focus on maintaining the existing road network as opposed to building new infrastructure is not anticipated to significantly increase traffic volumes or associated emissions. Furthermore, a poorly maintained network which deteriorates beyond the point of repair can require more substantial work as well as involve more unplanned emergency repairs with associated emissions. It is therefore not anticipated that this would have a negative effect on greenhouse gas emissions or air quality (SEA Objectives 1 and 3 respectively).

This recommendation supports a co-ordinated and packaged approach to tackle all issues at a location, to reduce the number of roadworks and associated congestion as well as the need for diversions in some instances. It would also reduce the number of trips required to undertake works. This approach can therefore be expected to have less of an impact on the greenhouse gas emissions (SEA Objective 1) associated with maintenance of the trunk road and motorway network. Improved road conditions can also reduce fuel consumption due to greater running efficiency.

While there is the potential for negative effects on natural resource requirements associated with asset improvements (SEA Objective 9), depending on the source and type of materials/natural resources used, this should be balanced against the interventions potentially reducing the requirement for materials for recurring repairs, should they not be made at the optimum time.

There is potential for negative environmental effects during construction on the water environment, biodiversity, soil, cultural heritage and landscape and visual amenity (Objectives 10 to 14). Effects on landscape and visual amenity could also potentially apply to the operational phase.

There is no (or negligible) clear relationship to the achievement of the remaining SEA objectives (Objectives 5 and 6).

It is recommended that further environmental assessment is undertaken as options develop to identify potentially significant location-specific environmental effects and mitigation where appropriate, for example, if a new link road is considered as part of the Fort William Integrated Transport Plan. This future environmental assessment should also identify areas for re-use of materials, adhering with circular economy principles. In addition, any opportunity to employ methods for decarbonisation of construction, through innovation in design, procurement and construction methods, should be identified as part of the design and development process. Similar work undertaken to date in exploring

options for decarbonising construction could be used as a basis for developing these methods.

Overall, this recommendation is expected to have a neutral effect in terms of the SEA assessment, under both the Low and High scenarios. For the Low scenario, the magnitude of effects would be less than for the High scenario due to the reduction in travel.

2. Equalities Impact Assessment (EqIA)

Low Scenario	High Scenario
+	+

This recommendation provides a minor positive impact, as the proposed plan includes removing accessibility barriers to improve equality of access for those with reduced mobility, whether through age or disability. This includes provision of tactile paving, dropped kerbs, bus shelter and bus stop improvements, improved footway widths and crossfall as well as improvements to footbridge access such as replacing stairs with accessible ramps, which would assist walking and wheeling access on the trunk road pedestrian network, as well as access to public transport.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

3. Island Communities Impact Assessment (ICIA)

Low Scenario	High Scenario
+	+

Trunk road network maintenance would have a minor positive impact on Island Communities. The trunk road network provides access to and from the ferry connections on both the mainland and islands, including on the Isle of Skye at Uig. The network is important for connecting communities and businesses and also integral to tourism on the islands. The network also provides access to airports which operate lifeline services between the mainland and Scottish islands.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

4. Children’s Rights and Wellbeing Impact Assessment (CRWIA)

Low Scenario	High Scenario
+	+

There would be a minor positive impact on Children’s Rights and Wellbeing, due to improvements in personal safety and security on active travel routes (e.g. lighting), and a reduction in the likelihood of road traffic accidents and casualties through road surface improvements and better crossing points and removal of accessibility barriers to public transport for those with impaired mobility such as parents with young children in pushchairs, or young people using wheelchairs

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

5. Fairer Scotland Duty Assessment (FSDA)

Low Scenario	High Scenario
+	+

There would be a minor positive impact on tackling inequality. The 2019 Scottish Household Survey indicated that 48% of the most deprived households (SIMD quintile 1) do not have access to a car and are twice as likely to use the bus to travel to work as households in the least deprived three quintiles. Therefore, actions taken to maintain and improve the resilience of the trunk road and motorway network used by local and longer distance bus services could improve accessibility to employment, education, healthcare and leisure activities for those most in need. Support for active travel routes also promotes equality for all users.

This recommendation is expected to have a minor positive impact on this criterion in both the Low and High scenarios.

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