STRATEGIC TRANSPORT PROJECTS REVIEW

STPR

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 34 – Traffic Scotland System renewal

Recommendation Description

The Traffic Scotland System (TSS) uses the information it collects about roadworks, accidents, congestion, and weather events to reduce disruption and improve the operational efficiency and safety of the trunk road and motorway network.

A business-critical part of the delivery of the services provided by Traffic Scotland is the Incident Management System (IMS), a core software system that supports the detection of incidents, the initial response and life-cycle management of those incidents, enhancing safety and network resilience. This element of the TSS is now at end of life and needs to be replaced.

This recommendation is for an upgrade of the current IMS and the related Fault Management System (FMS), including their re-architecture onto more open and supportable technologies. This recommendation extends to the other related Traffic Scotland Systems that require to be upgraded as a result of the IMS and FMS re-architecture.

This would address both current and future requirements in terms of both service delivery and also provide systems that could in turn be more easily developed to accommodate future changes to support Cooperative Intelligent Transport Systems (C-ITS) and Connected and Autonomous Vehicles (CAV).

The new TSS would provide Transport Scotland with the ability to enhance the coverage, level, and types of services provided across the transport network.

1.2. Relevance

Relevant to the trunk road and motorway network

The current IMS is reaching its end of life and a replacement system is required to maintain and improve the current level of service across the network; this is the focus of this recommendation.

There are many components to the TSS, however the key component is the IMS. The IMS Host provides a central processing platform delivering functionality to address many of the core business capabilities relevant to Transport Scotland's operational services, including: Incident Management; Queue Management; Variable Mandatory Speed Limits; Ramp Metering; Bus Lane Running; Traffic Databases and Journey Time Systems.

Without the core functionality of IMS, Transport Scotland would be unable to deliver many of the current network operations and benefits across the trunk road and motorway network, including the management and response to major incidents and providing a safe and efficient road network.

There is also a need for the re-architecture and replacement of the TSS supporting sub-

systems. Any such replacement would need to provide excellent reliability and resilience to failure, ensuring uninterrupted day-to-day operations.

The re-architecture of the TSS would need to accommodate the capacity and scalability to meet today's demands and those of future operational services.

The new system would need to demonstrate a flexible and sustainable technology base; ensuring it can be maintained and extended cost-effectively into the future.

This recommendation applies to and would benefit the trunk road and motorway network across Scotland but may have several wider uses in terms of new technology.

1.3. Estimated Cost

<£25 million Capital

The capital cost for the Traffic Scotland System Renewal of both the IMS and FMS are estimated to range from £5 million to £10 million.

The current TSS has an existing revenue spend and it is anticipated that this will continue to increase over time.

1.4. Position in Sustainable Investment Hierarchy

Maintaining and Safely Operating Existing Assets

This recommendation would contribute to seven of the 12 NTS2 outcomes, as follows:

- Help deliver our net-zero target;
- Adapt to the effects of climate change;
- Promote greener, cleaner choices;
- Get people and goods where they need to go;
- 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	+	+	+	0	0	0	0	0	0
High Scenario	+	0	0	+	++	0	+	+	+	0	0	0	0	0	0

This recommendation is essential for the maintenance and enhancement of the current and future level of service being delivered by the TSS.

As a core element to current and future development and delivery of Intelligent Transport Systems (ITS), it does impact on how traffic operates and how incidents are responded to and has a positive impact against Climate Change, Health, Safety & Wellbeing and Economy STAG criteria and a number of the Transport Planning Objectives (TPO), particularly related to developing a Reliable & Resilient Strategic Transport System.

In terms of deliverability, development and delivery of the new TSS is likely to be feasible

and publicly acceptable, the latter due to the benefits that would be delivered for users of the strategic transport network in terms of improving reliability, resilience and safety.

Details behind this summary are discussed in Section 3, below.

2. Context

2.1. Problems and Opportunities

This recommendation could help to tackle the following problems and opportunities:

Relevant Problem & Opportunity Themes Identified in National Case for Change
▪ **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. Reliability can also be an issue on the rail network[i].
▪ **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[ii], 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.
▪ **Information and Integration:** high-quality journey planning information, both digital and physical, is important to enable a resilient transport system that allows people and goods to get to where they need to get to. Some journeys are not possible due to a lack of connections or accessible modes of transport, and long wait times, the need for multiple tickets and complex connections deter people from some public transport services resulting in many running below capacity.
▪ **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.
▪ **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.
▪ **Air Quality:** transport, and road transport in particular, remains a significant contributor to poor air quality. Air pollution increases the risks of diseases such as asthma, respiratory and heart disease, particularly for those who are more vulnerable. Air quality is often worse in areas of deprivation and is a health inequality issue.
▪ **Global Climate Emergency:** the Scottish Parliament committed to an ambitious target of net zero emissions by 2045 and transport needs to play its part. Transport is currently Scotland's largest sectoral emitter, responsible for 37% of Scotland's total greenhouse gas emissions (greenhouse gas emissions encompass CO_2 emissions) [iii] in 2018 (National Atmospheric Emissions Inventory 1990-2017)[iv]. Our transport system needs to minimise the future impacts of transport on our climate.

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
▪ Provision of strategic bus priority measures (14);
▪ Trunk road and motorway safety improvement to progress towards 'Vision Zero' (30);

- Trunk road and motorway climate change adaptation and resilience (31);
- Trunk road and motorway renewal for reliability, resilience and safety (32);
- Future Intelligent Transport Systems (33);
- Intelligent Transport System renewal and replacement (35); and
- Speed Management Plan (38).

Other areas of Scottish Government activity

- Scotland's Road Safety Framework to 2030: The enhanced functionality of new roadside ITS services align closely with this long-term vision for road safety where there are zero road fatalities and injuries by 2050[v]
- Revised Draft Fourth National Planning Framework (Revised Draft NPF4)[vi] makes a number of references to resilience, however the North, North and West Coastal and Islands and South regional spatial priorities have a specific action on strengthening resilience.

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**
+	+

Upgrading the TSS is unlikely to have any major impact on contributing to this objective.

Although the upgrade does not have a direct impact on transport infrastructure, as an overarching strategic service it would impact how traffic operates and thereby offers the potential to impact the control of traffic flows; with traffic incident management software having the potential to reduce congestion and so reduce fuel consumption and emissions[vii].

Data from this system can also be beneficial for sustainable modes, including information of relevance to MaaS and can also help support the reallocation of road space for bus priority measures.

Overall, however, this recommendation is not anticipated to encourage sizeable modal shift to sustainable modes of transport nor to more sustainable fuel types.

Accordingly, this recommendation is expected to have a minor positive impact on this objective in both Low and High scenarios.

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

Low Scenario	High Scenario
0	0

The TSS could potentially benefit public transport in relation to influencing the development of bus priority lanes on the trunk road and motorway network. However, as a recommendation in its own right the TSS upgrade is not considered to have any impact on the affordability or accessibility of public transport.

Accordingly, this recommendation is expected to have a neutral impact on this objective in both Low and High scenarios.

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

Low Scenario	High Scenario
0	0

The focus of the recommendation is on upgrading TSS which help control traffic on the trunk road network and therefore this objective is unlikely to have any significant impacts in terms of enhancing communities as places or supporting health and well-being objectives.

As such, this recommendation is expected to have a neutral impact on this objective in both Low and High scenarios.

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

Low Scenario	High Scenario
+	+

Although the TSS upgrade does not have a direct impact on transport infrastructure, as an overarching integrated strategic transport system it would contribute to how traffic operates, supporting a more reliable and efficient network.

Any improvements in the ability to monitor and control traffic such that it operates more efficiently and enables incidents to be responded to in a timely manner, is anticipated to have a positive impact against this objective by reducing incident response times and the negative impact delays have on the economy.

This in turn would support enhanced resilience of the trunk and motorway network, increasing the competitiveness of travel to key domestic markets.

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

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

Low Scenario	High Scenario
++	++

Although the upgrade of the TSS does not have a direct impact on transport infrastructure, as an overarching strategic service it does impact on how traffic operates.

Providing reliable and resilient services is an important benefit of TSS upgrade, with associated positive impacts against safety and security.

As set out above, the TSS upgrade could also enable incidents to be responded to in a timely manner, which would also have a positive impact in terms of improving the safety and security of the strategic transport network.

This recommendation is therefore expected to have a moderate positive impact on this objective in both Low and High scenarios.

3.2. STAG Assessment

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 support a wide range of ITS technology and applications, which would assist in addressing the impact from climate change.

This would be achieved from the reduction of fuel consumption and lowering greenhouse gas emissions from transportation due to better management of incidents and congestion.

This recommendation could also improve the resilience (reduce the vulnerability) of the network to the effects of climate change and help the transport network to adapt to the effects of climate change.

For example, the TSS upgrade could better support the management of the network when climate change events occur, such as flooding, with ITS being used to disseminate information to travellers to avoid / divert / drive with caution around this type of event.

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

3. Health, Safety and Wellbeing

Low Scenario	High Scenario
+	+

Although the upgrade of TSS does not have a direct impact on transport infrastructure, as an overarching strategic service it does impact on how traffic operates, ensuring the safe and efficient movement of vehicles.

TSS allows traffic to be monitored and if required VMS signs can be altered, for example, to help improve the flow of traffic.

Effective incident management also reduces the risks of secondary incidents occurring through a quick response time and providing forewarning to other road users of an incident ahead[viii]. Accordingly, this recommendation is anticipated to have a minor positive impact in terms of reducing accidents and improving security.

The recommendation is not anticipated to have any impact on Health, Access to Health & Safety Wellbeing Infrastructure and Visual Amenity.

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

4. Economy

Low Scenario	High Scenario
+	+

Although the upgrade of TSS does not have a direct impact on transport infrastructure, as an overarching strategic service it does impact on how traffic operates.

TSS allows incidents to be reported more quickly, which results in reduced time delays and awareness of the situation allows improved travel time reliability[ix].

It is anticipated this would have a positive impact on traffic and travel times, which in turn would have a positive impact against Transport Economy Efficiency (TEE) sub-criteria through reduced journey times and vehicle operating costs.

The recommendation is not anticipated to have any impact on Wider Economic Impacts (WEIs).

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

5. Equality and Accessibility

Low Scenario	High Scenario
0	0

This recommendation is generally considered to have a negligible impact against this objective.

Upgrading TSS would not contribute to increasing public transport or active travel coverage and is not anticipated to impact on the affordability of travel.

The recommendation would also be unlikely to benefit particular protected characteristic groups, instead benefiting all users of the trunk road and motorway networks.

Similarly, the impact against comparative accessibility is considered to be negligible.

Please refer to EqIA/ICIA/FSDA/CRWIA Assessment in the next section.

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

3.3. Deliverability

1. Feasibility
Based on the monitoring and assessment of software being implemented at other control centres such as <u>CHARM in England and in the Netherlands</u>[x], this recommendation is considered to be feasible for future adoption and application in Scotland. The main risks would relate to the implementation of any new or unproven software / technology being selected/procured for use.

2. Affordability
Elements of the existing TSS is at or near the end of its life and requires updating to ensure the continuity of the existing systems and services supported by Traffic Scotland. It is understood there is inadequate funding currently available as part of Business-as-Usual updates and hence there would be some minor negative impacts on affordability as a modest funding stream would require to be realised to move this recommendation forward.

3. Public Acceptability
ITS services across Scotland, are well trusted and understood by the travelling public. The level of public acceptability is linked to the overall provision such as managing and clearing incidents thus reducing delays and risk of secondary incidents and the ability to provide a rapid response to incidents, which may assist in saving lives. Upgrading the TSS are therefore anticipated to perform positively from a public acceptability perspective.

3.4. Other Criteria Assessment

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

The recommendation is likely to support some of the SEA objectives related to climate adaptation (Objective 2), quality of life (Objective 4) and safety (Objective 7) due to improved journey reliability and safety and resilience of the road network through management during incidents or severe weather events. Minor positive effects are also assessed in relation to the sustainable use of the transport network (Objective 8), due to improvements in transport technology and the resulting improvements to the overall sustainability of the network.

Uncertain effects have been assessed in relation to reducing greenhouse gas emissions (Objective 1) and improving air quality (Objective 3), as it is uncertain whether the recommendation would result in a reduction or increase in the emissions of the transport system. Although improvements may result in the smoother flow of traffic and reduction of congestion, this may encourage greater use of the transport network generally.

It is considered that there would be neutral or negligible effects on the remaining SEA objectives as the recommendation is not directly related to them. However, it is not assessed to result in any negative effects on the achievement of SEA objectives related to noise and vibration (Objective 5), the water environment, biodiversity, soil, cultural heritage and landscape and visual amenity (Objectives 10 to 14).

Overall, this recommendation is anticipated to have a neutral effect on this criterion in both the Low and High transport behaviour scenarios.

2. Equalities Impact Assessment (EqIA)	
Low Scenario	**High Scenario**
0	0

This recommendation is unlikely to have any particular impacts protected characteristic groups given the focus of this intervention on the trunk road and motorway network.

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

3. Island Communities Impact Assessment (ICIA)

Low Scenario	High Scenario
0	0

This recommendation focuses on the trunk road and motorway network and, therefore, is not directly relevant to island communities.

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

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

Low Scenario	High Scenario
0	0

While this recommendation could provide improved sense of road safety and security for children and young people who are more likely to walk and cycle and are also vulnerable to fear of road danger, overall an upgrade of TSS is unlikely to have any significant impacts on children and young people.

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

5. Fairer Scotland Duty Assessment (FSDA)

Low Scenario	High Scenario
0	0

An upgrade of TSS is unlikely to have any particular impact on reducing inequalities of outcome for disadvantaged communities. There could potentially be an improved sense of road safety and security for those walking, cycling and wheeling; with those on low incomes often more dependent on walking or cycling to travel.

However, limited impacts would be anticipated.

Accordingly, this recommendation is expected to have a neutral impact on this criterion in both Low and High scenarios.

References

[i] ORR, Public Performance Measure – Table 3113, 2020-21 Q1, https://dataportal.orr.gov.uk/statistics/performance/passenger-rail-performance/table-3113- public-performance-measure-by-operator-and-sector/
The Public-Performance-Measure (PPM) is the standard industry measure for reporting performance. It counts all trains which arrive within 5 minutes of the scheduled performance time (ten minutes for the long-distance Train Operating Companies), compared with the number of trains planned to run. The Office of Rail and Road's data reported for Scotland are for ScotRail services only, which covers 95 percent of the trains run in Scotland.

[ii] Transport Scotland, Key Reported Road Casualties Scotland, 2018, https://www.transport.gov.scot/media/45015/sct05191903161.pdf

[iii] Greenhouse gas emissions encompass CO_2 emissions

[iv] National Atmospheric Emissions Inventory 1990-2017

[v] Scotland's Road Safety Framework to 2030, Transport Scotland, 2021, https://www.transport.gov.scot/publication/scotland-s-road-safety-framework-to-2030/

[vi] Scottish Government, NPF4 (Revised Draft at time of writing) https://www.transformingplanning.scot/national-planning-framework/

[vii] Traffic Incident Management Program and Benefit-Cost Analysis, J Ma, T Lochrane, P Jodoin, Institute of Transportation Engineers Journal, https://www.researchgate.net/journal/Ite-Journal-0162-8178

[viii] Best Practice in European Traffic Incident Management, Conference of European Directors of Roads (CEDR), 2011

[ix] Traffic Incident Management Program and Benefit-Cost Analysis, J Ma, T Lochrane, P Jodoin, Institute of Transportation Engineers Journal, https://www.researchgate.net/journal/Ite-Journal-0162-8178

[x] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727342/Highways_England_Delivery_Plan_2018-19_-_Final_Version.pdf