HITRANS / The Scotch Whisky Association

BOTTLENECKS!

Whisky Logistics - Identifying the barriers to growth in the Highlands and Islands

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JULY 2024

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EXECUTIVE SUMMARY

INTRODUCTION

WSP UK Limited were appointed by the Highlands and Islands Transport Partnership and the Scotch Whisky Association to identify existing issues on the transport network which could have an impact on the ability of the Scotch Whisky industry to continue to grow in Scotland.

THE SCOTCH WHISKY INDUSTRY IN THE HIGHLANDS AND ISLANDS

The industry provides a significant contribution to Scotland's economy and is a crucial part of the Highlands and Islands economy. The rural nature of the Highlands and Islands results in the majority of goods and materials associated with operational activities being transported by road, with ferries supporting access to the area's islands. The resilience of the road and ferry networks are therefore vital to the industry's efficient operation.

£7.1bn to the UK economy

£5.3bn generated in Scotland

25% in the Highlands and Islands

The whisky industry in the Highlands and Islands has experienced significant growth in recent years, with its annual whisky production capacity having increased by 26% since 2009. This study has reviewed the area's transport network to identify existing constraints to the Scotch Whisky industry's continued growth, in addition to forecasting the increased impact generated by the continued growth of the industry.

99 distilleries in the Highlands and Islands

67% of Scotch Whisky distilleries

45% of total distilling capacity

ANALYSIS OF THE USAGE OF THE HIGHLANDS AND ISLANDS TRANSPORT NETWORK

A spreadsheet analysis tool was developed as part of a previous 2011 study undertaken on behalf of the Highlands and Islands Transport Partnership and this has been used to highlight the sections of the transport network which accommodate the greatest level of trips generated by the Scotch Whisky industry.

The tool has also been used to review the impact of the continued growth of the industry on the transport network's operation.

A theoretical 10% growth across Highlands and Islands would generate:

159 additional daily HGV movements

58,115 additional annual HGV movements

STAKEHOLDER CONSULTATION

Stakeholders were consulted to inform this study, including:

- Scotch Whisky Association;
- Distillers;
- Maltsters;
- Hauliers;
- Ferry Operators; and
- Transport Scotland.

Key Concerns:

Reliability and Capacity of Islay Ferry

Restricted width of the A95

Rockfalls and Landslips on the A82 and A83

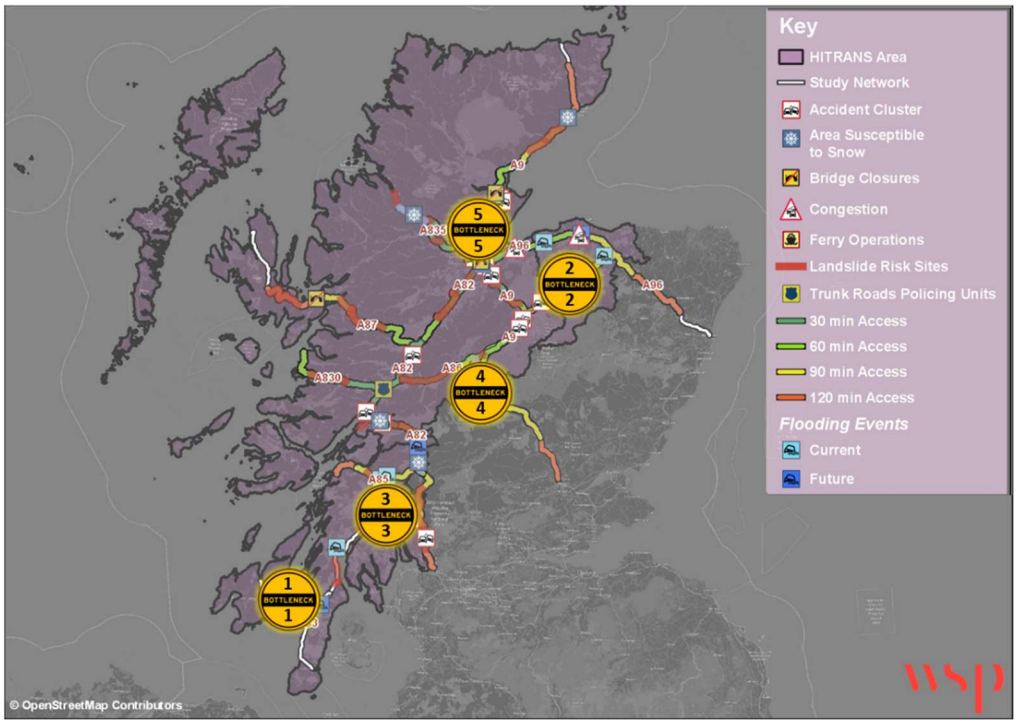
The consultation exercise was undertaken to identify current constraints on the Highlands and Islands transport network, along with issues affecting the Scotch Whisky industry and opportunities to support the industry's continued growth and intention to decarbonise the industry.

STUDY FINDINGS

The analysis was used to highlight the locations on the Highlands and Islands transport network which accommodated the greatest number of daily whisky industry generated trips. This information was combined with the results of the transport network review and stakeholder consultation exercise, to identify the following five key constraints (bottlenecks) on the transport network (as shown in Figure ES-1).

- Constraint 1 – Islay crossing.
- Constraint 2 - A95 between Grantown-on-Spey and Dulnain Bridge.
- Constraint 3 - A83 at the Rest and Be Thankful.
- Constraint 4 - A9 between Dalwhinnie and Druimuachadar.
- Constraint 5 - A9 between Invergordon and Tore.

Figure ES-1 - Key Constraints on the HITRANS Transport Network



Additionally, the A96 remains a critically important route to the industry to be maintained and upgraded so as to not risk becoming a future constraint.

REQUIRED SCHEMES / RECOMMENDATIONS

A strategic asset worth around £23 billion[1] to Scotland, the trunk road network in the Highlands & Islands is critical to support the Scotch Whisky industry's continued growth (and that of other businesses and communities in the region). Strategic investment to maintain and upgrade the trunk road network remains crucial to enable the industry and the region's continued success.

A number of schemes and measures have been identified to provide a resilient transport network which is able to support the Scotch Whisky industry's continued growth. These schemes and are summarised in the following table.

Theme	Required Scheme	Responsibility for Delivery
Improved Resilience	Fully optimise the utilisation of vessels across the network, including the operation of a freight-only service and drop-trailers for the Islay service, with a delivery plan to provide increased capacity for the long-term.	Transport Scotland/ Scottish Government
Road Safety	Development of a strategy and delivery plan to maintain and upgrade the trunk road network to ensure it is resilient and fit for purpose in the Highlands and Islands and meets the current and future needs of the industry, with a particular focus on the constraints identified: A83, A9, A95 and A96.	Transport Scotland/ Scottish Government
Improved Resilience	Commitment to a date by which the current scheme to minimise the impact of landslides on the operation of the A83 at the Rest and Be Thankful is completed	Transport Scotland/Scottish Government
Road Safety / Improved Resilience	Completion of dualling of the A9 between Perth and Inverness at the earliest opportunity	Transport Scotland/ Scottish Government
Improved Resilience	Support the continued development of the A82 Tarbet to Inverarnan improvement project	Transport Scotland
Improved Resilience	Provide commitment to carriageway widening schemes at constrained sections in association with planned maintenance activities so that roads meet expected design specification	Transport Scotland
Improved Resilience	Introduction of additional Variable Message Signage (VMS) and undertake a review of the availability / suitability of diversion routes for HGVs	Transport Scotland
Improved Resilience	Installation of wind deflectors on all major bridges in the Highlands and Islands which are susceptible to high winds	Transport Scotland
Improved Resilience	Update the design standards to improve the current drainage infrastructure to provide a road network which is more resilient to a changing climate and to ensure those standards are delivered across the road network	Transport Scotland
Road Safety	Location of existing Road Policing Units has an impact on accident response times and consideration should be given to the deployment of additional units in the Highlands and Islands	Police Scotland

[1] Transport Scotland - Transport Scotland's Approach to both Climate Change Adaptation and Resilience | Transport Scotland

Theme	Required Scheme	Responsibility for Delivery
Improved Resilience	Requirement to revisit the 2008 Scottish Road Network Landslides Study to identify a strategy to mitigate the impact of landslides on this section of the A82	Transport Scotland
Efficiency Improvements	Creation of a freight forum to facilitate better communication between customers and operators could lead to consolidation of loads to reduce the number of freight movements and demand on ferry crossings.	Transport Scotland

1 INTRODUCTION

1.1 STUDY BACKGROUND

1.1.1. WSP UK Limited were appointed by the Highlands and Islands Transport Partnership (HITRANS) and the Scotch Whisky Association (SWA), to identify existing issues on the transport network which could have an impact on the ability of the Scotch Whisky industry to continue to grow in Scotland.

1.1.2. The industry provides a significant contribution to Scotland's economy and is a crucial part of the Highlands and Islands economy. The rural nature of the Highlands and Islands results in the majority of goods and materials associated with operational activities being transported by road, with a limited number of route choices available for certain movements. The resilience of the road network is therefore vital to the industry's efficient operation.

1.2 PREVIOUS STUDY

1.2.1. The previous Spirit of the Highlands (SotH) study was commissioned by HITRANS with the results published in June 2011[2]. The previous study was supported by the development of a spreadsheet analysis tool to derive the level of traffic generated by the whisky industry on key road links throughout the Highlands and Islands.

1.2.2. Since the previous study was published, the whisky industry in the Highlands and Islands has experienced significant growth, having a capacity to produce around 373,000,000 litres of whisky on an annual basis, an increase of 26% when compared to 2009 when the data which informed the previous study was collected. The trunk road network in the Highlands & Islands therefore remains of strategic importance to support the Scotch Whisky industry's continued growth (and that of other businesses and communities in the region) and as a strategic asset is worth around £23 billion[3] to Scotland. Strategic investment to maintain and upgrade the trunk road network, for which the previous 2011 report had already identified a number of issues affecting the Scotch Whisky industry's operations, remains crucial to enable the industry and the region's continued success.

1.2.3. As with the previous 2011 study, this new 2024 study has been informed through extensive consultation with stakeholders in the industry to fully understand the issues that distillers, hauliers and maltsters experience.

1.3 REPORT CONTENT

1.3.1. Following this short introductory chapter, the report is set out as follows:

- Chapter 2 describes the Scotch Whisky industry, its processes and the locations of key infrastructure supporting its operation;

[2] https://www.hitrans.org.uk/Documents/Whisky_Logistics_Study.pdf
[3] Transport Scotland - Transport Scotland's Approach to both Climate Change Adaptation and Resilience | Transport Scotland

- Chapter 3 summarises the key national and regional transport policy which is relevant to this study;
- Chapter 4 describes the transport network in the Highlands and Islands, in addition to reviewing the current operation of the trunk road network;
- Chapter 5 summarises the impact of the whisky industry on the operation of the trunk road network;
- Chapter 6 sets out the outcome of the stakeholder consultation exercise which was undertaken to identify existing issues affecting the transport of goods and materials throughout the Highlands and Islands
- Chapter 7 summarises the issues identified from a review of existing data sources;
- Chapter 8 identifies potential future resilience issues;
- Chapter 9 identifies potential opportunities to address the identified issues and decarbonise the freight industry; and
- Chapter 10 provides a summary of the study and identifies a number of schemes and incentives which could be considered to address the identified issues.

2 THE SCOTCH WHISKY INDUSTRY

2.1 INTRODUCTION

2.1.1. The Highlands and Islands accounts for approximately 50% of Scotland's land mass but only accommodates around 10% of the Scottish population. The area is predominantly rural in nature, with the form and function of the transport network having a lower capacity than other areas of the country. According to Highlands and Islands Enterprise/Office for National Statistics, the Highlands and Islands Gross Domestic Product was £14bn in 2022, equating to 8% share of Scotland's £189bn GDP, excluding Oil & Gas. Scotch Whisky therefore accounts for 18% of Highlands & Islands GDP.

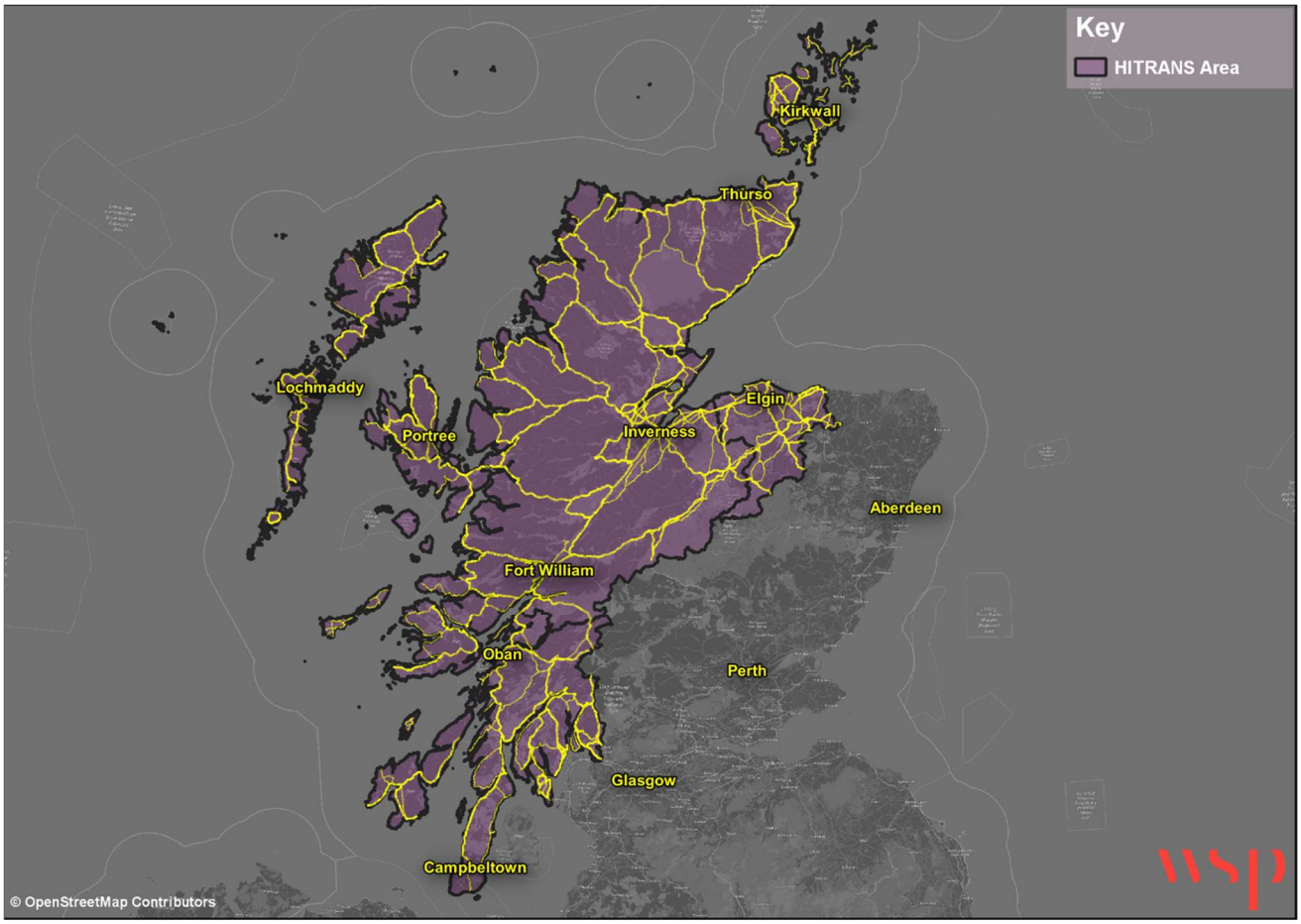
50% of Scotland's land mass

10% of the Scottish population

18% of Highlands & Islands GDP

2.1.2. Figure 2-1 shows the extent of the Highlands and Islands which includes Highland, Moray, Argyll & Bute and the Outer Hebrides / Eilean Siar council areas.

Figure 2-1 - Highlands and Islands (HITRANS) Area



2.2 WHISKY ECONOMY AND PROCESS

2.2.1. The Scotch Whisky Economic Impact 2022[4] study, confirmed that the industry contributed £7.1bn in gross value added (GVA) to the UK economy in 2022, with the majority of this (£5.3bn) generated in Scotland.

£7.1bn to the UK economy

£5.3bn generated in Scotland

25% of direct production GVA generated in the Highlands and Islands

2.2.2. Of the £3.4 billion GVA directly generated by production, £799m (25%), is generated in the Highlands and Islands. This is reflected by the employment figures, with around 25% of the 41,000 jobs supported by the industry in Scotland in the Highlands and Islands, further confirming the industry's importance to the area.

2.2.3. There are a total of 99 distilleries currently operational in the Highlands and Islands (as of October 2023), with the operation of these supported by a network of facilities and suppliers. The production of Scotch Whisky requires a number of different transport movements including, but not limited to:

- Cereals;
- Casks (full and empty) in dedicated Trailer Loaded Vehicles (TLV);
- Bulk spirit tankers (full and empty) c30,000 litres;
- By-products (e.g. draff and pot ale);
- Energy;
- Packaging materials; and
- Bottled Scotch Whisky (where this is bottled within the Highlands and Islands).

2.2.4. Scotch Whisky is defined in the Scotch Whisky Regulations 2009. These strict legal provisions govern how Scotch Whisky must be made, marketed and exported. Once distilled, spirit must mature in oak casks in Scotland for a minimum of three years. Some spirit is matured in warehouses adjacent to distilleries, although most is filled into tankers and is transported to maturation warehousing facilities, some within and some outwith the Highlands and Islands, where it is filled into casks. Upon maturation the whisky is ready to be blended or bottled. Most bottling takes place in large blending and bottling facilities located in central Scotland. Some bottling does however take place within the Highlands and Islands.

[4] https://www.scotch-whisky.org.uk/media/2170/scotch-whisky-economic-impact-report-2024.pdf

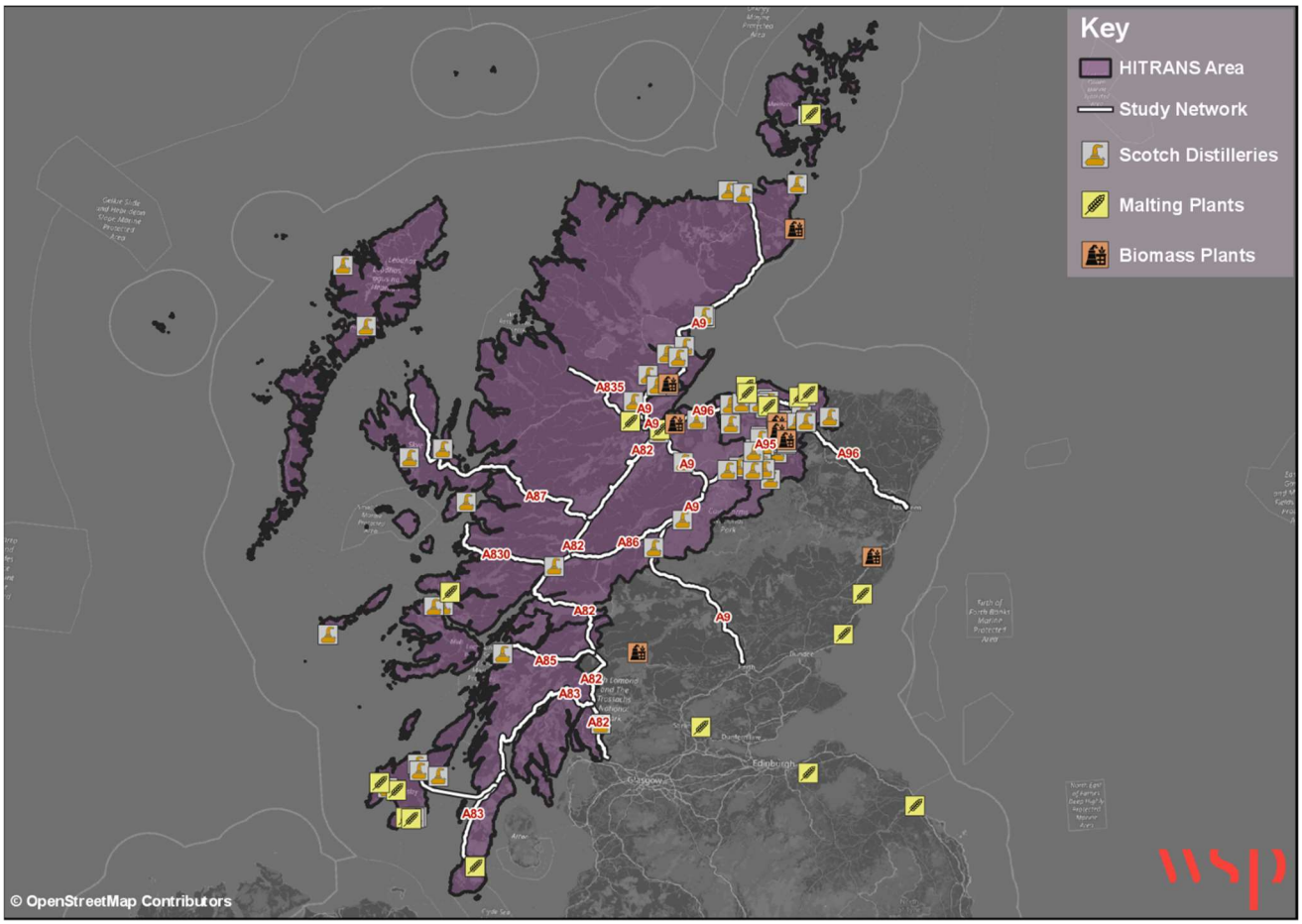
2.2.5. Ferries are used to support the operation of island based distilleries in the Highlands and Islands. Almost all of the materials needed to support the industry on the islands are transported by ferry (some fuel is transported by dedicated vessels, and for Islay a bulk carrier delivers grain to the maltings plant at Port Ellen).

2.2.6. In addition to the goods mentioned above, distilleries require to be fuelled depending on their location in relation to the gas grid. While a large proportion of Speyside distilleries are able to be powered by national gas, the majority of the more rural distilleries are supported by road tankers delivering fuel, such as fuel oils, LPG and biomass to support their operation. Distillers are increasingly looking at alternatives to fossil fuels as they decarbonise.

99 distilleries in the Highlands and Islands
67% of Scotch Whisky distilleries

2.2.7. Figure 2-2 shows the locations of the 99 distilleries located in the Highlands and Islands along with malting and biomass plants located throughout the rest of Scotland and northern England.

Figure 2-2 - Scotch Whisky Industry Facilities



Non-distilling facilities (e.g. cooperages, maturation warehousing and blending and bottling facilities) omitted for visual clarity. Transport links to facilities in other parts of Scotland are essential for the production of Scotch Whisky and its subsequent movement to markets around the World.

2.2.8. While a number of malting plants have been constructed in recent years in the area to support the industry's growth, the rural locations of the distilleries result in the majority of goods and product being transported to and from the sites by road, with some requiring specialised trailers such as spirit tankers and TLVs (for transporting casks).

2.2.9. The industry is, however, always looking for areas where it can reduce its carbon emissions, for example by reducing the number and length of vehicle journeys wherever possible, but it is not always possible to utilise space in empty lorries to back haul other products The use of HGVs also provides opportunity to be reactive in relation to the peak periods of demand for whisky consumption. It does, however, require a reliable strategic road and ferry network.

2.2.10. A trial was undertaken in 2013, in association with HITRANS, to review the potential for a proportion of spirit to be transported from the goods yard at Elgin, to Grangemouth Rail Freight Terminal. While the trial lasted for a number of months, no rail freight company has come forward with a service offering since. Intermodal rail services are used extensively to transport finished product (cased bottles of Scotch Whisky) to distribution hubs and ports in England.

2.3 SUMMARY

2.3.1. The majority of distilleries are located in rural locations and the whisky industry's operations rely on the road and ferry network to deliver materials to site and transport products and by-products from the sites.

2.3.2. The use of HGVs supports an agile industry which is able to adapt to short-term demands and while there a number of rail lines which pass through the area, the previous trial resulted in there being little scope to use the rail network to support whisky industry operations in the Highlands and Islands.

3 TRANSPORT POLICY REVIEW

3.1 INTRODUCTION

3.1.1. This chapter places the Highlands and Islands in context, outlining the national, regional and local policy background. This review is a key stage in identifying problems, issues, constraints and opportunities in the area, setting the scene for subsequent chapters.

3.2 NATIONAL TRANSPORT STRATEGY 2

3.2.1. The National Transport Strategy 2[5] (NTS2) was published in February 2020 and outlines the following priorities for Scotland's transport system over the next 20 years:

- Reduce inequalities;
- Take climate action;
- Help deliver inclusive economic growth; and
- Improve our health and wellbeing.

3.2.2. NTS2 introduces the Sustainable Investment Hierarchy, which Transport Scotland and other public bodies have begun to employ to assess transport investment decisions. This hierarchy prioritises investment proposals on reducing inequalities and the need to travel. Maintaining and safely operating existing assets is seen as a key element when considering the effects of climate change and the hierarchy promotes a range of measures tailored to specific decisions, to ensure transport systems are fully optimised.

3.2.3. NTS2 recognises the impact that delay (particularly that of road freight) has on the freight industry, for consumers, the economy, the environment and wider social impact of traffic in urban areas. NTS2 subsequently acknowledges that:

"*The number of goods vehicle trips… is forecast to increase by 44% between 2014 and 2037".*

3.2.4. Key NTS2 policy which is relevant to this study, include the following:

- Increase resilience of Scotland's transport system from disruption and promote a culture of shared responsibility;
- Provide a transport system which enables businesses to be competitive domestically, within the UK and internationally;
- Reduce emissions generated by the transport system to mitigate climate change;
- Reduce emissions generated by the transport system to improve air quality; and
- Ensure the transport system adapts to the projected climate change impacts.

[5] Transport Scotland: https://www.transport.gov.scot/media/47052/national-transport-strategy.pdf

3.2.5. NTS2 confirms that the Scottish Government will help drive inclusive growth and promote opportunities for Scotland's transport network to adapt for climate change and mitigate against disruption, allowing for trade to thrive whilst encouraging reduced emissions and improved air quality across the transport network.

3.3 STRATEGIC TRANSPORT PROJECT REVIEW 2

3.3.1. The Strategic Transport Project Review 2[6] (STPR2) was published in February 2021 and will inform transport investment in Scotland for the next 20 years (2022-2042). The key outcomes of the STPR2 are to:

- help make Scotland more accessible;
- create better connectivity with sustainable transport options; and
- highlight the value of transport in sustaining Scotland's economic growth.

3.3.2. STPR2 identifies the following key Transport Planning Objectives which are particularly relevant to this study:

- Behavioural change and modal shift for freight (27)
- Access to Argyll A83 (29);
- Trunk Road and Motorway Network Safety Improvements (30);
- Trunk Road and Motorway Network Climate Change Adaptation and Resilience (31); and
- Trunk Road and Motorway Network Renewal (32).

3.3.3. STPR2 notes the significance of the Scotch Whisky industry to Scotland's economy and acknowledges the challenges of the road network for the freight industry including the A82, A83, A87, and the A9 – all key routes used by the industry.

3.3.4. A Technical Note[7] of STPR2 confirms that:

"New roads projects will normally only be taken forward where they reduce the maintenance backlog; address road safety concerns; adapt the network to deal with the impacts of climate change; or benefit communities such as bypassing settlements. Furthermore, it is agreed that road infrastructure will not be built to cater for forecast unconstrained increases in traffic volumes."

3.3.5. STPR2 acknowledged the need for the transport network to have resilience to climate change, to improve safety on roads, to specifically improve access along the A83, and to reduce the maintenance backlog to achieve a more resilient network.

[6] Transport Scotland - www.transport.gov.scot/publication/initial-appraisal-case-for-change-highlands-and-islands-stpr2/
[7] Transport Scotland - final-technical-report-28-december-2022-stpr2.pdf (transport.gov.scot)

3.3.6. STPR2 also recognises the part which ferries play in supporting the wider transport network's operation, with Recommendations 18 and 24 relating to supporting integrated journeys at ferry terminals and promoting vessel renewal and replacement and supporting decarbonisation of the fleet.

3.4 FERRIES PLAN (2013 – 2022)

3.4.1. Transport Scotland published its Ferries Plan in 2012[8], with the document making a number of recommendations regarding:

- where investment should be focussed to make improved connections for island and remote rural communities;
- improving reliability and journey times;
- seeking to maximise the opportunities for employment, business, leisure and tourism; and
- Promoting social inclusion.

3.4.2. While commitment was provided to a range of measures and incentives as part of the Plan, none will have benefitted the Scotch Whisky industry.

3.4.3. The Islands Connectivity Plan (ICP) has been subject to public consultation[9], with this set to build on the Ferries Plan. The purpose of the ICP is to '*set out how ferry services, supported by other transport modes, will be delivered, and strengthened, working towards a long-term vision, and supported by clear priorities and defined outcomes for people and places.*'

3.4.4. The ICP sets out the following vision:

'*Scotland's ferry services, supported by other transport services, will be safe, reliable, affordable and inclusive for residents, businesses and visitors enabling transport connectivity, sustainability and growth of island and peninsula communities and populations.*'

3.4.5. The vision is supported by the following four policies:

- Policy 1 Reliable and Resilient
- Policy 2: Accessible
- Policy 3: Integrated
- Policy 4: Low Carbon

[8] https://www.transport.gov.scot/media/30208/j254579.pdf
[9] https://www.transport.gov.scot/consultation/public-consultation-for-islands-connectivity-plan-strategic-approach-paper-and-vessels-and-ports-plan/

3.4.6. The ICP acknowledges the capacity issues on the Islay ferry service and provides commitment to:

- Work with operators and communities to develop performance measures for reliability that reflect lived experience.
- Ensure future ferry service contracts are flexible and can respond to short and long-term changes during the contract, including responding to disruption to services.
- Explore freight issues in more detail by re-visiting the Freight Fares Review.
- Reduce the average age of the fleet to around 15 years by the end of the decade.
- Work towards further lowering emissions of ferry services to support the delivery of our net-zero target.

3.5 REGIONAL TRANSPORT STRATEGY

DRAFT RTS

3.5.1. The HITRANS Regional Transport Strategy (RTS) is currently being updated, with a draft of the document available for review and comment[10] at the time of the preparation of this report.

3.5.2. The draft RTS sets of the following vision:

'*Our transport networks and services will act to realise the economic potential of our region through reducing the actual and perceived impacts of distance, poor resilience and low population density. By doing this, they will facilitate economically and socially valuable activities for all, provide equality of opportunity, enable people to live active and healthy lives and allow our region to contribute fully to the national net zero emissions target.*'

3.5.3. The following six objectives have been set as part of the draft RTS:

- Strategy Objective 1: To make a just transition to a post-carbon and more environmentally sustainable transport network.
- Strategy Objective 2: To transform and provide safe and accessible connections between and within our city, towns and villages, to enable walking, wheeling and cycling for all.
- Strategy Objective 3: To widen access to public and shared transport and improve connectivity within and from / to the region.
- Strategy Objective 4: To improve the quality and integration of public and shared transport within and from / to the region.
- Strategy Objective 5: To ensure reliable, resilient, affordable and sustainable connectivity for all from / to our island, peninsular and remote communities.
- Strategy Objective 6: To improve the efficiency, safety and resilience of our transport networks for people and freight and adapt to the impacts of climate change.

[10] https://storymaps.arcgis.com/stories/644012c58f61412687ae683e4cb072d8

3.5.4. The draft RTS sets out a range of policies under 11 Strategy Themes, and the following are of particular relevance to this study:

- Strategy Theme 5: Providing connectivity that supports our island and peninsular communities - Improving the connectivity and reducing the peripherality of island and peninsular communities through improved ferry and air services, and potentially fixed links:
  - Policy ST5c: Where practicable, the RTS supports the operation of additional sailings on the supported ferry networks within the region.
  - Policy ST5d: The RTS supports year-round seven-day connections for island and peninsular communities where this is required for the long-term sustainability of a community and enjoys public support.
  - Policy ST5e: The booking and ticketing arrangements for ferry services in the region should support the convenience and efficiency of travel for all.
  - Policy ST5f: The RTS calls for the earlier opening of ferry booking systems and increased transparency around the release and management of vehicle deck space.
  - Policy ST5g: The RTS supports the principle of Road Equivalent Tariff (RET). However, where service frequency permits, controlled use of peak times / surge pricing could be used to help manage demand, recognising that this would need to be at no net detriment to the connectivity of island and peninsular communities.
  - Policy ST5h: The RTS supports operational measures which maximise the efficient management of vehicle deck space on sailings.
  - Policy ST5j: The RTS recognises the long-term underfunding of vessels and infrastructure in the region and strongly calls for fleet and infrastructure modernisation to address issues of reliability and resilience.
  - Policy ST5k: The RTS calls for the development of a regularly maintained Vessels and Infrastructure Planning Pipeline across all publicly supported ferry networks in Scotland.
  - Policy ST5l: The RTS supports an increase in the overall fleet size and the inter-operability of that fleet and supporting infrastructure to strengthen resilience.
  - Policy ST5m: The RTS supports the principle of increasing capacity through frequency rather than larger vessels.
  - Policy ST5n: The RTS calls for an objective consideration of the design characteristics of future vessels for all routes, including hull form and the provision of crew accommodation.
  - Policy ST5o: The RTS supports the introduction of new low or zero emissions vessels to replace life-expired tonnage. This should be done in line with the NTS2 Sustainable Investment Hierarchy.
  - Policy ST5p: With the vessel and infrastructure replacement cycle, the RTS supports measures to reduce journey times for our island communities. This includes providing direct sailings rather than via another island (where this is the preference of the local community) and consideration of new ferry terminal locations that reduce crossing distances.
  - Policy ST5q: The RTS supports harbour infrastructure improvements ahead of life expiry where this could contribute to a material improvement in reliability.
- Strategy Theme 6: Improving the efficiency of transport networks and supply-chains and reducing their impact on our communities - Many supply-chains in the region are marginal and face challenges not found elsewhere in Scotland, working around ferry connections for example.

This Strategy Theme is focused on enhancing the efficiency of supply-chains and identifying means for improving their environmental sustainability:

- Policy ST6a: The RTS supports the principle of new dedicated or high-capacity freight vessels on freight intensive routes.
- Policy ST6b: The RTS supports the formalisation and extension of the carriage of unaccompanied trailers to a wider range of routes.
- Policy ST6c: The RTS supports the operation of dedicated freight sailings, either by contracted or commercial operators where there is demand and it is operationally deliverable.
- Policy ST6d: The RTS supports moves towards greater simplification and consistency in the setting of ferry freight fares across the region, recognising that this would be achieved over the medium-term.
- Policy ST6f: The RTS supports infrastructure investment and funding initiatives which will enable the growth of waterborne and air freight to, from and within the region.

- Strategy Theme 7: Improving the safety, reliability and resilience of our road and rail networks - Weather, geological instability and very limited diversion opportunities make resilience a key issue in the region, whilst safety is a primary concern on many of the main road routes. This Strategy Theme is therefore focused on improving the safety, reliability and resilience of transport networks within the region:

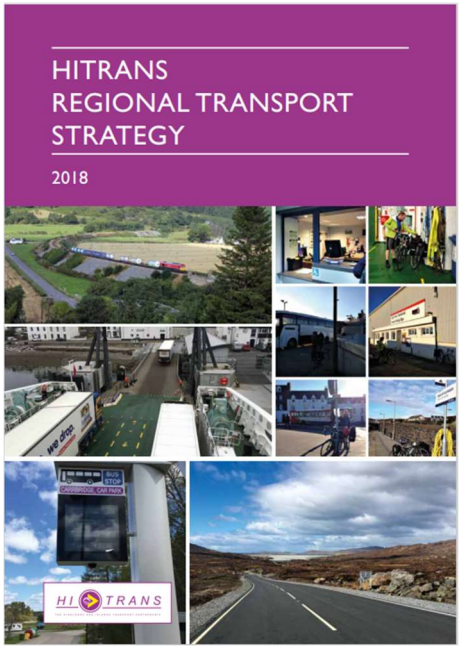
  - Policy ST7a: The RTS restates our support for the full dualling of the A9 and A96, with early prioritisation of the Elgin and Keith bypasses to dual carriageway standards, following the already committed Inverness to Wester Hardmuir scheme.
  - Policy ST7b: The RTS calls for incremental improvements to our road network where there are safety, efficiency and environmental benefits, including in relation to single track roads.
  - Policy ST7c: The RTS supports the expansion of 50mph HGV speed limits across the Trunk Road network in the region.
  - Policy ST7e: The RTS calls for investment in our regional road network where there are regular and sustained periods of disruption due to weather and / or geological instability.
  - Policy ST7f: The RTS recognises the increasing vulnerability of our region's road network to severe weather events linked to climate change and supports capital and revenue measures to mitigate this.
  - Policy ST7h: The RTS supports the continued provision and expansion of real-time travel information for motorists and public transport users through existing and emerging platforms.
  - Policy ST7i: The RTS recognises that many parts of our region's road network are in poor condition. It calls for enhanced preventative and remedial road maintenance to ensure the safe, reliable and efficient movement of people and goods and the delivery of services across our region.
  - Policy ST7j: Investment in our road network should continue to have an overarching focus on safety with a view to reducing road traffic casualties in accordance with Scotland's Road Safety Framework to 2030.
  - Policy ST7k: To address risks which are particular to roads in our region, the RTS supports: enhanced advisory signage; ongoing public information campaigns around the use of single-track roads; provision of additional safe motorist services and HGV rest areas; and information campaigns for visitors driving left-hand drive vehicles.

- Policy ST7l: The RTS specifically supports the improvement or removal of priority junctions on higher speed trunk roads, especially for right-turning traffic.

- Strategy Theme 9: Decarbonising our transport, mitigating the effects of climate change - Supporting the decarbonisation of transport through the adoption of zero emission vehicles, vessels, and aircraft:
  - Policy ST9a: The RTS supports the implementation of measures which facilitate the decarbonisation of the public transport vehicle fleet within the region, including commercial vehicles, buses and community transport, rail rolling stock, aircraft and ferries.
  - Policy ST9b: The RTS recognises the opportunities brought about by the availability of renewable energy in our region, including locally produced green hydrogen. The transport fleet mix and associated infrastructure should reflect this.
  - Policy ST9d: The RTS calls for the expansion of EV charging infrastructure to support the decarbonisation of all vehicle based travel in our region.
  - Policy ST9e: The RTS recognises the challenges of distance, topography, climate and short winter daylight hours to the rollout of battery electric powered commercial vehicles and seeks low or zero emission solutions appropriate to our region, and which capitalise on the surplus energy production within our region.
  - Policy ST9f: The RTS supports the roll-out of other alternative fuels to promote the decarbonisation of our transport networks, ports, ferry terminals, airports and airfields.

3.5.5. The vision and objectives of the draft RTS support the requirements of the Scotch Whisky industry through the promotion of a resilient transport network which is able to support the reliable transport of goods throughout the Highlands and Islands.

CURRENT RTS



3.5.6. The current RTS[11] published by the Highland and Islands Transport Partnership in 2008, and refreshed in 2018, represents a local planning strategy with community partners aimed at achieving the short and long-term goals as set out by the National Transport Strategy. The Strategy sets out the following overall objectives:

- Support sustainable economic growth across the whole region; and
- Reduce barriers to participation in employment, learning, social, leisure, health and cultural activities throughout the region.

3.5.7. The RTS proposed that these high-level objectives are achieved through the following six Transport Objectives:

- Reduce journey times and improve reliability and resilience.
- Improve the safety of transport and travel.
- Tackling capacity constraints across the network.
- Improve the quality and accessibility (availability, affordability, information and integration) of travel.
- Protect the environment and mitigate adverse impacts of transport and travel.
- Increase physical activity and participation to improve health and well-being.

3.5.8. The RTS recognises the importance of the whisky trade to the Scottish economy and a key component of the strategy is to improve the efficiency of freight operations though rail freight and Freight Quality Partnerships. The RTS states that it also aims to focus improvements to the network in areas that will benefit not only freight but also visitors, particularly in rural areas.

3.5.9. The committed projects within the RTS signal local authorities' motivation for the enhancement of existing road infrastructure, addressing inconsistent design standards and pinch points on trunk and local roads, and adaptation to climate change. Such committed projects include improvements to the A83 at the Rest and be Thankful.

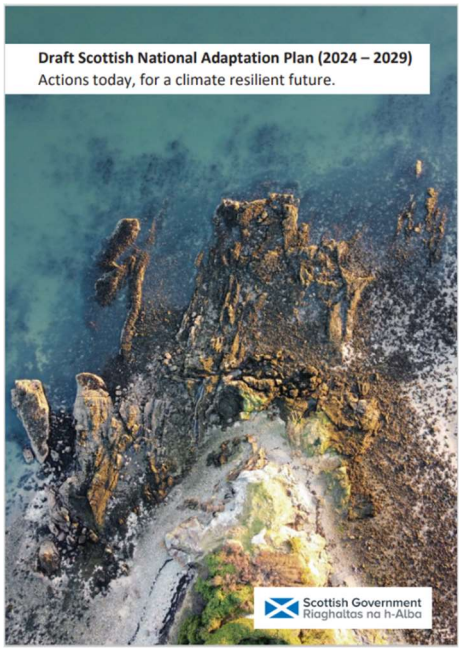
3.5.10. The RTS confirms HITRANS' commitment to promoting economic prosperity through improving the connectivity, quality and resilience of the road network.

[11] HITRANS - Regional_Transport_Strategy_Refresh_2018.pdf (hitrans.org.uk)

3.6 DRAFT SCOTTISH NATIONAL ADAPTATION PLAN (2024 – 2029)

3.6.1. The Scottish Government published a draft of the Scottish National Adaption Plan for consultation in January 2024, with the document identifying actions which can be taken to reduce emissions and support the adaption to climate change.

3.6.2. The Plan sets out five key outcomes to support this overall objective, with individual policy proposals identified to meet each of the outcomes. The following are of relevance to this study:



- Outcome Two: Communities:
  - A transformational National Flood Resilience Strategy to guide management of flooding from all sources.
  - Continued improvements to SEPA's flood forecasting and warning services.
- Outcome Three: Public Services and Infrastructure:
  - Adaptation and resilience embedded across trunk road, rail, aviation, active travel and maritime transport networks, supported by Transport Scotland adaptation strategy.
  - Updated statutory guidance on public bodies climate change duties to set Ministers expectations on adaptation for all public bodies and support more collaboration.
- Outcome Four: Economy, Industry and Business:
  - A transformational National Flood Resilience Strategy to guide management of flooding from all sources.
  - A transformational National Flood Resilience Strategy to guide management of flooding from all sources.

3.6.3. It is clear that the Plan perceives flooding to be one of the key areas that will be exacerbated as a result of climate change.

3.7 SUMMARY

3.7.1. NTS2 confirms that the Scottish Government is committed to increasing the resilience of Scotland's transport network to mitigate the effects of climate change while providing a network which enables businesses to be competitive.

3.7.2. STPR2 notes the significance of the Scotch Whisky industry to Scotland's economy and acknowledges the challenges for the freight industry and recognises the requirement to improve the road network's resilience to climate change.

3.7.3. The draft HITRANS RTS sets out a range of policies which support improvements to the Highlands and Islands transport network to provide a network which is resilient and able to accommodate the requirements of its communities and businesses, including the Scotch Whisky industry.

3.7.4. The current HITRANS RTS also recognises the importance of the Scotch Whisky industry to the Scottish economy and aligns with national policy and strategies by confirming the need to improve the transport network's resilience, in particular that of the A83, and to mitigate against climate change.

3.7.5. This message is echoed by the recently published draft Scottish National Adaption Plan which focusses on the requirement to adapt to climate change.

4 HIGHLANDS AND ISLANDS TRANSPORT NETWORK

4.1 INTRODUCTION

4.1.1. As with the previous SotH study, this 2024 study has focussed on the trunk road network along with ferry services, as they accommodate the majority of goods and supplies supporting the Scotch Whisky industry's operation.

4.1.2. Whilst the area is served by the national rail network which connects the central belt with Inverness and the far north, in addition to providing access to Fort William and Oban in the west, the road network supports the majority of the whisky industry's operational activities. Ferries are also used to connect the mainland with distilleries located on Islay, Jura, Orkney, Mull, Raasay and the Outer Hebrides.

4.1.3. The following sections describe the transport network and summarise the current operation of the main trunk road links which support access to distilleries located throughout the Highlands and Islands.

4.2 TRANSPORT NETWORK

ROAD NETWORK

4.2.1. The nature of the area results in the road network passing through challenging terrain, with sections susceptible to being blocked by snow, flooding or landslides. The trunk road network in the Highlands and Islands is also supported by a number of larger bridges which can be closed to high sided vehicles when wind speeds exceed a certain threshold.

4.2.2. Strong winds can also result in the delay or cancellations of ferry services operating in the Highlands and Islands.

4.2.3. The majority of the trunk road network in the Highlands and Islands is single carriageway, with the A9 providing the majority of the limited dual carriageway standard road in the area. The standard of the road network varies greatly away from the A9, with a significant proportion of the network of a width and alignment which does not comply with the current trunk road standards as identified within the Design Manual for Roads and Bridges[12]. The substandard nature of a proportion of the trunk road network causes operational issues for larger vehicles in addition to hampering the ability to undertake maintenance activities without the need to introduce delays for road users.

4.2.4. The following roads support the greatest volume of traffic generated by the whisky industry:

- The A82 which connects Glasgow with Inverness via Fort William;
- The A83 which provides access to Argyll and Bute and the small isles and connects with the A82 at Tarbet;
- The A9 which connects Stirling with Thurso via Perth and Inverness;
- The A95 which supports access to the Speyside area and connects the A9 with the A96; and

[12] Standards For Highways

- The A96 which connects Inverness with Aberdeen and passes through both Highland and Moray.

4.2.5. Table 4-1 provides a summary of the form of the roads, highlighting existing key constraints where appropriate.

Table 4-1 – Existing Road Network Review

Road	Key Constraint	Location
A82	Restricted road width and poor alignment	Loch Lomond (north of Tarbet?), Loch Linnhe and Loch Ness
A83	High landslide risk Restricted road width and poor alignment	Rest and be Thankful North of Tarbert
A9	Road affected by high winds Road affected by snow	Kessock, Dornoch and Cromarty bridges Druimuachadar and Slochd
A95	Restricted road width and poor alignment	A number of locations along its length
A96	Road currently passes through settlements which can generate delays	Nairn and Elgin

FERRY SERVICES

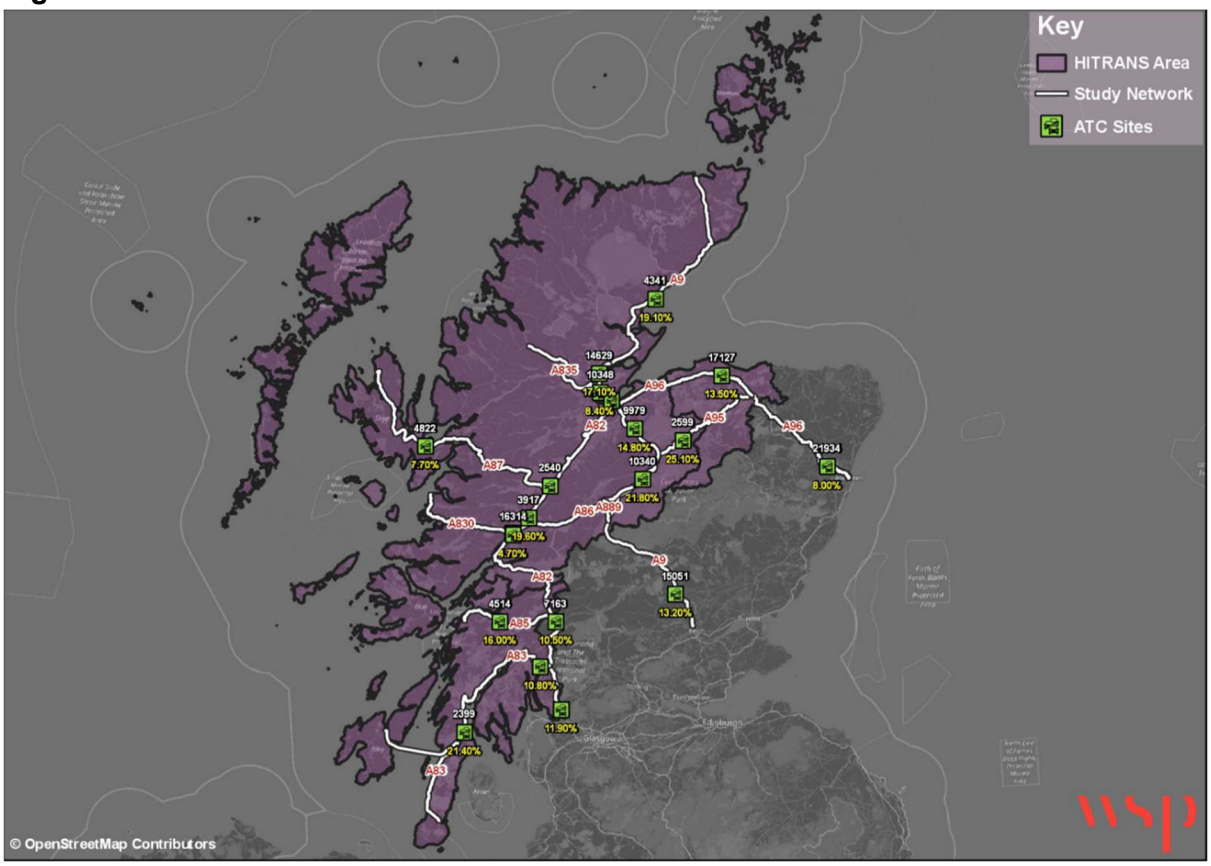
4.2.6. The number of distilleries which are located on Islay and Jura, are dependent on ferry services linking the island with the mainland. As with all ferry services operating on exposed routes, strong winds contribute to over half (51%) of all cancellations, with these having an impact on the ability to deliver goods to the island or transport product to the mainland. Islay and Jura services are supported by an ageing fleet of vessels which has an additional impact on the reliability of the services, with mechanical issues accounting for a further 27% of cancelled sailings.

4.2.7. The ferries are required to accommodate a greater demand in the summer months as a result of tourist traffic which includes larger motorhome vehicles, with these taking up additional space on each vessel. This matter is compounded by restricted space provided at Port Askaig and Port Ellen to accommodate the competing needs of private cars and commercial vehicles.

4.3 CURRENT OPERATION

4.3.1. Transport Scotland maintain a number of permanent Automatic Traffic Counter (ATC) sites across the trunk road network, with these recording details of traffic volume and classification. The ATC data has been used to inform this study, with sites selected based on their locations and ability to provide traffic flow data from 2023 or 2022, i.e. after the most recent years following the Covid-19 pandemic. Where appropriate, the longer trunk roads (i.e. the A9, A82 and A83) have been split into separate sections, with individual ATC sites used to review the operation of each. The locations of the ATC sites used to inform this study are shown in Figure 4-1.

Figure 4-1 - ATC Site Locations



4.3.2. The two-way Annual Average Daily Traffic (AADT) flow for total vehicles and HGVs was extracted from each counter site, with this used to review the impact of whisky industry generated HGV movements on the use of the network.

4.3.3. Table 4-2 summarises the two-way AADT flow recorded on each of the road links considered as part of this study.

Table 4-2 – AADT Two-Way Flow Summary

Road / Counter Location Description	Total Traffic	Total HGVs**	% HGVs
A83 200m S of West Tarbert	2,399	513	21.4%
A83 West of Arrochar	4,088	442	10.8%
A82 - South of Balloch Roundabout with A811	23,225	2764	11.9%
A82 Crianlarich (Core 903)	7,163	752	10.5%
A85-LOCHAWE-5.5KM E OF B845	4,514	722	16.0%
A830 B8006 to B8006 - (Blarmor)	9,410	668	7.1%
A82 Lochybridge South	16,314	767	4.7%
A82 Spean Bridge to Invergarry	3,917	768	19.6%
A82 Invergarry to Fort Augustus	2,540	538	21.2%
A87 Broadford (Core 982)	4,822	371	7.7%
A835 Tore to Leanig (B9169)	10,348	869	8.4%
A9 Golspie to Brora	4,341	829	19.1%

Road / Counter Location Description	Total Traffic	Total HGVs**	% HGVs
A9 Ardullie Roundabout to Skiach Junction	14,629	2502	17.1%
A9 North Kessock	30,322	4215	13.9%
A96 Elgin to Lhanbryde	17,127	2312	13.5%
A96 Clinterty	21,934	1755	8.0%
A95 A939 Junction to Cromdale	2,599	652	25.1%
A9 Moy 2+1 South	9,979	1477	14.8%
A9 Kincraig	10,340	2254	21.8%
A9 N of A822/Dunkeld	15,051	1987	13.2%

** Total HGVs includes Whisky and non-whisky HGVs

4.3.4. As can be seen from the above summary, the proportion of HGV use varies significantly across the network. This is primarily due to the variation in the overall traffic volume.

4.4 SUMMARY

4.4.1. The nature of the Highlands and Islands results in a large proportion of the road network passing through challenging terrain, with climatic events having an impact on the network's operation. Ferry services which link island distilleries with the mainland, are also affected by adverse weather and more recently, mechanical issues related to the ageing fleet and port infrastructure.

4.4.2. Traffic data has been extracted from a number of ATCs which are provided across the trunk road network and a review of the extracted traffic flow data highlights the varying level of usage of the network in the Highlands and Islands, both in terms of overall traffic flow and the proportion of HGVs using each section of the trunk road network.

5 USAGE OF THE TRUNK ROAD NETWORK BY THE WHISKY INDUSTRY

5.1 INTRODUCTION

5.1.1. As previously highlighted, a spreadsheet forecasting tool was developed to inform the previous SotH study and this has been revisited as part of this 2024 study, to quantify the impact of HGVs supporting the whisky industry's operation, on the trunk road network's usage.

5.1.2. The output capacity of each distillery located in or immediately adjacent to the Highlands and Islands has been extracted from the current edition of the Scotch Whisky Industry Review (2022), with this information used to estimate the level of HGV trips generated by each.

5.2 DATA ANALYSIS

5.2.1. The Spreadsheet Analysis Tool developed in the previous SotH study was designed to look at the theoretical production capacity and location of all distilleries within the Highlands and Islands.

5.2.2. Modelling undertaken for this study builds on that tool and takes cognisance of a number of factors, with the most significant of these relating to the following:

- Industry production when compared to its theoretical capacity;
- Spirit yield from malted barley; and
- HGV load capacity.

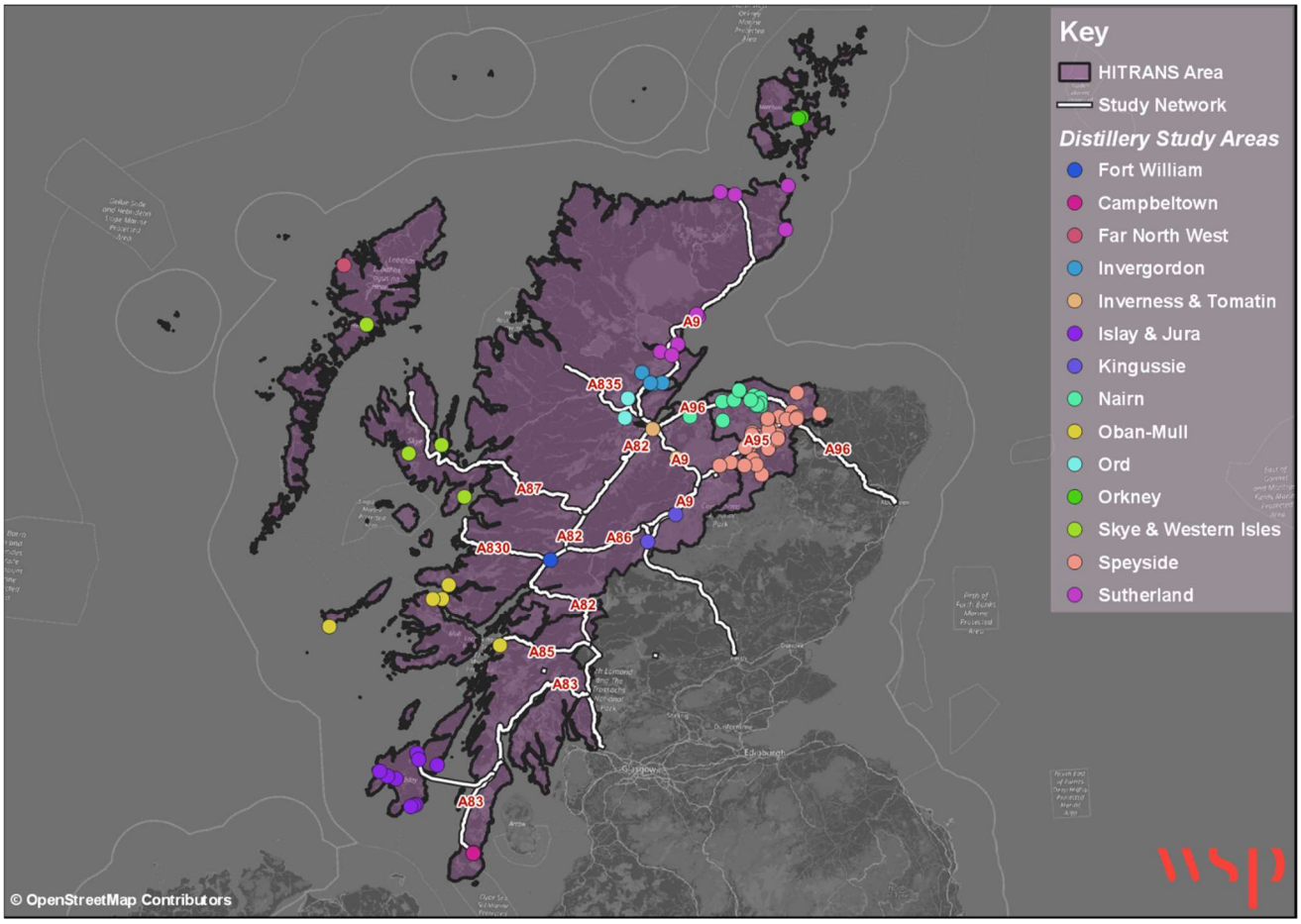
5.2.3. It has been assumed that the industry is currently operating at **83.7% of its theoretical capacity** in line with the level reported by the 2022 Industry Review.

5.2.4. The distilleries were grouped into 14 areas[13] used to develop the original Spreadsheet Analysis Tool, and the routing of goods was identified based on a review of the likely origin and destination for each HGV movement. HGV traffic was then assigned to 20 key routes, to identify the level of whisky traffic using each route and enable its impact to be established.

5.2.5. The locations of the 14 distillery areas and 21 key route segments used by whisky industry traffic are shown in Figure 5-1.

[13] Note: these are not the same as the three protected regions and two protected localities as set out in the Scotch Whisky Regulations 2009.

Figure 5-1 - Analysis Areas and Study Network



5.2.6. It should be noted that a direct comparison between the previous (2011) study and this 2024 study is not possible. In the previous study, the allocation of distilleries to geographical areas within the Highlands and Islands was not specified. In this study a catchment approach has been used whereby each distillery is allocated to an area relating to the location where the area routing starts.

5.2.7. The following products are transported to support the whisky industry's operation and has been considered for this analysis:

- Cereals;
- Casks (full and empty) in dedicated Trailer Loaded Vehicles;
- Bulk spirit tankers (full and empty);
- By-products (e.g. draff and pot ale);
- Energy;
- Packaging materials; and
- Bottled Scotch Whisky.

5.2.8. The modelling assigns HGVs associated with the delivery of the above elements on to the HITRANS road network based on the assumed origin and destination of each trip, with the number of HGV movements determined based on an assumed carrying capacity.

5.3 PROPORTION OF WHISKY INDUSTRY HGVS USING EACH LINK

5.3.1. A summary of the existing AADT flows recorded across the trunk road network was presented in Table 4-2. The current level of HGVs generated by the whisky industry on a daily basis has been determined, with this compared with the AADT data to review the proportion of traffic associated with the industry on each link. The result of this review is summarised in Table 5-1.

Table 5-1 – Daily Two-Way Traffic Flow Summary – Existing

Route	Route Name	Total Traffic	General HGVs	Whisky Industry HGVs	Proportion of Whisky Industry HGVs
1	**A96 – Keith to Inverness**	**17,127**	**2,312**	**159**	**6.9%**
2	**A95 – Keith to Granish**	**2,599**	**652**	**530**	**81.3%**
3	A9 – Tore to Invergordon	14,629	2,502	91	3.6%
4	A9 – Inverness to Tore	30,322	4,215	121	2.9%
5	A9 – Inverness to Granish	9,979	1,477	192	**13.0%**
6	**A9 – Granish to Kingussie**	**10,340**	**2,254**	**182**	**8.1%**
7	**A9 – Kingussie to Perth**	**15,051**	**1,987**	**173**	**8.7%**
8	A82 – Inverness to Invergarry	2,540	538	1	0.2%
9	A82 – Invergarry to Fort William	3,917	768	1	0.2%
10	A82 – Fort William to Tyndrum	16,314	767	4	0.5%
11	A9 – Invergordon to Thurso	4,341	829	38	4.5%
12	A82 – Tyndrum to Tarbert	7,163	752	4	0.6%
13	A82 – Tarbert to Dumbarton	23,225	2,764	12	0.4%
14	A87 – Invergarry to Uig	4,822	371	3	0.7%
15	A830 – Fort William to Mallaig	9,410	668	1	0.1%
16	A85 – Oban to Tyndrum	4,514	722	1	0.1%
17	A83 – Tarbert to Kennacraig	4,088	442	11	2.5%
18	A835 – Tore to Braemore	10,348	869	0	0.0%
19	A96 – Keith to Aberdeen	21,934	1,755	68	3.9%
20	A83 – Campbeltown to Kennacraig	2,399	513	2	0.4%

Routes experiencing a minimum 5% of HGVs associated with whisky production are highlighted in bold.

5.3.2. The previous summary confirms that over 81.3% of the HGVs using the A95 are associated with the whisky industry, demonstrating the importance of the road to its operation.

5.3.3. The data review also suggests that a large proportion of the HGVs using the A96 and the A9 to the south of Inverness, are supporting the whisky industry's operation.

5.3.4. While a lower proportion, the A83 is also considered to be a road which is vital to supporting the industry's operation given that it supports access to Islay.

81% of HGVs on the A95 are associated with the Whisky Industry

13% of HGVs on the A9 between Inverness and over Slochd are associated with the Whisky Industry

5.4 WHISKY INDUSTRY GROWTH

5.4.1. The Scotch Whisky Industry Review confirms that the industry has continued to grow with an annual average growth of 3.5% in spirit production recorded from 2017 to 2021.

5.4.2. The overall distilling capacity is increasing to meet the increased demand, with Table 5-2 comparing the current (as of 2021) capacity of the system (by area), with that available in 2009, the year used for the purpose of the previous 2011 SotH study.

Table 5-2 – Whisky Industry Capacity Comparison

Area	2009 Capacity	2021 Capacity	Increase
Ord	4,000,000	11,650,000	+191%
Sutherland	21,030,000	15,500,000	-26%
Nairn	8,600,000	50,900,000	+492%
Kingussie	2,600,000	3,050,000	+17%
Skye & Western Isles	2,700,000	4,090,000	+51%
Oban – Mull	1,700,000	2,400,000	+41%
Fort William	2,000,000	2,000,000	0%
Far North West	60,000	50,000	-17%
Campbeltown	2,250,000	4,750,000	0%
Orkney	3,500,000	3,700,000	+6%
Inverness & Tomatin	5,000,000	5,123,750	+2%
Islay & Jura	18,390,000	21,950,000	+33%
Speyside	166,500,000	196,100,000	+18%
Cromarty Firth	38,750,000	51,500,000	+33%
TOTAL	**277,080,000**	**372,763,750**	**+35%**

5.4.3. As can be seen from the above summary, the industry's capacity has grown by 35% between 2009 and 2021, which equates to an average increase of 2.9% per year.

35% Highlands and Islands Scotch Whisky capacity growth between 2009 and 2021

Speyside remains the largest producer

5.5 COMPARISON WITH PREVIOUS STUDY

5.5.1. The SotH study identified the proportion of HGVs which were associated with the whisky industry on four key road links and Table 5-3 provides a comparison with the revised analysis as presented in this study.

Table 5-3 – Comparison with Previous Study

	Previous SotH Study			Updated Analysis		
Road and Location	Daily HGV Traffic	Daily Whisky HGVs	Proportion of Whisky HGVs	Daily HGV Traffic	Daily Whisky HGVs	Proportion of Whisky HGVs
A9 at Invergordon	832	96	12%	1890	91	5%
A9 at Aviemore	1025	136	13%	2254	182	8%
A95 East of Grantown on Spey	754	377	50%	650	530	82%
A83 Tarbet	200	8	4%	442	11	3%

5.5.2. As can be seen from the above summary, HGV traffic has increased on three of the four routes, with the comparison suggesting that daily HGV traffic flows have decreased on the A95. While the previous study extracted traffic flow data from the DfT database which generally relies on an estimate of traffic flows based on historic survey data, this 2024 study has utilised recent data captured from live traffic counter sites. It is for this reason that there are significant variances on the majority of the road sections compared in Table 5-3.

5.5.3. There are also likely to be discrepancies in terms of the assignment applied to HGV traffic generated by the whisky industry and this has resulted in it being challenging to draw any meaningful conclusions when comparing the current and previous analysis. Nevertheless, the comparison suggests the following:

Whisky Industry HGVs Account For:

530 daily HGV movements on the A95

82% of the total HGV movements on the A95

- The level of whisky industry HGVs using the A9 and A95 has increased;
- The number of HGVs using the A9, A95 and A83 has increased since the previous study was undertaken; and
- The A9 and A95 continue to accommodate a large number of whisky industry HGVs.

5.6 FUTURE GROWTH

5.6.1. It is anticipated that the whisky industry will continue to grow and Table 5-4 illustrates the potential impact a theoretical 10% increase in capacity in ten years could have on the whisky industry in

terms of its capacity expressed in Litres Per Annum (LPA). This potential growth is a conservative estimate when compared with the 2.9% average annual growth calculated between 2009 and 2021 based on data gathered to support the Scotch Whisky Industry Review.

Table 5-4 – Potential Future Capacity (based on a theoretical 10% growth rate)

Area	2021 Capacity (LPA)	2031 Capacity (LPA)	Capacity Difference (LPA)
Ord	11,650,000	12,815,000	+ 1,165,000
Sutherland	15,500,000	17,050,000	+ 1,550,000
Nairn	50,900,000	55,990,000	+ 5,090,000
Kingussie	3,050,000	3,355,000	+ 305,000
Skye & Western Isles	4,090,000	4,499,000	+ 409,000
Oban – Mull	2,400,000	2,640,000	+ 240,000
Fort William	2,000,000	2,200,000	+ 200,000
Far North West	50,000	55,000	+ 5,000
Campbeltown	4,750,000	5,225,000	+ 475,000
Orkney	3,700,000	4,070,000	+ 370,000
Inverness & Tomatin	5,123,750	5,636,125	+ 512,375
Islay & Jura	21,950,000	24,145,000	+ 2,195,000
Speyside	196,100,000	215,710,000	+ 19,610,000
Cromarty Firth	51,500,000	56,650,000	+ 5,150,000
TOTAL	**372,763,750**	**410,040,125**	**+ 37,276,375**

5.6.2. As can be seen from the above summary, this theoretical growth could accommodate a potential increase of over 37,000,000 litres of production. Table 5-5 highlights the impact that this would have on the level of HGVs using each of the 20 routes which have been assessed as part of this study.

Table 5-5 – Daily Two-Way Traffic Flow Summary – Potential Future

Route	Route Name	Whisky Industry HGVs		
		2021	2031	Difference
1	A96 – Keith to Inverness	159	175	+ 16
2	A95 – Keith to Granish	530	583	+ 53
3	A9 – Tore to Invergordon	91	100	+ 9
4	A9 – Inverness to Tore	121	133	+ 12
5	A9 – Inverness to Granish	192	211	+ 19
6	A9 – Granish to Kingussie	182	200	+ 18
7	A9 – Kingussie to Perth	173	190	+ 17
8	A82 – Inverness to Invergarry	1	1	0
9	A82 – Invergarry to Fort William	1	2	+ 1
10	A82 – Fort William to Tyndrum	4	4	0

Route	Route Name	Whisky Industry HGVs		
		2021	2031	Difference
11	A9 – Invergordon to Thurso	38	41	+ 3
12	A82 – Tyndrum to Tarbert	4	5	+ 1
13	A82 – Tarbert to Dumbarton	12	14	+ 2
14	A87 – Invergarry to Uig	3	3	0
15	A830 – Fort William to Mallaig	1	1	0
16	A85 – Oban to Tyndrum	1	1	0
17	A83 – Tarbert to Kennacraig	11	12	+ 1
18	A835 – Tore to Braemore	0	0	0
19	A96 – Keith to Aberdeen	68	75	+ 7
20	A83 – Campbeltown to Kennacraig	2	2	0
TOTAL		**1,592**	**1,751**	**+ 159**

5.6.3. As can be seen from the above summary, a theoretical increase of 10% is estimated to require an additional 159 daily HGV movements using the trunk road network in the Highlands and Islands. This equates to an increase of approximately 58,115 additional HGV movements on an annual basis.

A theoretical 10% growth across Highlands and Islands would generate:

159 additional daily HGV movements

58,115 additional annual HGV movements

5.6.4. As previously highlighted, the continued expansion of the whisky industry is reliant on a resilient transport network which is able to accommodate the forecast increased demand generated by general traffic and vehicles supporting the industry's operation.

5.7 SUMMARY

5.7.1. The analysis suggests that the majority of HGVs using the A95 and a large proportion of the HGVs using the A96 and the A9 to the south of Inverness, are supporting the Scotch Whisky industry's operation.

5.7.2. While it is challenging to draw a meaningful conclusion from a comparison with the previous 2011 study, the data would suggest that the A9 and A95 remain vital to the whisky industry's operation. The A83 also remains a vital link given that it supports access to Islay and Jura where 10 distilleries are located.

5.7.3. A theoretical increase of 10% in the current industry's capacity over the next ten years, has the potential to develop an additional 156 HGV movements across the network on a daily basis and 56,888 HGV movements on an annual basis. It is therefore vital that the key roads used by the whisky industry are able to accommodate this growth in demand.

6 STAKEHOLDER CONSULTATION

6.1 INTRODUCTION

6.1.1. The previous SotH study was supported by consultation with key stakeholders and this exercise has been revisited to understand the issues faced by each, in addition to identifying potential opportunities to introduce improvements to the transport network.

6.1.2. The following sections describe the consultation process prior to summarising its outcomes.

6.2 METHODOLOGY

6.2.1. Stakeholder consultation was carried out throughout January and February 2024. Selected consultee organisations were agreed with the SWA and HITRANS to include distillers, maltsters, hauliers and ferry operators.

6.2.2. Qualitative data was collected via semi-structured interviews with individuals representing the various stakeholders and distilled into key themes which convey the main issues faced by the consultees. Potential opportunities to address these issues were also discussed.

6.2.3. Table 6-1 provides a list of those invited to be consulted, highlighting the dates on which individual interviews were held.

Table 6-1 - Consultees by Organisation and Sector

Whisky Production Network Sector	Organisation	Date of Interview
Distillers	4 SWA member companies	17/01/2023
		24/01/2024
		10/01/2024
		02/02/2024
Maltsters	Maltsters Association of GB (MAGB)	15/01/2024
Hauliers	4 road haulage companies	16/01/2024
		22/01/2024
		09/01/2024
		02/02/2024
	1 rail freight operator	30/01/2024
Ferry Operators	3 ferry operators	09/01/2024
		26/01/2024
		06/02/2024

6.2.4. Transport Scotland were also consulted to understand what, if any, measures were being planned on the trunk road network.

6.2.5. All stakeholders were keen to be involved with the study and WSP are very grateful for their participation.

6.3 STAKEHOLDER RESULTS

6.3.1. The following six key themes emerged through conversations with consultees:

- Trunk road infrastructure;
- Local road infrastructure;
- Haulage operations;
- Localised supply chains;
- Ferry operations; and
- Decarbonisation.

6.3.2. These themes have been used for the purpose of summarising the consultation outcomes in the following sections.

TRUNK ROAD INFRASTRUCTURE

6.3.3. Table 6-2 summarises the comments provided by each consultee type in relation to the trunk road network.

Table 6-2 - Stakeholder consultation feedback on Trunk Road Infrastructure

Consultee Type	Theme	Response
Distillers	A9	The **large majority** of inputs and outputs are transported via the A9 between distilleries in the north and the central belt.
		The continuation of the **A9 dualling** project was raised as desirable however not all consultees flagged it as their number one priority.
		It was generally thought that the A9 is **at capacity** and that it is *"reliable but slow"*.
		Works associated with the A9 dualling project was reported to have caused **delays** to deliveries.
		Maintenance of the A9, including **winter maintenance**, was reported as being well managed and did not cause recurring or significant issues outside of extreme weather events.
	A95 / A96	Consensus was that the A95 and A96 are heavily used.
	A96	The routing of the A96 through towns and villages was flagged as a cause of delays. Specifically, traffic at peak times through **Elgin** was reported as causing a bottleneck. It was raised that **bypasses** around the towns would be desirable to help alleviate these issues.
	A83 Rest and Be Thankful	Challenges were highlighted on the A83 (Rest and be Thankful) with the **risk of landslips** occurring on the road to the Kennacraig ferry port and Campbeltown This was highlighted by one consultee as a **higher priority than the A9.**
Hauliers	A82	**Rock falls and landslides** were cited as being particularly prevalent on the A82 between Drumnadrochit and Invermoriston

Consultee Type	Theme	Response
	A95	The majority of the A95's length is considered to be a major pinch point and it was felt that this road needs to be widened to meet the demand placed on the road.
	A9	It was felt that the Scottish Government has **not met its promises** with regards to dualling the A9 and A96.
	All Trunk Road Network	Trunk roads should be governed at a local level to allow issues to be actioned quicker.

LOCAL ROAD INFRASTRUCTURE

6.3.4. Table 6-3 summarises the comments provided by each consultee type in relation to the local road network.

Table 6-3 - Stakeholder consultation feedback on Local Road Infrastructure

Consultee Type	Theme	Response
Hauliers	Maintenance	In the winter the local access roads become tricky to traverse, impacting journey times, due to **adverse weather conditions** and a lack of winter maintenance.
		Road surface conditions on locally managed roads were raised as a significant issue affecting the condition of vehicles; it impacts tyres, suspension, chassis etc. *"If you look at some parts of the country where potholes are prolific, and you're running a loaded vehicle over the top of them, that's a problem."*
		There is **dense forestry** (particularly in spring time) along the side of the road. HGVs come into contact with this and knocks it onto the road presenting hazards to other road users.
		The **softening of verges** on narrow roads (example on A884) is getting worse. This causes HGVs to overturn / get stuck when they pull over to allow other vehicles to pass.
		One distiller raised specific issues with the maintenance of roads within **Moray Council area**. It was said there is a *"distinct line"* when crossing the boundary from neighbouring local authorities where conditions are *"noticeably worse".*
	Diversions	It was flagged that there a **very few diversion routes** available and these are unsuitable in terms of road size, height and weight restrictions (bridges).
		Sometimes diversion routes are considerable in terms of mileage and time. These can be as much as **100 miles** on the A82 for instance.

Consultee Type	Theme	Response
		The '**old military route**' around the Rest and be Thankful (A83) is very difficult for HGV tankers to navigate. This is because of how steep it is and the big apex's in the road.
Distillers	Congestion	Slow moving farm, construction and tourist traffic (particularly caravans) **impacts journey times.**
		Running convoy systems (on the A83 for instance) can cause significant delays and road closures at night. This reduces utilisation capacity of rolling assets, lower margins, higher wastage and lower productivity.

HAULAGE OPERATIONS

6.3.5. Table 6-4 summarises the comments provided by each consultee type in relation to haulage operations.

Table 6-4 - Stakeholder consultation feedback on Haulage Operations

Consultee Type	Theme	Response
Hauliers	Coordination	It was flagged that, for most hauliers, up to 50% of all trips involved **running empty trailers.**
		It was suggested that better coordination is needed between dispatch points and delivery points. It was reported that dispatch points and receipt points are not joined up meaning that full tankers have not been cleared when drivers arrive at delivery points resulting in a **bottleneck of up to 10-15 tanks** at a delivery point.
		Some sites and settlements have **time limits/curfews** which restrict vehicle movements during certain times of day. More movements during evening and nighttime hours could avoid deliveries being caught up in peak hour traffic but curfews restrict this.
	Restrictions	A barrier was raised in that there is no real opportunity to introduce **longer articulated trailers** as the weight of the product means hauliers are weighing out at gross weight. Increased weight limits would mean fewer vehicle movements.
		There is a difference in speed limits for HGVs between England (50mph) and Scotland (40mph) for single carriageway road which causes **confusion amongst drivers**. The A9 however retails a 50mph limit for HGVs along its length.
Distillers	Dedicated Fleet	One distiller was flagged as being unique in having a **dedicated fleet** (through a haulier). It was reported that this allows for more control of the movement of goods across Scotland.

LOCALISED SUPPLY CHAIN

6.3.6. Table 6-5 summarises the comments provided by each consultee type in relation to localised supply chains.

Table 6-5 - Stakeholder consultation feedback on Localised Supply Chains

Consultee Type	Theme	Response
Distillers	Localisation	Several distillers have made **significant gains** in securing a local supply chain where possible.
		Islay is faced with **significant barriers** to a local supply of malt due to the number of distilleries on the island.
	Facilities	Distillers with local supply chains still need to move product to the **central belt for bottling and distribution**.
	Local Knowledge	Some respondents felt there are advantages of using **local hauliers** as their local knowledge informs contingency plans and helps to improve resilience.

FERRY OPERATIONS

6.3.7. Table 6-6 summarises the comments provided by operators in relation to ferry operations.

Table 6-6 - Stakeholder consultation feedback on Ferry Operations

Consultee Type	Theme	Response
Ferry Operators	Fleet	It was noted that some **ports are difficult to access**. The vessels are therefore quite unique and are often built for specific routes. This also makes chartering other vessels a challenge as they can't meet operational requirements in terms of size, power and manoeuvrability.
		Some of the **fleet is very old** (older than design life in some cases). The parts for these vessels are obsolete and the manufacturers no longer exist making spare parts hard to source.
	Capacity	Some routes are already at **full capacity** (such as the Islay route) so there is **no resilience** in the fleet. A breakdown has an immediate impact on the service. Alternative vessels aren't available to bring in.
		The schedules currently employed are utilising the maximum number of crew hours available. **Additional crew** could be brought in but there is no capacity / accommodation onboard for those crew to live.
		Capacity is seasonal which can cause bottlenecks at certain times of year, impacted by various factors such as large fish landings on the islands, livestock season, various markets etc.

Consultee Type	Theme	Response
		Deliveries to and from Orkney tend not to take place during winter due to the unreliability of the ferries from Scrabster. When they are used, they must be booked far in advance due to increased demand from users.
	Restrictions	Alcohol is categorised as a **dangerous good** which restricts how much can be transported at any one time due to the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009. Some ships have very limited capability to carry dangerous goods. Where they might be able to carry many freight loads, they may only be able to carry just one dangerous good load per sailing.
	Demand Management	Some ferry operators do not have the ability to adjust the **cost of carriage** and therefore instil more effective demand management.
		A disjointed approach between key freight customers was raised as a challenge making it difficult to react to **spikes in demand** for ferry services.
	Weather	**Weather** has a big impact on sailings (even in the summer). Passenger vessels are more capable of operating in harsh weather than freight vessels due to them being stabilised.
	Maintenance	There are periods where vessels are in **dry dock** for routine maintenance which causes pinch points due to the lack of capacity in the ferry network.
	Collaboration	There is currently a public - private partnership which supports the **Jura ferry**. This partnership was able to fund a **standby** ferry in 2023 while the usual vessel was in dry dock for seven weeks. This service was procured from Ireland as there are no standby ferries available in Scotland. However it was noted that the **cost** for obtaining standby services has **significantly increased** in the last year due to demand.

6.3.8. Table 6-7 summarises the comments provided by each consultee type in relation to the operation of ferry services serving Islay.

Table 6-7 - Stakeholder consultation feedback on the Islay Ferry

Consultee Type	Theme	Response
Distillers	Reliability	For all consultees with an interest on the Isle of Islay or Jura, the Islay route was the **number one priority** on the transport network. These consultees spent the majority of their allotted time discussing this one issue.
		Overwhelmingly, distillers and hauliers feel that the service is **unreliable**.
		Issues with the crossing to Islay has **knock on effects** for those required to continue on to Jura.
	Demand Management	The Islay route **lacks capacity**.
		There is an appetite for **freight only services** to service the island.
	Capacity	Islay does not have the level of infrastructure to support its current economic activity.
		One distiller suggested that a freight ferry could supply fuel for the whisky industry across the whole island based on deliveries 2-3 times per week.
Hauliers	Reliability	Unreliable ferry times causes knock on disruption to vehicle movements and **queuing at ports**.
		Sometimes the ferry doesn't sail for 2 or 3 days and then when it does, the boat still leaves with space on it despite there being freight waiting to be loaded.
		Delays are very frequent with one haulier reporting they experience them 140 days per year.
Maltsters	Capacity	Consideration is also given to the movement of **waste and by-products** off the island in order to minimise empty runs. Where possible *"no empty truck leaves the island."*
		It was felt that there is a need for more and **bigger boats**.
		Due to lack of available maltings on Islay to serve the distilleries, there has been a recent **increase in demand** for imports of malt from the mainland.
	Reliability	Running of the Islay ferry is increasingly **weather dependent**.
Ferry Operators	Capacity	There is **no capacity** to run freight only services on this route.
		Two new vessels are on order, the first vessel is due to be delivered at the end of October 2024. It is proposed that it will come into service late 2024 / early 2025. The second is due to be delivered in Q1 2025, and will come into service later. This will increase the capacity in this route, but only by a small amount.
		Whisky transport projections are expected to **exceed available capacity** very soon so at some point in the near future we will run out of space. This is takes into account two vessels being introduced
	Demand Management	**Demand needs to be balanced** between whisky traffic and other cargo and passengers.

DECARBONISATION

6.3.9. The potential to decarbonise the industry both in terms of the transportation modes used to support its operation and the means by which distilleries are powered was explored with stakeholders and a summary of the consultation is presented in the following sections.

Green Fuel Infrastructure

6.3.10. Table 6-8 summarises the comments provided by each consultee type in relation to the potential to transition to greener fuel powered vehicles.

Table 6-8 - Stakeholder consultation feedback on Green Fuel Infrastructure

Consultee Type	Theme	Response
Distillers	Transition	There is a general appetite amongst distillers to support the **transition away from diesel** fuelled transportation.
		Many stakeholders have either fully decarbonised or are in the process of decarbonising their local fleet, such as **EV pool cars**, and **biomethane HGVs** used on site or to other local sites.
	Network Development	It is possible to generate biomethane using distillery by-products as the feedstock for use in HGV's. There is potential to develop a **biomethane fuelling network**.
	Supply Chain	There is a wide variety of locations fuel is sourced from. Some sites source green fuels from local sources of animal by products, while others rely on a supply of fuels from **across the UK.**
	Movement of personnel	As well as inputs and outputs, **movement of personnel** is a key consideration for distillers.
	Electric Vehicles	Many sites have invested in **EV pool cars** however this poses an issue as there are limited number of **charging facilities** on the A9. This issue is exacerbated in the summer with the increase in the number of tourists.
	Public Transport	The view amongst those consulted is public transport in the Highland area is too **unreliable** to transport personnel in a timely manner.
Hauliers	Network Development	The infrastructure for new fuels is *"just not there"*. Private investment has seen the development of initial sites however the network is not in place to **facilitate long distance movements**.
	Restrictions	**The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009** currently states that diesel combustion powered engines must be used to transport certain types of movements. This regulation is a **barrier** to transitioning to green fuel.
	Supply Chain	Develop the biomethane production obtained from the **digestion of distillery by-products** and make this available to hauliers
		There have been long waits experienced for the supply of alternative fuelled vehicles (e.g. EV and hydrogen) **up to 2 years**.

Consultee Type	Theme	Response
	Transition	Hauliers expressed hesitation towards transition as the cost of moving towards zero carbon is *"massive".*
		There is an appetite to **continue the trials** that have been carried out with HVO and gas options (CNG, LNG) as well as biofuels such as biomethane.
	Collaboration	Hauliers would like to work with distilleries and introduce a refuelling network at distilleries and haulier depots accessible by all those in the whisky supply chain. The location of refuelling points requires **careful consideration** to ensure this does not interfere with onsite production activity.
	Network Development	A comprehensive network would require '**external' refuelling** points on the road network. Perth was cited as an ideal location for a refuelling hub as *"everything going north has to go through Perth at some point".*
	Future Fuels	Long term, the hauliers that were consulted believe the future fuel of choice for the smaller vehicles (<26 tonnes), undertaking short hauls, would be **Battery Electric Vehicles (BEVs).** However, there are **concerns about the heavier vehicles** (which is the majority of the fleet) as it is not clear that the technology can cope with the increased demands and load carrying capacities. There are plans to start **trialling Hydrogen Fuel Cell Vehicles (FCEVs)** in the first half of 2024.
	Diversions	Improved and, where possible, **shorter diversion routes** would reduce the distances travelled and associated carbon emissions.
	Railways	It was felt, **electrifying the railway to Aberdeen and Inverness** would add a lot of value for serving the north.

Ferry Decarbonisation

6.3.11. Table 6-9 summarises the opportunities identified by each consultee type in relation to ferry operations.

Table 6-9 - Stakeholder consultation feedback on Ferry Operations

Consultee Type	Theme	Response
Ferry Operators	Roll on Roll off (Ro-Ro) Ferries	It was suggested that the introduction of Ro-Ro Plus vessels would benefit due to their **flexibility**. RoRo is short for 'Roll-on, Roll-off', which describes how products are loaded and discharged from a vessel. RoRo allows your products to roll on and off the vessel, as opposed to being lifted onboard using cranes. Self-propelled products, such as cars and HGVs, roll on and off the vessel on their own wheels. A RoRo plus vessel can be sailed as a freight vessel (carrying 12 passengers) or a passenger vessel (if one of the passenger vessels breaks down) which can be manned up to carry 200 passengers.' Their flexibility can help reduce the number of sailings required resulting in fewer trips, which equals a reduction in CO_2 emitted.

Consultee Type	Theme	Response
	Alternative Fuels	Running ferries using alternative, fuels would **reduce carbon** emissions.
	Freight Forum	Creation of a freight forum in order to facilitate **better communication** between key freight customers and ferry operators was identified as an opportunity which would assist with more effective demand management, ultimately reducing the number of sailings required.
Hauliers	Drop Trailers	Implementing a drop trailer service was identified as an excellent way to increase capacities on ferry services, reduce dock congestion, optimise the supply chain and increase operational efficiency.

Decarbonisation of Sites

6.3.12. Table 6-10 summarises the comments provided by distillers on the potential to decarbonise the operation of distilleries.

Table 6-10 - Stakeholder consultation feedback on Site Decarbonisation

Consultee (Organisation)		Response
Distillers	Transition	There is **aspiration from all** consultees to transition to clean/green power for their sites, ideally using local sources or operations by-products.
		There were reports of transition to **electric boilers** powered by renewable energy via the grid, the use of **green gas**, locally sourced **biofuel** (such as wood pellets), and **carbon offsets**.
		Due to the age and varying characteristics of each site the approach to decarbonisation must be **site specific**. For example, the use of biofuels vs wind turbines may be more or less relevant depending on the site.
	Islay	In terms of **local power network**, Islay has no 'green' provision and no plan for the future. The electricity supply in Islay is **constantly constrained** – one distiller explained that in 2023 its Islay operations was powered using diesel generators for 6 months.
		Onshore wind turbines have been considered however it is expected that the **local community would not support** this option.
		Biogas or hydrogen fuel may be a viable option in the future however there is currently a **lack of infrastructure**.
		It was stated that the *"network hasn't grown to take the opportunity of a vibrant distilling industry on Islay".*

6.4 ISSUES AND OPPORTUNITIES

6.4.1. The consultation process led to the identification of a number of key issues and opportunities across the transport network in the Highlands and Islands and these are summarised in the following sections.

ISSUES SUMMARY

6.4.2. Table 6-11 summarises the key issues which have emerged from the stakeholder consultation exercise.

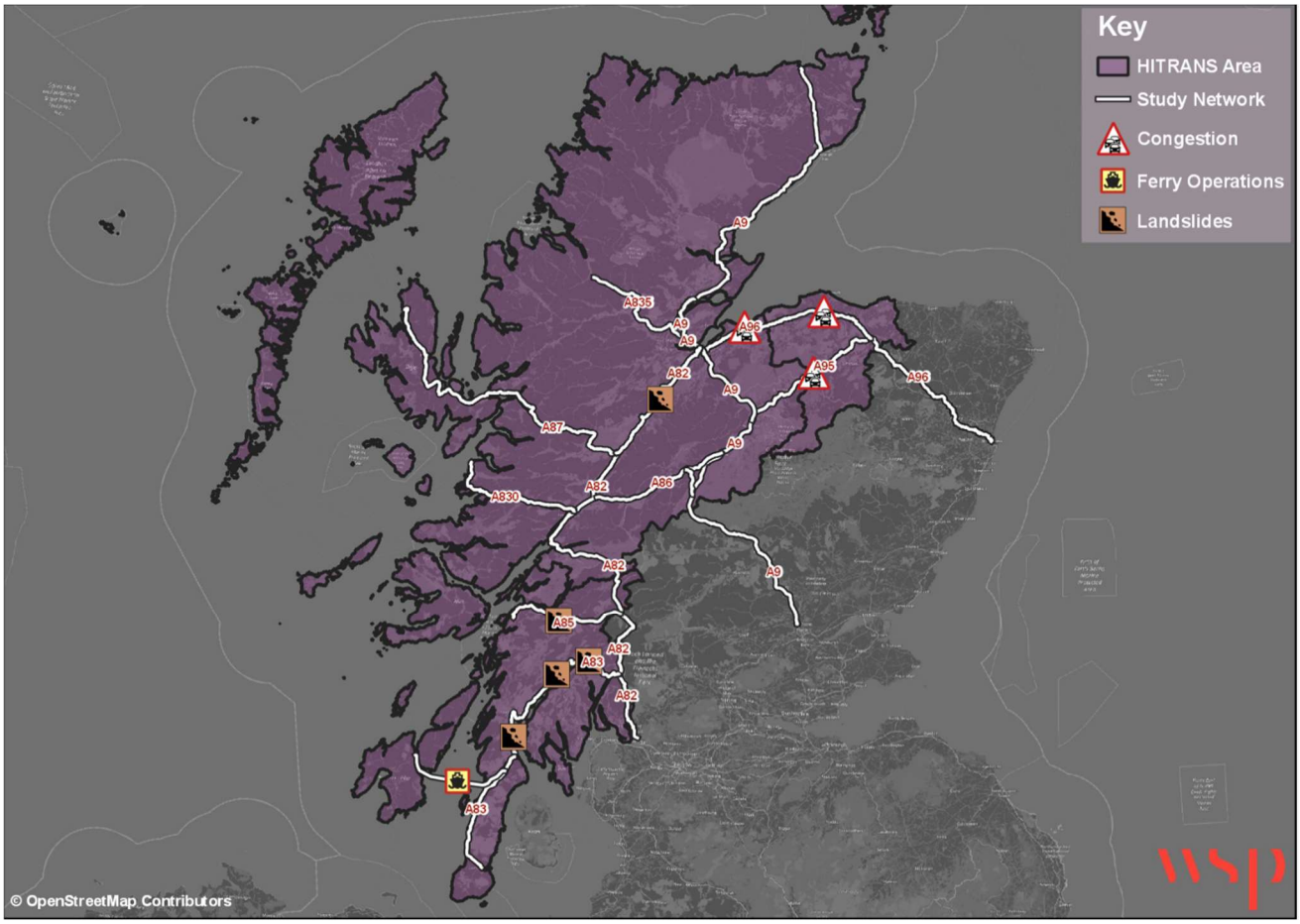
Table 6-11 – Summary of key stakeholder issues

Issue	Summary
Congestion on A9 / A95 / A96	Tourist, farm, and construction traffic, as well as impacts from dualling road works is seen as a key cause of delays on the A9.
Width of A95	It was felt that this road needs to be widened to accommodate the needs of HGVs and the level of demand generated by the whisky industry.
A82 between Drumnadrochit and Invermoriston	Rock falls and landslides were cited as being particularly prevalent on this route.
The old military road (A83)	Very difficult for HGV tankers to navigate. This is because of how steep it is and big apex's in the road. Whisky moves around in the tank causing the weight to lift off the drive axle.
A83 Rest and Be Thankful	Access to Kennacraig port (for Islay and Jura) and Campbeltown is regularly disrupted due to the frequency of risk of landslips.
Road maintenance	Several local road maintenance issues were raised including: ▪ Winter maintenance and surface quality on local roads was flagged as a concern for hauliers due to potential damage to vehicles. ▪ Dense forestry (particularly in springtime) along the side of the road was being knocked onto the road by passing HGVs. ▪ The softening of verges on narrow roads (example on A884) is getting worse. This causes HGVs to overturn / get stuck when they pull over to allow other vehicles to pass. ▪ Running convoy systems (on the A83 for instance) can cause significant delays and road closures at night.
Length of diversions	Diversions in northern Scotland can be up to 100 miles (A82).
Islay ferry	Capacity and reliability of the Islay ferry was the top priority for most consultees.

Issue	Summary
Operational restrictions	Several restrictions were raised as impacting operations: ▪ Difference in speed limit between Scotland and England can cause confusions for drivers. ▪ Weight limits prevent larger loads. ▪ Curfews impact operating and transport times in certain areas. ▪ The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 restricts carriage of certain products on ferries and well as the type of fuel that can be used for certain types of vehicles.
Coordination	Empty running, bottlenecks at dispatch and delivery points, and a lack of partnership working between distillers to consolidate loads leads to excessive runs and wait times.
Ferry fleet	A number of issues around ferry operations were raised as issues: ▪ Crew numbers are restricted due to staff quarters capacity. ▪ Sailings are increasingly affected by adverse weather. ▪ The age of the fleet and issues around maintenance was a key concern. ▪ Lack of resilience due to no standby ferries and the cost of sourcing standbys from Ireland. ▪ Cost of carriage is fixed in most cases.
Seasonality	Seasonality causes competition with other traffic on both the roads and ferries, particularly during peak tourist season.
Movement of personnel	Public transport is seen as unreliable for the movement of personnel including ferries and flights to islands.
Lack of facilities on Islay	It was flagged that the infrastructure on Islay, including transport and energy supplies, are at risk of restricting future growth, including whisky production on the island.

6.4.3. The overarching feedback is that the majority of the transport network in the Highlands and Islands is fit for purpose in its current form, however, concerns have been raised about the width of the A95 and its ability to accommodate the needs of the whisky industry which is dependent on it to access a large number of distilleries in the Speyside area. Rock falls and landslides were cited as being particularly prevalent on the A82 between Drumnadrochit and Invermoriston and on the A83 at the Rest and Be Thankful. Finally, increasing the capacity and improving the reliability of the Islay ferry service was seen as a high priority for a number of consultees. The locations of these key issues are shown in Figure 6-1.

Figure 6-1 - Key Issues Identified by the Consultation Exercise



OPPORTUNITIES SUMMARY

6.4.4. A number of potential opportunities were also highlighted by stakeholders and these are summarised in Table 6-12.

Table 6-12 - Summary of Key Opportunities as Identified by Consultees

Opportunity	Summary
Green fuelling infrastructure	There is an ambition from the industry to create a network of green fuelling infrastructure to serve the whisky supply chain. Trials are underway and can be supported to be developed and expanded. Consider both industry locations and external locations. Identify a strategic external location, such as Perth, to service A9 traffic.
Decarbonisation of sites	Movement of fuel to sites can be reduced by transitioning to onsite renewables or local biofuels.
Collaborative working	Creation of a freight forum to facilitate better communication between customers and operators could lead to consolidation of loads to reduce the number of freight movements and demand on ferry crossings.

Opportunity	Summary
Ease restrictions	Lobby government to ease HGV weight restrictions and allow for the use of alternative fuels. Bring speed limits in line with England.
Local roads	Widen roads at specific points and improve road maintenance.
Ferries	A range of opportunities were identified relating to ferries: ▪ Standardisation of the fleet to improve flexibility and maintenance. ▪ Introduce Ro-Ro vessels which can be used as both passenger and freight vessels and can be used across various locations. ▪ Freight only service. ▪ Introduce dynamic pricing to spread the demand. ▪ Consider alternative fuels. ▪ Introduce more drop trailer services

6.4.5. The above key opportunities demonstrate stakeholders' willingness to support the industry's transition to net zero in addition to implementing initiatives to improve the efficiency of operations where practical.

6.5 TRANSPORT SCOTLAND

6.5.1. Transport Scotland (TS) were also consulted to understand the agency's plans for the trunk road network and identify any schemes which could address existing issues highlighted as part of the consultation exercise.

6.5.2. Helpful comments were received, including confirmation of potential constraints which may have an impact on the whisky industry's operation; identification of improvements being made to the road network; and direction to management procedures by TS in addressing increasing climate risk. Transport Scotland also confirmed the level of investment which had been made in relation to the A82 and A83 in the Highlands and Islands.

Transport Scotland Investment between April 2007 and March 2023

£185.3m spent on the A82

£127.2m spent on the A83

6.5.3. Table 6-13 summarises the schemes which are currently being considered to address existing issues on both roads.

Table 6-13 - Summary of Stakeholder Consultation Responses

Consultee (Road)	Response
Transport Scotland Area Manager for the (**A83**).	The **A83 Rest and be Thankful** area is now to benefit from a Medium-Term and a Long-Term solution as detailed on the Transport Scotland website[14].
	A long-standing area of intended improvement is the narrow carriageway in the **Erines** area (c8 miles north of Tarbert) of the A83 however there is no current commitment to progress that at this time.
	There are areas of **West Shore, Tarbert** that we have identified as potential Vulnerable Locations, as certain stretches of carriageway are not overly above surge and storm levels.
	Glen Kinglas (A83) affected by landslides on 6-8 October 2023. Work is currently underway to devise a suitable monitoring and remediation regime.
Transport Scotland Area Manager for the (**A82**).	Design of the **A82 Tarbet to Inverarnan improvement project** is currently being progressed.

6.5.4. Transport Scotland also confirmed that the Road Asset Management Plan set out the means by which Operating Companies were required to respond to incidents on the trunk road network and this is discussed within Section 8.6 of this report.

6.5.5. Transport Scotland provided commitment in 2018[15] to the replacement of the MV Hebridean Isles with two new vessels which will complement MV Finlaggan and be designed with a clear focus on freight. The first new vessel is due to enter service in October 2024, with the second anticipated to become operational in early 2025.

6.6 SUMMARY

6.6.1. Stakeholder consultation was carried out throughout January and February 2024. Selected consultee organisations were agreed with the SWA and HITRANS to include distillers, maltsters, hauliers and ferry operators.

Key Concerns:

Reliability and Capacity of Islay Ferry

Restricted width of the A95

Rockfalls and Landslips on the A82 and A83

6.6.2. A number of issues were identified including the restricted width of the A95, the susceptibility of sections of the A82 and A83 to rock falls and landslips and the distance required to divert around issues on certain sections of the trunk road network. The limited capacity and reliability of the Islay ferry was also highlighted as a concern.

[14] Transport Scotland - Access to Argyll and Bute (A83) (transport.gov.scot)
[15] https://www.transport.gov.scot/public-transport/ferries/infrastructure-projects/

6.6.3. Stakeholders did, however, highlight a number of opportunities to support the whisky industry's transition to net zero.

6.6.4. Transport Scotland were also consulted and highlighted a number of schemes planned for the A82 and A83 in the Highlands and Islands which would improve the resilience of the two roads.

7 CURRENT ISSUES

7.1 INTRODUCTION

7.1.1. While a number of issues with the road network and ferry services have been highlighted through consultation with key stakeholders, a review of issues associated with the existing trunk road network in the Highlands and Islands has been undertaken given the whisky industry's dependence on it for its operation.

7.1.2. The key issues affecting the operation of the transport network within the Highlands and Islands are considered to be the following:

- Road accidents;
- Flooding;
- Landslides;
- High Winds; and
- Winter weather conditions (snow).

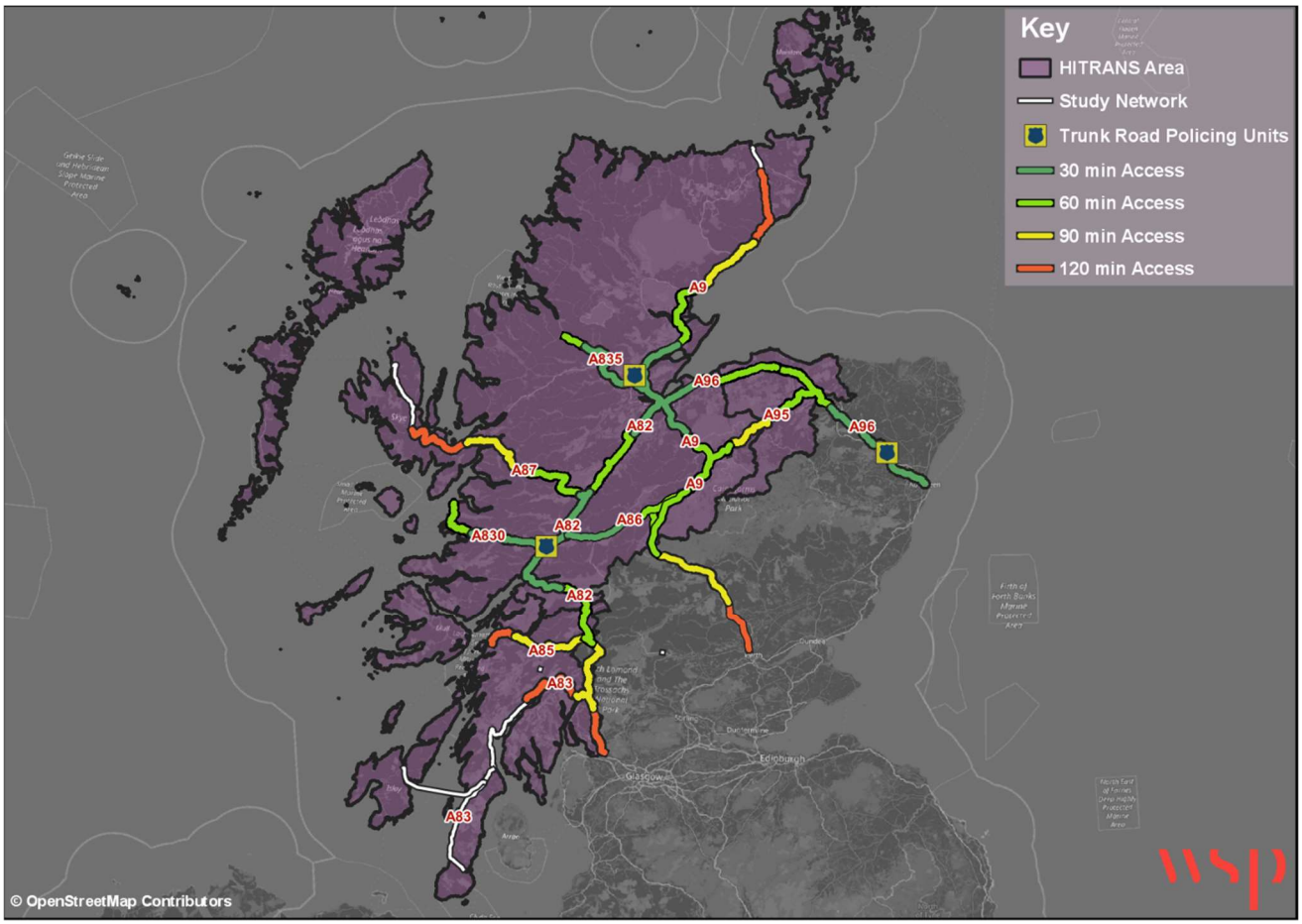
7.1.3. A range of data sources have been reviewed to identify current issues on the transport network in the Highlands and Islands and build on the results of the stakeholder exercise described in Chapter 6. The following sections consider each of the key issues in turn, highlighting the impact to the operation of the whisky industry caused by each.

7.2 REVIEW OF INJURY ACCIDENT DATA

7.2.1. As with the review of traffic flow data presented in Chapter 4, each route section has been reviewed in terms of the number and severity of accidents reported in the most recently available five-year period (January 2018 – December 2022). Injury accident data has been extracted from the STATS19 database which is populated by Police Scotland and reports the location and severity of injury accidents. The data relates to the operation of the road network as a whole and is not specific to vehicles supporting the Scotch Whisky industry's operations.

7.2.2. While a slight accident can generally be cleared in a relatively short time period, accidents resulting in serious or fatal injuries can take hours to be cleared. The timeframe for their clearance is also directly related to the location of the nearest Trunk Road Policing Unit to the incident. There are two units in the Highlands and Islands, with one located in Dingwall and another in Fort William, with a further unit located in Inverurie, Aberdeenshire. Figure 7-1 shows the locations of these in relation to the wider trunk road network.

Figure 7-1 – Highlands and Islands Trunk Road Policing Units



7.2.3. While it is accepted that there are other units located outwith the Highlands and Islands, Figure 7-1 provides an indication of the time it is likely to take the Dingwall, Fort William and Inverurie Policing Units to respond to an injury accident on the trunk road network.

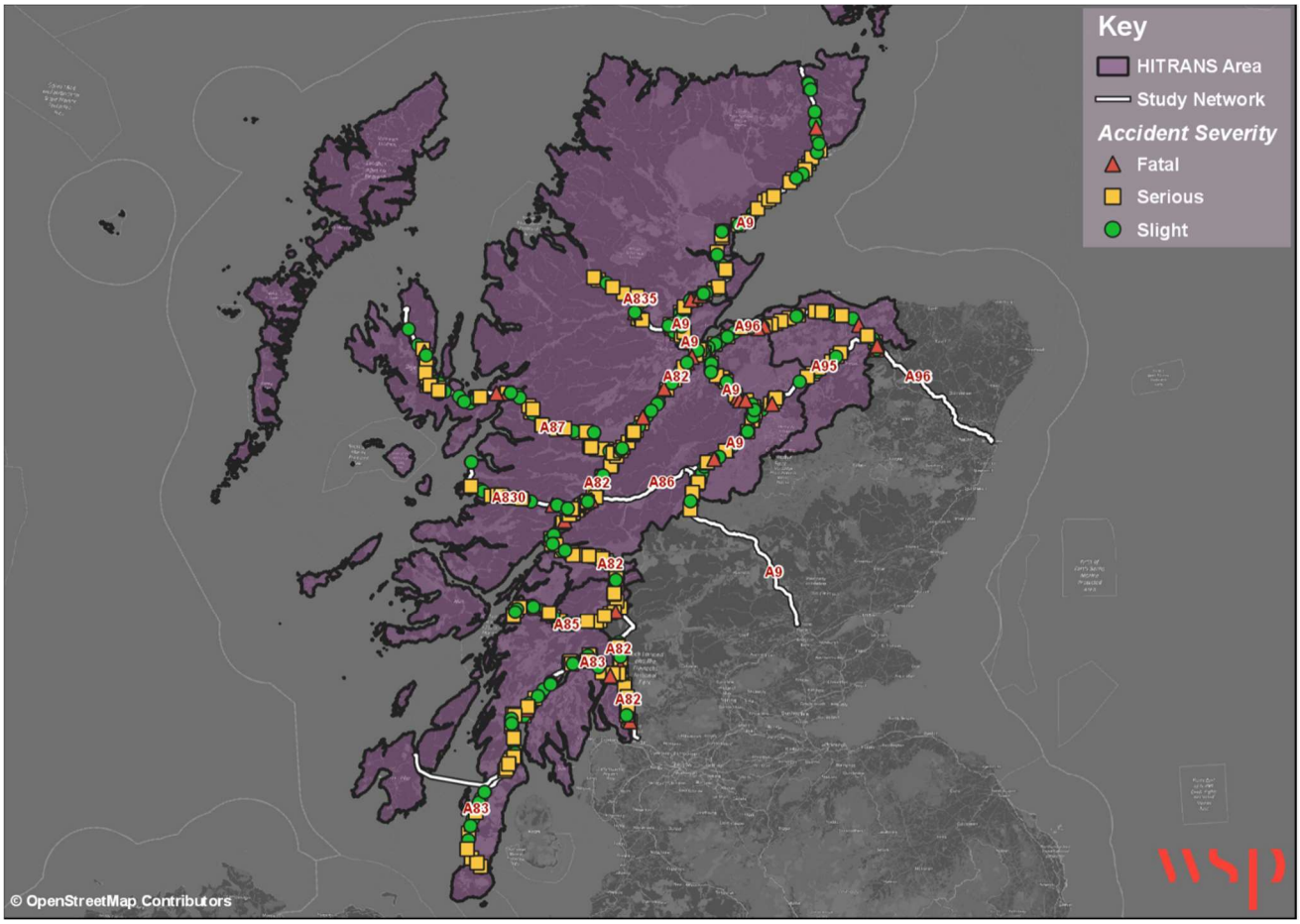
7.2.4. As can be seen, the network generally has good coverage around Inverness and parts of the A9 however, roads to Skye & The Western Isles and Parts of the A95 as well as the A83, are located over an hour's journey from the nearest HITRANS Trunk Road Policing Unit. This will have an impact on the time taken to respond to an injury accident and clear the road of any obstruction.

7.2.5. Table 7-1 summarises the number and severity of injury accidents reported on an annual basis on each road link, with the indicative locations of the injury accidents shown in Figure 7-2.

Table 7-1 – Injury Accident Data Review

Road	2018	2019	2020	2021	2022	Grand Total	%Fatal & Seriously Injured
A82	**59**	**57**	**34**	**51**	**38**	**239**	**49.4%**
Fatal	3	5	4	4	3	19	
Serious	16	29	14	23	17	99	
Slight	40	23	16	24	18	121	
A83	**35**	**29**	**16**	**17**	**15**	**112**	**42.9%**
Fatal	2	0	1	1	1	5	
Serious	6	17	5	8	7	43	
Slight	27	12	10	8	7	64	
A830	**3**	**8**	**2**	**6**	**5**	**24**	**37.5%**
Fatal	0	2	0	0	0	2	
Serious	0	2	1	2	2	7	
Slight	3	4	1	4	3	15	
A835	**7**	**9**	**4**	**3**	**9**	**32**	**50.0%**
Fatal	2	1	0	0	1	4	
Serious	1	5	1	1	4	12	
Slight	4	3	3	2	4	16	
A85	**20**	**14**	**8**	**9**	**14**	**65**	**50.8%**
Fatal	0	2	0	3	0	5	
Serious	8	7	5	2	6	28	
Slight	12	5	3	4	8	32	
A87	**29**	**18**	**15**	**14**	**10**	**86**	**40.7%**
Fatal	2	1	0	1	1	5	
Serious	4	6	6	8	6	30	
Slight	23	11	9	5	3	51	
A9	**46**	**66**	**35**	**28**	**36**	**211**	**39.3%**
Fatal	3	6	1	2	8	20	
Serious	11	17	11	13	11	63	
Slight	32	43	23	13	17	128	
A95	**7**	**9**	**3**	**6**	**5**	**30**	**60.0%**
Fatal	0	0	0	0	1	1	
Serious	2	6	2	3	4	17	
Slight	5	3	1	3	0	12	
A96	**19**	**25**	**10**	**13**	**19**	**86**	**44.2%**
Fatal	1	4	3	2	1	11	
Serious	5	7	4	3	8	27	
Slight	13	14	3	8	10	48	

Figure 7-2 - Personal Injury Accident Locations



7.2.6. As can be seen from the above summary, the longer roads (the A82 and A9) have experienced the greatest number of injury accidents over the most recently available five-year period.

7.2.7. As demonstrated in Chapter 5, the A9 is used by a large number of whisky industry HGVs and it is expected that the clear up time associated with each accident is likely to be longer due to the remoteness from the nearest police station to some section of this road.

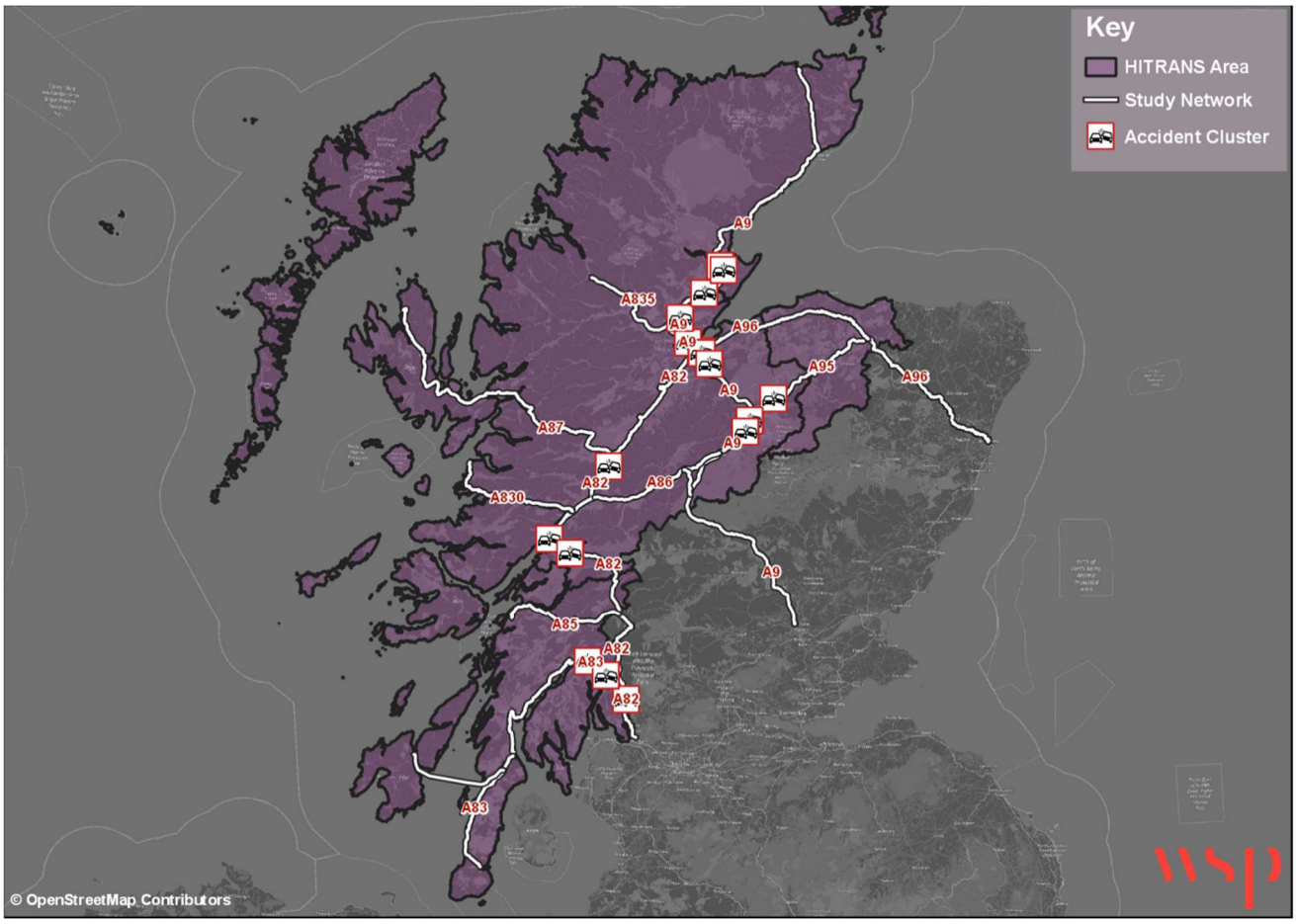
7.2.8. Dealing with serious and fatal accidents takes the longest time and are therefore likely to have the greatest impact on the trunk road network's operation. As summarised in Table 7-1, the highest proportion of fatal and serious accidents was reported on the A95 (60%). The accident data review does, however, show that the whole of the trunk road network in the Highlands and Islands is experiencing a significantly higher proportion of serious injury or fatal accidents than the UK average of 23.2% (DfT Data for 2022[16]).

7.2.9. Figure 7-3 shows the locations where a cluster of injury accidents (more than three in one location) was reported on the roads which have been identified to accommodate the greatest number of

[16] Reported road casualties Great Britain, annual report: 2022 - GOV.UK (www.gov.uk)

whisky industry HGVs, highlighting a location where there is a greater chance of disruption and delay to all road users.

Figure 7-3 - Accident Cluster Locations



7.2.10. As can be seen from the above summary, the review has identified a total of 17 accident cluster sites, with 5 on the A9 between Inverness and Tain, 5 on the A9 between Inverness and Dalwhinnie, one on the A95 at Dulnain Bridge, 4 on the A82 between Balloch and Invergarry and 2 on the A83 between Tarbet and Cairndow.

7.2.11. The cluster sites on the A82 are spread out over a longer section providing increased opportunities for diversions. Accidents occurring on the A95, especially where it connects to the A9, are particularly disruptive to whisky operations due to the high usage of this road by whisky industry HGVs. The restricted carriageway width over a proportion of the A95's length also increases the potential that the road will require to be closed when dealing with a serious or fatal accident, exacerbating the impact of the incident on the road's operation.

7.2.12. The lack of potential diversion routes and restricted carriageway width on sections of the A83 also make this route particularly vulnerable to delays caused by serious or fatal accidents.

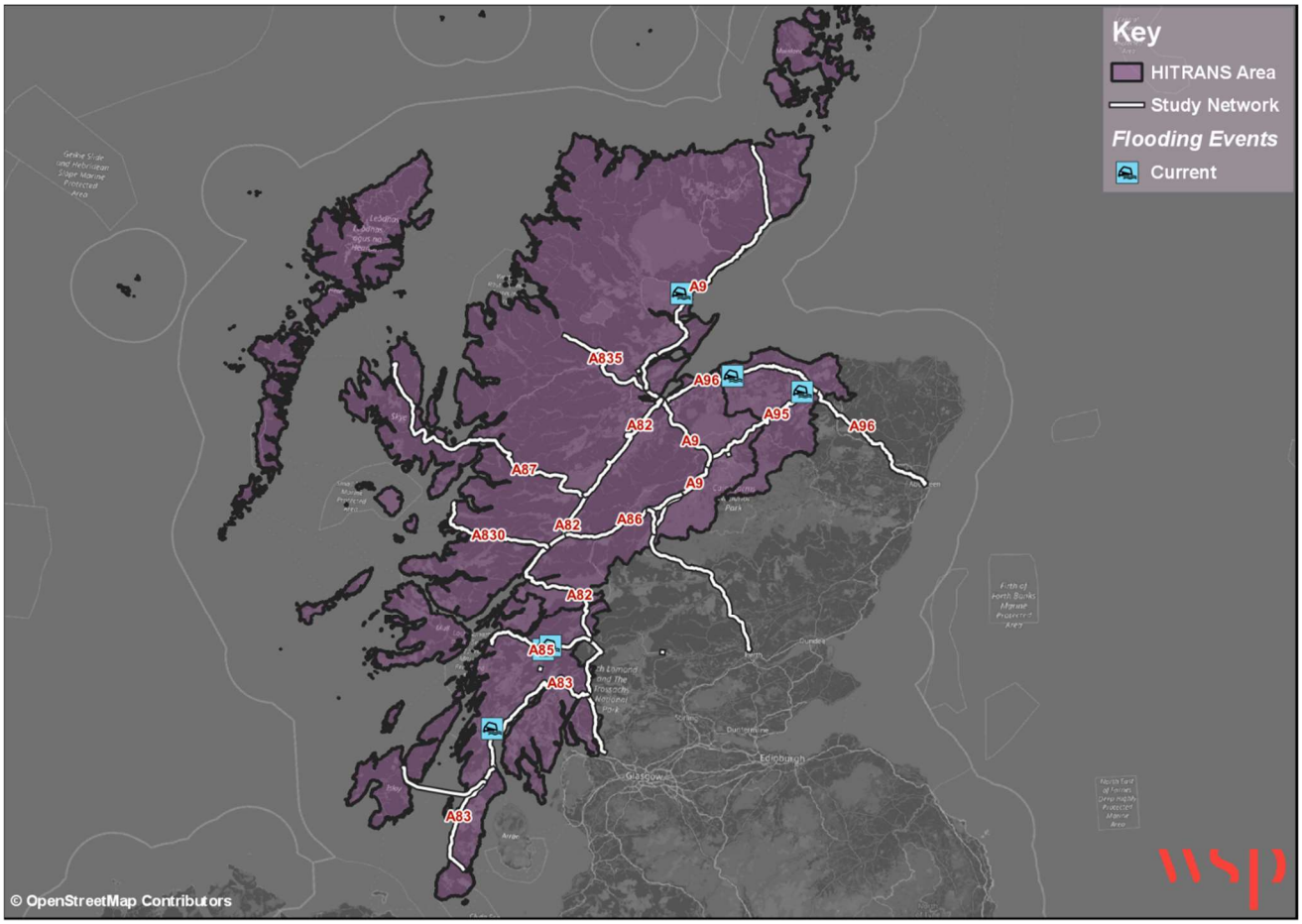
7.3 FLOODING EVENTS

7.3.1. One of the issues that has significantly affected the operation of the road network in recent years is flooding. For the purpose of this study, sections of the trunk road network which are susceptible to

flooding have been identified utilising SEPA Flood Maps[17] which provide indicative extents and depths of different scenarios of river, coastal and surface water flooding.

7.3.2. The potential for river flooding to have an impact on the road network's operation, current flooding levels have been analysed based on a high likelihood of flooding (a 1 in 10-year event), and the location of current flooding events can be seen in Figure 7-4.

Figure 7-4 - 1 in 10-Year Flooding Events (Current)



7.3.3. As seen from Figure 7-4 above, SEPA Flood Maps indicate current flooding events on the A83, A85, A95 and A96. This aligns well with flooding events as seen on the news in recent years. Flooding on the A96 has resulted in the construction of flooding schemes in the area to mitigate for these events.

7.3.4. The roads most susceptible to reoccurring flooding events are the A85 and A83, where road closures as a result of flooding are yearly occurrences. The possibility for diversions for these roads is also limited due to the rural nature and remoteness of the roads.

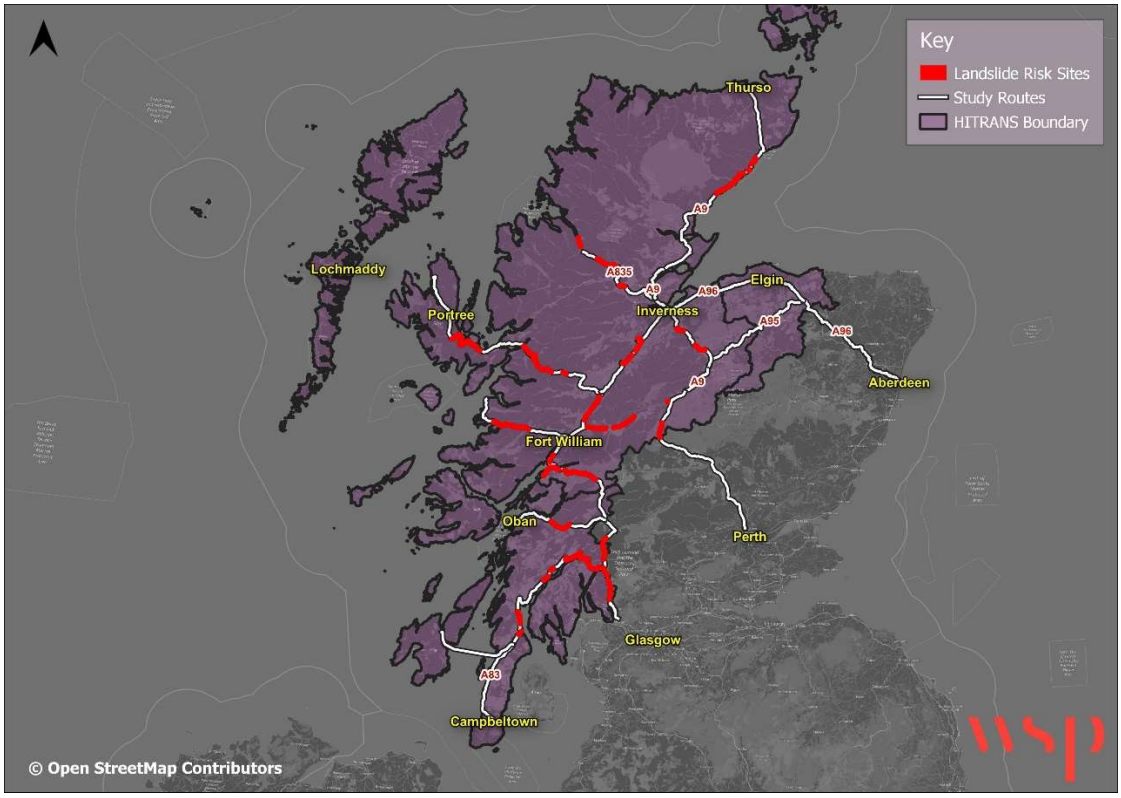
[17] Scottish Environmental Protection Agency (2024): https://www.sepa.org.uk/environment/environmental-data/

7.4 LANDSLIDE EVENTS

7.4.1. The Scottish Road Network Landslides Study18 (Transport Scotland, 2008) confirms that weather and climate are identified as key factors in triggering debris flows, and climate change models suggest potential future intensification. The study identifies a trigger threshold based on rainfall intensity that may allow for future forecasting (with ongoing research). The Scottish Road Network Landslides Study (SRNLS) recommends developing a real-time rainfall data capture with the Met Office and conducting simulations once the threshold is established.

7.4.2. Figure 7-5 below summarises indicative locations that the study identifies a landslide risk within the Highlands and Islands, and where there is potential disruption to road users.

Figure 7-5 – Current Landslide Risk Sites



7.4.3. As can be seen from the above summary, lengthy sections of the A82 and A83 pass through areas where landslides are likely to occur, with sections of the A9 also susceptible to landslides. While other sections of the trunk road network are identified to be susceptible to landslides, it is these three roads which have been identified to accommodate the greatest number of HGV movements associated with the whisky industry's operation.

[18] Scottish Road Network Landslides Study: Implementation (transport.gov.scot)

7.4.4. In terms of management of the effects of debris flow, the SRNLS recommends in first instance reducing the exposure (of road users) to areas of landslide risk by following the Detection Notification-Action (DNA) management procedure:

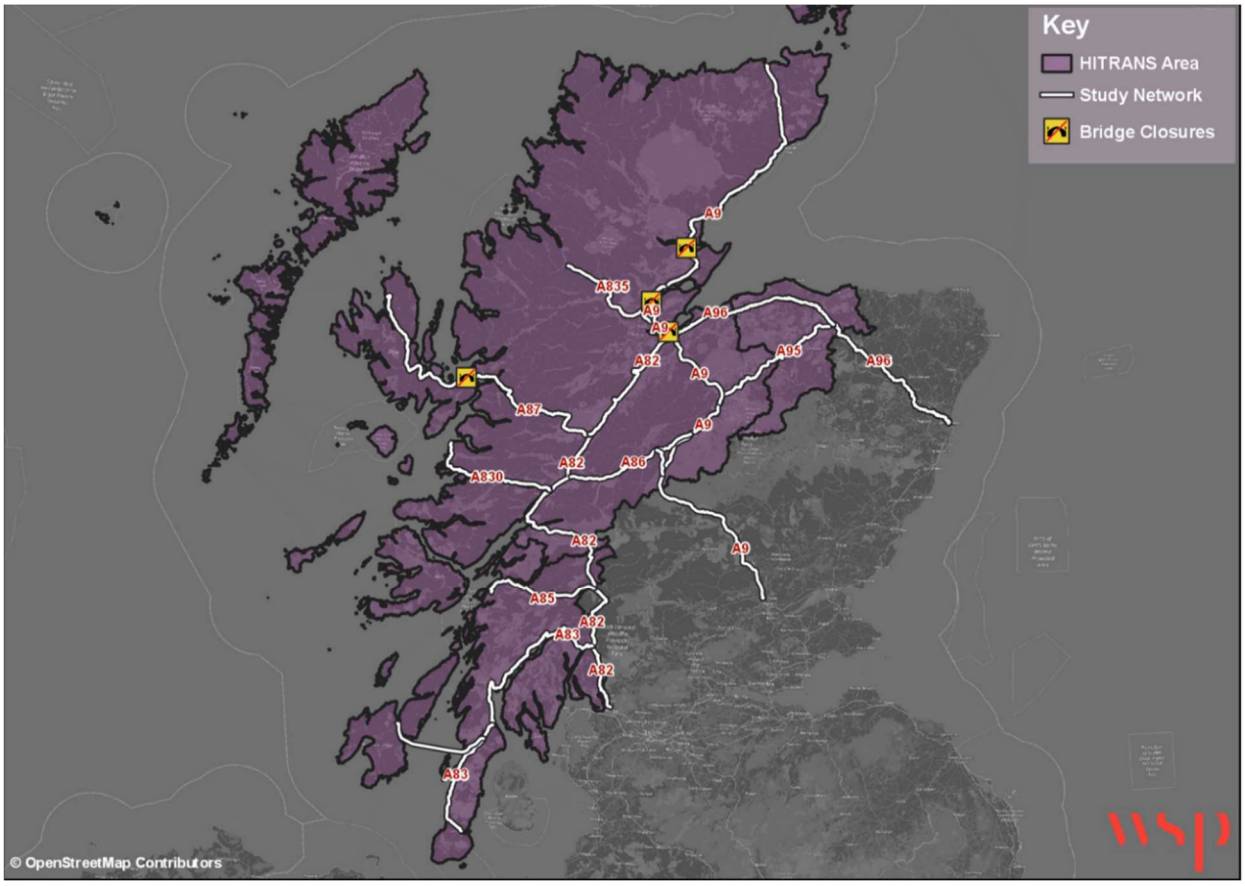
- **Detection:** Instruments detect movement, or movement is forecast due to conditions. Successful system run in Hong Kong.
- **Notification:** of appropriate authority.
- **Action:** Thereafter, where there is a risk of, (or following) debris flow:
  - integrating landslide requirements into the variable message signs (VMS) network;
  - erecting static signs for hazard sites;
  - implementing systematic landslide patrols (visual observation of hillside locations);
  - considering landslide gates where necessary (e.g. A83 Rest and Be Thankful area); and,
  - erecting information signs in layby areas of hazard areas (e.g., on the A9 and A82). Such infrastructure and data should be made digital and based on the Scottish roads and Landslides leaflet.

7.4.5. The SRNLS states that future actions for the management of debris flow should include a systematic review of drainage provision by Transport Scotland and a strategy put in place for light debris flow.

7.5 HIGH WINDS

7.5.1. Figure 7-6 shows the locations of bridges within the Highlands and Islands, which are regularly closed to high sided vehicles as a result of strong winds.

Figure 7-6 - Bridges Susceptible to Closures to High Sided Vehicles



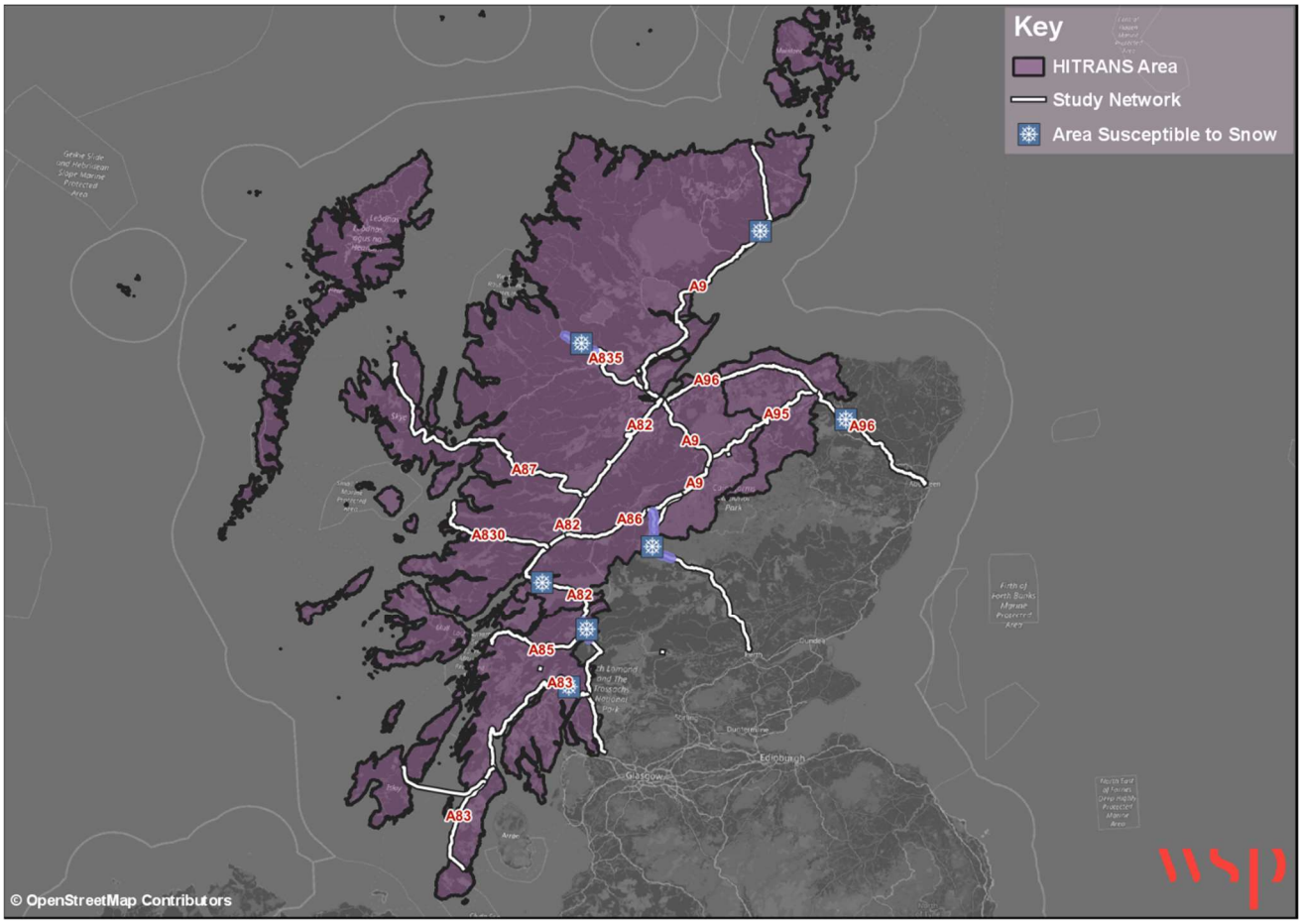
7.5.2. Closure of the Kessock Bridge to high sided vehicles would have the greatest impact on the whisky industry due to the number of HGVs using the A9 to cross the Beauly Firth and the length of the diversion route in the event of a closure. Closure of the remaining three bridges is expected to have a reduced level of impact.

7.5.3. As highlighted in Chapter 4, ferry services can be subject to disruption of cancellation due to high winds. While high winds will affect all ferry services, the Islay service accommodates the greatest number of whisky industry HGVs due to the number of distilleries on the island and it is therefore considered that any disruption to this service's operation will have the greatest impact on the whisky industry. A review of the reliability of the Islay ferry service suggests that weather-related cancellations accounted for over half (51%) of cancelled sailings, with mechanical issues accounting for a further 27% of cancelled sailings.

7.6 WINTER WEATHER (SNOW)

7.6.1. Figure 7-7 shows the indicative sections of the trunk road network across the Highlands and Islands that are susceptible to winter weather events and are managed by snow gates.

Figure 7-7 - Roads Susceptible to Closures due to Snow



7.6.2. While the higher sections of the A9 and the A82 are the roads most affected by road closures due to snow, the stakeholder consultation exercise suggested that the trunk road network was generally

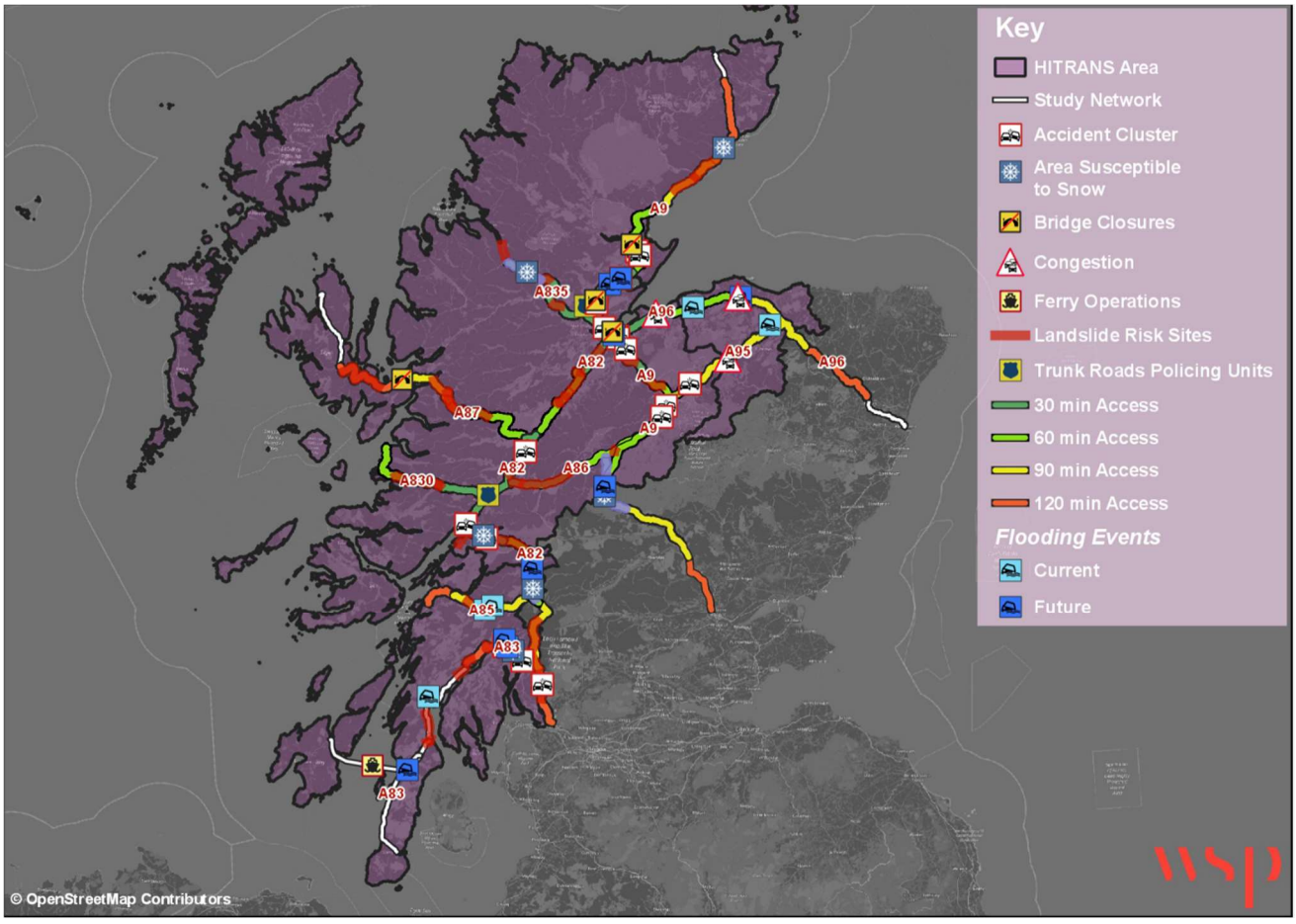
cleared quickly, with snow more likely to disrupt whisky operations by blocking the local road network and access roads.

7.6.3. Road closures or delays on the A83 is more often than not linked to melting snow, rather than the carriageway being blocked, with the meltwater destabilising steeper valley slopes, causing landslides and flooding.

7.7 SUMMARY OF KEY ISSUES

7.7.1. Figure 7-8 shows the locations of the issues identified in the preceding sections in relation to the journey times from the Dingwall and Fort William Trunk Road Policing Units (TRPUs). The issue with the Islay ferry, as identified by the stakeholder consultation exercise, is also identified on the figure.

Figure 7-8 - Key Issues on the HITRANS Transport Network

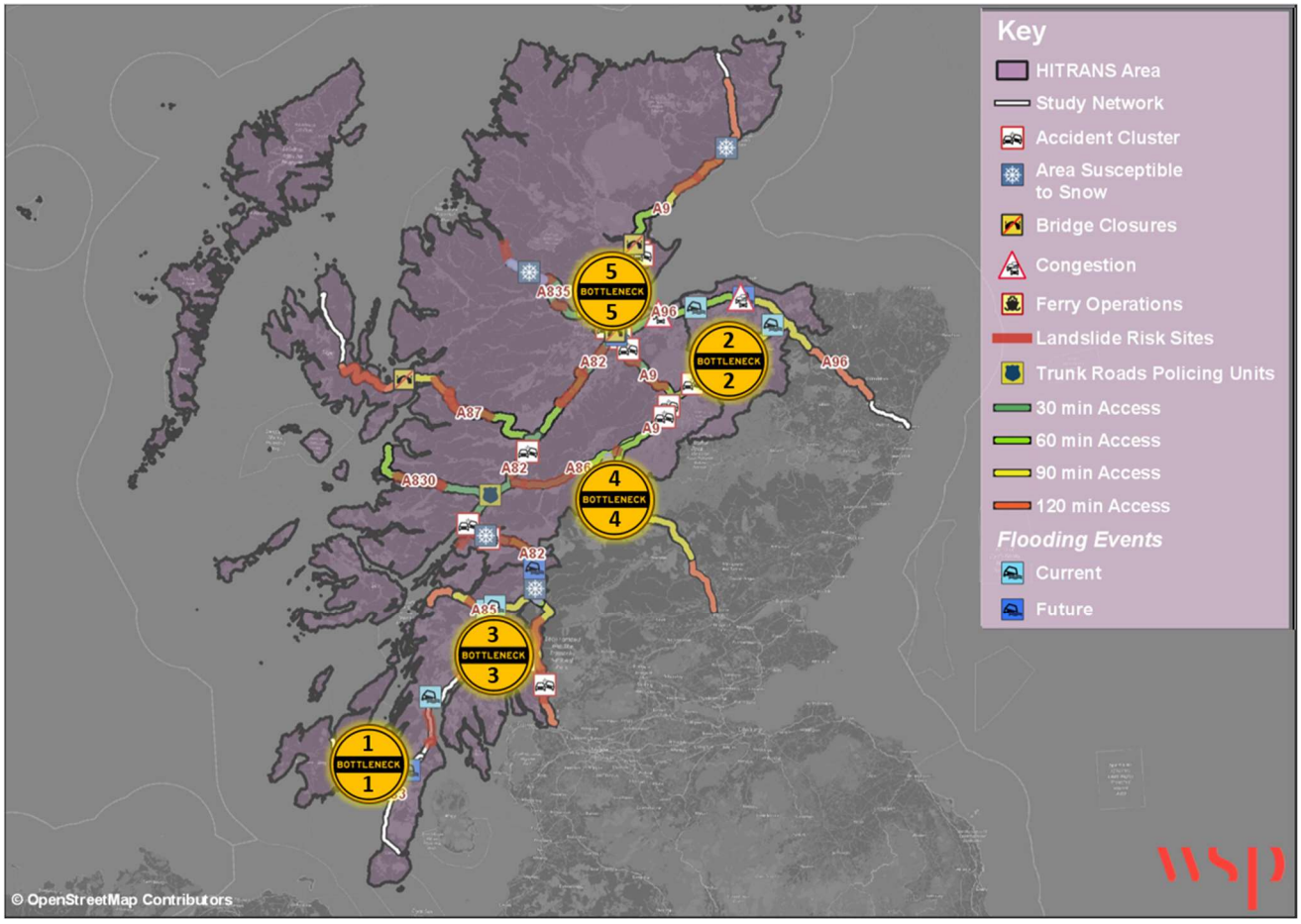


7.7.2. The review of current issues on the HITRANS transport network has identified the following five key constraints (Bottlenecks), in order of priority, on the main routes used by the whisky industry:

- Constraint 1 – Islay crossing.
- Constraint 2 - A95 between Grantown-on-Spey and Dulnain Bridge.
- Constraint 3 - A83 at the Rest and Be Thankful.
- Constraint 4 - A9 between Dalwhinnie and Druimuachadar.
- Constraint 5 - A9 between Invergordon and Tore.

7.7.3. The locations of these constraints are shown in Figure 7-9.

Figure 7-9 - Key Constraints on the HITRANS Transport Network



7.7.4. Additionally, the A96 remains a critically important route to the industry to be maintained and upgraded so as to not risk becoming a future constraint.

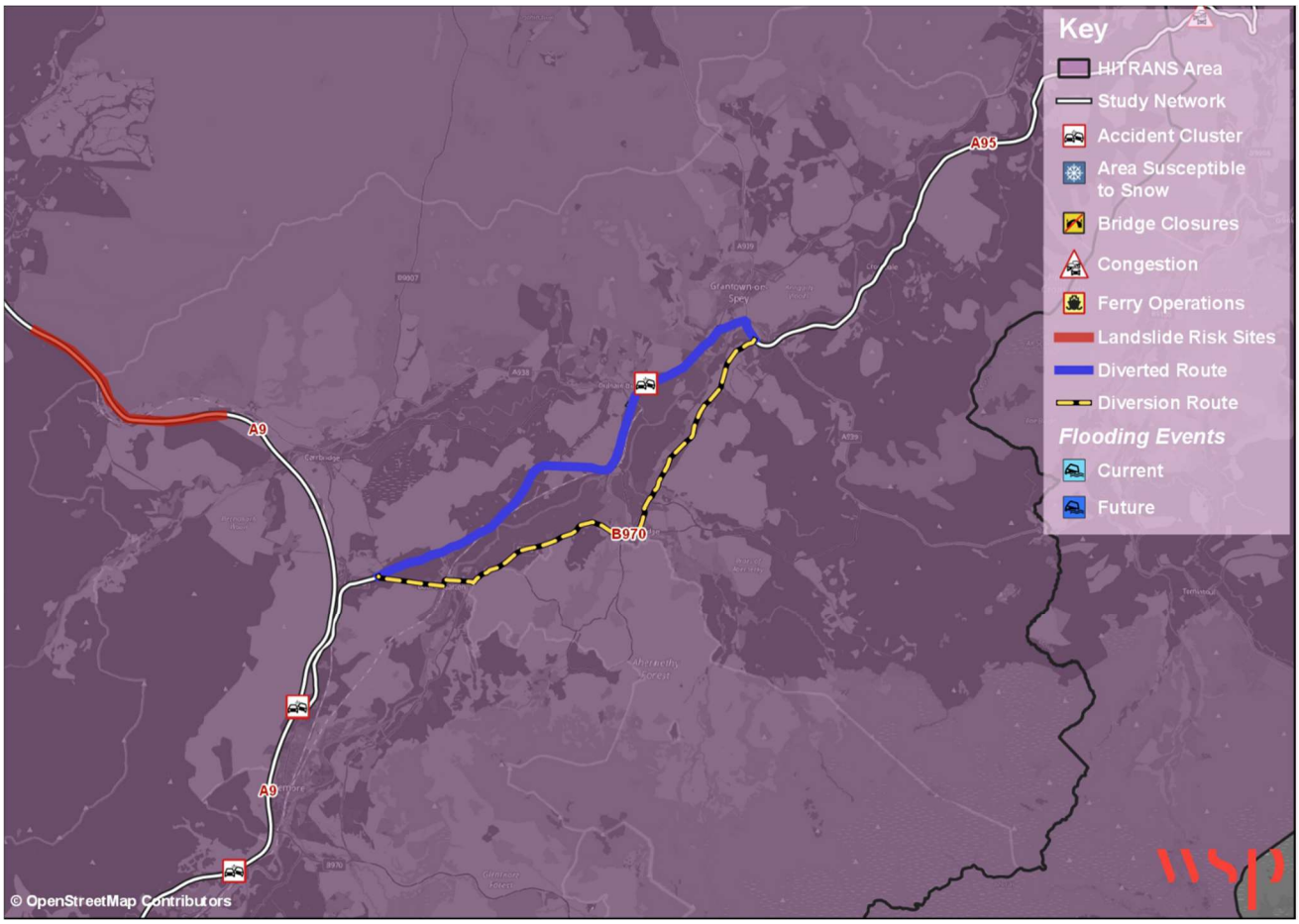
7.8 POTENTIAL DIVERSION ROUTES

7.8.1. The following sections explore the potential routes available for whisky industry HGVs looking to divert round the identified bottlenecks, confirming the additional distance associated with each diversion where appropriate.

A95 BETWEEN GRANTOWN-ON-SPEY AND DULNAIN BRIDGE

7.8.2. As highlighted previously, the A95 accommodates a significant number of HGVs associated with the whisky industry's operation. While the road varies in standard and width along its length, it is of a reasonable standard between Grantown-on-Spey and its junction with the A9. This bottleneck has been identified as a result of a cluster of injury accidents reported at the A95 / A938 junction, with this combining with the volume of whisky industry HGVs using the route, the lack of a suitable diversion route, and the distance the road is away from the nearest TRPU, to provide a bottleneck which would have an impact on the industry's operation. Vehicles would require to transfer onto the B970 and the unclassified road network within Boat of Garten to avoid a road closure in this location. This diversion route is shown in Figure 7-10.

Figure 7-10 – A95 Between Grantown-on-Spey and Dulnain Bridge Diversion Route



7.8.3. The route would result in HGVs diverting onto the B970 which is of a reduced width when compared with the A95, which itself is also width constrained. The route also requires HGVs to pass through Nethy Bridge and Boat of Garten, and this combined with the road's alignment, will result in increased journey times when compared with using the trunk road. This diversion route was recently implemented as a result of an injury accident which blocked the A95 on the 5th March 2024.

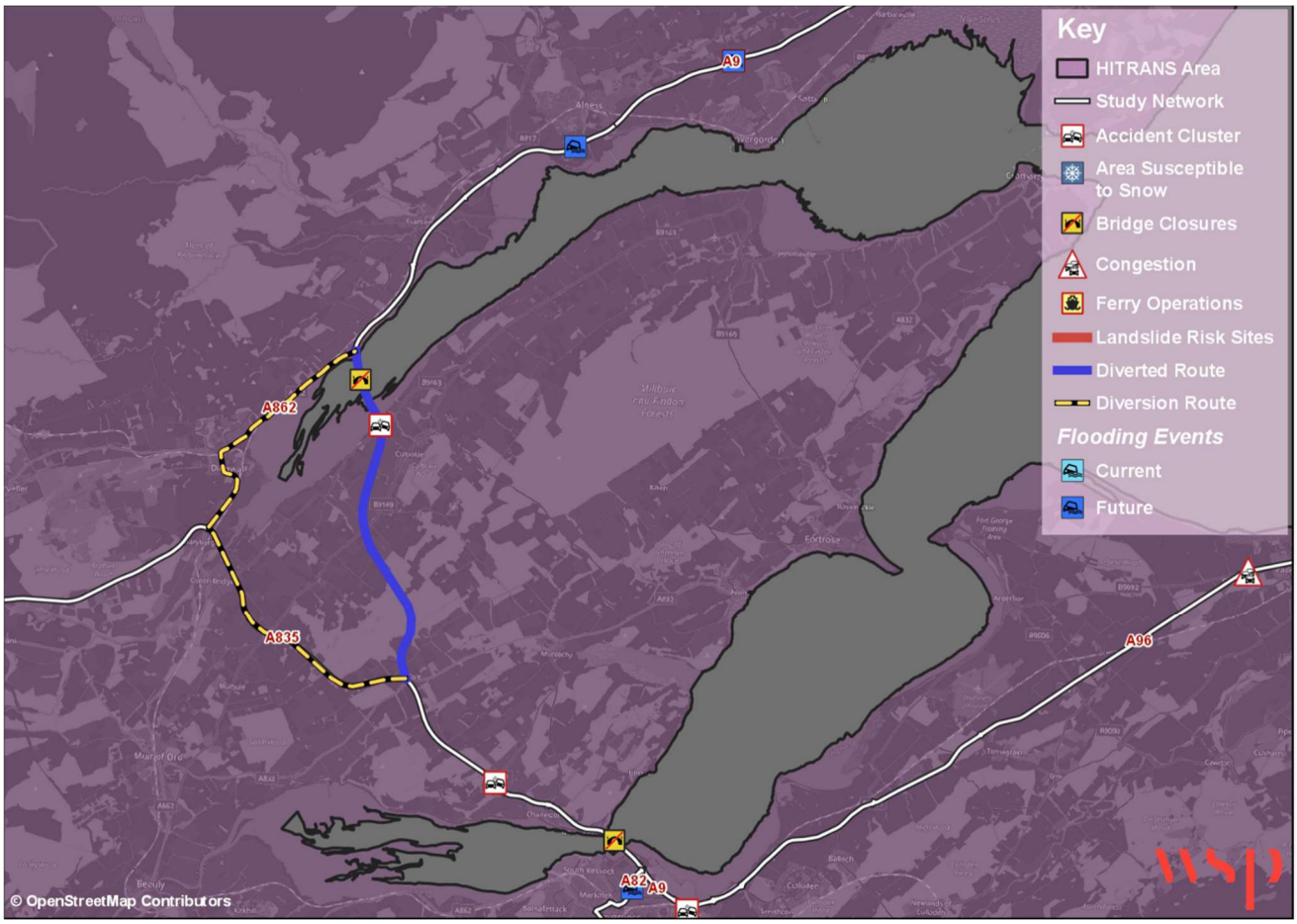
7.8.4. While an accident cluster site has been identified on this section of the A95 which has a diversion route which does not result in an increased journey length, a large proportion of the A95 has no suitable alternative routes which can be used by HGVs in the event of a closure. It is therefore suggested that there is a requirement to undertake a review of existing diversion routes along the length of the A95, to ensure their suitability for HGVs. Consideration should also be given to the installation of additional VMS at strategic locations on the network to provide advance warning of disruption and potential delay, to enable an alternative route to be used to avoid any blockages.

7.8.5. As with the remainder of the trunk road network in the Highlands and Islands, the A95 experiences a proportion of serious and fatal accidents at 60.0%, which is almost three times that of the UK average of 23.2%. This should be addressed both in terms of the lives affected and the delays caused to users of the road network.

A9 BETWEEN INVERGORDON AND TORE

7.8.6. The A9 is of a good standard and width for the majority of its length. While an accident cluster site has been identified immediately to the south of the Cromarty Bridge, this bottleneck is close to the Dingwall TRPU, providing the opportunity for accidents to be dealt with in an efficient and timely manner. The A9 is forecast to be prone to future flooding events in the vicinity of Alness and Invergordon, and high sided vehicles can be prevented from using the Cromarty Bridge in high winds. While there are limited diversion options between Evanton and the Cromarty Bridge, the A862 supports access to the A835 when the bridge is closed to high sided vehicles. This diversion route is shown in Figure 7-11 and results in an increased journey length of approximately 6km.

Figure 7-11 - A9 between Invergordon and Tore



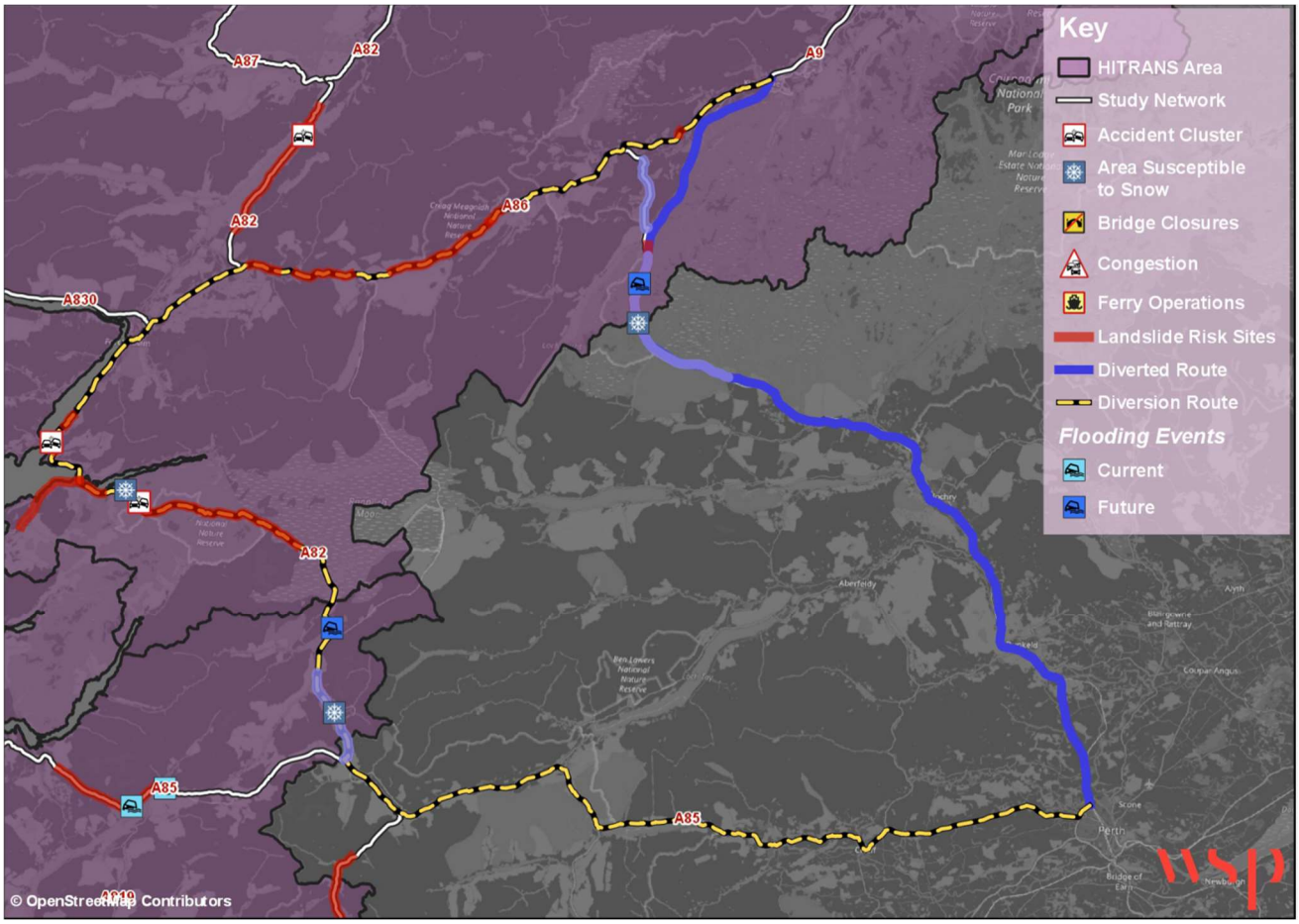
7.8.7. The diversion would result in HGVs travelling 6km further and routing through Dingwall, resulting in increased journey times when compared with using the A9.

7.8.8. The Queensferry Crossing was constructed with wind deflectors to enable HGVs to continue to use the structure in winds of up to 70mph. It is suggested that consideration be given to installing similar measures at major bridges provided across the trunk road network in the Highlands and Islands given their susceptibility to high winds and the frequency that the structures are closed to high sided vehicles.

A9 BETWEEN DALWHINNIE AND DRUIMUACHADAR

7.8.9. The A9 is of a good standard and width between Inverness and Perth. While the Scottish Government have plans to complete the dualling of this section of the A9, the majority is still currently single carriageway, presenting challenges when it comes to the road's resilience to disruption. This bottleneck is at the location where the A9 uses the Druimuachadar Pass to accommodate traffic passing between Highland and Perthshire, with the pass subject to blockage by snow as a result of its high altitude. Consultation with stakeholders confirms that the road is generally kept clear, but motorists were stranded for a number of hours when the road became impassable as a result of snow in December 2023 (Storm Gerrit). This section of the trunk road network is located over an hour's journey from the nearest TRPU, and it provides limited diversion route options. When the pass is blocked, motorists are required to use the A86, A82 and A85 to avoid this section of the road network should they not be notified sufficiently early to enable the A96 and A90 to be used instead. The western diversion route is shown in Figure 7-12 and results in an increased journey length of approximately 133km.

Figure 7-12 - A9 Between Dalwhinnie and Druimuachadar



7.8.10. In addition to significantly increasing journey times, the diversion would result in HGVs using sections of the trunk road network which are susceptible to landslides and flooding.

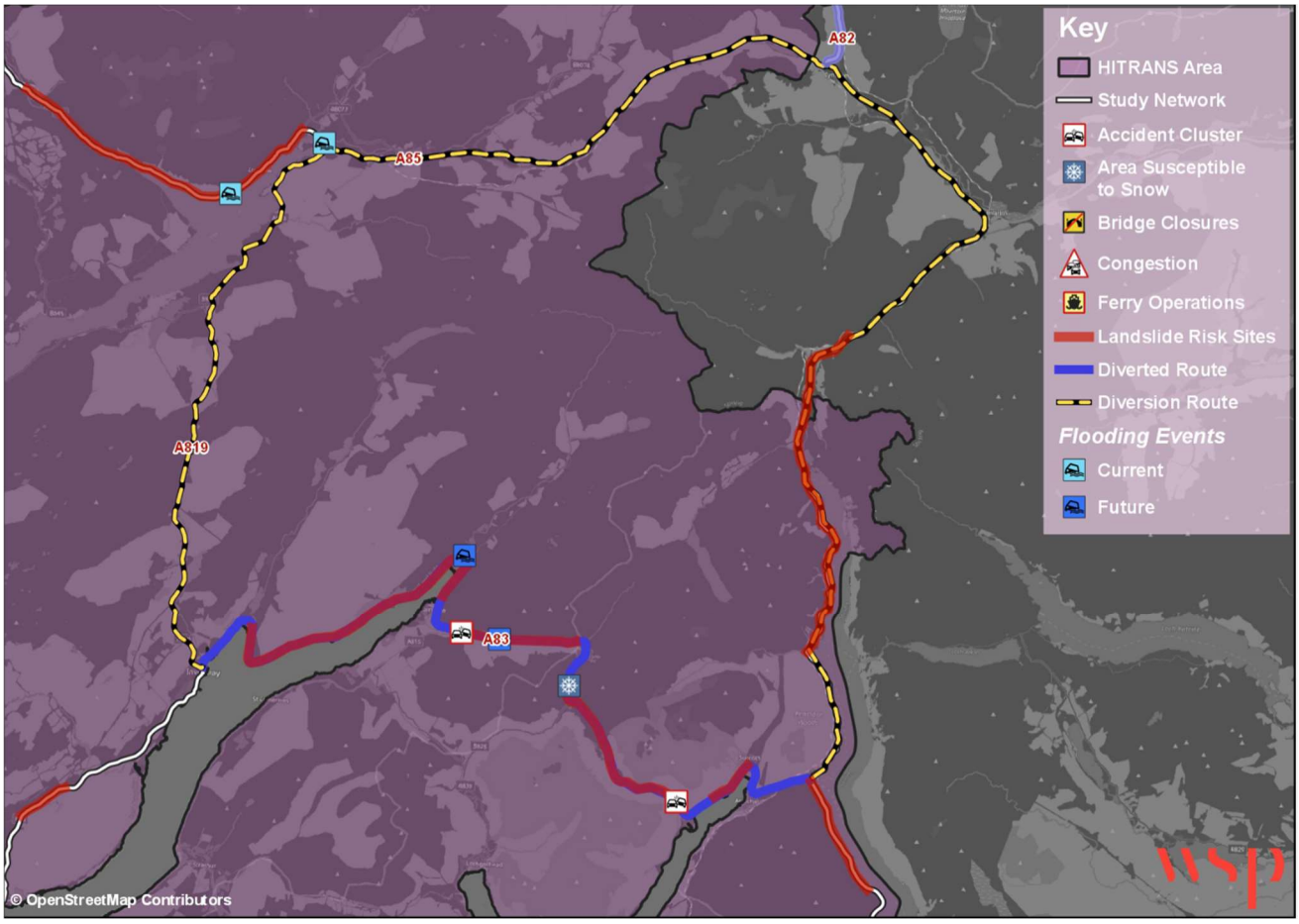
7.8.11. While the Scottish Government maintain their commitment to dualling the A9 between Perth and Inverness, the completion date for the scheme continues to slip well beyond the initial 2025 planned

completion date. As it is considered that the scheme will provide increased levels of resilience by offering a second carriageway, minimising the requirement for the current 133km diversion, this slippage is disappointing and will affect the region's growth prospects. Assurance should therefore be provided that the scheme will be constructed in its entirety with a view to accelerating its completion date as a strategic priority.

A83 REST AND BE THANKFUL

7.8.12. The A83 has experienced a number of landslips in recent years, with a proportion closing the road to all traffic. While the Old Military Road (OMR) provides a facility onto which vehicles can divert, as highlighted in the stakeholder consultation, the road presents issues to larger vehicles due to its alignment at the western end. The OMR can also become blocked by landslides, with all vehicles required to use the A82, A85 and A819 to avoid the closure. This diversion route is shown in Figure 7-13 and results in an increased journey length of approximately 40km.

Figure 7-13 – A83 at the Rest and Be Thankful



7.8.13. As can be seen from the above figure, the diversion route results in vehicles diverting along a section of the A82 which is susceptible to landslides, with the road also therefore having a greater chance of being blocked at the same time as the A83. The A82 is also of reduced width as it passes along Loch Lomond, making it unsuitable to accommodate a significant increase in HGVs generated by vehicles diverting around the Rest and Be Thankful. While the A82 is of an improved standard to the north of this, the A85 is susceptible to flooding in the vicinity of its junction with the A819. The

risk of flooding is naturally likely to be greater when landslides are experienced, with the potential for sections of the diversion route to be blocked by flooding or landslides when the Rest and Be Thankful is closed. The A819 forms part of the local road network, with a proportion of its length of a constrained width and reduced alignment.

7.8.14. This section of the road network is therefore considered to be a significant bottleneck on the HITRANS transport network. While it is acknowledged that a scheme design is currently being progressed by Transport Scotland to alleviate the issue at the Rest and Be Thankful, it is considered that there will continue to be disruption on this corridor given the landslide risk identified for a large proportion of the A83 between Inverary and Arrochar. Nevertheless, it is considered that the mitigation scheme will assist in reducing the instances when the A83 is closed and the timeframe for delivering the improvement scheme should be defined.

ISLAY FERRY SERVICE

7.8.15. The concentration of distilleries on Islay/Jura results in the existing ferry service being of significant importance to the whisky industry. There are no means of transporting goods to, or product from, the island other than by road and ferry, and the services are susceptible to disruption caused by strong winds which account for over half of cancellations (51%) with mechanical issues accounting for a further 27% of cancelled sailings and therefore have an impact on the ability for the island's whisky industry to operate.

7.8.16. Capacity constraints, coupled with resilience issues, affects all users of the ferry. For distillers this presents numerous operational challenges.

7.8.17. The stakeholder consultation exercise confirmed that two new ferries are on order to support the Islay ferry service's operation and while this should improve the reliability of the service, it is understood that their introduction will only result in a small increase in capacity. Consideration should therefore be given to introducing a freight only service to address the existing and anticipated future issue with the capacity of the vessels, in addition to improving the reliability of the service.

7.9 SUMMARY

7.9.1. The transport network in the Highlands and Islands is predominantly rural in nature and is impacting on by climatic events including flooding, landslides, high winds and snow. The network is also reported to experience a proportion of serious and fatal accidents which is twice that of the UK average.

7.9.2. The review of current issues on the HITRANS transport network has identified the following five key constraints on the main routes used by the whisky industry:

- Constraint 1 – Islay crossing.
- Constraint 2 - A95 between Grantown-on-Spey and Dulnain Bridge.
- Constraint 3 - A83 at the Rest and Be Thankful.
- Constraint 4 - A9 between Dalwhinnie and Druimuachadar.
- Constraint 5 - A9 between Invergordon and Tore.

7.9.3. It is considered that commitment should be provided to the following which will go some way to addressing the existing constraints on the transport network, thereby supporting a resilient network able to support the continuing growth of the whisky industry in Scotland:

- Undertake a review of existing trunk road diversion routes to ensure that they are suitable to accommodate HGVs;
- Installation of additional VMS at key locations on the trunk road network;
- Development of a strategy to maintain and upgrade the trunk road network to address the high proportion of serious and fatal accidents reported on the trunk road network in the Highlands and Islands;
- Installation of wind deflectors on all major bridges in the Highlands and Islands which are susceptible to high winds;
- Completion of dualling of the A9 between Perth and Inverness;
- Commitment to a date by which the current scheme to minimise the impact of landslides on the operation of the A83 at the Rest and Be Thankful is completed; and
- Provision of a dedicated ferry to serve freight movements between Islay and the mainland and plan to increase ferry capacity on the route for the long term.

8 POTENTIAL FUTURE RESILIENCE ISSUES

8.1 INTRODUCTION

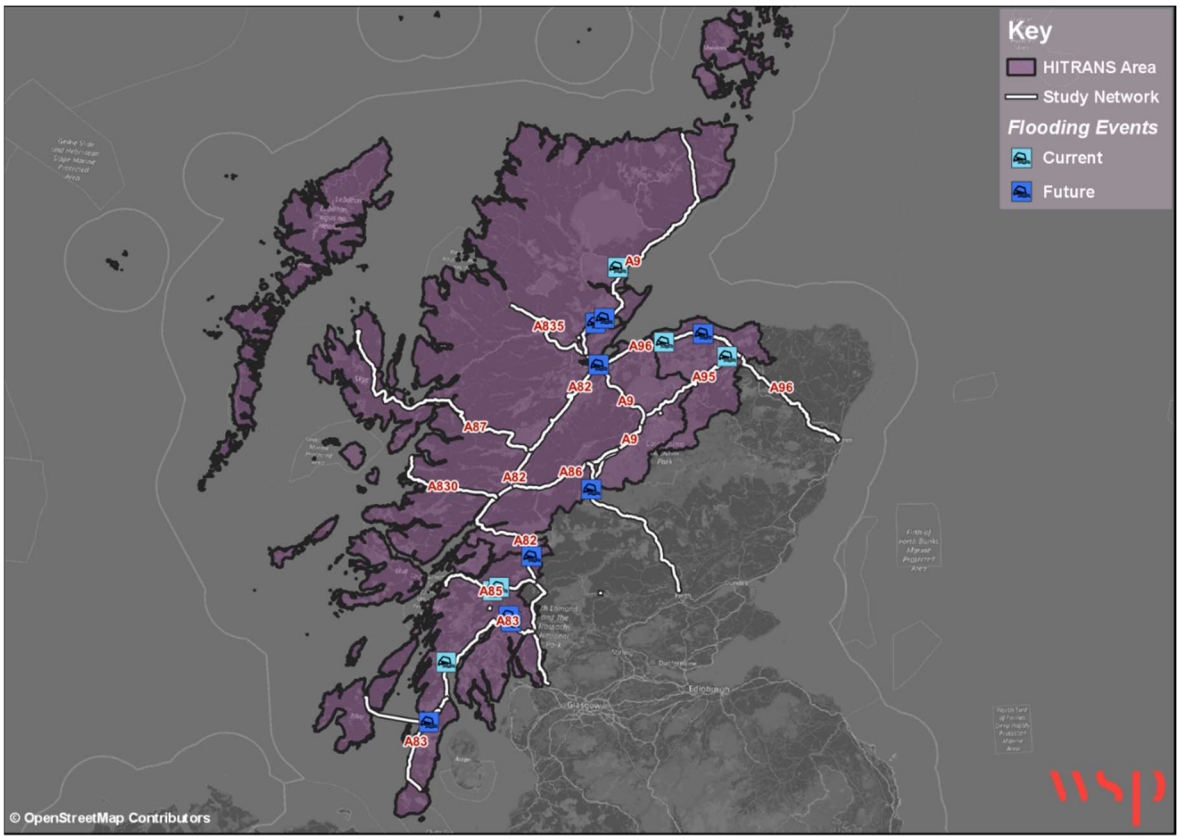
8.1.1. It is generally accepted that Scotland's weather is changing, with the transport network experiencing more frequent climatic events which have an impact on its operation. These events can result in sections of the trunk road network being partially or fully blocked by flooding or landslides, with high winds also closing the larger and more exposed bridges to high sided vehicles. There is, however, the potential that the frequency and intensity of snow events may decrease as a result of the changing climate.

8.1.2. The following sections review the potential for an increased likelihood of landslides, flooding and high wind events, in addition to highlighting Transport Scotland's planned strategic approach to addressing the impacts of climate change, prior to reviewing National Highways plans for the wider UK trunk road network.

8.2 FUTURE FLOODING

8.2.1. The locations and extent of future flooding events are difficult to accurately predict, however, using a combination of the SEPA flood data based on a medium likelihood of flooding accounting for high emissions as a result of climate change in 2080 (a 1 in 200-year event), and various news sources, potential locations likely to experience higher intensity and more frequent flooding events have been identified. These locations are shown in Figure 8-1, with a comparison made with the current locations of flooding events.

Figure 8-1 - 1 in 200-Year Flooding Events + Climate Change (Future)

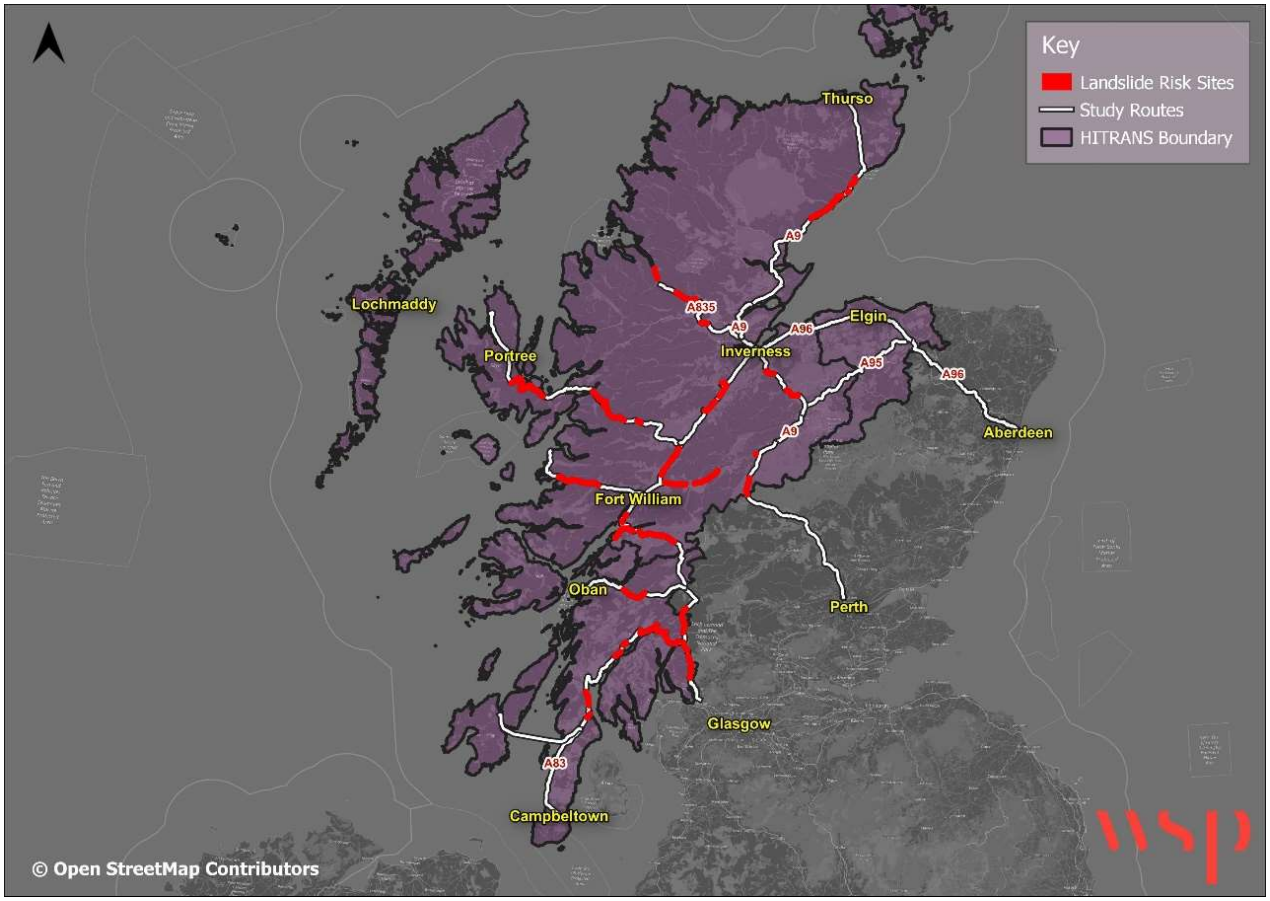


8.2.2. As can be seen from the above figure, there are a total of 14 locations on the trunk road network within the Highlands and Islands which are forecast to be susceptible to a 1 in 200-year flooding event, a significant increase when compared with the five areas currently identified to be susceptible to flooding. A number of these are on the A83 and A9 which, as demonstrated in Chapter 5, are key routes for the whisky industry.

8.3 LANDSLIDES

8.3.1. Figure 8-2 shows the areas of the trunk road network which are currently susceptible to landslides.

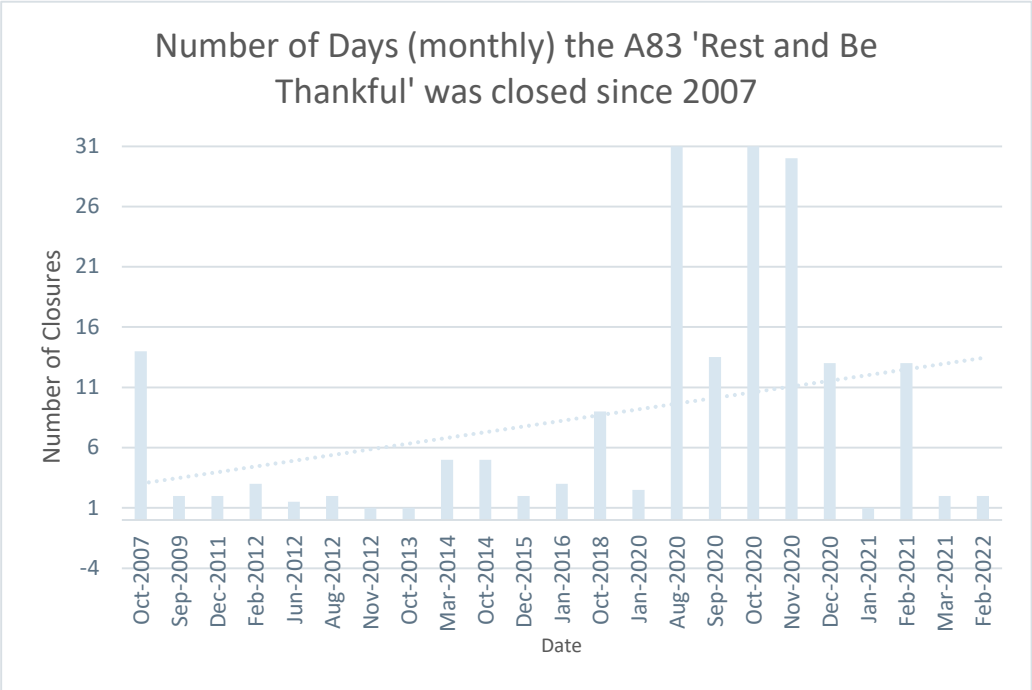
Figure 8-2 - Landslide Risk Sites



8.3.2. The areas identified within the above figure will remain susceptible to landslides, with the frequency of events likely to increase as a result of the changing climate. As previously highlighted, a significant proportion of the A82 and A83 pass through areas where landslides are likely to occur, with sections of the A9 also susceptible to landslides.

8.3.3. As shown in Figure 8-3, the frequency of road closures on the A83 at the Rest and Be Thankful is increasing.

Figure 8-3 - Rest and Be Thankful Road Closures[19]



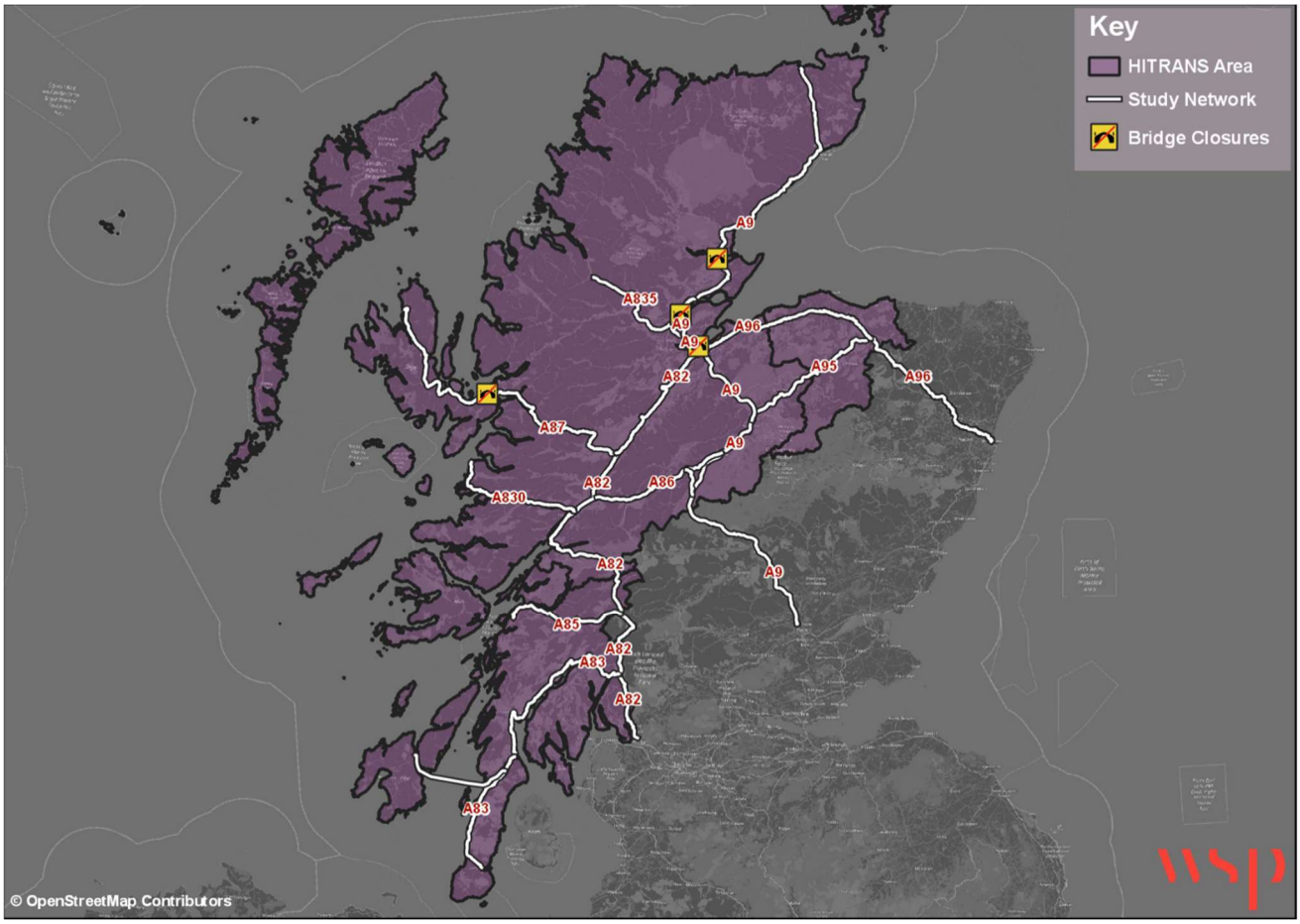
8.3.4. The data confirms that the road closures are most likely to take place in October and that there is a trend emerging with the frequency and duration of the A83's closure increasing, particularly between August 2020 and February 2021, in part due to Storm Bella (26/12/2020), Storm Christoph (19-21/1/2021) and Storm Darcy (7/2/2021).

8.4 HIGH WINDS

8.4.1. Figure 8-4 shows the locations of major bridges within the Highlands and Islands, which are regularly closed to high sided vehicles as a result of strong winds.

[19] Rest And Be Thankful closures since 2007: EIR release - gov.scot (www.gov.scot)

Figure 8-4 - Bridges Susceptible to Closures to High Sided Vehicles



8.4.2. As with the flooding and landslide events, it is anticipated that the frequency of bridge closures is likely to increase as a result of the changing climate. Closure of the Kessock Bridge is expected to have the greatest impact on the whisky industry's operation due to its location in relation to distilleries and the additional length of the diversion route to avoid the closure (approximately 23km).

8.4.3. While significantly less used by whisky traffic than the Kessock Bridge, the Skye Bridge has faced a rising challenge from climate change. Increasingly frequent periods of strong winds are causing more common and prolonged road closures20, particularly to HGV's. The bridge's infrastructure is under strain, disrupting daily transportation, with over 100 occasions that the bridge was closed in the space of 122 days between September and January of 2015. The local community are calling on collaborative efforts to navigate the escalating impact of climate change on this vital transportation link.

[20] The Herald - Skye Bridge closures in high winds being examined | The Herald (heraldscotland.com)

8.5 RECENT STORM EVENTS

8.5.1. There have been a number of recent weather events which have caused disruption to the operation of the transport network in the Highlands and Islands over the winter of 2023 / 24. The impact of two of the more disruptive storms (Storm Babet and Storm Gerrit) are summarised below.

STORM BABET

8.5.2. Storm Babet had a significant impact on the transport network's operation in October 2023 with unprecedented:

- Rainfall - to eastern Scotland, with 75mm to 200mm in the wettest areas.
- Extensive flooding – particularly through Angus and Aberdeenshire[21].
- High winds - The storm prompted red warnings from the Met Office, leading to significant impacts on transportation, infrastructure, and communities.
- Power Cuts - Around 30,000 homes in northern Scotland lost power during the storm.
- Landslides – 7 landslides on the A83.
- Road closed – A9, A85, A83, amongst others[22].


Storm Gerrit, A82 near Fort William

STORM GERRIT

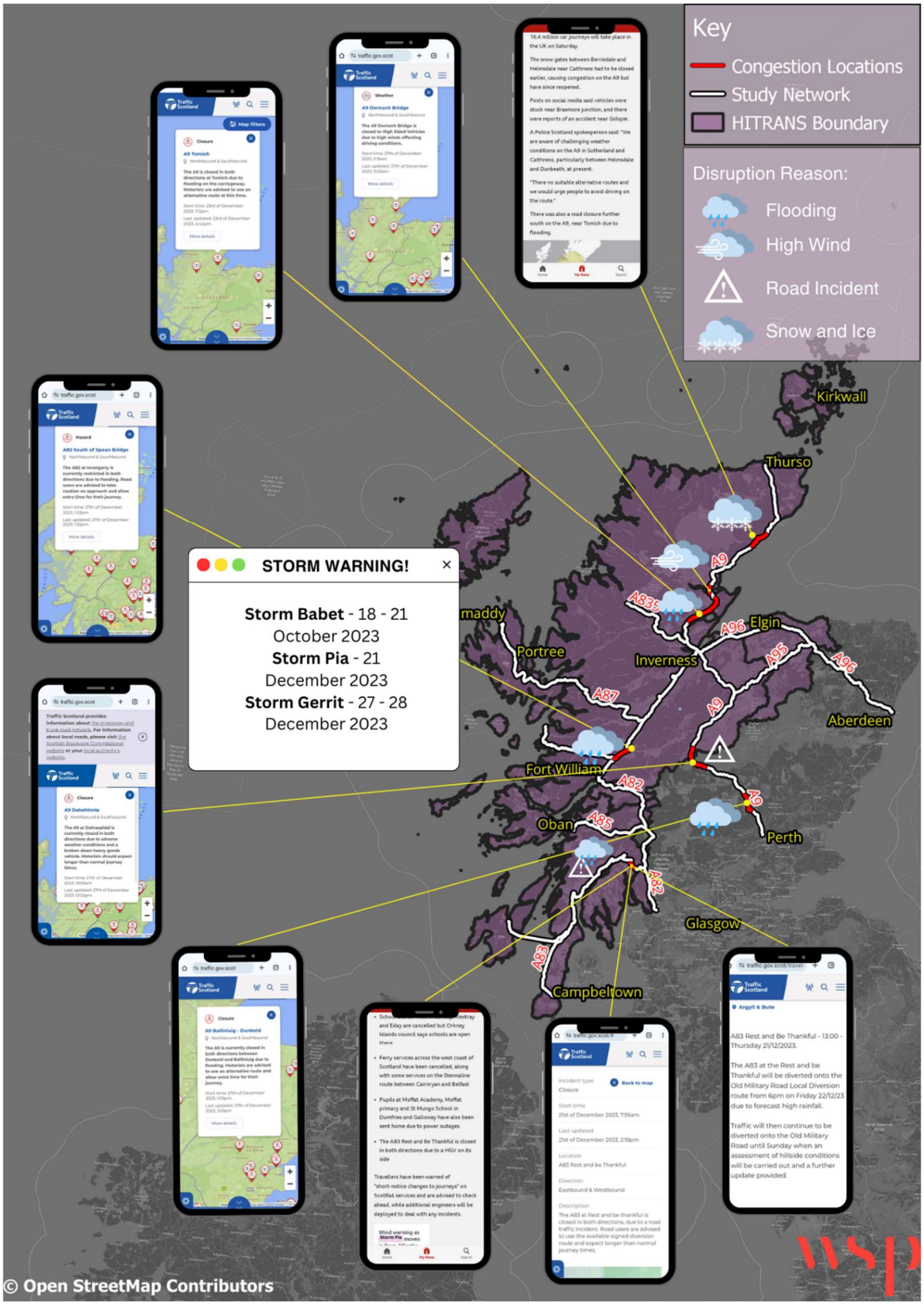
8.5.3. Storm Gerrit, which struck the UK in December 2023 brought with it destructive winds, heavy rain, and snow, leading to widespread travel disruption including:

- Landslips – on A83.
- Road Closures – A9, A87 and the A82.

8.5.4. The storms had a significant impact on the operation of the transport network throughout the Highlands and Islands, with Figure 8-5 providing an indication of the locations of areas affected by the storms.

[21] BBC News - In Pictures: Storm Babet flooding in Scotland - BBC News
[22] Yahoo - Road closures and cancellations as Storm Babet strikes Scotland (yahoo.com)

Figure 8-5 – HITRANS Transport Network Disruption in October and December 2023



8.5.5. As can be seen from the above summary, the storms had the greatest impact on the A83 and A9 in addition to causing the cancellation of numerous ferry sailings in the west of Scotland.

8.6 CLIMATE CHANGE ADAPTATION

8.6.1. It is generally accepted that Scotland's climate is changing from that used to set the standards that apply to the design of the trunk road network. An example of this is that drainage infrastructure is being overwhelmed by the intensity of the storms we are now experiencing, with this having an impact on the ability of the trunk road network to function. This is acknowledged by both Transport Scotland and National Highways who have published the following documents which set out each organisation's approach to adapting to the changing climate:

- Transport Scotland's Approach to Climate Change Adaptation and Resilience;
- Road Asset Management Plan for Scottish Trunk Roads; and
- Climate adaption reporting third round.

8.6.2. The following sections summarise a review of the three documents.

TRANSPORT SCOTLAND'S APPROACH TO CLIMATE CHANGE ADAPTATION AND RESILIENCE

8.6.3. Transport Scotland's Approach to Climate Change Adaptation and Resilience"[23] (ACCAR) published in August 2023 by Transport Scotland (TS), outlines the organisation's strategic approach to addressing the impacts of climate change. The overall vision for the strategy is to have a safe, reliable, and resilient transport system.

8.6.4. One of the ACCAR's strategic outcomes is focused on the trunk road network which is recognised as Scotland's biggest asset which is:

- 2,323 miles long;
- Worth £23 billion;
- Accommodating 35% of all traffic; and
- Accommodating 60% of HGV traffic.

8.6.5. TS plans to create the Trunk Roads Adaptation Plan which will be based on the most up-to-date climate change projections and risk assessments, and include a range of measures to improve the resilience of the trunk road network (TRN). The ACCAR identifies the following key risks to the trunk road network along with identifying proposed actions to tackle climate change:

- **Flooding**;
  - Delivering Scotland's Flood Risk Management Strategies;
  - Developing Flood Risk Maps; and,
  - Using biodiversity to reduce surface water run off, as detailed in the '*Biodiversity Strategy for Transport Scotland*'[24].
- **Landslides**;
  - Monitoring landslides using ongoing research and using *'The Scottish Road Network and Landslide Study'* (SRNLS) guidance to create a hazard ranking database system;

[23] Transport Scotland - Transport Scotland's Approach to both Climate Change Adaptation and Resilience | Transport Scotland
[24] Transport Scotland - Landscape and biodiversity | Trunk road management | Transport Scotland

- Using biodiversity[24] (such as trees) to improve ground stability.

- **Bridge Scour (where fast flowing water can undermine bridge abutments or piers)**;
  - Directing Operating Companies (OC) to follow the '*Scour Management Strategy and Flood Emergency Plan'* which details how to inspect, monitor, assess and record scour and bed-level changes.
  - TS has reviewed *BD 97*[25] to update the standards (to CS 469[26]) incorporating SEPA's most recent guidance, whilst developing a programme of proactive scour schemes.
- **High Winds**;
  - Developed the '*High Wind Strategy and National Wind Management Guidelines'* [27](HWS).
- **High Temperatures**;
  - Developed new temperature resistant road surfacing materials such as '*TS2010*'[28] to mitigate against temperatures up to 75°C.
  - Assesses the TRN materials across the network using a database.
- **Coastal Erosion**;
  - Monitor and reduce the impact of coastal erosion through the ongoing '*Dynamic Coast*'[29] project which collates historical data and projected coastal changes in Scotland to inform necessary interventions such as repair, realignment, or communications.

8.6.6. In terms of managing the road network, the ACCAR confirms that TS will work on:

- Their asset management strategy;
- The disruption risk management strategy;
- The Future Intelligent Transport Systems Strategy;
- The Road Safety Framework; and
- Incorporating UKCP18 projections and their potential impact on the trunk road network.

ROAD ASSET MANAGEMENT PLAN FOR SCOTTISH TRUNK ROADS

8.6.7. The Road Asset Management Plan for Scottish Trunk Roads[30] (RAMP) was published in January 2016 by TS and details the asset management practices deployed across Scotland's road network by both TS and Operating Companies (OCs). The RAMP document focuses on the trunk road responsibilities of Transport Scotland's 'Trunk Road and Bus Operations Directorate' (TRBO) and sets out the level of service (LOS) intended to be provided and the investment that is and will be required to achieve this.

8.6.8. In the context of climatic events, the RAMP serves to identify TS's management plan in times of unplanned weather events.

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[25] DMRB - BD 97/12 - The Assessment of Scour and Other Hydraulic Actions at Highway Structures (standardsforhighways.co.uk)
[26] ICE Publishing - New UK guidance on hydraulic actions on highway structures and bridges | Proceedings of the Institution of Civil Engineers - Bridge Engineering (icevirtuallibrary.com)
[27] Transport Scotland - https://www.transport.gov.scot/media/25393/j10783.pdf
[28] Transport Scotland - TRL Report Template (transport.gov.scot)
[29] Dynamic Coast - https://www.dynamiccoast.com/index
[30] Transport Scotland - Road Asset Management Plan for Scottish Trunk Roads, January 2016 (transport.gov.scot)

8.6.9. In managing the network's resilience, the RAMP follows an Identify, Analyse, Assess and Manage format in response to risk and this format is built in to all parts of TS through the Corporate Risk Management Strategy (CRMS). The CRMS provides a joined-up approach across all of the TS Directorates and is informed by the risk registers of each directorate. This allows for integrated planning and forecasting to allow for planning for increasing extreme weather events.

8.6.10. The following specific trunk road network Risk Management Practices as delivered through TRBO are summarised below:

- **Resilient Network** - the risk assessments are developed and reviewed to ensure there is connectivity between major communities and key transport interchanges, access to emergency facilities and critical infrastructure, that it provides principal public transport routes and connectivity to the local road network. These risk assessments feed into TS's CRMS.
- **Planning for Responding to Network Disruptions Disruption Risk Management Plan** – TS publish an internal manual for the "Management of the Risk of Unplanned Network Disruption" (MRUND) which details processes which are informed by the formal recording of all previous (including weather) events, as they occur. The recording provides a platform for early detection of changing conditions on the network. The MRUND also provides a "Disruption Risk Assessment Tool" which aids decision making in identifying vulnerable locations and assets. This will be used to drive investment to address the increasing frequency and impact of disruption events.
  With this information OCs must also carry out the above precautionary activities to mitigate against the risk of when unplanned disruption occurs. OCs are also required to prepare and maintain Disruption Risk Management Plans (DRMPs) which hold the processes, tools, records, and operational plans that communicate the activities used to mitigate the effects of emergencies.
- **Partnership Response** - Multi-Agency Response Team (MART) arrangements are in place with Met Office, Police Scotland, Scotrail to take collective action for unplanned events occurring on the network.
- **Management of Climate Change Risk and Changing Climate** - Various Climate / Trunk Road Network studies conducted indicate Scotland will experience:
  - Rise in *average temperatures* resulting in milder winters with fewer days of frost, ice and snow and warmer summers with extended periods of hot weather.
  - Unchanged *average annual rainfall*, but with summers expected to become drier and winters expected to become wetter.
  - Increase in frequency and intensity of *extreme weather events*, including prolonged and heavy precipitation events, high wind occurrences, storms and periods of drought. Furthermore, sea levels are projected to rise and storm surges are expected to become more severe.

  These weather events if not prepared for will likely bring increased:
  - Surface water flooding;
  - Landslides;
  - High winds; and,
  - Scour.

8.6.11. Key climate targeted management initiatives include:

- **Climate Change Adaptation** - routine climate change consideration is factored into TS's day-to-day decision-making processes rather than being considered one risk on the risk management

register. The Scottish Climate Change Adaptation Programme[31] (CCAP) was developed in response to Section 53 of the Climate Change (Scotland) Act 2009 and to address the impacts identified for Scotland in the UK Climate Change Risk Assessment (2012). The CCAP aims to deliver:

  - Objective B1: Understand the effects of climate change and their impacts on buildings and infrastructure networks.
  - Objective B2: Provide the knowledge, skills and tools to manage climate change impacts on buildings and infrastructure.
  - Objective B3: Increase the resilience of buildings and infrastructure networks to sustain and enhance the benefits and services provided.

- **Transport Scotland's Climate Change Adaptation and Resilience Plan** - As detailed in Section 8.6.3.
- **Flood Risk Management** - As mentioned in 8.6.5,TS has identified flooding as a key climate change risk, and with SEPA has development Local Flood Management Risk Management Plans and is delivering the Flood Management Risk Strategies. Ongoing work identified includes identifying Potentially Vulnerable Area (PVAs) and their impact on the TRN. This augmented with the OCs DRMPs will improve mitigation plans and improvement programs.
- **Managing the Impact of Landslides** - As mentioned in 7.3.7 the SRNLS[18] has identified management contingency plans including slope monitoring, liaison with Met Office, landslide patrols during weather events, road-side warnings during periods of increased risk; travel warnings and information, and physical engineering to reduce landslide risk.

CLIMATE ADAPTION REPORTING THIRD ROUND: NATIONAL HIGHWAYS (ARP3)

8.6.12. National Highways (NH) manage the English road network and in recent years have begun adapting the Strategic Road Network (SRN) for climate change. Key risks identified in the report Climate adaption reporting third round: National Highways (APR3)32 published in January 2022 by NH, sets out the actions completed in the past from 2015 – 2021 and for the next 10 years. Key climate risks are identified in Table 8-1.

[31] Scottish Government - Supporting documents - Scottish Climate Change Adaptation Programme (SCCAP) - gov.scot (www.gov.scot)
[32] National Highways - Preparing for climate change on the strategic road network - third adaptation report under the Climate Change Act (nationalhighways.co.uk)

Table 8-1 – Issues identifies to be climate change risks to the Strategic Road Network (SRN)

Issues identifies to be climate change risks to the Strategic Road Network (SRN)	
Rainfall • Overwhelming of Public Road Drainage Network; • Fluvial Flooding and High River Flows; • Ground Saturation affecting stability; • Destabilisation of earthworks; and • Waterlogging of pavement surface.	Temperature • Expansion of concrete pavements; • Softening and deformation of Asphalt; • Expansion of expansion joints in bridges.
Combined Risks • Increasing slope instability; • Underground utilities damage; • Foundational repairs due to ground water.	Other Risks • Wind damage to structures; • Structure damage due to storm surges; • Road surface damage due to freeze-thaw action; • Wildfire risk; • Obstructions on carriageway due to wind (i.e. fallen trees and/or building debris)

8.6.13. Within the APR3, NH state that drainage systems are a high-risk area for the SRN and have as a result:

- Published LA114: Climate[33] for environmental impact assessment (EIA);
- Reviewed and updated design standards to align with climate risks;
- Developed a drainage data management system (DDMS) database; and
- Monitored pavement conditions.

8.6.14. Specific design standards published by the Design Manual for Roads and Bridges (DMRB) includes:

- CD529: Design of outfall and culvert details[34];
- CG501: Design of highway drainage assets[35];
- LA113: Road drainage and water environment[36];
- CD522: Drainage of runoff from natural catchments[37];

[33] DMRB - LA 114 - Climate (standardsforhighways.co.uk)
[34] DMRB - CD 529 - Design of outfall and culvert details (standardsforhighways.co.uk)
[35] DMRB - CG 501 - Design of highway drainage systems (standardsforhighways.co.uk)
[36] DMRB - LA 113 - Road drainage and the water environment (standardsforhighways.co.uk)
[37] DMRB - CD 522 - Drainage of runoff from natural catchments (standardsforhighways.co.uk)

- CS641: Managing the maintenance of highways geotechnical assets[38]; and,
- CD356: Design of highway structures for hydraulic action[39].

8.6.15. These standards include details for the increased size and design of a gully as per the projected increase in stormwater to manage. Specifically, for flooding the APR3 states NH are:

- Developing a collaborative programme of flooding schemes to support flood risk reduction to the SRN;
- Improving flood recording and reporting processes; and
- Piloting natural flood management (NFM).

8.7 SUMMARY

8.7.1. Recent storm events have demonstrated the impact of the changing climate, with large parts of the transport network in the Highlands and Islands significantly affected by climatic events. It is clear from the level of impact on the transport network that its resilience needs to be improved.

8.7.2. As previously highlighted, sections of the trunk road network are susceptible to landslides and flooding, with the drainage of the network now appearing to be unable to accommodate the increased rainfall intensity generated by the changing climate.

8.7.3. While both Transport Scotland and National Highways acknowledge the impact of climate change, there is an urgent requirement to improve the transport network's resilience to climatic events to ensure that it can support the needs of its users including a growing whisky industry.

[38] DMRB - CS 641 - Managing the maintenance of highway geotechnical assets (standardsforhighways.co.uk)
[39] DMRB - CD 356 - Design of highway structures for hydraulic action (standardsforhighways.co.uk)

9 POTENTIAL OPPORTUNITIES

9.1 INTRODUCTION

9.1.1. A number of issues have been identified on the transport network in the Highlands and Islands, with a large proportion being unchanged from when the previous 2011 study was undertaken.

9.1.2. The following sections set out a range of measures and incentives which should be implemented to address the issues highlighted through the stakeholder consultation exercise and review of the HITRANS transport network as detailed in Chapters 6 and 7.

9.1.3. A separate section is provided to identify options to decarbonise traffic movements which support the whisky industry's operation.

9.2 RECOMMENDATIONS TO ADDRESS THE KEY ISSUES

9.2.1. Table 9-1 summarises the key issues identified by this study and sets out recommendations for addressing each issue.

Table 9-1 - Recommendations

Location	Current Issue	Recommendation
Throughout the Highlands and Islands	Injury accident rate on the trunk road network twice that of the UK	Development of a strategy to address the high proportion of serious and fatal accidents reported on the trunk road network in the Highlands and Islands
	Provision of only two Trunk Road Policing Units in the Highlands and Islands	This has an impact on accident response times and consideration should be given to the deployment of additional units in the Highlands and Islands
	Length of diversion routes	Introduction of additional VMS and undertake a review of the availability / suitability of diversion routes for HGVs
	Major bridges regularly closed to high sided vehicles	Installation of wind deflectors on all major bridges in the Highlands and Islands which are susceptible to high winds
	Trunk road network affected by flooding, with infrastructure struggling to cope with the increased rainfall intensity generated by the changing climate	Update the design standards and improve the current drainage infrastructure to provide a road network which is more resilient to the changing climate
	Maximising use of HGVs	Creation of a freight forum to facilitate better communication between customers and operators could lead to consolidation of loads to reduce the number of freight movements and demand on ferry crossings.
A82	Constrained width of the A82 to the north of Tarbert	Support the continued development of the A82 Tarbet to Inverarnan improvement project

	Rock falls and landslides on the A82 between Drumnadrochit and Invermoriston	Requirement to revisit the 2008 Scottish Road Network Landslides Study to identify a strategy to mitigate the impact of landslides on this section of the A82
A83	Significant potential for landslides on the northern section of the A83, including at the Rest and Be Thankful and the Old Military Road diversion is challenging for whisky tankers to negotiate	Commitment to a date by which the current scheme to minimise the impact of landslides on the operation of the A83 at the Rest and Be Thankful is completed
A9	Delays caused by volume of traffic, with no suitable diversion routes available for long sections of the road	Completion of dualling of the A9 between Perth and Inverness
A95	Constrained width of sections of the A95	Provide commitment to carriageway widening schemes where possible at constrained sections in association with planned maintenance activities
Islay Ferry	Existing capacity and reliability issues, with the capacity issue unlikely to be addressed through the planned introduction of two new ferries later in 2024 and early in 2025	Fully optimise the utilisation of vessels across the network, including the operation of a freight-only service and drop-trailers for the Islay service, with a delivery plan to provide increased capacity for the long-term.

9.3 DECARBONISATION OPPORTUNITIES

INTRODUCTION

9.3.1. This section of the report outlines what the UK and Scottish government are doing to help with the decarbonisation of transport through various national initiatives. It also identifies the challenges that the HGV sector is facing with regards to making the transition to alternative fuelled vehicles including what was communicated to the project team as part of the stakeholder engagement phase of this project. In addition, the potential options that are available to decarbonise the whisky logistics supply chain are explored including the potential for using electric, hydrogen and biofuels (biomethane, HVO, and FAME biodiesel) to fuel the vehicles and the development of a green refuelling network in partnership with the hauliers.

WHAT IS THE UK GOVERNMENT DOING TO HELP?

9.3.2. The UK Government released its Transport Decarbonisation Plan in 2021[40]. This plan lays out how the UK Government plans to work alongside local government and other key stakeholders to reduce carbon emissions produced by the UK's transport sector. It adopts a four-part approach:

- Reducing emissions
- Cutting costs for businesses and consumers
- Improving air quality across the UK
- Tackling congestion

9.3.3. HGVs are responsible for 19% of road transport GHG emissions and to combat this, the Government is proposing to ban the sale of new diesel vehicles weighing between 3.5 tonnes and 26 tonnes by 2035, and heavier vehicles by 2040. These targets have been met with a mixed response from the HGV sector and the RHA have expressed concerns stating, "This proposal as it stands is unrealistic as these alternative HGVs don't yet exist" and "we don't know when they will and what they will cost."

9.3.4. The DfT has recognised this and are exploring ways to incentivise the uptake of higher biocontent fuels (HBF) as an interim solution whilst electric battery and hydrogen fuel cell (HFC) HGVs reach full market deployment. Increasing HBF adoption will achieve further greenhouse gas emission savings in the road sector and help with stabilising the low carbon fuel market whilst demand ultimately shifts from road to harder to decarbonise transport modes such as aviation. Given the transition to zero emission tail-pipe HGV technologies will take more than a decade, HBF use in diesel HGVs could deliver substantial reductions in GHG emissions in the interim period.

SCOTTISH INITIATIVES TO SUPPORT GREENER TRANSPORT

9.3.5. The Scottish government have implemented several initiatives to support greener HGVs and reducing carbon emissions. These include:

- Low Emission Zones: The Scottish government is working on introducing LEZs in cities like Glasgow, Edinburgh, and Aberdeen.
- Low Emission Zone retrofit fund: Provides support to micro businesses who operate within LEZs, to help them retrofit their existing non-LEZ compliant vehicle with Clean Vehicle Retrofit Accreditation Scheme (CVRAS) approved solutions that meet the confirmed minimum standards of the LEZs. Grants cover up to 70% of the cost of a retrofit solution for (subject to a cap value dependent on solution and vehicle type) light commercial vehicles (LCVs) and HGVs.
- Zero Emission Truck Taskforce (ZETT): Has brought together key representatives from the logistics, manufacturing, energy and finance sectors to shape the pathway to the decarbonisation of Scotland's road freight and logistics sector. ZETT aims to identify solutions

40 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009448/decarbonising-transport-a-better-greener-britain.pdf

and the strategic actions that all parties need to take regarding vehicles, energy infrastructure and skills.

- Advanced Propulsion Centre (APC) programme: A Scottish-led project to develop a hydrogen fuel cell-powered heavy goods vehicle which has been awarded £30m from a government and industry initiative. Glasgow-based HVS, received a £15m grant from the government, with a further £15m coming from industry.
- Hydrogen Policy Statement: sets out Scotland's ambition to become a leading hydrogen nation, generating at least 5GW of renewable and low-carbon hydrogen by 2030 and at least 25GW by 2045. This ambition expects both battery electric and hydrogen systems to decarbonise transport in Scotland. The statement details the work which is already being done to achieve this ambition and commits £100 million of funding towards the development of a hydrogen economy in Scotland between 2021 and 2026.

9.3.6. European Regional Development Fund - HyTrEc2 – Interreg North Sea Region: The aim of the HyTrEc2 project is develop a hydrogen transport economy in the North Sea Region. The aims of the project are the deployment of hydrogen vehicles, green hydrogen production and storage, development of hydrogen refuelling stations and training.

NATIONAL INITIATIVES TO SUPPORT GREENER TRANSPORT

9.3.7. There are several national initiatives and policies in the UK aimed at supporting greener HGVs and reducing carbon emissions. These include:

- Innovate UK Grants: Innovate UK provides grants for research and development projects, and some of these projects focus on developing cleaner technologies and solutions for the freight and logistics sector. The government recently announced in October 2023 that it will be investing £200 million to drive innovation and get more zero emission vehicles on our roads. This funding will help to roll out up to 370 zero emission freight vehicles across the country and more than £2 million will also be given to small and medium-sized businesses in a separate competition to boost innovation and green tech in freight.
- The rapid charging fund (RCF): A £950 million fund to future-proof electrical capacity at motorway and major A road service areas to prepare the network for 100% zero emissions vehicles (ZEV) uptake. The fund will aim to ensure that the private sector can install ultra-rapid chargepoints (chargepoints capable of at least 150kW charging speeds) where they are needed ahead of growing demand. The fund will do this by providing grants towards the cost of electricity network capacity at key sites, where it is not commercially viable for the private sector to do so alone. The fund is open to motorway and major A road service area operators. Details about how to apply for funding will be announced soon.
- Road to Zero Strategy: The UK government's Road to Zero strategy outlines its commitment to phasing out new petrol and diesel HGVs by 2040. The strategy includes support for alternative fuels, such as hydrogen and electricity, and measures to increase the efficiency of HGVs.
- Plug-In Van Grants: Similar to the grants for cars, the UK provides grants to reduce the upfront cost of eligible electric vans, making them more attractive to businesses.
- Green Finance Institute's Coalition for the Decarbonisation of Heavy Industry and Heavy Duty Transport: This coalition focuses on driving investment into technologies and initiatives that support the decarbonisation of heavy-duty transport, including HGVs.
- Funding for Alternative Fuel Infrastructure: The government has committed to funding the development of alternative fuel infrastructure, including electric vehicle charging and hydrogen

refuelling stations, to support the deployment of greener HGVs. The Advanced Fuels Fund was launched on 19 July 2022 by the Department for Transport (DfT). The Advanced Fuels Fund has competitively allocated £135 million in grant funding to support UK advanced fuels projects until 31 March 2025.

- Vehicle Excise Duty (VED) Incentives: Changes in VED for HGVs based on environmental performance can provide an economic incentive for operators to choose greener vehicles.

WHAT CHALLENGES IS THE HGV SECTOR FACING WITH REGARDS TO MAKING THE TRANSITION TO ALTERNATIVE FUELS

9.3.8. There seems to be a clear route to decarbonisation for cars and vans due to their size and the way they are operated, but things aren't as straight forward for the HGV sector. There are several factors that can influence the choice of alternative fuel type for an HGV operator. This decision is typically based on a combination of economic, environmental, and practical considerations. The way that fleet operations are segmented are much more complex than cars and vans. The types of fuel that can be utilised by fleet operators without compromising their operational capabilities can be dictated by vehicle size, duty cycle, commodity types being transported, size of operator and depot location etc. Other key challenges that can influence fuel choice include:

- Environmental Impact: Many HGV operators are increasingly concerned about reducing their environmental footprint.
- Emission Regulations: Government regulations and emissions standards can influence fuel choices.
- Achieving a sustainable business model: By incorporating alternative-fuel vehicles, fleet operators can support environmental preservation and adhere to economic and social sustainability objectives.
- Public Perception and Brand Image: Some HGV operators might consider adopting alternative fuels to improve their reputation.
- Access to urban areas / Air Quality Zones: Many councils and cities are introducing Air Quality Management Areas and Ultra Low Emissions Zones to help fight pollution and charging operators who don't run zero emission vehicles for the privilege of entering.
- Fuel Price and Availability: Some alternative fuels might have fluctuating prices or limited availability, which could affect the overall operational costs.
- Fuel Efficiency: If the alternative fuel provides comparable or better fuel efficiency, it can make the investment more attractive to operators.
- Infrastructure: The availability of refuelling or recharging infrastructure is crucial and the operator needs to assess the feasibility of accessing this infrastructure along their routes.
- Range and Performance: Alternative-fuel vehicles must match HGV operators' typical routes and tasks, ensuring they meet operational needs without sacrificing efficiency or performance.
- Vehicle Compatibility and Conversion: Some alternative fuels might require modifications to existing diesel vehicles, or the purchase of new vehicles designed to run on that fuel. Operators need to consider the feasibility and cost of vehicle conversion or replacement.
- Technology Maturity: Established technologies might be more reliable, while newer technologies might offer better efficiency but come with uncertainties.
- Long-Term Fuel Price Stability: The stability of the fuel price over the long term can be a consideration. Some alternative fuels might have more predictable pricing compared to fossil fuels, which can be beneficial for budgeting and financial planning.

- Future Market Trends: If there is a clear shift towards certain alternative fuels, operators might want to position themselves ahead of the curve.
- Maintenance savings: Alternative fuelled vehicles (particularly EVs) can offer potential maintenance cost savings in comparison to their ICE counterparts.
- Uncertainty surrounding government future fuel strategies: Fluctuating policies, unclear long-term commitments and not having a stable regulatory framework in place can cause HGV operators to hesitate in their transition to alternative fuels. It also makes it hard for them to make informed decisions about fleet composition and accelerate fleet replacement cycles that they may have in place.
- Cost: The upfront cost of purchasing or converting vehicles to run on a particular alternative fuel can significantly impact the decision.
- Government Incentives and Support: Incentives such as tax credits, grants, or subsidies provided by governments can significantly affect the decision-making process. These incentives can help offset the initial investment cost and make adopting alternative fuels more financially viable.

WHAT THE STAKEHOLDER ENGAGEMENT TOLD US

9.3.9. Several challenges were highlighted with the adoption of alternative fuels, and these have been categorised below:

Infrastructure

9.3.10. Transport operators expressed that they Have reservations about the future direction of alternative fuels. This is due in part to a perceived lack of direction from the Government and a lack of investment in the refuelling infrastructure. This lack of infrastructure was cited as being a key reason as to why the roll out of the fuels was challenging particularly over longer distances and this made the application of the fuels specific to certain operations. It was noted that ‘Its proven difficult to find a fuel that will allow you to run the 300 miles without having to find a top up on route.’.

9.3.11. Although the uptake of HVO was good, hauliers stated that its only normally found in private tanks and pure HVO was not available in any of the forecourts in Scotland. It was felt that there was more that Government could do to incentivise the uptake of alternative fuels quicker such as investing in large scale infrastructure (charging points and refuelling stations) and subsidising the cost of HVO at the pump. Perth was highlighted as being an excellent ‘trial’ location for a multi-fuelled service station due to its strategic location on the road network with the majority of vehicles travelling North having to go through Perth at some point.

Weight limits

9.3.12. Some operators said that fully electric vehicles presented a few challenges for whisky logistics operations. It was thought the lighter end vehicles (<26 tonne) will definitely be electric battery, but this might not be the case for the heavier vehicles (which is the majority of the fleet in most cases). This is because there is doubt the technology can cope with the increased demands and load carrying capacities. Many of the loads are already ‘weighing out’ on standard length, diesel propelled, 44 tonne vehicles making the use of longer semi-trailers and EV’s (which have reduced payloads) impractical and not cost effective.

Vehicle availability

9.3.13. The timelines associated with the procurement of vehicle assets was highlighted by many operators. Although there was appetite for fleet operators to trial alternative fuelled vehicles, they were having to wait up to 2 years to have units delivered and begin trials.

Legislation and regulations

9.3.14. The carriage of dangerous goods is governed by 'The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009.' Until now, electric-powered models have only been permitted for breakbulk cargo. However, vehicles requiring a certificate of approval could only be approved with an internal combustion engine. From January 1, 2023, this was changed to allow them to be battery-electric for vehicles intended for the carriage of dangerous goods in tanks ("AT vehicles"). Work is currently underway to extend this further to FL and EX vehicles, although the inclination is to first wait for experience from the 2023 amendments. In addition, a solution still needs to be found for battery-electric vehicles with additional hydrogen storage and fuel cells. As alcohol is classified as a dangerous good (UN3065e), hauliers suggested that they often find that they are not able to use a lot of the technology to reduce their carbon footprint as they aren't compliant with the ADR rules and regulations.

9.3.15. The revision of these rules has made it possible for a distiller to begin a two-year trial using an electric HGV to transport casks between its bottling plant at Kilmalid near Dumbarton[41] to a maturation warehouse facility in North Ayrshire. This is a short haul, 50-mile round trip and the HGV will haul around 24 tonnes of full whisky casks on the first leg of its journey, returning to the bottling plant with empty casks.

Lack of real-world data

9.3.16. Hauliers stated that they need to participate in real life physical trials to make sure the vehicles can perform as needed as there is no data available to help inform the decision. This means the process is expensive and slow to implement. The trial data that is available has been collected for buses conducting passenger movements which isn't reflective of the movement of a 27-tonne load of whisky.

Operations

9.3.17. Drop trailers have the potential to increase capacity on ferries by freeing up deck space and reducing the weight of fright carried, particularly on the Islay ferry. Whilst there are practical and other issues to resolve, a trial to demonstrate drop trailers should be undertaken.

Potential for using biofuels (bio-methane, HVO, and FAME biodiesel) to fuel the vehicles

9.3.18. The hauliers engaged said that they didn't think EV or hydrogen technology was advanced enough to be able to cope with the range of duty cycles that they have to operate, as such they had been conducting several trials of Higher bio-content fuels (HBF) which cover biodiesel (Fatty Acid Methyl

[41] https://www.bbc.co.uk/news/uk-scotland-glasgow-west-65812980#:~:text=Chivas%20Brothers%20has%20begun%20a,day%20before%20being%20recharged%20overnight.

Esters) blends above retail diesel grade B7, notably B20 and B30, 'drop-in' renewable paraffinic diesel (hydrotreated vegetable oil, HVO) and biomethane obtained from the digestion of distillery products.

9.3.19. The Zemo partnership has reported that of the 84 current Scottish AD sites listed in the NNFCC AD database, 12 are associated with a distillery, brewery or malting site, and many more accept some volumes of distillery, brewery or malting residues. One distillery produces heat only, six operate a CHP only, while five carry out some level of biogas upgrading to biomethane. More distilleries and breweries have obtained or are in the process of obtaining planning permission for AD installations or biogas upgrading capacity. The Scotch Whisky Association has its own sustainability goals, including to reach net zero by 2045, and AD can help them achieve these goals.

9.3.20. In addition to the above, SWA and HITRANS could lobby government to introduce fiscal incentives (such as lowering the price per litre of biofuels) to incentivise the early adoption of biofuels.

Development of a green refuelling network in partnership with the hauliers

9.3.21. Collaboration with private-sector partners (such as hauliers etc.) to establish joint initiatives, such as fuelling infrastructure partnerships or joint research and development efforts can accelerate the adoption of alternative fuels. This was a suggestion proposed by a few of the hauliers that were engaged. They said the creation of a refuelling network within the industry comprising of refuelling points strategically located at distilleries and hauliers' depots would be an excellent way of encouraging transition to alternative fuelled vehicles. The refuelling points would include biofuels, chargepoints and potentially hydrogen (if it proves to be a suitable alternative) and would be accessible to all those operating in the whisky industry supply chain. The introduction of this infrastructure would need careful consideration however and this would need to be developed on a case-by-case basis. Early thoughts suggested that the location of the refuelling points would be best placed on the perimeter of a site so that 3rd parties could easily gain access without interfering with onsite activity.

Other decarbonisation options

<u>Infrastructure - Government intervention</u>

9.3.22. Hauliers said that there was more that Government could do to incentivise the uptake of alternative fuels quicker such as investing in large scale infrastructure (charging points and refuelling stations) and subsidising the cost of HVO at the pump. Perth was highlighted as being an excellent 'trial' location for a multi-fuelled service station due to its strategic location on the road network, with the majority of vehicles travelling North having to go through Perth at some point. A well-established infrastructure can alleviate concerns about range limitations and encourage the adoption of alternative fuels.

<u>Increasing weight limits</u>

9.3.23. The raising of weight limits to make these vehicles (particularly EV's which have reduced payloads) feasible was proposed. This could be similar in nature to the heavier intermodal freight trial whereby weight limits would be increased to 48 tonnes on pre-approved routes.

Legislation and regulations

9.3.24. The SWA and HITRANS could lobby government and get them to further revise The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 200942 to allow FL, EX vehicles and battery-electric vehicles with additional hydrogen storage and fuel cells to be permitted to transport dangerous goods where safe to do so and where other regulatory requirements permit

9.3.25. In addition, supportive regulations and standards that promote the use of alternative fuels, such as emissions standards and exemptions or reduced fees for vehicles using cleaner fuels could be implemented.

Collection of real-world data

9.3.26. The government, SWA and HITRANS could work with vehicle manufacturers, fleet operators and other relevant stakeholders involved in real life physical trials of alternative fuelled HGVs and make the data available to fleet operators wishing to transition. This would help inform their decision-making process and provide them with the confidence that the vehicles can perform as needed.

Cost of vehicles

9.3.27. SWA and HITRANS could lobby government to provide financial incentives such as grants, subsidies, or tax credits to reduce the upfront costs of purchasing alternative-fuelled HGVs. This can make these vehicles more economically attractive to fleet operators.

Research and Development Grants

9.3.28. These could be offered to companies and organisations working on innovative technologies for alternative-fuelled HGVs. This can spur advancements in the industry and make these vehicles more efficient and cost-effective over time.

Education and Awareness Programs

9.3.29. SWA and HITRANS could launch educational campaigns to raise awareness about the benefits of alternative-fuelled HGVs and provide information on available incentives to hauliers in its supply chain. This can help overcome misconceptions and encourage stakeholders to consider these options.

Collaboration with Industry Stakeholders

9.3.30. Collaborating with industry stakeholders, including manufacturers, fuel providers, hauliers and ferry operators could help SWA and HITRANS to better understand their needs and address barriers to adoption. Working together can lead to more effective policies and solutions.

Incentives for Fleet Turnover

9.3.31. This report highlights that there are both larger and smaller hauliers operating in the whisky supply chain. Many of the smaller ones don't have the resource to purchase newer, lower emitting vehicles

[42] https://www.legislation.gov.uk/uksi/2009/1348/contents/made

or alternatively fuelled ones. Creating incentives which specifically target fleet turnover to replace older vehicles with newer, alternative-fuelled models can contribute to a more rapid transition to cleaner transportation options and help them to overcome the financial constraints they face.

Demonstration Projects

9.3.32. SWA and HITRANS should support demonstration projects that showcase the performance and benefits of alternative-fuelled HGVs in real-world conditions. This can provide tangible evidence of the feasibility and advantages of adopting these technologies.

SUMMARY OF DECARBONISATION OPTIONS

9.3.33. The UK Government is actively addressing carbon emissions in the transport sector through its 2021 Transport Decarbonisation Plan. This comprehensive strategy focuses on reducing emissions, cutting costs, improving air quality, and tackling congestion. To combat the significant greenhouse gas emissions from Heavy Goods Vehicles (HGVs), the government plans to ban the sale of new diesel vehicles weighing between 3.5 and 26 tonnes by 2035 and heavier vehicles by 2040. While the Road to Zero Strategy outlines the commitment to phasing out new petrol and diesel HGVs by 2040, various national initiatives, grants, and incentives are in place to support the adoption of greener technologies, including electric and hydrogen-powered vehicles.

9.3.34. However, the HGV sector faces numerous challenges in transitioning to alternative fuels. Factors such as environmental impact, emission regulations, achieving a sustainable business model, public perception, and access to urban areas are critical considerations. Additionally, challenges include fuel price and availability, infrastructure concerns, vehicle compatibility, and uncertainty surrounding government future fuel strategies. The upfront cost of adopting alternative fuels, along with the lack of real-world data and long waiting times for alternative-fuelled vehicle deliveries, further hinder the industry's transition.

9.3.35. Stakeholder engagement has revealed key challenges, including concerns about infrastructure, weight limits, vehicle availability, legislation and regulations, lack of real-world data, costs, and operational considerations. To overcome these challenges, stakeholders propose various options, including the use of biofuels, the development of a green refuelling network in collaboration with hauliers, government intervention in infrastructure development, increasing weight limits, revising regulations, collecting real-world data, addressing vehicle costs, and supporting research and development initiatives.

9.3.36. Moreover, collaboration with industry stakeholders, education and awareness programs, incentives for fleet turnover, and demonstration projects are suggested to facilitate a smoother transition to alternative-fuelled HGVs in the whisky logistics supply chain. The report emphasises the need for coordinated efforts between the government, industry players, and organisations like the SSWA and the Highlands and Islands Transport Partnership to navigate these challenges successfully.

9.4 SUMMARY

9.4.1. A range of issues have been identified as part of this 2024 study following a review of existing data sources and consultation with key stakeholders. It is acknowledged that there are a number of schemes which are currently in the design or construction phase, which will alleviate a proportion of the issues, but there is a requirement for the Scottish Government to provide firm commitment to their implementation.

9.4.2. This study has highlighted that the transport network in the Highlands and Islands currently has a number resilience issues which are expected to worsen as a result of the changing climate.

9.4.3. The stakeholder consultation exercise has also highlighted the willingness of those supporting the Scotch Whisky industry's operation, to work to reduce the carbon emissions generated by the movement of goods and product throughout the north-west of Scotland.

10 SUMMARY AND RECOMMENDATIONS

10.1 SUMMARY

10.1.1. WSP UK Limited were appointed by the Highlands and Islands Transport Partnership and the Scotch Whisky Association, to identify existing issues on the transport network which could have an impact on the ability of the whisky industry to continue to grow in Scotland.

10.1.2. The previous Spirit of the Highlands study was commissioned by HITRANS, with the results of the study published in June 2011. The 2011 study was supported by development of a spreadsheet analysis tool to derive the level of traffic generated by the whisky industry on key road links throughout the Highlands and Islands.

10.1.3. Since the 2011 study was published, the whisky industry in the Highlands and Islands has experienced significant growth, with its capacity having grown by 35% from 2009 to 2021. The nature of the area results in the whisky industry being reliant on the road network and ferry services to operate and its growth has resulted in an increase in the number of HGV movements, with this placing a greater demand on the resilience of the transport network.

35% Growth in the industry's capacity between 2009 to 2021

10% Growth anticipated over the next ten years which would result in an additional 58,000 annual HGV movements

10.1.4. A theoretical increase of 10% in the current industry's capacity has the potential to develop an additional 58,115 HGV movements on an annual basis which will place an even greater demand on the transport network.

10.1.5. Distillers, maltsters, hauliers and ferry operators were consulted in January and February 2024 to identify existing issues which have an impact on the whisky industry's operation and highlight any potential measures which could address the issues. A number of issues were identified including the restricted width of the A95, the susceptibility of sections of the A82 and A83 to rock falls and landslips and the distance required to divert around issues on certain sections of the trunk road network. The limited capacity and reliability of the Islay ferry was also highlighted as a concern.

10.1.6. The transport network in the Highlands and Islands is predominantly rural in nature and is impacting on by climatic events including flooding, landslides, high winds and winter weather, with the majority of these likely to worsen as a result of the changing climate. The network is also reported to experience a proportion of serious and fatal accidents which is twice that of the UK average.

10.1.7. While the nature of the transport network in the Highlands and Islands will always present issues to the Scotch Whisky industry's operation, it is considered that there are measures which can be implemented to improve the network's resilience and enable the industry to continue to growth for the benefit of the Scottish economy.

10.1.8. The consultation exercise confirmed the industry and its stakeholder's willingness to embrace emerging technologies to support the transition to net zero, but the locations of distilleries in the Highlands and Islands will result in the industry continuing to rely on the trunk road network and ferry services for the foreseeable future. This will require further Government investment to both address the current resilience issues and provide a transport network which is able to adapt to the changing climate.

10.2 RECOMMENDATIONS

10.2.1. Table 10-1 identifies the schemes which are considered to be essential to the development of a resilient transport network which is able to support the Scotch Whisky industry's continued growth.

Table 10-1 - Recommendations

Theme	Required Scheme	Responsibility for Delivery
Improved Resilience	Fully optimise the utilisation of vessels across the network, including the operation of a freight-only service and drop-trailers for the Islay service, with a delivery plan to provide increased capacity for the long-term.	Transport Scotland/ Scottish Government
Road Safety	Development of a strategy and delivery plan to maintain and upgrade the trunk road network to ensure it is resilient and fit for purpose in the Highlands and Islands and meets the current and future needs of the industry, with a particular focus on the constraints identified: A83, A9, A95 and A96.	Transport Scotland/ Scottish Government
Improved Resilience	Commitment to a date by which the current scheme to minimise the impact of landslides on the operation of the A83 at the Rest and Be Thankful is completed	Transport Scotland/Scottish Government
Road Safety / Improved Resilience	Completion of dualling of the A9 between Perth and Inverness at the earliest opportunity	Transport Scotland/ Scottish Government
Improved Resilience	Support the continued development of the A82 Tarbet to Inverarnan improvement project	Transport Scotland
Improved Resilience	Provide commitment to carriageway widening schemes at constrained sections in association with planned maintenance activities so that roads meet expected design specification	Transport Scotland
Improved Resilience	Introduction of additional Variable Message Signage (VMS) and undertake a review of the availability / suitability of diversion routes for HGVs	Transport Scotland
Improved Resilience	Installation of wind deflectors on all major bridges in the Highlands and Islands which are susceptible to high winds	Transport Scotland
Improved Resilience	Update the design standards to improve the current drainage infrastructure to provide a road network which is more resilient to a changing climate and to ensure those standards are delivered across the road network	Transport Scotland
Road Safety	Location of existing Road Policing Units has an impact on accident response times and consideration should be given to the deployment of additional units in the Highlands and Islands	Police Scotland
Improved Resilience	Requirement to revisit the 2008 Scottish Road Network Landslides Study to identify a strategy to mitigate the impact of landslides on this section of the A82	Transport Scotland
Efficiency Improvements	Creation of a freight forum to facilitate better communication between customers and operators could lead to consolidation of loads to reduce the number of freight movements and demand on ferry crossings.	Transport Scotland

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