**Transport Appraisal and Modelling in Scotland
User Survey, 2019**

All completed responses should be submitted using the User Survey response form. The form should be returned to SCOT-TAG_Mailbox@gov.scot by **Friday 22nd November 2019***.*

There is no requirement to answer all questions – please provide responses to as many of the questions that you would like to respond on.

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1.   Introduction

1.1   Purpose of this User Survey

The aim of this user survey is to consider the current strengths of Scottish Transport Appraisal Guidance (STAG) as well as related areas such as modelling and data and where these should be reviewed. This is with the purpose to ensure our appraisal guidance, strategic models and supporting data continue to be credible and fit for purpose as well as align with and support the delivery of the vision for transport in Scotland as set out in the draft successor National Transport Strategy (NTS2) published for a 12 week consultation on the 31st July 2019:

'We will have a sustainable, inclusive and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors.' (Draft NTS2. July 2019)

The core of STAG is still relevant and five criteria resonate with the strategic framework of the draft NTS2. While STAG is still recommended and championed by Transport Scotland, it is also recognised that the policy landscape continues to evolve and appraisal methodologies continue to develop. As such, Transport Scotland also recognises that a review of STAG, the supporting modelling approaches/tools and data is required.

STAG provides an evidence based and objective led framework for: identifying transport problems in a study area and/or opportunities; setting objectives to reflect the transport problems/opportunities and identifying and appraising options in a consistent manner with the potential to meet the objectives. STAG is integral to the investment decision maker process at the Strategic Business Case stage, and it is not the intention that the fundamental principle and elements of STAG will change. Rather, the focus of the survey is to consider the existing appraisal framework taking account of the wider policy context and changing transport trends as well as to take the opportunity to consider points raised about the STAG framework through wider work activities, particularly the development of the draft NTS2 and early engagement in connection with the second Strategic Transport Projects Review (STPR2).

1.2   Background to STAG

STAG arose directly from the July 1998 Transport White Paper, *Travel Choices for Scotland*, which established the new policy framework for transport in Scotland. The White Paper heralded important developments in policy with a clear focus on three key aims:
- A strong economy.
- A clean environment.
- An inclusive society.

The draft version of STAG was issued for use and consultation in 2001 with the final version published for use in September 2003. The Guidance was then subsequently updated and launched on Scot-TAG, a web based platform, in November 2005.

The Guidance was refreshed in 2008 and changes since then have been issued as a number of business as usual updates to ensure it remains fit for purpose, is informed by the latest and best available evidence and is available in an accessible form.

1.3   Purpose of STAG

Transport is one of Scotland's most vital public amenities influencing, amongst other aspects, the economy, communities, environment and quality of life. A transport system that serves Scotland well is fundamental to achieving the Scottish Government's vision of a prosperous, inclusive and sustainable society.

The initial task in a Transport Appraisal is the identification of evidenced transport problems and/or opportunities. It is important this is underpinned by clear analysis and evidence to provide the rationale

for change. Objective led appraisal is at the heart of STAG and Transport Planning Objectives (TPOs) are then established to reflect the change(s) sought in a study area to address the evidence based problems or opportunities. The objectives provide the basis to assess the performance of different options in addressing identified problems and opportunities through consideration of their performance in meeting the objectives.

At the options appraisal stages, options are also assessed in terms of deliverability (technical, operational and financial as well as public acceptability) and performance in relation to the five STAG Criteria, namely:

- **Environment** (maximising the quality of the built and natural environment for enjoyment by all).
- **Safety** (reducing the risk and incidence of accidents and improving the security of all transport users).
- **Economy** (journey time savings and facilitating desired economic development).
- **Integration** (fitting the transport network together and ensuring a rational relationship between transport and land-use and wider policy).
- **Accessibility and Social Inclusion** (providing everyone, not just users but also non-users, with the means to travel to opportunities of all kinds).

There are also a number of other assessments that may need to be undertaken in parallel to a Transport Appraisal. The work undertaken as part of these assessments can inform the Transport Appraisal and vice versa:

- **Strategic Environmental Assessment (SEA)** - assesses the likely impact of plans, programmes and strategies on the environment and seeks ways to minimise those effects.
- **Equality Impact Assessment (EqIA)** - considers equality issues for the design and delivery of projects, plans and policies. It covers people in respect of all aspects of equality (age, disability, sex, race, religion or belief, sexual orientation, gender reassignment and pregnancy and maternity).
- **The Fairer Scotland Duty** - considers how to reduce inequalities of outcome caused by socio-economic disadvantage. In broad terms, 'socio-economic disadvantage' means living on a low income compared to others in Scotland, with little or no accumulated wealth, leading to greater material deprivation, restricting the ability to access basic goods and services.
- **Child Rights and Wellbeing Impact Assessment (CRWIA)** - considers impacts on children and young people. It covers individual children, groups of children, and all children up to age 18.
- **Island Communities Impact Assessment (ICIA)** - considers impacts on islands.

1.4   The Key Concepts of STAG

There are a number of key concepts which underpin STAG:

- **An appraisal using STAG allows the contribution of a potential intervention to the Government's Purpose to be presented in a consistent manner.**
- **STAG is objective-led rather than solution-led** which avoids pre-conceived solutions being brought forward without considering other options which may meet the identified problem or opportunities.
- **It provides best practice transport appraisal guidance** to be used to identify transport problems and/or opportunities and options to address the identified transport problems and opportunities using an evidence base.
- **The Transport Planning Objectives developed as part of a Transport Appraisal must capture the essence of the evidence based problem to be addressed or opportunity being undertaken** i.e. the objectives must reflect the changes sought in a study area.
- **It can be used in all transport appraisal contexts**, including transport and development policies or strategies.
- **It is one process** incorporating Pre-Appraisal; Initial Appraisal (Part 1), Detailed Appraisal (Part 2) and Post Appraisal. There is further information on each stage in the Scottish Transport Appraisal Guidance (STAG).

- **It should be applied proportionately but comprehensivel**y – the level of detail required will be determined by the scale of the impacts of the transport issue being addressed.
- **Robust Pre-Appraisal** provides the foundation to the whole process since it involves identification of evidenced transport problems and/or opportunities, setting Transport Planning Objectives to reflect these and the generation of options with the potential to address the problems and/or opportunities which are together fundamental elements of the case for change in a study area.
- **It does not prioritise between options** rather it is an aid to decision makers to allow them to make informed choices. A Transport Appraisal undertaken in line with STAG may provide an initial rationale for progressing the emerging option(s), however it is important that the STAG outcomes are revisited as the Business Case for an intervention develops.
- **The appraisal and reporting** should be completed before commencing the detailed design of the options using mode specific guidance. It is recognised that whilst mode specific guidance may be used to inform the options considered as part of the appraisal, designs should not be progressed past this level until the appraisal is complete and decision makers make their informed choice of the option(s) to be developed further.
- **Outcomes should be reported clearly and concisely** – reports should document the completion of each phase of the process comprehensively, but proportionately.
- **It embraces Scottish Government policy** across a range of areas.
- **It does not remove the need for practitioners to undertake their statutory obligations** – i.e. to adhere to all relevant and applicable Scottish, UK and EU legislation.

1.5   User Survey Themes and Questions

Following this introduction, the user survey document is structured around the following seven themes with a number of questions asked under each:
- Making the Case for Change in Transport Appraisal.
- Changing Policy Landscape.
- Scenario Planning for Handling Uncertainty.
- Land Use, Transport and Traffic Modelling.
- Data.
- Monitoring and Evaluation.
- Application of STAG.

A full list of the survey questions is also enclosed in Annex A.

The outcomes of the survey will provide Transport Scotland with a basis to take an informed view on the future focus and priorities for the ongoing development and refinement of Transport Appraisal in Scotland along with the future for our modelling tools and supporting data collection.

2.   Making the Case for Change in Transport Appraisal

2.1   Background

The first stage of STAG, Pre-Appraisal (pending a terminology change to Initial Appraisal: Case for Change), involves the analysis and identification of evidenced transport problems and opportunities; setting Transport Planning Objectives (TPOs) and generating a range of multi-modal transport options with the potential to address the problems and opportunities and meet the TPOs.

2.2   Making the Case for Change

A central focus at the Initial Appraisal: Case for Change stage is on evidencing problems and opportunities and making the case for change in the requirement for a transport intervention in a study area. It is important this stage is given due attention in the appraisal process to:
- Robustly evidence problems and opportunities.
- Consider multi-modal transport problems and potential options on an equal footing.
- Make a clear and compelling case for a transport intervention in the study area.

If no case is made for intervention in the study area at the Initial Appraisal: Case for Change stage, then progressing with the appraisal of options in the later stages of Transport Appraisal is abortive time and has cost implications. This would occur, for example, where:
- The case for change in the study area is not clear and evidence of a transport problem and/or opportunity is lacking.
- It is not evident how the TPOs reflect the identified problems and opportunities.
- The development and appraisal of particular transport options is not clear in terms of how they link to addressing the TPOs and in turn the evidenced transport problems/opportunities.
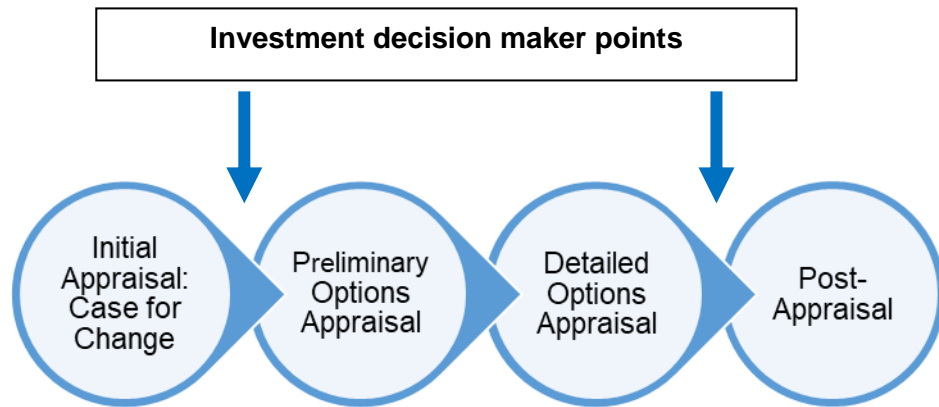
In these circumstances, there is also substantial risk to the investment decision maker of a failure to provide sufficient evidence for a Strategic Business Case and rationale for progressing any emerging intervention.

The end of the Initial Appraisal: Case for Change stage presents a key milestone and natural decision point which usually involves only the technical team/practitioners considering the outcomes and scope of the next stage of the Transport Appraisal. Similarly, the Preliminary Options stage considers whether options should be sifted out or taken forward for Detailed Appraisal and a second natural decision point from a technical point of view. The   investment decision maker may, however, only be involved in the decision making at the outset of the Transport Appraisal and once the appraisal work has concluded and a Final Report submitted for consideration. Staged reporting rather than one Final Report would align more closely to the staged approach of a Transport Appraisal.

2.3   Enhancing Guidance on Making the Case for Change

Given the importance of the Initial Appraisal: Case for Change stage to make the case for a transport intervention in a study area and time as well as cost risks of progressing immediately to the Preliminary Options and Details Options Appraisal stages, forthcoming updates to STAG will extend to:
- Terminology changes to the stages to clarify their purpose and sequential staged approach to STAG:
  - Pre-Appraisal   > Initial Appraisal: Case for Change
  - Initial Appraisal   > Preliminary Options Appraisal
  - Detailed Appraisal   > Detailed Options Appraisal
- Enhancing clarity on the criticality, focus and expected outcomes from the Initial Appraisal: Case for Change stage including, but not limited to, emphasising the need for clearly evidenced problems and/or opportunities.
- Creating a clear decision point for the investment decision maker at the end of the Initial Appraisal: Case for Change stage alongside the existing decision point on conclusion of the Detailed Options Appraisal.

The purpose of the updates will:

- Help to improve the robustness of Transport Appraisal and reporting.
- Mitigate the risk of solution-led Transport Appraisals.
- Involve investment decision makers throughout and provide clear decision-making points for the progress of a Transport Appraisal and associated reporting.
- Help to keep Transport Appraisal work and associated costs proportionate.
- Provide the opportunity to consider whether or not there is a case for progressing to the subsequent Preliminary Options Appraisal and Detailed Options Appraisal stages, thus avoiding inappropriate and potentially abortive appraisal work together with associated costs.

Questions

1. Do you consider there are further changes required to the Initial Appraisal: Case for Change stage of STAG? If so, what further changes do you suggest are required?
   For example: terminology, where to source data; how to be proportionate; roles and responsibilities of decision makers; how to better draw out opportunities [see Annex B for many other examples]

2. Transport is a derived demand. At the options generation stage of the Initial Appraisal we usually restrict ourselves to interventions in the transport system. Should we also be thinking wider about land-use; the role of digital in substituting travel and other non-transport interventions? If so, do you have information about any studies/research of relevance to how this should be approached?

3.   Changing Policy Landscape

3.1   Background

While our appraisal and modelling techniques have continued to evolve, so too has the focus of Government policy. This section of the survey considers key recent changes to Government policy and poses a number of questions on whether and how the transport appraisal framework may need strengthened as a result.

3.2   National Transport Strategy

The National Transport Strategy sets the long-term vision for transport in Scotland. The NTS provides the framework for enhancing the transport system, in response to the main transport challenges that Scotland faces, which in turn contributes to improved economic, environmental and social performance.

The first NTS was published in 2006 and set out three key Strategic Outcomes to be used as the guiding principles at national, regional and local level when developing strategy and prioritising resources. A refresh of the NTS, published in January 2016, found the overall framework to still be valid. The refresh provided an update of the strategic context and clarified roles and responsibilities across transport modes, locations and organisational hierarchy. It also recommended a *'fuller, collaborative review of the NTS to the next Scottish Government'*. Following an extensive and collaborative review, the draft successor strategy (Draft NTS2) sets out the vision for Scotland's transport system over the next twenty years.

The vision of the draft NTS2 for a sustainable, inclusive and accessible transport system that helps to deliver a healthier, fairer and more prosperous Scotland for communities, business and visitors is underpinned by four priorities and 12 associated outcomes as illustrated in Figure 1.

Our Vision
We will have a sustainable, inclusive and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors.

Promotes equality
- Will provide fair access to services we need
- Will be easy to use for all
- Will be affordable for all

Takes climate action
- Will adapt to the effects of climate change
- Will help deliver our net-zero target
- Will promote greener, cleaner choices

Helps our economy prosper
- Will get us where we need to get to
- Will be reliable, efficient and high quality
- Will use beneficial innovation

Improves our health and wellbeing
- Will be safe and secure for all
- Will enable us to make healthy travel choices
- Will help make our communities great places to live

Figure 1: National Transport Strategy – Vision, Priorities and Outcomes

The draft NTS2 priorities of Promotes Equality; Takes Climate Action; Helps Our Economy Prosper and Improves our health and wellbeing and related 12 outcomes resonate with the five STAG criteria described in Section 1 - Accessibility & Social Inclusion, Economy, Environment, Integration and Safety. The draft NTS2 outcomes will be measured using a range of indicators. The draft NTS2 sets out to develop a robust monitoring and evaluation framework to measure and report annually on performance in tackling the challenges and achieving the outcomes at a national, regional and local level. A summary of the work to-date on indicators is presented in Annex A of the draft NTS2.

Also, the Policy Assessment Framework (PAF) is a tool in STAG to assist early appraisal of a number of intervention options and to present outputs in a clear visual format. The purpose is to improve the ease of comparing options and make the assessment more balanced. The PAF is intended to help redress the balance away from Benefit to Cost Ratio (BCR) decision-making in appraisal.

The current PAF is made up from a range of published policy documents which form a hierarchy of policy objectives. There is also a functionality within the PAF to assess how options perform against criteria relating to deliverability and risk on a three point scale. The first tier of objectives are currently taken from the NTS high level objectives that map up to three key Strategic Outcomes. The secondary objectives are presently compiled from the Strategic Transport Projects Review (2008); National Performance Framework and a specific objective relating to transport integration originates from STAG.

The PAF will be updated in STAG to reflect the outcomes of the NTS2 when the final strategy is published by the end of 2019 and revised National Performance Framework outcomes.

Question
3. STAG currently uses five criteria (Accessibility & Social Inclusion, Economy, Environment, Integration and Safety) for the appraisal of interventions. Do you think the five STAG criteria and their sub-criteria are still 'fit for purpose' or do you think they should be changed and, if so, to what?

3.3 Gender Pay Gap

The Gender Pay Gap Action Plan was published on the 8th March 2019. This Action Plan seeks to continue to reduce the gender pay gap for employees in Scotland by the end of this Parliamentary term (May 2021) and to tackle the labour market inequalities faced by women, particularly disabled women, older women, minority ethnic women, women from poorer socio-economic backgrounds and women with caring responsibilities.

Under this action plan there is a specific transport commitment to: *undertake research into how transport infrastructure investment impacts on the gender pay gap in transport appraisal; this will then be incorporated into the Scottish Transport Appraisal Guidance (STAG).*

Question
4. What evidence do you have that considers how transport investment decisions impact on the gender pay gap?

3.4 Inclusive Growth

Scotland's Economic Strategy, published in 2015, brings increased focus to the dual objectives of boosting competitiveness and tackling inequality, and sets out the priorities to achieve these mutually reinforcing goals. Inclusive growth is defined by the Scottish Government as *'growth that combines increased prosperity with greater equity; that creates opportunities for all and distributes the dividends of increased prosperity fairly'.* This definition encompasses the ambition to grow the economy and, at the same time, create a fairer Scotland.

Inclusive growth is also central to the refreshed National Performance Framework with the purpose '*To focus on creating a more successful country with opportunities for all of Scotland to flourish through increased wellbeing, and sustainable and inclusive economic growth.'*

Why this focus on inclusive growth? There is recognition, supported by emerging international [evidence](), that inequality is a drag on the economy and harmful to not only growth, but also social cohesion over the long-term. Therefore, it is damaging one of the key tools supporting tackling inequality.

Inclusive growth is considered in STAG through:
- **Pre-Appraisal** - the identification of evidenced problems and opportunities provides the opportunity to consider whether there are aspects related to quantifiable elements of inclusive growth e.g. social mobility; access to services.
- **Stakeholder Consultation** is a key thread throughout the appraisal process. The views of stakeholders can inform assessing inclusive growth problems and opportunities as part of the information gathering underpinning a Transport Appraisal in a study area.
- **STAG is objective led** - if evidenced problems or opportunities relating to inclusive growth are identified then the Transport Planning Objectives should reflect this.
- **STAG is multi-modal** and provides a framework to assess different modes.
- The **Accessibility and Social Inclusion Criterion** includes elements associated with inclusive growth through the two sub-criteria of Community Accessibility and Comparative Accessibility.
- The **Integration Criterion** also contains elements of inclusive growth and includes three sub-criteria: Transport Integration; Transport and Land-Use Integration and Policy Integration. The Integration Criterion also incorporates the Policy Assessment Framework (PAF) referred to previously.

The draft NTS2 proposes that Transport Scotland will review and update STAG and investment decision-making processes to strengthen the approach to capturing equalities. This is in direct response to the findings of the Equality Impact Assessment (EqIA) undertaken as part of the development of the draft NTS2.

Questions
5. 5a) How could STAG be strengthened to assess the inclusive growth and equalities impacts of options?
   5b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

3.5   Climate Emergency

Scotland is a responsible global citizen with a moral obligation to contribute to the challenge of climate change and to influence others to do the same. In April 2019 the First Minister declared a Global Climate Emergency and in June 2019 the Parliament's Environment Committee voted in favour of a net-zero greenhouse gas emissions target for 2045 and to raise the ambition of the 2030 and 2040 targets to 70% and 90% emissions reductions respectively. Scotland will be carbon-neutral, meaning net-zero CO_2, by 2040 at the latest.

Latest greenhouse gas emissions statistics (2017 data) show actual emissions are down 3.3% since 2016. Emissions from transport, business & industrial processes, and waste management all increased over the year from 2016-2017. Within transport, increases from cars, light goods vehicles and international aviation are most pronounced (2.3%, 6.5% and 6.8% since 2016, respectively).

It is acknowledged that transport is Scotland's biggest emitting sector and that greenhouse gas emissions from transport have been rising since 2014. This is not unexpected as transport is a derived demand and intrinsically linked to economic growth. Existing plans for transport, including our ambition to phase out the need for new petrol and diesel cars and vans by 2032, will see the greatest emissions reduction, in absolute terms, of any sector over the lifetime of the Climate Change Plan.

Further action to decarbonise transport is, however, required to meet the new climate change targets. To this end, the draft NTS2 identifies climate change action as a priority and future investment decisions will be required to demonstrate how they support the NTS2.

The Environment criterion in STAG covers a number of sub-criteria, including Global Air Quality which considers CO_2 emissions arising from options. Local air quality is also considered, with key pollutants considered in STAG concerning NO_2 and PM_{10} (of primary concern in terms of health) and together are taken to account for local air quality.

Questions
6. 6a) How could STAG be strengthened to consider the contribution of options to the net-zero carbon target?
   6b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

3.6   Embedding a Sustainable Travel Hierarchy

In order to deliver the draft NTS2, the Strategy outlines that Scottish Government will take immediate action in three key areas: Increasing Accountability; Strengthening Evidence; and Managing Demand.

Embedding the Sustainable Travel Hierarchy in decision making - promoting walking, wheeling, cycling, public transport and shared transport options in preference to single occupancy private car use is a key policy in the draft NTS2 to support managing the demand for travel.

STAG is multi-modal, applicable in different settings and provides a framework to impartially consider the different impacts of options against a multi-criteria framework. However, through the development of the draft NTS2 and early engagement activities undertaken as part of the second Strategic Transport Projects Review, the appraisal of sustainable travel options and active travel in particular has been raised. It is apparent that despite the multi-modal and multi-criteria principles of STAG, the current appraisal framework can be perceived as giving prominence to options that demonstrate higher journey time savings and does not necessarily provide a level footing to the appraisal of different types of options or consideration of impacts now of a higher focus in an evolving policy landscape, for example the health dis-benefits of more sedentary car-based travel.

In response, the draft NTS2 proposes that Transport Scotland will review and update STAG and investment decision-making processes to strengthen the approach to capturing sustainable transport impacts.

Questions
7. 7a) How could STAG be strengthened to support the assessment of sustainable transport impacts and performance of these modes in transport appraisal?
   7b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

3.7   Place

Place is where people, location and resources combine to create a sense of identity and purpose, and is at the heart of addressing the needs and realising the full potential of communities. Places are shaped by the way resources, services and assets are directed and used by the people who live in and invest in them. Place is also relevant at different scales – Scotland as a place, regional and strategic places, and local places and neighbourhood.

The Scottish Government and Coalition of Scottish Local Authorities (COSLA) have agreed to adopt the Place Principle as a means of taking a more joined-up, collaborative approach to services and assets within a place to achieve better outcomes for people and communities. The principle aims to promote a shared understanding of place, and the need to take a more joined-up, collaborative approach to services and assets within a place to achieve better outcomes for people and communities. The principle is not prescriptive – rather, it encourages and enables local flexibility in responding to issues and circumstances in different places.

The principle supports that all those responsible for providing services and looking after assets in a place need to work and plan together, and with local communities, to improve the lives of people, support inclusive and sustainable economic growth and create more successful places.

In line with the Place Principle, the draft NTS2 outlines the promotion of a more joined up, collaborative and participative approach to assets and services to create a better Scotland. The draft NTS2 recognises that to create successful places in the future, there is also a need to manage demand supported by a Sustainable Travel Hierarchy promoting walking, wheeling, cycling, public transport and shared transport options in preference to single occupancy private car use.

Within STAG, the Accessibility and Social Inclusion criterion involves a detailed appraisal of accessibility impacts defined by the ability of people and businesses to access goods, services, people and opportunities. This includes consideration of local accessibility within and between communities - the measurement of opportunities to walk or cycle to services and facilities, including severance arising from proposed changes.

The Integration criterion within STAG also considers:
- Integration within and between different modes of transport – so that each contributes its full potential and people and goods can move easily between them.
- Integration of transport with the environment – so that our transport choices support a better environment.
- Integration between transport and land-use planning – at the Scotland and local level, so that the two work together to support more sustainable travel choices and reduce the need to travel.
- Integration of transport and our policies for education, health and wealth creation – to make a fairer, more inclusive society.

Further, stakeholder consultation and participation involving different interests is a core thread throughout each stage of a Transport Appraisal being undertaken in accordance with STAG. Bringing together different stakeholder interests at the outset and throughout an appraisal, in turn supports collaboration and joined up working as part of the wider Place Principle.

Questions
8. 8a) How could STAG be strengthened to better articulate the impact of options on Place?
    8b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

4. Scenario Planning for Handling Uncertainty

4.1 Background

Sections 2 and 3 have focused on the Transport Appraisal framework and key areas for future consideration around the STAG process. Sections 4 to 6 consider the information to support evidence based Transport Appraisals following STAG together with the modelling and analysis to assess the current transport network and wider socio-economic context as well as the performance of different options.

The future planning, delivery and operation of the transport network comes with increasing uncertainty. This reflects uncertainty over the demand for travel and how trips of the future will be undertaken as technology advances. Further, the uncertainty is also driven by unknowns in terms of climate change and what this means and will require from the future transport network in terms of resilience to the consequences of a warming climate and the policies that will emerge to deliver net-zero greenhouse gas emissions in Scotland by 2045.

4.2 Future Travel Demand – how much and by what means?

Transport Scotland published Transport Forecasts 2018 which primarily focusses on covering strategic trunk road and rail demand for the period up to 2037. Transport Scotland's primary forecast of demand in 2037 from a 2014 base is:
- 37% increase in road traffic miles.
- 7% decrease in Urban and a 5% decrease in Inter-urban bus passenger miles.
- 42% increase in rail passenger miles.

The primary forecast of demand is underpinned by a long list of assumptions about the future. However, the forecasts are not designed to be self-fulfilling. That is, the predictions of future demand are not 'set in stone', but will change and adapt as new interventions are brought forward and people's behaviour changes. To this end, Transport Scotland, like other Government departments, is contending with shaping policy making and investment in the face of uncertainty. Potentially disruptive transport technologies are only part of a more complex picture of societal change that will determine the nature and extent of future travel demand.

4.3 Scenario Planning

The New Zealand Ministry of Transport has been working to improve the decision-making frameworks they apply on transport issues. Further information can be found here. The work of the New Zealand Ministry of Transport also inspired the CIHT Futures project. Professor Glenn Lyons, who led on this work, has gone on, in collaboration with Mott MacDonald, to create a FUTURES toolkit.

Transport Scotland contributed to a roundtable table discussion on "Handling Uncertainty in Transport Planning and Decision Making" in July 2018 with a number of other practitioners involved in Scenario Planning. This explored a number of questions on the application of Scenario Planning to transport planning.

From these foundations, Transport Scotland introduced Scenario Planning into the development of the draft NTS2. Scenario Planning has been and continues to be used very successfully by organisations who work in an uncertain world. In essence, it seeks to establish:
- Those factors which are important to driving the outcomes being sought.
- Investigate those factors which are either "out of control" or can be left to be "out of control" to create a set of without-policy Plausible Futures.
- Test different strategies to see how to move from each without-policy Plausible Future to achieve desired outcomes.

The Scenario Planning Process Report detailing the application of this work was published alongside the draft NTS2. The principles of Scenario Planning will be taken forward into the appraisal of the second Strategic Transport Projects Review and we plan to include Scenario Planning in our appraisal guidance.

Questions
9. What do you see as being the main challenges to introducing Scenario Planning into Transport Appraisal?
10. How can we communicate effectively the impact of uncertainty about the future of transport on the options to Decision Makers?

5. Land-use, Transport and Traffic Modelling

5.1 Background

Land-use, Transport and Traffic models form a significant part of the toolkit for the quantitative assessment of transport planning and the development of Business Cases.

Working both alone and with a number of other Regional Transport Partnerships (RTPs) and Local Authorities (LAs), Transport Scotland has developed a range of land-use, transport and traffic models. These models are available for use on a variety of projects.

However, creating models is complex, time-consuming, data intensive and costly. Having a model with every possible mode of travel, at every scale from a short walk trip to an international flight, for all times of the day, and all days of the year, etc. is impossible. There is a need to prioritise what goes into our models.

The following sections identify some of the reasons and areas we've identified that could drive the future development of models in Scotland. This is not an exhaustive list.

5.2 Policy and Appraisal

The draft NTS2 vision, priorities and outcomes (see the 'Changing Policy Landscape' section) along with the indicators will influence how interventions are appraised and thus how models develop as they need to provide new quantitative evidence.

Question
11. What additional non-Scottish Government policy documents do you think could influence our future modelling strategy and how?

5.3 Travel Choices

As discussed in the previous section, there is increasing uncertainty about the future of transport. This comes from a range of choices we have:

- The 'supply' of transport may include major changes in what is available for the movement of people and goods such as Connected and Autonomous Vehicles (CAVs), drones for deliveries, Mobility as a Service (MaaS), micro-mobility (e-scooters), e-bikes, etc. as well as existing modes of travel.
- The demand to travel is changing with the potential for trips NOT to take place physically but virtually. For example, the way we work is changing with more flexible working options for many or zero-hour contracts changing how often we work and how certain we are of work.
- There are societal pressures to change our behaviour on how we travel due to the impact of travel on the climate, on local air quality, on the quality of place, etc.

5.4 Model Uses

The primary purpose behind the development of the land-use and transport modelling suite of models in the Strategic Transport Planning branch of Transport Scotland has been for the appraisal of transport interventions for Strategic Business Cases. The models can be used for many other reasons though. These include:

- Database for other models and studies such as Development Management.
- Event and Roadworks Planning.
- Resilience Planning.
- Development Planning.
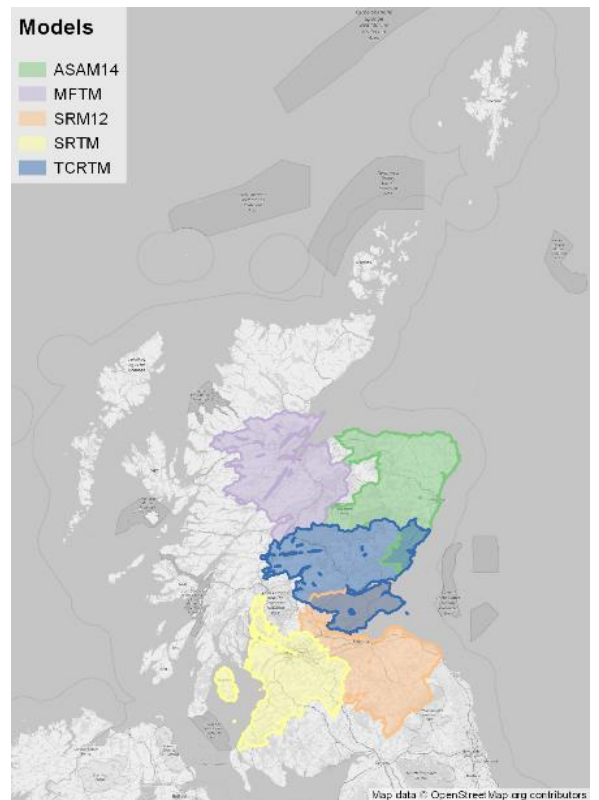- Real-time Operations.
- Accessibility Studies.

Using the models for purposes other than Strategic Business Cases can be challenging though as they were not designed for that purpose. There is, however, a need to ensure the models have a broad use as far as this is manageable.

5.5   Model Coverage

The national models (Transport Economic Land Use Model of Scotland - TELMoS and Transport Model for Scotland - TMfS) cover the whole of Scotland although representation of travel is focussed on the mainland and links to the islands. There are a number of sub-national models generally developed in partnership with Regional Transport Partnerships and Local Authorities. These are primarily focussed on the Scottish cities and their travel to work areas (see Figure):

- Aberdeen Sub-Area Model (ASAM) – Aberdeen.
- Moray Firth Transport Model (MFTM) – Inverness.
- SEStran Regional Model (SRM) – Edinburgh.
- Strathclyde Regional Transport Model (SRTM) – Glasgow.
- Tay Cities Regional Transport Model (TCRTM) – Perth and Dundee.

There is a balance between how frequently the models are updated, are enhanced and any new models developed.

Map data © OpenStreetMap.org contributors

Question
12. What should our priorities be for the future of our modelling suite? For example, Modes of transport, Spatial coverage, Temporal coverage, Frequency of updates, Journey purposes, etc.

6.   Data

6.1   Background

Data underpins transport planning from making the 'Case for Change' to modelling to the completion of the project evaluation. It will also be important for monitoring how we deliver the next National Transport Strategy. The draft NTS2 gives suggestion in Annex A of indicators we may use and the related application which is a Review of 2006 National Transport Strategy Indicators looks at the "lessons that can be learned for the development of outcomes for 'NTS2'". These include:

- Be clear about what success and failure looks like.
- Map out how indicators work together or conflict with each other and ensure that the final overall assessment of performance is considered in light of these features.
- Try to ensure there is adequate coverage of all important aspects of the outcome in question and consider whether subnational data is an acceptable proxy for something that is not feasible to gather nationally.
- Where possible, clearly set out appropriate comparison groups in advance that performance in Scotland on a given indicator can be contrasted against.
- Consider how differential impacts of strategy on different groups in society can be incorporated into a measurement framework.
- Set out a measurement framework clearly in advance to avoid being unable to assess progress in the future due to scarcity or discontinuation of data sources.

Allied to the need for data is the need to make data open (Scottish Government Open Data Strategy), yet also where relevant to protect data under the General Data Protection Regulations.

Anecdotal and contractual evidence shows that historically data collation is time-consuming, costly and subject to considerable quality assurance challenges.

Somewhat contrary to this, transport data availability is moving potentially from one of paucity to plenty through the availability of 'big data' usually from third party suppliers.

Questions

13. Where do you currently look for existing Land-use and Transport Datasets? Please include both open and non-open datasets.
14. What data isn't currently available but would be feasible to obtain with proportionate effort? Please explain why?

7. Monitoring and Evaluation

7.1 Background

Post-Appraisal is the fourth stage of the appraisal process. This part of the appraisal framework centres on the monitoring and evaluation of a transport project.

Monitoring involves an ongoing process of gathering and interpreting information on the performance of a project post-implementation. Evaluation in turn considers whether:

- The objectives of a project were met?
- The project is performing as predicted and actual outcomes as forecast?
- The project was delivered on time and to budget?

The Scottish Government and Transport Scotland require monitoring and evaluation to be undertaken and documented for any project for which it provides funding or approval.

7.2 Monitoring and Evaluation in Practice

It is important to consider the scope of monitoring activity during STAG to support the gathering of relevant and appropriate information to assess the impact of a project after implementation. The Monitoring Plan should form an integral part of the development and implementation of projects, selecting measurable indicators of progress towards meeting the Transport Planning Objectives, performance against the STAG Criteria and evaluating the impacts of the project on established policy directives.

For the purposes of STAG, a proposed Evaluation Plan is required to be reported outlining the scope and timing of the Evaluation to be undertaken together with an Evaluation Summary Table (EST) to report out-turn performance and impacts following implementation. The Evaluation Plan should be developed at an early stage to outline the general boundaries of the proposed evaluation including:

- Questions it seeks to answer.
- Resource requirements.
- Data collection requirements.
- Provisional timing and cost.
- Who should be consulted.

The requirements in STAG are complemented by the Scottish Trunk Road Infrastructure Project Evaluation (STRIPE) which provides a framework for the evaluation of road schemes costing over £5 million. The approach provides for up to three key post-opening evaluation phases - Initial 1 Year After and Detailed 3 and/or 5 Year After Evaluation. Alongside STRIPE, there is the Guidance for the Evaluation of Rail Projects which recommends a Stage 1 evaluation around a year following the completion of a project and Stage 2 evaluation typically 3 - 5 years after the completion of a project.

As well as the opportunity to monitor and evaluate the impact of an individual project, this stage also offers the opportunity for learning and lessons to be carried forward into future Transport Appraisals. While Post-Appraisal is an integral part of the appraisal framework, it is however not always given the required attention in Transport Appraisals and opportunity for learning also not fully realised. Early consideration of monitoring and evaluation at the appraisal stage will contribute to the robustness of the appraisal findings as well as Post-Appraisal. For example, the setting of TPOs which are **S**pecific; **M**easurable; **A**ttainable; **R**elevant and **T**imed (SMART) is important to informing a robust appraisal as well as understanding whether the objectives of a project were achieved through evaluation activities.

Question
15. Do you consider there are potential opportunities to strengthen the link between project evaluations and the appraisal process and, if so, what are they?

8.   Application of STAG

8.1   Background

It is recognised that the derived demand nature of transport and cross-cutting policy landscape together with ongoing research and development into appraisal techniques has introduced further elements to Transport Appraisal.

Proportionate application remains integral to the application STAG supported by Transport Scotland through the User Group forum. This is complemented by the involvement of Transport Scotland at the individual project level primarily through the roles of direct Client, Client Steering Group member, project advisory or in a stakeholder funding and/or strategic transport network capacity.

8.2   STAG in Practice

Engagement through transport appraisals and informal feedback have together identified that the application of STAG can be a challenge from different perspectives – be this the:
- Client setting the brief for a study to be undertaken in accordance with STAG.
- Practitioner/consultant team required to follow the STAG approach to a defined budget and timeframe.
- Reporting being clear and robust that presents a compelling and convincing case for change, accurately reflecting key risks and uncertainties in relation to the Transport Appraisal.
- Investment decision maker accountable for taking a decision on the work and findings of a Transport Appraisal underpinned by STAG.
- Stakeholders consulted as part of a study following the STAG process.

Questions
16. Do you face any challenges in the application of STAG and associated reporting; if so, what practical recommendations would you like to suggest?
17. What would make STAG more accessible, for example do you prefer pdf, html, word or other document format and do you have examples of alternative guidance formats that you would recommend?

8.3   Wider Guidance

STAG does not operate in a vacuum and has an interface with other Transport Scotland Guidance. For example, Guidance on the Development of Business Cases sets out that STAG can be seen as forming a key part of the Strategic Business Case for a project and Development Planning and Management Transport Appraisal Guidance is consistent with the principles of best practice contained in STAG.

Question
18. We plan to review these guidance documents in due course. Are there any points relating to other Guidance or indeed anything else concerning Transport Appraisal and Modelling in Scotland that you would like to take the opportunity to raise for consideration by Transport Scotland?

Annex A: Full list of User Survey Questions

1. Do you consider there are further changes required to the Initial Appraisal: Case for Change stage of STAG? If so, what further changes do you suggest are required?
   For example: terminology, where to source data; how to be proportionate; roles and responsibilities of decision makers; how to better draw out opportunities [see Annex B for many other examples]

2. Transport is a derived demand. At the options generation stage of the Initial Appraisal we usually restrict ourselves to interventions in the transport system. Should we also be thinking wider about land-use; the role of digital in substituting travel and other non-transport interventions? If so, do you have information about any studies/research of relevance to how this should be approached?

3. STAG currently uses five criteria (Accessibility & Social Inclusion, Economy, Environment, Integration and Safety) for the appraisal of interventions. Do you think the five STAG criteria and their sub-criteria are still 'fit for purpose' or do you think they should be changed and, if so, to what?

4. What evidence do you have that considers how transport investment decisions impact on the gender pay gap?

5. a) How could STAG be strengthened to assess the inclusive growth and equalities impacts of options?
   b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

6. a) How could STAG be strengthened to consider the contribution of options to the net-zero carbon target?
   b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

7. a) How could STAG be strengthened to support the assessment of sustainable transport impacts and performance of walking, wheeling, cycling, public transport and shared transport options in transport appraisal?
   b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

8. a) How could STAG be strengthened to better articulate the impact of options on Place?
   b) Do you have information about any studies/research in this field relevant to STAG that you are able to share?

9. What do you see as being the main challenges to introducing Scenario Planning into Transport Appraisal?

10. How can we communicate effectively the impact of uncertainty about the future of transport on the options to Decision Makers?

11. What additional non-Scottish Government policy documents do you think could influence our future modelling strategy and how?

12. What should our priorities be for the future of our modelling suite? For example, Modes of transport, Spatial coverage, Temporal coverage, Frequency of updates, Journey purposes, etc.

13. Where do you currently look for existing Land-use and Transport Datasets? Please include both open and non-open datasets.

14. What data isn't currently available but would be feasible to obtain with proportionate effort? Please explain why?

15. Do you consider there are potential opportunities to strengthen the link between project evaluations and the appraisal process and, if so, what are they?

16. Do you face any challenges in the application of STAG and associated reporting; if so, what practical recommendations would you like to suggest?

17. What would make STAG more accessible, for example do you prefer pdf, html, word or other document format and do you have examples of alternative guidance formats that you would recommend?

18. We plan to review these guidance documents in due course. Are there any points relating to other Guidance or indeed anything else concerning Transport Appraisal and Modelling in Scotland that you would like to take the opportunity to raise for consideration by Transport Scotland?

Annex B: Transport Appraisal and Modelling in Scotland User Group – 10 September 2019: Workshop Outputs

See separate document