



TRANSPORT SCOTLAND

SCOTTISH TRUNK ROAD INFRASTRUCTURE PROJECT EVALUATION (STRIPE)

Final Guidance



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(STRIPE)

Final Guidance
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ABBREVIATIONS

AADT	Annual Average Daily Traffic
BCR	Benefit to Cost Ratio
CO ₂	Carbon Dioxide
ES	Environmental Statement
DMRB	Design Manual for Roads and Bridges
EALI	Economic Activity Location Impact
HRA	Habitat Regulations Assessment
NESA	Network Evaluation from Survey and Assignment
NISR	Noise Insulation (Scotland) Regulations
NO ₂	Nitrogen Dioxide
NPV	Net Present Value
PEP	Project Execution Plan
PM ₁₀	Particulate Matter
POPE	Post Opening Project Evaluation
PVB	Present Value of Benefits
PVC	Present Value of Costs
ROAMEF	Rationale, Objectives, Appraisal, Monitoring, Evaluation and Feedback
SEA	Strategic Environmental Assessment
SPFM	Scottish Public Finance Manual
SCOT-TAG	Scottish Transport Analysis Guide
STAG	Scottish Transport Appraisal Guidance
STRIPE	Scottish Transport Infrastructure Project Evaluation
TUBA	Transport User Benefit Appraisal
WEBS	Wider Economic Benefits
EALI	Economic Activity & Location Impacts

STRIPE: AN OVERVIEW



1 INTRODUCTION TO STRIPE

1.1 What is STRIPE?

1.1.1 STRIPE is the **Scottish Trunk Road Infrastructure Project Evaluation** guidance. It has been developed to provide a framework for Transport Scotland to evaluate projects in the Scottish Motorway and Trunk Road Programme.

1.1.2 It has been designed to consider the following core questions:

- Were the scheme's Transport Planning Objectives achieved and benefits realised?
- Were the outturn impacts of the project as forecast?
- How well was the project implemented?
- What were the impacts on established policy directives?
- What lessons can we learn to improve decision-making?

1.1.3 This guidance is aimed at anyone involved in the evaluation of Trunk Road Schemes in Scotland.

1.2 What are the requirements of STRIPE?

1.2.1 In accordance with Scottish Transport Appraisal Guidance (STAG), Transport Scotland requires evaluation to be undertaken and documented for any project for which it provides funding. STRIPE should be considered by practitioners as the overarching guidance for this evaluation in the context of interventions on the Trunk Road network, regardless of funding source.

1.2.2 STRIPE is applied to all projects listed within Transport Scotland's Motorway and Trunk Road Programme (costing over £5m). These evaluations are undertaken by Transport Scotland, specifically the Technical Analysis Branch within Major Transport Infrastructure and Projects and their Evaluation Advisor¹.

1.3 Who is responsible for STRIPE?

1.3.1 Within Transport Scotland, MTRIPS has overall responsibility for ensuring STRIPE is executed effectively and that post-opening evaluation is undertaken. It, however, is the responsibility of all professionals involved in the development of a scheme to plan for its effect evaluation.

1.4 What are the benefits of STRIPE?

1.4.1 By applying STRIPE, Transport Scotland benefits from:

- an early indication of project performance so that any potential issues are identified and addressed;
- more effective project design and post-opening mitigation by examining whether projects are operating as expected and how they are performing against their objectives;
- improved appraisal techniques by comparing the accuracy of project forecasts;

¹ Advisor role typically performed by a Consultant appointed by Transport Scotland to provide advice on traffic and transportation related matters.

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- improved processes for project design, management and implementation by considering how a project was implemented;
- improved investment decision making by increased understanding of the critical elements which deliver value for money schemes; and,
- improved and demonstrable public accountability.

1.5 Policy Context

1.5.1 STRIPE has been developed taking into account the differing requirements on Transport Scotland in undertaking the evaluation of major trunk road projects from the following key documents:

- **HM Treasury's The Green Book: Appraisal and Evaluation in Central Government**²;
- **HM Treasury's The Magenta Book: Guidance for evaluation**³;
- **The Scottish Public Finance Manual (SPFM)**⁴;
- **Scottish Transport Appraisal Guidance (STAG)**⁵; and,
- **Design Manual for Roads and Bridges (DMRB)**⁶.

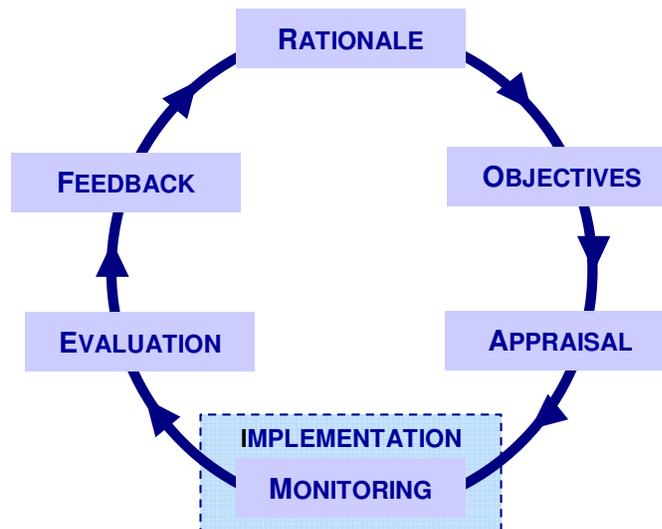


Figure 1 HM Treasury: Rationale, Objectives, Appraisal, Monitoring, Evaluation and Feedback (ROAMEF) Cycle

² HM Treasury's The Green Book: Appraisal and Evaluation in Central Government <http://www.hm-treasury.gov.uk/greenbook>

³ HM Treasury's The Magenta Book: Guidance for evaluation <https://www.gov.uk/government/publications/the-magenta-book>

⁴ The Scottish Public Finance Manual (SPFM) <http://www.gov.scot/Topics/Government/Finance/spfm/Intro>

⁵ Scottish Transport Appraisal Guidance (STAG) <http://www.transport.gov.scot/stag>

⁶ Design Manual for Roads and Bridges (DMRB) <http://www.dft.gov.uk/ha/standards/dmr/>

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- 1.5.2 **HM Treasury's The Green Book: Appraisal and Evaluation in Central Government** requires that government agencies undertake project evaluation to ensure that lessons learned are identified, communicated and applied when assessing new proposals. To maximise the benefit of project evaluation, The Green Book requires that evaluation be integrated within the project development, implementation and review process as illustrated by the ROAMEF Cycle in Figure 1 above.
- 1.5.3 Published in 2011, the **HM Treasury's Magenta Book** is "the recommended central government guidance on evaluation that sets out best practice for departments to follow". The guidance distinguishes between types of evaluation:
- Process evaluation – how was the policy or project delivered?
 - Impact evaluation – what difference did the policy make?
 - Economic evaluation – did the benefits justify the costs?
- 1.5.4 **SPFM** is issued by the Scottish Ministers to provide guidance to the Scottish Government and other relevant bodies (including Transport Scotland) on the proper handling and reporting of public funds. It advocates that appraisal and evaluation are essential parts of good financial management whenever a proposal (project, programme or policy related) has implications on public expenditure / use of resources. Under SPFM, major investment projects require the preparation of a post-project evaluation report, the main aims of which are:
- to evaluate the procurement process;
 - to review the success of the project against its original objectives;
 - to evaluate its performance in terms of time, cost and quality outcomes and against key performance indicators; and,
 - to consider whether it has delivered value for money.
- 1.5.5 **STAG** is applicable to all transport projects requiring funding, support or approval by the Scottish Government. It defines evaluation as "*a detailed, one-off objective driven review or audit of a project's performance*" and requires that a Process and Outcome Evaluation be undertaken.
- 1.5.6 Transport Scotland has been undertaking the evaluation of its Trunk Road Projects through a "Before & After Monitoring" programme for several years. The rationale for the programme lies in **DMRB**, Volume 5, SH 1/97 The Traffic and Economic Assessment of Road Schemes in Scotland, which states that the aims are:
- *"to satisfy the demands of good management and public accountability by providing the answers to questions about the effect of a new or improved road,*
 - *to identify the strengths and weaknesses in the techniques used for appraising schemes, so that confidence in the roads programme is maintained,*
 - *to allow the predictive ability of the traffic or transport models used to be monitored to establish whether any particular form of model is consistently more reliable than others when applied to particular types of schemes, and*
 - *to assist in the compensation under Part 1 of the Land Compensation (Scotland) Act 1973 for depreciation due to the physical factors caused by the use of public works."*

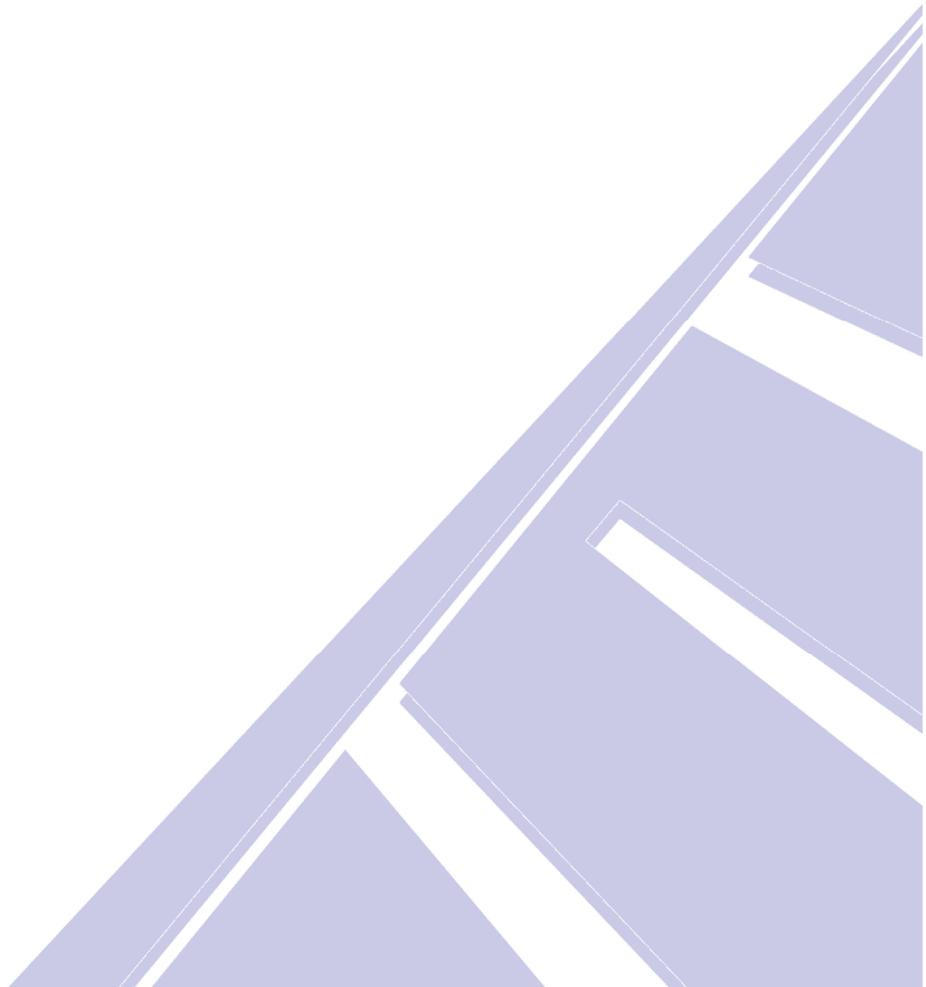
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- 1.5.7 Whilst SH1/97 provides no additional guidance on the methodology or reporting requirements of the Before & After Monitoring process, Transport Scotland has produced annual Before & After Reports since 1987 which provided a foundation for the development of STRIPE.
- 1.5.8 Highways England undertakes the evaluation of its Major Schemes through its **Post Opening Project Evaluation (POPE)** programme. POPE evaluates against a wide range of quantitative and qualitative issues under Environment, Safety, Economy, Accessibility and Integration objectives. The STRIPE guidance has recognised that lessons learned are not limited by geographic boundaries and that commonality (as appropriate) with the Highways England POPE programme provides an opportunity for cross-border learning.
- 1.5.9 Finally, STRIPE is consistent with the requirements of Audit Scotland's Good Practice Checklists⁷, as applied to Transport Scotland's Project Execution Plans (PEP) for trunk road schemes. Overall, STRIPE is an integral part of how trunk road schemes are delivered and is therefore linked to the PEP for each scheme. This is discussed in more detail within the STRIPE Guide for Project Managers.

⁷ Audit Scotland's Good Practice Checklists http://www.audit-scotland.gov.uk/docs/central/2008/nr_080624_major_capital_projects_checklist.pdf

THE STRIPE METHODOLOGY



2 PLANNING FOR EVALUATION

2.1 Overview of the STRIPE Process

2.1.1 Whilst much of the work within STRIPE occurs post-scheme opening, the STRIPE process applies to the entire development of a trunk road scheme – from the development of Transport Planning Objectives, through the Decision to Invest, and post-construction. The STRIPE process is summarised in Figure 2 below.

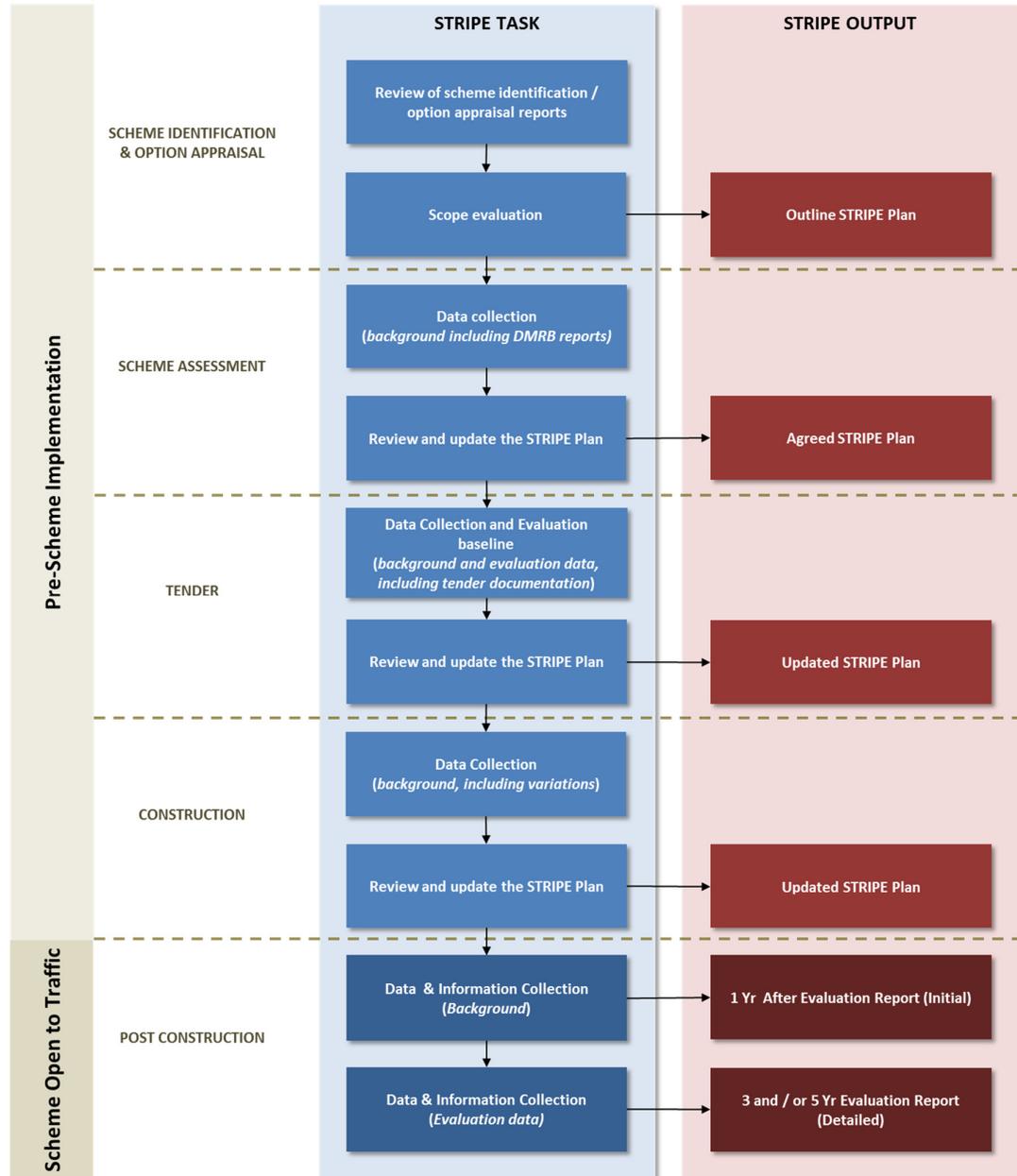


Figure 2 STRIPE Process

2.2 Key Requirements of STRIPE

2.2.1 STRIPE is focused on a number of key requirements, as follows:

- Timing of evaluation – Initial Evaluation 1 Year After Opening, and Detailed Evaluation 3 and/or 5 Years After Opening.
- The STRIPE Plan – the ‘framework’ for the evaluation.
- Background information and evaluation data.
- Proportional Evaluation.

2.2.2 These core elements are described in further detail below.

2.3 Timing of Evaluation

2.3.1 The STRIPE programme provides for up to three key post-opening evaluation phases:

- **Initial Evaluation: 1 Year After Opening Evaluation:** to provide Transport Scotland with an early indication (as far as is practicable) that the project is operating as planned and is on-track to achieve its objectives. The 1 Year After Opening evaluation also provides a Process Evaluation including an assessment of actual vs. forecast project cost, and programme together with reasons for variance.
- **Detailed Evaluation: 3 and / or 5 Years After Opening** – as, on many projects, impacts are likely to take longer to materialise, a second evaluation, three and / or five years after opening is required. The default time period for this evaluation is at the 3 Year After point. However, for some projects, an additional 5 Year After evaluation may also be required (see below). This second evaluation considers a project’s impacts in the context of data gathered over a longer post-opening timescale. In addition to reviewing some of the elements covered by the Initial Evaluation, it offers a greater focus on whether a scheme has achieved its objectives.

2.3.2 Guidance on the methodologies to be adopted for the Initial and Detailed Evaluations is provided in the Evaluation Toolkit presented in Section 3. Formal evaluation reports are prepared and are the key outputs of these evaluation phases. Transport Scotland’s Evaluation Advisor is author of these reports, liaising with relevant Transport Scotland Project Manager/s and stakeholders as required. These reports are published.

2.3.3 The 1 Year After Opening report should provide:

- Background to the project including the pre and post opening comparison of operational indicators.
- A summary of the data sources and processes used within the evaluation.
- A summary of performance against the process criteria.
- Confirmation of whether there are any indications that a project will not achieve its Objectives and an assessment of its contribution to any Wider Policy / Transport Objectives.
- An evaluation of the project as set out in the Evaluation Toolkit under Environment, Safety, Economy, Accessibility & Social Inclusion, Integration and Cost to Government.
- Summary of lessons learned and any implications for the detailed evaluation.

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2.3.4 A Detailed Evaluation Report at the 3 Year After point should include the following:

- Background to the project including the pre and post opening comparison of operational indicators.
- A summary of the data sources and processes used within the evaluation.
- An assessment of whether the project achieved its Transport Planning Objectives and its contribution to any Wider Policy / Transport Objectives.
- An evaluation of the project as set out in the Evaluation Toolkit under Environment, Safety, Economy, Accessibility & Social Inclusion, Integration and Cost to Government.
- Summary of key findings from the overall evaluation.
- A summary of lessons learned with action points for Transport Scotland if applicable.

2.3.5 If required, a further Detailed Evaluation Report at the 5 Year After point should focus on the following:

- Drawing together outcomes from all previous evaluation findings.
- An assessment of whether the project has achieved its Objectives and its contribution to any Wider Policy / Transport Objectives.
- An evaluation of the project as set out in the Evaluation Toolkit under Environment, Safety, Economy, Accessibility & Social Inclusion, Integration and Cost to Government.
- Summary of key findings from the overall evaluation.
- A summary of lessons learned with action points for Transport Scotland if applicable.

2.4 The STRIPE Plan

2.4.1 Early planning is fundamental for successful evaluation and should start during option appraisal, where an Evaluation Plan is developed as part of the business case process to outline, in general terms, how the evaluation will be undertaken. STRIPE should be used to support this work for trunk road schemes.

2.4.2 Once the decision has been taken to take a Trunk Road project further through the scheme assessment phase, it is appropriate for the first draft STRIPE plan to be developed. This ensures that the requirements (and potential cost) of evaluation are understood from the outset, that data collection is planned for appropriately and key background documents are archived throughout the process.

2.4.3 The STRIPE plan acts as a management plan for the evaluation and provides for the following:

- Capturing basic background information on the project including the agreed Transport Planning Objectives and scheme benefits, together with project programme and cost estimates throughout the project development phases;
- The proposed approach to the evaluation including the level of evaluation to be undertaken, the indicators to be used and the rationale for the approach;
- The timescales for evaluation and a programme of actions; and

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- Any other issues of importance to the evaluation.
- 2.4.4 Transport Scotland's Evaluation Advisor is responsible for working with the scheme Project Manager to advise on evaluation requirements, and to develop the STRIPE plan specifically. The Project Manager of the scheme at the relevant stage (e.g. design, construction) is the 'keeper' of crucial information on the scheme as it develops, and works alongside the Evaluation Advisor when required.
- 2.4.5 The STRIPE plan is reviewed and updated at key stages, the most crucial being at the completion of the DMRB scheme assessment stage. This ensures that opportunities are realised for the capture and storage of any additional pre opening data prior to construction alongside any background data of relevance to the evaluation.
- 2.4.6 The STRIPE plan is revisited following the detailed design stage (i.e. tender award) and also following the 1 Year After Opening evaluation in order to capture any additional issues emerging.

2.5 Background information and evaluation data

- 2.5.1 Good quality data is a prerequisite for effective evaluation and the STRIPE plan should support the identification and collection of data sets throughout the project life cycle.
- 2.5.2 Data can broadly fall into the following categories:
- *Background Data and Information (pre opening)* - reports, models and drawings etc. from the appraisal / assessment phases. This material is generated throughout the development of a scheme.
 - *Background Data and Information (post opening)* - reports, drawings etc. from during and after the construction phase (e.g. Road Safety Audits and as-built drawings).
 - *Evaluation data (pre opening) - Bespoke / Primary Data* gathered to reflect network conditions in the absence of the proposed scheme, including data on accidents, traffic volumes, journey times surveys, vehicle speeds, environmental surveys and any bespoke local community or household surveys if required. This data is important to establish an 'evaluation baseline'.
 - *Evaluation data (post opening)* – As per pre-opening Evaluation Data but updated for the evaluation year in question (e.g. 1 year after scheme opening).
 - *Site Visit (post opening)* - to provide observational data to support the evaluation.
 - *Stakeholder Consultations (pre and post opening)* - pre project opening, this engagement will inform key stakeholders of the evaluation and help to plan for data coming from another party such as a Local Authority. Post project opening consultation will provide qualitative data to inform the evaluation from an array of local stakeholders as required.
- 2.5.3 The exact requirements for each evaluation will need to be tailored to the proposed level of evaluation and the specific scheme objectives and benefits, and additional data sets may well be required. Any data collected to support the evaluation should be reviewed and archived by the Evaluation Advisor as it becomes available so the data is fresh and parties responsible for its creation / collection are easily contacted for any questions or points of clarification.

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- 2.5.4 Section 3 sets out the STRIPE Evaluation Toolkit. This Toolkit gives detail on each of the STRIPE criteria, with suggested approaches to data gathering and evaluation. It also offers guidance on how to maximise the effectiveness of site visits during the 1 Year After Opening Evaluation in particular.

Stakeholder Consultation

- 2.5.5 The engagement of stakeholders in the planning and subsequent evaluation is advised, and consideration should be given within the STRIPE plan as to the extent of consultation required. Stakeholder consultation falls broadly into the following categories:
- *TS Internal Stakeholders (minimum)* – key responsibilities lie with TS Project Manager but wider engagement should be sought with others including TS Project Managers for different phases of the project, Network Manager, Route Manager and the Operating Company.
 - *Local Stakeholders (advised)* – key will be the Local Authority but other organised groups and organisations may support the evaluation (e.g. public transport operators, cycling and walking groups, Community Councils).
 - *Statutory Consultees (as required by evaluation methodology)* – to support the evaluation of the Environmental objective / sub-objectives in particular.

Other Consultation

- 2.5.6 It is not a requirement of STRIPE to engage in direct public consultation as part of the evaluation process. However, where user views have been gathered through existing consultation and/or survey processes, this can be used within the evaluation. Indeed, this can add depth to the evaluation, particularly on the more qualitative aspects of how schemes may have impacted upon perceptions of personal security, transport integration opportunities with other modes, and improved accessibility to services and facilities.

2.6 Appropriate and Proportional Evaluation

By timescale

- 2.6.1 To ensure the evaluation process does not become a resource-intensive process, it is generally recommended that either a 3 Year After or a 5 Year After Opening evaluation is undertaken, with 3 years as the default Detailed Evaluation point. The STRIPE Plan will indicate the programme and level of evaluation required for each scheme.
- 2.6.2 As discussed above however, there may be some schemes which merit a further (and final) Detailed Evaluation at the 5 Year After point. In these instances, the 3 Year After Opening Evaluation becomes an **Interim** Detailed Evaluation.
- 2.6.3 Some of the rationale for a further 5 Year After Detailed Evaluation might include the following:
- The scheme is classed as a Major Trunk Road Scheme and is subject to formal Government Gateway Reviews, thus requiring a specific level of post-opening information which STRIPE can contribute to.
 - The scheme has attracted a significant level of public and / or political interest
 - Previous evaluations identified unexpected or unresolved outcomes.
 - The scheme impacts upon an area significantly wider than the immediate route (e.g. other trunk roads).

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- The Risk Register for the scheme highlighted high risk areas.
 - The scheme involved innovative design methods.
 - Some or all of the Transport Planning Objectives, scheme benefits and related impact areas for the scheme can only be measured over a longer time period e.g. impacts on local development patterns and employment activity, changes in modal shift.
- 2.6.4 The timing of evaluation will be agreed with the Evaluation Advisor and recorded in the STRIPE Plan.

By Impact Area

- 2.6.5 The following sections in conjunction with the Evaluation Toolkit set out in Section 3 provide advice on what level of evaluation may be required.
- 2.6.6 This guidance advocates a proportional approach to evaluation by **impact area** (as measured through evaluation criteria). It is rarely possible to define a scheme as requiring **Standard** or **Advanced** evaluation in its entirety, as some criteria will require more exploration than others depending on the nature and impacts of the scheme in question.
- 2.6.7 The **Required Evaluation** column within the Evaluation Toolkit details the minimum requirements for evaluation. There are some elements which are required for all projects, irrespective of size, nature or cost. The remaining elements should be evaluated when during the appraisal / assessment phases or through site visit / stakeholder consultation, it is clear that the project has impacted upon the objective.
- 2.6.8 At the Detailed Evaluation stage, there are two alternative levels of evaluation. This facilitates investigation of those elements of most relevance to the project being evaluated. These have been presented as:
- **Standard** – generally seeks to provide a quantitative measure of impact based on standard or easily obtainable datasets. This is appropriate where impacts are moderate / high or where indicators are suggesting variance in actual vs. forecast impacts.
 - **Advanced** – generally seeks to consider the wider impact or provide a deeper understanding of the impact and will usually require specific data / consultations to support the measurement of the impact. This is appropriate where impacts are high or where indicators are suggesting significant variances in actual vs. forecast impacts.
- 2.6.9 The level of evaluation for each impact area should be both ‘appropriate’ and ‘proportionate’, which is influenced by a number of factors, including:
- Project size;
 - Study area;
 - Sphere of influence;
 - Interest;
 - Risk;
 - Criteria / impact area; and
 - Level of analysis.

2.6.10 The level of evaluation required for the impact areas is shown diagrammatically in Figure 3 below.

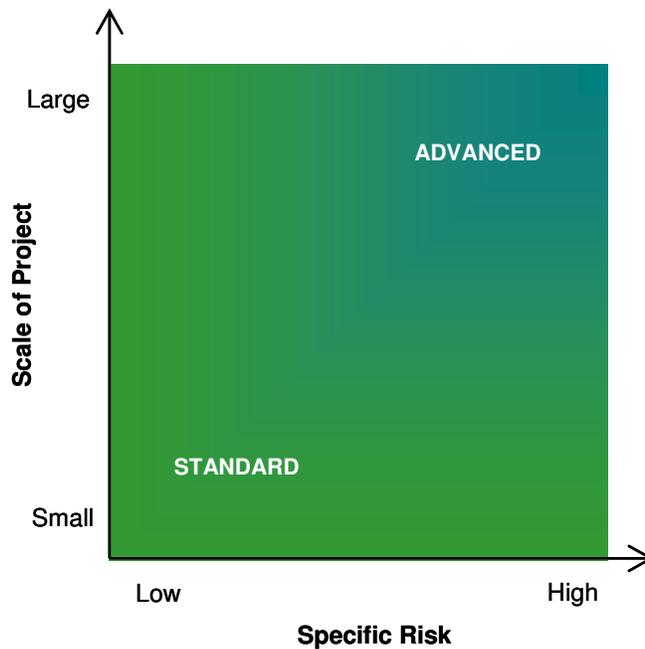


Figure 3 Level of Evaluation for Impact Areas

- 2.6.11 A degree of judgement will be required in selecting the correct level of evaluation for each of the impact areas, taking cognisance of the Transport Planning Objectives that have been set for the scheme.
- 2.6.12 Transport Scotland's Evaluation Advisor will discuss and agree the level of evaluation to be undertaken, for each impact area, with the relevant Transport Scotland Project Manager during the preparation of the outline STRIPE Plan.
- 2.6.13 Should issues be encountered with the collection or quality of the data obtained to provide the basis for a **Standard** or **Advanced** level of evaluation which renders the data unavailable, unreliable or unusable, a proxy analysis may be undertaken using other suitable available data.
- 2.6.14 Every effort should be made to ensure that data collected for either a **Standard** or **Advanced** level of evaluation forms a suitable basis for the evaluation of the project.

3 STRIPE METHODOLOGY – THE EVALUATION TOOLKIT

3.1 Introduction

3.1.1 This section provides the core element of the STRIPE methodology - the Evaluation Toolkit. It presents each objective / impact area together with guidance on the requirements and suggested methodology for evaluation. The Toolkit helps to determine the appropriate level of evaluation under each objective / impact area taking into consideration:

- the size, nature, level and public interest of the project;
- the scale and nature of forecast impacts; and,
- any wider policy or strategic objectives that may influence the scope of the evaluation.

3.1.2 Appendix A brings together all the tabulations within this section into a single Evaluation Toolkit reference guide.

3.1.3 It is recognised that there may, from time to time, be a requirement to consider additional objectives / impact areas and / or consider alternative indicators for evaluation from those presented in the Evaluation Toolkit.

3.1.4 Overall, the methodology set out in this guidance is a guide – it is recognised that some projects require a flexible approach depending on the level of information available and its individual objectives. Moreover, the evaluation criteria used should be tailored to the scheme transport planning objectives and predicted benefits.

3.1.5 Geared towards answering the core questions for evaluation, the Evaluation Toolkit within this section is structured to consider the following:

- **Objectives:** Did the project achieve (or is it moving towards) its stated Transport Planning Objectives?.
- **Process Evaluation:** How well was the project implemented, and are there any lessons learnt?
- **Operational Indicators:** How well is the project operating?
- How has the project actually impacted upon the areas covered by the key STAG and DMRB assessment criteria, how well were these impacts forecast and are there any lessons learnt?
 - **Environment,**
 - **Safety,**
 - **Economy,**
 - **Integration,** and
 - **Accessibility and Social Inclusion:**
- **Costs to Government:** Has the project delivered value for money?

3.2 Objectives

Transport Planning Objectives

- 3.2.1 All projects should be evaluated against their Transport Planning Objectives, and the question “*Did the project achieve its stated Transport Planning Objectives?*”. For Initial Evaluations, the key question is “*Is the project moving towards achieving its stated Transport Planning Objectives?*”.

In accordance with STAG, Transport Planning Objectives should have been set at the Pre-Appraisal Stage of the project. Objectives should express the outcomes sought in the study area and “fit” with the Government’s Purpose and National Outcomes and other relevant established policy directives. In support of these Objectives, a series of SMART indicators should have been developed to enable the Objectives to be measured and, accordingly, their achievement evaluated.

- 3.2.2 For smaller projects, it is likely that the Objectives set will reflect largely operational indicators (reduction in accidents number / severity, journey time savings / improved reliability etc.) for which evaluation of appropriate indicators should be relatively straightforward and moderately low in cost.
- 3.2.3 For higher value projects Objectives are likely to be more complex or geographically dispersed and include some social outcomes. Accordingly, the evaluation of such objectives is likely to require bespoke surveys and more complex evaluation methodologies at higher costs.
- 3.2.4 The Evaluation Toolkit provides further guidance on the appropriate methodologies for measuring operational indicators and objectives which should be used in the first instance to support Objectives evaluation. Where bespoke methodologies require to be developed, these should be agreed in consultation with the Evaluation Advisor.

Wider Policy / Transport Objectives

- 3.2.5 For major projects with regional or national impacts, consideration should be given to an evaluation of their performance against wider policy and transport objectives.
- 3.2.6 The Scottish Government’s Purpose is “to focus Government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth”. Five Strategic Objectives underpin this Purpose, to achieve a Scotland that is Wealthier and Fairer, Smarter, Healthier, Safer and Stronger and Greener.
- 3.2.7 To achieve these objectives, the Government’s National Performance Framework⁸ sets out 16 National Outcomes, monitored by 55 National Indicators (which includes 5 new indicators added in March 2016). Of direct relevance to trunk road schemes are the following National Indicators:
- Reduce traffic congestion
 - Increase physical activity
 - Reduce death’s on Scotland’s roads
 - Increase the proportion of journeys to work made by public or active transport

⁸ <http://www.gov.scot/About/Performance/purposestratobjjs>

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- 3.2.8 Other National Indicators may be relevant to schemes on a case by case basis, including those pertaining to economic development and improving access to education and training:
- 3.2.9 Whilst a project’s performance against its Objectives will always be assessed, in certain circumstances, it may be appropriate for a project’s individual contribution towards these wider transport policy objectives (or other policies) to be evaluated. These would be advised and the methodology for evaluation agreed with the Evaluation Advisor as part of the STRIPE plan development.

Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Transport Planning Objectives	TPOs should be agreed at appraisal and refined as appropriate.	Minimum requirement for all projects.	1. Comment on whether Transport Planning Objectives are likely to be achieved.	1. Change in TPO indicator (quantitative where possible) using pre and post data.	n/a
Wider Policy / Transport Objectives	Contribution of project to wider policy / transport objectives	Minimum requirement for all projects. Quantified impacts only where impact has been forecast / identified.	1. Comment on whether project contribution towards Wider Policy / Transport Objectives likely to be achieved.	1. Qualitative assessment of project contribution toward Wider Policy / Transport Objectives Indicators.	1. Quantitative (where feasible) assessment of project contribution toward Wider Policy / Transport Objectives Indicators.

Figure 4 Evaluation Toolkit – Objectives

3.3 Process Evaluation

- 3.3.1 The process evaluation seeks to provide consideration on “*how well was the project implemented?*” providing evaluation across the key elements of project cost, programme and process (project management compliance).
- 3.3.2 The Project Programme assessment provides a comparison of forecast vs. actual construction programme and where there is variance seeks to understand and report on the underlying causes. This assessment could consider changing forecasts over the life of the project or, if data is available, be extended to consider the preparation and planning programme.
- 3.3.3 As part of the evaluation process, it is necessary for an array of statutory and other key documentation to be collated. The Process Audit provides a commentary on the availability of the documentation required for the audit, and, key post-construction activities including Land Compensation surveys and Road Safety, Accessibility Audits and Cycle Audits.
- 3.3.4 Overall, the Process Evaluation is an important part of recording the “story” of the scheme. It aims to identify any success factors and lessons learnt which can be applied to the development of other schemes.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Project Programme	-	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	<ol style="list-style-type: none"> 1. Compare predicted and actual construction programme. 2. Establish reasons for variance. 	1. Update 1YA if required.	<ol style="list-style-type: none"> 1. Compare historic change in predicted vs. actual programme. (e.g. at scheme appraisal, pre-tender and tender, outturn). 2. Establish reasons for variance.
Process	-	Minimum requirement for all projects.	<ol style="list-style-type: none"> 1. Confirmation of project management process through review of availability of key / statutory documentation produced over project cycle and required to support evaluation. 2. Confirm that RSA Stage 4a Audit; Cycle Audit; Accessibility Audit; Land Compensation Surveys have been undertaken as required. 3. Confirm that SEA, ES and HRA mitigation measures are in place (reported under Environmental Criteria). 	<ol style="list-style-type: none"> 1. Update 1YA if required. 2. Confirm RSA Stage 4b complete. 	n/a

Figure 5 Evaluation Toolkit – Process

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3.4 Operational Indicators

- 3.4.1 This aspect of the STRIPE process seeks to answer “*how well is the project operating*”? It provides evaluation across the key elements of traffic volumes, vehicle speeds and journey times.
- 3.4.2 There are several indicators which support the evaluation of a range of objectives and the Operational Indicators section within the evaluation has been designed to provide a single section within the report, where these indicators are summarised and reported.
- 3.4.3 All projects require an evaluation of pre vs post and forecast vs actual traffic flows. The other elements - vehicle speeds and journey times - are only required where they relate to a Transport Planning Objective for the project or are required to support the evaluation of the objectives. Journey time reliability is considered within the Economy User Benefits Quality & Reliability element.

Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Traffic Volumes	-	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre (up to 3 years) and post opening traffic volumes and traffic composition if classified data is available. 2. Comparison of opening year forecast and actual traffic volumes and traffic composition if classified data is available.	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre (up to 3 years) and post (up to 5 years) traffic volumes and traffic composition if classified data is available. 2. Comparison of evaluation year forecast and post opening traffic volumes and traffic composition if classified data is available.	Evaluation can extend to more disaggregated examination of traffic characteristics (e.g. by peak hour, journey purpose, etc); or expanded to cover a wider network coverage.
Vehicle Speeds	-	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre and post opening vehicle speeds. 2. Comparison of opening year forecast and actual vehicle speeds.	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre and post (up to 5 years) vehicle speeds. 2. Comparison of evaluation year forecast and post opening vehicle speeds.	Evaluation can extend to more disaggregated examination of traffic characteristics (e.g. by peak hour, journey purpose, etc) or expanded to cover a wider network coverage.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Journey Times	-	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre and post opening travel times. 2. Comparison of opening year forecast and actual travel times.	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre and post (up to 5 years) travel times. 2. Comparison of evaluation year forecast and post opening travel times.	Evaluation can extend to more disaggregated examination of traffic characteristics (e.g. by peak hour, journey purpose, etc) or expanded to cover a wider network coverage.
Journey Time Reliability	-	Evaluation of Journey Time reliability is reported under User Benefits - Quality / Reliability Benefits.	-	-	-

Figure 6 Evaluation Toolkit – Operational Indicators

3.5 Environment

3.5.1 The Environment Objective has thirteen sub-objectives:

- Noise and Vibration
- Global Air Quality (Carbon Dioxide (CO₂))
- Local Air Quality (Particulate Matter (PM₁₀) and Nitrogen Dioxide (NO₂))
- Water Quality, Drainage and Flood Defence
- Geology
- Biodiversity and Habitats
- Landscape
- Visual Amenity
- Agriculture and Soils
- Cultural Heritage
- Physical Fitness, Pedestrians, Cyclists, Equestrians and Community Effects
- Land Use
- Vehicle Travellers

3.5.2 These sub-objectives reflect that whilst most are revisited as part of the Environmental Statement, some are assessed only at option appraisal (STAG). Across the Environmental sub-objectives, evaluation is required where a moderate / significant impact has been identified as part of the Environmental Statement (or earlier option appraisal work), or as a direct result of an observed (but unforeseen) impact arising from the site visit and consultation with Stakeholders.

3.5.3 The background information reviewed to inform the evaluation should consider the following pre-opening and post-opening information, where available:

- Environmental Statement (and associated appendices);
- Record of Determination;
- Habitat Regulations Appraisal;
- Environmental survey reports;
- Environmental commitments made during Public Local Inquiry,
- Environmental commitments made to stakeholders;
- Landscape plans, ecological management plans;
- As-Built drawings showing environmental mitigation;
- Assessments of post-consent design changes;
- Environmental consents/licence conditions; and
- Contractor/scheme consultant environmental monitoring reports.

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- 3.5.4 The primary focus of the 1 Year After Opening Evaluation is to confirm whether the mitigation measures detailed in the Environmental Statement have been implemented, whether they are in a satisfactory condition and to alert TS to any repairs/maintenance required to existing mitigation or additional mitigation that may be required. This is primarily informed by site visits and a review of relevant documentation where available. In some cases it may be prudent to undertake aspects of the “detailed evaluation” level at the 1 Year After Opening Evaluation stage, particularly if there are concerns over impacts in areas with environmental designations, the performance of mitigation measures or unforeseen impacts. This would be agreed with the Evaluation Advisor on a case by case basis. The evaluation should also confirm that any environmental monitoring commitments are being carried out.
- 3.5.5 The “detailed evaluation” provides a review of the ongoing effectiveness of the mitigation measures and provides an evaluation of forecast vs. actual impacts against relevant sub-objectives, including whether environmental issues identified are heightened and/or unforeseen issues arise as a result of variance in forecast and actual traffic levels.
- 3.5.6 In general the approach taken should not require additional environmental data collection except where there is heightened public interest or where initial evaluations have identified concerns over forecast or unforeseen impacts. In exceptional circumstances, given the time taken for some impacts to become evident, it may be appropriate to consider a follow-on evaluation after the detailed evaluation report. This would be agreed with the Evaluation Advisor.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Noise and Vibration	DMRB, STAG and NISR	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	<ol style="list-style-type: none"> 1. Site visit to confirm mitigation measures identified in ES have been implemented and are in satisfactory condition and to identify any additional issues / mitigation requirements. 2. Review post-construction monitoring report, where available, for satisfactory performance of mitigation measures. 3. Determine whether NISR 1st year assessment has been undertaken and any associated measures put in place. 4. If traffic flows are 25% more or 20% less than expected then assume that the local noise impact is likely to be either 'worse than' or 'better than' expected. 	<ol style="list-style-type: none"> 1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1YA site inspection. 2. Comparison of 3/5YA observed vs. forecast traffic flows from ES. If traffic flows are 25% more or 20% less than expected then assume that the local noise impact is likely to be either 'worse than' or 'better than' expected. 3. Determine whether any Part 1 Claims (under the Land Compensation Act 1973) have been made. 4. Review of any existing noise survey / monitoring data pre and post construction including that collected to assess Part 1 Claims. 5. If undertaking 5YA evaluation determine whether NISR 5th year assessment has been undertaken and any associated measures put in place. 6. Noise surveys could also be utilised to spot check locations such as sensitive residential properties. 	<p>Standard Evaluation +</p> <ol style="list-style-type: none"> 1. Where flows are 25% more than forecast, compare traffic volumes, traffic composition (HGVs) and vehicle speeds if data is available. Review any noise monitoring data where available and consider the need for further surveys where actual traffic is 25% or greater. Compare to the findings of the ES and, if necessary, consider appropriate mitigation if the results are shown to be more adverse than those identified in the ES. 2. Potentially review monetisation of benefits / impacts as per the STAG methodology.
Global Air Quality (Carbon Dioxide (CO₂))	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	<ol style="list-style-type: none"> 1. Desk top review of as-built drawings to confirm mitigation measures identified in ES have been implemented. 2. Review actual vs. forecast traffic from ES. If variance <10% then assume scheme appraisal robust. 	<p>Review actual vs. forecast traffic from ES. If variance <10% then assume scheme appraisal robust. Else review traffic flows, traffic composition and speeds as a proxy for expected change in emissions.</p>	<ol style="list-style-type: none"> 1. Calculate the Present Value Benefit (PVB (£)) of the total change in carbon emissions due to the project based on the actual change in vehicle kilometres travelled / fuel consumed. 2. Re-model the impacts to global air quality over study area using outturn data. Compare to the findings of the ES and, if necessary, consider

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
					appropriate mitigation if the results of the assessment are shown to be more adverse than those identified in the ES. 3. Potentially review monetisation of benefits / impacts as per the STAG methodology.
Local Air Quality (Particulate Matter (PM₁₀) and Nitrogen Dioxide (NO)₂)	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if: No issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	1. Desk top review of as-built drawings to confirm mitigation measures identified in ES have been implemented. 2. Site visit to confirm where mitigation measures implemented they are in a satisfactory condition and to identify any additional issues / mitigation requirements. 3. Review actual vs. forecast traffic from ES. If variance <10% then assume scheme appraisal robust.	1. Site visit to confirm mitigation measures identified in ES, where relevant are in a satisfactory condition, and to identify any additional issues arising since 1YA site inspection. 2. Review actual vs. forecast traffic from ES. If traffic flows vary by more than +/- 10% AADT than expected then assume that the local air quality is likely to be either 'worse than' or 'better than' expected. Compare traffic volumes, traffic composition (HGVs) and vehicle speeds if data is available. 3. Desk top analysis using published air quality data for the road links where available, compared to the findings of the ES and against National Air Quality Standards to determine if exceedances have occurred.	Re-model the impacts to local air quality over the study area using outturn data. Where flows are 10% more than forecast consider a simple assessment based on DMRB methodology at representative receptors. Compare the data to that predicted in the ES and against National Air Quality standards to determine whether exceedance is likely to occur. If necessary, consider appropriate mitigation if the results of the assessment are shown to be more adverse than those identified in the ES.
Water Quality, Drainage and Flood Defence	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	Site visit to confirm mitigation measures identified in ES have been implemented and are in satisfactory condition and to identify any additional issues / mitigation requirements.	1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1YA site inspection. 2. Desk top analysis of water quality data from SEPA, where available, compare against forecasts under the Water Framework Directive. 3. Review any information on flood or drainage issues at the completed scheme.	Standard Evaluation + 1. Sampling of water quality from affected watercourses and ground water reserves across the study area for comparison against the results of the ES and Water framework Objectives set for the watercourse. 2. Determine level of impact on drainage and flood hydrograph.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Geology	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	<p>1. Site visit to confirm mitigation measures, including contaminated land mitigation measures, identified in ES have been implemented, are in a satisfactory condition and to identify any additional issues / mitigation requirements.</p> <p>2. Review contaminated land / groundwater monitoring data, where available, for satisfactory performance of mitigation measures.</p>	<p>1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1YA site inspection.</p> <p>2. Assess sites of particular geological importance during site visit - evaluate degree to which the project has affected hydrogeology or buried / damaged important geological deposits or outcrops.</p> <p>3. Review of available information regarding sites of geological importance – SSSI's & local geo-diversity sites (SNH and Local Authorities) and contaminated land (SEPA and local authorities) to establish whether mitigation measures have been implemented and are in satisfactory condition.</p>	<p>1. Repeat Standard Assessment methodology after 5 years (or beyond).</p> <p>2. Consultation with the Local Authority and SEPA to determine whether contaminated land mitigation is performing as expected and to identify any additional issues / mitigation requirements.</p>
Biodiversity and Habitats	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	<p>1. Site visit to confirm mitigation measures identified in ES have been implemented and are in satisfactory condition and to identify any additional issues / mitigation requirements.</p> <p>2. Review post-construction monitoring information, where available, for satisfactory performance of mitigation measures.</p>	<p>1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1YA site inspection. Reference should be made to the guidance set out in DMRB Volume 10, Section 4 for information.</p> <p>2. Obtain data on any Road Traffic Accidents involving protected species as per the Maintenance Term Contracts, and any wildlife road kill data available.</p>	<p>1. Repeat Standard Assessment methodology after 5 years (or beyond) to show the trend in impacts over the time period and to recommend further studies / mitigation measures if deemed to be required.</p> <p>2. Stakeholder consultation with Scottish Natural Heritage and local wildlife groups should be undertaken to determine the likelihood for additional protected species to be present in the area.</p> <p>3. Site inspection and habitat survey to identify any significant changes in the surrounding environment compared with predicted (other surveys may be deemed appropriate at this stage depending upon the project and</p>

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
					the surrounding environment). 4. Repeat protected species surveys undertaken during the EIA.
Landscape	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	1. Site visit to confirm mitigation measures identified in ES have been implemented and are in satisfactory condition and to identify any additional issues / mitigation requirements.	1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1YA site inspection. Reference should be made to the guidance set out in DMRB Volume 10, Section 3. 2. Utilise information in Landscape Character assessments to determine whether the guidance for particular Landscape Character Areas (LCAs) has been incorporated into the project design.	1. Repeat Standard Assessment methodology after 5 years (or beyond) to show the trend in impacts over the time period and to record how the project has been integrated into the wider landscape following the establishment of any mitigation.
Visual Amenity	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	Site visit to confirm mitigation measures identified in ES have been implemented and are in satisfactory condition and to identify any additional issues / mitigation requirements.	1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1YA site inspection. 2. At site visit, take photographs from the key viewpoints identified in the ES and assess against the identified changes in the ES or photomontages. 3. Determine whether any Part 1 Claims (under the Land Compensation Act 1973) have been made and review.	1. Repeat Standard Assessment methodology after 5 years (or beyond) to show the trend in impacts over the time period and to record how the implemented project compares to the impacts identified in the ES and any photomontages that may have been produced following the establishment of any mitigation.
Agriculture and Soils	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	1. Site visit to confirm mitigation measures identified in ES have been implemented, are in satisfactory condition and to identify any additional issues / mitigation requirements.	1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1YA site inspection. 2. Review soil testing data and site photographs from pre and post construction phases where available. 3. Identification of exact land-take from areas of	1. Repeat Standard Assessment methodology after 5 years (or beyond). 2. Consultation with affected landowners and Scottish Government Directorate for Agriculture, Food and Rural Communities on the viability of farm holdings following the implementation of the project.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
				Prime Quality Agricultural Land and compare against the figures from the ES.	
Cultural Heritage	DMRB and STAG	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	1. Site visit to confirm mitigation measures identified in ES have been implemented, are in satisfactory condition and to identify any additional issues / mitigation requirements.	1. Desk top analysis and site inspection to determine where direct impacts or impacts to the setting of cultural heritage features has occurred. Review the effectiveness of the implemented mitigation measures. 2. Review archaeological report from project construction phase and further assess any identified mitigation measures recommended. 3. Stakeholder consultation with Historic Environment Scotland and the Local Authority Archaeology Departments.	1. Repeat Standard Assessment methodology after 5 years (or beyond).
Physical Fitness, Pedestrians, Cyclists, Equestrians and Community Effects	STAG (Physical Fitness), DMRB (Pedestrians and Others)	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	1. Site visit to confirm mitigation measures identified in ES have been implemented, are in satisfactory condition and to identify any additional issues / mitigation requirements.	1. Site visit to confirm mitigation measures identified in ES are in satisfactory condition and to identify any additional issues arising since 1 YA site inspection. 2. Pre and post monitoring, where available, to determine change in number of walk and cycle trips (outcomes). 3. Consultation with local authority and local community groups.	1. Repeat Standard Assessment methodology after 5 years (or beyond).
Land Use	DMRB	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	1. Site visit to confirm mitigation measures identified in ES have been implemented, are in satisfactory condition and to identify any additional issues / mitigation requirements.	1. Site visit to confirm mitigation measures identified in ES are in a satisfactory condition and to identify any additional issues arising since 1 YA site inspection. 2. Identification of exact land-take from different land uses and compare against the figures from the ES. Consultation with affected landowners following the implementation of the project regarding the operation of affected land uses.	1. Repeat Standard Assessment methodology after 5 years (or beyond).

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Vehicle Travellers	DMRB	Minimum requirement for consideration at site visit . No further evaluation required if there are no issues identified / no specific relevance; and does not relate to Transport Planning Objectives.	1. Site visit to confirm mitigation measures identified in ES have been implemented, are in satisfactory condition and to identify any additional issues / mitigation requirements.	<p>1. Site visit to confirm mitigation measures identified in ES are in a satisfactory condition and to identify any additional issues arising since 1YA site inspection.</p> <p>2. At site visit, take photographs from the key viewpoints identified in the ES and assess against the identified changes in the ES or photomontages.</p> <p>3. Review pre and post opening traffic flows and speeds as a proxy for expected change in driver stress.</p>	<p>1. Repeat Standard Assessment methodology after 5 years (or beyond) to show the trend in impacts over the time period and to record how the implemented project compares to the impacts identified in the ES and any photomontages that may have been produced following the establishment of any mitigation.</p> <p>2. Re-model driver stress over study area using outturn data. Compare to the findings of the ES and, if necessary recommend additional mitigation to be considered.</p>

Figure 7 Evaluation Toolkit – Environmental Objective

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3.6 Safety

3.6.1 The Safety Objective has two sub-objectives:

- Accidents
- Security

3.6.2 The evaluation of accidents is a minimum requirement, focussing on identifying the change in accidents (by severity) pre and post project opening in 1 Year After Evaluation and extending to consider forecast vs. actual accidents in the detailed evaluation. More detailed evaluations, considering locations, causation factors and the recalculation of Accident Savings may be appropriate where accidents / safety are a primary objective.

3.6.3 The Security sub-objective is a qualitative evaluation based on observations at site visits supported by increasing levels of stakeholder surveys, depending on the relative importance of safety to the overall Transport Planning Objectives.

Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Accidents	Change in Annual Personal Injury Accidents (total and by severity)	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre and post opening accidents by severity & location using STATS19 3 Years pre opening data against 1 Year post opening data 2. Review RSA to establish whether any further investigation / post-implementation mitigation required 3. Link to any anecdotal evidence from Stakeholder Engagement	For project and wider network (as required e.g. bypassed section): 1. Comparison of pre and post opening accidents by severity & location using STATS 19 3 Years pre opening data against 3/5 Years post opening data. 2. Comparison of predicted vs. observed accident numbers and establish reason for variance. 3. Review RSA to establish whether any further investigation / post-implementation mitigation required. 4. Link to any anecdotal evidence from Stakeholders. 5. Analysis of accident causation factors (where project targeted specific accident types).	Standard Evaluation + 1. Stakeholder Consultation (e.g. community groups) to gain understanding of project outcomes. 2. If accident savings are significant contributor to PV, update economic assessment for personal injury accident savings using actual data.
	Total Discounted Savings				
Security		Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	1. Desk top analysis and site visit to assess any changes to security. 2. Link to anecdotal evidence from Stakeholders.	1. Desk top analysis and site visit to assess any changes to security. 2. Link to anecdotal evidence from Stakeholders.	Standard Evaluation + 1. Consultation with stakeholder groups (e.g. walking / cycling groups, local schools or community groups) to gain understanding of project outcomes.

Figure 8 Evaluation Toolkit – Safety Objective

3.7 Economy

Transport Economic Efficiency (TEE) User Benefits

- 3.7.1 User benefits are broken down into the 4 constituent parts of the TEE table. The key drivers behind user benefits are traffic volumes (collated at least at the local level) and journey time. Using such simple base data as traffic volumes and comparison back to project forecasts it is possible to provide a commentary on the likely scale of such benefits in comparison to project forecast for the 1 Year After Opening work.
- 3.7.2 In later years more information is needed to improve estimates of benefits. Journey time estimates provide inputs to time benefits and also a proxy for vehicle operating cost forecasts. Whilst it is possible to develop tools to estimate the User Benefits based on the available post-opening data without re-running TUBA or NESAs, it may be considered appropriate to update the models at the “Standard” level of evaluation.
- 3.7.3 The validity of reliability estimates are closely linked to the quality of the datasets available. If continuous monitoring information is available over the section of network concerned then it is relatively straightforward to estimate the impacts. If not, then the survey costs may well be prohibitive and saved for projects where reliability was an identified objective.

Wider Economic Benefits - WEBS

- 3.7.4 WEBS are not an exact science in their measurement. The true impacts of the Agglomerative and Labour Market effects are unlikely to occur in any measurable form in the 3 to 5 year time horizon linked to evaluations undertaken in line with STRIPE. Whereas the Perfect Competition effect is in itself so hard to measure that even assessment guidance suggests just increasing business time savings by 10%.
- 3.7.5 That said there are indicators that can support, and point to the presence of WEBS emanating from a project. At 1 year, direct impacts, such as areas of land developed / improved, or increases in enquiry activity are all potential indicators that business is reacting. At 3-5 years post opening it should be possible to undertake business surveys to support evidence from any initial indicators. Such surveys should be linked to similar work required for EALIs.

Economic Activity & Location Impacts – EALIs

- 3.7.6 EALIs are very project specific. The impacts can cut across a variety of sectors, and the key is to identify what is going on as a result of the project, and how such impacts are distributed across the community. Note it is highly unlikely that EALIs will have a net national impact on the economy. If a project is considered to involve such magnitude STRIPE appraisers should refer to the Evaluation Advisor.
- 3.7.7 As with WEBS, EALIs can take a number of years to materialise. There are, however, a number of areas where the impacts can be more obvious. Initial evaluation should therefore be of a qualitative nature with a focus on direct evidence e.g. an observed re-distribution of economic activity. The detailed evaluation can consider bringing in business surveys to support the assessment, if these are in proportion to the overall evaluation of the scheme. Note distributional impacts are of key relevance in regeneration areas.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Transport Economic Efficiency (TEE) User Benefits	Travel Time	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	Comparison of approximate traffic predictions and actual opening year traffic flows to provide a statement on the likelihood of having over or under predicted the economic benefits during the appraisal. Collection and analysis of survey data restricted to the project and bypassed section for a bypass project.	Analysis of traffic survey data over the project area (including bypass routes for bypass projects), including the project and any other significant routes: 1. Comparison of predicted v outturn journey times and vehicle hours - use volumetric data and journey time surveys (model based figures can be used where pre opening surveys are not present) to calculate journey time impacts by time period and change in vehicular hours. 2. Monetise impacts and undertake comparison of predicted v outturn Present Value of Benefits (PVB).	Standard analysis of traffic survey data extended over the intermediate and strategic project area + 1. Re-run of economic models (e.g. NESA) using actual data.
	User Charges	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	Where relevant - desk review to establish any likely changes in charges post opening.	Where relevant - simple estimation of volume and charge rates. Noting real changes in charge levels.	Re-run economic modelling program using outturn data.
	Vehicle Operating Costs	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	Use of traffic volumes, and any available journey time evidence as a proxy for VOC changes - noting inherent distance changes from the project (a bypass is typically a longer route).	Proxy journey time, project distance and volume data to estimate impact on VOC - note it may be more appropriate/simpler to re-run the economic models.	Re-run economic modelling program using outturn data.
	Quality / Reliability Benefits	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	1. Observations and anecdotal evidence from local stakeholders. 2. Comparison of pre and post opening route stress (AADT/Congestion Reference Flow) using observed traffic volumes.	1. Observations and anecdotal evidence from key stakeholders. 2. Comparison of pre and post opening route stress (AADT/Congestion Reference Flow) using observed traffic volumes.	Standard Evaluation + 1. Determine journey time variability – change in standard deviation of journey time. Where reliability is a key objective, more extensive journey time variability data may be required (assessment should reflect methodology adopted for forecast and re-run models using observed data as appropriate).
Wider Economic Benefits	Agglomeration economies	Required only where impact has been forecast and / or relates to Transport	Identify specific developments linked to the project prior to construction, and note status of development.	1. Identify specific developments linked to the project prior to construction, and note status of development. 2. Identify indicators - floorspace, direct	1. Review and analysis of published local and regional indicators of employment. 2. Determine any changes in employment patterns potentially

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
		Planning Objectives.		employment, any identified indirect employment.	attributable to the project. 3. Stakeholder consultation with relevant enterprise body.
	Wider benefits arising from improved labour supply		<ol style="list-style-type: none"> 1. Identify specific developments linked to the project prior to construction, and note status of development. 2. Identify indicators - floorspace, direct employment, any identified indirect employment. 	<ol style="list-style-type: none"> 1. Identify specific developments linked to the project prior to construction, and note status of development. 2. Identify indicators - floorspace, direct employment, any identified indirect employment. 	<ol style="list-style-type: none"> 1. Review and analysis of published local and regional indicators of employment. 2. Determine any changes in employment patterns potentially attributable to the project. 3. Stakeholder consultation with relevant enterprise body. 4. Business surveys with main employers in area to understand Labour supply catchments, and thus identify proxy for how the project has affected the catchments.
Economic Activity and Location Impacts	Local Economic Impacts	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	EALI are very project specific. Reference to base document needs to be starting point. <ol style="list-style-type: none"> 1. Minimal impacts anticipated in first year. Need to highlight show-stoppers, these will be very local direct impacts from a project - consultation with local planning officers and desk based review. 	EALI are very project specific. Reference to base document needs to be starting point. <ol style="list-style-type: none"> 1. Desk review based on discussions with local planning officers. 	Business Surveys of sectors identified in base data. Focus on economic change over the period. Simple estimates of likely GVA and employment change, business investment rates.
	National Economic Impacts	Required only at Detailed Evaluation on exceptionally large national projects	Should only be assessed or exceptionally large national projects and not normally after 1 year.	Should only be assessed for exceptionally large national projects. Methodology should be agreed with STE Branch.	n/a
	Distributional Impacts	Required only where project is in designated Regeneration Area and impact has been forecast.	EALI are very project specific. Reference to base document needs to be starting point. <ol style="list-style-type: none"> 1. Minimal impacts anticipated in first year. Need to highlight show-stoppers, these will be very local direct impacts from a project - consultation with 	EALI are very project specific. Reference to base document needs to be starting point. <ol style="list-style-type: none"> 1. Desk review based on discussions with local planning officers - mapping of areas to have gained / lost from transport project - impact on economies assessed through planning officer discussions. 	Business Surveys of sectors identified in base data. Focus on economic change over the period. Simple estimates of likely GVA and employment change, business investment rates.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
			local planning officers.		

Figure 9 Evaluation Toolkit – Economy Objective

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3.8 Integration

3.8.1 The Integration objective is evaluated across:

- Transport Integration
- Land-use Transport Integration
- Policy Integration

3.8.2 Transport Integration only requires to be evaluated where there are forecast impacts, although unforeseen impacts may come to light through the site visit and / or in the examination of the as-built drawings. If this occurs, further investigation is essential.

3.8.3 For Land-Use Transport Integration and Policy Integration the evaluation required, as a minimum, should confirm that this review was undertaken during the scheme appraisal / development phases. i.e. that the project fitted with the policies current at the time. The evaluation does not need to consider whether these policies have changed or altered. If this policy review is not apparent then a review should be undertaken to ensure fit. For land-use integration, where land-use assumptions were fundamental to forecast benefits, more detailed investigation may be merited and consider whether the assumptions were valid.

Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Transport Integration	Services & Ticketing Infrastructure & Information	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	1. Site visit to confirm proposed changes to public transport infrastructure / services / ticketing etc have been implemented, are operating as expected and to identify any additional issues. 2. Consultation with TS PM, TS Route Manager and Local Authority.	1. Site visit to confirm proposed changes to public transport infrastructure / services / ticketing etc have been implemented and operating as expected and to identify any additional issues. 2. Consultation with TS PM, TS Route Manager and Local Authority.	Standard Evaluation + 1. Consultation with local public transport operators to establish perceived change in transport integration.
Land-use Transport Integration	-	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	1. Comment on strategic fit with local and national planning policies undertaken prior to implementation.	1. Confirm strategic fit with local and national planning policies undertaken prior to implementation.	1. Review of project appraisal methodology to establish whether land-use and transport integration was accounted for. Comment on potential impact on forecasts. 2. Stakeholder consultation with planning authorities.

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
Policy Integration		Required only where impact has been forecast and / or relates to Transport Planning Objectives.	1. Comment on strategic fit with wider Scottish policy context undertaken prior to implementation .	1. Confirm strategic fit with wider Scottish policy context undertaken prior to implementation.	n/a

Figure 10 Evaluation Toolkit – Integration Objective

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3.9 Accessibility and Social Inclusion

- 3.9.1 Sub-objectives under the Accessibility and Social Inclusion objective require only to be assessed where there are forecast impacts or in support of a Transport Planning Objective although unforeseen impacts may come to light through the Process Audit in reviewing the Accessibility Audits and Cycle Audits or as part of the site visit and / or examination of the as-built drawings.
- 3.9.2 Across all sub-objectives, an initial site visit and desk top review will provide some qualitative data but more detailed evaluation of impacts requires increasing levels of stakeholder consultation. Where stakeholder consultation is required, any surveys should be developed in consultation (most notably with Transport Scotland and the relevant Local Authority) and the methodology submitted to the Evaluation Advisor for approval.

Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
Community Accessibility	Public Transport Network Coverage	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	1. Identify any changes to local public transport network through site visit / desk top review including assessment of the bus network coverage, routing and frequency.	1. Identify any changes to local public transport network through site visit / desk top review including assessment of the bus network coverage, routing and frequency.	Standard Evaluation + 1. Stakeholder consultation with local stakeholders e.g. public transport operators, community groups. 2. Comparison of local indicators pre and post opening – nearness to bus stop, bus punctuality and mode share. 3. Re-assess using Accession to model changes in access to public transport and employment, education, health and supermarket destinations.
	Access to Other Local Services		1. Identify any changes to walking / cycling accessibility through site visit / desk top review of changes to footpaths, rights of way, pedestrian crossings, bridges, cycle lanes and cycle routes. 2. Review Cycling Audit and comment on findings / recommendations.	1. Identify any changes to walking / cycling accessibility through site visit / desk top review of changes to footpaths, rights of way, pedestrian crossings, bridges, cycle lanes and cycle routes. 2. Review Cycling Audit and comment on findings / recommendations.	Standard Evaluation + 1. Stakeholder consultation with local stakeholders e.g. Sustrans, local community groups, walking groups and cycling groups. 2. Analyse pre and post pedestrian / cyclist counts.
Comparative Accessibility	Distribution / Spatial Impacts by Social Group	Required only where impact has been forecast and / or relates to Transport Planning Objectives.	1. Identify any changes to access to transport for socially excluded groups through site visit and desk top review. 2. Review Accessibility Audit and comment on findings / recommendations.	1. Identify any changes to access to transport for socially excluded groups through site visit and desk top review. 2. Review Accessibility Audit and comment on findings / recommendations.	Standard Evaluation + 1. Stakeholder consultation with specific focus groups e.g. job seekers, disabled people, ethnic minorities. 2. Examine data from Scottish Index of Multiple Deprivation.
	Distribution / Spatial Impacts by Area		1. Identify any changes to access to transport for deprived and rural	1. Identify any changes to access to transport for deprived and rural areas through site visit and desk	Standard Evaluation + 1. Stakeholder consultation with specific focus groups e.g. job seekers, disabled people,

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Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
			areas through site visit and desk top review. 2. Link to anecdotal evidence from key stakeholders.	top review. 2. Link to anecdotal evidence from key stakeholders.	ethnic minorities. 2. Examine data from Scottish Index of Multiple Deprivation.

Figure 11 Evaluation Toolkit – Accessibility & Social Inclusion Objective

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3.10 Cost to Government

- 3.10.1 This area covers both outturn costs, and the impact cost and benefit changes have on key project economic indicators.
- 3.10.2 The Public Sector Investment Costs criteria provides at the simplest level a comparison of tendered vs outturn costs disaggregated into component elements (where data is available) at Initial Evaluation and updated, as required, at Detailed Evaluation. This in itself should allow for a re-assessment of project Present Value of Costs (PVC), and hence Benefit to Cost Ratio (BCR) / Net Present Value (NPV) provided the spend profile is also available
- 3.10.3 For larger projects it may be appropriate to consider the change in cost forecasts over the project cycle from initial option appraisal though to outturn and consider the treatment of optimism bias and risk within project cost forecasts.
- 3.10.4 The detail reportable in the project benefit – Present Value of Benefits (PVB) – sections is closely linked to the extent of evidence gathered in the benefits sections of the main framework. Typically therefore, at year 1 only an indicative direction of change will be possible in PVB terms, but with running the economic models in year 3 – 5 a more detailed re-assessment should be possible. The focus of the evaluation should be on those elements that provide the greatest contribution to the PVB.
- 3.10.5 NPV and BCR, calculations are inevitably linked to the above. However, even where detailed re-assessment of the PVB has not been possible it is worth re-estimating the NPV and BCR to highlight the impact of cost changes on project economic worth.

Sub-Objective	Element	REQUIRED EVALUATION	INITIAL 1YA EVALUATION Methodology	DETAILED 3YA and/or 5YA EVALUATION Methodology	
				STANDARD	ADVANCED
	Public Sector Investment Costs	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	1. Comparison of predicted and outturn project costs with reference to timeframes and impact of construction inflation plus overall build programme on outturn costs, as well as the base figures (where available, disaggregate construction, land, preparation and supervision costs) . 2. Establish reasons for variance.	1. Update 1YA if required.	Standard Evaluation + 1. Compare historic change in predicted vs. actual costs. (e.g. at scheme appraisal, pre-tender and tender, outturn) and where available, disaggregate construction, land, preparation and supervision costs. Assessment to breakdown the effects of point estimate from risk and optimism bias in the cost calculations to understand better project cost structures. 2. Establish reasons for variance.
	Present Value of Transport Benefits	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	Reference to User Benefit and Accident 1 Year analysis to develop a <i>qualitative</i> assessment of benefits against	Reference to User Benefit and Accident 1 Year analysis to develop a qualitative assessment of benefits against forecast estimate.	Comparison of forecast and outturn PVB based on evidence of benefits highlighted above - this may be a re-run of the economic model for some of the elements.

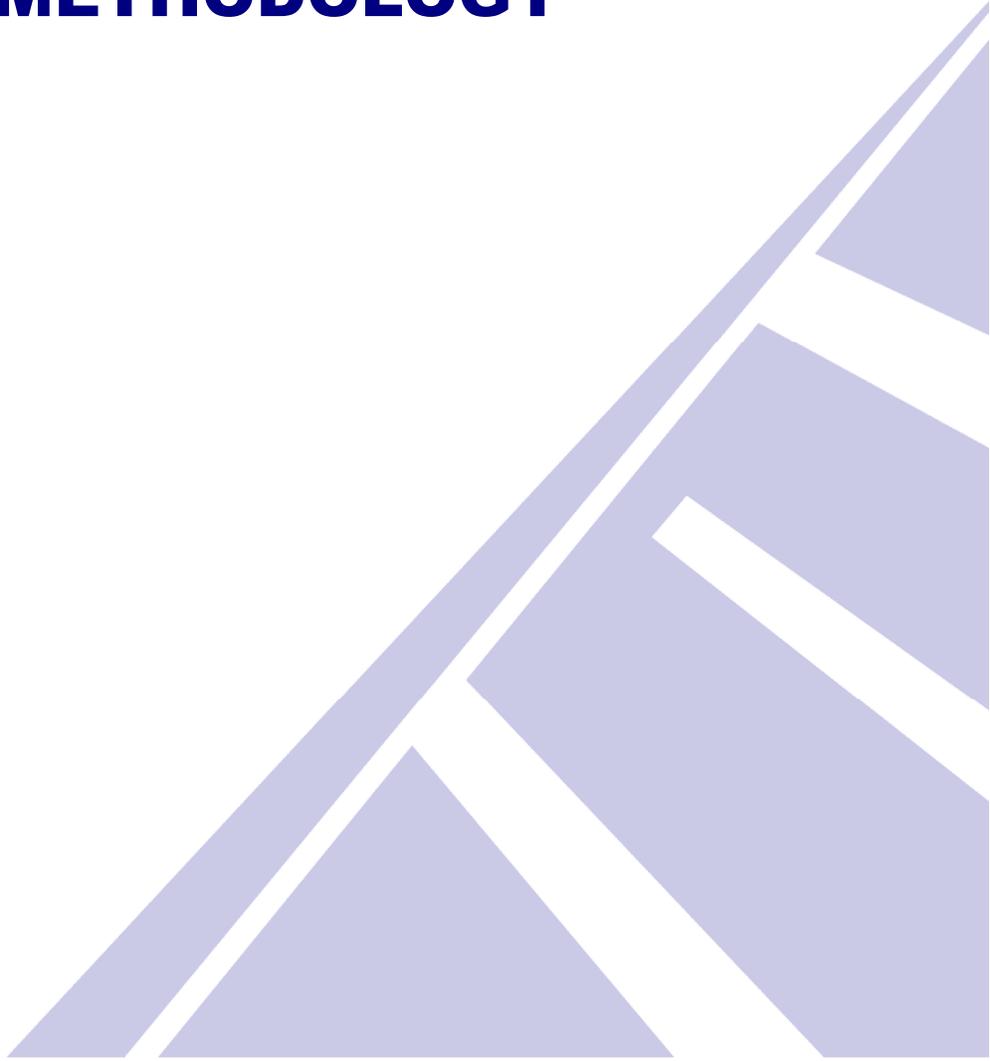
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			forecast estimate.		
Present Value of Cost to Government	Minimum requirement for all projects.	Re-estimated based on outturn costs.	Re-estimated based on outturn costs.	n/a	
Net Present Value	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	Reference to PVB and PVC changes to develop a <i>qualitative</i> assessment of benefits against forecast estimate.	Reference to PVB and PVC changes to develop a <i>qualitative</i> assessment of benefits against forecast estimate.	Reference to PVB and PVC changes to develop a <i>quantitative</i> assessment of benefits against forecast estimate.	
Benefit-Cost to Government Ratio	Minimum requirement for all projects. Advanced level optional at Detailed evaluation.	Reference to PVB and PVC changes to develop a <i>qualitative</i> assessment of benefits against forecast estimate.	Reference to PVB and PVC changes to develop a <i>qualitative</i> assessment of benefits against forecast estimate.	Reference to PVB and PVC changes to develop a <i>quantitative</i> assessment of benefits against forecast estimate.	
Benefit-Cost to Government Ratio (including WEBs)	Required only where WEBs are a key feature of the project objectives.	Reference BCR ¹ and assessment of WEBs <i>impact</i> to identify qualitative assessment.	Update 1YA as required. Reference BCR1 and assessment of WEBs impact to identify qualitative assessment.	n/a	
Benefit-Cost to Funding Agency Ratio	Required only where significant investment from 3rd parties >10% capital cost.	Reference BCR ¹ and assessment of whether <i>wider</i> project capital support did materialise.	Update 1YA as required. Reference BCR1 and assessment of whether <i>wider</i> project capital support did materialise.	n/a	

Figure 12 Evaluation Toolkit – Cost to Government Objective

THE STRIPE METHODOLOGY



4 LEARNING FROM EVALUATION

4.1 Introduction

4.1.1 As Figure 1 demonstrates, the sharing of learning across the organisation is fundamental to maximising the benefits of STRIPE.

4.1.2 There are three core elements to how Transport Scotland learns from the STRIPE process:

- **Annual reporting** and research aimed at a wider audience.
- **Internal feedback loop** to Transport Scotland teams involved in trunk road scheme development.
- **Ongoing development of STRIPE** to continually adapt to best practice and new technologies.

4.2 Annual Reporting and dissemination

4.2.1 An Annual Report is prepared by Transport Scotland, drawing on findings from completed evaluations. This is an opportunity for “meta analysis”, enabling themes or issues to be identified from across the full dataset of evaluations and provide consideration of where and why impacts are commonly occurring.

4.2.2 The Annual Report also provides a record and programme for evaluations coming forward.

4.2.3 The Annual Report provides a key learning opportunity for Transport Scotland in enhancing its forecasting and decision-making methods. Furthermore, it will present the key findings from evaluation to a wider audience and enhance the transparency of the decision-making process.

External dissemination

4.2.4 To support the external dissemination of learning, the following actions will be undertaken:

- publication of STRIPE reports on the Transport Scotland website; and
- feedback to the appraisal community through presentations at the STAG User Group and / or other agreed forums.

4.3 Internal feedback loop

4.3.1 Transport Scotland will continually learn from the findings of the STRIPE process. To support this learning, STRIPE reports will be circulated within the organisation and supported, as required, by workshops and presentations to staff. Most notably to:

- Project Managers / Sponsors - in enhancing the processes and procedures for project design and implementation and delivering cost-efficiencies;
- Technical Analysis Branch: - in terms of updating appraisal guidance / methodologies in SCOT-TAG and STAG specifically, and also in terms of in terms of providing advice on modelling, DMRB assessments etc.; and,
- Transport Scotland’s contractors - in terms of process and procedures.

4.4 Ongoing development of STRIPE

4.4.1 This STRIPE Guidance is a ‘live’ document. It will be subject to regular updates when necessary. Updates will be posted on the Transport Scotland website.

APPENDIX A:
STRIPE EVALUATION TOOLKIT