2 Evaluating Technology-based Interventions to Encourage Mode Shift

Figure 2.1 Evaluating technology-based interventions within STTRIDE Evaluation Process

2.1 What is evaluation?

Evaluation is a planned and structured assessment of the extent to which an intervention has met its objectives after it has been implemented; this is sometimes termed 'ex poste' evaluation. It assesses the benefits, financial costs and negative consequences.

Before making investment decisions for new interventions, an appraisal will often be carried out to identify the potential benefits, costs and impacts; such an appraisal (or pre-implementation evaluation or 'ex ante' evaluation) can be used both to justify the investment and to plan how and where the intervention will be implemented in more detail. This appraisal will also identify the aspects of the intervention to be evaluated and the feasibility of doing this can be taken into account in the decision to invest in the intervention.

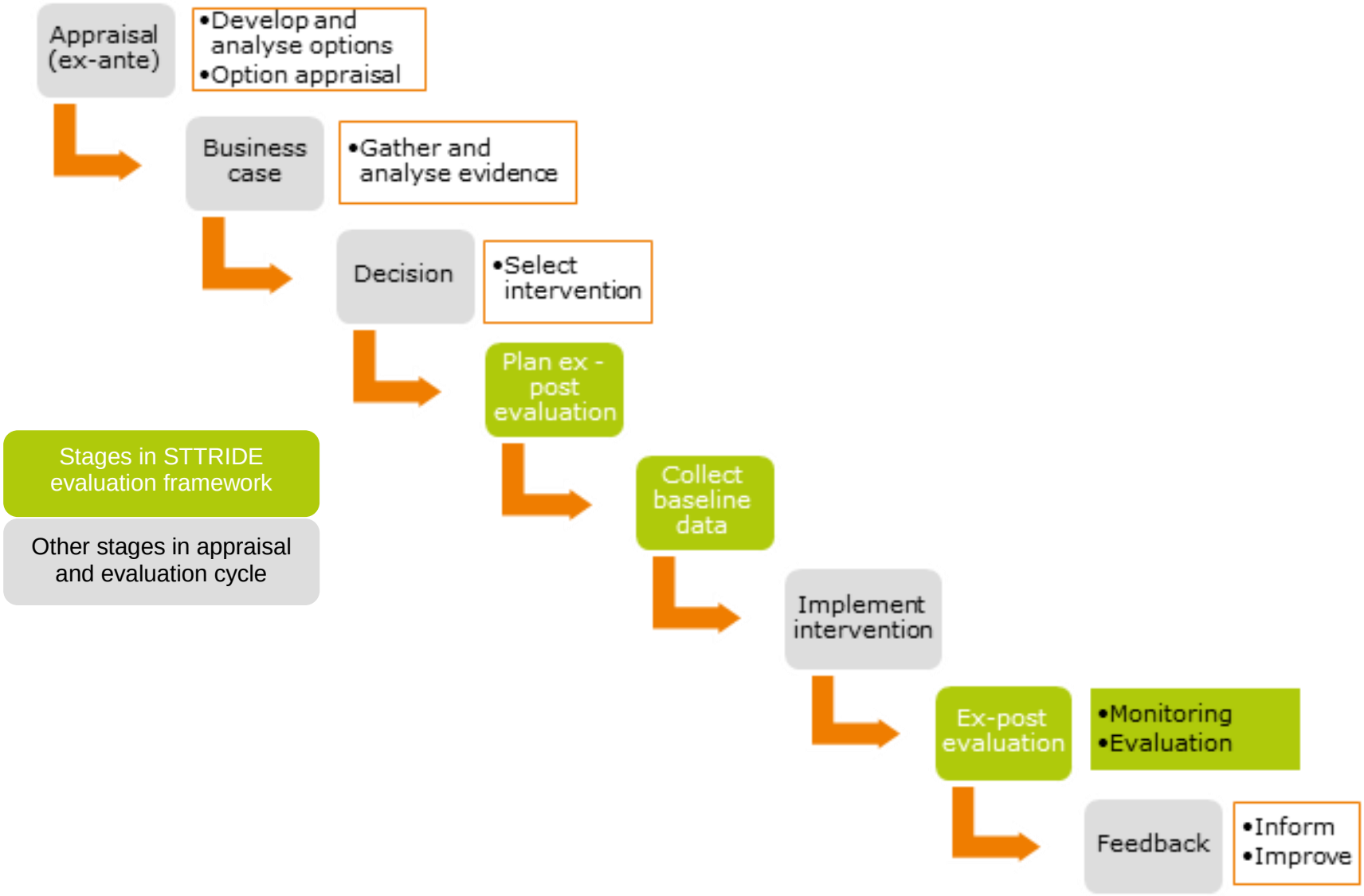
Usually in the case of interventions involving new technologies, a trial is undertaken before full scale implementation. Evaluation of the trial will then inform the decision on whether or not to proceed with further implementation. The approach to evaluation set out in this framework is appropriate for both trials and full scale implementations.

In the case of STTRIDE, the focus is on assessment of impacts after implementation (ex post evaluation). Although the focus in this case is on what happens after an intervention has been implemented, it is important that it is planned before implementation so that the current situation can be accurately monitored to provide a baseline against which to compare the intervention's impacts. Monitoring and evaluation are an important part of project management, and the approach presented here can be incorporated within project management processes.

Evaluation is often carried out by an organisation that is independent of those involved in implementing the intervention so that it can be clearly seen as an unbiased assessment.

Figure 2.2 below summarises the stages in the evaluation cycle from ex ante appraisal of potential interventions, to ex post evaluation of an intervention and feedback to inform improvements to the intervention and future decisions. It indicates the timing of the stages which are covered by the STTRIDE evaluation framework within the overall process.

Figure 2.2 Ex-post evaluation within the appraisal and evaluation cycle



2.2 Why evaluate?

Evaluation after an intervention has been implemented has three main purposes:

- To understand the impacts of the intervention on travellers and other stakeholders and the extent to which it has contributed to its objectives; in the case of STTRIDE interventions reducing single occupancy car use on the inter-urban network and thereby cutting congestion and achieving wider policy impacts such as improving safety, environment, health and well-being
- To improve performance and learn lessons that will benefit other schemes in future
- To check that the investment made in the intervention can be justified by the benefits achieved, thereby supporting the business case for similar schemes elsewhere.

Thus evaluation is a key element of implementing any scheme involving new technology where the impacts and consequences are not well known and understood.

2.3 How does evaluation planning fit in the life cycle of a project?

A key document for evaluation is the evaluation plan. This document is prepared by the evaluation team and agreed by the relevant stakeholders in the intervention, initially in draft form but then refined at intervals during a project as scheme details are finalised and detailed plans for evaluation are defined. This evaluation team may consist of in-house staff or external consultants or a mixture of the two (for example by contracting out the specialist work involved in designing and conducting surveys and other data collection). An example outline of an evaluation plan is available on the STTRIDE web site.

Evaluation planning should begin early in the life of a project. This enables the requirements for baseline and long term monitoring data to be defined early enough for any equipment and resources needed to be procured and operational in good time; procurement specialists will need to be involved at this stage. This early start to evaluation planning is indicated in Figure 2.2 above, in which planning the evaluation and collecting baseline data take place before the intervention is implemented. Early evaluation planning also helps to manage risks before investment decisions are made; mapping out the logic of the intervention and its likely impacts enables unintended consequences to be identified and addressed at the outset.

When implementing new technologies aimed at achieving modal shift, it is important to take account of the long term nature of some impacts. The lag time for some technologies is long so evaluation in the first year or two after the intervention may need to focus on what the intervention has delivered (outputs) and the short term outcomes. It will be important to consider whether to plan for evaluation resources to be made available for a longer term impact assessment to be carried out in future, in addition to the evaluation of short term outcomes.

2.4 Why use a common framework?

The STTRIDE evaluation framework provides a common, consistent basis for CEDR members to use when evaluating new technologies to encourage mode shift away from single occupancy car journeys and then reporting on the results. This consistency is intended to help CEDR members to compare different interventions and benefit from a pool of evaluation results focused on interventions addressing this specific objective.

Additionally, in cases where trial interventions are managed via external research or consulting engagements, the framework can provide guidance on evaluation *from* a CEDR member *to* its contracting partner.

The framework is intended to be sufficiently generic that it can help users to think through the issues relevant to evaluating this type of intervention and then prepare an evaluation plan that is tailored to their own context and type of intervention. Thus not all of the details set out in the framework will be relevant to all contexts and types of intervention.

Within the context of this common framework, there will be some national differences in the way that it can be applied, for two reasons:

- The roles of National Road Authorities will differ between countries – for example in the extent to which they are involved in policy and operational roles; this may affect the scope of evaluation required in particular countries
- Some countries provide guidance on how evaluation of transport or other investment should be carried out, and it will be important to take this into account.

2.5 What is the most suitable evaluation approach to use?

Various approaches to evaluation are available. When considering the influence of technologies within the domain of the STTRIDE project, there are several features which are relevant when deciding which approach to adopt:

- The influence of new technologies on modal shift will often be indirect, with the result that attribution of impacts to the introduction of those technologies (rather than other factors) will be difficult
- The nature and scale of the likely impacts is uncertain, so it will be important to gain some understanding of why any changes took place, rather than just identifying that they happened
- Connected journeys and multi-modal journeys do not lend themselves to traditional data collection and measurement; for example transport services usually collect data on their own users, not users of other modes. Therefore it is likely that suitable baseline data will not be readily available and bespoke baseline data collection will be needed, covering the interfaces or interchanges between modes
- Changes in other parts of the network or travel demands (e.g. from new housing, workplace or retail developments) may obfuscate changes resulting from specific interventions
- As mentioned earlier, some new technologies will have impacts several years into the future, so these will not be apparent within a normal evaluation time frame of 1-2 years.

The most robust approach to assessing the level of impact of an intervention is to use an 'experimental' approach by analysing two comparable areas, one of which receives the intervention and the other does not. However this approach does not provide explanations for any changes and relies on the premise that the area without the intervention is not influenced by other factors.

Taking into account the advantages and disadvantages of various approaches to evaluation, a combination of approaches is recommended for the STTRIDE context.

- For some elements, an 'outcome' approach is sufficient, looking at the short and medium term changes following the intervention – for example to identify the change in number and proportion of journeys made by different modes.
- Some aspects of a theory-based approach are recommended, working within the overall framework of an 'intervention logic map' that sets out the theoretical connections between an intervention and its impacts. This approach makes it possible to investigate why and under what conditions any changes occurred, using qualitative and quantitative research methods, in cases where it is difficult to attribute changes specifically to the intervention. Gathering data from different sources and then comparing them to assess how they complement and support each other will provide confidence in the results.

In addition, it is important to understand not just the context for implementation but also the conditions set by the actors involved and their relationship to the technology and data about impacts that may be generated. While guiding principles for data collection and analysis are useful, different actor configurations and choices about technology will affect what data can and will be generated, how it can be used, etc. The evaluating authority may in some cases be dependent on other actors (e.g. research partners, local authorities, technology providers) who define and control data collection and analysis, and should adjust its guidance accordingly.