

## 9 Frame the Research Questions

**Figure 9.1: Frame the Research Questions within the STTRIDE Evaluation Process**



## 9. Frame the Research Questions

### Research questions

The research questions define the questions to be answered during the evaluation. A series of research questions will be defined to address each assessment objective. These questions can also be used to structure the analysis and reporting.

Sub-questions are defined and a check is made to ensure that all elements of the logic map (as in 'Describe the Intervention Logic' module on the toolkit page of the [STTRIDE web site](#)), are included in the research questions.

Two types of research question may be relevant: those which inform the evaluation objectives, and those which help provide an understanding of the impacts.

### 9.1 Research questions to inform evaluation objectives

Research questions may be of various types: open, specific, or exploratory. [Table 9.1](#) sets out example research questions to address evaluation objectives. For simplicity of presentation, the research questions shown in the examples cover several aspects of each issue; in practice these would be separated out into sub-questions. The table is available in a template on the [STTRIDE web site](#).

**Table 9.1: Example evaluation objectives and research questions**

Type of assessment	Evaluation objective	Example research questions
Performance	Scale of service delivery/ amount of service provided	What is the scale of service delivery or amount of service provided, where, and when?
	Reliability of the service	How often does the service fail to operate as planned, and how long do these incidents last?
	Availability of the service	For what percentage of each day or week is the service fully operational/ what proportion of potential users have access to the service?
	Interoperability of the service	To what extent is the new system/ service interoperable with others/ existing services?
User acceptance	Awareness of the service	Are users aware of the service and informed about what it offers them?
	Accessibility of the service	What proportion of attempted uses fail because the user does not have the equipment/ service needed to access it and how many potential users does this represent?

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Type of assessment	Evaluation objective	Example research questions
	Ease of use of the service	<p>Have users found the service easy to use, and if so to what extent/ how?</p> <p>How long does it take users to complete actions required to use the service?</p> <p>How frequently is the service used by individuals?</p> <p>How is use of the service shared between different user groups?</p>
	Preferences for the service vs other options	How do users think the new service compares with what they did before in terms of cost, quality, overall journey time etc.?
	Willingness to pay for the service	How much were users willing to pay for the service, and how did this vary between types of user, types of journey etc.?
Impact assessment	Provision of new products/ services	Has there been a change in the number and/ or scale of delivery new products/ services that have been provided, and what has changed as a result?
	Introduction of new 'pain points' or 'bottlenecks'	Has the new technology led to a new 'pain point' in the transport system?
	Changes to other systems/ services	Has there been a need to change other systems/ services as a result of introducing the intervention, and what is the impact of those changes?
	Mode use	<p>Has the number of journeys made by each mode changed on the inter-urban network and or other roads, and if so in what way?</p> <p>Has the number of shared mode journeys changed on the inter-urban network and or on other roads, and if so in what way?</p> <p>Has the number of multi-modal or connected journeys changed on the inter-urban network and or other roads, and if so in what way?</p> <p>Have existing journeys been replaced with shorter ones that serve the same purpose, and if so which ones, where, and how?</p> <p>Have journeys been avoided by home working, home delivery, teleconferencing etc., and if so which ones, where and how?</p>
	Single car use on the inter-urban network	Has the number of single car occupant journeys on the inter-urban network changed, and if so, at what times, and by how much?

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Type of assessment	Evaluation objective	Example research questions
	Journey efficiency	Have journey times changed on the interurban network and/ or other roads, for car and other modes, and if so, in what way? Have journey speeds changed on the interurban network and/ or other roads, for car and other modes, and if so, in what way?
	Journey quality	Has the quality of journeys changed on the interurban network and/ or other roads, and if so, in what way?
	Accessibility	Has the number of people with access to key facilities changed in the area, and if so, in what way?
	Environment	Has fuel consumption changed on the interurban network and/ or other roads, and if so, in what way?
	Safety	Has the number of casualties changed on the interurban network and/ or other roads, and if so, in what way?
	Health	Has the amount of active travel changed, and if so in what way? Have vehicle emissions changed on the interurban network and/ or other roads, and if so, in what way?
	Well-being	Has the overall level of well-being changed in the area and if so, in what way?
	Social inclusion	Has the overall level of social inclusion changed in the area and if so, in what way?
Socio-economic evaluation	Societal gains and losses	What is the monetary value of changes in safety, economy, health and the environment? What were the overall costs of setting up and operating the scheme and over what timescale are these incurred?

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Type of assessment	Evaluation objective	Example research questions
Financial assessment	Financial impacts	What were the additional costs for service providers and operators of setting up and operating the scheme over what timescale? What were the additional revenues accrued by service providers over what timescale? Has the National Road Authority made cost savings, and if so how and over what timescale?

### 9.2 Research questions for understanding impacts

In addition to the research questions associated with the evaluation objectives, some stakeholders are likely to require different types of evidence: some will wish to demonstrate that the investment has delivered the impacts that were anticipated (accountability evaluation), while others will wish to gain an understanding of which interventions work, under what circumstances and why (knowledge based evaluation). These requirements may generate additional research questions aimed at further understanding of how and why the outcomes and impacts were achieved, and whether the anticipated outcomes and impacts were realised.

For example research questions in a knowledge-based evaluation might include:

- Were there any unanticipated impacts or displacement effects?
- To what extent were the observed changes in mode use additional to what would have happened in the absence of the scheme?
- What are the main factors or mechanisms that led to the intervention achieving its impacts?
- How were the impacts distributed between different groups of travellers, types of road, area?
- Which target groups was the intervention most effective for?
- What lessons can be learned for development of future interventions?

An accountability evaluation might include questions such as:

- Did the intervention result in the anticipated outcomes and impacts, including change in traffic flow, journey time, journey quality, cost of travel, ease of use of services, mode use, social, economic or environmental factors?
- To what extent were the planned outputs delivered?
- To what extent has the change in mode use anticipated from the intervention been achieved?

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- To what extent did the anticipated costs and benefits match those that were actually incurred or realised?

Having set out the broad types of question relevant to the intervention covering the evaluation objectives and the types of evaluation, the next stage is to develop specific sub-questions under each of the research questions. These can be reviewed against the intervention logic map to check that the questions match the logic map, and that all elements of the logic map are covered. If there are gaps, a decision will need to be taken on whether the scope of the evaluation should be extended to cover the gaps, or whether these gaps should be excluded from the scope of the evaluation.

The research questions related to changes associated with the intervention should be used to develop hypotheses for statistical testing during the analysis (see the 'Data Collection and Analysis' module on the toolkit page of the [STTRIDE web site](#)). A hypothesis is a statement linking a cause to an effect and predicts the expected direction of any change or difference.