



Appendix A – SMART Objectives

Introduction

This appendix was originally written in support of Report 2: Gaps and Shortfalls. It should therefore be read in the context of the work that was carried out at that time.

A1 Planning Objective One - Maintain Cross-Forth Transport Links for All Modes to at Least the Level of Service Offered in 2006.

Specific

This objective should seek to ensure that level of service (measured by journey times) for cross-Forth transport links for all modes, including rail, at least matches that offered by the existing crossings in 2006. The aim of this objective is that there will be no reduction in existing levels of service in 2022. Existing data collection programmes require to be reviewed to determine what data is required to establish the existing value.

Measurable

Selected journey times for car and bus provide a measure of change between the current and forecast situations. A similar analysis of rail is not required, as the journey times are dependent on timetable, which has not changed in the forecast scenarios in TMfS. However, an analysis of the level of crowding on the cross-Forth services in the AM peak will be undertaken, as this is a key factor in people's perception of the 'level of service' they are receiving from a rail trip. This information can be extracted from the TMfS model which is being used for this commission. It should be noted that this has not been applied to the STAG part 1 appraisal, but has been adopted within the STAG part 2 appraisal.

Achievable

The detailed modelling will determine if this objective is achievable. A tunnel crossing would be designed to allow "normal" flow, in terms of type of traffic and typical flow rates. It is recognised that Class One explosives could not be transported through a tunnel, however, the volume of vehicles carrying Class One explosives is considered to be small.

Relevant

The concern is that closure or severe restrictions on the existing Forth Road Bridge will have a negative impact on cross-Forth transport links for all modes.

Time Related

The objective is related to the sixteen-year time period of the study, from 2006 to 2022.

A2 Planning Objective Two - Connect to the Strategic Transport Network to Aid Optimisation of the Network as a Whole.

Specific

This objective should seek to ensure that cross-Forth transport provision connects to the strategic transport network to cater for existing (2006) and future (2022) traffic flows. The strategic road network is defined as the trunk road network and key principal routes. Optimisation relates to ensuring the transport network operates as smoothly as possible, in terms of average traffic speeds, and this objective seeks to achieve no net reduction in average speeds between 2006 and 2022. In addition, this objective seeks to minimise the requirement for additional vehicle kilometres. Existing data collection programmes require to be reviewed to determine what data is required to establish the existing (2006) and the anticipated 2022 values.

Measurable

How well the transport network is operating can be measured by the average speed of vehicles on the network. This can also be produced in TMfS for subsets of both geographical area (Local Authority) and type of road. It should be noted that this has not been applied to the STAG part 1 appraisal, but has been adopted within the STAG part 2 appraisal. It is not considered that connections to the strategic transport network would require to be monitored.

Achievable

In terms of optimisation, modelling of the average speed of vehicles on the network will determine if this objective is achievable.

Relevant

The concern is that closure or severe restrictions on the existing Forth Road Bridge will have a negative impact on cross-Forth transport links for all modes.

Time Related

The objective should be related to the sixteen-year time period of the study, from 2006 to 2022.

A3 Planning Objective Three - Improve the Reliability of Journey Times for All Modes.

Specific

This objective should seek to reduce delays and congestion for all road-based modes from Junction 4 on the M90 to Echline Roundabout, as this is considered to be representative of the main corridor. The methodology could be applied to other routes for the assessment of the route options. This objective seeks to result in a reduction of journey time values between 2006 and 2022. Reliability is defined by levels of congestion. This objective also considers the ability of the network to deal with emergency incidents, for example breakdowns and accidents. This objective seeks to improve reliability between 2006 and 2022. Existing data collection programmes require to be reviewed to determine what data is required to establish the existing and future journey time and congestion values.

Measurable

Reliability is closely related to the levels of congestion. It is therefore proposed to use a measure of congestion as a proxy measurement for this objective. An appropriate measure of congestion is the number of hours lost due to travel being slower than speed achieved on each road when traffic is flowing freely. This analysis will be produced for the AM peak from Junction 4 on the M90 to Echline Roundabout, as this is considered to be representative of the main corridor. The methodology could be applied to other routes for the assessment of the route options. In the absence of the introduction of any bus priority measures, the reliability of bus journeys is a function of the journey time of private road vehicles. The measurement of road congestion can serve as a proxy for both car and bus journey time reliability. In addition, a subjective assessment of the ability of the network to deal with emergency incidents can be undertaken. It should be noted that this has not been applied to the STAG part 1 appraisal, but will be adopted within the STAG part 2 appraisal.

Achievable

The detailed modelling will determine if this objective is achievable.

Relevant

The concern is that closure or severe restrictions on the existing Forth Road Bridge will have a negative impact on cross-Forth transport links for all modes.

Time Related

The objective should be related to the sixteen-year time period of the study, from 2006 to 2022.

A4 Planning Objective Four - Increase Travel Choices and Improve Integration Across Modes to Encourage Modal Shift of People and Goods.

Specific

The key aim is to encourage a greater proportion of trips to be undertaken by non-car modes, between 2006 and 2022. The key opportunity is to encourage modal shift from car to achieve an increase in public transport as a proportion of travel for cross-Forth trips. Specific levels of change are difficult to specify without a more detailed understanding of trip origins, destinations, journey modes, and journey purposes.

Existing data collection programmes require to be reviewed to determine what data is required to establish the existing (2006) modal split.

Measurable

The measurable outcome for this objective is the mode split between car and public transport for trips across the Forth. This information would be extracted from TMfS, albeit there may be a requirement to undertake additional surveys. It should be noted that this has not been applied to the STAG part 1 appraisal, but will be adopted within the STAG part 2 appraisal.

Achievable

Achieving modal shift requires an integrated approach from all bodies responsible for the delivery of transport services. The detailed modelling will assist in determining if this objective is achievable.

Relevant

The concern is that rising levels of traffic and congestion on the existing crossing is having a negative impact on cross-Forth transport links for all modes. Achievement of this objective will contribute to achieving a more sustainable transport profile for trips.

Time Related

The objective should be related to the sixteen-year time period of the study, from 2006 to 2022.

A5 Planning Objective Five - Improve Accessibility and Social Inclusion.

Specific

The key aim is to improve accessibility to employment, communities, services and other facilities. The aim is also to improve social inclusion through linkage to community regeneration areas, and assessing how the socially deprived can access centres of major employment. This objective also aims to avoid community severance.

Specific levels of change are difficult to specify without a more detailed understanding of trip origins, destinations, journey modes, and journey purposes.

Measurable

Social inclusion can be measured through an assessment of how the socially deprived can access centres of major employment.

The Scottish Index of Multiple Deprivation (2006) can be used to choose a selection of areas in the most deprived 20 per cent, ranked by income, both north and south of the Forth:

- S01002721: Cowdenbeath;
- S01002785: Kelty;
- S01002656: Dunfermline;
- S01002759: Methil;
- S01001926: Sighthill, Edinburgh;
- S01002279: Pilton, Edinburgh; and
- S01006402: Craigshill, Livingston.

The distribution of journey time/distances of Cross Forth movements to access employment by both the road network and public transport can then be assessed, showing the change in accessibility brought about by each scenario. It should be noted that this has not been applied to the STAG part 1 appraisal, but will be adopted within the STAG part 2 appraisal.

Achievable

Improving accessibility requires an integrated approach. Modal shift goals can only be achieved through the support of public transport operators and national/regional policies.

Relevant

This objective will contribute to achieving a more sustainable transport profile for trips and will address policy issues relating to social exclusion in the wider area.

Time Related

The objective should be related to the sixteen-year time period of the study, from 2006 to 2022.

A6 Planning Objective Six - Minimise the Impacts of Maintenance on the Effective Operation of the Transport Network.

Specific

The key aim is to minimise the requirement for maintenance and optimise the ability of traffic (total cross-Forth trips) to “switch between” the existing crossing or a new crossing and an alternative route, for example during periods of planned or unplanned restrictions.

Measurable

The total vehicle flow over the existing Forth Road Bridge, and particularly the total flow of heavy goods vehicles is closely linked to the requirement for maintenance and resurfacing work on the bridge carriageways. The Forth Replacement Crossing Study Report One: Network Performance concludes in its section on Surfacing (section 2.4.4) that “If the number of HGVs is reduced...it would be reasonable to predict that the life of the bridge surfacing would be increased”, and hence the amount of maintenance required. Conversely, it would also seem reasonable to assume that increased volumes of traffic, and HGVs in particular, would increase the amount of surface maintenance and the associated disruption.

Annual ‘total vehicle’ and ‘heavy goods vehicle’ flows will be prepared for each time period. It should be noted that this has not been applied to the STAG part 1 appraisal, but has been adopted within the STAG part 2 appraisal. The STAG part 1 appraisal has, at a high level, considered the diversion routes (vehicle kilometres) associated with “switching between” the existing crossing or a new crossing and an alternative route.

Achievable

The detailed modelling will determine if this objective is achievable.

It is recognised that for “replacement crossing” proposals, a tunnel option will perform less favourably than a bridge option in the same corridor, due to the distance of the portals from the Firth. In addition, it is recognised that a bridge option would allow greater flexibility through better connectivity to the strategic road network and hence more flexibility in terms of route choice.

Relevant

The concern is that closure or severe restrictions on the existing Forth Road Bridge will have a negative impact on cross-Forth transport links for all modes.

Time Related

The objective should be related to the sixteen-year time period of the study, from 2006 to 2022.

A7 Planning Objective Seven - Minimise the Impact on People, the Natural and Cultural Heritage of the Forth Area.

Specific

The key aim is to minimise the impact of the proposal on people and the natural and cultural heritage of the Forth area. This objective relates to designated environmental sites in addition to noise, visual and air quality impacts.

Measurable

This information can be extracted from detailed information relating to environmental designations within the study area. As this study progresses, it will be necessary to undertake detailed environmental monitoring to assess the impact of proposals against the “do minimum”.

An assessment of regional emissions (in tonnes) due to transport can be undertaken using TMfS. This can give the following outputs:

- Carbon Monoxide;
- Hydrocarbon Pollutants;
- Oxides of Nitrogen Pollutants;
- Particulate Pollutants; and
- Carbon Dioxide.

Monitoring of noise and visual impact will also be undertaken, using standard environmental monitoring. It should be noted that this has not been applied to the STAG part 1 appraisal, but will be adopted within the STAG part 2 appraisal.

Achievable

The environmental monitoring / modelling will determine if this objective is achievable.

Relevant

The concern is that proposals will negatively impact upon the local environment, both directly and indirectly.

Time Related

The objective should be related to the sixteen-year time period of the study, from 2006 to 2022.

A8 Planning Objective Eight - Support Sustainable Development and Economic Growth.

Specific

Local policies seek to promote economic development within the local area and improve strategic access to key economic hubs. Whilst stimulating economic development provides an ultimate goal, within the context of the scope of this study, an objective for reducing cross-Forth peak road based journey time (for all users) and modal shift provides a suitable proxy. Increasing public transport mode share as a proportion of travel will be a measurement of the success of this objective.

Measurable

The 2002 report Scotland's Transport Delivering Improvements: Transport Indicators for Scotland, published by the Scottish Executive outlines performance targets for their objectives to support sustainable development and promote economic growth. For sustainable development, the report identifies Transport Emissions, "Freight Lifted", and Modal Shifts on short journeys and journeys to work/school as key performance indicators. These factors are already reported upon for the following objectives:

- Transport Emissions are reported in "Minimise the impact on people, the natural and cultural heritage of the Forth area";
- "Freight Lifted" is reported in "Minimise the impacts of maintenance on the effective operation of the transport network"; and
- Modal Shift is reported in "Increase travel choices and improve integration across modes to encourage modal shift of people and goods".

For economic development, road traffic volumes, road traffic congestion and condition of the road network are listed as performance indicators. These factors are already reported for the following objectives:

- Road Traffic Volumes are reported in "Minimise the impacts of maintenance on the effective operation of the transport network"; and
- Road Traffic Congestion is reported in "Minimise the impacts of maintenance on the effective operation of the transport network".

The condition of the road network is not explicitly reported upon, as this is not a quantifiable output of the modelling. However, the volume of HGVs, and the level of traffic generally, can be taken as a proxy measure for this.

It should be noted that this has not been applied to the STAG part 1 appraisal, but has been adopted within the STAG part 2 appraisal.

Achievable

The detailed modelling will determine if this objective is achievable.

Relevant

The concern is that closure or severe restrictions on the existing Forth Road Bridge will have a negative impact on cross-Forth transport links for all modes and will therefore have an associated negative impact on sustainable development and economic growth.

Time Related

The objective should be related to the sixteen-year time period of the study, from 2006 to 2022.