

## Appendix 8: Monitoring

### The purpose of monitoring

Monitoring can be described as the systematic measurement of a parameter in terms of magnitude, time and space. Monitoring is not limited to quantitative or technological measurements, and may include qualitative issues such as severance or landscape quality.

Monitoring needs to have a pre-defined purpose. There is little value in measuring environmental parameters just for the sake of it. There also needs to be a framework or mechanism that enables monitoring to instigate amendments or remedial action as required.

The purpose of monitoring is to measure the environmental *outcome* of a plan (e.g. improvements in accessibility), the *performance* of a plan against pre-defined environmental objectives or targets, or *input* (e.g. improved public transport facilities).

Monitoring can be used to answer questions such as:

- Is the plan contributing to the desired environmental objectives and targets?
- Is the plan performing as well as expected?
- Are (mitigating) measures performing as well as expected?
- Are there any undesirable environmental effects? Are these within acceptable limits, or is remedial action required?
- Are the environmental impact predictions of the assessment accurate?

Effective monitoring can contribute to:

1. *Managing uncertainty*
  - Checking and adjusting plan implementation.
  - Identifying and managing unanticipated impacts.
  - Testing the accuracy of environmental impact predictions.
2. *Improving knowledge*
  - Improving impact prediction methods and the quality of future Environmental Reports.
  - Updating or filling gaps in existing environmental baseline information.
  - Keeping track of changes in the environment.
3. *Enhancing transparency and accountability*
  - Assisting in strengthening public involvement.
  - Verifying information in the Environmental Report.
4. *Managing environmental information*
  - Structuring information from various monitoring and evaluation activities.
  - Presenting monitoring information in a format appropriate for its purpose.

SEA monitoring should:

- Fit a pre-defined purpose
- Be customised for use at policy, plan or programme level
- Be focussed on the delivering information necessary to decision-making
- Be oriented towards problem-solving
- Address the significant key issues
- Relate to project EIA where appropriate, perhaps through tiering mechanisms
- Be transparent
- Be practical, easy to implement and cost effective
- Be a learning process

### Proposed monitoring framework

The SEA Directive does not specify that monitoring of significant environmental effects has to be done for each plan or programme individually. Monitoring may cover several plans or programmes as long as sufficient information about environmental effects is provided for the individual plans or programmes. There is in other words scope for e.g. authority-wide monitoring, providing this can be done in such a way that the requirements of the Directive are met.

The appropriate level at which to monitor depends on the type and scale of the transport plan or programme to be monitored. For example, monitoring the environmental impacts of a local transport plan for a small rural authority may be largely focussed on the localised effects of individual strategies or groups of projects, whereas the monitoring of a regional transport strategy or a large metropolitan LTP may be focussed more at the level of the whole transport plan or programme area.

A step-by-step guide for how to develop a monitoring system for transport plans and programmes is provided in stages 1 to 6 below.

#### Designing a monitoring system

1. Determine what needs to be monitored
2. Identify what sort of information is required
3. Identify existing sources of monitoring information
4. Identify and fill any gaps in existing information
5. Determine when remedial action would be required and which actions could be taken
6. Develop a management plan outlining responsibilities, timeframes and presentation

#### 1. *What needs to be monitored?*

The first issue to consider is exactly what needs to be monitored. Monitoring measures should be clear, practicable, and cost-effective. They must be clearly linked to the SEA process, for example:

- The objectives, targets and indicators that were developed for the SEA (see Section 3.3 of this guidance).
- Features of environmental baseline that will indicate the effects of the plan (see Section 3.4 of this guidance).
- The likely significant effects that were identified during the effects assessment (Section 5.3. of this guidance).
- The mitigation measures that were proposed to offset or reduce significant adverse effects (see Section 5.5 of this guidance).

Monitoring needs to be organised to focus on the entire transport plan/programme, where effects relate to the strategic objectives of the plan as a whole, including synergistic effects over and above the individual measures and over the lifespan of the plan.

It is not necessary to monitor everything or monitor an impact forever. Instead monitoring should focus upon:

- The significant environmental impacts that give rise to irreversible impacts upon environmental attributes of recognised value where monitoring seeks to identify trends in advance of such irreversible damage being caused.
- Significant impacts where considerable uncertainty has been evident in the SEA and where monitoring would enable preventative or mitigation measures to be taken.

- Impacts where a lack of information could constrain the decision making processes associated with the delivery of transport projects for example gathering of data over an extended timescale that would not be possible during an EIA.

## 2. *What sort of information is required?*

The type (e.g. quantitative or qualitative) and the level of detail of environmental monitoring information required will depend on the characteristics and level of detail of the plan and its forecast environmental effects.

- Wherever possible, it is preferable to measure *outcome* indicators (i.e. direct environmental effects).
- Any performance monitoring must be focussed on the *environmental* objectives, targets and indicators of the plan.
- In cases where it is difficult to establish the links between plan implementation and changes in the environment (i.e. cause and effect), it might be necessary to collect information on *indirect* factors such as implementation (e.g. progress of implementing a traffic reduction measure) or pressure factors/ input (e.g. emission levels). It might also be appropriate to undertake more 'general' monitoring of environmental change, which may involve measuring environmental effects or aspects of the environment that were not identified in the environmental assessment, or identifying changes in the environmental baseline. However, it is important to consider that the Directive requires the monitoring of *significant environmental impacts*, and that general monitoring (e.g. state-of-the environment reporting) might not be sufficient.

The monitoring of outcome indicators is however, fraught with technical difficulties in establishing causal links between the transport plan and the environmental conditions as many other factors may have a bearing upon the environmental conditions. Where outcomes are being monitored then the monitoring framework should be established in a way that seeks to take account of external factors and focus upon the links between the plan and the outcome.

Where the causal links between the plan output and the outcome are complex it may well be necessary to focus upon intermediate events, possibly to the extent that monitoring focuses upon outputs instead of outcomes. For example, it may be appropriate to ensure that the project delivery processes encapsulate the environmental issues identified in the SEA, leaving monitoring to ensure that the projects adopt satisfactory avoidance, mitigation, compensation or enhancement measures for that issue. The Driver, Pressure, State, Impact, Response (DPSIR) framework might be a useful way of identifying elements that can be monitored.

It should be recognised that some significant impacts that are being monitored may only become evident after extended timescales. Consequently, in some cases monitoring may extend over long periods while for other impacts a single observation may well be adequate.

## 3. *What are the existing sources of monitoring information?*

Many authorities undertake some form of environmental monitoring for transport plans. The monitoring is typically focussed on transport and traffic, and issues such as traffic flows, modal share, or public transport patronage. Some of these may have indirect impacts on the environment. However, the environmental monitoring that is undertaken for transport plans tends generally to be determined by what is required by regulations and legislation (e.g. the statutory requirement for assessment and review of local air quality under the Environment Act 1995), rather than being specifically linked to significant environmental effects as required by the SEA Directive.

In the case of LTPs, for instance, the performance of the plan is monitored against pre-defined targets and indicators and reported to the DfT in the form of an annual progress report (APR). The monitoring undertaken for the APRs does not necessarily include

environmental effects, unless the authority has developed for instance targets for local air quality, environmental performance indicators, or environmental best value indicators.

Wherever possible, use existing monitoring arrangements to obtain the required information identified in stage 2. Some of the existing information will be of direct relevance and use, such as local air quality data for a plan where air quality impacts are predicted to be significant. Other monitoring activities may provide data which require some degree of analysis or manipulation. Consider issues such as:

- What are the existing monitoring arrangements for the transport plan, and does this provide any of required information?
- What are the existing monitoring arrangements for other transportation policies/plans/programmes/projects within the authority, and is there scope for disaggregating/aggregating data to obtain any of the required information?
- What are the existing monitoring arrangements within the authority for non-transport issues, and do they provide any of the required information (e.g. monitoring according to the provisions of other UK and EU legislation)?
- Is any of the required information available from other sources, e.g. neighbouring authorities or data sources used for establishing the environmental baseline?
- Does there information exist that might help to identify environmental change and/ or trends?
- What organisational structures are needed to deliver the monitoring, and what institutional responses are required to manage adverse trends and outcomes?

4. *Are there any gaps in the existing information, and how can these be filled?*

Extensive primary data collection is neither feasible nor appropriate for this level of monitoring. There are other ways in which the required information can be obtained in a cost-effective and efficient way. For example:

- Develop environmental performance indicators for transport plans in order to incorporate environmental monitoring into existing performance monitoring programmes.
- Expand existing monitoring systems to include additional attributes.
- Where applicable, enter into agreements with neighbouring authorities to standardise monitoring methods and share information.

5. *When would remedial action be required and what are the potential remedial actions?*

The SEA Directive states that monitoring must enable appropriate remedial action to be taken. In order for this to be achieved, there must be a mechanism or framework in place to trigger remedial action to be taken if and when required.

- Determine criteria or thresholds for when remedial action is required (i.e. what are the conditions that would be regarded environmentally undesirable/ unacceptable).
- Identify potential remedial actions that could be taken if a significant environmental impact was identified (e.g. review aspects of the plan that are failing and make amendments, develop avoidance, mitigation, compensation and enhancement measures, make amendments to plan implementation).

6. *Who is responsible for the various monitoring activities, when should these be carried out, and what is the appropriate format for presenting the monitoring results?*

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- Determine time, frequency and geographical extent of monitoring (e.g. for performance monitoring this could develop out of the causal chain - e.g. be linked to timeframe for targets; and for effects monitoring whether the impact is short, medium or long-term).
- Determine how much the monitoring will cost and where to get the financial resources.
- Determine who is responsible for the different monitoring tasks, including the collection, processing and evaluation of environmental information.
- Establish the most appropriate format to present the monitoring information with regard to its purpose and the expertise of those who will have to act upon the information (e.g. information may have to be presented in a form accessible to non-environmental specialists).

The tables below are suggested formats for how to manage the monitoring process and document the monitoring data in a systematic and transparent manner.

Documenting the monitoring data					
What needs to be monitored (effect, indicator..)?	What sort of information is required?	Where can the information be obtained (sources of information)?	Are there any gaps in existing information and how can these be resolved?	When should remedial action be considered?	What remedial action could be taken?

Managing the monitoring process					
Monitoring activity to be undertaken	Who is responsible for the undertaking monitoring?	When should it be carried out (dates and frequency)?	How should the results be presented/ appropriate format?	Status/ problems encountered	