5

How to evaluate the programme

How to evaluate the programme

5.1 Planning the evaluation 133
5.1.1 Aims of evaluation 134
5.1.2 Types of evaluation 134

5.2 Choosing the evaluation methods 136
5.2.1 Study types for formative and process evaluation. 137
5.2.2 Study types for impact and outcome evaluations 138
5.2.3 Conducting an economic evaluation of a programme. . 141
5.2.4 Choosing the performance indicators 143

5.3 Dissemination and feedback 146

Summary 147

References 148

Monitoring and evaluation of any programme or intervention is vital to determine whether it works, to help refine programme delivery, and to provide evidence for continuing support of the programme. Evaluation will not only provide feedback on the effectiveness of a programme but will also help to determine whether the programme is appropriate for the target population, whether there are any problems with its implementation and support, and whether there are any ongoing concerns that need to be resolved as the programme is implemented.

Once the tools of speed management are chosen, the objectives set and quantified, and the programme of actions developed, the next step is to plan the monitoring and evaluation of the programme. Performance indicators can be identified for the programmes' hierarchy of objectives, and evaluation plans devised. This module describes the step-by-step process of planning, designing and conducting the monitoring and evaluation of a speed management programme. It is divided into three key sections:

5.1 Planning the evaluation: Evaluation and monitoring need to be built into the programme from the start. An important initial stage involves collecting baseline data to assess the current situation before developing and implementing the programme. This section shows how, based on this data, the aims of the evaluation can be defined and different types of evaluation methods considered.

5.2 Choosing the evaluation methods: Once the type of evaluation has been chosen, there are different methods that can be used to carry out an evaluation. This section describes the different study types, explaining the advantages and disadvantages of each type of method. It provides guidance on calculating sample size and describes how to conduct an economic evaluation. It also outlines the types of performance indicators that can be used to measure the success of a programme, and how to set up the monitoring mechanism to follow the progress.

5.3 Dissemination and feedback: This section describes how to feed the result of an evaluation back into the planning and implementation stages, as well as ways that the results of an evaluation can be shared with different interested parties. It stresses the need to recognize and reward the inputs made by individuals and agencies because this will help to ensure sustainability of the programme – as will broadcasting and celebrating successful outcomes.

5.1 Planning the evaluation

While the ultimate aim of speed management is to reduce deaths and injuries caused by driving at unsafe speeds, it is useful to identify a hierarchy of objectives, as discussed in Module 4. The evaluation framework should be built around these objectives.

It is important that the evaluation is built into the programme from the outset, not simply 'bolted on' at the end. The process should also be developed to provide much more than a simple 'yes-no' or 'good-bad' conclusion; and it is vital to be clear about the aims and objectives of the evaluation. Therefore it is essential that the evaluation framework is developed and implemented alongside the proposed programme. Baseline data need to be collected before the intervention is put in place so that changes can be measured. Thus, this work would be carried out by the working group as they develop the action plan for the programme and conduct the programme.

While introducing safety measures that have the support of general public is preferable, it is often necessary to pursue measures that will be highly effective but, initially at least, unpopular. In these circumstances it will be useful to collect information on public (and stakeholder) attitudes about speed campaigns.

5.1.1 Aims of evaluation

The evaluation will assess the extent to which the programme objectives have been met, and may have more than one aim. There are many possible indicators that can be measured for a speed management programme, so at the outset it is essential to clarify the aim/s of the evaluation – in other words, what questions does the evaluation need to answer? The breadth of an evaluation will always be limited by the resources available, but a well-designed, simple evaluation can be as useful as a more complex and costly one.

5.1.2 Types of evaluation

Evaluation may take several forms, and one or more may be appropriate, depending on the aims of the programme to be evaluated.

Formative and process evaluation

Formative evaluation determines whether a programme is appropriate, e.g. whether it addresses risk factors, and is suitable for the target audience. For example, formative evaluation of a media campaign would ask whether the marketing material is aimed at the appropriate audience.

Instead of measuring 'outcomes' such as a reduction in crash numbers, or 'inputs' such as speeds on a particular road, a *process* evaluation examines whether the programme was carried out as initially planned, and helps identify strengths, weaknesses and ways of improving delivery in the future *(1)*. This typically involves creating a list of 'simple' indicators that can be checked or measured in order to see that the programme took place as intended, and delivered the planned outputs efficiently and to a high enough standard.

For example, a *process* evaluation of a speed enforcement intervention might ask whether:

- the police accepted their (new) role and whether they anticipated they would continue with it as expected into the future; and had the resources available
- the police had the proper equipment and training
- drivers were able to circumvent the penalty process (for example, using bribery).

This type of evaluation seeks to identify evidence of the 'productivity' of the speed management interventions. These outputs can often be measured and compared to inputs to determine implementation efficiency. For example, speed enforcement outputs can be measured in numbers of hours spent in on-road traffic policing, or in numbers of speed cameras operating compared to the investments in these resources. Other outputs would include the number and quality of engineering treatments, lower speed limits established, and quality and quantity of signs.

The evaluation, could measure, for example, whether:

- speed limits are appropriate and clearly signposted, and whether a review programme is in place
- offenders issued with a speeding penalty paid their fine
- publicity and education campaigns informed the public about the reasons for, and benefits of, speed management.

Impact assessment

An important 'impact' performance indicator for speed management projects will be the reduction or increase in the speed of vehicles on the road. The level of compliance with speed limits is an indicator of speed-related risk, and is therefore a fundamental indicator to monitor. However, measurement of any change in average speeds, and speed variance, are important to assessing the impacts of speed management interventions (methods for speed measurement and speed data analysis are discussed in Section 2.2.2). Ideally, speed surveys should take place at six-monthly intervals and at a sufficiently large number and range of sites to give a good assessment of changes that could be attributed to the speed management interventions implemented. Importantly, the cost of these surveys should be built into the overall cost of the speed management programme.

Changes in road-user knowledge and perceptions about speed and speed management are also impact measurements. Indicators such as population or target-group knowledge of the risks associated with excessive speeds, attitudes towards speed limits and perceptions such as the likelihood of being detected by police for exceeding speed limits are indicators of the impact of public education and enforcement interventions.

Depending on programme objectives, impacts of engineering treatments could include, for example:

- whether pedestrian traffic is effectively kept separate from motor vehicle traffic
- the positive or adverse effects of speed humps or other traffic calming devices
- road user understanding of speed regulatory or advisory signs.

Outcome evaluation

This type of evaluation involves measuring actual outcomes to see if the programme was successful. For example, speed management programme outcomes might be evaluated in terms of reduction in the numbers of recorded crashes involving speed as a contributing factor, a change in the ratio of fatal crashes to serious, slight injury and non-injury crashes, or a reduction in the involvement of speeding as a contributing factor to serious injury crashes compared to other contributing factors.

Using more than one outcome indicator will help to explain more about what is being achieved. For example, one consequence of a general reduction in driving speed may be that while the numbers of deaths and serious injuries may be reduced, the number of slight injury or damage-only crashes may not decrease to the same extent, or may even increase. Understanding why overall crash rates are not improving – or may even worsen – requires an analysis of crash contributing factors as it may mean that speed management is not reducing crash incidence rates.

Moreover, it is useful to segment and analyze the speed crash and injury data by road user categories, such as pedestrians, cyclists, motorcycle riders/passengers, car and truck drivers, car and truck occupants and so on. Demographic information will also assist in understanding programme outcomes with respect to gender, age, nationality, and other factors.

5.2 Choosing the evaluation methods

The methods used for each type of evaluation will vary. Both qualitative and quantitative methods can be used within the design of an evaluation (Table 5.1). Qualitative methods may be employed for formative and process evaluations, e.g. focus groups, short-answer or open-ended questionnaires. Quantitative methods such as surveys may also be employed for process evaluations.

Impact and outcome evaluations may be carried out using a variety of quantitative methods. Using an experimental or quasi-experimental design to demonstrate a change (or not) is the most powerful programme evaluation for detecting changes in outcome. The methods used will depend on the aim and the budget for the evaluation.

There is an extensive and well-defined hierarchy of experimental designs for examining the effectiveness of interventions. These range from fully randomized control trials (which can provide high level evidence for the effectiveness of an intervention) to, for example, uncontrolled 'before–after' studies which can only ever provide weak indicative evidence of effectiveness.

Table 5.1 Study types and their advantages and disadvantages*

	Formative and process evaluation	Impact and outcome evaluation	Pros and cons
QUALITATIVE			
Focus groups/ in-depth interviews	✓– formative – process	✓– outcome	– Can provide information on why intervention may or may not have worked – Cheap – Sample (participants) are not random sample – Results are not generalisable
QUANTITATIVE			
Randomised controlled trials		✓– impact ✓– outcome	– Most rigorous evidence – Expensive – Randomisation not always feasible
Controlled before–after study		✓– impact ✓– outcome	– Most practical design – Must have comparable control group
Interrupted time series design		✓– impact ✓– outcome	– Practical design if sufficient numbers of events and accurate surveillance systems in place
Before–after study (no control group)		✓– impact ✓– outcome	– Cheap – Low level of evidence

* Further detail about study types is available in references *7* and *11*. There is also a useful online glossary of epidemiological terms at: www.cochrane.org/resources/glossary.htm

5.2.1 Study types for formative and process evaluation

Qualitative research is in-depth research used to understand why things happen. Such studies collect data about personal observations, perceptions and beliefs, which can be used to broaden understanding of the underlying processes. Specific techniques include using focus groups, in-depth interviews, or questionnaires with short answers or open-ended questions *(2,3)*. However, an evaluation may use both qualitative and quantitative methods. For example, a process evaluation of a speed enforcement campaign might seek to identify whether 'the public' were aware of the

campaign and whether it was likely to influence their behaviour and, perhaps most importantly, if not, why not?

While answers to the first two questions could be collected by simple quantitative methods such as surveys (either at the roadside, by phone or by post) the latter question (why not?) would best be answered by employing a series of focus groups – perhaps containing different types of driver. Such feedback aims to improve any future developments of the programme.

5.2.2 Study types for impact and outcome evaluations

The following methods are described for the use of road safety/speed management operational staff. The recommended study methods fall into two categories: experimental and quasi-experimental study designs.

Experimental – randomized control trial

The accepted 'gold standard' of evaluation is the randomized control trial (RCT) which can be used to provide the highest quality of evidence that an intervention or programme was or was not successful.

In a RCT, the study population is randomly allocated to either receive, or not receive the programme or intervention. If the randomisation process is adequate, other factors that may influence the outcome – measured and unmeasured – are more likely to be balanced between the intervention and non-intervention group. This means that it is possible to compare the outcomes of interest across the groups without fear of bias, and a robust estimation of the effectiveness of the intervention may be made. RCTs may be conducted at the individual level, whereby the unit of randomisation is a single unit (e.g. a person, road or intersection), or in clusters, where the unit of randomisation is a group of units, such as a town, or school (cluster RCT).

For speed management interventions the study group could be different roads, regions or cities. For example, to evaluate the effectiveness of speed detection devices in reducing speed, black-spot intersections in a city could be randomly allocated to receiving a device or not. Speeds at the intersections would be compared across all intersections before and after the implementation of the devices.

However, although RCT designs should always be considered when evaluating effectiveness of an intervention, they do require significant resources and may be difficult to conduct with a limited budget. There can also be ethical considerations in randomising a potentially beneficial intervention (that is, denying an effective intervention to participants in the non-intervention group).

Quasi-experimental study designs

If properly conducted, these study designs (while not as rigorous as fully randomized trials) can be used to establish the effectiveness of an intervention. They typically involve collecting 'trend' information by monitoring key indicators over time. Quasi-experimental evaluation methods include: controlled before-after studies, before-after studies with no control group, and interrupted time series studies. These are described below.

Controlled before-after study

This is often the most practical design for evaluating programmes. This design involves observing the outcome of interest (e.g. vehicle speeds, crash rates, violation numbers) before and after the intervention for both the sample experimental group undergoing the programme, and an equivalent control group (Box 5.1). The control group should be as similar as possible to the experimental group and any important differences between the groups need to be taken into account. A control group allows trends that may have been occurring in the population separately from those happening as a result of the programme to be taken into account.

It is necessary to plan this approach well in advance because often interventions are introduced over a lengthy period of time in different places.

Before–after study (no control group)

The before–after study without a control group is often used to evaluate the impact of a programme, but provides the weakest evidence for the effectiveness of a programme. This design involves measuring the outcome of interest before and after the programme has been run. This study design is simple, and may be conducted relatively cheaply because all that is needed is a sampling frame and people and/or equipment to conduct observations at various sites. However, without a control group, the scientific merit of these study types is relatively limited, because it is often difficult to attribute with any certainty the change in outcome solely to the introduction of the programme.

BOX 5.1: **Speed calming, Denmark**

A ten-year before-after study in Denmark showed that after speed calming was introduced on main roads through a number of rural villages (using engineering techniques such as road narrowing, medians, raised areas, bicycle lanes etc) the number of injuries decreased by 50%. In the control group, the total number of people injured fell by 29%. This illustrates the significant impact of general improvements to road safety, although the difference of 21% demonstrates the impact of the measures.

Source: *(4)*

Interrupted time series design

It is also possible to assess the effect of a programme by using multiple measures of the outcome of interest before and after the programme. There are a number of different variations on this design, some involving control groups (Box 5.2). Studies that have used these designs generally use routinely collected measures such as fatality rates, injury rates or crash rates, as multiple measures are required for appropriate analysis. The validity of this study design can be distorted by events outside the control of those monitoring the programme (such as a petrol shortage, or a massive increase in fuel costs), which may or may not have contributed to any observed effect. However, statistical analysis of such data can take account of such factors so as to establish whether the intervention was responsible for the change.

BOX 5.2: Speed cameras, Barcelona, Spain

In Barcelona, researchers used a time series study to assess the effectiveness of speed cameras in reducing the numbers of road collisions and injuries (and the number of vehicles involved in collisions) on the city's beltway. The 'intervention group' was the beltway, and the control group comprised arterial roads on which no fixed speed cameras had been installed. The data was fitted to Poisson regression models that were adjusted according to trends and seasonality. The relative risk (RR) of a road collision occurring on the beltway after (compared to before) installation of speed cameras was 0.73 (95% confidence interval [CI]=0.63, 0.85). This protective effect was greater during weekend periods. No differences were observed for arterial roads (RR=0.99; 95% CI=0.90, 1.10). Attributable fraction estimates for the two years of the study intervention showed 364 collisions prevented, 507 fewer people injured, and 789 fewer vehicles involved in collisions.

Source: *(5)*

Determining sample size

For all quantitative evaluations it is important to have sufficiently large numbers in the study sample to be sure that, if an effect exists, it is detectable. The rarer the event, the greater the sample size needs to be in order to detect a difference. Crash fatalities can be relatively rare events and a study using serious injury or death as an outcome would involve a larger monitoring period, while measuring individual vehicle speeds along a particular stretch of road would require a smaller period to obtain a suitable number of participants.

Factors that must be taken into consideration in determining the sample size are the expected size of any effect to be detected, the inherent variability of any measure, and the frequency at which measurable events occur *(6)*.

Sample size calculators are freely available on the internet, but it is wise to consult a statistician regarding such estimates, particularly where cluster randomized trials or random and/or stratified samples are necessary. Links to online sample size calculators may be found in the statistical package Epi Info™ which may be downloaded at www.cdc.gov/epiinfo/

A sample size calculator for cluster randomiszed trials can be found at www.abdn.ac.uk/hsru/epp/cluster.

Statistical significance testing

Quantitative study design data requires statistical analysis. For further guidance, see (*7, 8 and 11),* or visit the relevant lectures in the basic methods and injury sections at www.pitt.edu/~super1.

5.2.3 Conducting an economic evaluation of a programme

In recent years it has become increasingly important to conduct economic evaluations of safety initiatives to demonstrate 'value for money', and to help determine the best way to spend limited budgets *(9)*. This type of evaluation is especially important in low-income countries where there are very limited manpower and funding resources, and where planned expenditure needs to be justified and shown to be worthwhile (for example, by freeing up hospital beds used by accident victims and allowing more resources for other health problems).

Economic evaluation essentially addresses the question of whether an intervention represents a worthwhile use of resources. The usual way to address this question is a comparison of two or more intervention options one of these is usually either a 'do nothing' or 'status quo' alternative.

Economic evaluation is based on the comparison of alternatives in terms of their costs and consequences *(9)*. The term 'consequences' is used here to represent an outcome of value. There are various forms of economic evaluation that can be conducted – each differing in terms of scope, i.e. the range of variables included in the analysis. Importantly, each form of economic evaluation typically entails a set of starting assumptions; recognition of these is necessary for the policy-maker to make appropriate use of the evidence from such studies.

A common element across all forms of economic evaluation is that they involve measuring costs. Costs usually comprise, at least in part, the direct programme costs for the resources that are used to run the programme (e.g. equipment, staff, consumables). However, in principle, other costs may also be relevant such as those incurred by patients, carers and the wider community. Furthermore, there are 'downstream' costs and savings that may be considered. e.g. a programme may result in reduced hospitalisations and these savings in resources may be deemed relevant. The type of costs selected generally depends on the perspective taken in the evaluation and the nature of the resource allocation problem being addressed *(6, 9, 10)*.

Methods used in economic evaluation

The most common form of economic evaluation is cost-effectiveness analysis (CEA). This entails the total cost of programmes measured alongside a defined outcome to

produce a 'cost-effectiveness ratio' (e.g. cost per life saved, cost per life-year saved or cost per case prevented).

Because there is a comparison made between two alternatives, say A and B, the results are typically presented as an *incremental* cost-effectiveness ratio – measured as the additional costs of A vs B as a ratio over the additional outcomes achieved of A vs B. For instance if A costs $2 million and saves 100 lives and B (which might be current practice) costs $1 million and saves 20 lives, the incremental cost-effectiveness ratio of A vs B is $12,500 per life saved ($1 million/80 = 12,500). Whether this represents 'value for money' and thus should be funded is ultimately a judgement for the decision-maker, and might depend on factors such as the cost effectiveness of other alternatives and budgetary constraints.

The assumption in CEA is that the objectives of interventions being compared are adequately captured in the measure of outcome used. However, a single dimensional measure such as lives saved may not be sensitive to quality-of-life changes. One modification to conventional cost-effectiveness analysis is cost-utility analysis which is based on an outcome measure, Quality Adjusted Life Year (QALY) incorporates change in survival and quality of life and thereby enables a wider set of interventions to be legitimately compared than would be possible with CEA.

Another form of economic evaluation, often used to evaluate transport sector investment, is cost-benefit analysis (CBA), which seeks to evaluate interventions in terms of total costs and total benefits – both dimensions being valued in monetary terms (e.g. dollars). Therefore if benefits are greater than costs, the decision would be to fund the programme. Note here that a cost-benefit analysis does not require a direct comparison with a programme alternative because the 'decision rule' (i.e. the criterion on which investment decision is made) is based solely on the comparison of costs and benefits from a single programme measured in commensurate (monetary) units. Valuation of health benefits in this way can be challenging, but one approach would be to elicit from beneficiaries of programmes their maximum willingness to pay for these benefits (i.e. if they had to pay for it in a hypothetical market place). The idea behind this approach is to derive a valuation for an intervention akin to the way in which consumers value goods and services in markets. Another means of valuing benefits in monetary terms is in terms of productivity gains, e.g. reduced disability will result in greater productivity, which in turn could be measured by wage rates.

Choosing the appropriate type of economic analysis for the needs of the particular programme will depend on resources available (both economic and human), and the aims of the evaluation (Box 5.3). Taking quality of life into account is a powerful measure for evaluations of road crashes where lifelong disability resulting from serious injury may be an outcome.

BOX 5.3: **Speed calming, Ghana**

In 2007, the Ghana Highway Authority (GHA) and the Building and Road Research Institute (BRRI) carried out an evaluation of eight speed calming schemes on crash-prone stretches of highway passing through settlement areas. These schemes included measures such as road narrowing, delineators and road studs. The results proved that the schemes had been an extremely good investment for local people. The 'break even' analysis showed that the eight schemes had 'earned back' their costs in terms of benefits to the society in just 1.6 years – in savings on material damage, medical treatment and lost working capacity. At one site, the first year rate of return (FYRR) was 232%. It was an extremely cost-effective investment for Ghanaian communities.

5.2.4 Choosing the performance indicators

Performance indicators (or outcome measures) are a measure of how successful a programme has been. They should relate directly to the objectives of the programme. Choice of performance indicators will be determined by the aims of the evaluation, the study type used, the resources available and, to a certain extent, the requirements of the funding agency. For instance, government funding agencies may require certain information to ensure support for increased enforcement or for further roll-out of a programme.

To succeed in implementing a successful speed management intervention it is necessary to carefully monitor the programme's progress. The performance indicators could be changes in observed speeds, in the number of crashes, or reactions from the public and stakeholders. Monitoring is needed in order to rectify problems as quickly as possible, as well as ensuring government and key stakeholders are kept fully informed of progress, challenges, difficulties and solutions. The performance can also be measured in terms of economic efficiency. Ideally, outcome and other programme performance measurements are carried out by a qualified and independent evaluation specialist.

The quality of the evaluation depends on the accuracy of data collection. If there is a uniform capture, coding and reporting system already set up by the police or transport authorities (or even in hospitals and/or health departments) there may be aggregated data available on crash severity, types of crash and even contributory factors, such as excessive speed. As quality may vary, completeness and accuracy of these data sources should be carefully checked before use. Additional data collection methods – or improvements to the existing methods – may be required.

In some instances the evaluation may set out to assess the effectiveness of capacity building measures – e.g. training and equipping police to conduct speed

enforcement. Such an evaluation might assess whether the police have been provided with suitable equipment (e.g. speed radar), and been given proper training in its use, and sufficient knowledge of the programme's purpose in order to improve road safety and reduce casualties through enforcement.

NOTE

The need for monitoring and evaluation

A simple but effective monitoring and evaluation system is required to track progress of road safety activities and to estimate the safety impact. For action plans in developing countries, initial focus is often on institutional strengthening and capacity building rather than on reducing the number of casualties. Monitoring and evaluation systems established as part of implementing action plans and safety initiatives must therefore, where appropriate, be able to indicate progress towards achievement of institutional impact and developmental objectives.

Source: World Bank. Washington DC *www.worldbank.org/transport/roads/safety.htm*

Setting up a monitoring and evaluation mechanism follows the processes of carrying out a situational assessment (Module 2) and developing and implementing an action plan (Module 4). A monitoring programme for speed management would ideally analyze relevant data for measuring road crash injury outcomes and speed indicators. Table 5.2 gives examples of such measures.

Monitoring the programme involves keeping a close check on all indicators, to ensure the programme is on track towards the goals set out. Monitoring can be:

- *continuous*, with the lead agency of the working group overseeing the overall programme, or
- *periodic*, with activities measured at the end of each stage of the implementation.

Table 5.2 is not a comprehensive list of indicators or monitoring actions, but it gives an example of the types of monitoring that may be helpful in measuring the effectiveness of a speed management programme. It is important to allocate responsibility for the monitoring and evaluation and define resources for this task – both human as well as financial resources. A feedback mechanism should also be put in place to allow the regular revision of a programme and to report back to the programme owner. This could result in adjustments to improve the programme.

There are a number of sources to assist with guiding the preparation of an evaluation plan. For example, a United States government agency has produced a comprehensive guide to evaluating road safety projects *(11)*. It provides an overview of the steps required, from designing the evaluation to reporting the findings. The methods used for each type of evaluation will vary.

Table 5.2 Potential performance indicators for monitoring and evaluation (limited sample only)

	Objective	Potential indicators for monitoring	Monitoring mechanism/ data sources
Outcomes	Reduce incidence of speed as a factor in crashes	• Speed-related crashes compared with all crashes • Rates of speed crashes per 100,000 people • Rates of speed crashes per 10,000 vehicles • Rates of speed crashes per vehicle kilometre travelled	• Crash reports/police or crash investigators • Population census data • Vehicles registered for use on public roads • Highway/road administration data related to traffic volume and road design
	Reduce severity of road crashes	• Injury level per crash or numbers of fatalities per crash • Number or rates of speed-related fatalities or serious injuries over time	• Police, hospital and emergency services data on crash cause and injury severity • Monitor speed-related fatalities every month and record and track trends over time
	Reduce pedestrian fatalities	• Number of pedestrian deaths where speed is a factor	• Police, hospital and emergency services data
Impacts	Increase compliance with speed limits	• Percentage of drivers measured at or below speed limits	• Speed survey data
	Reduce mean free speeds and high speeds	• Reductions of driver travel speeds	• Speed survey data tracked over time
	Increasing public acceptance of speed management	• Percentage of people who are in favour of government actions to reduce speeding	• Interviews or written questionnaire data on community attitudes (e.g. to speed enforcement, engineering treatments, speed limits, etc.)
Outputs/process	Increasing capacity of police to enforce	• Extent of area covered by enforcement • Ratio of traffic police working with speed enforcement to total police	• Increase size of traffic police force • Change enforcement practices and locations • Improve system of issuing penalties and collecting fines
	Increased value for campaign expenditure	• Number and frequency of publicity spots in the media • Amount and nature of feedback from the target audience	• Monitor media coverage and compare costs of additional advertising that would have been needed • Target audience reach as determined through market surveys
	Increased improvements in separating vulnerable road users from motorized traffic	• Numbers of sites successfully treated • Numbers of vulnerable road users not protected	• Site changes documented and counted • Vulnerable road-user compliance observed

5.3 Dissemination and feedback

Once an evaluation is complete it is important to provide feedback to the stakeholders involved in the programme as well as the public, even if results were not very good. Dissemination of the results in this way will help to garner further support for the programme if it is successful, and help others gain support for the introduction of similar programmes. Publicity from dissemination activities may also increase the impact of the programme.

Checklist

- ☐ Start evaluation process at the beginning of programme implementation.
- ☐ Determine aim of evaluation and develop evaluation framework.
- ☐ Clearly define target population, place, time and performance indicators.
- ☐ Develop and test procedures for data collection, ensuring consistency in measurement.
- ☐ Collect and analyze data – before implementation and at predetermined intervals after implementation.
- ☐ Write and disseminate evaluation report, feeding back to various aspects of programme.
- ☐ Use evaluation results to feed back into new planning cycle and to promote programme sustainability.

Communicating results

While a programme may have succeeded in achieving its objectives, it is helpful to examine and discuss with the working group (see Section 4.2.1) what elements worked well and why.

If the programme has not been successful it is important to share this with others so that weaknesses or relevant issues are considered in similar interventions, including whether or not to introduce such interventions in the first place. The working group should discuss implications of the evaluation findings and consider whether they demonstrate any tangible benefits, problems to be rectified, or elements to be abandoned. Moreover the evaluation could discover unexpected side effects of the programme – both positive and negative. These should inform the further development of the programme.

Apart from discussing the evaluation results with the working group and the reference group (see Section 4.2.2), dissemination may involve presenting the results at public meetings, using the media to publicize the outcomes of the programme, or publishing reports and papers in scientific literature. The results of the evaluation

should be fed back into the planning cycle and the appropriate modifications to the programme made before it is further expanded.

Giving recognition to individuals and agencies, and celebrating success

When successful outcomes have been identified, it is recommended that both formal and informal activities be arranged with staff from participating agencies to celebrate success. In road safety projects the major benefit that staff receive from participation in a successful project is personal satisfaction. However, positive endorsement by senior management of the value of their work is a critical component for maintaining staff morale and showing all participants that their work is acknowledged and acclaimed. Equally, one agency showing its appreciation of the good inputs by another can go a long way towards building strong, long-lasting partnerships.

Sharing lessons to ensure sustainability of the programme

Sharing lessons about programme success factors with key stakeholders will help to ensure that any benefits obtained at the beginning of the programme are maintained. Longer term funding requirements and adequate speed management resources are more likely to be secured if programme performance is measured and reported.

Summary

- Monitoring and evaluation should be seen as an integral component of all speed management programmes.
- The strategy or framework adopted for monitoring and evaluation needs to be determined at the beginning of a programme, and any necessary data collection for the purpose of evaluation should be built into project implementation.
- As well as providing information on the effectiveness of a programme, monitoring and evaluation will help to identify any problems in implementing the programme, meaning that necessary changes can be implemented at an early stage.
- Determining the aims of the evaluation will help to decide how best to carry out the evaluation. There are a number of different methods that can be used to evaluate the various elements of a speed management programme. Each method has advantages and disadvantages, and the choice of which to use will depend on the main objectives of the programme, the evaluation questions, and the resources available.
- It is important that the results of any pilot testing, monitoring and evaluation are shared with the appropriate stakeholders, and that this information is used in planning and improving both current and future programmes.

References

1. Rossi PH et al. *Evaluation: a systematic approach*. California, Sage Publications, 2004.
2. Britten N. Qualitative research: qualitative interviews in medical research. *British Medical Journal*, 1995, 311:251–253.
3. Kitzinger J. Qualitative research: introducing focus groups. *British Medical Journal*, 1995, 311:299–302.
4. *Danish experiences with speed management*, paper presented by Lárus Ágústsson, MSc., Civ. Eng. (Project Manager, Danish Road Directorate, Danish Ministry of Transport) at Transportation Research Board 84th Annual Meeting, January 2005.
5. Pérez K et al. Reducing road traffic injuries: effectiveness of speed cameras in an urban setting, *American Journal of Public Health* 2007, 97:1632–1637.
6. Kerry SM, Bland JM. Statistics notes: Sample size in cluster randomisation. *British Medical Journal*, 1998, 316:549.
7. Woodward M. *Epidemiology: study design and data analysis*. 2nd edition. Boca Raton, Florida, Chapman and Hall CRC, 2005.
8. Rothman, KJ, Greenland S. Modern Epidemiology. 2nd edition. Hagerstown, Maryland, Lippincott-Raven, 1998.
9. Drummond MF et al. *Methods for the economic evaluation of health care programmes*, Oxford, Oxford University Press, 1997.
10. DETR, *A road safety good practice guide for highway authorities*. London, Department for Transport, Local Government and the Regions, 2001.
11. *The art of appropriate evaluation: a guide for highway safety program managers.* Washington DC, Department for Transportation Report HS 808894, May 1999 (www.nhtsa.dot.gov/people/injury/research/ArtofAppEvWeb/index.htm).