# C.05 Monitoring

## Key Principle

Local authorities should develop a robust system for monitoring and evaluating cycling activities throughout their area to enable targets to be set for future growth.

Cycle flows should be measured before and after the introduction of all new cycle tracks and lanes and consideration given to developing local targets based on these surveys that can feed into overall cycle–use targets.

Provision for the installation of automatic counters should be included in cycling scheme budgets (including those secured through Section 278 and Section 106 agreements in new-build schemes) to enable a network of data collection points to be established.

## Design Guidance

### Introduction

All local authorities should develop a robust system of monitoring and evaluation cycling activities throughout their area to enable targets to be set for their future expansion.

It is essential that data on cycling activities is recorded both before and after the introduction of new measures aimed at increasing cycling. This applies as much to soft (promotion etc) as hard (infrastructure) measures as well as changes in policy. Not only does the subsequent evaluation help justify the expenditure/activity it also helps demonstrate the value of further investment.

Cycle monitoring should be used to establish:

- **Baselines** – to create a starting point for use in setting targets
- **Levels of use** – across a range of routes and facility types
- **Trends** – to detect changes in use over time
- **Origins and destinations** – to identify primary desire lines
- **User profiles** – to identify existing and potential markets for encouragement
- **Scheme-specific impacts** –to identify the outcomes of both hard and soft measures

To be meaningful, the process of monitoring cycling levels has to address a number of issues. In particular, the decision to cycle on any particular day will be affected by a range of factors including the weather, the need to carry a bulky object, call at an additional destination etc. For this reason cycle use does not exhibit the same inflexible demand characteristics that enable conclusions to be reached about motor traffic levels based on one annual count. This means that to establish statistically significant results a number of counts have to be undertaken.

To complicate matters further, the number of counts needed varies with cycle flows. For example, to detect an annual change of 20% in a flow of cyclists exceeding 250 per day, with 90% confidence 7 counts would be needed. At a site where flows are between 100 and 260 per day the number needed rises to 13. Clearly this can impose a considerable burden on a local authority. Fortunately, a range of techniques is available to address these issues and these are outlined below.

**Monitoring General**

Unlike the monitoring of motorised traffic it is not possible to convert the results of cycle monitoring for short periods to annual averages or to compare results from different times of the year. When monitoring cycle flows the following should be borne in mind:

- Count when flows are highest
- Count during good weather
- Count during British Summer Time, preferably between May and October
- Count primarily utility trips on weekdays outside school holidays
- Count primarily recreational trips during school holidays – weekend counts may be appropriate
- Comparison counts should be taken at the same time each year
- Cyclists illegally using the footway should be counted amongst those cycling on the carriageway

Counts of cycling and walking activity can be conducted on the basis of counts at one or more points on the cycle or highway network. In addition, the counting of cyclists can be included within an authority's regular programme of cordon or screenline counts to provide an overall picture of movements between zones. However, to achieve an accurate picture this should include simultaneous counts on those minor roads and off-road routes that cyclists use to avoid the busier roads that normally form the basis of such programmes.

Provision for the installation of automatic cycle counters should be included in cycle track scheme budgets to enable a network of collection points to be established. On wholly new cycle tracks it will be impossible to record flows before construction but monitoring on routes feeding/being fed by the new facility will help build a picture of cyclists' flows. Cycle counters (where used) should ideally be installed and commissioned before the cycle track is opened so that growth can be measured from day one.

**Cycle Monitoring Techniques**

***Manual Classified Counts (MCC)***

Cyclists should be included in all MCCs. However, as explained above, the value of manual counts for establishing meaningful statistics on cycling levels is generally limited in view of the costs of carrying out the necessary number of counts. Nevertheless manual counts can be useful in calibrating automatic counters, providing detailed information such as age and gender of cyclists, establishing turning movements or providing indicative counts at short notice, e.g. peak hour school or employment trips.

***Destination Surveys*** (Cycle Parking)

Useful information can be obtained by undertaking counts of bicycle parked at a number of destination types. These can include transport interchanges, schools, defined areas (for consistency) within town centres and workplaces. Making parking surveys an integral part of travel plans can help provide useful information and reduce costs so long as consistency in methodology, regularity and reporting can be achieved.

***Interview surveys***

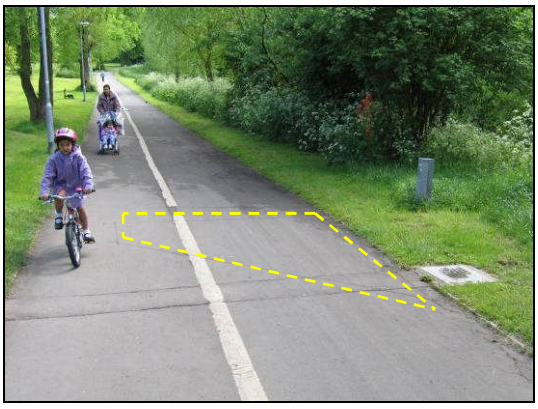
Roadside or destination interview surveys are expensive but can provide valuable, accurate information about origins and destinations. They can also give useful information about the demographic profile of those interviewed. Data provided will only represent a 'snapshot' unless site with high flows are chosen.

***Automatic Cycle Counters (ACC)***

Automatic counters are now well established and although they are becoming more and more sophisticated there are a number of issues that affect them all to a greater or lesser extent and which should be taken into account when their use is being considered:

- When sited within the carriageway they can be triggered by passing motor vehicles unless they are sited where only cyclists may be expected to pass/trigger counter
- Unable to distinguish between single and groups of cyclists
- May not be able to capture all passing cyclists (some may be on the footway when the ACC is within the carriageway or may miss cyclists on the pedestrian side of an adjacent facility)
- May be triggered by other users such as a pram or wheelchair
- Require calibration and control sites to establish accuracy

On the positive side, many of the counter units employed by ACCs have the advantage of being able to be moved from site to site to minimise capital costs. Solar powered counters can be used in rural areas where access to a power supply/regular battery replacement would make installation prohibitively expensive.



Inductive detection loops (highlighted) not covering full width of path

Picture: Mark Strong (Transport Initiatives - courtesy of Essex County Council)

Note: all ACC sites should be visited regularly to check that they are functioning properly and the results they are giving are not adversely affected by such things as maintenance activities, diversions etc.

*Inductive loops*

Inductive loops consist of a coiled wire buried within the carriageway or cycle track (can be bound or unbound surfaces) which creates an electromagnetic field. When a bicycle crosses the field its presence is recorded by the counter unit. This type of ACC has the advantage of being relatively cheap, requires little maintenance and can be up to 95% accurate.

Data capture by means of PDA plugged into counter unit of loop detector

Picture: Sustrans

*Piezoelectric counters*

Piezoelectric counters work by detecting the pressure made by a passing bicycle exerted on an embedded strip. These counters are generally up to four times more expensive than inductive loops but can be as accurate although this accuracy can reduce due to wear on the strip.

*Pneumatic Tube Counters*

Surface mounted pneumatic tubes laid in pairs can not only detect the presence of bicycles compressing the tube they can also determine speed and direction. Capital costs are low but they can be subject to damage by passing vehicles or vandalism.

*Radar detectors*

Radar detectors can provide good accuracy (over 90%) and can detect cyclists within mixed traffic flows. However, the need to site them out of the reach of vandals can make data retrieval more difficult and hence more costly.

*Other*

Other means of providing data on cycle use may be gained from the following (not exclusive):

- Travel behaviour surveys including travel diaries
- Satisfaction surveys (focus groups)
- Surveys of physical activity
- Citizens' panel surveys
- Census journey to work information (ten yearly cycle means information value reduces with time)

**References**

LTN 2/08 *Cycle Infrastructure Design* DfT 2008

TAL 1/99 *Monitoring Local Cycle Use* DfT 1999

*Research on monitoring cycle use* TRL Report 396 1999

*Guidance on monitoring local cycle use* TRL Report 395 1999

**Other references**

*Cycle Friendly Infrastructure - Guidelines for Planning and Design* Bicycle Association et al 1996