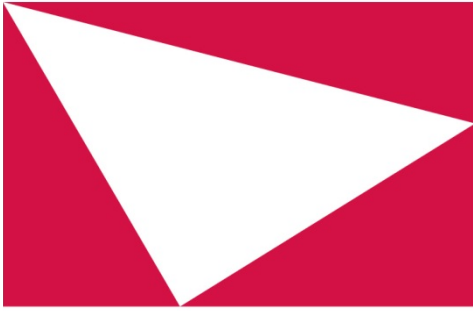


**Transport
Research
Institute**

Evaluation of cycling projects under the Scottish Government's Climate Challenge Fund

ClimateXChange

March 2013



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Issue Record

Version	Date	Description	Created by	Verified by	Approved by
01	11/03/12	First Issue	M.Careno J.Cowie R.Llewellyn K.Stewart S.Tully	J.Cowie	R.Llewellyn
02	13/03/12	Minor changes to text. Executive Summary added.	M.Careno J.Cowie R.Llewellyn K.Stewart S.Tully	J.Cowie	R.Llewellyn



Executive Summary

A study was undertaken to evaluate the success of cycling projects under the Scottish Government's Climate Challenge Fund (CCF).

The study reviewed nineteen CCF projects directly or indirectly related to cycling, along with a literature review of international best practice in cycling projects.

The conclusions of the best practice review were:

- in general cycling projects have a positive impact on modal shift, whether stand alone or as part of a package;
- the longevity of cycling interventions is little understood, although the most effective schemes tend to be area wide over a long period of time;
- meaningful reductions in carbon can be achieved with cycling schemes and it is the scheme content that is important, not whether it is a standalone scheme or part of a package;
- best results are achieved when a scheme has an objective led goal with baseline data and is regularly monitored during implementation;
- evaluation thresholds can be defined but caution should be exercised if doing so - the scheme may not stand on its own merits but may contribute positively to a wider initiative; and
- spill over benefits are associated with school schemes, but wider non-carbon benefits are also an important consideration when considering return on investment.

On the basis of these findings, it is recommended that:

- the CCF application form should be updated, in particular with a focus on a problem rather than solution based approach;
- the Travel Low Carbon Route Map should be updated to include additional guidance on project design, target group selection and the relevance of wider schemes;
- attention should be paid during the application evaluation process to the above points;
- consideration should be given to use of the European MaxSumo system for the evaluation of future cycling and mobility projects; and
- the accuracy of carbon accounting should be monitored, and if appropriate, the use of the MaxEva system should be considered to improve consistency.

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Appendix A CCF Projects Reviewed

Appendix B International Best Practice

1 Introduction

1.1 Background

The Transport Research Institute at Edinburgh Napier University was commissioned by ClimateXChange to evaluate the success of cycling projects under the Scottish Government's Climate Challenge Fund (CCF).

The work was commissioned to inform future evaluation of cycling projects under the fund. The outcomes of the study will be used by the Scottish Government, Keep Scotland Beautiful, community groups that are designing and managing projects and the CCF Grants Panel.

1.2 Project Brief

The brief from ClimateXChange was to undertake a study in two parts.

The first part required an evidence review to be undertaken, to identify best practice in community cycling and wider transport projects in terms of carbon emissions reductions. The review was required to cover typical schemes under the CCF in addition to UK and European best practice.

Specific questions to be answered were:

- How much car travel do cycling projects actually displace and what degree of genuine modal shift are they able to leverage?
- How 'sticky' are cycling behaviours – how long can we expect modal shift to last?
- Can stand-alone cycling projects achieve meaningful emissions reductions, or is a more integrated approach required?
- What strategies and techniques work best for encouraging modal shift (what would a 'good' project be expected to include)?
- How does that modal shift translate into carbon savings?
- What is the maximum realistic carbon abatement one could expect and what would the lower limit be below which emissions savings are not worthy of consideration?
- How much 'spill-over' can be expected from cycling projects?
- How do school projects or projects involving children differ from other projects in terms of spill over?
- What techniques and approaches to promote 'spill-over' from cycling initiatives work best?

Based on the findings of the initial work, the second part of the study was to recommend carbon best practice guidelines for community cycling projects. Specific recommendations were required on:

- strategies – including how much consideration projects ought to give to other transport options and wider modal shift;
- carbon accounting methods; and
- methods for maximising 'spill-over' behaviour change effects

The study was required to recognise and take into account the criteria for the CCF and the existing Travel Low Carbon Routemap.

1.3 Format of Report

The following sections of this report cover the findings under the two parts of the project brief. Section 2 contains the results of the review of the CCF schemes, in addition to a summary of best practice from similar schemes in the UK and Europe. Section 3 translates these findings into specific recommendations for assessment of future cycling projects under the CCF scheme.

Section 4 summarises the work undertaken and makes recommendations for future actions. Finally, references used in the compilation of this report and the case studies identified in the best practice review are listed in Section 5.

2 Best Practice Review

2.1 Methodology

The first part of the work was an evidence review, including a representative sample of cycling related CCF projects and best practice from examples from elsewhere in the world.

In total, nineteen CCF projects were reviewed to understand the performance of a typical cycling related project under the scheme. Ten of the projects were 'core' cycling projects, as provided by the client group. In addition, a further nine projects were selected which were believed to contain a significant representative cycling interest, but cycling based initiatives were not necessarily the main focus of the project. The application for each scheme, the CCF panel monitoring spreadsheet and where available, final reports were reviewed.

Desktop research and a literature review were undertaken of cycling schemes elsewhere in the UK and internationally. Evidence of best practice from these schemes was extracted and reported where there was particular relevance to current and future CCF schemes. Where reported, typical modal shift figures for such schemes have been noted.

The findings of the first part of the study are summarised under the headings below, which relate to the key questions raised in the project brief as shown.

A summary of key findings is presented at the end of the chapter and a table showing a summary of the CCF and international projects reviewed is contained in Appendices A and B.

2.2 Modal Shift Benchmarking

How much car travel do cycling projects actually displace and what degree of genuine modal shift are they able to leverage?

2.2.1 CCF Projects

Key to any assessment of modal change is the monitoring procedures employed. In the CCF projects reviewed, a high degree of variability in the mechanisms used to monitor project impact was found, with little evidence of a standard approach being taken. Evaluation ranged from simple hands up surveys and bike counts to more general behavioural surveys and focus groups.

Modal split was most easily monitored when the projects related to discrete populations such as school groups. The school projects benefited from the 'hands-up' survey which provided a simple method of achieving a consistent measure with near 100% response rates.

There was also some monitoring of modal share data to establish baseline surveys. In some projects a stronger understanding of the baseline position had been established to allow for effective targeting of future initiatives and subsequent monitoring of mode change (Sustaining Dunbar, Heriot Watt cycle rack surveys).

A significant number of the projects had received funding from a number of different funding sources, and in the project reports no attempt was made to identify specifically what the CCF funding had enabled the project to achieve.

Considering the above, where sufficient data was provided, the typical modal share from the CCF projects reviewed was between 2% and 3% before and 2.3% to 8% after scheme implementation, with the best performing scheme representing a shift of 5% in absolute terms.

The above figures come with a two caveats. Firstly, the sample size was small, with only three of the schemes reviewed providing full results. Secondly, given the lack of a standardised evaluation methodology and no independent verification of results, the levels of savings claimed by the groups may not be accurate, and there was evidence in the projects reviewed to suggest that some of these should be considered as upper end estimates.

2.2.2 Experience from Elsewhere

Overall, the evidence reviewed suggests that interventions that engage people in a participative process and contain specific measures that are relevant to the target population are more effective than interventions aimed simply at raising awareness or making changes to the physical environment (e.g. Sustrans, 2003; Ogilvie et al., 2004; Hemmingsson et al., 2009; Yang et al., 2010).

It is estimated that on average personalised journey planning type interventions have increased cycle use by around 10% (Ogilvie et al., 2004) and home based personalised travel planning interventions by up to 17% (Sustrans, 2003). However, not all studies cited have reported such positive effects. For example a review by Yang et al., 2010 concluded that in these types of studies, individualised marketing was associated with modest but generally consistent net increases in cycling trip frequency (range from 0 to +21 trips per person per year; median +8) - and in some studies no evidence in increased cycling was found (e.g. TravelSmart, 2011)

In relation to infrastructure enhancements, the evidence is more or less unanimous that appropriate infrastructure is a key requirement (or pre-cursor) to encourage/enable cycling (e.g. Monheim, 1990; Rietveld & Daniel, 2004; Fietsberaad, 2006; Pucher & Buchler, 2008; NICE, 2008). These measures include re-allocation of road space, i.e. cycle lanes (e.g. Rietveld & Daniel, 2004), restricting car access and/or traffic calming (e.g. Titze et al., 2008; NICE, 2008). For example, of the top ten best cycling cities in Europe, six have separate cycling facilities as standard and in seven cycle parking is an important policy focus (Fietsberaad, 2006)

In relation to soft (non-infrastructure) measures aimed at encouraging cycling, evidence remains scarce (e.g. Ogilvie et al., 2004; Chillon et al., 2011; Vuori, 2011). This is due mainly to there being a lack of data (because these interventions are often not rigorously evaluated, if at all) rather than evidence of ineffectiveness (Ogilvie et al., 2004).

2.2.3 Evidence concerning individualised measures

There is little peer reviewed evidence as to the effectiveness of cycle training in encouraging cycle use. However, some studies have suggested that appropriate training can increase cycling levels in children and adults by 0.9 to 2.2 trips per week (e.g. Jensen, 1998; Davis, 2002; Telfer, 2006).

Whereas there is little evidence that awareness raising campaigns in general can achieve any notable effects (e.g. Bowles, 2006; Yang, 2011) they can be a critical factor to promote new cycle routes (e.g. Danish Road Directorate, 2000; Merom, 2003).

For both infrastructural and soft measures, there is some evidence that additional measures that increase the cost of driving such as increased parking charges or road user charging will impact on the success of cycling interventions (e.g. Pucher & Buchler, 2008)

As a final point worth noting, whilst this current study notes that the CCF projects have weak or non-existent modal shift evaluation, this absence is not specific to CCF projects. There is agreement across the systematic reviews considered in this report that the vast majority of studies were of a low quality design or were poorly reported. However, in many European countries, proof of robust evaluation is part of the grant award, which does serve to reinforce the need for monitoring.

2.3 Modal Shift Lifecycle

How 'sticky' are cycling behaviours – how long can we expect modal shift to last?

2.3.1 CCF Projects

As regards the longevity of any identified behavioural change, many of the CCF projects based savings on assumptions for which a sound basis was hard to identify. This was related to the relatively short lifespan of these projects and the monitoring procedures employed. Any projects that did attempt to include longevity effects were based on highly questionable assumptions, usually lifetime change.

There was anecdotal evidence to suggest that some schemes *may* continue delivering results in future years such as schemes involving school groups. Whilst in general this would not require further investment to maintain, it would require continuity of the conditions which allowed the scheme to succeed in the first place.

In the context of school schemes for example, the continued support of the Head of School, the teachers and PTAs would be needed. Changes of staff and/or school policy may see the benefits of such schemes diminishing over time. For example, the Glendale and Garrowhill schemes were progressed by the Parents Council, which over time may change in membership and could see some of the benefits lost.

Whilst many of the CCF projects have not produced demonstrable longevity of carbon savings in relation to behaviour change, there is evidence that a legacy can still be left. Rather than directly resulting in change itself, the CCF award can be a catalyst for stronger community groups, which in

turn leads to change well beyond the timescale of the original CCF project. In the Sustaining Dunbar project, whilst the project itself delivered limited benefits, the group now has a strong identity and has clear plans for delivering further change. Similarly, the project at St Matthews School was started by a Parent Council, but has now evolved into the East Dunbartonshire Cycle Co-operative, with a wider remit and clear goals.

2.3.2 Evidence from Elsewhere

In line with the lack of studies generally that have robustly examined cycling interventions, there is little evidence regarding the longevity of effects that can be achieved. For example, in a recent review of local interventions to promote cycling, Blank et al. (2012) concluded that whilst only a few studies are available, all available evidence where follow-up studies had been conducted to examine the long-term effectiveness of cycling interventions show that the effects persisted post intervention, and for several years after.

In terms of longevity, large multi-component programmes (such as the UK Smarter Choices; Cycling Demonstration Towns) are shown to be the most effective. For example:

- Data from the UK Cycle Demonstration Towns suggest that the proportion of adults self-reporting cycling for at least 30 minutes once or more per month increased from 11.8% in 2006 to 15.1% in 2008, representing a 28% increase (Sloman et al., 2009) and data from automatic cycle counts in six towns indicated a 12% increase in the number of cyclists using all cycle routes and up to 60% at specific sites, several years after the campaign began (Sustrans, 2011);
- Similarly, data from the UK Sustainable Travel Towns initiative suggest that the number of cycle trips per head grew by 26-30 % over a 30 month period (Sloman et al., 2010);
- In a Swedish study, Hemmingsson et al. (2009) reported that those receiving 'physical activity counselling' were significantly more likely to continue cycling 18 months after the intervention, compared with a control group;
- EU project CHAMP suggests that around 75% continued to cycle (having previously driven) one year after opt-in workplace pledge scheme (Orebro, Sweden) and around 75% continuation rate was also observed post targeted cycle training (Burgos, Spain).

However, the methodology used in these (and typically other) studies has been questioned (e.g. Stopher & Greaves, 2007; Möser. & Bamberg, 2008), and it may have inflated these results. For example, the data are derived from studies where no control/comparison group is present and the analysis is more 'narrative' in style (i.e. people are asked retrospectively regarding changes in behaviour several months, or in some cases, years, after the actual intervention) or data are derived from cross-sectional type studies (which does not involve the same people in before and after data collection waves).

In assessing longevity, a more robust data collection method is the panel approach, whereby the same group of people are surveyed at the beginning before the intervention is made, and then at

various points (waves) thereafter, for up to 10 years. This approach has been popular in countries such as Australia, New Zealand, Japan and Germany (e.g. Axhausen et al., 2002; Stopher & Swann, 2008; Brog et al., 2009). Studies using a panel survey approach typically report much smaller decreases in car use over time (2-7 years) than those reported in the UK studies (e.g. Stopher & Swann, 2008).

All of the evidence available concentrated on short to medium term benefits. However, one limitation of all longevity monitoring reviewed is that the longer term effects of the interventions have generally not been assessed. This is due to the fact that the context in which the behaviour change applies may change. This is particularly relevant for schools schemes, where children may take changes in behaviour away from their school into their future workplace and wider lifestyle. Such potential underestimating of the benefits of a scheme were noted by the DfT (2010).

2.4 Meaningful Emissions Reductions

Can stand-alone cycling projects achieve meaningful emissions reductions, or is a more integrated approach required?

The evidence presented so far suggests:

- cycling projects involving people in a participative process, targeting those most receptive to change are the most successful;
- infrastructure measures are generally considered as pre-requisite for an effective scheme;
- appropriate cycle training can increase the participation in a scheme; and
- awareness raising measures, in isolation, have little effect but can contribute to the success of a larger package of measures.

It is clear from observations so far that cycling schemes in isolation *can* result in emissions reductions, particularly in cases where all of the above factors are combined. However, the question of whether a scheme achieves a 'meaningful' reduction is dependent upon how that term is defined.

In contemporary transport appraisal approaches such as the Scottish Transport Appraisal Guidelines (STAG), an objective led approach is adopted to assess potential transport interventions. A typical transport project would normally have several objectives, aligned with overarching government aims. Potential solutions are assessed against multiple objectives, which would usually include the financial and environmental performance of each potential intervention.

The CCF scheme is generally focussed on a single objective - i.e. the reduction of carbon emissions. Therefore, the logical way to compare stand-alone cycling schemes and more integrated approaches is through a comparison of return on investment in carbon terms.

The nineteen CCF projects reviewed showed that the average returns on investment ranged from:

- for standalone cycle schemes, £63/kgCO₂e to £33,450/kgCO₂e; and
- for schemes where cycling contributed, £263/kgCO₂e to £2,072/kgCO₂e.

It can be seen from this evidence that whilst one of the standalone schemes exhibited the highest potential return on investment, there was overlap between the two ranges. Therefore, it cannot simply be concluded that integrated approaches will achieve more meaningful reactions than standalone schemes. The specific content of the scheme and its relevant potential for success appear to be the real defining factors for meaningful carbon reduction.

2.5 Best Practice

What strategies and techniques work best for encouraging modal shift (what would a 'good' project be expected to include)? How does that modal shift translate into carbon savings?

Specific measures for encouraging modal shift are discussed in Section 2.2, but the success of a measure is also very much dependent on appropriateness to its context. Many of the measures reviewed under the CCF scheme could be considered a 'solution looking for a problem', rather than an intervention designed specifically to meet an objective.

There was also an issue with project monitoring. Of the CCF projects reviewed, a high proportion was from enthusiast/community groups, which raises the question as to what can be realistically expected with regard to project evaluation. A number of these projects were also of relatively low financial value. Hence again a concern may arise as to the level of evaluation that can be expected, as any in-depth evaluation could potentially syphon off a high proportion of the funds awarded.

Despite these potential issues, the results achieved and the quality of the monitoring carried out did not always relate to the amount of grant awarded, and appeared to be more related to the extent the project team was committed to assessing the impact of interventions. From those reviewed, the more successful projects had three clear elements in common:

- Firstly, a baseline assessment was undertaken. This served two purposes: it better established what was in place and thus highlighted potential areas at which prescriptive measures could be targeted; and (more obviously) it allowed monitoring to be carried out, which some projects were able to undertake during the course of the project. This allowed project progress to be monitored and actions to be changed if required.
- Secondly, successful projects appeared to build upon initiatives or expertise that were already in place. As a consequence, what they provided was an element of 'additionality', which would not have been possible without the CCF funding. As such these projects did not attempt to re-invent the wheel, which did appear to be the case in many of the less successful ones. Local authorities and other bodies such as Sustrans have a number of initiatives and work programmes, and the more successful projects built on these aspects e.g. St Matthews attracted the support of the Cycling Scotland Give Me Cycle Space campaign, whilst Sustaining Dunbar utilised existing expertise where Scottish Participatory Initiatives supported the design of the survey questionnaires. This also appeared to allow a far better grounding, in all project aspects, from which the intervention could be undertaken.

This need not detract from delivering innovative interventions; by utilising existing expertise for the core project elements, resources can be freed up to develop novel, community specific elements such as the St Matthews Guinness World Record for bell ringing.

- Thirdly, and running directly on from the second aspect, successful projects had far better targeted actions and far more realistic and achievable objectives. In other words, the area of intervention was clearly delimited whether this was in terms of the nature of the intervention or the group being targeted. This provided a far clearer focus for the intervention and also meant that a learner effect could occur, i.e. knowledge and experience was gained in the key relevant aspects of the project.

Clearly the three highlighted areas of best practice are very closely related, with a baseline assessment leading to identification of what is already in place, leading to far better targeted actions and realistic objectives. The least successful projects were those that appeared to take a blanket approach to their activities, had no real target in mind other than the general population, no idea of the measures or organisations already in place, and no idea or indication of how successful or otherwise such actions were. Whilst in hindsight that may seem to be very obvious, there is very clear evidence of those areas of good and bad practice in the CCF projects reviewed.

Many of the projects highlight in their final reports that a key learning was the need to plan the evaluation better and to think about this before the project started (Highland Perthshire, STRIDE). Sharing the identified best practice in evaluation could support future groups in achieving a stronger evaluation plan.

The correlation between the approaches taken on a project is clear: those projects with defined objectives, which built on existing initiatives with in-built monitoring regimes tended to perform better than projects which did not have such mechanisms in place.

2.6 Evaluation Thresholds

What is the maximum realistic carbon abatement one could expect and what would the lower limit be below which emissions savings are not worthy of consideration?

From the CCF projects reviewed, the maximum carbon abatement observed was 11,797 tonnes on the Better Way to Work scheme, at a cost of £750,000. As a comparison, a scheme such as the Sustainable Transport Towns the maximum carbon reduction (Peterborough) was 9,205.2 tonnes at a cost of 3.7 million (euros).

However, it is worth considering one of the earlier findings of this report: that the most effective schemes tended to build on other successful initiatives. On this basis, it may actually be inappropriate to consider a minimum or maximum carbon abatement level when assessing any particular scheme. More relevant perhaps is the contribution a project may make to a wider initiative and it is the combined effect which should be considered.

With this in mind, a lower limit below which emissions savings are not worthy of consideration could be considered an academic point. If such a level were to be defined, the logical approach would be to ensure that the forecast monetary benefits in carbon terms of implementing a scheme exceeded its costs. However, this approach should be taken cautiously, for the reasons given above.

2.7 Indirect Benefits

How much 'spill-over' can be expected from cycling projects? How do school projects or projects involving children differ from other projects in terms of spill over? What techniques and approaches to promote 'spill-over' from cycling initiatives work best?

2.7.1 CCF Projects

In the projects reviewed, it was very difficult, if not impossible, to assess the level of any indirect benefits relating to carbon savings as the reporting mechanism did not allow for any such formal assessment.

Bearing that point in mind, only those centred on schools displayed any form of knock on effects, where there was some evidence that interest in cycling had been raised in parents, whilst all others only appeared to have primary effects. However, as discussed earlier in this report, no assessment was made by any project of the potential lifetime impact on the participating children. It could be argued that not only do such projects have potential immediate spill-over effects, but they may also contribute to a wider range of behaviour changes over the life of the child.

To some extent the difficulty in assessment is related to the nature of these projects and cycling in general, where complementary benefits, such as health, longer life expectancy and reduced traffic congestion levels tend to dominate perceptions. As a consequence, the environmental aspect, or certainly cycling being viewed as a package of environmental measures, tends to be considerably understated.

2.7.2 Non-Carbon Related Spill-Over Benefits

In wider government investment terms, it is worth considering the additional benefits a scheme can bring, as the return on investment can be substantially higher than those associated with carbon savings alone. As an example, the Department for Transport (DfT) looked in more detail at wider, non-carbon benefits in relation to the Cycling Demonstration Towns (CDT) scheme.

The data gathered as part of this work were used to attempt to evaluate the benefits of the CDTs in terms of the effect on reduced mortality levels, resulting in a positive BCR (benefits to cost ratio) of 2.59. This however appears to be a substantial over-estimate, as some of the key assumptions used to derive the figure are highly questionable, particularly those relating to longer term benefits.

Building on the BCR work, the DfT (2010) produced a more detailed evaluation of the more general benefits arising out of the CDTs, not only considering the reduced mortality benefits, but other benefits as well. This specifically included reduced employee absenteeism, reduced traffic

congestion and benefits to cyclists arising from better facilities, as well as the cost of the increased number of accidents involving cyclists. One limitation they recognised in the approach taken however was that as a number of the CDTs specifically targeted schools, for which the longer term effects of the interventions could not be estimated, the BCR may be underestimated. Furthermore, a number of assumptions had to be used, as the original CDT data collection had not been aimed at carrying out a full BCR analysis.

Of key relevance to the CCF, in order to estimate the effect of reduced congestion, an assumption had to be made regarding the levels of increased cycling arising as a result of modal shift, and from this modal shift figure an estimate could be made of improved air quality and reduced CO₂ emissions. The level of carbon saving benefits however was found to be very much of secondary importance to health and other (economic) benefits. However, a key aspect of this appears to be the actual financial value that is attributed to carbon savings, which as highlighted by Mandell (2011), is a hugely problematic area.

2.8 Summary of Findings

Our findings on the CCF projects were:

- very few projects established baseline modal shift and ongoing modal shift monitoring was poor;
- the validity of results reported cannot be confirmed due to the lack of a standardised framework, with carbon savings calculations varying across projects;
- it is difficult to isolate CCF funding from other funding sources to truly assess the return on investment of the project;
- the level of reporting reflected the type of organisation doing the reporting;
- no attempt was made to estimate the longevity of effects, which were often assumed to be life time changes;
- the emissions calculations do not capture whole life potential, particularly for infrastructure projects;
- evaluation methodologies were more straightforward for school projects (via hands-up surveys) and infrastructure projects (counters);
- some projects have significant modal shift but given short journeys this does not translate into large immediate CO₂e savings; and
- the most successful projects were ones which started with clear objectives, built on existing schemes or initiatives and monitored against success throughout implementation.

Our findings on international best practice:

- most schemes evaluated modal shift, with results ranging from 0-25% mode change;
- most schemes were evaluated using robust evaluation methodologies, based on standardised guidance;

- proof of robust evaluation is often part of grant award (e.g. Germany, Sweden, The Netherlands);
- most successful schemes involve infrastructure or building on existing initiatives, with softer measures in a supporting role;
- softer measures (e.g. awareness campaigns) in isolation have limited potential, although some measures better (e.g. cycle training);
- targeted interventions, based on underlying psychological theory are most effective, i.e. that focus on those more susceptible/able to take up;
- packages of measures are most effective; there is little evidence for good single intervention measures;
- there is little evidence on longevity of effects, due to lack of longitudinal/panel type studies;
- cities with high mode share for cycling have achieved this with comprehensive packages of measures over a long timescale; and
- the evaluation of schemes does not in general consider carbon savings alone, other indirect (non-carbon) benefits contribute significantly to the return on investment for a scheme, particularly those relating to health and life expectancy.

General conclusions in relation to the questions asked in the brief were:

- cycling projects can/do have a positive impact on modal shift, whether stand alone or as part of a package;
- the longevity of cycling interventions is little understood, although the most effective schemes tend to be area wide over a long period of time;
- meaningful reductions in carbon can be achieved with cycling schemes and it is the scheme content that is important, not whether it is standalone scheme or part of a package;
- best results are achieved when a scheme has an objective led goal with baseline data and is regularly monitored during implementation;
- evaluation thresholds can be defined but caution should be exercised if doing so - the scheme may not stand on its own merits but may contribute positively to a wider initiative (i.e. additionality); and
- spill over benefits are associated with school schemes, but wider non-carbon benefits are also an important consideration when considering return on investment.

The next chapter of this report goes on to discuss how the lessons learnt from CCF cycling related project implementation to-date, combined with international best practice can be combined to improve the effectiveness of CCF grants.

3 Best Practice Guidelines

3.1 Introduction

This chapter details the findings of the second part of our study looking at evaluation approaches going forward. Reference is made to the current criteria for the CCF, the application process and the Travel Low Carbon Routemap.

The findings are summarised under headings related to the key questions raised in the project brief. A summary of findings is presented at the end of the chapter.

3.2 Strategies

3.2.1 Project Design

Based on our review of CCF projects it is clear that most projects use a weak design and evaluation approach, if any real evaluation is conducted at all. Furthermore, for those that do perform an evaluation no standardised approach is used. As discussed in the previous chapter, the best results are achieved when a scheme has a clear, objective led goal, with comprehensive baseline data and regular monitoring.

As discussed in an earlier section, current transport evaluation advice, such as the Scottish Transport Appraisal Guidance (STAG) requires transport interventions to be objective led. In a STAG appraisal, a range of options are tested against objectives, before sifting and scoring produces the preferred intervention. In this way the 'solution looking for a problem' situation (which arguably is how some CCF schemes could be described) is normally avoided.

At present, this objective led approach does not seem to be promoted clearly through the CCF application process. As a consequence, whilst many of the schemes which are awarded funding appear to have a sound basis for success, they are found to under deliver against potential or simply do not report results adequately.

There are a number of changes that could be made to the CCF application to help address this issue:

- The order in which questions are currently asked on the form does not lend itself well to a logical consideration of problems against solutions. Applicants are asked *first* for their press release (item 2.2), then their *solution* (item 2.3) before they are asked what the *problem* is (item 2.6). The guidance notes do actually suggest that applicants complete 2.6 before 2.2 and 2.3. Re-ordering the priorities on the form would help to ensure that project designs are more effective.
- In the project planning template (item 2.6), again, the order of the columns in the table could be changed commensurate with focusing on the problem to be solved. Specifically, the order of the 'outcome' column (which is currently listed before the 'need' column) and 'need' column could be reversed.

- Item 2.8 deals with monitoring and evaluation. However, the form and accompanying guidance notes could be improved to stress the importance of monitoring, in particular to ensure that a project is on track against its targets.

Given that the form is completed in general by inexperienced volunteers, with little knowledge of appraisal techniques, it is important that the form and Travel Low Carbon Routemap provide as much assistance to applicants as possible.

Recommendations:

- Reorder the CCF project application form to promote an objective led approach
- Rewrite the monitoring and evaluation section of the CCF form to promote project monitoring
- Include an additional introductory section to the Travel Low Carbon Routemap
- Target well planned projects with good evaluation planning for future awards

3.2.2 Targeting Behaviour Change

In order to measure the effectiveness of any behavioural change intervention, it is important for CCF scheme applicants to understand the behavioural change process.

In relation to mobility management/smarter choices type campaigns (which include cycling interventions) two key facts are important:

- Firstly, in any given population some people are more susceptible (ready) to change their behaviour than others (e.g. Anable, 2005; Carreno & Welsch, 2009). Accordingly, in any behavioural change intervention it is more efficient (and cost-effective) to focus resources on those people more likely (ready) to change their behaviour. This is a key consideration in most personalised travel planning interventions where initial screening of potential participants identifies those most motivated to change behaviour and focuses resources on these people.
- Secondly, it is increasingly acknowledged that in many instances behavioural change does not occur as a one-step process and can instead be viewed as a series of transitional stages (or steps) through which individuals progress in order to reach the final stage of behavioural change (e.g. Bamberg, 2013). For some interventions it is thus possible that whilst actual behavioural change may not occur, the intervention might serve to 'push' people towards actual change, i.e. into later stages (e.g. Carreno & Welsch, 2009).

At present, the CCF form does require 'who' the project will target to be defined (within item 2.6). However, neither the form nor the Travel Low Carbon Routemap requires any consideration of whether this group will be receptive.

Recommendations:

- Update the CCF application form guidance notes to emphasise the importance of a receptive target group
- Amend the Travel Low Carbon Routemap to include discussion on target group selection
- Check for a clear target group in project assessment

3.2.3 Meaningful Reductions, Evaluation Thresholds and Mode Shift Lifecycle

Notwithstanding all of the points made above with regard to project design and selection of target group, as noted in Chapter 2 of this report, many projects are highly successful when forming part of a wider initiative.

Evidence from Europe in particular, suggests that the success of many cities in achieving modal shift to cycling has been achieved over several years, with a series of smaller initiatives. On this basis, whilst the case for a particular project in carbon return on investment terms may not be immediately compelling, this does not necessarily mean the scheme should be ruled out.

Unfortunately, given the current lack of evidence on the longevity effects of cycling interventions, evaluating the potential success of marginal projects is somewhat difficult. However, provision of relevant information during the application stage relating to wider projects or initiatives should be encouraged, to allow an informed decision to be made. This is also the case where the applicant can demonstrate that no or very little is being done with regard to cycling initiatives in the area of intervention.

Recommendations:

- Update the CCF application form and guidance notes to encourage projects to refer to related wider initiatives which may be associated with the application
- Amend the Travel Low Carbon Routemap to include discussion on the relevance of wider schemes
- Include assessment of wider schemes in the application evaluation process

3.2.4 Optimum Combination of Measures

Earlier sections of this report noted that:

- cycling projects involving people in a participative process, targeting those most receptive to change are the most successful;
- infrastructure measures are generally considered as pre-requisite for an effective scheme;
- appropriate cycle training can increase the participation in a scheme; and
- awareness raising measures, in isolation have little effect but can contribute to the success of a larger package of measures.

On this basis, schemes demonstrating several of these points should, in general be favoured over other schemes.

Recommendations:

- Include consideration of the above points in the application evaluation process

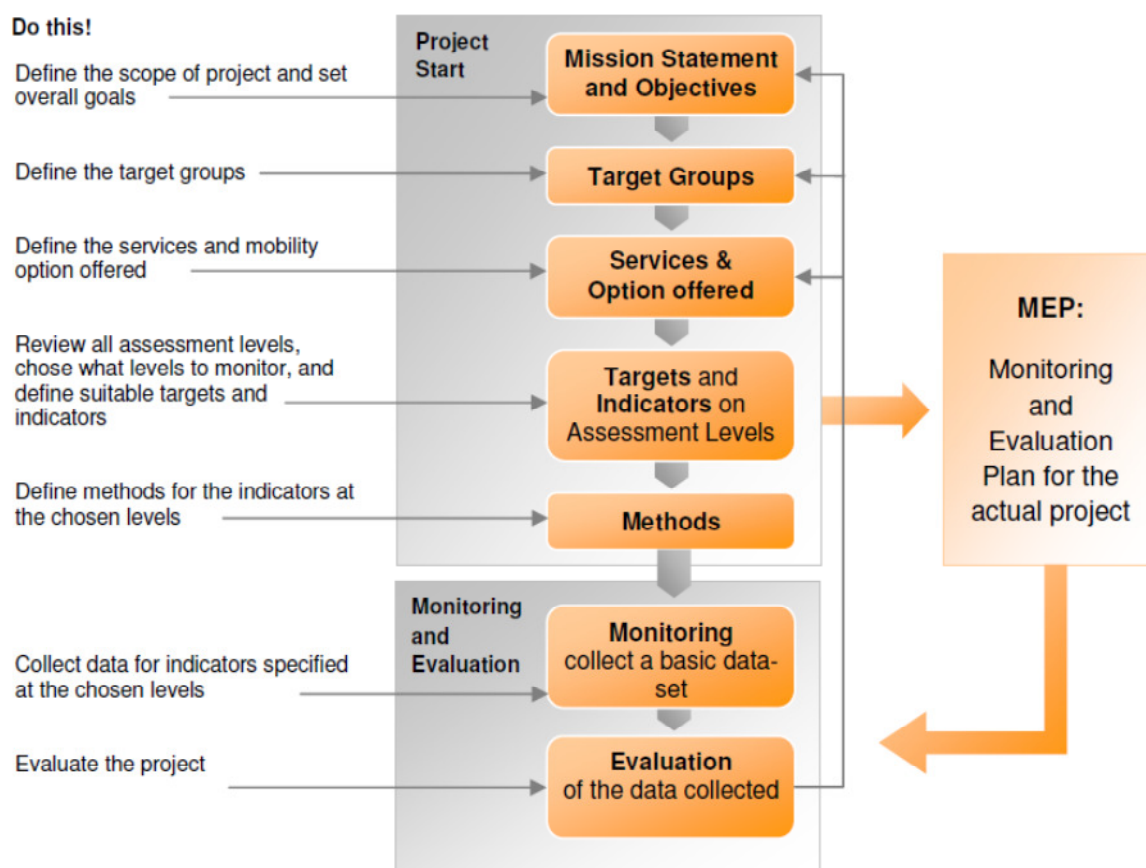
3.2.5 European Best Practice

European best practice in the evaluation of 'soft' intervention measures was recently compiled by the MAX-SUCCESS project funded under the EU's 6th Framework Programme. After an extensive review of available European evaluation techniques (including UK methods), the project authors identified the Swedish SUMO evaluation method, with some adaptations, as the most comprehensive approach to policy evaluation in this area. This resulted in production of the MaxSumo (2009) evaluation guidance.

In short, MaxSumo is a multi-level evaluation framework which can be used throughout the whole implementation process of projects, including guidance on how to develop a Monitoring and Evaluation Plan (MEP), prior to implementation of project measures. This provides a step-by-step process for successful implementation and evaluation of projects. The core of MaxSumo are multiple assessment levels to which those implementing projects record data as the project progresses (e.g. target setting, details of measures implemented, uptake of measures, and effects achieved in terms of changes in attitudes, behavioural change, and associated carbon reductions).

For future CCF projects, MaxSumo, with some adaptations to make it more specific to cycling projects, has the potential to address the current evaluation issues. The main advantages are that:

- it provides a standardised evaluation methodology;
- it is suitable for both large and small projects;
- step-by-step guidance and standardised questions are provided which will assist those in charge of CCF projects without previous experience of evaluation;
- it incorporates theoretical considerations within the evaluation framework to address issues outlined earlier;
- it is increasingly being used in many EU countries (and currently been promoted Europe-wide in a further project) and thus provides an opportunity for CCF projects to be benchmarked with other similar projects;
- it provides guidance on both the calculation of modal split and carbon reduction effects.



Source: MaxSumo - Guidance on how to plan, monitor and evaluate mobility projects (2009)

In addition to the possible employment of an adapted MaxSumo model to evaluation, the CCF may also wish to consider some form of funding threshold with regard to reporting procedures, as well as grant applications in general. This would allow an improvement in the evaluation procedures applied to CCF projects, however small value projects could still be approved at the discretion of the awards panel without being overly burdened with the administrative requirements of monitoring and reporting.

Recommendation:

- Consider use of the MaxSumo for planning, monitoring and evaluation of future CCF cycling and mobility projects
- Consider a two tier approach to monitoring, with a funding threshold to identify 'small value' projects.

3.3 Carbon Accounting

The review of CCF projects noted a high degree of variability in the projects reviewed, with little evidence of a standard approach being taken with regard to evaluation of project outcomes.

It is acknowledged that many of the schemes reviewed predate the Travel Low Carbon Routemap, so may not have benefited from the guidance given within it. A review of the guidance given suggests it is reasonably clear and the use of worked examples should assist applicants inexperienced in transport scheme appraisal and monitoring. However, should inconsistency in monitoring continue with future schemes, an alternative or complementary approach may be appropriate.

The MaxSumo approach described previously is implemented in the online webtool MaxEva, which is available for project evaluation and provides a standardised framework. Various carbon factors from a range of sources may be used, and the project is required to simply state which factors were selected.

The methodology for carbon accounting in MaxEva is directly comparable to that suggested in the Travel Low-Carbon Routemap in that the average distance travelled per mode is recorded both pre/post scheme and this is factored up for the target group size with appropriate emissions factors. For carbon accounting to be comparable across projects, the evaluation process to produce the mode shift figures must be comparable and hence the MaxEva webtool is recommended.

MaxEva

The EPOMM Evaluation Tool

Username: Password:
Forgot your password? Insert you login name and click here.

Home
Benchmark
What is MaxEva
Why use MaxEva
Register
English ▼

Benchmark
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Project overview and project results

Project	Sustainable Travel Towns - Peterborough	Duration	2004-04-01 to 2009-04-01
Customer (project initiator)	Department for Transport & Peterborough	Location	Peterborough
Organisation	Peterborough	Total Budget	€ 3,700,000
Evaluation Design	Control group	Target Group	137,000 people
Type of Project	Urban area mobility plan	Emission effect	-9,205.20 tons of CO ₂ per year
Links	http://www.peterborough.gov.uk/pdf/trans-tochoice-r http://http://www.dft.gov.uk/topics/sustainable/sm http://www.sustrans.org.uk/	Downloads	not available

Overall Project Description

In 2004, the Department for Transport (DfT) selected Darlington, Peterborough and Worcester as Sustainable Travel Towns to demonstrate the effectiveness of 'smarter choices' initiatives in reducing car use. The three Towns invested revenue funding between 2005 and 2008 to support the delivery of extensive programmes aimed at promoting walking, cycling, public transport and car-sharing.

Sustrans conducted the monitoring and evaluation activities.

Description of the system effects

No description of system effects has been defined for this project.

Lessons Learned

No description of lesson(s) learned has been defined for this project.

Project measures and effects

Modal Split	Change of car-users: -5%	Show details
Mileage Effect	Long-term change of car usage: -28,331,600 km/year	Show details
Emission effect	Emission effect (in total): -9,205.20 tons of CO ₂ per year	Show details
Project Promotion Activity	0 occasions	Show details
Services, Mobility Options and Effects		Show details
Services Provided		Show details
Overall Targets		Show details
External Factors		Show details

MaxEva - The EPOMM Evaluation Tool

Source: MaxEVA website - Example Results of Peterborough Sustainable Travel Town

Recommendations:

- Consider the use of the MaxEVA webtool for carbon accounting across all CCF cycling and mobility projects

3.4 Maximising Indirect Benefits

Only CCF projects centred on schools displayed any form of spill over effects, where there was some evidence that a desire to cycle had been increased in parents. There was, however, little evidence of any other spill-over benefit.

Work done by the DfT for the Cycling Demonstration Towns did indicate a significant amount of indirect benefits in non-carbon terms. It is noted that the CCF application form already includes an allowance for consideration of wider social and economic benefits; such consideration is also standard practice in transport appraisal such as STAG.

In order to maximise indirect benefits, it is recommended that more prominence be given to their importance in the application form and guidance notes.

Recommendations:

- Update the CCF application form and guidance notes to allow inclusion of spill-over effects and indirect benefits
- Consider adoption of wider appraisal process when evaluating schemes

3.5 Summary

Based on the findings of the CCF projects and international best practice review, this chapter has made a series of observations and recommendations for:

- project design;
- targeting behaviour change;
- meaningful reductions, evaluation thresholds and mode shift lifecycle;
- optimum combination of measures;
- European best practice;
- carbon accounting; and
- maximising indirect benefits

Consideration should be given to the recommendations with a view to improving the effectiveness of the CCF scheme going forwards.

4 Summary and Recommendations

4.1 Summary

A study was undertaken to evaluate the success of cycling projects under the Scottish Government's Climate Challenge Fund. The study was executed in two parts.

The first part consisted of a review of nineteen CCF projects directly or indirectly related to cycling, along with a literature review of international best practice in cycling projects. The conclusions of this part of the work were:

- in general cycling projects have a positive impact on modal shift, whether stand alone or as part of a package;
- the longevity of cycling interventions is little understood, although the most effective schemes tend to be area wide over a long period of time;
- meaningful reductions in carbon can be achieved with cycling schemes and it is the scheme content that is important, not whether it is a standalone scheme or part of a package;
- best results are achieved when a scheme has an objective led goal with baseline data and is regularly monitored during implementation;
- evaluation thresholds can be defined but caution should be exercised if doing so - the scheme may not stand on its own merits but may contribute positively to a wider initiative; and
- spill over benefits are associated with school schemes, but wider non-carbon benefits are also an important consideration when considering return on investment.

The second part of the study took forward these conclusions for consideration in relation to improved scheme evaluation going forwards. A series of recommendations were made on the basis of the earlier findings.

4.2 Recommendations

The following recommendations are made in relation to future evaluation of CCF schemes:

- the CCF application form should be updated, in particular with a focus on a problem rather than solution based approach;
- the Travel Low Carbon Route Map should be updated to include additional guidance on project design, target group selection and the relevance of wider schemes;
- attention should be paid during the application evaluation process to the above points;
- consideration should be given to use of the European MaxSumo system for the evaluation of future cycling and mobility projects; and
- the accuracy of carbon accounting should be monitored, and if appropriate, the use of the MaxEva system should be considered to improve consistency.

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Appendix A CCF Projects Reviewed

Project Name	Aims (Summarised Bullets)	Grant	Length of Project	Cycle Measures Implemented ¹	Other Measures Implemented ²	Evaluation Methods ³	Carbon Savings			£:kgCO2e/yr saved
							Targeted	After (annualised)	What Carbon Calc. Used	
Glendale	To support and enable low or no emission transport choices such as cycling, scooting and walking to school and in the local community.	9,975	2 day Cycle Shelter installation - 6 month monitoring	AR, NIS	GAR,BC	PPC, QS	1.6724	0.30	transportdirect.info	33,450.70
St Matthews PS	Expansion of School Cycle Trains Develop Cycle map Raise awareness	18,777	2 years	CT,AR	GAR,BC	PPC, QS	5	10.00	Not known	1,877.70
Recycle a bike	To replace carbon-emitting transport for short town journeys To reduce carbon To be self sustaining after the pilot To Promote cycling - general support of the Recycle-a-bike enterprise	182,350	10 weeks	AR, NIS, CLS	Waste	PPC, QUEST	400	0.13	carbonfootprint.com	1,401,034.28
Bike Station 'Better way to work'	Behaviour change through personalised travel planning, and incentives delivered at workplaces	750,471	18 months	CT, AR, CLS, RE	GAR,BC	PPC, FG	3847	11,797.42	Dft Webtag	63.61
Bike Station 'Better way to work' 2	Behaviour change through personalised travel planning, and incentives delivered at workplaces	250,000		None	None	PPC, FG	7416	268.80	ecometrica emmissions matrixes	930.06
Spokes	Provide tools to implement measures to facilitate cycle storage and disseminate information	8,750	9 months	AR,NIS	None	None				

Dr Bike Plus	1. Get 10% of employees usually commuting to work with carbon based transport (such as car) to travel with low carbon based transport, such as cycling. 2. Reduce amount of unused bicycles going to landfill sites. 3. Get Glasgow citizens to cycle more and change lifestyle to a healthy one. 4. Get employees to enjoy cycling to work.	64,650	1 year	CT,AR	None	None		719		89.92
Highland Perthshire	To increase confidence and skills To maximise the numbers of people on bikes	49,960	1 year	CT,AR	None	PPC, FG, QS	27.3	11		4,542
Garrowhill	More pupils, parents and teachers cycling, cycle trains and cycle maps	12,530		CT,AR	None	None	4	4		3,133
Bellfield	School bike stands and promotion	10,562	15 months	AR,NIS	None	None	1.64	3.64	learning and teaching Scotland website	
Multi-strand										
Culross	Opening up overgrown pathways for walkers and cyclists, with Info leaflets to publicise	2,400	1 year	AR,NIR	None	POST		3.3		727
Dunbar	Complete baseline surveys and route maps/timetable info	65,570	14 months	AR	GAR,CC	None	430	n/a	Carbongym.cat.org	
Dunblane	maps, promotion, infrastructure, report, car free day	19,500	15 months	AR	GAR,BC,CC	POST, FG		1.38	n/a	14,130
Birse: Finzean path	Create a path to enable resident to walk or cycle between community facilities	24,390	1 year	AR,NIR	None	PPC, Q	0.4	42	n/a	580.71
Greener Leith	A minimum 15% reduction in local residents transport related CO2 emissions	282,935	26 months	AR,CLS	GAR,BC,CC	PPC, Q	18,900	136.5	various	2,072.78

Heriot Watt	Have 50 more people cycle 2-3 times a week; Train 120 people in eco-driving techniques; Register 100 more people to car-share regularly; and Have 40 more people use public transport 2-3 times a week	48,590	10 months	AR,RE	GAR,BC,FD	POST, QUEST	100	109.7	Defra	442.94
Milnbank	To continue carbon reductions through housing, cycling and allotments schemes	206,760	1 year	CT, NIR, NIS, CLS	CCT, CC, ER, EE, FS, FG	PPC, Q	1139	785	EST Calculator for physical measures	263.39
STRIDE	Bring about a shift in people's thinking and behaviour concerning travel	68,056	1 year	CT,AR	GAR,BC	PPC, QUEST	160.8	75.89		896.77
Tarland	Reduce emissions by encouraging cycling	84,860	5 months	AR,NIR	GAR	PPC, QUEST, QS	70	105	Defra	808.19

Notes:

1. Cycle Measures Implemented - these are coded as follows:
 - a. CT – Cycle Training
 - b. AR – Awareness Raising
 - c. NIR – New/improved route infrastructure
 - d. NIS – New/improved supporting infrastructure
 - e. CLS – Cycle loan/hire scheme
 - f. RE – Repairs/Bike Servicing
2. Other Measures Implemented – these are coded as follows:
 - a. GAR – General Awareness Raising
 - b. BC – Behaviour Change
 - c. CCT – Carbon Counting Tool
 - d. CC – Community Consultation
 - e. ER – Eco Refurb
 - f. EE – Energy Efficiency
 - g. FS – Feasibility Study
 - h. FG – Food Growing
3. Evaluation Methods – these are coded as follows:
 - a. PPC – Pre/post comparison
 - b. QUEST – Questionnaire
 - c. QS – Quantitative Survey
 - d. FG – Focus Group

Appendix B International Best Practice

Project Name	Aims (Summarised Bullets)	Budget in Euros	Length of Project	Cycle Measures Implemented ¹	Other Measures Implemented ²	Evaluation Methods ³	Carbon Savings			EUROS:kgCO2e/yr saved
							Car-mode shift	After (annualised)-tonnes	What Carbon Calc. Used	
Bromley WTP	Reduce environmental impact Reduce need for parking	54,000	2 years	AR, NIS, CLS	GAR, BC	PPC, QUEST	-8.1%	209.8	UK (2009)	0.26
MM at Austrian MofEnv	Show case best practice Full mobility management-PR	110,000	10 years	AR	GAR, BC	PPC, QUEST	0%	82.2	Belgium (2010)	1.34
PDE2 campus du METTL, FR	Reduce environmental impact Reduce "drive alone" mode share	87,770	10 years	CT, AR, NIS	GAR, BC	PPC, QUEST, QS	-19%	608.9	Greece (2009)	0.14
Pariez sur le velo-phase I PREDIT4GO3	Introduce new mobility services in suburban business areas Bicycle commuting pilot project	216,000	5 months	CT, AR, NIS, CLS, RE	GAR, BC	PPC, QUEST	0%	0.1	France (2008)	2,160.00
Test Traveller Halland CC Sweden	Test-ticket scheme Reduce environmental impact Reduce parking need	10,200	3 years	-	BC	PPC, QUEST, QS	-36.8%	93.2	Sweden (2010)	0.11
WTP Traffic Authority, Goteborg, Sweden	Reduce Environmental Impact Reduce parking need Reduce travel costs Improve safety	unknown	4 years	AR, NIS, RE	GAR, BC	PPC, QS	-11%	20.0	Sweden (2009)	NA
CiViTAS Caravel, Burgos, Spain	Package mobility schemes & policy-integrated access restriction for city centre 23km new bike paths New information screens etc.	6,000,000	5 years	NIR	GAR, BC	PPC, QUEST, QS	-8%	2918.3	France (2008)	2.06
Mobilitt Plan, Merck Serono Switzerland	Company mobility plan Reduce need for parking	unknown	4 years	AR, NIR, NIS, CLS, RE	GAR, BC	PPC, QS	-4.3%	742.6	Belgium (2010)	NA
Mobility Plan Airport-Int Geneva	45% employees/passengers using sustainable transport by 2020. Improve health	3,500,000	6 years	AR, NIS, RE	GAR, BC	PPC, QUEST, QS	-8%	807.3	Belgium (2010)	4.34
Municipality of Munich(MVG) Omniphon	Urban mobility plan To test max-stages To compare different strategies To test behavioural effects of MM	unknown	2 years	-	GAR, BC	PPC, QUEST	-6.8%	68.5	France (2008)	NA

Meadowhall centre, WTP Sheffield, UK	Travel service network for retail partners to achieve 10% mode shift. Reduce congestion	unknown	2 years	CT, AR, NIR, NIS, CLS, RE	GAR, BC, EE	PPC, QUEST, QS	-32.7%	1518.4	UK (2009)	NA
Travel Habits-road 155, Traffic&PT Authority Gothenburg	Urban area mobility plan Reduce congestion Reduce environmental impact Improve health Improve safety	2,300,000	3 years	CT, AR, NIR, RE	GAR, BC	PPC, QUEST, QS	+1%	53875.6	Sweden (2010)	0.04
Short trip contract, St. Truin, Belgium	Single measure Cycle route awareness Improve health Reduce environmental impact	16,000	1 month	AR	-	PPC, QUEST, QS	-10%	142.8	Belgium (2010)	0.11
Free your feet National mobility plan England	Week long walking challenge for secondary schools. Information and awareness campaign with prize draw (shopping voucher)	200,000	1 week	AR	-	PPC, QS	-3%	2707.2	European Average (2010)	0.07
Sustainable Travel Towns Peterborough	One of three towns selected by DfT in 2004 to demonstrate "smarter choices" to reduce car use. Promoted walking, cycling, public transport and car-sharing.	3,700,000	5 years	CT, AR, NIR, NIS, CLS, RE	GAR, BC	PPC, QUEST	-5%	9205.2	European Average (2010)	0.40
Sustainable Travel Towns Worcester	One of three towns selected by DfT in 2004 to demonstrate "smarter choices" to reduce car use. Promoted walking, cycling, public transport and car-sharing.	3,700,000	5 years	CT, AR, NIR, NIS, CLS, RE	GAR, BC	PPC, QUEST	-4%	4783.8	European Average (2010)	0.77
Travel Plan Plus Cambridge	Network of employers to promote sustainable travel to work and business. 200 organisations and >7,500 staff.	345,000	3 years	AR	GAR, BC	PPC, QUEST	-8%	2320.0	European Average (2010)	0.15
Pariez sur le velo-phase II PREDIT4GO3	New mobility services in suburban areas-design, test and evaluate. Pilot to promote bicycle commuting in suburban Lyon.	216,000	5 months	CT, AR, NIR, CLS, RE	-	PPC, QUEST	-10%	9.7	European Average (2010)	22.27
Pariez sur le velo-phase III PREDIT4GO3	Fleet of 40 varying test bikes given to volunteer commuters. Cycle support services provided.	216,000	3 months	CT, AR, NIR, CLS, RE	-	QUEST	-49%	15.4	France (2008)	14.03

Notes:

1. Cycle Measures Implemented - these are coded as follows:
 - a. CT – Cycle Training
 - b. AR – Awareness Raising
 - c. NIR – New/improved route infrastructure
 - d. NIS – New/improved supporting infrastructure
 - e. CLS – Cycle loan/hire scheme
 - f. RE – Repairs/Bike Servicing

2. Other Measures Implemented – these are coded as follows:
 - a. GAR – General Awareness Raising
 - b. BC – Behaviour Change
 - c. CCT – Carbon Counting Tool
 - d. CC – Community Consultation
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 - f. EE – Energy Efficiency
 - g. FS – Feasibility Study
 - h. FG – Food Growing
3. Evaluation Methods – these are coded as follows:
 - a. PPC – Pre/post comparison
 - b. QUEST – Questionnaire
 - c. QS – Quantitative Survey
 - d. FG – Focus Group

Informing decisions. Shaping policy.



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