

# The value of investment in active travel

## Why we should invest in walking and cycling routes

## INFORMATION SHEET FH10

*“Chronic diseases, such as heart disease, stroke, cancers, and diabetes, are the biggest killers in developed countries, and physically inactive lifestyles contribute importantly to these leading killers. Too little investment is made in keeping people healthy by promoting physical activity, although there is substantial evidence this approach could be effective.*

*Physical activity promotion research and practice has been limited in the past, by theories of behaviour that focus exclusively on psychological and social influences. Transportation and urban planning professionals are now collaborating with health professionals to understand how built environments make it easier or more difficult for people to be physically active for transportation and recreation purposes. There is substantial evidence that the design of communities, transportation systems, and recreation facilities can be activity-friendly or -unfriendly. This evidence provides a mandate for policy change, but the cost-effectiveness and economic efficiency of built environment changes should be considered along with the inherent value of expected improvements in health and quality of life.”*

**Professor Jim Sallis, Professor of Psychology, San Diego State University; Program Director, Active Living Research; Founder and Co-ordinator, the International Physical Activity and the Environment Network**

## Physical activity and disease prevention

It is now well understood that physical activity can reduce the risks of ill-health and premature death; it has been called the ‘best buy’ for public health<sup>(1)</sup>.

In England, 63% of men and 76% of women are not meeting the recommended physical activity target – participation in activity of at least moderate intensity for at least 30 minutes on at least 5 days a week<sup>(2)</sup> – and in Scotland, 59% of men and 72% of women are not sufficiently active<sup>(3)</sup>. This inactive lifestyle substantially increases their risk of a broad range of chronic diseases.

In children, fewer than half of 15 year old boys and under 30% of girls in England achieve the recommended hour of physical activity on most days of the week; in Scotland the figures are similar for boys but only 23% for girls, and in Wales just 40% of boys and 18% of girls<sup>(4)</sup>.

A major factor in this decline in physical activity has been the growth of car travel, which has led to a long term decline in active travel – walking and cycling. Between 1975/76 and 2005 the total walking mileage per person per year fell 21%; cycling fell 29%<sup>(5)</sup>.

But this decline can be reversed, as shown by the development of the National Cycle Network (NCN), where usage has grown consistently since 1995. Between 2000 and 2005 cycling trips on the National Cycle Network increased by 187%, from 41 million trips to 117 million a year, and walking by



SCOTTISH EXECUTIVE

healthyliving



Glyndwrth Cynullad Cymru  
Welsh Assembly Government



Active Travel works with policy-makers and practitioners to promote walking and cycling as health-enhancing physical activity. Sustrans is the UK's leading sustainable transport charity and works on practical projects to encourage people to walk, cycle and use public transport to benefit health and the environment.

National Cycle Network Centre, 2 Cathedral Square, College Green, Bristol, BS1 5DD

# The cost benefits of active travel

135% from 49 million to 115 million trips a year. In face-to-face surveys, two thirds of users say that the NCN has helped them to increase their level of physical activity<sup>(6)</sup>.

In disease prevention terms, it is important to note that even low levels of physical activity reduce the risks of ill-health. Major gains in terms of reduced mortality and morbidity are possible by raising the activity levels of those insufficiently active people – even slightly. Active travel is just the kind of physical activity that insufficiently active people may be able to adopt: as the Chief Medical Officer for England has said, “for most people, the easiest and most acceptable forms of physical activity are those that can be incorporated into everyday life. Examples include walking or cycling instead of driving...”<sup>(7)</sup>.

## Physical activity and value for money: the developing evidence base

Research findings from the 1990s have begun to indicate the economic costs arising from the decline in physical activity. As methodologies are refined and interest in the area grows, peer reviewed studies are now considering cost-effectiveness and incorporating cost benefit analysis (CBA).

Economic assessment of the health benefits of physical activity has traditionally focused on specific clinical groups or sectors of the population such as children<sup>(8)</sup> and older adults<sup>(9)</sup> and have looked at ways of treating sick people, rather than prevention of disease. This focus, in the case of major diseases such as heart disease and stroke<sup>(10)</sup> has meant that less evidence has been available on lifestyle interventions to prevent disease, including physical activity. There is a shortage of economic studies of physical environments as potential influences on physical activity<sup>(11)(12)</sup>. Research completed in 2007 for the National Institute for Health and Clinical

Excellence suggests that available economic evidence links walking, cycling, or walking and cycling with the creation of trails or paths, and that studies tend to use cost-benefit analysis<sup>(13)</sup>.

Studies have tended to estimate the economic burden of inactivity, and to concentrate on costs directly associated with health care by the NHS<sup>(17)(18)</sup>. Costs such as those associated with poor physical and mental well-being or loss of productivity through sick leave receive less attention. However, the literature gives confidence to claims that physical activity can reduce annual health care costs<sup>(19)</sup>.

To date two main methods of analysis have been used – cost-effectiveness and cost benefit analysis – and both have indicated that activity promotion is good value for money.

## Cost-effectiveness studies

Cost-effectiveness studies tend to assess the cost of providing opportunities to exercise, against the reduced health care costs as a result of increased physical activity. Most studies involve exercise classes in leisure centres and gyms, or aerobic exercise that can be performed at home<sup>(20)(21)</sup>. These studies have largely concluded that important health benefits can be gained from physical activity at relatively low cost.

Some studies compared the cost effectiveness according to age. A study comparing people aged 15-44 with people aged 45 and above concluded that for older adults there is a strong economic case for exercise: “with regard to health and medical care costs, there are strong economic arguments in favour of exercise in adults aged greater than or equal to 45 but not in younger adults”<sup>(22)</sup>.

Cost-effectiveness analysis has also been used to assess the effect of exercising regularly to prevent particular diseases. Direct and indirect costs relating to coronary heart disease (CHD) were calculated in a study of two hypothetical cohorts of 1,000 men,

## The Wanless report: from a “national sickness service” to a true NHS

In March 2001, Derek Wanless was asked by the Treasury to review the long-term trends affecting the health service. He considered the potential impact of lifestyle changes – such as increased physical activity – on the level of health care resources required. He concluded that additional resources should be directed to public health and disease prevention<sup>(14)</sup>.

Further reviews by Wanless looked at prevention and the wider determinants of health in England<sup>(15)</sup> and how health and social care resources should best be used in Wales<sup>(16)</sup>. In both reviews, he referred to the lack of a solid evidence base for the cost-effectiveness of public health interventions, but he did not allow this shortage of evidence as an excuse for failing to address the promotion of healthy lifestyles.

Wanless concluded, “[the NHS] will need to shift its focus from a national sickness service, which treats disease, to a national health service which focuses on preventing it... Where the evidence exists on how to do this cost-effectively, it should be used; where it does not, promising ideas should be piloted, evaluated and stopped if the evidence shows that to be appropriate”<sup>(15)</sup>.

aged 35. The study estimated gains in Quality Adjusted Life Years (QALYs) - a standard measure used for comparative valuation of health interventions - through jogging:

- calculated costs were \$11,313 per QALY gained - favourable compared to other preventive or therapeutic interventions for CHD
- 78.1 fewer CHD events were predicted
- an estimated 1,138.4 QALYs would be gained over a 30 year period<sup>(23)</sup>.

Similar cost-effectiveness was found in a study of unsupervised exercise training on cardiovascular risk factors. The results were based on 50% of participants keeping to the programme for the first year and 30% for all additional years:

- costs were less than \$12,000 (for all individuals) per year of life saved
- unsupervised exercise represented good value, with relatively few risks, substantial long-term benefits, and modest costs<sup>(24)</sup>.

A workplace study examined the relationship between physical activity and health care costs for different weight groups. It showed that:

- even for those active just once or twice a week, annual health care costs were \$250 lower than inactive, and \$450 lower than inactive and obese people
- up to 1.5% of the total health care costs would be saved if all obese sedentary employees adopted a physically active lifestyle<sup>(25)</sup>.

Several studies have addressed the cost-effectiveness of active travel, including a Japanese study of 27,431 men and women, aged 40-79:

- walking more than one hour a day was associated with significantly lower medical costs (12%) as opposed to walking less than one hour a day
- After 5.5 years the accumulated costs for those walking more than 1 hour a day were 15% lower than for those walking less than an hour a day<sup>(26)</sup>.

Researchers are now looking at the cost-effectiveness of environmental interventions. In Nebraska, USA, the cost of building and maintaining walking and cycling trails was set against the estimated health benefits resulting from usage, over a predicted trail life of 30 years. Of the 3,986 trail users surveyed, 2,950 were more physically active since beginning to use the trails.

The cost-effectiveness ratio (the ratio of marginal cost to marginal effectiveness) for these trails was:

- US\$98 per person for those more active since beginning to use the paths
- US\$142 for those active for general health
- US\$884 for those active for weight management<sup>(12)</sup>.

## Cost-benefit analysis

For cost-benefit analysis the benefit to cost ratio is calculated by attributing a monetary value to a number of factors, such as healthcare cost savings from a healthier population, the savings to employers whose fitter workforce take less time off, and in the case of active travel, congestion reduction. The costs include investment, such as construction and maintenance costs of safe routes, and losses to the Treasury from reduced fuel taxes as people switch from driving to walking and cycling.

### Promoting physical activity

In Northern Ireland, the economic benefits of physical activity promotion were modelled to assess the value of reducing the risk of CHD, stroke, and colon cancer<sup>(27)</sup>. The 1996 Physical Activity Strategy Plan set a target to reduce the sedentary proportion of the population from 20% to 15% through physical activity promotion by 2002 and forecast that this could lead to:

- at least 121 lives saved each year among the under 75s
- £620,000 annual direct cost savings due to reduced hospital admissions and treatment costs
- associated economic benefits worth £131 million<sup>(28)</sup>.



The predicted savings would justify spending £2.35 million a year on physical activity promotion. The study assumptions on disease reduction and cost of treatment were conservative, and ignored benefits beyond the three specific health conditions being studied. Actual cost savings are likely to be significantly higher.

**Promoting active travel**

Active travel – walking and cycling - has the potential to bring significant cost benefits because of its positive impact on health<sup>(29)</sup>. A US study predicted savings of \$5.6 billion in heart disease treatment would result from just 10% of sedentary adults beginning a programme of regular walking (1992 prices)<sup>(30)</sup>.

Benefits such as improved fitness, reductions in health costs, decreased air and noise pollution and reduced parking costs were included in a CBA of walking and cycling infrastructure in three Norwegian cities, based on predicted levels of use. Other factors included traffic accidents, travel time, insecurity, school bus transport, and medical and welfare costs (the latter being 60% of the total cost)<sup>(31)</sup>.

A summary of the CBA results below shows the investment in walking and cycling networks in the three Norwegian cities to be highly cost effective:

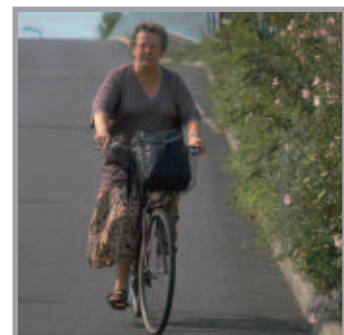
The Nebraska researchers also carried out CBA, and found walking and cycling trails to be cost beneficial from a public health perspective, after just ten years of use:

- per user annual cost of the trails was US\$209.28 (including construction, maintenance, equipment and travel)
- per capita direct medical benefit was \$564.41: an active person is calculated to have spent \$564 (in 1998) less on medical care, compared to someone inactive
- the cost-benefit ratio was 2.94: every \$1 invested in the trails led to \$2.94 in direct medical benefit<sup>(32)</sup>.

A study in England set out to predict the results of 100,000 people, evenly spread between the ages of 20 and 60, taking up regular cycle commuting. The study calculated:

- 50 fewer deaths per year as an aggregate of health benefits and reduced road traffic casualties among those cyclists - the equivalent to saving around 1,660 life years
- net benefits of just over £50 million a year from those 100,000 cyclists (assuming a value of around £30,000 per life year)<sup>(33)</sup>.

CBA of physical activity is now becoming mainstream in the UK, and is being incorporated into transport analysis guidance by the Department



**Benefits and costs of investments in walking and cycling track networks in three Norwegian cities (Norwegian Kroner)**

	Hokksund	Hamar	Trondheim
Total benefit	153.7m NOK	309.1m NOK	3,023.3m NOK
Total costs	30.2m NOK	20.1m NOK	767.4m NOK
Net benefit to cost ratio	4.09	14.34	2.94

Source: Sælensminde, 2004

for Transport (DfT). DfT cites a canal towpath in London, transformed into a high quality route for commuter use between 2002 and 2004, with improved route surface quality and connectivity. This, plus the introduction of the congestion charge, led to considerable increases in usage, resulting in:

- total present value of benefits £24,891,736
- of which £10,300,266 is attributed to increased physical fitness (based on numbers of preventable deaths)
- and £3,529,245 through reduced absenteeism
- a benefit to cost ratio of 22:1<sup>(34)</sup>.

This DfT methodology calculates monetary values for benefits in four areas:

- ‘journey ambience’ (the quality of environment experienced by users)
- health (the reduction in the number of deaths from CVD, stroke and colon cancer arising when people are active for 30 minutes a day)
- reduction in costs of congestion, changes in road accident effects, and reduced fuel tax revenue for the Treasury
- reduced absence from work arising from better health.

Sustrans used the methodology to calculate a benefit to cost ratio for three sample projects in the Links to Schools programme, carried out in 2004. The ratios were even more impressive than the Norwegian figures, ranging from 14.9:1 to 32.5:1<sup>(35)</sup>.

## The future

Sustrans is now working to analyse further UK projects, so as to make available a larger set of CBA data. We are also working with UK and other partners in a project led by the World Health Organisation to improve the evaluation of transport projects in terms of their health impact, and widen the evidence base.

## Conclusions

A variety of methodologies have been applied to assess the economic cost-effectiveness or cost benefits of walking and cycling interventions. Studies which looked at environmental modifications, whose impact is population wide, found that simply building walking and cycling infrastructure is enough to bring significant economic benefits, even without targeting specific groups as users.

Providing opportunities for walking and cycling may be particularly cost-effective, as people do not require supervision or costly facilities such as gyms to be physically active. This type of environmental intervention, enabling individuals to choose physical activity as part of their daily routine, may provide the most cost effective means of increasing population physical activity levels.

The volume of literature on cost effectiveness and CBA of interventions to promote routine walking and cycling is relatively small at present. Therefore the economic justification for investments to facilitate walking and



### Benefit to cost ratios for sample walking and cycling projects in the UK

	Bootle	Hartlepool	Newhaven
Present value of benefits	£12,601,051	£5,766,824	£16,782,954
Present value of costs	£430,294	£177,224	£1,126,014
Net present value	£12,170,757	£5,589,600	£15,656,940
Benefit to cost ratio	29.3	32.5	14.9

Source: Sustrans 2006

cycling may not have been given due weight in public policy decision-making.

Most of the studies report economic benefits of similar magnitude and are highly significant; most are also conservative in their assumptions and values, implying even greater economic benefits than those reported. As the evidence base develops further, lifestyle physical activity – and active travel – may come to be more widely recognised as the ‘best buy’ for public health.

## Recommendations

There is a strong consensus now that walking and cycling are accessible and realistic ways for very many people to get physical activity back into their lives, and that modifications to the environment in their favour are good value as official investments. Sustrans recommends that:

- transport schemes to facilitate walking and cycling should be monitored and evaluated to identify their cost-effectiveness or cost benefits, and public policy on the promotion of physical activity should take due account of these findings
- investment in walking and cycling infrastructure should not be delayed for the evidence base to develop – the existing findings already demonstrate the merits of such interventions
- research into lifestyle physical activity, and environmental interventions to promote it, should now be prioritised over pharmacological and clinical approaches; these have already been studied in great depth.

## References

- 1 Morris, 1994** Exercise in the prevention of coronary heart disease: today's best buy in public health, *Medicine and Science in Sports and Exercise*, 26
- 2 Department of Health, 2004** Health Survey for England 2003
- 3 Scottish Executive, 2003** let's make Scotland more active: a strategy for physical activity
- 4 Welsh Assembly Government Office of the Chief Medical Officer, (undated)** Health Behaviour in School-aged Children Series 1: Physical activity, sedentary behaviour, and obesity
- 5 Department for Transport, 1995 and 2006** National Travel Survey
- 6 Sustrans, 2005** The National Cycle Network. Route User Monitoring Report to end of 2005
- 7 Department of Health, 2004** At least five a week: evidence of the impact of physical activity and its relationship to health – a report from the Chief Medical Officer
- 8 Wang et al, 2003** Economic analysis of a school-based obesity prevention programme, *Obesity Research*
- 9 Robertson et al, 2001** Effectiveness and economic evaluation of a nurse delivered home exercise programme to prevent falls. A: Randomised controlled trial. *British Medical Journal*, 322
- 10 Ebrahim, 2000** Cost-effectiveness of stroke prevention, *British Medical Bulletin*, 56(2)
- 11 Sturm, 2005** Economics and physical activity. A research agenda, *American Journal of Preventive Medicine*, 28(2S2)
- 12 Wang et al, 2004** Cost-effectiveness of a bicycle/pedestrian trail development in health promotion, *Preventive Medicine*, 38
- 13 York Health Economics Consortium, 2007** An Economic Analysis of Environmental Interventions that Promote Physical Activity. Report to National Institute for Health and Clinical Excellence. <http://guidance.nice.org.uk/page.aspx?o=420946>
- 14 Wanless, 2002** Securing our Future Health: Taking a Long-Term View
- 15 Wanless, 2004** Securing Good Health for the Whole Population
- 16 Wanless, 2003** The Review of Health & Social Care in Wales
- 17 Colditz, 1999** Economic costs of obesity and inactivity, *Medicine and Science in Sports and Exercise*, 31(11)
- 18 Wang et al, 2001** Inactivity-associated medical costs among US adults with arthritis, *Arthritis and Rheumatism*, 45(5)
- 19 Weiss et al, 2004** Health-care costs and exercise capacity, *Chest*, 126
- 20 Munro et al, 1997** Physical activity for the over-65s: could it be a cost-effective exercise for the NHS, *Journal of Public Health Medicine*, 19(4)
- 21 Stevens et al, 1998** Cost-effectiveness of a primary care based physical activity intervention in 45-74 year old men and women: a randomised controlled trial, *British Journal of Sports Medicine*, 32
- 22 Nicholl et al, 1994** Health and healthcare costs and benefits of exercise, *Pharmacoeconomics*, 5(2)
- 23 Hatzidandreu et al, 1988** A cost-effectiveness analysis of exercise as a health promotion activity, *American Journal of Public Health*, 78(11)
- 24 Lowensteyn et al, 2000** The cost-effectiveness of exercise training for the primary and secondary prevention of cardiovascular disease, *Cardiopulmonary Rehabilitation*, 20(3)
- 25 Wang et al, 2004** Relationship of Body Mass Index and physical activity to health care costs among employees, *Journal of Occupational and Environmental Medicine*, 45(6)
- 26 Tsuji et al, 2003** Impact of walking upon medical care expenditure in Japan: the Ohsaki cohort study, *International Journal of Epidemiology*, 32
- 27 Health Promotion Agency for Northern Ireland, 2000** A health economics model: The cost benefits of the Physical Activity Strategy for Northern Ireland
- 28 Northern Ireland Physical Activity Group, 1996** Be Active, Be Healthy - The Northern Ireland Physical Activity Strategy 1996-2002
- 29 Foltynova and Kohlova, (undated)** Cost-benefit analysis of cycling infrastructure: A case study of Pilsen. <http://www.czp.cuni.cz/ekonomie/letskolacraj/bruhov/akohlova.pdf>
- 30 Jones and Eaton, 1994** Cost-benefit analysis of walking to prevent coronary heart disease, *Archives of Family Medicine*, 3(8)
- 31 Sælensminde, 2004** Cost-benefit analyses of walking and cycling track networks taking into account insecurity, health effects and external costs of motorised traffic, *Transportation Research Part A*, 38
- 32 Wang et al, 2005** A cost-benefit analysis of physical activity using bike/pedestrian trails, *Health Promotion Practice*, 6(2)
- 33 Rutter, H 2005** Valuing the Mortality Benefits of Regular Cycling, presented at Walk21 Satellite Symposium on transport-related physical activity and health, Magglingen, Switzerland
- 34 Department for Transport, 2007** Transport Analysis Guidance, Guidance on the Appraisal of Walking and Cycling Schemes
- 35 Sustrans, 2006** Economic Appraisal of local walking and cycling routes. <http://www.sustrans.org.uk/default.asp?slD=1092664298921>

### Active Travel

[www.activetravel.org.uk](http://www.activetravel.org.uk)

0117 926 8893

[activetravel@sustrans.org.uk](mailto:activetravel@sustrans.org.uk)

Sustrans would like to thank everyone who has contributed photography including its own staff and Ian Chamberlain, Julia Bayne, Kai, James Littlewood/Chilterns Conservation Board and David Rose.

**For permission to reproduce any material from this information sheet, please contact Active Travel**

© Sustrans June 2007 Registered Charity No 326550