Valuing the Benefits of Cycling

Executive Summary

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Valuing the Benefits of Cycling

Overview

1. This study was commissioned by Cycling England to examine the economic benefits of cycling, and the ways in which it can contribute to Government objectives. It is a review of existing research, bringing together different sources of evidence that make it possible, for the first time, to quantify in monetary terms the contribution made by cycling.

2. There is broad consensus that cycling offers tangible benefits for those who participate, but there are also wider benefits for society as a whole. The positive contribution to individuals' health, to the environment, and to mitigating the problems of congestion is evident, but cycling also plays a role in providing more independence to children; improving the quality of life for communities and, in many areas, supporting tourism.

3. The value accrues from the unique combination of the benefits that cycling offers. No other single activity can simultaneously:

   - improve general health and fitness
   - reduce pollution and the emission of CO2
   - help tackle congestion

4. These challenges represent three of the most pressing problems faced by Government and society. The relevance of cycling is shown by its potential to contribute to the policy priorities of six Government departments, embracing seven Public Service Agreements (Table 10-1 p63).

5. This study allows a value to be calculated for the economic loss directly attributable to the decline in cycling trips over the last decade, which, according to the National Travel Survey figures (NTS 2005), has fallen by 20% since 1995.

6. The cumulative cost in terms of health, pollution and congestion is around £600 million. Furthermore, the study quantifies the value that could be generated by an increase in cycling in the future. If, by 2015, the number of cycle trips returned to the level of 1995, the savings in health, pollution and congestion would be around £500 million.

7. At present only 1.5% of all trips on average are by cycle. An increase of 50% in this level – far below the original 1996 target of quadrupling trips by 2012 – would create total savings of more than £1.3 billion.

8. These are conservative values, comprising only (by definition) those benefits which can be quantified. No account is taken of the contribution of cycling to:

   - Protecting children against obesity
   - Improvement in physical development

- Quality of life in communities
- Wealth generation through tourism and leisure pursuits
- Potential for a reduction in the rate of road accidents

9. Despite these omissions, the economics in this study make a compelling case for sustained investment in cycling. The study clearly establishes the contribution cycling can make in helping to address some of the most pressing and complex problems facing contemporary society.

Placing a value on cycling

10. The study concludes that the value for each additional cyclist varies to a maximum of £382 a year. The value varies depending on the profile of new cyclists, in terms of their age and current activity level, as well as the distance and frequency of their cycling trips. Thus, investment which increases the number of new cyclists (rather than encouraging more cycling by existing cyclists) is likely to offer greatest benefits. Encouraging more, older cyclists and cycle trips that replace car trips, particularly in urban areas, are also likely to generate the greater returns on investment.

11. These figures are an aggregate of the benefits generated from:

- Improving health and fitness
- Reducing pollution
- Tackling congestion.

12. They are drawn from desktop analysis of established data, acknowledged and widely used by Government. Throughout the report it has been assumed that a cyclist travels an average of 3.9km per trip and makes 160 trips a year – the equivalent of 3 trips a week. However, in estimating the health benefits the report excludes cyclists that cycle too infrequently (less than once a week) and uses an average of 286 trips a year, based on the London Area Travel Survey, to calculate the number of cyclists that would benefit from the additional physical exercise.

Health and Fitness outcomes

13. In 2002, the cost of physical inactivity in England was estimated to be £8.2 billion a year. Greater physical activity is linked to the prevention of a range of chronic diseases including heart disease, stroke and colon cancer. Physical activity also improves physical and mental health and reduces absence from work. The value of cycling to health increases with age. Physical activity has a greater effect in reducing deaths from Coronary Heart Disease, the older the participant.

14. The health benefit generated by cycling is drawn from three areas; valuation of loss of life; possible savings to the NHS as a result of higher levels of physical activity and productivity

gains through reduced absence from work. The values are summarised in the following Table.

Health benefit	Values PER YEAR of cycling
Value of loss of life	£11.16 for 16 – 44 year olds
	£99.53 for 45 - 64 year olds
	£242.07 for 65 year olds and over
	£58.77 average
NHS savings	£28.30 for all cyclists
Productivity gains	£47.68 all cyclists
Total health benefits	£87.06 for 16 -44 year olds
	£175.51 for 45 – 64 year olds
	£159.48 average
Child health and obesity	Not quantified

Source: SQW

15. One of the most striking trends over the past twenty years is the growing threat of widespread obesity. In 2004, 22.1% of men and 22.8% of women in England were classed as clinically obese. The benefits gained from "regular" cycling outweigh the loss of life years through cycling fatalities by a factor of around 20 to one.

16. These values do not include the contribution cycling can make to child health and obesity, due to lack of data. However, cycling can play a role in not only improving childhood fitness but in giving young people both the skills and an exercise habit essential to living an active adult life.

17. In 2003, 32% of boys and 28% of girls aged 2-15 years were overweight and 17% of boys and 16% girls were obese. Based on current trends, 12 million adults and 1 million children will be obese by 2010.

18. There is often an assumption that increasing the amount of cycling will increase the number of accidents and it is often perceptions about safety that discourage cycling. This must be considered in context. Data for London over the past ten years show that as the number of cycle trips has grown, the number of cyclists killed or injured has fallen. Similar results have been found in other countries suggesting that increased cycling does not necessarily increase the number of fatal or serious injuries and may actually contribute to a reduction.

Pollution reduction outcomes

19. Road transport contributes to about 70% of the air pollution in UK towns and cities. Traffic pollution damages bio-diversity, local climate and degrades the built environment. But its greatest impact is on health. Evidence from the Department of Health suggests air pollution is responsible for 14-24,000 hospital admissions each year and the premature deaths of between 12-24,000 vulnerable people.

20. In addition, road traffic is responsible for 22% of the UK's total CO2 emissions. The Stern Review on the Economics of Climate Change provided the first measure of the economic

costs of global warming and the damage of continuing current levels of pollution. It followed the 2003 Energy White Paper, in which the Government set its own target of reducing carbon dioxide emissions by 60% by 2050.

21. This study indicates that an adult in an urban area switching from a car to a bicycle for a commuting journey of 3.9km each way, on 80 days a year, reduces the cost of pollution by £69.14. This is generated by quantifying the benefits to protecting health as well as the value of reducing greenhouse gas emissions.

22. Note that more than half of all car trips (56%) are less than five miles long and 23% are less than two miles – approximately the same distance as the average cycle trip.

Congestion/Transport Outcomes

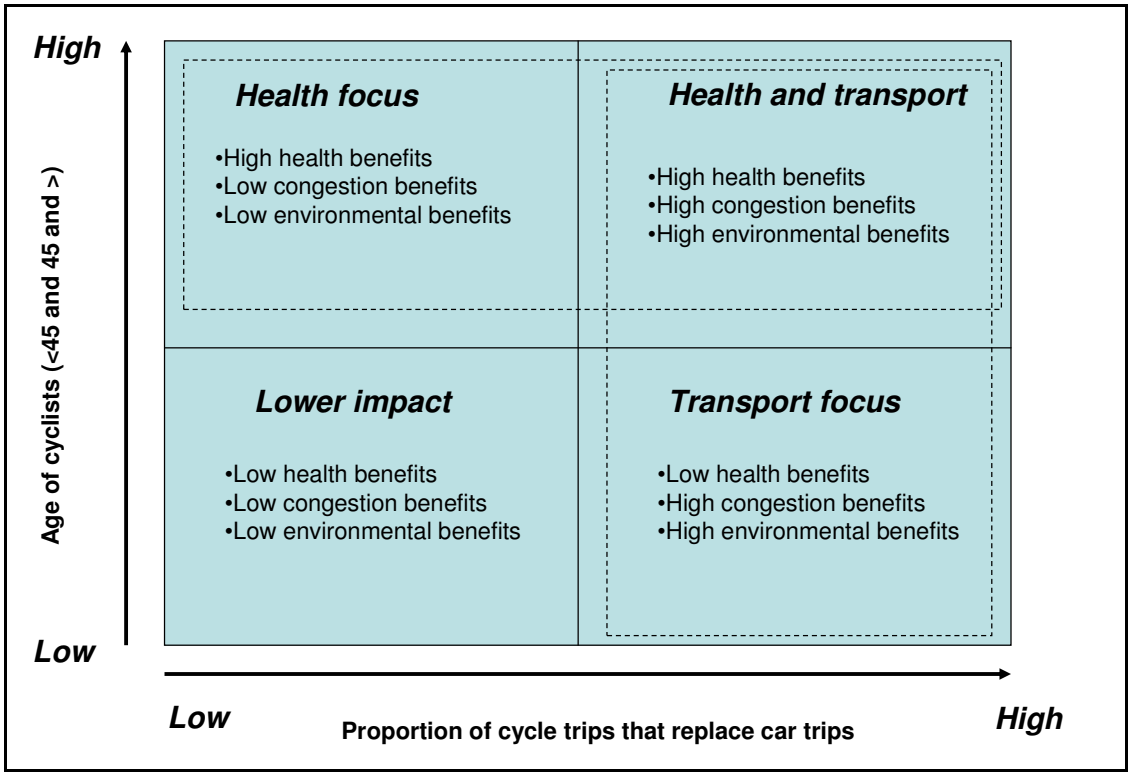
23. The study concludes that an adult switching from a car to a bicycle for a return journey of 3.9 km (the average cycle trip) each way, on 80 days a year in an urban area will generate annual savings of £137.28 through reduced congestion. The value of substituting car with cycle trips is higher in areas of greater congestion, creating greater savings for cycling investment in cities than in rural areas.

24. In particular there is a significant opportunity to make an impact on traffic congestion at school time, when one in five of all cars on the road are on a school run.

25. Encouraging cycling to school or work reduces traffic at peak times, lessens the strain on other forms of transport and cuts travel times for other road users. This would require the reversal of a trend which between 1990 and 2004 saw a 40% fall in the number of 11 to 15 year olds cycling to school.

Evaluating the impact of cycling

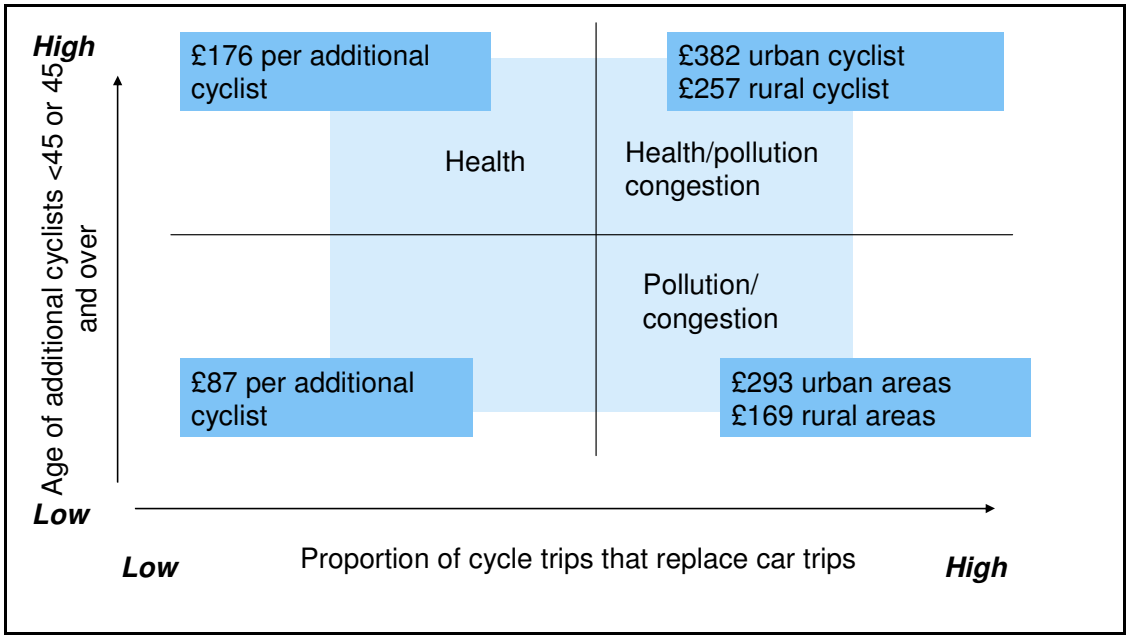
26. This study has been used to develop a matrix whereby the benefit of increasing cycling can be better understood and quantified. The matrix brings together two of the key variables; age which has a major bearing on the potential health benefits and switching from car use:



Source:SQW

28. This represents only a static and short-term interpretation of the impacts, and does not model any habit of cycling being developed among younger people and carried through to later life.

29. Using the value of the benefits calculated in the study, for health, pollution and congestion, the matrix provides a framework through which the value of specific investments in cycling can be assessed. It shows the maximum annual benefit depending on whether new cycle trips replace car trips and the scale of the health benefit depending on age.



Source: SQW

31. Thus, the value/benefit of cycling is higher where:

- Inactive people become active
- Older people are persuaded to cycle
- Where cycling replaces a car trip, particularly in urban areas
- Where the journey is a regular trip.

32. These estimates show only part of the picture. There is no allowance for reductions in obesity, and health benefits are limited to reductions in premature deaths. There is no value for children cycling, or for the many other social benefits that would result from more cycling. Given the potentially very significant unquantifiable benefits, it is important that the values outlined in this study are treated conservatively when used to appraise or evaluate cycling projects.

The potential for cycling to create future value

33. The economic modelling makes it possible to project the potential for cycling to generate future value. The study examined savings that might be achieved if the number of cycle trips were to increase by 20%, 30% and 50%.

34. These are far more modest levels than were proposed in the 1996 National Cycling Strategy which outlined a plan for a 400% increase in cycling by 2012. Indeed a 20% increase requires only that the number of adult trips reverts to its level of 10 years ago.

35. Across three scenarios the cumulative results range from £500 million to more than £1.3 billion.

	20% increase in cycling (£ millions)	**30% increase in cycling (£ millions)**	**50% increase in cycling (£ millions)**
Premature deaths (adult)	£107	£160	£267
NHS costs (adult)	£52	£77	£129
Absence from work (adult)	£87	£130	£217
Pollution (all)	£71	£107	£178
Congestion (all)	£207	£310	£517
Totals	**£523**	**£785**	**£1,308**

Source: SQW

36. The economic analysis of values generated by cycling makes it possible to apply a benefit to cost ratio for cycling projects. To this end, the report examines four examples of cycling intervention. Each is shown to produce positive returns to investment. The benefit to cost ratio ranges from 7.4 in the case of a cycle training programme to 1.4 for Bike It, an initiative that funds cycling officers who work with selected schools to encourage cycling. The two physical infrastructure projects show returns of between two and four. These values exclude any potential benefits to children's health or contribution to preventing or reducing obesity.

Summary Benefits, costs and ratios for intervention examples

	£ millions			
	Links to Schools	Bike It[1]	LCN +	Training
Appraisal period	30 years	4 years	30 years	5 years
Benefits	£4.80	£0.33	£794	£0.79
Costs	£2.22	£0.24	£201	£0.11
Net Present Value	£2.58	£0.09	£592.50	£0.68
Benefit cost ratio	2.17	1.36	3.94	7.44

Source: SQW estimates

Conclusion

37. Increases in cycling trips could make a worthwhile contribution to tackling some of the intractable public policy challenges faced by contemporary society. It is uniquely placed to help reduce health service costs, alleviate congestion, and reduce pollution.

38. For the first time, this study attributes a monetary value to that contribution, and provides a conservative indication of the scale of benefit that could be achieved in the next decade. The economic value of cycling rests principally on:

- improvements to health and
- the benefits of substituting for short car trips.

39. The study indicates that where investment in cycling provision leads to a reduction in trips by car, in the majority of cases, the combined benefits of improved general health and reduction in pollution and congestion are more likely to justify investment. In particular; investment schemes which targeted new cyclists in urban areas would generate disproportional economic benefit.

40. Indeed, the analysis of existing cycling interventions demonstrates the potentially significant returns to investment for a range of projects being undertaken today. The economic case for cycling will become only stronger, as the costs of inactivity, obesity, pollution and congestion continue to grow.

[1] Benefits for Bike It are lower than other interventions because the health (and safety) related benefits for children cannot be quantified.