CITY OF YORK COUNCIL

CYCLING CITY York

City of York Council
Cost/Benefit Matrix for Cycling Infrastructure

1. Foreword

A report commissioned by Cycling England and reported to them by SQW Consulting in December 2008, included a matrix which showed the number of additional cyclists which were needed in order to justify a given spend on a cycling infrastructure project.

Several variables gave estimated annual monetary values for each additional cyclist (cycling regularly for one year) including: health benefits; value of loss of life; NHS savings; productivity gains; pollution; congestion; and ambience. Because calculation is possible of the economic benefit of each cyclist, it is also possible to use these combined values to show the number of new cyclists required to ensure that an investment will at least break-even over the full life of the cycle facility (assumed to be 30 years). Because facilities are varied in type and location, the matrix also gave values for four different types: urban on-road; urban off-road, rural on-road; and rural off-road cycle facilities (Table 1).

In this way, and through before and after monitoring of new cycle facilities, we can estimate whether a scheme has been good value for money. It must be noted however that this is difficult to quantify as usage tends to build up steadily (and "accelerate") from an initial boost and therefore year-on-year growth in cyclist numbers is not usually uniform (see Malton Road example overleaf).

2. Cost/Benefit Matrix

Table 1: Number of cyclists needed to achieve a benefit to cost ratio of 1:1

Scheme Cost	Urban		Rural		Average
	On-Road	Off-Road	On-Road	Off-Road	
£10,000	1	1	1	1	**1**
£25,000	3	3	3	3	**3**
£100,000	11	10	12	11	**11**
£250,000	27	25	30	28	**27**
£500,000	54	50	60	56	**55**
£750,000	80	75	90	83	**82**
£1,000,000	109	100	120	111	**109**
£1,250,000	134	125	149	139	**136**
£1,500,000	161	151	179	167	**164**
£1,750,000	187	176	209	195	**191**
£2,000,000	214	201	239	222	**218**

For example, an investment of £100K on a rural, off-road scheme, requires an overall increase of 11 more people cycling regularly for the life of the project. An investment of £1M on an urban, on-road scheme would require 109 new cyclists. This means that there must be 109 additional cyclists cycling at least 3 times a week throughout the full life of the project (assumed to be 30 years). This does not mean that the same people must continue to cycle, but that on average, there should be 109 more cyclists each year than would be the case were the investment not made. Please note that where the effect of the intervention is likely to be shorter than 30 years, the number of extra cyclists will need to be higher.

These figures provide a simple and straightforward way to assess whether a cycling project is likely to generate a positive return on investment.

It is also important to bear in mind that the investment will frequently contribute to other objectives, such as increasing walking or use of public transport (and other LTP objectives). In the case of these multi-modal schemes, only an appropriate proportion of the costs of the investment should be attributed to cycling.

An example: Malton Road

Increase in Cyclists (see Table 2)

- In 1997 there was an average of 261 cyclists using this route (in both directions) each day.
- From this point onwards there has been a fluctuating, but steadily increasing number of cyclists using this route year on year, with large surges occurring when new infrastructure has been constructed.
- By 2007 there was an average of 439 cyclists – An increase of 178 cyclists, constituting a 68% increase over 10 years.
- Even if we accept that these years might have been 'extremes', and unfairly biased, if we take the average growth in the number of cyclists from the Trend Line (from just over 300 in 1997, to just over 400 in 2007), this still constitutes a steady increase of approximately 33% in ten years.

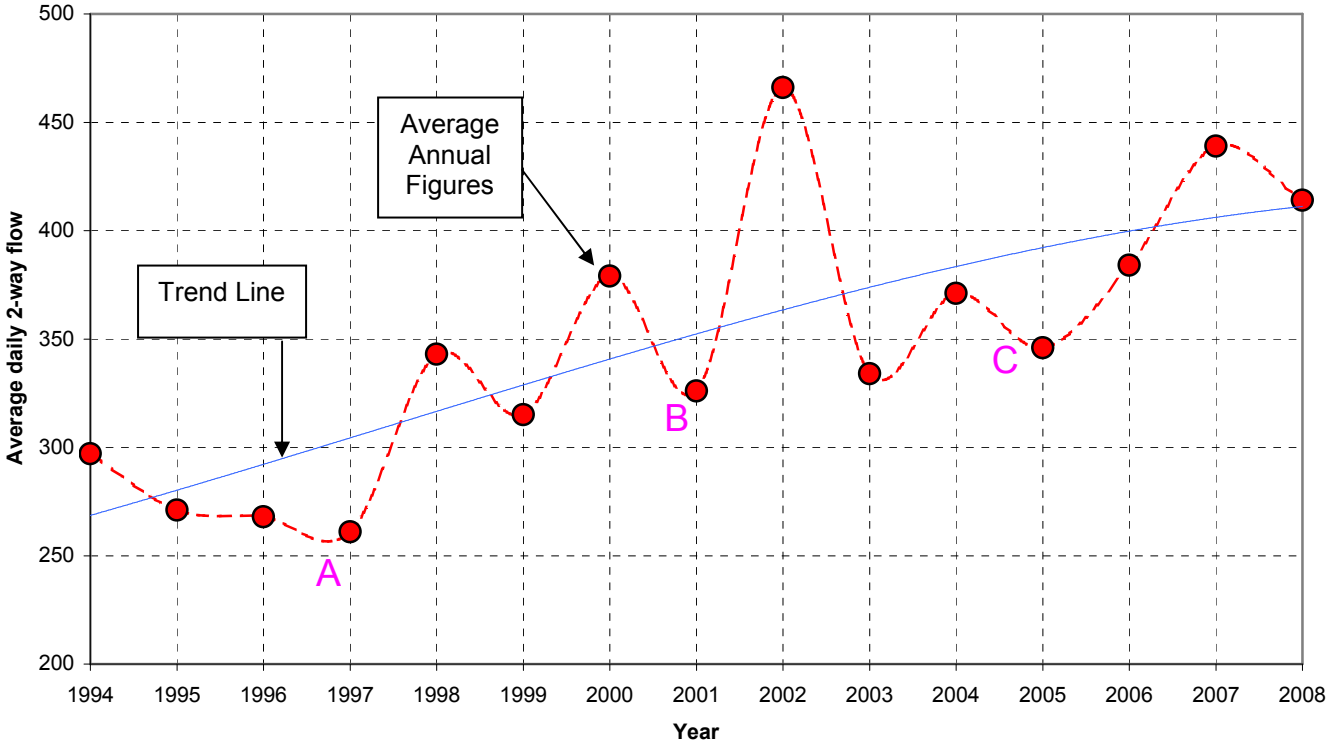
Costs

- The implementation of 'C' in the table (phased introduction of off-road cycle facilities from 2005) was done in combination with bus priority measures on this highway and had an estimated cost of £1.1M for the entire scheme. An estimated £600K was assigned to the cycle element of this scheme (approximately 4km of off-road facilities).
- Using the matrix, we can estimate that £600K of infrastructure works would achieve a benefit to cost ratio of 1:1 if the scheme created an additional 60 cyclists (approximately) for this urban, off-road route.

Results & Conclusion

- In fact, from a 2005 average daily usage figure of 346 cyclists, the actual increase in number of cyclists using this route was raised to 439 in 2007 (an increase of 93 cyclists), dropping slightly in 2008 to 414 cyclists (still an overall increase of 68 cyclists from 2005 figures).
- Considering these are average daily figures and the matrix assumes cyclists using a facility only three out of five days; and also that the lifespan of 'a project' is approximately 30 years; even after two/three years, the increase in cyclist numbers has easily exceeded the 1:1 ratio and therefore justified the scheme and proving that it had been "good value for money".

Table 2: Average daily 2-way flow of cyclists using Malton Road facilities



A Introduction of on-road facilities

B Opening of the “Magic Roundabout”

C Phased introduction of off-road facilities