



Department for
Infrastructure
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General Economic Appraisal Pro Forma

Project Title	Widening and lighting the Comber Greenway from Holywood Arches Road to Millmount
Completed by	Claire Mulvenna
Grade	SPTO
Date	6 th September 2017
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Grade	5
Date	9 th November 2017
Signed	

Important Note: All the boxes in this form can be expanded and the size of the box bears no relation to the amount of information required. Sufficient information should be included in each box.

If any help is required in filling in this form please contact Economics Branch for advice and assistance on 02890 541155 or 02890 540812.

1. Introduction

Please provide a brief introduction/background to the proposed project.

A significant increase in sedentary lifestyles across the population is one of the main factors responsible for increased risk of certain cancers, type 2 diabetes, heart attack and stroke¹. A variety of studies warn that sedentary lifestyles are likely to be causing as many deaths as smoking². The importance to health of an active lifestyle has, therefore been well documented as has the sky-rocketing cost to the economy of this increased need of healthcare. In 2006/2007, heart disease due to physical inactivity was estimated to cost the NHS £542 million³.

Other studies indicate that one of the best ways to endow children with lifelong health is to leave them an environment which encourages healthy, active travel. To do so villages, towns and cities must be made more people-friendly⁴. Provision of infrastructure to facilitate sustainable transport and the associated promotion of active travel (e.g. walking and cycling) are therefore key activities for the Department for Infrastructure as it also seeks to make a significant contribution to the alleviation of traffic congestion and reduction in CO₂ transport-related emissions.

For decades transport infrastructure has been developed in such a way that it has suppressed walking and cycling across all sectors of society⁵ and not enough has been done to reverse this trend. Until recently, transport appraisal favoured motorised traffic by not considering the wider value of cycling which is now known to contribute to better health and communities, less congestion, and better quality of life, all of which yield an economic return⁶. In order to secure the substantial health and economic benefits of active travel, it is important that transport infrastructure is developed which not only facilitates but encourages active travel. The development and construction of priority off-road greenways is one recognised way of achieving this as is the need for them to be strategically planned, invested in and managed at local and regional levels⁷.

The Comber Greenway is a 6½ mile traffic free off-road walking and cycling route which runs along the route of the former Belfast and County Down Railway mainline between the Holywood Arches in east Belfast and the Belfast Road near Comber, Co. Down. The Greenway is a popular route both for recreation and leisure and is used as a walking and cycling path including a significant number of bicycle commuters. It is, therefore, an important active travel route and has substantial potential to be developed to accommodate a significant increase in the number of people travelling actively in line with the draft Programme for Government objectives to increase levels of walking and cycling and levels of physical activity.

However, limitations in the width of the path exacerbate the amount of conflict

¹ <http://www.nchpad.org/403/2216/Sedentary~Lifestyle~is~Dangerous~to~Your~Health>.

² <http://www.getbritainstanding.org/health-risks.php>.

³ <http://www.bhfactive.org.uk/resources-and-publications-item/40/420/index.html>.

⁴ http://www.fph.org.uk/uploads/Take_action_on_active_travel.pdf, page 4.

⁵ Ibid, page 2.

⁶ <http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2011/regional-development/15411.pdf>, page 1

⁷ http://www.greeninfrastructurenw.co.uk/resources/The_Economic_Value_of_Green_Infrastructure.pdf.

between the different types of users and the fact that the path is not lit reduces the utility of the path as a walking and cycling route throughout the year.

New counters were installed at three locations on the path in April 2017. Data from these counters together with previous patterns of usage (derived from older counters which were removed several years ago) indicates annual usage levels of around 180K at Beersbridge Road, 180K at Abbey Road and 130K at Belfast Road, Comber⁸.

2. Strategic Context

Explain the strategic relevance of the proposed policy, programme or project. For example, the particular strategic aims and objectives to which it will contribute should be highlighted, and an explanation of how it is expected to contribute to them should be given.

The draft Programme for Government 2016 – 21⁹ is designed to help deliver improved wellbeing for citizens. It sets out fourteen outcomes which are aimed at achieving this and these reflect a cross-Departmental approach to delivery. Improving options for people to travel and the promotion of and provision for more active travel are at the heart of what DfI does but they cannot be seen simply in terms of transport. Active travel means more active lifestyles which in turn provides better health. That, in turn, improves educational achievement and economic productivity – not to mention better places, inviting spaces and an improved environment. The draft outcomes have not yet been agreed by Ministers but those which are most relevant to this project are:

- Outcome 2: we live and work sustainably – protecting the environment;
- Outcome 4: we enjoy long, healthy, active lives;
- Outcome 10: we have created a place where people want to live and work, to visit and invest;
- Outcome 11: we connect people and opportunities through our infrastructure;
- Outcome 12: we give our children and young people the best start in life.

A specific indicator under Outcome 11 is to increase the use of public transport and active travel and this includes a commitment to implement the regional Strategic Plan for Greenways and urban Bicycle Networks. The Comber Greenway is a key element of both of these plans.

The Framework for Preventing and Addressing Overweight and Obesity in Northern Ireland 2012-2022: 'A Fitter Future for All'¹⁰ aims to empower the population of Northern Ireland to make healthy choices, reduce the risk of overweight and obesity related disease and improve health and wellbeing, by creating an environment that supports and promotes a physically active lifestyle and a healthy diet.

The Economic Strategy: Priorities for sustainable growth and prosperity: 'Building a Better Future' sets out the objective, among others, to deliver higher productivity and increase social inclusion¹¹. This ties in with 'A Fitter Future for All' as there is a demonstrable link between a more physically active lifestyle and economic productivity¹².

The Regional Transportation Strategy set out the need for a shift in emphasis away

⁸ Estimated from counters installed on the Comber Greenway in April 2017 and annual patterns of usage from previous counters which were removed by TNI around 2015.

⁹ <https://www.northernireland.gov.uk/sites/default/files/consultations/newnigov/pfg-consulation-document.PDF>.

¹⁰ <http://www.publichealth.hscni.net/news/fitter-future-all-framework-launched>.

¹¹ <http://www.northernireland.gov.uk/ni-economic-strategy-revised-130312.pdf>, page 10.

¹² <http://www.brookings.edu/research/opinions/2012/10/24-exercise-productivity-pozen>.

from the car towards more sustainable modes such as walking, cycling and public transport¹³. The Strategy envisaged the development of safe and extensive walking and cycling networks, used regularly for travel to work, shops, education centres and leisure¹⁴. It was envisaged that infrastructure improvements would provide a safer and more attractive environment for cycling¹⁵.

The DfI business plan for 2017/18 sets out the strategic objective of developing our infrastructure in a sustainable way¹⁶. Under this, '*Northern Ireland Changing Gear: a Bicycle Strategy for Northern Ireland*' sets out the vision of 'a community where people have the freedom and confidence to travel by bicycle for everyday journeys'¹⁷. This strategy emphasises the attractiveness of greenways – off road and traffic free routes – to a broad spectrum of users including the inexperienced and young – where good physical activity habits can be developed at an early age. The strategy outlines the Department's intention to support local authorities in the development of greenways throughout Northern Ireland and references the Great Western Greenway (in Co. Mayo) as a case study which demonstrates how a greenway can contribute to transportation, the local economy, leisure and recreation¹⁸.

The Strategic Plan for Greenways '*Exercise – Explore – Enjoy*' sets out a high level plan to enable people to link to places locally, regionally and nationally by active modes of travel¹⁹.

The Comber Greenway was specifically cited in the draft Belfast Bicycle Network which was consulted upon early 2017²⁰. The document proposed a framework to be developed over the next ten years, connecting two thirds of Belfast City Council residents to 130km of safe and attractive cycling infrastructure. One of the highlighted improvements was the widening and lighting of the Comber Greenway.

Northern Ireland has the lowest levels of walking and cycling in Europe²¹. One of the reasons given for reluctance to cycle is concern about safety and this is documented in a recent study on 'Barriers to Cycling' by the Cycling Embassy of Great Britain²². The Belfast Bike Life report 2015 confirms the same message with only 29% of people rating cycling safety in Belfast as 'good' or 'very good'²³. This report also indicates that over 90% of people would be helped to cycle more by increasing the number of traffic-free cycle routes or routes protected from motorised traffic²⁴.

Government policies across different disciplines all lend support to the need to increase physical activity across the population. It is also recognised that walking and cycling provide a readily accessible means of incorporating this activity into everyday life. Concern about safety, however, is a major obstacle to many people and will remain so if 'fit for purpose' infrastructure is not provided. Developing greenways

¹³

<https://www.drdni.gov.uk/sites/default/files/publications/drd/Regional%20Transportation%20Strategy%202002-12%20-%20Whole%20Document.pdf>, page 19.

¹⁴ Ibid, page 48 and 50.

¹⁵ Ibid, page 100.

¹⁶ <https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/dfi-corporate%20plan-2017-2021-business-plan-2017-2018.pdf>, page 20.

¹⁷ <https://www.drdni.gov.uk/sites/default/files/publications/drd/a-bicycle-strategy-for-northern-ireland.pdf>, page 8.

¹⁸ Ibid, page 19.

¹⁹ <https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/exercise-explore-enjoy-a-strategic-plan-for-greenways-november-2016-final.pdf> page 6

²⁰ <https://www.infrastructure-ni.gov.uk/sites/default/files/consultations/infrastructure/draft-belfast-bicycle-network-2016-consultation-document-final.pdf>, page 45

²¹ <http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2011/regional-development/15411.pdf>, page 7.

²² <http://www.cycling-embassy.org.uk/wiki/barriers-cycling>.

²³ [http://www.sustrans.org.uk/sites/default/files/bike life belfast 2015.pdf](http://www.sustrans.org.uk/sites/default/files/bike%20life%20belfast%202015.pdf), page 5

²⁴ <http://www.niassembly.gov.uk/globalassets/documents/raise/publications/2011/regional-development/>, page 10

across Northern Ireland is an integral part of the Department's contribution to increasing levels of walking and cycling and redressing this impediment to increased levels of physical activity.

3. Assessment of Need

Use this section to establish that expenditure is needed. The proposed service provision or financial assistance needs to be justified and the following points should be considered:

- Where appropriate, details should be given of deficiencies in current services, or in the assets or other resources used to deliver them. If possible you should try and quantify the problem.
- If this is recurrent funding or a recurring project please use the results from the evaluation of the last scheme to inform the assessment of need and detail here what improvements, if any, are being proposed compared to the last round of funding.
- What are the implications of not going ahead with this project?
- Would this project go ahead, even if reduced in scope, in the absence of funding from the Department?

In 2017 the Department published a draft Belfast Bicycle Network which proposed the framework for the delivery of 130km of safe and attractive cycling provision accessible (within 400m) to two thirds of all Belfast Residents within the next ten years.

Proposals to upgrade the Comber Greenway, included in the Plan were to improve crossing junctions, access, widening and lighting the Greenway.

Currently the path is of shared use and is in the region of 2.5 – 3.0m wide. With the numbers of those walking, cycling, dog walking and running (around 400 cycling journeys and 250 walking journeys daily on average during the period April – September), issues exist with conflict not only because of the demographic of users but primarily due to insufficient width.

With a rising number of complaints about user conflicts, the Department joint funded Sustrans NI to develop and implement the 'One Path' initiative in 2016 (Council funding was provided by Belfast City, Lisburn and Castlereagh, and Ards and North Down). This behavioural change programme was aimed at avoiding conflict and ensuring mutual respect between different users. This has been successful to a certain extent (qualitative feedback only), but with quick growth of greenery and increased usage in the summer months especially, the issue still remains.

Recent research has shown that an optimum width of between 3.0m and 5.0m can mitigate such issues²⁵. The land is currently owned by the Department to a width of at least 8.0m.

In the urban section of the Comber Greenway from Holywood Arches to Millmount (6.4km), only 300m is currently lit. The last available figures show that cycling levels in the six-month period October – March drop to one half of the period April – September. Levels during the three winter months (December – February) are around one third of the level during the three summer months (June – August). Recent figures for a newly constructed protected cycle lane with street lighting in Belfast city centre showed little change in the level of cycling when figures for a week in August 2016 were compared with a week in November 2016 (the November figures actually showed an increase of around 8%).

The Belfast Rapid Transit (BRT) scheme is scheduled to become operational in

²⁵ <http://www.nwatn.org.uk/wp-content/uploads/2015/11/TPM-Paper-Steve-Essex.pdf>

September 2018 with the first phase running along the Upper Newtownards Road, parallel to the greenway. Cycling is permitted in bus lanes, which have recently been upgraded. Although there are no specific data for the number of people cycling on the Upper Newtownards Road, there is a concern that the frequency of the BRT service could increase the risk of conflict between bicycles and rapid transit vehicles and reduce the average speed of the service.

It is anticipated that a wider, lit Greenway would attract higher usage of the Greenway. It would encourage the use of the greenway for other utility journeys during the darker evenings between late September and early April and it would make the path more functional as a bicycle commuting route into and out of the city throughout the year.

The widening and lighting of the Comber Greenway would provide a number of important benefits which align with the Bicycle Strategy and the Strategic Plan for Greenways:

- i. It would demonstrate measures that the Department would support in order to deliver on the Programme for Government indicator to increase the use of active travel;
- ii. It would deliver quantifiable economic benefits through encouraging an increase in physical activity along this route;
- iii. It would make a significant contribution to the development of greenways on one of the primary greenway network routes of the Strategic Plan for Greenways and the draft Belfast Bicycle Network;
- iv. Widening of the greenway and lighting would make a significant contribution to reducing conflict between users;
- v. Cycling and walking groups (including Sustrans) and political representatives have been campaigning for an upgraded greenway including both widening and lighting;
- vi. It would tie in with the EU Cycle Highways Innovations for Smarter People Transport and Spatial Planning (CHIPS) project which is about developing and promoting bicycle highways as an effective and cost efficient low carbon solution for commuting. This ongoing project which involved working with communities and employers/employees to encourage behavioural change specifically on the Comber Greenway.

The total cost of widening and lighting the greenway is estimated at £960K.

With the current active travel promotion of the CHIPS project, it is logical that any improvements on the Greenway would not only improve the attractiveness and capacity of active travel but also maintain levels throughout the year.

The project provides an opportunity for partnership working with Local Government – in line with the proposals set out in the Strategic Plan for Greenways as well as cross-Departmental working with the Department for Communities.

It will deliver many benefits consistent with the Department's active travel objectives.

In a recent meeting of the People and Communities Committee of the Belfast City council a motion was passed noted '...the benefits which the Comber Greenway facility has created in allowing Belfast's citizens and visitors to the City the opportunity to become increasingly active and to promote instead health benefits. The Council calls upon the Department for Infrastructure to develop, through a collective approach, a strategic, political and costed plan for the Comber Greenway, as part of the recently launched Strategic Plan for Greenways within Northern Ireland'

4. Objectives, Targets and Constraints

In this section the overall objectives of the proposal should be set out. Targets should also be identified to enable an evaluation of the extent to which objectives have/have

not been achieved. Targets need to be clearly acknowledged to inform the Post Project Evaluation (PPE). Finally, a series of constraints should be identified to ensure that anything which could impede the successful delivery of the project can be considered at this stage.

4.1 Objectives

The following questions may help to set suitable objectives:

- What are we trying to achieve? What are our objectives? What would constitute a successful outcome or set of outcomes?
- Have similar objectives been set in other contexts that could be adapted?
- Are our objectives defined to reflect outcomes e.g. improved health, crime reduction or enhanced sustainable economic growth; rather than the outputs e.g. operations, prosecutions or job placements, which will be the focus of particular projects?

For further information on identifying the objectives and targets please go to <http://eaq.dfonl.gov.uk/steps/step3.htm>

Please identify the objective(s) in the table below.

Table 4.1: Objectives

Objectives
1. To provide safe access to a key segregated active travel route linking with commuting, recreation and leisure activities;
2. To provide active travel facilities and increase use of the greenway throughout the day and throughout the year.
3. To create a functional active travel link in support of the EU CHIPS project;
4. To provide further impetus to the delivery of the Strategic Plan for Greenways and the draft Belfast Bicycle Network
5. To reduce the potential for conflict between users on the greenway

4.2 Targets

The following questions may help to set suitable targets:

- How might our objectives and outcomes be measured?
- Are our objectives defined in such a way that progress toward meeting them can be monitored?
- What factors are critical to success?
- What SMART targets can we then set? What targets do we need to meet?

Please identify targets in the table below.

Table 4.2: Targets

Targets
1. Increase overall annual usage (walking and cycling) of the Greenway by 50% within 5 years (i.e. increase annual counts at Beersbridge Road and Abbey Road by 50% compared to the 2017/18 figure (available on 1 st April 2018) i.e.

from circa 180,000 to circa 270,000 at these locations.

2. Increase levels of cycling along the Greenway in October – March by 75% within 5 years (i.e. increase cycle counts at Beersbridge Road and Abbey Road by 75% compared to the 2017/18 baseline) i.e. from circa 47,000 to circa 83,000 at these locations.

4.3 Constraints

Important constraints upon the proposals should be explained. These may be technical, legal, financial or political in nature, or they may have to do with timing or location.

Please identify constraints in the table below.

Table 4.3: Constraints

Constraints
1. Funding for this project has been earmarked for the current financial year by DfC. There is a window of opportunity to avail of this for construction which will close on 31 March 2018.
2. Whether there is a requirement for consultation on the provision of lighting along the Greenway length.
3. With reduced resources due to VES, for both the design and delivery of the scheme.

5. Project Delivery

Please answer the following questions:

- a) Will a third party/consultant be responsible for delivering this project?

**Project will be designed by
Dfl Design & Consultancy
Services Partner, AMEY, with
Dfl staff supervising
construction.**

- b) If yes, what is the name of the consultant appointed?

Amey

Please provide details on the deliverables expected from the consultants; for example promotional activities or press releases. If available, a copy of the draft terms of reference for the project should be attached.

Consultant will provide Dfl with construction drawings which will be provided to Term Contractor. Dfl will be responsible for Public Relations

- c) If this project is not being delivered by the consultants, please explain why it was not necessary to use the consultants on this occasion.

Dfl have resources to supervise construction

6. Identification of Options

It is useful to begin by identifying a 'long list' of options, containing all the initial ideas about possible solutions. This should include not only the conventional solutions, but also any more innovative suggestions, however outlandish they may at first appear.

The options selected for in-depth appraisal should include a baseline or benchmark option. This will usually be the "status quo" option, representing the genuine minimum input necessary to maintain services at, or as close as possible to, their current level.

Alternatives to the status quo are referred to as the 'do-something' options. These should generally cover a range of levels of provision, for example, from 'minimum acceptable provision' to the highest standards of provision. They could reflect variations in the scale, content, timing and location of services.

For further information on this section, go to <http://eag.dfnri.gov.uk/steps/step4.htm>. The link also provides examples of strategic and operational options and gives a flavour for the information to be considered when designing options.

Give each option a title and provide a short description of the option. Make sure you have at least identified the status quo and one other viable option. It is good practice to appraise more than one 'do something' option. However, if necessary, options can be rejected at this stage as long as a reasonable explanation is given.

Status Quo: Do nothing

Under this option the Department would not develop the Comber Greenway and would not provide improvements to encourage more active travel as one of the Department's PfG Outcomes. It would also remain subject to ongoing representations for a better environment and would be portrayed at 'doing nothing' contrary to its published intentions in the draft Belfast Bicycle Network and the Strategic Plan for Greenways.

It would not address the potential for transferring the asset to Councils for future maintenance.

Option 1: Widening Only

Under this option the Greenway would be widened to 4m between Holywood Arches and Millmount Road. It would provide a more attractive route to increase the level of walking and cycling in daylight hours throughout the year. It would address the issue of volume and hence conflict of users. It would not improve conditions markedly for non-daylight hours as an unlit path can be a major deterrent to active travel in the dark winter months. It would partially achieve the objective to increase active travel on an annual basis.

It would partially address the potential for transferring the asset to Councils for future maintenance.

Option 2: Lighting Only

Under this option the greenway would have lighting installed between Holywood Arches and Millmount Road. This would increase the number of Greenway users in the winter months and during the darker evenings in spring and autumn. Although it will increase all year usage, it will not address the issues of potential conflict and complaints received by the Department. An increased volume of users is likely to increase the issues of conflict.

It would partially address the potential for transferring the asset to Councils for future maintenance.

Option 3: Widening and lighting

Under this option the Greenway would be widened to 4m and have lighting installed between Hollywood Arches and Millmount Road. It would realise the potential to increase the number of active travel journeys throughout the year, with sufficient width to mitigate conflict and the attraction for a lit route throughout the darker evenings and the winter months. This would also deliver a safer route for winter cycling and reduce the potential for conflict issues on the parallel BRT route on the Upper Newtownards Road. This might contribute to improved journey times for the BRT vehicles. Safety would be improved in general for walking.

This option would also make the greenway an attractive facility to be taken on by the three Councils for future maintenance.

7. Assessment of Monetary Costs and Benefits

7.1 Monetary Costs and Benefits

Appraisals should account for **all** the costs and benefits to NI and UK residents, (i.e. consider the total costs of the project not just the cost to the Department). Examples of the costs are:

- Capital cost of carrying work out (e.g. promotional materials). This will be particularly relevant when you are considering the cost of the in-house options;
- Cost of using consultant;
- Researchers;
- Transport Costs; and
- In-house cost of managing the project

For each option you have brought forward from the previous section identify a detailed breakdown of the costs and the benefits (revenue) in the table below. If the project is spread over a number of years then simply add additional tables below stating the year it refers to.

Please provide details below each table about how the cost and benefits were estimated (i.e. the assumptions). For instance, the cost of materials may have been estimated using experience from a previous campaign.

As these projects generally use the marketing consultants, it is important to estimate the in-house staff support costs. You do this by using the most recent DRD 'Ready Reckoner' and estimating the time spent on the project by staff. If assistance is needed with the calculation, please contact Economics Branch. The calculation should be outlined in the assumptions box below the table.

The DoF 2016/17 'Ready Reckoner' has been used to calculate the following and can be accessed by clicking this link:

Table 7.1: Monetary Costs and Benefits

Costs & Benefits Description	Status quo	Option 1	Option 2	Option 3
Costs				
In-house support/Partner	£0	£40,620	£50,700	£87,050

consultancy				
External cost	£0	£0	£0	£0
Additional Resource (maintenance) Cost (p.a)	N/A	£120	£3,500	£3,620
Capital Cost	£0	£460,200	£507,000	£870,480
Total Cost (A)	£0	£500,940	£561,200	£961,150
Monetary Benefits				
	NIL	NIL	NIL	NIL
Total Costs (A-B)*	£0	£500,940	£561,200	£961,150

* A negative total denotes a total benefit

Please provide details of the assumptions in the box below

In House Support/Partner Consultancy

Based on estimated in house costs, of similar schemes @ 10% of capital cost

Option 3 is a combination of options 1 and 2 so it offers a saving in overhead cost and doubling up of excavations which results in a 10% reduction in overall cost

Resource (Maintenance) Costs

Maintenance costs do not include hedge cutting, as this will be carried out no matter what the width.

Lighting maintenance is estimated to be £3,500 per annum over 5 years is £17,500

Cost of general (surface) maintenance is the current annual spend of £120/year

Therefore 5 years = £600

CAPEX:

Capital costs include level of OB of 30% based on previous experience of greenways.

7.2 Optimism Bias

Optimism Bias refers to the demonstrated, systematic tendency for project appraisers to be overly optimistic; it can only be applied to capital costs.

Do any of the options have relatively large capital costs that have been estimated and therefore you are uncertain about?

Yes (OB at 30%)

If you answered yes then you may need to carry out an optimism bias adjustment. To do this you need to follow the following link http://www.hm-treasury.gov.uk/media/D/B/GreenBook_optimism_bias.pdf . If further clarification is required please contact Economics Branch for assistance.

7.3 Net Present Value

Appraisals should generally include, for each option, a calculation of its Net Present Value (NPV). This is the name given to the sum of the discounted benefits of an option less the sum of its discounted costs, all discounted to the same base date. Where the sum of discounted costs exceeds that of the discounted benefits, the net figure may be referred to as the Net Present Cost (NPC).

Please answer the following questions:

- a) Is the expected economic life of the project expected to be greater than 3 years?

Yes

- b) Are you trying to compare an option with a high capital cost and to an option with low initial capital cost but high recurrent costs?

Yes

If you answered yes to the two questions then you are required to complete NPC calculation. DFP have templates for completing these can be found at <http://eaq.dfn.gov.uk/npc-calculator.xls> and further guidance to the completion of NPCs can be found at <http://eaq.dfn.gov.uk/appendices/appendix7.htm>. Economics Branch can also assist with NPV calculations.

Remember that optimism bias adjustments must be made prior to NPV calculations and included in the NPV calculations.

NPV are calculated and are included alongside this appraisal at APPENDIX A (an outline of the assumptions for the economic benefits are included at ANNEX A at end of this document)

8. Assessment of Non-Monetary Costs and Benefits

In many assessments there are non-monetary impacts such as environmental, social or health effects that cannot be valued cost-effectively. There are two main techniques to illustrate how options compare regarding factors that are not expressed in monetary values

a) Impact Statement

In essence, it consists of a table summarising the impact of each option upon each non monetary benefit.

b) The weighted scoring method

This involves assigning numerical weights to each factor to reflect its comparative importance, scoring the performance of each option against each factor on a numerical scale and calculating a 'weighted score' for each option.

The weighted scoring method is more detailed and is particularly useful when the monetary costs of options are similar and there are minor variations in non-monetary benefits. This pro forma includes an impact statement table but if it is felt necessary to complete a weighted scoring exercise please contact Economics Branch for assistance. Further information regarding non-monetary costs and benefits can be found at <http://eaq.dfn.gov.uk/steps/step7.htm>.

To complete the table below follow these steps:

1. Identify the non-monetary benefits in the benefit column;
2. For each of the non-monetary benefits identified give each option an impact rating using the key below the table; and
3. Assess the overall non-monetary benefit of each option.

Table 8.1: Non-Monetary Costs and Benefits

Benefit	Status quo	Option 1	Option 2	Option 3
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Overall	\	+	+	++
Increase in active travel	\	+	+	++
Potential to Improve comfort and attractiveness of current users	\	+	+	++
Improvements to health of the local population near the section of Greenway from Hollywood Arches and Millmount	\	+	+	++
Reduction in the number of cyclists using the bus lanes on the Upper Newtownards Road could prevent a reduced journey time for BRT vehicles	\	+	+	++

KEY				
--	-	\	+	++
highly negative	negative	no impact	positive	highly positive

Please give a short narrative explaining the non-monetary rankings given to each option.

Status Quo ranking: 4th

Explanation: Doing nothing will result in no benefits

Option 1 and 2 ranking: joint 2nd

Explanation: Option 1 and 2 both deliver some positive non-monetary benefits. To deliver one without the other would only bring some benefits. Option 1 would deliver benefits throughout the non-winter months and during daylight hours where, users would have more comfort in width and less conflict.

Option 2 would be of major non-monetary benefit in the winter months with the greenway being useable as a safe commuter route with lighting. There would be a little benefit in late Spring and early Autumn during April - September with width and conflict continuing to be an issue.

Option 3: ranking: 1st

This option makes a strong positive contribution to all the non-monetary benefits and in cost terms is about 10% cheaper to the Department rather than Options 1 and 2 being done separately. It would have a clear advantage in delivering the outcomes in a very short timescale and would deliver benefits which would develop good active travel habits for the whole year (It is difficult to maintain good habits if the environment is unpredictable, i.e. too many people on a narrow width in summer; too dark in winter

when width isn't an issue²⁶). Breaking the habit of spring/summer cycling because of dark nights often means that cycling is not taken up again the following spring.

9. Assessment of Risk

A vital first step in the analysis is to identify and analyse the important risks and uncertainties relevant to the case, and to show how they compare under each option. This risk analysis should help inform the adjustments for optimism bias and identification of risk management and mitigation measures.

It is good practice to summarise the relevant information in a table, called a 'Risk Log' or 'Risk Register', which identifies each relevant risk and compares how it impacts upon each option.

For further guidance on completing this section please go to <http://eaq.dfn.gov.uk/steps/step6.htm>

Please use the table below to complete an assessment of the risks of each option.

Table 9.1: Risk Assessment

Description of Risk	Impact of risk (H/M/L)	Likelihood of risk (H/M/L)				How can risk be mitigated?
		SQ	Opt 1	Opt 2	Opt 3	
In-house resource not immediately available	H	NA	M	M	H	This risk could be mitigated by using an outside consultant.
Costs	M	NA	L	L	M	Effective project management
Unforeseen issues in relation to the site works	H	NA	M	M	H	Effective site surveys prior to work commencement.
Availability of land	M	NA	L	L	L	All land is owned by the Department
Lack of neighbourhood support/Public acceptability	M	NA	L	M	M	Informal information events and gain support from community groups including Sustrans who are currently working with users and potential users of the Greenway
Availability of funding	H	NA	M	M	H	If project is delayed there may not be funding in the following years
Vires in terms of powers to light the	H	NA	NA	L	L	Currently the Roads Order permits the lighting of pathways and back

²⁶ http://ac.els-cdn.com/016920469402030J/1-s2.0-016920469402030J-main.pdf?_tid=46553d9c-9250-11e7-aae2-00000aacb35e&acdnat=1504626093_b715d365dae42285f8475581fd2d19

Paragraph 6.3.6

Greenway						passages which are not adopted by the Department. The Greenway could fall into this definition.
Environmental Impact	H	NA	M	M	H	The alignment of the widening can be adjusted to avoid areas of high environmental constraint. Innovative lighting solutions can be employed to light areas of specific environmental concern such as low level light or the use of bat covers. Lessons can also be learnt from the Connswater Community Greenway which was completed this year by Belfast City Council.
Demand for higher maintenance costs e.g. Winter Gritting, lighting	L	NA	L	M	M	Although there is no statutory obligation for the Department to grit any road, grit boxes could be provided for community use. It is hoped to be able to transfer the Greenway to the Council in the future which could mitigate the need for any future Departmental maintenance on the Greenway
Overall Risk		NA	M	M	H	

Key: H – high M – medium L – low NA – Not Applicable

10. Preferred Option

It is important to include a section which draws together the main findings and conclusions of the appraisal. Please use the table below to summarise the main results for each option.

Table 10.1: Summary of Results

Summary	Status Quo	Option 1	Option 2	Option 3
Total capital cost	£0	£460,200	£507,000	£870.480

Total resource cost²⁷ (pa over life of project)	£0	£2,151	£6,035	£7,972.50
NPC	£0	-£642,933	-£493,095	-£1,237,018
Non-monetary benefits ranking	4 th	2 nd	3 rd	1 st
Overall risk assessment	N/A	M	M	H

Please explain in more detail the choice of preferred option and why it was chosen.

On the basis of combined potential monetary benefits, actual non-monetary benefits and risk, Option 3 is the preferred option. Although it is the most expensive option it is the one that delivers better value for money as it has reduced the overheads of doing Options 1 and 2 separately. It also makes a significant contribution to increasing levels of walking and cycling on this corridor and a small contribution to fostering public transport use (via BRT) by reducing likelihood of delays on the BRT route

If Option 1 or 2 are pursued separately, the Department would come under pressure to complete the other option.

Option 3 delivers benefits throughout the year and reduces the added work to annually encourage active travel along the greenway when the environment is favourable depending on the season.

Option 3 also contributes to the reliability of the new BRT as it provides a feasible alternative route for cycling away from the BRT route.

11. Skills Transfer

Please outline the potential for skills transfer in the box below. Some points to consider include;

- What arrangements have been put into place to facilitate the transfer of skills from the consultants to departmental staff to the extent that this is a benefit of the consultancy?
- When is it anticipated that knowledge and skills delivered by the consultancy will be transferred to internal staff?
- What are the implications of skills transfer for future consultancy support?

There is no opportunity for skills transfer.

12. Displacement

Displacement relates to the extent to which the proposed activity under this project will affect similar activity in another area, either in a positive or negative way. That is, will some other similar activity be replaced as a consequence of this project? Ideally, displacement should be minimized.

Is it likely that displacement could occur with this project?

Yes

If yes, please give more details in the box below

²⁷ No resource funding if transferred to Council

Failure to deliver this scheme could impact adversely on the proposed BRT scheme on the Upper Newtownards Road due to begin in September 2018. There is a strong potential for more people to cycle in the bus lane due to lack of width in the summer and lighting in the winter which could create performance and conflict issues with BRT vehicles

13. Additionality

Additionality refers to the net impact of the project over and above what would have happened if the project did not go ahead. In other words, it refers to the extent to which the project would have gone ahead without public sector support. Additionality may be partial. For example, without assistance the project may have been carried out later, a smaller scale, lower standard of quality or carried out in a location of lower priority.

Would the project have gone ahead in any form, without public sector support?

No

If yes, please give more details in the box below

14. Financing of Preferred Option

Please complete the table below to illustrate the funding arrangements.

Table 14.1: Financing

Funding Organisation	% funding	Funding secured. Yes/No	If no at what stage of negotiations are you at?
DfI	63%	Yes	
DfC	37%	No	DfC to consider this business case and approve
TOTAL	100		

15. Project Management & Performance Review Arrangements

This section should address the following:

- What are the proposed project management arrangements, including details of monitoring officers, draft reports, Steering Groups etc?
- Proposed arrangements for on-going monitoring of consultancy performance and expected deliverables. The project managers should ensure that appropriate mechanisms are in place for influencing performance at interim stages and measuring how well the benefits and deliverables have been achieved. This will be important for evaluation;
- Identify person/persons responsible for managing/delivering skills transfer.
- What are the performance review arrangements for the assignment, e.g. the quality assurance employed from Departmental specialists?

A DfI/DfC collaborative Steering Group will be established with monthly meeting to report and monitor on the progress of design, delivery and spend.

16. Implementation and Evaluation

Appraisals should generally include a monitoring and evaluation plan. This should provide details of:

- **Who** will be responsible for monitoring and evaluation (the organisation, division, post, individual(s));
- **Who** needs to be consulted. This is important when you have a large number of stakeholders;
- **What** factors (e.g. costs, outputs, outcomes) will be monitored and evaluated, and **how** this will be done;
- **What** staff and other resources will be required;
- **When** evaluation will be undertaken (the intervals at which monitoring will occur, and the completion dates for evaluations); and
- **How** the results will be disseminated, including identification of the target audience.

Under DfI/DfC collaborative Steering Group joint Project Managers will be appointed responsible for the monitoring and evaluation of the scheme under an agreed terms of reference.

A Post Project Evaluation will be completed within 12 months of scheme completion.

ANNEX A – Assumptions for economic benefits in NPVs

Economic Benefits

Wider social and environmental costs and benefits for which there is no market price can be difficult to assess as the impact of the proposals that cannot be expressed in money terms.

By creating an enhanced Greenway, we will encourage many more people to consider cycling and walking or as part of their everyday journeys.

The full assessment of the economic benefit (over an assumed twenty year life of the greenway) is set out in the attached Appendix A. This assessment shows that all three options have a net benefit over the twenty year period (a net benefit of £1.2 million for the preferred option): an investment in only widening the greenway or an investment in widening and lighting the greenway together would have a net benefit after eight years while an investment in lighting the greenway only would have a net benefit after ten years.

Several studies of the economic benefit of cycling have been published. The soon to be published Belfast Bike Life 2017 report (publication date 14th November 2017) has for the first time calculated a figure specific to Belfast (= 82p per additional mile cycled). This is the figure used in the above calculation. It is also assumed that the average length of each additional journey cycled on the greenway is 3 miles (average journey length from the most recent Travel Survey is 5.2 miles²⁸).

Number of additional cycling journeys based on targets at section 4.2 (compared to 2017/18):

Year 1: +13K; Year 2 +26K; Year 3 + 38K; Year 4 +51K; Year 5 +64K (total additional journeys +192K)

Additional miles cycled = 3 x 192K = 576K

Economic benefit over five years = £0.82 x 576K = £472K

There is less information available in respect of the economic benefit of walking (in terms of per mile). However, a September 2017 study by the Victoria Transport Policy Institute in British Columbia, Canada²⁹ can be used to calculate the relative benefit between walking and cycling. This suggests that the economic benefit per mile of walking is around 1.2 times the benefit per mile of cycling. Using the 82p per mile figure in the Bike Life report (referred to above) gives a figure of 98p per mile for walking. It is also assumed that the average length of each additional journey walked on the greenway is 1 mile (average journey length from the most recent Travel Survey is 1 mile³⁰)

Number of additional walking journeys based on targets at section 4.2 (compared to 2017/18):

Year 1: +5K; Year 2 +10K; Year 3 + 15K; Year 4 +20K; Year 5 +25K (total additional journeys +75K)

Additional miles walked = 1 x 75K = 75K

Economic benefit over five years = £0.98 x 75K = £73K.

Total economic benefits over five years = £472K (cycling) + £75K (walking) = £547K

During the summer months (April – September) daylight hours occupy 84% of the time period (5.0 am – 11.0 pm) when people generally walk and cycle (and over 99% of the time when they would commute i.e. 7.0 – 9.0 am and 5.0 – 7.0 pm). It is, therefore, unlikely that lighting during those months will contribute much to an increase in walking and cycling (although it might contribute to a small increase might be expected in the evenings during April, August

²⁸ <https://www.infrastructure-ni.gov.uk/system/files/publications/infrastructure/TSNI-headline-report-2014-2016%20.pdf>, page 4

²⁹ <http://www.vtpi.org/nmt-tdm.pdf>, pages 44 – 46.

³⁰ *ibid*

and September). It is, therefore, estimated that 90% of the increase in walking and cycling journeys during the summer period is attributable to widening the greenway.

During the winter months (October – March) the situation is very different. Daylight hours occupy only 52% of the time period when people generally walk and cycle (and 58% of the time when they would commute). During those months, lighting will make a much greater contribution to an increase in walking and cycling – particularly at the busier commuting times. It is, therefore, estimated that 20% of the increase in walking and cycling journeys during the winter period is attributable to widening the greenway.

Consequently, 51% of the overall benefit (£279K) is attributable to widening and 49% (£268K) to lighting.

DRAFT

COMBER GREENWAY COUNTERS 2017

Counter	April 19 - 30th 12		May 1 - 31st 31		June 1 - 30th 30		July 1 - 31st 31		August 1 - 31st 31		September 1 - 30th 30		October 1 - 16th 16		TOTAL 181	
	Walking	Cycling	Walking	Cycling	Walking	Cycling	Walking	Cycling	Walking	Cycling	Walking	Cycling	Walking	Cycling	Walking	Cycling
Beersbridge Road	3,810	4,267	11,411	15,436	4,948	12,408	8,168	11,897	9,300	12,415	4,856	8,695	3,093	4,610	45,586	69,728
Abbey Road	3,606	4,439	11,781	16,165	2,155	12,082	8,158	13,207	9,696	12,613	7,076	8,589	3,482	3,874	45,954	70,969
Belfast Road, Comber	2,476	3,387	7,256	11,696	7,694	8,439	5,880	10,538	5,125	9,181	4,023	5,949	1,721	2,496	34,175	51,686
	9,892	12,093	30,448	43,297	14,797	32,929	22,206	35,642	24,121	34,209	15,955	23,233	8,296	10,980	125,715	192,383

Daily Average

Beersbridge Road	317.50	355.58	368.10	497.94	164.93	413.60	263.48	383.77	300.00	400.48	161.87	289.83	193.31	288.13	251.86	385.24
Abbey Road	300.50	369.92	380.03	521.45	71.83	402.73	263.16	426.03	312.77	406.87	235.87	286.30	217.63	242.13	253.89	392.09
Belfast Road, Comber	206.33	282.25	234.06	377.29	256.47	281.30	189.68	339.94	165.32	296.16	134.10	198.30	107.56	156.00	188.81	285.56
															694.56	1,062.89

Walkers as percentage of cyclers

Beersbridge Road	89.3%		73.9%		39.9%		68.7%		74.9%		55.8%		67.1%		65.4%
Abbey Road	81.2%		72.9%		17.8%		61.8%		76.9%		82.4%		89.9%		64.8%
Belfast Road, Comber	73.1%		62.0%		91.2%		55.8%		55.8%		67.6%		69.0%		66.1%

*Temporary problem with walking counters at Beersbridge Road and Abbey Road
Correct figures estimated at 8,500 for each site

*Temporary problem with walking counter at Beersbridge Road
Correct figure estimated at 6,500

Walkers as percentage of total

Beersbridge Road	47.2%		42.5%		28.5%		40.7%		42.8%		35.8%		40.2%		39.5%
Abbey Road	44.8%		42.2%		15.1%		38.2%		43.5%		45.2%		47.3%		39.3%
Belfast Road, Comber	42.2%		38.3%		47.7%		35.8%		35.8%		40.3%		40.8%		39.8%

OLD COUNTERS (cycling only)

Kinross Avenue (near Abbey Road)	2011	2012	2013	2014
All year figures	53570	58006	63274	71882
19 April - 16 October (SUMMER)	33609	36107	42847	48526
Summer as percentage of all	62.7%	62.2%	67.7%	67.5%
17 October - 18 April (WINTER)	19961	21899	20427	23356
Winter as percentage of all	37.3%	37.8%	32.3%	32.5%
Winter as percentage of summer	59.4%	60.7%	47.7%	48.1%
Beersbridge Road				
All year			72414	94507

19 April - 16 October (SUMMER)	40433	65760
Summer as percentage of all	55.8%	69.6%
17 October - 18 April (WINTER)	31981	28747
Winter as percentage of all	44.2%	30.4%
Winter as percentage of summer	79.1%	43.7%

ASSUME (in respect of the counters at Beersbridge Road and Abbey Road)

- i. Cyclists between 17th October and 18th April (inclusive) = one half of the figure for 19th April to 16th October (based on old counter data)
- ii. Walkers for the year = 70% of the cyclist figure (after correcting for the temporary problems with the counters in June and September)

Beersbridge Road		2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	
Cycling		116,213						
Walking		58,107						
Abbey Road								
Cycling		118,282	131,056	143,831	156,605	169,379	182,154	
Walking		59,141						
Abbey Road winter cycling	<input type="text" value="75%"/>	47,313	54,410	61,506	68,603	75,700	82,797	
Increase on 2017/18			7,097	14,194	21,291	28,388	35,485	
Abbey Road summer cycling	<input type="text" value="40%"/>	70,969	76,647	82,324	88,002	93,679	99,357	
Increase on 2017/18			5,678	11,355	17,033	22,710	28,388	
Total increase in cycling journeys			12,774	25,549	38,323	51,098	63,872	
Abbey Road annual cycling		118,282	131,056	143,831	156,605	169,379	182,154	54%
Abbey Road annual walking		59,141	64,109	69,077	74,045	79,013	83,981	42%
Total increase in walking journeys			4,968	9,936	14,904	19,872	24,840	
Abbey Road annual total		177,423	195,165	212,907	230,650	248,392	266,135	50%
Increase attributable to widening			6,529	13,058	19,587	26,117	32,646	<input type="text" value="90%"/> of the summer increase
Increase attributable to lighting			6,245	12,491	18,736	24,981	31,226	+ <input type="text" value="20%"/> of the winter increase
			51.1%	51.1%	51.1%	51.1%	51.1%	
			48.9%	48.9%	48.9%	48.9%	48.9%	

NET PRESENT COST MODEL SPREADSHEETS

The model spreadsheets included in this file are for general use in calculating Net Present Costs (or Net Present Values) in public sector economic appraisals. They are consistent with the requirements of the NI Practical Guide to the Green Book. The first model spreadsheet includes discount factors based on a 3.5% p.a. real discount rate, which is the current general discount rate for use in the U.K. public sector.

The second model spreadsheet includes discount factors based on an 8% p.a. real discount rate, which is the current rate for assessing the commercial viability of projects (unless Departmental economists advise otherwise).

Either of these spreadsheets may be adapted for use with another discount rate by simply substituting the appropriate discount factors.

It is recommended that you read all of the following brief notes before using the spreadsheets.

HOW TO USE THESE SPREADSHEETS

The first step is to save this file under another name so that the original may be kept blank for future use. The new file may then be adapted to the needs of the case in hand. For example, you may wish to create a new sheet for each option requiring appraisal or separate sheets for sensitivity analyses.

Inserting Values into the Spreadsheets

The spreadsheets contain all the formulae needed to do the calculations. All the user has to do is insert the relevant costs and benefits in the appropriate blank white cells and the formulae will do the rest.

Values should only be inserted in the blank white cells of the spreadsheets. Do not insert values in the green or blue cells as they contain formulae.

Do not put a minus sign in front of any of the figures inserted into the spreadsheets.

The formulae are set up to calculate all the necessary totals and sub-totals, and will automatically show a minus sign in front of a net benefit. Inserting a minus sign in front of a benefit (e.g. a residual value) will cause the formulae to calculate incorrectly. The final total NPC figure will automatically show a minus sign when there is a positive NPV result.

Costs and Benefits

Costs and benefits should be shown in detail. Each cost and benefit item should be identified in the left column of the spreadsheet, with relevant year by year figures shown in the corresponding rows.

It may be necessary to add extra rows if there are a large number of cost or benefit items to include.

Extra rows may be added by clicking on the 'Add Row' buttons in the left hand column of the spreadsheets.

Time Period for Appraisal

The time period chosen should reflect the economic life of the services being appraised, or the useful life of relevant key assets, and should be sufficiently distant to cover all the important cost and benefit differences between options. For example, office accommodation projects may be appraised over 25 years, commercial viability may be appraised over 10 years, and IT projects may be appraised over 5 years.

The model spreadsheets have columns for 10 years, but it will often be appropriate to use a different period.

Columns may be added or removed by clicking on the 'Add Year' or 'Remove Year' buttons at the top right corner of the spreadsheets.

The spreadsheets automatically allow for the fact that the general discount rate is reduced after Year 30 e.g. it is 3.0% p.a. for Y to 75 and 2.5% for Years 76 to 125 and so on. (See para 2.8.4 of the NI Practical Guide to the Green Book for fuller explanation)

If you have any queries about the use of these spreadsheets, or about economic appraisal in general, contact the Economics Branch in your Department, or this branch:

ECONOMIC APPRAISAL BRANCH

Department of Finance

CARLETON HOUSE

1 Cromac Avenue

Gasworks Business Park

BT7 2JA

NPV @ 3.5% p.a.		APPRAISAL DATE: Oct-17																				
OPTION NUMBER & TITLE: Opt 1 - Widening only																						
YEAR :	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	TOTAL
CAPITAL COSTS (£ 000s):	Add Row																					
Capital costs (incl 30% OB)		460200																				460200
																						0
																						0
																						0
A. Total Capital Costs (Annual)		460200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	460200
B. Total Capital Costs (Cumulative)		460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200	460200
REVENUE COSTS (£ 000s):	Add Row																					
Partner consultancy		40620																				40620
Maintenance			120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	2400
																						0
																						0
C. Total Revenue Costs (Annual)		40620	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	43020
D. Total Revenue Costs (Cumulative)		40620	40740	40860	40980	41100	41220	41340	41460	41580	41700	41820	41940	42060	42180	42300	42420	42540	42660	42780	42900	43020
E. Total Costs (Annual) (=A+C)		500820	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	503220
F. Total Costs (Cumulative) (=B+D)		500820	500940	501060	501180	501300	501420	501540	501660	501780	501900	502020	502140	502260	502380	502500	502620	502740	502860	502980	503100	503220
BENEFITS (£ 000s):	Add Row																					
Economic Benefit of (walking)			2499	4998	7497	9996	12495	12495	12495	12495	12495	12495	12495	12495	12495	12495	12495	12495	12495	12495	12495	224910
Economic Benefit of (cycling)			16310	32620	47675	63985	80294	80294	80294	80294	80294	80294	80294	80294	80294	80294	80294	80294	80294	80294	80294	1445299
G. Total Benefits (Annual)		0	18809	37618	55172	73981	92789	92789	92789	92789	92789	92789	92789	92789	92789	92789	92789	92789	92789	92789	92789	1670209
H. Total Benefits (Cumulative)		0	18809	56426	111598	185579	278368	371158	463947	556736	649526	742315	835105	927894	1020683	1113473	1206262	1299052	1391841	1484630	1577420	1670209
NET UNDISCOUNTED COST* (=E-G)		500820	-18689	-37498	-55052	-73861	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-92669	-1166989
DISCOUNT FACTOR @ 3.5% p.a.		1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	0.5384	0.5202	0.5026
NET PRESENT COST* (Annual)		500820	-18057	-35004	-49654	-64365	-78025	-75387	-72837	-70374	-67994	-65695	-63474	-61327	-59253	-57249	-55313	-53443	-51636	-49890	-48203	-46572
NET PRESENT COST* (Cumulative)		500820	482763	447759	398105	333740	255715	180328	107491	37117	-30878	-96573	-160046	-221373	-280627	-337876	-393190	-446633	-498268	-548158	-596360	-642933
TOTAL NET PRESENT COST* =			-642,933																			

* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.

NPV @ 3.5% p.a.		APPRAISAL DATE: Oct-17																				
OPTION NUMBER & TITLE: Opt 2 - Lighting Only																						
YEAR :	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	TOTAL
CAPITAL COSTS (£ 000s):	Add Row																					
Capital costs (incl 30% OB)		507000																				507000
A. Total Capital Costs (Annual)		507000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	507000
B. Total Capital Costs (Cumulative)		507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000	507000
REVENUE COSTS (£ 000s):	Add Row																					
Partner consultancy		50700																				50700
Maintenance			3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	70000
C. Total Revenue Costs (Annual)		50700	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	120700
D. Total Revenue Costs (Cumulative)		50700	54200	57700	61200	64700	68200	71700	75200	78700	82200	85700	89200	92700	96200	99700	103200	106700	110200	113700	117200	120700
E. Total Costs (Annual) (=A+C)		557700	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	3500	627700
F. Total Costs (Cumulative) (=B+D)		557700	561200	564700	568200	571700	575200	578700	582200	585700	589200	592700	596200	599700	603200	606700	610200	613700	617200	620700	624200	627700
BENEFITS (£ 000s):	Add Row																					
Economic Benefit of (walking)			2401	4802	7203	9604	12005	12005	12005	12005	12005	12005	12005	12005	12005	12005	12005	12005	12005	12005	12005	216090
Economic Benefit of (cycling)			15670	31340	45805	61475	77146	77146	77146	77146	77146	77146	77146	77146	77146	77146	77146	77146	77146	77146	77146	1386621
G. Total Benefits (Annual)		0	18071	36142	53008	71079	89151	89151	89151	89151	89151	89151	89151	89151	89151	89151	89151	89151	89151	89151	89151	1604711
H. Total Benefits (Cumulative)		0	18071	54214	107222	178301	267452	356602	445753	534904	624054	713205	802355	891506	980657	1069807	1158958	1248108	1337259	1426410	1515560	1604711
NET UNDISCOUNTED COST* (=E-G)		557700	-14571	-32642	-49508	-67579	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-85651	-977011
DISCOUNT FACTOR @ 3.5% p.a.		1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	0.5384	0.5202	0.5026
NET PRESENT COST* (Annual)		557700	-14078	-30472	-44654	-58892	-72116	-86977	-103211	-120444	-138677	-158010	-178453	-199916	-222509	-246342	-271535	-298208	-326481	-356384	-387957	-430995
NET PRESENT COST* (Cumulative)		557700	543622	513150	468496	409604	337489	267812	200491	135447	72603	11884	-46782	-103465	-158230	-211143	-262267	-311663	-359387	-405498	-450050	-493095
TOTAL NET PRESENT COST* =		-493,095																				

* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.

NPV @ 3.5% p.a.																							
APPRAISAL DATE:		Oct-17																					
OPTION NUMBER & TITLE:		Opt 3 - Widening and Lighting only																					
YEAR :		Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	TOTAL
CAPITAL COSTS (£ 000s):		Add Row																					
Capital costs (incl 30% OB)	870480																						870480
A. Total Capital Costs (Annual)	870480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	870480
B. Total Capital Costs (Cumulative)	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480	870480
REVENUE COSTS (£ 000s):		Add Row																					
Partner consultancy	87050																						87050
Maintenance		3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	72400
C. Total Revenue Costs (Annual)	87050	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	159450
D. Total Revenue Costs (Cumulative)	87050	90670	94290	97910	101530	105150	108770	112390	116010	119630	123250	126870	130490	134110	137730	141350	144970	148590	152210	155830	159450	159450	
E. Total Costs (Annual) (=A+C)	957530	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	3620	1029930
F. Total Costs (Cumulative) (=B+D)	957530	961150	964770	968390	972010	975630	979250	982870	986490	990110	993730	997350	1000970	1004590	1008210	1011830	1015450	1019070	1022690	1026310	1029930	1029930	
BENEFITS (£ 000s):		Add Row																					
Economic Benefit of (walking)		4900	9800	14700	19600	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	24500	441000
Economic Benefit of (cycling)		31980	63960	93480	125460	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	157440	2833920
G. Total Benefits (Annual)	0	36880	73760	108180	145060	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	181940	3274920
H. Total Benefits (Cumulative)	0	36880	110640	218820	363880	545820	727760	909700	1091640	1273580	1455520	1637460	1819400	2001340	2183280	2365220	2547160	2729100	2911040	3092980	3274920	3274920	
NET UNDISCOUNTED COST* (=E-G)	957530	-33260	-70140	-104560	-141440	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-178320	-2244990
DISCOUNT FACTOR @ 3.5% p.a.	1.0000	0.9662	0.9335	0.9019	0.8714	0.8420	0.8135	0.7860	0.7594	0.7337	0.7089	0.6849	0.6618	0.6394	0.6178	0.5969	0.5767	0.5572	0.5384	0.5202	0.5026	0.5026	
NET PRESENT COST* (Annual)	957530	-32135	-65476	-94307	-123257	-150141	-145063	-140158	-135418	-130839	-126414	-122140	-118009	-114019	-110163	-106438	-102838	-99361	-96001	-92754	-89618	-1237018	
NET PRESENT COST* (Cumulative)	957530	925395	859918	765611	642354	492214	347150	206992	71574	-59265	-185679	-307819	-425828	-539846	-650009	-756447	-859285	-958646	-1054646	-1147400	-1237018		
TOTAL NET PRESENT COST* =	-1,237,018																						

* A minus sign in these rows denotes a Net Present Value rather than a Net Present Cost.