

Positively Affecting Lives

The Health Benefits of the Forth & Clyde and Union Canals

Final Report for British Waterways Scotland and The Waterways Trust Scotland

June 2011



Document Control

Project Title: The Health Benefits of Scotland's Canals

MVA Project Number: C3A290-00

Document Type: Draft Report

Directory & File Name: H:\Contracts\Live\C3961600_British Waterways Framework Agreement\CSGN\Report\20110217 CSGN Draft Report V1.3.Doc

Document Approval

Primary Author: Stephen Canning

Other Author(s): Scott Leitham
David Connolly

Reviewer(s): Paul McCartney

Formatted by: Stephen Canning

Distribution

Issue	Date	Distribution	Comments
1	16/03/2011	Scott Leitham and Paul McCartney	Internal Draft for Comment
2	17/03/2011	Richard Millar (BWS) and Karen Moore (TWTS)	First Draft for Comment
3	01/04/2011	Richard Millar (BWS) and Karen Moore (TWTS)	Revised Draft to be Submitted to CSGN
4	06/06/2011	Richard Millar (BWS) and Karen Moore (TWTS)	Final Report

This report, and information or advice which it contains, is provided by MVA Consultancy Ltd solely for internal use and reliance by its Client in performance of MVA Consultancy Ltd's duties and liabilities under its contract with the Client. Any advice, opinions, or recommendations within this report should be read and relied upon only in the context of the report as a whole. The advice and opinions in this report are based upon the information made available to MVA Consultancy Ltd at the date of this report and on current UK standards, codes, technology and construction practices as at the date of this report.

Following final delivery of this report to the Client, MVA Consultancy Ltd will have no further obligations or duty to advise the Client on any matters, including development affecting the information or advice provided in this report. This report has been prepared by MVA Consultancy Ltd in their professional capacity as Consultants. The contents of the report do not, in any way, purport to include any manner of legal advice or opinion. This report is prepared in accordance with the terms and conditions of MVA Consultancy Ltd's contract with the Client. Regard should be had to those terms and conditions when considering and/or placing any reliance on this report. Should the Client wish to release this report to a Third Party for that party's reliance, MVA Consultancy Ltd may, at its discretion, agree to such release provided that:

- MVA Consultancy Ltd's written agreement is obtained prior to such release, and
- by release of the report to the Third Party, that Third Party does not acquire any rights, contractual or otherwise, whatsoever against MVA Consultancy Ltd and MVA Consultancy Ltd, accordingly, assume no duties, liabilities or obligations to that Third Party, and
- MVA Consultancy Ltd accepts no responsibility for any loss or damage incurred by the Client or for any conflict of MVA Consultancy Ltd's interests arising out of the Client's release of this report to the Third Party.

1	Introduction	1.1
1.1	Overview	1.1
1.2	Scope of the Study	1.1
2	Literature Review	2.1
2.1	Overview	2.1
2.2	The Scottish National Performance Framework	2.1
2.3	What is Greenspace?	2.2
2.4	The Health Benefits of Greenspace	2.3
2.5	Conclusion	2.10
3	Quantified Health Benefits of the Canals	3.1
3.1	Overview	3.1
3.2	Canal User Survey	3.1
3.3	Survey Results	3.3
3.4	Physical Health Benefits of the Canals	3.8
3.5	Safety Benefits	3.13
3.6	Air Quality Benefits	3.14
3.7	Absenteeism	3.16
3.8	Attitudinal Views towards the Canals	3.17
3.9	Summary	3.19
4	Wider Benefits of Scotland's Canals	4.1
4.1	Overview	4.1
4.2	Infrastructure	4.1
4.3	Canal Projects and Initiatives	4.4
4.4	Canal Events	4.11
4.5	Summary	4.15
5	Conclusions and Recommendations	5.1
5.1	Conclusion	5.1
5.2	Recommendations	5.1
6	Bibliography	6.1

Tables

Table 3.1: Proportion of Person-km Cycling, Running and Walking from Survey	3.9
Table 3.2: Proportion of Cycling, Running and Walking which is 'Additional'	3.10
Table 3.3: Additional Person Kilometres Generated by the Canal – Cycling, Running and Walking	3.11

Contents

Table 3.4: Comparison of Cycling Calorie Burn with Running and Walking	3.12
Table 3.5: Monetised Health Benefits of Canal Network	3.12
Table 3.6: Annual Value of Casualties Saved by the Canal Towpaths	3.13
Table 3.7: Reduction in Time Spent in Poor Air Quality (Person hours per annum)	3.16
Table 3.8: Benefits of the Canals in terms of Absenteeism	3.17
Table 3.9: Attitudinal Survey Findings	3.18
Table 3.10: Monetised Benefits Summary	3.19

Figures

Figure 2.1: <i>Scotland Performs</i> , The National Performance Framework	2.1
Figure 3.1: How did you find out about the survey?	3.4
Figure 3.2: Canal Access and Egress Points	3.4
Figure 3.3: Travel to a Destination – Journey Purpose	3.5
Figure 3.4: Travel for Leisure – Journey Purpose	3.6
Figure 3.5: Mode of Travel	3.7
Figure 3.6: What respondents would have done in the absence of the canal	3.8

Appendices

Appendix A: Additional Survey Information	
---	--

Key Headlines

- The canals generate almost **3.9 million additional person kilometres** of travel per annum, equating to a **physical health benefit of £6.4 million per annum**;
- The towpaths remove over 1 million cycle kilometres from the roads, with an **annual safety benefit of £220k**;
- Additional physical activity on the canal leads to a **£77k direct reduction in employer costs through reduced absenteeism**. There are also wider, but as yet unquantifiable benefits, in terms of **increased productivity**.
- The canals **reduce exposure to poor air quality by almost 85,000 hours per annum**;
- 81% of canal users either “Strongly Agree” or “Agree” that the canal encourages them to take more exercise;
- 57% of canal users either “Strongly Agree” or “Agree” that the presence of the canal encourages them to walk / cycle to work;
- 91% of survey respondents either “Strongly Agree” or “Agree” that the canal enhances their sense of personal wellbeing; and
- 86% of canal users either “Strongly Agree” or “Agree” that the presence of the canal encourages them to visit the outdoors more often.
- Investment in health related facilities has led to high levels of community engagement in health activities on the canals. This has often targeted traditionally hard to reach groups and has promoted physical health, mental wellbeing, and social cohesion, particularly in some of Scotland’s most deprived areas.

Overview

An important element of Scotland’s greenspace is its canal network, which combines both a high quality rural environment with direct access into Edinburgh, Glasgow, and Inverness. The potential contribution of the Scotland’s canals to improving the health of the population has perhaps been overlooked in the past. However, the visionary Millennium Link scheme, which restored the Forth & Clyde and Union Canals and linked them via The Falkirk Wheel has had a large impact on the use of the canals for travel and leisure purposes. In recognition of this, British Waterways Scotland (BWS) were awarded funding by the Central Scotland Green Network (CSGN) to more fully investigate the health benefits generated by these canals.



Literature Review – Key Themes

There is an extensive literature on the health benefits of greenspace. The evidence gathered to date clearly demonstrates a positive relationship between greenspace and physical health, mental health and wellbeing, and social health and wellbeing. The seminal literature on the topic explains that greenspace has a number of positive health benefits, namely:

- a positive general health and wellbeing impact;

Summary

- direct protection from physical environmental exposures – eg sunlight and poor air quality;
- restoration, relaxation and reduction in stress;
- promoting physical activity; and
- fostering social interaction and cohesion.

The literature review suggests that high quality and accessible greenspace can have a positive impact on the Scottish Government's health and wellbeing indicators.

The Physical Health Benefits of Scotland's Canals

An extensive survey of canal users identified that both the Forth & Clyde and Union Canals generate a significant amount of additional physical exercise. The extra travel can be monetised, as is illustrated in Table S1 below.

Table S1: Monetised Physical Health Benefits of the Canals

Mode	Additional Person KMs	€/KM	Monetised Benefit
Cycling	1.873m	£1.25	£2.348m
Running	0.351m	£3.43	£1.205m
Walking	1.633m	£1.73	£2.818m
Grand Total	3.587m		£6.372m

The estimated total physical activity benefits of the canals amount to **around £6.4m**, a significant amount!

Road Safety Benefits

A further benefit of the canals is that they offer a relatively safe and traffic free environment for travelling in. This is particularly true in an urban area where roads are often busy and there are conflicting movements of people and traffic. The survey outputs have been used to determine the safety benefits offered by the canals for **cyclists**. We have not included pedestrians within this analysis as this group is seen to be relatively low risk.

Table S2 identifies the safety benefits of Scotland's canals.

Table S2: Value of Casualties Saved by the Canal Towpaths

Casualty Type	No. of Casualties Saved	Cost per Casualty (2010 Prices)	Savings
Killed	0.04	£1,658,782	£64,645
Seriously Injured	0.62	£186,393	£115,399
Slightly Injured	2.76	£14,375	£39,622
Total	3.41		£219,667

In proportional terms, it is estimated that:

- 46% can be attributed to the urban section of the Union Canal;
- 32% can be attributed to the urban section of the Forth & Clyde Canal;
- 14% can be attributed to the rural section of the Union Canal; and
- 8% can be attributed to the rural sections of the Forth and Clyde Canal.

The benefits presented above represent a reduction of between three and four cycling casualties per annum, with a “Killed or Seriously Injured” casualty avoided on average in 2 years out of every 3.

Our analysis also indicates that over **1 million** cycling kilometres per annum are transferred from on-street routes to the safer towpaths of the four sections of the canal network included in this survey. This is made up of over 500,000 km per annum on-street cycling removed by the urban section of the Union Canal, over 350,000 km per annum removed by the urban section of the Forth and Clyde and around 150,000 km and 90,000 km using the corresponding rural sections respectively.



The qualitative survey findings also suggest that the canal is seen as safe environment for family cycling and as a place where children can be taught to cycle.

Absenteeism

There is a large body of evidence to suggest that additional physical activity can reduce levels of absenteeism. The Department for Transport estimate that a person undertaking 30 minutes of extra exercise per day, 5 days a week, will reduce their cost of absenteeism by 0.4% of their gross salary. In the context of the canals, this represents a **direct saving to employers of almost £77k per year**. There are also additional, but as yet unquantifiable benefits in terms of increased workplace productivity.

Air Quality

“The restored canal is a fantastic resource that extends the idea of the urban park in a more diverse and functional way.”

Air quality is becoming an increasing prominent issue in government policy – poor air quality contributes to many early deaths each year and is a factor in contributing to conditions such as asthma, heart disease and cancer. The canals generally represent areas of good air quality and provide a corridor of clean air into the heart of Scotland’s two largest cities.

Table S3 below summarises the reduction in the number of hours spent walking, running or cycling in the poor air quality in the road corridors parallel to the urban sections of the two canals.

Table S3: Reduction in Time Spent in Poor Air Quality (Person hours per annum)

Canal Section	Reduction in exposure to poor air quality (Person Hours per annum)
Forth and Clyde Urban	37,043
Union Canal Urban	47,898
Grand Total	84,941

The values suggest that the two sections of urban canal towpath reduce exposure to the poor air quality in the parallel road corridors by over 48,000 hours of walking time and almost 36,000 of cyclist-hours. This is a significant saving and clearly demonstrates the benefit of the canals as part of the wider urban path network.

Summary of Quantified Benefits

The analysis carried out above clearly demonstrates that the canals make a significant contribution to public health. Table S4 summarises the monetised benefits of the canal.

Table S4: Monetised Benefits Summary

Methodology	Benefits (£ Rounded)
Physical Activity	£6,400,000
Road Safety	£220,000
Absenteeism	£77,000
Total	£6,697,000

Summary

In addition to the monetised benefits, the canals contributed towards an additional **1 million** cycling kilometres per annum, which are transferred from on-street routes to the towpaths. As well as the road safety impacts, canal users benefit from an annual 85,000 hours spent in 'clean' air as opposed to 'polluted' air.

Attitudinal Views towards the Canals

As part of the survey programme, users were asked their general views of the health benefits of the canals. Respondents were asked to consider ten statements related to the canals and public health and indicate their level of satisfaction (ranging from "Strongly Agree" to "Strongly Disagree"). Key headlines to emerge include:

- 81% of canal users either "Strongly Agree" or "Agree" that the canal encourages them to take more exercise;
- 57% of respondents either "Strongly Agree" or "Agree" that the presence of the canal encourages them to walk / cycle to work;
- 91% of respondents either "Strongly Agree" or "Agree" that the canal enhances their sense of personal wellbeing; and
- 86% of respondents either "Strongly Agree" or "Agree" that the presence of the canal encourages them to visit the outdoors more often.

Wider Benefits of Scotland's Canals

While canals generate health benefits that can be monetised, they also offer a wide range of additional benefits over and above a simple money value. Investment in the canal network



has, in many respects, been focused on improving the quality of the greenspace and health related facilities on the canal. Canal groups, including British Waterways Scotland and The Waterways Trust Scotland, have worked extensively to actually make use of the canal for health related activities – excellent examples of this include the Community Canal Liaison Officer and Green Action.

Efforts are also being made to promote community cohesion and social wellbeing amongst communities through the medium of canal events. In summary, there is a strong evidence base to suggest that the canals are making a substantial contribution to the health and wellbeing of the Scottish population.

Recommendations

This study has established a detailed baseline for assessing the health benefits of Scotland's canals. There is considerable potential to build upon the outcomes identified here and a number of recommendations as to how this can be done are set out below.

The recommendations are outlined in terms of canal specific recommendations and wider recommendations.

■ Canal Specific Recommendations

As outlined at the outset of this report, the geographic scope of the study was limited by the extent of the

"I think the canal is a great investment in culture and leisure."

Summary

CSGN area and by a lack of data on both the Glasgow Branch of the Forth & Clyde Canal and the Monkland Canal. The benefits of these canals could potentially be substantial and there is potential for extending the study to cover these canals – the Monkland Canal has pedestrian counters that are expected to be switched on shortly, while the Caledonian and Crinan Canals already have count data available.

“The canal offers nice easy walking and good places to visit.”

The financial deadlines attached to this study meant that the survey programme had to be undertaken in January and early February 2011. The severe weather experienced during December 2010 left ice and puddles on the towpath. It is likely that this dissuaded use of the towpaths and potentially lessened the survey return. BWS should consider re-running the survey programme during the summer months. This could be deferred to the Summer of 2012 if there was a possibility that the wider canal network could be included.

As explained in Chapter 4, BWS is investing in a number of new areas of canalside greenspace, including the Falkirk HELIX and Maryhill Locks Park. These schemes may have a positive impact on the health benefits of the canals. BWS should consider ongoing monitoring of the health impacts of new areas of canalside greenspace.

■ Wider Recommendations

The findings of this study have wider impacts in terms of the benefits of greenspace on physical and mental wellbeing. The clear demonstration of the positive impacts of greenspace, and canals in particular, provide a basis for BWS and their study partners to move forward. BWS and their partners (eg the Forestry Commission, SNH, Sustrans etc) should use the findings from this report as a means of lobbying for extra funding for canal related greenspace projects.

“I appreciate being able to use the canal towpath – it keeps me away from the traffic and fumes and is far more peaceful than walking on the roadside.”

BWS and their partners should also continue to consider how the canals and towpaths can become more fully integrated into the wider core path and cycle networks.

1 Introduction

1.1 Overview

1.1.1 The promotion of public health is becoming an ever more important aspect of policy across local and national government. It is widely acknowledged that fostering a physically and mentally healthy population leads to higher levels of both labour force participation and productivity, whilst also reducing health service and social security costs. Whilst there are many aspects of health promotion, the availability of high quality greenspace has assumed increasing importance in recent years. Greenspace can act as a multi-functional health asset, encouraging people to take more exercise, providing a peaceful environment and offering a real alternative to undertaking journeys by the private car in some places.

“Canals are a valuable amenity to any community for health and wellbeing.”

1.1.2 An important element of Scotland’s greenspace is its canal network, which combines both a high quality rural environment with direct access into Edinburgh, Glasgow, and Inverness. The potential contribution of the Forth & Clyde and Union Canals to improving the health of the population has to some extent been overlooked in the past. However, the visionary Millennium Link scheme, which restored both of these canals and linked them via The Falkirk Wheel has had a large impact on the use of the canals for travel and leisure purposes.



In recognition of this, British Waterways Scotland (BWS) were awarded funding by the Central Scotland Green Network (CSGN) to more fully investigate the health benefits of the canals. BWS in turn commissioned MVA Consultancy to carry out this study.

1.2 Scope of the Study

Geographical Scope

1.2.1 As implied by its name, the CSGN covers the Central Belt of Scotland, stretching from Ayrshire and Inverclyde in the west to Fife and the Lothians in the east.¹ As a result, this study does not consider the health impacts of either the Caledonian or Crinan canals.

1.2.2 In addition, a lack of data on usage of both the Monkland Canal and the Glasgow Branch of the Forth and Clyde Canal has limited our ability to conduct any quantitative research on these waterways. Accordingly, the quantified outputs detailed in this report relate only to **the Forth & Clyde Canal and the Union Canal.**

Methodological Scope

1.2.3 This study undertakes a review of the health benefits of both the Forth & Clyde and Union Canals. “Health” and “Mental Wellbeing” are not easy terms to define and there are numerous different means of defining health impacts and outcomes. With this in mind, we have developed four different approaches to defining how the canals contribute to public health, namely:

¹ http://www.centuralscotlandgreennetwork.org/index.php?option=com_content&view=category&layout=blog&id=7&Itemid=6

Summary

- the quantified physical health benefit of undertaking additional activities on the canal;
- the benefit of travelling in 'clean' air as opposed to 'polluted' air;
- the safety benefits of using a canal towpath rather than a road for undertaking cycle journeys; and
- the use of the canals by BWS and the third sector in engaging local communities and promoting healthy activities.

1.2.4 This report will consist of a further four chapters:

- **Chapter 2** – Literature Review
- **Chapter 3** – The Quantified Health Benefits of Scotland's Canals
- **Chapter 4** – The Wider Benefits of Scotland's Canals; and
- **Chapter 5** – Conclusions and Recommendations.

2 Literature Review

2.1 Overview

- 2.1.1 There is an extensive literature on the health benefits of greenspace. The evidence gathered to date clearly demonstrates a positive relationship between greenspace and physical health, mental health and wellbeing, and social wellbeing. The purpose of this chapter is to review the seminal literature on the health impacts of greenspace as a means of providing context for the analytical work undertaken in Chapters 3 and 4.
- 2.1.2 It should be noted at the outset that **original research is outwith the scope of this review**, thus it only briefly reports on the findings of other key studies.
- 2.1.3 Before presenting the literature review, it is worth considering the Scottish Government's objectives related to health and wellbeing

"I appreciate the canal, both as a volunteer and as a local resident."

2.2 The Scottish National Performance Framework

- 2.2.1 The Scottish Government published its *Government Economic Strategy* in 2007. Central to this document was the statement of one single Purpose to which the Scottish Government should strive to achieve, which is:
- "To focus Government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth"².
- 2.2.2 Given the high level nature of the Purpose, the Government has developed a 'National Performance Framework', *Scotland Performs*. The National Performance Framework adopts a tiered approach, which builds on a base of quantifiable benchmarks (known as the 'National Indicators') through to the strategic Purpose. This is illustrated in Figure 2.1 below:



Figure 2.1: *Scotland Performs*, The National Performance Framework

² <http://www.scotland.gov.uk/About/scotPerforms/purposes>

Summary

- 2.2.3 Figure 2.1 illustrates that the first supporting tier of the National Performance Framework is the 'National Indicators and Targets'. By implication, if BWS can contribute towards the relevant National Indicators, they are in turn helping to deliver the Purpose.

Health Related National Indicators

- 2.2.4 The National Performance Framework sets out a number of National Indicators that are relevant to the potential health benefits of canals. These include:

- Reduce the rate of increase in the proportion of children with their Body Mass Index (BMI) outwith a healthy range by 2018;
- Increase the average score of adults on the Warwick – Edinburgh Mental Wellbeing Scale by 2011;
- Increase healthy life expectancy at birth in the most deprived areas;
- Reduce the percentage of the adult population who smoke to 22% by 2010;
- Reduce alcohol related hospital admissions by 2011;
- Reduce proportion of people aged 65 and over admitted as emergency inpatients two or more times in a single year;
- Reduce mortality from coronary heart disease among the under 75s in deprived areas;
- Increase the percentage of adults who rate their neighbourhood as a good place to live;
- Increase the proportion of journeys to work made by public or active transport; and
- Increase the proportion of adults making one or more visits to the outdoors per week.³

- 2.2.5 It can be clearly seen from the above list that the use of canal corridors as a means of travel and as a venue for leisure has the potential to contribute significantly to the Scottish Government's Purpose. Towpaths help encourage sustainable travel, whilst high quality greenspace encourages both gentle and vigorous physical activity amongst all ages, thus helping to tackle issues such as heart disease and child obesity. In addition, high quality greenspace can provide a peaceful and regenerative environment for people, whilst also improving the general aesthetic character of an area.

"I can't stress enough how much I enjoy my commute to and from work along the canal."

2.3 What is Greenspace?

- 2.3.1 Greenspace Scotland defines greenspace as any vegetated land or water within or adjoining an urban area. It includes:

- 'natural' greenspace – natural and semi-natural habitats;
- green corridors – paths, disused railway lines, rivers and canals;
- amenity grassland, parks, and gardens;
- outdoor sports facilities, playing fields and children's play areas;

³ <http://www.scotland.gov.uk/About/scotPerforms/performance>

- other functional greenspace – eg cemeteries and allotments;
- countryside immediately adjoining a town which people can access; and
- derelict, vacant, and contaminated land.⁴

2.3.2 In one respect, canals differ from other areas of greenspace in that they were purposefully constructed to provide a 'quick' and flat transit route between urban areas and ports. As a result, both the Forth & Clyde and Union Canals extend into and, in the case of Glasgow, through major urban areas. This provides a welcome green resource in often built-up and densely populated urban areas. It also helps extend the core path network from rural into urban areas.

2.3.3 A survey by Greenspace Scotland in 2007 on the Scottish public's attitudes to greenspace found that 58% of people use greenspace at least once a week and over 75% visit their local greenspace at least once a month. The survey found that use of greenspace had increased with only 8% of people reporting that they had never used greenspace, compared to 13% of people surveyed in 2004. Greenspace is used for a range of different activities, including:



- 49% of people using it for walking;
- 26% for taking children out to play;
- 16% to take their dog for a walk;
- 11% to relax;
- 9% to exercise;
- 8% to spend time with family;
- 5% to pass through en route to a destination;
- 3% to socialise with friends; and
- 1% to have contact with other people.⁵

2.3.4 The evidence above demonstrates clearly that use of greenspace is a popular pursuit in Scotland. The following sections discuss the benefits greenspace use in promoting health and wellbeing.

2.4 The Health Benefits of Greenspace

2.4.1 Greenspace Scotland's *Health Impact Assessment (HIA) of Greenspace Guide* provides a literature review of the health benefits of greenspace. The paper acknowledges that the relationship between greenspace and health is complex and multi-dimensional. However, it outlines five key areas where greenspace has a positive impact on health outcomes, namely:

- greenspace and general health and wellbeing;
- direct protection from physical environmental exposures;

⁴ Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 2.

⁵ *Ibid.*, p. 2.

- restoration, relaxation and reduction in stress;
- promoting physical activity; and
- fostering social interaction and cohesion.

2.4.2 The Countryside Recreation Network also argues that the presence of water enhances the benefits of good quality greenspace, which adds to the potential benefits of the canals.⁶

2.4.3 The remainder of this chapter will consider each of these headings in turn.

General Health and Wellbeing

2.4.4 The HIA Guidance explains that there is a positive relationship between greenspace and general health. By controlling for socio-economic status, the studies indicate that better health is related to greenspace regardless of socio-economic status. For example, a study conducted in England found that, in general, neighbourhoods with a greater proportion of greenspace were associated with better health. The study also found that the strength of the association between greenspace and better health varied according to the amount of income deprivation and the level of urbanisation in an area. A further key point arising from this study is that, for greenspace to be effective, it has to be of a good quality, otherwise it can be seen as inaccessible and aesthetically poor.⁷



2.4.5 In economic terms, a study by Dr Adrian Davis supported the view that investing in walking and cycling facilities has substantial economic benefits. Dr Davis points out that the benefits of walking and cycling have typically been undervalued in economic appraisal. He notes that, in the studies covered by his paper, almost all of the studies identified report economic benefits of walking and cycling interventions that are highly significant – the average benefit-cost ratio (BCR) is 13:1. For UK interventions only, the average BCR is 19:1, possibly reflecting the currently lower levels of walking and cycling in the UK compared to fellow European countries.⁸

“The canal is a great resource for residents and visitors alike.”

2.4.6 One piece of literature highly relevant to this study is benefit-cost analysis research undertaken by the Department for Transport (DfT). The DfT reviewed the impact of investment in a canal towpath in London. The towpath was transformed into a high quality walking and cycling route and assessed in terms of walking and cycling commuter use. Improved route surface quality and connectivity, in addition to the introduction of the congestion charge, led to considerable increases in usage, resulting in:

- a BCR of 24.5:1;
- savings of almost £5.5 million through reduced absenteeism; and

⁶ Pretty, J et al., A Countryside for Health and Wellbeing: The Physical and Mental Health Benefits of Green Exercise (Countryside Recreation Network, 2005), p. 1.

⁷ Mitchell, R. and Popham F., *Greenspace, Urbanity and Health: Relationships in England* (Journal of Epidemiology and Community Health, 2007) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 17.

⁸ Davis, A., *Value for Money: An Economic Assessment of Investment in Walking and Cycling* (NHS Bristol, 2010), p.1.

■ savings of £28.5 million due to increased physical fitness (based on numbers of preventable deaths).⁹

2.4.7 This study clearly demonstrates the extent of the economic benefits that can be derived through focused investment in strategically located canal towpaths.

2.4.8 In more general health terms, a study by Mass *et al* in Holland found that perceived general health was better for people living in greener environments, with the most beneficial effects found for older people (65 and over) and younger people (0 – 24 years) in urban areas.¹⁰ Similarly, a study in Tokyo found that living in areas with walkable greenspace had a positive impact on the longevity of older people, independent of age, sex, marital status, baseline physical health and socio-economic status.¹¹

2.4.9 A Danish study found that greater distance from home to greenspace was a better predictor of higher stress levels for all groups and obesity in younger respondents (aged 25 or below) than reported use of Greenspace.¹²

“The health benefits of using the canals are many.”

2.4.10 A Dutch study of 10,000 people suggested that, when assuming a causal relationship between greenspace and health, a 10% increase in greenspace in the living environment can lead to a decrease in health complaints equivalent to a reduction in age of five years.¹³

2.4.11 The evidence presented above demonstrates that greenspace does have a positive impact on general health and wellbeing. However, it is essential to point out that evidence suggests poorly maintained and / or inaccessible greenspace can severely limit the positive health impacts. This point is important – it adds weight to the claim that bodies in control of greenspace must continually preserve and invest so as to ensure it continues to be well used. The Millennium Link (the ambitious project that restored the Forth & Clyde and Union Canals) provides an excellent example of how transforming the quality of Greenspace can have a significant impact. In 1997, prior to the opening of the Millennium Link, the canal pedestrian counters recorded only 6.2 million visits. By 2009, this number had more than



⁹ Ibid., pp. 3-4

¹⁰ Maas, J., Verheij, R.A., Groenewegen, P. P., Spreeuwenberg, P., *Greenspace, Urbanity, and Health: How Strong is the Relation?* (Journal of Epidemiology and Community Health, 2006) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 17.

¹¹ Takano, T., Nakamura, K., Watanabe, M., *Urban Residential Environments and Senior Citizens's Longevity in Megacity Areas: The Importance of Walkable Greenspaces* (Journal of Epidemiology and Community Health, 2002) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 17.

¹² Nielsen T.S. and Hansen, K. B., *Do Green Areas Affect Health? Results from a Danish Survey on the use of Green Areas and Health Indicators* (Health and Place, 2007) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 18.

¹³ *Health, Place and Nature – How Outdoor Environments Influence Health and Well-Being: A Knowledge Base* (Sustainable Development Commission, 2008), p. 9.

trebled to 19.6 million visits.¹⁴ It can be strongly argued that the magnitude of this increase can be directly attributed to the Millennium Link investment.

Restoration, Relaxation, and Reduction in Stress

2.4.12 Stress and mental wellbeing have assumed a higher profile in the public consciousness in recent years. A recent article in *The Scotsman* quoted the Scottish Mental Health Association (SMHA), who cite the cost of poor mental health to the Scottish economy as being £10 billion, up £1.4 billion in the past five years.¹⁵ The Scottish National Accounts Project (SNAP) estimates that Scottish Gross Domestic Product (GDP) in 2009 was £137 billion, inferring that the cost of poor mental health amounts to 7.3% of national GDP.¹⁶ High quality greenspace has an important role to play in tackling this issue as it is where the majority of the urban population experiences day-to-day contact with nature. Aspects of greenspace that may reduce stress include: outdoor activity and exercise; natural daylight; stimulation of the senses (sight, sound, scent, temperature, touch, balance, and hearing); and aesthetic experience.¹⁷

“Our friends and family enjoy visiting the canal when they are here with us.”

2.4.13 There are three main theories related to the impact of nature on mental health and wellbeing and, in particular, the ability of natural and greenspaces to foster relaxation, reduction of stress, and restoration. These are:

- **Biophilia Theory** – human beings subconsciously seek contact with other species through a pre-determined evolutionary process reflecting man’s close relationship with the natural world.
- **Stress Reduction Theory** – this theory argues that natural environments promote recovery from any form of stress, both mild short-term stress, and longer-term problems. This is understood to be a consequence of a psycho-evolutionary process whereby particular types of environments produce certain types of effects. Thus positive emotional and psychological responses are triggered by the perception of certain types of environments as safe.
- **Attention Restoration Theory** – this theory suggests that nature assists with recovery from attention fatigue which occurs as a consequence of performing tasks that require prolonged maintenance of attention and focus. Natural environments assist with recovery by allowing individuals to distance themselves from route activities and thoughts and attract the attention without requiring concentration or effort.¹⁸

2.4.14 The Countryside Recreation Network (CRN) undertook a study considering the physical and mental health benefits of green exercise. The CRN conducted a quantitative analysis of the effects of ten countryside activities (which included Re-Union Canal Boats) in the UK on the health of 263 people. The study found that, in nine out of the ten activities, there was a significant improvement in self-esteem. This increase in self-esteem was not affected by the

¹⁴ Canning S. and McCartney, P., *British Waterways Scotland – Canal Economic Monitoring* (MVA Consultancy, 2010), p. 44.

¹⁵ <http://thescotsmen.scotsmen.com/scotland/Stressed-and-depressed--mental.6724118.jp>

¹⁶ <http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/SNAP>

¹⁷ Greenspace Scotland., p. 21.

¹⁸ *Ibid.*, p. 20.

intensity of the green exercise activities, though it did appear to rise over very long visits. This is a key finding as it implies that all intensities and durations of activity generate significant mental health benefits. The case studies also demonstrated across the board improvements in six categories of mood (anger / hostility, confusion / bewilderment, depression / dejection, fatigue / inertia, tension / anxiety, and vigour / activity). Encouragingly, Re-Union Canal Boats was one of the best performing case studies in each category.¹⁹

- 2.4.15 One study in England found that dissatisfaction with local greenspace could be correlated with poorer mental health²⁰, while another found that participating in an outdoor greenspace exercise programme improved levels of confidence, self-esteem and lifted mood.²¹



- 2.4.16 A study in Sweden found that the more time people spend in outdoor public greenspace, the less stressed they feel, regardless of age, gender and socio-economic status. Those people who visited greenspace more frequently also reported fewer stress related illnesses.²²

- 2.4.17 Studies carried out in the US also support the view that the presence of greenspace supports mental health and wellbeing. For example, one of the studies found that residents who lived in public housing with nearby nature (for example, with views of trees or open space) showed greater capacity to cope with stress than those who lived in dwellings without nature nearby.²³

- 2.4.18 While there is clearly a link between the natural environment and greenspace, it should be noted that it is unclear whether long-term exposure to nature has a cumulative effect.²⁴



- 2.4.19 The Forth & Clyde and Union Canals offer particularly good opportunities for restoration and relaxation. Unlike many other greenspaces, canals also offer a route to many destinations, such as central Edinburgh. The benefit of this is that canal users can spend travel as well as leisure time in greenspace.

Promoting Physical Activity

- 2.4.20 There is a relatively large literature on the ability of greenspace to promote physical activity. The general consensus is that greenspace does encourage people to take more exercise but

¹⁹ Pretty, J et al., pp. 2-3.

²⁰ Guite H.F., Clark, C., Ackrill, G., *The Impact of the Physical and Urban Environment on Mental Well-Being* (Public Health, 2006) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 20.

²¹ *Mind Ecotherapy: The Green Agenda for Mental Health* (2007) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 20.

²² Grahn, P. and Stigsdotter, U.A., *Landscape Planning and Streets* (Urban Forestry and Urban Greening, 2003) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 20.

²³ Kuo, F.E., *Coping with Poverty: Impacts of Environment and Attention in the Inner-City* (Environment and Behaviour, 2001) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 20.

²⁴ Greenspace Scotland., p. 21.

Summary

the extent to which this is true is dependent on a number of influences. These factors are set out below, along with an illustration of why the canals can be particularly good for promoting physical activity:

- **distance of residence from green space** – the nearer the greenspace, the more likely it is to be used regularly;
 - The canals travel the width of central Scotland, passing through major urban conurbations, meaning that they have a high user catchment. This could be quantified through the use of the *Accession* accessibility tool.
- **ease of access** – the more accessible in terms of routes and entrances and disability access, the more likely greenspace is to be used for some form of physical activity;
 - The canals have multiple formal and informal access points.
- **size of the greenspace** – the larger the size of the greenspace, the more people are likely to use it;
 - The canals cover a distance of some 67 miles across the central belt of Scotland.
- **connectivity to commercial and residential areas** – the greater the degree of connectivity and links to residential and commercial areas, the more likely it is to be used – eg people walking and cycling through greenspace to and from work;
 - The canals link many high density urban areas to both rural leisure opportunities and places of work.
- **attractiveness** – the more biodiverse the flora and fauna found within the greenspace and the less litter and graffiti there is, the more likely it is that the greenspace will be used; and
 - The canals offer a wide range of flora and fauna and are used by both nature groups and anglers.
- **multi-use** – the wider the range of amenities (eg children's play areas, quiet gardens with seating, playing areas for team games and picnic areas), the more likely the greenspace is to be used by different people.²⁵
 - The restoration of the Lowland Canals has been supplemented by the development of 'destinations', most notably The Falkirk Wheel.

2.4.21 It can be clearly seen from the above that the canals can assist in promoting increased physical activity. This will be explored in some depth later in the report.

Social Interaction and Cohesion

2.4.22 An often mooted criticism of modern society is that it is impersonal, with only limited interaction between people and communities. High quality greenspace can support interaction between people and foster greater community cohesion. For example, a study in England found that parks and other greenspace are a means of bringing together different

²⁵ Ibid., p. 23.

Summary

communities as they offer opportunities for regular informal contacts between different groups and individuals.²⁶

- 2.4.23 Well-planned and well-managed greenspace can bring people together as they develop a shared ownership and pride in their neighbourhood. More specifically, greenspace and greenspace projects can help address barriers within and between communities, encourage cross-community ties, and promote community cohesion.²⁷ This point is supported by canalside household survey work carried out by British Waterways Scotland during 2010, which found that 74% of canalside households in Falkirk, 69% in Maryhill, and 64% at Auchinstarry either “Agreed” or “Strongly Agreed” that the canal has a positive impact on their neighbourhood.²⁸ Only a very small percentage in each area felt that the canal had a negative impact on their community.



- 2.4.24 Evidence on the extent of the link between greenspace and social interaction is still being developed. Nonetheless, survey work carried out by BWS in 2010 does appear to support the view that the canals encourage a greater sense of community.
- 2.4.25 The *HIA Guide* explains that a key problem at present is that minority ethnic communities and people with disabilities are less likely to use greenspace.²⁹ This problem has been clearly recognised and addressed by canal groups, who work to involve all members of the community. For example, Seagull Trust Cruises run free boat trips for the disabled, while TWTS works closely with unemployed young people. BWS also regularly liaises with various user groups to ensure the canals are accessible to all.

“The canal is a wonderful place...it changes daily...and gives me an enormous sense of peace and wellbeing.”

Direct Protection from Physical Environmental Exposures

- 2.4.26 Greenspace may provide direct protection against physical environmental exposures. For example, trees and other foliage may protect against air pollution, noise, wind, soil erosion, flooding etc.³⁰ Indeed, chapter 3 of this report quantifies the additional amount of time spent in ‘clean’ air as opposed to polluted ‘air’.
- 2.4.27 Increased risk of flooding means increased risks of negative health impacts from flooding. The immediate health impacts of a flood range from the risk of drowning to stress. Exposure to polluted flood water can increase the risk of respiratory illness, stomach upsets, and high blood pressure. The health impacts of flooding



²⁶ Dines, N., Cattell, V., Gesler, W. and Curtis S., *Public Spaces, Social Relations and Well-Being in East London* (Joseph Rowntree Foundation, 2006) in Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008), p. 24.

²⁷ Land-Use Consultants, *Making the Links: Greenspace and Quality of Life* (Scottish Natural Heritage Commissioned Report Number 60, 2004), p.1.

²⁸ British Waterways Scotland Canal Household Surveys (2010).

²⁹ Greenspace Scotland., p. 24.

³⁰ *Ibid.*, p. 19.

Summary

are often felt long after the event. Damage to properties and subsequent difficult living conditions can have a major impact on an individual's health and well-being. This psychological distress may explain the increase in insomnia, depression, and non-prescription drugs and alcohol use often seen after a flood event.³¹ Canals offer significant potential for managing surface water run off and improving flood defences.

- 2.4.28 BWS has a planning and investment strategy in place for tackling the issues surrounding flooding.

2.5 Conclusion

- 2.5.1 This literature review has succinctly explained how high quality and accessible greenspace can contribute towards greater physical health, mental wellbeing, and social wellbeing. The following chapters develop an evidence base which demonstrates how the canals are contributing towards public health and, in turn, the Scottish Government's health indicators.

"Fantastic resource well worth the investment."

"We walk as a family, which is fantastic."

³¹ *Health, Place and Nature – How Outdoor Environments Influence Health and Well-Being: A Knowledge Base* (Sustainable Development Commission, 2008), p. 11.

3 Quantified Health Benefits of the Canals

3.1 Overview

3.1.1 This section sets out the quantified health benefits of the Forth & Clyde and Union Canals. There are four distinct elements to this:

- a monetary valuation of the health benefits of additional exercise generated by the canals;
- the safety impacts of cyclists using the towpath rather than a road;
- the number of extra minutes spent in 'clean air', as opposed to areas of poorer air quality; and
- attitudes towards the canals.

3.1.2 In advance of discussing these benefits, it is worth providing an overview of the survey and methodology used to collect the data.

3.2 Canal User Survey

3.2.1 In order to understand the health benefits of the canals, the project team designed and carried out an extensive survey of canal users. The survey was designed to establish the types of exercise that people undertake on the canal, how often they do so, and whether they would partake in this exercise elsewhere if the canal did not exist. The survey also asked a range of qualitative questions designed to seek the views of users on the amenity of the canals more generally.

Survey Methodology

3.2.2 This project was commissioned in October 2010 and had to be completed by 31 March 2011. The timescales necessitated the carrying out of towpath surveys throughout January and early February. Pedestrian counters for both the Forth & Clyde and Union Canals show that the first two months of the year tend to demonstrate the lowest levels of towpath usage. In addition, the severe weather experienced during December 2010 raised concerns about the ability to carry out lengthy on-towpath surveys.



3.2.3 With these issues in mind, the decision was taken to set up the survey as a web based questionnaire, using SNAP software. Enumerators handed flyers out to towpath users directing them to a website to fill in the survey. A truncated paper survey was also offered for those who do not have access to the internet, and this survey was carried out on the towpath itself.

"The F&C Canal genuinely increases my happiness every time I use it."

3.2.4 The canal was split into 14 sections, with each enumerator location roughly half way between two pedestrian counters. Enumerators surveyed on one weekday and one weekend day at each site. The survey locations were:

- Dalmuir (F&C);
- Westerton (F&C);
- Lambhill (F&C);
- Southbank, Kirkintilloch (F&C);
- Underwood Lockhouse, Allandale (F&C);
- West Falkirk, between Bonnybridge and The Falkirk Wheel (F&C);
- Bainsford, Falkirk (F&C);
- Greenbank, Falkirk (Union);
- Brightons (Union);
- Park Farm, Linlithgow (Union);
- Broxburn (Union);
- Hermiston (Union);
- Slateford (Union); and
- Viewforth, Edinburgh (Union).

3.2.5 In addition to the two surveys at each location, BWS publicised the surveys widely through the use of their website, towpath notices, and through discussions with local authorities and canal users.

3.2.6 A classified count was also undertaken at each location, which was used to validate the BWS count data provided.

Survey Content

3.2.7 The survey was focused on identifying the types and frequency of activity that people undertake on the canal towpath in a **typical week**. Respondents were asked to think of all answers in the context of what would be a typical week for them. Users were then asked to provide more details on the different uses that they had made of the canal in their typical week. Each different type of use was to be described separately, with the survey permitting details to be filled in for up to three journeys.



3.2.8 For each journey, respondents were asked to indicate both where they joined and left the canal. Given that there are numerous unmarked access and egress points on both canals, we set 166 standard access / egress points identified on the *BWS Skipper's Guide to the Forth & Clyde and Union Canals* map. This may in some cases have led to an over or under-estimation of the distances travelled. In general, however, this approach was seen to be a reasonable and proportionate means of identifying where users were joining and leaving the canal.

3.2.9 Users were then asked the particulars of each journey, namely whether:

Summary

- their journey was to a specific destination (eg work, shops etc) or purely for recreation (eg going for a walk or cycle etc);
- the mode of travel for undertaking the journey;
- how many times they undertake this journey in a typical week; and
- whether the journey is a return journey.

3.2.10 Importantly, users were also asked how they would have undertaken this journey (if at all) if they did not have access to the canal towpath. This question was essential in determining the level of **'additional'** physical activity generated by the canals.

"I would not cycle to work if I could not access the canal towpath."

3.2.11 Following on from the journey-based information, respondents were asked to answer a number of attitudinal questions on the amenity value of the canal. In line with good practice, they were also asked to provide core socio-economic data.

3.3 Survey Results

3.3.1 This section of the report sets out the main findings of the survey, before more detailed analysis of the results in the sections which follow.

Number of Responses

3.3.2 Despite carrying out the survey over the winter months, the volume of responses was highly encouraging. There were a total of 791 individual responses, accounting for 1,141 distinct trips / activities undertaken by users. Figure 3.1 identifies the means by which respondents were made aware of the survey.

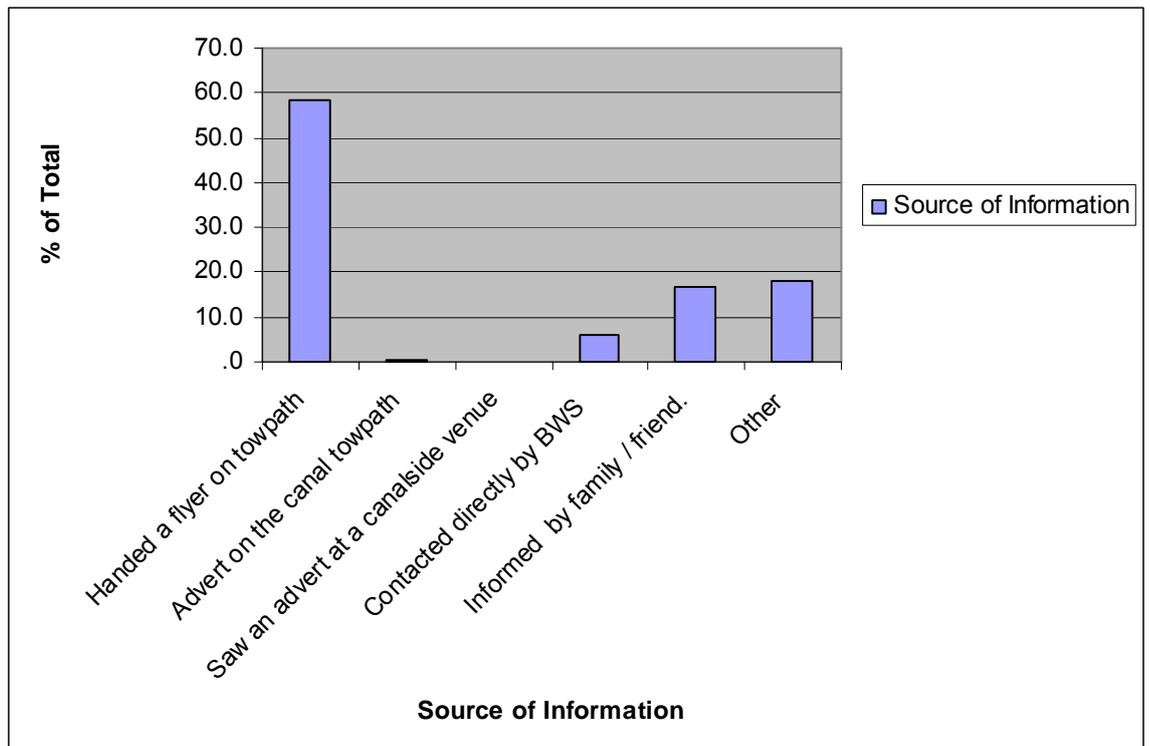


Figure 3.1: How did you find out about the survey?

3.3.3 As can be seen from Figure 3.1 above, almost 60% of those who responded to the survey were made aware of it through meeting an enumerator on the towpath. Some 17% of respondents found out through other means (eg through cycle groups, the NHS, third sector bodies etc), while a further 17% were informed by family or friends.

Geographical Distribution

3.3.4 As noted above, towpath users were asked to consider both their point of access and point of egress from the canal. In the interests of clarity, we have aggregated these responses into eight canal sections, as show in Figure 3.2 below.

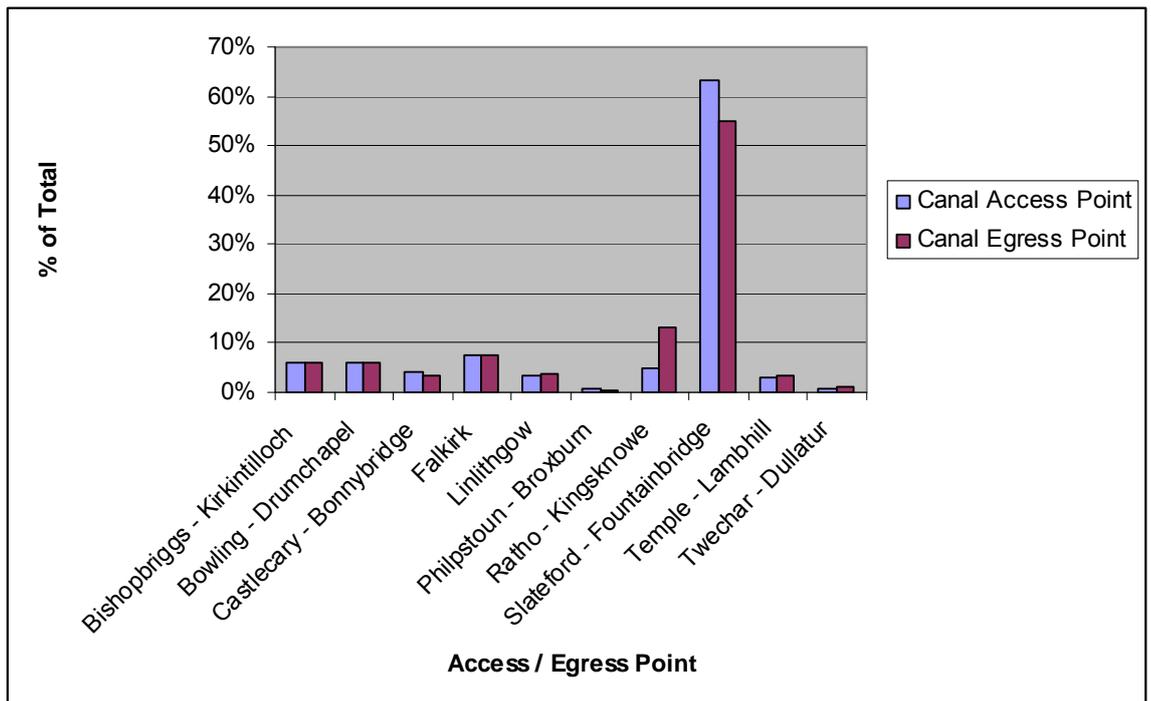


Figure 3.2: Canal Access and Egress Points

3.3.5 As would perhaps be expected from analysing the towpath count data, traffic is heaviest in and around central Edinburgh. On average, 63% of users access the towpath at the eastern end of the Union Canal between Slateford and Fountainbridge. There was also a relatively large number of responses from the Falkirk area. This is perhaps driven by two factors – Falkirk is the meeting point of the two canals and, arguably, was also the area to realise the greatest transformation through the Millennium Link Project. The volume of traffic on the Edinburgh sections of the Union Canal does suggest the majority of the health benefits will accrue in this area. Nonetheless, the significant health benefits generated elsewhere should not be ignored.



Journey Purpose

3.3.6 The survey revealed that use of the canal is split relatively evenly between travelling to specific destinations (eg work) and use purely for recreational purposes (eg walking, cycling etc). As would be expected, there is something of an urban / rural split in purposes, with urban journeys more focused on travel to a destination and rural journeys more focused on leisure.

3.3.7 Use of the canal for travel to a specific destination amounted to 43% of the overall total. It is likely that this figure is strongly influenced by the large travel-to-work contingent in the Edinburgh area. Use of the canal for purely leisure purposes accounted for 57% of the total sample.

3.3.8 Figure 3.3 shows the breakdown of journey purpose for those travelling to a destination:

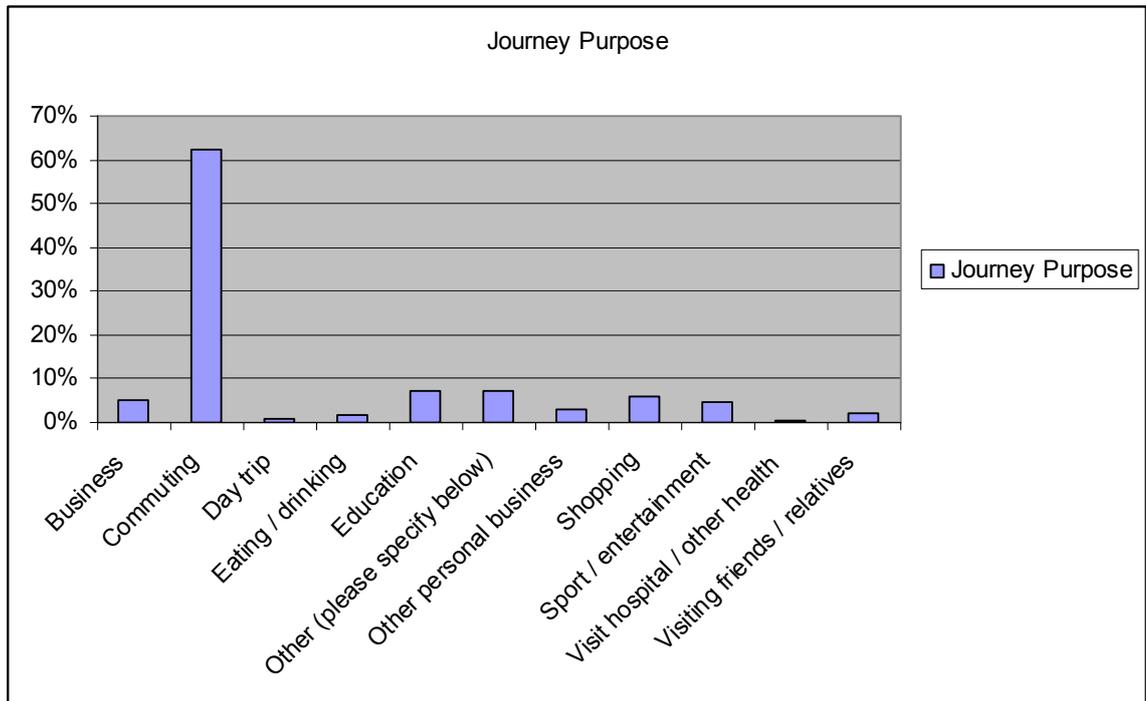


Figure 3.3: Travel to a Destination – Journey Purpose

3.3.9 Of the 43% of respondents travelling to a destination, 62% of those people are using the towpath for their commute to work. This is likely to be a particularly noticeable trend in the Edinburgh area, where travelling on the restored Union Canal appears to be relatively popular. There is a relatively even spread of other journey purposes but it is notable that use of the canal for travelling to the shops and education is relatively pronounced.

3.3.10 Figure 3.4 shows the breakdown of journey purpose for those using the canal for purely leisure purposes:

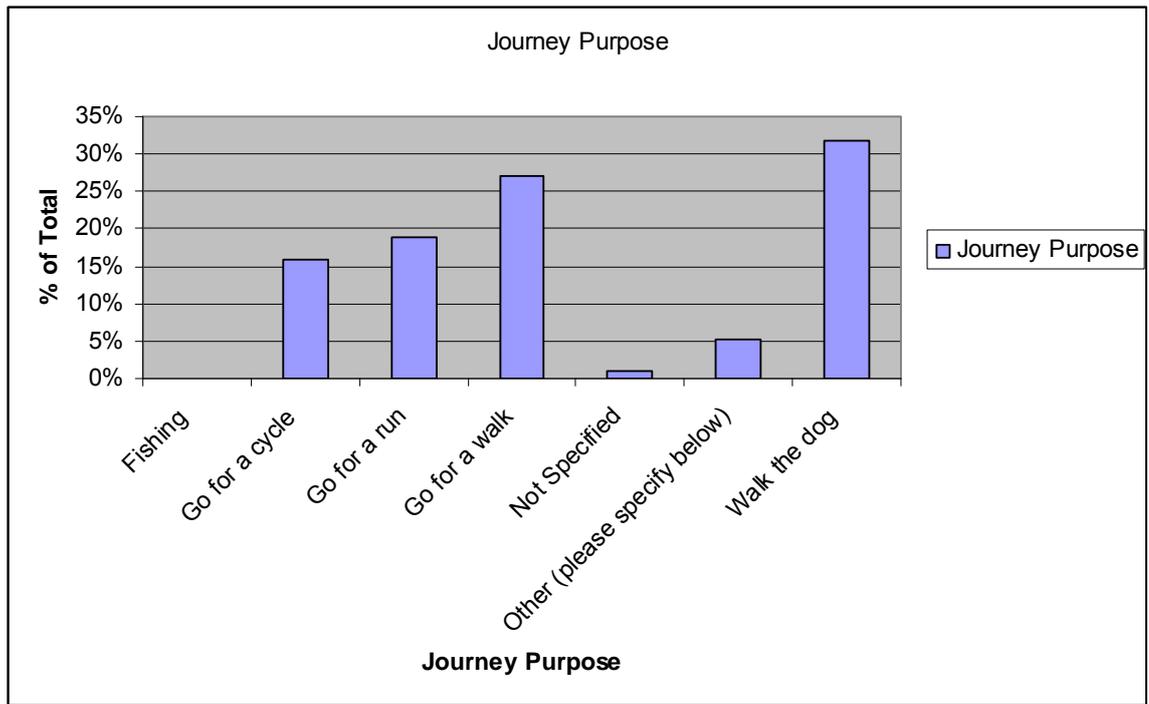


Figure 3.4: Travel for Leisure – Journey Purpose

3.3.11 It can be clearly seen from Figure 3.4 that the use of the canal for leisure purposes is relatively mixed. Just over 27% of respondents noted that they were using the canal to go for a walk. It can be argued that the relatively flat and traffic free towpaths encourage a relatively high use of the canal for running (19%) and cycling (16%). The use of the canal for dog walking is also a popular pursuit, with some 32% reporting this activity. ‘Other’ purposes include watersports angling, wildlife related pursuits, and tourism.

3.3.12 Figure 3.5 shows the selected mode of travel across all journey purposes:

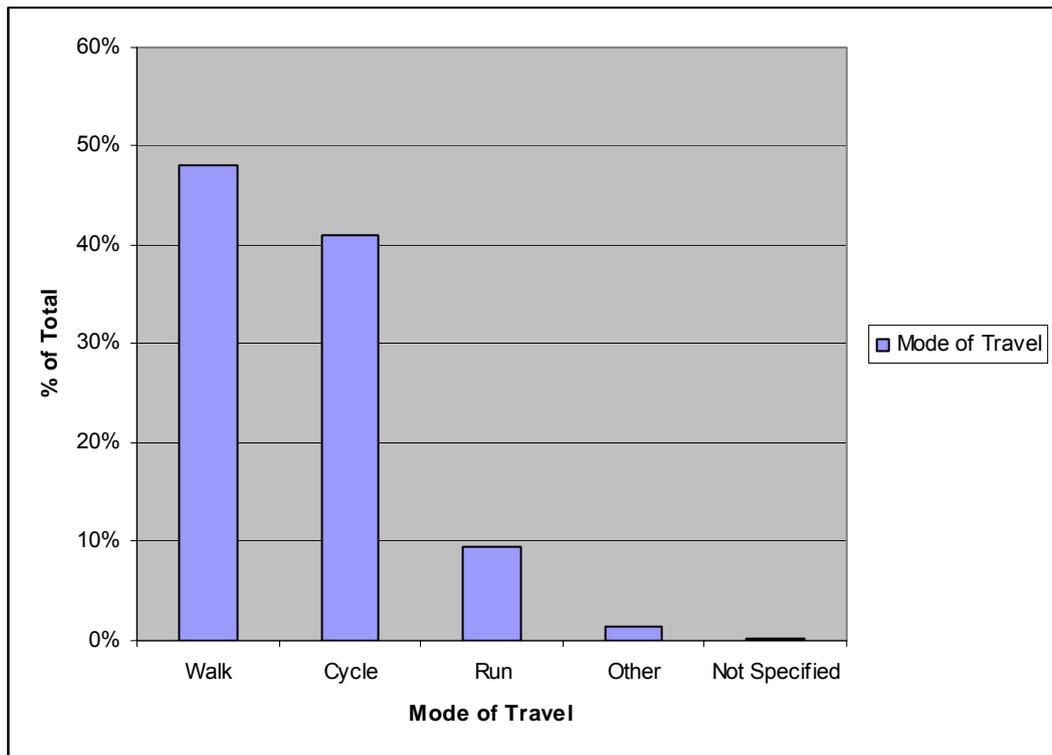


Figure 3.5: Mode of Travel

3.3.13 It can be seen from Figure 3.5 that walking and cycling account for almost 89% of travel on the canal towpaths. This in part reflects the large travel-to-work movements on the Union Canal but is also related to the use of the canal as a safe environment for leisure pursuits, particularly dog walking.

3.3.14 A key question in this survey was that related to what canal users would do if they did not have access to the towpaths. If a respondent would carry out the same activity somewhere else, there are no net additional quantifiable health benefits (except those related to air quality and safety) as the journey would simply be displaced from one path to another. In contrast, clear health benefits can be derived from the use of the canal instead of a motorised mode of transport or if the person in question would not have made a journey without an accessible towpath. Figure 3.6 shows the outcomes of this analysis:



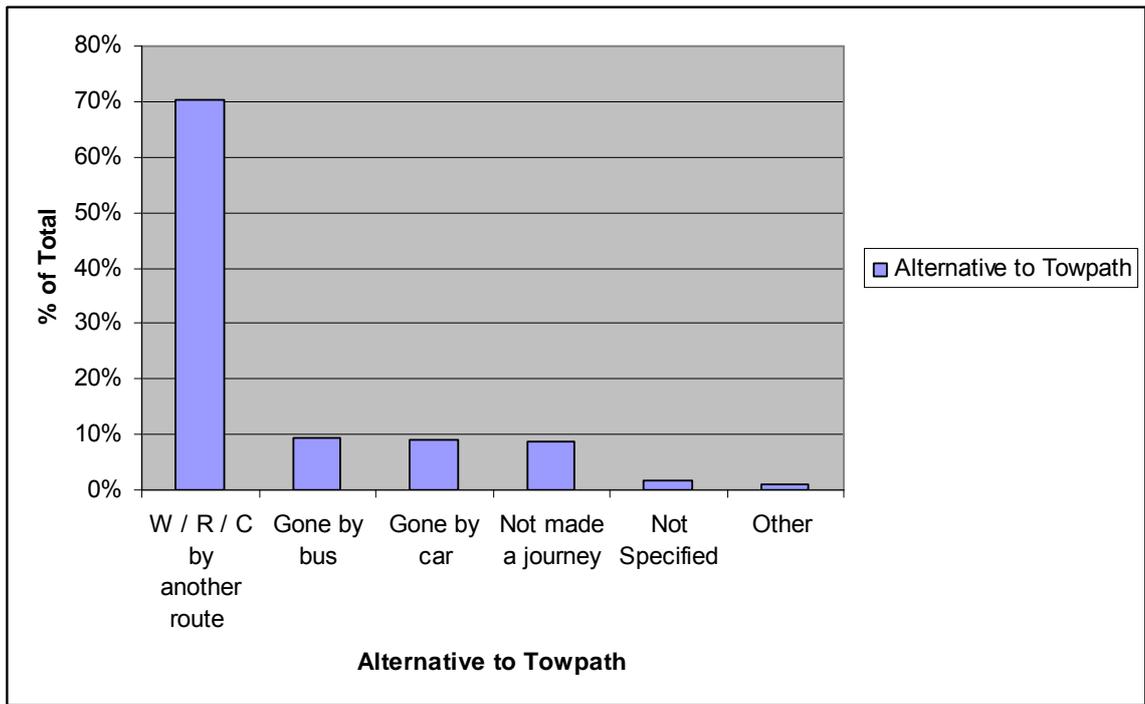


Figure 3.6: What respondents would have done in the absence of the canal

3.3.15 70% of respondents noted that they would walk / run / cycle somewhere else or by another route if the canal towpath was not accessible. In health economic terms, these journeys cannot be counted as a benefit, because they are simply displaced from one path to another. Nonetheless, it can be argued that those people who do undertake their activity elsewhere still value the canal more highly than the alternative (because they choose to use it). Without the canal, 28% of respondents would either have used a motorised mode of transport or not made a journey. Therefore, the use of the canal in these instances can be considered to provide ‘additional’ health benefits.



3.3.16 In general, the survey discovered that the majority of users would travel a similar distance if they were to walk / run / cycle by another route. In light of this, we have factored out the potential health impacts of longer or shorter distances travelled on alternative routes.

“I have recently moved home to be closer to the canal.”

3.3.17 A breakdown of the social and demographic characteristics of respondents is provided in Appendix A.

3.4 Physical Health Benefits of the Canals

3.4.1 This section identifies the physical health benefits of the canals in terms of additional exercise generated. The basis for this is that each additional person kilometre of travel ‘generated’, either through people switching from motorised transport or undertaking exercise they would otherwise not have taken, generates a health benefit that can be monetised. The canals are used extensively for walking, running, cycling and other physical

activities, many of which would not be undertaken if the canal and adjoining towpaths were not accessible. Indeed, 83% of the respondents to our survey either “Strongly Agreed” or “Agreed” that the canal encourages them to take more exercise.

Establishing a Baseline

3.4.2 In the interests of simplicity, we partitioned the canals into four sections, as follows:

- Union Canal (Urban);
- Union Canal (Rural);
- Forth & Clyde Canal (Urban); and
- Forth & Clyde Canal (Rural).

3.4.3 The initial step in developing the analysis involved calculating the total person kilometres travelled by each survey respondent in each section, broken down by cycling, running, and walking trips. This in turn allowed us to estimate the total proportions of cycling, running and walking in each section of the canal, as illustrated in Table 3.1 below.

Table 3.1: Proportion of Person-km Cycling, Running and Walking from Survey³²

Canal Section	Cycling	Running	Walking
Union (Urban)	59%	21%	19%
Union (Rural)	34%	10%	50%
F&C (Urban)	54%	13%	32%
F&C (Rural)	31%	18%	50%

3.4.4 At this stage, it is important to be clear as to what can be classified as a health benefit generated by the canal. The HM Treasury *Green Book* explains that an economic impact can only be included as a benefit if it is ‘additional’ – ie it would not have occurred without the intervention. In the context of this study, use of the canal can only counted as ‘additional’ if a person has transferred from a motorised mode to the canal or if they are undertaking exercise which they would not have undertaken without the canal. Where a person has simply transferred their physical activity, say from walking on another path or cycling on the road, there no net benefits to physical health – any benefits that accrue are simply displaced.

“I use the canal to walk my daughter to school as it is quiet and we can talk.”

3.4.5 In order to address this issue, the survey included a question for each journey asking:

- “Thinking about this trip / activity, if you had not had access to the canal towpath, what would you have done?
 - Walk / Run / Cycle by another route or somewhere else;

³² Note – “Other” purposes are factored out as there is no way of quantifying their benefits.

Summary

- Gone by bus;
- Gone by car;
- Mot made a journey / not gone walking / running / cycling at all;
- Other (please specify)."

3.4.6 Where a person selected "walk / run / cycle by another route or somewhere else", it was assumed that they did not receive any net health benefits from the canal because they would simply have taken exercise elsewhere. However, where a person selected any of the other four options, we assumed that they receive a health benefit as this would be net additional physical exercise. Table 3.2 shows the proportion of cycling, running and walking determined as additional.

Table 3.2: Proportion of Cycling, Running and Walking which is 'Additional'

Canal Section	Cycling	Running	Walking
Union (Urban)	38%	6%	36%
Union (Rural)	50%	12%	30%
F&C (Urban)	34%	12%	55%
F&C (Rural)	64%	57%	48%

3.4.7 In order to factor up the survey results to cover the whole canal 'population', we estimated the total annual person kilometres travelled on the canal network, based on BWS counter data. Having calculated the total person kilometres on the canal, we then applied the proportions for walking, running, and cycling in each section to calculate the total person kilometres travelled by each mode. Thereafter, we factored in the proportions of additional travel to calculate the total 'additional' person kilometres by mode on the canal network, as set out in Table 3.3.

"The canal has immeasurably improved the quality of our lives."

Table 3.3: Additional Person Kilometres Generated by the Canal – Cycling, Running and Walking

Canal Section	Cycling (KMs)	Running (KMs)	Walking (KMs)	Total Person KMS
Union (Urban)	376,606	20,944	110,177	507,778
Union (Rural)	419,629	29,428	375,303	824,360
F&C (Urban)	587,316	49,200	561,224	1,197,740
F&C (Rural)	489,727	251,676	586,031	1,327,436
			Grand Total	3,857,313

3.4.8 The table shows that the total additional person kilometres amounted to almost 3.9 million km.

Monetising the Impacts

3.4.9 The World Health Organisation has developed a Health Economic Assessment Tool (HEAT) for walking and cycling, which places a monetary value on additional walking and cycling kilometres generated.³³ The HEAT tool is used to estimate the value of the reduction in mortality that results from a specified amount of walking or cycling. We have produced a previous version of this report, when only the HEAT Cycling Tool was available. The walking tool was published on 27 May 2011 and, in light of this, we have updated the report to take account of both the walking tool and the revised cycling tool.

“The canal is a very valuable resource for me and my fellow paddlers to train.”

3.4.10 In addition to adding an analysis of walking, the revised HEAT tool also allows country specific values to be used in relation to mortality rates and the ‘statistical value’ of a life, where the previous version used European averages. This is an important change as the UK has lower mortality rates (460 per 100,000 annually) than the ‘WHO Europe’ value which was used previously (728 per 100,000), and this has the effect of reducing the benefits. We have also used a bespoke value of £1.215m (2002 values and prices) for the ‘cost of a life’ as specified in WebTAG³⁴ to override the default value of €1.5m. This value has been rebased to 2010 prices using the Retail Price Index (RPI).

3.4.11 The tools apply a financial benefit to a given distance, time etc travelled by each person. Our survey returns suggested that the average walk on the canal is 2.5km, while the average cycle is 5km. These values have been used to develop a ‘per km’ benefit associated with walking, cycling and running, and these values are shown in Table 3.4 below. We have

³³ <http://www.euro.who.int/en/what-we-do/health-topics/environmental-health/Transport-and-health/activities/promotion-of-safe-walking-and-cycling-in-urban-areas/quantifying-the-positive-health-effects-of-cycling-and-walking/health-economic-assessment-tool-heat-for-cycling>

³⁴ <http://www.dft.gov.uk/webtag/documents/expert/unit3.14.php>

Summary

assumed a 20 year 'appraisal' period and taken the average annual value of benefit as the basis for the calculation.

- 3.4.12 In the interests of simplicity, we assume that the benefits of additional travel generated do not differ based on the physical fitness of the individual in question, although this will be the case in reality.
- 3.4.13 At present, there is not a corresponding tool for monetising the benefits of running or water-based activity. In order to monetise the benefits of running, we have undertaken an approximate calorie-burn comparison with cycling and proportioned the monetary value accordingly, as also shown in Table 3.4.

Table 3.4: Comparison of Cycling Calorie Burn with Running and Walking

Mode	Calories per KM ³⁵	Ratio to Cycling	Monetary Value (£/km)
Cycling	31	N/A	£1.25
Running	85	2.74:1	£3.43
Walking	57	N/A	£1.73

- 3.4.14 Based on the above values, Table 3.5 sets out the annual monetary benefit of the additional kilometres travelled on the canals.

Table 3.5: Monetised Health Benefits of Canal Network

Mode	Additional Person Million KMs / annum	£/KM	Monetised Benefit (£m)
Cycling	1.873m	£1.25	£2.348m
Running	0.351m	£3.43	£1.205m
Walking	1.633m	£1.73	£2.818m
Grand Total	3.587m		£6.372m

- 3.4.15 The estimated **total physical activity benefits of the canals** amount to around **£6.4m**.
- 3.4.16 It is perhaps worth noting for illustrative purposes that, if all of the activity on the canal had been additional, the total benefits would have been around £16.2m. However, it is clear that much of the activity on the canal would have certainly occurred elsewhere – eg people would have walked, cycled or ran elsewhere.

³⁵ <http://www.internetfitness.com/calculators/calburncalc.htm>

3.5 Safety Benefits

3.5.1 A key benefit of the canals is that they offer a relatively safe and traffic free environment for travelling in. This is particularly true in an urban environment where roads are often busy and there are conflicting movements of people and traffic. We have used the survey outputs to determine the safety benefits offered by the canals for **cyclists**. We have not included pedestrians within this analysis as this group are seen to be relatively low risk.



3.5.2 The safety benefits of cycling accrue only to those who were travelling for a specific purpose and who reported that they would have made the journey by a different route. Without sufficient evidence detailing the alternative route cyclists would travel, we have assumed that, without the canal, they would cycle on roads and that the distance would be equivalent. In reality, such cyclists may use other 'safe' paths for part of or their entire journey. It is important to keep this caveat in mind when interpreting the results presented below.

3.5.3 The safety benefits of the canals for cyclists are calculated by:

- identifying the total kilometres cycled at the national (Scotland) level;
- deriving the total "Killed", "Seriously Injured" and "Slightly Injured" casualties for every one million kilometres cycled;
- identifying from the survey the number of cycle kilometres that have switched from roads to the towpath;
- multiplying the number of 'switched' cycle kilometres by the casualty rate for each casualty type. This identifies the number of casualties averted by the canals; and
- multiplying the number of casualties saved by the cost per casualty in 2010 prices.

3.5.4 Table 3.6 summarises the findings of the above steps.

Table 3.6: Annual Value of Casualties Saved by the Canal Towpaths

Casualty Type	No. of Casualties Saved	Cost per Casualty (2010 Prices) ³⁶	Savings
Killed	0.04	£1,658,782	£64,645
Seriously Injured	0.62	£186,393	£115,399
Slightly Injured	2.76	£14,375	£39,622
Total	3.41		£219,667

³⁶ Reported Road Casualties Scotland 2009 (The Scottish Government, 2009), p. 99.

Summary

3.5.5 It can be seen from Table 3.6 that the canals are estimated to provide a significant cost saving of **£220,000** in terms of casualties avoided. In proportional terms, it is estimated that:

- 46% (£101k) can be attributed to the urban section of the Union Canal;
- 32% (£70k) can be attributed to the urban section of the Forth & Clyde Canal;
- 14% (£31k) can be attributed to the rural section of the Union Canal; and
- 8% (£17k) can be attributed to the rural sections of the Forth and Clyde Canal.

3.5.6 The benefits presented above offer a reduction of between three and four cycling casualties per annum, with a “Killed or Seriously Injured” casualty avoided on average in 2 years out of every 3.

3.5.7 Our analysis also indicates that over **1 million** cycling kilometres per annum are transferred from on-street routes to the safer towpaths of the four sections of the canal network included in this survey. This is made up of over 500,000 km per annum on-street cycling removed by the urban section of the Union Canal, over 350,000 km per annum removed by the urban section of the Forth and Clyde and around 150,000 km and 90,000 km using the corresponding rural sections respectively.

3.5.8 The findings of this analysis support the argument that the canal towpaths actively contribute towards travel safety and thus national health. It can be argued that further investment in the quality of the towpaths (eg tarmac, drainage, towpath width etc) could play some part in encouraging more cyclists to move from roads onto the canalside. Further research would be required to identify the extent to which towpath investment would encourage cyclists to switch route.



3.5.9 One point that is important to note here is that a number of respondents in the survey identified a conflict between cyclists and pedestrians in the use of the towpath. Encouraging greater use of the towpath by cyclists would need to be supported by a set of actions designed to ensure that the canalside does not suffer from issues of congestion or user conflict.

3.5.10 Importantly, the qualitative aspects of the survey suggest that the canal is an important destination for **family cycling**, something which a number of respondents simply do not believe is possible on roads. In addition, a number of respondents pointed out that the towpath is a safe environment for teaching children to cycle. This in turn potentially contributes to promoting active lifestyles at a young age, breeding good habits for the future.

3.6 Air Quality Benefits

3.6.1 Air quality is becoming an increasingly prominent issue in government policy – poor air quality contributes to many early deaths each year and is a factor conditions such as asthma, heart disease and cancer. The canals generally represent areas of good air quality and provide a corridor of clean air into the heart of Scotland’s two largest cities.

Why is Air Quality Important?

3.6.2 The House of Commons Environmental Audit Committee explains that the main cost of air pollution arises from the adverse health effects on people. The 2007 Air Quality Strategy estimates the health impact of man-made particulate air pollution experienced in the UK in 2005 cost between £8.5 billion and £20.2 billion a year.³⁷ It is explained that this cost is actually likely to be an under-estimate, as the Air Quality Strategy ignores the impact on morbidity, costing only mortality.³⁸

“The profusion of greenspace definitely helps improve our local neighbourhood.”

3.6.3 The Air Quality Management Resource Centre notes that the health impacts of air quality in the UK are almost twice those of physical inactivity, which is estimated to be £10.7 billion per annum. A further estimate notes that the costs of poor air quality are equivalent to those of alcohol abuse, estimated to be £12 - £18 billion.³⁹ However it is framed, it is clear that air quality is a serious national issue.

Air Quality Impacts of the Canals

3.6.4 Recognising the importance of air quality impacts, we have attempted to identify the positive benefits that the canals provide in this area. The air quality benefits of the canals accrue to those identified in the survey who were travelling for a specific purpose and who reported that they would have made the same walking / cycling journey by a different route.

3.6.5 Before outlining the benefits of air quality on the canals, it is important to outline the key assumptions in our analysis. These are:

- the alternative routes to the canal towpath are again assumed to be made using the road network parallel to the canals;
- the air quality benefits are only assumed on the urban sections of the two canals, as roadside air quality is not an issue in rural areas;
- the length of the alternative route is assumed to be the same as the canal route (this is likely to underestimate the canal air quality benefits since, on both sections of urban canal, significantly more people noted that the alternative route would have been longer than shorter. However, it is not easy to quantify this under-estimation of the benefits); and
- it is assumed that the air quality on parallel urban routes is significantly poorer on the canal towpath – this will not always be the case.

3.6.6 Our analysis has estimated the amount of additional time that towpath users spend in ‘clear air’ as opposed to ‘polluted air’. Unfortunately, it is not possible to monetise these benefits at this juncture. We may be able to revisit this issue when the report is finalised in May 2011, but the consensus is that putting a monetary value on air quality impacts at this time will not be possible.



³⁷ *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland* (DEFRA, 2007).

³⁸ <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/229/22906.htm#note16>

³⁹ <http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/229/22906.htm#note18>

3.6.7 Based on the assumptions outlined above, Table 3.7 below summarises the reduction in the number of hours spent walking, running or cycling in the poor air quality in the road corridors parallel to the urban sections of the two canals.

Table 3.7: Reduction in Time Spent in Poor Air Quality (Person hours per annum)

Canal Section	Mode	Reduction in exposure to poor air quality (Person Hours per annum)
Forth and Clyde Urban	Walk	22,188
	Run	-
	Cycle	14,855
	Total	37,043
Union Canal Urban	Walk	26,247
	Run	543
	Cycle	21,108
	Total	47,898
Urban Combined	Walk	48,435
	Run	543
	Cycle	35,963
	Grand Total	84,941

3.6.8 The values suggest that the two sections of urban canal towpath reduce exposure to the poor air quality in the parallel road corridors by over 48,000 hours of walking time and almost 36,000 of cyclist-hours. This is a significant saving and clearly demonstrates the benefit of the canals as part of the wider urban path network.

3.7 Absenteeism

3.7.1 Increased physical exercise is also proven to have a positive effect on reducing levels of absenteeism at work. This section outlines the quantified estimate of additional exercise undertaken on the canal on levels of absenteeism.

3.7.2 The Department for Transport’s (DfT) WebTAG guidance was used to calculate the benefits of the canals in terms of reduced absenteeism. WebTAG is the standard dataset used for transport appraisals and can thus be considered robust. The guidance explains that taking

Summary

30 minutes of exercise five days per week reduces absenteeism by an amount equal to 0.4% of gross salary costs. So for example, assuming a person works 48 weeks per year, they would have to walk 7,200 minutes in a year for the employer to benefit from the 0.4% reduction in gross salary costs.

- 3.7.3 Confederation of British Industry figures suggest that the gross costs to the employer of one day off work is £88.82. Of those surveyed here, 70% were in employment.
- 3.7.4 Using the above figures, the benefits of this additional exercise on absenteeism are estimated to be as shown in Table 3.8.

Table 3.8: Benefits of the Canals in terms of Absenteeism

Mode of Travel	Absenteeism Benefit (£ / annum)
Cycling	£18,700
Running	£5,300
Walking	£52,900
TOTAL	£76,900

- 3.7.5 Table 3.8 illustrates that physical activity undertaken on the canals offer employers a **direct financial saving of almost £77k per annum**. In addition, there are additional but, at present, unquantifiable benefits in terms of improved productivity.

3.8 Attitudinal Views towards the Canals

- 3.8.1 As part of the survey programme, users were asked about their general views of the health benefits of the canals. Respondents were asked to consider ten statements related to the canals and public health and indicate their level of satisfaction (ranging from “Strongly Agree” to “Strongly Disagree”).
- 3.8.2 The findings are presented in Table 3.9 below.

“An amazing asset to our neighbourhood”

Table 3.9: Attitudinal Survey Findings

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Don't Know / Unsure
The presence of the canal has a positive impact on my neighbourhood.	67%	26%	4%	1%	1%	1%
The presence of the canal encourages me to visit the outdoors more often.	53%	33%	10%	2%	1%	1%
The presence of the canal encourages me to take more exercise.	48%	33%	12%	5%	2%	1%
The presence of the canal encourages me to walk / cycle to work.	37%	20%	20%	13%	6%	5%
The canal makes me more appreciative of the natural environment.	55%	38%	4%	0.5%	1.5%	1%
The canal enhances the local physical and built environment.	65%	28%	4%	1%	1%	1%
I value the link between the canal and my local culture and heritage.	50%	33%	13%	1%	1%	2%
Use of the canal and towpaths enhances my sense of personal wellbeing.	60%	31%	7%	1%	1%	1%
The presence of the canal makes my neighbourhood a safer place to live.	13%	13%	52%	11%	2%	9%
The presence of the canal makes my neighbourhood a more attractive place to live.	57%	33%	6%	1%	1%	2%

Summary

3.8.3 Table 3.9 provides a firm evidence base to support the quantitative analysis outlined in this report. It is clear that local people and users place a high value on the canal as a multi-functional asset. In almost all cases, a majority of users see the canal as having a positive impact on their local area, making it an attractive place to live. Respondents also tend to agree that the canal has a positive impact on their physical and mental wellbeing. Key headlines to emerge include:

- 81% of canal users either “Strongly Agree” or “Agree” that the canal encourages them to take more exercise;
- 57% of respondents either “Strongly Agree” or “Agree” that the presence of the canal encourages them to walk / cycle to work;
- 91% of respondents either “Strongly Agree” or “Agree” that the canal enhances their sense of personal wellbeing; and
- 86% of respondents either “Strongly Agree” or “Agree” that the presence of the canal encourages them to visit the outdoors more often.

3.8.4 The only area to achieve a combined score of below 30% for the “Strongly Agree” / “Agree” categories is neighbourhood safety. While more respondents felt that the canal had a positive impact in this area than the contrary, 52% responded that they “Neither Agree nor Disagree”. Anecdotal findings from the survey suggested that some concerns do exist about the safety of the canal at night and during summer days when groups of youths congregate on the towpaths.



3.8.5 Respondents were asked a more general question about how they rate the quality of their local canal area. 23% of people replied “Very Good”, with a further 59% rating it as “Good”. 6% thought the canal environment was poor, while only 1% of respondents felt that it was “Very Poor”.

3.9 Summary

3.9.1 The analysis carried out above clearly demonstrates that the canals make a significant contribution to public health. Table 3.10 summarises the monetised benefits of the canal.

Table 3.10: Monetised Benefits Summary

Methodology	Benefits (£ Rounded)
Physical Activity	£6,400,000
Road Safety	£220,000
Absenteeism	£77,000
Total	£6,697,000

Summary

- 3.9.2 In addition to the monetised benefits, the canals contributed towards an additional **1 million** cycling kilometres per annum, which are transferred from on-street routes to the towpaths. As well as the road safety impacts, canal users benefit from an annual 85,000 hours spent in 'clean' air as opposed to 'polluted' air.
- 3.9.3 The attitudinal data collected as part of the survey also demonstrates that the canals are valued highly by users. In particular, the majority of people agree that the canals promote physical exercise, mental wellbeing, and a greater link between communities and the natural and built environment.

"Any visit to the canal is a bit out of my way, but I take the diversion to enjoy the traffic free environment it provides."

"As a local walk leader, we find the canal a valuable asset."

"The ability to cycle without the presence of heavy road traffic greatly reduces the stress involved in my regular commute."

4 Wider Benefits of Scotland's Canals

4.1 Overview

- 4.1.1 Chapter 3 provided a detailed outline of the monetised and other quantifiable benefits attributable to Scotland's canals. Whilst significant, monetised values alone cannot capture the rich variety of activities taking place on Scotland's canals, many of which actively promote healthy lifestyles. In addition, the canals host many third sector organisations who work to promote physical and mental wellbeing amongst key or hard to reach groups, such as children, the elderly, the disabled, the unemployed, and those from deprived areas.
- 4.1.2 This section considers these wider and unquantifiable benefits of the canals. It is split into three distinct sections:

- **Enabling Infrastructure** – considers investment in health promoting facilities by BWS and TWTS;
- **Canal Projects and Initiatives** – details key activities undertaken by BWS and third sector bodies in promoting use of the canal for health activities; and
- **Canal Events** – details BWS and TWTS organised community events designed to promote social cohesion.

4.2 Infrastructure

- 4.2.1 Since the opening of the Millennium Link in the summer of 2001, BWS has worked closely with its partners to invest in a strategic regeneration and infrastructure improvement programme. Investment has focused on making the canal and its surroundings an attractive place to live, work, and visit. Included in this investment programme has been the creation of leisure destinations, ranging from the Scents and Sensitivities Garden at Auchinstarry to the forthcoming HELIX project, a 300 hectare greenspace project. This section reviews each of these key infrastructure improvements.

The Falkirk Wheel

- 4.2.2 The Falkirk Wheel was the flagship project of the Millennium Link, restoring the link between the Forth & Clyde and Union Canals, whilst also creating a visitor destination. Contained within this project was a commitment to create an environment that promotes health and wellbeing. In particular, new canal walks and cycle paths were created in and around the Wheel, while educational basin trails were created for adults and children alike. TWTS also successfully raised £330k to build a mini-canal water play area designed to support BWS's 'Schools Package'. The play area acts and educational and teaching resource through water play. Above all, The Falkirk Wheel acts as a family orientated destination.⁴⁰



⁴⁰ Canning, S. and McCartney, P., pp. 14-15.

The HELIX

- 4.2.3 The HELIX is a partnership between British Waterways Scotland, Falkirk Council, the Central Scotland Forestry Trust and BIG Lottery, with the aim of transforming under-used land between Falkirk and Grangemouth into a thriving urban greenspace. Once completed, the HELIX will be an outdoor recreational area open to all, offering easy access to picturesque woodland, a central park with a lagoon, linked walking paths and cycleways. The project will also significantly improve navigation between the tidal River Carron and the Forth & Clyde Canal.
- 4.2.4 Big Lottery awarded the project its maximum grant of £25 million under its Living Landmark fund in November 2007. The full budget has been confirmed at £43.8 million and is allocated and underwritten by the partnership. Development is currently underway and is expected to be fully complete by 2013.
- 4.2.5 The HELIX is an excellent example of the ambitious greenspace projects being pursued by BWS and its partners. It is likely that the scheme will generate additional walking, running and cycling activity, as well as enhancing the boating market. Above all, it will represent a peaceful and family orientated greenspace, transforming a largely derelict area of land.⁴¹



Maryhill Locks Park

- 4.2.6 As part of the wider regeneration of the North Glasgow area, the Glasgow Canal Regeneration Partnership (GCRP) (a partnership between British Waterways Scotland, Glasgow City Council and ISIS Waterside Regeneration), concerted efforts are being made to create new and high quality greenspace around the canal. Central to this is the proposed Maryhill Locks Park, a new high quality urban greenspace, which will surround the canal.
- 4.2.7 The GCRP state that *"This neighbourhood [Maryhill Locks] will be set around the dramatic centrepiece that will be the Maryhill Locks Park, which will be transformed to become a place where locals and visitors will come to enjoy the activity on the water and sit and take in the views of the hills beyond"*.⁴² The new development and park will be situated in an area that has typically suffered from multiple deprivation and where the quality of the built environment has been regarded as poor. The creation of the new park will create high quality urban greenspace which is likely to be used for exercise and as a place of relaxation and restoration.

"As a volunteer walk leader with "Paths to Health", I use the canal regularly for group walks."



Port Dundas

- 4.2.8 Port Dundas, in north Glasgow, is the terminus of the Glasgow Branch of the Forth & Clyde Canal. While this section of the canal is outwith the scope of this study, the proposed developments in the area are worth discussing. The Port Dundas area is the subject a

⁴¹ Ibid., pp. 21-22.

⁴² <http://www.glasgowcanal.co.uk/maryhill-locks.html>

Summary

masterplan designed to regenerate the area. Despite its close proximity to Glasgow City Centre, the M8 motorway has effectively cut off Port Dundas from the city, creating an area of poor aesthetic character. BWS is playing an active part in the regeneration process.

- 4.2.9 An important health promoting initiative is the joint venture between BWS and TWTS to create a new paddlesports centre in the Pinkston Basin of the Forth & Clyde Canal. The facility would be focused on an outdoor bathing water standard arm of the canal, with two permanent and two temporary canoe polo pitches, and a new 90 metre whitewater course and 30 metre play feature located alongside.
- 4.2.10 The centre will be located on an island site and will provide changing accommodation, showers, and other communal facilities. In addition, individual organisations and clubs who have expressed an interest in becoming residents will be afforded the opportunity to provide their own storage facilities alongside.⁴³ The Pinkston Paddlesports Centre would be the only one of its kind in Scotland and would be designed to host major events and competitions. This investment is a further example of how the canals are contributing towards positive health outcomes

“The canal has encouraged me to switch from bus to walk to work. This winter, I only had one cold, whereas normally I would have had 3 or 4 fairly long spells of illness.”

Auchinstarry Basin – Scents and Sensitivities

- 4.2.11 As part of its partnership with Scottish and Newcastle Pub Enterprises, BWS invested heavily in the regeneration of the Auchinstarry Basin. As well as the new Boathouse Eco-Pub, significant landscaping work has been undertaken in the area surrounding the basin, transforming an area of overgrown and poor quality greenspace into a high quality landscape.
- 4.2.12 In addition, TWTS raised funding for the creation of the *Scents and Sensitivities* project at Auchinstarry. *Scents and Sensitivities* includes a Sensory Garden and Nature Trail, a walkway from the Boathouse eco-pub to the canal, new seating and artworks. The garden and nature trail has proven to be a popular attraction and has contributed to the ongoing success of the adjacent Boathouse and Auchinstarry Marina as a leisure destination.
- 
- 4.2.13 Phase 2 of the project has created a place that is suitable for relaxation, stimulation or education by creating a new sensory trail, linking the sensory garden with the canal basin and by developing a mix of hard and soft landscaping to enhance the environmental quality of the area. In addition to this, a network of paths, sculpture, plants and trees, and interpretation link the two completed areas from the first phase with the new Sensory Trail and connect the newly constructed ‘Soon Cut’ path (a 2km circular walk) linking Auchinstarry to Croy.⁴⁴
- 4.2.14 The revitalised Auchinstarry now also hosts OutdoorTrax, a business that provides for the hire of bikes, canoes and kayaks. In addition, the company offers climbing and canoeing

⁴³ www.glasgow.gov.uk/en/Residents/Environment/Rivers/pinkstonproposal.htm

⁴⁴ Canning, S. and McCartney, P., pp. 22.

Summary

instructors. This business is an important means of directly engaging people in physical exercise on the canal. In addition, it has allowed the canal to act as a focal point for school activities, promoting health amongst young people.

Other Projects

- 4.2.15 In addition to projects typically targeted at creating greenspace or improving health, BWS also contributes towards improving access and landscaping more generally. Examples include:

- The Phoenix Flowers - a project to improve pedestrian and cyclist access between Speirs Locks and Glasgow City Centre;
- Creation of new bridges – eg the Big Man Bridge in Maryhill and the Sylvania Way Bridge in Clydebank; and
- Landscaping improvements at new developments like Bowling Marina, Southbank Marina, and Edinburgh Quay.

4.3 Canal Projects and Initiatives

- 4.3.1 In addition to developing and maintaining canal infrastructure, BWS, TWTS and other social enterprises have worked closely to develop a number of additional projects and initiatives. Many of these projects are targeted at improving the health and mental wellbeing of canalside communities. Of particular value is the work undertaken by organisations like TWTS, Re-Union Canal Boats and the Seagull Trust Cruises in engaging vulnerable and / or 'hard to reach' groups.
- 4.3.2 The information below provides firm evidence of the way in which the canals are being used to promote positive mental wellbeing.

"I enjoy seeing the wildlife at the canal."

Action Outdoors

- 4.3.3 Action Outdoors is an excellent example of how the canals are being used to promote a healthier population. In recent years, there has been a significant growth in the number of outdoor activity centres, with the likes of Outward Bound and Go Ape becoming extremely popular. Action Outdoors is following in this vein by utilising the canal, towpaths and the natural environment to provide opportunities for young people.
- 4.3.4 Action Outdoors provides personal and social development courses and an opportunity to gain National Governing Body Awards in a range of Outdoor Activities. The £1 million activity centre is a positive example of how BWS and TWTS adopt partnership working to realise health benefits. While the centre is run by Falkirk Council and was built by TWTS, it was funded by a wide range of parties including BWS; SportsScotland; the Scottish Government; Falkirk Council; the Hugh Fraser Foundation; the Energy Savings Trust; the Scottish Community and Households Renewables Initiative; the SUST Initiative; Big Lottery, Rank Foundation; the Robertson Trust; and a major private donor.



Summary

- 4.3.5 TWTS directly raised £500k for the new build and £300k for three years revenue funding, as well as an additional £60k for the jetty. Importantly, 4,700 young people have benefited from the activity programmes to date.



Green Action

- 4.3.6 Green Action is an environmental and tourism volunteer programme based at the Action Outdoors Centre in Falkirk. The programme aims to enable young people to develop new skills, gain qualifications and improve their employment prospects. Green Action was funded by the Voluntary Action Fund; the Scottish Government Wider Role Fund; and Linkwide and Paragon Housing Associations. The programme provides young people aged 16-24 with tourism and conservation training. TWTS has been instrumental in developing Green Action, raising £122k for the two year youth environmental and tourism employability project.

- 4.3.7 A key achievement and focus of Green Action has been the promotion of youth employment. The Scottish Economic Statistics indicate that, in absolute terms, claimant count unemployment is highest amongst the under-24 age group in the “unemployed for under three months category”. Youth unemployment is also high in the 3-6 months category.⁴⁵ The link between unemployment and ill-health is well recognised. Unemployment is generally harmful to health and can lead to:

“Fantastic resource, greatly under-used!”

- higher mortality;
- poorer general health and longstanding illness;
- poorer mental health, psychological distress, minor psychological / psychiatric morbidity; and
- higher medical consultation, medication consumption and hospital admission rates.⁴⁶

- 4.3.8 Green Action volunteers come to the project via different routes, including:

- current pupils of Carronrange Special Needs School in Falkirk;
- ‘Real Jobs’ (part of Carronrange that tries to support the transition of moving from school to work, training or education programmes);
- Forth Valley College courses for people with learning difficulties – eg Workstart and Lifestart;
- Scottish Skills Development (Careers Office)
- referred by Falkirk and Grangemouth Job Centre Plus;
- unemployed;
- brought by parents; and
- come of own volition.

⁴⁵ <http://www.scotland.gov.uk/Publications/2009/01/29150444/57>

⁴⁶ Wadell, G. and Burton K. A., *Is Work Good for Your Health and Wellbeing?* (TSO, 2006), P.9.

Summary

- 4.3.9 The abilities of the young people who have attended Green Action range from a child with severe autism and learning difficulties to a gentleman on a gap year before going to university.
- 4.3.10 The multiple award winning programme has assisted in engaging hard to reach groups of young people, promoting both their physical and mental wellbeing, as well as teaching them relevant skills for the workplace. In addition, the environmental tasks undertaken on the canal enhance the surrounding environment, making it a more pleasant and relaxing place for others to visit.
- 
- 4.3.11 The feedback from parents, carers, support workers etc has been extremely positive to date. All of these groups have witnessed a positive impact on young people in terms of increased confidence, self-esteem, direction and sense of purpose. For example, an Employment Support Worker at Carrongrange School noted of the volunteers that “their confidence and self-esteem was boosted”. Similarly, one parent noted that their son Michael “has more confidence in himself and is willing to work” as a result of his involvement in Green Action.
- 4.3.12 Importantly, Green Action has managed to support 20 young people in moving into work and training. Excellent progress is being made towards most outputs and there is evidence of contributions to outcomes.
- 4.3.13 Green Action, utilising the Action Outdoors Centre,

“I work in Bonnybridge and walk along the canal during my lunch hour – I meet so many people daily and it’s a great escape from work.”

Community Canal Liaison Officer

- 4.3.14 TWTS has acted to directly engage communities in the canal through raising funding for the appointment of a Community Canal Liaison Officer (CCLO), Steven Cole. The CCLO project has run from December 2008 and, working throughout Glasgow and West Dunbartonshire, aims to:
- link with local communities, schools and current users of the canal corridor to maximise their enjoyment and use of the canal corridor as a recreational experience;
 - to conserve and enhance the natural beauty, wildlife and heritage of the Forth & Clyde Canal, providing information, knowledge and an opportunity for local people to investigate the local history; and
 - to maintain close liaison with local individuals, communities and a range of partners and user groups providing an effective communication between BWS, TWTS and the public.
- 4.3.15 In working to achieve these aims, the CCLO has engaged approximately 8,000 people, either directly or indirectly. Much of this engagement has focused on raising awareness of the potential of the canal for positive health activities. The paragraphs below provide some examples of where the CCLO has promoted health activities.

Health Walks

- 4.3.16 The CCLO has worked closely with the North Glasgow Health Walk Network (NSM) to integrate the canal into the wider walking routes. The NSM includes 20 registered walking groups and 400 members, several of which use the canal as part of their walking groups. The CCLO runs a fortnightly walk from Maryhill Locks, sits on the NSM Steering Group, and organised a walkers' away day in October 2009.
- 4.3.17 The West Dunbartonshire walks started up in January 2010, originally as alternate fortnightly walks from Old Kilpatrick and Clydebank. However, this has recently changed to a weekly walk from Clydebank. This walking group has now been joined by Stepping Stones members and GP referrals.⁴⁷

Walks Leaflets

- 4.3.18 The CCLO has worked with partners SNH, BWS, and Knightswood Camera Club to create six canalside walk leaflets. The aim of this project is to encourage people to walk along the canal as part of a healthy lifestyle.
- 4.3.19 The walks leaflets are a pack of six walks that fit into a plastic sleeve. There are also two postcards included – one is a general information and title card while the other promotes the SNH 'Simple Pleasures' campaign.
- 4.3.20 The leaflets give some basic information on what is seen on the walk, as well as maps and directions. Each circular walk starts at a different place and varies in length from 2.5 kilometres to 7 kilometres. The leaflets are distributed to partners, health centres, libraries, and relevant places near to each start point.⁴⁸

Access Improvements

- 4.3.21 The literature review included within this study explained that greenspace has to be both high quality and easily accessible if it is to provide benefits for society. The CCLO has worked to improve access to the canal for surrounding areas. For example, a resident of Rotherwood Avenue in Westerton requested that an access route to the Forth & Clyde Canal was improved. The CCLO contacted Glasgow City Council Countryside Rangers and organised volunteers to help improve the access. The work was done over two days and represented a significant access improvement. The CCLO has identified two other sites that require access improvements.⁴⁹



Mouseboat

- 4.3.22 The CCLO was approached by Community Links Scotland to develop a canal related project designed to engage with young people in the Dalmuir / Clydebank area, who might otherwise be involved with anti-social behaviour. Several ideas were discussed but it was the mouseboat building sessions that were deemed to be the most suitable project.
- 4.3.23 Mouseboats are simple to build wooden canoes that are ideal to use on the canal. It was thought that this would be a good project as it would develop skills that could help towards

⁴⁷ Cole, S., *Canal Community Liaison Officer – Final Evaluation* (TWTS, 2010), p. 11.

⁴⁸ *Ibid.*, p. 20.

⁴⁹ *Ibid.*, p. 16.

Summary

further training or employment, encourage teamwork and help keep young people off the streets. This project has increased the confidence and self-esteem of young people, more specifically teenagers that were at risk from participating in anti-social behaviour within their local community.⁵⁰

■ John Muir Award

- 4.3.24 The CCLO worked with young people to raise awareness and appreciation of the canal through the John Muir Awards Process. The John Muir Award is in four parts – discover a wild place; explore it; do something to conserve it; and share your experiences. Working with St. Charles Primary School and Cadder Primary School, The CCLO led a series of walks and activities along the canal and supported both classroom based sessions and presentation of the findings.⁵¹

■ School Boat Trips – Wildlife Safaris and Heritage Hunts

- 4.3.25 The CCLO successfully engaged 675 children from 17 schools in canal boat trips, focusing on wildlife and the surrounding environment. The events introduced children to the canal and the importance of water safety.⁵²

■ Summary

- 4.3.26 It can be seen from the above commentary that the CCLO has made a substantial contribution to promote positive physical and mental wellbeing amongst all age groups. The canal has been used in a number of innovative ways to engage people and has also helped tackle wider social issues such as anti-social behaviour.

Feet First

- 4.3.27 Feet First is a free canal and waterways guided walking programme run by TWTS to encourage walking as a healthy, educational and enjoyable form of exercise for people of all ages. The programme is funded by Scottish Natural Heritage; Big Lottery Awards for All; the People's Postcode Trust; Forests for People Grant; and a major private donor. It aims to:

- educate those taking part about Scotland's canals, their heritage and the environment;
- promote and encourage walking along waterways and other natural environments as an enjoyable and educational form of exercise; and
- teach people taking part about water safety.

- 4.3.28 Feet First has been running since 2007 and TWTS has raised £87k to deliver the programmes. Eighteen primary schools (577 children) have participated in six week programmes of canal walks. In addition, 183 people have participated through the eight week community programmes. In 2009 generally, there were 982 people involved in Feet First walks.



- 4.3.29 The Feet First programme is also closely linked to the John Muir Award programme, a national environmental programme which provides stepped awards for

⁵⁰ Ibid., p. 18-19.

⁵¹ Ibid., p. 14.

⁵² Ibid., p. 8.

Summary

people of all ages who become actively involved in the natural environment.⁵³ Feet First has assisted 495 people to achieve the John Muir Discovery Level Award, which requires 15 hours input over three months.

- 4.3.30 The Feet First programme provides an excellent example of how the third sector is making use of the canals to promote healthy activities. It is particularly relevant that TWTS is working closely with primary schools, as reducing the level of child obesity is a key objective of the Scottish Government.⁵⁴

Water-Safety Education Programme

- 4.3.31 Whilst the canals offer many opportunities to promote healthy activities, it is important to remember that waterways can be dangerous if used irresponsibly. Before the restoration of Scotland's canal network, there were regrettable instances of drowning and other incidents. BWS and TWTS have addressed this important issue by providing a Water Safety Education Programme.

- 4.3.32 TWTS has worked with local community arts groups and Impact Arts to develop the water-safety education programme using visual arts and drama to devise creative class based activities that allow children to explore the dangers that the waterways can pose if used irresponsibly. The sessions also informed children about the canals and how they can be used to create a healthy and active lifestyle. The use of a creative approach to education is important in communicating with children and in fostering positive use of canals.

"The amount of users is testament to how popular the canal is, with a mix of ages and body sizes all partaking in activities to keep fit."

- 4.3.33 Nearly 2,800 pupils from Falkirk, Glasgow and Edinburgh have benefited from the programme since its inception in 2006.⁵⁵

Towpath Tidy Events

- 4.3.34 The recent renaissance of the Lowland Canals has, to some extent, created its own pressures. An important message to emerge from the survey programme was the importance of keeping the towpath and canal tidy. Issues of dog waste and litter were frequently cited as problems in particular stretches of both the Forth & Clyde and Union Canals.

- 4.3.35 TWTS recognises the importance of this issue and is working to address the problems caused. TWTS organises an annual 'Towpath Tidy Week' along the Forth and Clyde and Union Canals as part of British Waterways' annual clean-up initiative. The events take place in March of each year and attract volunteers from the local community and schools. Towpath Tidies are a further means of raising community awareness of the canals and in fostering civic pride in the local environment.



⁵³ <http://external.cis.strath.ac.uk/JMC/JMT/JMAward/>

⁵⁴ Canning, S. and McCartney, P., pp. 35.

⁵⁵ Canning, S. and McCartney, P., pp. 37.

Re-Union Canal Boats

- 4.3.36 Re-Union Canal Boats is a social enterprise based on and around Edinburgh's Union Canal. Re-Union offer training and support to a wide range of volunteers in crewing, first aid, hospitality, health and hygiene and a variety of other courses that are identified and driven by the volunteers needs and requests. The activities of Re-Union are important in promoting confidence, self-esteem, and mental wellbeing.
- 4.3.37 Re-Union engages meaningfully with canalside communities from Edinburgh Quay to Wester Hailes through a variety of projects including canoe building, supporting the development of a canoe club, orchard planting, co-ordinating community consultations and supporting the Edinburgh Canal Festival.
- 4.3.38 Re-Union brings people together to develop their skills, learn from one another and realise their potential whilst maintaining and promoting the canal as a remarkable asset for the community.

■ Volunteers

- 4.3.39 Re-Union has worked with 38 volunteers throughout 2009. Eight of these volunteers have moved on (but kept in touch), while 10 new applications have been received. Re-Union continue to recruit through word of mouth, and links with the Wester Hailes Health Agency, Departments within City of Edinburgh Council, the NHS Keep Well, the canoe club and the community. Re-Union is promoting PAL (Peer Assisted Learning) which enables existing volunteers to support and encourage new recruits.

"Such a peaceful, wildlife soaked route out of a busy city."
- 4.3.40 The feedback received from volunteers is very positive and there is anecdotal evidence about how the health, quality of life and confidence of volunteers have improved. Examples of some of the activities and projects undertaken by Re-Union are provided below.

■ Activities and Projects

- 4.3.41 Re-Union has worked closely with Prospect Community Housing to develop the **Wester Hailes Canoe Club**. The club has put 12 members through the SCA one-star certificate and continues to train members through the grading system. It is hoped that some will be proficient enough to become canoe instructors within two years. Re-Union is supporting this group to become a constituted group with their own autonomy and two of their volunteers are taking positions on the Management Committee. Encouraging local people to engage in watersports is an important example of how the third sector is actively promoting health through use of the canal.
- 4.3.42 Re-Union also ran a "**Floating Youth Club**" throughout March and April 2009 at Hailes Quarry Park, the Calders, and Harrison Park. It was funded by Cashback for Communities and it was very successful in providing diversionary activities for young people. The community police were very supportive of the project and engaged well with the young people. Re-Union volunteers assisted in the delivery of the youth club sessions and are developing their youth work skills as a result.



Summary

- 4.3.43 Re-Union also took part in an “**Open Doors Day**” event by linking with British Waterways who were offering walks along the Union Canal. They offered teas and coffees to the participants and over the day had 110 walkers on board.
- 4.3.44 Re-Union worked with The Waterways Trust Scotland and volunteers from the Royal Bank of Scotland to develop a **community orchard** at Wester Hailes. In addition to Re-Union volunteers, others were also attracted from a variety of local groups including Westburn Village Neighbourhood Council, the Calders High Rise Neighbourhood Council and the Wester Hailes Health Agency. Everyone worked together to clear an area at Calders Crescent and plant around 30 trees. A path was laid and natural wood benches were placed amongst the new trees. Re-Union is now maintaining the orchard and is in discussion about developing the surrounding site into a Healthy Eating Garden in partnership with Wester Hailes Health Agency.
- 4.3.45 As can be seen from the above activities, Re-Union’s volunteers are given a great many opportunities to explore their talents and put them to use whenever and wherever they think they would be best used. By encouraging everyone to try different things, they are building an impressive pool of volunteers with increased self-confidence and belief in themselves.⁵⁶

“Thank you for providing me with a safe and enjoyable route to work.”

The Seagull Trust Cruises

- 4.3.46 The Seagull Trust Cruises provides free canal cruising for disabled people, supporting efforts to enhance the health of this important societal group. Cruising takes place on a daily basis, including weekends, between the months of April and October and the duration of the cruise is in accordance with local conditions and the wishes of the user group.
- 4.3.47 In July 2003, the Trust introduced a residential canal boat into service, which allows a family with a disabled member to cruise the Lowland Canals at their own pace, over a period ranging from a few days to one week.
- 4.3.48 The Trust explain that “medical opinion confirms that canal cruising is of considerable therapeutic value to people with special needs”. This, therefore, is an excellent example of how the revitalised canals are being used to promote society wide health benefits.⁵⁷

“I am old enough to realise what a great asset the canal is.”

4.4 Canal Events

- 4.4.1 The literature review explains that social wellbeing and community cohesion are important aspects of the overall wellbeing of society. High social capital can contribute towards better mental health, self-esteem and civic pride. Anecdotal evidence suggests that, in recent years, society has become more impersonal, with less concern for one’s ‘neighbour’. BWS and TWTS have made significant efforts to place the canals back at the heart of the communities they serve. An important part of this has been the organising of canal festivals and events, which are designed to promote social wellbeing and community cohesion. This section outlines some key facts from recent events.

⁵⁶ Re-Union Canal Boats, *2009 Annual Report* (Edinburgh, 2009)

⁵⁷ <http://www.seagulltrust.org.uk/>

Clydebank Canal Festival

4.4.2 The Clydebank Canal Festival was launched in July 2008, replacing the successful Dalmuir Park Gala Day. The Gala Day attracted around 5,000 people on an annual basis but was limited by geographical and physical capacity constraints. The recent regeneration of the canal bank in Clydebank provided an opportunity to relocate the Gala Day, expand activities and increase the number of visitors (and hence visitor spend) to the area.



4.4.3 The 2008 and 2009 Canal Festivals (both held in July) provided visitors with a varied and entertaining range of activities and attractions, including boat trips; a sponsored duck race; Army Cadet and Sea Cadets displays; local arts and crafts; books stalls; a fun fair; street theatre; children's entertainment; and live music.⁵⁸

Kirkintilloch Canal Festival 2009

4.4.4 The Kirkintilloch Canal Festival is an annual event, taking place in August each year. The 2009 event was held on the weekend of 29 and 30 August and was the tenth festival held in the town. The Festival is organised primarily by East Dunbartonshire Council and delivered in partnership with TWTS; the Forth & Clyde Canal Society; the Seagull Trust; Peel Park Community Heritage Events Association; Strathclyde Police; Kirkintilloch's Initiative; the Regent Centre; East Dunbartonshire Campus for Further and Higher Education; and Stage Storm Video Productions.

"I feel very strongly that the canal has a direct benefit to the wellbeing of all local residents. Having an outdoor space so full of wildlife and nature in the middle of a city is vital for a balanced quality of life."

4.4.5 Events were held at sites around Kirkintilloch, with the Southbank Marina housing the Saturday night entertainment. The events which took place included a variety of boat trips and water activities; fireworks; live music and performances; a themed street parade; funfairs; arts and crafts stalls; heritage displays; emergency service vehicle demonstrations; art exhibitions; and street theatre.

4.4.6 East Dunbartonshire Council carried out market research at the festival in which feedback was gained from a sample of attendees. The information gathered was used to establish levels of satisfaction and to identify the economic impact of the event, whilst also gathering suggestions for future development of the festival.

4.4.7 Approximately 25,000 people attended the festival over the course of the weekend. Interestingly, the majority of attendees were from Kirkintilloch (50%), while 15% were from the rest of East Dunbartonshire. In short, around 65% of attendees were drawn from what can broadly be termed as the 'local' area – this is significant as it reflects an element of civic pride and demonstrates the value that local people attach to their canal. The number of visitors from outside the district was higher compared to 2008, with 8% of



⁵⁸ Canning, S. and McCartney, P., pp. 30-31.

Summary

visitors coming from Glasgow, 26% from elsewhere in Scotland, 2% from the rest of the UK and the remaining 1% attending from overseas.

4.4.8 Satisfaction levels amongst respondents were also very high, with 97% stating that they were either 'very satisfied' or 'satisfied' with the festival. Of those who also attended in 2008, 80% thought that the festival had improved.

4.4.9 Despite poorer weather conditions than experienced in previous years the event was still very well attended and again there was undoubtedly a feel good factor in the town. Indeed, the event was runner-up in the Scottish Thistle Awards, a Visit Scotland initiative to promote excellence in tourism.⁵⁹

Edinburgh Canal Festival 2009

4.4.10 The Edinburgh Canal Festival evolved from the Edinburgh Raft Race, which previously took place in 2007 and 2008. The inaugural Edinburgh Canal Festival included a programme of onshore and waterborne activities and was launched at Edinburgh Quay on 27 June 2009 by the then Chancellor of the Exchequer, the Rt. Hon. Alistair Darling MP.

"I have used the canal for years and it's always a pleasure – well done to all at BWS, you should be very proud of yourselves."

4.4.11 The event was coordinated by the social enterprise Re-Union Canal Boats and supported by BWS and the City of Edinburgh Council. The community focused event brought together canal enthusiasts; canal societies; community councils; local musicians and crafts people; traders; and community groups to enjoy and promote Edinburgh's new canal quarter.

4.4.12 The Edinburgh Canal Festival offered a wide range of events, including:

- free boat trips, offered by Re-Union, which were highly popular;
- the annual raft race;
- community stalls;
- craft and fair trade stalls;
- a community mural project involving children from nine schools;
- Feet First Walk, a guided walking tour between Leamington Lift Bridge and Slateford Aqueduct;
- 'Canal Dipping', which allowed young people to explore canal species;
- an art exhibition;
- boat displays;
- a 'wee boat' flotilla;
- a canoe display;
- a spinning display (demonstrating how to spin yarn); and

⁵⁹ East Dunbartonshire Council Enterprise Team, *Kirkintilloch Canal Festival 2009 – Visitor and Economic Impact Evaluation* (2009), p. 2.

■ music performances.

- 4.4.13 Around 3,000 people attended the event and an evaluation exercise was carried out, although the weather did have an effect on sample sizes. 94% of attendees rated the event as either 'good', 'very good' or 'excellent' and, like Kirkintilloch, there was strong local involvement in the event. Notably, all of those surveyed said they would come back to similar events at Edinburgh Quay.⁶⁰

Maryhill Bigman Canal Festival II

- 4.4.14 The 'Bigman' project is a 30 metre steel sculpture at Stockingfield Junction that also acts as a canal footbridge. The free event is organised by TWTS and is designed to encourage use of the canal and highlight to the public the wide range of uses for the waterspace. The festival was aimed at promoting the planned development at Maryhill Locks and the surrounding areas. The event also aimed to demonstrate the partners' continuing commitment to develop this section of the Forth & Clyde Canal, specifically engaging with local communities, and aimed to gather information and feedback from the public about the many regeneration projects that are taking place in the area. Information was gathered to find out the level of support that the Bigman Bridge had in the area and the level of knowledge about the project. A ten foot Marquette of the Bigman was displayed at the event along with artwork to show the scale of the project.



- 4.4.15 The first Bigman Festival took place at Maryhill Locks in October 2008, attracting 2,500 visitors. The second Bigman event was held in September 2009 and succeeded in surpassing the previous event by attracting 4,000 visitors and, importantly, extensive media coverage. The event attracted a good mix of visitors, with a wide age range of family groups and visitors from the surrounding area and from further afield.
- 4.4.16 The daylong event involved dragon boat racing along the Kelvin Aqueduct (11 Dragon Boat Teams – a total of 176 people); waterpolo; boat trips to Stockingfield Junction; and live music and street entertainment. TWTS note that 898 visitors benefited from a free boat trip, with a further 100 young people enjoying a taster canoe session.
- 4.4.17 A Bigman Canal Festival III was held in 2010. The festival was called "BigDance and BigSing" and was attended by an estimated 3,000 people. The project was strongly focused on involving young people.⁶¹

Monkland Canal Festival

- 4.4.18 Whilst the Monkland Canal is currently outwith the scope of this study (purely for data reasons), it is worth noting that the inaugural Monkland Canal Festival was held in 2010. The event attracted around 3,000 people and represents another important step in the regeneration of the canal.

⁶⁰ Re-Union Canal Boats Ltd, *Edinburgh Quay (27th June 2009) – Report / Finance / Evaluation* (2009), pp. 2-10

⁶¹ The Waterways Trust Scotland, *Bigman 2 Event 2009 – Debrief Report* (TWTS, 2009), pp. 3-4.

4.5 Summary

- 4.5.1 While canals generate health benefits that can be monetised, it is clear from the above that their impact is actually much wider than a simple money value. Investment in the canal network has, in many respects, been focused on improving the quality of the greenspace and health related facilities on the canal. Canal groups, including BWS and TWTS, have worked extensively to actually make use of the canal for health related activities – excellent examples of this include the CCLO and Green Action. Efforts are also being made to promote community cohesion and social wellbeing amongst communities through the medium of canal events. In summary, there is a strong evidence base to suggest that the canals are making a substantial contribution to the health and wellbeing of the Scottish population.

“I live in the Knightswood / Westerton area and strongly believe funding should be put into the canals – Glasgow is very proud to have our canals and they contribute to a positive and more health community.”

5 Conclusions and Recommendations

5.1 Conclusion

5.1.1 This report has set out the positive health impacts of Scotland's Lowland Canal network. The wide ranging analysis undertaken has established that the canals generate health benefits in terms of increased physical activity; safety; air quality; and social and community cohesion.

5.1.2 In quantitative terms, the canals deliver:

- The canals generate almost 3.9 million additional person kilometres of travel per annum, equating to a **physical health benefit of £6.4 million per annum**;
- The towpaths remove over 1 million cycle kilometres from the roads, with an **annual safety benefit of £220k**;
- Additional physical activity on the canal leads to a **£77k direct reduction in employer costs through reduced absenteeism**. There are also wider, but as yet unquantifiable benefits, in terms of **increased productivity**.
- The canals **reduce exposure to poor air quality by almost 85,000 hours per annum**;

5.1.3 In addition, investment in the canals and canal related activities are successfully promoting improved public health. As well as encouraging physical activities, social enterprises are engaging hard to reach groups including those with special needs, young people, and the elderly. BWS and their partners are also arranging numerous canal focused community events, promoting community cohesion and social wellbeing.

5.2 Recommendations

5.2.1 This study has established a detailed baseline for assessing the health benefits of Scotland's canals. There is considerable potential to build upon the outcomes identified here and a number of recommendations as to how this can be done are set out below. The recommendations are outlined in terms of canal specific recommendations and wider recommendations.

Canal Specific Recommendations

5.2.2 As outlined at the outset of this report, the geographic scope of the study was limited by the extent of the CSGN area and by a lack of data on both the Glasgow Branch of the Forth & Clyde Canal and the Monkland Canal. The benefits of these canals could potentially be substantial and there is potential for extending the study to cover these canals – the Monkland Canal has pedestrian counters that are expected to be switched on shortly, while the Caledonian and Crinan Canals already have count data available.

5.2.3 The financial deadlines attached to this study meant that the survey programme had to be undertaken in January and early February 2011. The severe weather experienced during December 2010 left ice and puddles on the towpath. It is likely that this dissuaded use of the towpaths and potentially lessened the survey return. BWS should consider re-running the survey programme during the summer months. This could be deferred to the Summer of 2012 if there was a possibility that the wider canal network could be included.

Summary

- 5.2.4 As explained in Chapter 4, BWS is investing in a number of new areas of canalside greenspace, including the Falkirk HELIX and Maryhill Locks Park. These schemes may have a positive impact on the health benefits of the canals. BWS should consider ongoing monitoring of the health impacts of new areas of canalside greenspace.

Wider Recommendations

- 5.2.5 The findings of this study have wider impacts in terms of the benefits of greenspace on physical and mental wellbeing. The clear demonstration of the positive impacts of greenspace, and canals in particular, provide a basis for BWS and their study partners to move forward. BWS and their partners (eg the Forestry Commission, SNH, Sustrans etc) should use the findings from this report as a means of lobbying for extra funding for greenspace projects.
- 5.2.6 BWS and their partners should also continue to consider how the canals and towpaths can become more fully integrated into the wider core path and cycle networks.

"It's a special place where people interact with each other in a way they do not on normal paths."

6 Bibliography

Books / Journals / Articles

Davis, A., Value for Money: An Economic Assessment of Investment in Walking and Cycling (NHS Bristol, 2010).

Dines, N., Cattell, V., Gesler, W. and Curtis S., Public Spaces, Social Relations and Well-Being in East London (Joseph Rowntree Foundation, 2006).

Grahn, P. and Stigsdotter, U.A., Landscape Planning and Streets (Urban Forestry and Urban Greening, 2003).

Guite H.F., Clark, C., Ackrill, G., The Impact of the Physical and Urban Environment on Mental Well-Being (Public Health, 2006).

Kuo, F.E., Coping with Poverty: Impacts of Environment and Attention in the Inner-City (Environment and Behaviour, 2001).

Land-Use Consultants, Making the Links: Greenspace and Quality of Life (Scottish Natural Heritage Commissioned Report Number 60, 2004).

Maas, J., Verheij, R.A., Groenewegen, P. P., Spreeuwenberg, P., Greenspace, Urbanity, and Health: How Strong is the Relation? (Journal of Epidemiology and Community Health, 2006).

Mitchell, R. and Popham F., Greenspace, Urbanity and Health: Relationships in England (Journal of Epidemiology and Community Health, 2007).

Nielsen T.S. and Hansen, K. B., Do Green Areas Affect Health? Results from a Danish Survey on the use of Green Areas and Health Indicators (Health and Place, 2007).

Pretty, J et al., A Countryside for Health and Wellbeing: The Physical and Mental Health Benefits of Green Exercise (Countryside Recreation Network, 2005).

Takano, T., Nakamura, K., Watanabe, M., Urban Residential Environments and Senior Citizens's Longevity in Megacity Areas: The Importance of Walkable Greenspaces (Journal of Epidemiology and Community Health, 2002).

Wadell, G. and Burton K. A., Is Work Good for Your Health and Wellbeing? (TSO, 2006).

Policy Documents and Evaluations

Canning S. and McCartney, P., *British Waterways Scotland – Canal Economic Monitoring* (MVA Consultancy, 2010).

Cole, S., *Canal Community Liaison Officer – Final Evaluation* (TWTS, 2010).

East Dunbartonshire Council Enterprise Team, *Kirkintilloch Canal Festival 2009 – Visitor and Economic Impact Evaluation* (EDC, 2009).

Greenspace Scotland, *Health Impact Assessment of Greenspace – A Guide* (Stirling, 2008).

Health, Place and Nature – How Outdoor Environments Influence Health and Well-Being: A Knowledge Base (Sustainable Development Commission, 2008).

Mind Ecotherapy: The Green Agenda for Mental Health (2007).

Re-Union Canal Boats Ltd, *Edinburgh Quay (27th June 2009) – Report / Finance / Evaluation* (2009).

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (DEFRA, 2007).

The Waterways Trust Scotland, *Bigman 2 Event 2009 – Debrief Report* (TWTS, 2009).

Other Data Sources

British Waterways Scotland Canal Household Surveys (2010).

Reported Road Casualties Scotland 2009 (The Scottish Government, 2009)

Re-Union Canal Boats, *2009 Annual Report* (Edinburgh, 2009)

Websites

http://www.centralscotlandgreennetwork.org/index.php?option=com_content&view=category&layout=blog&id=7&Itemid=6 – Central Scotland Green Network

<http://www.scotland.gov.uk/About/scotPerforms/purposes> - Scottish Government National Performance Framework

<http://thescotsman.scotsman.com/scotland/Stressed-and-depressed--mental.6724118.jp> - The Scotsman Newspaper

<http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/SNAP> - Scottish Economic Statistics

<http://www.euro.who.int/en/what-we-do/health-topics/environmental-health/Transport-and-health/activities/promotion-of-safe-walking-and-cycling-in-urban-areas/quantifying-the-positive-health-effects-of-cycling-and-walking/health-economic-assessment-tool-heat-for-cycling> - WHO HEAT Tool

<http://www.internetfitness.com/calculators/calburncalc.htm> - Calorie burn calculator

<http://www.publications.parliament.uk/pa/cm200910/cmselect/cmenvaud/229/22906.htm#note16> – Commons Select Committee Air Quality Paper

<http://www.glasgowcanal.co.uk/maryhill-locks.html> - Maryhill Locks

www.glasgow.gov.uk/en/Residents/Environment/Rivers/pinkstonproposal.htm - Pinkston Paddlesports

<http://www.scotland.gov.uk/Publications/2009/01/29150444/57> - Scottish Unemployment Statistics

<http://external.cis.strath.ac.uk/JMC/JMT/JMAward/> - John Muir Awards

<http://www.seagulltrust.org.uk/> - The Seagull Trust Cruises

MVA Consultancy provides advice on transport, to central, regional and local government, agencies, developers, operators and financiers.
A diverse group of results-oriented people, we are part of a strong team of professionals worldwide. Through client business planning, customer research and strategy development we create solutions that work for real people in the real world.

For more information visit www.mvaconsultancy.com

Abu Dhabi

AS Business Centre, Suite 201, Al Ain Road, Umm al
Nar, P.O. Box 129865, Abu Dhabi, UAE
T: +971 2 510 2402 F: +971 2 510 2403

Birmingham

Second Floor, 37a Waterloo Street
Birmingham B2 5TJ United Kingdom
T: +44 (0)121 233 7680 F: +44 (0)121 233 7681

Dublin

First Floor, 12/13 Exchange Place
Custom House Docks, IFSC, Dublin 1, Ireland
T: +353 (0)1 542 6000 F: +353 (0)1 542 6001

Edinburgh

Second Floor, Prospect House, 5 Thistle Street,
Edinburgh EH2 1DF United Kingdom
T: +44 (0)131 220 6966 F: +44 (0)131 220 6087

Glasgow

Seventh Floor, 78 St Vincent Street
Glasgow G2 5UB United Kingdom
T: +44 (0)141 225 4400 F: +44 (0)141 225 4401

London

Second Floor, 17 Hanover Square
London W1S 1HU United Kingdom
T: +44 (0)20 7529 6500 F: +44 (0)20 7529 6556

Lyon

11, rue de la République, 69001 Lyon, France
T: +33 (0)4 72 10 29 29 F: +33 (0)4 72 10 29 28

Manchester

25th Floor, City Tower, Piccadilly Plaza
Manchester M1 4BT United Kingdom
T: +44 (0)161 236 0282 F: +44 (0)161 236 0095

Marseille

76, rue de la République, 13002 Marseille, France
T: +33 (0)4 91 37 35 15 F: +33 (0)4 91 91 90 14

Paris

12-14, rue Jules César, 75012 Paris, France
T: +33 (0)1 53 17 36 00 F: +33 (0)1 53 17 36 01

Woking

Dukes Court, Duke Street, Woking
Surrey GU21 5BH United Kingdom
T: +44 (0)1483 728051 F: +44 (0)1483 755207

Email: info@mvaconsultancy.com

Offices also in

Bangkok, Beijing, Hong Kong, Shenzhen and Singapore

mvaconsultancy

Appendix A – Additional Survey Outputs

This appendix sets out additional information gathered from the canal user survey programme, including the socio-demographic breakdown of respondents and information about their core physical activity.

Profile of Respondents

59.5% of those who completed the survey were male, with the remaining 40.5% being female.

Figure A1 provides an overview of the age profile of respondents:

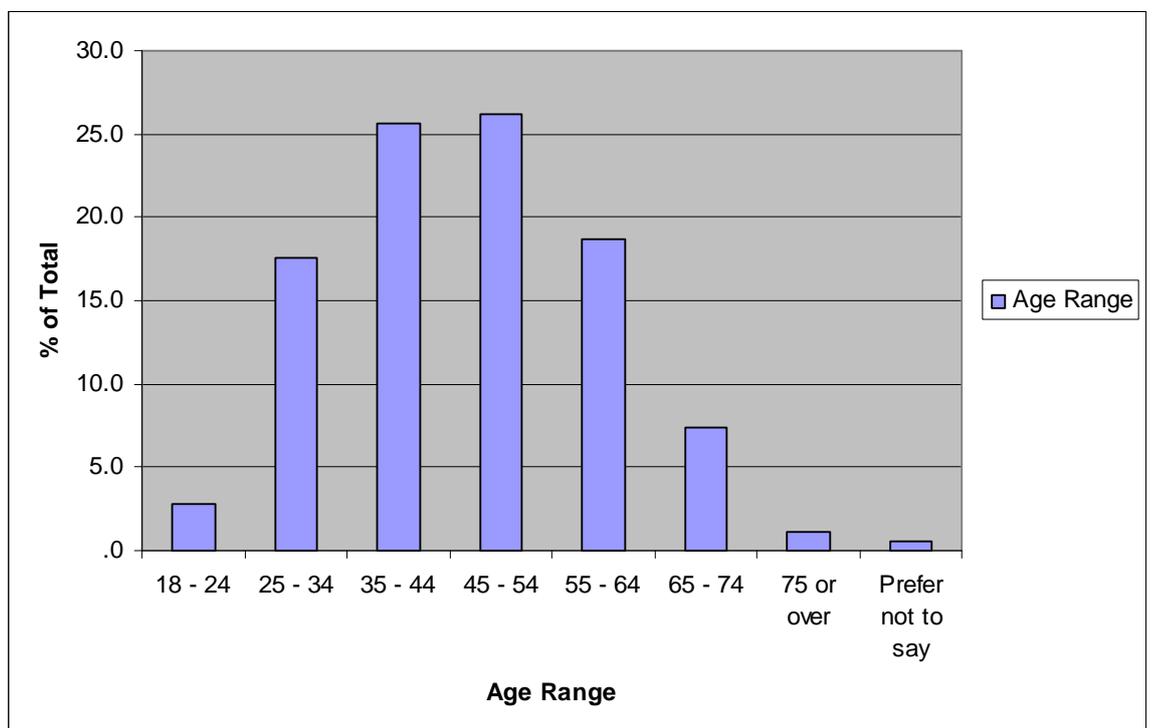


Figure A1: Age Range of Survey Respondents

Figure A1 shows the 88% of those who completed the survey were aged between 25 and 64. The age group with the largest number of returns was 45-54, with some 26% of the total. This was closely followed by the 35-44 age bracket, with just over 25% of the total. The figure shows that there were comparatively few respondents in the 18-24 age range. Similarly, few of the respondents were aged over 75.

Figure A2 considers the employment status of those surveyed:

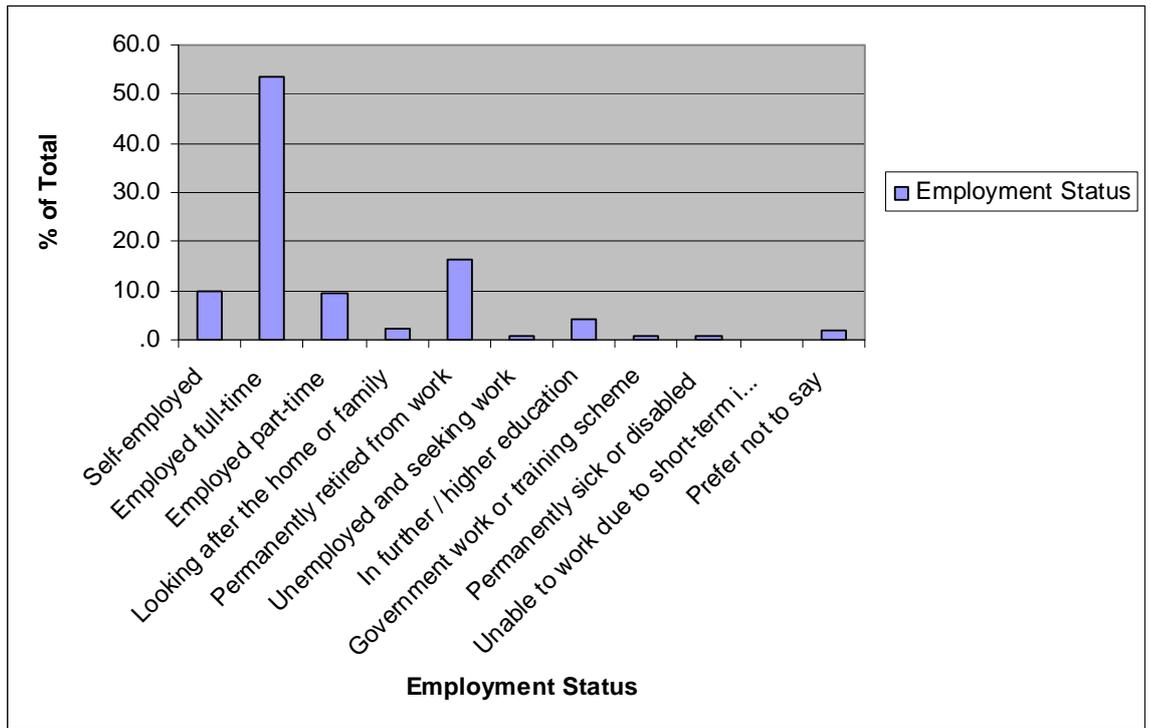


Figure A2: Employment Status of Survey Respondents

The majority of the canal users (54%) were employed full-time, with a further 10% employed part-time, and 10% self-employed. Retirees account for 17% of the respondents, while students 4% of the sample. There were only small numbers of people contained within the other categories.

Figure A3 details the annual pre-tax income of the survey respondents:

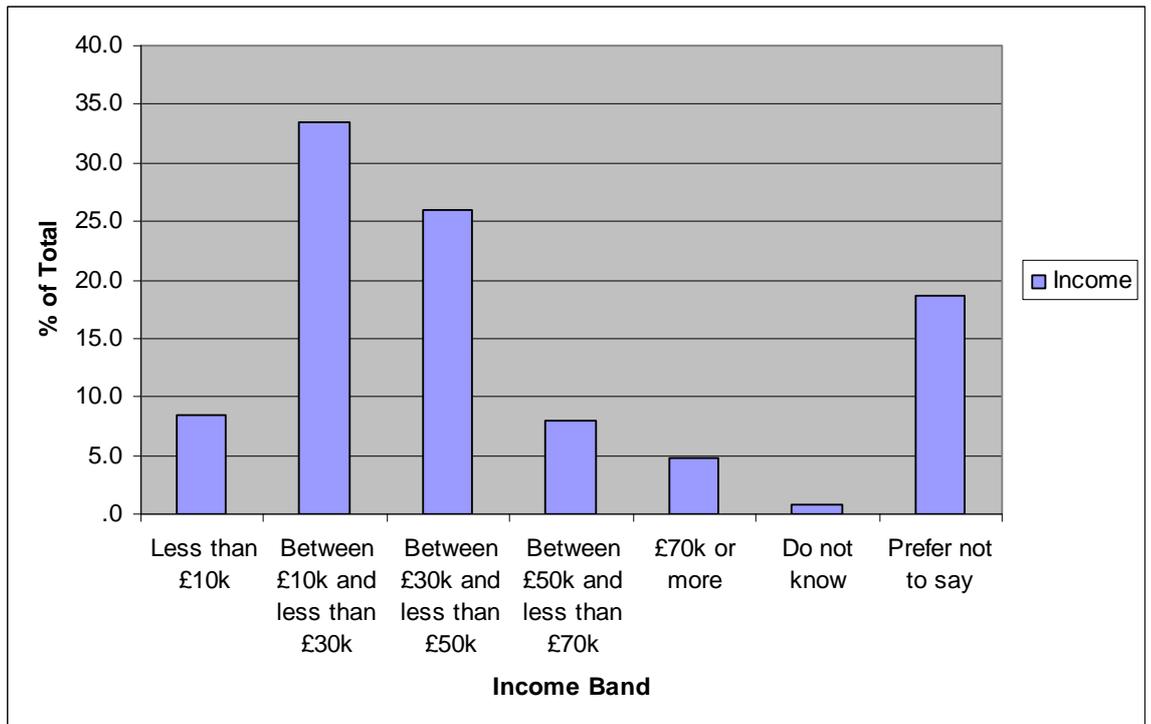


Figure A3: Annual Pre-Tax Income of Survey Respondents

It can be seen from Figure A3 that the majority of people surveyed are contained within the low to medium income bracket of £10k - £30k per annum, accounting for 34% of the survey. 26% of respondents earn between £30k-£50k, with 13% earning over £50k per annum. Understandably, 19% of respondents preferred not to reveal details of their income.

4.4% of respondents explained that they have a longstanding illness or health problem. Of these people, 49% reported physical impairment, while 14% reported having a sensory impairment. 37% of the initial 4.4% chose not to answer this question.

Exercise Habits

The survey also asked canal users about the physical intensity of their job and their general exercise habits in summer and winter.

Figure A4 outlines the types of employment of those surveyed:

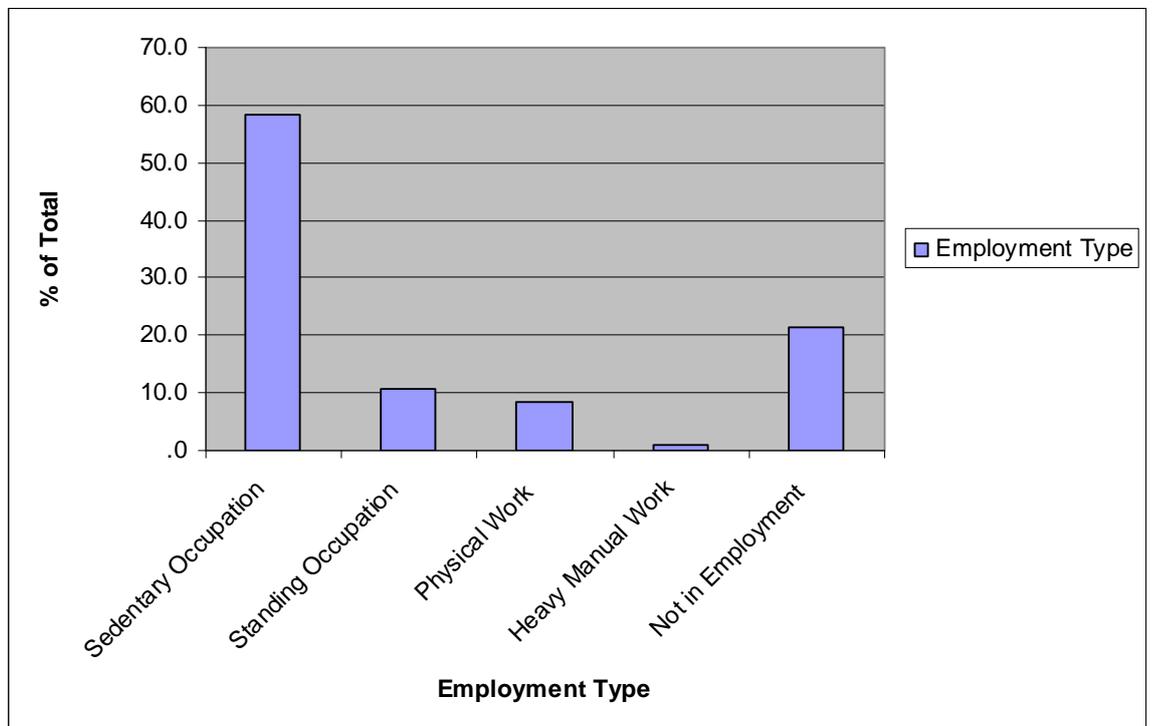


Figure A4: Employment Type of Survey Respondent

58% of the survey respondents work in a sedentary occupation, where most of their working day is spent sitting down. 11% of those surveyed work in a standing occupation, which involves spending most of the working day standing or walking but where intense physical effort is not required (eg hairdresser, shop assistant etc). 9% of respondents noted that they are involved in physical work, which involves some physical effort including the handling of heavy objects (eg plumber, cleaner, nurse etc). Only 1% of respondents noted that they are involved in heavy manual work.

In terms of this study, all respondents have been treated the same in terms of the health benefits they realise. In reality, however, it is likely that greater health benefits would

accrue to those working in non-manual jobs, while lesser benefits would accrue to those who are physically fit through their employment.

Figure A5 highlights the number of hours survey respondents spend cycling in a typical week in both the summer and winter months.

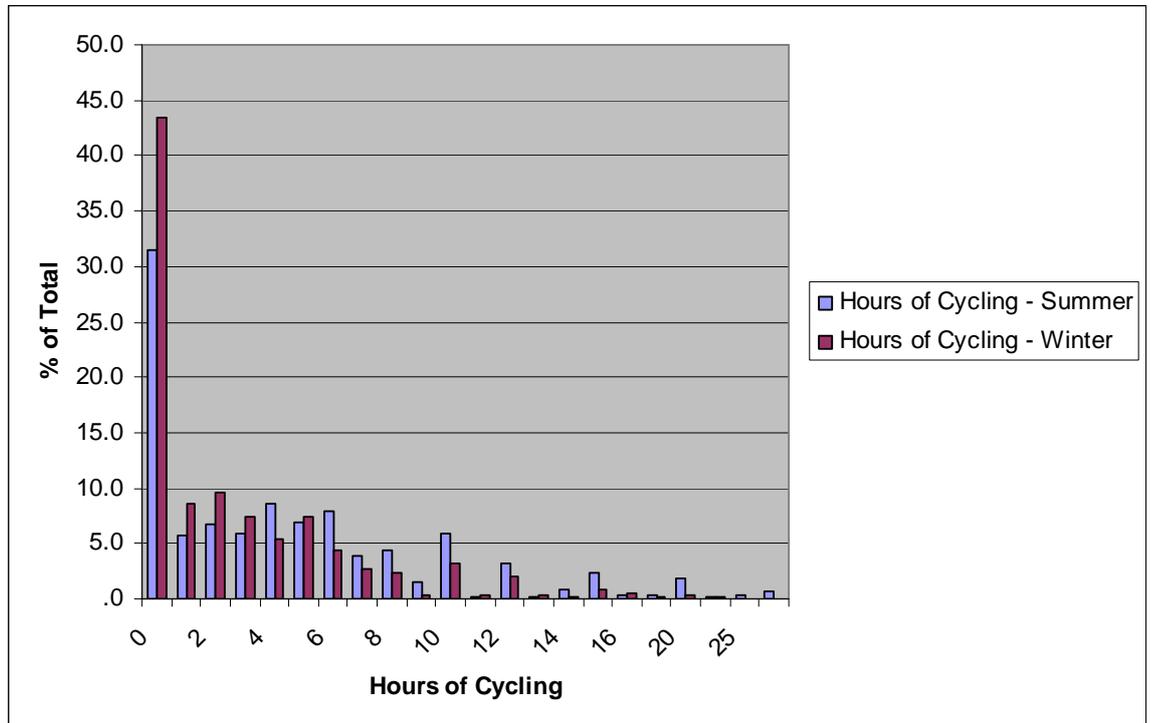


Figure A5: Hours Spent Cycling in a Typical Week – Summer and Winter

As would perhaps be expected, the majority of respondents cycle only 1-2 hours per week over the winter. In the summer months, the majority of users cycle between 1-4 hours per week. There are also notably higher proportions of cyclists travelling for longer periods during the summer. For example, 6% of cyclists travel for 10 hours per week in the summer, compared to only 3% in the winter months.

Figure A6 sets out the same data for other physical exercise, such as keep fit, aerobics, swimming, running etc during the summer and winter months.

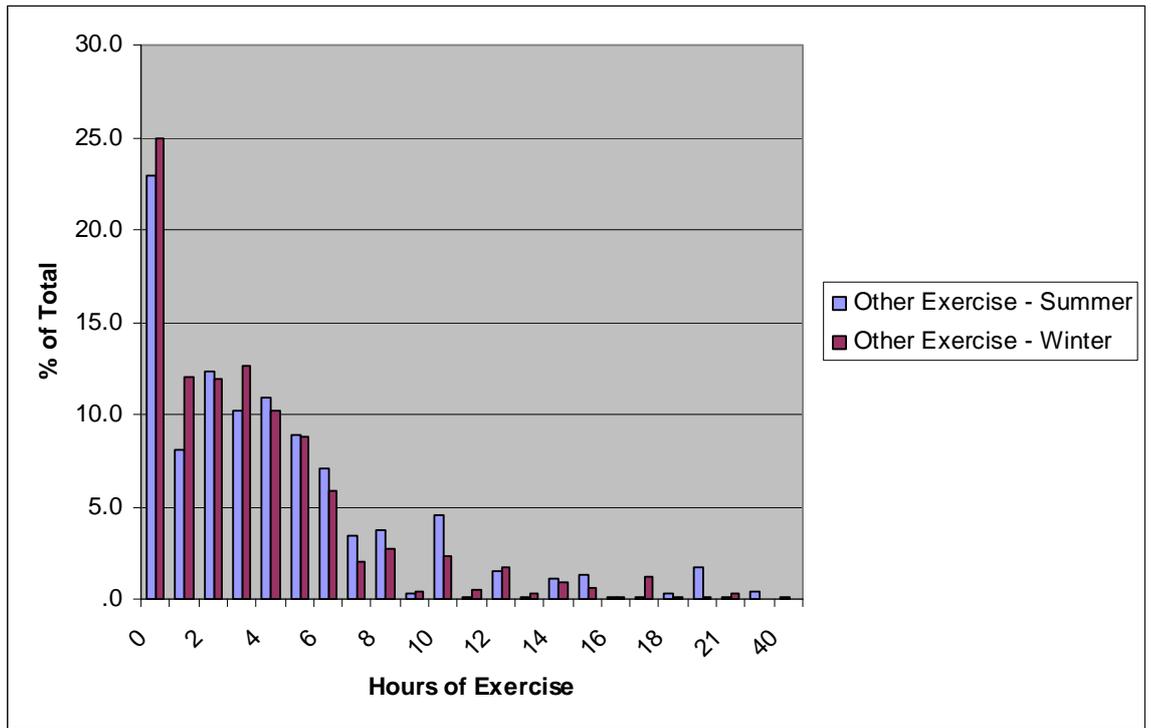


Figure A6: Hours Spent on Other Physical Activities in a Typical Week – Summer and Winter

It can be seen from Figure A6 that, in the winter months, the majority of respondents spend between 1-4 hours per week on physical exercise. It is likely that much of this will be on indoor activities given the prevailing weather at that time of year. As with cycling, there is generally a great level of weekly physical activity during the summer months.

Geographical Distribution of Survey Respondents

Figure A7 shows the geographical distribution of survey respondents based on the home postcodes provided:



Figure A7: Geographical Distribution of Survey Respondents

Figure A7 clearly demonstrates that the majority of canal users tend to live relatively close to the canal itself, with significant clusters in Edinburgh and Glasgow. It should also be noted however that there are a good number of users who live some distance from the canal.