Belfast Public Hire Bike Scheme

Outline Business Case

July 2011

Contents

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1 Executive Summary

Title

Introduction

1.1 Public hire bike schemes have become an increasingly common feature of cities in recent years, particularly in western Europe, with over 100 scheme operational under a variety of structures. Landmark cities such as London, Paris, Copenhagen, Dublin and Barcelona all operate large bike sharing schemes, however, smaller regional cities have also implemented their own projects - with varying degrees of success. Public bike hire schemes are considered to offer many potential benefits to the cities in which they operate, to users and to residents, including:

- provision of a new mode of public transport and encouragement of modal shift from motorised transport;
- health and environmental benefits;
- addressing of the 'first mile / last mile' commuter issue;
- reductions in congestion; and
- promotion of tourism.

1.2 There are in turn a range of risks which need to be addressed in considering the implementation of such a scheme, including over/under estimation of demand; theft and vandalism; safety and public liability issues; availability of space and planning issues; and revenue and capital funding.

Strategic Context

1.3 Both the Department for Regional Development and Belfast City Council have strategic objectives within their respective Corporate Plans which focus on inter alia reducing emissions, congestion, and creating a cleaner, greener City - objectives which a public hire bike has the potential to contribute towards. Belfast City Council furthermore has key aims to improve health and activity levels within the City, and to reduce health and social inequalities. A public hire bike scheme has the potential to operate as a new, fully inclusive and low cost public transport option which is accessible to all the community, providing both transport and health benefits to those who are most disadvantaged. Indeed, the Belfast Metropolitan Transport Plan also aims to provide for greater levels of cycling and recognised the role transport initiatives can play in addressing health and social inclusion measures.

1.4 Key infrastructure developments in the City Centre including in particular Belfast On The Move, also aim to focus on the development of 'sustainable transport enabling measures' and aim to create a more cycle friendly city through the provision of increased cycling infrastructure and cycle lanes. The development of a bike hire scheme can serve to help exploit these sustainable transport measures. The development of such a scheme will also align with policy initiatives including Travelwise NI and the Northern Ireland Cycling Strategy, which again reinforces the potential for health, environmental and social inclusion benefits to be delivered through cycling.

Current Position

1.5 There is no existing public hire bike scheme in Belfast. In terms of physical cycling infrastructure, there is a relatively small network of both segregated and non segregated cycle lanes in the City Council area.

1.6 At present, cycling in Belfast (and Northern Ireland as a whole) has a relatively low uptake. Over the past decade, the overall level of cycling within Northern Ireland, measured by total

distance travelled, has remained at approximately 0.3%. Within the Belfast area the overall modal share for cycling remains less than 1% in terms of total distance travelled. However, the average distance travelled by cyclists has more than doubled as a proportion of overall travel over the last decade. In terms of commuters and business trips, the percentage utilising bicycles as a mode of transport to work within the Belfast area has grown, but remained low over the last decade, at circa 3%, albeit it has increased from a low base level. By way of comparison, the overall share of people travelling to work in the UK on bicycle is also approximately 3%[1].

Assessment of Need

1.7 In line Department for Transport (DfT) Transport Analysis Guidance (TAG), a Comparative Study, which makes comparisons with other schemes similar to the one being proposed, has been undertaken. This involved:

- Detailed study of metrics and experience from a list of **Most Similar Cities**, including consultation with scheme operators or public authorities, where possible and
- Case studies of **best practice & experience elsewhere** from identified landmark schemes.

1.8 The Most Similar Cities study examined a range of physical and performance metrics from Dublin, Aarhus, Montpellier and Bari. This was undertaken through interviews and consultation with scheme operators and public sector authorities where possible, and through detailed desktop research. In addition, metrics and data from several other schemes of varying sizes have also been assessed, which are based on a research exercise undertaken by the European sponsored OBIS Project ("Optimising Bike Sharing in European Cities").

Conclusions of Need / Demand based on Comparative Study

1.9 The Most Similar Cities study and the review of Experience Elsewhere indicates that there is potential for an appropriate level of demand for a public bike hire scheme in Belfast, if one were to be provided. The key cities examined indicate a conservative registration or uptake range of between **2% to 4%** of the population could be achieved. In Belfast, based on a population of 268,300 this would imply the potential for a registration or uptake of between circa 5,500 and 11,000. These potential metrics for Belfast have been discussed and informed by consultation with operators of schemes elsewhere. In addition, an online survey has been carried out on behalf of Belfast City Council in February 2010 of over 200 individuals which indicated that over 50% of the people living or working in Belfast would use a public hire bike scheme if one were implemented in the City[2].

1.10 The key cities examined also indicates a conservative level of infrastructure provision may be in the range of **300 to 500 bikes**. In terms of bikes to stations ratio, a metric of approximately 10:1 to 15:1 would imply that serviced by between **20 to 50 bike stations**. The bike stations would have a docking point to bike ratio of in the region of **2:1**. The bike stations should be located no more than 300-400 meters apart at key strategic locations.

1.11 These potential metrics for Belfast have been discussed and informed by consultation with operators of schemes elsewhere based on the indicative geographic, demographic and socio economic characteristics of Belfast. These operators also strongly recommended against the development of a scheme using an initial pilot programme on a smaller scale, based on their experience elsewhere, as these schemes typically fail to attract critical mass and utilisation.

1.12 The following table summarises the projected range of **Uptake**, **Infrastructure** and **Utilisation** which may be achievable in Belfast, on the basis of the Most Similar Cities

[1] Method of Travel to Work UK/NI Comparison, Travel Survey for NI In Depth Report 2007-09, DRD
[2] Examining the potential for bike sharing in Belfast, British Council, 2010

comparative study and examination of cities and experience elsewhere, including consultation with scheme operators.

Range	Low	High
Registration Uptake (% of population)	2%	4%
Registration Uptake (no.)	c. 5,500	c. 11,000
Bikes (no.)	c. 300	c. 500
Stations (no.)	c. 30	c. 50
Trips per Day (no.)	c. 900 – 1,500	c. 1,500 – 2,500

Summary of Key Experience

1.13 A number of key lessons and success factors have emerged during the research as to characteristics of a successful scheme. These are summarised below:

- **Critical Mass** - research has indicated that small scale pilot projects are generally unsuccessful. Discussions with operators of existing schemes have also delivered the clear message that pilot schemes often will fail.
- **User Tariffs and Cost Recovery** - user revenue is unlikely to cover the costs of the scheme. In Dublin, 96% of all trips generated have been free of charge[3]. This is primarily due to the tariff providing the first 30 minutes use free of charge. This structure is considered to be a key success factor. Similarly, many schemes do not charge at all for use. Recovery of costs through a form of public subvention or payment in kind is therefore key.
- **Vandalism & Theft** - schemes can fall victim to vandalism and theft due to the communal nature of the bikes. Key lessons to minimise such incidence include the incorporation of a '3rd Generation' scheme with electronic registration which identifies who has hired a bike, and holds a significant deposit via a bank or credit card against the return of the bike. This has been evidenced through very low levels of vandalism experienced by Dublin.
- **City Characteristics** - research carried out by the NICHES programme (a European Commission funded programme focusing on sustainable surface transport) states that schemes are most suitable to cities with a population of greater than 200,000[4]. Belfast has a population of 268,000 and therefore would fall within this category.
- **Conditions for Urban Cycling** - the NICHES programme furthermore indicates that a minimum level of safe cycling infrastructure, alongside a strategy to promote cycling, is required to develop a successful scheme. This can include measures such as traffic calming, cycle networks, parking facilities and education and marketing.
- **Service and Maintenance** - a key aspect of successful schemes was a high level of maintenance and customer service. Bikes and bike stations are required to be serviced and cleaned on a daily basis and maintenance carried out on defective bikes to ensure safety, but also to avoid customer disappointment.
- **Helmet Laws** - there is currently no legal requirement for cyclists to wear a helmet in Northern Ireland. The statutory requirement to wear a helmet has been noted as perhaps the key reason for the failure of the scheme in Melbourne to attract a critical mass of users and members. Within this context, it is noted that a compulsory helmet law has recently been backed by the Northern Ireland Assembly, although any legislation is required to go through further stages in the Assembly. A mandatory helmet law would be considered to have a detrimental impact upon the potential success of a scheme in Belfast.
- **Operator Design Input** – detailed design of the scheme and the selection of the location of the docking stations and bikes needs to be undertaken in conjunction with experienced scheme operators as part of the tendering process. The procuring authority can undertake strategic decisions regarding the broad scale and area of operation of the scheme however

[3] Meeting with Dublin City Council, 8 December 2010
[4] New Seamless Mobility Services - Public Bicycles, NICHES Programme

discussions with Dublin City Council and operators has reinforced the recommendation that detailed location decisions are undertaken with the operator based on their experience of developing numerous other successful schemes elsewhere.

Objectives and Constraints

1.14 The core project objectives of this OBC are set out below. These have been defined within ranges given the range of potential provision which has been identified in the Assessment of Need and to allow for the market to respond to a potential future tender, undertaken on an output specification basis, with their analysis of the most suitable solution for Belfast.

- To improve the opportunities for cycling in Belfast through establishment of a public hire bike scheme providing between 300 and 500 bikes (subject to operator market responses) for public use and between 20 and 50 docking stations, with docking stations no further than 300m apart on average;
- To deliver a scheme which is 3rd Generation in nature (characterised by secure-by-design principles, smart card access technology, electronically operated docking stations and locks, telecommunications systems and online account management) and supplemented by an appropriate service and maintenance arrangement.
- To procure a scheme by 2013 which has minimal requirement for public sector (cash) subsidy.
- Obtain 2,500 members within the first year of operation and 10,000 members within the first 3 years of operations;
- To generate 3 hires per day per bike on average within the first year of operations; and
- To ensure the scheme is accessible to all citizens of Northern Ireland and meets all relevant equality legislation.

1.15 In addition, key transport objectives have been defined, baselines identified and target measures for this scheme established. These are summarised below:

- to increase the mode share of cycling in the City.
- to reduce accident rates for cyclists in Belfast
- to procure a public hire bicycle scheme which minimises theft and vandalism
- to create new jobs through delivery of scheme, to include 2 apprenticeships per annum
- to design and implement a public hire bicycle scheme which is open for the use of tourists, designed to accommodate short term membership and serve key tourist destinations
- to design a public hire bicycle scheme which integrates with Belfast's existing and future public transport network

1.16 Perhaps the key constraints in identifying appropriate options for a public hire bikes scheme is the limited funding support which would be available and the need to examine alternative forms of assistance, or payment in kind, to deliver the scheme.

Identification of Options

1.17 A long list of options (in terms of scale of infrastructure provision) was developed and screened to consider whether they provide a significant contribution to the achievement of the project objectives. The short list of options for detailed appraisal resulting from this exercise was:

- **Option 1** - Do Nothing;
- **Option 3** - Mid Sized 3rd Generation Scheme - 300 bikes and 30 stations; and
- **Option 4** - Full Sized 3rd Generation Scheme - 500 bikes and 50 stations.

1.18 The implementation of a smaller scale, or pilot scheme did not meet the objective of providing a scheme of between 300 – 500 bikes in the City. In addition, the strong evidence of

experience elsewhere and consultation with existing scheme operators indicates that pilot programmes are generally unsuccessful when implemented due to a lack of critical mass or network. In this case, such an Option will also fail to meet objectives focusing on increasing modal share due to lack of uptake.

1.19 It is not within the scope of this OBC to define precise locations of bike hire infrastructure. This OBC sets out the scale of proposed infrastructure which may be viable in Belfast. Detailed planning and liaison with the Planning Service, NI Environment and Heritage Service, Roads Service, utilities and prospective operators will be required to determine the precise location of infrastructure. It will also be important to utilise the significant expertise of suppliers and / or operators gained on other schemes in determining the location of the scheme, as location can have a significant influence on crime and vandalism, usage patterns, bike distribution & availability, and overall success. The process of concluding on locations will require to be an iterative process with suppliers and / or operators as part of the dialogue during any future procurement and cannot be concluded as part of this OBC - experience from Dublin in particular has highlighted this issue.

Monetary Costs

1.20 Benchmark cost estimates have been derived from publically available information from similar schemes and use average data to project anticipated capital and operating cost estimates for a public hire bike scheme in Belfast. Cost estimates have been provided for the two shortlisted 'Do Something' options. The following table sets out total cost project costs for both.

Cost Classification	Option 3 (300 bikes) £	Option 4 (500 bikes) £	Comment
Opportunity Costs (Total)	898,560	1,497,600	15 yrs (£60k / £100k per annum)
Capital Costs	688,500	1,137,500	Year 1 only
Operating Costs	4,194,400	6,804,000	14 yrs (£300k / £486k per annum)
Total Costs	**5,781,460**	**9,439,100**	**-**

1.21 As can be seen from the table above, the initial capital costs for Options 3 and Option 4 is estimated to be circa £689k and £1,138k, respectively. There are projected to be annual operating costs of circa £300k and £486k for Options 3 and 4 per annum, respectively. In addition, it is important to note that bike docks are often required to be developed on car parking bays and as such an opportunity cost of revenue foregone of £60k for Option 3 and £100k for Option 4, per annum, has been estimated.

Assessment of Risk and Optimism Bias

1.22 The following key risks in relation to the development of a bike hire scheme in Belfast have been established.

- Over /underestimation of demand risk;
- Planning permission risk;
- Design & technology complexity risk;
- Site conditions risk;
- Affordability risk;
- Market interest risk;
- Theft and vandalism risk;
- Increase in accidents risk;
- Political & departmental support risk; &
- Liability and insurance risk.

1.23 Appropriate approaches to mitigation of these risks have been developed as part of this OBC.

1.24 Cost data gathered (based on evidence from existing schemes) has been considered to have addressed the key risks which would normally contribute towards Optimism Bias. In this context, Optimism Bias has not been applied to the capital costs of this project. This approach has been agreed with the Department for Regional Development.

Assessment of Non-Monetary Costs and Benefits

1.25 The approach taken to the appraisal of the non-monetary costs and benefits of the options is based on the methodology set out in TAG Unit 3.14.1 "Guidance on the Appraisal of Walking and Cycling Schemes" which recommends the completion of an Appraisal Summary Table (AST) to allow a consistent view of the impacts of a scheme to be taken across options. The AST is presented in summary form below.

Description	**Option 3**	**Option 4**
	300 bikes 30 stations	**500 bikes 50 stations**
Scheme Costs		
Opportunity Cost (£ pa)	59,904	99,840
Capital Costs (£)	688,500	1,137,500
Operating Costs (£ pa)	299,600	486,000
Net Present Cost (£m)	4.52	7.38
Scheme Benefits		
Noise	Qualitative Benefit. Potential to generate up to 1,500 trips per day under Option 3 and 2,500 trips per day under Option 4 within scheme area. Whilst modal shift from car is expected to be low, any reduction in motorised transport will lead to a reduction in noise levels. Option 4 offers potentially greater level of benefits although overall impact on noise annoyance likely to be small.	
Air Quality and Greenhouse Gases	Potential to save: 78,840-131,400 miles from private car transport pa; 26,280-43,800kg C02 avoided pa	Potential to save: 131,400-219,000 miles from private car transport pa; 43,800-73,000 kg C02 avoided pa
Fuel Cost Savings	Potential to save: £12,390-£20,640 in fuel costs pa for shift from private car alone.	Potential to save: £20,640-£34,416 in fuel costs pa for shift from private car alone.
Townscape	Qualitative Benefit. Development of bike hire scheme in conjunction with Planning Service and NIEA unlikely to have negative impact. Research from elsewhere indicates scheme can have strong positive impact on image of city as 'green' and environmentally aware. Marginal difference in impact between Options.	
Physical Fitness	Significant potential economic benefits based on WHO HEAT tool assessment which estimates health benefits from cycling. In addition it has been estimated that new cyclists covering short distances can reduce risk of death by up to 22%.	
	Potential economic benefit: £234,000-£389,000 pa	Potential economic benefit: £389,000-£648,000 pa

Description	Option 3	Option 4
	300 bikes 30 stations	500 bikes 50 stations
Accidents	Qualitative Benefit. Research indicates that cyclist accident rate decreases after introduction of scheme due to greater driver awareness of cyclists and 'safety in numbers' effect. Absolute level of accidents may increase although not possible to quantify. Marginal difference in impact between options.	
Security	Qualitative Benefit. Location of docking stations may increase levels of passers-by and passive surveillance in areas where scheme operates. May also lead to implementation of direct surveillance such as CCTV. Both of these factors may contribute to a greater sense of security in the scheme area.	
Transport Efficiency	Qualitative Benefit. Development of bike hire scheme offers potential to reduce journey times for commuters and residents, particularly at rush hour period. Proportionately greater benefits under Option 4.	
Reliability	Qualitative Benefits. Increased reliability of journey times for those undertaking cycle trips as opposed to utilising other modes, particularly at rush hour. Proportionately greater benefits under Option 4.	
Wider Economic Impacts	Qualitative Benefits. Potential great additional employment opportunities and apprenticeships within the City. Potential to increase footfall in peripheral areas in City Centre, increase accessibility for tourists, shoppers and residents.	
Social Inclusion	Qualitative Benefits. Greater social inclusion; potentially free of charge form of public transport. Increase access to cycling due no ownership costs, increase access to associated health benefits. Increased access to public transport which may encourage greater levels of access to health, education and employment opportunities for most disadvantaged. Proportionately greater benefits under Option 4.	
Public Transport Accessibility and Interchange	Qualitative Benefits. Potential to increase overall levels of usage of public transport by improving 'first mile-last mile' connectivity to existing public transport hubs and stations, particularly for those without access to a car, young or older people.	

Net Present Costs and Identification of Preferred Option

1.26 The table below sets out for each shortlisted Option a calculation of its net present cost. This has been calculated over a 15 year appraisal period using the standard HM Treasury real discount rate of 3.5%.

Option	NPC £m	Ranking
Option 1 - Do Nothing;	0	1
Option 3 - 300 bikes and 30 stations	4.52	2
Option 4 - 500 bikes and 50 stations.	7.38	3

1.27 There are a significant range of potential economic, social and transport related benefits for the City of Belfast across both Option 3 and Option 4, over and above the Do Nothing Option. These benefits have been estimated across a range of potential outcomes, where possible, although it is clear that a greater level of benefits (particularly economic, health and social inclusion benefits) may be achievable under Option 4 than Option 3 due to the greater scale of provision. However, Option 4 is also the most costly in NPC terms, and therefore proportionately greater support from Government (financial and non financial) is likely to be required to facilitate its implementation.

1.28 It is therefore proposed that the Preferred Option is to seek to procure a 3rd Generation public hire bike scheme for Belfast with the provision of between 300-500 bikes and 30-50 docking stations. It is proposed that the market should determine the optimum precise size and scale of a suitable scheme for Belfast through the procurement process, and subject to a minimum level of provision equivalent to Option 3. Analysis from the Most Similar Cities study and consultation with existing operators has all confirmed that a scheme within this range should be viable, sustainable and attractive to the market.

Commercial and Financial Case

1.29 Existing bike sharing schemes around the world are diverse in not only their size and scale, but also in terms of the ownership, operating and financing models which exist. The majority of large successful schemes are currently operated by private sector partners and are often funded through an associated contract for advertising and street furniture. A form of a public private partnership would be established for the delivery of the service in this structure. In addition, many cities and authorities do not have the available funding, expertise nor the desire to own, operate and maintain a public hire bike scheme and therefore a partnership model with a private sector company, often linked to advertising, can appear attractive. The requirement to site the majority of bike stations on public footpaths, roads and car parking spaces also necessitates a form of partnering between the public and private sectors. The following table summarises the broad range of available structures which have been assessed in terms of ownership, operation and financing of a public hire bike scheme.

	Owner	Operator	Revenue/Finance	Examples
Public	Public Authority / Public Transport Co	Public Authority / Public Transport Co	Public Funding Member/User Fees Ads on bikes/stations	Orebro, Montpellier, Rome
	Public Authority	Assoc/Co-op	Public Funding Member/User Fees Ads on bikes/stations	Aarhus, Rimini, Modena
	Public Authority	Private Operator	Public Funding Member/User Fees Ads on bikes/stations	Barcelona, Lyon, London
	Advertising Co Contract (or similar)	Advertising Co Contract (or similar)	Low/No Public Funding Member/User Fees Ads on bikes/stations	Dublin, Stockholm, Paris
Private	Private Transport Co	Private Transport Co	Member/User Fees Ads on bikes/stations	Dresden, Dusseldorf, Krakow

1.30 Two key constraints in relation to the ownership, operations and financing of the scheme have been identified in conjunction with Belfast City Council, the Department for Regional Development and the Strategic Investment Board:

- **Ownership & Operations** - Belfast City Council do not have statutory powers in relation to transportation and therefore are unable to own or operate the proposed scheme. In addition, whilst the Department for Regional Development and Roads Service do have such transport powers, the Department has confirmed that it does not intend to own or operate the scheme as it considers that this function is best delivered by the private sector who have significant experience in the development, implementation and operation of numerous schemes throughout Europe.
- **Financing & Affordability** – the options for the proposed bike hire scheme in Belfast must have minimal capital or revenue funding requirements for Belfast City Council or the Department of Regional Development.

1.31 Based on analysis of the broad range of commercial structures available within the context of the ownership and financing constraints, the most appropriate commercial structure is one where an advertising company (or similar) both owns and operates the bike hire scheme. This approach also offers the ability to minimise (although potentially not completely eliminate) conventional capital and revenue funding - instead finance for the scheme would be through a payment in kind, primarily through the creation and provision of **new advertising assets** to the operator, for the duration of the scheme. Importantly, as set out above this commercial structure does not assume that the revenues from existing advertising assets would simply be assigned to the operator as this would result in a cash cost to the public sector.

1.32 The broad principle of this approach would also allow for the financing of the scheme through other forms of payment in kind which may be proposed by the market during a procurement. This commercial approach has been agreed with Belfast City Council, the Department for Regional Development and the Strategic Investment Board.

Affordability and Value for Money

1.33 The proposed commercial structure to deliver the Preferred Option is based on the principle of a payment in kind (PIK) to a private sector owner/ operator. In order to assess the potential level of PIK which may be required by a private sector operator to deliver the Preferred Option in Belfast, it has been assumed that all costs involved in the establishment and operation of the scheme will be met by the operator. In order for the operator to generate a commercial return, a value of payment in kind must be made to provide the operator with an acceptable IRR for the commercial risks which they are assuming. The results of this assessment for the Preferred Option are set out in the table below.

Description	**Preferred Option**
	Real Terms (£m)
Public Sector Costs	
Opportunity Cost per annum (Parking Revenue Foregone)	0.06 - 0.10
Initial (Yr 1 only) Capital Cost	0
Revenue Cost per annum	0
PIK Costs	
Annual PIK	0.36 – 0.58
Total PIK & Revenue (Cash) cost & Revenue foregone p.a	**0.42 – 0.68**
Description	**NPC (£m)**
NPC Opportunity Costs (Parking Revenue Foregone)	0.69 - 1.15
NPC Public Sector Costs	0

NPC PIK	4.12 – 6.71
Total NPC	**4.81 – 7.86**

1.34 As can be seen from the table above for the provision of a 3rd Generation system of between 300-500 bikes with 30-50 docking stations, an annual payment in kind has been calculated of between **£0.36m and £0.58m**. This is based on an estimated IRR of 15%. In addition, the opportunity cost (parking revenue foregone) is between £0.06m - £0.1m per annum.

1.35 This PIK is the value of, for example, new advertising space to the operator which would require to be created and assigned to the operator for the 15 year operational period of the scheme. It is important to note that this assumes that new advertising assets would be created to deliver the PIK, and that existing assets and revenues would not simply be assigned.

1.36 As can also be seen from the table above, this assumes zero public sector cash contribution, although the NPC of parking revenue foregone is between £0.69m and £1.15m. Apart from the potential level of parking revenue foregone, under this scenario, there is a zero cash affordability impact for Belfast City Council or the Department for Regional Development, with the scheme being financed through the value of the PIK. The total NPC of the PIK payments and revenue foregone is between £4.81m and £7.86m.

Sensitivities and Risks

1.37 A number of risks and associated sensitivities have also been undertaken, and the development of these has been informed by consultation with existing scheme operators:

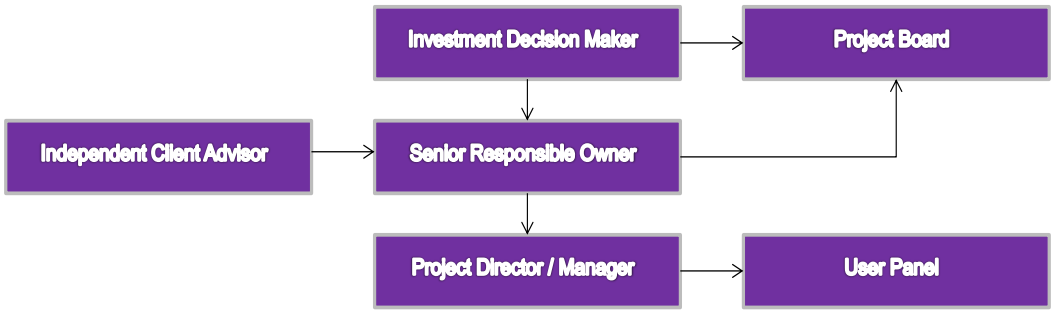
1 Increased market IRR requirement;
2 Market requirement for cash contribution towards scheme in lieu of full financing of scheme via advertising; and
3 Market requirement for public sector underwrite where value of PIK provided (e.g. advertising space) falls in value.

1.38 In addition to the quantified risks and sensitivities set out above, there are a number of further commercial based risks when utilising this commercial approach. Due to the nature of these risks, they are not quantified by way of sensitivity, but have been set out in qualitative terms but are nonetheless important risks which may impact on the project. These further risks include:

4 Failure of scheme to attract projected levels of demand/utilisation; and
5 Advertising market saturation in Belfast resulting in displaced revenues.

Management Case

1.39 In line with the Northern Ireland Guide to Expenditure Appraisal and Evaluation, the project procurement and contract management structure will reflect the guidance provided by OGC in the Achieving Excellence in Construction – Project Organisations guide. A summary of the roles that will be associated with the delivery and management of the project is set out the diagram below.



Procurement Procedure and Timetable

1.40 The Preferred Option is for the provision of a 3rd Generation public hire bike scheme in Belfast of between 300 – 500 bikes with between 30 – 50 docking stations. It is proposed that the market should determine the optimum precise size and scale of a suitable scheme for Belfast. In tandem the preferred commercial structure is to finance the scheme through the provision of a Payment in Kind, most likely to be the creation and provision of new advertising assets for the use of the appointed tenderer.

1.41 Given the Preferred Option is to develop a scheme within a range of scale, the requirement to allow for innovative approaches to scheme design, operation and funding to be proposed by the market, and the degree of complexity associated with a form of payment in kind, it is currently envisaged that a contract for the design, build, finance, operation and maintenance of the scheme would be procured under the Competitive Dialogue procedure.

1.42 A target date for the completion of the procurement has been set out in the table that follows. The timetable assumes a fast tracked competitive dialogue process of 10 months followed by a detailed design and implementation phase in conjunction with the appointed operator which is assumed to take 12 months in total.

Milestone	Target Date
Approval of OBC	June 2011
Dispatch Contract Notice	July/August 2011
Receive Prequalification Submissions	September 2011
Issue ITPD and Commence Dialogue	October 2011
Close Dialogue and Issue ISFT	January 2012
Receive Final Tenders	February 2012
Submit Full Business Case	March 2012
Appoint Preferred Bidder	May 2012
Contract Award	June 2012
Commence Operations	June 2013

1.43 As can be seen from the table above, a period of twelve months has been planned between contract award and the commencement of operations. This period is based on the period of time which was required to move from contract award to commencement of operations in London and also has been noted as reasonable by potential bidders during the experience gathering exercise.

1.44 However, significant uncertainties exist surrounding the period to commencement of operations. This period will be defined by the final payment in kind approach agreed with the Preferred Bidder. In particular, should the preferred bidder solution be based on payment in

kind through the provision and creation of new advertising assets in the City, the installation of advertising panels would require to be subject to the statutory planning process in Northern Ireland. This may involve a significant number of applications to be prepared, processed, amended (where appropriate), possibly appealed, and approved.

Benefits Realisation Plan

1.45 The success of this project will be measured in terms of the extent to which the scheme is utilised and therefore the underlying benefits which underpin the case for investment are realised. Establishing a clear statement of these benefits, how they will be measured and the targets to be achieved (in comparison with the current baseline) is therefore an essential step in managing the realisation of benefits associated with the scheme.

1.46 A draft benefits realisation plan for the public hire bike scheme has therefore been developed The draft benefits realisation plan will be further developed and enhanced during the next stages of the project. Key benefits to be measured include:

- Increase in cycling within Belfast;
- Reduction in CO2 emissions;
- Promotion of Belfast as 'green' city; and
- Accessibility and social inclusion.

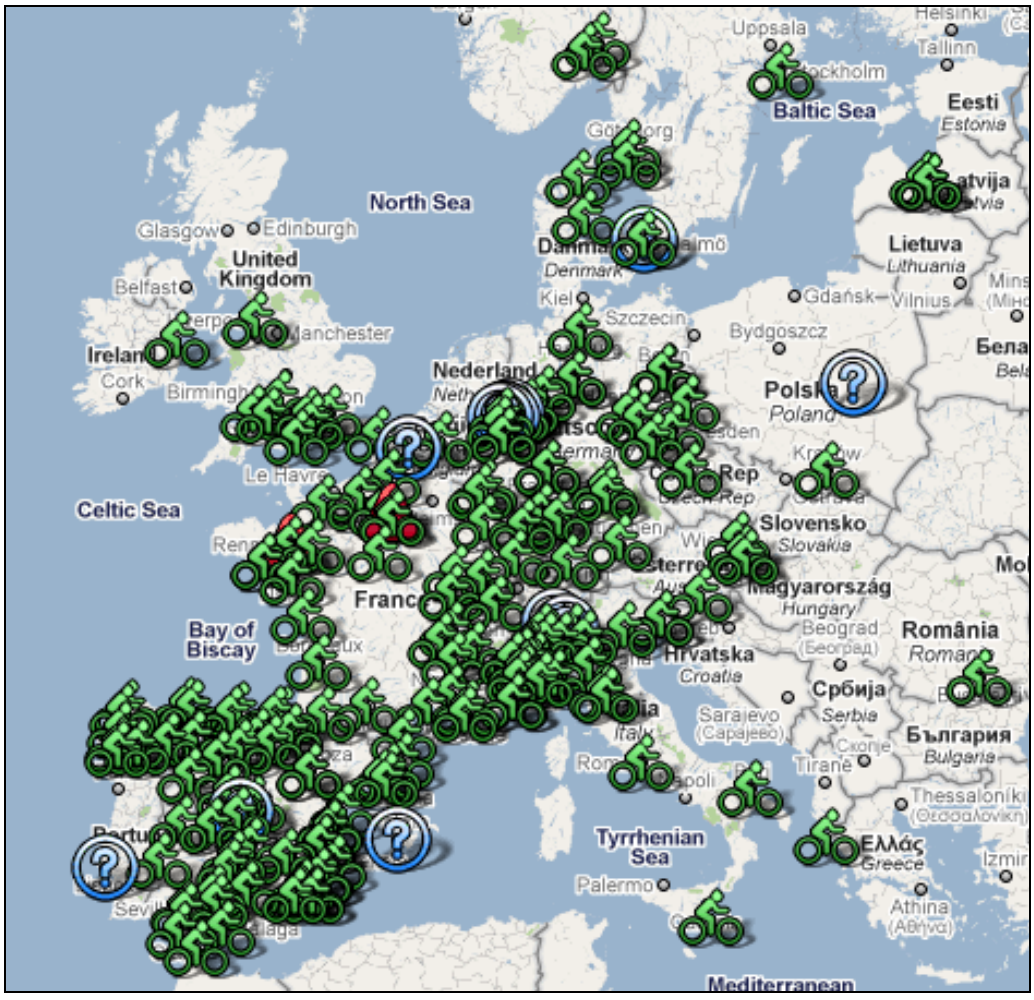
1.47 The draft Benefits Realisation Plan (will be further developed, enhanced and monitored throughout the next stages of the programme. The main actions and responsibilities for benefits management have been defined and allocated within the identified programme management structure.

2 Introduction

Background

2.1 The Strategic Investment Board (SIB) in conjunction with Belfast City Council (BCC) and the Department for Regional Development (DRD) are seeking to examine the rationale and need for establishing a public hire bike scheme in Belfast through the development of this Outline Business Case (OBC).

2.2 Public hire bike schemes have become an increasingly common feature of cities in recent years, particularly in western Europe, with over 100 scheme operational under a variety of structures. Landmark cities such as London, Paris, Copenhagen, Dublin and Barcelona all operate large bike sharing schemes, however, smaller regional cities have also implemented their own projects - with varying degrees of success. The diagram below[5] shows the locations of known schemes in existence in Europe at present:



[5] Bike-sharing World Map, Paul deMaio, 2010

2.3 Modern bike sharing schemes are often characterised by:

- public access bikes situated on public spaces with a common, robust, bike design;
- a network of docking stations and bikes throughout city centre locations;
- self service model through simple locks or sophisticated kiosks; and
- flexible rental period with short term rentals encouraged through tariff calibration.

2.4 Increasingly sophisticated schemes may also include dedicated call centres, chip and pin devices, bike redistribution systems and renewable energy installations on docking stations.

2.5 An example of the bikes used in the Dublinbikes scheme is set out below[6].

2.6 Public bike hire schemes are considered to offer many potential benefits to the cities in which they operate, to users and to residents. Benefits which are related to the establishment of schemes can potentially include:

- provision of a new mode of public transport and encouragement of modal shift from motorised transport;
- addressing of the 'first mile / last mile' commuter issue;
- health and environmental benefits;
- reductions in congestion; and
- promotion of tourism.

2.7 There are in turn a range of risks which need to be addressed in considering the implementation of such a scheme, including:

- over/under estimation of demand;
- theft and vandalism;
- safety and public liability issues;
- availability of space and planning issues; and
- revenue and capital funding.

Purpose of Business Case

2.8 A draft Strategic Outline Case (SOC) was prepared by DRD in September 2010 which concluded there was sufficient evidence to justify the development of an OBC for the scheme.

[6] www.dublinbikes.ie

2.9 Building on the SOC, this OBC aims to provide a full assessment of the strategic fit of the scheme alongside a clear rationale and need for the introduction of a scheme in Belfast. The options surrounding the potential scope and scale of a scheme in Belfast will be informed by a research and consultation exercise with similar existing schemes in Europe (successful and unsuccessful). This exercise will also seek to establish key benchmarks and metrics for any scheme in Belfast, set out key success factors, benefits and seek to draw out experience and lessons learned from successful and unsuccessful schemes implemented to date.

2.10 The OBC will also involve consultation with commercial scheme operators to establish the viability of a scheme in Belfast from an operator's perspective, inform potential scheme business models and assess barriers to entry for operators in Belfast. The resultant financial assessment will establish whether there is a funding gap and assess alternative forms of assistance that may be made available to address any public funding requirement.

2.11 The OBC has been structured to set out the strategic context, current position and need for a scheme in Belfast. It then focuses on the qualitative and quantitative assessment of options to identify the recommended option and, where appropriate, procurement route.

3 Strategic Context

Introduction

3.1 This section presents the strategic context for the potential development of a public hire bike scheme project in Belfast. It discusses the key policies and plans applying to key project stakeholders and sponsors, the strategic relevance of the proposed project and explains specifically how the proposed bike hire scheme project it is expected to contribute to them.

Strategic Context

Belfast City Council Corporate Plan 2008-2011

3.2 The Corporate Plan established for Belfast City Council sets out a number of strategic themes which reflect the priorities for the City in the context of the Council's analysis of needs in the City. Regeneration is a key theme for the Council, with the aim of making Belfast an attractive place to live in, work in, study in, invest in and visit - also developing a strong cultural and tourism experience. A successful public hire bike scheme has the potential to contribute towards the achievement of these objectives through the development of a new, low cost transport mode for both residents and tourists, potentially improving access to the City Centre from transportation hubs and accessibility for tourists.

3.3 In addition, the Council have key objectives of creating a cleaner and greener City, reducing the City's impact on climate change, improving air quality and promoting the City's natural and built heritage. Public bike hire schemes are a clean form of transport, with typically zero direct carbon emissions and have the potential to encourage transport modal shift from motorised forms of transports. Belfast has a very low cycling modal share at present (circa 3%) and cities such as Dublin, London and Paris experienced very large uptakes in cycling upon the launch of schemes in these cities, beyond original expectations.

3.4 Finally, the Council have the related objectives of improving health and activity levels within the City and reducing health and social inequalities. The provision of a public hire bike scheme creates an opportunity for increased levels of activity amongst users and regular cycling is considered to have benefits for general health and well being. Furthermore, a tariff structure which includes a period of free use (typically for the first 30 minutes) is a common feature of schemes to encourage use and indeed this free use may contribute towards addressing health and social inequalities by facilitating access for parts of the community who cannot access a bike at present.

Department for Regional Development Corporate & Business Plan 2010-11

3.5 The DRD Corporate & Business Plan for 2010-11 recognises the need to promote sustainability whilst achieving a proper balance between economic, environmental and social needs, indeed the Department now have a particular focus on sustainability in relation to travel and transport. The Plan recognises the high dependency on the car, particularly in urban areas is not sustainable and states that the significant increase in emissions and in congestion must be addressed. The Department aim to assist the Executive in achieving targets in line with the Programme for Government to reduce greenhouse gas emissions by 25% by 2025.

3.6 The development of the public hire bike scheme fits these strategic objectives as the greenshouse gas emissions from cycling are zero and the emissions from a public hire bike

scheme would be limited to that produced by any motorised vehicles employed in the operation and maintenance of the scheme. The potential to encourage a modal shift within Belfast City Centre will also contribute towards the reduction in both emissions and the easing of congestion levels.

Travelwise NI

3.7 Travelwise NI is a DRD Service initiative to encourage the use of sustainable transport options such as walking, cycling, public transport or car sharing. The initiative is delivered in partnership with the Department of Education, DOE Road Safety Branch, Sustrans, Public Health Agency and Translink. With regard to cycling, Travelwise NI sets out the range of benefits for cyclists such as improved health, reduced stress, lower costs, with a view to encouraging uptake of this form of transport. The initiative also sets out the range of benefits to local employers and suggests ways in which employers can create a more cycle friendly workplace. The initiative furthermore provides advice to cyclists and potential cyclists on topics including: combining cycling with other modes of public transport, health & safety and provides cycling route maps.

3.8 The development of the public hire bike scheme in Belfast would clearly fit with the aims of the DRD Travelwise NI initiative; specifically that the provision of strategically located bikes for public use will further encourage sustainable transport through cycling in the City.

Northern Ireland Executive Sustainable Development Strategy

3.9 The Executive's Sustainable Development Strategy is a framework document to inform decisions taken locally in progressing the sustainability agenda in Northern Ireland. The Strategy recognises that sustainability in all its forms can lead to economic benefits for everyone and therefore seeks to promote sustainability across all parts of the community.

3.10 The Strategy sets out a number of Guiding Principles and Strategic Objectives which are considered to represent the most urgent challenges for the Executive. In relation to the public hire bike scheme, the Strategy aims to ensure investment in physical regeneration and infrastructure investment meets sustainability objectives, and develop an integrated transport structure which promotes growth and social inclusion whilst reducing emissions and adverse impacts. The development of a public hire bike scheme would represent only a small part of a larger integrated transport structure, however, the scheme would be fully aligned with these objectives of growth, sustainability and social inclusion. Indeed, the scheme offers the opportunity to be fully integrated into the wider public transport network through the use of integrated ticketing or smart cards.

Belfast Metropolitan Transport Plan

3.11 The Belfast Metropolitan Transport Plan (BMTP) was developed by DRD in 2004 and recognised that transport problems are adversely affecting the environment and the quality of life in the metropolitan area and, because of increasing congestion, are impacting upon the economic competitiveness of Belfast and Northern Ireland as a whole.

3.12 The BMTP aimed to develop a multi-modal approach to transport that taking into account the sustainable local transport provision and aimed to provide for and encourage greater levels of cycling It recognised the important role that transport can play alongside other government initiatives in helping social inclusion by providing better access to employment, health and leisure facilities. In this context, the development of a public hire bike scheme would fit with the aims of the BMTP by providing a sustainable mode of public transport, which could be integrated with existing modes and at the same time contribute towards employment, health and access to leisure facilities.

Northern Ireland Cycling Strategy

3.13 The Northern Ireland Cycling Strategy was developed in 2000 by the Department for Regional Development and was intended to act as a building block to encourage and facilitate a more sustainable mode of transport. The Strategy recognised the potential health, environmental and social inclusion benefits of cycling. Whilst the Strategy did not in itself foresee or include provision for the development of a public hire bike scheme in Belfast the development of such a scheme would have the potential to contribute towards the objectives of increased cycling and improved health benefits contained within the Strategy document.

Belfast On The Move

3.14 Belfast On The Move is the transport masterplan for Belfast City Centre developed by DRD focusing on the development of "sustainable transport enabling measures" in the city centre. The masterplan and proposals were open to public consultation until 30 November 2010. The main aim of the proposals is to reorganise traffic management within the city centre to facilitate the reduction in general traffic levels and encourage walking, cycling and public transport use. Key elements of the proposals include:

- redistribution of existing roadspace to provide extensive bus priority measures for use by all public transport vehicles, taxis and cyclists;
- over 2.6km of new bus lanes which will also accommodate cyclists and taxis; and
- 1.3km of new dedicated cycle lanes.

3.15 Responses to the consultation have been assessed as supportive of the proposals and DRD will take forward their development over the next two years[7]. These measures outlined above will improve the cycling infrastructure within the city centre, make the area less congested and therefore more suitable to the development of a scheme which can attract a sustainable level of use. Any proposals to develop a public hire bike scheme in Belfast will need to be developed within the framework and masterplan set out by this programme.

Belfast Rapid Transit

3.16 DRD are currently progressing with proposals to develop a Rapid Transit programme in Belfast. A number of potential rapid transit halts have been identified in the City Centre and the development of a public hire bike scheme will need to be cognisant of the proposed locations of these halts. The optimal location for the bike scheme docking stations will allow for integration with all modes of public transport to facilitate the completion of journeys into and around the City.

Belfast Streets Ahead

3.17 The Belfast Streets Ahead project commenced in June 2007 and is due to complete in Spring 2011 with the aim of transforming fourteen of Belfast's main streets and public spaces, through the improvement of street infrastructure, the provision of public artworks and the provision and improvement of public furniture, lighting, signage and landscaping. The development of a public hire bike scheme in Belfast will need to be undertaken in the context of this project and the facilities and maintenance arrangements put in place by the scheme.

Conclusion

3.18 Based on the review of the relevant strategic policies, and programmes set out above, the development of a public hire bike scheme in Belfast would provide a strong fit with these key policies and programmes.

[7] http://www.roadsni.gov.uk/index/belfast_on_the_move.htm

4 Current Position

Introduction

4.1 This section of the OBC sets out the current level of cycling provision in relation to bike hire in Belfast, cycling infrastructure in Belfast and presents information of the current level of cycling uptake and modal share in the City. The section also sets out the key stakeholder groups in relation to cycling in Northern Ireland.

Current Cycling Provision in Belfast

4.2 There is no existing public hire bike scheme in Belfast similar in nature to those operated in Dublin, London, Paris and many other European cities. There are in contrast a number of private hire options available to the public which are typically operated by local cycle retailers. These schemes are characterised by daily and weekly hire charges and are primarily aimed at tourists and visitors who will hire bikes for up to a week or more at a time.

4.3 The Belfast Metropolitan Transport Plan (BMTP) notes that infrastructure provision for cyclists in Belfast is currently poor in comparison to some other UK metropolitan areas, and poorer still in comparison to a number of towns and cities in continental Europe. It is noted that cycling is often unattractive in the Belfast metropolitan area due to conflicts with road traffic.

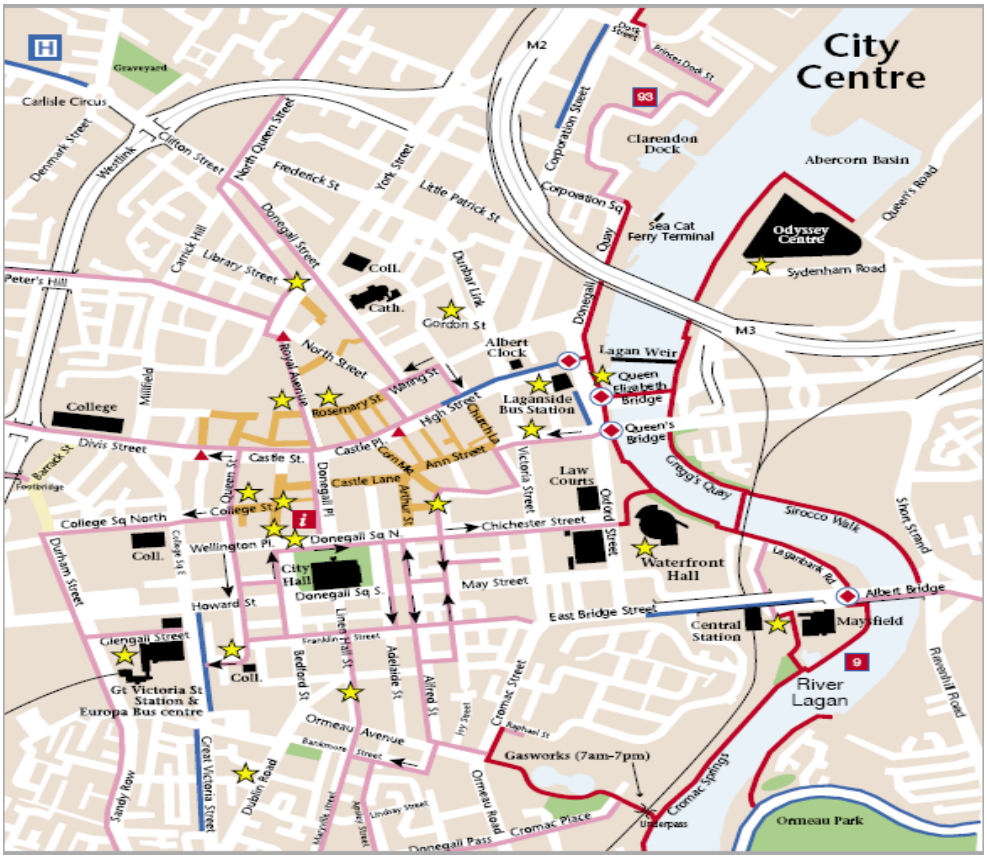
4.4 In terms of physical cycling infrastructure, there is a relatively small network of both segregated and non segregated cycle lanes in the City Council area. Within the City Centre (where any potential public hire bike scheme is most likely to be located) the off road, or segregated cycle tracks are primarily located along the route of the River Lagan from the Odyssey Arena in the north through to Botanic Gardens in the south of the City; the Gasworks area; Ormeau Park; and alongside the Westlink from the Grosvenor Road to Broadway.

4.5 There are a number of on road, or non segregated cycle lanes or cycle/bus lanes in the City Centre also. These are located primarily located along High Street, East Bridge Street, Great Victoria Street and Corporation Street. There are also non segregated lanes on the Ormeau and Ravenhill Roads, Crumlin Road and Sydenham Bypass.

4.6 There are over 750 miles of National Cycle Network in Northern Ireland[8]. Within the greater Belfast area, there are 21 miles of cycle lanes and towpath through the heart of Belfast, on National Cycle Network Route 93 and 9. Route 93 commences in Jordanstown and travels up Belfast Lough, through the Clarendon and harbour areas to the City Centre. Route 9 then continues from the vicinity of the Waterfront Hall along the embankment towards Stranmillis and on towards Lisburn.

4.7 A map of the existing cycle network within the Belfast City Centre area is presented in the diagram below[9].

[8] Bike it with Translink, www.translink.co.uk
[9] http://www.travelwiseni.co.uk/belfast_by_bike_2004.pdf, Travelwise NI



The Department for Regional Development has advised that within the Belfast City Council area at present there are 74 km of dedicated cycle tracks or cycle lanes, and a further 24 km of bus lanes which allow cycling. However, the majority of this network exists outside of the core city centre area depicted in the graphic above. The detailed list of the existing cycle facilities and cycle lanes within Belfast is included at Appendix A to this report.

Current & Historical Cycling Data

4.8 At present, cycling in Belfast (and Northern Ireland as a whole) has a relatively low uptake compared to a number of cities in Europe. Over the past decade, the overall level of cycling within Northern Ireland, measured by total distance travelled, has remained at approximately 0.3%. A summary of average distance travelled by travel mode is set out in the table below[10]:

Mode	99-01	%	03-05	%	06-08	%	07-09	%
	Miles		Miles		Miles		Miles	
Walk	146	2.4	139	2.3	143	2.4	144	2.4
Cycle	19	0.3	20	0.3	16	0.3	20	0.3
Car	4,891	81.8	4,870	81.8	4,916	81.4	4,840	80.6
Motorbike	20	0.3	31	0.5	11	0.2	14	0.2
Bus	415	6.9	369	6.3	351	5.8	375	6.3
Rail	53	0.9	56	0.9	76	1.3	69	1.2
Other	441	7.4	466	7.9	520	8.6	540	9.0
Total	**5,985**	**100**	**5,951**	**100**	**6,033**	**100**	**6,002**	**100**

[10] Average Distance by Travel Mode, Travel Survey for NI In Depth Report 2007-09, DRD

4.9 As can be seen from the table above, the average distance travelled by bike within Northern Ireland has remained at approximately 0.3% of total miles travelled throughout the last decade.

4.10 The following table presents a summary of the average distance travelled per person by mode specifically within the wider Belfast area[11]:

Mode	**99-01**	**%**	**03-05**	**%**	**06-08**	**%**	**07-09**	**%**
	Miles		**Miles**		**Miles**		**Miles**	
Walk	186	4.9	188	5.6	248	7.0	242	6.4
Cycle	13	0.3	14	0.4	19	0.5	28	0.7
Car	2,987	79.1	2,570	76.7	2,617	74.7	2,858	75.8
Motorbike	20	0.5	16	0.5	2	0.1	2	0.1
Bus	350	9.3	306	9.1	371	10.6	322	8.5
Rail	52	1.4	38	1.1	63	1.8	84	2.2
Other	168	4.5	220	6.6	185	5.3	233	6.3
Total	**3,776**	**100**	**3,352**	**100**	**3,505**	**100**	**3,769**	**100**

4.11 As can be seen from the table above, within the Belfast area the overall modal share for cycling remains less than 1% in terms of total distance travelled. However, the average distance travelled by cyclists has more than doubled as a proportion of overall travel over the last decade.

4.12 In terms of commuters and business trips, the percentage of workers who utilised a bicycle as a means of travel has remained constant at 1% over the past decade across the whole of Northern Ireland. In contrast, the percentage of workers travelling by car has increased marginally from 80% to 81%[12] across Northern Ireland. The following table sets out the data relating to method of travel to work for the Belfast area[13]:

Mode	**99-01 (%)***	**03-05 (%)**	**06-08 (%)**	**07-09 (%)**
Walk	11	17	25	22
Cycle	1	1	3	3
Car	80	66	54	59
Motorbike	1	2	0	0
Bus	5	11	13	12
Rail	1	1	0	0
Other	1	2	5	4
Total	**100**	**100**	**100**	**100**

* Data for 99-01 relates to NI as a whole. Remaining data relates to Belfast only.

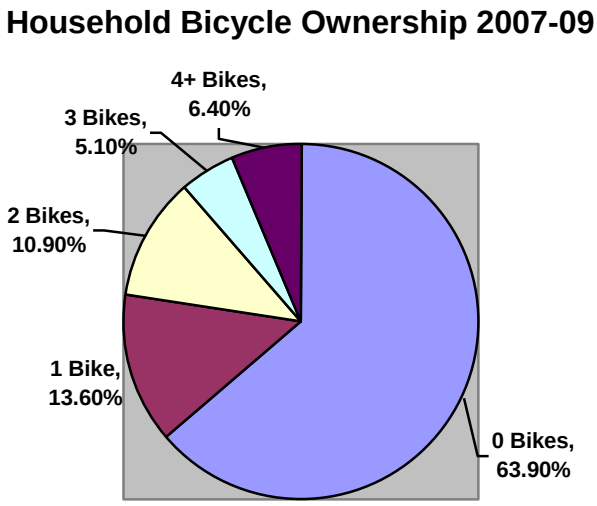
4.13 As can be seen from the table above, the overall percentage of people who utilise the car in Belfast has reduced over the last 10 years, however the percentage utilising bicycles as a mode of transport to work within the Belfast area has grown, but remained low over the last decade,

[11] Average Distance by Travel Mode, Travel Survey for NI, DRD (99/01, 03/05, 06/08, 07/09)
[12] Method of Travel to Work, Travel Survey for NI In Depth Report 2007-09, DRD
[13] Method of Travel to Work by Area, Travel Survey for NI, DRD (99/01, 03/05, 06/08, 07/09)

at circa 3%, albeit it has increased from a low base level. By way of comparison, the overall share of people travelling to work in the UK on bicycle is also approximately 3%[14].

Current Bicycle Ownership and Demographics

4.14 The Travel Survey for Northern Ireland 2007-09 estimates that 36% of households in Northern Ireland own one or more bicycles. A subset of data specifically relating to Belfast was not published. The following chart sets out the level of household bicycle ownership in Northern Ireland in 2007-09[15].



4.15 The table above shows that almost 64% of the population do not own a bicycle. In terms of change over the last decade, the results for 2007-09 are noted by the DRD Travel Survey to be very similar to those recorded in 1999-01.

4.16 The following table sets out further details on the age and sex of those who have cycled in the last 12 months in Northern Ireland[16]. Again it should be noted that this dataset relates to Northern Ireland as a whole as data for Belfast was not published.

	Percentage who have cycled in last 12 months		
Age	**Male**	**Female**	**All Persons**
0-15	61%	61%	61%
16-29	30%	21%	25%
30-59	29%	18%	23%
60+	9%	2%	5%
All Persons	32%	22%	27%

4.17 As can be seen from the table above, cycle usage in Northern Ireland decreases with age, with the majority of those who have cycled in the last 12 months aged under 15 years. Furthermore,

[14] Method of Travel to Work UK/NI Comparison, Travel Survey for NI In Depth Report 2007-09, DRD

[15] Household Bicycle Ownership, Travel Survey for NI In Depth Report 2007-09, DRD

[16] Bicycle Usage, Travel Survey for NI In Depth Report 2007-09, DRD

cycle usage is generally higher among males, with the exception of the 0-15 years age group where the uptake of cycling is broadly equal.

Conclusion

4.18 The paragraphs above have set out clearly that the level of cycling within Northern Ireland has increased over the last decade, although remains a very low level of overall modal split. The overall level of bike usage at present in Northern Ireland however is relatively similar to the rest of the UK. Northern Ireland however remains heavily dependent upon car use, particularly outside of Belfast.

5 Assessment of Need

Introduction

5.1 It is a requirement of the Northern Ireland Guide to Expenditure Appraisal and Evaluation (NIGEAE) that business cases and appraisals should establish the a need for Government intervention, regardless of whether Government support or interventions takes the form of public service provision or capital and revenue funding or some other measure. This section therefore sets out the rationale and need for public sector intervention in the provision of the scheme.

Rationale for Public Sector Intervention

5.2 Public sector intervention is required to address instances of market failures and to advance the achievement of economic efficiency. In this context, the SOC noted that if the private sector was able to successfully operate a scheme in Belfast, in the absence of any public sector support, then such a scheme would likely already exist. Indeed, evidence from schemes elsewhere clearly suggest that a level of public sector support is required in order to deliver an effective and sustainable bike hire scheme. Public sector support or intervention can be provided in a number of different ways, and examples of public sector support for existing, successful bike schemes in a range of countries are set out in the table below:

Scheme	Public Sector Support
Dublinbikes	Provision of advertising space, access to road network and public space to commercial operator.
London Cycle Hire	Operating subsidy, access to road network and public space to commercial operator.
Paris	Provision of advertising space, access to road network and public space to commercial operator.
Lyon	Provision of advertising space, access to road network and public space to commercial operator.
Barcelona	Operating subsidy, sharing of car parking revenues, access to road network and public space to commercial operator..
Stuttgart	Operating subsidy, access to road network and public space to commercial operator..

5.3 A further efficiency argument for the introduction of a scheme in Belfast would be the existence of positive externalities. These are generally accepted to include increased public health benefits, reduced pollution and reduced congestion. The existence of these positive externalities and benefits is quoted by a number of sources including the NICHES Consortium[17] (an EU sponsored project designed to address urban transport policy implementation) and the Business Case developed by Transport for London for the implementation of a cycle scheme in London[18]. The potential for externalities and benefits will be assessed in detailed in Section 10 of this OBC.

[17] New Seamless Mobility Services - Public Bicycles, Policy Notes, NICHES Consortium
[18] Cycle Hire Scheme Business Case Submission, Transport for London

5.4 In addition, an online survey has been carried out on behalf of Belfast City Council in February 2010 of over 200 individuals which indicated that over 50% of the people living or working in Belfast would use a public hire bike scheme if one were implemented in the City[19].

5.5 The introduction of a public hire bike scheme in Belfast also offers the potential to have an additionally impact through the creation of net output and employment in the City. For example, the Aarhus cycle scheme has created social employment opportunities through a dedicated project where the local Labour Market Centre is responsible for the ongoing maintenance and servicing of the public bikes[20]. The City Bike scheme in Copenhagen sustains 30 employess on rehabilitation programmes within the Bycykelservice organisation and notes that 80% of people involved in the scheme subsequently go on to find permanent employment[21]. Furthermore, the Indeed, all schemes when operational will offer employment opportunities in the region. It is considered that these positions will be real net benefits to Belfast as there is no similar scheme currently in existence from which social employment may be displaced.

Evidence Based Demand Assessment - Approach

5.6 The NIGEAE requires that relevant projections of the future nature and levels of demand for services over time should be provided and suitably quantified. The approach to the estimation of demand for new cycling facilities in this Outline Business Case has been undertake in accordance with Department for Transport (DfT) Transport Analysis Guidance (TAG), specifically TAG Unit 3.14.1 "Guidance on the Appraisal of Walking and Cycling Schemes".

5.7 TAG Unit 3.14.1 provides for the estimation of future levels of cycling through the undertaking of a Comparative Study, which makes comparisons with other schemes similar to the one being proposed.

Comparative Study Background

5.8 In order to undertake this Comparative Study, a comprehensive list of almost 80 existing, operational public hire bike schemes in Europe in 2010 was developed. This list captured the location and name of each scheme, key metrics in relation to the cities in which the schemes operated (urban population and area) and high level scheme parameters (number of bikes, number of docking stations).

5.9 Extracts from the detailed list of schemes is presented in the table below. The full list of cities captured during this initial information gathering exercise is set out at Appendix B to this report.

City	Name	City Population	City Area (km2)	No. of bicycles	No. of Stations
Copenhagen	Bycyklen	531,199	88	2,000	110
Lyon	Vélo'v	608,000	67	4,000	340
Dublin	dublinbikes	506,211	115	450	40
Bari	Bari in bici	322,511	116	50	5
Oslo	Oslo Bysykkel	590,941	454	1,200	106
Stockholm	Stockholm city bikes	829,417	188	500	83
Blackpool	Hourbike	141,900	35	500	70

[19] Examining the potential for bike sharing in Belfast, British Council, 2010
[20] http://www.aarhusbycykel.dk/index_eng.html
[21] Smart Measures Portfolio – Public Bikes and Cycle Hire Schemes, Cycling England

Most Similar Cities

5.10 A two stage approach was then taken to developing the Comparative Study as follows:

- Detailed study of metrics and experience from a list of **Most Similar Cities**, including consultation with scheme operators or public authorities, where possible and
- Case studies of **best practice and experience elsewhere** from identified landmark schemes.

Stage 1 – Identifying Most Similar Cities

5.11 As set out above, the first stage in the Comparative Study was to identify a panel of Most Similar Cities which would be taken forward for detailed research and examination. The primary criteria used to initially identify the Most Similar Cities was City Population and City Area. In defining City Population and Area, it was attempted to establish these metrics for the core cental area of each city, and not the wider urban or metropolitan area.

5.12 Using these primary criteria, the list of cities was filtered to identify those which were most comparable to Belfast. The key data in relation to Belfast used to filter the long list of existing schemes is set out in the table below, with a 25% variance:

City	Name	City Population	City Area (km2)	No. of bicycles	No. of Stations
Belfast	n/a	268,300 [22]	110 [23]	n/a	n/a
	+ 25%	335,375	138		
	- 25%	201,225	83		

5.13 The list of Most Similar Cities for detailed research was agreed in consultation with DRD, Belfast City Council and SIB. The cities identified are as follows:

City	Name	City Population	City Area (km2)	No. of bicycles	No. of Stations
Aarhus	Århus Byckel	242,914	91	400	57
Bari	Bari in bici	322,511	116	80	10
Montpellier	Vélomagg'	265,634	57	750	59
Dublin	dublinbikes	506,211	115	450	40

5.14 Given the unique demographic and geographic characteristics of each individual City, it is not possible to develop a shortlist of cities which are exactly aligned with Belfast in terms of both population and area. However, the cities set out above were considered to represent the most comparable within a 25% tolerance. As can be seen from the table above, a wide range of countries was also selected.

5.15 In addition, Dublin has been included on this list of cities. It is recognised that whilst Dublin City is similar in terms of area to Belfast, the city population and therefore population density is significantly greater. However, it was considered that given the proximity of the scheme and

[22] Population and Migration Estimates Northern Ireland (2009) Statistical Report, NISRA
[23] http://www.nisranew.nisra.gov.uk/census/area_measurement.html, NISRA

the similar geographic, demographic, climatic and cultural characteristics, that Dublin should be included on this list of Most Similar Cities.

Stage 2 – Identifying Best Practice and Experience Elsewhere

5.16 The second stage in the Comparative Study was to review further landmark schemes for evidence of best practice and to gather experience elsewhere in case study format. There are a number of schemes and cities which are considered to be very successful, and whilst some of these cities may not be directly comparable to Belfast in terms of population of size, it is considered important to gather experience and best practice from these cities.

5.17 This further gathering of best practice and experience would be used to inform the demand analysis, but primarily the development of options for a scheme in Belfast. These cities are:

City	Name	City Population	City Area (km2)	No. of bicycles	No. of Stations
Paris	Velib	2,168,000	105	20,000	1,639
Lyon	Velo'v	480,660	72	4,000	400
Barcelona	Bicing	1,621,537	101	6,000	400
London	Barclays Cycle Hire	7,556,900	659	6,000	400
Montreal	Bixi	1,620,693	365	5,000	400
Melbourne	Melbourne Bike Share	4,000,000		600	50
Bristol	Hourbike	551,066	115	Scheme Closed	
Cambridge	'Green Bikes'	123,000	48	Scheme Closed	
Brussels	Cyclocity	1,081,000	161	Scheme Closed	

5.18 As can be seen from the table above, Bristol, Cambridge and Brussels were included on this list. In contrast to the other cities named, each of these schemes have ceased operations and folded. (Note Brussels has since re-launched a revised scheme). In addition, Melbourne is considered to be a scheme struggling to gain popularity and significant uptake since its introduction. It is considered vital for this project to also consider the lessons learned from these failed schemes and to apply any experience to the development of a potential scheme in Belfast.

Most Similar Cities Study

5.19 A wide range of metrics have been gathered to inform the Most Similar Cities study. The metrics are based on a research exercise undertaken by the OBIS Project ("Optimising Bike Sharing in European Cities") and supplemented where existing research had not been performed as part of the project or where the OBIS Project had not examined particular cities.

5.20 The OBIS Project is a European sponsored initiative to advance the role and the opportunities of cycling as a an instrument to foster clean and energy efficient sustainable modes of mobility in urban areas. Key partners within the OBIS Project group include:

- Transport for London;
- Call a Bike, Deutsche Bahn;
- Cete de Lyon; and
- Adjuntament de Barcelona.

5.21 The Most Similar Cities study which follows sets out the a range of indicators to allow for comparison of specific features across the identified Most Similar Cities. These indicators are organised under four broad themes and are summarised below:

Category	Indicator
Infrastructure & Performance	System Infrastructure and Size
	Utilisation and Membership
	Integration
Operational	Commercial Structure
	Tariff Structure
	Employment
Geographic	Population, Area and Density
	Mode Share
	Weather and Topography
	Bicycle Culture

5.22 The data in relation to the above indicators is subsequently followed in this Section by a narrative case study of each of these schemes, including key success factors and lessons learned. The detailed data together with sources of information is presented in Appendix C to this report.

Infrastructure and Performance Indicators

5.23 The following set of indicators set out a range of scheme specific characteristics within each of the Most Similar Cities. These indicators focus on the level and scope of provision of physical scheme infrastructure, but also set out information and comparators in respect of scheme uptake, demand and utilisation.

System Infrastructure and Size

5.24 The following table sets out the scale of schemes which are currently understood to be operational in the Most Similar Cities.

Description	Dublin	Aarhus	Montpellier	Bari
Number of Bikes	450	450	650 long term 600 short term	90
Number of Stations	40	57	50	13
Number of Docks	800	n/a	528	140
Area Covered by Scheme	5 km2	c. 6 km2	c. 6 km2	c. 5 km2
Ave Distance between Stations	300m	c. 300m	c.350m	c. 500m
Fixed Docking Stations	Yes	Yes	Yes	Yes
Online Information	Yes	Yes	Yes	Yes
'Live' Online Information	Yes - iPhone	No	Yes	Yes
Operational Period	0530-0030	24 hours	24 hours	0700-2200
	All year	01/04 - 31/10	All year	All year

5.25 As can be seen from the table above, both Dublin and Aarhus have a similar level of bike provision. Montpellier operates an alternative scheme to that in Dublin in Aarhus, whereby residents have the option of taking a long term (up to one year) loan of a bike. However, in terms of short term bike provision, the number of bikes provided is also similar to that in both Dublin and Aarhus. The scheme in Bari is noticeably smaller in terms of bike provision, indicating a pilot scheme in nature.

5.26 In terms of docking stations, Dublin, Montpellier and Aarhus also have similar levels of provision; Bari has a lower level given the fewer bikes in the scheme, however the ratio of stations to bikes in Bari is slightly lower than in the other cities. The number of docking points provided at docking stations in each city varies. Dublin has a ratio of approximately 2:1, Bari approximately 1.6:1 with Montpellier circa 1:1. No data was available in relation to Aarhus.

5.27 Each of the schemes examined operates within a core city area in the region of 5-6 km2, with docking stations mainly around 300 meters apart, on average.

5.28 Each city also offers online information in relation to (where relevant) user accounts, bike station locations, tariffs and live information on the location of available bikes and vacant docking points (excluding Aarhus). Aarhus and Montpellier operate on a 24 hours a day basis, whereas Dublin for safety reasons decided not to operate the scheme between the hours of 00.30 and 05.30. In addition, Aarhus operates on a seasonal basis due to climatic conditions in the winter in the city.

Utilisation and Membership

5.29 The following table provides available data in relation to the levels of membership and utilisation for each of the identified schemes.

Description	Dublin	Aarhus	Montpellier	Bari
Key User Groups	Residents & Workers	Residents, Tourists, Workers	Residents & Workers	Residents, Tourists, Workers
Average Daily Hires	5,000	6,000[24]	1,950	30
Average Daily Hires per Bike	11	13	3*	<1
Total Registrations	44,097	46,000	9,000	N/A
Registrations in Previous Year	44,097	n/a	n/a	N/A
Hires in Previous Year	1,101,877	1,200,000	c. 266,000	c.10,500

***** Based on short term bike hires.

5.30 In establishing a bike sharing scheme in a city, it is vital to establish who the target user group for the scheme is intended to be. This will in turn be central in informing scheme design, locations and operational factors. In the cities identified, the OBIS data noted that each of the cities sought to target primarily target city residents and workers moving in the city, or coming into the city. The schemes in Aarhus and Bari were also designed to take cognisance of tourism, however were primarily focused on residents and workers.

5.31 Data in relation to the Dublin scheme and consultation with Dublin City Council and the scheme operator demonstrates a very strong uptake and usage of the scheme, with over 44,000 registrations and an average daily level of hires of 5,000 and each bike being used on average 11 times per day. This compares favourably with the less advanced scheme in Aarhus. Estimates from user surveys undertaken in the city implied up to 46,000 registrations (albeit there is no formal membership required for the scheme in Aarhus), approximately 6,000 daily hires with a bike being used on average 13 times each day.

[24] Registration is not required and not recorded due to lack of electronic systems, however an evaluation undertaken by DMA Research indicated that the scheme is used by 19% of Aarhus's residents. This would equate to approximately 46,000 registrations on an electronic based system. Within this population of 19%, 5% use the bikes on a daily basis, 5% use the bikes up to 3 times a week, <2% use the bikes up to 2 times a week and 88% use the bikes at most once per week. A weighted average daily use has therefore been calculated at approximately 6,000 per day and circa 1.2m uses during operational months each year.

5.32 The Montpellier scheme is estimated to be used almost 2,000 times per day, which equates to an average of 3 uses per day per bike. There are estimated to be approximately 9,000 scheme members (long term semi-permanent hire and short term) according to the data gathered for the OBIS project. Data in relation to the scheme in Bari was limited in nature however research compiled for the OBIS project estimated that bikes were being hired on average only 30 times per day across the scheme, with each bike being used on average less than once per day.

Integration

5.33 The following table sets out indicators in relation to bike scheme integration.

Description	Dublin	Aarhus	Montpellier	Bari
Integrated Transport Ticket	No	No	Yes	No
Train Stations with Docks	No	2	21	1

5.34 In order to encourage intermodality, cities will often ensure that their bike share scheme is integrated or compatible with local public transport systems, often through integrated ticketing. In the case of the cities identified for examination however, only Montpellier has progressed down this route. However, it should be noted that the scheme in Aarhus is not electronic in nature therefore integrated ticketing is not possible, and the scheme in Bari appears to be operating as an initial pilot scheme. The ticketing system is Dublin is not integrated with public transport, for example, Luas or DART systems, primarily due a lack of electronic (or swipe card) technologies in operation on existing modes of public transport. Lessons learned from other cities are presented later in this chapter, however a key criticism of the London bike share scheme is the lack of interoperability of the bike system with the City's Oyster Card scheme.

5.35 However, in the case of Montpellier, a large number of docking points are located within transport hubs to allow for a physical integration of modes. Dublin in particular took an consciously opposing stance, whereby bike stations are not located directly at major public transport hubs. This was primarily to manage demand, and avoid bike racks being continually empty at these hubs, requiring continual forced redistribution and in turn fostering a level of dissatisfaction and disappointment in large numbers of commuters presented with constantly empty racks at train stations and other hubs.

Operational Indicators

5.36 The following indicators focus on operational and commercial aspects of the Most Similar Cities.

Commercial Structure

5.37 The indicators below provide details on the owner/operator commercial model employed by each scheme, and an estimation of the revenue sources in operation.

Description	Dublin	Aarhus	Montpellier	Bari
Bike Provider/Manufacturer	JC Decaux	Schroeder Cykler CIOS	Smoove	Bicincitta
Operator	JC Decaux	Århus Municipal Authority	TAM	Amtab Spa
Commercial Risk Owner	JC Decaux	Århus Municipal Authority	Montpellier Agglomeration	Commune di Bari
Tariff Income (%)				
Income from Users	-	-	10%	100%
Income from Advertising	100%	23%	-	-
Subsidy from Public Sector	-	77%	90%	-
Contract Duration	15 years	N/A	N/A	N/A
Advertising on Bikes	No	Yes	No	No
Street/Billboard Advertising	Yes	No	No	No
Advertising on Stations	No	No	No	No

5.38 Each of the cities identified operates a different commercial structure. The dublinbikes scheme is owned, operated and maintained by the advertising company JCDecaux, who have a 15 year contract to provide the scheme in return for the provision of advertising assets within the city. The scheme is therefore funded entirely through advertising revenues (user revenues are a very small proportion) and JCDecaux retain the operating risk from the scheme. In contrast the Aarhus scheme is owned and operated by public municipal authorities, in part as a social enterprise project; the maintenance of the scheme is undertaken as part of an unemployment project in the city. The scheme is funded entirely by the city and more recently, the city has introduced an advertising agent to sell advertising space on bikes and it is estimated that this may provide up to 23% of the revenue for the scheme.

5.39 The schemes in Montpellier and Bari are both owned and operated by the municipal authority and public transport company, respectively. Neither scheme incorporates advertising revenue, however the key difference is that the Montpellier scheme is primarily funded by public sector subsidy, whereas the Bari scheme (which is considered to be a pilot) is funded through user tariffs. Further detail in relation to the commercial structure of the schemes in set out in the case studies which follow.

Tariff Structure

5.40 The table below sets out the tariff charging structures operated by each scheme in the study.

Description	Dublin	Aarhus	Montpellier	Bari
Payment Method	Card only	Coin only	Cash or Card	Card In Person
Unlocking System	Card Based	Coin Based	Key	Card
Deposit Amount	€150	20 DKK	€150	None
Fare Description 1	Long Term	No Fare	Explorer	Bari in Bici
Fare Validity	365	-	4 hrs / 1 day	365
Registration Cost	€10	-	€1.00 / €2.00	€10
Free Use Period	30mins	-	0	0
Cost after 1 hr	€0.50	-	0	0
Cost after 2 hr	€1.50	-	0	0
Fare Description 2	3 Day Ticket	N/A	For Me	N/A
Fare Validity	3 days	-	3 mth/ 12 mth	
Registration Cost	€2	-	€40 / €80	
Free Use Period	30mins	-	N/A	
Cost after 1 hr	€0.50	-	0	
Cost after 2 hr	€1.50	-	0	
Fare Description 3	N/A	N/A	Free Time	N/A
Fare Validity	-	-	365.00	-
Registration Cost	-	-	0.00	-
Free Use Period	-	-	N/A	-
Cost after 1 hr	-	-	€0.25	-
Cost after 2 hr	-	-	€0.50	-

5.41 A range of payment methods are employed on the schemes in the study. The Dublin scheme operates a sophisticated smart card based system which provides access to bikes via electronic terminals, and also provides for credit card access via terminals at select bike stations. In contrast, the Aarhus scheme operates on a much simpler, low cost model whereby access is gained through the deposit of a coin into a locking mechanism on each bike. No tariffs are charged for the scheme so there is no need for coin or card based payment systems. Bari and Montpellier operate a payment system similar to that in Dublin where access can be gained via a smart card, however Montpellier also provides for coin operation of the system.

5.42 Both Montpellier and Dublin are able to retain significant deposits against the hire of bikes due to the electronic nature of the access, billing and operation of the schemes. No deposit is taken in Aarhus or Bari.

5.43 Dublin operate a long term and short term membership system. The long terms system is aimed at the majority of regular users and is characterised by a 30 minute period of free usage, followed by a tariff which increases steeply thereafter. Dublin also offer a short term membership option which is aimed at tourists and those who wish to trial the scheme. The schemes in Aarhus and Bari do not charge for any period of usage. Montpellier offers two variants on long term rental - one where a greater upfront cost is paid with no restrictions on

usage, and a second with no registration cost but a small cost for any period of usage. Montpellier also offers a short term rental tariff.

Employment

5.44 Available information in relation to the employment created by the schemes in set out in the table below.

Description	Dublin	Aarhus	Montpellier	Bari
Total Employees	21	8	11	5

5.45 The scheme in operation in Dublin is the largest and most sophisticated of those examined and is estimated to have created and sustained just over 20 jobs in call centres, maintenance and bike distribution. The schemes in Montpellier and Bari employ 11 and 5 people respectively. The Aarhus scheme is operated in conjunction with the local employment centre and utilised unemployed people seeking skills and training in the maintenance and operation of the scheme.

Geographic Indicators

5.46 The geographic indicators provide a comparison of the general characteristics, demographics, and topography of the identified Most Similar Cities and seeks to identify similarities and differences between these cities with existing bike sharing schemes, and Belfast.

Population, Area and Density

5.47 The following table sets out key geographic aspects of the Most Similar Cities.

Description	Dublin	Aarhus	Montpellier	Bari	Belfast
City Population	506,211	242,914	255,000	322,511	268,300 [25]
City Area	115 km2	91 km2	57 km2	116 km2	110 km 2[26]
City Density	4,401 p/km2	2,669 p/km2	4,473 p/km2	2,780 p/km2	2,439 p/km2

5.48 As can be seen from the table above, the population density of Belfast is estimated to have a population density very similar to that in Aarhus and in Bari where schemes are in operation at present. The density in Dublin and Montpellier is considerably greater.

Mode Share

5.49 The following table presents data in relation to mode share by number of trips in the Most Similar Cities prior to the introduction of a bike sharing scheme, where information is available. It should be noted that information in relation to modal split post the introduction of a bike sharing scheme was not available for the cities identified or was not meaningful due to the recent introduction of a scheme. European cities due to their relatively dense historic patterns of development typically have lower shares for car based transport.

[25] Population and Migration Estimates Northern Ireland (2009) Statistical Report, NISRA
[26] http://www.nisranew.nisra.gov.uk/census/area_measurement.html, NISRA

Description	Dublin	Aarhus*	Montpellier	Bari	Belfast*[27]
Modal Splits:					
Car & Passenger	55%	43%	51%	n/a	55%
Motorbike	1%	0%	2%	n/a	<1%
Public Transport	21%	19%	8%	n/a	31%
Cycling	4%	26%	2%	n/a	1%
Walking	13%	7%	26%	n/a	13%
Other	6%	5%	1%	n/a	n/a

* Proportion of journeys to work

5.50 As can be seen from the table above, the modal split in each of the cities for which data is available is broadly similar in terms of private car transport. Equally, the share of cycling in both Dublin and Montpellier is low. This is in contrast to Aarhus which already had a very high share of cycling prior to the introduction of their scheme.

Weather and Topography

5.51 The weather and local topography has the potential to affect cycling as a mode of transport to a greater extent that almost any other mode. Extreme weather conditions and significant rainfall would have an impact on the uptake of a potential scheme, as would an overly hilly or steep topography within the designated zone of a cycle scheme. The table below therefore sets out a comparison of these factors.

Description	Dublin	Aarhus	Montpellier	Bari	Belfast
General Topography	Low	High	Low	Low	Low
Average Temp.	13 C	7.5 C	16 C	17 C	12 C [28]
Max Annual Temp.	30 C	20 C	29 C	39 C	29 C
Min Annual Temp.	-12 C	-3.5 C	3 C	0 C	-13 C
Annual Precipitation	762 mm	630 mm	656 mm	517 mm	846 mm
Annual Precipitation (days)	139	118	95 days	87 days	213 days

5.52 As can be seen in the table above, the data represented from the OBIS project describes the selected cities as having a relatively low topography that is conducive to cycling. Aarhus conversely considers itself to have a steeper topography and to this extent has introduced bikes with gear systems to alleviate this problem. Belfast would have a similar average annual temperature to the cities studied, however would experience the lowest minimum temperature in winter. In this respect, as noted earlier the scheme in Aarhus operates on a seasonal basis and whilst this may not be necessary or desirable in Belfast, the ability to close the scheme in the event of extreme weather may be appropriate. Belfast would also experience the greatest level of rainfall of the cities examined.

Bicycle Culture

5.53 Cities in Scandinavia, the Netherlands and Germany would be considered to have a stronger 'bicycle culture' than cities in for example, the UK, Spain or France. However the success of schemes in for example, Barcelona, London, Paris, Montpellier and Lyon may suggest that there is a level of latent demand when bike sharing schemes were introduced and eliminated obstructions to private ownership such as theft, maintenance and cost.

[27] http://www.civitas-initiative.org/forumcity_sheet.phtml?id=184&lan=ro
[28] http://www.bbc.co.uk/weather/world/city_guides/results.shtml?tt=TT003750

Most Similar Cities - Case Studies

5.54 The following paragraphs set out narrative case studies of the Most Similar Cities. The information provided is information that is either publically available or information that the scheme operators or relevant public authorities were prepared to provide for the purposes of this report. It is not possible to obtain the same scope of information for each city.

Dublin - Dublinbikes

Overview and Scale

5.55 The Dublinbikes scheme was launched on 13 September 2009 and is currently comprised of 450 bikes and 40 docking stations within the central area of the city bordered by the canals. Within the first year of operation, over 40,000 users had registered for the scheme and over 1,000,000 journeys had been recorded. Initial projections developed for the scheme estimated just 2,000 registered users in the first year[29]. This equates to a registration uptake of almost 9% in the first year, with each bike being rotated, or utilised, on average almost 7 times per day.

5.56 In view of this success, the scheme is currently in the process of being expanded with an extra 4 new stations, 287 docking bays and an additional 100 bikes[30]. This expansion will be funded by the provision of an increased number of new advertising hoardings in the city. Indeed, Dublin City Council consider that the current scale of the scheme now represents only an initial phase of a much larger project that will see eventually several thousand bikes rolled out across a much wider area of the city[31]. The operator of the scheme has noted that the initial scale of the scheme at launch was, in hindsight, much too small in view of the unexpected demand[32].

Funding and Operations Structure

5.57 The scheme is operated under a 15 year commercial contract between Dublin City Council and JCDecaux. In exchange for advertising spaces across the city, the contractor will cover the cost of installing, managing and maintaining the scheme on behalf of the Council. It is estimated that the Council have provided the Contractor with approximately 72 new billboards in exchange for the scheme. The scheme is therefore both owned and operated by the Council's private sector partner[33].

5.58 JCDecaux are responsible for the repair and maintenance of the bikes. Technicians visit stations around the city and carry out repairs and clean the stations. Damaged bikes are removed off site for maintenance. JCDecaux also undertake a forced distribution of bikes between key stations to ensure the availability of bikes at particularly busy stations at peak times of the day.

Scheme Design

5.59 The bikes were designed specifically for Dublin and are of a robust unisex design with three gears, a basket and mudguards, chain guards and automatic lights. The bikes also have a large capacity durable front basket. From a safety perspective, the bikes have automatic rear and front lights, operating day and night and reflective strips on wheels and pedals. In order to minimise theft and vandalism, the bikes have the front and rear brakes integrated in wheel hubs, a chain guard, and anti theft lock. The bike is depicted below[34]:

[29] http://www.rte.ie/news/2010/0814/transport.html
[30] http://www.dublinbikes.ie/Magazine/News/dublinbikes-to-be-extended
[31] Dublinbikes – One Year On, Ciaran Fallon, Dublin City Council, 2010
[32] Meeting with Joanne Grant, Managing Director, JCDecaux, 27 January 2011
[33] Meeting with Dublin City Council, 8 December 2010
[34] http://www.dublinbikes.ie/

5.60 The stations and terminals have a third generation computerised user interface which allows users to select a bikes, consult their account, view availability of bikes and stands at other stations, check the station map, and locate a credit card enabled terminal (almost half of the terminals accept credit card payments to allow for short term cards to be issued). Users can check the details of their account online and view station locations although this does not yet provide real time data on availability of bikes and docking stations.

5.61 An example of the stations and stands is shown below:

Key Experience

5.62 Key success factors which are specific to the Dublin scheme have included the recent completion of the Dublin Port Tunnel which has removed heavy goods vehicles from the City Centre, the introduction of a 30kph speed limit in the City Centre and the relatively flat topography of the City. It is understood that to date there have been no reported incidents of accidents involving the scheme. Success factors which are more generic in nature have included the decision not to implement a mandatory helmet law, the inclusion of a membership or registration fee which encourages a sense of ownership of the scheme and a significant deposit which is forfeited should the bike not be returned. In this respect, incidence of vandalism and theft have been almost non existent.

5.63 The scheme also considered that the provision of a critical mass of bikes was key to success, as opposed to a small scale roll out of the scheme. This allowed for the immediate development of a practical and functional scheme[35]. The 30 minute period of free use, together with an increasing tariff thereafter, may also be considered to be a key success factor in that 96% of the

[35] Dublinbikes – One Year On, Ciaran Fallon, Dublin City Council, 2010

one million plus trips to date have been free to the user. In this respect, the scheme was designed by the Council to deliver a free access public transport system. Finally, Dublin City Council spent a significant amount of time considering the strategic locations of docking stations. The location of stations was fully informed by the target users for the scheme, which were defined as city centre residents and workers. Furthermore, the location of docking stations has also been a primary consideration when addressing the risk of theft and vandalism; each station has been located in a prominent position with adequate levels of passive surveillance[36].

5.64 A further key success factor for the scheme was noted as being the high level of maintenance and service provided and the location of bikes and the supporting redistribution system. A high level of quality and maintenance is considered to have encouraged people to join the scheme and indeed to renew annual memberships. The local of bike stations was well researched and developed to map to key intra city traffic flows, and to allow for the joining of locations not served by a direct public transport link. The forced redistribution of bikes also minimises the incidence of customer 'disappointment' which occurs when they cannot obtain or cannot return a bike at the most convenient location[37].

Aarhus - Århus Bycykel

Overview and Scale

5.65 Aarhus is Denmark's second largest city and is located on the eastern coast of the peninsula of Jutland. Aarhus has a city population of circa 242,000 and an area of 91 km2, making it a comparable city to Belfast in terms of both size and population. Aarhus Bycykel, or Aarhus City Bikes commenced operations in 2005, following a lengthy period of development and following in the footsteps of a similar scheme in Copenhagen. The scheme currently comprises approximately 450 bikes and 57 docking stations throughout the city.

5.66 The present scheme was made permanent in 2007 following an initial two year trial period and an evaluation which was undertaken by DMA Research which assessed the scheme as being particularly successful[38]. The research indicated that 94% of residents were aware of the scheme and 19% of residents actively use the bikes. The research also found that 93% of respondents thought that the scheme should continue. Furthermore, 80% of those survyed as part of the research consider that the scheme promoted an image of a 'young, vibrant' City and 85% considered the scheme promoted a 'green' image of the City[39].

Funding and Operations Structure

5.67 The local council originally considered establishing the scheme as a commercial venture with an operator to be appointed via a bidding process, however, the City Council subsequently decided that scheme was to be a municipal project between the Family and Employment Department of the Århus Municipal Authority and the Department of Technical Affairs.

5.68 The scheme is operated by the municipal Authority and is primarily funded through the City Council (c 32%) and the Aarhus Employment Department (c 45%). A contract for the provision of 3rd party advertising space on the bikes was let in 2007 and this accounted for approximately 23% of scheme revenue. The scheme operates within the restrictions of its income levels to ensure a balanced budget.

[36] Dublinbikes – One Year On, Ciaran Fallon, Dublin City Council, 2010
[37] Meeting with Joanne Grant, Managing Director, JCDecaux, 27 January 2011
[38] http://www.aarhusbycykel.dk/eng_sites/facts.html
[39] Evaluering af bycykelordningeni Århus, DMA Research 2006

5.69 The bikes are assembled by unemployed individuals in employment projects within the City. This assignment is managed by Arbejdsmarkedscenter (Labour Market Centre) the City, which is also responsible for the ongoing maintenance and service of the city bikes. The scheme creates approximately 8 positions during the summer season and 4 during the winter season[40].

Scheme Design

5.70 The bikes used by the scheme are provided by CIOS and are depicted below[41]. The design of the bike is less tamper proof than is in operation on schemes in Dublin and London. The brake and chain mechanisms are not covered or contained within the frame of the bike. There is also no basket attached to the bike and the bike is not equipped with lights.

5.71 The scheme is relatively basic in nature with no electronic or smart cards used in its operation. The bike docks and stands are also straightforward metal structures with no complex technology or means to communicate with customers or the operator. Access to the cycles in obtained through depositing a DKK20 coin (approximately £2) into a manual release mechanism on the bike. There is no requirement to register with the scheme or become a member. The simple stands and locking mechanisms are visible in the picture below[42].

[40] Correspondence with Erwin Berngruber, Director, Arbejdsmarkedscenter Nord
[41] http://www.facebook.com/pages/Arhus-Bycykel-Aarhus-City-Bikes/89466640949?v=photos
[42] http://www.facebook.com/pages/Arhus-Bycykel-Aarhus-City-Bikes/89466640949?v=photos

5.72 The lack of electronic systems however means that the City is unable to accurately record data on usage and membership levels or usage patterns. However, whilst the this usage data is not available to the City, the scheme is considered to be widely used and successful[43].

Key Experience

5.73 The evaluation of the scheme undertaken by DMA Research considered the scheme to be particularly successful. A key factor in continuing the success is a good working relationship and communications between the various project stakeholders, including the local authority, project manager, the workshop and service department.

5.74 Despite the low tech nature of the scheme in comparison to cities such as Dublin, the scheme remains successful. The cost of introducing a comparible scheme in Belfast would most likely be considerably less expensive than a high tech, or third generation, bike sharing system.

5.75 A further key finding of the survey was that high maintenance and quality of service was essential to both the continued utilisation of the system and also for maintaining the image of both the City and the scheme itself.

5.76 The integration of social economy elements into the scheme is a key lesson for Belfast to consider. As set out above, the service and maintenance arrangements for the scheme are managed by the local employment services and provide meaningful employment and activity to long term unemployed in the region.

Montpellier - Velomagg

Overview and Scale

5.77 The Vélomagg is the public bike sharing service operating in the city of Montpellier. Montpellier is a city of approximately 255,000 residents and covers an area of approximately 57 km2 in southern France. The scheme was launched in June 2007 and currently consists of over 1,000 bikes and has 50 docking stations around the City. The scheme is estimated to have over 9,000 long and short term subscribers and facilitated 266,000 rentals in 2008[44].

[43] Telephone interview - Ester Fibiger, Aarhus Arbejdsmarkedscenter Nord, 19 January 2011
[44] OBIS Project data

Funding and Operations Structure

5.78 The scheme structure is relatively unique in that it is managed and operated by the local transport company, the Transports de l'Agglomération de Montpellier (TAM) although the bikes and infrastructure were provided by the French transport company Smoove. The scheme is not funded through an advertising linked deal or arrangement and it is estimated that 90% of the cost of the scheme is met by the local authorities, with 10% of revenues deriving from user tariffs and membership charges[45].

5.79 Similarly to the scheme in Aarhus, the maintenance of the bikes is undertaken by a team of 3 TAM engineers, but in collaboration with the local School of Trades[46].

Scheme Design

5.80 The bikes utilised by the scheme are manufactured by the French company Smoove. Smoove primarily offer modular products and services ranging from the management systems for a fleet of cycles already acquired by a city. The bikes in use in Montpellier are shown in the image below[47].

5.81 The bikes are of a relatively simple design which incorporates a basket, a stand and a rack on the back. The bikes are also fitted with bells and fittings for lights. The design however does have exposed cables which could potentially facilitate vandalism. The bikes are released via a lock and key based system. The user swipes a membership card at the docking station and a key is released which corresponds to a bike in the rack. The key is then used to release the bikes from the docking station. One perceived advantage of the relatively simple system is that the docking stations and terminal require little or no civil engineering or mains electricity connection when being installed, which can help reduce costs. The docking station and terminal is depicted below[48].

[45] OBIS Project data
[46] http://www.montpellier-agglo.com/participer/salle-de-presse/archives/des-velomagg-toujours-disponibles-158578.khtml?RH=1159291527598
[47] www.cyclesud.fr
[48] goennowa.blogspot.com

Key Experience

5.82 There are a number of key success factors which are apparent in relation to the Velomagg scheme. High on this is list is the very low incidence of downtime caused through vandalism and damage caused to bikes. This rate is around 2% on the entire fleet of 1 600 bicycles operated by TAM. A recent study carried out b TAM estimated an incidence of vandalism on around just 2% of the bikes, in contrast to 58% of bikes in Paris having suffered vandalism or damage at some point[49]. The TAM operator also noted that most vandalism related to minor matters such as burst tyres, damage to lights, seats and bells. This was in contrast to Paris which suffered from a high level of serious damage to bikes, including disassembly, fire damage and graffiti.

5.83 TAM noted several reasons for the low vandalism incidence. These included[50]:

- simple operating mechanisms, with minimal technology on the bike or stand;
- a system which accommodated private bicycles by provided storage and docking for non short term rental bikes; and
- robust bike design and quality.

5.84 A satisfaction survey carried out in relation to the scheme also indicated that 96% of users are satisfied with the service and in turn highlighted key areas which have contributed to the perceived success of the Velomagg. These include:

- Cleanliness of the bike: 94%
- Operating condition: 93%
- Appearance: 89%
- Simple Locking Mechanism: 79%

[49] http://www.montpellier-agglo.com/participer/salle-de-presse/archives/des-velomagg-toujours-disponibles-158578.khtml?RH=1159291527598
[50] http://www.montpellier-agglo.com/participer/salle-de-presse/archives/des-velomagg-toujours-disponibles-158578.khtml?RH=1159291527598

Bari - Bari in Bici

Overview and Scale

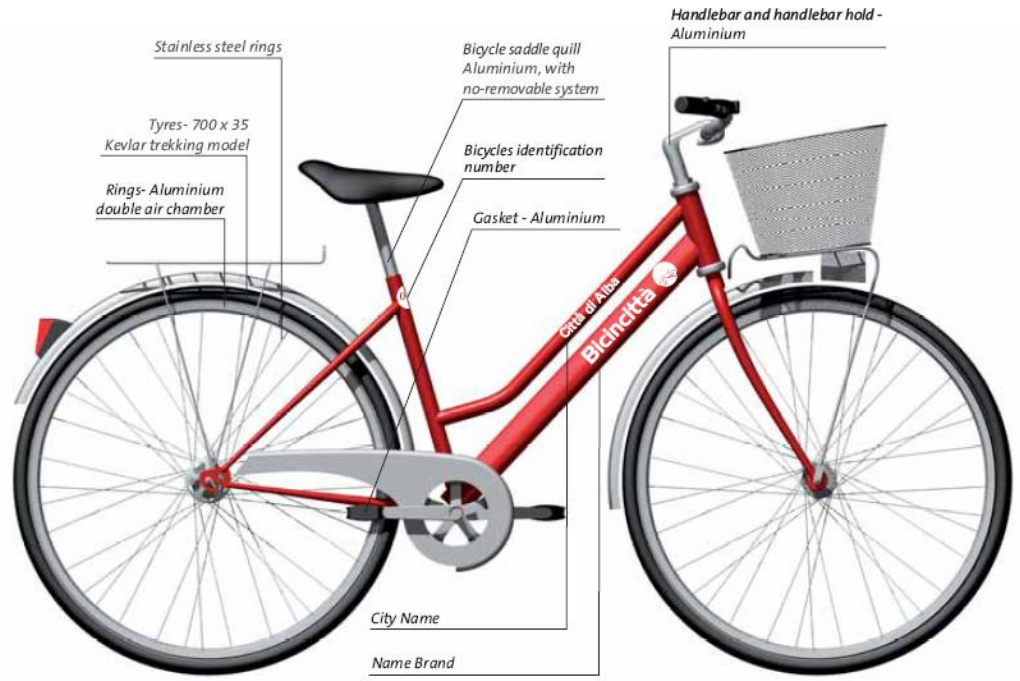
5.85 Bari is a city of approximately 320,000 people in the south of Italy. The Bari in Bici scheme is a small scale scheme in comparison to the previous cities which have been examined. The scheme was launched in 2007 as an experimental programme[51] however the scale of the scheme has not been significantly increased since launch. At present, the scheme has approximately 90 bikes and 13 stations with circa 140 docking points. Based on data available through the OBIS project and referenced earlier in this section, the scheme does not appear to have attracted a great degree of success or membership, with available data indicating less than 1 hire per day per bike, in comparison to Dublin which experiences circa 10 hires per day per bike.

Funding and Operations Structure

5.86 The scheme is owned by the municipal authority in Bari, Commune di Bari, and is operated by the local public transport company, Amtab SpA. The bikes and infrastructure were provided by the Italian company Bicincitta. The scheme is not funded by advertising revenue, and OBIS data indicates that the scheme is intended to be funded entirely via user subscriptions and charges, although given the relatively low level of uptake it is not clear that this will have been achievable.

Scheme Design

5.87 As noted above, the bikes are provided as part of an 'off the shelf' system by a private company called Bicincitta. The bikes are lightweight steel and aluminium, have gears and are fitted with a basket and rear rack. The bike is locked to the bike stand via a hook lock mechanism at the front of the bike and contains mechanisms to allow for the adjustment of the seat but not the removal. However the bike does have exposed cables, chains and gear mechanisms which could be subject to damage and vandalism. The bikes are depicted below.



5.88 The Bicincitta system offers a range of bike docking stations with varying degrees of sophistication. These range from simple bike racks with limited functionality to more complex docking stations which require electronic cards to access and release bikes. The electronic ID

[51] http://www.telestreetbari.it/content/view/386/5/

card allows for users to access bikes at any station and to return to any station throughout the city. The bikes and docking stations are depicted below.

Key Experience

5.89 The Bari scheme launched in 2007 as a pilot and has increased only marginally in size since then. The scheme appears to have suffered from a relatively low level of uptake as indicated in the Most Similar Cities study. This would appear to provide evidence of pilot schemes which prove to be unsuccessful due to a lack of critical mass and a lack of bike stations at all key strategic locations throughout the city which restricts the population for which the scheme may prove attractive. There is limited information available as to further reasons for the apparent lack of uptake in this scheme.

Further OBIS Data

5.90 The Most Similar Cities study focused on a detailed range of metrics and statistics for a selection of cities which were comparable in population and size to Belfast. However, the OBIS Project undertook a statistical gathering exercise on a wide range of cities across Europe. This information was categorises according to city population as follows:

- >500,000 residents
- 100,000-499,999 residents
- <100,000 residents

5.91 Whilst Belfast would fall within the 100,000 - 499,999 residents category, the majority of cities covered by OBIS in this range were below 200,000 residents. However key metrics in relation to number of bikes, stations and utilisation (where available from OBIS research) is set out in the table below.

OBIS Data - Cities with population between 100,000 to 499,999[52]

City	Terrassa	Pamplona	Vitoria	Dijon	Orleans	Rennes*	Karlsruhe	Chemnitz	Orebro	Modena	Rimini	Parma	Salzburg	Brescia
Population (000's)	206	200	233	152	108	210	289	241	132	200	150	197	149	190
Area (km2)	n/a	n/a	277	40	27	52	173	221	380	183	134	261	66	n/a
Bikes (no.)	100	101	300	350	250	200	343	130	1,400	224	52	48	15	120
Stations (no.)	4	5	15	39	33	23	0	15	5	32	6	11	1	24
Registrations	4,721	1,956	n/a	15,000	1,687	4,839	1,881	n/a	n/a	2,000	180	696	n/a	1,518
Registrations as % of population	2.3%	1.0%	n/a	9.9%	1.6%	2.3%	0.7%	n/a	n/a	1.0%	0.1%	0.4%	n/a	0.8%
Ave Daily Rents (no.)	n/a	n/a	n/a	n/a	250	265	51	n/a	n/a	120	n/a	40	4	167
Ave Daily Rents/bike (no.)	n/a	n/a	n/a	n/a	1	1.3	0.2	n/a	n/a	0.54	n/a	1	<1	1.4

* Based on Velo a la carte scheme which was replaced in 2010.

5.92 As can be seen from the table above, there is a wide range of schemes in operation in this range of population covered by the OBIS data in terms of both size and scale, and implied levels of uptake and therefore success. There are a significant number of gaps in this data which OBIS has not been able to source, either because the information was not made available to them or because the scheme are non electronic and data on usage is therefore not captured. The incidence of manual, non electronic schemes is much more prevalent in smaller cities such as those outlined above.

[52] OBIS Project data

5.93 As can be seen from the table above, the remaining schemes in this population bracket covered by OBIS range is size from 15 to 1,400 bikes and from 0 to 39 stations (zero stations due to system operated employing a non docking stations based system). Registration as a proportion of population ranges from circa 1% to almost 10%. Whilst it is difficult to infer any patterns from the remaining OBIS data, one characteristic which does appear apparent is that the larger schemes in terms of bikes attract generally a greater uptake in terms of registrations than smaller (most likely pilot) schemes. For example, the three schemes with the highest level of registration (Dijon, Terrassa, Rennes) also have some of the largest schemes in terms of number of bikes and stations of the sample covered.

5.94 Conversely, the schemes which are the smallest in term of infrastructure provision (Rimini, Parma, Salzburg and Brescia) have achieved the lowest level of uptake and indeed are evidencing very low levels of bike utilisation compared to larger schemes.

Further Experience Elsewhere Case Studies

5.95 The following paragraphs set out key operational and demand characteristics of a number of high profile, successful and indeed unsuccessful schemes elsewhere. The information provided is information that is either publically available or information that the scheme operators or relevant public authorities were prepared to provide for the purposes of this report. It is not possible to obtain the same scope of information for each city.

Paris Bike Rental Scheme

5.96 Perhaps most well known bike rental schemes in the world is the Vélib system which was introduced in Paris during the summer of 2007. Similar to the Dublin scheme, the Paris scheme is managed and operated by JCDecaux in return for between 1,600 – 2,000 advertising structures around the city. The scheme originally began with 10,648 bicycles and 750 bike stations strategically located around the city of Paris. The scheme has grown significantly since its introduction and now provides for in excess of 20,000 bicycles, making it one of the largest schemes of its kind in the world.

5.97 In its first year of operation Vélib had over 200,000 annual subscribers, over 270,000 weekly subscribers and 3.5m one-day subscribers. The bicycles were hired 26 million times with an average journey duration of 18 minutes[53]. Based on a municipality population of approximately 2.2 million people, this translates to an uptake of approximately 9% in terms of annual subscribers. JC Decaux reported 27.5 million trips in the first year, and average of 75,000 trips per day[54]. This equates to a bike rotation of almost 4 uses per day per bike.

5.98 The subscription costs of the scheme are as follows[55]:

- Annual subscription: €29.00
- Seven-day Subscription: €5.00
- One-day subscription: €1.00

5.99 Similar to the Dublin scheme there is a period of 30 minute free usage with an incremental increase in rental costs thereafter. Ten service vehicles and approximately 400 staff members maintain and redistribute the bikes on a daily basis. In addition to this, the maintenance and redistribution of bikes is also supported by the operation of a maintenance barge which travels along the River Seine. Unlike the Dublin scheme, the Paris bike rental scheme has suffered as a result of vandalism with approximately 9,000 bikes reported to have been stolen since the

[53] http://www.paris-insider.com/transportation/velib-liberates-paris-two-wheels-all
[54] Bike Share, Opportunities in New York City, NYC Department of City Planning
[55] http://www.velib.paris.fr/

scheme was introduced in 2007[56] although the operator notes that most thefts are caused by day users because they are not familiar with how the docking systems works and they leave the bike accidentally unsecured.

Lyon Bike Rental Scheme

5.100 The Vélo'v scheme in Lyon was introduced in May 2005. This was the first large scale cycle hire scheme to be operated in Europe and was provided for by JCDecaux in exchange for advertising in the City. At present the scheme has 4,000 bicycles and 400 bike stations.

5.101 There are estimated to be approximately 60,000 registered users[57] of the scheme which based on a core population of just over 608,000 equates to an uptake rate of almost 10%. There are estimated. The 4,000 bikes are used approximately 20,000 times each day, which equates to an average rotation of approximately 5 uses per day per bike[58].

5.102 The subscription costs of the scheme are as follows[59]:

- Long term subscription: €5.00
- Short term Subscription: €1.00

5.103 Similar to the Dublin scheme there is a period of 30 minute free usage with an incremental increase in rental costs thereafter. A €150 deposit is held via the users bank card when a bike is in use.

5.104 JCDecaux implemented the Lyon scheme two years prior to the Paris scheme and subsequently made a number of amendments based on lessons learned from theft issues in Paris. These included:

- Improved docking station design to improve access;
- Reductions to number of parts on the bikes to improve robustness and reduce maintenance; and
- Provision of smart card technology to allow the user more efficient access to the system as opposed to manually entering details into the terminal for each use.

Barcelona Bike Rental Scheme

5.105 The Bicing scheme was introduced in Barcelona in the summer of 2007. The scheme is managed and operated by the Clear Channel Advertisement Company. Similar to the experience in Paris and Dublin, the scheme has been far more successful than initially anticipated. The scheme began with 1,500 bicycles and 100 bike stations. Such has been the success of the scheme that the number of bikes has been increased to 6,000 whilst the number of stations has been increased to 200[60].

5.106 Within the first six months of operation, the had 90,000 registered users generating on average 22,000 trips per day[61]. Based on a core population of 1,600,000 this equates to an uptake of almost 6% within the first six months and a bike rotation of over 15 uses per bike in that same period (based on the original 1,500 bikes).

[56] http://www.guardian.co.uk/environment/2010/jul/20/london-bike-hire-scheme-paris-velib
[57] Feasibility Study for a Central London Cycle Hire Scheme, Transport for London
[58] Feasibility Study for a Central London Cycle Hire Scheme, Transport for London
[59] http://www.velib.paris.fr/
[60] Feasibility Study for a Central London Cycle Hire Scheme, Transport for London
[61] Feasibility Study for a Central London Cycle Hire Scheme, Transport for London

5.107 At present, the scheme is designed almost exclusively for residents of Spain. There is an annual subscription fee of €24.00 to avail of the scheme and there is a penalty of €3.00 for exceeding two hours of use. A weekly ticket is available for €1.00. Under both tariffs, the first 30 minutes is again free of charge with the tariff structure designed to encourage short term usage.

5.108 The City of Barcelona pays Clear Channel a fixed sum each year to implement and operate the scheme rather than fund the scheme through advertising. Some of the funding for the scheme is also generated through the city's car-parking revenue, and third of the cost is recovered from tariffs and user charges[62].

5.109 Key learning points which may be identified from the Barcelona scheme include:

- Implementation has been phased in order to best meet demand;
- The scheme is integrated with smart ticketing;
- The scoping process included a public consultation;
- The sloping topography causes a large number of vans to be required to redistribute bikes around the city;
- Demand has been higher than expected and as a result users have had to wait to access and drop off bikes;
- There has been some vandalism.

London Bike Rental Scheme

5.110 The Barclay's cycle hire scheme was introduced in London in July 2010. The scheme comprises 6,000 bikes with 340 bike stations, and this is due to increase to 400 stations by March 2011 with a station every 300 meters throughout the serviced area[63]. The scheme has been financed by the government with the scheme costing £140 million for the initial 6 years, with £25 million being recouped from Barclays Bank sponsorship.

5.111 The schemes annual subscription costs £45 with the first 30 minutes usage free. Following the initial 30 minutes free usage there is an incremental increase in rental costs up to £50 for 24 hour usage. After this period there is a late return charge of £150 whilst a damage charge of £300 also exists[64].

5.112 During the first six months of operation, it is estimated that there were over 110,000 members of the scheme and that over 2 million journeys had been made[65]. This equates to an initial uptake of 1.5% of the London population, and a rotation of approximately 2 users per bike per day. The bikes were not available for walk-up "casual use" to non-members during this initial 6 month breaking-in period, but with the opening of the scheme to casual users on 3 December 2010, the usage of the scheme is expected to increase significantly again[66].

5.113 The bikes in London are of a different design to that used in Dublin and some negativity has been experienced regarding the fact that the bikes design does not include provision for a basket. These bikes are also used in Montréal, Minneapolis, Minnesota, and in Washington DC.

Montreal Bike Rental Scheme

5.114 The Bixi public bike sharing system was launched in Montreal in May 2009. The system provided for 3,000 bikes and 300 stations when first introduced but such has been the success

[62] Feasibility Study for a Central London Cycle Hire Scheme, Transport for London
[63] http://www.guardian.co.uk/environment/green-living-blog/2010/oct/13/london-bike-hire-profit
[64] http://www.tfl.gov.uk/roadusers/cycling/14811.aspx
[65] http://www.tfl.gov.uk/corporate/media/newscentre/archive/17885.aspx
[66] http://www.tfl.gov.uk/corporate/media/newscentre/archive/17591.aspx

of the scheme that it has now been expanded to provide 5,000 bikes and 400 stations[67]. In the year to November 2010, the scheme had over 30,000 registered members and generated over 3.3 million trips. Based on a core population of 1,600,000 this equates to an uptake of around 2%, and a bike rotation of circa 4 uses per bike per day (the system is operational only 8 months of the year due to harsh winter weather conditions).

5.115 The annual subscription costs of the bike scheme are Can$78.00 or a user can avail of a day pass for Can$5.00. The tariffs associated with the bike rentals are designed to encourage a rapid turnover of bikes. Similar to the Dublin scheme, the first 30 minutes is free. The second 30 minutes rental is Can$1.50 and after two hours usage, the 30 minute rate increases to Can$6.00[68].

5.116 Montreal has located bike stations approximately every 250-300 meters throughout the serviced area of the City. Montreal is also noted to have an extensive cycle lane infrastructure already in place. Given the weather conditions, the system was developed as a modular 'drop and go' system which is bolted to the ground (without the need for underground works or excavations) and then can be removed in winter and returned or repositioned as appropriate in the spring. The bike stations are low cost and can be removed or assembled in approximately 20 minutes, significantly reducing capital costs. The stations are also solar powered and therefore no underground wiring is required[69]. The capital cost per bike is estimated to be in the region of USD3,000 versus an estimate of USD4,400 per bicycle for the Velib[70].

5.117 The programme is intended to be funded by user revenues and sponsorships although no further information on the finance generated is available. Following initial teething problems, initial vandalism has become less of an issue and the scheme has proved to be hugely successful. The Bixi system has been adopted in London.

Melbourne Bike Rental Scheme

5.118 The Melbourne bike rental scheme was launched on the 31st of May 2010. The scheme consists of 600 bikes and 50 bike stations and uses the Bixi system. Melbourne's bike rental scheme is funded by the State Government's Aud$38b State Transport Plan. The Annual subscriptions costs are Aud$50, a weekly ticket costs Aud$8 and a one-day ticket costs Aud$2.50. a Aud$300 deposit is taken for daily and weekly hires, no deposit is taken for yearly subscribers. Similar to most other schemes, the first 30 minutes of use is free, with the tariff increasing significantly after 90 minutes use[71].

5.119 There is limited information available on the uptake for the scheme at present. However the scheme has experienced considerable media attention given the fact that despite the Aud$5.5 million investment, reports suggest that the scheme is only used circa 70 times a day[72].

5.120 It has been suggested that the primary reason the scheme has experienced such low levels of usage is down to the fact that it is compulsory to wear helmets in Melbourne. Melbourne the first large scale bike scheme deployment in a country with a mandatory requirement to wear a helmet. The scheme does not provide helmets but offers subscribers the option to purchase a helmet at low cost or from nearby retailers. In contrast, Mexico City repealed its helmet law prior to the launch of their own scheme[73].

[67] http://montreal.bixi.com/news/full/BIXI-Phase2/
[68] Bike Share, Opportunities in New York City, NYC Department of City Planning
[69] Bike Share, Opportunities in New York City, NYC Department of City Planning
[70] Bike Share, Opportunities in New York City, NYC Department of City Planning
[71] http://www.melbournebikeshare.com.au/pricing
[72] http://www.bikeradar.com/news/article/melbourne-bike-share-scheme-starts-slowly-27178
[73] http://bike-sharing.blogspot.com/search?q=melbourne

5.121 Increasing pressure has been put on the Governing officials to follow Mexico City's lead and waive compulsory helmet laws for the public bike rental system in Melbourne.

Bristol Hourbike

5.122 June 2008 saw the launch of the Hourbike scheme in Bristol, which had been announced as England's first 'cycling city' in an initiative to encourage cycling. The scheme was a partnership between Bristol City Council, The University of the West of England and First Great Western Trains. The scheme was launched as a pilot , the intention of which was to test the acceptance of the concept and determine the potential demand for such a scheme with the hope of expanding it beyond a pilot[74]. The scheme comprised 7 bike hubs and approximately 20 bikes. Membership costs were £10 with the first 30 minutes use free, with each subsequent hour costing £1.

5.123 Perhaps the main criticism of the scheme and key to the failure of the scheme was the pilot nature of the programme and the extremely limited network with which the scheme was launched. Large parts of the city were simply not serviced by the scheme. Bristol was also considered by many users to be a hilly city. It was considered that despite initial public interest in the scheme, due to the small network the scheme failed to attract a critical mass of users[75].

5.124 Bristol City Council furthermore decided that it had other, more pressing funding priorities and therefore was unable to commit to continue to fund the scheme. The operator also noted that without the support of the local authority (in terms of both funding and credibility) it was unable to attract further private sector investment[76]. Consultation with the operator of the Bristol scheme confirmed that Council funding was not forthcoming to support the expansion and full implementation of the scheme, and that the lack of network was key to the lack of public utilisation. The operator of the scheme also noted that without joined up and significant buy in and support from the sponsoring authorities and departments, the scheme was in their opinion never likely to fulfil its potential[77].

Cambridge

5.125 The introduction of a small bike sharing scheme was attempted in Cambridge in the early 1990's with 50 bikes placed for unregulated public hire throughout the city. The bikes were not attached to any form of docking station and there was no membership required or personal data recorded to indicate who had hired a bike at any particular time. All 50 bikes were stolen upon launch of the scheme, and indeed a second batch of bikes which were introduced were also stolen. A further factor to consider in the failure of a scheme in Cambridge is the existing high level of bike ownership in the city[78].

Brussels

5.126 The Cyclocity scheme was launched originally in Brussels in 2006 by JCDecaux. However, the scheme in its orginal form closed in 2008/09 due to poor uptake and performance. The original Cyclocity scheme comprised on 250 bikes and 23 stations in a city with a population over 1,000,000 inhabitants (compared to 20,000 bike for 2,000,000 Parisians). The key reasons for the failure of the scheme are widely considered to be the low level of bikes and stations provided and the fact that there was a charge for the first 20 minute period of use. The scheme has since been re-launched by JCDecaux as 'Villo!' and now provides over 2,500 bikes and 180 stations across the city.

[74] http://jamesbarlow.co.uk/bristol-hourbike-scheme-defunct
[75] http://www.thisisbristol.co.uk/news/Bike-hire-scheme-launched-Bristol/article-1165980-detail/article.html
[76] http://jamesbarlow.co.uk/bristol-hourbike-scheme-defunct
[77] Interview with Tim Caswell, Director, Hourbike, 28/01/11
[78] http://www.tcs.cam.ac.uk/issue/news/city-proposes-cycle-hire-scheme/

Summary of Key Experience

5.127 A number of key lessons and success factors have emerged during the research as to characteristics of a successful scheme. These are summarised below:

- **Critical Mass** - research has indicated that small scale pilot projects are generally unsuccessful. This has been indicated by experience in Bari, Bristol, Salzburg and Brussels which have attempted to roll out small scale or pilot programmes and which have witnessed poor or very low uptake. Discussions with operators of existing schemes throughout Europe have also delivered the clear message that pilot schemes more often than not will fail. This is primarily due to the constraint on the number of locations which can be covered by a pilot scheme. If a scheme does not cover key strategic locations throughout the scheme area, then it becomes increasingly likely that customers will not use the scheme as it either does not offer a station at a convenient location to start a journey, or does not offer a convenient location to the end of their journey. This will significantly restrict the appeal of a scheme to the wider public.
- **User Tariffs and Cost Recovery** - experience particularly from the Dublin scheme has indicated that user tariff revenue is unlikely to cover the revenue costs of operating the scheme. In Dublin, 96% of all trips generated by the scheme have been free of charge[79]. This is primarily due to the tariff structuring of providing the first 30 minutes use free of charge. This tariff structure is considered to be a key success factor in developing a scheme, based on experience elsewhere as established in this section. Similarly, many schemes do not charge at all for use, including Aarhus. The recovery of costs through a form of public subvention or advertising linked model is therefore crucial.
- **Vandalism & Theft** - public bike sharing schemes can fall victim to vandalism and theft due to the communal nature of the bikes. Levels of incidence are also influenced by cultural and social aspects and demographics within cities. However, key lessons to minimise the incidence of theft and vandalism include the incorporation of a '3rd Generation' scheme with an electronic registration based system which identifies at any time who has hired a bike, and holds a significant deposit via a bank or credit card against the return of the bike. This has been evidenced through the very low levels of vandalism which has been experienced by Dublin and in contrast the high levels of theft suffered by the scheme in Cambridge which did not require electronic registration. Further lesson learned from Dublin in this context is the location of bike stations in busy, well lit areas of the city. The Paris scheme conversely has experienced significant levels of theft. Whilst this scheme operates an electronic system, a large part of the thefts have been attributed to the design of the bike stations which have resulted in people (particularly tourists) failing to properly lock and return bikes, which are in turn stolen.
- **City Characteristics** - research carried out by the NICHES programme (a European Commission funded programme focusing on sustainable surface transport) states that schemes are most suitable to cities with a population of greater than 200,000[80]. Belfast has a population of 268,000 and therefore would fall within this category. The NICHES study and experience in cities including Bristol and Barcelona indicate that cycling schemes are also best suited to cities without a hilly topography. In the case of Bristol, the topography (combined with the small scale of the scheme) was attributed to be a factor in the failure of the scheme. In Barcelona the topography has resulted in bikes amassing at the bottom of hilly areas and a lack of availability at the 'top' of these areas. The core area of Belfast would not be considered to be particularly hilly, except for parts of south Belfast.
- **Conditions for Urban Cycling** - the NICHES programme furthermore indicates that a minimum level of safe cycling infrastructure, alongside a strategy to promote cycling, is required to develop a successful scheme. This can include measures such as traffic calming,

[79] Meeting with Dublin City Council, 8 December 2010
[80] New Seamless Mobility Services - Public Bicycles, NICHES Programme

cycle networks, parking facilities and education and marketing. Belfast has an existing network of cycle lanes around the centre of Belfast and there are plans to increase the number of cycle lanes in the City. Furthermore, the Belfast on the Move programme with result in the significant alteration in the flow of traffic around the City Centre and should improve further the cycle-friendliness of the City. In terms of climatic conditions, it is clear that schemes are particularly successful in warmer, dry climates such as in France or Spain. However, Dublin has evidenced that a scheme can thrive in a climate similar to that of Belfast. Furthermore, the generally mild climate means that the scheme would be capable of operation all year round, unlike many schemes (which are considered successful in spite of this) in northern Europe and Canada which only operate during spring and summer.

- **Service and Maintenance** - a key aspect of successful schemes, and a factor which was emphasises in consultation with existing scheme operators and city authorities was a high level of maintenance and customer service. Bikes and bike stations are required to be serviced and cleaned on a daily basis and maintenance carried out on defective bikes to ensure safety, but also to avoid customer disappointment. Within any service and maintenance arrangements, the need for forced redistribution of bikes throughout the network at peak times of the day is also very important to the success of the scheme.
- **Helmet Laws** - there is currently no legal requirement for cyclists to wear a helmet in Northern Ireland. The statutory requirement to wear a helmet has been noted as perhaps the key reason for the failure of the scheme in Melbourne to attract a critical mass of users and members. Within this context, it is noted that a compulsory helmet law has recently been backed by the Northern Ireland Assembly, although any legislation is required to go through further stages in the Assembly. The implementation of a mandatory helmet law would be considered to have a detrimental impact upon the potential success of a scheme in Belfast.
- **Operator Design Input** – detailed design of the scheme and the selection of the location of the docking stations and bikes needs to be undertaken in conjunction with experienced scheme operators as part of the tendering process. The procuring authority can undertake strategic decisions regarding the broad scale and area of operation of the scheme however discussions with Dublin City Council and operators has reinforced the recommendation that detailed location decisions are undertaken with the operator based on their experience of developing numerous other successful schemes elsewhere.

Conclusions on Need / Demand based on Comparative Study

5.128 The following paragraphs summarise the findings of the research into demand and scheme metrics and sets out the potential for a scheme in Belfast.

Uptake Metrics

5.129 The Most Similar Cities study and the review of Experience Elsewhere indicates that there is potential for an appropriate level of demand for a public bike hire scheme in Belfast, if one were to be provided. It is clear from the data sets and research presented above that actual uptake rates (in terms of registrations) vary significantly on a city by city basis, and indeed successful schemes are influenced by a range of physical and operational factors.

5.130 The uptake (registration) rates for the schemes described in this section are summarised in the table below, where information was available.

	Most Similar Cities				Experience Elsewhere Case Studies						OBIS Data for Cities >200,000						
City	**Dublin**	**Aarhus**	**Montpellier**	**Bari**	**Paris**	**Lyon**	**Barcelona**	**London**	**Montreal**	**Melbourne**	**Terrassa**	**Pamploa**	**Vittoria**	**Rennes*** **	**Karlsruhe**	**Chemnitz**	**Modena**
Registration Rate*	c9%	c19%	3.5%	n/a	c9%	c10%	c6%	c1.5%**	c2%	<2%	c2%	1%	n/a	2.3%	0.7%	n/a	1%

* As % of population
** initial uptake in 6 months operation from commencement only
*** Based on Velo a la Carte scheme which was replaced in 2010.

5.131 As can be seen from the table above, the key cities examined indicate a conservative registration or uptake range of between **2% to 4%** of the population of the City. In Belfast, based on a population of 268,300 this would imply the potential for a registration or uptake of between circa 5,500 and 11,000. These potential metrics for Belfast have been discussed and informed by consultation with operators of schemes elsewhere.

5.132 In addition, an online survey has been carried out on behalf of Belfast City Council in February 2010 of over 200 individuals which indicated that over 50% of the people living or working in Belfast would use a public hire bike scheme if one were implemented in the City[81].

[81] Examining the potential for bike sharing in Belfast, British Council, 2010

Infrastructure Metrics

5.133 The Most Similar Cities study and the review of Experience Elsewhere also identified a broad range of infrastructure provision across cities, in terms of number of bikes provided and number of bike (docking) stations. The following table sets out the level of bike infrastructure provision for the Most Similar Cities, and the additional cities with a population of over 200,000 contained within the OBIS project study. The cities studied as part of the wider experience gathering exercise are not presented here due to the disproportionate scale and population in comparison to Belfast.

	Most Similar Cities				Experience Elsewhere Case Studies						OBIS Data for Cities >200,000						
City	**Dublin**	**Aarhus**	**Montpellier**	**Bari**	**Paris**	**Lyon**	**Barcelona**	**London**	**Montreal**	**Melbourne**	**Terrassa**	**Pamploa**	**Vittoria**	**Rennes****	**Karlsruhe**	**Chemnitz**	**Modena**
Bikes (no.)	450	450	1,150	90	-	-	-	-	-	-	100	101	300	200	343	130	224
Stations (no.)	40	57	50	13	-	-	-	-	-	-	4	5	15	23	0	15	32
Bikes:Stations	11.3	7.9	23	6.9	-	-	-	-	-	-	25	20	20	8.7	n/a	8.7	7.0
Registration Rate*	c9%	c19%	3.5%	n/a	c9%	c10%	c6%	c1.5%**	c2%	<2%	c2%	1%	n/a	2.3%	0.7%	n/a	1%

* As % of population

** Based on Velo a la Carte scheme which was replaced in 2010.

5.134 As can be seen from the table above, and based on the key experience and case studies set out in this section that pilot programmes are generally considered to be unsuccessful, the key cities examined indicate a conservative level of provision may be in the range of **300 to 500 bikes**. In terms of bikes to stations ratio, a metric of approximately 10:1 to 15:1 would imply that serviced by between **20 to 50 bike stations**. The bike stations would have a docking point to bike ratio of in the region of **2:1**. The bike stations should be located no more than 300-400 meters apart at key strategic locations. These potential metrics for Belfast have been discussed and informed by consultation with operators of schemes elsewhere.

5.135 In addition to the comparative approach to determining the level of bike provisions set out above, consultation with existing operators also established that a metric of approximately 20-30 subscribers per bike would be considered to be the maximum for the operation of an effective scheme[82]. On this basis:

[82] Meeting with Clear Channel Ltd, 28 January 2011

- A 2% registration rate implies circa 5,500 members and approximately 20 subscribers per bike implies a level of provision of circa 300 bikes; and
- A 4% registration rate implies circa 11,000 members and approximately 20 subscribers per bike implies a level of provision of circa 500 bikes.

5.136 This metric based calculation of the level of bike provision is broadly consistent with the results of the comparative based approach set out previously.

5.137 Finally, a level of provision in the region of 300 – 500 bikes with between 30 and 50 stations was also considered reasonable in consultation with key existing bike hire scheme operators (JCDecaux, Clear Channel and Hourbike Ltd), based on the indicative geographic, demographic and socio economic characteristics of Belfast. These operators also strongly recommended against the development of a scheme using an initial pilot programme on a smaller scale, based on their experience elsewhere.

Utilisation Metrics

5.138 The projected level of journeys or utilisation of the scheme can be considered based on metrics of average daily uses per bike (or bike rotation) achieved in the Most Similar Cities and the other cities examined as part of the comparative study. The table below sets out the average daily trips for each scheme and then presents the average bike rotation metric for these cities, based on available information.

	Most Similar Cities				**Experience Elsewhere Case Studies**						**OBIS Data for Cities >200,000**						
City	**Dublin**	**Aarhus**	**Montpellier**	**Bari**	**Paris**	**Lyon**	**Barcelona**	**London**	**Montreal**	**Melbourne**	**Terrassa**	**Pamploa**	**Vittoria**	**Rennes*** **	**Karlsruhe**	**Chemnitz**	**Modena**
Bikes (no.)	450	450	1,150*	90	>20,000	4,000	6,000	6,000	3,000	600	100	101	300	200	343	130	224
Average Trips (no.)	5,000	6,000	1,950	30	75,000	20,000	22,000	11,000	11,500	70	n/a	n/a	n/a	260	55	12	100
Ave. Bike Rotation	c11	c13	c3*	<1	c4	c5	c15**	c2	c4	<1	n/a	n/a	n/a	1.3	0.2	0.1	0.5

* Based on short term members and excluding long term members who have sole use of a bike for an extended period.
** Based on original provision of 1,500 bikes and before expansion to 6,000 bikes. Data on 6,000 bike utilisation not available.
*** Based on Velo a la Carte scheme which was replaced in 2010.

5.139 As can be seen from the table above, the level of average trips and therefore bike rotation (average levels of trips per bike per day) varies significantly on a city by city basis. Dublin is considered to have a very high rotation of bikes; consultation with the operator confirmed that the scheme has been a huge success and needs to significantly expand to deal with the demand for the scheme. On this basis, the level of utilisation and rotation in Aarhus is also very high. Montpellier is estimated to have a lower level of rotation, based on the number of bikes available for short term rent as opposed to long term lease to individuals. The scheme in Bari continues to demonstrate a very low level of usage.

5.140 Consultation with existing operators confirmed that a bike rotation (number of uses per day) of more than 8 times, will result in access and maintenance issues[83] suggesting again that the usage levels indicated at Dublin, Aarhus and also in Barcelona are very high in comparison to the level of bike provision.

5.141 On this basis, a bike rotation of between 3 to 5 uses per day would represent a reasonable level of utilisation. On this basis:

- A 2% registration rate which implies circa 5,500 members and a provision of circa 300 bikes represents between 900 and 1,500 trips per day; and
- A 4% registration rate which implies circa 11,000 members and a provision of circa 500 bikes represents between 1,500 and 2,500 trips per day.

Summary

5.142 The following table summarises the projected range of **Uptake**, **Infrastructure** and **Utilisation** which may be achievable in Belfast, on the basis of the Most Similar Cities comparative study and examination of cities and experience elsewhere, including consultation with scheme operators.

Range	Low	High
Registration Uptake (% of population)	2%	4%
Registration Uptake (no.)	c. 5,500	c. 11,000
Bikes (no.)	c. 300	c. 500
Stations (no.)	c. 30	c. 50
Trips per Day (no.)	c. 900 – 1,500	c. 1,500 – 2,500

[83] Meeting with Clear Channel Ltd, 28 January 2011

6 Objectives and Constraints

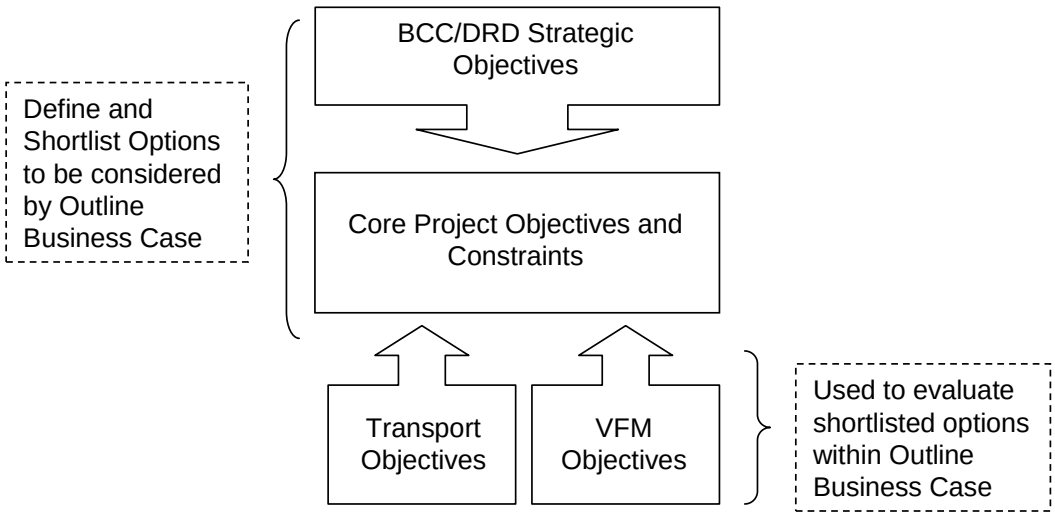
Introduction

6.1 The purpose of this section of the report is to set out both the objectives and constraints of the proposed bike sharing scheme.

Objectives

6.2 Objectives for the proposed scheme have been developed in conjunction with representatives from Belfast City Council, the Department for Regional Development and the Strategic Investment Board. In line with NIGEAE guidance, objectives have been developed to be broadly consistent with statements of government policy, departmental or agency objectives, departmental Public Service Agreements (PSAs), or wider macro-economic objectives. These policy frameworks have been described where relevant for each objective.

6.3 The broad framework within which objectives for the proposed scheme have been defined is set out in the diagram below:



6.4 The diagram shows that the overall aims and objectives of the proposed scheme are developed and assessed within the context of the wider policy objectives for Belfast City as defined by inter alia Belfast City Council and the Department for Regional Development.

6.5 The relevant strategic objectives and policies are set out within Section 3 of this Outline Business Case. The underpinning objectives are described in the paragraphs which follow.

Core Project Objectives

6.6 The core project objectives of this Outline Business Case, as agreed with the Project Management Group are set out below. These have been defined within ranges given the range of potential provision which has been identified in the Assessment of Need section and to allow for the market to respond to a potential future tender, undertake on an output specification basis, with their analysis of the most suitable solution for Belfast.

- To improve the opportunities for cycling in Belfast through establishment of a public hire bike scheme providing between 300 and 500 bikes (subject to operator market responses) for public use and between 20 and 50 docking stations, with docking stations no further than 300m apart on average;
- To deliver a scheme which is 3rd Generation in nature (characterised by secure-by-design principles, smart card access technology, electronically operated docking stations and locks, telecommunications systems and online account management) and supplemented by an appropriate service and maintenance arrangement.
- Obtain 2,500 members within the first year of operation and 10,000 members within the first 3 years of operations;
- To generate 3 hires per day per bike on average within the first year of operations; and
- To ensure the scheme is accessible to all citizens of Northern Ireland and meets all relevant equality legislation.

Transport Objectives

6.7 This project involves the development and implementation of a new mode of transport within Belfast City. The proposed scheme must therefore be considered in the context of a set of transport objectives developed in accordance with TAG Guidance and the Appraisal Summary Table described therein[84]. The key transport objectives which have been defined for this scheme are outlined below, together with a summary of the context from which the objectives have been derived. The measures, baseline and target values for each objective are presented in the table at the end of this Section.

Environment and Health

6.8 Belfast is committed to creating a cleaner and greener city, improving air quality and reducing the City's impact on climate change. In parallel with this, the Department for Regional Development aims to assist the Executive in achieving Programme for Government targets of a reduction in greenhouse gas emissions by 25% by 2025.

6.9 Cycling is in principle an emissions free form of transport and cyclists contribute significantly less greenhouse gas emissions that those using other motorised forms of transport in the City. As such, an increased level of cycling in Belfast has the potential to reduce the level of greenhouse gas emissions, improve air quality and reduce environmental impact.

6.10 In addition, Belfast City Council aims to improve health and activity levels within the City. Cycling offers enormous potential to help improve public health. The main advantage cycling has over other forms of exercise is the way it can become part of everyday activity, rather than people having to find additional time for exercise. One of the key studies of cycling has found that people who cycle to work experienced a 39% lower rate of all-cause mortality compared to those who did not – even after adjustment for other risk factors, including leisure time physical activity[85].

6.11 **Transport Objective 1** of the scheme is therefore:

- to increase the mode share of cycling in the City.

Safety

6.12 The Department for Regional Development and the Roads Service are committed to the development and operation of safe roads and public transport services. An effect that has been

[84] The Appraisal Process, TAG Unit 2.5
[85] Department for Transport, www.dft.gov.uk/cyclingengland/health-fitness/health-benefits-of-cycling/

recorded in a number of cities including London has been that as the number of cyclists on the road increases, the accident rate decreases. The development of a public hire bike scheme in Belfast will increase the number of cyclists on the streets of Belfast and therefore may further improve the accident rate for cyclists and the wider public transport network[86].

6.13 Furthermore, the progression of the Belfast On The Move scheme is intended to have a significant impact on the levels of city centre traffic, as has been experienced in cities such as Nottingham, Leeds, Newcastle and Sheffield which have also implemented public transport infrastructure measures and priority improvements[87].

6.14 **Transport Objective 2** of the scheme is therefore:

- to reduce accident rates for cyclists in Belfast.

6.15 Allied to the theme of safety is the issue of the security of the proposed bike hire scheme. Theft and vandalism rates for bike hire schemes vary significantly across cities, for example, with Paris suffering significant levels of theft and vandalism, whereas Dublin has practically no such recorded incidents despite the significant utilisation and profile of the scheme. As set out in the key experience and lessons learned in Section 5 of this OBC, design is key to minimising theft and vandalism, as is instilling a sense of ownership within the public.

6.16 **Transport Objective 3** of the scheme is therefore:

- to procure a public hire bicycle scheme which minimises theft and vandalism.

Economy

6.17 The establishment of a public hire bike scheme either in partnership with the private sector or as a public sector only scheme, the opportunity exists to include social benefit requirements within any such scheme. Furthermore the inclusion of such clauses is now encouraged by the Executive. The operation of such as scheme in the City is not considered to cause displacement of existing employment, rather it will offer the potential to create new employment positions. The scheme in Dublin created circa 30 new jobs through the private sector operator[88]. From a social aspect, the Aarhus scheme is operated in conjunction with the local employment centre and sustains around, 8 training positions in the summer and 4 in the winter[89] which impart skills on long term unemployed people and help them find subsequent employment.

6.18 **Transport Objective 4** of the scheme is therefore:

- to create new jobs through delivery of scheme, to include 2 apprenticeships per annum.

The potential exists to open the scheme to use by tourists in the City. This could potentially provide tourists with greater freedom, flexibility and accessibility throughout the City. The provision of a cycle scheme in the City may also serve to promote Belfast to tourists as an attractive, modern and environmentally aware City; a key corporate objective of the Council.

6.19 **Transport Objective 5** of the scheme is therefore:

[86] Cycle Hire Scheme Business Case Submission, Transport for London
[87] DRD Roads Service, Belfast on the Move scheme - Experience Elsewhere
[88] Interview with Joanne Grant, Managing Director JCDeceaux Ireland, 27 January 2011
[89] Correspondence with Erwin Berngruber, Director, Arbejdsmarkedscenter Nord

- to design and implement a public hire bicycle scheme which is open for the use of tourists, designed to accommodate short term membership and serve key tourist destinations.

Integration

6.20 The development of the public hire bike scheme will potentially complement initiatives already under way in the City, including Belfast On The Move which aims to facilitate a reduction in general traffic levels and encourage greater walking, cycling and public transport use. In particular, the next stage of the Belfast On The Move scheme to be taken forward focuses on Sustainable Transport Enabling Measures and in terms of cycle facilities will provide 2.6km of new bus lanes which will also accommodate cyclists, contra-flow cycling provision around Grosvenor Road and Durham Street and 1km of new dedicated cycle lanes[90].

6.21 In addition, the provision of a new transport mode offers the potential to address gaps in the public transport network, address the 'first mile – last mile' connectivity issue, increase connectivity between modes and in turn encourage use of the wider public transport network. Any design would require to be flexible or cognisant of future public transport developments including addressing integration with the proposed Rapid Transit scheme. The bike hire scheme will also be a resilient form of transport which will be available when engineering or network issues create problems with trains or buses.

6.22 **Transport Objective 6** of the scheme is therefore:

- to design a public hire bicycle scheme which integrates with Belfast's existing and future public transport network.

Accessibility & Social Inclusion

6.23 The development of a public hire bike scheme will provide the City with a low cost mode of public transport accessible for use by all parts of the community who are physically able to ride a bike. Increasing accessibility to public transport is especially important for low income groups, people without cars, young and older people. The scheme will also reduce the barriers to cycling – through eliminating the cost aspect of purchasing a bike, and decreasing the personal deterrents of risk of theft or vandalism.

6.24 **Transport Objective 7** of the scheme is therefore:

- to procure a public hire bicycle scheme which reduces barriers to cycling in the City and which maximises accessibility and social inclusion of cycling.

Value for Money and Operational Objectives

6.25 A key tenet of appraisal, as defined by the NIGEAE, is to assist in defining problems and finding solutions that offer the best value for money. Accordingly, the options for delivering a public bike hire scheme in Belfast should also be evaluated in the context of relevant value for money objectives.

6.26 It is also important to define as far as possible scheme specific targets and outputs from an operational point of view which contribute towards the achievement of wider strategic objectives. For the purposes of this business case therefore, the value for money and operational objectives can be summarised as follows:

[90] http://www.roadsni.gov.uk/index/belfast_on_the_move/botm4-what_is_proposed.htm

Viability

6.27 In delivering a public hire bike scheme for the City, the proposed options will be required to be viable in terms of delivery, operations and monitoring. Therefore options must be:

- capable of description in clear, objective, output-based terms;
- sufficiently flexible to address changing regulatory or demand factors; and
- capable of being subject to a robust performance monitoring regime.

Desirability

6.28 It is important to develop options which are capable of delivering a high quality product and service level to ensure uptake and use of the scheme, but this must also be balanced against cost and maintenance issues. Therefore options must be able to:

- deliver innovation and high quality product and service delivery; and
- achieve an appropriate balance between upfront capital investment and on-going costs.

Achievability

6.29 The delivery of a public hire bike scheme in Belfast must be considered to be achievable in order to deliver best value for money. Therefore options should be:

- capable of being procured and delivered and attract sufficient market interest;
- achievable given the existing public sector resources to deliver the project; and
- be deliverable within an appropriate procurement timetable.

Objective Measures, Baseline and Target Values

6.30 The tables which follow present the key measures, baseline value and target values (where available) for each of the transport and value for money objectives set out above. These measures and values also provide the basis for the non monetary evaluation of options and also for the development of a Benefits Realisation Plan for the project, which is presented in Section [12] of this OBC.

Transport Objectives

Theme	Objective	Relevant Measures	Baseline Value (where available)	Target Value
Environment & Health	To increase the mode share of cycling in the City	• Distance travelled per person per annum by mode in Belfast • Travel to work mode share in Belfast	• Average distance travelled per person per annum by cycle mode in Belfast – 28 miles • % of workers utilising cycles as means of travel to work – 3% (source – Travel Survey for Northern Ireland in Depth Report 07-09)	• Increase average distance travelled per person per annum from 28 miles to 42 miles within full year of scheme operation. • Increase % of workers utilising cycles as means of travel to work from 3% to 4.5% within full year of scheme operation[91].
Safety	To reduce accident rates for cyclists in Belfast	• Number of accidents involving cyclists within scheme boundaries	• To be determined.	• To be determined.
	To procure a public hire bicycle scheme which minimises theft & vandalism	• Incidence of theft and vandalism affecting scheme.	• Not applicable.	• Less than 5% of bikes to suffer vandalism or theft per annum[92].
Economy	To create new jobs through delivery of scheme, to include [2] apprenticeships per annum	• Number of full time jobs and number of apprenticeships created.	• Not applicable.	• Create 10 full time jobs plus employ 2 apprenticeship positions per annum.
	To design & implement a public hire bicycle scheme	• Facility to allow short term membership for non	• Not applicable.	• Facility to allow short term membership for non

[91] Paris experienced a 24% increase in cycling in first year of scheme despite existing high modal share (Bike Share, Opportunities in New York City, NYC Department of City Planning); Barcelona achieved a 130% increase in mode share (http://bike-sharing.blogspot.com/2009/09/cycle-mode-share.html)

[92] Barcelona suffered less than 5% in first year, Paris c.10% (Feasibility Study for a Central London Cycle Hire Scheme, Transport for London), Dublin has experienced practically zero incidence of theft and vandalism (http://www.spur.org/blog/2010-10-06/notes_abroad_dublins_bike_share_success)

Theme	Objective	Relevant Measures	Baseline Value (where available)	Target Value
	which is open for the use of tourists, designed to accommodate short term membership and serve key tourist destinations	residents. • Bike stations located in proximity to key tourist locations.		residents. • Bike stations located in proximity to inter alia City Hall, Queen's University, Cathedral Quarter, Ulster Museum, Titanic Quarter, Victoria Square (subject to planning constraints).
Integration	To design a public hire bicycle scheme which integrates with Belfast's existing and future public transport network	• Bike stations located in proximity to key existing public transport provision. • Flexibility to provide for integration with future public transport developments. • Integrated ticketing.	• None.	• Bike stations located in proximity to inter alia Central Station and key train halts within scheme boundary. Proximity to Laganside Bus Centre and key bus terminus in scheme area. • Flexible contract and infrastructure to allow for future adaptation to public transport changes. • Integration of cycle scheme with Translink smart ticketing.
Accessibility & Social Inclusion	To procure a public hire bicycle scheme which reduces barriers to cycling in the City and which maximises accessibility and social inclusion of cycling	• Tariff and membership structure which provides accessibility to all members of the community.	• Not applicable.	• Annual registration cost of maximum £10 with 30mins free use per journey.

Value for Money Objectives

Theme	Objective	Relevant Measures	Baseline Value (where available)	Target Value
Viability	Deliver a bike hire scheme which is: • capable of description in clear, objective, output-based terms; • sufficiently flexible to address changing regulatory or demand factors; and • capable of being subject to a robust performance monitoring regime.	• Described in clear, objective, output-based terms; • Flexibility to address changing regulatory or demand factors; and • A robust performance monitoring regime.	• Not applicable.	• Fully deliver the Relevant Measures.
Desirability	Deliver a bike hire scheme which can: • deliver innovation and high quality product and service delivery; • achieve an appropriate balance between upfront capital investment and on-going costs. • Have zero or minimal cost to public purse with finance via innovative funding methods.	• Innovative and high quality product and service delivery; • Appropriate balance between upfront capital investment and on-going costs. • Zero or minimal cost to public purse via innovative funding methods.	• Not applicable.	• Fully deliver the Relevant Measures. • Zero or minimal cost to public purse through utilisation of innovative funding approaches as determined during procurement by tenderers.
Achievability	Deliver a bike hire scheme which is: • capable of being procured	• Procured and delivered and attracts sufficient market interest;	• Not applicable.	• Fully deliver the Relevant Measures. • Operational scheme within

Theme	Objective	Relevant Measures	Baseline Value (where available)	Target Value
	and delivered and attract sufficient market interest; • achievable given the existing public sector resources to deliver the project; and • be deliverable within an appropriate procurement timetable.	• Allocation of appropriate public sector resources to deliver the project; and • Delivery within an appropriate procurement timetable.		defined infrastructure range. • Operational scheme by June 2013

Constraints

6.31 In defining what a future bike sharing scheme may look like in Belfast, it is important to identify and explain a range of constraints which exist. A number of constraints in relation to the proposed bike sharing scheme have been identified in conjunction with Belfast City Council, the Department for Regional Development and the Strategic Investment Board. These are described in the following paragraphs.

Affordability and Funding

6.32 A key aim of the Outline Business Case is to examine alternative forms of delivery for a scheme in Belfast. In this context, the options for the proposed bike hire scheme in Belfast must have minimal capital or revenue funding requirements for Belfast City Council or the Department of Regional Development.

Site Selection

6.33 In common with the characteristics of successful schemes in other cities throughout Europe the development of a public hire bike scheme in Belfast will be focused, at least initially, on a relatively small City centre based zone. As established earlier in this OBC, characteristics of successful schemes in other cities include the provision of a critical mass of bikes and docking stations which are located a key strategic sites throughout this central zone.

6.34 In order to establish the scheme, it will therefore be necessary for the public sector to identify and have access to a sufficient number of appropriate, strategic sites throughout the City Centre. Where large or strategic land holdings are held within private companies or by individuals, this will form a constraint on the development of the scheme.

Environmental/Planning

6.35 The delivery of a bike hire scheme in Belfast will likely require the installation of a significant level of on street furniture and supporting infrastructure. For example, Dublin has installed a large number of on street bike docks and bike stations, and as part of the contract a significant number of advertising structures and a way finding signage system were erected around the city.

6.36 The design and implementation of the scheme will therefore comply with all statutory environmental and planning requirements. In particular, the installation of on street furniture will require consents and planning approvals from both Belfast City Council, the Department for Regional Development / Roads Service and also the Planning Service.

6.37 In addition, a further significant constraint identified during discussions with Dublin City Council is that any on street furniture is design and installed to be compliant with all relevant disability and accessibility legislation.

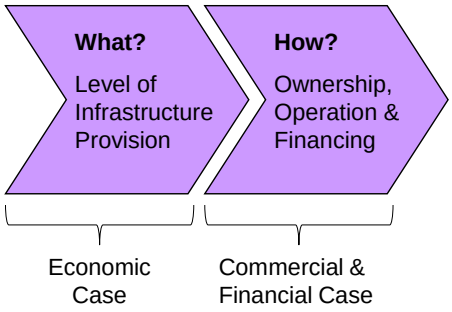
Approval to Proceed

6.38 The proposal to develop a public hire bike scheme in Belfast is dependent upon DRD, other relevant Departments and Agencies and Belfast City Council providing their approval to proceed at each key milestone of the project and on the key assumptions that are contained within this Outline Business Case remaining valid.

7 Identification and Description of Options

Introduction

7.1 This section considers the range of options available to Belfast City Council for the delivery of a public hire bike scheme in the City. Given the nature of the project, there are a two key dimensions which need to be considered in developing a bike hire scheme. The following diagram sets out these key variables.



7.2 This section considers the Options for the City in terms of the level of infrastructure provision, which are evaluated in Sections 8 to 11 of this OBC. The approach to the ownership, operation and financing, which are the key commercial variables of the scheme, is addressed in Section 12 of this Outline Business Case.

Level of Infrastructure Provision

7.3 The Assessment of Need section of this OBC concluded that a range of infrastructure provision may be appropriate for the delivery of a public hire bike scheme in Belfast. These ranges are re-presented below.

Range	Low	High
Registration Uptake (% of population)	2%	4%
Registration Uptake (no.)	c. 5,500	c. 11,000
Bikes (no.)	c. 185 – 275	c. 350 – 550
Stations (no.)	c. 13 – 28	c. 25 – 55
Trips per Day (no.)	c. 570 – 1,375	c. 1,110 – 2,750

Long List of Options

7.4 Six broad options in terms of infrastructure provision have been identified for the long list. These options have been derived from the broad range of provision identified in the Assessment of Need as set out at paragraph 7.3 above and cover the dimensions of scale, phasing and quality / technology of provision:

- **Option 1** - Do Nothing;
- **Option 2** - Pilot 3rd Generation Scheme - 100 bikes and 10 stations;
- **Option 3** - Mid Sized 3rd Generation Scheme - 300 bikes and 30 stations;
- **Option 4** - Full Sized 3rd Generation Scheme - 500 bikes and 50 stations;
- **Option 5** – Mid Sized Reduced Technology Scheme - 300 bikes and stations; and
- **Option 6** – Full Sized Reduced Technology Scheme - 500 bikes and 50 stations.

7.5 It is not within the scope of this OBC to define precise locations of bike hire infrastructure. This OBC sets out the scale of proposed infrastructure which may be viable in Belfast. Detailed planning and liaison with the Planning Service, NI Environment and Heritage Service, Roads Service, utilities and prospective operators will be required to determine the precise location of infrastructure. It will also be important to utilise the significant expertise of suppliers and / or operators gained on other schemes in determining the location of the scheme, as location can have a significant influence on crime and vandalism, usage patterns, bike distribution & availability, and overall success. The process of concluding on locations will require to be an iterative process with suppliers and / or operators as part of the dialogue during any future procurement - experience from Dublin in particular has highlighted this issue.

Identification of Short List of Options

7.6 The next stage in the option development process was to screen each of the options included in the long list against the objectives established for the project to consider whether they provide a significant contribution to the achievement of each of the project objectives.

7.7 The implementation of a pilot scheme clearly does not meet the objective of providing a scheme of between 300 – 500 bikes in the City. In addition, the strong evidence of experience elsewhere and consultation with existing scheme operators indicates that pilot programmes are generally unsuccessful when implemented due to a lack of critical mass or network. In this case, the 100 bike Option will fail to meet objectives focusing on increasing modal share due to lack of uptake. This option will also fail to meet key VFM objectives of achievability as interviews with operators indicated market interest would be weak for a small scale scheme. This option has therefore been de-selected from the list of options for detailed appraisal.

7.8 As set out in the Core Project Objectives in Section 6, the proposed physical infrastructure would be required to be Third Generation in nature (characterised by secure-by-design principles, smart card access technology, electronically operated docking stations and locks, telecommunications systems and online account management) supplemented by an appropriate service and maintenance arrangement over the duration of the operation of the scheme. This is a key aspect of modern bike share scheme which not only serve to improve the user experience by providing up to date information on bike availability, ease of access and detailed management information, but critically serves as a major deterrent against vandalism and theft.

7.9 The Assessment of Need Section identified a number of key lessons from existing (and some failed) schemes in relation to technology – this primarily indicated that electronic registration encourages a sense of ownership and avoids 'anonymity' of users which can facilitate vandalism and theft. This has been evidenced by the failure of the non-electronic scheme in Cambridge which closed due to massive theft issues, and is in contrast to the experience in Dublin where there has been practically no incidence of theft. This is a fact which the Council attribute in part to the 'ownership' conveyed through the electronic system. In addition, non-electronic systems cannot provide useful information on levels of utilisation, distribution, and creates problems for users seeking to subscribe and pay for service, particularly on a short term basis. Options 5 and 6 have therefore not been taken forward for detailed appraisal.

7.10 Options 3 and 4 are retained for detailed appraisal as they are considered to offer potential to meet each of the defined objectives. Option 1 is retained as the base case comparator. As set out above, concluding a detailed list of locations will require to be an iterative process with suppliers and / or operators as part of the dialogue during any future procurement. The short list of options for detailed appraisal is therefore:

- **Option 1** - Do Nothing;
- **Option 3** - Mid Sized 3rd Generation Scheme - 300 bikes and 30 stations; and
- **Option 4** - Full Sized 3rd Generation Scheme - 500 bikes and 50 stations.

8 Identification of Monetary Costs and Benefits

Introduction

8.1 This Section of the OBC sets out the estimated cost of investment in the physical infrastructure for a public hire bike scheme and also the estimated cost of the on-going operating and maintenance requirements for the shortlisted Options.

8.2 Public hire bike scheme are primarily provided, and in many cases operated, by private sector companies. Component cost data for a typical bike sharing scheme is not readily available and this information is not shared by private sector operators, such as JCDecaux or Clear Channel.

8.3 Research of existing bike hire schemes from Europe and North America has produced a range of metrics and benchmarks for the cost of developing and maintaining a typical 3rd Generation bike hire scheme. Therefore this Section sets out key capital and operating cost benchmarks and metrics from these existing schemes to project an anticipated average installation and subsequent maintenance and operations costs for a public hire bike scheme in Belfast.

Timeline

8.4 Section 13 of this report outlines the arrangements for procuring and managing the a public hire bike scheme in Belfast. The following indicative timetable has been prepared for the procurement of bicycles with the aim to complete the implementation of the scheme within 2013.

8.5 The timetable set out below is based on the Competitive Dialogue process and makes no allowance for the impact of external factors which cannot be identified at this stage and which could affect the timetable, for example, approval of business cases or delays from statutory processes.

Milestone	Indicative Date
Approval of OBC	June 2011
Dispatch OJEU Notice	July/August 2011
Award Contract	June 2012
Commence Operations	June 2013

8.6 The financial evaluation of the options identified in Section 7 has been carried out over 15 years. This is based on consultation with operators who indicated this as a reasonable contract duration. The remainder of this chapter sets out the approach and key findings of the quantification of monetary costs and benefits.

8.7 It is important to note that VAT has been excluded from the following analysis.

Cost Categories

8.8 The costs of a public hire bike scheme vary depending on the level of bikes and supporting infrastructure to be provided and the level of technology employed by the overall system. The following paragraphs set out benchmark estimates derived from publically available information

from similar schemes and use average data to project anticipated capital and operating cost estimates for a public hire bike scheme in Belfast. Cost estimates have been provided for the two shortlisted 'Do Something' options set out below:

- **Option 3** - Mid Sized 3rd Generation Scheme - 300 bikes and 30 stations; and
- **Option 4** - Full Sized 3rd Generation Scheme - 500 bikes and 50 stations.

8.9 The estimated cost implications of these options are presented below.

Opportunity Costs

8.10 As it is anticipated that docking stations will be primarily located by the roadside, on wide payments or existing on street car parking spaces. The opportunity cost of parking revenues foregone have been included as an opportunity cost of the scheme. It has been assumed that approximately 50% of the docking stations under each Option may be located on existing on street car parking spaces. The following table sets out a full list of the assumptions and calculations used in order to calculate the opportunity cost of the scheme.

Description	Assumption	Comment
Number of Days (Mon – Sat)	6	DRD Roads Service Website
Weeks in Year	52	-
Number of Parking Days p.a	312	-
Number of Chargeable Hours per day	8	Based on average chargeable period
Assumed Parking Space Utilisation	80%	-
Number of Chargeable Hours p.a	1,997	
Revenue per Hour	£1	DRD Roads Service Website
Percentage of Docks in parking spaces	50%	-
Number of Docking Stations per Parking Space	2	-
Opportunity Cost p.a – Option 3	**£59,904**	**30 Spaces foregone x £1,997**
Opportunity Cost p.a – Option 4	**£99,840**	**50 Spaces foregone x £1,997**

8.11 Opportunity costs set out in the table above have been included in each year of the appraisal period.

Capital Costs

Infrastructure Costs

8.12 Infrastructure Costs of the public hire bike scheme include the cost of bikes, manufacture and installation of docking stations, purchase of service and distribution vehicles, and the cost of the necessary hardware and software and customer service function.

8.13 The following table sets out the available average capital cost metrics for 3rd Generation public hire bike schemes in a range of major cities. The figures provided represent an overall total capital cost metric per bike. Whilst capital costs vary depending on the scheme design and specification of the infrastructure, each of the schemes set out below is '3rd Generation' in nature which is characterised by the use of specially designated public hire bikes with secure design and smart technology operating and monitoring systems and supporting IT infrastructure.

City	Scheme	Total Capital Cost (£ per Bike)	Source	Year
Montreal	Bixi estimate	1,875	Journal of Public Transport	2009
Washington D.C	Clear Channel estimate	2,250	Bike-Share Opportunities in New York City	2010
Lyon	JC Decaux Velov estimate	2,813	Bike-Share Opportunities in New York City	2005
Paris	JC Decaux Velib estimate	2,750	Journal of Public Transport	2010
Barcelona	Clear Channel Adshel estimate	1,208	Philidelphia Bikeshare Concept Study	2010
Minneapolis	Niceride estimate	2,117	Phillidelphia Bikeshare concept study	2010
n/a	Clear Channel estimate	2,250	Journal of Public Transport estimate for generic scheme	2010
n/a	Hourbike estimate	1,500	Hourbike estimate for generic scheme	2011
	Average	**2,095**		

8.14 Based on the metrics and benchmarks set out above, an infrastructure capital cost metric in the region of £2,095 per bike has been derived for the implementation of a public hire bike scheme in Belfast. The total infrastructure cost is therefore set out below for each Option.

Cost Classification	Option 3 £	Option 4 £	Comment
Infrastructure Capital Cost	628,500	-	Based on 300 bikes * £2,095
Infrastructure Capital Cost	-	1,047,500	Based on 500 bikes * £2,095
Total	**628,500**	**1,047,500**	

8.15 The total infrastructure capital cost for Option 3 is projected to be £628,500 and the total capital cost for Option 4 is projected to be £1,047,500.

Start-Up Costs

8.16 In addition to the capital costs for bikes and docking stations set out above, provision has been made for a number of 'Start-Up' Costs. These are one off costs incurred in year 1 in order to launch the scheme. The costs classifications and assumed expenditure are set out in the table below.

Cost Classification	Option 3 £	Option 4 £	Comment
Pre-Launch Promotional Expenditure	30,000	45,000	Raise publicity of scheme and methods of participation.
Detailed Docking Station Location & Traffic Flow Study	20,000	30,000	Study ensures that bikes are located in optimal city locations.
Pre-Launch Office & Admin Expense	10,000	15,000	-
Total Start Up Costs	**60,000**	**90,000**	

Summary of Capital Costs – Option 3 and Option 4

8.17 On the basis of the capital infrastructure cost figures set out above, the estimated capital cost for Option 3 and Option 4 is set out in the table below.

Cost Classification	Option 3 £	Option 4 £
Infrastructure Capital Cost	628,500	1,047,500
Start Up Costs	60,000	90,000
Total Capital Costs	**688,500**	**1,137,500**

8.18 As can be seen from the table above, Option 3 is projected to have a total capital cost of circa £688,500 and Option 4 is projected to have a total capital cost of circa £1,137,500.

Operating Costs

8.19 The total operating costs of a public hire bike scheme include costs associated with maintenance and lifecycle replacement of stations and bikes, replacement of stolen and vandalised bikes, salaries for maintenance and admin staff, administration and operations, insurance and costs for redistribution of bikes between docking stations. Operating costs also include maintenance of the website, software system and administration of payments.

8.20 The following table sets out the available average operating cost metrics for 3rd Generation public hire bike schemes in a range of major cities. The figures provided represent an overall total operating cost metric per bike, including replacement for theft and vandalism. Further disaggregation of the component operating costs is not publically available.

8.21 Whilst operating costs vary depending on the scheme design and specification of the infrastructure, each of the schemes set out below is '3rd Generation' in nature which is characterised by the use of specially designated public hire bikes with secure design and smart technology operating and monitoring systems and supporting IT infrastructure.

City	Scheme	Opex cost per Bike (£)	Source	Year
Montreal	Bixi estimate	750	Journal of Public Transport	2009
Washington D.C	Clear Channel estimate	1,000	Bike-Share Opportunities in New York City	2010
Lyon	JC Decaux Velov estimate	938	Bike-Share Opportunities in New York City	2005
Paris	JC Decaux Velib estimate	1,063	Journal of Public Transport	2010
Barcelona	Clear Channel Ashdel estimate	938	Philidelphia Bikeshare Concept Study	2010
Minneapolis	Niceride estimate	1,000	Phillidelphia Bikeshare concept study	2010
n/a	Clear Channel estimate	1,215	Journal of Public Transport estimate for generic scheme	2010
n/a	Hourbike estimate	550	Hourbike estimate for generic scheme	2011
	Average	**932**		
Adjustment for Theft		(52)	10% of bike replacement cost	
Average Opex ex Theft Replacement		**880**		

8.22 In order to present the cost of replacement due to theft separately and to perform subsequent sensitivities on this variable, and estimate has been made of the cost of a replacement bike, the frequency of replacement and this has been presented separately.

Replacement Costs – Theft & Vandalism

8.23 It assumed that 10% of bikes will be require replacement per annum due to theft and /or vandalism. Evidence available from existing schemes varies quite considerably. Theft rates observed during year 1 of the Paris scheme were in the region of 14%[93]. However, the

[93] Bike Share, Opportunities in New York City, NYC Department of City Planning

equivalent rate in Lyon was 5%[94] and the scheme in Dublin has experienced practically no incidence theft and vandalism[95]. Aarhus experiences a theft rate of approximately 5% per annum[96]. On the basis that security measures and designs have improved since the launch of the Paris scheme, a replacement assumption of 10% of bikes per annum is considered to represent a conservative projection for Belfast. The table below sets out available information in relation to the estimated cost of a replacement bicycle.

Description	Capital cost per Bike (£)	Source
Generic - Clear Channel	375	Bike-Share Opportunities in NYC
Minneapolis Estimate	625	Twin Cities Bike Share Business Plan
Generic - JCDecaux	818	www.bikeoff.org
Velib - JCDecaux	364	http://cityoutdoor.org/jcdecaux-has-difficulty-sustaining-business-model-of-velib/
Bicing - Clear Channel	409	http://www.bikeoff.org/design_resource/dr_PDF/schemes_public_bicing.pdf
Average	**520**	(Note – adjusted out of overall Opex metric)

8.24 Based on the replacement frequency assumption of 10% of total bikes per annum and the replacement cost of £520 as set out in the table above, the following annual replacement costs are projected to be incurred for each Option.

Cost Classification	Option 3 £ p. a.	Option 4 £ p.a.	Comment
Bike Replacement Cost	15,600	-	Based on 300 bikes * 10% * £520
Bike Replacement Cost	-	26,000	Based on 500 bikes * 10% * £520
Total	**15,600**	**26,000**	

8.25 As can be seen from the table above, Option 3 is projected to incurred annual replacement costs due to theft and vandalism of £15,600 and Option 4 is projected to incur annual costs of £26,000.

Contract Management Costs

8.26 In addition to the operating costs identified above, on-going contract maintenance costs have been included to cover management of the contract. A figure of £20k per annum has been included for both Options.

[94] Non Profit Business Plan for Twin Cities Bike Share, City of Minneapolis
[95] Meeting with Dublin City Council, 8 December 2010
[96] Correspondence with Erwin Berngruber, Director, Arbejdsmarkedscenter Nord

Summary of Operating Costs – Option 3 and Option 4

8.27 On the basis of the operating and replacement cost figures set out above, the estimated total operating cost for Option 3 and Option 4 is set out in the table below.

Cost Classification	Option 3 £ p. a.	Option 4 £ p.a.	Comment
Operating Cost	264,000	-	300 bikes x £880
Operating Cost	-	440,000	500 bikes x £880
Bike Replacement Cost	15,600	-	Based on 300 bikes * 10% * £520
Bike Replacement Cost	-	26,000	Based on 500 bikes * 10% * £520
Contract Management	20,000	20,000	-
Total Per Annum	**299,600**	**486,000**	
Total over Appraisal	**4,194,400**	**6,804,000**	

As can be seen from the table above, Option 3 is projected to have an annual operating cost including replacement for theft and vandalism, of circa £299,600. Option 4 is expected to have an annual cost of circa £486,000. The total recurrent spend over the appraisal period is projected to be circa £4,194,400 for Option 3 and circa £6,804,000 for Option 4.

Summary of Costs of Options

8.28 The following table sets out total cost project costs for Option 3 and Option 4 over the lifetime of the proposed scheme. Please refer to Appendix D for detailed presentation.

Cost Classification	Option 3 £	Option 4 £
Opportunity Costs	898,560	1,497,600
Capital Costs	688,500	1,137,500
Operating Costs	4,194,400	6,804,000
Total Costs	**5,781,460**	**9,439,100**

9 Assessment of Risk and Optimism Bias

Introduction

9.1 This Section of the OBC seeks to both identify the key risks associated with the Options previously developed and to set out adjustments for Optimism Bias, in line with the Department for Transport Guidance, "Procedures for Dealing with Optimism Bias in Transport Planning", June 2004.

Risk

9.2 The analysis of risk and uncertainty is a key element in project appraisal. In a project which is innovative such as this, there will be a range of risks that need to be understood and managed. It is vital to identify and analyse these risks which are relevant to the project and furthermore to show how they compare under each Option. Risks and uncertainties have been categorised under the following key groups:

- Utilisation and Demand Risks;
- Technical and Design Risks;
- Financial and Commercial Risks; and
- Stakeholder Risks.

9.3 Each risk has been assigned a probability of high, medium or low based upon the likelihood of occurrence and a value of high, medium or low based upon estimated monetary value. The probability of occurrence and estimated monetary value of each risk have then been combined into an overall qualitative financial impact rating in accordance with the methodology set out in the table below.

		Probability		
		High	**Medium**	**Low**
	High	High	High	Medium
Value	**Medium**	High	Medium	Low
	Low	Medium	Low	Low

9.4 The table shows that a risk that is considered to have a high value and a medium probability would have a high overall impact. Similarly, a risk with a low value and a medium probability would be considered to have a low overall impact.

9.5 The following assessment sets out the key risks inherent in the project, the impact of each risk identified based on the methodology set out above and compares the impact of each risk on an Option by Option basis.

Risk Register

9.6 The table below sets out a summary of the option by option comparison of the risks identified. Option 1 has been noted as 'not applicable' due to the fact that this is a Do Nothing comparator option.

		Option 1 – Do Nothing				Option 3 – 300 Bikes				Option 5 – 500 Bikes		
Nr	**Risk**	**Value**	**Prob**	**Impact**		**Value**	**Prob**	**Impact**		**Value**	**Prob**	**Impact**
Utilisation and Demand Risks												
1	Over/under-estimation of Demand	n/a	n/a	n/a		H	M	H		H	M	H
Technical and Design Risks												
2	Planning permission	n/a	n/a	n/a		L	M	L		L	H	M
3	Design and Technology complexity	n/a	n/a	n/a		M	L	L		M	L	L
4	Site conditions	n/a	n/a	n/a		M	L	L		M	L	L
Financial and Commercial Risks												
5	Affordability	n/a	n/a	n/a		M	H	H		M	H	H
6	Market interest	n/a	n/a	n/a		H	M	H		H	L	M
Stakeholder Risks												
7	Theft and vandalism	n/a	n/a	n/a		M	M	M		M	M	M
8	Increase in accidents	n/a	n/a	n/a		H	L	M		M	M	H
9	Political and Departmental Support	n/a	n/a	n/a		H	M	H		H	M	H
10	Liability and Insurance	n/a	n/a	n/a		M	L	L		M	L	L

10.1. The table below sets out a detailed description of each of the key risks identified above, mitigating actions, the risk owner and an assessment of the comparison of each specific risk across the short listed Options.

Nr	Risk	Description	Mitigation	Owner	Option Comparison
Utilisation and Demand Risks					
1	Over/under-estimation of Demand	Projected levels of registration and trips per day are over/under estimated.	Conservative estimates of uptake based on experience elsewhere. Flexibility in contract to deal with under estimation of demand. High quality scheme product and service with appropriate tariff structure.	Project Director	The over or under estimation of demand is considered to represent a high value risk for both options due to the relative cost of the infrastructure provision. The probability of an over or underestimation is assessed as medium given the detailed analysis undertaken in the Assessment of Need but also the lack of precedent for a scheme such as this is Northern Ireland. Therefore the overall impact is assessed as high.
Technical and Design Risks					
2	Planning permission	A risk exists that Planning Service may raise issues during the planning application process.	Early engagement with Planning Service, to determine precise level of planning consent required. Involvement of Planning Service at procurement stage.	Project Director	The value of this risk is assessed as low for both options as should planning not be forthcoming for a particular location the cost in applying for an alternative nearby location in unlikely to be significant. No work will have been commenced on the ground prior to planning decisions. The probability has been assessed as medium for Option 3 due to the large volume of applications which may be required and high for Option 4 given the increased volume again potentially. The overall impact is assessed as low for Option 3 and medium for Option 4.
3	Design and Technology	A scheme has not previously	Utilisation of	Project	The value of this risk has been assessed as medium for

Nr	Risk	Description	Mitigation	Owner	Option Comparison
	complexity	been implemented in Belfast before therefore a risk in relation to design and technology implementation and operation exists.	experienced scheme providers and / operators.	Director	both do something options due to the high cost of infrastructure and technology. However, the scheme would be required to be provided by an experienced scheme designer and manufacturer and there are numerous examples of successful schemes across the world from which operator experience will be applied. The probability is therefore assessed as low for both options as the same design and technology solution would be implemented regardless of scale. The overall impact is therefore assessed as low for both options.
4	Site conditions	Infrastructure will probably necessitate a degree of foundation and excavation work. No sites have yet been precisely defined therefore risk exists that site conditions may prove unsuitable post selection.	Early engagement with utilities and Roads Service. Access to diagrams setting out key utilities locations to potential bidders.	Project Director	The value of this risk is assessed as medium for both options as foundation and excavation work will be relatively expensive to undertake and make good where sites prove not to be suitable. The probability is assessed as low for both options as early engagement with utilities and Roads Service should prevent any nugatory work at inappropriate sites. There is not considered to be any material change in the probability of occurrence across the Do Something options. The overall impact is therefore assessed as low for both options.
Financial and Commercial Risks					
5	Affordability	Risk that projected costs are underestimated or increase	Sensitivity analysis to understand implications.	Project Director	The value of this risk is assessed as medium for both options due to fact that any increase in projected costs

Nr	Risk	Description	Mitigation	Owner	Option Comparison
		during procurement.	Gathering of wide range of benchmark cost data. Competitive procurement to ensure costs are not artificially inflated.		would directly impact the project stakeholders although the costs of the scheme are moderate compared to other transport initiatives. The probability however has been assessed as high for both options due to lack of precedent for a scheme in Belfast and as costs cannot be estimated with complete accuracy at this stage of the project and due to the lack of available funding. There is not considered to be any material change in the probability of occurrence across the Do Something options. The overall impact is therefore high for both options.
6	Market interest	A lack of market interest may deliver poor competition, poor innovation and poor value for money.	Continued engagement with private sector providers. Joined up approach from Government to address key private sector concern.	Project Director	The value of this risk is assessed as high for both options as a lack of market interest may result in poor competition and poor value for money due to lack of competitive tension. The probability has been assessed as medium for Option 3 and low for Option 4 due to the fact that the experience gathering exercise undertaken with existing operators highlighted a greater preference for a large scheme, and certainly indicated a lack of interest in a small scale scheme. The overall impact is therefore assessed as high for Option 3 and medium for Option 4.
Stakeholder Risks					
7	Theft and vandalism	Risk of higher than expected theft or vandalism of bikes	Ensure secure by design approach adopted to	Project Director	This risk has been assessed as medium value for both Options as schemes such as that in Paris and those which

Nr	Risk	Description	Mitigation	Owner	Option Comparison
		and infrastructure.	infrastructure and lessons learned by experienced operators in relation to design and employed.		fail to employ smart technology to identify users have resulted in significant costs through theft and vandalism. The probability as assessed as medium for both options due to the relatively low levels of theft and vandalism experienced by most schemes implemented by experienced operators, and in particular in Dublin. There is not considered to be any material change in the probability of occurrence across the Do Something options. The overall impact is therefore assessed as medium for both Options.
	Increase in accidents	Risk exists that an increased level of accidents occur.	Provision of information/starter packs, cycle training, targeted safety campaign.	Project Director	The impact of accidents increasing is assessed as having a high value across both options due to the high economic cost of road traffic accidents. This is considered to be materially the same across both Options. The probability of a major increase is estimated to be low for Option 3 and medium for Option 4. This is due to the relatively low levels of accidents which have been reported in comparable cities around Europe and indeed Dublin, but the potential for greater journeys and therefore accidents under Option 4. Research has also indicated that an increase in the volume of cyclists can in fact result in a decrease in accident rates due to an increased awareness from drivers. The overall impact is therefore assessed as medium for Option 3 and high for Option 4.
	Political & Departmental Support	Risk exists that the scheme	Early engagement with	Project	The value of this risk is assessed as high for both Do

Nr	Risk	Description	Mitigation	Owner	Option Comparison
		fails to attract the necessary support from the wide ranging stakeholder group.	key stakeholders, particularly DRD and Belfast City Council. Demonstration of benefits through OBC process.	Director	Something options due to the fact that a lack of stakeholder support will not only stymie the progression of the scheme, but also significantly impact upon the level of market interest, willingness to tender and therefore overall value for money. The probability has been assessed as medium for both options due to the large range of stakeholders and interest groups across both options. The overall impact has therefore been assessed as high fot both Do Something Options.
10	Liability and Insurance	Risk exists that the scheme will be structured inappropriately or fail to have adequate insurances and the public sector will face public liability claims.	Appropriate risk sharing with private sector through procurement.	Project Director	The value of this risk is assessed as medium for both Do Something options as the value of a claim could prove to be significant. However there is significant experience and knowledge in the market as to how to mitigate against claims and liability issues which can be exploited during procurement. The probability of this risk and the overall impact is therefore assessed as low for both Do Something options.

Optimism Bias

9.7 The UK Treasury Green Book introduced the concept of Optimism Bias for use in public sector capital projects. Optimism Bias is a percentage adjustment made to the capital costs of a project to account for the systematic tendency to underestimate the time and cost overrun risks of capital projects.

9.8 Guidance sets out a standard methodology for applying the adjustment to a defined range of projects, based on empirical evidence, combined with a range of potential mitigating factors. The capital costs for the introduction of a public hire bike scheme in Belfast are relatively unique in nature and standard optimism bias guidance, and indeed specialist guidance produced by the Department of Transport does not set out an optimism bias percentage for similar schemes.

9.9 Capital cost estimates for this project have been based on cost evidence from similar bike hire schemes around the world and an average cost used for the purposes of this Outline Business Case. In addition to no guidance in relation to the application of Optimism Bias to a public hire bike scheme being available, the cost data gathered (based on evidence from existing schemes) can be considered therefore to have addressed the key risks which would normally contribute towards Optimism Bias. In this context, Optimism Bias has not been applied to the capital costs of this project. Detailed sensitivity analysis in relation to both capital and operating costs are set out in Section 11 of this Outline Business Case. This approach has been agreed with the Department for Regional Development.

10 Assessment of Non-Monetary Costs and Benefits

Introduction

10.1 This section of the OBC sets out an assessment of the non-monetary costs and benefits of options which are not evaluated through the net present cost analysis. This section describes the methodology used to assess the non-monetary costs and benefits and sets out the detailed rationale, and where possible, quantification of benefits for each shortlisted option.

Methodology

10.2 The approach taken to the appraisal of the non-monetary costs and benefits of the options is based on the methodology set out in TAG Unit 3.14.1 "Guidance on the Appraisal of Walking and Cycling Schemes" which recommends the completion of an Appraisal Summary Table (AST) to allow a consistent view of the impacts of a scheme to be taken across options.

10.3 The AST provides the opportunity to summarise the potential benefits associated with the proposed bike hire scheme, in both qualitative and quantitative terms, across the five key transport categories of economy, safety, environment, accessibility and integration; these can in turn be subdivided where appropriate. In addition to the transport categories prescribed by the TAG Guidance, an assessment has also been made of the non-monetary impact of the options on value for money criteria.

10.4 In establishing the non-monetary costs and benefits of the options, this section therefore sets out a description of the potential benefits under each of the relevant transport and value for money categories, alongside any quantification of benefits where this is possible. The overall findings are presented in the Appraisal Summary Table at the end of this section. It should be noted however that benefits which have been quantified represent indicative quantifications only due to the estimated nature of the underlying data and assumptions.

10.5 It is from this Appraisal Summary Table that a judgement can be made about the overall value for money of the options in achieving the Government's objectives. It should be noted that typically a single AST is completed for each option, however due to the fact that the options currently under consideration at this stage are identical except in terms of scale (300 versus 500 bikes), a single AST table has been completed which sets out the potential benefits and where appropriate, a range of impacts or costs by option.

Environment

10.6 The following sub objectives have been considered to provide potential benefits under the Environment category. This category deals with impacts on both the built and natural environment and on people.

Noise

10.7 Noise annoyance is defined by the World Health Organisation (WHO) as 'a feeling of displeasure evoked by noise'[97]. The implementation of a public hire bike scheme in Belfast has the potential to reduce the level of noise and thus noise annoyance primarily within the boundaries of the scheme. A reduction in noise annoyance can only occur if there is a reduction in motorised traffic as a result of the implementation of the scheme.

[97] http://www.dft.gov.uk/webtag/documents/expert/unit3.3.2.php

10.8 Evidence from the dublinbikes scheme is that the primary modal shift was from mid to long distance walks as opposed to from motorised transport[98]. The bikes are also heavily used following on from the use of motorised transport to access the city centre.

10.9 As set out in Section 4, a scheme of 300 bikes, is projected to generate between 900 – 1,500 trips per day and a scheme of 500 bikes is projected to generate between 1,500 – 2,500 trips per day. Modal shift achieved from private car transport is difficult to estimate, however, figure of 10% of bike trips replacing private car trips is considered reasonable based on experience elsewhere[99]. On the assumption that 10% of journeys are made instead of private car transport, it is considered that this could make a small improvement to noise annoyance levels. It would be considered that the same principles and assumptions would apply to overall levels of congestion in the City Centre as the introduction of a scheme may reduce the number of vehicle journeys depending on the level of modal shift attained. Proportionately greater benefits would accrue under Option 4 than Option 3 and all benefits accruing under both Option 3 and 4 would be additional to Option 2 Do Nothing.

Air Quality and Greenhouse Gases

10.10 Similar to the Noise criteria, each trip which is made on the bike scheme as a substitute for motorised transport will result in an reduction in harmful emissions. The average distance travelled in by bike in Belfast per trip is 2.4 miles[100]. On the assumption that this is the maximum distance for which a bicycle hire trip would replace motorised car transport, a 2.4 mile bicycle trip will save 0.8kg of CO2 emissions versus making the same trip in a medium sized car. The maximum potential benefits over Option 1 are summarised below for Options 3 and 4 in the scenario where 10% of bike journeys made are in substitute for car transportation.

Description	Option 3	Option 4
Bikes	300	500
Ave. Bike Journeys (no. per day)	900-1,500	1,500-2,500
Average Distance per Bicycle Trip[101]	2.4 miles	2.4 miles
% Shift from Motorised Transport	10%	10%
Total Distance Shift from Motorised Transport pa	78,840-131,400 miles	131,400-219,000 miles
CO2 Emissions per Journey (2.4 miles)[102]	0.8 kg	0.8 kg
CO2 Saved	26,280-43,800 kg	43,800-73,000 kg

10.11 Option 3 is projected to save between 26,280kg and 43,800kg and Option 4 has the potential save between 43,800kg and 73,000kg of CO2 per annum, based on the assumptions set out above, from the 10% of modal shift from private cars. There would be additional C02 savings where modal shift was achieved from other forms of motorised transport such as bus, train or taxi.

[98] Presentation by Ciaran Fallon, Dublin City Council
[99] Modal shift from private car – Lyon 7% (New Seamless Mobility Service – Public Bicycles, Niches), Barcelona c.10% (Public Bicycles, An Individual Transport System, TfL), Minneapolis c19% (http://bike-sharing.blogspot.com/2010/11/nice-ride-minnesota-survey-results.html)
[100] DRD Statistics Branch, Data for 2007-09
[101] Travel Survey for NI In Depth Report 2007-09, DRD
[102] http://trafficscotland.org/carboncalculator/index.aspx, based on Medium size engine car. Substitution from bus would save 0.3 kg per 2.4 mile trip.

Fuel Cost Savings

10.12 Based on the assumptions for substitution from car transportation, there is also a significant cost saving to the individual over the course of a year, particularly in the current era of record petrol prices. This is set out in the table below.

Description	Option 3	Option 4
Total Distance Shift from Motorised Transport pa	78,840-131,400 miles	131,400-219,000 miles
Cost per Litre Petrol (estimate)	135p	135p
Fuel Cost Saved per annum[103]	£12,390-£20,640	£20,640-£34,416

10.13 As can be seen from the table above, based on the assumptions, the scheme offers the potential benefit of saving the user population between £12,390 and £34,416 in fuel costs per annum, just in relation to the 10% modal shift from private car. Greater benefits would be achieved when shift from other forms of motorised transport were also to occur.

Townscape

10.14 Townscape is the physical and social characteristics of the built and unbuilt urban environment and the way in which we perceive those characteristics. It is this mix of characteristics and perceptions that make up and contribute to townscape character and give a 'sense of place' or identity[104].

10.15 Belfast's townscape is characterised by grand public and commercial buildings in the City Centre, such as the Scottish Provident building, the Cleaver building, and City Hall. The Belfast City Centre Conservation Area was designated in May 1998 and is one of three adjoining Conservation Areas within Belfast City Centre, with the Linen Conservation Area to the south and Cathedral Conservation Area to the north. It encompasses a substantial area extending from the City Hall to North Street and from Victoria Street across to Durham Street[105].

10.16 The development of a public hire bike scheme would require to be situated a key locations throughout this central townscape and conservation area, in order to fulfil the objectives of the scheme and best serve the public. These locations would require to be determined and approved in conjunction with key stakeholders including Belfast City Council, NI Planning Service and NI Environment and Heritage Service. This would ensure that the impact of bike docking stations on the surrounding townscape did not have a negative impact.

10.17 In terms of sense of place or identity, a survey undertaken on behalf of the bike hire scheme in Aarhus found that 85% of those surveyed believed that the scheme in Aarhus contributed positively towards portraying the city as having a 'green' and environmentally friendly identity[106]. Furthermore, the scheme in Dublin has been a major success, generating over 1 million trips within its first year, and the scheme has been heavily publicised and marketed as a success story in the city. The bike hire scheme has the potential to benefit the image of Belfast as a green city. There would be minimal difference in the positive impact between Options 3 and 4, with no impact under Option 1.

[103] http://www.parkers.co.uk/advice/fuelcostcalc.aspx (Based on Volkswagen Golf Hatchback 1.6 S)
[104] http://www.dft.gov.uk/webtag/documents/expert/unit3.3.8.php
[105] Belfast City Centre Conservation Area, NI Planning Service
[106] Evaluering af bycykelordningeni Århus, DMA Research 2006

Physical Fitness

10.18 This sub objective relates to increased levels of personal physical activity. Cycling schemes are considered likely to have a positive effect on physical fitness where new or extended trips are made and generate broad health benefits. Physical inactivity is a primary contributor to a broad range of chronic diseases, weight gain, obesity and mental health issues[107].

10.19 There are potentially very significant benefits to be obtained through the implementation of a public bike hire scheme in the City. It has been estimated that new cyclists covering short distances can reduce their risk of death (primarily through reduction of heart disease) by as much as 22%[108].

10.20 The World Health Organisation (WHO) has developed a Health Economic Assessment Tool (HEAT) for cycling, which produces a monetised estimate of the mean annual economic benefit due to reduced mortality as a result of cycling[109]. The HEAT tool calculates a monetary result based on the number of trips per day within the system and the average trip distance.

10.21 A set out predetermined parameters including mortality rates, value of a life and proportion of people who would otherwise not cycle are included within the base model.

10.22 The output of this tool is set out below for both Option 3 and Option 4.

Description	Option 3	Option 4
Bikes	300	500
Ave. Bike Journeys (no. per day)	900-1,500	1,500-2,500
Average Distance per Bicycle Trip[110]	2.4 miles	2.4 miles
Mean Annual Benefit (EUR:GBP 1.10)	£234,000-£389,000	£389,000-£648,000

10.23 As can be seen from the table above, the WHO HEAT tool estimates that the mean annual economic benefit due to reduced mortality as a result of cycling ranges between £234,000 and £648,000 per annum. In line with the guidance set out in TAG Unit 3.14.1, further research is required to be undertaken on the relationships between health and activity used in this model and therefore the values should be taken to be indicative.

Safety

10.24 The following sub objectives have been considered to provide potential benefits and dis-benefits under the Safety category. There are two key issues to address under this objective – accidents and security. Transport interventions such as the public hire bike scheme will alter the risk of accidents, and also affect the level of security for road users and public transport users as a whole.

Accidents

10.25 Accident impacts occur across all modes of transport and affect non-users as well as users. Impacts which occur as a result of accidents include medical costs, lost economic output and human distress. However there are of course also benefits from any reduction in accidents to society.

[107] TAG Unit 3.14.1, Department for Transport
[108] Feasibility Study for a Central London Cycle Hire Scheme, Transport for London
[109] 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
[110] DRD Statistics Branch, Data for 2007-09

10.26 TAG Guidance suggests that a significant reduction in motorised vehicle mileage may result in a decrease in motorised related accidents, however given the level of journeys projected and the fact that a large proportion may simply displace walking, this is unlikely to be a material benefit to apply to the Options in this OBC.

10.27 In terms of accident levels of users of the proposed scheme, Department for Transport guidance which sets out parameters for estimating accident levels per total distance does not apply to cycle schemes therefore it is not possible to quantify these based on the data available. The number of minor cycling incidents did increase in Paris post implementation of the Velib scheme, however serious incident levels did not change. The overall rate of accidents per 1,000 trips fell in both London and Paris post scheme implementation. The scheme in Dublin reported only two accidents within the first year[111].

10.28 It is not possible to conclude on the limited available evidence as to whether a scheme in Belfast would cause a material increase in the level of cycling related accidents, or indeed reduce the overall rate of accidents per trip. This issue therefore remains a risk to the scheme as set out in Section 9 for both Do Something options.

Security

10.29 The security sub objective aims to reflect changes in security as a result of the implementation of the public hire bike scheme. The bike scheme operators and designers have developed significant experience over the last decade in designing and installing schemes to increase the level of security for the infrastructure and for scheme users.

10.30 In terms of potential benefits to the public however under the Do Something options, the bike infrastructure design and location does serve to increase levels of formal and informal surveillance in the City Centre. Bike docking stations attract greater levels of passive or informal surveillance from scheme users and passers-by, and in addition may result in the installation of additional formal surveillance techniques including CCTV. This increased level of activity in the City Centre and key areas around Belfast can potentially serve as a benefit by increasing people's sense of security through these forms of formal and informal surveillance. The level of potential benefit is greater under Option 4 than under Option 3, although both present greater potential benefits than Option 1.

Economy

10.31 The Economy category aims to set out any benefits which can be achieved with improving the economic efficiency of transport and the efficiency of economic activities. The following sub objectives have been considered to provide potential benefits and under the Economy category.

Transport Economic Efficiency

10.32 The development of a pubic hire bike scheme in Belfast offers the potential to create journey time savings for users, particularly for commuters at rush hour peak times when used to replace walking, bus or short train journeys. It also offers the potential to reduce travel times for users when used to replace cars for short journeys around the City Centre or scheme operational area. Two examples are set out below to illustrate potential time savings for a commuter and a tourist.

- Belfast Central Station – Belfast City Hall is a distance of 0.7 miles and takes approximately 15 minutes on foot, or 7 minutes on car with traffic. This journey is estimated to be achievable in less than 4 minutes by bike, assuming an average speed of 5m/s[112] which

[111] www.situp-cycle.com/2010/11/26/message-to-melbourne-from-dublin-bikes/comment-page-1/
[112] Assumption per Cycle Hire Scheme Business Case, Transport for London.

results in a saving of 11 minutes per trip versus walking and 3 minutes per trip versus driving.

- Belfast City Hall – Waterfront Hall is a distance of 1.2 miles by car and takes approximately 7 minutes with traffic. The same journey is approximately 0.6 miles by foot and takes approximately 11 minutes. This journey is estimated to be achievable in around 3 minutes on bike, a saving of 4 minutes by car and 8 minutes versus walking.

10.33 Clearly these represent two simple, hypothetical examples but there is a clear potential for economic benefits from a reduction in travel times to be achieved, particularly at rush hour periods; the busiest period for the Dublin scheme is during the peak rush hour periods and at lunch time where bikes have primarily replaced walking medium to long distances and represents a solution to the first mile-last mile connection issue.

10.34 Detailed trip analysis undertaken in London indicated that the average time saving per trip achieved by cycling was over 12 minutes versus bus, and 13 minutes versus walking and that these savings equated to significant economic benefits to both individuals and businesses. Clearly these benefits would apply to both Options 3 and 4, with greater benefits potentially accruing under Option 4.

Reliability

10.35 The reliability of journey times undertaken using a cycle is unlikely to change significantly, assuming that bikes are available for use as and when required by users. This is in contrast to motor car travel and public transport, particularly at rush hour periods. Any switch of mode from car or public transport would likely deliver the benefit of increased journey time reliability to the user who switched. Again, greater benefits are likely to accrue under Option 4 than Option 3.

Wider Economic Impacts

10.36 The development of a public hire bike scheme in Belfast will be an entirely new economic activity in the City with the potential to create new employment and apprenticeship positions. The recently launched dublinbikes scheme has created over 20 new jobs, and the remaining schemes included within the Most Similar Cities; Aarhus, Montpellier and Bari employ approximately 8, 11 and 5 people respectively (Bari is a small pilot scheme therefore has lower staffing levels). Indeed as noted earlier, the scheme in Aarhus is operated in conjunction with the local employment centre and is used to provide training and skills to local long term unemployed who have in turn been successful in finding permanent employment. Both Options therefore have the potential benefits of creating new additional employment opportunities in the City, with Option 4 likely to provide greater levels of employment due to the larger scale of the proposed scheme.

10.37 Benefits may also accrue to the City through the use of the scheme by tourists. Should the scheme have provision for short term membership which allows tourists to access the bikes, this will create greater opportunity for greater tourist footfall and therefore economic activity in the City Centre and also at more peripheral locations and attractions around the City Centre, for example, the Titanic Quarter and Queen's University areas of Belfast which are much more easily accessed on bike than by foot from the core City Centre. The bike scheme also offers the potential to increase footfall in more peripheral areas of the City Centre which have suffered from the siting of major developments such as Victoria Square. The bike scheme would potentially make it much quicker and easier for shoppers, tourists and residents to move between all zones of the City Centre. Option 4 is likely to provide greater levels of benefit in this respect due to the larger scale of the proposed scheme.

Accessibility

10.38 The Accessibility category aims to set out any benefits which can be achieved with improving the access to the wider public transport system and improving.

Social Inclusion

10.39 The development of a bike scheme offers the City a range of accessibility and social inclusion benefits. On the basis that an appropriate user tariff is implemented, which offers a free period of use of up to 30 minutes, the bike scheme is potentially available to all members of the community to use, and can allow for much wider access to cycling particularly for groups in society who cannot afford to purchase and maintain a bike, or have no facility at their place of residence to store a bike. In this respect, the bike hire scheme also offers access to a free, or very low cost, form of activity and exercise to all parts of the community.

10.40 In terms of social inclusion, the bike hire scheme provides an additional form of public transport which will be free to use to all members of the community. This again ensures that the most disadvantaged in the community have access to this form of public transport. There may be indirect benefits derived from the socially inclusive nature of the bike scheme such as providing greater access to employment, education and healthcare activities to the most disadvantaged elements of the community. Clearly, Option 4 offers greater potential benefits in this respect than Option 3 due to the difference in scale.

Accessibility to Public Transport System

10.41 The bike hire scheme also offers the ability to provide a link to all aspects of the public transport network. The scheme and the location of docking stations may provide increased access to public transport hubs and connections, particularly to those people who do not have access to a car, younger people and those for whom the existing public transport network is not accessible due to the location of either their residence or employment. Users would be able to access public transport to the key central destinations and subsequently use the bike hire scheme to reach their final destination which may be a significant distance from the available public transport hubs. Option 4 may offer greater benefit in this respect due to scale.

Integration

10.42 The Integration category aims to set out benefits relating to improving the overall integration of public transport networks and wider Government policies.

Transport Interchange

10.43 Whilst the Accessibility objective set out the potential benefits relating to increasing access to the public transport network for those currently not able to due to socio-economic or locational reasons, the benefit which may potentially arise here is that there may be an increase in overall public transport usage due to the improved linkages between the available modes. This may accrue where, for example, people drive to work because public transport hubs are not convenient to employment or residential locations. The flexibility of the bike hire scheme may result in much greater ability to interchange between bus, train with the bike addressing the first mile-last mile connection issue and therefore promoting a greater use of the wider public transport network. Option 4 presents the opportunity for greater benefits here as the wider the network the greater the overall level of linkages and ability to interchange will become.

Value for Money Objectives

10.44 The Value for Money objectives relate to commercial, financial and management issues and are therefore discussed and assessed in Sections 12 and 13 of this OBC, which identify the most appropriate commercial and organisational structure to procure, deliver and manage the Preferred Option.

10.45 The key benefits set out in the previous paragraphs are presented below in the Appraisal Summary Table for both Options 3 and 4.

Options:	**Description:**	**Problems:** Refer to Section 3 of this OBC which sets out Strategic Case for proposed public bike hire scheme	**Scheme Total Cost**
Options 3 & 4	Option 1 – Do Nothing Option 3 – 300 bikes & 30 Stations Option 4 – 500 bikes & 50 stations		**Option 1 – n/a** **Option 3 - £4,515k NPC** **Option 4 – £7,375k NPC**

Objective	**Sub Objective**	**Summary Qualitative Impacts**	**Quantitative Measure**	**Assessment**
Environment	Noise	As set out in Section 5, a scheme of 300 bikes, is projected to generate between 900 – 1,500 trips per day and a scheme of 500 bikes is projected to generate between 1,500 – 2,500 trips per day. On the assumption that 10% of journeys are made instead of private car transport, it is considered that this could make a small improvement to noise annoyance levels. It would be considered that the same principles and assumptions would apply to overall levels of congestion in the City Centre as the introduction of a scheme may reduce the number of vehicle journeys depending on the level of modal shift attained. Proportionately greater benefits would accrue under Option 4 than Option 3.	n/a	Slight positive impact under Options 3 and 4. Option 4 proportionately greater impact. Option 1 no benefit accruing.
	Air Quality and Greenhouse Gases	Each trip which is made on the bike scheme as a substitute for private car transport will result in an reduction in harmful emissions. Further savings would be achieved for shifts from other forms of motorised transport in addition to this.	Potential Shift from Motorised Transport: Option 1 – no shift. Option 3 – 78,840-131,400 miles Option 4 – 131,400-219,000 miles	Positive Impact. C02 emissions potentially avoided: Option 1 – zero Option 3 – 26,280-43,800 kg Option 4 -43,800-73,000 kg

Objective	Sub Objective	Summary Qualitative Impacts	Quantitative Measure	Assessment
	Fuel Cost Savings	Based on the assumptions for substitution from car transportation, there is also a significant cost saving to the individual over the course of a year, based on 10% of journeys replacing private car, particularly in the current era of record petrol prices. Further savings would be achieved in shift from other forms of motorised transport are achieved.	Potential Shift from Motorised Transport: Option 1 – no shift. Option 3 – 78,840-131,400 miles Option 4 – 131,400-219,000 miles	Positive Impact. Potential Fuel Cost Saved per annum: Option 1 – zero Option 3 - £12,390-£20,640 Option 4 - £20,640-£34,416
	Townscape	In terms of sense of place or identity, a survey undertaken on behalf of the bike hire scheme in Aarhus found that 85% of those surveyed believed that the scheme in Aarhus contributed positively towards portraying the city as having a 'green' and environmentally friendly identity[113]. Furthermore, the scheme in Dublin has been a major success, generating over 1 million trips within its first year, and the scheme has been heavily publicised and marketed as a success story in the city. The bike hire scheme has the potential to benefit the image of Belfast as a green city. There would be minimal difference in the positive impact between Options 3 and 4, with no impact under Option 1.	n/a	Moderate Positive Impact. There would be minimal difference in the positive impact between Options 3 and 4, with no impact under Option 1.
	Physical Fitness	There are potentially very significant benefits to be obtained through the implementation of a public bike hire scheme in the City. It has been estimated that new cyclists covering short distances can reduce their risk of death (primarily through reduction of heart disease) by as much as 22%[114].	Mean Annual Economic Benefit calculated and monetised under WHO HEAT tool.	Significant Positive Impact Option 1 – zero Option 3 - £234,000-£389,000 Option 4 - £389,000-£648,000
Safety	Accidents	TAG Guidance suggests that a significant reduction in motorised vehicle mileage may result in a decrease in motorised related accidents, however	n/a	Uncertain Impact

[113] Evaluering af bycykelordningeni Århus, DMA Research 2006
[114] Feasibility Study for a Central London Cycle Hire Scheme, Transport for London

Objective	Sub Objective	Summary Qualitative Impacts	Quantitative Measure	Assessment
		given the level of journeys projected and the fact that a large proportion may simply displace walking, this is unlikely to be a meaningful benefit to apply to the Options in this OBC. It is not possible to conclude on the limited available evidence as to whether a scheme in Belfast was cause a material increase in the level of cycling related accidents, or indeed reduce the overall rate of accidents per trip.		Option 1 – no impact Options 3 and 4 – uncertain impact.
	Security	In terms of potential benefits to the public however under the Do Something options, the bike infrastructure design and location does serve to increase levels of formal and informal surveillance in the City Centre. Bike docking stations attract greater levels of passive or informal surveillance from scheme users and passers-by, and in addition may result in the installation of additional formal surveillance techniques including CCTV. This increased level of activity in the City Centre and key areas around Belfast can potentially serve as a benefit by increasing people's sense of security through these forms of formal and informal surveillance	n/a	Moderate positive impact under Options 3 and 4. Option 4 proportionately greater impact. Option 1 no benefit accruing
Economy	Transport Economic Efficiency	The development of a pubic hire bike scheme in Belfast offers the potential to create journey time savings for users, particularly for commuters at rush hour peak times when used to replace walking, bus or short train journeys. It also offers the potential to reduce travel times for users (commuters, residents and tourists) when used to replace cars for short journeys around the City Centre.	Journey from Belfast Central Station to City Hall – bike trip saves 11 minutes and 3 minutes per trip versus walking and car respectively. Journey from City Hall to Waterfront Hall – bike trip saves 8 minutes and 4 minutes per trip versus walking and car respectively.	Moderate positive impact under Options 3 and 4. Option 4 proportionately greater impact. Option 1 no benefit accruing
	Reliability	The reliability of journey times undertaken using a cycle is unlikely to change significantly, assuming that bikes are available for use as and when required by users. This is in contrast to motor car travel and public	n/a	Moderate positive impact under Options 3 and 4.

Objective	Sub Objective	Summary Qualitative Impacts	Quantitative Measure	Assessment
		transport, particularly at rush hour periods. Any switch of mode from car or public transport would likely deliver the benefit of increased journey time reliability to the user who switched.		Option 4 proportionately greater impact. Option 1 no benefit accruing
	Wider Economic Impacts	The development of a public hire bike scheme in Belfast will be an entirely new economic activity in the City with the potential to create new employment and apprenticeship positions. The recently launched dublinbikes scheme has created over 20 new jobs, and the remaining schemes included within the Most Similar Cities; Aarhus, Montpellier and Bari employ approximately 8, 11 and 5 people respectively. Benefits may also accrue to the City through the use of the scheme by tourists and create greater opportunity for greater tourist footfall and therefore economic activity in the City Centre and also at more peripheral locations and attractions around the City Centre. The bike scheme also offers the potential to increase footfall in more peripheral areas of the City Centre which have suffered from the siting of major developments such as Victoria Square. The bike scheme would potentially make it much quicker and easier for shoppers, tourists and residents to move between all zones of the City Centre.	Create a minimum of 5 new employment positions plus 2 apprenticeships per annum, subject to final scale of scheme implemented.	Positive impact under Options 3 and 4. Option 4 proportionately greater impact. Option 1 no benefit accruing
Accessibility	Social Inclusion	On the basis that an appropriate user tariff is implemented, which offers a free period of use of up to 30 minutes, the bike scheme is potentially available to all members of the community to use, and can allow for much wider access to cycling particularly for groups in society who cannot afford to purchase and maintain a bike, or have no facility at their place of residence to store a bike. the bike hire scheme provides an additional form of public transport which will be free to use to all members of the community. This again ensures that the most disadvantaged in the community have access to this form of public transport. There may be indirect benefits derived from the socially inclusive nature	Scheme fully accessible to all members of the community under Options 3 and 4.	Significant positive impact under Options 3 and 4. Option 4 proportionately greater impact. Option 1 no benefit accruing

Objective	Sub Objective	Summary Qualitative Impacts	Quantitative Measure	Assessment
		of the bike scheme such as providing greater access to employment, education and healthcare activities to the most disadvantaged elements of the community.		
	Accessibility to Public Transport System	The bike hire scheme also offers the ability to provide a link to all aspects of the public transport network. The scheme and the location of docking stations may provide increased access to public transport hubs and connections, particularly to those people who do not have access to a car, younger people and those for whom the existing public transport network is not accessible due to the location of either their residence or employment.	n/a	Slight positive impact under Options 3 and 4. Option 4 proportionately greater impact. Option 1 no benefit accruing
Integration	Transport Interchange	The benefit which may potentially arise here is that there may be an increase in overall public transport usage due to the improved linkages between the available modes. The flexibility of the bike hire scheme may result in much greater ability to interchange between bus, train with the bike addressing the first mils-last mile connection issue and therefore promoting a greater use of the wider public transport network.	n/a	Moderate positive impact under Options 3 and 4. Option 4 proportionately greater impact. Option 1 no benefit accruing

11 Net Present Costs and Sensitivities

Introduction

11.1 This section of the OBC sets out the detailed net present cost calculations for each Option. This section then proceeds to present a detailed sensitivity analysis of each Option to assess how the impact on the Options of reasonable variations in key assumptions. It should be noted that the following calculations do not include benefits which have been quantified in Section 10 due to the indicative and estimated nature of these quantifications.

Net Present Cost Calculation

11.2 In accordance with the Northern Ireland Guide to Expenditure Appraisal and Evaluation, this Section sets out for each shortlisted Option a calculation of its net present cost. This has been calculated over a 15 year appraisal period using the standard HM Treasury real discount rate of 3.5%. The results of this analysis are set out in detail at Appendix E to this report and are summarised in the table below.

Option	NPC £m	Ranking
Option 1 - Do Nothing;	0	1
Option 3 - 300 bikes and 30 stations	4.52	2
Option 4 - 500 bikes and 50 stations.	7.38	3

11.3 As can be seen from the table above, Option 1 is clearly the lowest cost option with zero net present cost given that this is the Do Nothing Option. Option 3 has a net present cost of circa £4.52m and Option 4 is the most expensive option with a net present cost of circa £7.38m, 63% greater than Option 3. The following table presents an analysis of the NPC over the appraisal period, of each Option into the major component parts in order to highlight the key differences between the NPC of each Option.

Description	Option 1	Option 3	Option 4
	NPC £m	NPC £m	NPC £m
Opportunity Costs	-	0.69	1.15
Capital Costs	-	0.67	1.10
Revenue Costs	-	3.16	5.13
Total Costs	**-**	**4.52**	**7.38**

11.4 As can be seen from the table above, there is a significant increase in the level of opportunity capital, and operating costs between Options 3 and 4. However this increase is simply reflective of the increase in scale between options.

Sensitivity Analysis

11.5 The key risk areas associated with the shortlisted Options were set out in the risk analysis in Section 9 of this report. In line with Northern Ireland Guidance on Expenditure Appraisal and Evaluation, sensitivity analysis has been carried out on the net present cost calculations in order to test whether uncertainties may affect the choice between the Options.

11.6 In line with the key risks identified, the following sensitivities have been performed:

6 Increase in Capital Costs under Options 3 and 4 by 30% to reflect the upper bound of scheme capital cost benchmarks identified in Section 8;
7 Increase in Operating Costs under Options 3 and 4 by 30% to reflect the upper bound of scheme operating cost benchmarks identified in Section 8;
8 Increase in theft and vandalism replacement rate from 10% to 30%; and
9 Combined sensitivity.

11.7 The following paragraphs summarise the results of the sensitivity analysis when the proposed adjustments are made to the base case net present cost calculations for each Option. Detailed net present cost workings are included at Appendix F to this report.

Increase in Capital Costs under Options 3 and 4 by 30%

11.8 Given the broad range of costs identified for the bike hire scheme infrastructure, and the uncertain costs associated with ground conditions and installation, there is considered to be a degree of uncertainty regarding the actual level of bike and docking station infrastructure installation costs. The cost metric range identified was from £1,208 to £2,813 as set out in Section 8. As also set out in Section 8, the mean cost used to produce the overall cost estimates was £2,095. The variance between the mean cost and the maximum cost per bike is therefore £717 or 34%. A 30% increase has therefore been applied as a sensitivity to the capital infrastructure costs to quantify the risk of higher capital cost metrics.

11.9 The table below sets out the impact of this sensitivity on the net present cost breakdown for both Do Something options. The overall ranking does not change.

Description	Option 3	Sensitivity	Variance	Option 4	Sensitivity	Variance
	NPC £m	NPC £m	%	NPC £m	NPC £m	%
Opportunity Cost	0.69	0.69	-	1.15	1.15	-
Capital Cost	0.67	0.86	30%	1.10	1.43	30%
Revenue Cost	3.16	3.16	-	5.13	5.13	-
Total Costs	**4.52**	**4.71**	**4.2%**	**7.38**	**7.71**	**4.5%**

11.10 As can be seen from the table above, the net present cost of the capital costs increases by 30% under both Options (due to the upfront nature of the capital costs). The overall impact on the total costs is to increase the net present cost of Options 3 and 4 by 4.2% and 4.5% respectively.

Increase in Operating Costs under Options 3 and 4 by 30%

11.11 Similar to the previous sensitivity, a broad range of operating cost metrics were identified for the maintenance and administration of a public hire bike scheme. The variance between the mean cost used to develop the base case for Options 3 and 4 and the most expensive metric identified was £283 per bike, or 30%. A 30% increase has therefore been applied as a sensitivity to the operating costs (excluding theft and vandalism replacement costs) to quantify the risk of higher operating cost metrics.

11.12 The table below sets out the impact of this sensitivity on the net present cost breakdown for both Do Something options. The overall ranking does not change.

Description	Option 3	Sensitivity	Variance	Option 4	Sensitivity	Variance
	NPC £m	NPC £m	%	NPC £m	NPC £m	%
Opportunity Cost	0.69	0.69	-	1.15	1.15	-
Capital Cost	0.67	0.67	-	1.10	1.10	-
Revenue Cost	3.16	3.99	26%	5.13	6.52	27%
Total Costs	**4.52**	**5.35**	**18%**	**7.38**	**8.77**	**19%**

11.13 As can be seen from the table above, the net present cost of the operating costs increases by 26% and 27% under both Options respectively. The overall impact on the total costs is to increase the net present cost of Options 3 and 4 by 18% and 19%, respectively. The overall project net present cost is therefore significantly more sensitive to changes in revenue or operating costs than capital costs.

Increase in theft and vandalism replacement rate under Options 3 and 4 from 10% to 30%

11.14 The base case for Options 3 and 4 assumes that 10% of the bikes will require replacement due to vandalism or theft per annum. This is considered to be a conservative assumption, however, cities such as Paris have experienced initial very high levels of theft and vandalism and there is therefore an uncertainty regarding the levels of incidence which may affect a scheme in Belfast. The following sensitivity sets out the impact on the total costs where a 30% theft or vandalism replacement rate is assumed.

Description	Option 3	Sensitivity	Variance	Option 4	Sensitivity	Variance
	NPC £m	NPC £m	%	NPC £m	NPC £m	%
Opportunity Cost	0.69	0.69	-	1.15	1.15	-
Capital Cost	0.67	0.67	-	1.10	1.10	-
Revenue Cost	3.16	3.49	10%	5.13	5.68	11%
Total Costs	**4.52**	**4.85**	**7%**	**7.38**	**7.93**	**7%**

11.15 As can be seen from the table above, the net present cost of the operating costs increases by 10% and 11% under both Options respectively. The overall impact on the total costs is to increase the net present cost of Options 3 and 4 by 7%.

Combined Sensitivity

11.16 The following sensitivity sets out the impact of all three previous sensitivities occurring simultaneously.

11.17 The table below sets out the impact of this sensitivity on the net present cost breakdown for both Do Something options. The overall ranking does not change.

Description	Option 3	Sensitivity	Variance	Option 4	Sensitivity	Variance
	NPC £m	NPC £m	%	NPC £m	NPC £	%
Opportunity Cost	0.69	0.69	-	1.15	1.15	-
Capital Cost	0.67	0.86	30%	1.10	1.43	30%
Revenue Cost	3.16	4.33	37%	5.13	7.07	38%
Total Costs	**4.52**	**5.88**	**30%**	**7.38**	**9.65**	**31%**

11.18 As can be seen from the table above, the impact of the combined sensitivity on the net present cost is to increase the total costs under Options 3 and 4 by 30% and 31% respectively. The key uncertainty in terms of the total net present cost over the appraisal period relates to the level of operating costs. These have the greatest impact on the overall project costs over the duration of the appraisal period.

Conclusion to Options Assessment

11.19 The detailed assessment of needs and the option development process has resulted in three shortlisted Options:

- **Option 1** - Do Nothing;
- **Option 3** - Mid Sized 3rd Generation Scheme - 300 bikes and 30 stations; and
- **Option 4** - Full Sized 3rd Generation Scheme - 500 bikes and 50 stations.

11.20 The two 'Do Something' options are essentially similar, with the only difference relating to the size of the proposed scheme to be implemented. The details assessment of needs research and consultation with the market has indicated that a 3rd Generation bike scheme in the range of 300 to 500 bikes with supporting infrastructure could be viable in Belfast and attract sufficient demand and utilisation.

11.21 A number of key qualitative benefits have also been established for each Option, with the larger scale option (Option 4) offering the potential to deliver proportionately greater benefits. A number of potential benefits have also been quantified and where possible monetised. These again have the potential to be realised under both Options, but to a greater extent under Option 4. No benefits accrue under the Do Nothing scenario, Option 1.

11.22 The costs have also been established to implement both Options. Whilst Option 1 clearly has no cost impact, Option 3 has the lower cost of the two Do Something options, by virtue of the smaller scale. The key costs and benefits are clearly set out in the Department for Transport prescribed Appraisal Summary Table at Section 10. The key costs and benefits for both Options are reproduced below in the following table.

Description	Option 3	Option 4
	300 bikes 30 stations	**500 bikes 50 stations**
Scheme Costs		
Opportunity Cost (£ pa)	59,904	99,840
Capital Costs (£)	688,600	1,137,666
Operating Costs (£ pa)	299,469	485,781
Net Present Cost (£m)	4.52	7.38
Scheme Benefits		
Noise	Qualitative Benefit. Potential to generate up to 1,500 trips per day under Option 3 and 2,500 trips per day under Option 4 within scheme area. Whilst modal shift from car is expected to be low, any reduction in motorised transport will lead to a reduction in noise levels. Option 4 offers potentially greater level of benefits although overall impact on noise annoyance likely to be small.	
Air Quality and Greenhouse Gases	Potential to save: 78,840-131,400 miles from private car transport pa; 26,280-43,800kg C02 avoided pa	Potential to save: 131,400-219,000 miles from private car transport pa; 43,800-73,000 kg C02 avoided pa
Fuel Cost Savings	Potential to save: £12,390-£20,640 in fuel costs pa for shift from private car alone.	Potential to save: £20,640-£34,416in fuel costs pa for shift from private car alone.
Townscape	Qualitative Benefit. Development of bike hire scheme in conjunction with Planning Service and NIEA unlikely to have negative impact. Research from elsewhere indicates scheme can have strong positive impact on image of city as 'green' and environmentally aware. Marginal difference in impact between Options.	
Physical Fitness	Significant potential economic benefits based on WHO HEAT tool assessment which estimates health benefits from cycling. In addition it has been estimated that new cyclists covering short distances can reduce risk of death by up to 22%.	
	Potential economic benefit: £234,000-£389,000 pa	Potential economic benefit: £389,000-£648,000 pa
Accidents	Qualitative Benefit. Research indicates that cyclist accident rate decreases after introduction of scheme due to greater driver awareness of cyclists and 'safety in numbers' effect. Absolute level of accidents may increase although not possible to quantify. Marginal difference in impact between options.	
Security	Qualitative Benefit. Location of docking stations may increase levels of passers-by and passive surveillance in areas where scheme operates. May also lead to implementation of direct surveillance such as CCTV. Both of these factors may contribute to a greater	

Description	Option 3	Option 4
	300 bikes 30 stations	**500 bikes 50 stations**
	sense of security in the scheme area.	
Transport Efficiency	Qualitative Benefit. Development of bike hire scheme offers potential to reduce journey times for commuters and residents, particularly at rush hour period. Proportionately greater benefits under Option 4.	
Reliability	Qualitative Benefits. Increased reliability of journey times for those undertaking cycle trips as opposed to utilising other modes, particularly at rush hour. Proportionately greater benefits under Option 4.	
Wider Economic Impacts	Qualitative Benefits. Potential great additional employment opportunities and apprenticeships within the City. Potential to increase footfall in peripheral areas in City Centre, increase accessibility for tourists, shoppers and residents.	
Social Inclusion	Qualitative Benefits. Greater social inclusion; potentially free of charge form of public transport. Increase access to cycling due no ownership costs, increase access to associated health benefits. Increased access to public transport which may encourage greater levels of access to health, education and employment opportunities for most disadvantaged. Proportionately greater benefits under Option 4.	
Public Transport Accessibility and Interchange	Qualitative Benefits. Potential to increase overall levels of usage of public transport by improving 'first mile-last mile' connectivity to existing public transport hubs and stations, particularly for those without access to a car, young or older people.	

11.23 As can be seen from the table above, there are a significant range of potential economic, social and transport related benefits for the City of Belfast across both Option 3 and Option 4, over and above the Do Nothing Option. These benefits have been estimated across a range of potential outcomes, where possible, although it is clear that a greater level of benefits (particularly economic, health and social inclusion benefits) may be achievable under Option 4 than Option 3 due to the greater scale of provision. However, Option 4 is also the most costly in NPC terms, and therefore proportionately greater support from Government (financial and non financial) is likely to be required to facilitate its implementation.

11.24 It is therefore proposed that the Preferred Option is to seek to procure a 3rd Generation public hire bike scheme for Belfast with the provision of between 300-500 bikes and 30-50 docking stations. It is proposed that the market should determine the optimum precise size and scale of a suitable scheme for Belfast through the procurement process, and subject to a minimum level of provision equivalent to Option 3. Analysis from the Most Similar Cities study and consultation with existing operators has all confirmed that a scheme within this range should be viable, sustainable and attractive to the market.

12 Commercial and Financial Case

Introduction

12.1 This Section of the OBC aims to establish the most appropriate commercial structure for the delivery of the Preferred Option in Belfast. It commences by setting out the broad range of ownership, operating and financing structures in use throughout the world and concludes on the optimum approach based on commercial and financial constraints which have been identified.

12.2 This section then sets out the affordability implications of the most appropriate commercial structure and concludes by setting out key sensitivities and commercial risks in relation to this structure.

Ownership, Operations and Financing Structures

12.3 Existing bike sharing schemes around the world are diverse in not only their size and scale, but also in terms of the ownership, operating and financing models which exist. As can be seen from the previous review of existing schemes, the majority of large successful schemes are currently operated by private sector partners and are often funded through an associated contract for advertising and street furniture. A form of a public private partnership would be established for the delivery of the service in this structure.

12.4 In addition, many cities and authorities do not have the available funding, expertise nor the desire to own, operate and maintain a public hire bike scheme and therefore a partnership model with a private sector company, often linked to advertising, can appear attractive. The requirement to site the majority of bike stations on public footpaths, roads and car parking spaces also necessitates a form of partnering between the public and private sectors.

12.5 Nevertheless, a significant number of schemes are owned and / or operated by a local authority. There is also experience of ownership or operation of a scheme being undertaken by a co-operative or not for profit organisation which may be established for the purposes of operating the scheme. In these instances, the lack of advertising revenues generally necessitates some form of public sector subsidy as the user tariffs do not cover the capital and operating costs of the scheme.

12.6 The following table therefore summarises the broad range of available structures in terms of ownership, operation and financing of a public hire bike scheme.

Public → Private

Owner	Operator	Revenue/Finance	Examples
Public Authority / Public Transport Co	Public Authority / Public Transport Co	Public Funding Member/User Fees Ads on bikes/stations	Orebro, Montpellier, Rome
Public Authority	Assoc/Co-op	Public Funding Member/User Fees Ads on bikes/stations	Aarhus, Rimini, Modena
Public Authority	Private Operator	Public Funding Member/User Fees Ads on bikes/stations	Barcelona, Lyon, London
Advertising Co Contract (or similar)	Advertising Co Contract (or similar)	Low/No Public Funding Member/User Fees Ads on bikes/stations	Dublin, Stockholm, Paris
Private Transport Co	Private Transport Co	Member/User Fees Ads on bikes/stations	Dresden, Dusseldorf, Krakow

12.7 The following paragraphs provide an overview of the range of structures set out above.

Public Authority/Transport Co Owned and Public Authority/Transport Co Operated

12.8 This structure is where the public authority owns and operates the bike sharing scheme, and is the model which has been implemented in Montreal in Canada, and also a number of small towns and cities throughout Europe. Ultimately this model will provide the public authority with the greatest degree of control over the scheme, the ability implement change to the scope and operations of the scheme at its own discretion and remove the risk of under performance by a private sector partner. As an alternative, the role of the public authority as owner and / or operator of the scheme may be assumed by the local public transport company. As set out in detail in Section 5 of this OBC, this is the model which is operated in Montpellier, where the Velomagg scheme is operated by the Transports de l'Agglomération de Montpellier (TAM). A significant number of schemes in Germany are also operated by Deutsche Bahn under the Nextbike name. A key advantage of this model would be the ability to integrate the proposed bike sharing scheme with the existing public transport infrastructure and the ability to benefit from the expertise of the public transport company directly, particularly from an operational perspective. Under both variations of the public owned/operated model the upfront cost of the scheme and the revenue funding predominantly financed through public subvention, although user revenues may make up a small proportion of the revenue streams. This model will also involve the public authority assuming all the risks associated with the scheme. In particular, the public authority would be responsible for the service and maintenance of the scheme, for the cost of replacement parts and bikes, the promotion of the scheme, the management of the infrastructure and the customer servicing arrangements. The public authority would also be responsible for all upfront capital costs associated with the scheme and be liable for all recurring operating costs. Issues of public liability in relation to the provision of the bike service may also be assumed.

12.9 Summary advantages and disadvantages of this structure include:

+ Greatest degree of control over design, implementation and operation
+ Ability to access public funding (where available)
+ Ability to closely integrate with public transport models
+ Retention of valuable advertising assets

- Lack of experience in implementing and operating

- Upfront capital and operating cost responsibility
- Full assumption of operating and maintenance cost risks
- No ability to access skills of experienced operators
- Ongoing governance and accountability issues

Public Authority Owned and Association/Co-operative Operated

12.10 This structure is very similar to the previous structure, with the key difference being the utilisation of an association / co-operative or not for profit organisation being utilised to operate and service the scheme. This structure may involve the establishment of a new organisation to operate the scheme or the utilisation of an existing organisation. This structure would again provide a high degree of control to the public sector with regard to the operation and performance of the scheme, subject to any arm's length or governance restrictions inherent in the operator body. This structure is employed in Denmark; with the scheme in Aarhus operated in conjunction with the local employment centre, and in Copenhagen where the scheme is operated by City Bike Foundation of Copenhagen. These quasi-public sector bodies are likely to be single purpose entities therefore dedicated to the success of the scheme, and may present opportunities to remove any public liability issues from the local authority and indeed may present opportunities to utilise tax savings afforded to charities and leisure trusts. However, such bodies are likely to be heavily reliant on public subvention and support to operate and will have limited experience in the development and operation of a scheme.

12.11 Summary advantages and disadvantages of this structure include:

+ High degree of control over design, implementation and operation
+ Strong focus on social outcomes
+ Ability to access public funding (where available)
+ Potential to remove public liability
+ Retention of valuable advertising assets
+ Potential tax benefits

- Lack of experience in implementing and operating
- Upfront capital and operating cost responsibility
- Full assumption of operating and maintenance cost risks
- No ability to access skills of experienced operators
- Cost associated with set up, ongoing governance and accountability issues

Public Authority Owned and Privately Operated

12.12 The next step in the evolution of the public authority owned structure is where the scheme is operated by a private sector operator (for example Serco, JC Decaux or Clear Channel). This structure will, similar to the previous models, involve significant upfront investment as the ownership of the assets is required to reside with the public authority therefore the cost of the assets needs to be met by upfront by the authority. In this scenario, the need to subvent the scheme through advertising is not necessary, although alternative means of payment to the operator have been explored by cities such as Barcelona. In Barcelona, the scheme is owned by the authority but operated by Clear Channel. The City makes significant annual payments to the operator - in 2007 Barcelona paid Clear Channel €4.5 million to operate and maintain a scheme with 3,000 bikes, in addition to revenue generated through roadside parking within a defined 'Green Area'[115]. This is also the model which is operated in London where the Barclay's Cycle Hire Scheme is owned by TfL but operated by Serco as an independently appointed operator. Clearly this structure does not rely on the financing of the scheme through the use of advertising assets but is required to be funded through public finances, user tariffs and sponsorship revenues. Key advantages are the ability to retain a good degree of control

[115] Bike Share, Opportunities in New York City, NYC Department of City Planning

over the design and implementation of the scheme through a robust performance mechanism (it may be less straightforward to penalise poor performance where payment is made through the provision of advertising space) and the retention of valuable advertising assets for alternative use. There may also be the ability to transfer operating and maintenance risk to the operator under this structure. However, there is clearly the requirement for significant upfront capital investment in the implementation of the scheme and it would be most likely to require ongoing revenue funding to support operations.

12.13 Summary advantages and disadvantages of this structure include:

+ May attract experienced operators
+ Good degree of control over design, implementation and operation
+ Retention of valuable advertising assets
+ Potential to remove public liability
+ Potential to transfer operations and maintenance risk

- High upfront investment costs
- Market soundings indicated other revenue sources (e.g. advertising assets) would be required
- Ongoing governance and accountability issues

Advertising Company Owned and Advertising Company Operated (or similar)

12.14 There are also a number of structures to consider whereby ownership of the assets resides with the private sector, in this case, usually an advertising company. This is perhaps the most highly publicised approach and has been implemented on numerous schemes across Europe, including forming the basis for the schemes in Dublin and Paris. Under this structure, the provision of the bike scheme infrastructure is tied to a contract for on-street furniture, usually advertising, with the provider and operator receiving rights to utilise certain (primarily new) sites for the sale of advertising space over a defined contract period in exchange for the provision and operation of the scheme. In terms of financing, the operator will typically cover the upfront capital costs associated with the scheme and can assume varying degrees of risk in relation to the operations and maintenance element. Consultation with the market has indicated a degree of public sector underwriting (e.g. through risk sharing or a contribution towards capital or operating costs) may be sought by some bidders rather than the scheme relying 100% on advertising revenue as payment in kind. Revenue share agreements are often in place between the public and private sectors, although the level of revenue generated through the scheme may not be large. This form of scheme can be time consuming to implement as there is significant planning and environmental heritage implications in relation to proposed locations of advertising assets. However, the owner / operator is typically very experienced in the development and operation of bike share schemes and can bring this experience to bear in designing a scheme, although the public stakeholders will need to closely monitor and engage in the development phase to ensure the objectives of the advertising company align with the objectives of the public authority in terms of the outcomes of the scheme. A further issue is that the creation of new advertising assets for the private sector can cause negative publicity for the authority, particularly during the development phase, as was the experience in Dublin.

12.15 An variant on this option would be to wrap the provision of a bike sharing scheme into a wider contract for either street furniture or the existing bus shelter contract in Northern Ireland. The current contract is with Clear Channel Adshel who installed and maintain a large network of modern bus shelters across Northern Ireland in exchange for the rights to locate and advertise on a defined number of these shelters. The contract is due for renewal in 2016 and there would be an opportunity to procure a bike scheme alongside re-procuring the bus shelter contract.

12.16 There could also be further alternative sources of payment in kind, and the procurement process would allow the market and potential operators to come forward with innovative proposals.

12.17 Summary advantages and disadvantages of this structure include:

+ Limited or no upfront capital cost or operating subsidy
+ May attract experienced operators
+ Potential to remove public liability
+ Potential to transfer operations and maintenance risk
+ Ability to tie into re-procurement of existing bus shelter contract

- Less control over design, implementation and operation
- Relatively long lead time and planning complexities
- Potential for negative publicity associated with advertising space

Private Transport Company Owned and Private Transport Company Operated

12.18 A structure in which a private company both provides and operates a bike sharing scheme which is not related to the provision of advertising rights is relatively uncommon. The public authority responsible for procuring such an arrangement would typically be required to meet significant upfront capital costs associated with the provision of the infrastructure. Recurring costs are unlikely to be covered to a significant extent by the charging of user tariffs, therefore an annual subsidy or operating charge would be required from the public authority. Indeed, experience set out previously in this OBC has indicated that the most successful tariff structures in terms of attracting users involve initial periods of free use, which mean the vast majority of journeys are free. However, this approach would allow for the public authority to potentially transfer elements of both the development and operation and maintenance risks to the private sector, and exercise a significant degree of control over the design and implementation of the system. This would be particularly so where an off the shelf solution, such as offered by private companies such as Hourbike, is used.

12.19 Summary advantages and disadvantages of this structure include:

+ Good degree of control over design, implementation and operation
+ Retention of valuable advertising assets
+ Potential to remove public liability
+ Potential to transfer operations and maintenance risk

- High upfront investment costs
- Significant on-going revenue subsidy likely to be required
- Absence of advertising element may preclude some experienced operators bidding

Ownership, Operations and Financing Constraints

12.20 Two key constraints in relation to the ownership, operations and financing of the scheme have been identified in conjunction with Belfast City Council, the Department for Regional Development and the Strategic Investment Board. These are set out below.

Ownership and Operations

12.21 Belfast City Council do not have statutory powers in relation to transportation and therefore are unable to own or operate the proposed scheme. In addition, whilst the Department for Regional Development and Roads Service do have such transport powers, the Department has confirmed that it does not intend to own or operate the scheme as it considers that this function is best delivered by the private sector who have significant experience in the development, implementation and operation of numerous schemes throughout Europe.

Financing and Affordability

12.22 As set out in Section 6 a key aim of the Outline Business Case is to examine alternative forms of delivery for a scheme in Belfast which minimise the cost to the public purse. In this context, the options for the proposed bike hire scheme in Belfast must have minimal capital or revenue funding requirements for Belfast City Council or the Department of Regional Development.

Filtering of Ownership, Operations and Financing Structures

12.23 Based on the constraints identified above and within the context of the experience elsewhere and other successful schemes, an exercise was undertaken in conjunction with Belfast City Council, the Department for Regional Development and the Strategic Investment Board. The purpose of this exercise was to conclude on the most appropriate commercial structure for the delivery of the Preferred Option. The results of this exercise are summarised below.

Structure		Funding	Assessment
Owner	**Operator**		
Public Authority/ Transport Co	Public Authority/ Transport Co	Public Funding Member / User Fees Ads on bikes / stations	This structure has not been taken forward as either Belfast City Council or DRD would be required to own and operate the scheme. In addition, the scheme would be required to be primarily conventionally funded and subsidised which is incompatible with the identified funding constraint. Potential exists for advertising to be placed on bikes and stations however experience elsewhere, including Aarhus indicates that this will not cover the costs of providing and operating the scheme.
Public Authority	Association / Co-operative	Public Funding Member / User Fees Ads on bikes / stations	This structure has not been taken forward as either Belfast City Council or DRD would be required to own the scheme. An association of co-operative would need to be constituted with appropriate powers but would likely remain under the ultimate control of DRD or Belfast City Council. The scheme would be required to be primarily conventionally funded and subsidised which is incompatible with the identified funding constraint.
Public Authority	Advertising Co/ Private Transport Co	Public Funding Member / User Fees Ads on bikes / stations	An advertising company may be procured to operate the scheme for advertising space in lieu of conventional funding. A private transport company would require payment or subsidy for any shortfall in user tariff income which would likely be insufficient to cover costs due to the proposed free usage period to encourage utilisation. This structure has not been taken forward as either Belfast City Council or DRD would be required to own the scheme. In addition, for the public sector to own the assets would likely necessitate upfront capital investment in infrastructure by Belfast City Council or DRD.
Advertising Co	Advertising Co	Low/ No Public Funding Member / User Fees Ads on bikes / stations and other new sites	This structure would not require the scheme to be owned or operated by Belfast City Council or DRD but instead by a private company, most likely an advertising company. The scheme has the potential to be financed through the creation and provision of new advertising assets in lieu of conventional funding to the advertising company for the duration of the scheme. Importantly, this

			commercial structure does not assume that the revenues from existing advertising assets would simply be assigned to the operator as this would result in a cash cost to the public sector. Market sounding has indicated that a degree of subsidy or underwrite may possibly be required from the public sector, rather than 100% advertising revenue finance, although this would be significantly lower than under previously discussed structures.
Private Transport Co	Private Transport Co	Public Funding Member / User Fees Ads on bikes / stations	This structure would not require the scheme to be owned or operated by Belfast City Council or DRD but instead by a private company. However, the private operator would require conventional payment for the provision and operation of the scheme and would not be accept the provision of advertising assets or similar payment in kind. This structure has therefore not been taken forward.

Identified Commercial Structure

12.24 Based on the analysis of the broad range of commercial structures available within the context of the ownership and financing constraints, the most appropriate commercial structure is one where an advertising company (or similar) both owns and operates the bike hire scheme. This approach also offers the ability to minimise (although potentially not completely eliminate) conventional capital and revenue funding - instead finance for the scheme would be through a payment in kind, primarily through the creation and provision of **new advertising assets** to the operator, for the duration of the scheme. Importantly, as set out above this commercial structure does not assume that the revenues from existing advertising assets would simply be assigned to the operator as this would result in a cash cost to the public sector.

12.25 The broad principle of this approach would also allow for the financing of the scheme through other forms of payment in kind which may be proposed by the market during a procurement. This commercial approach has been agreed with Belfast City Council, the Department for Regional Development and the Strategic Investment Board.

Affordability and Value for Money

12.26 As set out in the paragraphs above, the proposed commercial structure to deliver the Preferred Option is based on the principle of a payment in kind to a private sector owner/ operator. All costs associated with the establishment and operation of the scheme would require to be met by the operator. There must be a minimal to no capital or revenue impact for the public sector.

12.27 As a result, the ability to measure the value for money and affordability of the scheme must be considered in the context of the payment in kind which may be provided to the operator and the identified benefits of the scheme assessed against this payment in kind.

Affordability Assessment

12.28 In order to assess the potential level of payment in kind which may be required by a private sector operator to deliver the Preferred Option in Belfast, it has been assumed that all costs involved in the establishment and operation of the scheme and set out in Section 8 of this OBC will be met by the operator. In order for the operator to generate a commercial return, a value of payment in kind must be made to provide the operator with an acceptable IRR for the commercial risks which they are assuming. Therefore an annual Payment In Kind (PIK) value which generates a commercial IRR of 15% when all costs (excluding opportunity costs) are met by the operator has been calculated for the Preferred Option of a range of provision between 300 and 500 bikes. It should be noted that this IRR excludes inter alia finance costs, residual value, taxation and any revenues which may be generated through subscriptions or user tariffs. In addition, the competitive procurement process should be utilised to drive down the level of commercial IRR sought by prospective bidders.

12.29 The results of this assessment for the Preferred Option are set out in the table below.

Description	**Preferred Option**
	Real Terms (£m)
Public Sector Costs	
Opportunity Cost per annum (Parking Revenue Foregone)	0.06 - 0.10
Initial (Yr 1 only) Capital Cost	0
Revenue Cost per annum	0
PIK Costs	
Annual PIK	0.36 – 0.58
Total PIK & Revenue (Cash) cost per annum	**0.36 – 0.58**
Description	**NPC (£m)**
NPC Opportunity Costs (Parking Revenue Foregone)	0.69 - 1.15
NPC Public Sector Costs	0
NPC PIK	4.12 – 6.71
Total NPC	**4.12 – 6.71**

12.30 As can be seen from the table above for the provision of a 3rd Generation system of between 300-500 bikes with 30-50 docking stations, an annual payment in kind has been calculated of between **£0.36m and £0.58m**. This is based on an estimated IRR of 15%.

12.31 This is the value of new advertising space to the operator which would require to be created and assigned to the operator for the 15 year operational period of the scheme. It is important to note that this assumes that new advertising assets would be created to deliver the PIK, and that existing assets and revenues would not simply be assigned. The detailed PIK calculation and cashflow is set out at Appendix G to this OBC.

12.32 As can also be seen from the table above, this assumes zero public sector cash contribution, although the NPC of parking revenue foregone is between £0.69m and £1.15m. Apart from the potential level of parking revenue foregone, under this scenario, there is a zero cash affordability impact for Belfast City Council or the Department for Regional Development, with the scheme being financed through the value of the PIK. The total NPC of the PIK payments is between £4.12m and £6.71m.

Affordability Sensitivities

12.33 However, the base case PIK value for the Preferred Option set out above contains a number of risks which need to be quantified through sensitivities. The risks and associated sensitivities which are quantified as part of this OBC are as follows:

10 Increased market IRR requirement;
11 Market requirement for cash contribution towards scheme in lieu of full financing of scheme via advertising; and
12 Market requirement for public sector underwrite where value of PIK provided (advertising space) falls in value.

12.34 In addition to the quantified risks and sensitivities set out above, there are a number of further commercial based risks which need to be understood when utilising this commercial approach. Due to the nature of these risks, they are not quantified by way of sensitivity, but are set out in qualitative terms but are nonetheless important risks which may impact on the project. These further risks include:

13 Failure of scheme to attract projected levels of demand/utilisation; and
14 Advertising market saturation in Belfast resulting in displaced revenues.

12.35 These sensitivities and risks are assessed in detail in the following paragraphs.

1 - Increased Market IRR Requirement

12.36 The base case affordability requirement derived an annual PIK value range based on an operator IRR requirement of 15%. If during a procurement the market assessed the risk profile of the scheme as requiring a higher IRR, the level of PIK would increase also. The following analysis indicates the impact on the level of PIK required if an 18% IRR was sought by the market during a competitive procurement. The impact of this sensitivity on the base case PIK is set out below.

Description	Preferred Option	Sensitivity	Variance
	Real Terms (£m)	Real Terms (£m)	(%)
Public Sector Cash Costs			
Opportunity Cost per annum (Parking Revenue Foregone)	0.06 - 0.10	0.06 – 0.10	-
Initial (Yr 1 only) Capital Cost	0	0	-
Revenue Cost per annum	0	0	-
PIK Costs			
Annual PIK	0.36 – 0.58	0.37 – 0.60	3%
Total PIK & Revenue (Cash) cost per annum	**0.36 – 0.58**	**0.37 – 0.60**	**3%**
Description	**NPC (£m)**	**NPC (£m)**	**Variance (%)**
NPC Opportunity Costs (Parking Revenue Foregone)	0.69 - 1.15	0.69 - 1.15	-
NPC Public Sector Cash Costs	0	0	-
NPC PIK	4.12 – 6.71	4.25 – 6.94	3%
Total NPC	**4.12 – 6.71**	**4.25 – 6.94**	**3%**

12.37 As can be seen above, increasing the estimated project IRR from 15% to 20% increases the annual value of the annual PIK and the total NPC of the PIK by approximately 3%.

2 - Market Requirement for Cash Contribution

12.38 The market sounding established that the potential scheme in Belfast may require to provide a cash contribution towards the development of a scheme rather than relying on the 100% subvention provided by the PIK (e.g. advertising revenues). In this circumstance, there would be a requirement for the public sector stakeholders to make a capital and /or revenue contribution. This sensitivity assumes that 30% of all upfront cost and 25% of all on-going revenue costs are to be provided by the public sector via a cash contribution to the operator with the balance provided via a PIK (e.g. advertising) subvention to the operator.

Description	Preferred Option	Sensitivity	Variance
	Real Terms (£m)	Real Terms (£m)	(%)
Public Sector Cash Costs			
Opportunity Cost per annum (Parking Revenue Foregone)	0.06 - 0.10	0.06 - 0.10	-
Initial (Yr 1 only) Capital Cost	0	0.21 – 0.34	100%
Revenue Cost per annum	0	0.08 – 0.12	100%
PIK Costs			
Annual PIK	0.36 – 0.58	0.26 – 0.43	(27%)
Total PIK & Revenue (Cash) cost per annum	**0.36 – 0.58**	**0.34 – 0.55**	**(5%)**
Description	**NPC (£m)**	**NPC (£m)**	**Variance (%)**
NPC Opportunity Costs (Parking Revenue Foregone)	0.69 - 1.15	0.69 - 1.15	-
NPC Public Sector Cash Costs	0	0.99 – 1.61	-
NPC PIK	4.12 – 6.71	3.03 – 4.94	(26%)
Total NPC	**4.12 – 6.71**	**4.02 - 6.55**	**(2%)**

12.39 As can be seen from the table above, under this sensitivity there would be a requirement for an initial public sector cash contribution towards capital costs of between £0.21m and £0.34m. There would also be an annual revenue cash contribution required of between £0.08m and £0.12m per annum. This is in addition to the parking revenue foregone of between £0.06m and £0.10m per annum) Under this sensitivity, the annual PIK range for the Preferred Option falls by approximately 27% to between £0.26m and £0.43m per annum. The overall NPC of the public sector cash contribution and the PIK is approximately 2% lower than the base case.

3 – Market Requirement for PIK Underwrite

12.40 Under this scenario, the market during procurement may seek to obtain a risk share or underwrite arrangement with the public sector whereby any significant fall in the value of the PIK (for example, through a significant fall in the value of advertising space values) is required to be partly underwritten by the public sector. Equally, there would be expected to be a reciprocal arrangement in place whereby any significant increase in the value of the PIK (advertising space value) would be shared with the public sector. For the purposes of this scenario, it is assumed that the operator must assume the risk (and indeed the reward) for the first 10% decrease (or increase) in the value of the PIK and that the public sector is required to underwrite any further fall (or indeed recover any greater increase) in the value of the PIK. In this sensitivity, the value of the PIK is assumed to fall by 30% from year 2 onwards. The results are presented in the table below.

Description	**Preferred Option**	**Sensitivity**	**Variance**
	Real Terms (£m)	**Real Terms (£m)**	**(%)**
Public Sector Cash Costs			
Opportunity Cost per annum (Parking Revenue Foregone)	0.06 - 0.10	0.06 - 0.10	-
Initial (Yr 1 only) Capital Cost	0	0	-
Revenue Cost per annum	0	0.07 – 0.12*	100%
PIK Costs			
Annual PIK	0.36 – 0.58	0.25 – 0.41	**
Total PIK & Revenue (Cash) cost per annum	**0.36 – 0.58**	**0.32 – 0.53**	****
Description	**NPC (£m)**	**NPC (£m)**	**Variance (%)**
NPC Opportunity Costs (Parking Revenue Foregone)	0.69 - 1.15	0.69 - 1.15	-
NPC Public Sector Cash Costs	0	0.75 – 1.23	100%
NPC PIK	4.12 – 6.71	2.99 – 4.87	(27%)
Total NPC	**4.12 – 6.71**	**3.74 – 6.10**	**(9%)**

* From Year 2 when value of PIK falls and public sector required to contribute towards fall in revenue.

** Value of PIK is per Preferred Option Base Case, but sensitivity indicates 30% fall in value to trigger risk share cash payment from Year 2

12.41 As can be seen from the table above, the public sector is required under the risk share mechanism to make a cash contribution of between£0.07m and £0.12m to account for the fall in the value of the PIK to the operator. As can also be seen from the table above, the annual value and total NPC value of the PIK has fallen due to the assumption of a 30% decrease in the value of the PIK. This results in a lower NPC under this scenario however it is important to note that the lower NPC is only due to the fall in PIK which is absorbed at risk of the private sector operator and the public sector is required to make a significant revenue contribution which it does not have to make under the base case.

4 – Failure to Attract Demand / Utilisation

12.42 This risk will occur in the circumstance where the public hire bike scheme is delivered but falls significantly short of attracting projected levels of demand or utilisation. In this scenario, the public sector will continue to make available the PIK for the duration of the contract to the operator, however the scheme will not be utilised as expected and the potential qualitative and quantitative benefits will fail to accrue, such as reductions in CO2, fuel savings, health benefits and journey time improvements.

12.43 In addition, under this scenario, whilst no cash payments are to be made by the public sector there is a significant reputational risk that the Department and the Council are perceived to be providing valuable PIK (advertising space) to the operator in return for a scheme which is not used. This will be viewed as poor value for money and may lead to reputational damage for the Department and Council. The image of cycling in the city may also be damaged through a scheme which is not used, stations may attract greater levels of vandalism and car parking spaces foregone for the installation of the scheme will be unable to be utilised.

12.44 This risk will need to be managed through protections in the contract which incentivise the operator to market the scheme and deliver strong operational performance and which provide DRD with an option to break the contract early.

5 - Advertising Market Saturation

12.45 As set out earlier, the commercial structure proposed involves the creation of new advertising assets to generate a PIK for the operator, and not the assignment of revenues from existing advertising assets in the City which may accrue to the Council or Departments. However, should the advertising market in the current economic climate fail to support the proposed additional annual value of advertising in the City, then the risk exists that the creation of the new advertising assets will simply displace existing advertising revenues currently accruing to the owners or leaseholders of existing advertising assets.

12.46 In this circumstance, the risk exists that any income presently accruing to the public sector from non- scheme related assets will be diluted or diverted to the new assets. The effect of this diversion will be a reduction in revenue generated from existing assets to public sector. This displacement or reduction in revenue would therefore be a cost of the scheme in cash terms.

12.47 Belfast City Council have recently appointed an advertising agency to undertake a study to assess the ability of the Council to raise additional revenue through advertising on Council assets. This study is due to be concluded in June 2011 and the findings should be reviewed by Belfast City Council and public hire bike scheme project stakeholders, prior to commencing a procurement. This will allow the project stakeholders to assess the capacity of the market to sustain additional advertising assets in the City and therefore the likelihood of this risk materialising.

Summary of Impact of Affordability Sensitivities

12.48 The table below summarises the results of the quantified affordability sensitivities.

Description	Preferred Option	Sensitivity 1	Sensitivity 2	Sensitivity 3
	Real Terms (£m)	Real Terms (£m)	Real Terms (£m)	Real Terms (£m)
Public Sector Cash Costs				
Opportunity Cost per annum (Parking Revenue Foregone)	0.06 - 0.10	0.06 - 0.10	0.06 - 0.10	0.06 - 0.10
Initial (Yr 1 only) Capital Cost	0	0	0.21 – 0.34	0
Revenue Cost per annum	0	0	0.08 – 0.12	0.07 – 0.12*
PIK Costs				
Annual PIK	0.36 – 0.58	0.37 – 0.60	0.26 – 0.43	0.25 – 0.41
Total PIK & Revenue (Cash) cost per annum	**0.36 – 0.58**	**0.37 – 0.60**	**0.34 – 0.55**	**0.32 – 0.53**
Description	**NPC (£m)**	**NPC (£m)**	**NPC (£m)**	**NPC (£m)**
NPC Opportunity Costs (Parking Revenue Foregone)	0.69 - 1.15	0.69 - 1.15	0.69 - 1.15	0.69 - 1.15
NPC Public Sector Cash Costs	0	0	0.99 – 1.61	0.75 – 1.23
NPC PIK	4.12 – 6.71	4.25 – 6.94	3.03 – 4.94	2.99 – 4.87
Total NPC	**4.12 – 6.71**	**4.25 – 6.94**	**4.02 - 6.55**	**3.74 – 6.10**

* From Year 2 when value of PIK falls and public sector required to contribute towards fall in revenue.
** Value of initial PIK is per Preferred Option Base Case, but sensitivity indicates 30% fall in value to trigger risk share cash payment from Year 2

12.49 As can be seen from the table above, Sensitivity 1 increases the overall level of PIK to be provided due to the increased IRR requirement of the operator. This results in a higher overall NPC of PIK payments than under the Preferred Option. Under Sensitivity 2, the public sector is required to make a cash contribution towards initial capital costs and annual revenue costs. This has the effect of reducing the level of PIK required by the operator. The total NPC of the public sector cash contribution and value of the PIK is marginally lower than under the Preferred Option. Finally under Sensitivity 3 the public sector is required to make a revenue cash contribution to the operator due to the fall in value of the underlying PIK assets. Whilst the NPC of PIK appears lower under this sensitivity, the same assets are being provided as under the Preferred Option however the lower NPC reflects the reduced value to the operator.

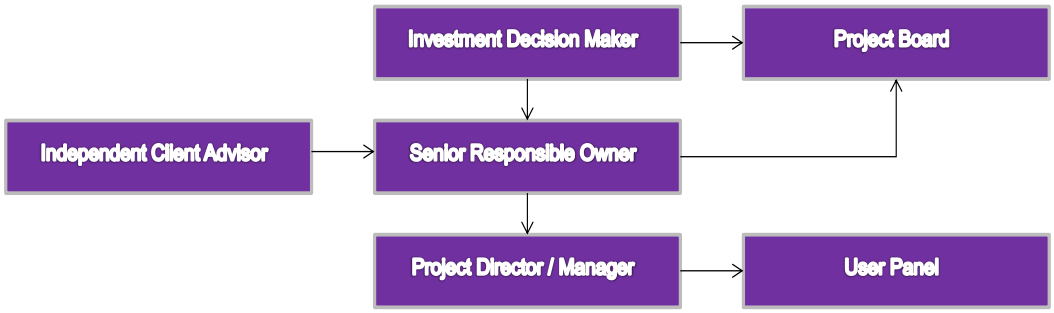
13 Management Case

Introduction

13.1 This section of the OBC describes the arrangements for managing the procurement of a public hire bike scheme for Belfast, including the project organisation and structure, procurement procedure and timetable, and the main actions to be completed to prepare for procurement. The section also describes the arrangements for monitoring and evaluating outcomes and includes a draft Benefits Realisation Plan.

Project Organisation – Project Delivery and Management

13.2 In line with the Northern Ireland Guide to Expenditure Appraisal and Evaluation, the project procurement and contract management structure will reflect the guidance provided by OGC in the Achieving Excellence in Construction – Project Organisations guide. A description of the roles that will be associated with the delivery and management of the project is set out the diagram below.



13.3 The project organisational and management structure comprises a number of key **roles and responsibilities** as follows:

Investment Decision Maker

13.4 The Investment Decision Maker (IDM) takes the final decision whether or not to proceed with the procurement of a partner to deliver a bike hire scheme in Belfast and to approve the supporting investment in terms of any resources allocated (including capital, operational and human resources) for the procurement of a partner, implementation and operational stages. An objective of this project is to minimise any investment in the delivery of the scheme and hence the investment requirements may solely relate to the cost of resources and advisors for the procurement stage and contract management.

13.5 The IDM also takes the final decision to award the contract, and approval to proceed and implement the scheme. This decision will be based on need, affordability, cost effectiveness, and whole life value for money as evidenced by an updated Business Case at the end of the bike hire scheme procurement process. The IDM will require to be satisfied that all options have been appropriately evaluated and risks identified together with potential impact on the project in terms of quality, cost and time.

13.6 The IDM role is to be undertaken by the Minister and / or Permanent Secretary within DRD.

Senior Responsible Owner

13.7 The Senior Responsible Owner (SRO) defines the scope of the bike scheme to be procured and ultimately awarded in Belfast and has overall responsibility for the success of the proposed bike scheme during the procurement, implementation and operational phases. Reporting directly to the IDM, the SRO will be accountable for the project budget and ensuring appropriate resources are made available to enable a successful outcome and the realisation of benefits.

13.8 In order to function effectively, the SRO will have:

- the status and authority to provide the necessary leadership to the bike scheme project on behalf of the IDM; and
- clear accountability for delivering the project outcomes and benefits as set out in the Business Cases; and
- visibility to senior management within the key stakeholder Departments including the Department for Regional Development and Belfast City Council.

13.9 As set out above, the SRO will be required to hold sufficient authority and powers to make key decisions, and will require to have strong relationships and influence with key stakeholders. The SRO role will be a part time position, and will not act as the day to day project director / manager. The key SRO responsibilities include:

- Reporting directly on progress to the IDM;
- overall responsibility for the bike hire scheme delivery and success;
- acting as project champion, committed to delivering the bike hire scheme and its associated outcomes and benefits;
- overseeing the preparation of required business cases and project budgets and submitting these to the IDM for approval;
- ensuring resources are made available and allocated during procurement, implementation and operations;
- ensuring key stakeholders are involved in, and committed to, the bike hire scheme;
- appointing a Project Director/Manager for the scheme;
- establishing a progress and reporting procedure;
- resolving issues with team members and stakeholders;
- approving any necessary changes to the scope of the bike hire scheme;
- ensuring a post implementation review is undertaken and considered by all stakeholders;
- ensuring that the final bike hire scheme delivered continues to meet the identified objectives and needs as set out in the Business Cases.

13.10 The SRO position is to be fulfilled by a senior officer within DRD.

Project Board

13.11 The Project Board for the bike hire scheme have the specific remit to support the SRO in decision making and directing the on-going progress of the project. The Project Board is chaired by the SRO, who as set out above, takes lead responsibility for the decisions relating to the procurement and implementation of the bike hire scheme. In addition to the SRO, the Project Board will comprise senior representatives from the Department for Regional Development, Belfast City Council and the Strategic Investment Board. The Project Board members have the authority to take decisions on behalf of their respective organisations during the development, procurement and delivery of the bike hire scheme. The Project Board may require to be expanded to include representatives from DoE Planning Service and Roads Service.

Project Director / Manager

13.12 The Project Director / Manager will act as project sponsor and be the focal point for day to day management of the bike hire scheme project, securing project development, procurement and delivery. The Project Director / Manager will report directly to the SRO and will be a suitably experienced officer within DRD. The Project Director / Manager will have:

- empowerment to take decisions within defined delegated limits;
- clear reporting lines to the SRO and IDM;
- allocated resources for carrying out procurement and contract management activities in relation to the bike hire scheme; and
- approval to procure resources, as and when required, subject to budgetary constraints.

13.13 Key roles undertaken by the Project Director / Manager will include:

- managing resources allocated by the SRO;
- coordinating and directing project team inputs;
- ensuring appropriate risk management;
- managing budget; and
- providing a key contact point for an appointed contractor or service provider.

13.14 The Project Director / Manager for the procurement of the bike hire scheme is likely to also fulfil the contract management role during implementation and operations. During the operational phase key tasks will include:

- ongoing liaison with appointed operator to address issues arising;
- monitoring and enforcement of performance regime and any gainshare arrangements; and
- monitoring of scheme utilisation and identification of issues in conjunction with operator.

Independent Client Advisor

13.15 The independent client advisor role will primarily relate to functions for which specialist in-house skills or resources are not available. The advisor(s) for the bike hire scheme will support the SRO and Project Director / Manager in key decision making, particularly during the procurement stage and during contract implementation and monitoring. Key advice which will be provided in this respect will relate to procurement, financial advice and value for money, contract monitoring and technical aspects of the bike hire scheme project. The independent nature of the advisory role will ensure conflicts of interest are avoided during the procurement, implementation and delivery stages of the bike hire scheme.

User Panel

13.16 Consideration will also be given to the establishment of a User Panel for the Belfast bike hire scheme project. This panel would represent the interests of users and wider project stakeholders during the development, procurement and implementation of the bike hire scheme. The panel may also represent user views during the operational phase of the scheme. This panel might include key members of the DRD Active Travel Forum, for example:

- Belfast Chamber of Commerce;
- Sport NI;
- Sustrans;
- Translink; and
- Local cycling group stakeholders.

Procurement Procedure and Timetable

13.17 The following paragraphs set out a consideration of the likely procurement procedure and timetable and includes a discussion of key tasks to be undertaken in preparation for procurement.

Procurement Procedure

13.18 The EU Procurement Directives set out the legal framework for public procurement and apply where public authorities seek to acquire supplies, services or works. They set out defined procedures which are required to be adhered to by procuring authorities and public bodies in awarding a contract, where the value of the contract exceeds a defined threshold.

13.19 The three main procedures under which the contract for the provision and operation of the public hire bike scheme may be awarded are likely to be:

- **Open Procedure** - this is essentially a single stage tendering process, whereby all parties who express an interest in a tender opportunity are entitled to submit a tender for the project. Under this procedure, no negotiations with tenderers on key aspects of contracts and in particular prices are allowed;
- **Restricted Procedure** - under this procedure, a short list of prequalified tenderers is developed and only this short list is invited to respond to the subsequent Invitation to Tender for the contract. Under this procedure, no negotiations with tenderers on key aspects of contracts and in particular prices are allowed. The key advantage of this procedure is the ability to filter the initial responses and assess tender responses from a more manageable number of organisations and the ability to award within a shorted timeframe; and
- **Competitive Dialogue** - this process mirrors the restricted procedure until the Invitation to Tender stage. At this point, under Competitive Dialogue the procuring authority may enter into dialogue with a number of bidders to refine proposals and develop suitable solutions. Whist this inevitably elongates the procurement process, the procedure is most suited to particularly complex projects or those that include a wide range of services and assets to be delivered.

13.20 As set out previously in this OBC, the Preferred Option is for the provision of a 3rd Generation public hire bike scheme in Belfast of between 300 – 500 bikes with between 30 – 50 docking stations. It is proposed that the market should determine the optimum precise size and scale of a suitable scheme for Belfast. In tandem the preferred commercial structure is to finance the scheme through the provision of a Payment in Kind, most likely to be the creation and provision of new advertising assets for the use of the appointed tenderer.

13.21 Given the Preferred Option is to develop a scheme within a range of scale, the requirement to allow for innovative approaches to scheme design, operation and funding to be proposed by the market, and the degree of complexity associated with a form of payment in kind, it is currently envisaged that a contract for the design, build, finance, operation and maintenance of the scheme would be procured under the Competitive Dialogue procedure.

13.22 The procurement process will take place in four main phases, which will follow the approval of this OBC. A summary of the principal activities within each phase of the procurement process is set out below:

- **Phase One: Prequalification** – this phase of the procurement will commence with the publication of a Contract Notice in the Official Journal of the European Union. It will involve the preparation and publication of a Project Information Memorandum and Questionnaire, the holding of a Private Sector Briefing Day, the receipt and evaluation of

prequalification responses submitted by private sector organisations, and the selection of a short list of bidders for the Project;

- **Phase Two: Dialogue** – this phase of the procurement will involve the preparation and distribution of an Invitation to Participate in Dialogue (ITPD) to each of the short listed bidders, following which, a dialogue will be commenced by the Services with each of the bidders. The purpose of the dialogue is to enable bidders to develop the solutions, both technical and financial, that they believe are best suited to meet the project requirements as set out in the ITPD. The dialogue will take place in successive stages to enable the bidders to refine their solutions based on structured feedback. The dialogue stage will also be used to move towards a high level of commercial and contractual certainty before dialogue is closed. For a project of this nature we would expect that the dialogue phase might incorporate the following stages:
  - **ITPD**: the issue of the ITPD, which as described above sets out the process to be followed for the competitive dialogue, the submission requirements at each stage, the timetable, the services required, the requirements for solutions, the draft contract and proposed contractual terms including payment mechanism;
  - **ISOS**: dialogue to support the bidders in the development of outline solutions, resulting in the submission of Outline Solutions and an evaluation of the outline solutions submitted by each bidder.
- **Phase Three: Final Tenders** - feedback on the outline solutions and further dialogue to support the bidders in the development of fully detailed solutions, including their final pricing. Once there has been sufficient dialogue to provide bidders with an equal opportunity to develop and refine their detailed solutions (both technical and financial), and it is apparent that there are one or more solutions that will meet the Service's requirements, the Services we will declare the dialogue closed. Dialogue will only be closed once the Project Team are satisfied that all significant commercial issues have been resolved. At the conclusion of the dialogue phase the bidders will be issued with the Invitation to Submit Final Tenders (ISFT), and bidders will prepare their final tenders based on the solution(s) they have identified and refined during the dialogue phase. The final tenders received will then be evaluated, clarified and fine tuned during the detailed evaluation stage, subject to the requirement that such clarification and fine tuning does not involve changes to the key features of the tender and that any variations do not distort competition or have a discriminatory effect.
- **Phase Four: Finalisation** – this final phase of the procurement involves the appointment of a Preferred Bidder and the final clarification of the Preferred Bidders' tender (for example, finalising the contract documents and the preparation and submission of a Full Business Case for approval. This phase will conclude with the award of the contract.

Procurement Timetable

13.23 A target date for the completion of the procurement has been set out in the table that follows. The timetable assumes a fast tracked competitive dialogue process of 10 months followed by a detailed design and implementation phase in conjunction with the appointed operator which is assumed to take 12 months in total. This timetable however makes no allowance for external factors that cannot be determined at this time and which could impact on start or completion dates, such as delays in the approval of business cases, delays from statutory process (particularly planning and heritage issues) or from unforeseen ground conditions (such as utilities).

13.24 A procurement period of 10 months is considered achievable, based on the commercial nature of the scheme, the absence of bank finance and the experience of other non-PFI projects.

Milestone	Target Date
Approval of OBC	June 2011
Dispatch Contract Notice	July/August 2011
Receive Prequalification Submissions	September 2011
Issue ITPD and Commence Dialogue	October 2011
Close Dialogue and Issue ISFT	January 2012
Receive Final Tenders	February 2012
Submit Full Business Case	March 2012
Appoint Preferred Bidder	May 2012
Contract Award	June 2012
Commence Operations	June 2013

Timetable from Award to Implementation

13.25 As can be seen from the table above, a period of twelve months has been planned between contract award and the commencement of operations. This period is based on the period of time which was required to move from contract award to commencement of operations in London and also has been noted as reasonable by potential bidders during the experience gathering exercise.

13.26 However, significant uncertainties exist surrounding the period to commencement of operations. This period will be defined by the final payment in kind approach agreed with the Preferred Bidder. In particular, should the preferred bidder solution be based on payment in kind through the provision and creation of new advertising assets in the City, the installation of advertising panels would require to be subject to the statutory planning process in Northern Ireland. This may involve a significant number of applications to be prepared, processed, amended (where appropriate), possibly appealed, and approved.

Dublin City Council Experience - Development and Implementation Timetable

13.27 Based on experience in Dublin, if the advertising model is to be utilised as payment in kind, the process of identifying, mutually agreeing appropriate sites and undertaking the relevant planning process is likely to be iterative in nature. The Dublin City Council scheme awarded contract in December 2006, with planning applications for advertising sites lodged immediately post award in December 2006 and January 2007. Planning permissions were granted for the majority of advertising sites, post appeals by February 2008. The advertising assets were in place by August 2008. Also during 2008, a working group from the Council Roads and Traffic and Planning Departments carried out a detailed assessment of the suitability of 120 sites for docking stations, including ground testing for services and consultation with all relevant Departments and external agencies such as the National Council for the Blind and the Dublin Transportation Office. 40 station sites were identified and approved in April 2009, with the scheme launched 5 months later in September 2009.

13.28 In contrast to the approach described above for the Dublin scheme, Belfast should ensure that the process of identifying, surveying and agreeing appropriate sites for docking stations is undertaken in parallel to the process of agreeing on suitable locations for advertising assets, where appropriate.

Preparation for Procurement

13.29 The timetable set out above is challenging and significant preparatory work will be required in advance of dispatching the OJEU Contract Notice in order to achieve this timetable. Key activities will include:

- **Belfast Advertising Market Report** – the findings of the report currently being prepared for Belfast City Council on the ability of the Council to raise revenue through the creation of new advertising assets should be reviewed to assess whether the City has the capacity to sustain additional advertising and that new assets created for a bike scheme would not simply displace existing advertising revenues from public and indeed private sector sites;
- **Advisors** – appointment / re-appointment of suitably skilled advisors to assist with the development of the contract and with the procurement under European Directives;
- **Contract and Tender Documentation** – development of the contract and ITT will need to be undertaken prior to and alongside the issuing of the Contract Notice;
- **Governance Arrangements** – the governance arrangements to be put in place between project stakeholders for the procurement and operational phase should be formally agreed and documented; and
- **PIN & Market Briefing** – making the market aware of the opportunity coming out and allowing through responses to the PIN for the market to highlight other payment in kind approaches which they may wish to consider during the procurement.

Contractual Framework

13.30 As set out in Section 12, the identified commercial structure is one where the appointed tenderer designs, builds, finances and operates the bike hire scheme. The contractual framework will seek to minimise (although potentially not completely eliminate) conventional capital and revenue funding - instead finance for the scheme would be through a payment in kind, primarily through the creation and provision of **new advertising assets** to the operator, for the duration of the scheme. However it is important that the proposed contractual approach would also allow for the financing of the scheme through other forms of payment in kind which may be proposed by the market during a procurement.

13.31 Key terms and features of the proposed contract are likely to include:

- **Term of Contract** – where a form of payment in kind is to be utilised a contract period of up to 15 years, with the potential for contract extension. The dublinbikes contract is for a period of 15 years, as are the similar schemes in Brussels and Lyon which are based on the advertising model.[116] The Paris Velib is for a duration of 10 years[117];
- **Payment** – the contract is likely to be financed through a payment in kind, through the making available of assets for advertising to the operator. However, as set out in Section 12, the market may require that a proportion of the scheme is financed through conventional capital and revenue payments during the contract period. The level of any payment will also be linked to the level of operation and maintenance risk passed to the private sector operator, and the extent of any risk sharing arrangements in relation to the underlying value of any payment in kind assets, in particular, advertising;
- **Gain-share** – any significant increase in the value of the underlying payment in kind assets should be subject to a gain sharing arrangement which allows the contractor to make an appropriate commercial return and ensures the public sector continues to achieve best consideration from any underlying assets, such as advertising sites;
- **Security** – the contract is likely to include construction bonds and/or retentions and performance guarantees to provide appropriate protections for the public sector;
- **Change Control** – a procedure for change control and variation will be included to allow for the future expansion or required alterations to the scheme;
- **Performance Mechanism** – a suitable performance mechanism and availability standards will be defined for the scheme to incentivise contractor performance; and

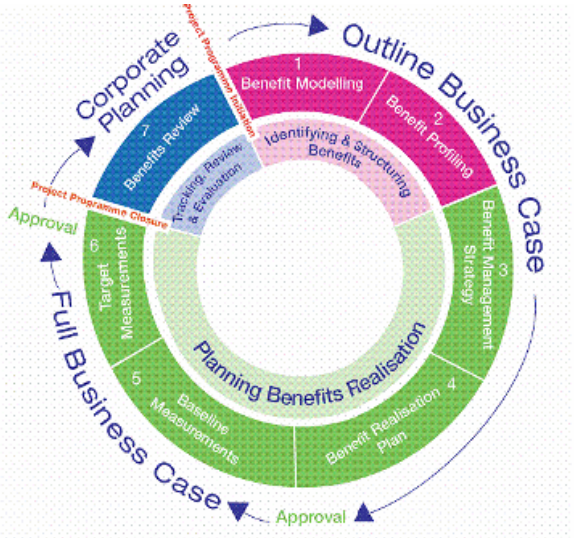
[116] OBIS Project Data
[117] OBIS Project Data

- **Revenue Sharing –** whilst the scheme is proposed to be free of charge for the first 30 minutes of use, a level of revenue will be generated by the scheme through initial user subscriptions and longer term use charges. These will be shared on an appropriate basis with the public sector.

Benefits Realisation Plan

13.32 The success of this project will be measured in terms of the extent to which the scheme is utilised and therefore the underlying benefits which underpin the case for investment are realised. Establishing a clear statement of these benefits, how they will be measured and the targets to be achieved (in comparison with the current baseline) is therefore an essential step in managing the realisation of benefits associated with the scheme.

13.33 The lifecycle diagram below outlines the seven activities identified by OGC in the UK as being the key steps in benefits management. It illustrates the relationship to this Outline Business Case, which seeks to justify the investment in the bike hire scheme, and also the importance of continuing to manage benefits realisation through procurement, final / full business case and into the operational stage of the programme.



13.34 This section of the OBC sets out a draft benefits realisation plan for the public hire bike scheme, covering the benefit priorities, initial benefit profiles and the benefits management strategy in accordance with OGC guidance in the UK. The draft benefits realisation plan will be further developed and enhanced during the next stages of the project.

Benefit Priorities

13.35 The benefits have been assessed in the benefits priority table that follows in terms of:

- **Overall benefit ranking** - the ranking of the benefit in relation to the full suite of benefits associated with the Programme as set out in the benefits model;
- **Priority / importance to success** - the importance of the benefit to the success of the Project, scored from 1 to 5 (1 = very low, 5 = very high);
- **Likelihood of failure** - the possibility of the benefit not being achieved, scored from 1 to 5 (1 = very low, 5 = very high); and
- **Overall risk rating** - which indicates the overall risk of the benefit not being achieved, and is determined by multiplying the priority / importance by the likelihood of failure.

13.36 The table also provides a short comment to help explain the score provided in respect of the likelihood of failure.

	Benefit	Type	Benefit Ranking	Importance to Success	Likelihood of failure	Risk Rating	Comment
A	Increase in cycling within Belfast	Non financial/qualitative	1	5	2	10	Key benefit for scheme, dependent on overall project implementation, marketing and appropriate tariff structure. Low level of cycling at present therefore provision of scheme likely to increase cycling from baseline levels.
B	Reduction in CO2 emissions	Non financial/qualitative	2	4	3	12	Reduction in emissions may be achieved through modal shift from motorised transport. Modal shift may occur from existing motorised public transport than private car which would reduce level of impact.
C	Promotion of Belfast as 'green' city	Non financial/qualitative	2	3	2	6	Increase in public perception of Belfast as an environmentally friendly City. Experience in Dublin and Aarhus is that public perception of schemes within City is very positive.
D	Accessibility and Social Inclusion	Non financial/qualitative	1	4	2	8	Scheme should be accessible by all members of the community and also provide a new free of charge public transport option. Free of charge tariff structures common across Europe.

Benefits profiles

13.37 An initial benefit profile has been developed for each of the intermediate and end benefits identified in the benefits model above. These initial benefit profiles are presented in Appendix H and set out:

- Benefit owners;
- Details of the benefit to be measured and method of measurement;
- Baseline and target values (where currently available);
- Measurement dates / periods;
- Benefit rankings, priorities and risk ratings (as per benefit priorities tables);
- Dependencies; and
- Risks and countermeasures.

13.38 Where baseline values are not currently available, these will be identified, recorded and monitored by the project team and added to the benefit profiles after approval of the OBC.

Benefits management

13.39 The draft Benefits Realisation Plan (BRP) set out in this OBC will be further developed, enhanced and monitored throughout the next stages of the programme. The main actions and responsibilities for benefits management are set out in the table below.

Stage	Actions	Responsibility
Pre-procurement	• Formal review of BRP, benefits management process and resources	Project Board
Procurement	• Further develop benefit profiles • Identify baselines where appropriate • Manage procurement to support delivery of benefits	Project Director / Manager
Post Award	• General monitoring of BRP and production of benefits report • Manage and monitor risks to benefits realisation	Project Director / Manager
Operations	• Evaluation of Benefits Realisation	Project Director / Manager