## ON STREET BICYCLE HIRE SERVICE

FEASIBILITY STUDY



FEASIBILITY STUDY JUNE 2013

# An On Street Bicycle Hire Scheme for Darlington?

#### Highlights

Darlovelo could provide an on-street bicycle hire service for the town with between 8 and 20 pickup points

A core role would be to compliment and integrate with public transport, "filling the gaps"

A fleet of 20 to 50 bicycles would be needed

# The setup cost of a 20 - bike service would be around £53,000, and cost £12,500 per year to run. It could earn around £4,200 per year, and would therefore require 66% funding from non-revenue streams

# The setup cost of a 50-bike service would be around £80,000 and cost £21,500 per year to run. It could earn around £8,000 per year, and would therefore require more than 60% funding from non-revenue streams

We estimate an average of 9 hires per day for 300 days in the year for the 20 bicycle scheme, and 25 per day for the 50 bicycle scheme.

- Timing of such a scheme requires a number of pre-requisites - stronger everyday cycling culture, completed infrastructure, and ongoing commitment from central and local government

### **Introduction**

Darlovelo is a charitable association, managed by its members. As declared in its constitution, Darlovelo's objects are:

🐜 i. To encourage cycling as a means of everyday transport

*i*. To promote a cultural change in the way that people view cycling so that it becomes a cultural norm for people to cycle to school, college, work, to the shops and for other local trips.

*iii.* To help empower people, especially young people to travel independently, to promote cycling and influence decision making with regard to provision for cycling.

\* iv. To address social barriers to cycling, particularly amongst girls and young women.

*w* v. To run a self sustaining none-profit making cycle hire scheme providing good quality cycles for hire at a rate of hire that makes them accessible to people on a low income.

The project developed out of the experience of Beauty and the Bike, a documentary project run by Darlington Media Group in 2008 and 2009, which explored the barriers to cycling for teenage girls in the town. The prize-winning film has been screened in towns and cities throughout the world, and the accompanying book has been equally widely read.

Darlovelo was launched in 2010, following a successful grant bid by Darlington Cycling Campaign to the New Ideas Fund run by Bike Hub. This helped Darlovelo buy a fleet of city bikes which, alongside the existing bikes from Beauty and the Bike (donated to Darlovelo by Darlington Media Group), and a further 6 from Darlington Borough Council, established a hire fleet of over 30 bicycles. Deliberately chosen to prove attractive to women, who in the UK are much more reluctant to cycle than their male counterparts for reasons revealed by Beauty and the Bike, Darlovelo recruited a part-time organiser and a freelance bike mechanic, ran regular events and in 2011 put substantial efforts into a sustained marketing campaign.

In terms of the project's aims, the scheme's success was mixed. On the positive side, over 90% of bike hires were to women, and of these around 30 followed their hire period by buying a bicycle of their own, either from Darlovelo or from a local retailer. On the negative side, the hope was that sufficient hires would be possible to make the scheme

financially self-sustainable. But with a turnover of little more than £1,000 in its first full year, this was never going to be likely.

This strategy - encouraging women to try cycling with Darlovelo in the hope that they would eventually buy their own - clearly had its financial limits. We were searching out women in the town who might, with a bit of support and encouragement, start using a bicycle as an everyday means of transport, and then leave the scheme to buy their own bike. Moreover, it soon became evident that the well-known barriers to cycling - a lack of safe cycle infrastructure, a lack of everyday cycling culture, urban planning still strongly geared to motorised transport, and a resultant problem with motorist behaviour towards cyclists - denied the project any hope of financial self-sufficiency. The scheme, to continue on this scale, would require subsidy, something that ran against contemporary government ideology. Yet, as this study points out, this is precisely how successful bike share schemes operate.

In response, Darlovelo's members decided in 2012 to manage the scheme on a voluntary basis, to keep a bicycle hire service available to the town, and to meanwhile explore ways of broadening its appeal to other potential hirers. One obvious route that has been considered by the association on a number of occasions is to make our fleet available for very short-term hire, in the manner used by city bike hire schemes in London, Paris and elsewhere. However, until now this has proved prohibitively expensive for a small town like Darlington.

### **Types of Bike Sharing Schemes**

Wikipedia states that the 535 bike-sharing programmes around the world fall can be divided into two general categories: "Community Bike programmes" organised mostly by local community groups or non-profit organisations; and "Smart Bike programmes" implemented by government agencies, sometimes in a public-private partnership<sup>1</sup>. The first known scheme was set up in Amsterdam in 1965. This so-called *White Bicycle Plan* provided free bicycles that were supposed to be used for one trip and then left for someone else. Within a month, most of the bikes had been stolen and the rest were found in nearby canals. A more successful free bike hire scheme, *Vélo Jaunes*, was launched in the French city of La Rochelle in 1974., whilst Cambridge's Green Bike Scheme, launched in 1993, saw the majority of the fleet stolen during the first year.

In response to these problems, smart technology was introduced in a number of bike hire schemes in the 1990's, usually involving special locking bike stands, but this did not stop ongoing vandalism to parked bikes in cities such as Helsinki and Copenhagen. Today, theft can be potentially tackled with the use of GPS tracking technology, though this cannot stop vandalism of parked bikes.

One compromise solution is being introduced by Abellio, the international arm of the Dutch government rail operator Nederlandse Spoorwegen, who operate Merseyrail, Greater Anglia and Northern Rail. Their Bike & Go scheme will operate from 50 railway stations, mostly in the North of England (though not Darlington), and will offer rail users the opportunity to book a bike at their arrival station, use it to get to their destination, and return it back to the station at the end of the use period. Thus the bikes are normally stored safely within the rail station, rather than out on the streets.

Bike hire schemes don't come cheap. London's famous scheme, as of March 2012, has cost more than £119m, of which sponsors Barclays had paid just £13m<sup>2</sup>. Slough Borough Council recently produced a business plan for a scheme that would serve a town of 140,000, at a net cost of £681,000 over 5 years<sup>3</sup>. The more modest hire scheme in Dumfries in Scotland, a town of 43,000, cost £155,000.

However, in 2012 Grand Scheme, who run a bicycle hire scheme in Newcastle upon Tyne, announced the invention of a revolutionary new device that can be attached to the handlebars of any bicycle. The device is a GPS and keypad-

<sup>&</sup>lt;sup>1</sup> Figure for April 2013. see <u>http://en.wikipedia.org/wiki/Bicycle\_sharing\_system</u>

<sup>&</sup>lt;sup>2</sup> see <u>http://www.mayorwatch.co.uk/exclusive-tfl-reveals-how-much-barclays-has-paid-for-cycle-hire-scheme/201223704</u>

<sup>&</sup>lt;sup>3</sup> published on <u>www.slough.gov.uk</u> Darlovelo

controlled key safe in one. The user uses a mobile phone to hire a bike, receives a text by return with details of the bicycle (identity, location) and a pin code, which s/he then uses to open the key-safe. Inside is the key for the bike-lock. The user unlocks the bike and cycles off. The hire ends when the user locks the bike up at a drop-off point, returns the key to the key-safe, and texts back. Location and key are confirmed via GPS.

Such a scheme in Darlington could, with a much more modest capital outlay, be established. The GPS technology addresses the problem of theft (though not vandalism of a locked bike). GPS tracking also means that pick up and drop off points can be created through the simple addition of a metal pole and signage at standard bicycle stands. Moreover, because of its potential to operate at a small scale, revenue costs could be covered through much smaller subsidy, and could also attract a local business as a sponsor at a level more in keeping with the scale of the town. The remainder of this study therefore looks at options for a Darlington scheme based on this technology.



### Challenges & Opportunities

Much is made of the fear of theft and vandalism. Along with the likes of rain, hills, and distance, it is one of a matrix of excuses regularly given for not using a bicycle at all. With GPS technology, the bike share theft question is largely solved. But what of those other challenges? A United Nations background paper<sup>4</sup> produced in 2011 lists the principle issues that can act as barriers to use of a bicycle hire scheme, as well as those that can contribute to a scheme's success.

#### Challenges:

Just Theft and vandalism: experience varies, from Paris where nearly the whole fleet has needed replacement, to

Montreal which so far experienced relatively low theft and vandalism rates<sup>5</sup>. Reported anti social behaviour incidents in Darlington currently run at around 400 per month, not especially high by national standards.

Helmets: The report suggests that, in some regions, the main hindrance to implementation of bicycle-sharing programmes is helmet laws or helmet culture. However, experience in Darlington suggests this is not a major problem



**Topography and Climate**: Relatively speaking, Darlington's

topography is conducive to cycling, with few steep hills. Climate might appear to be a factor, but Darlington in fact enjoys a relatively low level of rainfall for the UK, around 660mm a year, comparable with the city with one of the highest levels of cycling in Europe, Groningen in the Netherlands (600mm).

**Exaggerated Benefits:** According to an online survey of 1,432 people in Montreal conducted in the summer of 2010 by researchers at McGill's School of Urban Planning, the vast majority of trips (86 per cent) replaced sustainable modes

<sup>5</sup> Shaheen, 2010 Darlovelo

<sup>&</sup>lt;sup>4</sup> <u>http://www.un.org/esa/dsd/resources/res\_pdfs/csd-19/Background-Paper8-P.Midgley-Bicycle.pdf</u>

such as walking, or rides on personal bicycles or public transport. On the other hand, Darlington Borough Council published figures in 2007 showing a drop in car use of 9%, and a rise in cycling of 66%. Either way, proponents of bicycle-sharing systems need to be more cautious in their estimates of potential benefits. How many potential users of the Abellio scheme would have otherwise used a private car, for example?

**Inexperienced Cyclists:** In some cities there have been complaints from motorists that cyclists who use bicycle-sharing schemes tend to be inexperienced riders who do not follow the traffic rules. This can be overcome by training programmes.

#### From experience, opportunities depend on a number of key factors:

Bicycle Re-distribution: Mechanism to address asymmetrical demand for bicycles by location

**Cycling infrastructure:** Quality and quantity of designated cycling space – dedicated bicycle lanes, intersection facilities, slow streets etc

Jensity and Trip Demand: Demand for one way trips in multiple directions

**Maintenance:** Bicycles and access terminals in good operating condition

🗼 Network Configuration: Location specific network design based on system objectives and travel demand

**System Accessibility:** Cost of use including monetary and convenience costs

Jicycles: Bicycle specifications respond to user demographics and operating conditions

- Jocking Stations: Terminals are visible and signage easy to understand
- Reality of Public Transport: Capacity to motivate residents to forgo auto trips
- Weather & Topography: Amount of Precipitation, Hills
- Safety & Security: Terminals and cycling facilities are well lit and patrolled as necessary
- **System Availability:** Hours of Service
- Jechnology Platform: Speed of access, real time information, privacy and security of data

Any decision to go ahead with an on-street scheme would need to first examine each of these factors in turn. However, a few can be initially considered here.

#### **Cycling Infrastructure**

Following 6 years of Cycling Demonstration Town funding, some progress has been made in developing an attractive cycling network. However, the early decision to default to a network of "signed routes" has considerably reduced both the standard and attraction of the town's cycle network. Many sections are on-road, stretches that require most attention, for example Parkgate (Darlington's busiest street), are ignored, and where good quality infrastructure exists it is not yet fully joined-up.

#### **Trip Demand**

Demand for cycle hire is of course related to population size in any city or town, but also compactness, the strength of cycling culture and infrastructure, and the availability of alternative travel options. Strikingly, towns with a similar, or even smaller, population to Darlington have and do sustain bike sharing schemes, despite low levels of cycling generally - the German towns of Coburg, Tübingen, Offenburg and indeed Darlington's twin town Mulheim -an-der-Ruhr all

have bike share schemes, as do the small French towns of Chalon-sur-Saône, Calais, Vannes, Belfort and Darlington's twin town Amiens. None of these towns have particularly high levels of cycling.

But in all these cases, local authority support is in place. Research into the financial structuring of these schemes lies beyond the scope of this paper, but it seems clear that such support is in place precisely because cycling levels are not yet high enough to support a fully commercial model. In Darlington, after an initial rise in cycling numbers of 65% (albeit from a very low base of just 1% of all trips), monitoring figures suggest a leveling off of cycling at between 2% and 3% of all trips, still well below the figure of 7% that is regarded by many as a threshold for "normalising" everyday cycling. Our experience with Darlovelo also suggests that levels of demand in the town are nowhere near enough for a successful commercial model.

#### **Network Configuration**

For an on-street bike hire scheme to prove attractive, sufficient bikes would need to be provided at sufficient pickup/ dropoff points to cover as much of the town's envisaged demand as possible. Two immediate areas of demand come to mind:

**Commuting from nearby towns and villages:** Although primarily urban, Darlington also has a number of satellite villages which have suffered in recent years from cuts in public transport services. To provide a service that genuinely offers an alternative to the private car, these villages will need to be served with a pickup/dropoff point.

**Cross town centre travel:** With most urban bus services terminating in the town centre, there is little public transport provision for travel from one side of the central Darlington area to another, for example from the railway station to Cockerton.

The following villages are within the Darlington Borough area:

- 🐜 Coatham Mundeville / Brafferton
- Murworth
- 🐜 Middleton St George
- 🐝 Piercebridge
- 🐜 Sadberge

To cover the central urban area of Darlington, pickup/dropoff points at or near the following locations would probably be required:

- Railway Station
- 🐝 Town Centre
- -Cockerton
- 🐝 Firth Moor
- 🐜 Haughton Village
- 🖗 Harrowgate Hill
- 🐝 Whessoe
- 🐝 West Park
- 🖗 Lingfield Point

This list, though not comprehensive, suggests that ultimately some 20 pickup/dropoff points are needed for the scheme to comprehensively cover the Borough. However, given the nature of the Grand Scheme technology, no special stands and locking mechanisms need to be installed. Indeed, existing cycle parking provision can easily be used, with the simple addition of signage providing details of how to use the scheme. Ideally, key locations would include cover for Darlovelo

parked bicycles, but again this is something that already exists in a number of locations (railway station, Lingfield Point, The Bridge arts venue and others).

Capital costs for the setting up of pickup/dropoff points is therefore relatively low (see budget). The major startup expense will be the further purchase of sufficient bicycles to service the network of pickup/dropoff points - a minimum of two per point - and the Grand Scheme boxes for the full fleet. Taking into account the need to service bikes on a regular basis, we would estimate that a fleet of 50 will meet the needs of such a network. However, as with the number of pickup/dropoff points, Darlovelo will be able to slowly scale up from a smaller number. With 11 of our existing bicycles already suitable, we would seek to add a further 9 to create an initial fleet of 20 bicycles, which could service 8 pickup/dropoff points.

#### System Accessibility

We would envisage a charging structure much like that of other on-street hire schemes, with an initial, near free (around 20p) hire period of 30 minutes for regular (local) users, followed by a rapidly increasing scale of charges for longer hire periods. As a small town, Darlington is fortunate in having most destinations that can be reached within thirty minutes from anywhere else in the Borough. We would therefore expect no more than 10% to 20% of hires to incur a higher charge.

The only cost for users beyond this will be membership, which also enables us to confirm the identity of the hirer. Typically, schemes feature two types of membership, frequent user and occasional visitor. The former involves a higher membership fee, and cheaper use, the latter a lower initial fee and more expensive use. We would follow this approach, with a frequent user membership of around £20 a year followed by 20p for the first 30 mins use. Occasional users would pay £1 membership, and £2 for the first 30 mins.

#### **Types of Bicycle**

Darlovelo currently owns around 20 city bikes, most of which are dutch-style step-through Pashleys or Gazelles, but also including four ClaudButler hybrids, of which two are cross-bar and two are step-through. All on-street bike hire schemes use step-through bikes, as these are universally useable by hirers. Size is also normally regularised to a medium adult utility height, with an easily adjustable saddle offering variability for different-sized hirers. A number of UK hire schemes use bicycles without built-in lights, although the better ones do. Brake systems in the UK are typically hand-controlled rather than back-pedal.

For all these reasons, not all of Darlovelo's current fleet would prove appropriate for an on street Bike Share scheme. We estimate that 5 Pashleys, 4 Gazelles and 2 ClaudButlers (subject to fitting permanent lights) would fit the scheme. We have found that, in practice, the Gazelles have proved to be the sturdiest bikes for prolonged and varied use, and would therefore look to augment these existing suitable bikes with further purchases of Gazelles.

But there is also an argument that a new scheme is best launched with a fleet of dedicated bikes, designed with the project in mind. Many schemes advocate bespoke bicycles to make them less attractive to thieves or vandals. Moreover, the existing fleet has obviously already been used for three years, and will require replacing at some point. An alternative approach is therefore to seek to fund an initial fleet of 20 new bikes, and sell much of the existing fleet to help part-finance the purchase. We would envisage maintaining a small-scale long-term hire service alongside the on-street scheme, and would therefore retain some 6 bikes for this purpose.

#### **Finance**

Whilst Darlovelo has been able to sustain a long-term hire service on a voluntary basis, short-term, an on-street system will require paid staff to manage the online system, relocate bicycles and carry out regular maintenance. Paid staff implies the need for office space, much as we required during our first two years, when we employed a part-time organiser. The solution we used then, of sharing office space with other community projects, worked well, and gave us

office space at a cost far lower than anything that could be found commercially. We would expect a similar solution to be adequate for an on-street hire scheme.

Initially, we should be able to manage a 20-bicycle scheme with our current network of mini-hub storage, but any significant scaling up will require dedicated storage. We made enquiries regarding this during our early days of operation, and a range of options are available in the town at a reasonable price. This, together with longer working hours for paid staff and higher overheads, makes the target scheme of 50 bicycles and 20 pickup/dropoff points viable only with substantial grant aid or sponsorship. For this reason, it makes sense to structure the scheme's business plan over 2 phases.

Our figures (see appendix) suggest that a 20-bike, 8 pickup point scheme would cost £53,200 to set up and £12,480 per year to run, a total of £90,640 for a three year programme.

The exact tariffs will depend on the flexibility of the new technology, but our figures suggest a target income for a phase 1 scheme to be some £4,200 per year. This is based on an average of 9 hires per day, for 300 days of the year, of which 7 are for less than 30 minutes. A full breakdown of these figures is given in the appendix. They leave a revenue shortfall of some £8,280 per year, which would need to be bridged through public or private support. Thus a 3 year scheme on this scale would require around £76,000 to kick start.

A phase 2 expansion would make sense if demand for hires begins to exceed supply, and average daily hires exceed around 20. Each additional bicycle, equipped with a Grand Scheme box, will cost £2,100 to supply. It is a fairly simple calculation to establish at what point additional units should be purchased, and then at what point additional pickup points (cost approx. £1,500 per point) can be developed. A 50% increase in income to £6,000 would put too much strain on a limited fleet. Yet a 50% increase in the fleet and number of pickup points would cost £27,000. For this reason, it makes sense from the beginning to include flexibility in the growth plan, and therefore the capital outlay needed. A number of scenarios, ranging from the Phase 1 kick start of £76,000 for three years (£25k per annum) to a full Phase 2 option of £200,000 for 5 years (£40k per annum), should therefore be considered.

Daunting as they seem, these figures compare extremely favourably with hire schemes in towns and cities around the country. As we have already seen, the schemes in London, Dumfries and Slough are considerably more expensive. Glasgow is planning an initial 150 bicycle scheme, with 15 docking stations, for 2014 at a cost of £1.35million to the City Council. Even in cycle-friendly Oxford, Local Sustainable Transport Funds are being used to finance a Grand Scheme project in the Headington area.

Darlovelo's local knowledge, experience, and network of support members on the ground gives it a head start in being able to deliver a cycle hire scheme at modest cost. But like all hire schemes, the gap in costs still leaves a minimum shortfall of £8,000 per annum, even for a very modest scheme. The question is, can the gap be bridged via a modest sponsoring or public funding input of, say £4k per year, a figure not unreasonable to a small town like Darlington? Either savings need to be made, highly unlikely on such a modest operating budget, or earnings need to be increased.

#### **Models of Financing**

Whilst in Darlington we would be only looking for a modest annual sum to help sustain what is already an extremely economic model, it would be worth examining the various models that are employed around the world, and to consider their efficacy for the town. These include direct public subsidy, sponsorship, or a mix of the two. What is clear is that the idea of a "commercially viable" bicycle hire scheme is fantasy, and merely reflects the current financial climate for local authorities, who are expected to chase "one-off" funds like the Local Sustainable Transport Fund to help set up "new" initiatives. When these temporary funds run out, projects are expected to run commercially or cease.

This limited financial approach has emerged from a coincidence of developments - radical cuts in public spending by central government (in turn affecting local government spend), an ideological shift towards commercial targets for funded bicycle projects, a move towards time-limited project-funding, and the inability of cycling to reach agenda-parity

with other modes of transport in the fields of urban and economic development. But it is inappropriate for a cycle hire scheme in a town with low levels of everyday cycling and a deteriorating public transport service.

### **Timing**

In conclusion, whilst Darlovelo could offer a highly economic on-street cycle hire service for the town, there are a number of reasons why this could not happen at this point in time:

set the financial model required is currently not embraced by central and local government

much more work needs to be done to increase everyday cycling levels in the town to one where a hire service becomes mainstream

\* cycling needs to be fully integrated into Darlington's Local Transport Plan as an important mode of transport

This report shows that a public service cycle hire scheme is possible for a modest economic outlay. But for it to be implemented will require stronger political will to develop a climate-friendly public transport system that fundamentally integrates cycle hire. With technology like smart cards and GPS becoming ever easier to implement, we see this report as providing a template for such a future, which we hope will not be long in coming.

Darlovelo September 2013

## <u>Appendix - Budget Scenarios</u>

## Phase 1 - 20 bicycles, 8 pickup points

Phase 1 Initial Capital Outlay			
	No	Unit Cost	Total
20 new bikes, locks	20	£600	£12,000
20 Grand Scheme controllers	20	£1,500	£30,000
Signage for 8 pickup points	8	£800	£6,400
Supplementary Sheffield Stands	12	£400	£4,800
Total capital outlay			£53,200
Phase 1 Revenue Costs			
Part-time Manager (8 hours p/w)			£6,500
Bicycle Relocation Services support			£500
Repair & Maintenance Services			£1,200
Office Costs, Phone, Stationery	52	£40	£2,080
Insurance			£800
Web, Marketing			£800
Other			£600
Total revenue costs			£12,480
Phase 1 Income			
50 Frequent Memberships @ £20	50	£20	£1,000
200 Occasional Memberships @ £1	200	£1	£200
5 Frequent Member short hires per day @ 20p	300	£1	£300
1 Frequent Member long hire per day @ £1	300	£1	£300
2 Occasional Member short hires per day @£2	300	£4	£1,200
1 Frequent Member long hire per day @ £4	300	£4	£1,200
Total revenue income			£4,200
Annual revenue support required			£8,280

## Phase 2 - 50 bicycles, 20 pickup points

Phase 2 Capital Outlay			
	No	Unit Cost	Total
30 new bikes, locks	30	£600	£18,000
30 Grand Scheme controllers	30	£1,500	£45,000
Signage for 12 pickup points	12	£800	£9,600
Supplementary Sheffield Stands	20	£400	£8,000
Total capital outlay			£80,600
Phase 2 Revenue Costs			
Part-time Manager (16 hours p/w)			£13,000
Bicycle Relocation Services			£1,000
Repair & Maintenance Services			£2,000
Office Costs, Phone, Stationery	52	£40	£2,080
Insurance			£1,500
Web, Marketing			£800
Storage			£600
Other			£600
Total revenue costs			£21,580
Phase 2 Income			
Phase 1 Memberships, hires x 2			£16,000
Annual revenue support required			£5,580

## Summary & Alternative Scenarios

Summary			
Phase 1 Capital			£53,200
Phase 1 Revenue x 3 Years			£37,400
Cost for 3 Year Programme			£90,600
Income over 3 Years			£24,600
Sale of 15 existing bicycles	15	£150	£2,250
Net cost Phase 1 over 3 years			£63,750
Phase 2 Capital			£80,600
Phase 2 Revenue x 3 Years			£61,500
Net cost Phase 2 over 3 years			£19,100
Full Phase 2 Start			
Phase 1 capital			£53,200
Phase 2 capital			£80,600
Phase 2 Annual Revenue Costs	5	21580	£107,900
Full 5 Year Phase 2 cost			£241,700
Income over 5 Years	5	20500	£102,500
Full Phase 2 Kick Start Needed			£139,200