

*Final report:*

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**For: Guildford  
Borough Council**



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# **Guildford Bike Share - Feasibility Study**

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**By: Transport Initiatives LLP  
&  
Urban Movement**



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**May 2019**

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Final report:

# Guildford Bike Share - Feasibility Study

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# 1. Background

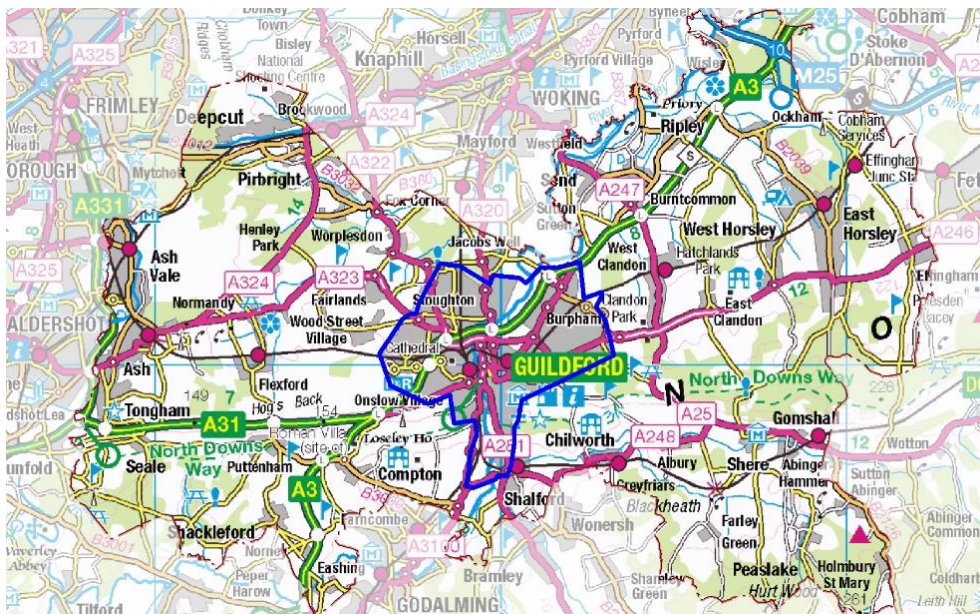
## 1.1 Bike share in Guildford

In September 2017 a report on bike share was presented to the Borough, Economy and Infrastructure Executive Advisory Board of Guildford Borough Council (*Guildford BC*). This supported the commissioning of a feasibility study looking at the development of a scheme in the town.

A number of issues and concerns were raised by Board members. The feasibility study was seen as providing assurance that these would be addressed, as well as assessing both appetite and potential for a bike share scheme in the borough.

While the Board supported a ‘docked’ scheme over a ‘dockless’ scheme, it felt that the feasibility study should examine both models before coming to a conclusion. The study would also examine the option of electrically assisted cycles (‘e-bikes’). The key points brought up by members were included in the study brief.

In 2018 Urban Movement (*UM*) and Transport Initiatives (*TI*) were commissioned by Guildford BC to carry out the feasibility study. The study focus was the town of Guildford itself (outlined in blue below), rather than the overall council area.



Plan 1. Study area (blue) in context of overall Guildford BC area.

At the start of the study process, the University of Surrey was committed to establishing a bike share scheme based on its two main campuses. This was subsequently launched in August 2018 (see 1.3 below).

Guildford BC’s intention is for a town-wide scheme to operate in parallel with the University scheme, extending the range of bike share to the whole of Guildford.

The primary aims of this feasibility study are therefore:

- a. To consider the viability of a bike share scheme in Guildford and allow the council to make a decision on whether to progress a scheme
- b. To assess compatibility with the existing University of Surrey scheme
- c. If a decision is taken to proceed with a bike share scheme, to provide initial information and guidance to instigate the procurement process

Further support for the formal procurement process, including assistance with any tenders

and assessment of bids, was not initially part of the feasibility study. However, following the issue of the draft report, Transport Initiatives has provided advice on the subsequent discussions regarding procurement.

## 1.2 Brief

The brief for the study set out the following elements (the full specification is set out in Appendix A).

### **A. Demonstration that there is sufficient need for a bike share scheme**

- i. Review of bike share systems, looking at ‘docked’ and ‘dockless’ models
- ii. Evidence to show potential usage
- iii. Consideration of the local benefits of a bike share scheme plus assessment of risks and barriers to a successful scheme
- iv. Review of financial issues including an outline appraisal to justify capital expenditure and an assessment of whether a scheme can be self-sufficient

### **B. Identification of preferred design and operating model**

- i. Outline of scheme extent (number of bikes & number/sites of docking stations) and type (electric/traditional/mixed fleet)
- ii. Alignment with University of Surrey plans
- iii. Operational and management considerations

Following inception of the study these elements were delivered in a slightly different order which is reflected in the remainder of the report.

In particular, the business case, including the review of financial issues, forms the final section.

## 1.3 University of Surrey scheme

In 2017 the University of Surrey entered the Santander Cycles University Challenge, a competition by Santander Bank to support the development of a university focused bike share scheme. The competition was held in partnership with Nextbike, a large well-established bike share operator. Nextbike is based in Germany but operates schemes across Europe. In the UK, they provide bike share schemes in nine towns and cities, with the largest scheme currently being in Glasgow.

Although the University of Surrey was not the overall winner, as a runner-up in the competition it was awarded £75,000 from Nextbike to help set up its own scheme. Together with other crowdsourced funding and a further £25,000 investment from the University, this enabled a scheme to be launched in August 2018, comprising eight hubs and 50 cycles. The scheme has two main focuses at the main Stag Hill campus and the Manor Park campus to the west.

In December 2018, Huawei was announced as a sponsor of the University of Surrey scheme. This will enable a further two hubs to be added during 2019.



Nextbike launch, University of Surrey



Launch of sponsorship livery, Dec. 2018

## 1.4 Cycling in Guildford

This study specifically examines bike share solutions for the town of Guildford, rather than the overall Guildford BC area. It therefore needs to take into account the current and proposed provision for cycling in Guildford.

Guildford is a prosperous town in Surrey, located 27 miles (43km) southwest of central London on the A3 trunk road, roughly midway between the capital and Portsmouth. The town has a population of around 85,000 and lies at the centre of Guildford Borough Council which has an estimated 148,000 inhabitants (both 2017 mid-year estimates).

The town has a large central railway station at Guildford, used by 8 million passengers annually. In early 2018 planning permission was granted (on appeal) for a large mixed-use development at the station. Guildford lies on the Portsmouth Direct line, served by South Western Railway. It also provides interchange with other services, including CrossCountry, the Ascot-Guildford line and the North Downs line between Reading and Gatwick Airport

(both GWR). Guildford is also served by two smaller stations at London Road and Shalford (south of the main built-up area). Two new stations are planned as part of future developments.

The main Stag Hill campus of the University of Surrey lies just to the west of the town centre. The University has over 16,000 students and over 2,000 staff. A second campus at Manor Park was opened in 2005, around 1 mile (1.6km) to the west of the main campus. It includes a large amount of the university’s student accommodation, as well as the Surrey Sports Park, and was designed to be car-free. The two campuses are separated by the dual carriageway A3 trunk road, although a shared use (if narrow) subway allows people to walk and cycle between them.

Experience from bike share schemes in the rest of the UK and across the world shows that the provision of a good network of cycle routes is a key factor in how well a scheme is used. While there are a number of routes in Guildford, of varying quality, the cycle network is sparse and few routes are attractive to people who do not currently cycle. The main exceptions to this are the Downs Link to the south of the town, and the River Wey towpath through the town.

However, both Guildford BC and Surrey County Council are in the process of developing proposals for improved routes. In particular, the Sustainable Movement Corridor will include cycle infrastructure with improved links to the University of Surrey and the north and north-east of the town.

In 2018 TI and UM started work on a study of the existing cycle network, to include prioritised recommendations for routes and localised interventions. This is expected to be completed by summer 2019.



*Cycle track along A25 at junction with Woodbridge Meadows*

## 2. Assessment of bike share

### 2.1 Review of bike share models

There are a number of settings where bicycles are provided for multiple users. The various types of scheme are shown in Table 1 below.

Type of scheme	Description	Examples
<b>Public bike share</b>	Open to the public, with bikes available for hire on-street, 24 hours a day, 7 days a week. Booking, hiring & locking made via smartphone app, website, cycle or terminal. Variety of docked, hybrid & dockless systems.	Santander Cycles, Nextbike Glasgow, BTNBikeShare, JustEatCycles Edinburgh, Mobike, Lime
<b>Private bike share</b>	Open to staff only (also students if university based), with bikes available on site, 24 hours a day, 7 days a week. Booking, hiring & locking made via app, website or cycle. Variety of docked, hybrid & dockless systems.	Nextbike University of Surrey, Bewegen Cathedral Square
<b>Location-based hire</b>	Open to the public, with bikes available for hire at specified locations (e.g. rail stations) only. Booking made via terminal, website or ticket office.	Brompton Hire, Abellio Bike & Go
<b>Workplace pool bikes</b>	Open to staff only (also students if university based), with bikes available on site during working hours only. Booking, hiring & locking involves either simple booking sheet or internal system.	Many workplaces
<b>Peer-to-peer</b>	Open to members only using bikes provided by private individuals. Booking usually made via website.	Spinlister
<b>Loan</b>	Bikes available for longer hire periods (commonly a month) on low rates, convertible to purchase	Big Bikes Birmingham
<b>Bike library</b>	Location or mobile unit with fleet of bikes available for short-term loan, mainly for families or children	Family Cycling Library, Hackney

Table 1. Bike share / hire models

While there are differing benefits to all these schemes, this study only examines in detail the first two types which can be considered to be ‘Bike Share’ as opposed to ‘Cycle Hire’. The key difference is the ability to make automated bookings for short-term trips. These models use similar systems to operate either as public or private bike share schemes, differing only in whether they are available to the general public.

A local example of a private bike share scheme operates in Guildford at Cathedral Square business park, where 20 e-bikes are available for use solely by employees. While the e-bikes can be used anywhere within the town, they are marketed mainly for trips between the business park and Guildford Station. The scheme is managed by Bewegen which mainly operates schemes in North America.

Location-based hire schemes are available to the public and are similar to public bike share schemes. However, there are a number of key differences:

- Cycles are hired from and returned to a limited number of locations (usually at or near rail stations)
- Cycles are hired on a daily basis rather than a shorter period
- They are generally seen as complementing rail trips rather than providing a stand-alone option, and are not intended as mass-market transport solutions

Again, there is a local example, with a 24 dock Brompton Hire hub located outside Guildford Station. It is likely that the main users are people commuting to London.

The remainder of this section focuses on public bike share schemes (though many of the issues discussed also apply to private schemes). These fall predominantly into two categories:

- **Docked:** cycles are hired from and returned to formal docking stations clustered into hubs, possibly with terminals. **Hybrid** schemes are a variation where cycles can also be parked away from hubs, possibly for an extra charge.
- **Dockless** (or **'free-floating'**): cycles are parked on-street, usually utilising an on-cycle smart lock, with no physical infrastructure

### **Docked / hybrid bike share**

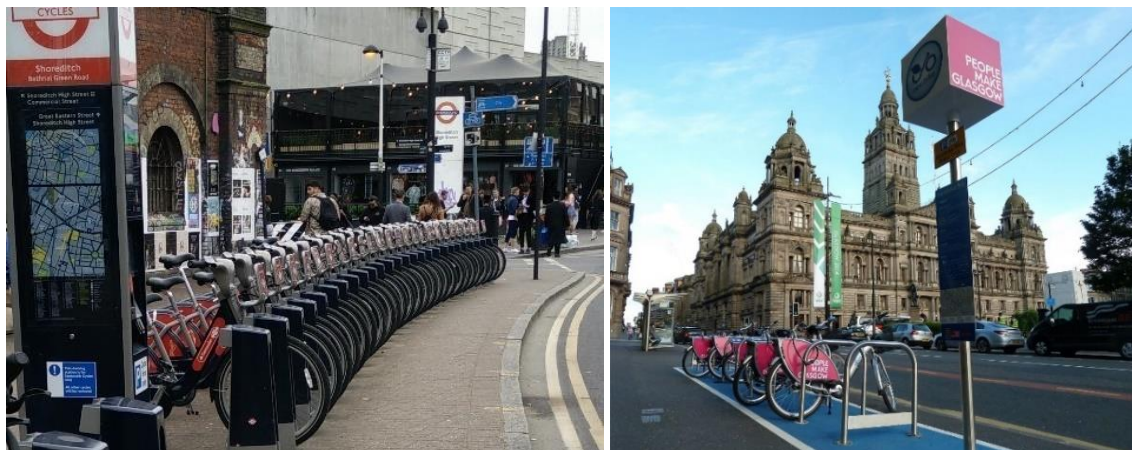
Until 2017, every bike share scheme in the UK used the docked model. Its main characteristics are:

- Cycles at hubs (clusters of 5-20 individual spaces), locked to bespoke docks or dedicated cycle stands
- Hubs in key locations around a town/city and at regular intervals in between
- Hubs can include a terminal for hiring a cycle (*'dumb bike'*) or the technology (terminal, GPS etc.) can be located on the cycle (*'smart bike'*)
- Bookings can be made at the terminal (if applicable), on the cycle or by an app
- Hires can only be completed by parking the cycle at a hub and cannot be ended anywhere else
- Robust good-quality cycles to withstand heavy use, with gears
- Some schemes have locks to enable short stops during a hire period

The first large-scale bike share scheme in the UK began operation in London in 2010, funded by TfL and operated by Serco. Initially all hiring was done through terminals although subsequently an app was introduced. At the launch, it was branded as Barclays Cycle Hire, and following a change of sponsor is now called Santander Cycles. After consistent year-on-year growth it has over 12,000 bikes and over 770 docking hubs. During 2017 over 10 million trips were made (around 2 trips per cycle per day).

Note that the first UK bike share scheme was actually Blackpool, launched in 2009. This was very small (50 cycles). Low usage, due to poor planning, led to its closure in 2012.

Subsequently, there has been a rapid expansion in schemes across the UK, with schemes now operational in nearly 30 towns and cities. As with the TfL scheme, initial schemes were all terminal-based though these have been dropped in recent schemes. Some schemes use bespoke docking mechanisms while others are based on standard Sheffield-style stands (either dedicated to bike share or shared with private cycles).



Examples of docked schemes: Santander Cycles, London (left), Nextbike Glasgow (right)



Hybrid systems offer a more flexible variation of the docked model. The main differences to the basic docked model are:

- Cycles are mainly parked at hubs, but also can be free-floating if permitted
- Virtual hubs can be created on a permanent or temporary basis e.g. where space is limited or for special events
- Hubs have no terminal – all technology is located on the cycle, including GPS
- Hires can be completed by parking the cycle either at a hub (or adjacent if this is full) or at any location within the scheme boundary ('out-of-hub')
- There is generally a small charge for parking outside a geo-fenced area around a hub, to help reduce street clutter and obstruction. Users are encouraged to lock cycles to a fixed object, ideally a cycle stand.
- There is a large charge if users park a cycle outside the scheme boundary



*Examples of hybrid schemes: JustEat Cycles, Edinburgh (left), BTNBikeShare, Brighton (right)*

Major operators of docked and hybrid schemes include Serco (London and Edinburgh), Nextbike (West Midlands region, plus nine cities including Belfast, Cardiff and Glasgow), and Hourbike (six cities including Brighton and Derby). A number of operators are present in only one or two places e.g. Smoove/ITS (Slough and Kingston) and RideOn (Dundee).

**Dockless bike share**

During 2016 there was a steep increase in dockless (or 'free-floating') bike share across the world, notably in China. Its main characteristics are:

- Free-floating cycles, with varying degrees of on-board technology
- No fixed hubs so no need for fixed locations (but can have virtual hubs)
- Cycles can be picked-up/dropped-off at any location within a fixed boundary, with sensitive areas shown as off-limits
- Guidelines for members on how to park cycles without causing obstructions, with penalties if they cause problems or take cycles out of the system area
- Cycles cannot be parked for short stops – the hire must be ended
- Members join, pay & hire via app only
- Cycles generally of low quality with most schemes using single-speed versions

The first large-scale dockless scheme in the UK was launched by obike in London in summer 2017. This closed within a few months due to major problems linked to a lack of engagement with TfL and London boroughs. An Irish-based operator, Urbo, launched in the UK during 2017 but withdrew in early 2018. A larger operator, ofo, was present in many UK cities including London, but ceased all international operations, including the UK, in early 2019. The closures of both Urbo and ofo were mainly due to financial difficulties.

There are currently two large operators (Mobike and Lime) and a number of smaller operators such as Yobike, Donkey Republic and Pony Bikes. In London, Oxford and Cambridge there are multiple operators, with different but overlapping operating areas.

Lime is notable for being the first large-scale dockless scheme in London using e-bikes (see below). It is centred on a small number of west London boroughs and its hire charges are significantly higher than standard bike share schemes.



Examples of dockless schemes: Mobike, London (left), Ponybikes, Oxford (right)

### Strengths and weaknesses

The table below compares docked / hybrid and dockless models.

Docked / hybrid		Dockless	
Strengths	Weaknesses	Strengths	Weaknesses
Good visibility & awareness, with localised branding	Significant capital funding required for physical infrastructure, especially for e-bikes	No capital investment required	Commercial operator decides area covered & number of bikes - little scope for public influence
Operators run scheme with little revenue support	Operators need support to serve less commercial target markets	Operators can scale up quickly	Operators will not serve less commercial target markets & can scale down quickly
Certainty of locating a cycle, leading to confidence in system	Users can only leave bikes at hubs (non-hybrid schemes)	Operators run scheme with no revenue support	Financial case may be weaker, with long-term sustainability uncertain
Reinforces Council support for cycling (e.g. Guildford BC Corporate Plan 2018-23)	Possible issues in siting hubs (planning, loss of car parking, conservation)	Scheme can reach areas which are more marginal in terms of demand / propensity to cycle	Relies on smartphone and on-line payments so excludes people without smartphone / credit card
Robust & well-maintained cycles	High maintenance & redistribution costs	Simple cycles with reduced need for repairs	Low quality & often poorly maintained cycles
Ability to hire cycle without smartphone app	Potential revenue support needed for ongoing operations	Lower costs for users (depending on scheme)	Use of Council assets (footway, cycle stands) with no compensation
Council investment allows influence on scheme development	Lack of flexibility in moving hubs or expanding scheme	Users can leave bikes anywhere	Cluttering & obstruction in public areas, with some stored privately
Good parking behaviour due to need to dock bike	Reputational risk to Council if issues arise		Reputational risk to Council when issues arise but no influence

Table 2. Strengths and weaknesses of docked and dockless models

## 2.2 E-bikes

A variation that applies to all forms of bike share has been the introduction of **electric bikes** ('e-bikes') into fleets. It is important to note that e-bikes have electric assisted pedalling and cannot legally be ridden using the motor alone. The electric assist is also limited to a top speed of 25km/h (15mph) after which the motor cuts out. As e-bikes are heavier than non-assisted cycles this is a deterrent to excessive speed.

In general, e-bikes increase the potential market for cycling and there has been a large increase in use in recent years. They have become a major part of the cycle market in the rest of Europe (e.g. 20% of all cycles sold in Germany), with sales growing in 2017.

E-bikes attract a wider range of people cycling and increase the number and length of trips people (especially those with lower fitness levels) can make by cycle. In particular, disabled people, older people and others with restricted strength benefit from the electric assist, with evidence showing they increase accessibility. Importantly for Guildford, e-bikes also reduce the impact of hills for all users.

There is now considerable research<sup>1</sup> showing that e-bikes have clear health benefits for users, although these are slightly lower than for non-assisted cycles. The combination of encouraging more cycling (particularly switching from driving) and increased trip lengths means that there is a definite gain in public health and air quality.

Until 2018 the use of e-bikes in public bike share schemes did not mirror the increase in private usage. The first UK fleet (Co-bikes, Exeter) currently has only 20 e-bikes based on the Nextbike system (due to expand in summer 2019 to around 100 e-bikes). A larger e-bike hybrid scheme was launched in Derby in June 2018 with around 30 hubs and 200 cycles, run by Hourbike. This is proving to be very successful.

The schemes in Glasgow (operated by Nextbike) and Edinburgh are also planning to incorporate a significant number of e-bikes into their fleets during 2019.



*Launch of Co-bikes expansion with support from Exeter City Council*

As noted above, Lime launched in London in December 2018 with 1,000 e-bikes. While these are nominally based in three London boroughs, the ability to cover longer distances means that they are available across large parts of central London. However, as with standard dockless bike share, this has led to problems with bikes being left obstructing the footway and in other inappropriate locations. Availability is also inconsistent even within the boroughs that are formally served by Lime.

<sup>1</sup> [www.forbes.com/sites/carltonreid/2018/11/23/riding-electric-bicycles-boon-to-health-and-not-cheating-confirms-literature-review](http://www.forbes.com/sites/carltonreid/2018/11/23/riding-electric-bicycles-boon-to-health-and-not-cheating-confirms-literature-review)

E-bikes have been shown to attract new groups of people to bike share. Over 30% of people taking part in the Shared Electric Bike Programme managed by CoMo UK (see 2.4 below) had rarely or never cycled before they started using the shared e-bikes.

The range of bike share is also extended by e-bikes, with the average length of trips being 5 miles, compared to 3 miles by non-assisted bike share cycles. Evidence from the Derby e-bike scheme show different patterns of usage compared to non-assisted bike share, with longer trip lengths (around 4 miles) and higher utilisation levels (over 3 trips/bike/day).

Finally, for many people e-bikes are a more attractive alternative to car use than non-assisted bike share. In one commuter scheme, 46% of regular shared e-bike trips were previously made by private car as a passenger, driver or in a taxi. This is much higher than the proportion switching from private motor vehicles in non-assisted schemes.

There have also been developments in the use of e-bikes in private bike share schemes. As noted above, the scheme at Cathedral Square business park offers 20 e-bikes for use by employees, aimed mainly at people travelling between the site and Guildford Station.

Similar schemes limited to council were launched in London at the start of 2019 by the London Boroughs of Waltham Forest (ten Freebike e-bikes) and Enfield (20 Beryl e-bikes).



Private e-bike schemes: Bewegen, Cathedral Square (left), Freebike, Waltham Forest (right)

### 2.3 Using bike share

There are variety of ways in which bike share cycles can be hired: a fixed terminal, a terminal or keypad on the cycle, a website or via an app. However, once hired, most systems offer more or less similar ways in which the hire is charged, with relatively minor variations in tariffs, free periods etc.



Hiring a bike: on-cycle terminal, BTNBikeShare (left), app, Donkey Republic, Worthing (right)

There are generally two types of membership: Casual (pay as you go) and Member (daily/monthly/annual). Some schemes offer discounts for certain groups e.g. students.

Typically, hires are charged in 30 minute periods. Some systems offer a free first period for members while others combine daily membership with the charge for the first period. Recent schemes operated by Hourbike (e.g. BTNBikeShare) differ from the norm by charging 3p/minute. Examples of tariff structures are shown in Table 3 below.

Scheme	Details
<b>Santander Cycles, London</b>	<ul style="list-style-type: none"> <li>£2 daily membership, giving access for 24 hours. All hires under 30 min are free, with longer hires charged at £2 for each additional 30 min period</li> <li>£90 annual membership, with all hires under 30 min free</li> <li>Longer hires charged at £2 for each additional 30 min period</li> </ul>
<b>Nextbike (e.g. Glasgow)</b>	<ul style="list-style-type: none"> <li>£1 per 30 min for casual users, capped at £10 for 24 hours</li> <li>£60 annual membership with first 30 min free and longer hires charged at £0.50 for each additional 30 min period, capped at £5 for 24 hours</li> </ul>
<b>BTNBikeShare (Hourbike)</b>	<ul style="list-style-type: none"> <li>£72 annual membership (£65 for staff of supporting / sponsoring bodies) with up to 1 hour a day free use. Longer hires charged at 3p/min</li> <li>Pay as You Ride fee of 3p/min for casual users, with a minimum fee of £1, capped at £10 for 24 hours</li> <li>£2 to lock cycle away from a hub but within the operating area / £10 if locked outside operating area</li> <li>Refund to user of £1 for cycle hired at out-of-hub location</li> </ul>
<b>Mobike</b>	<ul style="list-style-type: none"> <li>£1 for 20 min period for both single speed &amp; Lite (3 speed) cycles</li> <li>Passes for longer durations from 30-360 days</li> <li>Refundable deposit of £15 (“to encourage responsible use”)</li> <li>£5 (Oxford &amp; Cambridge) / £10 (London) charge if locked outside of operating area</li> </ul>
<b>Just Eat Cycles Edinburgh</b>	<ul style="list-style-type: none"> <li>£1.50 for single trip of up to 1 hour, £1 per each extra 30 minutes period</li> <li>£3 day (24 hours) pass, allowing unlimited hires up to 1 hour</li> <li>£90 annual membership, allowing unlimited hires up to 1 hour</li> <li>Extended rentals over 1 hour at £1 per 30 minutes.</li> </ul>
<b>Lime</b>	<ul style="list-style-type: none"> <li>£1 to unlock bike (no rental period included)</li> <li>£0.15/minute fee (equivalent to £4.50 for 30 min), with no cap</li> </ul>

Table 3. Examples of tariffs

## 2.4 Market changes

CoMo UK (short for ‘co-mobility’ and formerly known as CarPlus BikePlus) is an industry body set up to encourage and facilitate shared mobility: car clubs, bike share and lift/ride sharing. Its most recent maps of bike share schemes in London and the rest of the UK (and Ireland) are shown below. Note these are from September 2018, and so do not reflect more recent scheme openings and closures.

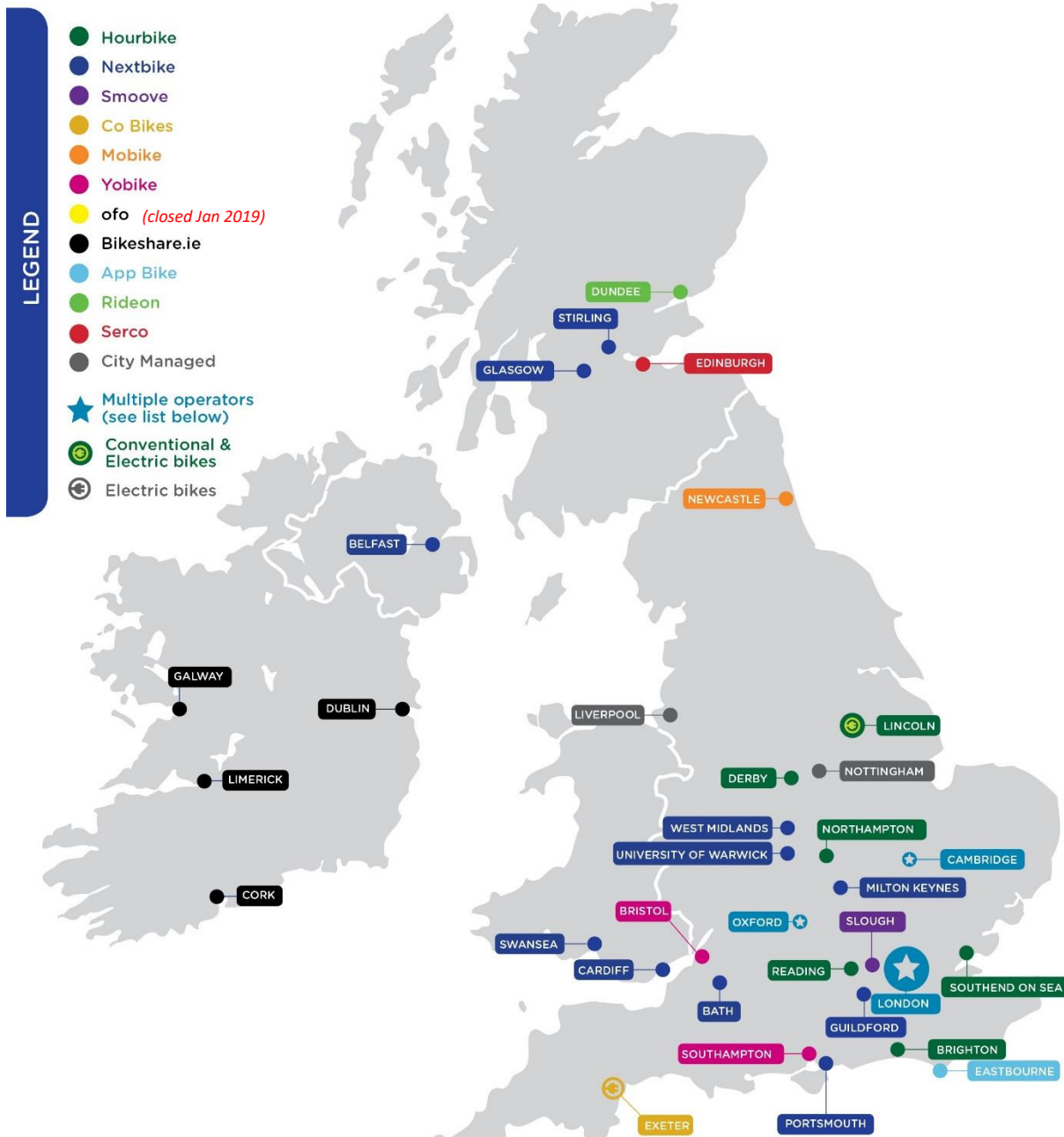
Even during the period of this study, there has been rapid flux in the bike share market, with schemes and even operators starting and withdrawing at short notice. There have been three high-profile changes:

- Withdrawal of dockless operator Mobike from Manchester in September 2018 (after an operational period of just 15 months)
- Launch of Lime dockless e-bikes in London in December 2018
- Complete withdrawal of ofo from the UK in January 2019

Most recently implemented schemes have either been hybrid, or docked with the possibility of conversion to hybrid. This now appears to be the norm for new schemes. It is expected that this will continue to be the case, with most docked schemes offering flexibility in terms of locations for parking with financial or other constraints encouraging parking at fixed hubs.

SEPT 2018

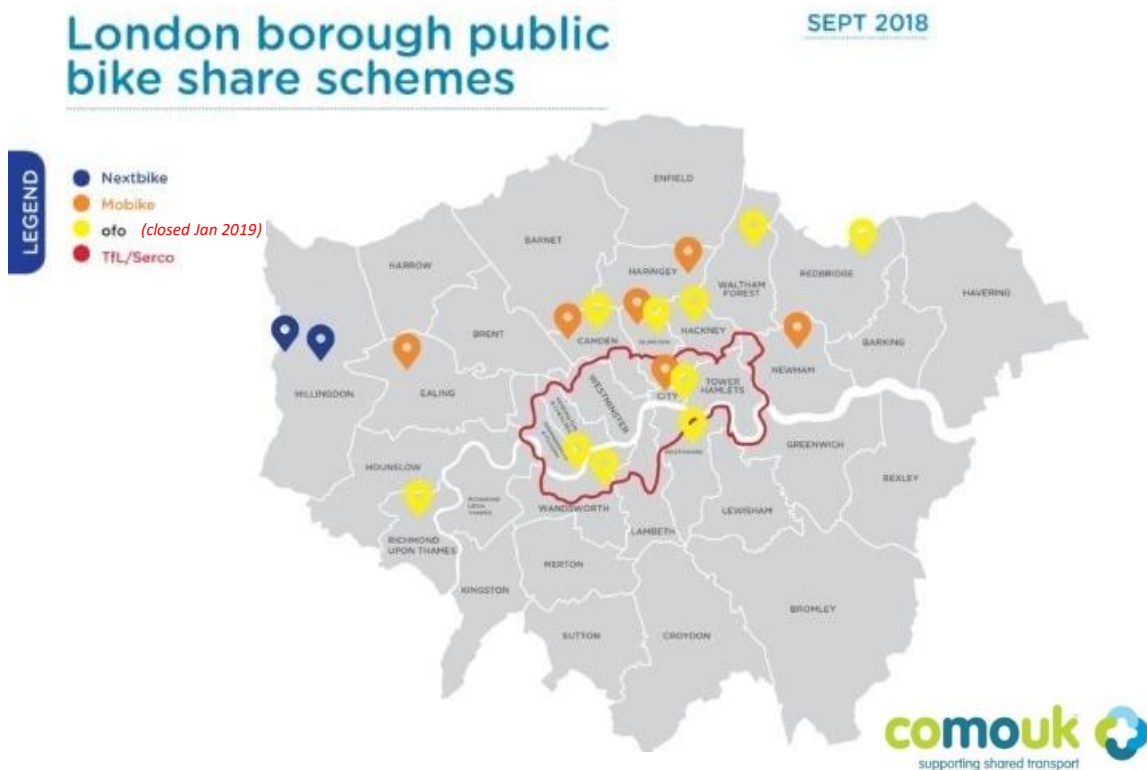
# United Kingdom public bike share schemes



OXFORD:	LONDON:	CAMBRIDGE:
Ofo	See separate map	Ofo
Mobike		Mobike
Ponybike		



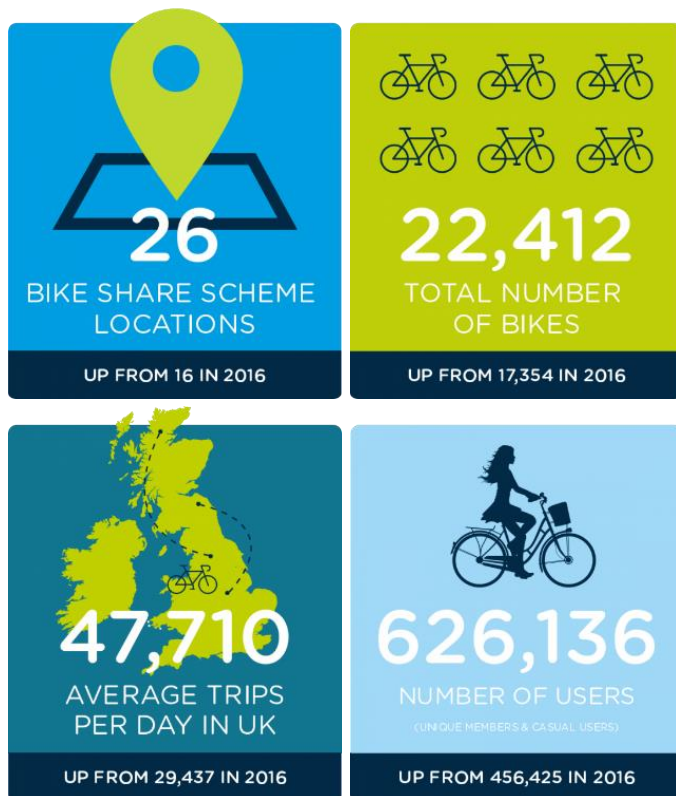
Bike share schemes in UK & Ireland, outside London (CoMo UK)



Bike share schemes in London (CoMo UK)

## 2.5 Evidence to show potential usage

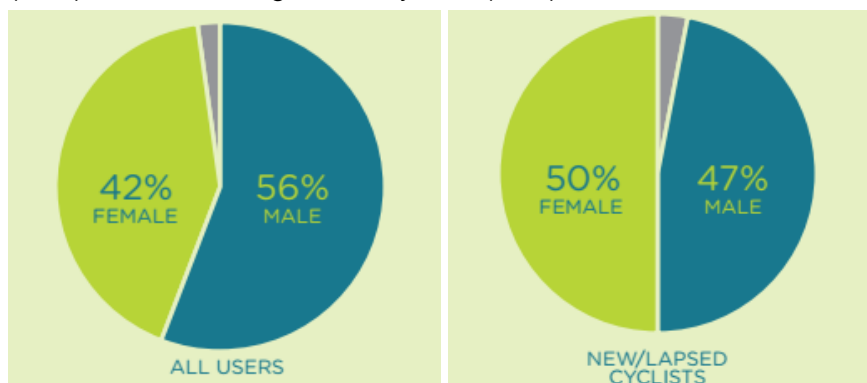
Evidence for the impact of bike share is provided by data from the 2017 survey of bike share users, published by CoMo UK in September 2018<sup>2</sup>. This gathered details on schemes across the country, based on around 1,800 user responses (see excerpts below).



Key points from 2017 bike share survey

<sup>2</sup> <https://como.org.uk/wp-content/uploads/2018/06/Public-Bike-Share-User-Survey-2017-A4-WEB-1.pdf>

It is particularly notable that bike share appears to attract a higher proportion of women (42%) than the average for all cyclists (25%).

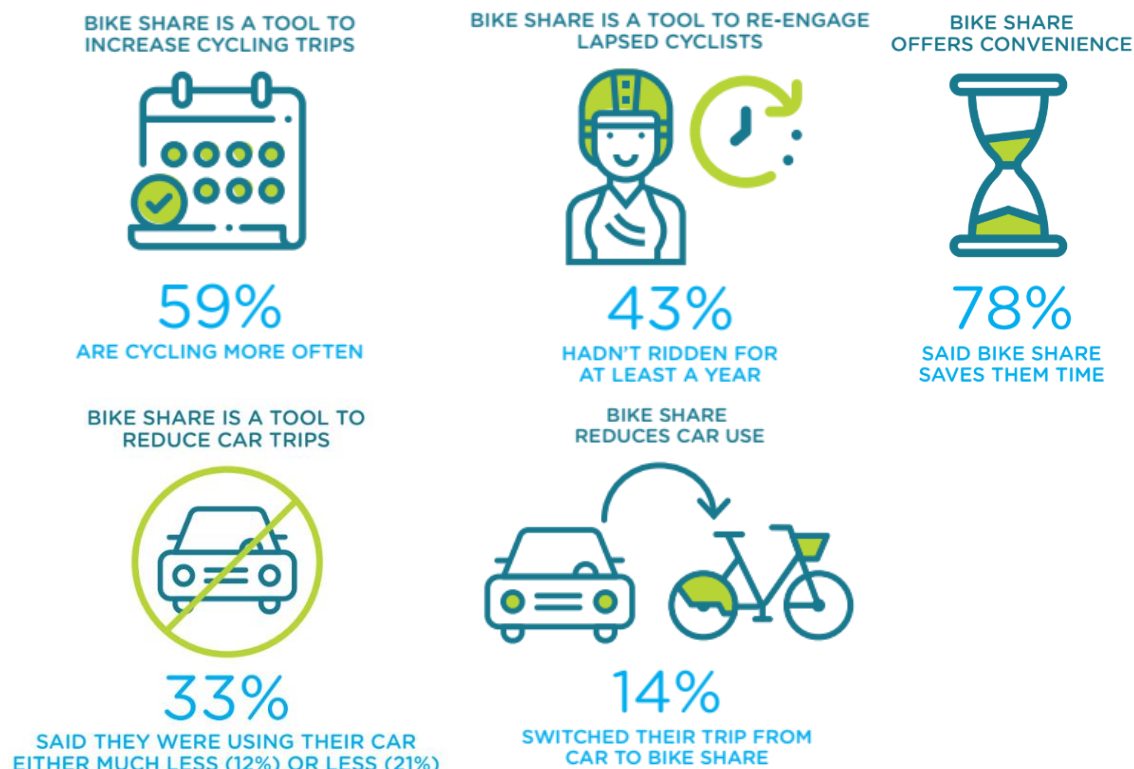


Proportion of male/female users from 2017 bike share survey

Users valued bike share for a number of reasons, with over three-quarters saying that bike share saves them time. Half of users said bike share helped them get to places not served by public transport.

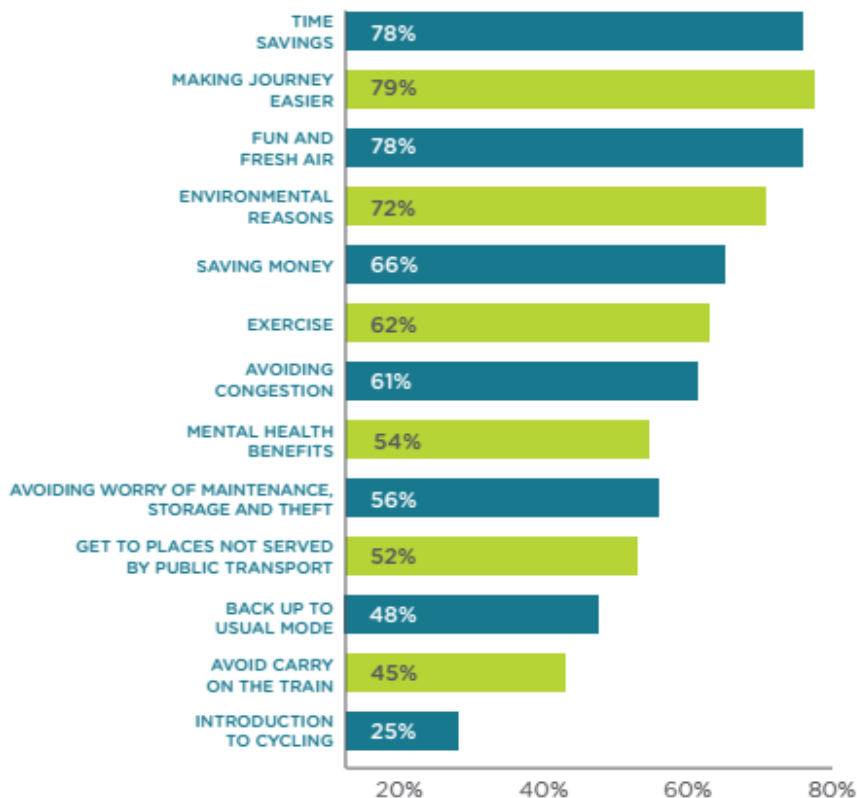
Bike share was used in combination with other forms of transport (mostly public transport) on half of the last trips reported by users.

Finally, while bike share replaced many walking trips, 14% of trips transferred from motor vehicles (excluding buses) with 7% being completely new trips.

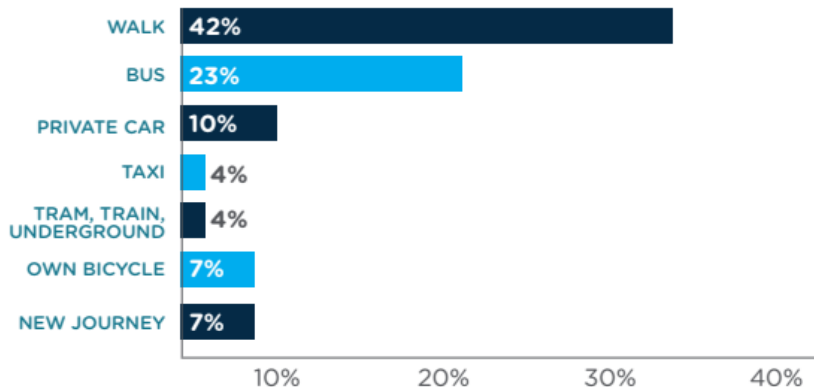


Other data from 2017 bike share survey

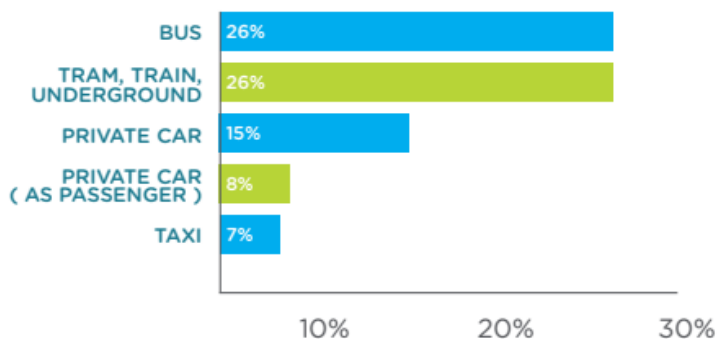




Reasons for using bike share, 2017 bike share survey



Transport mode replaced by bike share, 2017 bike share survey



FOR 49% OF PEOPLE, THE LAST TRIP THAT THEY MADE WAS COMBINED WITH OTHER MODES.

Transport mode combined with bike share, 2017 bike share survey

## 2.6 Local benefits of a bike share scheme

A key task set out in the study brief was a review of the existing cycle infrastructure and routes in Guildford, looking at how this might be improved for bike share users as well as other people cycling in the town.

However, during the study period it became apparent that this was a much larger task than originally envisaged. A separate, more detailed, study was commissioned to look in detail at route corridors which might be expected to become the most commonly used by people cycling in Guildford (using bike share and private cycles). This is expected to be completed by summer 2019.

The general benefits of bike share are set out in Table 4 below, plus examples of how these might have an impact in Guildford. These are based on a wide range of research.

General benefits	Local benefits
Increasing number and variety of people cycling, leading to improved health and well-being	Increased cycling especially to north and west of town will improve health of these communities. Also important in attracting cycle trips to locations such as Spectrum Leisure Complex.
Alternative to the private car for short trips (especially e-bikes), helping to reduce congestion and pollution	Many workplaces are reasonably close to the centre of Guildford but have high car use, e.g. Guildford Business Park, Surrey Research Park
Providing improved access to jobs, education and amenities with “first / last mile” connectivity solutions	Will improve accessibility of locations such as University of Surrey and Guildford College
Supporting public transport by relieving pressure on overcrowded routes and/or increasing multi-modal trips, with flexibility where services are limited	Key linkage to rail trips to/from Guildford station providing good alternative to car trips from outside the town
Improving road safety by increasing the number and visibility of people cycling	Evidence from other cities (London, Brighton) that increased use of bike share helps underpin development of better infrastructure
Developing tourism by offering an enjoyable way to link leisure facilities	Increased access to attractive off-road routes such as River Wey towpath, Downs Link
Some users of bike share go on to purchase their own cycles	Support for local cycle shops
Corporate ambitions	Delivery of bike share will help reinforce Guildford BC support for cycling in particular and innovation and sustainable transport in general
Provision of e-bikes leads to longer trips and attracts a wide range of users	Given the nature of both the topography and transport patterns in Guildford, e-bikes would provide a stronger attraction for people to start cycling for a range of local trips, helping to reduce congestion.
Potential to support local social enterprises who could deliver services such as maintenance and redistribution, and also increase local employment	Local cycle charities / CICs could help deliver services (as in Liverpool, where Peleton CIC delivered redistribution and maintenance activities for Citybike until 2018). Note the University of Surrey scheme has helped to support a repair service on the campus.

Table 4. Benefits of bike share

An appraisal of the benefits is set out in the business case in Section 4.

## 2.7 Assessment of risks and barriers to a successful scheme

As well as benefits, there are also a number of risks to the development of a successful bike share scheme.

These fall into two categories, internal (scheme dependent) and external (determined by wider transport and other factors). Table 5 sets out a summary of these, based on experience of other schemes,

Risk category	Description	Mitigation
Internal	Capital cost (for docked / hybrid schemes)	<ul style="list-style-type: none"> <li>Robust cost estimate, based on in-depth analysis of likely scheme size combined with industry research, means budget should be reasonably accurate</li> <li>Secure funding commitments before proceeding</li> </ul>
	Revenue cost	<ul style="list-style-type: none"> <li>Most recent schemes have been revenue neutral with on-going support not required</li> <li>Tender to make it clear that there will be no revenue funding</li> </ul>
	Reputational risk if scheme is not successful	<ul style="list-style-type: none"> <li>Development of strong business case</li> <li>Selection of high-quality operator through tender process</li> </ul>
	User experience (fees, access to booking etc.)	<ul style="list-style-type: none"> <li>Focus on these issues during tender</li> <li>Ensure KPIs included in tender &amp; on-going management</li> </ul>
	Legal issues during procurement	<ul style="list-style-type: none"> <li>Tender process &amp; award to follow strict procurement rules</li> </ul>
	Operation (management, redistribution, repairs, charging of e-bikes)	<ul style="list-style-type: none"> <li>Focus on these issues during tender</li> <li>Ensure KPIs included in tender &amp; on-going management</li> </ul>
	Area covered	<ul style="list-style-type: none"> <li>Scoping study of area</li> <li>Robust study of possible locations to focus on areas with highest potential</li> </ul>
	Cycle & equipment design	<ul style="list-style-type: none"> <li>Selection of established operator with high-quality equipment through tender process</li> <li>Operator open-day to allow council &amp; stakeholders to try out systems</li> </ul>
External	Competition for same market as short public transport trips	<ul style="list-style-type: none"> <li>Promotion of bike-share as multi-modal option (NB evidence shows around 25% of bike share trips are combined with bus / train)</li> </ul>
	Lack of good cycle network & routes leading to increased risk to user safety	<ul style="list-style-type: none"> <li>Work by Guildford BC, in partnership with Surrey County Council, to develop improved high quality cycle network based on LCWIP process</li> <li>Local measures at / near bike share hubs</li> </ul>
	Limited availability of attractive leisure routes, restricting use to utility cycling	<ul style="list-style-type: none"> <li>Work with partners (e.g. Sustrans, National Trust) to improve range of off-road routes for cycling by people of all abilities</li> </ul>
	Competition from other providers	<ul style="list-style-type: none"> <li>CoMo UK accreditation includes requirement for operators to have council approval before launching, even if no funding required</li> </ul>
	Low propensity to cycle among hard to reach groups	<ul style="list-style-type: none"> <li>Introduce 'Better Bike Share' programme with outreach, discounts etc based on examples in UK (Glasgow) and USA</li> </ul>

Table 5. Risk factors affecting bike share, with mitigation measures

## 2.8 Safety issues

There are a number of additional safety issues that need to be addressed by a bike share scheme compared to use of private cycles. However, it is important to note the bike share schemes have a very good safety record, with lower levels of crashes and casualties compared to the same number of trips by private cycle. For example, BTN BikeShare in Brighton only suffered a single reported injury incident during its first year of operation, during which 347,000 trips took place. In North America, cities with a large increase in bike share use saw a fall in the rate of cycle casualties.

A recent study by the International Transport Forum<sup>3</sup> examined the safety of bike share systems. The study found that the evidence suggests that bike share is safer than riding private cycles. It concluded that *“The results of our two sub studies lead us to conclude that, on a per kilometre basis, bike share is associated with decreased risk of both fatal and non-fatal bicycle injuries when compared to general bike riding.”*

It is likely that the good safety record of bike share is attributable in part to the design and maintenance of the cycles. Bike share cycles are expected to have functioning brakes and properly inflated tyres. They also have in-built lights, and in most schemes these either turn on automatically when the cycle is hired, or when an on-board sensor detects it is dark.

Nevertheless, it is crucial that the operator is aware of their duty of care to users. As part of this they should establish that a cycle is fit for purpose at the start of every hire. It is important therefore that a system to ensure this forms part of the scheme. This should be addressed during the procurement process.

All responsible operators carry out regular checks on their fleet, with most having a system where all cycles are checked at least once every three days. There is usually a facility for users to report defects after which the cycle is immediately removed from service. Mechanics servicing bike share cycles will have appropriate training and qualifications.

Bike share users have to agree to conditions on road safety as part of the contract for hiring a cycle. This covers three main areas:

- A commitment to cycle responsibly, following all highway laws
- An understanding that they use the system at their own risk (excluding issues such as poor maintenance) and that riders are responsible for their own actions
- A disclaimer that the operator and any funder (such as the council) are not liable for any damage or loss due to the actions of a user unless this can be shown to arise from negligence

In particular, users are made aware that the use of protective equipment such as helmets is not a legal requirement and as with private cycles they are a matter of personal choice.

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<sup>3</sup> “The Safety of Bike Share Systems”, ITF, July 2018 [www.itf-oecd.org/sites/default/files/docs/safety-bike-share-systems\\_1.pdf](http://www.itf-oecd.org/sites/default/files/docs/safety-bike-share-systems_1.pdf)

## 3. Preferred bike share model

### 3.1 Suggested model

Based on the review of bike share systems and feedback from stakeholders, we recommend that a **hybrid scheme** is likely to serve Guildford best. This will allow a focus on dock-based hubs in the centre of the town but also provide flexibility to make trips to areas without docks if required.

Dockless bikeshare schemes are generally run without local authority input and decisions on issues such as the operating area, locations of bikes, tariffs and promotion are made by the private operator. Recently launched schemes have included a Memorandum of Understanding between the operator and the host council, but an MoU is not binding on either party and (as in the case of Manchester) it is no guarantee of a long-term commitment. The operator will generally, and understandably, seek to maximise profit rather than work to deliver the council's wider transport aims. In addition, a dockless system is likely to impact negatively on conservation and other sensitive areas. There is also a risk of obstructions to pedestrians.

These issues all make it less likely that a dockless scheme can deliver a sustainable and consistent scheme which helps to deliver the aim of an increased mode share for cycling. Based on these and other factors set out above, we do not recommend this model.

Looking at a hybrid scheme in more detail, it will be important to ensure docked hubs where certainty of a cycle is required (e.g. at Guildford Station) or in areas where there may be an impact on the public realm. Other areas may be more suited to 'virtual' hubs using geofencing. A hybrid scheme allows these to be created on both a long-term and temporary basis. This will increase flexibility by enabling trial locations in areas where bike share may be more marginal. The impact on sensitive areas should be considered and some areas may need to be declared 'out-of-bounds' (e.g. Castle grounds).

The ability in a hybrid scheme to require a cycle to be locked to a stand (both at a hub and in other areas) at the end of a trip will reduce problems in areas of high demand caused when no docks are free. It will also reduce the risk of obstruction to pedestrians.

The design of the bike share cycle and equipment will be dictated by the choice of operator as it is unlikely that a bespoke Guildford design will be feasible. However, we recommend that (unlike the London scheme) there should be the possibility for cycles to be locked during a hire to allow short stops. This will allow people to use local shops and services while making a bike share journey

This form of scheme would be most compatible with the University of Surrey scheme. As part of the procurement process, any scheme must show clearly that it can work alongside the University scheme, ideally with shared membership and using the same hubs.

Based on the success of the e-bike scheme in Derby, e-bikes are considered to have significant potential to increase use given the hilly nature of much of Guildford. These will encourage non-cyclists and people returning to cycling to use the scheme and also make areas of the town more accessible by cycle.

We recommend that the options for a partly or fully e-bike fleet should be explored as part of the tender process rather than fixed in advance.

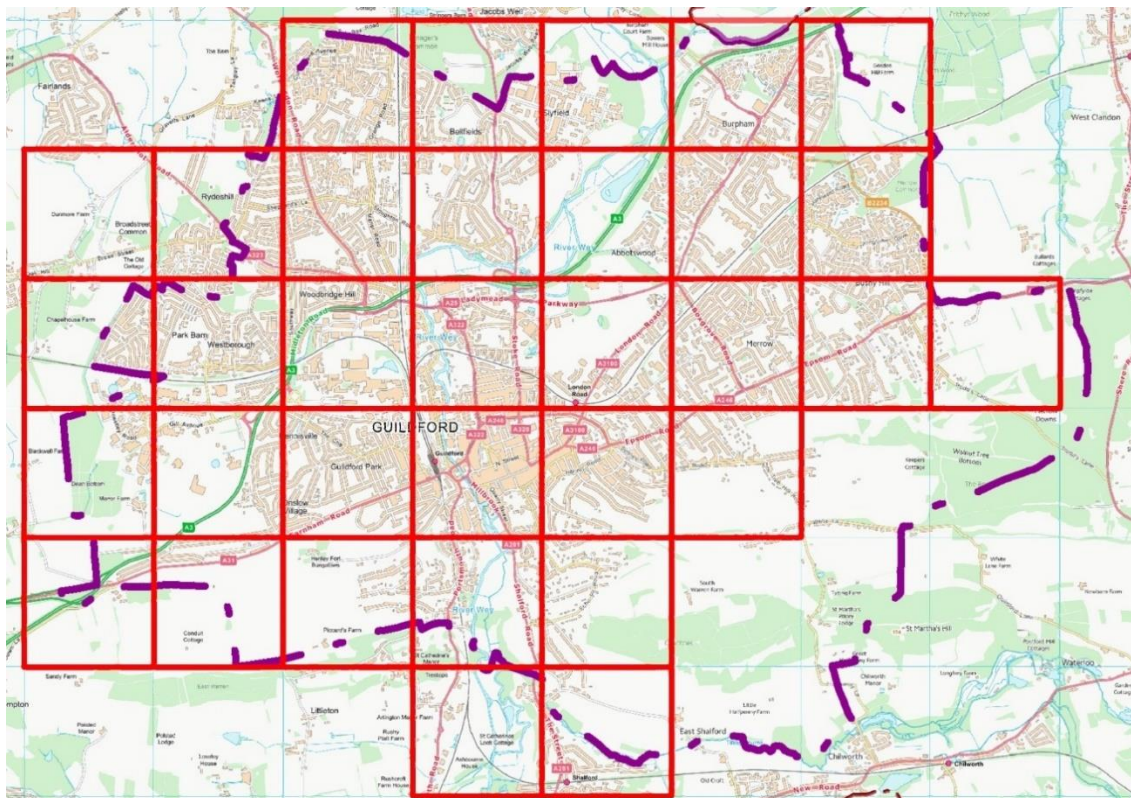
As part of the procurement process the selected operator should be required to have CoMo UK accreditation. This will ensure that safety features are built into the cycle design, as well as requiring a good level of maintenance and redistribution.

All these issues should be addressed as part of the tender and a range of KPIs established to ensure a high quality scheme while achieving best value.

### 3.2 Assessment of bike share potential

An initial assessment was carried out of the wards covering the urban area of Guildford. This includes less accessible rural / semi-rural areas in Holy Trinity ward, with some challenging gradients. We have considered that these are unsuitable for standard (non e-bike) bike share. The potential for e-bike usage is examined at the end of this section.

A desk-based review was carried out of the remaining built-up areas within the town boundary to determine the possible extent of a bike share scheme. This resulted in a study area of 33km<sup>2</sup>, which was then analysed using a grid of 1km x 1km cells.



Plan 2. Guildford town area (outlined in purple) with initial area of search for bike share scheme

The cells were assessed against eight key factors (see Table 6). Guidance and experience from established UK and international<sup>4</sup> bike share schemes indicate these are the main factors determining take up of bike share. Transport Initiatives has used this system to assess a number of bike share schemes, including Derby (launched in June 2018).

Factor	Score
A. Existing key destinations/attractions and major people generators	8 / 6 / 4 / 2 / 0
B. Propensity to cycle (based on socio-demographic data)	4 / 2 / 0
C. Potential for increased cycling (based on PCT tool)	4 / 2 / 0
D. Main cycle routes	4 / 2 / 1 / 0
E. Significant areas of future development	4 / 2 / 0
F. Public transport / park & ride provision	2 / 1 / 0
G. Levels of cycling	2 / 1 / 0
H. Population density	2 / 1 / 0

Table 6. Factors used to assess bike share potential

<sup>4</sup> Optimising Bike-sharing in Europe handbook <http://www.eltis.org/resources/tools/obis-handbook-optimising-bike-sharing-europe>

The data sources shown in Table 7 were used to assess the score for each cell. Fuller details of the methodology can be found in Appendix C, along with plans showing the assessments for a number of the individual factors.

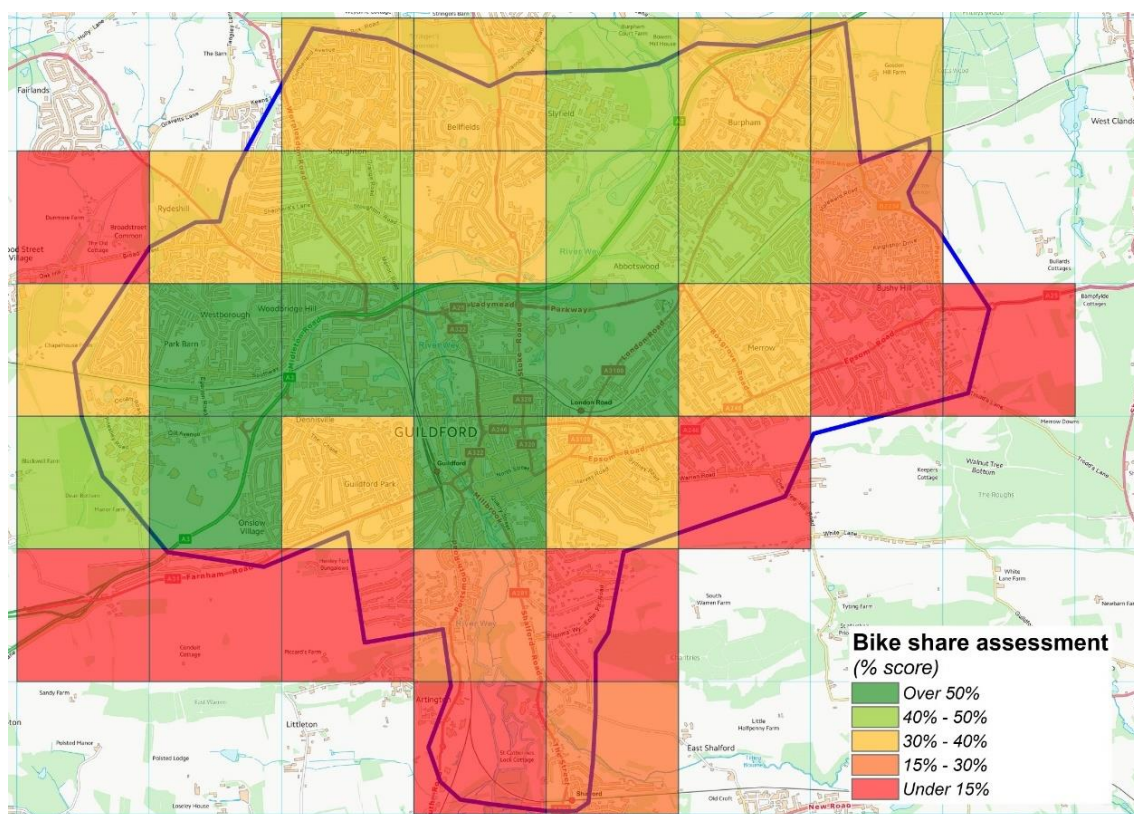
Topography itself has not been used as a factor, since bike share has been shown to work in some hilly areas such as Brighton. However, evidence does show that topography is linked to existing levels of cycling as well as other factors (e.g. cycle routes).

The key factors (highlighted by orange and yellow shading in Table 6) were given extra weighting, in particular the density of key destinations. The maximum score possible is 30, taking account of the weighting for factors A-E. The overall bike share potential was calculated as a percentage score for each grid cell.

Factor	Description
<b>A. Key destinations/ attractions</b>	Schedule of key destinations/attractions and workplace clusters, plus data from the (then) emerging Local Plan
<b>B. Propensity to cycle</b>	Socio-demographic data (Mosaic) at ward level, informed by OAC at LSOA level
<b>C. Potential for increased cycling</b>	Propensity to Cycle Tool (PCT) plotted at LSOA level
<b>D. Main cycle routes</b>	GIS layer of existing/future cycle network, with extra weighting given to higher quality infrastructure
<b>E. Significant areas of future development</b>	Guildford Borough Submission Local Plan: strategy & sites (2017)
<b>F. Public transport / Park &amp; Ride</b>	GIS mapping of rail stations and Park & Ride sites
<b>G. Levels of cycling</b>	2011 census at LSOA level, plus cycling O-D pairs
<b>H. Population density</b>	2011 census plotted at LSOA level

Table 7. Data sources for factors

Plan 3 below shows the classification for each cell, showing where bike share is most likely to be successful. This uses a five point scale (very high, high, medium, low and very low).



Plan 3. Overall score for assessment of bike share potential

Some areas of Guildford were assessed as having low or very low potential for bike share. Possible reasons include:

- Predominantly residential neighbourhoods, with few non-residential destinations
- Low existing cycling levels due to distance from town centre and/or hillier areas
- Limited (if any) cycle route infrastructure
- Low propensity to cycle

While parts of Guildford have medium scores, this does not mean that bike share has no potential in these areas in the longer term (especially if e-bikes are used). However, including these at the outset would be likely to lead to low levels of use and hence not be cost effective. There would also be the possibility of negative publicity arising from low use.

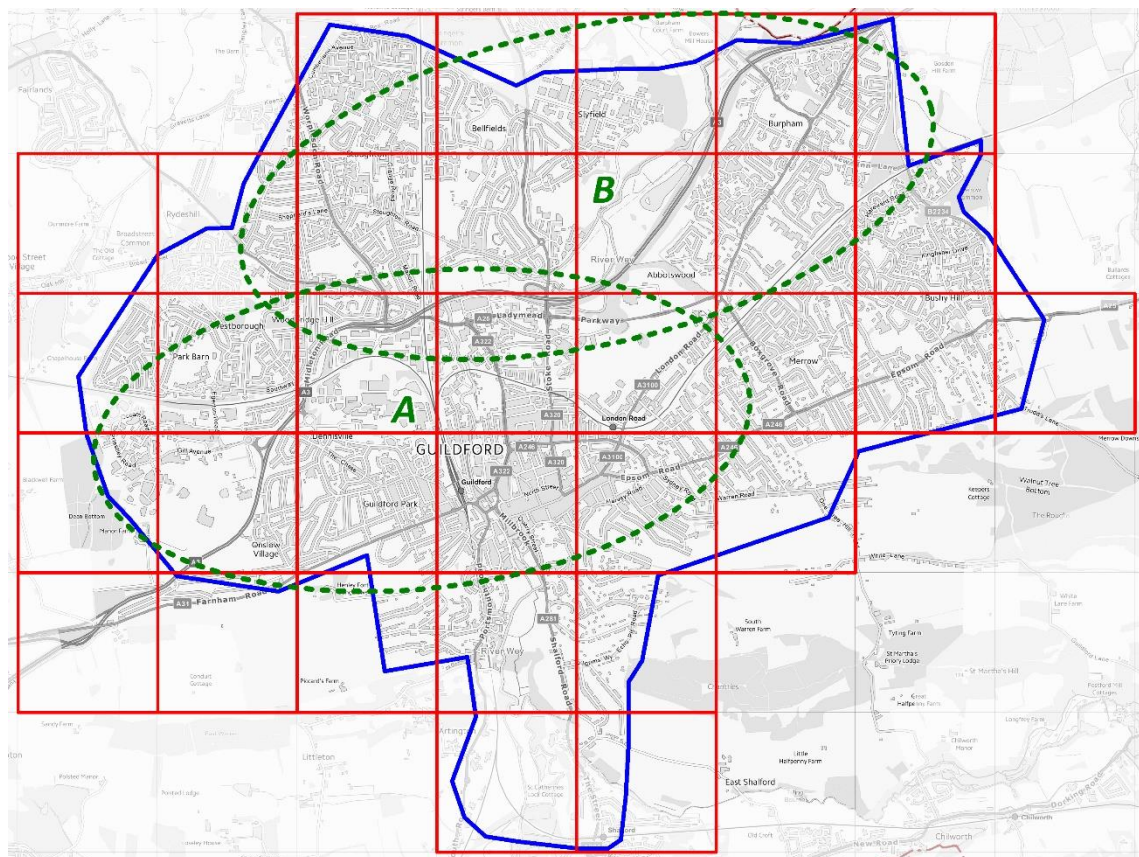
**Effect of e-bike scheme**

The assessment was carried out on the basis of a standard (non-e-bike) scheme. Using e-bikes would significantly increase the score for factor C (potential for increased cycling). This would result in some cells outside the town centre increasing from medium to high potential (i.e. from amber to light green in Plan 3), or from low to medium potential. The main outcome would be more longer trips, supporting future expansion into outer areas.

**3.3 Suggested scheme extent and phasing**

Based on the assessment and stakeholder input, we recommend that the scheme is developed in a phased manner that is compatible with the existing University of Surrey scheme. Plan 4 shows two areas, corresponding to two phases of bike share development, identified as ‘A’ and ‘B’. These areas and phases cover the higher potential areas.

- A. Town centre & west Guildford (including University of Surrey campuses)
- B. North Guildford plus additional hubs within area A



Plan 4. Suggested bike share phases



These two areas can be used to develop options for the size of a town-wide scheme, based on established parameters for hub locations. Table 8 below shows the approximate area and residential population of the areas covered by the two phases. Note that this does not include daytime population i.e. employees or non-resident students.

Phase	Approx. urban area (km <sup>2</sup> )	Approx. residential population (2017 est.)
<b>A</b> (including area covered by University of Surrey scheme)	8.5	31,000
<b>B</b>	9	27,000

Table 8. Phase areas and population (based on LSOAs)

Best practice in other countries recommends that hubs are located about 250m-300m apart (about 3 minutes walk). However, in the UK this has been increased slightly to 400m (i.e. about 5 minutes walk) to match the recommended spacing for bus stops, providing a density of around 6 hubs per km<sup>2</sup>. This is the density for the Santander Cycles scheme in London. Other schemes are generally less dense e.g. Brighton and Belfast have 3 hubs per km<sup>2</sup>, while Edinburgh and Cardiff have just 2. However, this is mainly due to a number of outlying hubs which serve to reduce the average density.

In practice, hubs are usually sited either at or very near to key destinations, rather than exactly spaced. In core areas there might be two hubs close to each other – for example at Guildford Station and across the River Wey by the Odeon cinema.

In areas such as more residential neighbourhoods a lower density of around 3-4 hubs per km<sup>2</sup> is acceptable at the launch of a scheme (spacing of around 600m), with some in-fill at a later date. This approach has been used in Brighton where the initial phase of around 40 hubs at the launch of BTN BikeShare in September 2017 was intensified with 10 more hubs in November 2018 and incremental expansion since then.

Based on these densities, we have developed a range of suggested scheme sizes for each phase, set out in Table 9.

Phase	Town centre		Wider Guildford area		Total	
	Hubs	Cycles	Hubs	Cycles	Hubs	Cycles
<b>A</b>	8 - 10	60 - 70	15 - 20	90 - 105	<b>25 - 30</b>	<b>150 - 175</b>
<b>B</b>			25 - 30	150 - 175	<b>25 - 30</b>	<b>150 - 175</b>

Table 9. Suggested range of scheme size

We suggest that Phase A could comprise between 25-30 hubs with a fleet of 150-175 cycles. When combined with the existing University of Surrey scheme (50 cycles, 10 hubs of which two are opening in 2019) this would result in a total scheme size of around 35-40 hubs with 200-225 cycles.

Phase B has not been considered in as much detail but an outline estimate would suggest a roughly similar scale to Phase A to allow for the less dense areas covered. This would give a total for the combined schemes, including that of the University of Surrey, of around 350-400 cycles and 60-70 hubs.

Note that all figures for cycles are for the total fleet size. Based on experience of recent schemes, we suggest that an allowance of around 10% should be made for cycles that are unavailable due to repairs and maintenance.

The suggestions for scheme size apply to both fully docked or hybrid schemes. The initial expectation is that all hubs comprise physical docks. However, if a hybrid system is used this gives the option during the implementation stage of considering the use of virtual hubs in some locations. This would be an issue to be agreed in partnership with the selected operator rather than at this stage.

Using the resident population allows use of an alternative guideline for the number of cycles in the scheme. The ITDP Bike Share Planning Guide (2014) suggests a range of 10-30 per 1,000 resident population. Based on this, a scheme covering the Phase A area would require between 310 and 930 cycles, considerably higher than the area-based estimate. However, this is derived from experience in cities world-wide with much higher cycle usage than the UK in general and Guildford in particular. The town is also much smaller than the cities researched by ITDP (e.g. New York, Paris, London) with a much lower daytime population. Hence, we consider that the suggested level of hubs and cycles is reasonable.

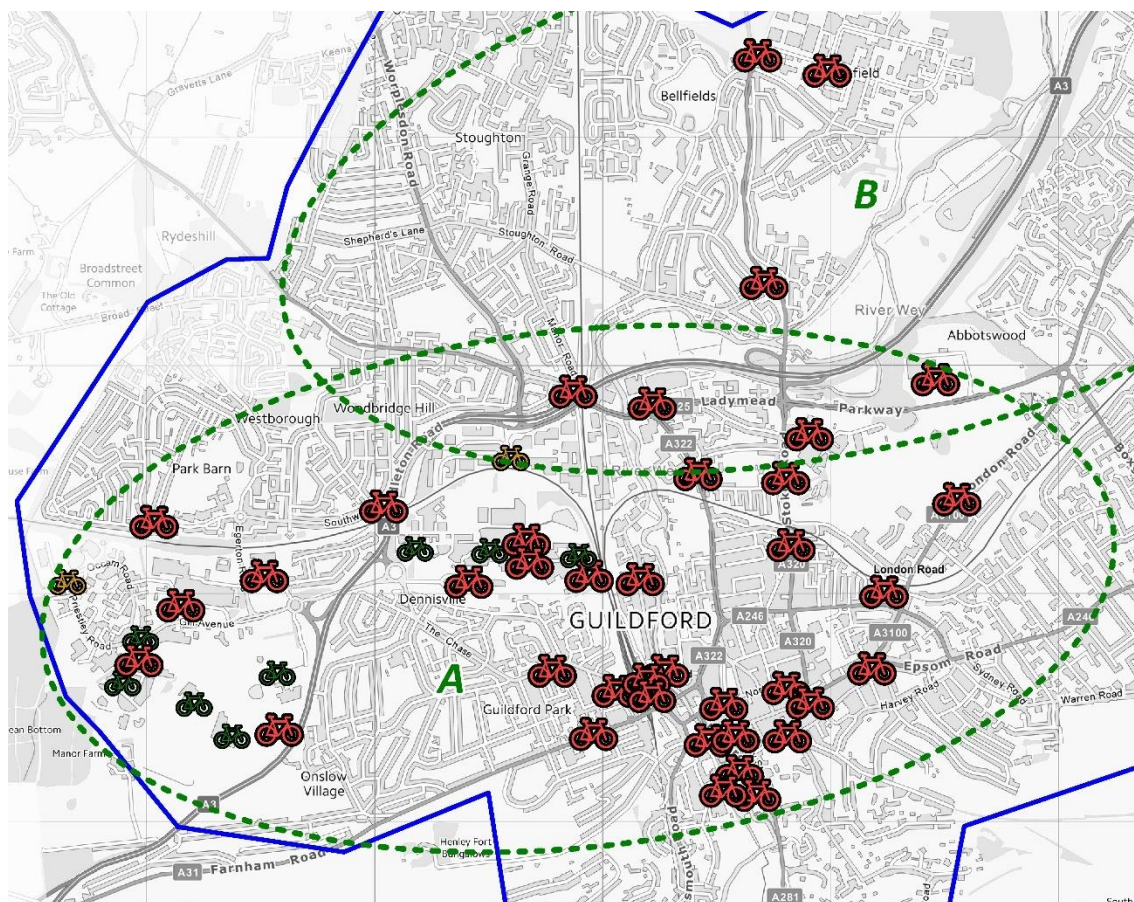
### 3.4 Possible hub locations

We carried out a detailed review of the Phase A area as shown above to produce an initial schedule of possible hub locations (whether physical docks or virtual hubs). It was agreed that a review of Phase B was not required at this stage.

The long list of suggested locations was discussed at the stakeholder event in July 2018 (see Section 4). There was broad endorsement for these initial suggestions, with one key exception. This was a request for inclusion of the Slyfield Industrial Estate (in the Phase B area) to be considered for inclusion in Phase A. This was due to the large amount of shift work on the estate and the poor provision of public transport.

To support this, two additional hubs are proposed at the industrial estate (east and west), plus a hub at the junction of Stoughton Road and Old Woking Road (on the cycle route between Guildford town centre and Slyfield).

The suggested hub locations are shown on Plan 5 below. A full schedule of these is provided in Appendix C, which includes general location details for each hub (e.g. “Outside Guildford Station”) and a brief assessment of any issues.

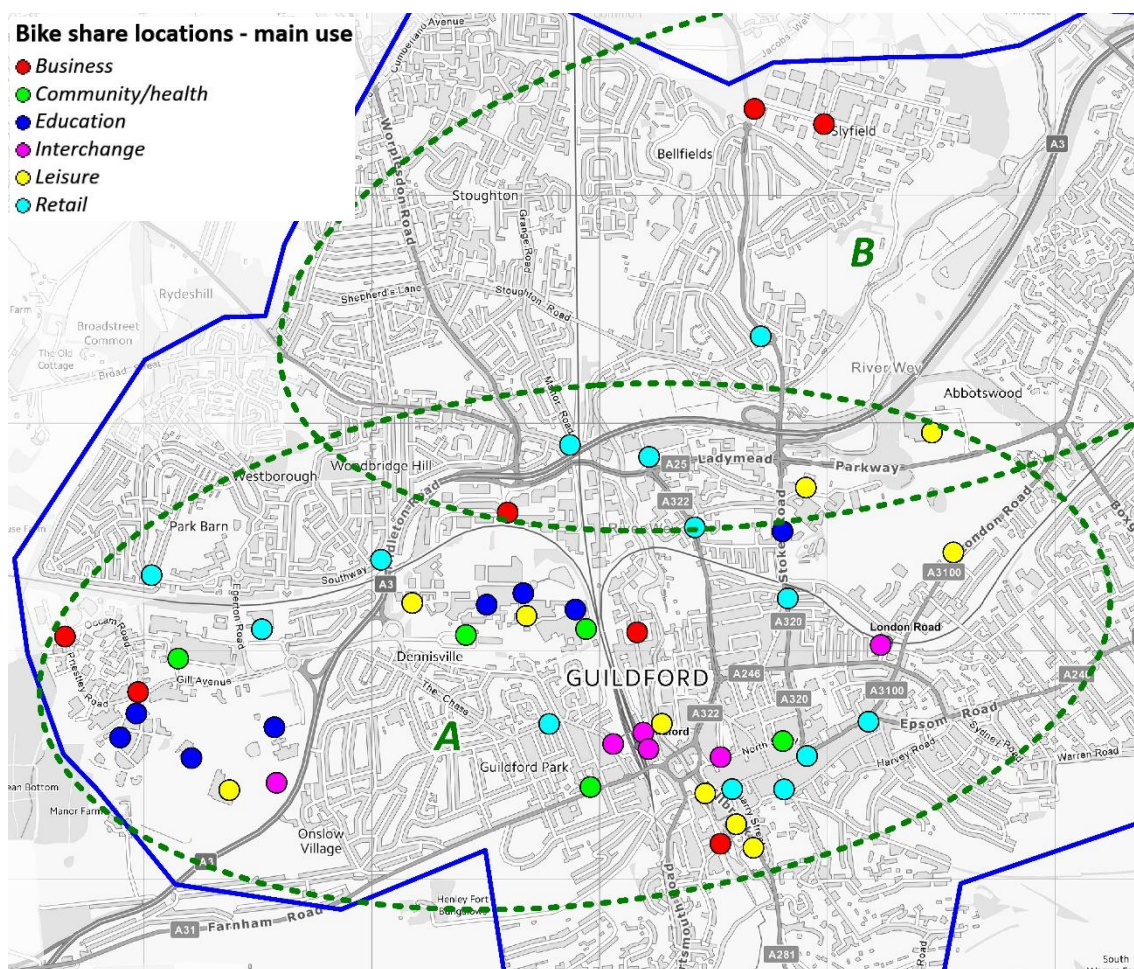


Plan 5. Suggested Phase A hubs (red) with existing (green) & planned (orange) UoS hubs

The precise details of where and how a hub is placed will depend on the nature of the location, the size of the hub (i.e. number of docks) and the available space. There may be other local considerations such as access, the impact on people walking, and conservation and public realm issues. In some locations the preferred option will be on the carriageway which will also mean possible re-purposing of car parking spaces. Some of these issues will also apply to virtual or geo-fenced hubs.

If a e-bike scheme chosen then there will be also be a need to consider the location of charging docks, with electricity supply, possible new cabling and streetworks all being issues. Whilst this is not a trivial matter, we would only anticipate around a third of hubs would need to be used for charging, reducing the impact of charging hubs.

The suggested hub locations were classified using six primary use categories (see Plan 6). This will enable a clearer case to be made for each hub at the implementation stage. However, it is important to note that most hubs would serve a variety of trip purposes.



Plan 6. Classification of Phase A hubs by use category

More detailed assessments have not been carried out at this stage as this is best done in partnership with a prospective operator. Different systems have varying requirements in terms of the method of installation, the physical size of a dock and other issues such as an electricity supply. They will also need to take into account how the hub is serviced which again will vary according to the operator.

Once a scheme has progressed through the procurement process a datasheet should be produced for each potential hub, with a plan and details on the number of docks and other issues, including permissions, electrification and any constraints. This will also allow complementary issues to be addressed (e.g. a hub on a one-way street might require a contraflow cycle lane to be provided).

Any potential impact on third parties could also be discussed at this stage. An example is the concern expressed by the National Trust regarding additional maintenance that might be needed on the River Wey towpath if bike share leads to significant increased use.

Plan 7 below shows the catchment areas for each suggested hub, based on a 400m buffer. This assumes a worst-case situation where a hub is empty and a user needs to walk to an adjacent hub to hire a cycle. Most of the Phase A area is within 400m of a hub, apart from a section of the Guildford Park neighbourhood and the western part of Merrow. If the lack of hubs in these areas is felt to be an issue, this could be addressed with infill in Phase B.



Plan 7. 400m buffers around proposed hub locations

### Park and Ride

At the outset it was suggested that consideration should be given to the inclusion of the four Park and Ride sites in Guildford as potential bike share hubs. As shown in 2.5 above, data from the CoMo survey shows that 15% of bike share users combine their journeys with driving a private car trip (and a further 8% with a passenger trip in a car). There is therefore in principle some potential to combine bike share and Park and Ride.

However, the theoretical potential should be considered alongside practical details of the siting and layout of Park and Ride sites. When these are examined, only two of the four sites (Onslow and Spectrum) would be likely to support bike share. Detailed comments on the Park and Ride sites are set out in Table 10 below.

P & R site	In Phase 2?	Comments
<b>Artington</b>	No	Far from town centre along a busy main road (though the towpath is an alternative route). Low usage would therefore be expected.
<b>Merrow</b>	No	Far from town centre along a busy main road with very little cycle provision. Low usage would therefore be expected.
<b>Onslow</b>	Yes	Near University of Surrey campus at Manor Park and would therefore complement existing scheme.
<b>Spectrum</b>	Yes (at Leisure Complex)	Combined with parking for the Spectrum Leisure Complex and hence a single hub could serve both destinations.

Table 10. Potential for bike share at Park & Ride sites

### 3.5 Compatibility with University of Surrey scheme

The University of Surrey (UoS) bike share scheme, operated by Nextbike UK, was launched in August 2018 with 50 cycles at 8 hubs. While the main focus is travel by staff and students, it also serves Surrey Research Park. The scheme will expand in mid 2019, with two new hubs at the Research Park and Guildford Business Park.

In principle the proposed town-wide scheme could be entirely compatible with the existing UoS bike share scheme. The operators Nextbike already manage a number of larger schemes across the UK and there would be no operational barriers to Nextbike managing a larger scale scheme in Guildford.

However, due to procurement regulations the UoS scheme cannot simply be expanded in its current form. If Guildford BC wish to implement a town-wide scheme, the council would normally be required to carry out a formal procurement process to seek an operator.

There are two options for a town-wide scheme:

- Competition with the existing UoS scheme, with a distinct and separate offer
- Partnership with the existing UoS scheme (to a greater or lesser extent)

The competition option would create a number of difficulties, set out in Table 11 below.

Issue	Impact of competition
<b>In city-wide schemes the student market forms a key sector of users</b>	<i>Competing schemes would target the same users. Evidence shows that where this exists (e.g. Oxford) most people join only one scheme &amp; hence there will be an impact on economic viability of both schemes</i>
<b>Use of University campuses</b>	<i>A competing town-wide scheme would not be permitted to site hubs on UoS campuses, limiting potential for use by the student market</i>
<b>Lack of clarity between schemes</b>	<i>Most people would be unlikely to appreciate the differences between competing schemes &amp; therefore may join one but expect to use the other, leading to user dissatisfaction &amp; negative attitudes to bike share</i>
<b>Reputational risk for both Guildford BC &amp; UoS</b>	<i>Lack of collaboration between the local council as a public sector body and a publically funded university would be seen as counter-productive &amp; a waste of resources by both parties</i>
<b>Reduced scope for bike share trips</b>	<i>Different systems will not be able to use each other's hubs meaning that the potential number of trips will be reduced e.g. it would not be possible to use bike share between UoS &amp; Guildford Station</i>
<b>Different equipment</b>	<i>The provision of two distinct types of bike share cycles would lead to confusion with some users trying to park one type at the other's hubs</i>
<b>Operation (management, redistribution, repairs)</b>	<i>Two distinct operations will be needed reducing opportunities for economy of scale including increased trips by redistribution vehicles and the need to hold stocks of two types of spares</i>

Table 11. Impact of town-wide bike share in competition with University of Surrey scheme

These issues make it unlikely that a competing scheme would be successful. We would expect established operators to be reluctant to submit bids without a guarantee of Guildford BC underwriting their revenue costs. Hence, we recommend that the only viable and cost-effective option for a town-wide scheme is partnership with the existing University of Surrey scheme in order to achieve either a single scheme or compatible inter-operable schemes.

As part of the procurement process we recommend that the issues shown in Table 12 below should be addressed to ensure maximum compatibility. While these issues do not rule out an operator other than Nextbike operating the town wide scheme, they would not be able to serve the UoS as it stands. The University's contract with Nextbike precludes it from being involved in any other scheme, without Nextbike's written consent.

Some of these issues mirror the situation experienced in the bus industry in areas where services are franchised and appear as a single brand while being run by multiple operators (i.e. London).

Issue	Requirement of town-wide system
<b>Equipment (cycles &amp; hubs)</b>	<i>All cycles &amp; docking systems should be compatible allowing both the UoS &amp; town-wide schemes to use each other's hubs</i>
<b>Operation (management, redistribution, repairs)</b>	<i>As far as possible the two operations should combine activities such as redistribution trips, maintenance centre, mechanics etc.</i>
<b>Branding</b>	<i>Consideration should be given to the establishment of a new overarching Guildford-wide branding which would allow sub-branding for the UoS &amp; town-wide schemes</i>
<b>Membership</b>	<i>Membership of one scheme should automatically confer free membership of the other scheme, possibly through an opt-in process. Operators of both schemes should be strongly encouraged to share membership databases.</i>
<b>'Cross-ticketing'</b>	<i>The two schemes should allow users to switch easily &amp; seamlessly between them on an ad-hoc basis</i>
<b>'Better bike share'</b>	<i>The two schemes should collaborate to promote &amp; encourage bike share among hard to reach groups</i>

Table 12. Issues to be addressed under a partnership option

### 3.6 Operational and management considerations

Our final set of recommendations focus on the operation and management of the scheme, both in terms of Guildford BC's relationship with the operator(s) and by the operator itself. Based on the review of schemes, and our assessment of the local issues in Guildford, we recommend that:

- A system should be procured on a similar basis to other cities and large towns, i.e. a concession to operate a bike share scheme in Guildford for 3-5 years with a 2 year extension based on good performance
- The system should be compatible with the UoS scheme and operate in partnership with it, as set out above
- Tariff periods etc. should be aligned to the UoS scheme although higher fees may be acceptable for standard (i.e. non-concessionary) users to make the scheme viable.
- While the operator will be responsible for all operational matters, including maintenance and redistribution of cycles, they should be encouraged to deliver this through local businesses / organisations
- The operator will be expected to cover all revenue costs and will be responsible for seeking sponsorship, although the council will assist with contacts etc. All branding must be agreed with the council.
- As part of the procurement process the council will set out draft KPIs and other conditions, including response times required, levels of service, and local storage of bikes. These will be finalised with the chosen operator.
- As part of the procurement process, options for a part or full e-bike system should be set out in a reasonable amount of detail.
- Data collection and its open use should be required to enable the council and stakeholders to establish route choices, future hub locations etc. All data feeds should conform to the General Bikeshare Feed Specification (GBFS).
- Allowance should be made for an officer at Guildford BC to support the scheme during procurement and implementation (0.5 FTE) and operation (0.1 FTE)

### 3.7 Marketing and promotion

Marketing and promotion activities are a significant element that can define the success of any bike share scheme. This is an activity that can often be overlooked in the development, lead up and implementation of a bike share scheme, and a dedicated budget and resource should be provided in order to promote the scheme, particularly during the initial launch period.

Any bike share scheme brought forward in Guildford would need to be well marketed. Schemes such as Santander Cycles in London, Nextbike Cardiff and BTN BikeShare in Brighton have regular promotions and make full use of social media, especially Twitter, which have been instrumental in the success of the respective schemes. Although it was only launched in 2018, JustEat Cycles in Edinburgh has already demonstrated good use of marketing, including giving each bike a name to encourage users to post images.

Providing information to businesses and residents raises awareness and sign ups can be offered at general promotional events in workplaces and at community events. Businesses can also be encouraged to become corporate members. If the scheme seeks to expand into 'less traditional' areas with lower propensity to cycle, this needs to be accompanied by significant marketing and promotion to engage and sign up people and to offer training and support to use the system. Experience gathered by the "Better Bikeshare" programme in Glasgow could be used to inform this.

Promotion would best be done as a partnership between the operator and the Council, allowing a balance to be struck between commercial needs and the Council's wider policy aims. Marketing and promotion budgets should be set aside to cover the start-up and ongoing roll out of the scheme.

It is assumed that, in the absence of a headline sponsor, the scheme would initially be branded as part of Guildford's Sustainable Movement programme. It is noted that this would reduce the need for a separate marketing and communication team. While the existing University of Surrey scheme has received sponsorship from Huawei, this is not an exclusive arrangement and there is still potential for a separate sponsor to support part or all of the wider scheme.

### 3.8 Monitoring and review

Detailed monitoring is crucial to assess the success of any implemented scheme. This should include before and after surveys of participants. Outside London, this does not appear to have been carried out before the introduction of bike share schemes.

CoMo UK carry regular surveys of bike share users nationally, but this has not been done for individual schemes. Hence we recommend that this needs to be addressed as part of developing a scheme in Guildford.

Regular meetings should take place between the operator and the council to discuss progress and monitor performance against the KPIs and other criteria in the contract. This should include discussion of user feedback.

As noted above, data collection and its open use will enable the council and stakeholders to gather information on the route choices made by users, as well as usage at each hub. This can be used to inform development of the bike share scheme as well as wide cycling infrastructure.

## 4. Stakeholder feedback

### 4.1 Stakeholder workshop

Following completion of the first stage of the feasibility study, a stakeholder engagement workshop was held in July 2018. Attendees included Cllr. Matt Furniss (then Lead Councillor for Infrastructure & Governance), officers of Guildford Borough Council and Surrey County Council, representatives from the University of Surrey and representatives of cycling, other transport, community and environmental bodies.

There were two discussion sessions: on bike share in general and a discussion of proposals for a town-wide scheme in Guildford. There was also a short presentation on the Nextbike / University of Surrey scheme which was subsequently launched in August 2018. Notes of the meeting are set out in Appendix D.

Cllr. Furniss noted that reducing congestion and improving air quality in Guildford are key issues that the introduction of a bike share scheme would help address. Furthermore, with the level of new development taking place in Guildford, a bike share scheme would provide enhanced access and connectivity for both residents and visitors in place of use of a private car.

The importance of ensuring supporting cycle infrastructure alongside bike share was discussed. It was noted that this should reflect the major changes in approach in recent years on how to provide for cycling. Ability to cycle, provision of cycle routes and attitudes towards cycling all impact upon the potential success of a scheme (for example modern flat dwellers are more likely to cycle).

It was also seen as important to provide a bike share scheme as part of a comprehensive package of travel measures, including marketing, promotional activities, cycle training and school engagement. This would all help to normalise cycling and increase use of the scheme.

There was a general view that a hybrid scheme is likely to serve Guildford best. Stakeholders felt that any town-wide scheme should also be inter-operable with the University scheme.

The importance of 'docked' hubs where certainty of a bike is required (e.g. at Guildford Station) was noted. The use of geo-fencing in sensitive areas was also discussed. Concerns were expressed about the potential impact of a dockless system on the conservation areas in the town. E-bikes were seen as having potential to increase use given the hilly nature of much of Guildford.

Cycling groups were keen to ensure that any scheme would not impact negatively on existing cycle parking in the town. If a scheme progresses that uses existing parking then it was important to ensure that at least the same number of new spaces are provided so there will be no impact on existing cyclists.

The location of the proposed hubs was generally supported. However, stakeholders felt that Slyfield Industrial Estate (proposed for Phase B) should be considered as an earlier priority. This is a large employment site with limited parking provision and poorly served by public transport.



## 5. Bike share business case

**[Sections 5.1, 5.2 and 5.3 are provided in Appendix 2. Appendix 2 is exempt from publication.]**

**[Sections 5.1, 5.2 and 5.3 are provided in Appendix 2. Appendix 2 is exempt from publication.]**

## 5.4 Appraisal

It is difficult to carry out a full appraisal of the proposed scheme at this stage due to the lack of detailed costings over a long period from established bike share schemes. However, a reasonable outline figure can be derived using the estimated costs set out above.

The benefit can be calculated using the estimated figures for usage. This can be combined with the benefit of £3 per hire trip developed by the HEAT model for use in the business case for the Glasgow bike share scheme (2008 values).

This does not take into account other benefits such as reduced congestion, improved air quality and impact on road safety. A rough estimate of these benefits can be provided by the appraisal model used in Denmark which ascribes a public benefit of £0.15 per km cycled (equivalent to £0.10 per mile).

Using these figures gives an estimated cumulative benefit over 10 years of £3 million for a standard bike share scheme, or £3.7 million for a scheme with e-bikes.

A full DfT WEBTAG compliant appraisal based on the 2017 Value for Money Framework<sup>5</sup> would normally be carried out over a period of 30 or more years. There is insufficient data on any bike scheme anywhere in the world for this to be done. However, we have made an estimate for the Benefit Cost Ratio based on the initial and expanded scheme set out above. This shows a BCR of 2.3 by Year 10 (standard bikes) or 2.2 (e-bikes), at the lower end of the DfT's 'High Value for Money' category.

The DfT's Active Mode Appraisal Toolkit<sup>6</sup>, published in May 2018, provides an alternative methodology. This calculates mode shift, health and journey quality benefits based on a range of walking and cycling projects.

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<sup>5</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/630704/value-for-money-framework.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630704/value-for-money-framework.pdf)

<sup>6</sup> [www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/712871/active-mode-appraisal-toolkit.xlsx](http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/712871/active-mode-appraisal-toolkit.xlsx)

According to the Toolkit the BCR for the proposed bike share scheme is around 3.1, again in the ‘High Value for Money’ category. The chart below shows how the benefits are mostly related to health, with only a small proportion (4%) attributed to mode shift.

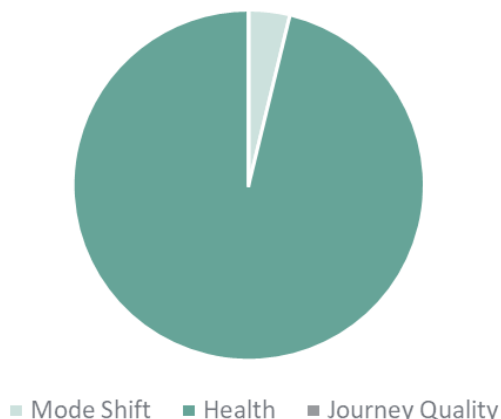


Figure 3. Estimated benefits by type

Finally, a higher level approach can be taken using generalised figures for appraisal of cycling projects produced by Cycling England in 2010. This assessed a large range of cycling infrastructure projects between 2005 and 2008 by the six Cycling Demonstration Towns, ranging from small interventions to major schemes. This estimated that the average benefit of 11 new users annually of cycling infrastructure was equivalent to £100,000.

Hence the overall cost of an e-bike scheme cost over the first five years of around £830,000 would require just 91 people to start using the scheme regularly to show a benefit – fewer than 20 new users per year. This is significantly lower than the number of expected members, and hence there would be a net benefit even without taking into account casual users.

## 6. Conclusions

### 6.1 Summary

The study has established that a bike share scheme would be feasible in Guildford and has set out the estimated cost for either a standard or e-bike system.

As set out above, we suggest that a bike share system should be procured on a similar basis to other cities and large towns, i.e. a concession to operate a bike share scheme in Guildford for 3-5 years with a 2 year extension based on good performance. This should be compatible with the University of Surrey scheme and operate in partnership with it, in order to achieve either one scheme or compatible schemes which are interoperable.

The operator will be responsible for all operational matters, including maintenance and redistribution of cycles. However, they should be encouraged to deliver this through local businesses / organisations wherever possible.

The operator will also be expected to cover all revenue costs and will be responsible for seeking sponsorship, although the council will assist with contacts etc. All branding must be agreed with the council.

Data collection and its open use should be required to enable the council and stakeholders to establish route choices, future hub locations etc. All data feeds should conform to the General Bikeshare Feed Specification (GBFS).

### 6.2 Next steps

If it is confirmed that the council wishes to establish a bike share scheme on the basis set out in this study, this will require a detailed procurement process.

If the decision is to carry out an open tender, this should be carried out in two stages: firstly, a call for Expressions of Interest, with a short questionnaire and basic diligence, to be followed by an Invitation to Tender to no more than three operators. This will ensure a shortlist comprising only those operators with a realistic likelihood of success. The operators invited to tender should be asked to attend an open day with members, officer and stakeholders, to establish a good understanding of their systems.

Alternatively, if it is accepted that the sole tenderer route is acceptable, this could be carried out using the VEAT process. This would still require the operator to submit a full detailed tender to demonstrate value for money and allow proper diligence.

As part of the procurement process the council will set out draft KPIs and other conditions, including response times required, levels of service, local storage of bikes, maintenance etc. These will be finalised with the chosen operator. The tender should also lay out Guildford's broader transport and cycling strategy ambitions and specify the core objectives of the bike share scheme.

The tender should request bidders to provide a price for operating a scheme of the size set out in this study as Phase A with an indicative cost for Phase B. Bidder should also be required to set out options for a part or full e-bike system, in sufficient detail to allow a well-founded decision.

An option to be considered during the procurement process is a mechanism enabling the bike share scheme to be extended to other locations in Guildford BC (and indeed the rest of Surrey) without necessitating a completely new procurement exercise.

Finally, it is important that the introduction of a bike share scheme is not done in isolation. A further sum has therefore been allocated for complementary measures to ensure accessibility and ease of cycling, such as the provision of contraflow cycling where a hub is on a one-way street. Many of these will also benefit people using their own cycles.

# Appendix A - Brief



## **Guildford Bike Share Project**

### **Feasibility Study Brief**

#### **1. Introduction**

Guildford Borough Council is considering a bike share scheme for Guildford Town Centre and its surrounding area. The report in Appendix A provides some further information on work completed to date.

This brief sets out the requirements of a feasibility study which should be completed by the end of March 2018.

#### **2. Background**

The report in Appendix A provides background information regarding the project. This report was presented to Members of Guildford Borough Council on 13/9/17. Members raised a number of questions pertaining to the potential scheme, and these are included in the specification below.

This feasibility study will therefore seek to reassure Members and all stakeholders that their concerns have been addressed and there is both appetite and potential for a bike share scheme in the borough.

It now seems highly likely that the Santander funded scheme at the University of Surrey (referred to in the report) will be going ahead. Hence a key part of the feasibility study will be to ensure that the two schemes are compatible.

Following the feasibility study, it is expected that there will be a need to produce tender documents in order to appoint an operator to supply and manage the bike share scheme.

The primary outcomes of this study are:

- a. To determine the viability of a bike share scheme in Guildford and allow Members to make a decision on whether to progress a scheme
- b. If a decision is taken to proceed, to provide the necessary information and guidance to be able to put the scheme out to tender quickly.

#### **3. Key partners**

As part of the feasibility, key partners will need to be consulted. This should either be in the form of individual discussions or preferably at a workshop.

These include: Surrey County Council, University of Surrey, Cycling UK, Guildford BUG, Royal Surrey County Hospital (RSCH), Guildford Business Park, Surrey Research Park, plus others to be identified at inception.

## 4. Specification

There are two main elements of the feasibility study:

- A. Demonstration that there is sufficient need for a bike share scheme, including:**
  - i. Review of Bike Share models
  - ii. Evidence to show potential usage
  - iii. Consideration of the local benefits of a bike share scheme plus assessment of risks and barriers to a successful scheme
  - iv. Review of financial issues including an outline appraisal to justify capital expenditure and an assessment of whether a scheme can be self-sufficient
- B. Identification of preferred design and operating model, including:**
  - i. Outline of scheme extent (number of bikes & number/sites of docking stations) and type (electric/traditional/mixed fleet)
  - ii. Alignment with University of Surrey plans (or otherwise as recommended by the study)
  - iii. Operational and management considerations

These are addressed in greater detail below.

### **A. Demonstration of demand for bike share**

#### ***i. Review of Bike Share models***

The initial task should be to review the current models for bike share, taking into account the more recent developments in dockless or 'infrastructureless' schemes. The report in Appendix A suggests that a docked system would be most appropriate for Guildford. The feasibility study should not assume this, however, and consideration should be given to dockless systems with a view to determining what would be most successful in the town. It is important that the range of scheme types is fully assessed to ensure that a decision is based on objective criteria.

#### ***ii. Evidence for potential usage***

A key element will be an analysis of the potential demand for bike share, based on a range of criteria which have been shown to affect bike share usage in other areas.

In order to determine the level of demand, it is suggested that the consultant should complete an initial survey exercise with a workshop for relevant stakeholder groups later in the study.

#### ***Key routes to be considered for users***

The consultant is asked to briefly outline corridors which might be expected to become the most commonly used by the bike share customers. The purpose of this is to identify which routes we would need to evaluate for future interventions – this will be studied as a separate project.

#### ***iii. Consideration of the local benefits of a bike share scheme***

Having identified a demand for the scheme, the benefits such as improved accessibility, reduced congestion, economic and health benefits need to be identified and the likely outcome of the scheme should be set out. This should present the case for implementing a scheme and support the capital outlay the Council is committing.

#### *Risks & barriers*

Any risks or barriers to the delivery of the project should be detailed, these should be identified from the various stakeholder survey and workshop, plus (if deemed necessary) a formal risk workshop. To date Borough Members have indicated that they would like to see the following given consideration:

- What competition could there be to a council scheme?
- Any ongoing revenue issues and how they can be resolved
- Opportunities to link the bike share to other corporate ambitions
- Any legal or liability implications of introducing public bike share

#### *iv. Financial issues*

The benefits of bike share in the borough will need to be monetised in order to demonstrate that there is a sound business case for making the investment. A full appraisal is not required at this stage but an outline Benefit:Cost Ratio would be desirable.

There is capital funding available for the scheme, however the borough council do not wish to be burdened with an ongoing revenue cost. Therefore it is essential that the feasibility study is able to demonstrate that the scheme is likely to be self-sufficient within a short time after opening.

This will include consideration of whether there is sufficient interest from businesses to sponsor the scheme; novel sponsorship ideas are also encouraged to maximise income.

### ***B. Preferred design and operating model***

#### *i. Outline of scheme extent and type*

Based on the review in Stage A, the following issues should be addressed:

- Possible scheme extent (number of bikes & number/sites of docking stations)
- Possible scheme type (electric/traditional/mixed fleet)

An outline for the broad extents of the scheme can be agreed at the study inception meeting. It is suggested that the Park and Ride sites offer a useful and logical perimeter for the scheme, though this can be considered further as part of the study. The number of docking stations and cycles will need to be considered based on the market research and also existing evidence regarding the viability of bike share schemes of varying sizes.

The location of suggested docking stations should be set out in general terms (e.g. "Outside the station), with any broad issues highlighted (e.g. planning requirements and conservation issues). However, detailed assessments are not required at this stage since this is best done in partnership with the prospective operator. Different schemes have varying requirements in terms of the method of installation, size of the dock and any potential challenges such as the

need for an electricity supply. Note that the Parking Manager will need to be consulted as part of the docking station siting process.

Once a scheme has progressed through the procurement process it will be necessary to produce a datasheet for each potential Docking Station detailing number of bays and other requirements, including permissions, electrification and any other pertinent information. This will also address complementary issues (e.g. a docking station on a one-way street might require a contraflow cycle lane to be provided).

The mix of electric and traditional bikes will also need to be considered based on the market research. Because Guildford has challenging topography in certain areas, there is likely to be a need for some electric bikes; these will encourage non-cyclists and less fit people who are interested in cycling to take up the bikes and also make areas of the borough much more accessible by bike.

The bicycle design, including whether they can be locked up away from a dock, and specific safety features and what telemetry they should carry should be outlined by the feasibility study. However, the precise details will be dictated by the choice of operator as it is unlikely that a bespoke Guildford design will be feasible.

### ***ii. Alignment with University of Surrey plans***

The University bike share scheme is currently planned to be a 60 bike scheme with 8 stations. The feasibility study should identify to what degree the Guildford project should be aligned with this scheme.

It is anticipated (though not assumed) that the greatest benefit would come from utilising a compatible system. The feasibility study should consider this and provide justification for the recommended course of action.

### ***iii. Operational and management considerations***

The final element of the study should address the operation and management of the scheme, both in terms of the council's relationship with the operator(s) and by the operator itself.

It is expected that the operator will be responsible for the maintenance and rebalancing of the scheme. However, in the tender it could be specified that this should be through local businesses/organisations and the viability of this needs to be considered.

Detail is required regarding what should be specified in a scheme for:

- Scheme administration – including Membership and any smart card distribution, payments, data collection, analysis and reporting, etc.
- Maintenance and rebalancing – including response times required, levels of service, how data is shared with third parties, etc. any need for storage of bikes.
- Operating Costs – an estimate of the annual cost for the scheme is required, looking at the initial scheme as a one off 5-7 year project and as the project as an ongoing scheme which would require capital to invest in new stock.
- Fees and Charges – the fees expected to be charged should be investigated, based on the survey data, the university's proposed regime and the optimum costs to make the scheme viable. The bike share scheme is provision of a service and so lower



costs are preferred, with consideration of discounts for people on low incomes, students etc.

- Potential for Sponsorship – related to the above, there needs to be a source of income to cover the balance of the scheme not met by fees. Any potential profit should be shared between the operator and the Council, however the likelihood of this needs to be assessed. The operator will be expected to source and reach agreement with any sponsor(s). Novel sponsorship options are also expected to be proposed as part of the feasibility.
- Key Performance Indicators and Data collection – KPIs to be included in the final bike share scheme need to be identified. This should be based on comparison of other bike share schemes nationwide to establish the most beneficial KPIs that are not so onerous that they effect the viability of the scheme. Data collection and its use should be explored, this will enable the council and stakeholders to establish route choices, future docking station locations and also any novel uses of data should be identified.

## 5. Deliverables and Timescales

Deliverable	Deadline
Initial study programme	At inception meeting
Stage A - Demand Assessment incl. interim report	16 February 2018
Stakeholder workshop	During February 2018
Stage B – Design & operational issues incl. interim report	9 March 2018
Draft Feasibility Study Report	19 March 2018
Full Feasibility Study Report	29 March 2018

## 6. Budget

All work for Stages A and B of this study should carried out for a fee not exceeding £10,000 (excluding VAT), including travel and other expenses.

Note that the council will be able to provide a free venue for the stakeholder workshop.

# Appendix B - Methodology for bike share assessment

The following data sources were used to analyse each cell.

Factor	Score
A. Key destinations/attractions	Schedule of key destinations/attractions and workplace clusters, plus data from the (then) emerging Local Plan
B. Propensity to cycle	Socio-demographic data (Mosaic) at ward level, informed by OAC at LSOA level
C. Potential for increased cycling	Propensity to Cycle Tool (PCT) plotted at LSOA level
D. Main cycle routes	GIS layer of existing/future cycle network, with extra weighting given to surfaced routes
E. Significant areas of future development	Guildford Borough Submission Local Plan: strategy & sites (2017)
F. Public transport / park & ride provision	GIS mapping of rail stations and Park & Ride sites
G. Levels of cycling	2011 census at LSOA level, plus cycling O-D pairs
H. Population density	2011 census plotted at LSOA level

### Data sources

The methodology for assigning a score to each of these factors is given below. Apart from A, each cell was assigned one of three ranks (High/Medium/Low) with a score of 2, 1 or 0. Due to its importance, factor A was scored on a 5-point scale from 4 to 0. These scores were then doubled for the key factors A-E.

**A. Destinations** – this is the most important factor for bike share. It is based on density and diversity of trip generators, ranging from very high in Guildford town centre, high in the area around University of Surrey and Manor Park, down to 0 in residential areas such as Merrow.

**B. Propensity to cycle** – this was based on a combination of the categories in MOSAIC and Output Area Classification (OAC), produced by OS. As MOSAIC data was only available at ward levels the open-data OAC was used to provide more detailed background. Our best judgement was used to align these with cycling propensity indices, such as those used for TfL and TfGM. An example is shown below.

OAC category	Cycling propensity
1 – Rural residents	Very low
2 – Cosmopolitans	Very high
3 – Ethnicity central	Medium to high (depending on sub-category)
4 – Multicultural metropolitans	Low to medium (depending on sub-category)
5 – Urbanites	Medium to very high (depending on sub-category)
6 – Suburbanites	Very low
7 – Constrained city dwellers	Low
8 – Hard-pressed living	Very low

### OAC classifications and cycling propensity

**C. Cycling potential** – the Propensity to Cycle Tool produced for DfT was used to show the potential increase in cycling for each cell. The PCT sets out a range of scenarios for increased cycling. The one chosen was the “Government Target” model as this is considered most feasible in the medium term. The e-bike scenario can be used to show how wide-spread use of e-bikes would increase cycling significantly. More details on the PCT can be found at [www.pct.bike](http://www.pct.bike).

**D. Cycle routes** – plans of existing and proposed cycle routes were supplied by Guildford BC. Existing routes were used to determine the density of provision in each cell. Greenway routes with poor surfacing or tortuous alignments were given a lower weighting.

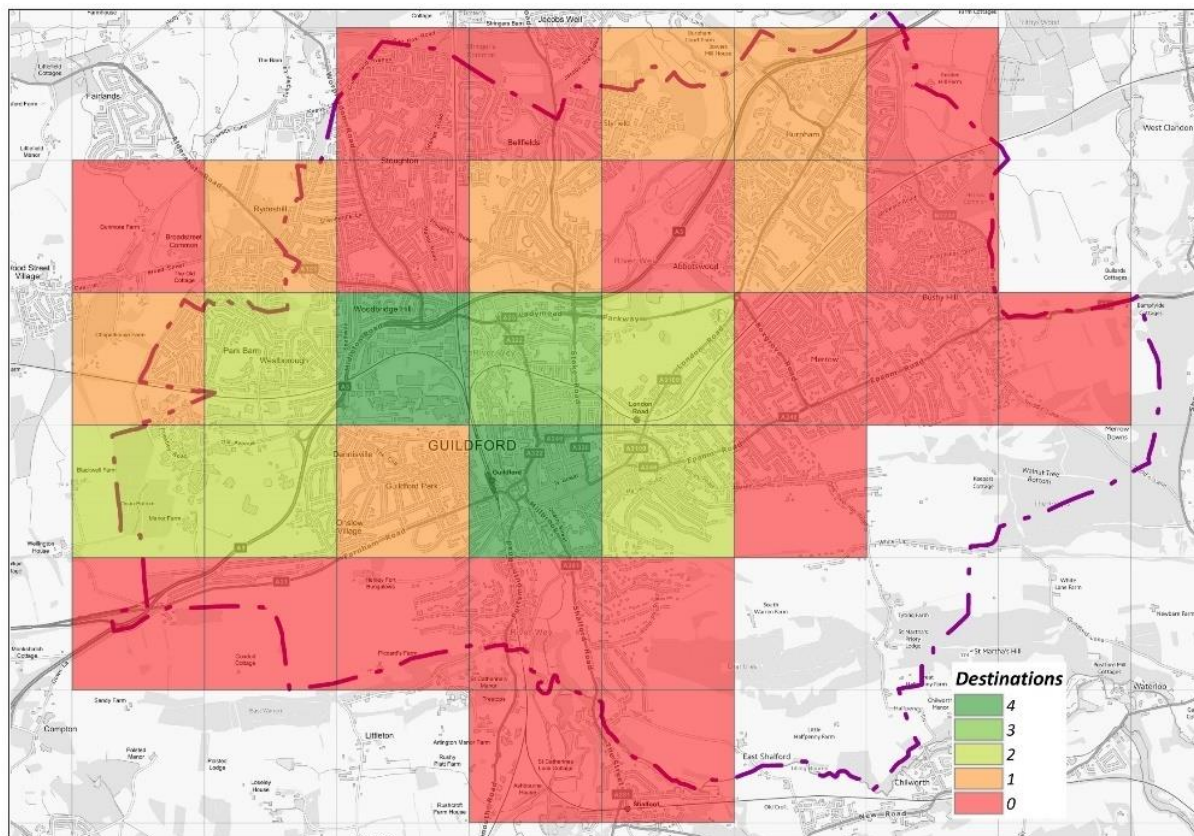
**E. Significant areas for development** – plans from the Guildford Borough Submission Local Plan: strategy & sites (2017) were used to determine the proposed level of development in each cell.

**F. Public transport provision** – a combination of rail stations and park & ride sites were used to determine the level of public transport provision in each cell.

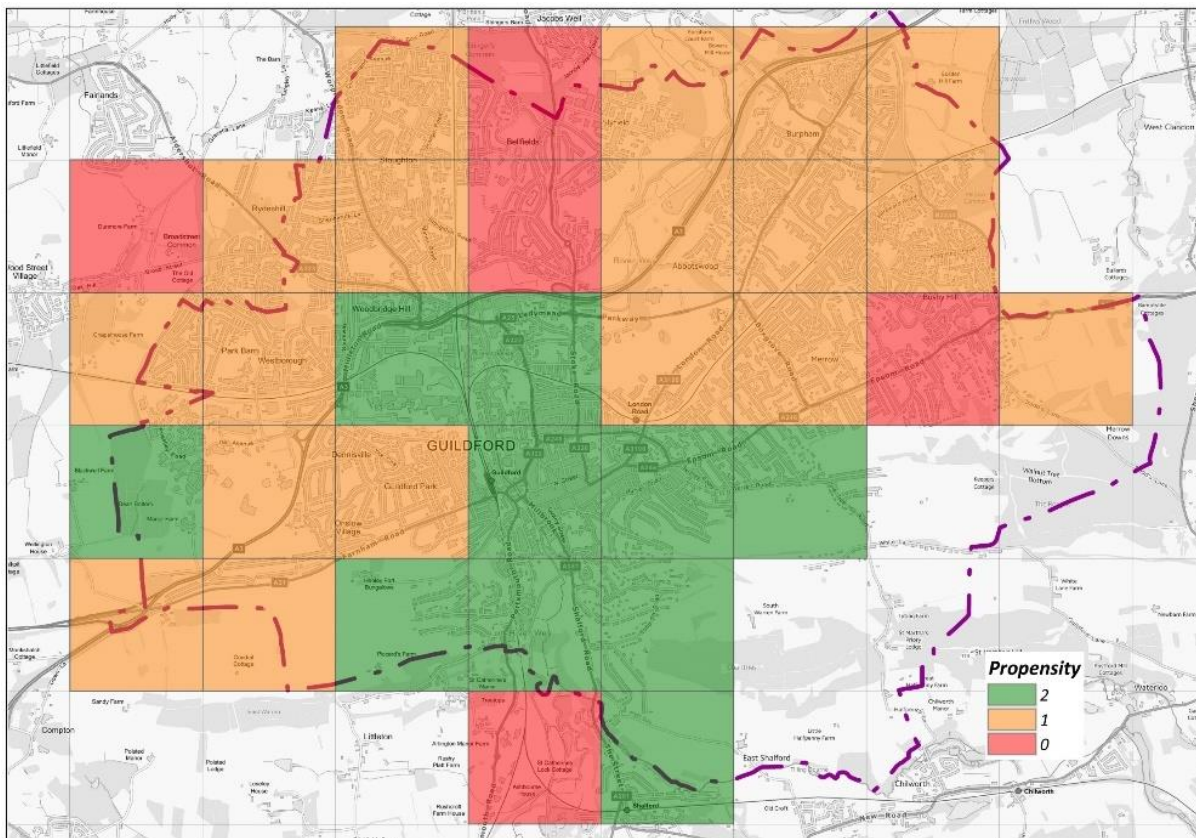
**G. Levels of cycling** – the levels of cycling in to work recorded in the 2011 census were plotted at LSOA level. This only reflects trips by residents so key destinations for cycle commuting were also taken into account based on O-D pairs from the census.

**H. Population density** – population estimates from the 2016 mid-year estimates were used to provide density at the LSOA level.

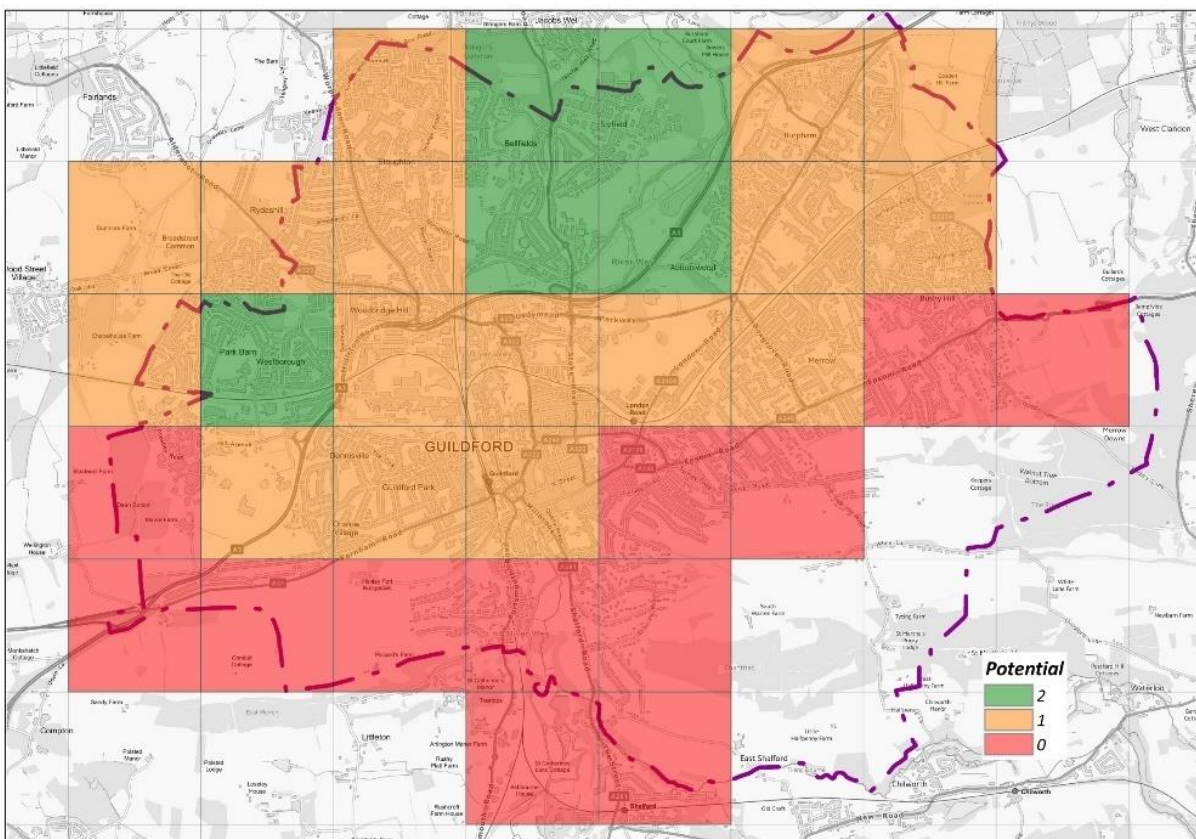
Plans showing some of these factors are shown below, overlaid with the grid used in the area of search.



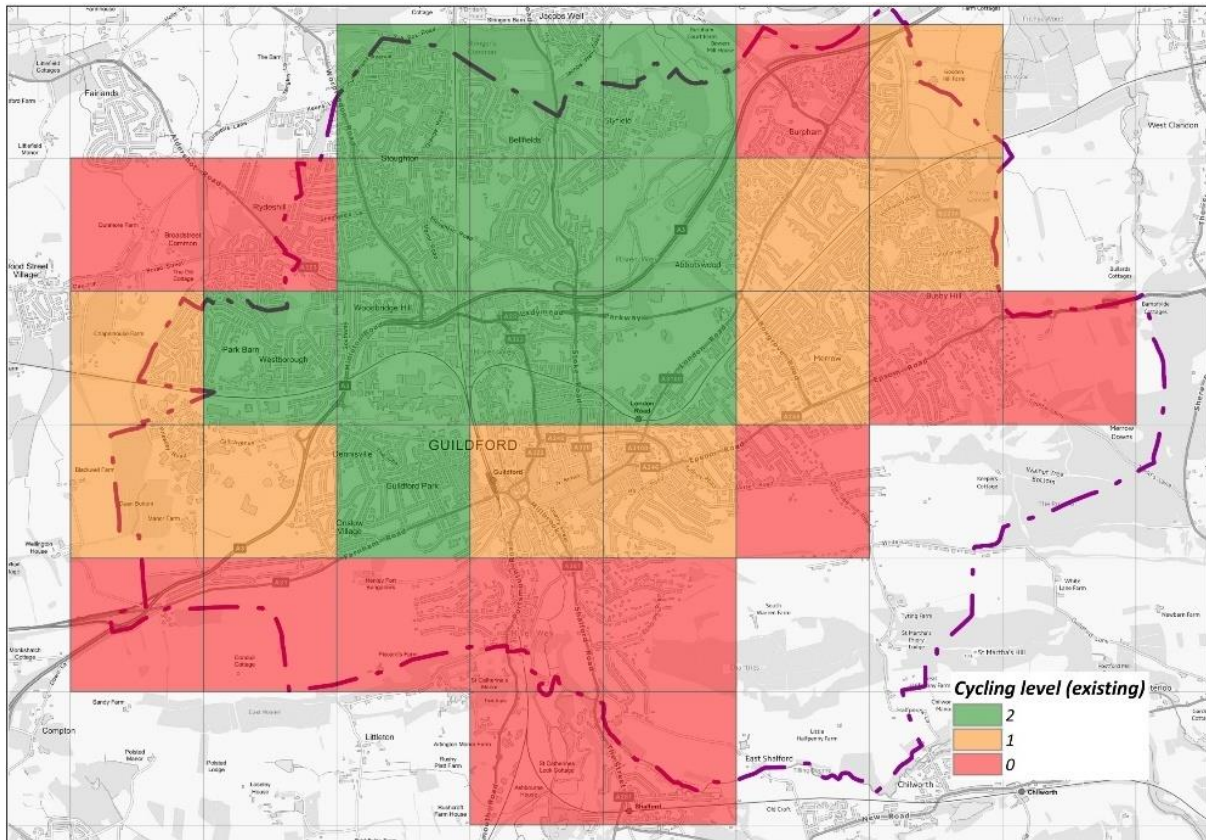
Density of destinations



Cycling propensity (based on OAC)

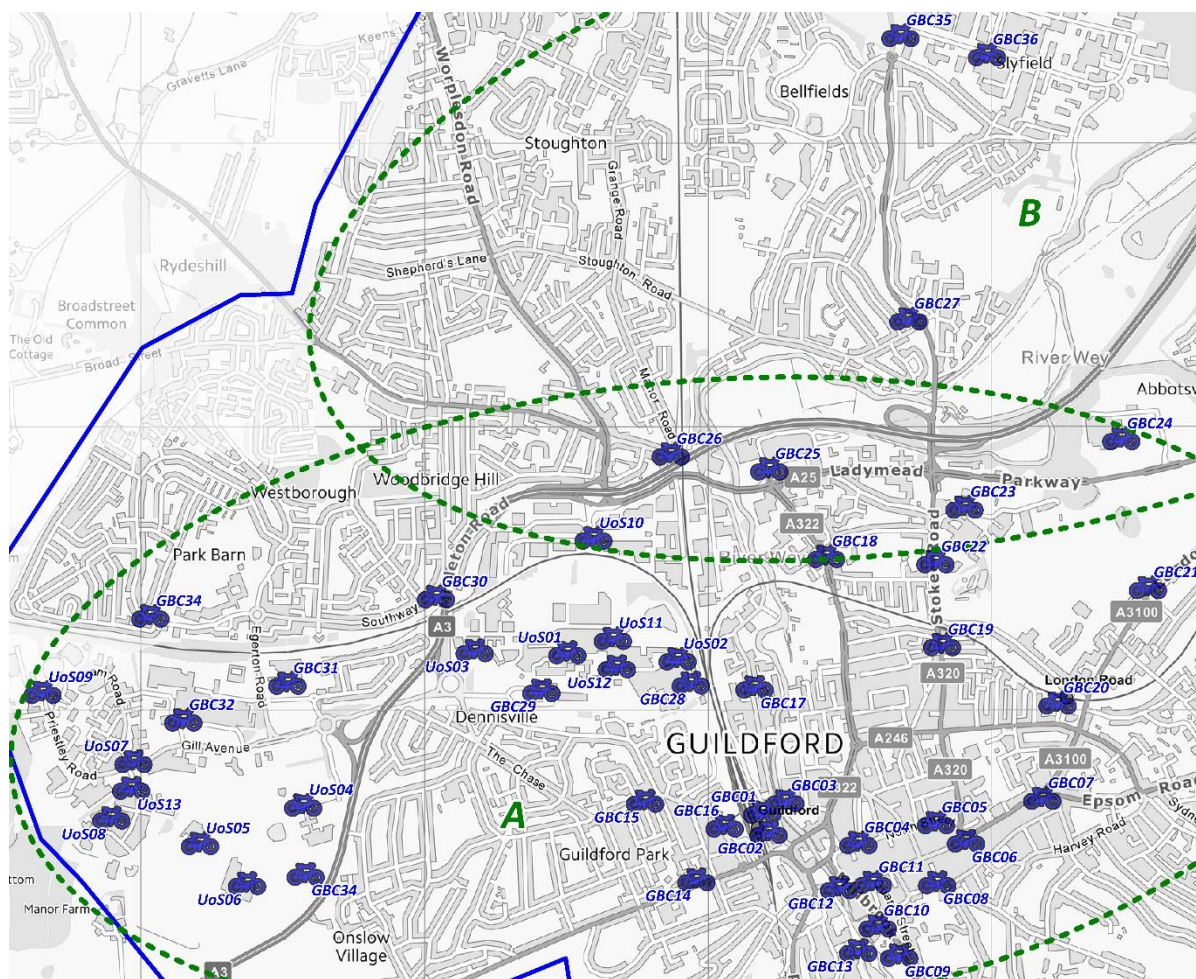


Cycling potential (based on PCT)



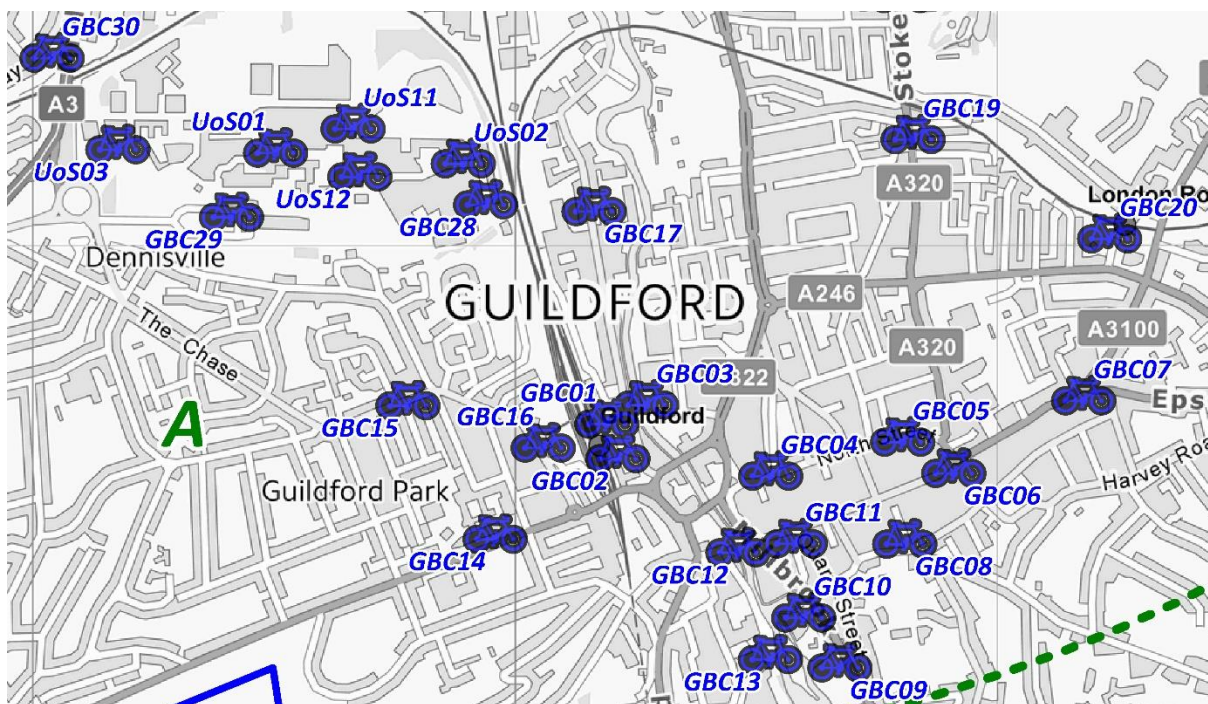
Cycling levels (2011 census)

# Appendix C - Existing, planned & proposed bike share hub locations



Existing, planned and suggested bike share hub locations

Ref	Location	Primary purpose	Secondary purpose	Status	Comments
<b>Existing University of Surrey nextbike scheme (current/planned/suggested hubs)</b>					
UoS01	George Edwards Building	Education	Residential	Existing	By library
UoS02	Duke of Kent Building	Education	Residential	Existing	
UoS03	Rear of University Arts Centre	Leisure	Residential	Existing	
UoS04	Nursery Car Park	Education	Business	Existing	
UoS05	Veterinary School	Education		Existing	
UoS06	Surrey Sports Park	Leisure		Existing	
UoS07	Surrey Research Park south	Business		Existing	By Surrey Technology Centre
UoS08	Manor Park Residential complex	Education	Residential	Existing	
UoS09	Surrey Research Park north	Business		Planned	To be installed 2019
UoS10	Guildford Business Park	Business		Planned	To be installed 2019
UoS11	In Senate House car park	Education	Business	Suggested	
UoS12	By Students Union	Leisure	Residential	Suggested	
UoS13	By cafe & services, Manor Park Residential Complex	Education	Leisure	Suggested	



Existing, planned and suggested bike share hub locations (town centre & UoS Stag Hill campus)

Ref	Location	Primary purpose	Secondary purpose	Status	Comments
<b>Guildford BC bike share scheme – suggested hub locations (bold indicates higher priority locations)</b>					
GBC01	Guildford Station main entrance (north)	Interchange	Residential	Suggested	Two hubs to allow for demand at new station
GBC02	Guildford Station main entrance (south)	Interchange	Business	<b>Suggested (priority)</b>	Two hubs to allow for demand at new station
GBC03	Cinema	Leisure	Business	<b>Suggested (priority)</b>	
GBC04	Bus station / Friary Centre	Interchange	Retail	Suggested	
GBC05	Library, North Street	Community/health	Retail	<b>Suggested (priority)</b>	
GBC06	High Street / North Street	Retail	Leisure	Suggested	
GBC07	High St, Epsom Road, London Road junction	Retail	Leisure	<b>Suggested (priority)</b>	G-Live
GBC08	Tunsgate	Retail	Leisure	<b>Suggested (priority)</b>	Also serves Guildford Castle
GBC09	Millbrook car park	Leisure		Suggested	Northern end of Downs Link
GBC10	Yvonne Arnaud theatre	Leisure	Retail	Suggested	
GBC11	High Street / Quarry Street	Retail	Business	Suggested	
GBC12	Guildford Town Bridge	Leisure	Retail	<b>Suggested (priority)</b>	At eastern end
GBC13	Guildford Council offices	Business	Community	<b>Suggested (priority)</b>	In public car park
GBC14	Farnham Road Hospital	Community/health	Residential	Suggested	
GBC15	Madrid Road	Retail	Residential	Suggested	
GBC16	Guildford station western entrance	Interchange	Residential	<b>Suggested (priority)</b>	

<b>GBC17</b>	<b>Walnut Tree Close</b>	<b>Business</b>	<b>Residential</b>	<b>Suggested (priority)</b>	<b>Possibly by Riverside Business Park mixed use development</b>
<b>GBC18</b>	<b>Woodbridge Road opposite Gateway Guildford</b>	<b>Retail</b>	<b>Business</b>	<b>Suggested (priority)</b>	<b>Either side of road</b>
GBC19	Stoke Road / Kings Road	Retail	Residential	Suggested	Outside Kings Head pub
<b>GBC20</b>	<b>London Road Station</b>	<b>Interchange</b>		<b>Suggested (priority)</b>	
GBC21	Stoke Park	Leisure	Residential	Suggested	
<b>GBC22</b>	<b>Guildford College</b>	<b>Education</b>	<b>Residential</b>	<b>Suggested (priority)</b>	
GBC23	Lido	Leisure		Suggested	Also for north part of Stoke Park
<b>GBC24</b>	<b>Spectrum Leisure Complex</b>	<b>Leisure</b>	<b>Interchange</b>	<b>Suggested (priority)</b>	<b>Also Park &amp; Ride site</b>
GBC25	Ladymead Retail Park	Retail		Suggested	May be scope for two hubs
<b>GBC26</b>	<b>Woodbridge Hill</b>	<b>Retail</b>	<b>Residential</b>	<b>Suggested (priority)</b>	<b>Serving area to north</b>
GBC27	Woodbridge Road / Stoughton Road	Retail	Residential	Suggested	By shops. Intermediate hub to complement GBC35 & GBC36
GBC28	Guildford Park car park	Community/health	Residential	Suggested	On GBC land south of UoS campus boundary, near Health Centre
GBC29	Guildford Cathedral	Community/health	Leisure	Suggested	By café?
GBC30	Southway (east)	Retail	Residential	Suggested	Small shopping parade including bike project
GBC31	Tesco Guildford	Retail		Suggested	
<b>GBC32</b>	<b>Royal Surrey County Hospital</b>	<b>Community/health</b>		<b>Suggested (priority)</b>	<b>Near main entrance</b>
GBC33	Onslow Park & Ride	Interchange		Suggested	At pick-up area
GBC34	Park Barn, Southway (west)	Retail	Residential	Suggested	Pound Meadow to side of Nisa Local
<b>GBC35</b>	<b>Slyfield Industrial Estate west</b>	<b>Business</b>		<b>Suggested (priority)</b>	
GBC36	Slyfield Industrial Estate east	Business		Suggested	



# Appendix D - Notes of stakeholder workshop, July 2018

## Guildford Bike Share stakeholders' meeting

*GBC offices, 26 July 2018*

### 1. Attendance and apologies

#### Attended:

**Guildford Borough Council:** Cllr Matt Furniss, Rob Curtis, Edward Cheng, Chris Wheeler, Diana Roberts, Gary Kirk, Bob Crane, Chris Burchell & Donald Yell

**Surrey County Council:** Matt Strong & Becky Willson

**Stakeholders:** Martin Taplin & Nigel Burke (*G-BUG*), Chris Ogle (*Experience Guildford*), Bill Stokoe (*Guildford Vision Group*), Chris Peck (*Cycling UK*), Colin Selvin (*Guildford Society Transport Group*), John Gibson (*National Trust*), Julian Scriven (*Nextbike*) & Tracy Smith (*University of Surrey*)

**Consultants:** Mark Strong & Ken Spence (*Transport Initiatives*)

**Apologies:** Michael Green & Matthew Jezzard (*Surrey County Council*), Doug Clare (*G-BUG*), Ed Nelson (*University of Surrey*), John Rigg (*Guildford Vision Group*), Amanda Masters (*Experience Guildford*), Paul Calvert (*Network Rail*), Darren Little (*Royal Surrey County Hospital*), Louise Punter (*Surrey Chambers of Commerce*), John Dales & Brian Deegan (*Urban Movement*)

### 2. Introduction (Rob Curtis, GBC)

### 3. General presentation on Bike Share (Mark Strong, TI)

Transport Initiatives & Urban Movement had been carrying out a study on bike share & submitted an interim report to GBC, summarised in presentation here and item 6.

Question about seasonality. There is now a smoothing out between summer and winter.

### 4. Discussion about general Bike Share issues

*Q. What did failing schemes do wrong?*

**A.** Lack of planning – Blackpool: focus on leisure trips only & poor siting; Newcastle: low tech that did not work longer term; Dumfries: town too small to sustain bike share

*Q. How does maintenance, rolling of schemes work out?*

**A.** All is included in the contract, the proof is in the planning and professional nature of how the scheme is set up. Existing schemes have been generally well run.

*Q. What is lifespan of bikes?*

**A.** 5-6 years if well used by which point they need to be changed anyway as newer better versions with updated software will be available. nextbike write them down after 5 years.

*Q. Do E-bikes need to be docked?*

**A.** Not necessarily as current bikes should have sufficient charge to last all day if charged overnight. Batteries can be swapped by maintenance team.

*Q. Is there a typical user profile?*

**A.** Biggest user group aged 20-30, followed by 30-40. Bike share cycles are typically more robust and heavier than standard cycles, so need at least a basic level of cycling experience. Many users do not necessarily consider themselves “cyclists” (i.e. regular cycling using specialist equipment/clothing). Taller/older children are often also allowed to use bike share.

*Q. Are bike share users more likely to be at risk of road safety related injury?*

**A.** No evidence that they are. Good safety record in London.

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## 5. University of Surrey Bike Share Scheme (Julian Scriven – nextbike)

UoS scheme followed successful kickstarter project sponsored by Santander (four successful universities). However, UoS scheme itself will not be sponsored. Scheme to have 50 cycles & 8 hubs but plans for quick expansion with 2 more hubs envisaged soon. Launch date 2 August.

## 6. Detailed presentation on Bike Share in Guildford (Mark Strong, TI)

### 7. Discussion on Guildford bike share

*Q. Are people going to use the bikes when the infrastructure is not great?*

**A.** Existing cycle provision, especially around UoS, is sufficient to sustain the scheme if better promoted and signed. Guildford Sustainable Movement Corridor will complement use of bike share. Clearly, more infrastructure would benefit bike share as well as general cycling. Evidence (e.g. London) shows synergy between bike share and developing new infrastructure – high level of “non-cyclist” bike share users helps create demand for more routes.

*Q. Slyfield Industrial Estate in area 3 should be an early priority as a large employment site with poor parking provision and no bus service*

**A.** Yes, this will definitely be looked at closely

*Q. Guildford quite hilly so E-bikes may be more viable*

**A.** Yes, this has great potential. nextbike experience is that hybrid schemes (mix of e-bikes & standard cycles) can work quite well.

*Q. GVG have looked at routes – how does bike share relate to sustainable corridors*

**A.** Very well as the areas being considered fit very well with this

*Q. Have any usage surveys been undertaken and of how increased usage may affect maintenance and interaction particularly on the towpath?*

**A.** Surveys were carried out by UoS. Bike she operation will take into account impact of usage. There will be guidance on interacting with pedestrians & other road users

*Q. Will bike share impact on cycle parking for private bikes?*

**A.** This depends on which bike share scheme is chosen – some models use standard cycle stands (with or without branding), others like nextbike use dedicated docks. However, if the Guildford scheme does make use of cycle parking then at least the same number of new spaces will be provided so there will be no impact on existing cyclists.

*Q. What has driven this for Guildford?*

**A.** From the council perspective bike share helps support delivery of a number of policies, particularly the transport strategy. The professional judgement is that the potential is good.

### 8. Next steps

TI to finish report to GBC by end August, then council to make decision on whether to progress to formal procurement within a few months.

TI & UM have also been commissioned to carry out cycle network & parking study including detailed suggestions for improved cycle provision (NB stakeholder meeting in the autumn).

#### Actions:

- A.** TI to meet GVG & G-BUG to hear their detailed ideas
- B.** Presentations by Rob Curtis, Mark Strong & Julian Scriven to be circulated