

Dockless bikeshare – friend or foe?

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Abstract

Dockless bikeshare, a bikeshare system not requiring docking stations, is coming. In fact, dockless bikes have already arrived in Auckland (in October 2017, unannounced!), in Wellington (July 2017, also unannounced and since folded); and other New Zealand cities will follow. They can – and do – create huge problems, from footpaths cluttered with broken bikes, to bikes being dumped in waterways in large numbers (as Melbourne found out the hard way). But they can also transform cities for the better by giving people convenient access for short trips, complementing public transport, and replacing long walks or short car trips. Which experience will your city have?

This paper argues that, internationally, dockless bikeshare (and hybrid dockless/docked systems) will displace the remaining docked-only systems. The authors contend that dockless bikeshare operators (DBOs) should be actively managed by local government. Make it known that dockless bikeshare in your city is by invitation only. Pick an operator you trust, insist that they meet agreed performance targets and thus avoid the many possible pitfalls. Publicly back the operator and give them social license. This will put your city on track to reap the benefits of these schemes and avoid the pitfalls.

Introduction

Internationally, dockless bikeshare is a phenomenon so far driven mostly by Chinese companies. Dockless bikeshare operators (DBOs) are rolling out their schemes in cities around the world. The recent takeover of Jump Bikes (formerly Social Bicycles, an American DBO), by Uber (Marinova 2018) shows that there is also interest in the western world. Dockless bikeshare can provide benefits to the cities and / or create a variety of problems.

This paper explores how dockless bikeshare is of relevance to New Zealand. The primary target audience of this paper are the larger territorial authorities in New Zealand, and in some cases adjacent authorities who would provide a single market. The paper may also be of interest to Australian authorities, and to transport planners, urban designers and transport advocates. This paper also makes recommendations aimed at central government level.

DBOs are mostly interested in larger cities, and Figure 1 shows the urban areas with a population greater than 50,000. Also included is Queenstown, which has a significantly lower population, but tourism numbers on a par with Wellington and Christchurch. Going forward, these larger authorities may have little control over what happens as they will generally not be asked to pay for this service. While docked systems generally rely on subsidy, DBOs operate without requiring public money and may simply choose to turn up, just as they did in Auckland and Wellington as outlined below.



Figure 1: Areas of potential interest for bikeshare operators

Overview

Docked versus dockless

Dockless bikeshare is fundamentally different to docked systems as customers can park the bikes anywhere. With docked systems, customers need to find a docking station nearby that has capacity to take a bike, which can be difficult at peak times in popular locations.

With docked systems, the clever part are the docks; with dockless systems, the smarts are in the bikes themselves. Most dockless bikes have an inbuilt GPS system which allows the customer to find bikes, and similarly, the operator knows where bikes are. DBOs can also see elevation and therefore identify bikes parked in basements or upstairs apartments where they are inaccessible to other users – in violation of the user agreement – and can impose a penalty for such behaviour.

Compared to docked systems, dockless systems are easier and cheaper to implement. They can grow much faster as no docking stations need to be installed, and bike distribution can be adjusted quickly based on customer demand. Dockless bikes get a customer to exactly where they want to go, and this flexibility sees dockless systems gaining higher usage rates. In the USA, docked systems average 1.7 trips per day per bike. Latest data from the (dockless) JUMP e-bike share: 6 trips per day per bike; Lime dockless e-scooters: 9.3 rides per day per scooter (Schneider 2018).

Docked and dockless can blend into one another: dockless systems can have preferred parking locations without any infrastructure (i.e. virtual; only defined in the app); or parking stations with infrastructure (from just markings to branded signs and stands). As explained below, Singapore is going to mandate such parking arrangements for DBOs.

Some commentators such as Michael Colville-Anderson of Copenhagenize.com strongly favour docked systems as “a credible extension of public transport, not a *Pokemon Go* game” (Teffer 2018). Docked systems have typically been funded through a combination of user fees, advertising, and public funds. With the much lower implementation cost, no public subsidy has (yet) been required for dockless systems. Time will tell but we simply cannot see how docked bikeshare can survive the financial disadvantage of requiring subsidy.

Big players

The two biggest players in the dockless market are Mobike and ofo, both relatively new companies with headquarters in Beijing. Mobike was founded in January 2015 and ofo the year prior. Both first entered markets outside China in 2017. They are estimated to have a combined global market share of 95% (NZ Herald staff reporter 2017).

Mobike and ofo both operated in 250 cities each by March 2018 (Dickinson 2018). Mobike was sold in April 2018 for US\$2.7b to Meituan-Dianping, the world's largest online and on-demand goods delivery platform with 10 million daily orders as of mid-2017; ofo has a similar market value (Liang 2018). The parent companies (or main backers) of Mobike and ofo are said to be waging a proxy-war using bike sharing as the battlefield, and this competition is forcing all the other smaller (and less well-funded) DBOs out of the marketplace.

The main financial backers for ofo are the Alibaba Group, a Chinese multinational e-commerce, retail, internet, artificial intelligence and technology conglomerate, and Didi-Chuxing (Russell 2018). Didi-Chuxing is the leading ride-share operator in China, and they forced Uber out of the Chinese market (Solomon 2016). Meituan-Dianping is challenging Didi-Chuxing with a peer-to-peer ride-sharing system as part of a push into ‘mobility-as-a-service’¹ (MaaS)-focused enterprises (Lucas and Feng 2018).

In the western world, the peer-to-peer ride share company Uber is also expanding into the bikeshare market. Uber bought the California-based company Jump Bikes in April 2018 for US\$200m and announced a planned expansion of Jump e-bikes into Europe later this year (Drozdiak and Nicola 2018). In June 2018, it became known that Motivate (formerly Alta Bicycle Share) was in the process of being acquired by Lyft, a competitor to Uber, for a reported US\$250m. Motivate operates docked systems in seven US cities with Lyft interested in expanding into dockless systems (Bevilacqua 2018). All signs are pointing strongly at bikeshare being part of MaaS, with cashed-up companies buying their market shares.

Advantages and disadvantages

The advantages of dockless bikeshare may apply to authorities, users, or citizens. As noted above, authorities don't pay subsidies to DBOs. The bikes provide a cheap opportunistic mobility that is not space-intensive (compared to automobiles). Dockless bikes often get used for the first or last mile of public transport trips and they can thus make buses and trains more attractive. Some overseas cities have already integrated public transport ticketing with the payment system for bikeshare, a form of MaaS. Dockless bikeshare may thus reduce the amount of car travel, with less urban space taken up by cars either driving or parking, reduce congestion, and decrease pollution. There can thus be benefits even for those citizens who don't make use of bikeshare. The most significant benefit, generic to all forms of cycling, is improved health by giving users exercise.

The list of potential disadvantages and problems can be equally long. Photos of bikes piled high in bikeshare graveyards have made the rounds in the media, although these are largely a Chinese phenomenon arising from government crackdowns and/or operators going bankrupt. Bikes cluttering public spaces is more likely to be an Australasian issue. In some Australian cities, the authorities have a stand-offish attitude that contributes

¹ MaaS describes a shift away from personally-owned modes of transportation and towards mobility solutions that are consumed as a service

to much of the wider public perceiving bikeshare companies as a nuisance (Herald Sun 2017, Koob 2017). This attitude and a public antipathy towards cycling entices some people to vandalise the bikes or dump them in waterways. Poorly performing DBOs may have ill-maintained bikes, apps that don't function well or low-quality support systems; there's a lot of potential for users to have a negative experience.

One potential problem of both types of bikeshare is the collection and possible misuse of personal data. Dockless systems are more likely to have on-board GPS, which means that the operator can monitor an individual user's location information. In New Zealand, bike share operators are covered by the provisions of the Privacy Act 1993; there may be a need for an update to this legislation considering technological advances and recent models such as the European General Data Protection Regulation (GDPR).

Helmets

Mandatory helmet wearing is a barrier to bikeshare uptake (Friedman, Adamson et al. 2016). This is a problem unique to Australasia which necessitates provision of helmets with the bikes. Whilst some other countries also have helmet legislation, it either applies just to children (children are generally excluded from bikeshare), or outside of urban areas (bikeshare is generally provided in urban areas only) or is not enforced. Mandatory helmet wearing for all users on all trips is unique to Australia and New Zealand; it was introduced in New Zealand in 1994. Bikeshare helmets often go missing, meaning hirers might inadvertently break the law, making them subject to police fines.

In May 2018, we visited Auckland and noticed that very few OnzO dockless bikes came with helmets. The fine for not wearing a helmet in NZ is \$55, but enforcing the helmet law is a low priority for police; 11,000 fines were issued in the 2013-14 financial year but only 5,500 for 2015-16 financial year without there having been a change in helmet wearing rates (Fagan 2017). The only other country where a universal helmet wearing law applies and is enforced is Australia. In Melbourne, an initial bikeshare scheme was tried whereby cheap helmets were sold in vending machines or convenience stores, because some users disliked wearing a helmet that others had used before. Studies show that Melbourne and Brisbane have significantly lower bikeshare user rates than comparable cities, with mandatory helmet wearing given as the major differentiating factor (Fishman 2016). Seattle is the only city in the United States with a public bikeshare system where an all-ages helmet law applies, but in March 2017, it was the first major city in the country to shut down its docked bikeshare system. Some commentators believe that the helmet legislation was a contributing factor (Cohen 2017). However, three dockless systems are now operating in Seattle (LimeBike, Spin, and ofo), so data may soon be available to compare Seattle with other similar cities without mandatory all-ages helmet laws.

Because favourable public health outcomes and improved access to sustainable transport align with central government's priorities, the government could consider relaxing mandatory helmet requirements for bikeshare users. Such a measure was once proposed by the Queensland Parliamentary Committee (Fishman 2016) and a more general lifting of mandatory helmet legislation may be coming in the ACT (Pryor 2018).

New Zealand situation

Early bike-sharing systems, such as the Green Bike schemes in Porirua and Palmerston North, are not discussed in this paper due to their dissimilarity with modern bike-sharing.

Local authority working party

Since December 2016, the Transport Agency (NZTA) has convened a bikeshare working party for local authorities. The Transport Agency has developed a template for a DBO agreement that is based on London's code of practice. Auckland Council and Auckland Transport modified this template for the city's requirements in December 2017. The legal basis for the Auckland agreement is the Trading and Events in Public Places Bylaw 2015.

The (then) transport minister, Simon Bridges, announced in May 2017 that the Transport Agency would work with Auckland Transport and Christchurch City to investigate bikeshare schemes for those cities.

Cities with bikeshare

Auckland

The first company to provide bikeshare in Auckland was Nextbike New Zealand, the license holder for technology produced by Nextbike, a German company headquartered in Leipzig. Founded as "Good Gear Ltd" in late 2006, the company fronted by Julian Hulls (initially) provided dockless share bikes from February 2008

(North Harbour News staff reporter 2009). In September 2008, the company was renamed “Nextbike New Zealand Ltd” (New Zealand Companies Register 2018b). The hire scheme was a fully commercial venture, financing itself from user payments and advertising revenue, with some initial advertising from the Auckland Regional Transport Authority (Smith 2009). The venture failed to meet its financial targets and the 170 bikes were scaled back and offered in docking stations placed at private land owners Auckland Waterfront and Hobsonville Land Company (Dearnaley 2010). Shortly after the number of bikes was reduced, Auckland Council turned down Nextbike’s request for \$1.4m of public funding to run the system to complement public transport in the central city (Dearnaley 2011). A similar request made to the Greater Wellington Regional Council (GWRC) was also turned down. As of May 2018, there were three Nextbike docking stations in the Waterfront area, a further two docking stations in Hobsonville Point.

The DBO OnzO entered the Auckland market on 29 October 2017 by distributing 100 of their bikes throughout the CBD. There was no prior notification and not even Auckland Transport knew anything about the plans. Within the following days, OnzO delivered further bikes to suburbs surrounding the CBD including the North Shore. OnzO is registered as Pacific on Wheels Ltd, with Xinyu Hu the majority shareholder (Wilson 2017, New Zealand Companies Register 2018c). OnzO received a 3-month street-trading licence from Auckland Council at the end of November 2017 for 660 bikes. The licence was renewed in February for an increased total number of bikes of 1,700. By the end of January 2018, OnzO reported having 600 bikes in Auckland, with a further 900 to be deployed by the end of February (Penman 2018). One of the company’s main challenges is the supply of helmets; helmets are frequently lost as they are not secured to the bike when it is locked. Figure 2 shows two of their bikes.



Figure 2: OnzO bikes in Auckland

Rotorua

In 2017, a Bay of Plenty resident initiated the idea of having a dockless bikeshare system in Rotorua. Together with some business partners, they developed a business model and worked towards obtaining a license from the local district council. They had secured Chinese company Bluegogo as their supplier of dockless bikes. The scheme failed in late 2017, primarily because Bluegogo went into bankruptcy.

Wellington

On 23 July 2017, Mighty Share, also known as MTShare, placed 18 bikes in Wellington’s CBD (Macdougall 2017). The company behind the scheme, Wellington Eshare Ltd, was set up by three residents from Wellington and Lower Hutt in early 2017, with a fourth director based in Melbourne joining them in June 2017 (New Zealand Companies Register 2018d). Wellington City Council staff knew nothing about the initiative and had to track down the owners through the NZ Companies Office. Council staff believe that their trading bylaw is strong enough that they can prevent operators without a license from providing bikeshare services. This was neither tested nor discussed with Wellington Eshare Ltd and the bikes disappeared with the owners never having responded to approaches by council staff (Barker 2018).

Christchurch

In 2012, Robert Henderson, of Cycle Solutions Ltd (New Zealand Companies Register 2018a), received some of the Nextbikes held in storage in Auckland and introduced them at the halls of residence of the University of Canterbury (Spink 2015) and at Christchurch Hospital (Berry 2012). In late 2014, Henderson found a corporate sponsor (Spark) to cover the operating costs (Spink 2015) but needed \$45,000 to lease 36 bikes from Nextbike NZ for a two-year pilot project. He ran a PledgeMe campaign for four weeks which closed just before Christmas and raised just over \$50,000 (Henderson 2014, Pearson 2014). Henderson eventually aimed to have between 300 and 350 bikes in the CBD and estimated the capital expenditure for this to be \$2 million (Cairns 2015). Bikes were initially available in five racks and eventually six racks located throughout the CBD (see Figure 3) plus additional bikes at the Ara campus in Woolston (McCrone 2017). Cycle Solutions also completed a trial that allowed for a Metrocard, the Christchurch public transport card, to be used to unlock the Nextbikes (Christchurch City Council 2017).



Figure 3: Nextbikes at the Christchurch Arts Centre

In late 2017, Christchurch City called for expressions of interest from bikeshare providers (Lewis 2017). By the end of May, the tender negotiations had not been completed and no formal announcements had been made, but the local newspaper, *The Press*, speculated that both Mobike and OnzO would enter the Christchurch market (Lewis 2018b). The newspaper also reported that Nextbike was not the selected tenderer and that Council had advised the company to remove its 36 bikes and the stations by the end of May 2018 (Lewis 2018a).

Approach to bikeshare

Media coverage

Media coverage of dockless bikeshare differs around the world. While it appears mostly balanced internationally, in Australia and New Zealand there has been considerable negative media coverage. The origins for this negativity are in Melbourne in 2017 when the Singaporean company oBike launched. The launch of oBike was in direct competition to the docked bikeshare system (600 bikes across 50 stations) funded

by the state government and operated by the Royal Automobile Club of Victoria (RACV) on behalf of Public Transport Victoria (Bowden 2017). The bikes were not welcomed by the city authorities and oBike were criticised for a lack of consultation with the councils (Koob 2017). It did not take long before the Lord Mayor declared the bikes to be “clutter” (Herald Sun 2017) and sometime later called oBike a “shadowy organisation” with the only purpose of attracting venture capital, and not a good citizen but a detractor (Koob 2017). Daniel Lewkovitz, a trainer of NSW police in counter-terrorism measures, even proclaimed (without providing evidence) that bicycles packed with explosives had killed dozens of people and having thousands of share bikes was thus a major security risk (Graham 2018). We believe that the hostility of authorities removed the legitimacy from dockless share bikes. At the same time, about a third of the non-cycling public holds negative perceptions towards cyclists, driven in large part by slanted media reporting (TRA June 2015) and culture denigrating cycling compared to driving (Nielsen and Bonham 2015). These factors give people license to vandalise. The media reports spread throughout Australian cities and vandalism of share bikes subsequently become a significant problem in Sydney. In other centres, vandalism was less of a problem but public attitude to bikeshare was also tainted by this media coverage.

Civic management approaches

Bikeshare will come to the larger New Zealand cities sooner or later. There is a range of approaches that cities could take, with the extremes as per Figure 4:



Figure 4: Response range for cities to bikeshare

A laissez faire approach could appear the right thing to do given that dockless bikeshare operators don't ask for a fee. However, given that companies are making use of public space for a commercial activity, some rules need to be agreed on. Auckland City has a Trading and Events in Public Places Bylaw 2015 in place and this is referred to in their DBO license agreement. Auckland has chosen to give access to any company that is prepared to sign this license agreement.

At the other end of the scale, a city may try and restrict access to just one or two operators of its choice (or none). A city's options to restrict access to its roads and public places include public nuisance and trading bylaws under the Local Government Act 2002. Making it known that DBOs are welcome “by invitation only” is a useful management approach that cities could take.

The benefit of choosing a preferred operator (or operators) is that it provides the city with the option of giving a DBO not just a legal but also a moral license to operate, thus minimising potential disbenefits (e.g. vandalism) and getting the most out of bikeshare for the public at minimal cost to a council. Forming a strong relationship with the DBO, with city officials and other leaders publicly backing a DBO, is our recommended approach for city councils.

The international experience is that dockless bikeshare is often used in combination with public transport, with the bikes providing the “first mile” and / or “last mile” of a person's trip (Baca 2018). We thus advise city authorities that they should work with DBOs on how bikeshare and public transport can best be integrated. This could go as far as integrating payment systems and having transfer agreements in place (ITDP 2018). Conceptually, if a share bike can be paid for using an app or by scanning a QR code, the same technology could be used on buses (tag on and tag off by scanning a QR code), with GPS determining the fare zones of the journey. Ideally, all the providers of each different transport service could have coordinated fare recovery transfer mechanisms and privacy protocols. Consolidating ticketing to one or two systems in the country is the focus of the National Ticketing Programme led by the Transport Agency under the brand name Project Next (Mitchell 2018). For customers, transport choices would become more plentiful if bike share integration is achieved. This is another example of how bikeshare can be a component of MaaS.

The movement of share bikes will provide valuable data for city authorities such as favoured locations, locations where infrastructure is lacking, where public transport users come from and go to, and obvious gaps in public transport coverage (Carpenter 2018). Therefore to best provide for the transport needs of the people in cities, any agreement between city authorities and DBOs needs to include access to movement data (Baca 2018) and this is part of the Transport Agency's DBO agreement template.

Having agreements in place also provides cities with an opportunity to regulate the number of bikes in circulation. This has been shown to be necessary by the experiences in Chinese cities where the sheer number of bikes make them a nuisance. Singapore has also just announced that, by the end of 2018, it will begin to regulate where bikes can be parked, with all bikes needing technology to alert users when they are not in one

of the many designated parking areas (Yang 2018). We suggest that this measure will not be necessary in New Zealand unless a city starts experiencing those problems.

Alex Baca, who herself was general manager of a bikeshare system in Cleveland, Ohio, points to another interesting discussion that could come out of bikeshare. She points out that much of the public realm is taken up by cars either being driven or being stored. So far, the assumption appears to be that much of the space taken up to store share bikes comes off the space designated for pedestrians. Baca argues that it is time to redistribute space away from people using cars rather than from people walking (Baca 2018).

This could, for example, mean that bikeshare parking gets designated within existing on-street car parking areas. Baca also points to dockless bikes not being the last mobility invention that we will see (Baca 2018). In some North American cities, shared e-scooters are ubiquitous (Roose 2018); a development that has not yet reached New Zealand. E-scooters can be used on footpath (unlike bike infrastructure, every city has a mostly coherent footpath network), don't require helmets, and may be perceived as safer or more convenient than bikes.

Recommendations

- To address the significant changes in technology and data security, the Government should consider updating the Privacy Act in line with the EU's GDPR; this will help allay privacy concerns around the use of GPS-enabled shared bikes.
- There are numerous benefits resulting from more people using bikes in urban areas. To remove a significant barrier for access to bikeshare in New Zealand, the Government could consider relaxing the mandatory helmet requirements for share bike users.
- The best way to maximise the benefits of bikeshare, and to counter potential disadvantages, is for local authorities and trusted bikeshare operators to form strong working relationships. City authorities and leaders publicly backing an operator is likely to give them legitimacy and public trust.
- City authorities and bikeshare operators should embrace the opportunities from share bikes providing "first mile" and "last mile" for public transport users, and payment systems and transfer arrangements should ideally be integrated.
- Cities should make it publicly known that dockless bikeshare operators (DBOs) are welcome "by invitation only" so that there is an opportunity to choose trusted operators.

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Declaration of competing interests

The authors have received consulting income from Mobike for assisting with their tender to become Christchurch City's preferred bikeshare operator.