LITERATURE SURVEY

A NEW HINT TO TRANSPORTATION -ANALYSIS OF THE NYC BIKE SHARE SYSTEM

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TITLE : BIKE SHARE SYSTEM

AUTHOR : **ELLIOT FISHMAN**

Bikeshare has grown rapidly in the past decade. Although the concept has been around since the 1960s, the number of cities offering bikeshare has increased from just a handful in the late 1990s to over 800 at the time of publication (Meddin & DeMaio, 2015). Contemporary bikeshare programmes (BSPs) refer to the provision of bikes, which can be picked up and dropped off at self-serving docking stations. Typically, trips are of a short duration (less than 30 min). The bicycles usually contain technologies that allow the programme operator to track their docking station location and some are equipped with a global positioning system (GPS) (Davis, 2014). Payment is usually by credit card, and this also acts as a form of security and eliminates the anonymity that led to the demise of earlier, less technologically advanced BSPs (DeMaio, 2009; Shaheen, Guzman, & Zhang, 2010).

The global growth of BSPs has spurred an enthusiastic response from transport researchers, which has led to a burgeoning of papers examining bikeshare. Who uses bikeshare and why? What factors prevent others from choosing bikeshare and what might encourage them to do so? What impact has bikeshare had on reducing car use? What do the data tell us about bikeshare and road safety? This paper sets out to capture critical themes emerging from recently published

literature on these and other bikeshare topics. The overall aim is to provide researchers, bikeshare operators and government policy-makers with a distillation of the salient findings from bikeshare research. It is hoped such a paper will enhance the capacity of the rapidly growing bikeshare sector to capitalise on recent research, thereby enhancing the performance of new and existing BSPs.

1. **TITLE : History and Recent Growth**

AUTHOR: E FISHMAN

In 1965 Witte Fietsen (White Bikes) was launched in Amsterdam (Davis, 2014). This programme consisted of white painted bicycles on the street, free for people to use. The total absence of security mechanisms led to theft and vandalism, and a rapid demise of Witte Fietsen (DeMaio, 2009). Bikeshare, as a concept, experienced little growth after the failure of the White Bike programme, until technological advancements emerged designed to reduce the threat of vandalism and theft.Some researchers have categorised the evolution of bikeshare systems into four ‘generations’ (Parkes, Marsden, Shaheen, & Cohen, 2013). The White Bike programme described above is known as a first-generation bikeshare ‘system’, characterised by no payment or security functions. Second-generation programmes involved a coin deposit system (similar to trolleys at a supermarket or airport). The first large-scale second-generation programme launched in Copenhagen in 1995, but the anonymity exposed the system to theft (DeMaio, 2009). The problems experienced by these first two generations of bikeshare led to the development of third-generation systems, which are characterised by dedicated docking stations (in which bicycles are picked up and returned), as well as automated credit card payment and other technologies to allow the tracking of the bicycles (Shaheen, Cohen, & Martin, 2013). It is these elements, in combination with growing public policy interest in cycling (Pucher & Buehler, 2012), that have enabled the rapid growth of BSPs globally (Shaheen & Guzman, 2011). The features of fourth-generation systems are not quite so clear, but are said to potentially include dockless

systems, easier installation, power assistance and transit smartcard integration (Parkes et al., 2013).

TITLE: Generations of Bike Share

AUTHOR: Davis, L. S

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In the past decade, the number of cities operating a BSP has increased from 13 in 2004 to 855 as of 2014, as illustrated in Figure 1. The global bikeshare fleet is estimated at 946 000 bicycles, of which 750 500 are in China (Meddin & DeMaio, 2015). China also has more than double the number of bikeshare systems as the next closest country, at 237, compared to 114 in Italy and 113 in Spain. The USA, a relative

latecomer to bikeshare, has 54 cities offering bikeshare (Meddin & DeMaio, 2015).

In 2010, Oliver O'Brien began visualising bikeshare activity in different cities, making this available via the website http://oobrien.com/bikesharemap/. This became the most efficient method of examining the number of bikes available and the number of bikes in use. Interestingly, an analysis of these data reveals that the number of bikes available is often considerably lower than what bikeshare operators report. Figure 2 uses data collected via the aforementioned bikeshare map for selected cities, showing the maximum number of observed bicycles. European systems tend to be larger than North American systems and some have suggested that this may be due to a tendency for European systems to be totally or largely funded through advertising, as well as cycling participation being higher in most European countries (Parkes et al., 2013).