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The role of a non-profit organisation-run public bicycle-sharing programme: the case of Kitakyushu City, Japan

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ABSTRACT

Public bicycle-sharing programmes (PBSPs) are experiencing enormous growth as an increasing number of cities worldwide are adopting the scheme. PBSPs are managed and operated by the private sector; by local community groups, including non-profit organisations (NPOs); and by local governments. In many Japanese cities where private bicycle sharing is high, the scale of PBSPs is relatively small, leading to challenges such as difficulty in securing funding and appointing operators. This paper proposes that NPOs may have the capacity to operate and effectively manage PBSPs in conjunction with other non-profit activities to promote community development. Using a case study approach and implementing a user perception survey, this study examines the experience of a small-scale, NPO-run PBSP in Kitakyushu City, Japan. Findings show that NPO management and operation added value to the PBSP. In addition, some users were interested in the PBSP beyond its role as a means of transport. These users tend to engage in local activities more frequently than other users. Finally, almost all of the users were satisfied with the bicycle-sharing service, regardless of their reasons for using the programme. The insights gained from these results may help improve small-scale PBSP implementation, policy, and planning, both in Japan and beyond.

1. Introduction

Public bicycle-sharing programmes (PBSPs) have experienced enormous growth as more and more cities adopt bicycle sharing worldwide (Shaheen et al., 2010; Midgley, 2009). These projects have adopted various management models. In addition to local governments and transport business operators, non-profit organisations (NPOs) and private companies oversee these projects and manage public transport to develop the local community (Beroud and Anaya, 2012).

The Paris PBSP is a large-scale model operated by an advertising company; it has attracted significant attention and has also been widely researched (Nadal, 2008). In comparison, pilot programmes in Japan tend to be smaller in scale (Ministry of Land, Infrastructure, Transport and Tourism (MLIT), 2010). Early evidence suggests that some larger programmes (those involving 50 or more stations) have had more government involvement, while small to medium programmes (2–50 stations) tend to be operated by NPOs (United States Department of Transportation (USDOT), 2012). However, to the authors' knowledge, few studies have examined the role of local NPOs in the operation of small-scale PBSPs.

To the authors' knowledge, the few studies that have examined NPOs as operators (e.g., Beroud and Anaya, 2012) do so in a general way. This paper advances the existing literature by investigating the extent to which an NPO-run scheme can be a viable governance model in PBSP implementation. Furthermore, the analysis of user perceptions in our case study city – Kitakyushu City in Japan, where the scale of the PBSP is relatively small – shows that a smart and skilful management system benefits the local area. Insights provided by this study may help improve the planning and implementation of small-scale PBSPs in Japan and elsewhere.

2. Review of past studies

2.1. Non-profit organisations as public bicycle-sharing operators

PBSPs have been introduced in a number of urban centres, including Paris, London, Washington, DC, and Montreal. Shaheen et al. (2010) discussed four generations of PBSPs, including: (1) white bikes, or free-bike systems; (2) coin-deposit systems; (3) IT-based systems; and (4) demand-responsive, multimodal systems. A fourth generation PBSP, according to DeMaio (2009) and Shaheen et al. (2010), would be characterised by system

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integration (e.g. transit integration, smart card integration with other transport modes), technological innovations (e.g. Radio Frequency Identification) and responsive design (e.g. surveillance system in docking stations). To date, the most prominent funding sources for PBSPs have been municipalities and advertising partnerships. Advertising companies operate PBSPs in exchange for the right to advertise on city streets and billboards (e.g. Brisbane's CityCycle). Beroud and Anaya (2012) cited two key governance models in the provision and operation of PBSPs: market initiatives (private bodies) and authority initiatives (public bodies). Specific examples include governments, quasi-governmental transport agencies, NPOs, advertising companies, and for-profit companies (DeMaio, 2009).

The four main characteristics of a non-profit model, as discussed in studies by the City of Minneapolis (2008), DeMaio (2009), USDOT (2012) and Shaheen et al. (2012), are:

1. An NPO can leverage the popularity of bicycle sharing to accomplish important social benefits, including:
   a. Education about cyclist safety and the potential to reduce car dependency.
   b. Coordination with employer wellness projects to create incentives for healthy lifestyles.
   c. Advocacy for bicycle- and pedestrian-friendly infrastructure.
2. The non-profit model may help raise awareness of bicycling as an additional and complementary mode with other bicycle-related non-profit activities.
3. The non-profit model benefits the locality. An NPO can obtain the capital needed for initial equipment purchase through public subsidies and private sponsorship. This model is well positioned to operate the system at low cost by using local contractors and employees, and by obtaining cash and in-kind sponsorship.
4. The non-profit mission is aligned with the interests of public users as well as economic concerns. Although the mission of NPOs is not to make a profit, they aim to manage the projects efficiently and to satisfy their customers.

Based on the above references, this paper hypothesises that important contributing factors to effectively managing small-scale non-profit PBSPs include an operator's relationship with the local government and residents, as well as the spatial effective connection between the city centre, residences, public facilities and public transit stations. Moreover, small-scale schemes must be flexible enough to respond to the needs of potential users in the local community. Furthermore, the non-profit model must not only provide public transport but also take the initiative to encourage community involvement and have been actively involved in community activities to meet various social objectives.

In general, while the above studies suggest the key attributes and roles of NPOs as operators, no case studies of small-scale PBSPs in Japan have used primary data (e.g. using questionnaire surveys) to comprehensively examine an NPO-operated PBSP. Therefore, this study looks at the non-profit model in a Japanese context.

The next section reviews relevant literature on current PBSPs in Japan.

3. Public bicycle-sharing projects and users in Japan

In Japan, PBSPs and pilot projects have been carried out in many cities and areas, such as Kitakyushu City, Toyama City, Setagaya Ward (Tokyo), Yokohama City, Sapporo City, Hiroshima City, Nagoya City, Hanshin Area, Chigasaki City, Okayama City, Sendai City, and Kanazawa City. Studies of those projects are described in Hasegawa (2002), Hikawa (2011), Ishihara (2011), Kamihara (2010), Kuromizu (2010), Makino et al. (2009), Mitamura et al. (2009), Nakajima et al. (2007), Nakamura (2012), Sahashi (2010), and Sawa et al. (2010). In addition, MLIT (2010) summarised these projects and their characteristics, as shown in Table 1 and Fig. 1.

The pilot projects in Japan typically employ about 50–300 bicycles. This is smaller in scale than the approximately 20,000 bicycles used in Paris and the 6000 bicycles used in London. The PBSP per bicycle per day utilisation rate ranged from a low of 0.22 to a high of almost 65.96. Although the purposes of usage varied across different cities or areas, bicycles were generally used for sightseeing, except in Sendai and Nagoya, where the bicycles were used primarily for shopping. It is interesting to note that bicycles were rarely used for business purposes. Additionally, Nagoya's relatively large-scale pilot project allowed for special features to be incorporated into the system, such as high-density bicycle access docking stations in vacant buildings of local shopping areas, which helped change users' choice of transport mode. As shown in Fig. 1, while many users shifted from using public transport, such as buses and trains, to PBSPs, fewer private car users shifted to bicycles.

3. The Kitakyushu non-profit organisation-run public bicycle-sharing project

This study focuses on a PBSP in Kitakyushu, a government-designated city located at the northeast tip of Fukuoka prefecture in the Kyushu region. Kitakyushu is an international city of more than 970,000 people that borders the main island of Japan. The city has seven wards, with Kokura station in Kokura-kita ward serving as the main rail hub of the city. The Kitakyushu public bicycle-sharing service is mainly accessible in the Kokura station area, although there is another service area near Yahata station in Yahata-higashi ward (Fig. 2).

In this section, the authors summarise the characteristics of the cooperation and the spatial connections between the non-profit operator of the PBSP in Kitakyushu City, the local administration, and private companies, as well as the characteristics of the project's operation system.

3.1. Cooperation and diversification of activities for sustainable operation

Since 2003, the NPO that operates the Kitakyushu PBSP has managed a sightseeing bicycle-rental business using electric-assisted bicycles, parking lots around urban stations, and car-sharing businesses in Kitakyushu City Traffic Park, which operates traffic education projects. Through these businesses, the organisation has gained experience in co-operating with the municipal government. The PBSP was launched following repeated discussions with the municipal government to address various bicycle-related problems in the area. The NPO carried out the facility construction and has been responsible for maintenance and operations since. However, it is important to note that the organisation was supported by the municipal and national governments at many points. For example, national government provided initial capital in the form of subsidies, while the Kitakyushu municipal government assisted with promotional activities. Public officers now use the service for their official business.

The NPO's purpose is to provide various community benefits and help improve the quality of life of the general public. In addition, as the organisation attaches importance to continuity in managing and operating the project, and to connecting the city spatially and politically, it reinvests part of the profits from its related businesses back into the PBSP. The complementary aims of some such related businesses include: to counteract illegal bicycle

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