Understanding the Modal Shift in Response to Bike-sharing Systems in the City of Delft

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The introduction of bike-sharing systems has revitalized cycling in many cities around the world. In general, the bike-sharing systems operated worldwide can be divided into two categories: docked bike-sharing and dockless bike-sharing [1]. In the docked bike-sharing system, users have to rent bicycles from designated docking stations and then return them to the available lockers in the docking stations. The dockless bike-sharing system is designed to provide more freedom and flexibility to travellers in terms of bicycle accessibility. In contrast to docked bike-sharing, riders are free to leave bicycles in both physical and geo-fencing designated parking areas provided in public space with or without bicycle racks.

As a greener travel mode, bike-sharing is competitive in short distance travel and people who have long commuting distance are more likely to choose public transit integration with it. Previous research has shown that bike-sharing reduces car and taxi usage and increases cycling in almost every city [2]. Bike-sharing system has been shown to reduce trip demand of public transportation including train, metro and bus [3].

In Delft as a student city in the Netherlands, cycling is seen as the most important mode of transport within the city. There exist three different bike-sharing schemes in operations, including OV-fiets, Mobike and Swapfiets. OV-fiets was introduced in the Netherlands in 2003 [4]. The bicycles should always be brought back to the location where the rental started. At this moment, there are almost 300 rental locations consisting of 20500 bicycles [5]. Mobike is a dockless bike-sharing service and is more flexible than the existing docked bike-sharing alternative. Mobike extended the operations to Delft in March 2018 with a focus on the university campus [6]. Swapfiets, launched in 2014, is a bicycle-rental system on a subscription basis, can be used for regular private trips [7]. Now it has over 50,000 customers in 38 cities in Europe. The coexistence of different bike-sharing schemes in Delft enables this city to be a test bed for bike-sharing research.

This paper aims to understand the modal shift dynamics and the factors influence travellers’ choices in response to different bike-sharing systems by conducting a survey targeting OV-fiets users, Mobike users and Swapfiets users and private-bike users. The sociodemographic background of the respondents and their transportation modal shift dynamics for commuting and train access/egress trips after the introduction of bike-sharing systems were collected in the survey. This survey commenced in June 2019, and ended in July 2019. The survey collection was mainly performed during morning and evening peak hours, at the train stations, the campus, city centre and different student housing facilities because of the high numbers of bicycle trips. We are still in the process of data analysis, conceptual model development. The final results will be completed and presented in the full paper.
Keywords: bike-sharing, modal shift, commuting, train access/egress

References:


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