Two Stage Bicycle Parking System

M.Maniyarsan[1], P.Naveen Kumar[2], M.Praveen Kumar[3], J.Praveen[4], S.Prem Kumar[5]
[1]Professor, Dept of Mechanical Engineering
[2, 3, 4, 5]Dept of Mechanical Engineering
[1, 2, 3, 4, 5] Muthayammal Engineering College, Namakkal

Abstract- *Cycling is experiencing a revival in many cities. Research has focused on the determinants of cycling in particular the role of the built environment and road infrastructure. Bicycle parking has received little attention—even though bicycles are parked most of the time. This article reviews the scientific literature on bicycle parking and identifies existing gaps in research and knowledge. The review analyses 94 peer-reviewed papers identified through a search in Scopus and Web of Science, in December 2017. Few studies report on bicycle parking throughout cities, and hardly any on parking at residential locations. Bicycle parking supply and quality appears to be a determinant of cycling for current and potential cyclists.*

I. INTRODUCTION

Typically, bicycles are parked at the residential location for the majority of time. The residential location is the origin of most trips – including utilitarian (e.g. the work commute) and recreational trips. Compared to other locations, parking at home involves parking for a long duration (often multiple days or even weeks and months), with the potential of parking multiple bicycles per household.

A second frequent location to park is at work. Parking at work is concentrated during an 8h work day and must accommodate multiple employees commuting by bicycle. Bicycles are also often used in combination with public transport.

Parking at bus stops and train stations ranges from short term parking to parking for multiple days. Parking at public transport stations may potentially be very crowded, with continuous movement of bicycles being parked and collected throughout a day. Finally, parking may take place at any other urban or rural location. This parking can be highly variable in duration and could be either spatially concentrated or dispersed.

II. LITERATURE SURVEY

Increased bicycling is of great importance for a sustainable transport system. This report is the result of a literature study concerning how different factors associated with bicycle planning influence the propensity to choose the bicycle for transportation. The literature study was carried out in the search engine Google Scholar and only scientific papers, articles and books were included.

Through this literature review, knowledge has been gathered concerning bicycle planning, policies and other factors that influence the use of the bicycle in daily transport. Through the literature study it became evident that the attractiveness of the bicycle should be seen in relation to the car. If it is more attractive to use motorised modes of transport (e.g. through parking norms, costs, level of service) it will be hard to convince people to use the bike instead of the car.

III. OBJECTIVE

It seems intuitive that parking is important infrastructure for cycling. Bicycle parking can protect bicycles from theft, damage, and weather. The presence of bicycle parking, the convenience and security of the location, its quality, and potential cost facilitate or hinder cycling.

Easily accessible, safe, secure, and inexpensive bicycle parking may increase the likelihood to ride a bicycle. In contrast, the absence of easily accessible, safe, and inexpensive bicycle parking may deter cycling.

Next to theft, longer travel times, or more demanding journeys due to inconveniently located and remote bicycle parking or increased effort to park safely could reduce cycling.

IV. PROPOSED WORKING

A bicycle parking rack, usually shortened to bike rack and also called a bicycle stand, is a device to which bicycles can be securely attached for parking purposes. A bike rack may be free standing or it may be securely attached to the ground or some stationary object such as a building.

Indoor bike racks are commonly used for private bicycle parking, while outdoor bike racks are often used in commercial areas. General styles of racks include the Inverted U, Serpentine, Bollard, Grid, and Decorative. The most effective and secure bike racks are those that can secure both wheels and the frame of the bicycle, using a bicycle lock.

Project Diagram

For projects that anticipate or would like to encourage high levels of bicycle travel, providing additional bicycle facilities beyond minimum requirements or showers and lockers may be suitable.

With Planning Director approval, vehicle parking requirements may be reduced with the provision of additional bicycle facilities. Such facilities must meet all standard requirements for bicycle facilities. Locating parking areas underground, to the side or behind buildings decreases the visual impact of parking and creates a more "pedestrian friendly" environment, encouraging walking and the use of other alternative transportation modes. Where possible for new uses, surface and structured parking should be placed behind buildings.

In locating parking areas behind buildings is not possible, locating parking to the side of buildings is the next best choice.

Only when it has been demonstrated that neither of these locations is feasible may parking areas be located in front of buildings or uses. Underground parking is also encouraged.

In approving parking area location relative to the street, the Planning Director will consider existing site constraints, such as the location of existing buildings, or sites with multiple street frontages where it is impractical to locate parking behind or beside buildings relative to all street frontages.

V. CONCLUSION

In conclusion, this review showed that while there is some clear empirical evidence that bicycle parking may be an essential criterion to stimulate cycling, the results are limited due to empirical and methodological limitations in existing research. Consequently, we still have a narrowed understanding of the effects of bicycle parking policies and provisions.

Despite these shortcomings, for research, our findings can serve as input for an evidence-based debate on the role of bicycle parking. For practice, our research supports investment in bicycle parking, but acknowledges that a proper evaluation of such initiatives needs to be conducted to increase the level of evidence of the effects of bicycle parking on cycling.

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