

## A REVIEW ON BICYCLE SHARING SYSTEM

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**Abstract:** *Rapid urbanization all over the globe has left the engineers with immense challenges and opportunities in almost all areas of civil engineering. The year 2008 was the landmark year in this context as half of the total population of the world was living in urban areas then. With urban population increased in India, though the level of urbanization is in the vicinity of 28%, due to the high population, the urban areas are becoming denser with population and issues like urban transportation are demanding more and more. This paper identifies the issue of accessibility of mass transportation and the effort has been made to propose a solution. In order to solve the increasing frequencies of traffic jams in urban areas, it is desired that more and more people use public transportation modes like metro, local train like in Mumbai, buses and BRTS etc. BRTS is one of the new concepts in this area and in Gujarat a few cities have adopted the same. In order to encourage the citizens to use such facilities, it is required to increase accessibility of stations of the same. Bicycle sharing, here is proposed as one of the tool for the same. The case study of VELIB bicycle sharing system (BSS) from Paris, France has been included.*

**Keywords:** Bicycle Sharing System, Feeder System, Accessibility, VELIB bicycle sharing system, BRTS Surat.

### 1 INTRODUCTION

**What is Bicycle Sharing System?**

“Bicycle sharing is a bicycle rental system that allows to take a bicycle from one point and to return it in a different point, where the bicycle can be rented by another user.”

#### OVERVIEW OF BICYCLE SHARING SYSTEM (BSS)

**Table 1: Comparison of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> generation of bicycle sharing system**

1 <sup>st</sup> Generation	2 <sup>nd</sup> Generation	3 <sup>rd</sup> Generation
Since 1967	Since 1991	Since 2000
No registration	No registration	Registration required
No identification	No identification	Identification required

No pricing	Deposit	Pricing
No lock	Locked bikes	Locked bikes
Painted bicycles	Exclusive design	Exclusive design
No advertising	Incipient advertising	Relevant advertising

No clear definition of fourth generation exists yet and it is recommended being expectant to next developments of BSS. Some authors support that BSS that work with one integrated card valid for bike-sharing and public transport might be the fourth generation.

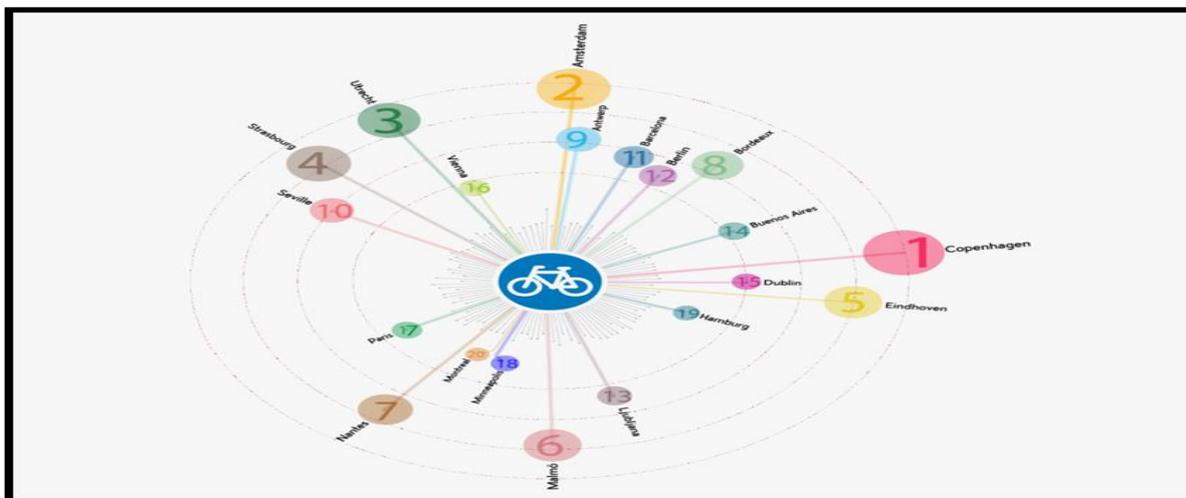


Fig. 1 Top 20 Bicycle friendly cities on planet

### 3 LITERATURE REVIEW

#### 1) Cherry, Worley, Jordan, Electric Bike Sharing-System Requirements and Operational Concepts, 2010

Develop a joint bicycle and electric bike sharing system on the University of Tennessee-Knoxville campus. It is a hilly region and gives the two stations hosting 15 electric bikes and 6 traditional bicycles.

In this paper very first talking about give the electric bicycle because of the hilly region but there is the one limitation about the recharging of that battery usage so that the solution is that gives the both bicycle over there electric as well as traditional but in electric cycle gives the solar charger in the cycle and also gives the charging point at the station to overcome this problem and also make the hybrid cycle(e.g. Luna) so pedal also connected with the motor and save the energy at battery.

#### 2) Peter Midgley, the Role of Smart Bike-sharing Systems in Urban Mobility, 2009

In this paper various cities examples are discussed like (Paris, France), (Barcelona, Spain), (Washington, D.C.), (Montreal, Canada),(Lyon, France) discuss on their objective and implementing policies and study of that all cities model make the one best common implementing policy for the BSS.

For the implementation of bike-sharing various schemes are developed and a checklist to help policy makers design and plan for a successful bike-sharing scheme.

##### 1) City size

- Most suitable for medium to large cities (> 200,000 inhabitants).
- 2) Implementation time
    - Short term(< 2 years)
  - 3) Stakeholders involvement
    - Rail or public transport operators.
    - Street furniture companies.
    - Advertising companies or local authorities.
  - 4) Challenges
    - Mutual respect between cyclists, pedestrians and car drivers needs to be strengthened.
  - 5) Costs
    - Principal cost factors include staff needed for operation, service and maintenance; bicycles costs and racks and service terminals.
    - In most cases financial backing is needed.

### **3) Gary Graham, Lihong Zhang, Smart cities and digital technologies: the case of bike-sharing systems, 2015**

The concept of ‘sharing a bike’ originated from European cities with a history of rise-and-fall. The infrastructures on which smart cities are based present new ways and challenges, to design and deliver products or services in more resource-sharing, customer-centric and environmentally-friendly manners.

In smart cities views the main objective is the mass transportation so that the big question: how to make efficient mass transportation in the cities?

In order to begin to answer of this question findings to: how a smart City can enable the development of new service operations models that linked to bicycle sharing systems.

China is currently leading the world with some 80 PBSs and a total fleet of 400,000 bicycles.

#### **Sharing = Gaining**

The paper aims to make a contribution to theory by presenting the potential of the smart City to facilitate a City-network perspective to capacity sharing decision making, which is more efficient than individual bike sharing schemes taking independent decisions, which often leads to duplication and inefficiency with cycling capacity failing to meet volatile and rapidly changing demand.

Primary purpose is to explore the contribution that smart City driven integration could have on the performance of “bike sharing” as part of a future City transport mobility system.

#### **4 DISCUSSIONS**

Though there is good mass transportation system like BRTS is available, problem is that lack of accessibility in terms of reaching the BRTS station. If people reach there with their own private vehicle, there is no parking facility available near the station. Rickshaw is the only option to reach the BRTS stations and rent is high. So people do not prefer the BRTS because the rate is almost same as other transportation system to reach any destination. Bicycle lane is also there on the both side of the road. So only parking facility is to be provided. It is the best solution for shorter trips between origins to destination.

## REFERENCES

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- [03] Gary Graham, Lihong Zhang, Smart cities and digital technologies: the case of bike-sharing systems, White Rose University of Leeds, march 2015.