



Public Bicycle Schemes: Applying the Concept in Developing Cities

Examples from India

Sustainable Urban Transport Technical Document # 3

By Chhavi Dhingra and Santhosh Kodukula

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1. Introduction

Cities in developing countries are fast falling victims to the trend of rapid motorisation, *i.e.* the increasing use of personal cars and two wheelers. Lack of decent public transport and non-motorised transport (NMT) facilities in cities have forced commuters (at least those who can afford to) to shift to using personal motorised vehicles, which occupy more road space, consume more fuel, and disturb the city's environmental and social balance. The other category of commuters (those who cannot afford personal motor vehicles) have been left with no option but to travel daily in poor and difficult conditions, and get exposed to a plethora of transport related negative externalities like bad air quality, road accidents, high noise levels, social exclusion, etc. In these cities, where development is equated to motorisation and speed, modes such as the bicycle (bike) have a very low image and are associated with poverty. Consequently the bicycle is, more often than not, not a choice mode but a captive mode (Tiwari, G. *et al.*, 2009).

Most cities, especially in developing countries, have overlooked the importance of planning for sustainable transport as a precursor to liveable cities and have given precedence to the automobile thereby completely ignoring the existence of clean and healthy non-motorised transport modes like walking and cycling. Policy-makers and transport professionals often do not realise the wrong



Figure 1
Increasing road space to cater to the needs of the motorised modes will only worsen the mobility situation and reduce the importance of more efficient modes like public transport and non-motorised transport in developing cities.

Photo: Armin Wagner

path that their cities have embarked upon, however, it is still not too late. The developing cities are still at a greater advantage, as their per capita car ownership is yet not as high as their auto centric developed counterparts. Decisions and directions taken by developing cities today will determine how sustainable their urban transport will be and how citizens will travel and live in the future. As cities grow and emerge as the centres of economic growth, their demand for mobility, even more so personal mobility, will rapidly increase. How people choose to travel will be determined equally by their personal choices and economic status, as well as the 'mobility environment' provided by the city authorities. It is obvious and clear that cities encouraging cleaner and healthier modes of travel will have a better quality of life to offer to their citizens, as opposed to cities that continue to favour usage of the automobile, and continue to neglect walking and cycling as key transport modes.

Providing affordable, easily accessible and safe NMT facilities as an 'alternative transport' choice will go a long way in making developing cities more sustainable and liveable, as it will positively impact a number of aspects like health, environment, personal and social well-being, economic cost savings, etc. Threatened by the challenges of energy security, increasing GHG emissions and local pollution, several cities in the west have been successful in reversing the trends of increasing motorisation and have managed to increase the modal shares of public transport and non-motorised transport trips by extensively promoting these modes over personal cars, using a variety of instruments and schemes. One such key attempt has been the revival of the concept of cycling as a



Figure 2
Not acknowledging the existing numbers of bicyclists in developing cities results in low or no facilities for bicycling and makes the bicyclists less important and more vulnerable.

Photo: Santhosh Kodukula

lead to numerous social, environmental and economic benefits. As an initial step towards encouraging, reviving and respecting bicycling and bicyclists in cities, a bike sharing or public bicycle scheme can be a good idea for city authorities to take up and a powerful catalyst for change. The ultimate goal of bike sharing is to expand and integrate cycling into transportation systems, so that it can more readily become a daily transportation mode (Shaheen, S. *et al.*, 2010). A few cities in Asia, including India, have already started to introduce such programs.

This document is intended as an introduction to the concept of bicycle sharing programs and attempts to analyse the developing country climate (taking India as an example) for encouraging schemes like bike sharing in cities, based on the challenges faced and lessons learnt in the west and other Asian cities where such programs have already been implemented. The objective of this technical document is to familiarize city authorities, transport planners, businesses, civil society representatives and policy makers with the various components of a bicycle sharing program, and to provide initial guidance and advice on designing and implementing such programs for Indian cities. An analysis of the existing bicycle rental programs in India and their challenges validates and reinforces the document's objectives.

This technical document reiterates the importance of bicycling in developing cities in Section 2. Section 3 provides a description of the concept and evolution of bicycle sharing programs, the benefits that a city would obtain by developing bike sharing programs and the steps that need to be considered by city authorities before, during and after a public bicycle scheme is implemented. This includes aspects like network planning, infrastructure provision and financing. Section 4 of the document cites examples of public bicycle schemes implemented in parts of Europe and Asia and briefly discusses the key characteristics of these schemes. Section 5, after a brief discussion on the status of NMT in India, describes two case studies where bike sharing schemes have been introduced in India (Delhi and Mumbai), which is accompanied by a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis. Section 6 gives practical suggestions and recommendations for developing cities who want to implement such a program.

It is emphasised that in most cities there is a gap between bicycle ownership statistics and bicycle usage numbers indicating a large group of potential cyclists who could be brought on the road if their barriers are addressed (Tiwari, G. *et al.*, 2009). Introducing public bicycle schemes and providing the supporting environment to encourage bicycling in cities could be one way to achieve this.

key urban transport mode (and not just for leisure purposes) and making it attractive to all user categories, by introducing 'public bicycle' or 'bike sharing' or 'bike rental' systems, where a user can pick up and then drop off a bicycle at certain locations in the city, and use it for a fixed amount of time and cost. Such schemes have demonstrated an increase in the share of bicycle trips and to some extent substitution of walking and transit trips by bicycles in European cities.

The bicycle has traditionally been an integral feature of 'mobility of the masses' even in developing cities. Even today, a significant share of trips in these cities is made on bicycles. Bicycles as transport modes can

2. Cities and bicycles

Since the early twentieth century, riding a bicycle was a common practice in most of the present day *automobile centric* developing cities. Even today, bicycles continue to provide mobility to a large segment of the population in the two largest countries in the region – China and India. However the share of bicycles in urban transport has been steadily declining in both countries (Tiwari, G. *et al.*, 2009).

Several cities in Europe have demonstrated that preserving the bicycle culture and maintaining it as a key transport mode, preserves the city's heritage as well as its modern lifestyles and therefore its future liveability. Learning from the mistakes made by the developed cities could be one approach developing cities can adopt in order to shape the future of their urban mobility and spaces. The streets must be returned to the people and noisy and polluting vehicles should be replaced with clean and healthy travel options. Increasing the shares of NMT and public transport trips is the only way this can be achieved.

On the environmental side, cities in developing countries face severe health problems on account of heavily congested and polluted streets. An improvement in air quality and a reduction in GHG emissions is possible when cities shift to clean transport modes. Table 1 compares the per capita CO₂ emissions from passenger transport from various developed cities around the world with their transport modal shares. It is evident from this that cities having greater modal shares of public transport, walking and cycling have significantly lower *per capita* CO₂ emissions.



Figure 3
In Amsterdam, priority is given to the bicycle and not a motorcar. This shift in priorities makes Amsterdam a clean and healthy city to live in.

Photo: Carlosfeliipe Pardo

Table 1: Per capita annual CO₂ emissions from passenger transport and transport modal shares for selected cities

| City | % public transport, walking and cycling | CO ₂ emissions (kg per capita per year) |
|----------|---|--|
| Houston | 5 | 5,690 |
| Montreal | 26 | 1,930 |
| Madrid | 49 | 1,050 |
| London | 50 | 1,050 |
| Paris | 54 | 950 |
| Berlin | 61 | 774 |
| Tokyo | 68 | 818 |
| Hongkong | 89 | 378 |

(Source: Allen, 2010)

The path towards the above mentioned sustainable modal split (one where public transport, bicycling and walking have a higher mode share than personal motorised vehicles) might not be an easy one for developing cities, as presently the trend is the opposite, where in cities like Delhi, Mumbai, Shanghai, Beijing, Jakarta, Karachi, Dhaka, etc., motorised personal vehicles are growing exponentially and the shares of NMT and public transport vehicles are fast falling. However, these cities should not give up without making an effort. Increasing the modal share for cycling and walking

has been a battle even for cycling and walking friendly European cities. The main reason why these cities were able to achieve their goal was due to proper political decisions taken by these cities. Developing cities need to take similar decisions today.

On the social side, developing decent non-motorised transport facilities is of great advantage for developing cities as cycling and walking are the urban poor’s only medium (besides public transport) to access work, education, healthcare and markets. Therefore, it is not an exaggeration to say that the availability of these facilities or the lack thereof, defines the quality of life of this segment of society as also the level of social inclusion existing in a city’s societal fabric. There are two strong arguments as to why improvements in NMT need to be made keeping in mind the urban poor:

the urban poor:

- This group forms and will most likely continue to be perhaps the most regular and loyal user group of NMT modes for a while, and hence every effort should be made to ensure that they are not forced to shift to using a personal vehicle, due to lack of NMT facilities or adequate public transport.
- Usually the urban poor reside on urban fringes and work near the city centre which implies that they spend a considerable part of their day travelling by NMT or public transport, and hence efforts should be made to ensure their travel is as comfortable, safe and hassle-free as possible.

On the economic front, encouraging the use of cycling and walking will yield long term economic savings in terms of fuel, time, improved human health and wellbeing, user money and environmental benefits, to name a few. The illustration (Figure 4) depicts a study by Interface for Cycling Expertise (I-CE) in which the economic value of planning for bicycling was calculated for Bogotá.

Note that the cost-benefit ratio was 1:7.

In a recent study, I-CE calculated the economic value of planning bicycle facilities in four cities, one of which was Bogotá. The costs of building bicycle paths, their maintenance, and promotion and education campaigns were calculated at USD 178 million over a 10-year period, with construction costs estimated at USD 200,000/km, for a high quality bicycle path.

Savings from reduced infrastructure needs, reduced congestion and reduced pollution due to the replacement of car kilometres over ten years totalled USD 492 million, of which more than half came from savings on parking spaces. Road safety was expected to improve by 50%, based on experiences abroad. This would bring additional savings worth USD 643 million.

Savings on operating costs for road users fore-going car or bus use came to USD 167 million.

The overall result was that benefits should reach USD 1,302 billion over ten years, versus an investment of USD 178 million costs. The benefits were therefore 7.3 times higher than the costs. More information available at <http://www.cycling.nl> (Source: The Economic Significance of Cycling; VNG/I-CE, The Hague/Utrecht: 2000)

$$C / B = 1 : 7$$

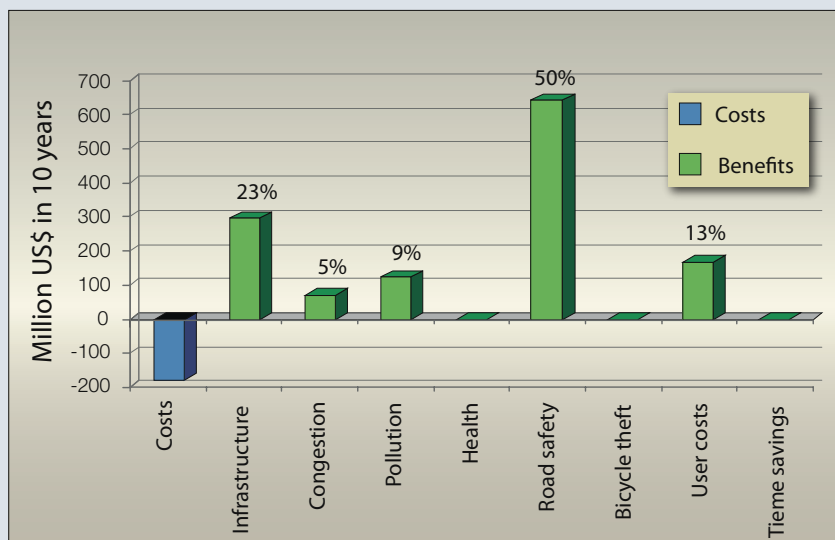


Figure 4
Cost Benefit Analysis of Bogotá's bikeway project.
Source: I-CE & GTZ, 2009

3. Introduction to Public Bicycles or Bike Sharing Programs

Among the various available options for improving cycling in cities, bicycle sharing is one of the popular approaches that many cities are trying to adopt. Bicycle sharing (also known as bike sharing or bicycle rental or public bicycle scheme) is a concept where people use bicycles on an *as-needed* basis without having to own a bike.

Bike sharing is short-term bicycle access, which provides its users with an environmentally friendly form of public transportation (Shaheen, S. *et al.*, 2010). This is usually done by renting/borrowing bicycles from designated places within a city. Depending on the nature of the system, the bikes can be used and then dropped off at designated places.

Bicycle sharing as a concept has been around for over 35 years and has expanded over four continents – Europe, Australasia, North America and South America. Today, there are approximately 100 bike sharing programs operating in an estimated 125 cities around the world with over 139,300 bicycles in four continents and another 45 projects planned in 22 nations in 2010 (Shaheen, S. *et al.*, 2010).

Literature on the subject reveals that bicycle sharing programs have witnessed three generations of change. The first generation system in the 1960s provided free bicycles that were supposed to be used for one trip and then left for someone else. However, this resulted in mass theft of bicycles. The incorporation of designated bicycle stations and the use of coin-deposit locks in second generation systems in the early 1990s created a much more reliable bike sharing system. This method was both dependable and resulted in fewer thefts than before. The third generation bike-sharing programs followed soon after and managed to overcome the challenges faced by the earlier programs. The reason for success goes to the use of technologies like GPS tracking systems, improved bicycle locking systems, electronic booking and automated payment systems, etc. and also better management and organisational structure. The different generations of bike sharing programs have been summarised in Figure 5.

Asia's bike sharing history is limited to third generation IT-Based Systems. Despite its more limited experience, Asia is the fastest growing market for bike sharing activity today (Shaheen, S. *et al.*, 2010). Some of the examples from India discussed later in the paper are essentially examples of bike rental programs.

The operation and contractual arrangements of bike sharing schemes would vary from city to city. Bike sharing schemes can be completely

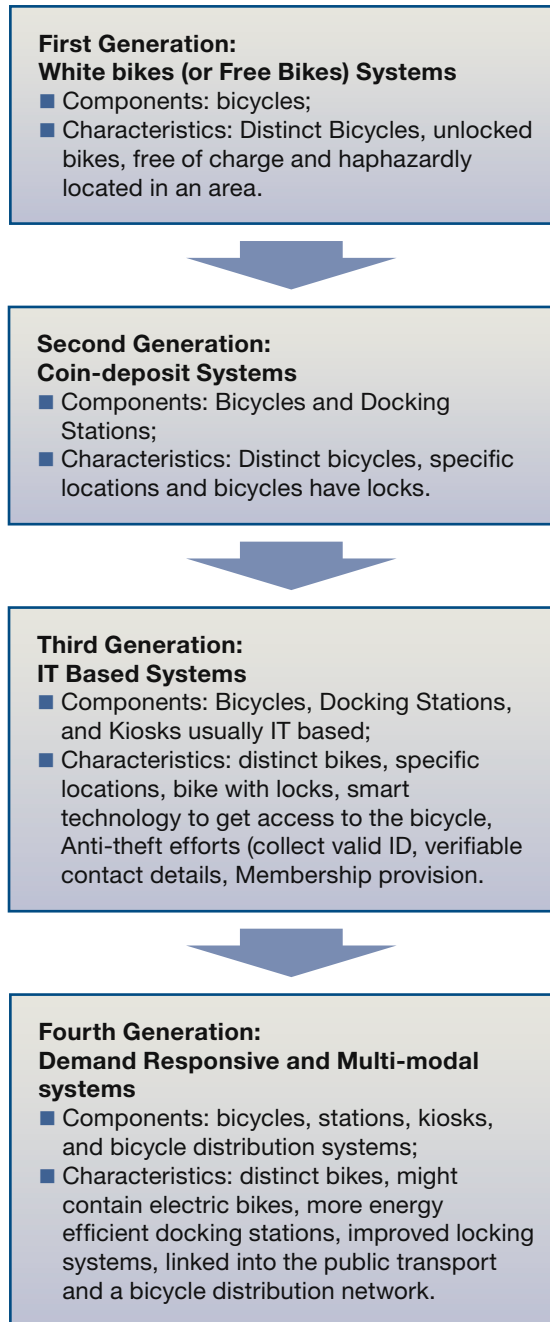


Figure 5
Bike sharing generations.

Adapted from Shaheen, S. *et al.*, 2010

under the municipal control, or completely under a private control or both public-private through a partnership. More on the topic of operations and management of bike sharing programs will be discussed later in the document. However it is important to note here that unlike bike sharing, bike rentals traditionally targets users interested in leisure-oriented mobility and are most prevalent in areas with a high tourist concentration. Bike rental systems generally consist of a single or limited number of bike stations that are operated by a service attendant. A majority of bike rental programs also require users to return rented bicycles to the original bike station and are generally operated on an hourly pricing basis (Shaheen, S. *et al.*, 2010).

3.1 Benefits of bike sharing programs

As stated earlier, bike sharing is an attempt by the city to promote cycling and thus the benefits from bike sharing and cycling in general are bound to overlap. Though the benefits from bike sharing may not be as large as a general city-wide cycling development program, they are valid for the specific areas that get affected by the bike sharing scheme.

- To start with, bike sharing programs are in line with promoting a clean and low carbon transportation system in an urban context, which implies clean air and a healthy lifestyle and also a possible modal shift in cities;
- Bike sharing systems usually are more cost-effective and flexible than the typical investments made in urban transport such as building more roads, flyovers and parking lots, thereby providing more road space for cars;
- The implementation and operational costs are much lower compared to other motorised feeder systems like shuttle services, etc. and at the same time the bike-sharing concept can contribute to increased usage of public transport by acting as effective feeders;
- A bike sharing program encourages people to use low carbon mode for short trips that are otherwise made by a car or by a two-wheeler, especially in developing cities;
- Improved personal health, reduced traffic congestion, fuel usage, air and noise pollution, and preservation of the city space are of course other benefits.

The following section explains the various stages in the development of a bike-sharing program.



Figure 6
Cycling-friendly facilities (infrastructure, signage, parking, etc.) and policies should be encouraged by local governments in order to move towards a higher modal share of NMT.

Photo: Carlosfeliipe Pardo

3.2 Steps for implementing a bike sharing program

Having discussed the benefits of bike sharing, it is important to note that the ultimate goal of the city must not be simply having a bike-sharing scheme but an overall sustainable transport system, and bike sharing is one of the many steps that could be taken to achieve this larger goal. Having this broad vision will enable the city to have a comprehensive bike sharing plan rather than a narrowly defined project just for the sake of doing something.

The following steps for implementing bike sharing programs have been adapted from city wide cycling implementation guidelines discussed in the GTZ and I-CE joint publication titled “Cycling Inclusive Policy Development: A Handbook for detailed explanation on the qualitative and quantitative methods” (2009).

3.2.1 Identifying the location for the scheme and thus its network

Firstly, a land-use map of the potential area needs to be developed or collected from the relevant municipal agency. This will show the various locations such as residential, commercial, schools, etc. that could be potentially tapped for introducing such programs. Ideally, this map should also show the existing road network in the area and the existing non-motorised facilities. In this step the potential area of implementation is studied for the origin and destinations (O-D) points of the people in the area. The O-D map gives an idea on the travel activity of the people to various destinations and a potential demand for cycling.

An important factor here is to also consider the various public transport stations located in the area. Examples are bus stops, metro stations, Bus Rapid Transit (BRT) stations, railway stations, *i.e.* commuter rail or sub-urban rail or trams. This will help in greater integration of cycling with other modes and fulfil the purpose of using cycles as feeders to public transport.

3.2.2 Integrating the Bike Plan into the Transport Plan

A bike rental scheme could be planned for the entire city in the initial stage and implemented in phases. After completing Step 1 for various parts of the city, the idea has to be incorporated into the traffic and transport plan of the city and ensured that provision for cycling is considered in all future transport developments in the city.

3.2.3 Designing Roads fit for Cycling

The design characteristics could vary for residential roads, semi-arterial roads and arterial roads. The residential roads which should have lower traffic speeds will have to be designed primarily for non-motorised transport (both cycling and walking) and discouraging car usage. This would give greater benefit even for the people living in the locality by improving road safety. The semi-arterial roads will have higher traffic speeds than the residential and would consist of commercial activities. On these semi-arterials it is challenging to combine both the non-motorised and motorised modes and carefully studying the details in the design will help in addressing this challenge. Also, these locations need to be considered when planning for bike sharing stations. Designing the residential and commercial areas for pedestrians and cyclists will make the areas more attractive and will in turn increase the turnover for the commercial



Figure 7
Designing roads with bicycle facilities gives importance to cyclists and encourages cycling in a city.
Photo: Andreas Broaddus

areas. On the major arterials, the cyclists need to have a physically segregated space since the speeds and volumes of the motorised modes are highest on the arterials. Special attention must be given to designing the intersections so that there is no clash between the cyclist movement and the motorised traffic. Considering all of the above factors will increase the safety and comfort for bicycle users.

3.2.4 Infrastructure Design: Bike Stations, Parking and Bikes

The infrastructure consideration is one of the crucial factors for the success of a bike sharing scheme. The comfort and the access to these facilities will determine the future ridership or usage of the scheme.

The bicycles used in the scheme can vary depending on the project size in terms of the financial capability of the project. Likewise, the quality of the bikes will increase the comfort for the riders. In an ideal scheme the bicycles will need to be comfortable and sturdy, preferably with adjustable

seats and handles to cater to various customers. Also, the bikes need to have good locking mechanisms to prevent theft. On the higher end the bikes can be fitted with tracking devices that will prevent theft as in the case of the Vélib' scheme in Paris (discussed in the next section). In special cases bicycles can also be specially designed for the scheme with hard-to-remove locking mechanisms. National University of Columbia has a similar system where it provides exclusively designed bicycles free of charge for users on its campus.

Bike stations need to be located in pre-defined centres and at a walkable distance from bus stations, BRT stations, metro stations and other public transport facilities. A bike station can be both manned and unmanned depending on the technology that will be used in the stations and on the bikes. Unmanned bike stations are usually technology dependent (using smart cards, etc.).

It has to be taken into consideration that the bike stations could have some empty bike parking bays for other personal bicycles, which do not belong to the program. Cyclists

can use these extra spaces either at no cost or for a reasonable cost. When such spaces are available close to transit stations or shopping areas, they encourage bicycling as the cyclists are assured that there is a parking place for their bicycle. In an ideal situation it should be possible to leave a bike taken from one station at another station. In some low-end examples such as Bangkok and Delhi the bikes have to be returned to the same station where they were picked up. This system might deter the use of the bicycle unless the trip being made is pendular. On the other hand, regular bicycle parking at major destinations can be coupled with bike sharing schemes and when such parkings are manned, it increases the security for the cyclist. Considering bicycle parking also has additional benefits – it indicates that the city is committed to move away from a motorised dependent development and is promoting cycling, which is a key demand management strategy in sustainable transportation. However, just providing parking would not create a large impact unless it is coupled with other car restraint policies.



Figure 8
Public bicycles in Copenhagen are colourful, free to use for anyone and available at most locations in the commercial district.

Photo: Andreas Broaddus

3.2.5 Financing the Bike Sharing System

A public bicycle scheme will have basically two types of costs – the initial start-up costs and the maintenance or running costs. These start-up and maintenance costs will vary from system to system and mainly depend on how the system is being organised. For example in Paris, the initial system costs were around GBP 90 million (approx. USD 140 million) for installing 20,600 bicycles, which is around USD 6,796 per bicycle (Nadal, 2007). In Paris, the cost of the bicycles and operation are borne by JCDecaux, an international advertising firm, which runs the bicycling system and in return gets access to advertising spaces in various locations of the city. More information on the business models is provided later in this document.

The public bicycle scheme in Minneapolis, M.N., USA has 1,000 bicycles and 75 to 80 stations. The total start-up costs for this scheme was USD 3,387,000 and the break-up of the same is mentioned below (Transport Canada, 2009):

- For bicycles and station – USD 3,200,000;
- For Maintenance equipment and promotion – USD 106,000;
- For salaries and administration – USD 80,000.

The second type of cost, *i.e.* the maintenance or running costs also seem to vary from system to system. For example in Lyon's Vélo'v (also a JCDecaux system) the annual running cost per bicycle was a 1,000 GBP (NICHEs, 2007), while in Minneapolis, the annual cost per bicycle per year was about USD 1,930 (Transport Canada, 2009).

Unforeseen costs such as the theft of bicycles and mishandling of the bicycles is usually considered under the running or maintenance costs, and these costs tend to fluctuate depending on the technology used in the bicycles. Smart bikes such as the ones equipped with GPS and automatic locking system cost anything between GBP 250–1,200 (NICHEs, 2007).

Several systems charge a membership or a user fee to cover the costs of operations to some extent and annual membership fees vary between USD 50–80. Schemes such as Vélib' and Bicing which are run by advertising companies, charge around USD 46 while Montreal, which is not run by any advertising agency, charges an annual membership fee of USD 75.

The user fees are time-dependent and are designed to encourage short term use. Many systems have the first half hour free for members after which the fares increase every 30 minutes. More details on fare structures have been discussed in the next section.

3.2.6 Business Models for Public Bike Schemes

Once the design related aspects are firmed up, the penultimate step is to have a sound organisational structure to support such a program. The success of the third generation programs has increased the number of bikesharing vendors, providers, service models, and technologies. Bike-sharing providers, for instance, range from local governments to transport agencies, advertising companies, for-profit, and non-profit groups, the most prominent ones being partnerships between municipalities and advertising companies (Shaheen, S. *et al.*, 2010). Public agencies under guidance of the local government and not-for profit bike sharing programs, requiring government support at the start-up level, are also emerging models.



Figure 9

A bicycle scheme properly implemented with all the partners in the project contributing fairly, will be financially sustainable and beneficial to everyone.

Photo: Carlosfeliipe Pardo

A fully government run project would imply that the full funding is sourced from the municipality. The advantage here is that it is easier to initiate any design related changes on the roads and policy interventions for promoting cycling in the city. The disadvantage of course is that the local governments usually do not have any funds earmarked for such projects, and as in the case of most Indian cities, have very little say in urban transport matters. More importantly they lack the commitment or interest to pursue such initiatives. This significantly affects the quality of the system being implemented, as was observed in Bangkok, where the local authorities lost interest after starting the scheme as a result of which it did not attract many users.

A large number of European public bike schemes ventured into Public-Private Partnerships (PPP) especially with advertising companies. These companies in return for the advertising space agreed to provide the equipment for the bicycle scheme and also do the operation and maintenance of the system. Should the revenues of the advertising company be larger than the operating costs of the bicycle scheme, the profits were to be shared between the city and the company. On the other hand, if the revenues were lesser than the operation costs the city government would cover the difference. For example in Paris the profits are shared between the city government and JCDecaux, while in the Bicing scheme in Barcelona, the city government covers the operation costs to some extent.

This type of an agreement between the private company and the city government is done as a result of a tendering process for the advertised space in the city where the public bicycle scheme is being introduced. As a part of the conditions in the tender, the provisions of the public bicycle scheme along with detailed description of area, size of the scheme, stations, number of bikes, and often the framework of the charging system, is mentioned. The major advantage for the municipality in this is that there is a lesser burden on it for providing direct funding to set up a bicycle scheme, but on the other hand, the revenues from the advertising space have to be foregone.

Table 2 describes a typical distribution of responsibilities in a PPP model for a shared bike scheme.

Table 2: Roles and responsibilities of the agents involved in a PPP model for Public Bike Scheme

| Agent | Responsibility |
|-----------------------|--|
| Municipality | <p>Roles:</p> <ul style="list-style-type: none"> ■ Provides advertising space ■ Designates station locations ■ Provides space for stations ■ Provides bicycle friendly infrastructure, e.g. bike lanes/tracks <p>Costs covered:</p> <ul style="list-style-type: none"> ■ Cost for constructing bike lanes/tracks ■ May cover cost of stations ■ May cover cost of bicycles and a portion of operation costs |
| Private player | <p>Roles:</p> <ul style="list-style-type: none"> ■ Provides bicycles, station infrastructure and maintenance equipment ■ Provides the technology for system control (if applicable) ■ Provides customer service ■ Provides staff for manning and running the scheme <p>Costs covered:</p> <ul style="list-style-type: none"> ■ Rolling stock and equipment: bicycles, stations, service vehicles, IT infrastructure ■ Operation: staff, maintenance, replacement of bicycles |

Note: This table has been adapted from the Bike Sharing Guide (Transport Canada, 2009)

Apart from these there are also various other business models where the private party's involvement is at a much reduced scale. One such possibility is that the city government or a non-profit organisation appointed by the city government develops a model combining various aspects, as is the case in Copenhagen. The project called *Bycyklen* in Copenhagen is run through public subsidies, bank loans and various other sponsorships. The system does not charge any membership or user charges. The innovative concept here is that the advertisements are placed on the bicycle instead of placing them on the bicycle stations or elsewhere.

Similarly Montreal's BIXI project has an identical model. The BIXI system charges a user fee and gets corporate sponsorships and advertising licenses. The city government only contributed initial capital investment towards planning, implementation and marketing of the system. The system is now owned and operated by a specially created agency called Stationnement de Montreal, a city-owned special purpose vehicle (SPV), that oversees on-street parking and municipal parking lots. This SPV has made an agreement with the aluminium giant Rio Tinto Alcan, which agreed to supply aluminium for the building of bicycles and fund the system operations (Transport Canada, 2009). Also an agreement is made with a local advertising agency Astral Media Outdoor (AMO) to place advertisements at 200 of the 300 BIXI stations.

Alternatively, a for-profit bike sharing program provides profitable bike sharing services with minimal government involvement. Revenue sources include user fee as well as advertising revenue on bicycles and stations.

3.2.7 Marketing Plan and Public Awareness Raising before and after implementation

(Please refer to the GTZ Sourcebook Module 1e: Raising Public Awareness about Sustainable Urban Transport for more information on this topic)

The last step in creating a successful shared bike project is to have a solid marketing plan and regular public awareness campaigns. The marketing of the bike sharing scheme should be carried out as a continuous process both before and after implementation of the system. It is important for people in the city to know that the transformation happening in their city is for their own good, and that they should be a part of it.

So the marketing of the system should focus on informing the citizens of the city on the following:

- The existing transport issues in the city and how those issues will affect their daily lives;
- Strategies that the city aims to implement in tackling the above mentioned transport issues;
- Importance of non-motorised transportation in the city and how it will change their city, possibly with pictures of the future city;
- How the bicycling project could positively change their neighbourhood and lifestyles;



Figure 10
The car-free event in Jakarta attracts people from all walks of life. People come to bicycle, walk, run or simply for leisure.

Photo: Santhosh Kodukula

- The safety issues related with the bicycle sharing project, *i.e.* how the people using the network are secure from the vehicular traffic and what precautions the users need to take while using the bicycle;
- Operational details of the bike sharing system like fares, access, locations, timings, features, etc.
- Integration of the system with public transport.

Marketing could be done in various ways like media (print and electronic), stakeholder discussions, public fora and events, bicycle rallies, demonstration programs in schools, etc.

Some public awareness campaigns/initiatives that could compliment the marketing of the intended program could be:

- **Car-free day:** This is a very famous concept and usually the 22nd of September every year is celebrated as the World Car Free Day. A city can adopt this day for having a bike rally in which people without bicycles are free to use the public bicycles. This campaign will enable people to experience riding bicycles once again, which they would have perhaps done in their childhood. The people participating in this campaign will also experience the other options available for travel in their city and will have a chance to experience the city from a fresh perspective than what they usually see from within their cars.
- **Ciclovía:** Spanish for *bike way*, this is a concept commonly associated with the city of Bogotá. Every Sunday and on public holidays the main streets of Bogotá are closed for motorised traffic from 7:00 until 14:00 and are open for all kinds of non-motorised activities. People come on the streets with their bicycles, roller skates and skateboards and there are aerobics instructors and yoga lessons, and various other street performances that take place. The phenomenon began in 1974 in Latin America and has been steadily supported by various politicians. A part of the credit goes to Bogotá's ex-Mayor Enrique Peñalosa for reviving cycling in Bogotá and carrying on with the *Ciclovía* culture. Similar events also take place on Sunday mornings on some major streets in Jakarta and other cities.

Having similar activities in other cities will not only encourage people to use healthier modes of transport and experience their city in a different fashion, it will also enable people to come together socially and share the common urban space in an equitable and enjoyable manner.

- **Cause related campaigns:** Campaigns are taken up to call for action on various issues such as AIDS, women's and children's rights, malaria, water shortage, etc. There is no reason why cities cannot designate days and campaigns for promoting bicycling, as it is a positive and healthy cause to promote.
- **Critical Mass:** This is a phenomenon that takes place in more than 300 cities around the world on the last Friday of every month where a large number (critical mass) of bicyclists storm the streets of a city in protest of the bicycle-unfriendly of cities. The concept, not so friendly, but effective, was started in San Francisco in 1992 and since then has become popular in many cities. Delhi has had some critical mass activities where the participants went up to 400 cyclists. In some cities the numbers have gone up to 1,000 cyclists. It is important to ensure that such events do not get out of control and violent.



Figure 11
Ciclovías enables people to experience the city from a whole new perspective on a bicycle.

Photo: Tom Goodefrooij

4. Bike Sharing Case Studies from Europe and Asia

There are several cities in Europe and Asia that have implemented or are in the process of implementing public bicycle systems and some of them have even been successful in achieving an increased share of bicycling trips. A few such examples have been briefly described below in order to give readers a snapshot of the basic features of such schemes where they have been already implemented.

4.1 Germany's Call a Bike System

Promoted by the German railway, Deutsche Bahn (DB), in the *Call a bike* service commuters can hire a bicycle at any place and at any time in various German cities by simply making a phone call. These bicycles are attractive in terms of design, cost and accessibility as they can be picked up from any of the S-Bahn stations and dropped anywhere in the city. Even though the system receives substantial subsidies from government (as the rest of public transport systems in Germany), the bicycles are kept in good condition.

Berlin is one of the many German cities where the Call a Bike Program has been implemented. Call a Bike was introduced in Berlin in 2002. As of data available from the year 2008, there were 1,715 bikes operational by DB Rent, a subsidiary of DB (Büttner J, 2009). The city of Berlin was not involved in financing or operating the scheme and the system is totally financed by user fares.

The scheme is mobile phone based, where the rider registers via a hotline number or the company website. Each bike is equipped with a telephone number and the user calls the telephone number to get a 4-digit unlocking code. When the code is entered on the touch screen the bike is unlocked.

Once the journey is complete the user presses the lock button on the touch screen, after which the user again receives another 4-digit code. The user then has to call the hotline and enter the 4-digit lock code and leave a voice message giving the location of the bicycle.

Tariff for using the bicycle is EUR 0.08 per minute or EUR 9.00 for a day. As of 2008 statistics (Table 3), the bikes were rented about 171,000 times in the year (approximately 469 times a day) and around 50,000 customers were registered for the service (Büttner J., 2009).

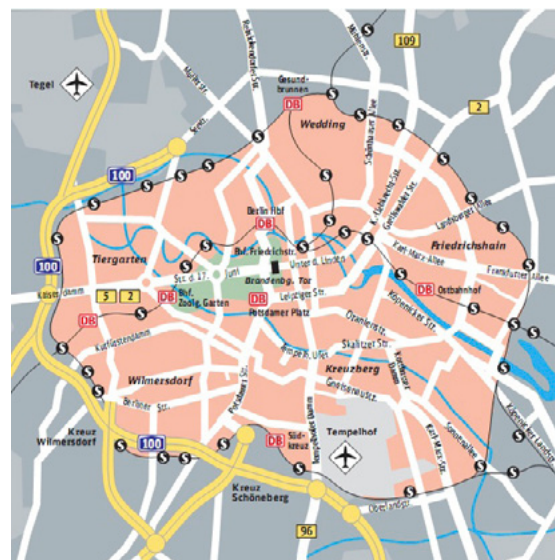


Figure 12

All the S-Bahn stations shown on the map have a Call a Bike facility.

Source: Büttner J, 2009

Table 3: Usage details from the Call a Bike program in Berlin, Germany

| Registrations | | Rents | | | |
|--|----------------|---|---|---|-------------------------------------|
| Total ^(a) | 2008 | 2008 | Monthly Peak ^(b) | Hourly Peak Working Days ^(c) | Hourly peak weekends ^(c) |
| 49,189 | 6,306 | 171,148 | 24,730 July | 18:00 – 20:00 | 14:00 – 16:00 |
| Average Rent Duration | | Bikes | Transport mode substituted ^(b) | | |
| 58 min | | 1,715 | 25 % PT | 4 % Motorised private vehicle | |
| Fare ^{(b) (f)} | | Usage ^(b) | | | |
| Price adequate | Price too high | Daily | Weekly | Monthly | Less frequently |
| 48 % | 45 % | 1 % | 6 % | 25 % | 66 % |
| Trip purpose is leisure ^(b) | | "I use Call a Bike to be independent from timetables and routes of the PT" ^{(b) (d)} | | "Awareness of BSS by bikes and stations" ^(b) | |
| 85 % | | 42 % | | 57 % | |

(a) From the start till 31.12.08 (b) 2008 (c) 2004 (d) Most frequent answer EUR most and least frequent answer (f) regular fare EUR 0.08 per minute

Source: Büttner, 2009

4.2 Vélo'v, Lyon, France

Lyon is the second largest city in France after Paris and has a great potential for tourism. The Vélo'v bike sharing project was started on 19 May 2005 and presently has 350 stations located at various places (every 300 m) around the cities of Lyon and Villeurbanne. The subscription to the service is card based – known as 'Carte Vélo'v' –, which can be purchased either online or at a bike station. The bicycles are accessed using a code given to the subscribers. The duration of the rentals can last from less than 30 min up to 24 hours. A report by the company in 2006 stated that there were over 22,000 rentals, in a day, by more than 52,000 subscribers. The cost of renting of the bicycles is free up to the first 30 min and after that the rent varies from EUR 0.50 to EUR 1.00 for every 30 min depending of the type of subscription. It is found that over 90 % of the journeys last less than 30 min in Lyon¹. The subscription for the service is done through a credit card to ensure that the bicycles are looked after by the users and are returned.

Table 4 shows the usage details of Vélo'v, collected by the OBIS project <http://www.obisproject.com>.

Table 4: Usage details from the Vélo'v bike sharing scheme in Lyon, France

| Rents | | | | | |
|--|---------------------|-----------------------------|--------------------------------|----------------------------|-------------------------------|
| 2008 | | Monthly Peak ^(a) | Monthly Minimum ^(a) | | Hourly Peak ^(b) |
| 6,467,825 | | 717, 309 May | 342,116 December | | 16 – 18h |
| Infrastructure ^(c) | | | PT provided with bike station | | Journey |
| Stations | Hire Points | Bicycles | Railway Station | Metro Station | Average duration |
| 341 | 6,600 | 3,800 | 100 % | 100 % | 17 min |
| User profile ^(e) | | | | | |
| 80 year old ^(d) | Male ^(b) | Student ^(b) | Non-owner car ^(b) | Non-PT card ^(b) | Non-owner bike ^(b) |
| 48 % | 60 % | 35 % | 60 % | 69 % | 96 % |
| "Bike sharing is..." funnier and faster ^(b) | | | | | |
| 50 % | | | | | |

(a) 2008 (b) 2005 (c) 2009 (e)2006

Source: Robert and Oliver, 2009

4.3 Vélib', Paris, France

In 2007, Paris, France, introduced a bike sharing system known as Vélib'. Currently it is one of the most successful systems in the world and also the largest. The idea was strongly supported by the then mayor Bertrand Delanoë. The system currently has 24,000 bicycles in more than 1,750 automated stations².

The subscription is done online for a long-term membership and for a short-term membership. For immediate trips the user can use the service

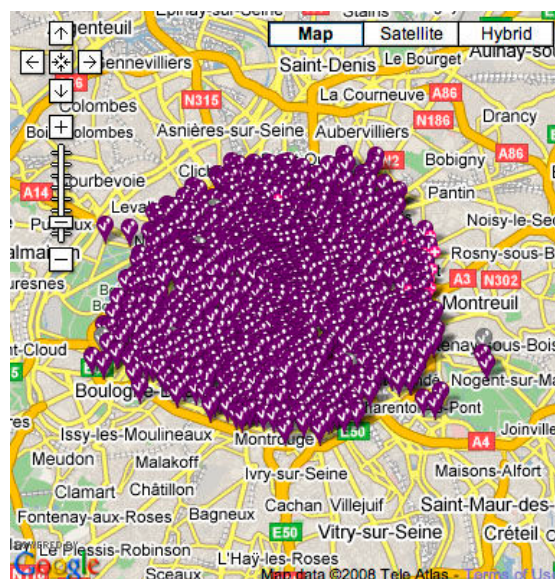
¹ The information above is taken from Wikipedia: Wikipedia, 2010, Vélo'v. Available at <http://en.wikipedia.org/wiki/Vélo'v>. Accessed on 8 July 2010.

² <http://www.guardian.co.uk/environment/2010/jul/20/london-bike-hire-scheme-paris-velib>. Last accessed on 12 August 2010.

Figure 13

Vélib' bicycle stations in Paris.

Source: Google Maps



through a credit card. Each subscriber is given a number, which has to be entered to obtain a bicycle. There is also a EUR 150 security deposit, in case the bicycle is lost or stolen. The cost of using the bicycle for up to 30 minutes is free, and from then on increases progressively. Table 5 explains the progressive fare scheme of Vélib'.

Table 5: Progressive Tariff – Vélib'

| Time | 0:30 h | 1:00 h | 1:30 h | 2:00 h | 5:00 h | 10:00 h | 20:00 h |
|------|--------|--------|--------|--------|--------|---------|---------|
| Rate | Free | EUR 1 | EUR 3 | EUR 7 | EUR 31 | EUR 71 | EUR 151 |

The system is completely operated and maintained by JCDecaux in return for advertising space and maintenance of city bus stops in Paris. Further, the city receives all the revenues from the bike sharing system. In 2009, the city agreed to pay USD 500 per bicycle for replacement due to high levels of thefts and vandalism. This contribution accounts up to USD 2 million per year³⁾. The system also faces some technology related glitches like malfunctioning displays at bike stations and over or under billing due to unsynchronised clocks between stations. The city council has assured the users that these faults will be rectified and where ever applicable refunds will be made to the riders.

The user reaction towards the system has been largely positive. Many feel that the system is very good for the environment and addresses the air quality issues in Paris.

Another noteworthy fact contributing to the success of the Vélib' project is the integration of bicycling into the master plan for Paris. Money was invested into widening the pavements (from 4 to 8 metres) for pedestrians, planting trees and building bikeways. The result of the investments was that in 2001 the bicycle share in Paris was around 1 % of the 10.6 million daily trips, while from 2001 to 2006, the bike share increased to 48 % with no additional bicycle crash or injury (Nadal, 2007).

Further, several traffic restraint measures were also implemented by Paris which reduced the private motorised traffic by 20 % and truck traffic by 11 % between 2001 to 2006, *i.e.* prior to the implementation of Vélib' (Nadal, 2007).



Information, reservation and payment terminal

Your Vélib' bicycle

Bicycle attachment point

| Rates after the first 30 minutes | |
|-------------------------------------|-----------------------------|
| 1 st additional 1/2 hour | 1 € |
| 2 nd additional 1/2 hour | 2 € |
| as of the 3 rd 1/2 hour | 4 € per additional 1/2 hour |

- ◆ Vélib' is adapted to everyone
- ◆ Thousands of self-service bicycles
- ◆ Available 24/7
- ◆ A station every 300 metres
- ◆ First half-hour free
- ◆ Accessible to everyone from the age of 14

Compatible bank cards



*for Visa Electron and Mastercard Maestro cards, your payment limit will be reduced during the validity period of your subscription, for the amount of the security deposit.

Subscribe for 1 year

◆ How?

You have the option of taking out a 1 year subscription. To obtain information about an annual subscription, go to the velib.paris.fr website.

◆ How much?

The  1 year card costs 29 €. This subscription entitles you to an unlimited number of journeys for 12 months, the first 30 minutes of each journey being automatically free of charge.

³⁾ <http://en.wikipedia.org/wiki/Vélib'>. Last accessed on 4 July 2010.

Figure 14
Subscription information from a Vélib' brochure.

4.4 Hangzhou Public Bicycle Service, Hangzhou, China

The largest and most famous bikesharing program in Asia is the *Public Bicycle* system in Hangzhou, China. Launched by the Hangzhou Public Transport Corporation in 2008, this system was the first IT-Based system in Mainland China. With a population of 3.73 million, Hangzhou's high population density makes it a promising bikesharing location (Shaheen, S. *et al.*, 2010). Hangzhou's system operates with 40,000 bicycles and 1,600 stations and is expected to expand to 50,000 bicycles and 2,000 stations by the end of 2009 (Shaheen, S. *et al.*, 2010). Following the success and popularity of the program in cities like Hangzhou, Beijing, Tianjin, Hainan and Suzhou launched pilot programs in 2008 and 2009.



Figure 15
Hangzhou Public Bicycle Service.

Source:
<http://bike-sharing.blogspot.com>

Membership for the system is essential and it can be obtained by using a valid identity card along with a security deposit of CNY 200 (USD 29). The system is free for use during the first hour to its members. Charges increase progressively with hours.

The potential of bikesharing programs to reduce vehicle emissions is promising when one considers current data on modal shifts. For instance, in a recent survey of SmartBike members in Washington, D.C., researchers found that bike sharing drew nearly 16% of individuals who would otherwise have used personal vehicles for trip

making. Vélo'v in Lyon, France reports that bicycle use replaced 7% of trips that would otherwise have been made by private vehicles, and in Paris, 20% of Vélib' users also reported using personal vehicles less frequently (Shaheen, S. *et al.*, 2010).

After an overview of a few bicycle sharing programs around the world, the next section focuses on the application of this concept in the Indian context, with the help of a few case studies.

5. Public Bicycles in India: Case Studies from Delhi and Mumbai

5.1 Status of NMT in India

Despite the perceived increased usage of personal vehicles in Indian cities, there is still a considerable share of the population that commutes by walking and cycling. Most of the medium and large cities in India have about 56–72 % trips which are short trips (below 5 km trip length), offering a huge potential for bicycle use. Bicycle use varies from 7–15 % in large cities to 13–21 % in medium and small cities. Bicycle ownership is very high in all Indian cities. Most of the medium and large cities have 35–65 % households owning one or more bicycles as per Census 2001, whereas in the smaller cities, ownership varies between 33–48 % (Tiwari, G. *et al.*, 2009). Most of this population belongs to low income categories that either cannot afford to use public transport or cannot find suitable public transport on the routes that they want to travel on.

Therefore, it is worth mentioning that the need to address aspects relating to promoting bicycling as an important mode of transport in Indian cities, not only assumes importance from the point of view of increasing the share of a clean and carbon-free mode of transport in the city, but also that many people depend on cycling for their livelihood and any interventions made must keep in mind their needs and usability.

In 2006, the Government of India in its National Urban Transport Policy (NUTP) laid huge emphasis on the need for increasing the modal share of non-motorised and other clean and low-carbon modes of transport in cities. Towards this, it clearly stated that “*The Central Government would give priority to the construction of cycle tracks and pedestrian paths in all cities, under the National Urban Renewal Mission (NURM), to enhance safety and thereby enhance use of non-motorised modes. Cities would also be encouraged to explore the possibility of a public bicycle program, where people can rent a bicycle for use in specially designated areas*” (MoUD, 2006)

Despite the NUTP, the car-, fuel- and road lobbies traditionally being the strongest and highly influential, continue to dominate the urban transport planning scenario, where more cars and two-wheelers get added to roads daily and in turn more road space gets taken away from cleaner modes. Most of the traditional city level planning documents like Master Plans, budgetary allocations for city infrastructure, etc. do not incorporate components that include/promote non-motorised



Figure 16
Cyclists on Delhi roads amidst mixed traffic conditions.

Photo: Chhavi Dhingra

vehicles friendly elements, as a result of which cyclists and pedestrians get completely neglected in the overall process of ‘city development’. Also, even though the budgetary outlay for transport in the city government plans has been increasing over the years, the fund allocation towards pedestrian, bicycle and NMT improvement is merely less than 1 % of the total annual transport budget outlay (Jain and Tiwari, 2009). Bicycles are still perceived to be a ‘poor man’s travel mode’. This perception hinders the acceptability of programs like bike sharing. It is only recently that a few state and city governments have started to recognise and somewhat address this issue. Cities like Delhi and Ahmedabad introduced dedicated bicycle tracks along their new BRT corridors. However, due to issues like lack of enforcement in preventing the two wheelers from riding on the tracks or improper track design and surfacing, cyclists have not been able to fully derive the benefits of using them.

One of the key problems is that there is not enough awareness raising and campaigning that is being done to promote bicycling as an attractive means of transportation. This barrier has to be overcome through proper initiatives on part of city governments and other interest groups. Despite being emphasised in the National Urban Transport Policy and planning documents like the Delhi Master Plan, there is hardly any focus on bicycle planning, its demand estimation and inclusive thinking amongst policy makers at local levels. There are no targets set or authorities created to work towards increasing the shares of bicycle trips in cities. To start with, there is a need for tools, models and manuals to estimate and design for the bicycle demand, which practitioners can use easily for planning, designing and advocating the bicycle infrastructure construction (Jain and Tiwari, 2009). Once good and safe infrastructure is in place, people will get attracted to the idea of using bicycles more regularly.

In order to promote the use of bicycling for all categories of users and not just the urban poor (who cannot afford other modes) in the long run, it is essential for the motorists to recognise the benefits of bicycling and acknowledge it as a respectable and safe mode of travel. This is where the concept of bicycle sharing or public bicycling will be instrumental as it will provide a platform and transition for promoting bicycle usage for making short distance and feeder trips, as a starting point.

More details on the challenges of bicycle usage and experiences from public bicycle schemes in India have been discussed in the subsequent sections.

5.2 Bike rental programs in India

The concept of bike sharing has been recently introduced in India and a few cities have already begun to experiment with the idea.

5.2.1 “GreenBIKE” – Cycle Feeder and Rental Scheme, New Delhi

To address the challenges that rapid motorisation has posed on Delhi today and arrest the rapidly falling public transport shares in the city, the Delhi Government has formulated its *Delhi Integrated Multimodal Transport Vision 2021* which comprises of an extensive metro and bus rapid transit network. In order to achieve a safe and convenient multimodal, door-to-door mobility solution it is essential to provide high quality feeder services to and from the stations.

A large number of commuters use bicycles to go to work in India; however given that there are no special facilities for them on the roads, cycling in Indian cities is quite a dangerous and an unpleasant experience. In Delhi, cyclists constitute 5 % of the total trips but 14 % of the fatalities (Mohan and Tiwari, 1999). The Delhi Bicycle Master Plan states that 40 % reduction in road fatalities could be achieved if the city developed a proper bicycling network (DIMTS, 2010).

The first ever effort in this direction was the creation of 2.5 metres wide segregated bicycle lanes along the pilot 5.8 km stretch of the Delhi BRT corridor (DIMTS, 2010). Delhi Integrated Multimodal Transport System (DIMTS), a joint venture company of the Government of National



Figure 17
Bicycle tracks run parallel to the BRT corridor in Delhi.

Photo: Chhavi Dhingra

Capital Territory of Delhi and the Corridor Manager for the Delhi BRT System, in October 2009, set up a bicycle rental scheme along the BRT corridor called “GreenBIKE – Cycle Feeder & Rental Scheme”.

The facility is presently available at five BRT stations along the BRT corridor. Each station is equipped with a station guard who takes care of the registration procedure. In order to rent a bicycle the user has to provide a valid Indian ID-Card, Voter Card or Driving License which will be kept as a deposit until the return of the bicycle at the station (GTZ, 2010).

In a field survey carried out by IIT Delhi in 2007, it was felt that certain bus stops along the BRT corridor required a bicycle facility, and this would greatly benefit the commuters providing them with a smooth inter-modal connectivity, thereby also increasing the ridership of the BRT system. GreenBIKE is the first of its kind initiative in Delhi, which integrates a bus system with cycling (DIMTS, 2010). Here one can rent a bicycle from 8:00 until 20:00⁴⁾ and one can pick up and drop a bicycle at any of the rental stations along the BRT corridor. The cycles are priced at INR 10 for four hours, with an additional INR 5 charged for every extra hour after that. The membership fee of INR 100 is charged for one year. Every day around 40–50 persons use the facility and daily collection is around INR 200–250 (DIMTS, 2010).

The capacity of the docking stations at both the BRT and metro stations is not more than 10–12 bicycles, which is quite low.

According to the DIMTS 2010 Report, it has signed an agreement with Planet Advertising Pvt. Ltd. to build, operate and manage the bicycle stations along the BRT Corridor for a



Figure 18
The conditions for getting access to a public bike in Delhi are stringent. Non-locals can access the system only by submitting their passports.

Photo: Chhavi Dhingra

⁴⁾ Bicycles are also available after 20:00 but at a flat rate of INR 100/-

Figure 19
The public bike stations in Delhi are manned and the locking system uses the conventional chain and lock mechanism.

Photo: Chhavi Dhingra



period of 5 years. The concessionaire pays INR 20,000 (approx. USD 450) per month per station and make revenue through selling the advertisement space on bicycle station and hire charges. On the other hand, the concessionaire made initial investment and bears the recurring charges for the maintenance and upkeep of the facility. Though the user saves almost 20% cost on each trip, since the revenues from the user fees hardly cover the salary of the station guards, the project mainly relies on advertisement space at the stations as a source of revenue (GTZ, 2010).

DIMTS is actively promoting its bicycle sharing program through regular media appearances and by organizing bicycle rallies, etc. in the city and has a plan to expand this program for all future BRT corridors in the city.

In February 2010, the German Technical Cooperation (GTZ) in cooperation with DIMTS carried out a user perception survey (final sample size = 116) for the rental bicycle users along the pilot BRT Corridor in Delhi. Key findings of the survey results are discussed below⁵⁾:

- i. Each station had a daily average of 11 customers.
- ii. The typical user of the Delhi bicycle sharing project is between 20 and 30 years old, male and earns between INR 2,000 and 10,000 a month. This main target group resembled that from other bicycle sharing projects in Europe.
- iii. 62.3% of the users possess a personal vehicle. 43.0% own a two-wheeler, 18.4% own a bicycle and 12.3% own a car.
- iv. Regarding the reasons to rent a bicycle, 71.9% users said that it was a convenient and fast mode of travel, 67.5% said it offered a cheap mobility solution and only 11.5% of the people mentioned that they did not have another choice than renting a bicycle to reach their destination. This indicated that a large number of people on this corridor were choosing to bicycle, because it was a fast and convenient choice, and not only out of compulsion.
- v. 49.6% of all respondents rented a bicycle at least once a week.
- vi. The average rental time was 174 minutes, which was a very high figure compared to most other rental schemes in the world. With a bicycle occupancy rate of 1.1, the average number

⁵⁾ Data courtesy Mr. Sebastian Schlebusch, Intern, GTZ.



Figure 20
The bicycle rental in Delhi is a very cumbersome process. The quality of the bicycles is not uniform at all stations.

Photo: Santhosh Kodukula

of trips per day worked out to be only 55 along the BRT corridor stations, which was quite inefficient. This was due to the non-existence of a cycling network in the city and the restriction imposed by the system where the bicycle must be brought back to its origin rental station.

- vii. The user evaluation that the scheme received was very positive, with almost 99.0% respondents saying they would use the system regularly. Given this positive feedback, the scheme has already managed to attract quite a few users who rent bicycles frequently. 49.6% of all respondents rent a bicycle at least once a week.

Around 8 metro stations in Delhi have provided users a bicycle rental facility similar to the Green Bike which is also operated by the same company, Planet Advertising Ltd. An interesting feature of the bicycle rentals at the metro stations is that the smart card holders of Delhi Metro can park their personal bicycles free of cost at these rental facilities, while others will have to pay a nominal amount of INR 2 for parking their own bicycles at the stations. These facilities were generally found to be not very well managed and maintained, and thereby not attractive.



Figure 21
The bike rental service at the metro rail stations are usually in the car parking area and the bicycles are blocked by the parked cars.

Photo: Chhavi Dhingra

5.2.2 Delhi Metro Cycle Feeder Service, New Delhi

In March 2010, two private entrepreneurs formed a company called Delhi Cycles Private Ltd. (DCPL), and proposed a business plan to the Additional Commissioner of the Transport Department of Delhi Government to implement a third generation bicycle sharing system in the city. Their project was carefully thought of by the entrepreneurs after having studied the operational details of the previously discussed scheme.

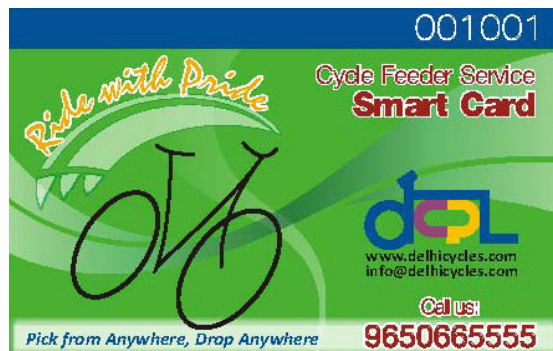
This is intended to be another bicycle rental service (a pilot) where one can hire a bicycle from a bicycle sub-stand close to one's origin and drop it at the metro station and continue their journey

on the Delhi metro. This system proposes a hub and spoke architecture of metro station rental stands with 6–7 substations in residential and commercial areas within the radius of 2–3 km of the metro station. Currently, the system is not fully operational although there is a docking station with 25 bicycles at the Rohini East metro station; the proposed sub-stations for accessing the metro station are yet to be developed. More information on this scheme can be found at: <http://www.delhicycles.com>.

Figure 22

Picture of the Delhi Metro Cycle Feeder Service Smart Card. Despite all the preparations, this scheme has not been able to kick off yet.

Source: <http://www.delhicycles.com/get-a-smart-card.html> (last accessed on 9 August 2010)



The rental procedure is based purely on a smart card system with a registration procedure similar to the sim-card registration of mobile phones, thus it is common knowledge to most citizens. By using the smart card system, it is also possible to monitor traffic flow in real time, thus offering government bodies with essential information about origin destination patterns and traffic flow data of rental cycles (GTZ, 2010). In many ways, this service might cater to the slightly higher income classes, as it requires an up-front payment of INR 350 to make the card, of which INR 300 is refundable fee. On the other hand, it will save commuters the hassle of carrying original identification documents with them all the time, as is the case in the GreekBike system discussed earlier.



Figure 23

The space for bicycle parking at a metro station overlooking the road is used for advertising. Unlike the BRT stations, in this case the existence of the bike rental facility is not evident at all from the main road.

Photo: Santhosh Kodukula

The fare structure is INR 3 for the first 30 minutes and INR 3 for each additional 15 minutes. This gives the users incentives for making shorter trips as compared to the BRT Greenbike system and is ideal for making feeder trips in dense areas. However, this scheme as of now does not appear to be financially viable as DMRC has put restrictions on using advertising as a revenue source. International evidence from bicycle sharing systems shows that all financially viable schemes have to integrate advertisement revenues, as the user fares are supposed to be relatively low to attract as many people as possible (GTZ, 2010).

One reason why this service has not started despite the availability of bicycles and smart cards is that the service providers have been waiting for the last eight months to seek approval for using land spaces in various parts of Delhi as sub-stations from the Delhi government. DCPL feels that without proper government support, its investment will be a waste and the company will go into a huge deficit. Even if the government does not provide a subsidy but soft loans like advertising provisions, etc. the company can survive. At the moment DCPL pays the Delhi Metro Rail Corporation 25% of every INR 3 it earns, and will need to pay a similar amount to the Municipal Corporation of Delhi as rent for land space for sub-stations. The company plans to eventually extend the service to all 86 metro stations with a suitable number of substations, as also introduce modern IT systems in the bikes. However, given the challenges it currently faces in terms of acceptance and support from the government, it might have to withdraw this pilot initiative completely.

Though there is enough potential to develop a full-fledged bicycle sharing system in Delhi to decongest the city and create a clean and safe travel environment, due to many factors the usage is still limited and inhibited. GTZ SUTP's own research and discussions with urban transportation experts and entrepreneurs of bike sharing programs revealed that several challenges remain in order to make bike sharing systems a wide success in Delhi.

Challenges faced in Delhi

- i. Lack of interest amongst policy makers and city leaders to champion this cause and make it a part of the city was one of the key issues faced by service providers of shared bicycle schemes. As discussed earlier in the business models section, the common practice in other countries is that if the program goes in loss, the government steps in and provides financial assistance, in order to keep the system going. This is because such systems are essentially city/public welfare projects. However in Delhi, private service providers revealed that the government was of the view that the entire risk of running the system should be borne by the service provider, and if the system was successful, there was no incentive for the service provider, however, if it failed, the service provider must bear all associated losses. Obviously, such actions would only discourage people from coming up with good ideas for the city.
- ii. There is lack of a strategic plan due to the difficulty of implementing it across individual agencies which work to their own agendas. As a result, there is no progress on making a bicycle and pedestrian friendly city or even bicycle-friendly localities. In the absence of full government backing, the initiatives remain piecemeal and one-off.
- iii. Unwillingness to devote resources at the administrative level is another challenge. Cycling is seen as trivial investment and does not attract the same fancy political imagery that metro rails, expressways and other cost intensive projects do. The Delhi model is working so far due to whatever the advertising revenue generates. However, more enthusiasm and interest on part of the government is required if this activity is to spread wide in the city.
- iv. Lack of cycling friendly infrastructure is a real barrier to making local trips by bicycles as is the lack of traffic calming.
- v. The quality of cycles is quite poor and so is the maintenance arrangement. Features like helmets, baskets, lights, gears, adjustable seats, etc. are missing in most cases. Technology needs to improve to offer consumers a '21st century' cycling experience similar to the one they have by using a metro. This becomes especially important in Delhi where cycling is seen as a 'poor man's transport mode'. This will greatly help in changing the users' perception towards bicycles and cycling as an activity.

- vi. The GreenBike system could get a bit inconvenient to access, as one needs to have an original identity proof (having an address) with them at all times, in order to access the system, which is something people are not habituated to. This discourages a lot of fresh new users who want to simply try the system. However, relaxing this condition in the past led to bike thefts, where the thieves could not be traced due to lack of proper address records. Therefore, unless money is invested for introducing more sophisticated systems to access bikes and prevent bike thefts, there will always be a trade off between attracting more riders and keeping the bicycles secure.
- vii. It is a challenge to make one holistic and integrated program in a city like Delhi where one needs to get the agreement of so many different (and competing) agencies which do not necessarily work in a co-ordinated manner.
- viii. There is also very little and vague information available on how many trips the potential cycling user groups could make and hence their needs do not get incorporated into planning for bicycle sharing.

5.2.3 FreMo, Thane

Inspired by Spain's 'Bicing' program, and derived from the phrase *Freedom to Move*, FreMo (<http://www.fremo.in>) was launched by Ecomove Solutions Pvt. Ltd (<http://www.ecomovesolutions.com>) as a networked bicycle rental service in Thane, a city lying northeast of Mumbai, and part of the Mumbai conurbation, in January 2010. This was intended to create convenience for people to use bicycles for their daily short distance travel needs, and in turn help achieve a reduction in fuel consumption, traffic congestion and pollution (both noise and air) thereby creating better health for people and the city.

The scheme was targeted to create multiple depots across the city so that members of this programme could take a bicycle from any designated location and leave it in designated another location of his/her choice. This system was mainly targeted at the *last leg* transportation segments, where users would use the service to access the key public transport modes (mostly train in the case of Mumbai).



Figure 24

FreMo is a bike sharing program in Thane, Maharashtra. This system imitates the Bicing model of Spain.

Photo:

EcoMove Solutions Pvt. Ltd., 2010

In Mumbai, almost 22 million passenger trips are made per day and public transport is used for over 75 % of all motorised trips in Greater Mumbai. Out of this, shares of rail and bus are nearly equal. What is interesting to note is that 25 % of all bus trips are actually feeder trips to the train having an average trip length of 2–5 km⁶⁾. This is the travel segment that FreMo essentially targeted to capture. More specifically the target segments included white collared commuters essentially from the lower-middle and middle class segments, which commuted 2–5 km from their homes to the train stations; college students commuting by trains; courier companies/delivery boys and large corporate/institution campuses.

FreMo has currently 5 rental stations in Thane and works purely on a membership based

⁶⁾ <http://www.123eng.com/projects/EFFICIENT%20TRANSPORTATION%20SYSTEM.pdf>. Last accessed on 30 July 2010.

structure. Various depots are established at strategic locations across the city, where anyone can go and register themselves. These depots are run manually with the help of depot staff. With the membership/access card, anyone can pick up and drop a bicycle at any of the depots during the day. Bicycles cannot be retained overnight by users. Along with the bicycle, the service provides to the customer on a need basis, a sackbag for carrying things, helmets and raincoats, which are to be returned to the depot after use. The charges are very competitive with different usage plans available for subscription.

A smart card is issued to each of the member, who will swipe the card, take the bicycle, and swipe it again while leaving the bicycle. Every bicycle is also fitted with RFID (Radio Frequency Identification) and therefore, each bicycle is identified by a specific number. Also each bicycle is designed to be different for easy identification.

A yearly plan would cost the subscriber eight paise⁷⁾ per minute. Due to the software system, the charging is clocked at minutes, which means that if a subscriber uses the bicycle for 5 minutes, the charges will be just 40 paise. Similarly, if he uses for 60 minutes, the charges will be INR 4.8. Being a for-profit business, FreMo offers multiple pricing plans to its users keeping in mind their possible usage needs⁸⁾. FreMo estimated that its members will be able to save anything between INR 10–45 per day on travel⁹⁾. Also, once a member, a person would also become eligible for the free personal accident insurance of INR 500,000.

Challenges faced in Thane

Despite its huge potential, this initiative in Mumbai did not achieve the desired results. In fact the service providers are now at the brink of shutting down the services, as it is not able to generate the anticipated ridership and hence the returns, forcing the entrepreneur to consider withdrawing the services. GTZ-SUTP team's interaction with the service provider revealed the following as some of the key challenges that had to be faced in Thane while implementing the bike sharing scheme:

- The government agencies did not seem to get excited by such an idea and were not too supportive of the initiative. This led to the service provider going ahead alone and launching the bike sharing scheme, which did not generate much buzz or support amongst the public, as some of the fancier projects like the Bandra-Worli sealink expressway or the Mumbai Metro would have generated.
- Another challenge was in terms of acquiring the depots at strategic locations. Each depot, being located in important transport junctions, was extremely expensive, which again the service provider had to acquire without any financial aid from the government.
- The major challenge was to reach out to the people to take this as a mode of transport. In a society where buying more and more luxurious cars is made to look trendy, making people use a bicycle was a difficult task! People's perceptions of bicycling being an unsafe and a sweaty activity made it difficult to attract riders. An online survey conducted by the service provider as part of his marketing plan revealed that among 1,217 respondents, 74% people said that they would like to travel short distances on bicycle, out of which 87% of the respondents were male and 86% of the respondents were in the age group of 21 to 50. An opinion poll in Mumbai Mirror (Times of India Publication) published on 4 June 2009 also showed that whopping 90% people would like to use cycles for their travel. Yet, people are reluctant to use bicycles as a daily commuting mode.

Despite the above challenges, the service providers, determined to encourage the use of cycling in the city, have now started providing bicycle facilities to large residential complexes and industries in Thane as 'doorstep delivery' model. These cycles are available on a monthly rental basis and users

⁷⁾ 1 INR = 100 paisa

⁸⁾ <http://www.fremo.in/FeesAndMemberships.aspx>. Last accessed on 10 August 2010.

⁹⁾ <http://www.fremo.in/HowItWorks.aspx>

can use them for short distance commuting, even within the housing or industrial complexes¹⁰. Finally, to conclude, given that there are about 90 railway stations, 50 bus stations (depots) and 50 projected metro stations in Mumbai, with such potential for introducing public bicycles, it will be a pity if bicycles are not made a part of this network.

5.3 Comparison of features of existing bike rental programs in India with features of other typical bike sharing schemes

Table 6 summarises the key features available with the three Indian bike rental examples discussed earlier and indicates further scope for improvement.

Table 6: Comparison of bike rental schemes in India

| Features of a typical bike sharing program | FreMo, Thane | GreenBike Cycle Rental and Feeder Scheme, Delhi | Delhi Metro Cycle Feeder Service, Delhi |
|--|--|--|---|
| Distinguishable bicycle fleet | Yes (carries logo) | Yes (carries logo) | Yes (carries logo) |
| Features like gears, lights, adjustable seats, etc. | No | No | No |
| Provision of chain lock and helmets with the bikes | Yes (helmets only) | No | Yes |
| Number of stations (Nos.) | 5 (at selected locations in the city) | At 5 BRT and approx. 8 metro stations | 3 metro stations |
| User interface technology | Yes (smart card reader at stations) | No (manual station attendant) | Yes (smart card reader at stations) |
| Locking mechanisms | Conventional chain lock mechanism | Conventional chain lock mechanism | Conventional chain lock mechanism |
| Usage eligibility | Access card (for registered members only) | Both members and non-members need to deposit valid original proof of identity, which is returned after the trip | Smart card holders only |
| Pricing | Multiple plans. Increases with reduction in usage time (ranges from INR 4.80 to INR 18 per hour) | INR 10 for 1–4 hours; INR 5 for each hour extra | INR 12 per hour |
| Theft deterrents | Membership card can help trace user | Membership card can help trace user; for non-members they deposit their original Id cards, so can be easily traced | Smart cards carry user details which can be traced |
| Ubiquity (provision to access and drop the bike at any of the designated stations) | Yes | No, bikes must be returned to the station where they were picked up from | Yes |
| Integration with public transport | Yes (important transport junctions are covered); no fare integration | Yes (only in terms of infrastructure, bicycles are not allowed on board the bus or metro); no fare integration | Yes (only in terms of infrastructure, bicycles are not allowed on board the metro); no fare integration |
| Financing | Individual investor | PPP (partnership between a Public Sector Undertaking and an advertising company) | Private company |
| Support of local authority | Only for provision of station space | SPV set up by Delhi Government initiated the concept | Only for provision of station space |

Note: The comparison given above is more basic and factual. It does not of course indicate if the features are working successfully or not.

¹⁰ <http://epaper.hindustantimes.com/PUBLICATIONS/HT/HM/2010/07/31/ArticleHtmls/For-cleaner-air-31072010581003.shtml?Mode=1>. Last accessed on 6 August 2010.

It is evident from Table 6 that the bike sharing systems introduced in India so far are somewhere between the 2nd and 3rd generation bike systems (*cf.* to Figure 5). Having said that, it is important to note that given the rudimentary challenges that developing cities still face with respect to non-motorised transport, it may not be possible and enough to simply replicate a system from the West in these conditions.

5.4 SWOT analysis for implementing bike sharing schemes in India

Based on the experiences of Thane and Delhi, Table 7 presents a SWOT analysis for implementing bike sharing schemes in India.

Table 7: SWOT Analysis

| | |
|---|--|
| <p>Strengths</p> <ul style="list-style-type: none"> ■ Very low cost of travel as compared to other modes for short distance travel; ■ Good for health; ■ Environmentally friendly; ■ Low recurring costs (salaries and servicing only); ■ Cycling is not a new mode and most people have cycled as children in india, which makes the learning curve not very steep; ■ More usage will result in overall reduction of GHG emissions and bringing down global warming; ■ Public spaces made available to the people, not to vehicles. | <p>Weaknesses</p> <ul style="list-style-type: none"> ■ Lack of strong political commitment towards sustainable urban transport planning and cycling as main travel mode; hence governments do not have much faith in the service providers or first generation entrepreneurs; ■ Poor bicycling infrastructure; ■ Mixed traffic conditions; ■ Concerns about safety, especially of children on roads are valid; ■ Poor image of cycling in the society; looked upon as a ‘poor man’s mode’ and against rising social status; cost intensive projects like metros, parking lots and expressways receive more campaigning, advertising and popularity as they are perceived as ‘modern’; ■ Inadequate data on user groups and their needs. |
| <p>Opportunities</p> <ul style="list-style-type: none"> ■ With the nstp, cities in india are in the process of revamping public transport infrastructure and services, and these could be easily tied in with such schemes; ■ There will be an increased demand for feeder services once more brt and metro systems come up; especially delhi and mumbai will have lot of potential; ■ New housing complexes, high rise buildings, etc. That are coming up can all make bicycle sharing programs part of their development; ■ People’s interest in cycling for better health and environment may in turn also increase public transport patronage if proper integration is provided, as also will concessions offered on public transport fares for bicycle users. | <p>Threats</p> <ul style="list-style-type: none"> ■ The weather in india is not conducive to cycling and walking too much; ■ Most work places, do not offer bicycle friendly facilities like bicycle parking, showers, employee incentives to use public transport, etc. ■ Auto rickshaws and bicycle rickshaws could offer more innovative and convenient options for short distance trips; ■ Public transport could offer their own motorised feeder services which might defeat the feeder purpose of bike sharing schemes. |

6. Conclusion and Recommendations

User evaluations in both Indian cities that have implemented public bicycle schemes show that there is a substantial potential for decongesting city roads and creating a more liveable atmosphere by substituting short motorised trips by cycling. Suggested below are recommendations/guidelines that cities in India can use to implement a successful bike sharing program. The recommendations range from broad policy and planning level interventions to specific operations related suggestions.

6.1 Policy and institutions

- In both the Indian case cities analysed, lack of political support and government backing was identified as the key challenge for service providers of such programs. It is time that the authorities recognised and promoted NMT as a smart and clean mode of travel, and shift their focus from cost intensive projects like multi-level parking, expressways and metros, which do not necessarily clean the environment nor are accessible to all, to more clean and low cost solutions.
- Provision for cyclists and their welfare should be made a part of relevant acts and laws governing/ impacting urban transport in India. City authorities should be empowered and incentivised to drive a paradigm shift towards cycling as a key travel mode in their cities. However, while laying down the laws, one should be careful to keep in mind the end objectives. For example, compulsory bicycle helmet law in Melbourne actually acted as a dampener to the Melbourne bicycle hire scheme as not all people found it comfortable or hygienic to use and sub-consciously the message being sent out by the authorities was that biking is not a safe activity, thereby discouraging cycling. Therefore, laws should be designed and implemented (perhaps gradually) keeping the socio-cultural and other aspects of the users in mind.
- A transport authority with responsibility and powers for integrating all modes of transport in the city is what is ultimately needed to ensure the longevity and success of such a scheme. At the city level as well, there needs to be an authority whose mandate should be ensuring bicycling friendly policies and guidelines are made part of the city land use and transport system. For example, Transport for London has a dedicated group taking care of cycling, walking and accessibility in the city. The Municipal Corporation of Delhi established a bicycle cell in 2004. However, due to an unclear mandate, and very small budgetary support the bicycle cell has not been very successful in creating bicycle infrastructure in the city (Tiwari, G. *et al.*, 2009). Such failures need to be studied and addressed.
- There must be a clear target to increase levels of walking and cycling in the city plus mandatory strategic plans and local area based plans with a budget and identifiable partners to implement them. As an example, the Mejor en Bici ('Better on Bicycles') bike sharing program launched in March 2010 in Mexico City is part of the city Mayor's goal to increase the number of bicycle trips made in Mexico City from 1.2–5.0% by the end of his term in 2012. The city authority together with technical experts and an operating advertising company is determined to meet this target and is working actively towards it.

6.2 Planning

- Under the ambit of the massive multi-million dollar urban development initiative called the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), cities in India are in the process of giving their urban systems a face-lift, and improvement of public transport systems is an integral component of this program. Given that initiatives for urban transport under the JNNURM have to be NUTP compliant, this is a good opportunity to tie up programs like bicycle sharing with these developments. For example, the government can ensure that City Mobility Plans ensure not only the development of bicycle tracks along public transport corridors, but also programs like bicycle sharing to incentivise and increase cycling usage as a key transport mode in the city, with proper backing of the city authorities.

- The government should ensure that the resources available with the concerned government departments under the JNNURM ambit as well as other projects are spent judiciously. For example, investing in pilot and demonstration projects on public bicycle schemes might be a more visible and cost-effective idea than having series of conferences and feasibility studies in order to come up with the so-called best approach.
- All city level planning documents related to urban development, city planning, roads development, etc. should carry bicycle-friendly infrastructure guidelines in detail, which are currently absent.
- For a bike program to be successful it is important that the correct technology and package of services involved be mated to the unique challenges that each program faces. It is strongly recommended that each agency considering implementation of a bike share program have an independent assessment of community needs, economics, technologies, logistical issues, service area, and other challenges faced by a final system (Alta, 2009). However, as mentioned earlier, such programs may not require extensive time or monetary resources to study, as they are better tested on a pilot basis on actual ground, than on paper.
- Identifying barriers to direct, convenient bicycle usage (for instance, perhaps a major junction can be avoided by opening up a short cut through a park) is necessary.
- Physical infrastructure like bicycle lanes throughout the city, safe and secure docking stations, adequate crossings to improve permeability, suitable signage for legibility, access through local parks to improve directness, traffic calming and wide pavements around schools, etc. is what is needed as a key ingredient for the success of such programs. Taking away road space from cars and two wheelers in developing cities is in itself a big challenge. However, not being able to provide dedicated bicycle tracks should not be a deterrent to starting such a program.
- Finally, the program must be large so that it has the potential to generate a large number of new bike trips. Since bikes must be returned to a bike sharing docking station, a small system offers the capacity to reach only a small percentage of a city's trips. Secondly, from a purely statistical perspective, a small number of bikes cannot impact the thousands of trips that are made each day within the city¹¹⁾. Hence the coverage must be vast and adequate bicycles should be available to users at all times.

6.3 Financing

- Initially the service could only receive a capital subsidy from the government to build the stations and secure the land for sub-stations. Revenue costs could be secured through a private company through a combination of bicycle hire, advertising and the sale of drinks and snacks that could take place at each station.
- PPP between a billboard company and a local authority could be established; where the billboard company receives the right to use specific public spaces for advertisement and in return implements and operates a public bicycle scheme (NICHES, 2007). To financially compensate for the higher costs of advanced bicycles, opportunities for advertisement on the bicycle (on back tire mud covers & baskets) should be explored.
- Local authorities could play a pro-active role and initiate a tendering process to compare costs and service quality offered by different service providers. They could even create a competitive environment, monitor the system and give incentives for increased ridership to service providers.

Basically, a whole range of possibilities for business models is available (see Section 3.2), as long as the city authorities support the system and are able to provide assistance whenever its intervention is needed.

¹¹⁾ <http://www.portlandonline.com/transportation/index.cfm?c=50814>.
Last accessed on 5 August 2010.

6.4 Operations and management

- It is recommended to develop a network of stations within a radius of 2–5 km around the existing stations most frequented to maximise bicycle use. The distance between docking stations should typically vary from 125–400 metres to ensure that users have to walk only for a few minutes before they can access a bike hiring station. Also ensure that CBDs, work places, universities, schools and high rise residential areas are well covered by the network.
- Cycles and docking stations should be selected keeping in mind the local weather conditions. For example, auto-locking mechanisms that are common in Europe, will not work in India, because with the general heat and dust in the city if the cycles are parked on the road, they will be spoiled and will not be clean for the users to use.
- In order to ensure that bicycles are available at key stations at times when the demand peaks, bicycles may have to be redistributed between stations. For example, to manage the growing demand for its 20,600 bicycles, Vélib' uses 20 natural gas powered vehicles to transport bicycles from one station to another (Shaheen, S. *et al.*, 2010). This feature gains more prominence once the system expands and starts to attract heavy ridership.
- It would be useful to design proper and flexible registration systems (with multiple-options) suited to customer convenience, which the users can relate to and understand easily – using smart cards, mobile phones and internet, phone booking, etc. Usually, a self-service system with a smart card technology is preferred by people.
- Pricing and incentivising usage of bicycles to realistic time durations would be fruitful so that customers do not idle and return bicycles without delay, in order to ensure maximum availability of bicycles at all times.
- A progressive fare structure with the first half hour free (as in Vélib' and Hangzhou) is usually a good model to attract users.
- Proper maps and information systems at stations must be present.
- The bicycles should have an easily identifiable design which addresses the desires of the main target group (young people). They should look sporty and cool but remain practical, safe and stable (GTZ, 2010).
- Experience from other countries has revealed that bike thefts and vandalism are major challenges that such programs face. Features like inexpensive bikes, unique designs, and compulsory membership for access have shown to minimise the danger of theft. In India, the procedure of submission of an original identity proof has helped prevent thefts, however, a more sophisticated and less cumbersome system like RFID would be better. This would of course call for a higher investment.
- The station guards/attendants/staff should be customer service orientated, encouraging people to use the bicycles and providing a modern and positive atmosphere.
- Learning from the Delhi example, agencies must be flexible and ready to provide parking spaces for sub-stations as only having a hire facility at the metro/BRT stations means people have to rent bicycles for long periods and hence at times bicycles are not available for others to hire.

6.5 Marketing and promotion

- A brand label should be developed for the bike sharing scheme in the city, which is catchy, unique and invokes a sense of pride and belongingness in the people towards their city.
- The project should be promoted frequently and widely among different channels (homepage, posters on buses and metro trains/stations, TV adverts, print media, etc.), with politicians, film actors and other celebrities urging people to use the system. Just like other important causes like health prevention from diseases, water conservation, environmental protection, using energy efficiency home appliances, etc. demand campaigning efforts, similarly bicycling should be vigorously promoted and campaigned for as a clean, safe and healthy activity.

- Given that shared bike systems are essentially looked upon as feeder systems to public transport, bike sharing programs can have special partnerships with public transport systems and mass transit systems. Ideally mass transit systems should be able to allow bicycles on board. This can be done in various ways, for example, in some cities the trains have special coaches that allow people with bicycles on board and buses are equipped with bike racks in front so that the bikes can be secured while the rider travels in the bus. In cases where bikes cannot be allowed on board, agreements with public transport companies can be made to provide proper bike parking facilities and bike sharing stations at transit stations. It is also useful if stations carrying public bike facilities are marked on the BRT or metro or other public transport route maps.
- Marketing activities where volunteers visit every house in the neighbourhood and provide information on the public transport system in the locality and also give a complete map of the locality with bicycle routes and public bike stations could be one way to create awareness and interest amongst people.
- Besides the conventional public transport modes like trains and buses, public bicycling initiatives could get associated with residential colonies and their associations, neighbourhood communities, sports clubs and spas, sports stores, etc. to make them more attractive. Fare integration between public transport modes and public bike schemes could also be thought of.
- Marketing strategies like free rides in the first month, incentives for lifetime members, students, senior citizens, etc. should be designed for users. The Barclays bicycle hire scheme that opened up recently in London (as also many other similar schemes in their first few months), initially has the first hour usage free for users. This encourages many people to try the bicycle for short trips, and then take a new bike for another trip, and this way get used to the system.
- Small supporting actions in workplaces and malls to have showers for people so that they could freshen up after the bike ride, or employers/cinemas/chain stores, etc. to provide incentives or benefits to people who commute by bicycles, can also go a long way in creating a positive paradigm shift towards cycling.

To conclude, a successful bike sharing program cannot be standalone and would need to be complimented by communication and awareness raising campaigns, integration of cycling planning in the overall spatial and transport planning and healthy local partnerships. There is a whole variety of models and implementation options available for bike sharing projects that Indian cities can find useful. A successful system will be one that addresses the specific needs of its users and market segments prior to and after deployment, and has the full support of the government and city residents.

The fact that such a concept has taken off recently in India is commendable (the only other Asian countries to have introduced it being China, South Korea, Thailand and Taiwan), however given that the latent demand for bicycle usage in India is huge, and given the urgent need for a modal shift towards cleaner travel modes in urban areas, much more needs to be done and in a bigger way. Introducing well-planned and attractive public bicycle schemes across Indian cities could be one sure-shot way of opening up people once again to the idea of cycling and for city authorities to return the city streets to its people.

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