



सत्यमेव जयते

**NITI Aayog**

(National Institution for Transforming India)  
Government of India

# Promoting Bicycles in India



**NITI Aayog**  
March 2020



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4<sup>th</sup> March, 2020

### **FOREWORD**

A rapidly growing population has been a major reason for brisk urbanization. It can be safely presumed that this ever-increasing pressure on cities is primarily a result of people migrating from rural areas in search of better livelihoods, education and amenities to urban centres.

Migration and subsequent urbanization raises the need for mobility. The unprecedented growth in road transportation and a corresponding massive fossil-fuel-based motorization have created indirect negative externalities and impacts, such as poor air quality, health hazards and congestion, as well as rising import bills and compromising energy security. The need of the hour is the development of sustainable alternatives to reduce the growing reliance on automobiles, particularly for short-distance travel.

The bicycle has emerged as the most sustainable mode of mobility, promising an affordable transportation option for millions of Indians who cannot afford any form of motorized transport, especially in rural areas. Apart from its inherent benefits of not being dependent on any fossil fuel, ergo no emissions, no strain on foreign reserves; it also helps in maintaining good health.

From the perspective of attainment of Sustainable Development Goals too, use of bicycles can play a significant role in alleviation of poverty, enhancement of school enrolment, gender equality and enabling faster access to health facilities. TERI reports of 2014 and 2019 are credible evidence of the huge positive impact of bicycle usage on the Indian economy. To put it simply, the bicycle is, 'One Transport: Fits Many Solutions for Masses and Classes'.

The notion that bicycle usage in India should decline due to supply and demand issues is not acceptable. This trend needs to be reversed for reaping benefits in social, environmental and economic sectors of India. All over the world, people are rediscovering the benefits of cycling. Cities are responding by building the infrastructure to have separate tracks for cyclists to keep them safe.

In this backdrop, NITI Aayog feels strongly about promoting bicycles in India in a systematic, scientific and synergetic manner.

The report provides multiple recommendations on how to turn around the declining trends of bicycle usage and at the same time promoting a sustainable, affordable, green and healthy mode of transport. I am confident that the respective Governments at the Central, State/UTs and ULBs level, the Industry and other stakeholders will find this report valuable for informed decision making in implementing the recommendations for 'Promoting Bicycles in India'.

(Rajiv Kumar)



एक कदम स्वच्छता की ओर





**अमिताभ कांत**  
**Amitabh Kant**  
**मुख्य कार्यकारी अधिकारी**  
**Chief Executive Officer**



सत्यमेव जयते

**PREFACE**

**भारत सरकार**  
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This report is on a core, but ignored mode of transportation, i.e, Bicycles. In spite of its inherent benefits, bicycle usage has not grown to its potential. In fact, it's per capita penetration and mode share have gone down in India; which is not a sustainable trend.

National Urban Transport Policy -2014 of Government of India emphasizes overriding preference to cycling (after walking) as an active transport. Cycling is resurging world over including in heavy traffic cities such as New York, Tokyo and London and thus contributing towards creation of livable cities and enabling affordable and efficient short distance travel. A bicycle integrates well in rural and urban spaces, for different needs, and could contribute in sustainable mobility solutions to millions. In this backdrop, NITI Aayog felt it necessary to study promotion of bicycles in India, identify gaps and measures for its systematic growth and development in India.

The report reveals that 200 million people travel by foot up to 10 kms for their work, and bicycle may not be affordable for millions. Mode share of cycling had declined substantially over the decades and is reported to be between 7% and 21 % in different cities. At the global level, the bicycle ownership per 1000 persons in India, is at a meagre 90 per 1000 persons as compared to China's 300, Japan's 700 and The Netherlands' 1100. It confirms a huge bicycle usage - gap in India.

The report examines issues mainly in three areas: interventions for turnaround of the Indian bicycle industry, promoting the use of bicycles for diverse needs and enabling resurgence of bicycle use in urban spaces.

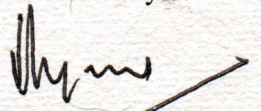
The Bicycle manufacturing sector needs an integrated turnaround strategy to pursue its vision of 50 million made-in India bicycles by 2025 with 1 lakh additional jobs with institutionalized support. The Indian bicycle industry is the second largest producer ( i.e 22 million annually) in the World and bears labour intensive character but suffers from technology gap, untested Bicycles, no minimum standards, low -tech Bicycles and so on. Therefore, setting up of Bicycle Development Council under DPIIT, introduction of mandatory standard and upscaling of Bicycle R&D Centre have been recommended.

Bicycle being an income generating asset and, an affordable and reliable mode for commuting, whereas also being an enabler in the wider sense for the underprivileged has tremendous potential in India to be harnessed. This is expected to create a win -win situation for supply and demand side. The direct Bicycle demand may be generated through different Schemes and enabling provisions.

It is further recommended that appropriate intervention be taken to enhance cyclist's safety at all three stages - bicycles, cyclists and road networks as a first and foremost measure especially through transformational measure of the safe cycling network. The availability of safe, separate and seamless cycling networks and associated infrastructure in cities and ULBs can increase bicycle usages for short distances and can fulfill the need for last mile connectivity. This needs to be effectively promoted through development of infrastructure, and should begin at the conceptual stage itself- something along the lines of the Complete Street Policy of USA- though a national framework under the Ministry of Housing and Urban Affairs.

I am hopeful that the findings and recommendations of the report will motivate the different stakeholders - different Ministries, agencies and manufacturers- to implement the policy and other measures to realize the potential of this benign and healthy mode of transport.

My compliments to the central ministries /departments, NITI Aayog team and Bicycle association for the preparation of this Report.

  
(Amitabh Kant)

**Place- New Delhi**  
**Dated- March 4, 2020**





## **ACKNOWLEDGEMENTS**

I would like to thank all individuals and institutions that participated in the stakeholders' meetings on 7 June, 11 June, 21 June and 26 July 2018 and for their valuable contributions and inputs on the issues concerning the promotion of bicycles and challenges faced by the bicycle industry in India.

I am extremely indebted to Shri Amitabh Kant, CEO, NITI Aayog, for assigning the important task of convening the group on promoting bicycles in India and for his invaluable guidance.

The guidance and directions by Sh. Jagdish Khatter, former MD of Maruti Udyog Ltd. and Sh. Yaduvendra Mathur, former Special Secretary, NITI Aayog in the meetings have been invaluable.

I place on record my deep appreciation and sincere thanks to Shri Girish Kapur, President, and Dr K.B. Thakur, Secretary General of All India Cycle Manufacturers' Association (AICMA), and Shri Neeraj Chandra, Vice President of Hero Cycles, and senior members of member companies of AICMA, who did a splendid job of providing valuable insights, inputs and continued support.

NITI Aayog is also thankful to the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Housing and Urban Affairs, Ministry of Rural Development, Department of Financial Services, and other ministries of the Government of India for providing support in deliberations and locating likely role in promoting bicycles. We are also grateful to TERI for expert support.

Last but not the least, I would like to thank officers of NITI Aayog involved in coordination, drafting and finalization of the report.



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March 4, 2020





### **ACRONYMS / ABBREVIATIONS**

<b>Sr. No.</b>	<b>Acronyms / Abbreviations</b>	<b>Description</b>
1.	AICMA	All India Cycle Manufacturers' Association
2.	AMRUT	Atal Mission for Rejuvenation and Urban Transformation
3.	BIS	Bureau of Indian Standards
4.	BRTS	Bus Rapid Transit System
5.	CKD	Completely Knocked Down
6.	DPIIT	Department for Promotion of Industry and Internal Trade
7.	FAME	Faster Adoption and Manufacturing of Electric Vehicles in India
8.	GEF	Global Environment Facility
9.	GST	Goods and Service Tax
10.	IS	Indian Standards
11.	JNNURM	Jawaharlal Nehru National Urban Renewal Mission
12.	MOHUA	Ministry of Housing and Urban Affairs
13.	MSME	Micro, Small and Medium Enterprises
14.	MUDRA	Micro Units Development and Refinance Agency Ltd.
15.	NMT	Non-Motorized Transport
16.	NUTP	National Urban Transport Policy
17.	NUATAI	National Urban Active Travel Ways Authority of India
18.	PBS	Public Bike Sharing
19.	PSL	Priority Sector Lending
20.	RFID	Radio-Frequency Identification
21.	SUTP	Sustainable Urban Transport Project
22.	TERI	The Energy and Resources Institute
23.	UCPMA	United Cycle Parts Manufacturers Association
24.	UDPFI	Urban Development Plans Formulation and Implementation

25.	UITP	International Association of Public Transport
26.	UNIDO	United Nations Industrial Development Organization
27.	UNICEF	The United Nations Children's Fund
28.	ULBs	Urban Local Bodies

## **Executive Summary**

1. NITI Aayog has been proactively pursuing ‘**transforming India’s mobility**’ as one of the key elements of ‘**Sabka Sath: Sabka Vikas**’ vision of the Government of India. Towards this, the Aayog has been increasingly focusing on inclusive, affordable and sustainable modes of transportation, such as walking and cycling. The bicycle has the potential to become the most-liked and favoured mode for traveling short distances as it addresses many alarming concerns related to health and environment in urban areas and much larger issues of economic backwardness, illiteracy, mobility, social exclusion and accessibility to healthcare and means of livelihood. It is estimated in the TERI report of 2019 that, ‘Cycling for short distances can result in an annual benefit of Rs 1.8 trillion to the Indian economy, which is equivalent to 1.6% of India’s annual GDP, as per the analysis for 2015–16.’ In a nutshell, the bicycle is one transport that fits many solutions and deserves to be called a vehicle for the masses and the classes.

2. In this backdrop, the Aayog felt there is a need to promote bicycles in India. Accordingly, it constituted a group in May 2018 to examine the potential, challenges and roadblocks in the bicycle sector to promote it in India.

3. Bicycle usage trends in India are the starting point to diagnose the type and degree of the usage gap, the main demand and supply side bottlenecks and provide the basis for future strategies. Nearly 45% households or 111 million households in India owned bicycles as per the 2011 census. Amongst the states, the usage varied from below 10% households (mainly in the hilly states) to more than 70% households (in Assam, Bihar, Punjab, UP, Odisha and Chhattisgarh). The percentage share of households owning bicycles in India during the decade 2001 to 2011 increased by about 3%. In contrast, the corresponding growth of two-wheelers and cars increased by more than 10%. Mode share of cycling in the total mode shift has declined substantially over the decades and is currently reported to be between 7% and 21%, while the corresponding figure in China is 11% and 47%.

4. The low and slow growth of bicycles in India was mainly attributed to migration to motorized transports due to easy availability of finances. It’s a major finding busting the myth that the low price of a product will motivate anyone to easily purchase it notwithstanding the unaffordability of bicycle price by millions of poor potential buyers. Based on the income and expenditure pattern of rural households, it can be safely concluded that almost 50% of the households are not in a suitable position of incurring any substantial expenditure on non-consumptive items. Other causes responsible for slow growth are non-availability of separate, safe and seamless cycling network as also issues related to air pollution, extreme climatic conditions, no parking facilities and unsecured bicycles, poor man’s transport tag, etc.



5. The commensurate huge bicycle potential will have to be harnessed through migration from most of the long walking trips in rural India and short motorized trips in urban India to bicycle trips. For realizing this potential, the macro-level impelling drivers for bicycle promotion includes deploying it as a basic and the most appropriate mobility mode for the socio-economic empowerment of millions of the poorest of poor in rural India. It, however, would require concurrent, continuous and coordinated efforts of the industry and the governments—Central, states and ULBs.

6. **Cyclists' safety** is the core part of the overall bicycle promotion strategy, which is governed at three levels, namely road and traffic conditions, bicycle and cyclist, of which, the former plays a transformational role with substantial perceived gains. Official statistics confirm that cyclists constitute a low percentage of fatal road accidents (i.e. 2.4% of the total in India during 2018). It is, however, in absolute terms, an area of concern. Specific interventions of safe cycling conditions, QCO (quality control order) on reflectors, mandatory safety standards, cyclist's traffic discipline, etc., are suggested to enhance cyclists' safety while using or riding it.

7. The Indian bicycle industry is largely located in the mega cluster of Ludhiana, comprising 4000 MSMEs and employing a workforce of 10 lakh in the entire value chain, including sales and repair shops, and producing more than 2 crore bicycles per annum. The industry is further divided into bicycle and part producers. Ludhiana in Punjab is the most cost competitive bicycle manufacturing cluster of India. Any dispersal of the industry to other regions of India will be feasible provided a sufficiently high bicycle demand is created on sustained basis.

8. In 2018–19, the estimated bicycle production in India was around 2.2 crore (second largest after China). The industry, in last three years, has witnessed growth of sub-standard, untested bicycles by the unorganized sector comprising traders, dealers and importers, the so-called bicycle assemblers. This proliferation is happening due to no-minimum mandatory safety standards in place for testing and performance requirement, and dealers' preference for margins and not quality. This emerging issue would necessitate sustained institutionalized support of DPIIT, BIS and Bicycle R&D Centre for migrating to minimum bicycle safety standards.

9. The total imports of bicycles was more than 7 lakh in 2018–19 and the same is increasing on a year-to-year basis. Of which, more than 50% imports were from China. This apart, India has the potential to export in a big way—beyond USD 360 million exports in 2018–19 provided.

10. The Indian bicycle industry envisions to become a world leader in design, engineering and manufacturing and to meet the future demand arising out of the bicycle's inherent, incredible and indefinite benefits and sustainable character. It, however, suffers on account of demand and supply side issues of short- and long-term relevance and most of them fall in the purview of various governments of Centre, States and ULBs. It would, therefore, require institutionalized support so as to address multidisciplinary and multi-ministerial issues on

continual basis. The Bicycle Development Council under DPIIT would be providing institutionalized forum for addressing issues of bicycle industry.

11. For the last three years, there has been an unprecedented growth of substandard, and untested bicycles. It is impacting the entire value chain and if not corrected timely and adequately, it may hurt the Indian bicycle manufacturing, apart from compromising the safety of cyclists. The long-term solution is to introduce cycle safety standards. Department for Promotion of Industry and Internal Trade (DPIIT)—administrative ministry for bicycle in consultation with BIS may cover cycle safety standards (adult and kids) and parts standards under the Compulsory Registration Scheme

12. MSMEs of bicycle cluster at Ludhiana are serviced by the Bicycle R&D Centre a common facility for testing, inspection, certification and R&D. In order to develop the bicycle ecosystem at a world-class level, the upgradation and scaling up of the Centre is required. The industry in consultation with the Bicycle R&D Centre has identified hard and soft technological gaps of the Centre. The DPIIT, from its own UNIDO, may further support upgradation/scaling-up of the Centre for needs of the Industry.

13. In India, a free bicycle distribution scheme is being run on regular basis by around 18 states (around 5 million bicycles/annum altogether) for underprivileged students of classes 8 or 9 for commuting to schools at cycling distance. Each state has its own criteria and procedures for identification of beneficiaries of the scheme. The evaluations by different agencies indicate positive results. One of the studies concluded that the cycle programme increased girls' age-appropriate enrolment in secondary school by 30% and also reduced the gender gap in age-appropriate secondary school enrolment by 40%. Considering the impact of the scheme, it may be further expanded by other states/UTs.

14. Rural India faces the uphill task of basic mobility, for example, 200 million people travel by foot up to 10 km for their work. This segment can neither afford nor get a loan to own a bicycle. This critical mass of poor households in the absence of a bicycle faces mobility challenges. This critical mobility-gap should be bridged through a bicycle support as an income-generating asset or as an affordable means of commuting to access livelihood. The bicycle support need to be institutionally extended.

15. In urban areas, the bicycle constitutes 7%–21% of mode share, which may ideally go up to 72% for trips up to 5 km. The bicycle is recognized as One transport: Fits Many Solutions for Urban mobility. The Ministry of Housing and Urban Affairs, GoI, has been seriously trying to promote sustainable transports, including bicycles through the NUTP, 2014, policy and projects/schemes such as SUTP, smart cities, etc. However, at the pan-India scale, nothing significant is happening as most of the states and ULBs are lacking in creating enabling cycling infrastructure.

16. As a matter of fact, most of the ULBs (cities/town) are not creating enough cycling infrastructure. Since urban development is a state subject, a framework on the lines of Complete Street Act of USA may be thought of as it fits into the Indian federal framework. This apart, the Urban Affairs Ministry, GoI, should lead further concurrent actions as recommended for cycling (and walking) in line with best global practices and the states should bring a legislation and ULBs should implement the measures for safe and seamless cycling infrastructure.

17. Public bike sharing or PBS (an app, RFID and digital-payment-driven rental bike system) has emerged in India from 2016 in 100 smart cities and in few large institutions/complexes. This initiative gave birth to start-up companies mainly MOBYCY, Yulu, Ola Pedal, Zoom car, Hexi, etc. PBS witnessed a boom in China between 2014 and 2018 due to unregulated operation and thereafter registered a decline due to the regulation in place. Undoubtedly, PBS is a very inexpensive, fun and people-friendly and a promising concept for short, fast and smart bicycle travel in crowded cities and has the potential to attract many start-ups. However, it will become popular or successful only if operational issues such as vandalism, theft, bad conditions of bikes and roads, and unsafe traffic are resolved by the agencies concerned.

## Chapter 1

### Introduction

#### Background

1.1. Although the vision of **Sabka Sath Sabka Vikas** promotes the culture of inclusiveness, there are many sections of the society that face exclusion, and this needs to be addressed. Mobility is one of the key determinants of inclusive growth and development in all sectors of the economy. Nevertheless, the prerequisite for achieving the *vision* through mobility would require enveloping it in the framework of sustainable transport to benefit the generations of today and tomorrow.

It should be accomplished in a manner that is safe, affordable, accessible, efficient and resilient; taking care to minimize carbon and other greenhouse gas emissions, environmental impacts and maximizing health and empowerment benefits. The Aayog has been proactively working towards **transforming India's mobility** for the past few years-as is evident in its increased emphasis on inclusive, affordable and sustainable transport as a part of its 'bottom-up approach'.

Bicycle is the second-most important sustainable mode of transportation; the first being walking. Cycling, per se, is partly the answer to alarming concerns related to poverty alleviation, illiteracy, asthma, obesity, diabetes, carbon footprints, traffic jams and rising noise levels. No doubt, 'bicycle' is identified as one transport, fits many solutions.

1.2. Bicycle is not only a means to commute, but also as a tool for development. It is in fact an access to livelihood, education, healthcare and sports besides being a simple, affordable, reliable and environmentally sustainable means of transport.

One bicycle per poor family could be a game changer in their lives for buying/selling goods or providing/seeking services at a cycling distance, resulting in ease of conducting business and thus gaining prosperity.

An independent and credible study by TERI on bicycles found that they can do wonders in the socio-economic and environmental sectors—provided policy and regulatory gaps are addressed adequately so as to reap the larger benefits of bicycles, primarily by the masses (for basic commuting) as also by the classes (for fitness and recreation). It is estimated by TERI, in the report, 'Benefits of Cycling in India: An Economic, Environmental, and Social Assessment, 2018' that cycling for short distances can result in an annual benefit of Rs 1.8 trillion to the Indian economy, which is equivalent to 1.6% of India's annual GDP, as per their analysis for 2015–16.

1.3. Cycling is a core constituent of sustainable transport protocol: walking (0–1 km), cycling (0–3 km) and public transport (0–any km), in that order. Bolstered by institutionalized supports and regulations, cycling is resurging world over, especially in cities such as London, Tokyo, Paris and New York.

The bicycle ownership per 1000 persons in India is a meagre 90 as against 1100 of the Netherlands and 360 of China. There is a need to explore the huge potential for leveraging

bicycle usage in India. Over a period of two decades, bicycle usage in India, having gone through decline for a while due to various factors, is regaining importance in line with the best global mobility practices.

1.4. The Indian bicycle industry is the second largest in the world, next only to China, with an annual production of 22 million and a turnover of Rs 7000 crore; through 4000 MSMEs that employ nearly one million people in the entire value chain. However, the industry suffers on account of technology gap, lack of usage of superior materials and demand-related bottlenecks. The dependence of the industry on institutional sales is substantial.

Unaffordability and absence of micro-financing in rural areas and non-availability of safe and separate cycling lanes in urban areas are the major factors that need to be addressed through appropriate measures.

1.5 Considering the immense possibilities to promote the manufacturing and usage of bicycles in the country, NITI Aayog through a Group interacted various stakeholders on the subject of promoting bicycles in India. The report is outcome of these interactions and the same is structured in nine chapters and an executive summary.

## Chapter 2

### Bicycle Usage: India and Global Scenarios

#### Decadal Growth

2.1. Census 2011 confirms that the percentage share of households owning cycles in rural areas has increased in the last decade (from 43% in 2001 to 46% in 2011); urban areas on the other hand have witnessed a decline (from 46% in 2001 to 42% in 2011). Growth in cycle ownership in India over the last one decade has been very slow. Household cycle ownership increased at a rate of about 3% per annum between 2001 and 2011. Nearly 45% households, or about 111 million households, in India owned bicycles in 2011.

2.2 While almost every household in rural China owns a cycle, less than 50% households in rural India do so. China's urban-cycle-ownership level is also higher as compared to India.

#### Growth Rates of Automobiles vs Bicycle

2.3 The growth of automobiles and bicycles during 2001–11 is shown in Table 1. It shows two-wheelers and cars have seen a much faster growth of more than 10% in both rural and urban areas. In contrast, bicycle growth increased by a mere 3%.

**Table 1**  
**Households Owning Automobiles and Cycles (2001–11)**

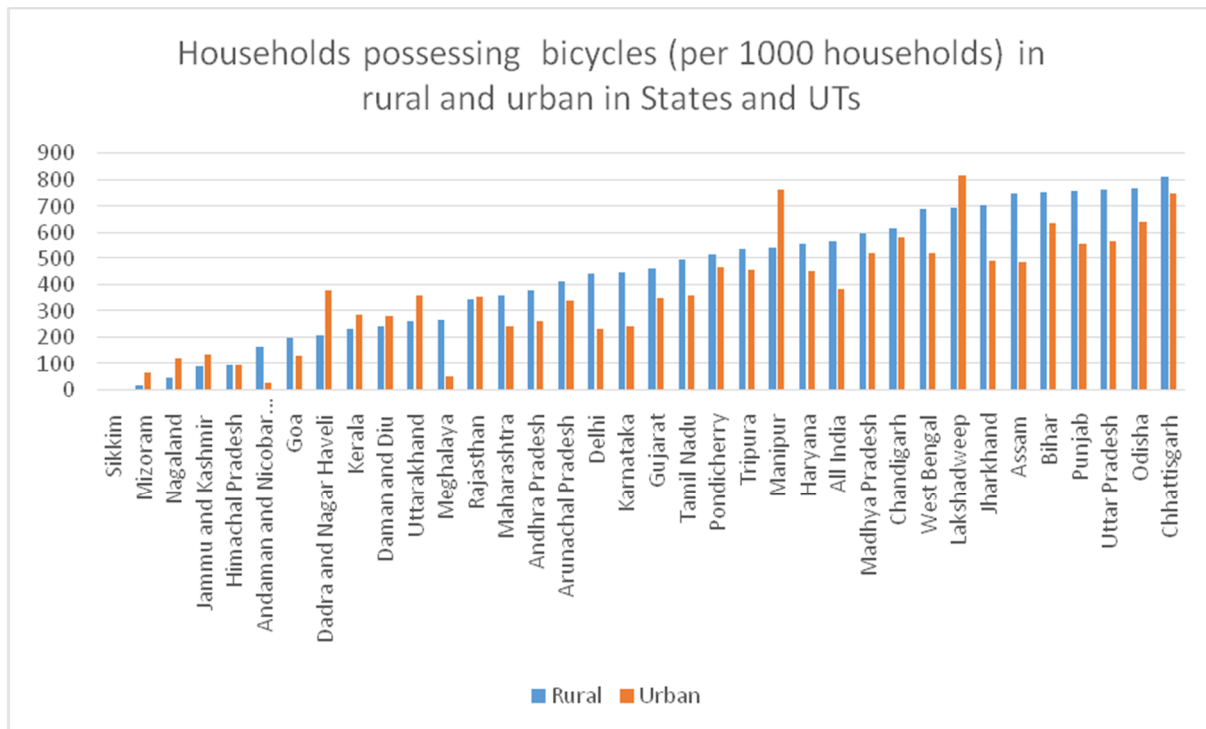
Sr. No	Vehicle	Increase in times	Annual Growth Rate (R: Rural and U: Urban)
1	Cars	2.4	R: 11%, U: 15%
2	Two-wheelers	2.3	R: 16%, U: 11%
3	Cycles	1.3	R: 3%, U: 3%

**Source:** 'Pedaling towards a Greener India: A report on Promoting Cycling in the Country', TERI, 2014.

#### Per 1000 Household Ownership

2.4 The India-Household Consumer Expenditure: NSS 68th Round Survey captures the variations across the states in 2011–12 (Figure 1). While bicycle ownership in rural areas of Assam, Bihar, Punjab, UP, Odisha and Chhattisgarh has been more than 700 per 1000, ownership in Goa, Kerala, Rajasthan and the hilly states has been much below the national average. The huge variation in bicycle usage at state levels suggests that there is a scope for improvement in low-usage states as compared to high-usage states; of course, further improvements in better-performing states is also desirable.

**Figure 1**



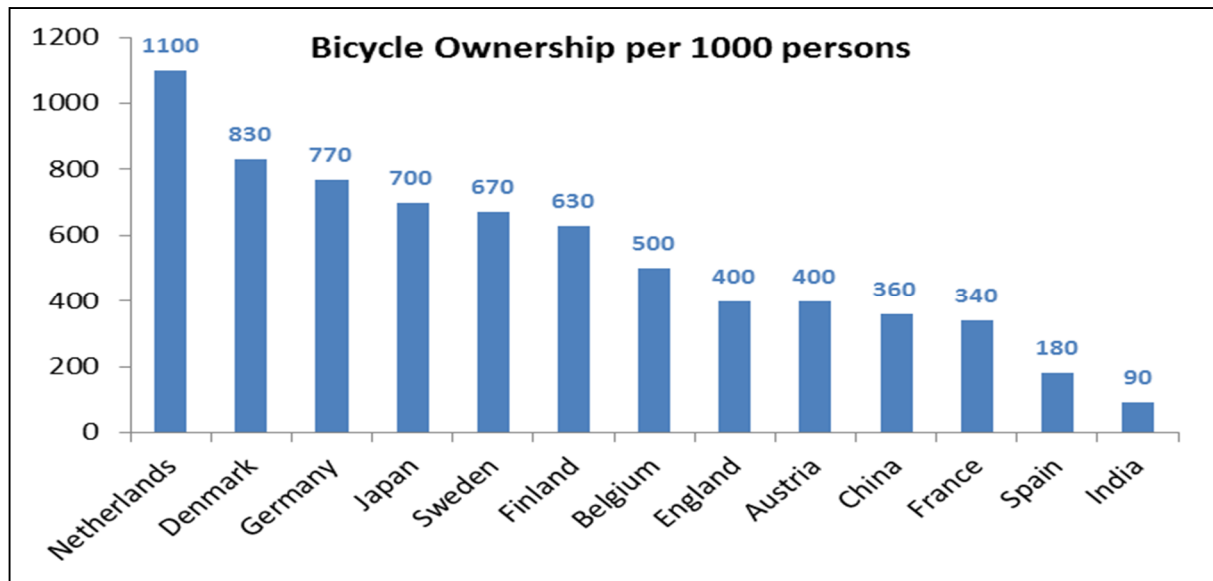
Source: India - Household Consumer Expenditure: NSS 68th Round, Schedule 1.0, July 2011 - June 2012

2.5 Global comparison of bicycle ownership per 1000 persons indicates an interesting scenario (Figure 2). The Netherlands is the global benchmark for the entire world at 1100 ownership level, whereas Denmark, Germany and Japan vary between 1000 and 700, Sweden, England, China and France vary between 700 and 300, and Spain and India stand below 300.

It may be true to an extent that the bicycle is a poor man's mode of transportation and is prevalent more in countries that are poor and less motorized. Cycling in India is essentially preferred by people who have no other choice due to income constraints. As such, it has remained a mode for captive users, and this is reflected in the low levels of cycle ownership in the country, just about 90 per 1000 population.

On the other hand, cycle ownership levels in many developed and highly motorized countries are at a much higher level because cycling is a mode of transportation by choice in these countries. In essence, India needs to develop a favourable cycling culture so here too, it can become a mode of choice.

Figure 2



**Source:** ‘Pedaling Towards a Greener India: A Report on Promoting Cycling in the Country’, TERI, 2014.

### Modal Share of Bicycle

2.6 The share of cycling as a mode of transport in Indian cities has been steadily declining. According to Tiwari and Jain (2010), the modal share in cities having a population of more than 1 million (having trip length less than 7 km) varied between 7%–21 %. In Delhi, it declined from 36% in 1957 to 4% in 2008. A comparative range in China was 11% to 47% (CAI: Asia 2010), with Beijing being as high as 32%. The major cause for this decline is the non-availability of a separate, safe and seamless cycling network. Other associated causes are extreme climatic conditions, no parking facilities and lack of security of cycles.

2.7 At the macro level, if the *business-as-usual* scenario continues, the private motorized transport share will register an increase from 43% to 57%. Commensurately, walking and cycling is estimated to plummet from 43% to 34% and public transport will fall from 16% to 9% by 2031 (Traffic and Transportation Policies and Strategies in Urban Areas in India, MOUD Study, 2008, by Wilbur Smith). On net basis, average city journey speed is estimated to fall from 17–26 kmph to 6–8 kmph, with the urban mobility condition going from bad to worse (National Transport Development Policy Committee, Working Group on Urban Transport, Ministry of Urban Development, GoI, 2012).

*Cycling and walking are active means of transportation for people who only use the physical power of humans for locomotion, and are the most basic, common and universal sustainable mode of transportation. It caters to low speed, small-size, light weight and short-distance active transportation, mainly represented by millions of cyclists and pedestrians in India.*

2.8 The bottom line is, unless hard and soft measures are undertaken on concurrent basis to enable cycling in a bottom-up manner with top-down statutory provisions and interventions, the vision of livable cities will remain a dream.



## Bicycle Growth Potential

2.9 The pan-India potential for promotion of bicycles is multifold. The low level of per capita bicycle ownership at the pan-India level (0.09) vis-à-vis the benchmark level of the Netherlands (1.1) indicates a huge scope, which can reach as high as twice the current level. This potential needs to be harnessed for various segments of the society, from urban to rural areas and encompassing different economic backgrounds.

Based on commuting needs:

2.9.1 The 2011 census provides reliable mode-wise data of average distance travel. The analysis of 1–10 km (leaving aside 0–1 km for walking trips) travel vis-à-vis mode of transport suggests a huge potential of migration from two-wheelers to bicycles (up to 72% of the trips) from cars/jeeps to bicycles (up to 55% of trips) (UITP).

This indicative potential is feasible to achieve if ‘avoid the avoidable’ principle is adopted for short-distance travel of say, 10 km.

Based on inherent and unlimited benefits of cycling:

2.9.2 In India, there is a humongous scope to boost cycling in urban areas. For a cyclist, the most promising driver is the desire to improve fitness. At the societal level, the motivating drivers are, traffic jams, rising fuel costs and a desire to protect the environment (air/noise pollution). The emerging mess of urban transport in Indian cities vis-à-vis externalities has led to a scamper for pushing concurrent measures by all stakeholders. This is bringing in a notable shift towards cycling, which may witness high growth if safe cycling infrastructure is ensured by the respective authorities.

## Cyclists’ Safety

2.10 The Ministry of Road Transport, GoI, publishes yearly road accident data, which confirms that the cyclists in fatal accidents had a decreasing percentage share (4.3% in 2009 to 2.4% in 2018) among the total number of people killed in road accidents. The percentage of cyclist killed under road user category reduced by 32.5 % from 2009 to 2018 (i.e. in last ten years) as shown in the table below.

Year	Number of Cyclists killed (% of total killed)	% decrease in Cyclists killed w. r. t. 2009
2009	5443 (4.3%)	-
2018	3673 (2.4%)	32.5 %

**Source:** Road Accidents in India, Ministry of Road Transport and Highways, GoI.

2.11. Although there is reduction in fatal accidents of cyclists, still, continuous and concurrent measures need to be adopted to further reduce the absolute number (i.e. 3673 in 2018) of fatal accidents of cyclists in India.

2.12 Cyclists’ safety is governed at three levels: road and traffic conditions; bicycle; and cyclist. Safe and seamless road and traffic conditions for cyclists, if attained and maintained properly by the respective government authorities, have the potential to prevent most of the accidents. Cyclists’ road discipline, safety gazettes and bicycles equipped with safety accessories are incremental measures with incremental safety gains.

2.13 Fewer people on cycles, however, does not mean fewer accidents; on the contrary, the number of cyclist deaths per 100 million kilometers cycled is 5.8 in the United States and 3.6 in the United Kingdom. In contrast, in a cycling-happy country like Denmark, it is 1.5—four times safer than in the US and twice as safe as the UK. And cycling is even more safe in the Netherlands, with just 1.1 deaths per 100 million kilometers on the road. It appears that the more cycling is encouraged and taken up, the [safer it becomes](#).

2.14. In 1998, the Colombian city of Bogota built more than 300 kilometers of ‘greenways’—protected bike routes separated from roads by trees. Enrique Penalosa was Bogota’s mayor at the time, and in a recent TEDx talk, he stressed that these greenways were not ‘a cute architectural feature’, but showed ‘that a citizen on a \$30 bicycle is as [equally important as one in a \\$30,000 car](#)’.

2.15 Despite the uneven regulatory landscape for cycling, a common ‘core’ of rules does seem to emerge in many but not all countries. Generally, laws related to cycling and cycling safety fall in one of the following categories: mandatory bicycle standards; lighting laws; mandatory safety equipment for cyclists (helmet, clothing, etc.); vehicle standards to protect cyclists; traffic rules (such as Liability and Responsibility Rules); and most importantly, bicycle- ways laws.

2.16 Government spending on cycling may take place at the national, regional and local levels. It may also encompass many expenditure categories, e.g. new infrastructure, maintenance and operation of existing facilities, cycling education, cycling and safety awareness campaigns. There are different revenue sources for cycling and co-financing may extend to multiple partners.

2.17 Given the complexity of funding and expenditure streams, few countries have a clear view of the total government expenditure on cycling. One example is the Netherlands, where the total spending on cycling (all levels of government) reached €487 million in 2010, about €30 per capita (Source: [aviewfromthecyclepath.com](#)).

2.18 Taking learnings from the best international practices in the cycling space, cyclists’ safety should be a central part of bicycle promotion in India. For this purpose:

- Authorities at the central, state and city level should come together to make safe cycling infrastructure from planning to maintenance as per IRC-11 Code mandatory in line with set objectives vis-à-vis goals of NUTP 2014. Cycling infra investment is reported to be a small proportion in relation to the total investment in road infrastructure.
- Department for Promotion of Industry and Internal Trade (DPIIT) may consider issuing a mandatory order on the installation of 10 reflectors to ensure its uniform implementation through BIS instead of self-certification.
- In order to curb sub-standard adults and kids’ bicycles, DPIIT may bring in corresponding cycle-safety standards under the Compulsory Registration Scheme.
- In the long run, the industry in consultation with DPIIT should draw a roadmap for enhancing cyclists’ safety. Introduction of a lighting system, as an active-visibility device because reflective devices work only on reflection of light from another source for more visibility during night, can be implemented.

- Cyclists' road safety awareness and training through existing government institutions and adoption of global best practices of cyclists' safety from other countries should be welcomed.

## Chapter 3

### Indian Bicycle Industry: Structure, Trends, Issues and Way Forward

#### The Structure

- 3.1 The Indian bicycle industry exhibits a two-tier structure: bicycle manufacturing companies (mostly located in Ludhiana and Rajpura of Punjab and one unit each at Sahibabad, Sonipat, Ghaziabad and Chennai and two near Patna), and around 4000 micro to medium parts- or component-making units, mainly located in Ludhiana.
- 3.2 Bicycle manufacturers produce complete bicycles, along with major parts namely frames, chains, saddle and rims for captive consumption. Bicycle parts manufacturers produce pedals, carriers, nuts and bolts, levers, tires and tubes, spokes, axles, saddle, freewheel, hubs, bearings and mudguards, etc. Bicycle assembly essentially needs more than 100 parts.
- 3.3 Bicycle manufacturing is further divided into:
  - **AICMA Companies (Organized):** These are mostly large companies with reputed brands and have been in existence for more than five decades.
  - **Non AICMA Companies (Mostly Unorganized Players):** These encompass around 30 small bicycle manufacturers in Ludhiana; 80–100 units manufacturing kids' bicycles in Ludhiana; 20–25 local cycle assemblers based in Delhi; and 20–25 importers.

This apart, two AICMA companies, namely, Hero Cycles (in the UK and Sri Lanka) and TI Cycles (in Sri Lanka), have bicycle manufacturing bases abroad.

- 3.4 The bicycle market comprises thousands of conventional multi-brand shops, contemporary showrooms of domestic and imported brands as well as several thousand hut-type bicycle repair shops. Bicycles are normally traded in CKD form and assembled at the retail end.
- 3.5 Bicycles are not covered under Central Motor Vehicle Act and do not require licence, registration, road tax and insurance. Cyclists are legitimate users of roads and the same traffic rules apply to them. Bicycle and its parts are covered under 12% GST slab and raw material steel under 18% slab. The bicycle industry is protected with a basic import duty of 30% on bicycles and 20% on its parts.
- 3.6 Three new plants and five reflector manufacturing plants were set up in this sector in the last 3 years. The industry is concurrently trying to make critical materials at company levels and premium components at large-scale new projects in Hi-Tech Cycle Valley, Ludhiana. Expansions are happening in the areas of e-bicycle and Public Bike Sharing Scheme. Future areas of innovations are, folded, cargo, lighter (Al/carbon fibre/ titanium) and intelligent bicycles.

#### Trends and Issues

#### Production

3.7 The production trend of bicycles in India in the last three years is depicted in Table 1 consisting of all types of bicycles (roadster – institutional / retail, fancy, kids and exports) of AICMA and non-AICMA companies. The data of non-AICMA companies is based on a market survey. The major findings are as follows:

- (i) Overall growth in 2018–19 over 2016–17 was 7%, in which, AICMA companies grew by just 1.25% and non-AICMA by 25%.
- (ii) In retail, AICMA companies witnessed negative growth of 8% and non-AICMA, a growth of 23%.
- (iii) Non-AICMA companies are mushrooming at an unprecedented rate in the kids' segment with around 65% share of the total segment.
- (iv) 30% import duty protection on bicycles and assured institutional sales (around 5 million/annum) to selected state governments are the two major supporting factors for sustenance of the industry.

3.8 These recent unhealthy trends confirm emergence of substandard/untested bicycles and thus, compromising bicycle worthiness and endangering safety of adult and kids' cyclists.

Hence, there is a need for introducing minimum mandatory safety and quality requirement in the entire bicycle value chain to encourage manufacturing that promote fair competition and ensure road safety of users. There is a dire need to respond, before the bicycle manufacturing hub becomes merely a trading hub. It is required to rebuild the industry on its inherent strengths for becoming self-reliant.

3.9 The bicycle production mix comprises 48% roadster (low value), 25% fancy, 22% kids and 5% export bicycles for the year 2018–19. The major share is of low value-added bicycles having thin profit margins. More so, it is a material intensive (steel parts, plastics, rubber, etc.) industry having as high as 80% of share in the total cost, followed by 5% each of labour and power and around 15% over heads.

**Table 1**  
**Bicycle Production**

Parameter	Numbers in Crore		
	2016–17	2017–18	2018–19
AICMA Companies (Organized)	1.59	1.52	1.61
Non-AICMA (Mostly Unorganized)	0.47	0.53	0.59
Total	2.06	2.05	2.2

3.10 Although the industry has world-class fundamentals in steel bicycle manufacturing, it lacks in terms of next generation technology of lighter materials (Al alloy, carbon fiber

and titanium), premium components such as one piece crank; coaster brake; alloy rim; BB Cartridge; PAH free cable casings and grips; derailleur set; and disc brake for bicycles leaving the industry dependent on imports in this area. Indian plants practise manual welding and assembly as against the international trend of robot-based welding and automated assembly. It also lacks painting technology and testing facilities and is thus constrained to test/certify the quality required by Europe/ USA market. These plants need to switch over to world-class bicycle manufacturing technologies to be a leader like China in this segment.

Startup companies with innovative ideas have not yet made inroads in the bicycle industry. Though being a low-tech product, it has a huge potential for attracting startups.

## Imports

3.11 The industry is facing an increasing threat of imports, especially from China and Sri Lanka. It is claimed that imports from China have an inherent cost advantage of around 15% on account of manufacturing and export subsidies. Table 2 confirms that such imports from China in volume has increased by 53 % in 2017–18 and 49% in 2018–19 over 2016–17 and is likely to impact Indian production beyond repair if not checked timely and adequately.

**Table 2**  
**Bicycle Imports**

Country	In Numbers				
	2016–17	2017–18	2018–19	Growth in 2017–18 over 2016–17 (%)	Growth in 2018–19 over 2016–17 (%)
<b>China</b>	252100	384484	376100	52.51	49.19
<b>Bangladesh</b>	61407	50981	43330	-16.98	-29.44
<b>Sri Lanka</b>	129693	117841	256330	-9.14	97.64
<b>Malaysia</b>	45460	38875	40200	-14.49	-11.57
<b>Cambodia</b>	10232	5984	1120	-41.52	-89.05
<b>TW + Others</b>	7149	8213	17860	14.88	149.83
<b>Total</b>	<b>506041</b>	<b>606378</b>	<b>734940</b>	<b>19.8</b>	<b>45.23</b>

## Exports

3.12 Bicycle exports of the world are dominated by the Chinese bicycles. China produces 90 million bicycles and exports around 60 million with inherent value-added and scale-manufacturing advantages. It dominates more than 90% of the US bicycle market of 19 million and is trying hard to do so in the EU as well, but for antidumping restrictions in the EU and other issues.

India's bicycles and their parts export trend of last 3 years is given in Table 3 in value terms. The export consists of bicycles and parts mainly to African and Asian countries (largely cheaper bikes) and premium bikes to the EU countries. Over a period, the export of Indian bicycles has increasingly become less competitive. The main attributing reasons are as follows:

- (i) cost disadvantage of around 15% over China,
- (ii) Bangladesh increased the import rate on Indian bicycles/parts for valuation from 1 USD/kg to 1.5 USD/kg, thus bringing it at par with Chinese bicycles.
- (iii) Import duty in the EU for Indian bicycles is 14.5% while for Bangladesh and Sri Lanka it is zero, thus exports bases are shifting to these neighboring countries.
- (iv) The export incentive of 5% on the focus product scheme has gone down to 3% MEIS rate and duty drawbacks after GST came into being, both became less supportive apart from increase in raw material price.

**Table 3**  
**Bicycle and Parts Exports**

Parameter	2016–17	2017–18	2018–19
Exports (Million USD)	293	328	360
% Growth over 2016–17	-	12%	23 %

### **Developing Future Bicycles**

- 3.13 Urbanization and socio-economic rural development are most important trends that would positively influence the use of bicycle as one of preferred modes of transportation. The bicycle is splendidly suited for an emerging India struggling with climate change, an obesity epidemic and a rising population pressure, particularly in cities.
- 3.14 The 21st century has seen continued application of technology to bicycles: in designing, building and using them. Bicycle frames and components continue to get lighter and more aerodynamic without sacrificing strength, largely through the use of computer aided design, finite element analysis and computational fluid dynamics. Recent discoveries about bicycle stability have been facilitated by computer simulations. New design technology is applied to manufacturing such as hydroforming and automated carbon fiber layup. Finally, electronic gadgets have expanded from just cyclo computers to now cycling power meters and electronic gear-shifting systems.
- 3.15 Towards this, the Indian industry is proactively developing contemporary bicycles to meet emerging needs. For example, there are a series of bicycle companies struggling to launch e-bicycles of various ranges in India as well as to tap into the export market. There are challenges before manufacturers to be cost competitive on account of the high cost of imported battery, motor and controllers.

3.16 Having said this, future bicycle development in India would cover high performance components and lighter materials (from first generation of steel to Al alloy/carbon /titanium materials as second to fourth generation materials), folded bicycles, vertical peddling, cargo bicycles, *custom bicycle concepts*, *intelligent bicycles*, etc., with commensurate demand and aspiring consumers in India. Considering India's inherent strength in aluminum production, it will be wise to switchover to second generation Al bicycle material technology in terms of testing facility and manufacturing capabilities.

### **Dispersal of the Bicycle Industry**

3.17 Historically, bicycle capacity world over moved from the US to Japan to China/Taiwan/India and is now shifting to other countries, such as Malaysia, Vietnam, Sri Lanka and Bangladesh, due to favourable economic factors. For current low-tech and low-value bicycles for CKD, pan-India supplies with unified GST regime; Ludhiana is the most cost competitive hub. The dispersal of bicycle manufacturing to other regions of India is also feasible in conducive economic conditions.

3.18 Chennai in the south, Patna in the east and Nashik in the west have the potential to be bicycle manufacturing hubs. All three are located at or near seaports. Manufacturing at these locations can take advantages of domestic as well as export markets. The process of dispersal of industry could be catalysed through the development of focused cluster in these regions.

### **Global Bicycle Industry**

3.19 The global bicycle industry is dominated by China in terms of production, exports and consumption. The EU and USA have a huge market of around 19 million each. The global market is of 140 million and its associated parameters are as under:

- Global production per annum: 140 million [China (90 million) and India (20 million)]
- Value by 2019: 42 USD billion
- Market growth forecast : CAGR 2.4% (2016–21)
- High growth area: Asia–pacific region
- Emerging diversification: e-bicycle and PBS
- Major drivers: Preferred recreational and fitness activity, growing traffic congestion, worsening environment and health indicators, lack of cheap motorized transport and rising fuel prices
- Bicycle population on the road: 800 million

India remains the second-largest producer and a growing market owing to its current low penetration. It needs to be calibrated comprehensively for enhanced position in the global bicycle landscape.



## **The Way Forward**

- 3.20 The Indian bicycle industry aims to become a world leader in design, engineering and manufacturing of lighter, smarter, value-added, safe and faster premium bicycles, which are comparable with minimum, mandatory global standards for exports and the domestic market; growing in volume to over 50 million per annum by 2025; and generating an additional 1 lakh jobs.
- 3.21 For pursuance of the stated vision, the industry needs to develop a hi-tech bicycle manufacturing ecosystem, introduce superior materials, premium components, world-class testing and R&D facility, and skilled manpower. This apart, direct and indirect measures are needed to promote and popularize bicycles in India. The specific recommendations are suggested by the industry associations (see Annexure I) and the important one elaborated in the subsequent chapters.

## **Chapter 4**

### **Interventions for Turnaround of Indian Bicycle Industry**

- 4.1 The global bicycle industry is continuously advancing and increasingly becoming competitive and innovative. In this emerging scenario, the Indian bicycle industry has many challenges in meeting the demands of various types of bicycles for domestic and export markets, including additional, rural demand expected through government initiatives. The Indian bicycle value chain needs institutionalized mechanism to pursue the vision of industry and take up hard and soft measures/supports for the turnaround of the industry. In this context, the following impactful supportive measures are proposed:
- (i) Setting up of Bicycle Development Council under the Department for Promotion of Industry and Internal Trade.
  - (ii) Make BIS safety standard of bicycles (IS 10613:2014 & IS 15533: 2004) and critical parts from voluntary to mandatory.
  - (iii) Modernization of existing bicycle R&D Centre at Ludhiana and setting up an integrated facility for aluminum components of bicycles in India.

#### **Setting up of Bicycle Development Council under DPIIT**

- 4.2 Bicycle is a sustainable, green, healthy and affordable transport, which caters to 50% households of India, a lifeline for 11 crore poor commuters. It, however, suffers on account of demand and supply issues of short- and long-term relevance. The issues concerning this mode of transport relates to the Government of India, States and ULBs simultaneously.
- 4.3 Bicycle is one of the scheduled industries covered under ‘Transportation’ in the First Schedule of Industries (Development and Regulation) Act. In fact, all transportations have either separate ministries or departments with a policy, plan, budget, etc. However, the bicycle does not have any; therefore, a council is necessary.
- 4.4 The vision of the Indian bicycle industry is to become a world leader in design, engineering and manufacturing of lighter, smarter, value-added, safe and faster premium bicycles, which are compatible with minimum, mandatory global standards for exports and domestic market. The industry also has dreams of growing in volume—to over 50 million per annum by 2025—and generating additional 1 lakh jobs.
- 4.5 For pursuance of the stated vision vis-à-vis resolving the diversified issues, it is recommended to set up a ‘Bicycle Development Council’ under the Development Council of Industries (Procedural Rules) 1952, and (Development and Regulation Act), 1951. This will be an overarching standing mechanism to address bicycle promotion-related multidisciplinary and multi-ministerial issues on continual basis with broad functions, viz. to improve competitiveness and level of services of the industry; technological transformation and ensuring minimum safety standards of bicycles made

in India and its value chain, along with allied issues such as safe cycling infrastructure, microfinancing, etc.

- 4.6 It will stimulate the development of bicycle value chain and ensure accelerated growth of 'Make in India Bicycles'.

#### **Make BIS Bicycle and Parts Safety & Quality Standard Mandatory:**

- 4.7 The bicycle is a means of transportation for several million people in India and enjoys all legitimate rights of the use of road, at par with motorized vehicles. Therefore, road worthiness of bicycle is a prerequisite for ensuring cyclists safety and accident prevention. The long-term goal is to further reduce fatal accidents involving cyclists substantially from the current share of 2.4% (2018) in the total fatal accidents of India.
- 4.8 In India, BIS has around 30 bicycle standards (2 safety and rest component standards) but all are voluntary in nature. Most of the market demand was met till recently from the organized and branded companies (around 10) having company standards (equivalent to BIS) with quality assurance and requisite testing facilities in place. Also, these manufacturers have BIS licences for main parts—frame, fork, mudguard and rim—and some of their vendors have licences in parts mainly to cater to the need for government supplies (around 5 million per annum).
- 4.9 For the past few years, there has been a fast expansion of unorganized suppliers, selling substandard, untested bicycles from traders/dealers and importers. The same can be attributed to the lack of minimum, mandatory quality standards. The Association emphasized that in the current situation the entire value range has been negatively affected due to the defaulting credit system, prevailing CKD-based supplies, multiband shops and untested bicycle supplies. In addition, bicycles being price sensitive and lack of awareness amongst buyers are impacting manufacturing, market and cyclists' safety. If timely action to mandate standards is not taken, it may convert the Indian bicycle manufacturing hub into a trading hub.
- 4.10 In the absence of supply-side mandatory standards and compliance, the whole bicycle value chain is sensitive to prices and is growing in an unstructured way. It was emphasized that apart from conformance to safe bicycles for consumers, the Compulsory Registration Scheme for Bicycles would create more quality conscious culture and sustainable bicycle value chain, bringing in more organized sales and repair shops, premium components and increased exports. Therefore, it is desirable to introduce minimum safety quality standards.

#### **Best Practices of Bicycle Safety**

- 4.11 The rules and regulations governing bicycles and their use are much less harmonized internationally. Despite the uneven regulatory landscape for cycling, a common 'core' of rules does seem to emerge in many countries. The two examples of such mandatory safety standards are 'Product Safety Standards (Pedal Bicycle) Regulations 2000 of New

Zealand ‘and ‘US Bicycle Regulation’. These bicycle regulations aim to ensure higher consumer safety.

- 4.12 The Association has strongly advocated to bring the adults’ and kids’ bicycles and parts standards under the Compulsory Registration Scheme. In addition, the TERI report of 2014 suggested: ‘Regulation should be put in place to ensure that no components /bicycles are sold in the market unless they are tested for safety’ and the central government may also consider introducing mandatory quality control orders for both imports and domestic production.
- 4.13 The Compulsory Registration Scheme is operated under the Bureau of Indian Standard (Conformity Assessment) Regulation, 2018, as per the BIS Act 2016. The Scheme aims to provide momentum to the rapidly expanding sectors while simultaneously protecting Indian consumers from spurious and substandard products. It has upgraded the competitiveness of domestic manufacturers and given Indian consumers the right to enjoy world-class-quality-compliant goods. The strategy adopted by the Government of India has helped in preventing the dumping of non-complaint goods and bridged the gap between people, technology and safety. In case a product is notified under compulsory registration, no entity shall manufacture or import or sell or distribute the specified good, which does not conform to the specified Indian standards and does not bear the standard mark.

#### **Phased Mandatory Standards**

- 4.14 The industry body is voluntarily proposing to migrate to compulsory standards. Two standards exclusively related to Cyclists safety—for Adult (Cycles-Safety Requirements for Bicycles: IS 10613: 2014 adopted from 4210-2, and Kids Cycles - Safety requirements for bicycles for young children - IS 15533: 2004/ISO 8098) and critical parts standards are proposed to be made mandatory. It may be initiated by the DPIIT.
- 4.15 Two safety standards specify safety and performance and testing requirements for the design, assembling and testing of bicycles and lay down guidelines for instructions regarding the use and care of bicycles.
- 4.16 The import of bicycle in 2018–19 stood at approximately 7 lakhs, more than 50% came from China. The mandatory standard may help to curb increasing imports too.
- 4.17 The Research and Development Centre for Bicycle and Sewing Machine (RDCBMS), Ludhiana, under the Punjab government is providing different facilities to about 4000 units operating in bicycles and parts manufacturing sectors. The Centre should prepare a plan to upscale its facilities and strategize for the additional manpower that will be needed to meet the huge demand of third-party testing and certification during implementation phase of Standards.
- 4.18 The Department for Promotion of Industry and Internal Trade (DPIIT)—administrative ministry for bicycle in consultation with BIS may cover cycle safety standards (adult and kids) and parts standards under the Compulsory Registration Scheme (after revision of the standards, which is in the pipelines).

## **Modernization of Existing Bicycle R&D Centre at Ludhiana and Setting up an integrated Facility for Aluminum Components of Bicycles in India**

- 4.19 The Bicycle R&D centre is an autonomous body, which is situated in the middle of a mega bicycle cluster at Ludhiana. It was set up with UNIDO assistance in 1984, owned by the Punjab government and operated by a dedicated technical manpower. Its council is headed by the Director, Industry, the Government of Punjab, in ex-officio capacity.

This Centre, however, has not been upgraded to meet the modernization needs of the industry and has resultantly remained more of a tool room. In 2015, it was felt necessary to take the Centre to the next-generation technology level so it could become a centre of excellence for world-class testing, certification, third-party inspection, etc.

- 4.20 This Centre, with the assistance of UNIDO phase-I project, in the last three years has been successful in bridging the basic hard and soft gaps (Annexure-II). However, the same is yet not adequate to bridge the earlier wide gap. It still lacks in terms of tool manufacturing, product development, testing, product validation/certification, technology transfer, Al alloy product development and skill development.

The UNIDO action agenda report has recommended many more upgradations. A need for next-stage modernization is inevitable. The emerging requirements to introduce superior materials, premium component technologies and new versions of the bicycle like e-bicycle, foldable bicycle and public bike sharing, has further necessitated stringent testing, validation requirements for bicycles and parts. This is one of the major common concerns of bicycles and parts' units in the Ludhiana cluster.

- 4.21 The Association has sought governmental assistance for setting up certain common facilities in the next phase of modernization of the R&D Centre so that the ecosystem for domestic manufacturing of aluminum bicycles is strengthened. It should be made a state-of-the-art R&D and testing facility. More importantly, it is becoming urgent to meet the manifold requirements of testing and certification of cycle safety standards, already in the pipeline.
- 4.22 The existing centre is a common facility catering to the needs of 4000 units of the bicycle cluster in Ludhiana. The DPIIT, from its own or some other ministry's scheme or UNIDO, may support the upgradation of the centre for the needs of industry.

## **Chapter 5**

### **Impacts of Different Schemes like Distribution of Free Bicycles, etc. on Enrolment of Students**

#### **Issue of Accessing Schools in Rural Areas**

- 5.1 Ideally, accessing school beyond walkable distance should not become a reason to drop out. This gap is being addressed through the proven and versatile scheme of free distribution of bicycles (transport ownership model) and transport voucher scheme (public transport service model) in Rajasthan.

#### **Impact of Transport Voucher Plan in Rajasthan**

- 5.2 The Government of Rajasthan introduced a Transport Voucher Plan operational in 2017–18. The vouchers are provided for free transportation facilities to girls in the age group of 6 to 14 years. Furthermore, for all those students studying in classes 1 to 8 in rural areas where there is no government primary school or government middle school within a distance of one and two kilometers from their residence, the Transport Voucher Plan is also available. The present scope of this scheme is limited by specific pick and drop by a state-run bus at a scheduled time and does not provide time flexibility and service reliability.

#### **Impact of Free Bicycle Distribution Scheme on Enrolment**

- 5.3 With an objective to improve enrolment in secondary and higher-secondary schools, many state governments have been providing free bicycles for eligible students to facilitate commuting to their schools. Around 15 states have regular programmes to empower children with free new bicycles as basic and independent mobility support. The selected beneficiaries are from economically weaker sections. Approximately 4 to 5 million bicycles that constitute more than 25% of the bicycle production in India are funded annually through the State Government programmes for students of both genders. The details of free bicycle distribution by 18 states are provided in Annexure-III.
- 5.4 The eligibility criteria for providing bicycles, however, varies from state to state in terms of gender, class, age, etc., and the scheme is not yet covered by some states like UP, Maharashtra, Goa, Kerala, J&K and 6 NESs (Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Sikkim). Most of the states provide bicycle ‘in-kind’ except one or two states ‘by cash’. The distribution of bicycles in kind ensures BIS-quality bicycles from the branded bicycle producers of India through competitive bidding with assured after sales service in a transparent manner.
- 5.5 Two independent evaluation reports of such programmes in Bihar (by Muralidharan and Prakash, 2013) and West Bengal (by Pratichi India Trust, Kolkata) have validated that free bicycles schemes have reduced dropout rates substantially.
- 5.6 ‘Cycling to School: Increasing Secondary School Enrolment for Girls in India’, the study by Karthik Muralidharan and Nishith Prakash (NBER Working Paper, 2013) evaluated

the impact of the cycle programme by the state government of Bihar. The study concluded that the programme increased girls' enrolment in secondary schools by 30% and also reduced the gender gap in secondary school enrolment by 40%. The study also found that the cycle programme was much more cost effective at increasing girls' enrolment than comparable conditional cash transfer programmes in some countries of South Asia. This observation suggests that the coordinated provision of bicycles to girls may have generated externalities beyond the cash value of the programme, including improved safety for girls cycling to school in groups, and changes in patriarchal social norms that proscribed female mobility outside the village, inhibiting female secondary school participation. Other conclusions of the study may be seen in Annexure IV.

- 5.7 The study commissioned by UNICEF India through ERU consultants on 'formative study to enhance the understanding about reasons for smooth transition among boys and girls to secondary schools' (West Bengal Report, February 2017) (Annexure V) comprehensively analyzed the issues impacting transition to secondary schools. Two important schemes, 'Sabuj Sathi' and 'Kanyashree', were introduced in West Bengal in the recent past for facilitation of secondary education. Children who continue their education to secondary and higher secondary level are provided bicycles once in their academic cycle either at the secondary level or at the higher secondary level under the 'Sabuj Sathi' scheme. These two schemes have played a very important role in the transition and retention of students at the secondary level. The government incentives (school uniform, cycle, scholarship, Kanyashree and MDM) ranked first as an enabling factors for transition and retention in secondary education as opined by the school going girls (std. IX) in survey conducted under the study.
- 5.8 The other similar evaluation study generally points out the positive impact of providing bicycles to the students for their transition and retention leading to higher enrolment in secondary schools. Himachal Pradesh and Uttarakhand have also introduced the bicycle scheme in the last 4–5 years but the overall reach does not seem to be wide. There is a need for comprehensive evaluation of the bicycle scheme as this not only impacts the enrolment but also empowers the students particularly girl students in multiple ways.
- 5.9 The Annual Survey of Education Report (ASER) 2017 findings suggest, 'While on average the difference between enrolment levels of boys and girls at age 14 are declining; by 18, when the state doesn't enforce compulsory education through the RTE Act, 32% girls and 28% boys are not enrolled.' As per UDISE data, net enrolment ratios (NERs) for girls at Secondary and Higher Secondary Levels are 53% and 32% respectively for the year 2016-17 and this indicates the scope for improvement.

### **Bicycle Scheme Merits Comprehensive Attention**

- 5.10 Distribution of free bicycles bridges the critical mobility gap for poor rural students and helps them to access schools beyond walking but within cycling distance. Bicycle empowerment addresses issues of safety and security of girl child, lack of reach of public transport, early girl marriage and poverty. Bicycle facilitates access to schools with flexible timetables; improves school dropout rates; provides enhanced security, as girls travel together in small groups; empowers them with knowledge; creates equal mobility

opportunities for all students irrespective of their class, caste, gender or other backgrounds.

Overall, it has a multiplying effect that can help to break the cycle of poverty enabling them to become socio- economically independent and reduces child marriage and gender harassment. Bicycles provided could also be used for other purposes for travelling shorter distances by the household during off-school hours.

#### **Need for Pan-India expansion of Cycle to School Schemes of the States/UTs**

- 5.11 Undoubtedly the free distribution of bicycles to students' scheme in states has been successful in decreasing school dropouts in rural areas. Therefore, the adoption of the Scheme, preferably through in-kind delivery, by states/UTs where such Schemes are not presently in practice, is recommended.



## **Chapter 6**

### **Integrating Productive use of Bicycle in Rural Economy**

#### **The Context**

- 6.1 As per 2011 census, of the 121 crore Indians, 83.3 crore live in rural areas. Where 38.3% of people do not travel for various reasons, one of them may be assigned to - absence of means of transport; 21.9% walk and 13.2 % use bicycles for mobility.
- 6.2 NABARD All India Rural Financial Inclusion Survey (NAFIS) 2016-17 provides details on financial capacity of rural household based on income, expenditure, and savings information. The survey covered a sample of 1.88 lakh persons from 40,327 agricultural and non-agricultural rural households across the 29 states of the country. Some of the observations / findings of the survey were follows:
- (i) For all households combined, the average monthly income stood at Rs 8,059, with that being higher for agricultural households (Rs 8,931) as compared to non-agricultural ones (Rs7,269).
  - (ii) 20% of households earned Rs. 2,500 or lesser per month which appears insufficient to meet the bare necessities of life. A sharp rise was seen in the households falling in the top 20th percentile, with income level rising from roughly Rs. 11,000 to 48,833 per month. These figures are reflective of wide income disparities in the rural communities with a very large divide between the rich and the poor. These disparities may be attributed to existing inequalities in terms of households' ability to access various resources and opportunities which are essential for their development.
  - (iii) 60% of Rural Households (HH) earned Rs 6,667 or lesser per month.
  - (iv) Based on the reported expenses, the overall average Monthly Per Capita Capital Expenditure (MPCE) for all households combined was calculated to be Rs 6,646. The median MPCE was calculated to be Rs 1,375.
  - (v) The study shows that there existed a wide disparity in the consumption expenditure with the lowest 20% households reporting to have spent lesser than Rs 765 per person per month.
  - (vi) Among rural HH only 50.6% of Rural HH have reported savings (institutional) in last one year.
- 6.3 Based on the income and expenditure pattern of rural households (NAFIS, 2016-17) it can be safely inferred that almost 50% of the households are not in a suitable position of incurring expenditure on non-consumptive items such as bicycle.
- 6.4 A study for the 'mode used to travel for work' mentions that approximately 200 million (Source: UITP) people walk up to 10 km for their work. This mobility gap is critical for the socio-economic empowerment of rural households. It prevents them from harnessing their untapped earning potential and also deprives them from productive social engagements. This mobility gap could be bridged with a simple, reliable, affordable and self-owned transport for all critical needs—the bicycle.

#### **Bicycle Addresses Critical Rural Mobility Needs**

6.5 A bicycle per poor rural household could bring substantial socio-economic progress in the well-being of the household in more ways than one, as elaborated under:

- **As direct income-generating asset:** Bicycle is used for a number of direct-income generating purposes. It enables to commute to buy and sell goods such as farm products, clothes, food items, etc., from village to market. It also helps in providing/ seeking other daily services like delivery of milk, newspapers, LPG cylinders, etc.
- **As an enabler to access employment:** Bicycle enhances the income-earning potential of a person by reducing his/her time spent on travel. This, in turn, enables people to access extended workplaces at affordable cost.
- **As facilitator of mobility for social purposes:** Rural households necessarily need to connect with nearby medical facilities, attend social and cultural gatherings, sports, etc., very often for their overall well-being.

### Issue of Bicycle Ownership

6.6 The expenditure capacities, as assessed based on NAFIS 2016-17, is that a basic bicycle ownership is out of reach for the millions of poor rural households for the reasons mentioned below:

- A bicycle in India costs around 2.7% of annual per capita income. The poor rural households cannot afford upfront purchase of a bicycle costing Rs 3500 plus. It entails for reduction in GST to make it affordable for masses.
- Banks have provision under PSL (priority sector lending) for small loans but due to small size of bicycle loan it is discouraged, on account of disproportionate processing cost, efforts needed for monitoring and control of micro EMIs and additional recovery cost in case of default. Therefore, such provisions need to be revisited by the Department of Financial Services.

### Peddling Rural Development: A National Level Initiative

6.7 In the national perspective, inclusion is being accomplished from existing schemes (e.g. subsidized food items, LPG, affordable housing, free education and healthcare). Similarly, supporting a bicycle loan through appropriate government schemes to the needy low-income rural population could have a cascading impact in empowering the poorest of poor households with dignity in an inclusive and equitable way. It can enable them to enlarge viable livelihoods by leveraging their own resources, skills and preferences and thereby helping them come out of poverty.

6.8 There is evidence of studies done in Sri Lanka and Africa that owning a bicycle, can lead to an increase in household income that can be as high as 40%. A World Bank study depicts that owning a bicycle increases family income of economically weaker sections by 30%.

6.9 In this backdrop, realistic possibilities need to be explored to associate bicycles in an institutionalized way at the pan-India level to work towards expanding choices and capabilities of rural people. All this in effect, leads to achieving the goal of eradicating poverty and backwardness at national level and achieve sustainable development goals.

## **Institutionalized Possibilities for All-Round Development of Rural Households**

6.10 In this broad perspective, the potential of institutionalized possibilities to empower the low-income households with the support of bicycles are briefly summarized as under:

6.10.1 **Productive use of bicycles by, of and for the SHGs:** The most practical way to reach low-income households in rural areas is through self-help groups (SHGs). There are around 17.97 crore rural households in India as per SECC, 2011, report. There are around 5.67 crore people who are members of SHGs. With the present stage of rural connectivity and membership of SHGs, and for the intervention to be impactful, providing loans for bicycles to about 2 crore people in a short span of time may be considered. There are two ways to support SHGs with bicycles.

(a) **Soft Cycle Loans:** The SHGs can be sensitized to tap the potential of providing loans for bicycles to their members. This fits well as an income-generating asset for their members. An advisory in this regard may be issued.

(b) **Cycle Rental, a Business Model:** SHGs may be educated about the avenues surrounding bicycle rental. One SHG can keep 5 bicycles or more and offer them to villagers to take cycles on rent. A business model that will enable savings and make bicycles free from all loans within one year is feasible. SHGs may be encouraged to take this as one of the entrepreneurial initiatives.

### **6.10.2 Entrepreneurial Initiatives for Woman under the Mudra Scheme**

There is provision of Rs 1,00,000 loan for women under the Mudra scheme. This will empower women to undertake small entrepreneurial initiatives for enhancing income by adopting businesses relevant in villages including bicycle rental. Women should be encouraged to purchase 15–20 bicycles under the Mudra loan so they can provide them on a minimal rental of Rs 20 per day to villagers going for work (not restricted) thus enabling her to additionally earn Rs 7000 to Rs 10,000 per month. This offering will also give opportunity to daily workers of village to hire a low-cost mobility and travel larger distances to earn their livelihoods.

6.10.3 **MFI:** Micro-financing Institutions (MFI) are closely connected with low-income groups and interact with them on regular basis. Most of these members are small entrepreneurs and use loans to increase their incomes. The Department of Financial Services can issue guidelines to MFIs for inclusion of bicycles as ‘income generating asset loans’ (IGL). This will enable low-income members to purchase bicycles.

### **6.10.4 Ayushman Bharat Yojana:**

**ASHA Workers:** While an ASHA worker takes care of the health of villagers, she travels by foot even during adverse weather conditions to reach her patient’s home. Free

bicycles were provided to 150 ASHA workers of Cheheniya block of Chandauli district of UP. A study conducted showed ASHA workers were able to:

- Cover 42% more houses/patients
- Increase their income by 17%
- Travel time reduced by 57%

All 9 lakh ASHA workers should be empowered with a bicycle. There are about 1.5 lakh health and wellness centres (HWCs) being managed by government health staff. Each of these HWCs should have access to 15 bicycles. These bicycles will be gainfully utilized by the staff to work and patients to reach HWC.

**6.10.5 Aspirational Districts Programme:** To enable optimum utilization of their potential, this programme focuses closely on improving peoples' ability to participate fully in the economy. The broad contours of the programme are convergence (of Central & State Schemes), collaboration, and competition among districts. With states as the main drivers, this program focusses on the strength of each district, identifies the low-hanging fruits for immediate improvement, measures progress, and ranks districts. As many as 115 districts have been selected mainly from Bihar, Jharkhand, UP, Odisha, Chhattisgarh and MP. These states have suitable terrains to ride a bicycle. A programme component for Aspirational Districts may be devised to increase access of bicycles to different populations in some of these districts in a focused manner, to enhance education and livelihood opportunities. If it is established that owning a bicycle increases the participation of people in the growth of the economy, the project can be scaled up.

## **Chapter 7**

### **Enabling Bicycle Resurgence in Urban Spaces**

#### **Unsustainable Urban Mobility in India**

- 7.1 Going by the present scenario, cycling (and walking) as active travel by 2031 will reduce from 43% to 34% and public transport will reduce from 16% to 9%; however, private transport will increase from 41% to 57%. These trends are not sustainable for 7935 cities and towns of India ('Traffic and Transportation Policies Strategies in Urban Areas in India', 2007, by Wilbur Smith).
- 7.2 The foremost reason for the public disinterest in active travel is the prevailing mixed traffic and unsafe roads. The cycling lanes and footpaths are either not built nor properly designed or remain poorly maintained or suffer encroachment. It is discouraging to note that 33%–55% of mode share of active travel (of which, bicycle has 7%–21 % mode share) is getting neglected.

#### **Bicycle as One Transport: Fits Many Solutions for Urban Mobility**

- 7.3 Bicycle is recognized as a sustainable mode of transportation and has a promising future. Bicycle ownership levels in many developed and highly motorized countries are much higher because cycling is a choice mode of transportation in these countries whereas in developing countries like India, it is essentially used by persons who have no other option due to income constraints.

#### **Global Resurgence of Cycling**

- 7.4 All over the world, citizens are rediscovering the benefits of cycling. The return of the bicycle to the modern urban transport ecosystem continues unabated. Cities are responding by building the infrastructure to serve and keep them safe. To improve the quality of city life is the greatest movement in urban spaces.

Of course, not all cities are equal. Some charge ahead, while others lag. The list of best cycling cities in the world amongst other includes Malmö (Sweden), Amsterdam (The Netherlands), Minneapolis (Minnesota, USA), Portland (Oregon USA) and Copenhagen (Denmark). The common denominators between these cities are clear: the realization of the potential of cycling as transport, investment in infrastructure and culture, and a desire to make cities better.

For almost a century, urban planners have asked only one question about transport: 'How can we send more cars down this street?' In today's age of booming urbanization, modern cities have changed that tired question to: 'How can we send more people down this street?' The answer includes robust public transit and walking infrastructure—and, of course, a heavy dose of bicycle.

- 7.5 It is pertinent to mention here that the UN in 2018 declared 3<sup>rd</sup> June as World Bicycle Day to create awareness about the multiple societal benefits of using the bicycle for

transport and leisure. This UN declaration is an acknowledgement of the contribution of cycling to the Sustainable Development Goals.

### **Central Government leads: States and ULBs lags in Pro-Cycling Initiatives**

- 7.6 Recognizing the dire need to redefine urban transport in India, including the role of bicycle, the Government of India formulated the National Urban Transport Policy (NUTP), 2014, (see Annexure VI), which recognizes the importance of active, non-motorized transport (NMT), i.e. walking and cycling, as green modes of transport. It further reinforces that other than walking, cycling is the most important mode of transportation for urban population. Cycling should be encouraged to improve reach and effectiveness of public transport (PT).
- 7.7 The NUTP stipulates specific bicycle promotion provisions, which include: construction of safe and segregated bicycle lanes (arterial/first and last-mile connectivity) involving targeted beneficiary; construction of cycling crossings at road sections; encouraging public bike-sharing programme; formulation of a specific area plan for NMT; preference for NMT parking space; funding for cycling lanes; formulation and implementation of pilot projects; and campaign for green travel habits.
- 7.8 These NMT provisions are included in mega schemes of the urban affairs ministry such as JNNURM, Sustainable Urban Transport Project (SUTP), Smart Cities, AMRUT and other urban development or transportation funding programmes. Through these projects, the GoI is investing in building NMT infrastructure as pilot initiatives. As an illustrative example, 100 smart cities have been selected so far for cycling infrastructure and PBS scheme. SUTP demonstration cities (Indore, Mysore, Hubli-Dharwad, Naya Raipur, Pimpri-Chinchwad), SUTP guidance documents cities (Gurugram, Bhopal, Aizawl, Vishakhapatnam, Mumbai) and decongesting Delhi report and plan for NMT are part of this initiative. Some states like Uttar Pradesh have made cycling tracks in Noida, Lucknow and Greater Noida and cycle runway of 260 km from Etawah to Agra. Cities have taken proactive interest in building cycling infrastructure.
- 7.9 In addition, there are examples of municipal corporations constructing cycling lanes. Chandigarh has 160 km cycle tracks constructed during 2001–03. In Bengaluru, 40 km of cycle lanes were marked in Jayanagar area in 2012. Pune has a cycle plan (Pune Bicycle Plan), which was prepared in 2016 to help make Pune a cycle-friendly city. Significant progress has been made over the past year to achieve a 300 km bicycle track in the city. The Chennai Corporation's Council adopted a progressive non-motorized policy in October 2014 to make walking and cycling its priority (Non Motorised Transport Policy, 2014). The policy mandates that a minimum of 60% of the corporation's transport budget be allocated to construct and maintain NMT infrastructure—a clear demonstration of the Corporation's commitment to creating safe streets that consider the needs of all users.
- 7.10 This apart, the National Mission on Sustainable Habitat focuses on greater use of NMT for reducing GHG gases. Even National Road Safety Policy of the Ministry of Road

Transport, GoI stipulates that design and construction should take into consideration the needs of non-motorized transport.

- 7.11 The pro-cycling framework exists in the country by way of NUTP Policy, IRC code 11, and UDPFI guidelines. At the state and ULBs level, however, nothing significant is being done towards providing a safe, separate and seamless cycle network. In fact, status of cycle lanes being such that these are not even built in most ULBs (cities/town) citing multiple reasons. Even in a few cases, where these are built, they are either not properly designed keeping cyclists' safety in view or remain dilapidated due to poor maintenance or encroachments.
- 7.12 The 'Complete Street' framework of USA encompasses the following:
- **Complete Street Concept:** 'Complete streets' is a transportation policy and design approach that require streets to be planned, designed, operated and maintained to enable safe, convenient and comfortable travel and access to users of all ages and abilities regardless of their mode of transportation, including walking and cycling. (Complete Street, Smart Growth America).
  - **Federal Level Policy:** In 2010, the US Department of Transportation issued a policy statement on bicycle and pedestrian accommodation, declaring its support for their inclusion in federal-aid transportation projects and encouraging community organizations, public transportation agencies, and state and local governments to adopt similar policies.
  - **States/Regional/City-Level Legislation, etc.:** By 2018, over 1400 agencies at the local, regional and state levels adopted complete street policies, some as legislation, others as executive order or as internal policy.

## **Way Forward:**

### **A. Need for National Policy Framework for Active Travels**

- 7.13 **Adopt 'Complete Street' as a Benchmark Framework:** In urban areas, bicycle constitutes 7%–21 % of mode share, which has potential to increase multifold for trips up to 5 km. In this scenario, the need is to create a framework for urban transport (intra city/town transport) to bring about radical changes to ensure sustainable growth by giving preference to walking, cycling and public transport. While public transport is being taken care of in many ways, walking and cycling as dominating mode of transportation need to be promoted through such framework. Towards this, it is suggested to adopt a bold policy and implementation framework that helps promote cycling widely and effectively.
- 7.14 In order to evolve a policy and implementation framework something on the lines of 'Complete Street' at the pan-India level, a need to constitute an Authority (like NHAI) to actively promote 'Complete Street Framework' is envisaged. The envisaged Authority will be empowered to implement the proposed 'complete street framework' in collaboration with States and UTs, and also motivate them to legislate on this subject.

## **B. Creating Pro-Cycling Culture and Safe Infrastructure**

7.15 The suggestions made by the AICMA for speedy and effective implementation of existing NUTP policy were as follows:

- i. Make safe cycling infrastructure conditions (lanes, parking, etc.) mandatory in all central funding of JMMURM and AMRUT.
- ii. The Ministry may introduce a mandatory provision for bicycle parking spaces with stands at different types of developments (residential, commercial, industry and other public places) in model building by-laws, 2016.
- iii. Support creation of cycling friendly infrastructure beginning with UTs (in coordination with Ministry of Home affairs)
- iv. In Delhi, DDA may create cycling and walking circumferential network through an independent entity with a focus on O&M provision as a role model. Create cycling lanes in children parks. It may amend parking by-laws of the NCT of Delhi in different types of developments (residential, commercial, industry and other public places) for providing mandatory bicycle parking spaces with stands.
- v. Mandate metro stations with cycle parking stations
- vi. Adopt transit-oriented design approach with NMT-based last-mile connectivity.
- vii. Initiate cycle to work scheme in government offices, big, private establishments, factories, etc.

7.16 **Nationwide Campaign by Central Ministries:** Nationwide communication campaign to be undertaken by the ministries of urban affairs, health, environment, petroleum, etc., to uplift the image of cycling as new-age activity, green habits and well-being promotion in association with the states.

7.17 **Initiatives by States and ULBs:** States should adopt the Complete Street framework through legislation, and ULBs should initiate concurrent safe, separate and seamless cycling infrastructure, including secure parking actions in ULBs in tier-1 and tier-2 cities.



## **Chapter 8**

### **Innovative Models Promoted by Startup Companies in the Bicycle Space**

#### **Public Bike sharing: A Smart System**

- 8.1 Public Bike Sharing or PBS means the shared use of bicycles. It is defined as ‘a self-service, short term, bike rental offer in public spaces, for several target groups, with network characteristics using various technologies.’ In a nutshell, it is a technology-driven, unmanned and systemic version of traditionally manned, rented bicycles.
- 8.2 The technology needs a smartphone with internet, online payment facility and a PBS bicycle with RFID chip. Operational steps include downloading the PBS app, locating the PBS bike, unlocking and riding it, parking at dock or anywhere and locking it manually after finishing the ride. Deposits vary from Rs 1000 and Rs 2500 for a bike. Rentals are between Rs 5 and Rs 10 per hour.
- 8.3 The objective behind this business was to solve the last-mile connectivity problem faced by people commuting daily between their homes and public transport. It also caters to longer rides in towns and cities that attract a large number of tourists and people cycling for leisure. Other than that, it benefits urban people and their lives in terms of decongestion, being fit and healthy and freedom from pollution.

#### **Global Emergence of PBS**

- 8.4 Globally PBS began to expand explosively in China in 2014 and eventually had 30 plus operators (Ofo and Mobike shared approximately 90% of the total market) in an unregulated manner and their roll outs were beyond the carrying capacity. It reached 209 million users in 2017. Around June 2017, Chinese tiers 1 and 2 cities got saturated and the PBS market was shaken up. The Chinese government stepped in and decided to regulate PBS. Consequently, the PBS growth rate went down, thus generating a surplus capacity of PBS bike manufacturing units and a huge inventory of new and used PBS bicycles. Thereafter, Chinese PBS operators started expanding world over (Source: news articles).
- 8.5 In India, PBS started in June 2017 with docked operations in Mysuru and Bhopal and then dock-less (being less capital intensive) in Coimbatore and Pune and further expanding to other 100 smart cities, universities, metro stations, etc. The PBS operators were of Chinese origin (Ofo, Mobike, etc.) as well as Indian start-ups (MOBYCY, Zoom Car, MyByk, Vogo Atomotive, ONN Bikes, Wiked Ride, Stoneheadbikes, Rentabike, Tazzo technologies, Wheel street, Yulu, fremo, Greenride, Ola pedal, etc.). Indian-origin bicycle companies like Hexi, a subsidy of Hero Cycles, are also actively associated with various PBS projects.

#### **PBS Experiences in India**

- 8.6 Ofo and Mobike were quite aggressive in India in 2017 and 2018, but almost withdrew from India due to their own investor issues and due to directions of MOHUA for providing level playing field for Made-in-India PBS bicycles. In addition to this, the

smart bicycle initiative faced losses due to universal problems of vandalism, theft, bad condition of bikes and roads, unsafe traffic, etc. Overall, so far, PBS has not yielded desired results in India.

8.7 The area and scale of operation of most of these PBS operators is low. Mobycy was the first to enter the Indian market. Mobycy, being in the process to raise funding for expanding their operations in India, began with an app-based bicycle-sharing platform, providing last-mile connectivity in 9 cities. However, they restructured their operations based on e-scooter and are currently operational in Gurugram, parts of Delhi on a pilot-project basis, and Hyderabad's HITEC city. In a recent article published in Hindu in April, 2019 the assertions made by Mobycy about the nuances of the PBS market are as follows:

- Mobycy are staying away from cycles right now as they are not the best way to solve the Indian last-mile problem. When it comes to commuting, the preference for cycles is a niche segment, not a mass segment.
- The company has dabbled in cycle sharing as well but found that e-scooters are the best way to tackle the short distance commute issue.
- The consumers would go for an e-scooter over a cycle because of form-factor preference and reduced effort.
- It is density rather than expansion that works in this business. Instead of expanding to 50 cities, Mobycy would want to be focused on five cities and go deeper in them.

8.8 As such the PBS market in India is under evolution. The solutions have to be city-specific as the need for last-mile connectivity will differ from city to city. Perhaps, e-scooter sharing market will be evolving faster than PBS market.

8.9 The PBS ventures will be competing not only with the ownership model but with the rickshaw/e-rickshaws also. It is difficult to predict how the PBS model will impact the demand of bicycles in India. But looking at the public response to PBS (number of bicycle units to be deployed), the medium-term impact of these ventures on the bicycle industry seems to be limited.

### **Future is Bright for PBS in India**

8.10 Irrespective of teething problems relating to cyclists, operators, bicycles, roads and traffic and competing options of PBS in India, compared to other public transportation projects, cycle-sharing systems are inexpensive, fun and people-friendly. In addition to this, they come with a promising concept for short, fast and smart travel in crowded cities and have the potential to attract many start-ups. Cycle-sharing systems can be well utilized or integrated as a feeder system which can provide first and last mile connectivity to public transport systems like, BRTS and metro. It, therefore, needs a massive push and support to be successful in India. Keeping that in mind, the Ministry of Housing and Urban Affairs, Government of India, may review the PBS and devise solutions for the prevailing issues.

## Chapter 9

### The Way Forward

9.1 The Report analyses the issues and identifies the action agenda for short and long - term implementation by the mandated agencies for pushing -pulling desired growth and development of the Bicycles India. The broad way forward is as under:

#### I. Enhancing Cyclist Safety

Provide safe Cycling network, quality control order on reflectors, organize regular cyclists' road safety campaigns, and introduce appropriate lighting system to increase visibility of cyclists in night. Adopt global best practices of cyclist's safety from other countries.

#### II. Measures for turnaround of the Industry

- a. **Long term measure:** To create '**Bicycle Development Council under DPIIT**' as standing mechanism.
- b. **Medium term measure:** To make Bicycle standards mandatory and scaling - up of the Bicycle R&D Centre

#### III. Supporting Bicycle demand in rural India

- a. Make Bicycle financing effective under Priority Sector Lending (PSL), Jan Dhan, etc. Consider reduction of GST on Bicycle and parts to make it affordable for masses.
- b. The improved access to schools facilitated by free bicycle Schemes positively impacts Net enrolment ratios (NERs) at Secondary and Higher Secondary Levels. Therefore, the adoption of the Scheme, by states/UTs where such Schemes are not presently in practice, is recommended.
- c. Enabling socio- economic empowerment of Rural population
  - i. **Bicycle soft loan:** The SHGs need to be sensitized to tap the potential of providing loans for bicycles to their members. This fits well as an income-generating asset for their members. An advisory in this regard may be issued by concerned agencies.
  - ii. **Bicycl Rental - A Business Model:** SHGs may be encouraged to take business loan to purchase 5 bicycles & earn livelihoods by renting out bicycles in mass.
  - iii. Bicycle renting entrepreneurship by women under **MUDRA** scheme.
  - iv. **MFI** - Guideline to MFIs for inclusion of bicycles as Income Generating loan (IGL).
  - v. **Health & Wellness Centres (HWCs):** Provision of 15 bicycles in each HWCs – to be used by staff & patients.
  - vi. **Aspirational Districts Programme** – A programme component for Aspirational Districts may be devised to increase access of bicycles to different populations in some of these districts in a focused manner, to enhance education

and livelihood opportunities. Based on programme's effectiveness the same may be considered for scaling up.

#### **IV. Enabling Bicycle resurgence in Urban Spaces**

- a. Setting up of National policy framework for Active travels: similar to “**Complete Street**” policy of USA under MOHUA.
- b. Actions for creating pro- cycling culture & its safe infrastructure.
- c. Mandate Metro stations with Bicycle parking stations
- d. Adopt Transit oriented design approach with non-motorized transport (NMT) based last mile connectivity.
- e. Nationwide campaign by the Central Ministries.

#### **V. There is a need for review the Public Bike Sharing (PBS) and devise solutions for the prevailing issues by MOHUA.**

**Proposals by All India Cycle Manufacturers' Association**

All India Cycle Manufacturers' Association vide their letter dt. 18.5.2019 to CEO, NITI Aayog and followed by detail presentation to the NITI Aayog expressed the following demand and supply side issues.

In the Demand - side, Bicycles in urban areas suffers due to non - availability of safe and separate roads; long commuting distances & discomfort due to weather and pollution and in rural areas have constraints of un- affordability of Bicycle and non-availability of institutionalized financing for Bicycle. In the supply – side, there exists a technology - gap in terms of lighter materials, high performance components and automated assemblies and unprecedented mushrooming. These impediments have affected the growth and development of Bicycles in India. In order to turnaround the bicycle sector, the AICMA suggested following proposals under various categories.

**Category - I: Socio-economic empowerment through Bicycles**

- A. BLESS (Bicycle Leading to Educational Sustainability & Self-reliance)
- B. Provisioning of Fifteen Bicycles at each Health and Wellness Centre under Ayushman Bharat Yojana
- C. Empowering SHGs in Rural and Urban Areas through Bicycles
- D. Cycle support for factory workers

**Category -II: Enabling measures to promote Bicycle penetration**

- E. Issue advisory for effective disbursement of Bicycle loan to the poor
- F. Setting up of “National Urban Active travel - ways Authority of India (NUATAI)”
- G. Inclusion of E-Bicycle in FAME–II Scheme of DHI, GOI

**Category -III: Boost Indian Bicycle manufacturing**

- H. Setting of “Bicycle Development Council -BDC “under DIPP
- I. Dispersal of Bicycle Industry to other regions of India, apart from Ludhiana
- J. Set –up an integrated facility for Aluminum components of Bicycles in India
- K. Upscaling of exiting Bicycle R&D Centre at Ludhiana
- L. Central Support to develop Common Industrial infrastructure at Cycle valley project Ludhiana
- M. Make BIS Bicycle Standard from voluntary to Mandatory
- N. Provisioning Bicycle assembly as part of Atal Tinkering Labs under AIM.
- O. Mainstreaming “Startup India Scheme” in Indian Bicycle space

**Category -IV: Popularize Cycling for all at pan India level**

P. Measures include Connecting noble role of Bicycle with “MANN KI BAAT Programme; Networking of Bicycle clubs/Groups; and Promote Bicycles in gated societies with Cycle stand provision.

**UNIDO assisted Bicycle Project (project No 160072)**

**A. UNIDO Phase -I**

Department of Industrial Policy and Promotion and Government of Punjab supported UNIDO Project namely 'Development and adoption of appropriate technologies for enhancing productivity in the Indian bicycle and bicycle parts sector' was initiated in June 2016.

The counterpart agencies associated in the Project are:

- (i). Research and Development Centre for Bicycle and Sewing Machines (RDCBSM)
- (ii). All India Cycle Manufacturers Association (AICMA),
- (iii). United Cycle & Parts Manufactures Association (UCPMA)

The objective of the project is to strengthen the global competitive position of the Indian bicycle sector through comprehensive upgrading of capabilities of the R&D Centre and the associations (AICMA and UCPMA) through both soft (skills development, training, capacity building, technical workshops, etc.) as well as hard (procurement of equipment for the testing facility of the R&D Centre -RDCBMS) interventions. The 21-month duration project was initiated in June, 2016.

**Outputs of the Project:**

The first output in the implementation phase is a diagnostic study of the three institutions. As such, the report assesses the gaps in technology, management, training and quality services provided to individual companies by the three institutions.

The second output in the implementation phase is the development of individual action plans based on the aforementioned output for RDCBSM, AICMA and UCPMA. These will cover, but are not limited to, the following:

- Productivity improvements
- Plant improvement
- Quality management systems
- Technology development
- Technology transfer
- Process improvement
- Technical trainings and expertise
- Market development focusing on export markets
- Resource identification
- Networking.

The third output of the implementation phase involves the upgrading of the missing capacity that was identified as a part of the diagnostics. This will take place primarily within the frame of implementing individual action plans at the level of the three institutions. International accreditation of the testing labs of RDCBSM for certification is part of the project.

## **B. Need for phase -II of UNIDO support**

**Key Needs of Industry Bicycle Industry identified in Action Plan Meeting – UNIDO Bicycle project and the Industry-wide recommendations (Date: 09 January 2018; Venue Udyog Bhawan, Chandigarh, India) ; Industry-wide needs identified are as under.**

- Availability of correct grades of appropriate raw materials (with a focus on Aluminum)
- Expert handholding for modern manufacturing processes;
- Technology sharing mechanisms for adoption of superior raw materials (Aluminum, plastic, etc.) and production of high-specialty components;
- Design competence (aesthetic design; industrial design & componentry; supporting tooling/machining);
- **Robust testing and certification: testing for various international standards**, raw material testing, environmental/chemical testing, component-specific tests and benchmarking of high-quality components for development of quality-based tests;
- Technology development for new products (such as e-bikes, load bearing hybrid roadsters, carbon fibre/titanium/bamboo bicycles);
- Market research for industry trends, demand analysis & market scoping, futuristic trend projections, reporting/exploration of emerging technologies and related developments Marketing and sales channels for international markets;
- Active advocacy mechanisms for key infrastructure/policy driven issues (import duties, freight charges, promotion of indigenous production, cycling infrastructure, promotion of cycling, etc.).



**Free Bicycle distribution scheme by the State Governments**

<b>S. No.</b>	<b>State</b>	<b>Quantity distributed from 2014/15 to 18/19 * (in lakhs)</b>	<b>Since when (no. of years)</b>
1.	Tamil Nadu	30.04	16
2.	Karnataka	25.70	12
3.	West Bengal	76.00	5
4.	Assam	10.00	7-8
5.	Gujarat	11.55	8-9
6.	Rajasthan	15.65	8-9
7.	Punjab	1.50	Not Regular
8.	Madhya Pradesh	19.83	3-4
9.	Andhra Pradesh	3.70	2
10.	Chhattisgarh	5.08	7-8
11.	Tripura	0.73	4-5
12.	Jharkhand	3.00	4-5
13.	Himachal Pradesh	0.20	3-4
14.	Uttarakhand	0.48	5
15.	Telangana	2.10	5
16.	Haryana	0.2	5
	<b>Total</b>	<b>205.76</b>	

**Note:** Besides this, some states provide direct money to buy bicycles for students Bihar (10-12 Lacs Bicycles) and Orissa (3-4 Lacs Bicycles). Many credible evaluations suggested for distribution of Bicycles only in kind and not in cash. In kind, ensures distribution of BIS quality safe Bicycles from the reputed Indian Bicycle producers with assured after sales service, distribute Bicycles publicly for transparency and it prevent misuse of cash by the households for other purposes and producing fake Bike Bills and meets the stated purpose. (\*) Ongoing in 2018/19.

**Cycling to school: Increasing secondary school enrollment for girls in India**

Karthik Muralitharan Nishith Prakash

Working Paper 19305 <http://www.nber.org/papers/w19305>

NATIONAL BUREAU OF ECONOMIC RESEARCH 1050

Massachusetts Avenue Cambridge, MA 02138 August 2013

**Conclusions (abridged) :**

- The Cycle program in the state of Bihar has been one of the most visible policy initiatives for improving female educational attainment in India in the past decade and has been widely imitated in other states. However, while the program has been politically popular and received wide media coverage, it has been challenging to credibly measure its impact on girls' secondary school enrollment because the program was rolled out across the entire state at the same time.
- The rate of age-appropriate participation in secondary school for girls increases by 30 percent in cohorts exposed to the Cycle program (a 5.2 percentage point increase on a base of 17.2%) and also find strong evidence to suggest that the mechanism of impact was the reduction in the 'distance cost' of attending school induced by the bicycle. We find a significant increase in the number of girls who appear for the SSC exam, suggesting that the increase in enrollment was not just on paper, but led to a real increase in school participation. However, we find no impact of the program on the number of girls who pass the SSC exam.
- Comparisons with conditional cash transfer programs in other South Asian contexts suggest that the Cycle program was much more cost effective at increasing girls' secondary school enrollment than an equivalent-valued cash transfer.
- From a policy perspective, it is also worth reflecting on why the Cycle program was implemented effectively, with leakage rates as low as 3% (Ghatam et al. 2013) even in a context of high leakage and corruption in other public programs. Discussions with policy makers, field officials, and researchers suggest that the reasons for low leakage in the Cycle program included:
  - (a) universal eligibility - every girl enrolled in 9th grade was entitled to the grant for the bicycle, which removed officials' discretion in determining beneficiaries;
  - (b) the transparent and one-time nature of the transfer, which made it easier to monitor than several ongoing smaller transfers;
  - (c) the public ceremonies for awarding the cash to purchase bicycles in schools, which provided an easy platform for beneficiaries to notice irregularities and to report grievances;
  - (d) the demographic group that was eligible for the benefit (households enrolling girls in secondary school) is likely to have been considerably more empowered to begin with

relative to the poorer and more disadvantaged recipients of other public programs, making it more difficult for officials to deny them benefits; and

(e) commitment of the political leadership of the state towards the program, and the clear political rewards from a program that was highly visible to beneficiaries and communities and relatively easy to implement (Mani and Mukund 2007). These design features are all easy to translate to other low-income settings, suggesting that it may be worth scaling up similar programs in other developing countries as a promising policy option to increase low rates of female secondary school participation.

- Finally, the main area of concern for policy makers from our results is the finding that the Cycle program had no impact on the number of girls who passed the SSC exam in spite of the significant increases in female enrollment and the number of girls attempting the SSC exam. The challenge of converting increases in inputs (including student enrollment) into learning outcomes is a fundamental one that is faced at all levels of the Indian education system. However, while there is a growing body of evidence on effective interventions in primary education in developing countries such as India (see Muralidharan 2013 for a review) there is relatively little corresponding evidence on cost-effective interventions to improve the quality of secondary education in low-income settings. This is an important area for future research.

**Formative study to enhance the understanding about reasons for smooth transition among boys and girls to secondary schools West Bengal Report**

ERU Consultants Private Limited New Delhi February 2017  
Study commissioned by UNICEF India  
By Pratichi (India) Trust

The Study commissioned by UNICEF India through ERU Consultants on ‘Formative study to enhance the understanding about reasons for smooth transition among boys and girls to secondary schools West Bengal Report’, February 2017 comprehensively analyzed the issues impacting transition to secondary schools.

**Systemic reasons encouraging children’s participation: Incentive schemes**

Although school uniform, Mid-day Meal and text books (except Mathematics and Language books) are not provided in West Bengal at secondary level, two important schemes viz. ‘Sabuj Sathi’ and ‘Kanyashree’ were introduced in West Bengal in the recent past for facilitation of secondary education. Children who continue their education in secondary and higher secondary level are provided cycle once in their academic cycle either in secondary level or in higher secondary level under the ‘Sabuj Sathi’ scheme. Likewise, girls who continue their education even after completing 13 years of age, are unmarried and enrolled in std. VIII or above are provided a cash incentive under the ‘Kanyashree’ scheme. Till the completion of their age of 18 years they are provided an annual scholarship of Rs. 700 and after the completion of 18 years they receive a one-time stipend of Rs. 25000.

As observed, these two schemes have played a very important role in the transition and retention of students in secondary level. However, the implementation of ‘Sabuj Sathi’ scheme was found to be unsatisfactory in the study area because the cycles are provided to students at the end of their academic cycle

**Non-Motorized Transport (NMT)- National Urban Transport Policy, 2014**

**10.1 NON-MOTORIZED TRANSPORT (NMT)**

**10.1 Importance of NMT**

11.1.1. NMT i.e. walk, cycle and cycle rickshaw are green modes of transport that belong to the low carbon path, do not consume energy or cause pollution, provide social equity and in addition provides employment. With increasing urban sprawl, non-motorized transport is losing its earlier importance. The resulting long trip lengths have made cycling difficult. Further, non-motorized modes are exposed to risk of accidents as they share a common right of way with motorized vehicles. However, non-motorized modes are environment friendly and have to be given their due place in the transport network of a city. The problems being faced by them would have to be mitigated. Government of India, through financial measures, would support all efforts in this direction.

**10.2 Walk**

11.2.1. Walk is the most universal form of commuting. All trips, especially PT trips, begin and end with walk. Walking is critical for success of PT: Walking will reduce vehicle use for short distance commuting: For weaker sections of society walk is the only choice: Walking enhances urbanity, lifestyle, and health. Walk facilities should be designed and managed to accommodate a wide range of uses. People walk alone and in groups, walk pets, push strollers and carts, run, skate, bicycle, stop to gaze and talk, play and eat on sidewalks and paths. Footpaths serve as both travel-ways and stopping areas. Walking is a zero-emission mode of transport that needs to be the primary focus of a sustainable habitat.

**10.3. Cycling**

11.3.1. After walk, cycle is the second most important mode of transport for urban poor. Cycling should be encouraged because reach and effectiveness of PT can be improved. Cycling contributes to improving air quality and mitigating climate change, noise reduction and improved physical health.

**10.4. Safety Issue for Walk & Cycle**

11.4.1. Walking and cycling demand safe environment. The safety concerns of cyclists and pedestrians have to be addressed by encouraging the construction of segregated rights of way for walk and cycles. Apart from improving safety of walk and cycle, the segregation of vehicles moving at different speeds would help improve vehicular traffic flow, increase the average speed of traffic and reduce emissions resulting from sub-optimal speeds. Such segregated paths would be useful not only along arterials, to enable full trips using NMT but also as a means of improving access to PT stations. Such access paths, coupled with safe bicycle parking places, would contribute towards increasing the use of PT. Creative facilities like shade giving landscaping, provision of drinking water and resting stations along bicycle corridors would also be encouraged as they can mitigate, to a large extent, adverse weather conditions. The use

of the central verge along many roads, along with innovatively designed road crossings, seems to offer promise for being developed as cycle tracks.

11.4.2. It has been the experience that many such cycle tracks and pedestrian paths do not get used as initially envisaged. However, a view has been that this is because these facilities are designed badly and without fully recognizing the limitations and problems faced by cyclists or pedestrians. It would, therefore, be essential that such facilities be constructed after an open debate on the designs with experts and the community that is expected to use them. It is expected that such public appraisal would lead to designs that enable greater use by the potential beneficiaries. Encroachment of footpaths too affects pedestrian safety adversely and requires strict enforcement coupled with public participation. Pedestrian and cycle facilities including crossing facilities at busy intersections should be well-maintained and kept free of encroachments.

## **10.5. Cycle Rickshaw**

11.5.1. Cycle rickshaw is a public mode of personalized transport and best suited to provide the last mile connectivity in an integrated citywide multimodal PT network. This mode has not received much attention from planners so far. Cycle rickshaw should form a part of UT planning process and be provided with the necessary infrastructure such as stabling and waiting places. The technology of cycle rickshaw, in India, is outdated. Several American and European manufacturers of cycle rickshaws often incorporate features not found in developing world vehicles, such as hydraulic disc, and lightweight fiber glass bodies, multispeed gears to lessen the effort for the rickshaw puller. Similar upgrade should be undertaken in India.

## **10.6. Promoting NMT**

11.6.1. The Government of India would give priority to the construction of cycle tracks pedestrian paths and facilities for cycle rickshaws in all cities to enhance safety and thereby enhance use of non-motorized modes. Footpaths and dedicated cycle lanes should be citywide to assure the commuter that he can complete his journey all the way by walk or cycle if he so chooses. Provision of such facilities should be included as a part of megaprojects such as rail transit. Funds allocation for major transport infrastructure should be linked to achieving targets for creating facilities for NMT. Indeed a separate budget head for such facilities should be created and a separate cell set up in the Municipalities for planning design implementation and maintenance. Cities would also be encouraged to explore the possibility of a public bicycle sharing program, where people can rent a bicycle for use in specially designated areas.

11.6.2. The Government of India would support;

- i. The construction of safe pedestrian crossings at busy intersections and high-density traffic corridors.
- ii. Formulation and implementation of specific “Area Plans” in congested urban areas that propose appropriate mix of various modes of transport including exclusive zones for NMT.
- iii. Upgrade of cycle rickshaws.

## **15.4. Research, Development and Technology Upgrade**

15.4.1. Investing in and promoting scientific research and development in the UT will go a long way in finding innovative, indigenous, low-cost, and sustainable solutions and technology

which would be more suited for Indian cities. This will also help in reducing India's dependence on foreign technology and foreign companies in solving UT problems as well as significant improvements in costs, time, comfort, efficiency, safety, operations, and technology of UT services.

15.4.2. The Government of India, through IUT, would initiate new schemes for innovation, research and development in UT to promote indigenization and development of low cost technologies, pilot projects, public bicycle scheme, improvement of para-transit through".

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