

Promoting Non-Motorized Transport in Asian Cities: Policymakers' Toolbox

December 2013

UN HABITAT
FOR A BETTER URBAN FUTURE



Promoting Non-Motorized Transport in Asian Cities: Policymakers' Toolbox

December 2013

UN HABITAT
FOR A BETTER URBAN FUTURE



Disclaimer :

The views expressed in this publication are those of Clean Air Asia staff, consultants and management, and do not necessarily reflect the views of the Board of Trustees of the Clean Air Asia Center. The Clean Air Asia Center does not guarantee the accuracy of the data included in this publication and does not accept responsibility for consequence of their use.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the secretariat of the United Nations concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries regarding its economic system or degree of development. Excerpts may be reproduced without authorization, on condition that the source is indicated. Views expressed in this publication do not necessarily reflect those of the United Nations Human Settlements Programme, the United Nations and its member states.

Acknowledgements :

The team would like to thank UN-Habitat and Shakti Sustainable Energy Foundation for providing generous support for funding and guidance in carrying this work into fruition.

The writing of this document was led by Sudhir Gota, together with Sameera Kumar Anthapur and Parthaa Bosu of Clean Air Asia. Content and editing were provided by Alvin Mejia, Kathleen Dematera, and Mark Angelo Tacderas, also of Clean Air Asia.

This report was extensively reviewed by a diverse group of global experts. For sharing their expert insights, we would like to thank,

Derlie Babiano, Lecturer, The University of Queensland

Prof Madhav Badami, Associate Professor, McGill University - School of Urban Planning

Bert Fabian, Program Officer, United Nations Environment Programme

Bradley Schroeder, NMT Specialist

Susan Zielinski, University of Michigan - Sustainable Mobility & Accessibility Research & Transformation

©2013 Clean Air Asia. All rights reserved.

Clean Air Asia Center, 2013. "Promoting Non-Motorized Transport in Asian Cities: Policymakers' Toolbox." Pasig City, Philippines.

This publication may be reproduced in whole or in part in any form for educational or non-profit purposes without special permission from the copyright holder, provided acknowledgment of the source is made. The Clean Air Asia Center would appreciate receiving a copy of any publication that uses this Clean Air Asia Center publication as a source. No use of this publication may be made for resale or for any other commercial purpose whatsoever, without prior permission in writing from the Clean Air Asia Center.

HS Number : HS/020/14E

Design : Mudra

www.mudraweb.com

Contents

1. MOTIVATIONS FOR PROMOTING NMT IN ASIAN CITIES	1
1.1 Asia Urbanizing and Motorizing Fast	1
1.2 Decline of Walking and Cycling in Asia	2
1.3 NMT Accidents and Fatalities	6
1.4 Air Pollution Exposure	7
1.5 Transport Energy Consumption and Emissions	8
1.6 Impact of Improved Walking and Cycling Facilities	8
1.7 Growth of Public Bike Share Schemes	8
1.8 Summary	9
2. HOW TO IMPROVE NMT IN ASIAN CITIES?	12
2.1 The Transportation Planning Process	12
2.2 Visioning	12
2.3 Diagnosis - How to Assess Walkability	13
2.4 Diagnosis - How to Assess Cyclability	14
2.5 Cyclability Assessment Tool for Asia	16
2.6 Involving Stakeholders	22
2.7 Guidelines and Policies: Complete Streets	23
2.8 Implementing NMT Policies, Strategies and Projects	26
2.9 Summary	31
ANNEXES	32
Annex A: 5 D's of Transport	32
Annex B: Walkability Survey Guide	33
Annex C: Cyclability Index Survey	42
Annex D: Cyclists Preference Survey	58
Annex E: Pedestrian Preference Survey	60
Bibliography	63

1. Motivations for Promoting NMT in Asian Cities

"Globally, only 68 countries have national or sub national policies to promote walking and cycling."

- WHO Global Road Safety Status Report 2013

1.1 Asia Urbanizing and Motorizing Fast

By 2011, 52% of the global population has lived in cities and by middle of this century it would have increased to almost 67%.¹ Asia will continue to have half of the world's mega cities. In 1975, eighty cities in Asia had a population greater than one million. By 2025, it is estimated that this will rise to 332 cities (United Nations, 2007). Parallel to urbanization, Asia is undergoing rapid motorization. Asia is now home to around **half a billion vehicles**. It has been estimated that by 2035, both the vehicle population and motorization index² will at least double in the Association of Southeast Asian Nations (ASEAN)³ region, China and India from current levels (2012). In many countries, vehicle growth rates are higher than gross domestic product (GDP) growth rates. Despite projected high number of vehicles for 2035, the projected motorization index for Asia will still be considerably lower than the current motorization index of the developed world. As such, a further rise in motorization levels can be expected beyond 2035 as Asian economies continue to grow. It is important to note that the motorization phenomenon is much more intensive in cities as compared to countries as the wealth of Asia's economies is concentrated in its cities. Apart from rising income levels, growing dissatisfaction with available transport options is forcing as well as attracting people towards the use of personalized, motorized vehicles. In many Asian cities, the motorization levels have reached double the national values.

To cater to this increase in number of vehicles, countries like China and India are rapidly building more roads. Latest estimates from IEA⁴ suggest that China nearly tripled its paved roadway network since 2000 and India added one million paved lane kilometers in the past decade. However, building more roads is a solution that creates a vicious cycle of further inducing travel demand, increasing car use and again, the need for roads (Litman, 2013). Unfortunately, land is limited: A lot of Asian cities can't support more roads and even if they can, the construction of roads takes a long time to be approved and constructed by responsible agencies.

In terms of personal expenditure, transport costs comprise a large proportion of the expenditures of many poor people. For instance, the low income population in Shanghai paid as much on transport as on healthcare (5% of income), clothing (5% of income) and rental (0.8% of income) combined in 2003.⁵ A similar situation, although of varying scales, can be found in other Asian cities, and rising fuel prices and fuel security issues will further exacerbate this situation in the future.

At a macroeconomic level, negative externalities from transport (i.e. air pollution, traffic congestion, accidents) already amount to 6-10% of GDP in many Asian cities (Partnership on Sustainable Low Carbon Transport, 2013).

1. http://esa.un.org/unup/pdf/WUP2011_Highlights.pdf

2. Motorization index/motorization rate = number of vehicles per 1000 population, <http://data.worldbank.org/indicator/IS.VEH.NVEH.P3>

3. ASEAN = Association of Southeast Asian Nations; ASEAN countries included are Indonesia, Malaysia, Philippines, Singapore, Thailand and Viet Nam.

4. http://www.iea.org/publications/freepublications/publication/TransportInfrastructureInsights_FINAL_WEB.pdf

5. Per Capita Consumption Expenditures Urban Household In Main Years <http://www.statssh.gov.cn/2003shtj/tjnj/nje07.htm?d1=2007tjnj/e0919.htm>

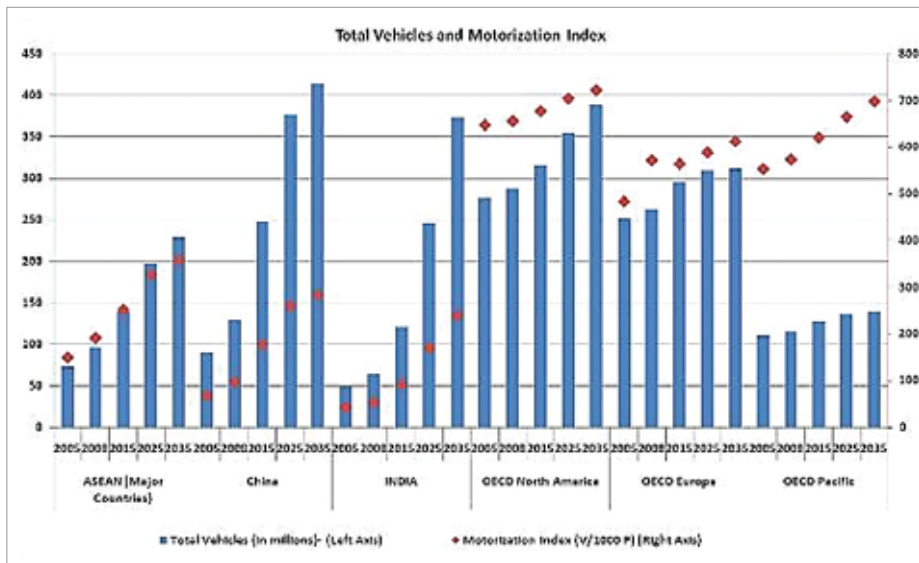


Figure 1: Vehicle Count and Motorization Index in Asia vs OECD

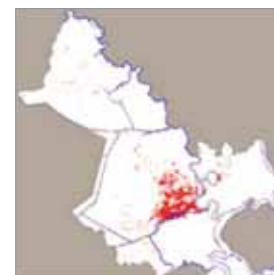
Source: Asian Development Bank and Clean Air Initiative for Asian Cities. 2009

1.2 Decline of Walking and Cycling in Asia

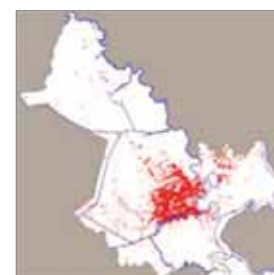
It is no longer pleasant to walk and cycle in many Asian cities and in fact for some cities it is becoming almost impossible. The rapid increase in motorization in Asia combined with limited attention to pedestrian, cycling and public transport facilities have resulted in a decrease in the overall non-motorized transport trip mode share. However, it needs to be highlighted that walking and cycling still provide mobility to a large percentage of people in many cities (Figure 5). Short distance non-motorized transport trips are very common in Asian cities which are characterized by very high population densities and mixed land-use development. But this trend is changing fast. Rapid urbanization and migration of people is causing population growth in city areas with new development being sprawled in the absence of more public and non-motorized transport modes, especially along massive ring road networks. This “steroid effect” results in higher trip lengths causing an increase in motorized trips.

Consider Ho Chi Minh City (HCMC) as an example for the above discussion. The following geographic information system (GIS) images show the growth patterns that occurred in the development of HCMC from 1989 to 2006.

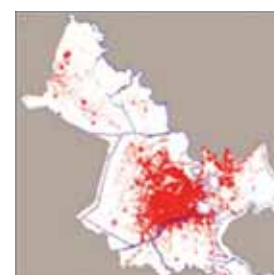
Massive migration and development activities have led to the rapid expansion of Ho Chi Minh City. In the absence of policy support, investment and prioritization for public and non-motorized modes, Ho Chi Minh City has a very high vehicle ownership (especially motorcycles). At the end of June 2010, there were 4.7 million motorcycles registered in HCMC.⁶ This equates to 1.5 motorcycles



1989



1998



2006

Figure 2: Growth in Urban Built-up Area of HCMC, 1989 – 2006

Source: Tran et al (2008)

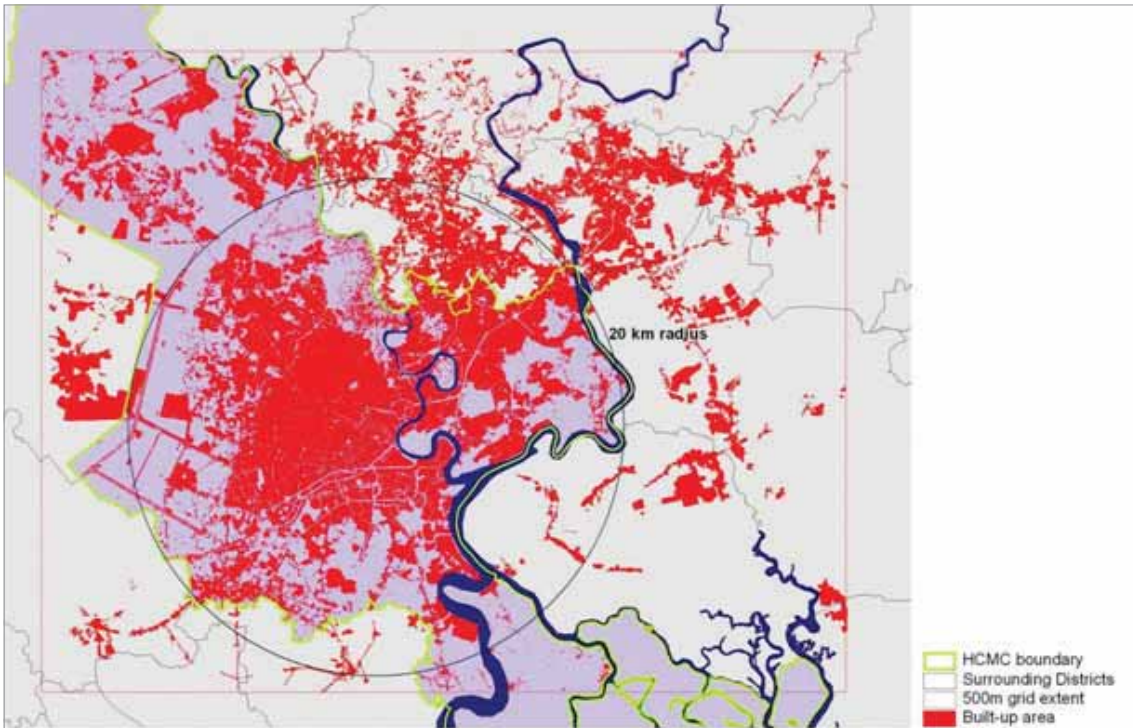


Figure 3: HCMC Metropolitan Region Urban Built-up Area, 2011

Source: Clean Air Asia, ADB and Chreod

per capita. This shows that as the city expands and non-motorized transport space shrinks, average trip lengths for the general population increase, forcing travelers to use motorized forms of transport even more. Non-motorized trips which were 61% in 1995 reduced to 33% in 2002.⁷ HCMC now has one of the highest motorcycle ownership per land area in the world.



A significant number of bicycles do exist but are not reflected in transport statistics

Source: Gota, Sudhir 2010

In many Asian cities, a significant share of the population owns bicycles but it is not reflected in trip mode share data (Figure 4). In India, there is a large number of households owning bicycles compared to those that own motorized vehicles but this is not reflected in statistics, policies, strategies and investments. The traditional transport demand models usually take into account only motor vehicle ownership and motor vehicle trips and not the non-motorized modes, which results in recommendations that are strong in terms of improving the level of service for motorized travel.

6. Phi (2011)

7. The Master Plan of Urban Transportation for Hanoi City (1997), JICA and ADB-TA - 6416 (REG) : A Development Framework for Sustainable Urban Transport

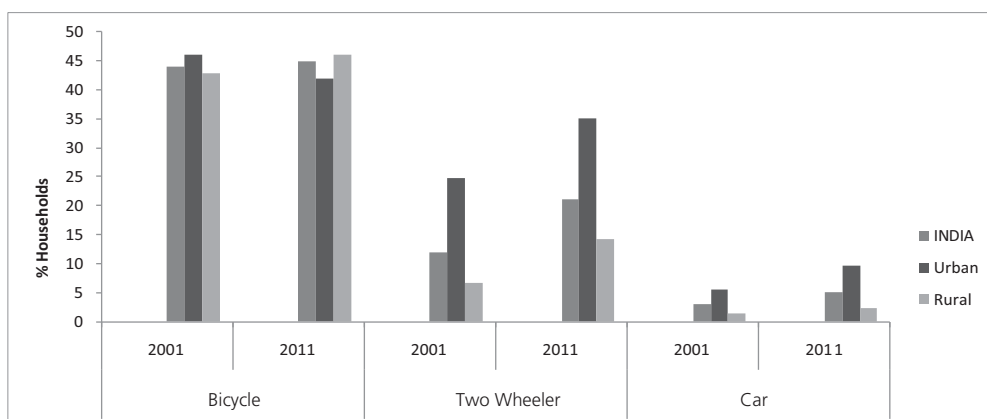
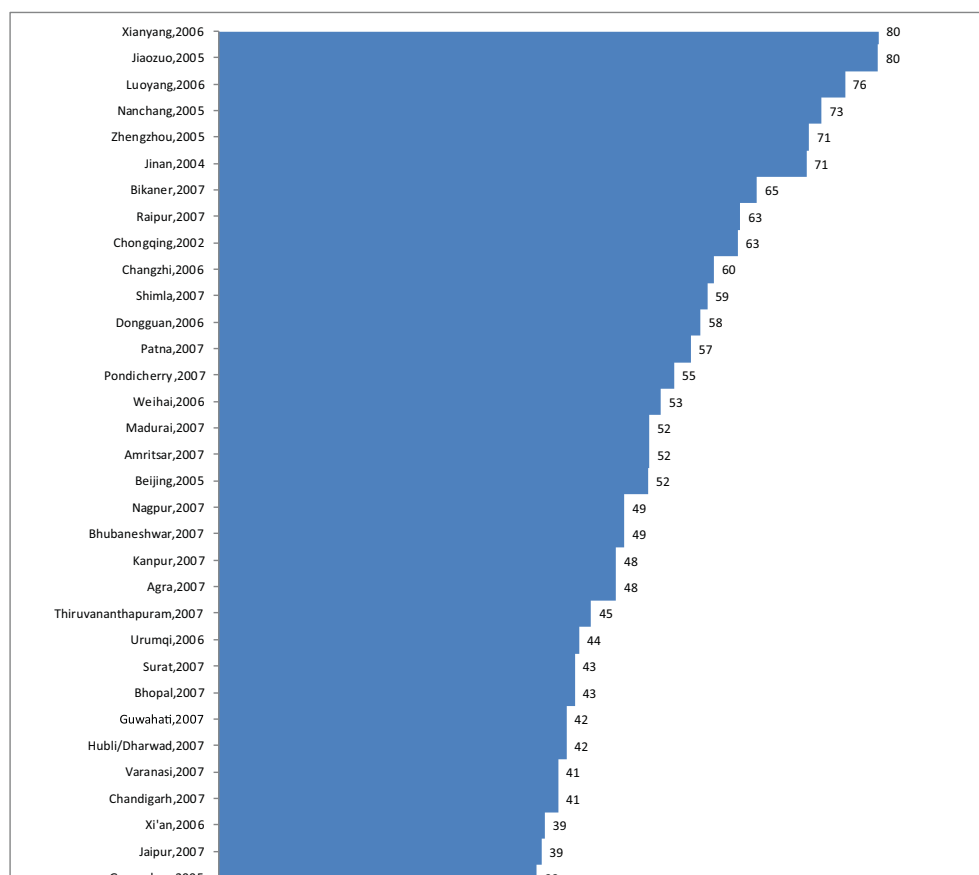


Figure 4: Vehicle ownership in India between 2001 and 2011⁸



预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_18675

