

# Identify various factors affecting to NMT provisions: - A Review

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**Abstract:** The urban transport systems in Indian cities suffer from poor allocation of financial resources, lack of regulatory frameworks, institutional weaknesses, inefficient public transport systems, poor allocation of road space and inadequate traffic management systems. The today's urban mobility challenge in Indian cities is to arrive at balanced provision of traffic infrastructure for both Motorized Transport (MT) traffic and Non- Motorized Transport (NMT) traffic. The road infrastructures within CBD of Indian cities were majorly designed for MT giving little attention to NMT. The high proportion of all motor vehicles in cities are personal private cars, where more than 70% only carry one passenger and the use of bicycles is very limited within the city. Most of these factors disproportionately affect the urban poor in terms of limited access to affordable transport services, ill-health from pollution, and road safety concerns. NMT passengers generate no air pollution, no greenhouse gases, and little noise and air pollution; they are efficient and environmentally sustainable means of making short trips within urban and city centres.

**Index Terms - Urbanization, NMT (Non-Motorized Transport), Motor Transport (MT), Private vehicle, Air pollution, and Traffic congestion.**

## I. INTRODUCTION

The predominant trends influencing mobility of urban population in Indian cities are rapid urbanization, rising motorization and dwindling modal share of Non-Motorized Transport (NMT). These factors have resulted in a sudden rise in the demand for travel. At the same time, the rapidly increasing levels of motor vehicle ownership and use has resulted in an alarming increase of negative externalities such as road congestion, air pollution, road fatalities, and social issues of equity and security.

There is no one-size-fits-all strategy or solution to the complex transport challenges facing the 468 cities. Therefore, the focus has been towards strengthening the existing governance mechanism in a way that it could respond decisively and effectively to the issues at hand and, at the same time, be in sync with the broader policy goals of achieving sustainable, environment-friendly and affordable transportation systems at the regional and national level.

## II. TRENDS INFLUENCING URBAN MOBILITY IN INDIA

The predominant trends influencing mobility of urban population in Indian cities are rapid urbanization, rising motorization and dwindling modal share of Non-Motorized Transport (NMT). These factors have resulted in a sudden rise in the demand for travel. At the same time, the rapidly increasing levels of motor vehicle ownership and use has resulted in an alarming increase of negative externalities such as road congestion, air pollution, road fatalities, and social issues of equity and security.

### A. Rapid Urbanization

Urbanization trends and patterns present unprecedented challenges to urban mobility systems. In 1951, there were only five Indian cities with a population greater than one million and 42 cities with a population greater than 0.1 million, much of India effectively lived in villages.

Table 1: Number of cities as per population

Cities as per population	No. of cities
>10 million	3
5 – 10 million	5
2 – 5 million	10
1 – 2 million	35
Total million-plus cities	53
0.5 – 1 million	43
0.1 – 0.5 million	372
Total number of cities	468

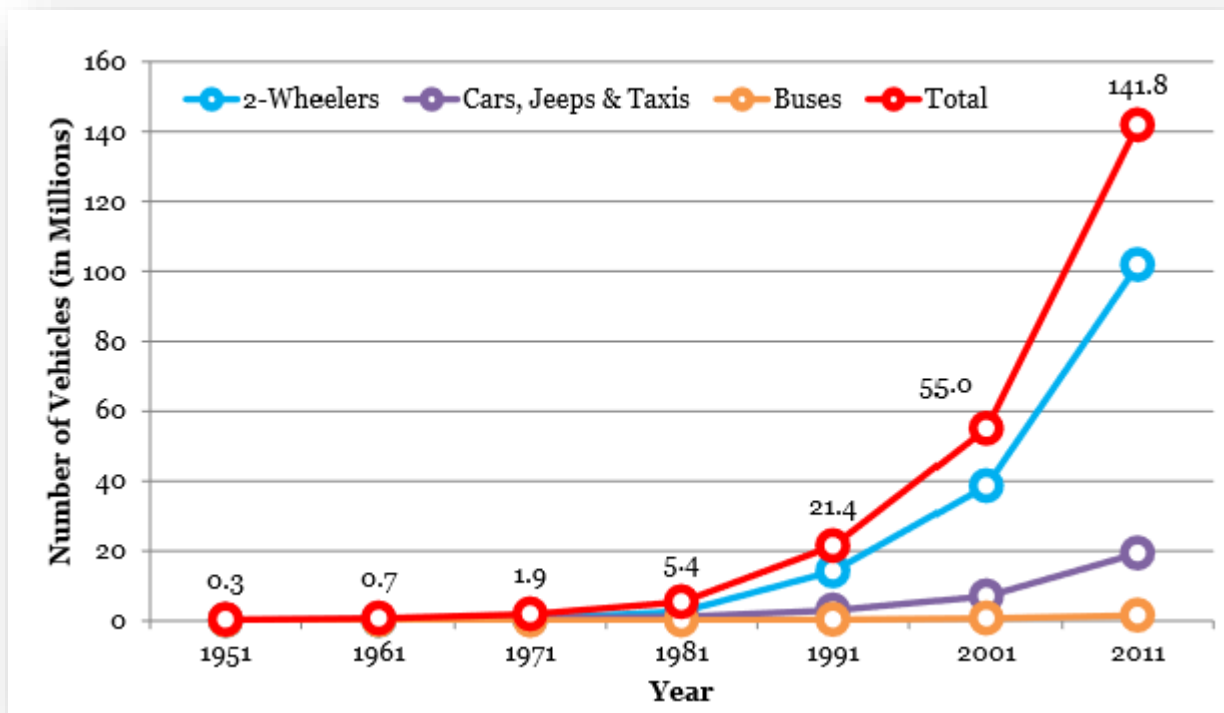
Source: Population figures as per 2011 census

Table 1 shows the India's urban population increased from 286 million to 377 million. Of these, nearly 50 per cent lives in small cities (> 0.5 million). Fastest decadal growth was observed in cities with population between 100,000 and 1 million, such as Surat, Nashik and Faridabad, while metro cities like Mumbai, Delhi, Kolkata, Chennai, Hyderabad and Bengaluru experienced slower peripheral growth with neighboring villages surrounding the core city merging with the larger metropolitan area. According to 2011 census data, there are three cities with population of above 10 million and another 53 cities with an urban population greater than 1 million. In the coming decades, cities and towns are expected to increasingly become dominant drivers of the country's economic growth.

### B. Dwindling share of Non-motorized Transportation

Non-Motorized Transportation (NMT), also known as Active Transportation, includes walking, bicycling, other variants such as small-wheeled transport (push scooters, skates and hand carts), and wheelchair travel. In Indian cities, people who commute by walking outnumber those who use private motorized transport.

### C. Rapid Motorization



Growth of registered vehicles in India in Millions

Source: ITDP Guidelines

Since 2001, the number of vehicles per 1,000 people in Indian metropolitan cities have grown significantly. The total registered vehicles in the country grew at a CAGR (Compounded Annual Growth Rate) of 9.8 per cent between 1991 and 2009. Personalized private vehicles like cars and two-wheelers grew at CAGR of 9.6 per cent and 10.3 per cent per annum. The growth of registered vehicles in cities with population more than a million is significantly higher than the rest of India. Meanwhile, vehicle registrations in metro cities grew at almost double the rates than that of million-plus cities. Five metro cities have vehicle registration rates in excess of 500 per 1,000 people and account for 54 per cent of the total vehicles in the metropolitan cities as of 2011 depicts as in figure 1.

## III. URBAN TRANSPORT PROBLEMS

### A. Road congestion

As populations increase, the average travel distances as well as intensity are expected to increase as there is a direct correlation between the two indicators. This trend in trip length and frequency is only expected to increase with increasing income levels, migration, participation of women and a service-oriented economy. As more people travel over longer distances on regular basis for employment and education purposes, will inevitably lead to road congestion.

### B. Parking problems

The acute shortage of parking spaces both on and off the streets in Indian cities increases the time spent searching for a parking spot and induces traffic congestion. Available data shows that a high proportion of Indian streets are faced with on-street parking issue. This problem is especially acute in smaller, compact Indian cities explain as in figure 2.

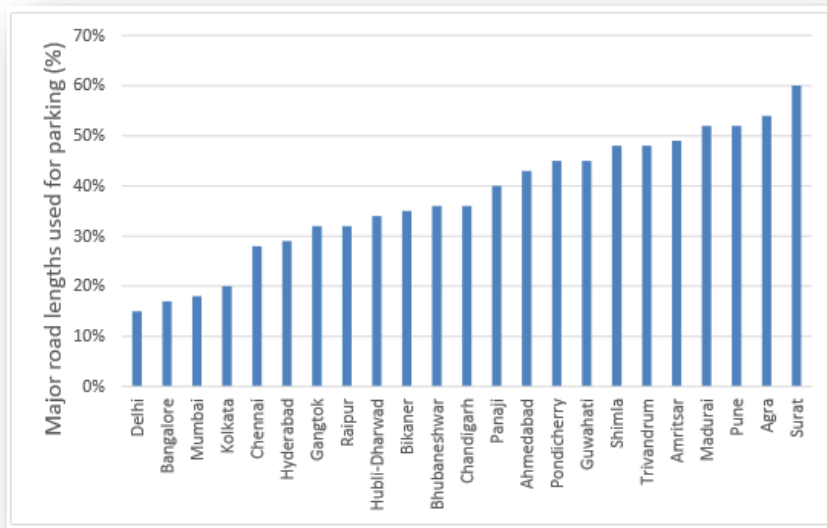


Figure 2: Share of road length used for on-street parking in key Indian cities

Source: (Singh et al., 2008)

### C. Air pollution

The severity of air pollution in Indian cities is judged based on CPCB's (Central Pollution Control Board) air quality classification. According to available air quality data, of 180 Indian cities, there is a wide variation in the pollution concentration and severity across cities. Cities are considered critically polluted if the levels of criteria pollutants are more than 1.5 times the standard.

### D. Energy Loss

Road transport is the backbone of economic development of India and meets the 75 percent of transport demand. The transport sector is the second largest consumer (50%) of commercial energy. It ranks first in the consumption of petroleum energy, consumes almost entire amount (98%) of the petroleum product in the form of petrol and diesel. Usage of petroleum energy in transport grew at 1.3% annually during 1971-1981; it has grown at 6-7% annually during 1991-1999. Transport energy demand has grown at 1.2 times the GDP growth rate.

### E. Deteriorating road safety

The high dependence of migrants on non-motorised transport modes such as walking and cycling causes traffic mix in common roads where fast-moving motorised traffic shares the roads with slow-moving modes leading to an increasing number of fatalities and road accidents. In most Indian cities, non-motorised modes like cycling and walking presently share the same right of way as cars and two-wheelers leading to unsafe conditions for all (National Urban Transport Policy (NUPT)).

### F. Gaps in Laws and Regulations

Presently, there is no legislation at central, state or local level that comprehensively covers urban transport requirements of Indian cities. The current systems of laws, regulations and governance for urban transport are the legacy of an era when Indian cities were sparsely populated and had not yet witnessed the kind of transport problems they are encountering today. Many Acts that are in place today are the legacy of the British Raj and a few of these have evolved to address specific issues in urban transport resulting in fragmentation or overlap of jurisdictions. For example, there are three Acts that are specific to metro systems in India which need to be examined and appropriately amended to be mutually consistent in their treatment of this transport mode.

### G. Fragmented Institutional Frameworks

Urban transport systems require several functions to be performed in a well-coordinated manner for seamless and comfortable travel experience for commuters. Unfortunately, these are performed by multiple agencies under the central, state and city governments which do not necessarily work together. According to the Seventh Schedule (Article 246) of the Indian Constitution, urban development, which includes urban transport, is in the State List. While, in some states, the transport department undertakes urban transport planning, in others, it is the urban development or municipal administration at the urban level that does it.

## GOVERNMENT SCHEMES

- National Urban Transport Policy (NUTP)
- National Mission for Sustainable Habitat
- 12th Five Year Plan of India
- Jawaharlal Nehru National Urban Renewal Mission (JNNURM)
- Green Urban Mobility Scheme

## IV. CRITICAL STUDY

- **Ar. Divya Pandey, Ar. Dushyant Ludhekar (2017)** : In this paper the author investigated the the ability of NMT to help achieve transportation planning objectives such as congestion reduction, road and parking facility cost savings, consumer cost savings, and various environmental benefit which will conclude to the —ECONOMICAL BENEFIT of NMT. It identify and discusses various parameters for evaluating the benefits of improved walking or cycling conditions, increased non-motorized travel, and shifts from motorized to no motorized modes. This study indicates that pedestrianization provides significant benefits, and that these profit can increase with cost effective incentives. Conventional transportation assessment practices tend to overlook many of these benefits, and so underestimate pedestrianization transportation progress and incentives and its feasibility.
- **Santhi J Bedadala, Mallikarjuna C (2016)**: The main objective of this paper is to identify the factors which are likely to have an influence on non- motorized mode choice particularly in the developing countries. In developing countries as the trip lengths are increasing day-by-day, it is necessary to make use of the multimodality behaviour of non- motorized modes in order to reduce severe traffic congestion thereby improving the journey speeds.
- **M. Absar Alam (2016)**: The paper highlights the current scenario of transport related, policies and planning and existing transport infrastructure and services in Delhi. It presents a critical analysis of transport planning and practices as per the proposed master plan through transport related expenditures on various components of transport. It suggests that development of NMT infrastructure, operational and physical integration of PT systems viz. Delhi Metro and Urban Bus services are required for better mobility linked with adequate pathways for NMT. The paper provides an outline of transport related services in Delhi and suggestions for proper guidelines and standards to be formulated for operators such as mini bus operators, shared auto and ERickshaw.
- **Dr. Rakesh Kumar Jain (2015)**: Various factors influencing the demand for NMT are discussed in this paper. The paper also presents in brief the traffic and transport problems and prevailing non-motorized situation in Pune Metropolitan Region (PMR). The concomitant issues related to NMT emerged from this analysis have been highlighted for deliberations.
- **Siddharth Purohit, Ujjal Chattaraj, Mahabir Panda (2014)**: Developed a special model to investigate the effects of various non-conventional vehicles on stream performance including lane capacity and saturation flows. Made a study on the effect of NMVs on urban road traffic characteristics from four mid-block sections of Dhaka, Bangladesh and concluded that NMVs have adverse effect on fundamental traffic parameters.
- **Bibie Sara Salleh (2013)**: This study aim to define strategies for influencing of shifting from motorised to non-motorised modes of transport in the framework of a sustainable urban transport. It gives solution for how to improve NMT condition. This study points to the concept of the implementation of cycling and walking in the urban environment and how to integrate NMT with PT.
- **Mr Kobus Labuschagne (2011)**: This paper mainly focuses on planning issues and Environment emission. The author says that planners have to looking for different policy options and one such solution to promote and integrate non-motorized modes in transportation system, planned and developed for habituated areas.

## V. CONCLUSION

Sustainable mobility is a key enabler of economic growth and towards eliminating poverty and shared prosperity in Indian cities. Comprehensive integration of urban transport and land use planning systems is needed so that synergies are harnessed, interconnections are promoted and functionality optimized through multimodal mobility solutions for Indian cities. Present urban transport issues such as congestion, road accidents, pollution, etc. cannot be wished away by conventional interventions that favour public funding and investments for private transport instead of public modes of transport More public resources need to be allocated to developing NMT and high capacity public transport infrastructure, oversight and accountability of such institutions towards its people need to be ensured. All this can only be possible by strong political will and sustained public pressure for change.

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