



Informal public transport modes in India: A case study of five city regions☆☆☆



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ABSTRACT

Traditionally, the provision of public transport is considered to be government's responsibility. Due to resource and capacity constraints in developing countries, however, government-provided public transport is often inadequate; it is the privately operated public transport modes like shared auto-rickshaws, *Vikrams*, mini-buses, and *Tata Magics*, etc., that cater to the mobility needs of the population. This sector, however, is not sufficiently acknowledged for the important contribution that it makes toward mobility supply, in terms of both policymaking and city planning exercises. In addition, government authorities typically perceive these modes as unsafe, highly-polluting and a cause of traffic congestion as there is a complete absence of research and knowledge on these modes.

To address this knowledge gap, an empirical study on informal public transport modes was undertaken in five cities/city regions of India. This paper presents the results of this research study, which provides a stronger understanding of the operational characteristics, roles, and contributions of these systems in meeting the mobility needs of the people. The paper also discusses commonly held perceptions of how these modes relate to safety and pollution.

The paper highlights that these systems bridge a large transport supply gap and play an important role in Indian cities. The modes may follow some illegitimate practices, but they do it to become profitable, which in turn helps them provide the much-needed mobility services. The study also shows that these systems are not as unsafe and polluting as people often perceive them to be. However, there is significant room for improvements in terms of vehicle efficiency and compliance with regulatory provisions related to public transport.

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1. Introduction

Rapid urbanization in developing countries has led to an unprecedented increase in demand for mobility services, which in turn has put tremendous pressure on urban transport infrastructure and services. Increase in supply of public transport services, in particular, has been slow and has failed to meet the mobility needs of the urban population due to several fiscal and institutional constraints [3].

India is no different from rest of the developing world. For an urban population of approximately 377 million residing in 7935

cities and towns (as of 2011), government-provided public transport services in the form of bus- and rail-based transport are present in only 65 cities [5,6]. All other cities in the country are dependent on walking, cycling, non-motorized transport, personal vehicles, and informal public transport services for meeting their mobility needs.

Even in cities where public transport is available, formal public transport services are often inadequate and unreliable, giving rise to the population's dependence on personal mobility options and informal public transport services for meeting their mobility needs.

Informal public transport services, as the term suggests, refer to public transport services that are provided differently as compared to the typical government-provided bus- and rail-based transport in cities.

Existing mostly in the form of shared services, informal transport modes use vehicles with seating capacity ranging from 3 to 20 people. These services are usually provided by private-sector entities, some of which do not comply with the government rules and regulations. The term is often used to refer to all public transport services that are not provided by government agencies [2,4]; the informality of each system in terms of compliance with regulations

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on vehicle manufacturing and operations, however, could vary from mode to mode and city to city.

The existing literature highlights the important role played by informal public transport systems in meeting mobility needs by providing frequent, convenient, flexible, and affordable services that either complement the existing public transport systems or fill the gaps left by existing systems [1,2,3,6,8]. There are, however, several negative externalities associated with their operations, and these systems are commonly perceived as sources of traffic congestion, air and noise pollution, and traffic accidents [2,3,6,7]. The negative externalities, some of which may be more along the lines of common misperceptions than actual negative externalities, have created a common negative perception about these modes and thus led to a lack of adequate recognition of the contributions that these systems make in terms of meeting travel the demands of growing cities. The poorly understood cost–benefit nature of informal transport is the key factor behind why policymaking and plan-making processes generally ignore this sector [2,3]. Even when recognized, there is not enough information available on the subject to enable city authorities to make rational policy or planning decisions related to the sector. Informal modes are therefore either completely banned in view of the commonly held perceptions or left to exist in the background of city systems without much attention.

The current lack of policy attention and knowledge related to informal public transport systems indicates the need for policy research on these systems. This paper grew out of this need and had the dual objective of creating knowledge on the existing informal public transport systems in Indian cities and identifying the policy areas that need attention in order to address the sector's problems. The specific objectives were to study informal public transport systems in five cities in India – Amritsar, Jaipur, Noida, Ahmedabad-Gandhinagar, and Sanand-Viramgam – in order to understand the operational characteristics of these systems and the key issues associated with the ways that these systems operate in different cities or under different conditions. The end objective was to identify policy areas that need attention in order to improve these systems and maximize the associated mobility benefits.

2. Methods

We reviewed the existing literature to develop a robust research framework for the study and then selected five target city/city regions: Amritsar, Jaipur, Noida, Ahmedabad-Gandhinagar, and Sanand-Viramgam. The informal public transport modes in the five selected regions included high-capacity mini buses, medium-capacity *Tata Magics*, *Mahindra Gios* and other similar vehicles, low-capacity, three-wheeled, motorized auto-rickshaws, pedal-powered non-motorized cycle rickshaws, and other locally manufactured modes like

Chakdas and *Kadukas* (Table 1, Fig. 1). The following key components of these informal public transport systems were studied:

- Roles and contributions of informal public transport systems
- Vehicle characteristics (design and manufacture, etc.)
- Ownership patterns
- Operational characteristics
 - o Regulations governing the operations of the modes
 - o Area/zone of operation
 - o Routes and scheduling
 - o Fare structure
 - o Business model and profitability
- Concerns related to safety and environmental performance
- Mini bus: A small bus with a seating capacity of 20 passengers
- *Tata Magic*: A four-wheeled, van-like vehicle with a designed seating capacity of 7 passengers
- Auto-rickshaw: A three-wheeled vehicle with a designed seating capacity of 3 passengers
- *Vikram*: A three-wheeled auto-rickshaw/tempo-like vehicle
- *Mahindra Gio*: A four-wheeled passenger cab with open sides and a seating capacity of 6 passengers
- *Force Cruiser*: A large four-wheeled vehicle with a designed seating capacity of 13 passengers
- *Jeep*: A four-wheeled vehicle, usually with open sides/rear; operate well in rugged topography
- *Maruti Omni*: A typical urban four-wheeled van
- *Kaduka*: A locally manufactured four-wheeled vehicle that runs on diesel generator sets (generally used for irrigation purposes), has a rear passenger trailer made of wooden planks, and carries up to 20–25 passengers per trip (according to drivers)
- *Chakda*: A three-wheeled vehicle comprising a motorcycle chassis retrofitted with a rear trailer; carries up to 20 passengers (according to drivers)
- Cycle rickshaw: A tricycle running on pedal power; generally carries 2 passengers at a time

Existing official statistics and plans were reviewed but found inadequate in terms of providing detailed information on informal public transport systems. Detailed primary surveys were therefore conducted to collect information related to operations of these systems. Three types of surveys (targeting drivers, passengers, and other road users) were conducted in all five selected cities/city regions. Additionally, consultations were carried out with relevant stakeholders like fleet operators, fleet manufacturers, government officials (traffic police, transport departments, municipal corporations, and urban development authorities, etc.), NGO representatives, and academics. Reconnaissance surveys were also conducted to understand the penetration/routes and patterns

Table 1
Informal public transport modes studied in selected case study regions.

City/City region	State	Population (2011)	Informal modes	Setting
Jaipur	Rajasthan	3,646,590 ^a	Mini buses, <i>Tata Magics</i> , Auto-rickshaws, <i>Vikrams</i> , <i>Force Cruisers</i> , Jeeps, Cycle rickshaws	Urban
Amritsar	Punjab	1,132,761	Mini buses, <i>Tata Magics</i> , Auto-rickshaws, <i>Mahindra Gios</i> , Cycle rickshaws, <i>Kadukas</i>	Urban and peri-urban
Noida	Uttar Pradesh	642,381	<i>Tata Magics</i> , <i>Vikrams</i> , Auto-rickshaws, Cycle rickshaws	Urban
Ahmedabad-Gandhinagar	Gujarat	Ahmedabad: 6,352,254 ^b Gandhinagar: 208,299	Auto-rickshaws, <i>Maruti Omni</i> , Jeeps	Urban, peri-urban, and rural
Sanand-Viramgam	Gujarat	Sanand: 41,530 Viramgam: 55,821	Auto-rickshaws and <i>Chakdas</i>	Urban, peri-urban, and rural

Source (Population): Census of India, 2011.

^a Population of Jaipur Metropolitan Area.

^b Population of Ahmedabad Metropolitan Area.

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