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GREEN AND PRO-POOR? THE ROLE OF INFORMAL PUBLIC TRANSPORT IN INDIA

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SUMMARY

Urban transport has risen to the top of the agenda for many Asian cities in the last decades, as traffic jams and chronic congestions are becoming a part of everyday life. A well functioning public transport system is key to turning the trend of increased private motorized transport and ensuring an environmentally sustainable and pro-poor urban transport system. While cities are struggling to keep up with the ever-increasing need for public transport, investments often do not sufficiently benefit the poor who remain transport marginalized. Instead, informal public transport (IPT) has risen to fill the role as the 'people movers' for the poor in many Indian cities. The vital role that IPT plays in urban mobility is however seldom acknowledged. Urban transport planning and policy response focus on limiting and discouraging IPT and very little is done to incorporate IPT as a part of an inclusive public transport system.

IPT plays an important role for the urban poor in providing both mobility and employment. It is accessible, available, flexible, adaptable and affordable. However, there are trade-offs, both environmental and social. Policy should work at making sure that the trade-offs are not socially unjust or environmentally damaging. Urban transport policy must take cognizance of the fact that IPT arise because there is a need for it; that it is an integral part of the public transport system in a city and provides for critical mobility needs of people. Also it must recognize the fact that IPT is not inherently malignant, even though it has shortcomings which are often result of other structural imbalances. Policy should aim at helping IPT evolve into IPT-like services based on the good of current IPT services (compact vehicles, high frequency, flexibility in routing, affordable, etc.) while minimizing the negative impacts.

An enabling policy for IPT should address transport planning, regulatory frameworks, physical infrastructure and organizational/institutional set-up. With the right policy and regulatory framework in place, IPT has the potential to fill a critical function in a pro-poor and green urban transport system.

1 INTRODUCTION

Urban transport has risen to the top of the agenda for many Asian cities in the last decades, as traffic jams and chronic congestions are becoming a part of everyday life. The cities

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[2] For more information, see the conference website: http://www.adb.org/Documents/Events/2010/Environments-Poor/default.asp

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response to congestion has typically been the construction of more roads, flyovers, urban highways etc. which have led to an even further increase in private vehicle ownership, creating a vicious cycle of cars and congestion. A well functioning public transport system is key to turning this trend and ensuring an environmentally sustainable and pro-poor urban transport system.

Cities are struggling to keep up with the ever-increasing need for public transport, and while some investments are made in public transport systems such as bus rapid transit and metro rail, these investments often do not sufficiently benefit the poor who remain 'transport marginalized'. In this vacuum, informal public transport (IPT) has risen to fill the role as the 'people movers' for the poor in many Indian cities.

Despite this, the vital role that IPT plays in urban mobility is seldom acknowledged. Urban transport planning and policy response is often at best a quiet acceptance that these modes are here for the time being, but more commonly, policies focus on limiting and discouraging IPT. Very little is done to incorporate IPT as a part of an inclusive public transport system.

This paper argues that IPT deserves to be acknowledged as an important piece of the puzzle in sustainable urban mobility, especially for the poor, and as such should be addressed more actively in urban transport planning. It discusses the merits and demerits of IPT from a pro-poor and environmental perspective and gives policy recommendations for better integration of IPT in a comprehensive, pro-poor and environmentally friendly public transport system. The paper is based on the CDIA study Informal Public Transport in India, carried out by the authors in five Indian cities during 2010 and on earlier research on the subject.

1.1 Urbanization and the need for mobility

Since the last two decades, owing to liberalization policies adopted by the government of India, cities have become the focus of development. As a result of destitution in villages and economic opportunity in urban areas, India has seen a rise in migration from hinterland to the city. As per the 2001 census, 28% Indians lived in cities. This is set to change – official sources estimate that 40% Indians will live in cities by 2021 [MoUD, 2010]. The economic growth in cities has until now not had a significant impact on poverty reduction. As of today, poverty is rife in urban areas – it is estimated that 75% dwellers in urban areas live on less than $2 a day [McKinsey, 2010]. The overall rich-poor divide in the country has increased in the last decades. On the one hand, while India is home to the world's richest individuals, on the other it is also home to one of the world's poorest.

Transport facilitates development by providing access to resources and services. It helps students access education, workers access jobs, homemakers access home wares, the ill access health care and so on. Urban transport happens in many forms around the world – people can walk, use a bicycle, a car or ride communally in a large vehicle like a bus or van.

The availability of public modes of transport is one of the hallmarks of urbanity. In an urban society marred by high levels of poverty, it is all the more necessary that transport – the critical facilitator – is available to all equitably at an affordable price and service level. Care must be taken to make sure that the transport needs of one group do not overshadow the needs of others. For instance, providing more road space for private cars, in a scenario where only a minority owns and drives cars, while the rest are so poor that they find using

public transport expensive, is neither appropriate from an environmental perspective nor the equity perspective.

It is a given that people in cities need mobility. The demand for mobility depends on various factors such population, supply of road space, land use character of the urban area, cultural trends, and so on. With increasing population in urban areas in India, the demand for mobility has seen a natural increase. It is common sight to see extremely crowded public transport in cities. Also, as a result of increased incomes for some people in urban areas, there has been an increase in the number of private vehicles – both cars and motorized two-wheelers. This increase has led to congestion in many cities, who responded by increasing the supply of road space by undertaking road-widening projects and building urban highways. However, this does not seem to solve the problem as traffic congestion continues to increase.

In many Indian cities, real-estate development often happens in far-flung peripheral areas in cities. This is because land prices are cheap at the periphery and such real estate is affordable for the lower and middle classes. However, employment opportunities are not necessarily located in these newly developed areas; people still have to commute to their original place of work. This results in an increase in the need for mobility. The urban poor, who mostly fulfill their mobility needs walking or using bicycles, are often relocated to peripheral city areas, away from their place of work on account of infrastructure projects or lack of tenure of their original dwelling. Having been moved far away, these people can no longer walk or bicycle to work. They are forced to use motorized transport thereby increasing the “need for mobility” in cities. With the lack of a well functioning public transport system, their poverty is enforced.

2 CURRENT CONSTRAINTS IN URBAN TRANSPORT PLANNING AND INVESTMENTS

Cities, especially small and medium sized cities, which are growing rapidly, are struggling to keep up with the increasing need for transport and mobility. With low (financial) capacity for investments in public transport, there is a chronic backlog of investments in this sector.

Patterns of car-centric development adopted by most cities around the world in the last decades are exclusive for the poor and highly unsustainable from an environmental sustainability point of view. And yet, the response to congestion has been the construction of more roads, flyovers, urban highways etc. which have led to an increase in private vehicle ownership, creating a vicious cycle of cars and congestion. For the urban poor, car ownership, or even owning a motorized two-wheeler, is beyond the reach for most.

Sustainable, non-motorized, modes of transport such as walking and cycling are indirectly discouraged in current transport planning. Little investment goes into building bicycle lanes, improving pedestrian accessibility etc. In many Asian cities, walking and cycling means being subjected to the mercy of the motorized transport drivers, and traffic safety is a critical concern.

A well functioning public transport system is key to turning the trend of increased private vehicle ownership. Improvements in public transport and discouraging the use of private

vehicles should be a key concern for most city governments. Present levels of investments in public transport modes are however not sufficient and are often associated with high costs and subsidies. Financially, cities struggle with how to finance public transport investments within limited budgets and capacity. Importantly, even when formal public transport investments are being made, they tend to focus on highly resource-intensive projects such as BRT and MRT which often do not sufficiently reach the poor who remain 'transport marginalized'. Reasons for this include poor coverage, flexibility, affordability, access and capacity of the public sector. Therefore, ironically, the high subsidies often associated with major formal public transport investments tend to benefit the middle income groups rather than the poor.

Investments in public transport are especially problematic in small and medium sized cities, where people travel from "everywhere to everywhere" and volumes tend to be too small for large-scale public transport solutions.

In the vacuum left by the lack of urban mobility options for the poor, IPT has risen to fill the role of the "people movers" for many poor in many Indian cities. IPT takes many shapes and plays many roles, as commuter modes for marginalized areas, as feeder-modes for formal public transport, as door-to-door connectivity, etc.

IPT has been found to play a large role in the absence of formal public transport systems, especially in small and medium-sized cities, where public transport has not yet developed or is insufficient. IPT has also been found to thrive despite significant formal public transport availability. In such cases, IPT often plays the role of a feeder and also provides affordable mobility in areas where the public transport system does not reach.

IPT operates *despite* the state. It provides mobility for millions where formal transport systems are lacking, on a for-profit basis and without practically any support from the state. The IPT sector however, has received very little attention in the urban transport debate, and focus has mostly been on finding ways of discouraging it. However this sector plays a key role for the urban poor from two aspects – it is a means of mobility and as a source of employment. Both these aspects are critical for the urban poor.

3 THE ROLE OF INFORMAL PUBLIC TRANSPORT IN URBAN MOBILITY

3.1 Defining Informal Public Transport

IPT is a fuzzy phenomenon. In academic literature, authors have been found to use paratransit, intermediate paratransit and informal public transport interchangeably [Cervero, 2000; Golub, 2003] while others use paratransit and intermediate paratransit to describe transit services that would, according to our definition, still be described as IPT. Paratransit, also known as intermediate public transport, is defined as the intermediate mode between privately owned automobiles and conventional transit with fixed routes and schedules [Ahmed & Datta; 2006]. The definition used in this paper defines IPT as means of transport that is available for communal public use but is in some way unsanctioned [Cervero, 2000; 2007].

By this definition, IPT is bound to have varying levels of informality and variegated manifestations. A transport vehicle that is available for communal use could qualify as IPT because it operates without a license and charges commuters a fare decided upon not by

the contract of carriage (the contract) but whimsically by the vehicle driver or owner. Another transport mode could qualify as IPT because of the informal manufacturing of the vehicle – for instance the jugaads, which are vehicular contraptions manufactured informally by local mechanics. Cycle rickshaws could qualify as IPT when they operate without a legal permit, for instance in cities where they are banned. A 3-wheeled motorized auto rickshaw could qualify as IPT when the driver, as a general rule, charges a fixed fare on a per-head basis (when he is not allowed according to the contract), charges more than the fare stipulated by the contract or carries more passengers than legally allowed.

To be able to systematically discuss the nature of IPT, it is necessary to break down the concept of informality in public transport. The table below helps illustrate different types of informality, such as the nature of the transport system and operations, the informality of the vehicle, and human aspects.

Table 1 – Types of Informality

	IPT Type / **Types of informality**	M3W	M4W - Matador	Cycle Rickshaw type 1	Cycle Rickshaw type 2	M4W - Minibus	Others
VEHICLE	Manufacture						
	Sale						
SYSTEM & OPERATIONS	Overcrowding						
	Fare						
	Routes						
	Driving permit						
	Stand/Terminal						
	Parking						
HUMAN	Ownership						
	Employment						
	Other criteria						
	Total						

The value of this exercise is not so much in having a detailed discussion on what is informal, what is formal and what is somewhere in between, but rather to have a basis for a more nuanced discussion on the nature of IPT. Because of its informal nature, IPT is often seen as something that should be discouraged. It is therefore important to understand *how* IPT operates, *why* people use it, wherein its informality lies and in which ways it could be integrated into the public transport system as a whole. More important than the definition on

which mode qualifies as informal or not is the discussion on the extent to which is it acknowledged, and fills a role, as a part of the public transport system.

3.2 What role does IPT play?

IPT, along with cycling and walking, is the lifeline in most Indian cities. Small- and medium-sized cities (SMCs, defined for the purpose of this paper as cities having a population less than 4 million) in India usually have short trip lengths, trips originating and ending all over the city and characterize lesser per-capita income than big cities [Tiwari, 2002]. Moreover, 85 percent of the urban poor live in SMCs [Mahadevia, 2010] and their transport needs need to be met economically. The economy and flexibility demanded by commuters in SMCs makes a formal public transport system economically and practically infeasible without heavy subsidies.

In such cities, IPT systems form the self-styled, self-managed public transport system. Also, Indian towns often characterize narrow streets and alleys where public transport may be unable to reach, especially in the context of slum areas. This is another winning point for informal public transport (with its compact vehicles) in not only SMCs but also the more populous cities [Cervero, 2000].

Because of the fuzzy nature of Informal Public Transport, the share of Intermediate Paratransit found in the modal split of cities may be an inaccurate reflection of the true share of IPT in Indian cities. In academic literature, IPT practices and their numbers are not well documented and there is a great discrepancy between official statistics and what is visible on most Indian streets. A study in the city of Amritsar in Punjab, found that 94 percent of all passenger trips were catered to by paratransit modes [Luthra, 2006].

Estimations based on fieldwork have shown that the real share of IPT in a city is often much more than that estimated in studies. According to official estimates, shared auto rickshaws in Rajkot account for a mere 7% modal share of passengers trips while estimates from this study estimate their modal at 22%.

IPT is found to not only satisfy the transport needs of the urban poor, but forms an important mode of transport for people living in urban fringes and bridging the ‘last mile’ problem for the relatively well-off as well. Shared auto-rickshaws operate aplenty around suburban local train stations in Mumbai. Even the relatively well off use them because they are quicker than the formal public transport.

3.3 IPT in present transport planning

Authorities in cities tend to overlook the ‘illegal’ nature of IPT because it fulfills the gap that public transport leaves. However, authorities have a disparaging attitude towards them in general. The scoffing at entire gamut of informal activities as being symbols of backwardness is common in the developing world and informal transport IPT is no exception. There seems to be a cyclic logic to this. IPT is most prominent in the developing parts of the world. It is this inverse relation between wealth and informal transport that prompts public authorities to ban them in hopes of conveying a modern, first world image [Cervero, 2007].

In general, it can be said that the transport policy and planning take an active approach to some parts of the transport sector such as private motorized transport, through construction

of roads, bridges, flyovers, tunnels, parking, etc. It also, to a varying degree, takes an active approach to certain public transport modes, such as light rail (through substantial investments) and bus and BRT systems, separate lanes, bus stops, terminals, parking etc.

When it comes to other types of public transport, such as auto rickshaws, cycle rickshaws, minivans, informal water transport etc, the state typically plays a 'reactive' role. This can mean taking measures that discourage IPT. The brief case studies of IPT in three Indian cities below gives an idea of the role and importance of IPT, and in what way it is managed in transport planning.

3.4 Examples of IPT – Three case studies from India

The Chakdas of Rajkot

The City: Rajkot is an important city in the state of Gujarat in western India. It is a typical middle-sized Indian city on many accounts. Like many other cities in Gujarat, Rajkot is growing very fast. It has been ranked the 22nd fastest growing city in the world. It has a population of about 1.4 million (as of 2010). Between 1991 and 2001, the population increased by 79%, one of the highest surges in population growth since independence. By 2021, Rajkot is projected to have 2.2 million residents.

Transport Scenario: As in most Indian cities, there are a wide variety of transport modes in use in Rajkot. Cars, motorbikes, scooters, bicycles, auto rickshaws, chakdas (larger 3-wheeled auto rickshaws) and city buses are used by residents of Rajkot for meeting daily travel needs. In Rajkot, 28% trips are made walking, 21% on bicycles, 13% on public transport and 38% on private motorized transport (EMBARQ, 2009). Traffic congestion, while a non-existent phenomenon in Rajkot till a couple of years ago, is becoming a reality. Public transport in Rajkot is road based and largely informal. There are two kinds of public transport available in Rajkot – formal public transport buses and informal shared auto rickshaws run individually by entrepreneur-drivers. The formal public transport buses are fewer than required (a mere 50 in number) and run at a low frequency, which makes them very impractical for the typical user. Informally run, 3-wheeled diesel-powered auto rickshaws, known as "chakdas" are the favorite mode of communal transport in Rajkot.

Informal public transport: Chakdas are licensed as contract carriage auto rickshaw taxis, which should charge the customers according to the rate fixed by the government (recorded and displayed by a meter). However, drivers run Chakdas as a point-to-point service with fixed fares. Even though the chakdas are licensed to seat 3 passengers in addition to the driver, there is virtually no limit to the number of people the driver picks up. Depending on the time of the day, the number of passengers in the chakda could vary between 2 to 12 or more. Chakdas run all over Rajkot and their routes can broadly be classified in to two kinds – arterial routes and ring road routes – and about 6,000 are in service in Rajkot (2010). The presence of chakdas on all arterial streets and the ring road means that a potential passenger is never too far from it and can easily walk to it.
An estimated 400,000 passenger trips are made on Chakdas every day, indicating a modal share of 22% in the city passenger trip modal split. The operating frequency of chakdas is

purely demand based. Chakdas begin service early in the morning from 6 AM and keep running till 10-10.30 PM in the evening. At rush hours, chakdas are available on all routes every 2-3 minutes.

Regulatory Environment: There are a number of bodies planning, governing and regulating urban development in Rajkot – Rajkot Municipal Corporation, Rajkot Urban and Regional Development Authority. However, as far as chakdas and auto rickshaws are concerned, it is the Traffic Police and Regional Transport Officer (RTO) that take all decisions. Thus, in Rajkot, it is the traffic police that, while not professionally qualified to do so, engage in the critical task of traffic planning.

Infrastructure for Chakdas: Even though chakdas are the most important element of the public transport system in Rajkot, for the government and city planning authorities, they are not legitimate stakeholders in the city public transport system and the larger urban development paradigm. Because of this, there is virtually no planning for them. No infrastructure provided to facilitate their smooth flow or provide safety to their users or drivers. Neither are there are any special lanes in the city for chakdas nor parking or designated stops. Since chakdas run as a point-to-point service, they require termini. All that exists in the name of termini are non-demarcated empty spaces near the points where chakdas terminate. Typically, these spaces are informally taken over by the chakda drivers.

Chakda Users: Chakdas users are a motley crowd. However, a majority of chakda users are the working classes, urban poor, lower income group women, children and the old (who often cannot drive a two-wheeler) and students. Women users stated that they did not feel afraid of boarding a chakda alone even after it got dark. During a brief survey, car and motorized two-wheeler users were also found using chakdas. All users stated that chakdas were extremely useful, omnipresent, cheap and flexible mode of transport in Rajkot. Overcrowding is however a major issue, which in turn becomes a safety issue.

Sociology & Economics of the Chakda-trade: Most chakda drives simply cannot afford to buy a chakda themselves. Typically, a chakda driver rents the vehicle from someone else for an average daily rent. Because the drivers are not owners, their profit margins are low. The situation is not too different with owner-drivers who, in order to get a loan for the purchase of the Chakda resort to private financers who charge a high rate of interest. The average working hours for a chakda and its driver is 14-16 hours, and drivers are pressed to make ends meet. It is because of paucity of profits that chakda drivers overload passengers, which is one of the biggest hazards associated with chakdas in Rajkot.

Integration with formal public transport: One of the important projects sanctioned under the JNNURM in Rajkot is building of a BRTS. This is the second most capital-intensive project sanctioned under the JNNURM in Rajkot[3]. The BRTS plan envisages creating feeder routes for the system, which will be fed by public transport buses other than those in the BRTS. This means that feeder buses would compete with chakdas. The BRTS plan does not mention integrating the already existing chakdas in to the BRTS, perhaps as feeders. The introduction of BRTS and the feeder buses, in theory, would ring the death knell for chakdas. Auto dealers and manufacturers report that the sale of chakda auto rickshaws has been increasing over the years. Chakdas of Rajkot are a classic example of informal public

[3] Bus Rapid Transit System Phase-1 (Development of Blue Corridor (part-1) costing Rs.1.1billion is second capital cost-wise only to Sewerage System Phase-II, Part-II, which has a sanctioned cost of Rs.1.9 billion.

transport that affordably serves the transport needs of people in most mid-sized cities in India.

The informal public transport system of Alwar

The City: Alwar is a mid-sized city with an urban population of 434,493 (Census 2001) located about 160 km from New Delhi.

Transport Scenario: Daily travel in Alwar is made in cars, on motorized two-wheelers, bicycles, auto rickshaws and cycle rickshaws.

Informal public transport: Public transport in Alwar is largely informal. Shared 3-wheeled auto rickshaws that run a fixed-fare, "point-to-point" style service are the most important public carriers in Alwar. Cycle rickshaws (rickshaws) are the second most important public carriers. A few years ago, the city introduced city bus service but it was discontinued soon thereafter because of huge losses and opposition from the local auto rickshaw unions.

Cycle rickshaws

While not recognized as a legitimate mode of transport, there are an estimated 6,000 rickshaws in service in Alwar and can be found all day (and night) round. Even though designed to seat 2 to 3 people, any number can tag on as long as the rickshaw puller and passengers agree. Cycle rickshaws are ubiquitous around the city and run all day round. Rickshaws are primarily used for short trips 1-3 km but they do go longer distances. Fares are set informally.

Regulatory Environment and Infrastructure for rickshaws: There are no designated routes for cycle rickshaws – they are found on all kinds of streets. Since they offer door-to-door connectivity, it is possible to find a rickshaw in local streets as well. Owing to its compactness and small turning radius, the rickshaw can negotiate interstices in the dense parts of the older city well. There is no infrastructure of any kind either for rickshaws or rickshaw pullers anywhere in Alwar. On the roads, there are no special lanes or priority for rickshaws, there are no markings at traffic intersection that would facilitate (or make safer) rickshaw crossing; there are no notified stands where rickshaw pullers can gather. But they do gather – informally – and in a way the traffic police "tolerates them". However, rickshaw pullers report that police harassment has increased and feel severely exploited because of this.

Users: Rickshaws are used by people of all ages. Majority users belong to the lower- and middle-income groups. Rickshaws are popular with housewives and children since many a time they do not drive themselves. Many rickshaws also serve as school taxis. All in all, everyone in Alwar uses rickshaws. An estimated 90,000 passenger trips are made every day in Alwar on rickshaws.

Sociology & Economics of the rickshaw-trade: A majority of rickshaw pullers do not own rickshaws – they rent them. Rickshaw trade is a seasonal job for many. Rickshaw pulling is easy employment for village-folk from nearby villages when agricultural activity is low. It forms a very important source of livelihood for them during this time. A typical rickshaw puller works for 12-14 hours a day (which is the typical duration for one "shift" of rickshaw rental). Some pullers are actually day workers in other jobs in the city who supplement their income

by rickshaw pulling in the night or when they are free from their regular job. Many rickshaw pullers are homeless, especially the seasonal pullers. Their living condition is abysmal and the lack of shelters at rickshaw stands exacerbates their living condition. During the day they can be seen taking breaks sleeping on their rickshaws. At night, they sleep on footpaths. Rickshaw pullers said that shelters at rickshaw stands would be of great benefit for them. Most rickshaw pullers are illiterate, which makes it easy for those in power to exploit them.

Three-wheel taxis:
Shared 3-wheeled auto rickshaws that run a fixed-fare, "point-to-point" style service are the most important public carriers in Alwar. They offer cheap and quick transport service around the city. These shared 3-wheeled taxis are found on most important roads in Alwar and there are about 7 notified routes where they run to and fro services. Officially authorized to seat 7 passengers plus a driver, it is easy to see over-stuffed auto rickshaws. During rush hours and on popular routes, 'Vikram' auto rickshaws could seat up to 15 people. They begin operating around 6 AM and run till 8 PM. From almost anywhere in Alwar, it is easy to walk to a road where one finds these vehicles.

Regulatory Environment: These fixed-fare shared auto rickshaws are ingeniously organized in Alwar. There are about 5 main unions that organize drivers and owners of auto rickshaws. Though claiming to not be aligned with any political party, the unions wield political force. No fixed-fare auto rickshaw can operate in Alwar without the union's consent. Unions have their own system of numbering vehicles, which are organized with them. Unions have organized queue systems wherein at the termini, auto rickshaw drivers are obliged to wait their turn in line before starting off again. The unions balance the number of vehicles and frequency at which they run in order to maintain fair running business share for everyone. Auto rickshaw drivers reported that this queue system not only makes sure that everyone gets equal business opportunity but also makes sure that people drive only 6 days a week. It is the unions who, looking at travel demand between certain areas, propose new routes. They give proposals to the RTO who then surveys the route. If the RTO finds the proposal justified, they formally institute the route and start issuing permits for that route. Unions also serve as watchdogs for the users. In case a driver misbehaves with a customer, that customer can lodge a complaint with the union who take the driver to task.

Infrastructure for auto rickshaws: There is no approbated permanent infrastructure in Alwar to facilitate smooth movement of auto rickshaws or provide comfortable waiting areas for drivers or users. There are no dedicated lanes in the city for auto rickshaws. Auto rickshaw parking & stands are informal and "just tolerated" by the traffic police. The traffic police, allegedly often capriciously, shift the informal parking stands from one place to the other. There is no shelter of any kind at these informal auto rickshaw stands.

Users: Users of these services belong mostly to lower-income groups; women form a significant part of the user group. Women reported a general feeling of personal safety against crimes no matter what time they ride. Each route is divided in to a number of stops. The number of stops one travels across measures fare. Even though there are these fixed points where the vehicle is supposed to make halts, drivers usually stop anywhere to pick or drop passengers. This is highly appreciated by the users.

Economics of the trade: In Alwar, a majority of drivers own the vehicles. Daily turnover of owner-drivers varies throughout Alwar depending on the route they run on. Most owner-

drivers take loans from private financers to purchase the vehicle. The going rate of interest (2010) is around 20% pa. Many driver-owners therefore pay a significant sum every month towards repayment of loans. This, naturally, has a diminutive effect on their savings.

Integration with formal public transport: In Alwar, public transport is largely informal and little in the form of formal public transport exists.

Informal Transport in Mumbai Metropolitan Region

The City: One of the largest urban agglomerations in the world, Mumbai Metropolitan Region (MMR) is home to around 21 million people and projected to grow to 34 million by 2031. Mumbai is a city of contrasts – while on the one hand it is home to the richest people in the world, more than half of Mumbai's population lives in slums. It is estimated that 54% of Mumbai's population live in about 1950 "slums" which are located both on public and private lands and lack basic services.

Transport Scenario: Mumbai has one of the most efficient and prolific public transport systems in India. Public Transport ridership in Mumbai is one of the highest in the world with 52% of all passenger trips (excluding walk trips) being catered to by it. Suburban trains and buses are the public carriers in Mumbai. Even though formal public transport is well organized in Mumbai, it reels under severe pressure. Between 1991-2005, the number of cars increased by 137%, motorized two-wheelers by 306%, 3-wheeled auto rickshaws by 420% and 4-wheeled taxis by 128%. The main roads in Mumbai experience heavy traffic jams during rush hours.

All around the MMR, informally run shared auto-rickshaws have emerged as a popular mode of transport from the suburban train stations to home – the proverbial "last mile". Whether it is the posh suburb of Bandra, the fast-growing hub of Navi Mumbai – Vashi, Thane, Meera Road or Mumbra, informally run shared auto-rickshaws can be found everywhere. Shared 4-wheeled taxis also run between the posh business district of Mumbai – Nariman point to Church Gate and CST railway stations. It is regular licensed "black-and-yellow" auto rickshaws and taxis offer this "informal" service. The route typically is between the suburban rail station and a neighboring locality. The route run through any kind of street – arterial, distributor or access; the exact routing selection is carefully done by the drivers keeping in mind their time budget and availability of passengers in various locations. The route is informally divided (by consensus of drivers' unions) into points between which they run the informal "point-to-point" service. Even though fares are calculated on a "point-to-point basis", drivers pick and drop passengers anywhere. This, as in other cities, is much appreciated by the passengers. Informally shared auto rickshaws begin plying around 6 AM and continue throughout the day till late in the evening (10-11 PM). There are no fixed timings for the service to stop – this business is purely demand driven; service time depends on the time till there are customers willing to ride. The frequency depends on the volume of passengers, which in turn is dictated by suburban train timings. In practice, throughout the day, shared auto rickshaws are available for a waiting time of less than 5 minutes.

Regulatory Environment: The shared auto rickshaw trade in Mumbai is a subset of the larger auto rickshaw trade in MMR. There are various regulatory issues that are seen by drivers as impediments to growth of the industry. Regulations in the form of caps on numbers foster an undercurrent of illegality & informality.

It is the traffic police that acts as traffic planner – deciding where auto rickshaws can go and where they can't; what they can do and what they can't; where they can park and where they can't. The interesting thing with Mumbai Traffic Police is that it is department from which officers cannot to transferred to other police department. This means that traffic policemen are in for the "long haul" in business and they can be trained to handle traffic better.
Auto drivers' unions have been demanding for a long time that shared auto rickshaws be legalized. Recently, the authorities agreed to allow pilot shared auto rickshaw service projects.

Infrastructure for auto rickshaws: Since shared auto rickshaws are largely not formally recognized, there is no special infrastructure for them. Shared auto rickshaws use the same infrastructure as that which exists for normal auto rickshaws. Auto rickshaw stands are aplenty in the MMR and they usually have at least some of the basic amenities like drinking water, shade and a resting area. There are no special lanes on the roads for regular auto rickshaws, and of course none for shared ones. The popular sentiment, much purported by the media is that auto rickshaws are a major cause of traffic congestion; because of their small turning radius, people claim auto rickshaws can easily "cut lanes" and cause impediments in traffic flow. There are no identified pickup points for the shared auto rickshaw service. Auto drivers' unions in Thane propose legalizing sharing of auto rickshaws and setting up of simple poles along the routes guide passengers to the pickup location in order to organize the system better.

Users: Unlike other study cities IPT is used in large numbers by middle class along with the lower income classes. This is because in MMR a large part of middle class use suburban trains for daily travel and IPT usually helps take them the "last mile" i.e. from the suburban train station to their neighborhoods. Also, often in the outer suburbs of Mumbai, public transport does not necessarily reach newly developed areas; even if it does, sometimes its frequency is not up to commuters' expectations. This is where shared auto rickshaws in their IPT avatar come in delivering faster service at a high frequency. Students and middle class working men and women are major shared auto rickshaw patrons in the MMR. Families or larger groups traveling together do not prefer it because hiring an auto rickshaw or taxi and paying by meter is cheaper.

Economics, Sociology & Politics in the trade: In Thane, it is estimated that about 50% drivers own their vehicles. Drivers work, on average between 14-16 hours a day. Related to the rising cost of living and vehicle maintenance is the larger issue of fare revision that plagues the whole auto rickshaw industry in MMR. The government revises fares in accordance with the rise or fall in the price of fuel only. Auto rickshaw drivers and unions claim that this is structurally flawed, as it does not take in to account the overall increase in the cost of living, vehicle spare parts and vehicle maintenance.
The auto rickshaw trade happens to be a heavily politicized. There are a large number of auto rickshaw unions, most of them organized by regional and national political parties. Political differences and the quest for power often results in unions trying to beat each other out. As far as auto rickshaws (and shared auto rickshaws) are concerned, this results in unions that are strong in a particular region "prohibiting" auto rickshaw drivers belonging to another union from entering their "area". Auto stands in the MMR usually display the name of the union that is strong or active there. Auto rickshaw drivers reported that if they try to pick up passengers in an area where a union, which is trying to compete with them holds strong, they might face opposition and even be physically assaulted.

Integration with formal public transport: Shared Informal auto rickshaws have grown around public transport hubs. Though not officially considered legitimate, they are “automatically integrated” with public transport. There are many impediments plaguing the auto rickshaw and shared auto rickshaw industry in Mumbai, still they thrive.

4 IS IPT GREEN AND PRO-POOR?

Having discussed the challenges of urban mobility, the constraints of current transport planning and the role of informal public transport, the question must be asked what implications this should have on urban transport policy. Is IPT green and pro-poor, and can/should it be a part of a sustainable urban transport system?

The question of whether IPT is 'pro-poor' or not must be discussed from two perspectives; IPT as providing mobility for the urban poor, and IPT as a source of employment for the poor. The discussion on environmental aspects focus on the environmental impact of IPT (pollution and climate) and the potential for improvement.

4.1 Mobility for the urban poor

The poor confront everyday problems related to mobility such as access to employment, social services, educational opportunities and domestic tasks. If the public transport services in the city/area are physically and financially inaccessible to the poor, they contribute in reinforcing their poverty. Poor people's inability to access jobs and services is an important element of the social exclusion that defines urban poverty.

In many cases, IPT exists because there is no formal public transport system available to the poor. IPT is then the lifeline that ensures that they are able to access (employment) markets, services, education etc. The largest chunk of IPT users are from lower-income groups who cannot afford private means of transport. This is where IPT becomes an informal but great enabler that facilitates access to jobs and other resources for the poor. IPT arises because of many reasons which include lack of formal public transport supply, different needs of people that cannot be fulfilled by formal public transport, everywhere-to-everywhere movement pattern in Indian cities, high number of short trips, lack of penetrability by formal public transport in dense city (slum) areas and so on. Often the urban poor live in far-flung peripheral areas in cities where formal public transport supply is either not there or its frequency is lower than people desire. IPT has been seen to be present in such places serving mobility needs of people. IPT is the lifeline for great masses of people in India. Simply put, IPT exists because there is a socio-economic-temporal need for it. Having grown out of a process where supply responds to demand, it is available and affordable (though definitely not always cheap) to the poor.

Policies regarding IPT modes thus have an impact on the poor as customers, as operators and as employees. The issues involved may be complex. There has been a great deal of debate over what policies should be adopted towards the various 'non-corporate' transport modes. However, focusing on poverty issues, it is widely agreed that reducing barriers to the informal supply of both passenger and goods transport will be a 'pro-poor' policy [UNDP 1998].

However, IPT also has a number of demerits which must be addressed. One is the issue of affordability. While IPT is affordable to the extent that it is being used by low-income groups, it also represents a significant expense for them. A large proportion of the monthly income is spent on transport. Therefore, compared to highly-subsidized formal public transport, IPT is sometimes a quite expensive mode of transport.

Health and safety are two other key issues that negatively impact the users of IPT. While outside the scope of this paper, it is clear that the exposure to toxic fumes from motorized transport pose a health threat to IPT users (and primarily drivers) and that poor traffic safety of many IPT vehicles in combination with threats from other high speed transport modes is a challenge.

Finally, what is *not* a pro-poor approach is that such an un-proportionate part of public investment in transport goes to providing for private motorized transport, or public transport that is out of reach – geographically and financially – for the poor.

4.2 IPT as a source of employment

As a source of employment, IPT plays an important role in providing employment to a large number of urban poor involved in the whole spectrum of IPT associated services and industries. Though further research is needed on the significance of the IPT industry as a source of employment, evidence from Bangladesh, suggests that around 14% of the Bangladeshi population relies indirectly on rickshaw pulling for their livelihoods (their families, manufactures, garage owners, painters, repair men). In Dhaka alone, some 20% of the population relies on pulling or indirectly, which amounts to about 2.5 million people [Wipperman and Sowula 2007]. This large workforce and its continued growth are attributable to two major factors;

a) the unemployment problem in agro-based rural areas and subsequent large urban drift, and
b) easy access to jobs in rickshaw industry.

As a result, non-motorized public transport is woven deeply into Bangladesh society in terms of its employment, cultural and socio-economic contributions, especially amongst the poorest sections of society. In a city like Dhaka, the “hard” transport planning issues cannot be fully separated from the “soft” socio-economic implications of non-motorized public transport policies [Rahman et al 2009].

4.3 Is IPT environmentally friendly?

Whether IPT is environmentally ‘friendly’ or not is a complex question. Firstly there is a need to distinguish between different types of IPT, primarily between motorized and non-motorized modes. Non motorized modes, such as the cycle rickshaw naturally offers one of the most environmentally sustainable modes of transport available from a pollution perspective, while it is being accused for slowing down traffic and causing congestion (for cars). Motorized modes however, such as the 2-stroke auto rickshaw, are often criticized for being one of the worst polluters in the city. Though this needs further study, it is clear that compared to light rail and modern busses, auto rickshaws still have a long way to go in ensuring environmental sustainability.

Secondly, we need to ask the question, environmentally friendly *compared to what*? As discussed, IPT fills the void left by formal public transport modes. Given the rapid pace of urbanization, it is safe to say that there will be an under-supply of formal public transport in the foreseeable future in many Indian cities. A well functioning public transport system (whether formal, informal or both) is a prerequisite for turning the tide of increasing private vehicle ownership. Therefore, when comparing the environmental impact from IPT, it must be kept in mind that the alternative is not that people would ride the bus. It is most likely that they would acquire private motorized transport modes, such as two-wheelers. From that

perspective, IPT fills an important function to keep down even further environmental degradation as a result of continued growth of private motorized transport.

A third aspect is in seeing the potential for environmental improvements in the IPT sector. An interesting question to ask is *why* vehicles are so poorly maintained and *why* so little investment has gone into finding ways of improving their performance from an environmental perspective. The unsanctioned and uncertain situation for IPT in most cities results in a very short term perspective on operating an IPT business, and consequently investments in vehicles. There is a significant potential for mitigation of CO_2 emissions and other pollutants through relatively simple measures such as improving engine performance, switching to bio gas and introduction of electrical vehicles.

In summary, IPT has the potential for becoming a key component in a pro-poor and environmentally sustainable public transport system. A policy that aims to integrate IPT in the formal transport planning in a sustainable way could make significant impact on poverty and environment in urban India.

5 INTEGRATING IPT IN FORMAL TRANSPORT PLANNING – ACHIEVING A GREEN AND PRO-POOR PUBLIC TRANSPORT SYSTEM

While IPT fulfils critical mobility needs of millions, there are trade-offs. Policy should work at making sure that the trade-offs are not socially unjust or environmentally damaging. For instance, IPT is cheap enough to be affordable and appealing to urban poor; however, operating at low profit margins and in the face of rising cost of living, drivers resort to filling over capacity thereby jeopardizing everyone's (inside or outside the vehicle) wellbeing. Environmental damages are especially important to take care of in case of motorized IPT. It is fairly common for vehicles to be poorly maintained and spew noxious gases aplenty. Motorized auto rickshaws definitely do not do too well in case of per capita emissions as compared to buses. Technology can definitely play an important role here. In the case of cycle rickshaws, even though pullers sell their labor cheap, they often have very long working hours and their living conditions are abject – this would be counted as social injustice.

Therefore, there is a need to embrace the good of IPT – flexibility of working hours, flexible routing, and high frequency; policy and consequent action need to improve IPT's follies to evolve an "IPT-like" system. Very logically, we refer to the overall policy and practice climate that will result in the proposed, "Enabling Environment".

5.1 An enabling environment for IPT

The present approach in urban planning in India (including urban transport planning) shuns and disparages informal practices; the current mainstream planning rhetoric is to do away with the informal because it is supposed to be inherently malignant – it is perceived as a sign of underdevelopment and the only alternative according to this view, is in the formal.

However, as we see from studies in different cities, the formal public transport of today may not necessarily be what fulfils people real day-to-day mobility needs or what is appropriate in the given socio-economic-temporal makeup of a city. There seems to be a gap between the people and planners and decision makers.

Stringently sticking public transport solutions in their present form may not necessarily be economically prudent as well. Small- and many medium-sized cities may not need large-scale formally organized public transport system based on buses or rail. Since the trip lengths in such cities are usually short, a city may do very well by having a very high quality non-motorized transport network, aided by a quasi-formally organized low-carbon public transport system comprising compact vehicles (like 3-wheelers or minibuses) run by individual entrepreneurs. The city would have gotten then a public transport system at a very small cost to the city.

In larger megacities, the city could enhance the performance of communal transport by augmenting public carriers' capacity ingeniously using IPT-like services. This could lead to lower financial burden (at times) on the city exchequer as well as foster wide spread economic development, much like in small- and medium-sized cities.

Cooperatives and associations of IPT-like services should be encouraged to work in harmony along with the city government and other concerned city-building professionals and civil society actors. This close contact will help allay misgivings that one group may have about the other. By emphasizing on individual entrepreneur IPT service providers, there is a possibility of equitable local economic development.

All cities are unique. Even though they may have similar physiognomy, their detailed makeup is most often distinct. Therefore, cities' response and method of planning and managing transport systems need to be custom-made; the approach may be common but not necessarily the exact solutions. Therefore, city governments should engage in detailed cross-disciplinary study of the state of IPT or IPT-like services prevalent in their respective cities as a first step to understanding raisons d'être of these services' existence. Planners and decision makers should beware of understanding things facilely. For instance, IPT's follies are prominent – poorly maintained shoddy vehicles, pollution, overcrowding, etc. Looking at these, it is easy to conclude that IPT doesn't deserve merit and should be immediately done away with. However, in-depth investigation will show that there are underlying structural reasons for this. Through this study, we have tried to highlight common misunderstandings about IPT.

Urban transport policy must take cognizance of the fact that IPT arise because there is a need for it; that it is an integral part of the public transport system in a city and provides for critical mobility needs of people. Also it must recognize the fact that IPT is not inherently malignant, even though it has shortcomings, which are often result of other structural imbalances. Policy should aim at helping IPT evolve into IPT-like services which basically is a transport system based on the good of current IPT services (compact vehicles, high frequency, flexibility in routing, affordable, etc.). With this outlook in policy, cities should work on the following:

> **Physical Infrastructure:** It goes without saying much that if IPT is to be upgraded in to an IPT-like service; the physical infrastructure of the city must provide for it, it must also integrate IPT into the larger urban transport and urban infrastructure. Currently, very little exists by way of infrastructure for IPT in Indian cities. Most city infrastructure that IPT currently uses in cities is either sanctioned by authorities on a piecemeal basis and keeps shifting or IPT providers have simply taken over infrastructure not officially meant for them. Parking stands form an important element

of physical infrastructure critically needed by these services. IPT service providers raised lack of tenure over parking stands as one of their single biggest concerns. They reported a lack of it overall, and specifically lack of civic facilities provided at the existing stands. Because of lack of tenure, harassment by authorities was reported at places. The problem of parking and stands is especially acute for cycle rickshaws whose pullers they say are driven around the city like cattle. High quality parking stands should be provided in the city wherever needed and basic human necessities like drinking water, shade and benches should be part of it at the minimum.

An interesting mechanism of having a bottom-up approach of deciding where parking stands should be built for auto rickshaws is seen in Jaipur. When drivers' unions gauge need for an auto rickshaw-parking stand at some location, they approach the RTO and traffic police with a proposal for it. The traffic police and RTO then survey the area to study the possibility of building a parking there. If the RTO and traffic police conclude that building the parking stand will not impede other traffic, they give their approval. Then the proposal goes to Jaipur Development Authority who is required to give a NOC. After its receipt, the parking stand is notified and auto rickshaws can start assembling. However, due to conflict over ownership of land, its tenure is uncertain and therefore infrastructure like shade and benches cannot be permanently built.

Other than parking, physical infrastructure need also provide shelters for passengers on fixed-route services. They could be ingeniously clubbed with bus stops in a way that does not create unwanted friction between buses and IPT vehicles. Our study has shown that users prefer being dropped off as close to their destination as possible. In current IPT practice, this results in the IPT vehicle stopping just anywhere to pick and drop passengers. While it may not be possible to allow such stopping everywhere, depending on a city's needs and possibilities, it may be visionary to provide for extra "informal" pick up and drop off locations than those already built for IPT-like services. This could mean providing simple shoulders at places or wherever not needed, not even that – just a sign "IPT vehicles stopping" could be enough.

In places, IPT vehicles, by virtue of their being public carriers need to be prioritized. A number of Indian cities are working on building priority lanes for buses. While priority lanes for buses are very important, depending on context, IPT vehicles could also be prioritized similarly. In Paris, bicycles are allowed to ride in the bus lanes; if a bus driver wants to alert a cyclist, the driver uses a bicycle bell. Such examples show how ingenious and contextual planning can be. Cycle rickshaws need special priority lanes; either physically segregated or painted depending on the speed of other vehicles. Shelters and parking stands for cycle rickshaws are required equally importantly as they are for other IPT modes.

Service Providers; the socio-economic angle: IPT service providers, even though in the trade for profit, engage in delivering public good. This needs to be recognized and respected. IPT service providers across India have long working hours (averaging 14 hours a day), hardly any holidays and no social security. One of the underlying reasons for the numerous negatives of IPT like overcrowding, decrepit polluting vehicles, etc. is economic feebleness of service providers. A majority of IPT

providers do not own their vehicles and have to pay a daily rent which has a diminutive effect on their savings. Those who own vehicles not too far away because they are generally in debt and have to pay a hefty sum each month to repay the loan they took for buying the vehicle. The reality is, the people who actually deliver IPT services are economically unsound. Not only that, in the face of increasing cost of living in India, they find it hard to make ends meet. As a result, they are on the lookout for every opportunity to make a little more money. The easiest way to do it is to carry more passengers and spend as little on maintenance as possible, all major follies of informal public transport.

In seeing the ways in which IPT benefits a city and its people (including saving the city billions of rupees if it were to provide subsidized public transport to everyone who rides IPT), for the sake of having a more benign IPT, easy credit schemes should be set up for IPT service providers. There could be different schemes for those beginning the trade than those who have been around for a longer period. City governments could help set up communal cycle- or auto-rickshaw banks from which those wanting to offer IPT services could loan vehicles for a fair rent. A “group as collateral” approach like that of Grameen Bank in Bangladesh could be followed for those who do not have cash or other collateral. In this approach, loans or vehicles are lent out to groups that are together responsible for it; in case of non-payment or damages to the product, the entire group is responsible. This method had considerable success in Bangladesh in ensuring reduction of defaults. Cycle rickshaw pulling could also be innovatively tied up with the proposed National Urban Employment Guarantee Scheme.

IPT service providers need to be recognized as legitimate stakeholders in the public transport system and cared for. Social security schemes should be set up to provide a basic fallback option for IPT service providers and their families in case of hapless incidents. The informal character of the trade may make it difficult to set up a traditional social security net because in IPT, there is no guarantee that a person is permanently an IPT service provider or there is often no proof that one is associated with the industry. Answers to this will have to be found in informality itself. A good approach would be to work with the IPT service provider community itself discussing ways in which such measures could be initiated for them. A basic tenet of all kinds of economic benefits would be that the IPT providers will not break further the mutually agreed rules set down for IPT-like services. There could be a point system in which IPT service performance could be calculated positively or negatively by monitoring how well the IPT service providers perform.

It is not naïve to hypothesize that if IPT service provider’s income levels increase, they will, as a direct or indirect result, adhere more to the prescribed for the simple reason that doing the opposite could result in immediate monetary disincentives for them. A precondition for such solutions to work in reality is real-time engagement with the IPT service provider community and building of mutual trust with them.

Knowledge Exchange: It is important for cities, planner and decision makers to keep learning and updating knowledge. It is equally important to learn from other’s mistakes than it is to learn from their successes. Regular knowledge exchange

sessions need to be organized both within the country as well as abroad, especially within the nations in the Global South, which often share similar problems.

Regulatory Reform: The way Indian cities govern themselves is undergoing change. The 74th Amendment Act of the Indian Constitution provisions allow for strengthening the capability of municipal governments. The main areas to which attention has been given are: constitution of three types of municipalities; regular and fair conduct of municipal elections; representation of weaker sections and women in municipal governments through reservation of seats; devolution of greater powers and functions to municipalities; constitution of state finance commissions; constitution of wards committees, metropolitan planning committees and district planning committees. After the full enactment of this Act, cities would be more independent financially and can take "matters in to their own hands". This could be very good, amongst other things, for the task under focus here – improving IPT services.

It was observed in almost all case study cities that the RTO and traffic police is taking decisions regarding transport. While traffic police is an enforcement agency and RTO merely concerned with issuing permits for different types of vehicles, they are at the forefront of making traffic planning decisions. It is usual in Indian cities for traffic police and RTO to decide where an auto rickshaw or cycle rickshaw stand will be authorized. While these agencies and offices are legitimate stakeholders in a city's management, they are definitely not supposed and, more importantly, qualified to make traffic planning decisions. This needs to change. Planners and other relevant city building professionals should be making all kinds of traffic planning and city building decisions, albeit in collaboration with traffic police and the RTO.

Most importantly, development planners, thinkers, decision makers and city building professionals needs to realize that at this stage, since cities in India are undergoing metamorphosis just like growing organisms, a city's response in terms of building and shaping infrastructure needs to be dynamic. Cities need to keep inventing and reinventing. They need to keep testing what works or does not work for them. Evaluation is very important. Pilot projects and their evaluation will be of much use in arriving at appropriate solutions. The challenge is to create, implement and enforce a regulatory environment that embraces the positives sides of IPT while addressing the negatives.

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