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Urban transport crisis in India

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Abstract

Indian cities face a transport crisis characterized by levels of congestion, noise, pollution, traffic fatalities and injuries, and inequity far exceeding those in most European and North American cities. India's transport crisis has been exacerbated by the extremely rapid growth of India's largest cities in a context of low incomes, limited and outdated transport infrastructure, rampant suburban sprawl, sharply rising motor vehicle ownership and use, deteriorating bus services, a wide range of motorized and non-motorized transport modes sharing roadways, and inadequate as well as uncoordinated land use and transport planning. This article summarizes key trends in India's transport system and travel behavior, analyzes the extent and causes of the most severe problems, and recommends nine policy improvements that would help mitigate India's urban transport crisis.

1. Overall situation in developing countries

Although the word 'crisis' has been used to describe transport problems in European and American cities, the term seems far more appropriate for cities of the developing world. Environmental pollution, noise, traffic fatalities and injuries, congestion, and mobility problems are far more severe in developing countries, making the problems in Europe and North America seem quite modest by comparison (Gakenheimer, 1999; Gwilliam, 2003; Pendakur, 2002; Pucher and Lefevre, 1996; Silcock, 2003; Vasconcellos, 2001).

Developing countries have several factors in common that contribute to the severity of their transport problems. Overall population growth and increasing urbanization have led to the especially rapid growth of large cities, which have been overwhelmed by the sudden jump in travel demand. The supply of transport infrastructure and services, by comparison, has lagged far behind demand. Public sector finances, in general, are so limited that funding for transport improvements is woefully inadequate. Most transport facilities are used far beyond their design capacity. Moreover, facilities for pedestrians and cyclists are virtually non-existent in most cities, thus forcing them to share crowded rights of way with rapidly moving motor vehicles.

The problem of overall low per-capita incomes in developing countries is compounded by extreme income inequality. The wealthiest tenth of the population typically earns over half of total national income (Vasconcellos, 2001). Much of the population is so poor that it cannot afford any motorized transport at all and must spend up to three or even 4 h a day for travel. Moreover, the concentration of wealth among an economic and political elite has distorted transport policies in all developing countries. While the poor suffer the most from severe and worsening transport problems in cities, government policies generally focus on serving the needs of an elite minority. For example, a disproportionate share of government funds is spent facilitating the ownership and use of private cars, while the needs of mostly low-income pedestrians and cyclists are ignored. Similarly, public transport does not get the funding or traffic priority it needs because the elite do not use it.

Rapid growth, low incomes, and extreme inequality are among the main underlying causes of transport problems in developing countries. Although the nature and extent of transport problems obviously vary from one country to another, virtually all developing countries suffer from the following:

- Unplanned, haphazard development at the suburban fringe without adequate infrastructure, transport, and other public services

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- Limited network of roads, often narrow, poorly maintained, and unpaved
- Extremely congested roads with an incompatible mix of both motorized and non-motorized vehicles traveling at widely different speeds
- Rapidly increasing ownership and use of private cars and motorcycles
- Inadequate roadway accommodations for buses and non-motorized transport
- Primitive or non-existent traffic control and management, often without even the most basic street signage
- Extremely high and rapidly rising traffic fatalities, especially among pedestrians and motorcyclists
- Overcrowded, uncomfortable, undependable, slow, uncoordinated, inefficient, and dangerous public transport
- Extremely high levels of transport-related pollution, noise and other environmental impacts, especially in large cities

As documented in this article, Indian cities share all these problems of developing countries. We examine the range of urban transport problems in India as they relate to trends in urban development and travel patterns. In the process, we also offer a critical analysis of public policies and how they might be improved.

2. Urban conditions in India

The most important factors common to India and other developing countries are population growth, increasing urbanization, rising motorization, and low per-capita income. The total urban population of India burgeoned over the past three decades, rising from 109 million in 1971 to 160 million in 1981 (+47%), 217 million in 1991 (+36%), and 285 million in 2001 (+31%) (Office of the Registrar General of India, 2001a; Padam and Singh, 2001). The largest cities have grown especially fast. By 2001, India had three megacities: Mumbai (Bombay) with 16.4 million inhabitants, Kolkata (Calcutta) with 13.2 million inhabitants, and Delhi with 12.8 million inhabitants. Chennai (Madras), Hyderabad, and Bangalore each had more than 5 million residents. And 35 metropolitan areas had populations exceeding one million, almost twice as many as in 1991 (Office of the Registrar General of India, 2001b).

The rapid growth of India's cities has generated a correspondingly rapid growth in travel demand, overwhelming the limited transport infrastructure. The sharply increasing levels of motor vehicle ownership and use, in particular, have resulted in alarming levels of congestion, air pollution, noise, and traffic danger. For most segments of the population, mobility and accessibility have declined.

India's poor have been especially disadvantaged. They have such low incomes that they cannot even afford public transport fares and thus must walk or cycle long distances. In 2002, the per-capita income of India was the equivalent of only US $2,600 (purchasing power parity), less than a tenth of average incomes in countries of North America and Western Europe (Central Intelligence Agency, 2002). With 26% of the population below the poverty line in 1999–2000 (Ministry of Finance, 2002), roughly a fourth of urban residents cannot afford the basic necessities of life, including virtually any form of public transport or even a bicycle. The urban poor live in congested slums in older, deteriorating inner-city areas or in illegal squatter settlements on the outskirts of cities. Those living near the center suffer not only from overcrowded housing but also from high levels of air pollution, noise, congestion, and traffic danger. The poor living on the suburban fringe must endure ramshackle housing conditions, largely non-existent public services, and long, time-consuming trips to menial jobs in other parts of the city.

While the poor are especially disadvantaged, the Indian middle class also struggles with inadequate housing and transport. The unavailability of good, affordable housing near the center forces a rising proportion of the middle class to live in distant suburbs. Such peripheral locations require long, exhausting commutes to jobs using either slow, overcrowded public transport or dangerous motorcycles. Even the affluent Indians who own private cars must endure long commutes on hopelessly congested and unsafe roadways.

3. Trends in land use

As Indian cities have grown in population, they have also spread outward. Indeed, the lack of effective planning and land-use controls has resulted in rampant sprawled development extending rapidly in all directions, far beyond old city boundaries into the distant countryside. That has greatly increased the number and length of trips for most Indians, forcing increasing reliance on motorized transport. Longer trip distances make walking and cycling less feasible, while increasing motor vehicle traffic makes walking and cycling less safe.

Most public policies in India encourage sprawl. In an explicit attempt to decongest city centers, government regulations limit the ratio of floor areas to land areas for buildings in the center, and thus restrict the heights of buildings and density of development in the center. For example, the so-called 'floor space index (FSI)' in sampled city centers in India was only 1.6, compared to indices ranging from 5 to 15 in other Asian city centers (Bertraud, 2002; Padam and Singh, 2001). By contrast, government regulations permit higher floor space/land area ratios in suburban developments, thus further inducing firms to decentralize. Indeed, local governments in the suburbs advertise the less stringent land-use regulations there to lure economic development to their jurisdictions. Such land-use policies obviously discourage development in the center and force both firms and residences to seek locations on the suburban fringe. Moreover, local governments have