



Briefing No:19

Delhi, India



The urban public transport system in Delhi, India, is one of many contradictions, reflecting a country and a city undergoing rapid transition in a somewhat uncoordinated way. With a state of the art metro but a BRT system marred in failure, poor integration and political controversy lead Delhiites to face daily battles with traffic congestion and horrible smog. Delhi became the colonial winter capital in the 1930s and was largely built for the purpose, becoming the administrative centre all year round after independence in 1947. The planned nature of the city is evident in its large avenues, the concentric circles

around Connaught Place commercial area and good connections with regional and national bus and train transport, however, within the city population growth and decades of inept transport planning have led to serious challenges for mobility and access for the now 17 million people living in the metropolitan area of the Delhi Capital Territory.

The vast majority of public transport in Delhi Capital Territory is road-based, but even so represents a wide range of modes, including pedestrians, bicycles, motorised-two-wheelers, animal-drawn carts, bicycle



- and autorickshaws, minibuses, buses and private motorised vehicles. A ring railway from the 1970s has been largely abandoned by population and officials alike and is now derelict and mainly used for freight (train remains the most popular mode for national public transport). The metro extends to the airport and opened in February 2011, six months after the planned opening, intended to coincide with Delhi hosting the Commonwealth Games in 2010. The third phase of the metro is currently under construction and in addition to extending the existing, radial lines, will add a peripheral line along the inner ring road due to open in 2016. The planned phase IV will add an outer peripheral route to cater for access needs in an increasingly polycentric metropolitan area. All lines are currently operated by the state-run Delhi Metro Rail Corporation, DMRC, after a public-private partnership for the airport express line was discontinued when the private operator, Delhi Airport Metro Pvt. Ltd., a subsidiary of Reliance Infrastructure Ltd., refused to continue operations in July 2013 over infrastructure safety concerns. DAMPL was subsequently bought out by DMRC who also is responsible for infrastructure and claims proper repairs have been carried out. The same month saw the central

government approve plans for a regional rapid rail transit system that will connect Delhi with the urban sprawl that has extended into neighbouring states and which is expected to open in 2017.

Infrastructure financing is largely a state government affair, reflecting the institutional history of India as a planned economy with heavy reliance on state-led companies. However, the large general budget allocations used to finance the urban transport system makes it difficult to track the original sources of finance, residing amongst various general taxes since little public revenue is earmarked in the Indian system. The Delhi metro is one of the only such in the world running an operating profit, despite government regulated fares. The metro also secures financing under the UN's Clean Development Mechanism, whereby carbon credits earned from an environmentally friendly braking technology is auctioned off on international carbon markets. The metro's brake technology is power regenerative, meaning that every time they are employed, electricity is generated and used to run the train.

There are several bus systems serving the capital, including metro feeder lines

(privately operated), the Delhi Transportation Corporation, DTC's, buses (publicly operated), a largely failed BRT-experiment (publicly operated, see box on next page) and a cluster bus system that is currently being rolled out (privately operated). The latter will see the metropolitan area divided into 17 clusters with more than 650 routes and each cluster auctioned off to a private operator who is remunerated on a fixed per person-km rate, thus transferring the costs risks to the private sector while retaining the revenue risks with the public authorities. DTC boasts the largest fleet of green buses in the world following a supreme court ruling in 2002 that all diesel buses be replaced with those fuelled by clean natural gas, CNG.

Health and safety concerns

Women's safety and sexual harassment are serious concerns for all urban public transport systems in India, issues that recently reached international headlines with a series of reported gang rapes aboard buses in both Delhi and Mumbai. Delhiite women therefore only constitute 25% of metro ridership, preferring taxis or private modes of transport, despite the introduction of designated women-only coaches on the metro. Terrorist attacks from domestic and international sources are a general concern in India who has seen its fair share of communal violence over the years and the crowded metro stations are frequented by special forces to this end. Road safety is another serious problem with the capital alone seeing an average of five traffic-related fatalities and 11 hospitalisation daily. Emissions and particle exhaust from Delhi's ageing vehicular fleet are thought to be major causes of respiratory disease in the capital as well as the corrosion of many architectural structures of cultural value. Adequate transport planning in Delhi Capital Territory is therefore just as important from a public health perspective as an economic one.

Social inclusion

In addition to being overwhelmingly male, metro passengers are also young (68% are between 19 and 30 years old) and either a student or formally hired professional (92%). The official economic survey of Delhi offers no explanation for this but it is believed that in a society where means of transport traditionally has served as a signifier of social status, the metro has come to symbolise the young, middle-class urbanite, thereby deterring other social groups from its use. The lack of station-

calling by conductors and electronic ticketing pose challenges for many. As of the 2011 census almost 15% of the capital territory's population are illiterate, a number that does not include the 'functionally illiterate'. Furthermore, the areas currently serviced by the metro are the richer suburbs and business districts who are more heavily frequented by young men in professional positions. Feeder lines are inadequate to properly serve populations further away from stations.

The bus systems (with the exception of the BRT system) is better catered to the wider public's needs. Each of the 17 clusters of bus routes set out by the government combines economically profitable routes with routes that may not make a profit but are desirable from a social point of view, a move that does much to improve the mobility and hence access of the urban poor. The cluster structure in general better reflects the polycentric urban structure of the metropolitan area.

Overall quality of system

One of the first things one encounters when examining the public transport system of Delhi Capital Territory is the plethora of government bodies, companies and special committees regulating and supposedly integrating the system. Delhi's public transport system is fragmented, poorly integrated and not well designed for the population's mobility and access needs, with just the metro being overseen by four different authorities representing various combinations of the three layers of government found in India. It is not uncommon to see infrastructure and maintenance carried out by different departments with questionable coordination and communication. The metro stands out as a relatively well-functioning part of the system despite safety concerns on the airport express line's infrastructure. Unfortunately, however, it serves a very limited segment of the population at present and there are serious issues of social inclusion embodied in its design and operations, even if the proposed extensions to the metro network are believed to improve its accessibility. Delhiites frequent public transport with more than 60% of all trips relying solely on its modes. The two main challenges for Delhi Capital Territory, therefore, remain social inclusion, i.e. designing a system that serves the entire population, and mode integration, whereby pedestrians, cyclist, motorised two-wheelers and other road users are safely integrated into the system and accident rates brought down.



A divided ridership

Not only is the population of Delhi Capital Territory growing quickly, it is becoming richer and the middle class is booming. The rate of motorisation has averaged 8% the past ten years with current car ownership standing at 436 private cars per 1000 people, according to official Economic Survey of Delhi 2012-13. This is not even counting other forms of private, motorised transport in a city where two-wheelers (scooters and motorcycles) are a ubiquitous first sign on rising incomes. With road space already constituting 25% of urban land use, extending or widening the road network is feasible, resulting in the imperative of encouraging a modal shift towards public transport modes for improving the liveability of Delhi. Metro ridership is rapid increasing, with August 2013 seeing daily numbers reach 2.5m for the first time. This represents an estimated 15% of all daily trips made in the capital territory, that otherwise relies on road-based transport. DMRC has struggled to keep up with the metro's success but is increasing frequency and train lengths to stem issues of overcrowding.

Mode of transport remains a strong indicator of social status in India and car ownership is highly coveted by the rapidly growing middle classes. There is therefore a risk that the coming decades will see the currently high ridership statistics drop as incomes rise. Currently roughly 60% of daily trips include an element of public transport.

BRT "Experiments"

The much debated BRT system in the rich suburbs of South Delhi have by many been declared a failure, including Delhi's chief minister Sheila Dikshit. Boasting merely 14.5km on a single corridor, only 5.8km of these are actually completely free of traffic with the remaining stretch seeing lengths of mixed-traffic lanes and the transition points frequent accidents. Furthermore, the system is charged with worsening traffic congestion without bringing down transport times since buses are too few and far between, stations lack parking facilities and feeder lines are virtually non-existent. Run by Delhi Integrated Multi-Modal Transit Ltd. (DIMTS, a joint venture equal equity company between the Delhi state government and the IDCF foundation), Delhi's BRT buses currently bring in about Rs. 6500 per bus per trip, which is significantly less than the DTC buses who bring in Rs 8000 per bus per trip, causing the BRT system to run at heavy losses. A proposed extension plan from 2011 involving the construction of 14 BRT corridors has had to go through the constitutional court, and despite winning the case, still looks shaky and faces strong opposition both within planning departments and the wider public.

Picture credit

Map of planned extensions:
<http://sarsonkekhet.blogspot.co.uk/2009/11/jumping-gun-on-delhi-metros-phase-iii.html>

Source: Times of India.



Further reading

<http://jnnum.nic.in/> - the central government's plans for urban renewal

www.census2011.co.in - 2011 Census

www.delhimetrorail.com - DMRC website

http://delhi.gov.in/wps/wcm/connect/doit_dtc/DTC/Home - DTC website

www.dimts.in - DIMTS website

http://www.dimts.in/pdf/Delhi_BRT_System_Lessons_Learnt.pdf - DIMTS' own reflections on the BRT system

<http://www.safedelhi.in/> - Campaign for women's safety across the city,

including public transport

Murty et al., 2006. "Social Cost-Benefit Analysis of Delhi Metro", MPRA Paper No. 1658. Available at <http://mpra.ub.uni-muenchen.de/14465/>

Mitric, S., 2008. Urban Transport for Development: Towards an operationally-oriented strategy. Transport Paper 22. Transport Sector Board, World Bank Group. Available at: <http://siteresources.worldbank.org/EXTURBANTRANSPORT/Resources/341448-1269891107889/development.pdf>

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