

Urban transportation financing

A strong case for public-private partnership*



In Summary

Urban transportation projects generate multiple benefits ranging from pure private good to public good. The beneficiaries for each category are also different. There is a strong case for public-private-partnership in capturing value of urban transportation projects that accrues to all categories of beneficiaries. Public institutions need to develop innovative instruments that capture value from indirect and proximity beneficiaries so that urban transportation projects do not excessively rely on real-estate development for financing.

The specific type of instrument would vary depending upon the demand for commercial real estate, existing density, availability of complementary instruments, and administrative efficiency of ULBs. The revenues generated from such instruments should be ring-fenced into a separate urban transport fund. Finally, formation of Unified Metropolitan Transport Authorities would help in realigning the institutional structure to address urban transport related issues in an integrated manner.



01 Introduction

Managing the urbanisation process is likely to be the single biggest challenge that will confront policy makers in India over the next decade.

The urban population has crossed 320 million and is estimated to grow to 460 million by 2026. With urban areas contributing over 60% of India's GDP, sustained long-term GDP growth critically hinges on making basic services available in urban areas.

Urban mobility or transportation is one such basic requirement. Ensuring smooth and efficient movement of people and goods in urban areas has direct economic benefits and enhances productivity of workers. Availability of good and efficient transportation services at affordable costs also enhances the quality of life of residents. Importance of public transportation has also come under increased focus due to the contribution of vehicular pollution to climate change and deteriorating air quality and its impact on health.

02 Urban transportation in India



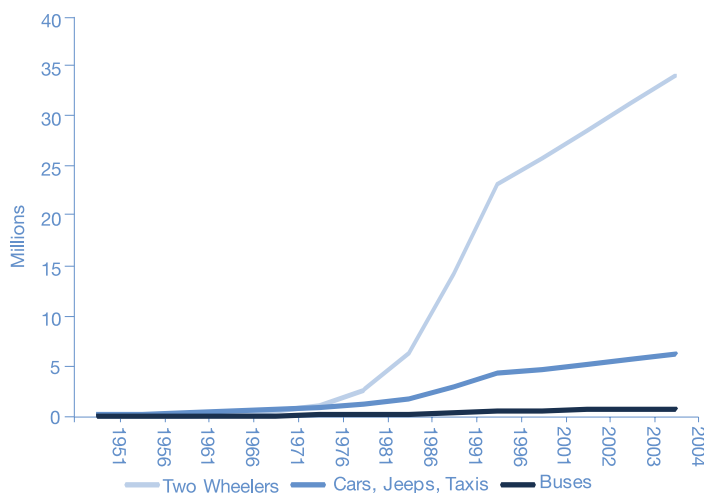


Urban transport has hitherto been a neglected area both in terms of policy planning and implementation.

Even though 17 of the 23 metropolitan cities in India have organised bus services with a combined fleet of about 25,000 buses, and four cities – Delhi, Mumbai, Kolkata, and Chennai – have metro/sub-urban rail services, a substantial part of the population relies on private vehicles to meet their daily transport needs. Private vehicle population has grown exponentially over the last two decades. It is expected that two-wheeler population will grow by over 6 times between 2005 and 2035, while the number of cars and SUVs will increase by over 13 times.

While this growth is a result of rising per capita income and higher affordability, absence of efficient public transportation system is likely to accentuate the move towards ownership of private transport vehicles.

Growth of private vehicles in India



Source: Ministry of Shipping, Road Transport and Highways, Government of India

Except in the mega cities, the modal split in favour of public transport is generally less than 20%. The poor sections of the community bear a disproportionately higher impact of inefficient public transport. Not only do they have to spend more time travelling to their work place, but they also may have to forgo lucrative employment opportunities due to lack of public transport. Thus, improving public transport will also improve social welfare. Bringing a shift in commuter preference from private transport vehicles to use of public transport is at the core of sustainable urban transport.

Very few cities have taken concerted effort to provide viable public transport solution to their residents. The problem is only magnified by the multiplicity of government institutions responsible for different areas relating to urban transport. In certain cases, as many as eight institutions are responsible for various activities ranging from licensing of vehicles, construction of road corridors, enforcement of traffic rules, monitoring air quality, operation of bus services, and land usage planning.

National Urban Transport Policy

The National Urban Transport Policy was approved by the Union Cabinet in April 2006. The policy accords centre-stage to people in all plans and seeks to ensure that urban evolution process supports the social and economic activities that take place in cities. The policy lays emphasis on the following areas:

- Incorporating urban transportation as a parameter into urban planning to pro-actively deal with urban transport needs
- Investing in transport systems that encourage use of public transport and non-motorised modes instead of personal motor vehicles
- Promoting the use of better and cleaner technology for smooth traffic management and reducing harmful effect on the environment
- Involving private sector to realise benefits of better management skills and lower costs in a variety of activities
- Innovative use of land as a resource for financing public transportation projects



03 Diversity of urban transport project beneficiaries



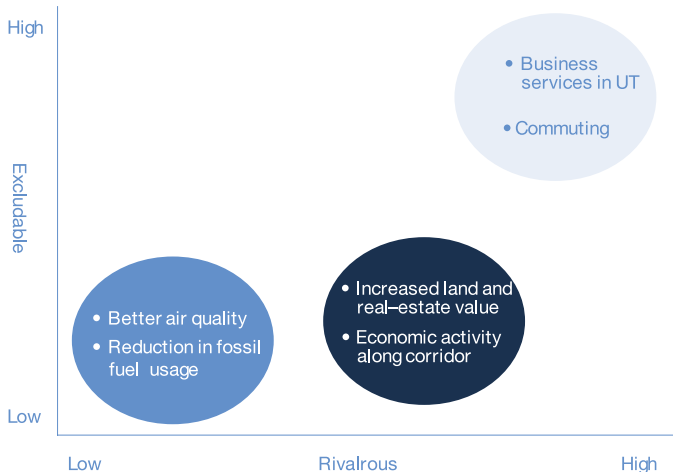
Developing a sustainable and affordable public transportation solution results in benefits for a wide set of stakeholders. We can categorise them broadly into three groups depending upon the extent of direct use benefit and the extent to which they contribute to the project:

1. Direct-use beneficiaries
2. Proximity beneficiaries
3. Indirect beneficiaries

Direct user beneficiaries include commuters who will use the transport services, businesses using benefit from the assets created, and advertisers who may be able to generate revenue by utilising the space on rolling stock, stations, bus stops etc. Proximity beneficiaries are those businesses along or close to the corridor along which the public transportation system will operate. They benefit from increase in customer flow and business activity. Value of land and property owned by residents in these areas will also appreciate due to the better transportation linkages. Finally, indirect beneficiaries include all other road users who experience less congestion on the roads due to other users using the public transport. Indirect benefits also include improvement in air quality, availability of more public space, and reduction in use of fossil fuels and the concomitant impact on environment throughout the city.

As one proceeds from direct-use to proximate and indirect use benefits, the outputs/ services transform from strictly private goods to public goods. The direct-use benefit is rivalrous – usage by a prospective commuter in a system operating at full-capacity can only be at the cost of other commuters; and excludable commuters, businesses, advertisers who do not pay for the outputs can be clearly excluded from receiving the benefits. In other words, it is clearly a private good. The benefits that accrue to proximate beneficiaries is a quasi public good as it is somewhat rivalrous, since greater distance from the transportation corridor or a metro station would reduce this benefit. However, the benefit is non-excludable since the project proponents have no direct tools at their disposal to make these users pay for such benefits. Finally, the indirect benefits are non-rivalrous and non-excludable as good air quality enjoyed by one resident does not impinge on the benefits derived by other residents.

Benefits from an urban transport project



Source - PwC Analysis

Quite often, excessive emphasis is laid on financing the project largely through direct use benefits, viz., user charges, advertising rights etc. The need to keep public transport affordable to the poor results in charges being made so low, that even recurring expenses are not met. Currently, there are very limited tools and instruments available for deriving value from proximate benefits. The administrative and implementation needs for capturing these values will be substantial. There are hardly any instruments, even at a conceptual level for making indirect beneficiaries pay for the benefits received from public transport. It is also useful to note that the value of proximate and indirect benefits is also nebulous and would involve certain degree of subjectivity.

Urban transportation projects, such as metro rail, are highly capital intensive with capital cost of more than Rs. 100 crore per km of network. In the absence of suitable tools to realise value from beneficiaries other than direct-use beneficiaries, there is little option but to fund such projects through support from the government.

Case for public-private partnerships in urban transportation

In light of the above discussion, two important questions emerge

- a. What types of instruments are necessary for capturing part of the value that accrues to different sets of beneficiaries?
- b. Which is the most suitable institution or entity that should be tasked with implementing each of the instruments?

The project developer is ideally placed to recover fare box collections, advertising revenues, and license fee from various types of direct-use beneficiaries. Even real estate development along the corridor can be undertaken by the project developer. Since other benefits more closely resemble public good, there is a definite role for public institutions such as local government, state transport undertakings and other state government institutions to apply different types of tax and non-tax instruments. Therefore, there is a strong case for public-private-partnerships for urban transportation project with an active role for the public institution.

In most cases, governments at all levels have given little thought to using such instruments for project-based financing. As a result, quite a substantial portion of the capital cost, and even recurring costs in many cases, is met through budgetary support from government.

04 Rethinking urban transportation finance



It is necessary to consider urban transportation financing as part of a comprehensive framework which captures the variety of benefits that accrue to different forms of beneficiaries rather than in the narrow sense of financing a metro rail, bus rapid transit system, or urban road network.

Urban transportation financing should seek to achieve the following objectives:

- Maximise the social-economic benefits to the society through implementation of the most cost-effective option for urban transportation
- Capture value from direct benefits to project users and as well as value from significant positive externalities that will accrue indirectly from the project
- Ensure affordability of public transportation fares to encourage usage and maximise consumer welfare

It would be necessary to use different policy instruments to attain different objectives. Transportation is a basic necessity and is likely to have low price elasticity. This may be particularly true for the poor, who do not have any other option other than the public transport. Applying monopolistic pricing principles may lead to over-charging consumers. However, this would

be in direct conflict with ensuring affordability of public transportation. Due to strong social consideration, fares are often set in a manner that they are insufficient even for meeting the operating costs. Charging a very low price may lead to deterioration of service and a shift away from public transport. Therefore, other policy instruments should also be explored for financing urban transportation projects.

It is difficult to capture the true impact of positive externalities and charge the beneficiaries. Some of the socio-economic benefits are also difficult to value. In case of PPP projects in urban transportation, private developers may not be able to capture value from proximate and indirect benefits. Therefore, governments provide up-front capital subsidy or grant to private developers to help internalise the value from such externalities. Government of India has various schemes under which financial support is provided for urban transportation projects. These include Viability Gap Funding of up to 20% with an enhanced limit of up to 30% for rail-based MRTS projects. Bus transit system projects in many cities are also being funded through PPP under JnNURM.



Conventional instruments for financing urban transportation

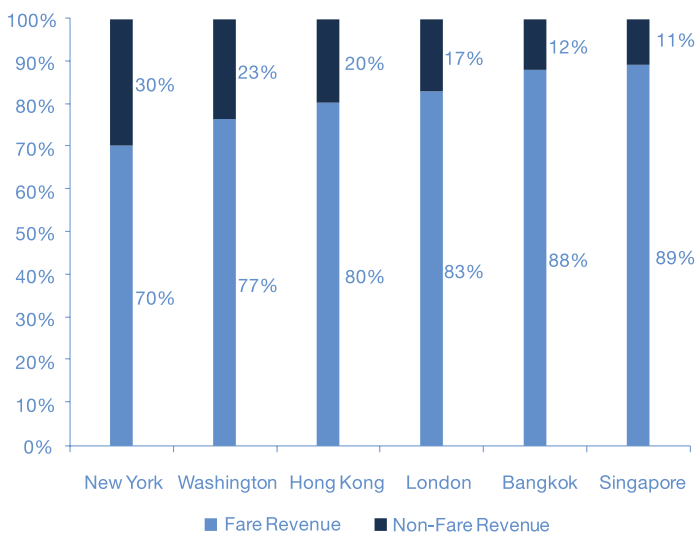
This section elaborates on the various characteristics that should be examined to determine the type and suitability of instrument to be used. While the choice seems fairly obvious in case of direct-use benefits, there are a lot of variables that should be closely considered for effectively capturing value from other types of benefits.

Fare-box revenues: Also referred to as user fares, these represent the fee paid by commuters for using the public transport service. There are different decisions to be taken with respect to the fare level, structure and extent of cross-subsidy. As an overall principle, the operating cost of the bus service should be met from the user fare. However, this objective is not easy to achieve as the fare may have to be set at a higher level than what is socially and politically acceptable. Often pro-poor considerations are cited to justify low level of charges. Achieving social welfare through lower public transport fares is likely to be in-effective as the rich or middle income groups would also benefit from low fares. In reality, the opportunity cost of inefficient public transportation has a greater impact on the poor as they may be denied access to better employment opportunities. The fare structure should be commensurate with the distance travelled while providing a discount for long distance journeys.

In many cases a block-based fare is adopted with a separate charge for different journey length. It requires greater administrative effort and so cities often adopt flat tariffs based on average journey length. Such tariffs are generally considered to be pro-poor as the poor tend to travel longer distances using public transport. However, it may have to be set at a higher price to recover costs. In cities where residential colonies are highly segregated based on income groups, a higher fare may be charged for journeys commencing or terminating in such localities as a tool for implementing cross-subsidy between from the rich to poor commuters. Finally, there should be a clear and transparent mechanism for setting the fare. It may be necessary that tariffs should be set by an independent body, preferably a regulatory authority, which would also monitor adherence to standards of service.

Ability to recover cost of operations from fares depends on a number of factors such as availability of competing modes of transportation, quality and coverage of the network, population density, presence of feeder network and last mile coverage. Fare-box revenue is likely to be the major source of income for urban transport project and it is critical to set fares at a suitable level to ensure recovery of costs.

Fare and non-fare revenue of metro services around the world (2007)



Source - PwC Analysis

Advertising revenue: The rolling stock consisting of bus and trains is an excellent means for advertising. In addition stations, en-route stops and the corridor also provide ample space for advertisements. These rights may be sold based on a fixed fee or even on revenue sharing basis. The inherent risk under both methods is quite different. In a booming economy the up-side potential from revenue sharing may be quite high while rates may drop-off precipitously during a downturn. These rights may also be renewed periodically so that the best option may be chosen depending upon the scenario and competition for the space.

License fee from business activities: The urban transportation project may give rise to a number of business activities. These include development and management of parking areas around stations, food stalls, book-stores, banking services such as ATMs etc. Metro stations provide a captive traffic for such business and these are normally valued at a premium which is attributable to the local. Such location-based economic rent can be suitably captured by auctioning the right to use the facility among competing private parties.

Real estate development rights: The right to develop property at certain points along the corridor and at the stations may be bundled with the urban transportation project to make it viable. However, it depends on availability of government land along the corridor. Further, the potential depends upon the demand for commercial real estate in different parts of the city.

While the first three revenue sources are largely targeted towards meeting the operating costs and other overheads, real-estate development is often seen as having the potential to fund the capital expenditure. Since meeting the capital expenditure is an immediate requirement for project development, disproportionate weightage may be placed on real-estate development. It is extremely important to ensure that the urban transportation project should not be heavily dependent on real-estate development as this may shift the focus away from the core project. Suitable safeguards should be built in to ensure that the primacy of urban transport component is maintained. Another potential hazard of relying more heavily on real-estate development is that governments may escape from addressing the urban transportation issue in a holistic manner by not examining the potential of some of the tools discussed in the next section.



Capturing proximity benefit value

Till now the focus of instruments discussed above was on capturing the value from direct-use benefit from the urban transportation project. However, a substantial benefit from the project is the increase in economic activity along the corridor as well as increase in the value of land and real-estate in the proximity of the stations, bus stands and the corridor. There may be multiple instruments that could be used to capture part of this value for funding the project. The choice of instrument and the institution responsible for implementing it would depend upon the following factors:

- The demand for commercial and residential real-estate in the proximate area
- Effectiveness of property tax administration and collection system
- Institution responsible for city planning and development
- Availability of instruments for managing real-estate development and trading of real-estate development rights

Additional Property tax: The urban transport project is an amenity that will increase the value of land or property near the stations. One option for the Urban Local Body (ULB) to capture some value from this benefit is to levy a higher rate of property tax on these properties. The ULB may designate areas/ colonies close to the stations as the “project influence zone” and levy a higher rate of property tax. It is important that this higher rate should not be applicable throughout the city. Such properties must be easily accessible from the stations and are able to generate higher rental income. The additional property tax levy may capture a small part of the enhanced rental value of the property. Similarly, commercial properties close to the stations would be more valuable as they can attract more consumers and should pay additional property tax. This option would only work if the present system of property tax administration and collection is efficient. If property tax coverage is poor then the ability to generate revenue from higher property tax would be limited.

Betterment levy: An alternative to higher property tax is to levy a one-time betterment levy on properties in the proximity zone. This option could help generate upfront resources from beneficiaries for part-funding the capital cost. This levy would also be applicable on any property that comes-up at a later stage. However, if the quantum of such levy is substantial it could result in lower compliance.

Proximity benefit value charging by PCMC

Pimpri-Chinchwad Municipal Corporation has adopted a number of instruments to charge beneficiaries for the value derived from being located in the project influence zone. These measures are:

- TDR from other parts has been allowed to be used in the project influence zone after payment of a premium
- Categorising the area under the project influence zone for into a higher category for property tax
- Building permission fee in the project influence zone to be ear-marked for urban transport fund.

Higher Floor Space Index (FSI): If the project influence zone is under-developed, the potential to generate revenues from the above tools would be limited. In order to incentivize real-estate development in the project influence zone, a higher FSI may be allowed. Buildings used for commercial purposes may be allowed to increase the built-up area in this zone after paying an up-front fee to the ULB. This could also be charged in addition to regular building permission fee as applicable. It is necessary to ensure that this tool should not be indiscriminately used for revenue generation. Detailed analysis is necessary to assess whether other infrastructure services such as water supply, parking facilities etc would be able to cope with the higher demand.

Transferable Development Rights (TDRs): This is a tradable instrument that gives the owner the right to a certain quantity of built-up area in another part of the city in lieu of giving away land for social amenities. Owners of TDRs may be allowed to transfer or sell the development right for additional property development in the project influence zone for a transfer premium. This instrument would be suitable for planned densification of areas close to the corridor. However, it is necessary that the project influence zone has sufficient capacity to bear the additional load on infrastructure services.

The effectiveness of the above instruments would vary depending upon the local circumstances, scope for real-estate development and densification as well as availability of complementary instruments.

Instruments for indirect benefits value

Indirect benefits are largely public good, and it is also difficult to estimate the value to consumers from such benefits. If more people use public transportation, it reduces road congestion. This benefits existing road users as well through less travel time and more fuel efficiency. However, the valuation of this benefit, especially savings in travel time, would vary by location depending upon the extent of inter-modal shift from private vehicles to public transport. Further, the value will depend upon the opportunity cost of time, individual trade-off between work and leisure etc. It is not possible to reward the public transportation users for such benefits as it is their behavior that results in these benefits accruing to indirect users. An alternative is to impose a tariff or levy on private vehicle users which reflect the cost of congestion and more fuel usage. Different instruments are explored for this purpose.

Congestion pricing: Road users, especially those with private vehicles, increase congestion on the road during peak hours. In cities with poor public transportation system there may be little option other than to use private transport. However, in cities with an efficient public transportation system, excessive use of private transport not only causes increased road congestion

but also leads to poor utilisation of public transport system. Congestion pricing should reflect the short-run marginal cost of using private vehicles and is typically imposed for entry into downtown and business districts or based on the time of the day. Congestion pricing is an excellent tool as compared to administrative procedures for traffic management as it alters the relative prices between use of private vehicles and public transport and thus provides the appropriate incentive for behavior change. Furthermore, it charges a price for each trip that contributes to the congestion and thus is a better tool as compared to a licensing scheme under which the vehicle user may buy a license for entry into the congested parts of the city. This does not alter the relative price faced by the user before undertaking each trip and would have less impact than congestion pricing for each trip. The effectiveness of congestion pricing depends on efficiency of the traffic administration system. Since imposition of toll through physical barrier for entry into congested parts would be impractical, congestion charging should be implemented through use of a technology that does not require physical collection of tolls.

Congestion pricing in Singapore

In 1975, Singapore introduced an Area Licensing Scheme for charging drivers who enter downtown Singapore. In 1998 the scheme was changed to an Electronic Road Pricing (ERP) system involving toll for each trip to certain parts of the city. Each vehicle is fitted with an In-Vehicle Unit (IU) with a cash card fitting in the IU. The appropriate toll is deducted from the cash card when the vehicle passes through the ERP zone in the city.

Fuel taxes as carbon surcharge: In case congestion pricing is not feasible, a fuel surcharge may be levied to capture the externality cost of use of private transport. As in the case of congestion pricing, a fuel tax changes the relative price between private vehicle use and public transport and has the potential to incentivize inter-modal shift. However, it does not sufficiently target cost of additional congestion on the roads as it is levied uniformly on all users irrespective of whether the vehicle is driven into congested areas or during peak hours. Such taxes are more suitable if levied as charges for carbon emission from use of private vehicles. The efficiency of using this tool should be examined in the context of distortions that exist in fuel pricing. In India, a substantial portion of the fuel price consists of taxes. Imposing an additional tax may only lead to further distortions without necessarily sending out the suitable price signals.

Carbon credits: Public transport project has the benefit of reducing carbon emission by providing a viable alternative to use of private transport. At present developing countries are not mandatorily required to reduce their carbon emission. However, adoption of carbon emission abatement projects in developing countries earns carbon credits that can be used for off-setting emissions by developed economies through the Clean Development Mechanism (CDM) framework. An urban transport project may be eligible for such credits.

The National Action Plan on Climate Change unveiled by Government of India also refers to the use of pricing, taxes and charges to influence travel demand and choice of transportation. If the union government adopts a policy for emission reduction and imposes limits on the quantum of emission restriction on industrial activities, a public transportation project may be able to sell the carbon credits to other industries.

Carbon Credits for Bus Rapid Transit in Bogota

TransMilenio, Bogota, Colombia is the first BRT project to be successfully registered under CDM for carbon credits. Credit is available for projects which have a clear plan to reduce existing public transport capacities either through scrapping, permit restrictions, economic instruments or other means and replacing them by a BRT system. Transmilenio will generate credits from the following source:

- Improved fuel-use efficiency
- Use of new and larger buses and scrapping of old buses
- Mode switching due to the availability of a more efficient and attractive public transport system.

The project was successfully registered in 2006

05 Directions for Future



Institutional framework for the future

Despite being a major contributor to economic value generation in urban areas, urban transport has not received serious consideration. Financing urban transportation requirements needs to be taken-up as a priority. In addition, the institutional framework for management of urban transport should be realigned to reflect the new challenges.

Ring-fencing of resources

Instruments for capturing value from proximate and indirect users may not directly accrue to the project developer. Indeed, in many cases, the ULB or other state government institution would have jurisdiction over imposition and collection of a tax or levy. It is necessary that such revenues should be earmarked for use in urban transportation related projects. For this purpose it may be necessary to ring-fence these revenues from the consolidated fund of state governments and ULBs. Government of India has encouraged state governments to set up dedicated urban transport fund by earmarking specific state and local taxes for meeting investment requirement for urban transport.

There are multiple institutions responsible for planning, developing, implementing and managing activities relating to urban transport. This has resulted in piece-meal solutions to addressing the overall problem by different institutions. This issue has been addressed in the NUTP which calls for setting-up of a Unified Metropolitan Transport Authority in all metropolitan cities to ensure coordinated planning and implementation of urban transport projects as well as integrated management of urban transportation system. This can be most efficiently accomplished by establishing an SPV with participation from ULB and other relevant stakeholders. It should be professionally managed by including people with suitable technical expertise.

Urban Transportation fund in Pune

Pune Municipal Corporation has proposed the creation of an urban transport fund to raise Rs. 2600 crore for self-financing of metro rail project. This fund would be raised through additional FSI of three in the metro corridor. Rs. 2300 crore would also be raised through additional FSI allocation for financing BRTS project.

Pimpri-Chinchwad Municipal Corporation has also set-up an urban transport fund which will be financed through resources generated from capturing value from beneficiaries in project influence zone. The fund would be managed separately through an SPV.

Unified Metropolitan Transport Authority in Hyderabad

Government of Andhra Pradesh has enacted a law for formation of UMTA for Hyderabad metropolitan region. The UMTA would have the power to give decisions on all major infrastructure projects in the city, such as construction of flyovers, connectivity to airport, new railway lines and construction of new bus terminals. It has the power to direct different agencies involved in implementation of traffic and transportation policies. Any new project or ongoing project pertaining to traffic and transportation would be placed before UMTA for clearance.

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Jairaj Purandare

Leader Markets & Industries
PricewaterhouseCoopers Pvt. Ltd.
252, Veer Savarkar Marg
Shivaji Park, Dadar
Mumbai 400 028
+91 22 6669 1400
jairaj.purandare@in.pwc.com

Amrit Pandurangi

Leader Transportation, Logistics & Infrastructure
PricewaterhouseCoopers Pvt. Ltd.
Building 8, 7th & 8th Floor
Tower – B, DLF Cyber City
Gurgaon – 122002, Haryana
+91(124) 4620517
amrit.pandurangi@in.pwc.com

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