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GROUND VIEW

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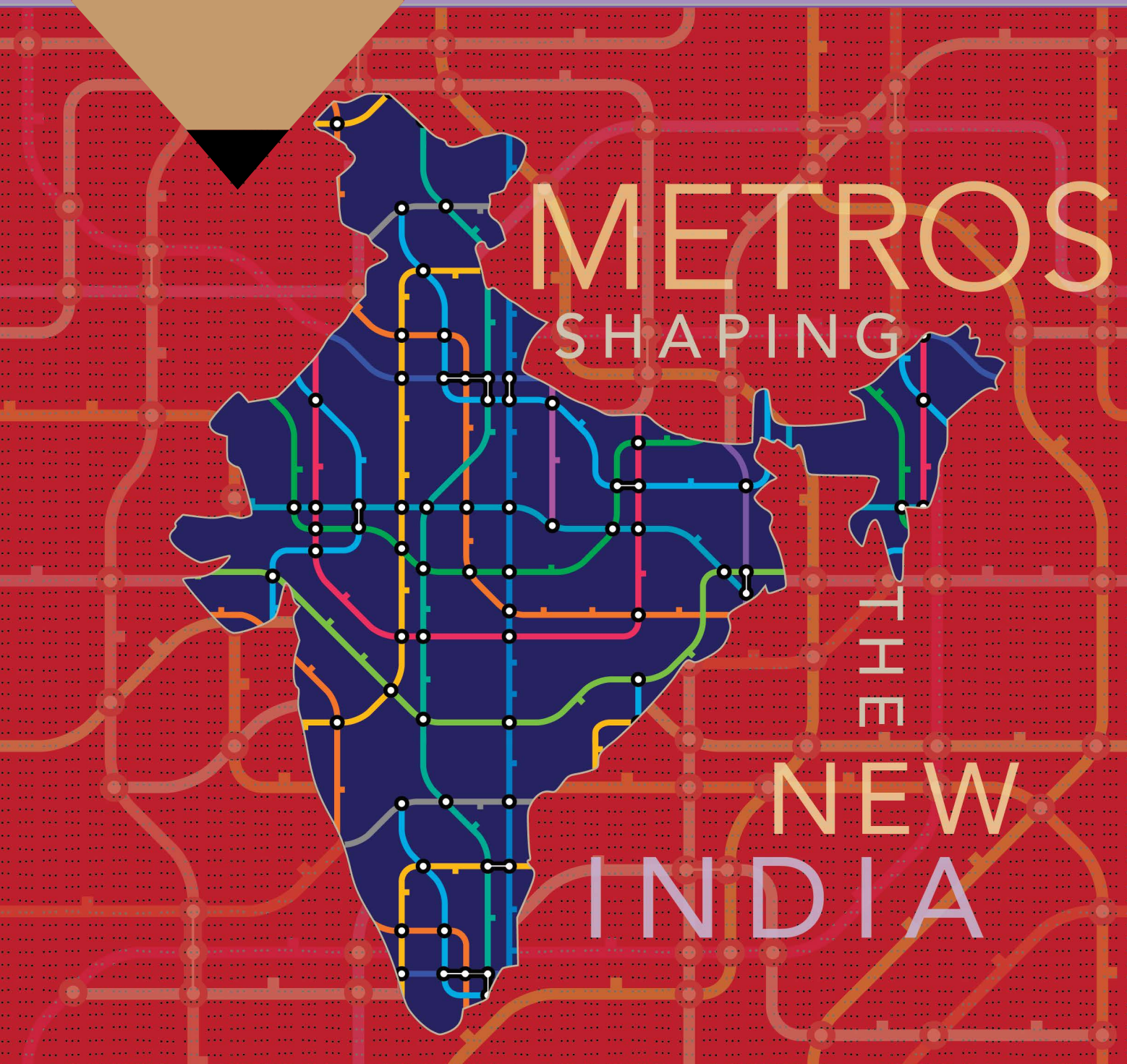

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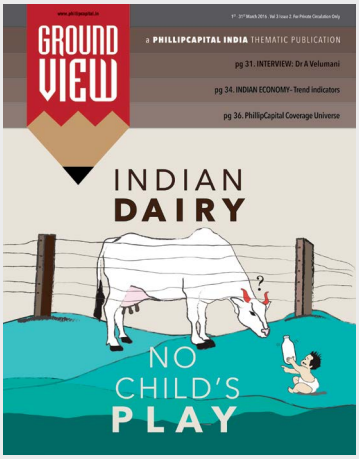

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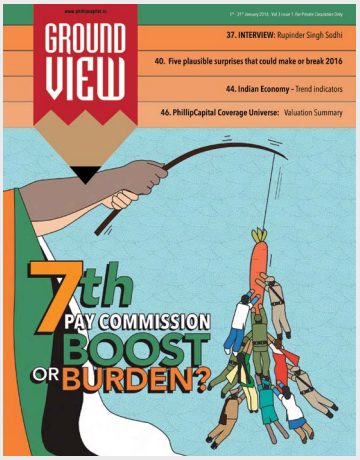

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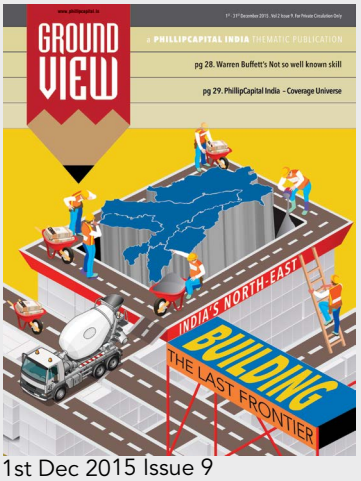

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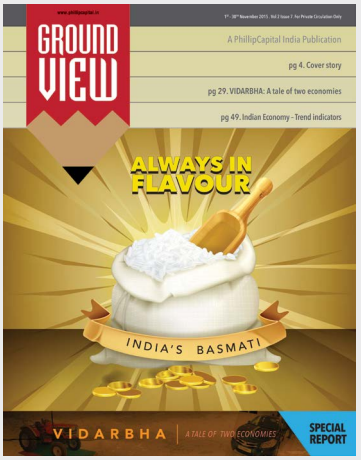

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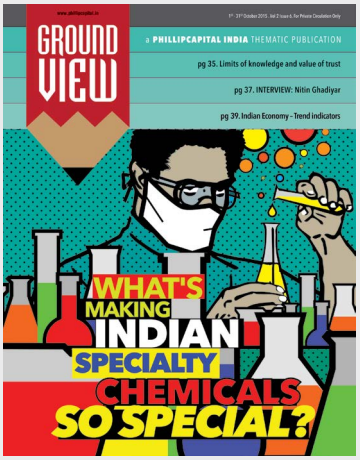

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From the MD

The former mayor of Bogota, Columbia, Mr Enrique Penalosa once said – "A developed country is not a place where the poor have cars. It's where the rich use public transport". But for that to happen, the country needs to have adequate public transport infrastructure in place – something India has always lacked so far. However, over the last few years there has been a surge in awards and execution of metro projects across the country. There is a sort of a race among various city authorities to commission their metro networks – and the residents couldn't be happier!

Metros are a proven means of efficient public transport – not only are they convenient, they also reduce congestion and pollution. After the first leg of the Delhi Metro started operations in 2002, multiple cities chalked out plans to build metro networks. But with the red-tapism and lethargy of India's system, it took nine years for the next city (Bengaluru) to join the bandwagon. Nevertheless, over the last five years, multiple cities have commissioned their metro networks. What's even more heartening is that many more are on the anvil and are expected to start execution or commission soon.

Our cover story is an on-the-ground status check of various metro networks being operated, built, or planned across the country. Our analysts Vibhor Singhal and Deepak Agarwal have covered 21 metro projects – which are at various stages of execution in the country – by meeting government representatives, regulators, and companies. Even if we assume a couple of years of delay in these projects, which is perhaps the new normal for infrastructure projects in India, the building blocks for satisfying Mr Penalosa's statement surely seem to be in place.

Also read in this issue – an interview with Mrs Subhasri Sriram, ED & CFO of Shriram City Union Finance (SCUF), where she talks about the current state of the SME segment and growth strategies for SCUF. She also discusses the impact of migration to 90dpd NPA recognition norms and challenges that small finance banks pose to NBFCs.

Best Wishes

Vineet Bhatnagar

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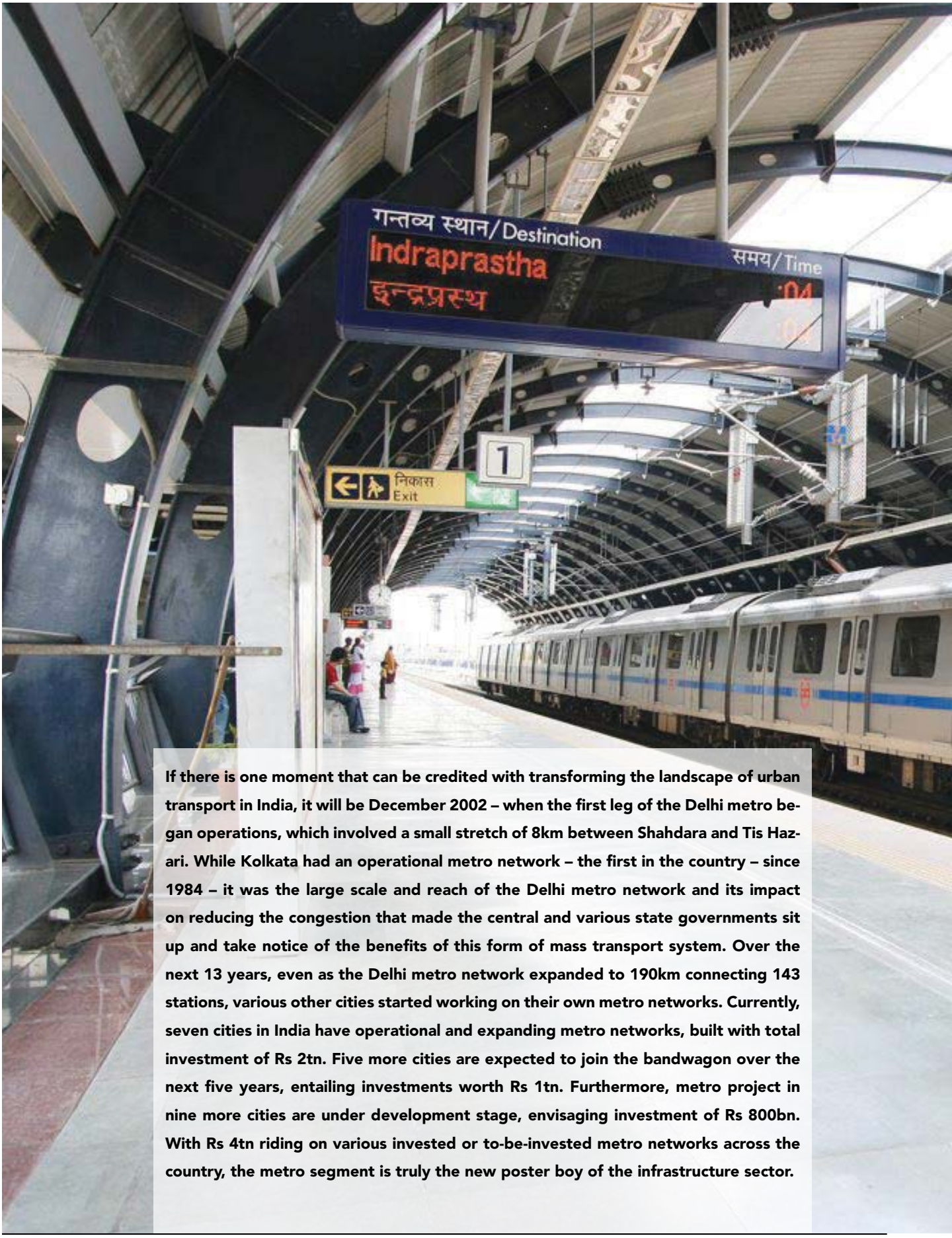


If there is one moment that can be credited with transforming the landscape of urban transport in India, it will be December 2002 – when the first leg of the Delhi metro began operations, which involved a small stretch of 8km between Shahdara and Tis Hazari. While Kolkata had an operational metro network – the first in the country – since 1984 – it was the large scale and reach of the Delhi metro network and its impact on reducing the congestion that made the central and various state governments sit up and take notice of the benefits of this form of mass transport system. Over the next 13 years, even as the Delhi metro network expanded to 190km connecting 143 stations, various other cities started working on their own metro networks. Currently, seven cities in India have operational and expanding metro networks, built with total investment of Rs 2tn. Five more cities are expected to join the bandwagon over the next five years, entailing investments worth Rs 1tn. Furthermore, metro project in nine more cities are under development stage, envisaging investment of Rs 800bn. With Rs 4tn riding on various invested or to-be-invested metro networks across the country, the metro segment is truly the new poster boy of the infrastructure sector.

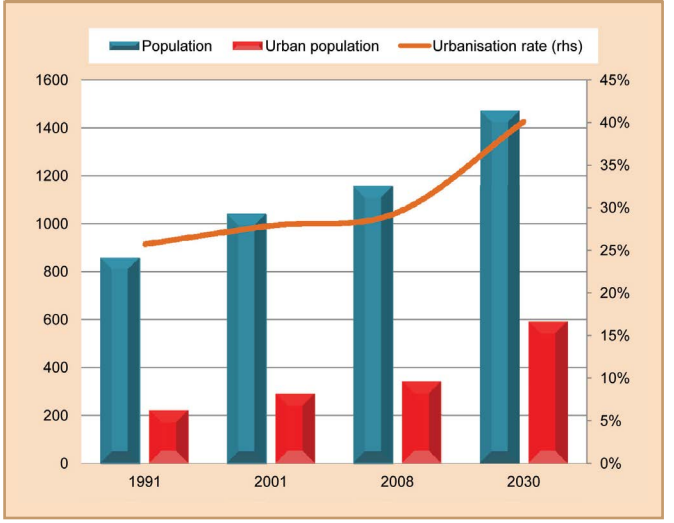
BY VIBHOR SINGHAL & DEEPAK AGARWAL

Metros
Shaping the new India

Need for a robust mass-transit system

While the Indian demographic has seen rapid urbanisation over the last decade, the pace is likely to pick up over the next few. Currently, 377mn Indians or 31% of the population live in urban centers as compared to 45% in China, 54% in Indonesia, and 87% in Brazil. The earlier Planning Commission had estimated that this number will touch 600mn by 2031 – an exodus of over 200mn in just 20 years!

Rapid pace of urbanization in India (mn)



Metro networks – global and local

	City details		Metro Network details			
City	Population (mn)	Area (km²)	Length (km)	Operations Start - Date	No of stations	Passenger traffic (Daily Avg.)
Shanghai	24.3	7,037	588.0	10-Apr-1995	364	6.24
Beijing	21.5	16,801	554.0	1-Oct-1969	334	6.74
London	8.5	1,572	402.0	10-Jan-1863	270	3.21
New York	8.5	1,214	368.0	27-Oct-1904	469	4.53
Moscow	11.9	2,511	333.3	15-May-1935	200	6.55
Seoul	10.4	605	327.0	15-Aug-1974	302	6.90
Hong Kong	7.3	1,104	218.0	1-Oct-1979	97	3.96
Paris	2.2	105	214.0	19-Jul-1900	383	4.18
Singapore	5.5	719	170.0	7-Nov-1987	118	3.03
Delhi	18.0	1,484	190.0	24-Dec-2002	143	2.40
Kolkata	5.0	185	25.1	24-Oct-1984	23	NA
Mumbai	22.4	603	11.4	8-Jun-2014	12	NA
Chennai	9.8	426	10.0	29-Jun-2015	7	NA
Bangalore	11.5	741	6.7	20-Oct-2011	6	NA

Source: metrobitf

Operational metro projects

Operational Metro projects	Length (Km)	Operational Length (Km)	Operational stations (No)	Project Cost (Rs bn)	Implementing Agency	Current Status	Commencement of service (expected)
Delhi Metro	349.2	189.9	143	704	DMRC	Phases I (65.1km - 2006); Phase II (124.8km - 2011)	Phase III by Dec-2016
Kolkata Metro	41.9	27.2	24	67	IR & KMRCL	North-South Corridor operational	East-West Corridor by Dec-17
Bengaluru Metro	114.4	25.5	25	409	BMRCL	Reach 1,2, 3 operational	Phase I by Dec-16, Phase II recently approved
Gurgaon Metro	12.0	5.1	6	34	HUDA, IL&FS*	Phase I operational in Nov-13	Phase II by 2017
Mumbai Monorail	20.1	8.9	7	25	MMRDA	Phase I operational in Dec-13	Phase II by Dec-16
Mumbai Metro	11.4	11.4	12	24	Reliance Infra*	Phase I operational in June-2014	Multiple phases at various stages
Jaipur Metro	35.8	9.6	9	135	JMRC	Phase I operational in June-2015	Phase II planned for 24km
Chennai Metro	143.0	10.0	4	604	CMRL	Line I operational in June-2015	Line II to be operational by Oct-16
Total	**727.8**	**287.6**	**230**	**2,001**			

Most Indian cities are ill equipped to handle such a large population migration. With such migrations, it is not just basic necessities such as water, power, and sanitation that need to be provided, but infrastructure facilities such as public transport and roads also need to be upgraded. Since most cities in India are not planned, there is limited scope for intra-city road expansions and this creates a pressing need for other forms of transport.

Currently, only seven cities in India (with a population of over one million) have a metro network – five of these commissioned their first phase in the last two years. Most of these metro networks (except Delhi) are currently too small – either to decongest roads or to provide a plausible alternative means of transport.

The seven cities with operational metro networks, have total investment of Rs 2tn riding on them.

Under-construction metro projects

Project Name	Length (Km)	Stations (No)	Project Cost (Rs bn)	Implementing Agency	Current Status	Commencement (expected)
Mumbai Metro	195.0	158	651	MMRDA, CIDCO	EPC contractors shortlisted for Phase 3	EPC contracts for Phase 2A, 5A to be announced
Hyderabad Metro	71.2	66	160	L&T*	Phase wise COD to start from June-16	
Nagpur Metro	38.2	36	87	NMRCL	Corridor 1 Under construction	EPC contracts for corridor 2 to be awarded in May-16
Lucknow Metro	35.0	33	118	LMRC	Phase 1A CoD expected by Dec-16	EPC contarcts for Phase 1B to be awarded by June-16
Ahmedabad Metro	37.9	32	117	MEGA	Corridor 1 under construction	Corridor 2 expected CoD 2019
Kochi Metro Metro	25.6	23	52	KMRL	Expected CoD by June-16	
Total	**402.9**	**348**	**1,185**			

*Being developed on PPP basis

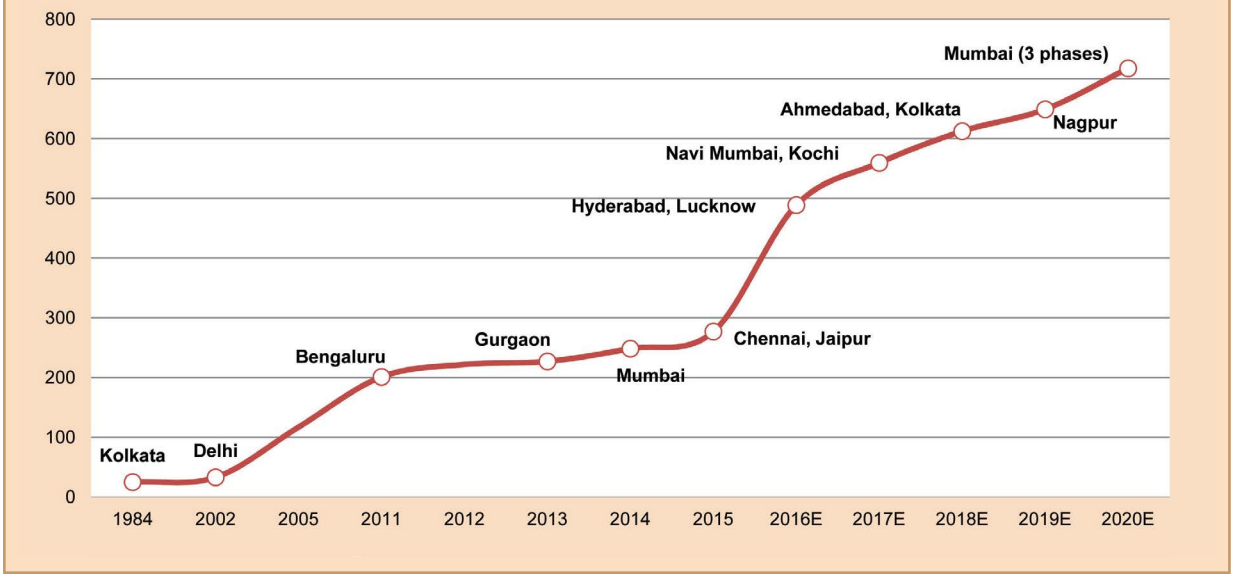
Five more cities are expected to join the bandwagon over the next five years, entailing investments worth Rs 1tn. With those projects commencing operations, the metro network in the country is expected to expand from the current 280km to over 700km by 2020.

Furthermore, metro projects in nine more cities are under development stage, envisaging investment of Rs 870bn, adding another 400km to the metro network. With Rs 4tn riding on various invested or to-be-invested metro networks across the country, the urban landscape of the country can be expected to witness a radical transformation.

Planned metro projects

Project Name	Length (Km)	No. of stations	Project Cost (Rs bn)
Pune Metro	31.5	30	136.0
Kanpur Metro	36.0	29	105.0
Varanasi Metro	26.0	22	75.0
Meerut Metro	30.0	22	65.0
Agra Metro	25.0	23	65.0
Ludhiana Metro	28.8	27	87.0
Chandigarh Metro	37.6	30	136.0
Bhopal Metro	85.0	89	80.0
Indore Metro	107.0	75	120.0
Total	**406.9**	**347**	**869.0**

Metro network expansion in India (km)



A quick word about the global major metro networks

LONDON (THE TUBE)

402KM, 270 STATIONS

The famous London Tube first opened as an "underground railway" in 1863, but the first electric line was opened in 1890, making it the world's first metro system. It's also the third-longest system (after Shanghai 588km and Beijing 554km). One of the unique features that the London Tube offers is the Oyester card system, which offers seamless connectivity throughout the city, as it can be used to travel on bus, Tube, tram, DLR, London Overground, TfL Rail, Emirates Air Line, River Bus services, and most National Rail services in London.

NEW YORK

368KM, 469 STATIONS

The famous subway of NYC has the largest number of stations in the world. Opened in 1904, it's also one of the oldest (8th to be exact) and 4th longest – carrying 4.5mn passengers every day. It provides a highly efficient means of transport, in a heavily congested city like New York. It offers service 24 hours per day and every day of the year. Being one of the busiest metro networks in one of the most aggressive cities in the world, it has had its share of frequent problems like flooding, litter and rodents, terror threats, accidents, and believe it or not, an exceptionally high share of suicides!

SINGAPORE

170km, 118 stations

The initial section of Singapore's MRT, opened on 7 November 1987, making it the second-oldest metro system in Southeast Asia. The network has since grown rapidly to a route of 170km with 118 stations, in accordance with Singapore's aim of developing a comprehensive rail network as the backbone of the public transport system, with an average daily 'ridership' of 3.03mn. The Singapore MRT has effectively utilised the LRT (Light Rail Systems) to connect far-flung and lesser populated suburban areas of Singapore.

SEOUL

327KM, 302 STATIONS

The Seoul Subway opened much later than other metro systems – in 1974. While it the sixth largest metro network in the world, it carries the highest number of passengers – 6.9mn daily. With Seoul being one of the most densely populated cities in the world, an efficient metro system becomes even more necessary. However, the fact is most Indian cities rank higher than Seoul in population density and still do not have a metro network!

HONG KONG

218KM, 97 STATIONS

It comprises the MTR, Airport Express, and Light Rail. The MTR is a heavily used railway system consisting of nine lines. For a largely reclaimed city like HK, an efficient MRT provides seamless connectivity to islands like Kowloon, Lantau Island, and New Territories. The Hong Kong Metro has the envious stature of being the only profitable metro network in the world – due to the highly congested city and with a large part of its total revenue (almost 60%) coming from property development (more on it in the HK Metro box section).

MOSCOW

333KM, 200 STATIONS

The Moscow metro system opened in 1934 and services almost 6.5mn people every day – third highest in the world (after Seoul and Beijing). The system is mostly underground, with the deepest section 243 ft underground at the Park Pobedy station, one of the world's deepest. Its stations are known as "Underground palaces" – the beautiful underground structures are designed with pictures on the walls, chandeliers hanging from the ceilings, and much more.

SHANGHAI AND BEIJING

588/554KM AND 364/334 STATIONS

The Shanghai and Beijing metros are the two longest metro networks in the world and carry the highest number of passengers – 6.24 and 6.74mn daily. On April 1, 2015, Shanghai metro set a world record by ferrying 11.3299mn passengers. While the Beijing metro ferries the highest number of passengers daily, it is still not able to meet the city's transit needs adequately – and has an extensive expansion plan to expand to a whopping 1000km by 2020.

From where it all started

Delhi Metro network, built and operated by the Delhi Metro Rail Corporation (DMRC), has inspired various government bodies (centre and state) to implement metro projects across the country. The network, which started from a single line of 8km and six stations, has now expanded to 190kms and 143 stations – and is still expanding. It is now the 12th largest metro system in the world – both in terms of length and number of stations.

Currently Phase 1 and 2 of the DMRC development plan are operational, boasting of a daily ridership of 2.4mn passengers. Phase 3 of the network (160km, 107 stations) is currently under construction, which will expand the connectivity of Delhi to Greater Noida, Ghaziabad, Badarpur, Najafgarh, and Gurgaon – and is expected to take the annual ridership to 4mn passengers.

Delhi Metro project details

Phase	Project Cost (Rs bn)	Length (Kms)	Underground length (km)	No. of Stations	Status
Phase I	105.7	65.0	13.17	58	Operational
Phase II	187.8	124.9	34.89	85	Operational
Phase III	410.8	159.3	53.84	107	Under construction; Expected CoD Dec-16
Total	**704.3**	**349.2**	**101.9**	**250**	

DMRC has already spent Rs 290bn on the first two phases of the Delhi Metro network – funded over 50% by JICA. Phase 3 entails an investment of Rs 411bn, which will again be 49% funded by JICA.

Delhi Metro funding

Funding Source	PHASE - I		PHASE - II		PHASE - III		TOTAL	
	Rs bn	Share (%)	Rs bn	Share (%)	Rs bn	Share (%)	Rs bn	Share (%)
JICA Loan	63.4	60%	102.3	54%	199.5	49%	365.3	52%
Int free debt / Grant	5.3	5%	13.4	7%	43.6	11%	62.3	9%
GOI Equity	14.8	14%	30.8	16%	41.2	10%	86.8	12%
Prop devlpmnt / Int Accrual	7.4	7%	10.5	6%	30.2	7%	48.1	7%
GNCTD Equity	14.8	14%	30.8	16%	41.2	10%	86.8	12%
Land & Central Tax					55.0	13%	55.0	8%
Total	**105.7**		**187.8**		**410.8**		**704.3**	

Source: DMRC

Delhi Metro Phase 1 and Phase 2

Phase I	Length (Kms)	No. of Stations
Shahdara-Tri Nagar-Rithala	22.1	18
Vishwa Vidyalaya-Central Secretariat	10.8	10
Indraprastha-Barakhamba Road-Dwarka Sub City	32.1	30
Total	**65.0**	**58**
Phase II		
Shahdara – Dilshad Garden	3.1	3
Indraprastha – Noida Sector 32 City Centre	15.1	11
Yamuna Bank – Anand Vihar ISBT	6.2	5
Vishwavidyalaya – Jahangir Puri	6.4	5
Inderlok – Kirti Nagar -Mundka	18.5	16
Central Secretariat – HUDA City Centre	27.6	19
Dwarka Sector 9 to Dwarka Sector 21	2.8	2
Airport Express Line	22.7	6
Anand Vihar – KB Vaishali	2.6	2
Central Secretariat – Badarpur	20.2	16
Total	**124.9**	**85**

Delhi metro has been exemplary in more ways than one. It showed the Indian public and bureaucrats that government projects could be executed in a timely and cost-effective manner. It was admirable – the way in which its MD over 1995-2012, Dr E. Sreedharan (the man credited with turning the metro dream of the country into reality), executed the project ensuring minimum inconvenience to the public ("some inconvenience will be there", he once quipped).

DMRC also deployed multiple engineering techniques for the first time in the country. In the early stages of the project, it used the 'incremental launching method' to speed-up the construction of a 533-meter span-bridge over the river Yamuna. In 2002, when the Delhi metro was expanding to the northern part of the city, it experienced severe difficulty in boring underneath the ground due to the unpredictable nature of the soil. Every day of delay was costing DMRC Rs 130mn. To overcome this, it deployed NATM – New Austrian Tunnelling Method – for the first time in India. Hard rock was blasted using explosives and TBMs (Tunnel Boring Machines) were thereafter used to excavate and complete the construction work. The result is the Chawri Bazaar Station – at 30-metres below the ground – one of the deepest metro stations in the world.

The contribution of the Delhi Metro to economic activity has been huge. But what has been even more remarkable is its

Delhi Metro Phase 3

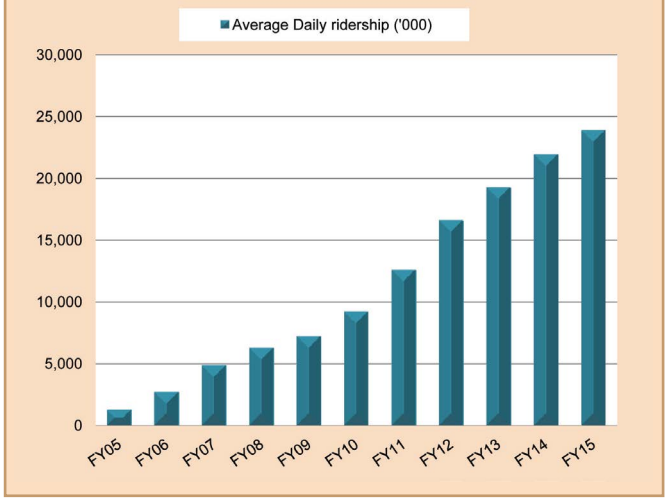
Phase III	Length (Kms)	No. of Stations	Expected CoD	% Complete*
Majlis Park - Shiv Vihar	58.6	38	Dec-16	80%
Janakpuri West - Botanical Garden	38.2	25	Dec-16	84%
Central secretariat - Kashmere Gate*	9.4	7	Sep-16	92%
Jahangirpuri - Samaypur Badli	4.5	3	Nov-15	100%
Badarpur - Escorts Mujesar	13.9	9	Sep-15	100%
Dwarka - Najafgarh	4.3	3	Dec-16	55%
Mundka - Bahadurgarh	11.2	7	Dec-16	67%
Escorts Mujesar - Ballabhgarh	3.2	2		
Dilshad Garden - Ghaziabad Bus Adda	9.4	7		
Noida City Centre - Sector 62 Noida	6.7	6		
Total	**159.3**	**107**		

Source: DMRC

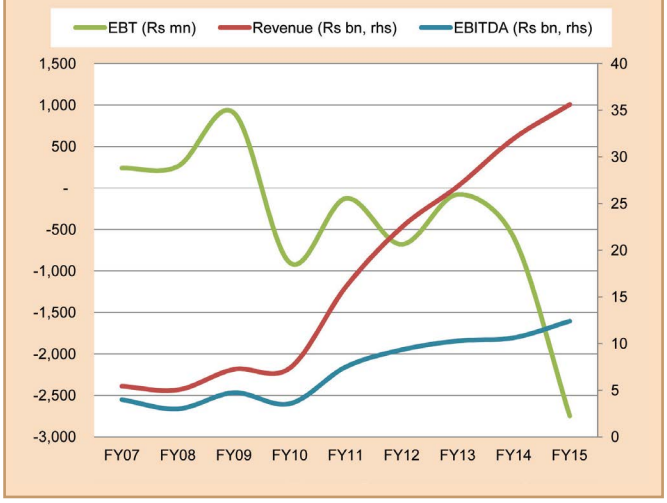
*As of Jan 2016.

Phase 3 is the largest and the most ambitious phase planned by the DMRC. Currently, only two lines of 18kms are operational, while work on all other corridors (apart from three lines) will be complete by December 2016, which will add 159kms and 107 stations to the Delhi metro network.

Rapid growth in daily ridership as DMRC network expanded



Financials turning into red, as network expanded



impact on the development of the NCR region – the suburbs of Noida, Gurgaon, and Faridabad. Seamless connectivity to almost every part of the city has ensured that a large number of potential migrants from these regions can now stay back in their native places and travel to work every day. This has also led to an increase in job opportunities for people in the neighbouring poor states of Haryana, Rajasthan, and UP.

Financials

The Delhi Metro's success lies in its reach and the steady rise in its ridership. Its average daily ridership has grown to 2.4mn in FY15 from 124,000 in FY05 – as the network expanded from its initial 15km to touch 294km now. The annual revenue for DMRC has also increased – to Rs 35.6bn in FY15 from Rs5.4bn in FY07. However, continuous capex and expanding network has meant the Delhi Metro, which was once profitable (along with HK Metro) has slipped into the red – its net profit of Rs 240mn in FY07 has turned into a recent net loss of Rs 2.75bn.

Yet another first in the country

Soon, DMRC will embark upon yet another revolutionary journey - it plans to operate driver-less trains, for the first time in India, on sections of the Phase-3 network. The new trains, which will begin service with drivers for a short period, are expected to be operational by the end of next year. For unattended operation, stringent trials will be held (global standards - 12-18 months trial period).

The trains will run on the over 58 km-long Majlish Park-Shiv Vihar (Line 7) and the 38 km-long Janakpuri (West)- Botanical Garden (Line 8) corridors of the Phase-3 - both expected to be operational by Dec-16. The trains will have on-board CCTV cameras for inside and outside view of the train, which would be directly accessed by the control centre in driverless mode.

"These new-generation trains are suitable to eventually run on UTO mode, that is, train operators will not be required to operate these trains and the Operations Control Centres (OCC) of the Delhi Metro system will directly regulate the movement of the trains," DMRC official (media source).

"Even the rich people will also use metro after about 10 years, when they find that there is no place to park their cars"

Dr E.Sreedharan, on the use of metro networks by different sections of society.

PHASE-I

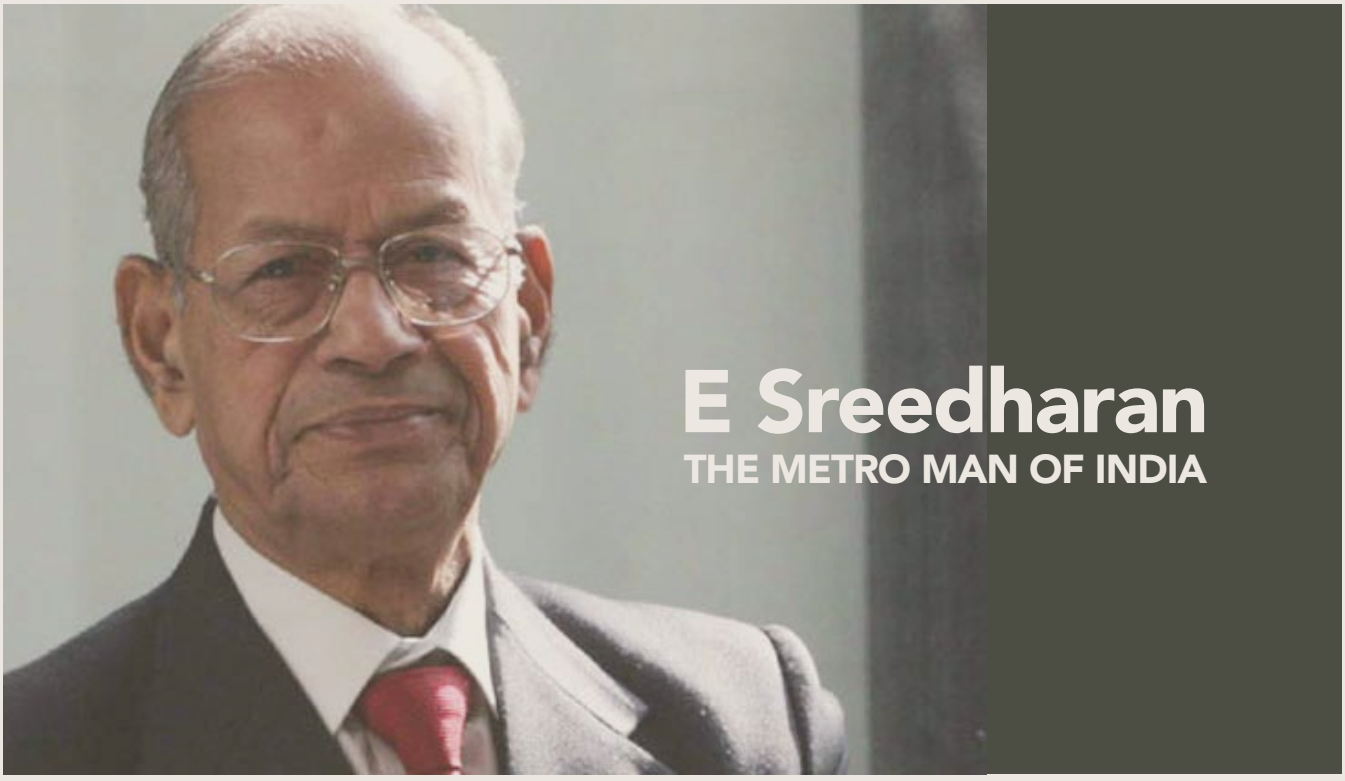
Colour of Line	Name of Line	No. of Stations	Length (km)	At Grade (km)	Underground (km)	Elevated (km)
RED	Shahdara - Rithala	18	22	4.5	0	17.50
YELLOW	Vishwavidyala - Central Secretariat	10	11	0	11	0
BLUE	Dwarka Sector 9 - Indraprastha	31	32.1	0	2.17	29.93
	Total	59	65.1	4.5	13.17	47.43

PHASE-II

Colour of Line	Name of Line	No. of Stations	Length (km)	At Grade (km)	Underground (km)	Elevated (km)
RED	Shahdara - Dilshad Garden	3	3.09	0	0	3.09
YELLOW	Vishwavidyala - Jahangirpuri	5	6.36	0	0.94	5.42
BLUE	Indraprastha - Noida City Centre	11	15.07	2.17	0	12.90
BLUE	Yamuna Bank - Vaishali	7	8.74	0	0	8.74
GREEN	Inderlok - Mundka	14	15.15	0	0	15.15
YELLOW	Central Secretariat - HUDA City Centre	19	27.58	0	11.76	15.82
GREEN	Kirti Nagar - Ashok Park Main	2	3.31	0	0	3.31
VIOLET	Central Secretariat - Badarpur	18	20.18	0	6.10	14.08
BLUE	Dwarka Sec-9 - Dwarka Sec-21	2	2.77	0	0.96	1.81
ORANGE	Airport Line (New Delhi - IGI - Dwarka-21)	6	22.70	0	15.13	7.57
	Total	85	124.93	2.17	34.89	87.87

PHASE-III

Colour of Line	Name of Line	Underground (km)	Elevated / At Grade (km)	Total	NO. OF STATIONS Underground	Elevated	Total
PINK	Line-7 Majlis Park - Shiv Vihar	19.117	39.479	58.596	12	26	38
MAGENTA	Line-8 Janakpuri West - Kalindikunj	23.807	10.466	34.273	15	8	23
VIOLET	Line-6 Central Secretariat - Kashmiri Gate	9.370	0.000	9.370	7	0	7
YELLOW	Line-2 Ext. Jahangirpuri - Badli	0.000	4.489	4.489	0	3	3
VIOLET	Line-6 'S' Badarpur - Faridabad	0.000	13.875	13.875	0	9	9
GREEN	Line-5 Ext. Mundka - Bahadurgarh	0.000	11.182	11.182	0	7	7
BLUE	Dwarka - Najafgarh	1.541	2.754	4.295	1	2	3
MAGENTA	Kalindikunj - Botanical Garden	0.000	3.962	3.962	0	2	2
VIOLET	Escorts Mujesar - Ballabhgarh	0.000	3.200	3.200	0	2	2
RED	Dilshad Garden - Ghaziabad Bus Adda	0.000	9.410	9.410	0	7	7
BLUE	Noida City Centre - Sector 62 Noida	0.000	6.675	6.675	0	6	6
	Total	53.835	105.492	159.327	35	72	107



E Sreedharan
THE METRO MAN OF INDIA

NO report on the metro network in India can be complete without mentioning the Metro Man as he has popularly come to be called – Mr E Sreedharan. He is the person to credit with taking Delhi (and the entire country) into the 21st century on the wheels of the metro networks – he served as the Managing Director of DMRC from 1995-2012. He was awarded the Padma Shri in 2001 and named one of Asia's Heros by TIME magazine in 2003.

Mr E Sreedharan joined the IES (Indian Engineering Services) in 1954. Due to his excellent work and skills demonstrated during his tenure, the Indian Railways called him back to head the Konkan Railway project even after his retirement in 1990. In this, he completed one of the most beautiful and breathtaking stretches for the Indian Railways – a track of 760km on India's west coast with 150 bridges and 92 tunnels – and all this with no cost/time overruns! This paved the way for an assignment that was to transform his legacy – he headed the DMRC.

It was E Sreedharan's dedication that helped secure Japanese funding for DMRC and many other metro projects thereafter. Sceptical of Indian engineers executing a metro project on time and within the estimated cost, Japanese investors were shy of investing. Sreedharan and his team set out to convince them in the best manner that engineers know – by building things. They constructed the first 8.5km stretch of the Delhi metro within the stipulated four years (an unheard of schedule until then). The stretch had many challenges – the biggest was constructing a 533-meter span-bridge over river Yamuna, which itself was going to take two years. Sreedharan's team used 'incremental launching method' for the first time in India and completed the project on time, securing Japanese funding.

Sreedharan's extremely high energy was contagious – this spurred contractors, both domestic and foreign. Sreedharan was an exceptional engineer, had keen business acumen, and shared a good rapport with staff. He made land acquisition into an art – he even sent movers and packers to facilitate people vacating their premises. At one point, he convinced the school management to provide him with the land and necessary support to construct the metro station right next to their premises by bringing them on board about how the children would actually benefit due to the station. His corporate consciousness meant he retained most of his key staff, even when the private sector lured most of the DMRC staff away with lucrative salaries.

Sreedharan is credited with a lot of 'firsts' in the DMRC project – the 'incremental launching method' to build bridge over Yamuna, the 'NATM' for tunnelling under the unpredictable terrain underneath North Delhi, etc. However, one special thing that the DMRC staff still remember him for is his 'reverse clock'. For every critical phase of the Delhi metro, to keep everyone on their toes, he put a huge clock that ran backwards to the deadline.

If there is one man who can be credited with professionalising the way PSUs worked, of convincing foreign investors of the infrastructure potential in the country, or of taking the country into the 21st century – it has to be E. Sreedharan. And the most unbelievable part is he did all this while heading a PSU and with a monthly take-home salary of only Rs 30,000.

Interaction with Chin Kian Keong

LAND TRANSPORT AUTHORITY, SINGAPORE

> *"We build roads such that they require minimum maintenance and have NO potholes"*

We met Mr Chin Kian Keong, Group Director at Land Transport Authority (LTA), Singapore. LTA is in charge of the roads and metro network in the city of Singapore and works in coordination with the urban development ministry. Just like India, and most other countries, it constantly runs into the green development department and utilities department while carrying out its expansion/maintenance projects.

Few points during our interaction with LTA were eye-openers for us. For example, despite the highly efficient metro network that exists in Singapore, which is more than adequate for the city's current needs, the LTA is already executing its next phase of expansion, which will double the existing network length (to 360km from the current 178km) – taking care of the next 20 years of the city's transit needs.

The LTA currently employs 6000 people – a rather high number we believe, keeping in mind Singapore's 5.5mn population. It is completely funded by the Singapore government, and had a maintenance budget of US$ 400mn last year, over and above the US$ 2bn expansion capex. The LTA makes extensive use of CCTV cameras to monitor the traffic and upgradation requirement of the metro/road network in the city – it has deployed over 1000 CCTVs across the city.

Our conversation with Mr Keong hit a rather surreal patch when we tried to find out how and when they carry out patch-repair work on their roads, especially potholes. After 3-4 'lost-in-translations' – we figured it was actually an unchartered territory for him. "We build roads such that they require minimum maintenance and have NO potholes," he told us. For the miniscule number that do appear, they use pre-fabricated 'bitumen packs' which are dumped into the potholes, and take its shape, filling it up almost instantly!

The LTA also uses regulation in the best possible manner to benefit citizens. The tolling on various roads is done to manage traffic NOT to add to revenues. It also controls the number of taxis running across the city – giving licenses to companies and NO individuals. The companies have to adhere to multiple constraints minimum fleet size of 200 – and plans to expand to over 500 during the next two years.

Better late than never

While Mumbai should have been one of the first cities in the country to start a metro service (given the paucity of land for building roads), it has been a laggard amongst all Indian metros. Not just Delhi, even Bengaluru started its metro service in October 2013 (before Mumbai). Not just the city, the entire state of Maharashtra has borne the brunt of the state government's apathy – with literally no infrastructure project of significance commissioned over FY03-13. However, whether it was an effort to gain brownie points before the 2014 central/ state elections or a happy coincidence, the city saw multiple mega projects (Eastern Freeway, Metro, Monorail, SantaCruz-Chembur link road, and Integrated International airport terminal T2) commissioned in FY14.

The Mumbai metro masterplan

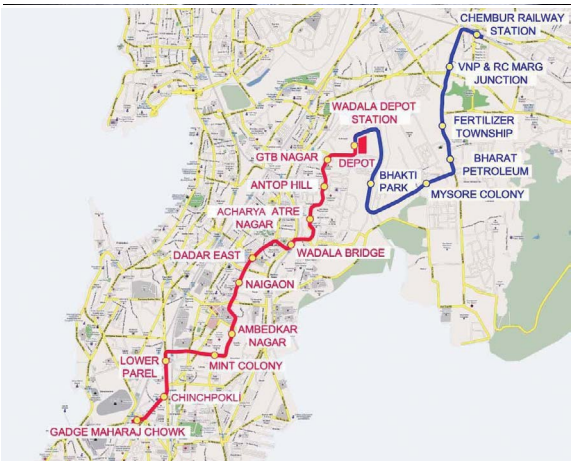
The MMRDA metro master plan has undergone so many changes in the past three years that it becomes difficult to believe any new route being proposed till its plan and funding are approved and accepted. The new state government proposes to expand the current metro network by 118km, comprising four new lines at an investment of Rs 354bn (Phase 2, 4, 5, and 6). This, along with the underground phase-3, being executed by MMRC (Mumbai Metro Rail Corporation at a cost of Rs 231bn) and the Navi Mumbai Metro (being executed by CIDCO a cost of Rs-41bn) are set to expand the Mumbai metro network by a whopping 175km, with an investment of Rs 626bn. The timelines for phases 2A, 3, and 5A have been set aggressively as 2019 – before the next state elections are due. With the two-year delay experienced in phase-1 of the metro, it seems unlikely that these deadlines will be met. However, even if the projects are delayed by a year or two – the city of Mumbai can look forward to a much better public transport system in 2020.

Mumbai Metro Masterplan

Phase	Name of Corridor	Project Cost (Rs bn)	Length (km)	No. of Stations	Implemeting Agency	Status
Phase I	Versova-Andheri-Ghatkopar	24	11.4	12	Reliance Infra	Commissioned in Aug-14
Phase 2	Dahisar-Charkop-Bandra-Mankhurd	120	40.0	36	MMRDA	Plan & Funding approved
Phase 2A	Dahisar-DN Nagar (part of above)	64	18.6	17	MMRDA	Financial bids to be invited
Phase 3	Colaba-Bandra-SEEPZ	231	33.5	27	MMRC	EPC Winners announced in Dec-15
Phase 4	Wadala-Ghatkopar-Thane-Kasarvadavali	120	40.0	25	MMRDA	Plan & Funding approved
Phase 5	Dahisar(E)-Andheri(E)-Bandra(E)	81	27.0	24	MMRDA	Plan & Funding approved
Phase 5A	Andheri (E) – Dahisar (E) (part of above)	62	16.5	16	MMRDA	EPC Winners announced in Apr-16
Phase 6	Jogeshwari-Vikhroli Link Road	33	11.0	8	MMRDA	
	Navi Mumbai Metro	41	23.4	20	CIDCO	Under construction
	Mumbai Monorail	25	20.1	18	MMRDA	Phase I operational; Phase II by Dec-16
	Total	**675**	**206.4**	**170**		

Source: MMRDA

MUMBAI MONORAIL



Mumbai Monorail

MMR finally got its first metro/monorail service in December 2013, when the first phase of the Mumbai monorail was thrown open to the public. Constructed by L&T, the monorail currently connects Chembur and Wadala, and intends to extend the connectivity to Mahalaxmi (the beginning of South Mumbai) in the second phase. It has reduced the travel time between Chembur and Wadala from 40 min to 20 min. The project has seen tremendous response since it became operational and the traffic is only expected to grow hereafter.

While everyone has lauded the effort and money invested in making the monorail a success, many have questioned the wisdom of connecting a sparsely populated suburb (Wadala) at the cost of ignoring suburbs that would have actually benefitted more from a similar service. However, the MMRDA strongly defends its decision — "The plan was to provide horizontal connectivity and connect the suburb of Chembur to town. Also, with the ISBT and other developments planned in Wadala, it is expected to become another CBD in the city," justifies a senior MMRDA official. Phase 2 of the monorail, connecting Wadal to Jacob Circle, is expected to be completed by December 2016.

Mumbai Metro Phase 1 (MM1)

The long wait finally ended in May 2014, when the first phase of Mumbai Metro, built by a Reliance Infrastructure-led consortium on a PPP basis, was thrown open to public. The service has significantly decongested the suburb of Andheri and provided much needed connectivity between western suburb of Versova to the eastern suburb of Ghatkopar. The 10-kms-long service line has 10 stations at equal intervals, implying travellers will find stations every half kilometre from wherever they are on the line. It has reduced travel time between the two ends from 90 minutes to 21 minutes.

Even though the project was much delayed, the construction of the Mumbai Metro can be hailed as an engineering marvel — the track was laid through one of the most densely populated suburbs of the city (Andheri and Ghatkopar). The company had to deploy 'form traveller' to build the viaduct above the western express highway (an example of poor and myopic planning, visible all across the MMR region).

VERSOVA - ANDHERI - GHATKOPAR METRO LINE-1

Navi Mumbai Metro (NMM)

The Navi Mumbai metro is being developed by CIDCO, to provide connectivity between various parts of Navi Mumbai, and also to the main island city. The 23.4km line, being built at cost of Rs 40.7bn, is proposed to have 20 stations. The foundation stone of the metro was laid in May 2011, with an initial deadline of December 2014. However, multiple hurdles like clearance from Central Railways for over-bridge, clearance for extending the height of high tension wires, and heavy traffic on Sion-Panvel Highway has meant that the project has faced huge time/cost over-runs.

The project cost for the line-1 of phase-1 has, in the meantime, escalated to Rs 30bn, from an initial Rs 19.9bn. The project has already missed its revised deadline of January 2016 and is now expected to be completed by May 2017. Currently, while 90% of the viaduct work is complete, 50% of station construction, 60% of car depot work, and 35% of overall civil work is pending.

Upcoming phases

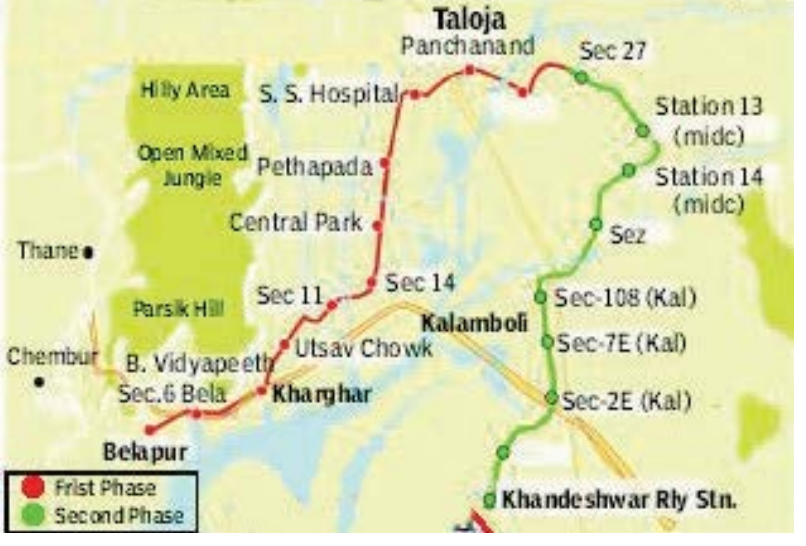
The new BJP-led state government seems determined to continue the momentum that propelled it to victory in centre and state elections in 2014. It has been quick to realise the importance of a large and spread-out metro network in the city. Funding for phase-2A, phase-4, and phase-5A of the Mumbai Metro Masterplan has been approved while the winners of EPC contracts for Mumbai Metro Phase 3 (MM3) were announced in December 2015 (the LoAs yet to be signed).

Navi Mumbai metro masterplan

Phase	Corridor	Length (km)
1	Belapur-Taloje-Pendhar-Khandeshwar-NMIA	23.4
2	Mankhurd-NMIA-Panvel	32.0
3	Sewree-Kharkopar-NMIA (MTHL)	22.0
4	Dighe-Turbhe-Belapur	20.0
5	Vashi-Ghansoli-Mahape	9.0
Total		**106.4**

Navi Mumbai Metro – Phase 1 development plan

Line	Corridor	Length (km)	No. of stations	Cost (Rs bn)	Status
I	Belapur-Kharghar-Taloja-Pendhar	11.1	11	19.9	Expected CoD: May-17
II	MIDC Taloja-Kalamboli–Khandeshwar	10.3	8	15.1	Yet to start
III	Interlink between Pendhar and MIDC	2	1	5.7	Yet to start
Total		**23.4**	**20**	**40.7**	



Source: CIDCO

Mumbai Metro 3 package details

Name of Corridor	Project Cost (Rs mn)	Length (km)	No. of Stations	EPC Bidder (L1)	EPC Bidder (L2)
Cuffe Parade - Hutatma Chowk (Fountain)	33,050	4.0	4	L&T	Pratibha
CST - Grant Road	27,200	4.1	4	HCC	ITD
Mumbai Central - Worli	27,180	6.4	5	Soma	ITD
Siddhi Vinayak - Mahim	31,250	4.8	3	ITD	JKIL
Dharavi - Domestic Airport (Wakola)	29,880	7.0	4	JKIL	HCC
Domestic - International Airport	23,420	3.5	3	JKIL	ITD
Marol - SEEPZ	26,040	2.7	4	L&T	
Total	**1,98,020**	**32.5**	**27**		

Mumbai Metro 3 particulars

Route Length	32.5 km
Total stations	27
Train /Platform Length	8 car train/185 m
Car Shed	Aarey Colony – 30 Ha
Depth of Tunnel	15-20 m (Below Ground)
Estimated Ridership	2021 – 13 lakhs per day (PHPDT – 39,000)
	2031 – 17 lakhs per day (PHPDT – 42,000)
Train carrying capacity	6 car – 1,792 passengers
	8 car – 2,406 passengers

MM3 funding plan (earlier estimates)

Funding Source	Rs bn	Share (%)
Equity by Centre	24.0	10%
Equity by MMRC and State	24.0	10%
Sub debt by Centre	10.3	4%
Sub debt by State	16.2	7%
Property development and impact fee	10.0	4%
Stakeholder contribution (MIAL)	7.8	3%
ASIDE funding / MMRDA grant	6.8	3%
JICA loan	132.4	57%
Total	**231.4**	**100%**

Source: MMRDA

Mumbai Metro Phase 3 (MM3)

The winners of EPC contracts for the much-awaited MM3 were announced in December 2015. The 34km completely underground metro project is highly ambitious and intends to decongest city roads. JICA (Japan International Co-operation Agency) is funding 57% of the total project cost of Rs 231bn, while the central and state governments are funding the rest. The project is expected to be complete by 2020.

While the winners of the EPC packages were declared in December 2015, the MMRDA has not signed the finals LoAs yet. The awarding body is re-evaluating the financing plan of the project in the wake of the recent INR depreciation and higher project costs submitted by the bidders. Hence, the order awards are expected to be delayed and execution is now expected to start only in 2HFY17.

Mumbai Metro Phase 2 and Phase 5 (MM2 and MM5)

In October 2015, the PM inaugurated work for two metro projects – phase-2A (Dahisar-Andheri – 16.5km) and phase-5A (Dahisar-Charkop-DN Nagar – 18.6km). Phase 2A is part of the larger phase-2 (Dahisar-Charkop-Bandra-Mankhurd) which was earlier awarded to Reliance Infra on a PPP basis, but cancelled thereafter. Similarly, phase-5A is part of the larger phase-5 (Dahisar(E)-Andheri(E)-Bandra(E)). The total investment required in phase-2 and phase-5 is Rs 200bn, which has been approved by the state government. Phase-2A and 5A will together cost Rs 126bn, for which the funding plan has been finalised, with 40% loan to be secured from JICA.

On April 18, 2016, MMRDA announced the winners of the three EPC packages for Phase 5A – Simplex Infrastructure, NCC and JKumar Infraprojects. Winners for the EPC packages for phase 2A are expected to be announced in last week of April-2016.

Mumbai Metro Phase 2A and 5A

Phase 2A	Dahisar - DN Nagar
Length	18.6
No of stations	17
Total Project Cost (Rs bn)	**64.1**
Funding (Rs bn)	
MMRDA Equity	18.9
GOM Equity	14.2
GOI Equity	2.9
Bilateral loan	28.0
Others	-
Total	**64.1**
Phase 5A	**Andher(E) - Dahisar(E)**
Length	16.5
No of stations	16
Total Project Cost (Rs bn)	**62.1**
Funding (Rs bn)	
MMRDA Equity	23.2
GOM Equity	13.4
GOI Equity	3.0
Bilateral loan	22.5
Others	-
Total	**62.1**

Source: MMRDA

IMPORTANCE OF INTERCHANGE AND SCALE FOR A METRO NETWORK

Globally, most cities with well developed public transport provide for interconnectivity between all modes of transport. So, while metro/monorail lines cross each other at multiple locations, most stations are co-incident with major railway and bus stations. There is also direct connectivity to airports and jetties.

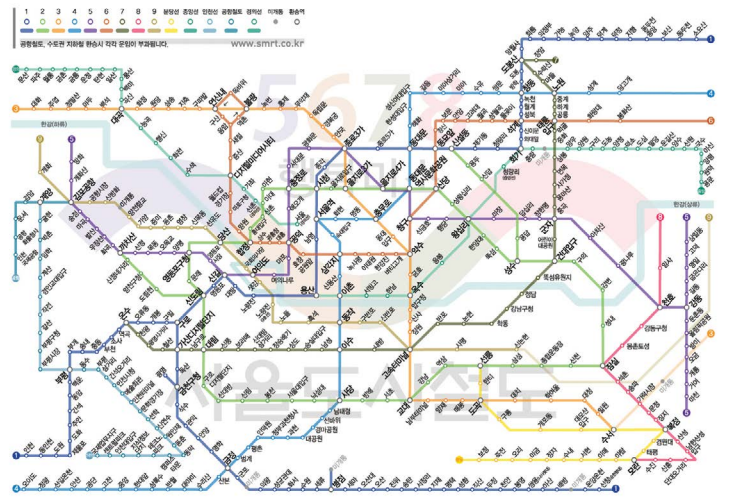
In India, Delhi is the only city that can qualify as a city with developed public transport. However, a look at the Delhi metro map too reveals that there are only five interchange stations across the seven lines. A comparison with London, Paris, Singapore, or even Seoul offers a completely different picture – these cities have many more interchange stations.

The current Mumbai local network too has only four interchange stations across three lines. Addition of the metro (phase-1) and monorail have enhanced the horizontal connectivity of the city but only four of their stations are coincident with the local train network. The upcoming Phase 2, 3, and 5 should add more interconnectivity to the public transport system – but it would still be far behind other global cities and insufficient for the needs of the city. While the metro network in most cities is still in its nascent stage, it would definitely help if the authorities included this consideration while designing the next phases of the metro network.

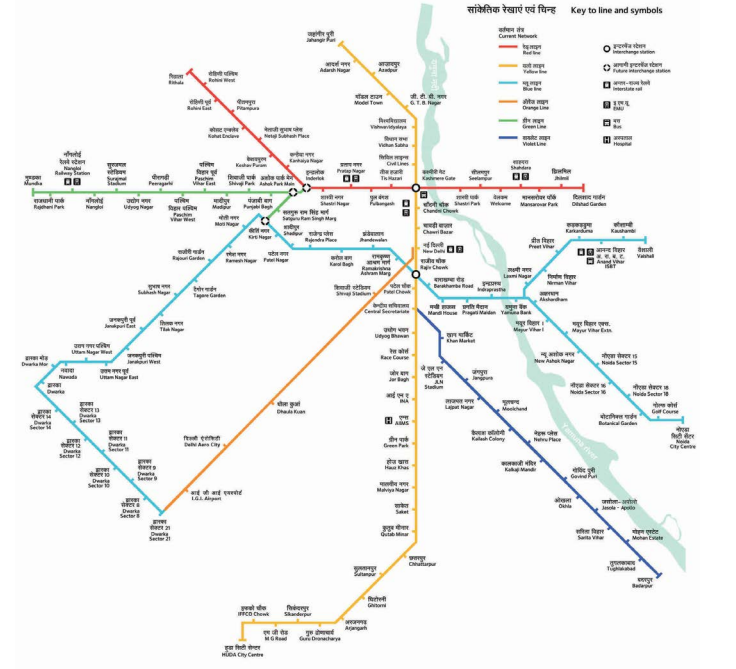
Note: These maps are only meant to illustrate the number of intersection points.

LONDON

SEOUL



DELHI



Bangalore Metro: Making rapid progress

Bangalore Metro, or Namma Metro as it is called (meaning 'our metro') is the first metro system in South India and the second in India, to become operational after the Delhi Metro (excluding Kolkata, which became operational in the last century). Its first stretch of 6.7km was inaugurated in October 2011 after which another 18.8km was opened to the public, taking its cumulative operational length to 25.5km – this makes it the second-largest metro network in the country.

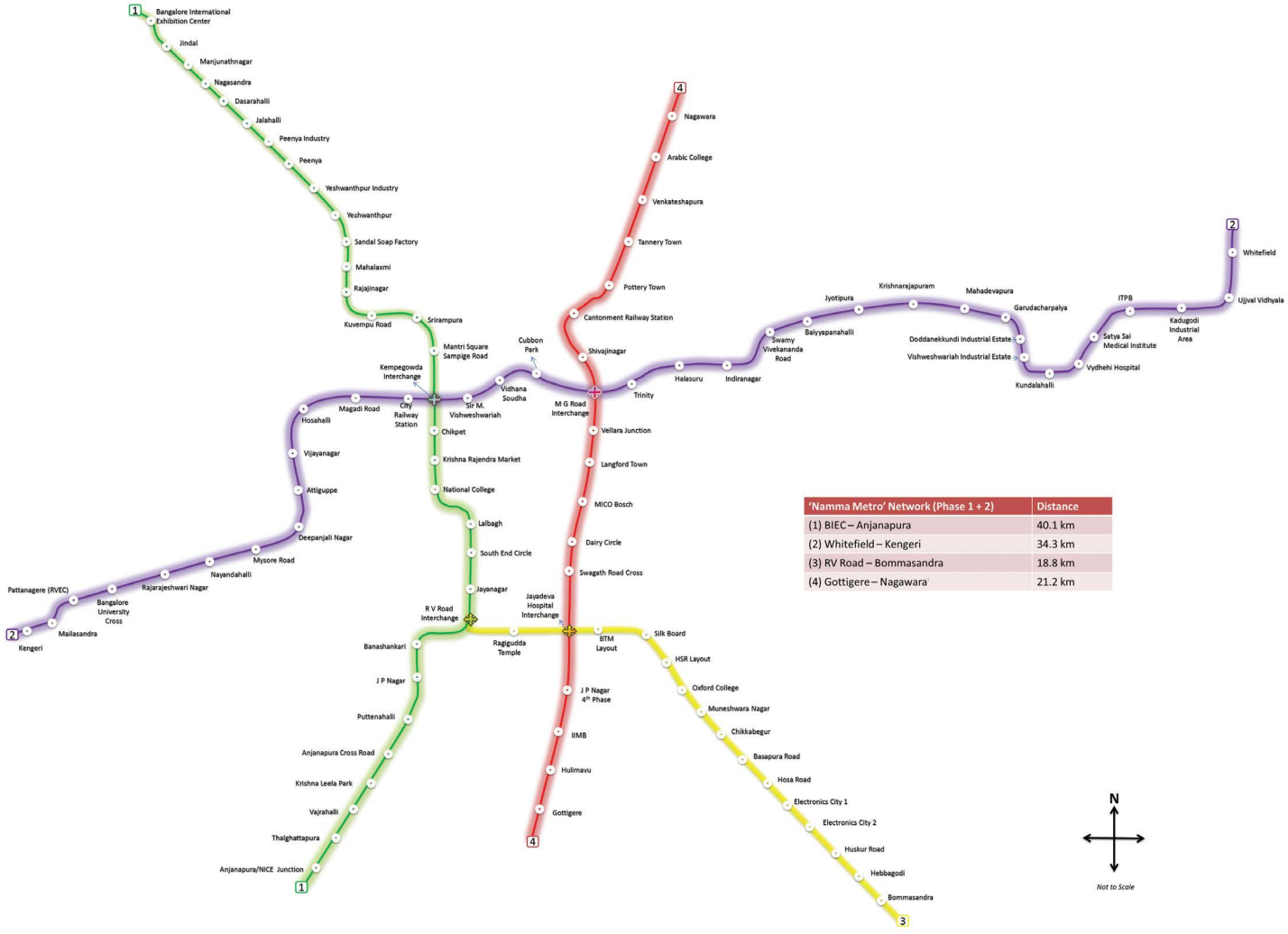
Bangalore Metro is gearing up to commission its first underground stretch of 4.8km – from MG Road to Magadi Road. If the tenders for the 'sweets' invited by BMRCL are any indication, the stretch might be inaugurated in April 2016 (Bangalore Metro Rail Corporation was planning to distribute 10,000 packets of laddoos at the inauguration of its much-delayed underground stretch of the east-west corridor, said media reports). Three more stretches (two overhead and one underground) are expected to be thrown open to public over the next twelve months – thus completing the phase-1.

Bangalore Metro project details

	Line	Name of Corridor	Cost (Rs bn)	Length (km)	Underground length (km)	No. of Stations	Status
Phase I	Purple	Baiyyappanahalli to Mysore Road	138.5	18.1	4.8	17	Part operational
	Green	Majestic to Nagasandra		24.2	4.0	24	Part operational
Phase II	Purple	Mysore Road – Kengeri	270.0	6.5	-	5	Plan approved in Jan-14
	Purple	Baiyyappanahalli - Whitefield		15.5	-	13	
	Green	Puttenahalli – Anjanapura		6.3	-	5	
	Green	Hesaraghatta cross – BIEC		3.8	-	3	
	Yellow	R V Road – Bommasandra		18.8	-	16	
	Red	Gottigere – Nagavara		21.3	13.8	18	
		Total	**408.5**	**114.4**	**22.6**	**101**	

Bangalore Metro completion schedule (Phase I)

Line	Section	Length (km)	Terminals	Opening date	
Purple	Reach 1 (east)	6.7	Baiyyappanahalli	Mahatma Gandhi Road	20-Oct-11
Purple	Reach 2 (west)	6.4	Mysore Road	Magadi Road	16-Nov-15
Purple	Underground UG1 (E-W)	4.8	Mahatma Gandhi Road	Magadi Road	Apr-16
Green	Reach 3 (north)	5.1	Sampige Road	Yeswanthpur	01-Mar-14
Green	Reach 3A (north)	4.8	Yeswanthpur	Peenya Industry	01-Mar-14
Green	Reach 3B (north)	2.5	Peenya Industry	Nagasandra	01-May-15
Green	Underground UG2 (N-S)	4.0	Sampige Road (upto Majestic)	National College	June-16 and Dec-16
Green	Reach 4 (south)	4.1	National College	Rashtreeya Vidyalaya Road	Dec-16
Green	Reach 4A (south)	3.9	Rashtreeya Vidyalaya Road	Puttenahalli	Dec-16



'Namma Metro' Network (Phase 1 + 2)	Distance
(1) BIEC – Anjanapura	40.1 km
(2) Whitefield – Kengeri	34.3 km
(3) RV Road – Bommasandra	18.8 km
(4) Gottigere – Nagawara	21.2 km

The Bangalore Metro master plan envisages two phases with a cumulative length of 114km. Phase 1 involves the construction of two corridors, which will together span 42.3km. This phase is expected to be completed by December 2016. Phase-2 involves extension of the four corridors built in phase-1 and the construction of two new lines. A total of 72.1km will be added at an investment of Rs 270bn by 2020.

While the fact that it is about to complete its phase-1 in the next twelve months might appear to be a sign of robust execution by BMRCL, it is important to note that the foundation stone for this phase's construction was laid by the then PM, Manmohan Singh, on 24 June 2006. Thereafter, it took the body five years to commission a stretch of 6.7km of overhead metro line, and yet another five years for a 4.8km underground line. Persistent delays due to heavy congestion on Bangalore roads and utility-shifting led to significant time and cost overruns.

There was also a proposal to build a 33km line from MG Road to Bangalore International Airport (BIA) for Rs 57.7bn – but this was scrapped keeping in mind its viability and cost. An airport metro extension from Nagavara to BIA might be considered for inclusion in phase-3, the DPR for which is being prepared.

Chennai Metro: Plagued with multiple hurdles

After the success of the Delhi Metro, Chennai was one of the first cities to develop their metro masterplan, starting execution in the first phase in 2009. However, it took six years for the first leg of 10km to become operational. The project, plagued with the termination of multiple contracts (Gammon JV, Lanco, CCCL), and natural disasters (floods), has already exceeded its extended deadline. Even the remaining 35km of the phase 1, is not expected to be completed before December 2018.

Chennai Metro Rail will be the first metro project in the country that was conceived to integrate other public transportation systems. Integration with city/state bus and railways transport system was envisaged to provide seamless connectivity to passengers, along the lines of cities like Singapore, Hong Kong, and London. However, from the very start, the project met with multiple hurdles. As many as three accidents took place between 2012 and 2014, leading to the demise of three construction workers. In June 2015, an accident led to the death of a civilian along with injury to another.

However, the biggest impediment that CMRL faced was the termination of three of its contracts. In July 2015, CMRL had to terminate the Rs 19.5bn contract with Gammon India-Mosmetrostroy JV for tunnelling operations over 18km and construction of 19 underground stations. The termination happened after Mosmetrostroy suddenly disappeared in May 2015, leaving the contract mid-way. Series of allegations and

counter-allegations followed suit, and the matter is currently sub-judice. Similarly, CMRL had to terminate contracts awarded to Lanco (Rs 1.78bn, terminated in August 2013) and CCCL (Rs 2.24bn, terminated in January 2014) due to tardy progress. These incidents have led to cost and time overruns, elevating the total project cost to Rs 190bn from the earlier envisaged Rs 147bn.

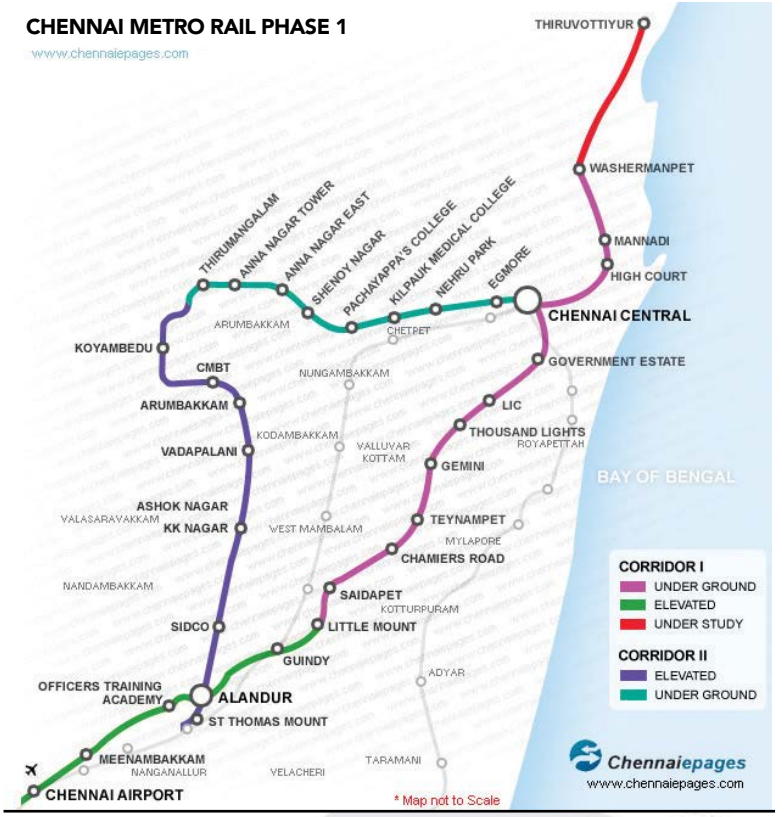
Chennai metro project details

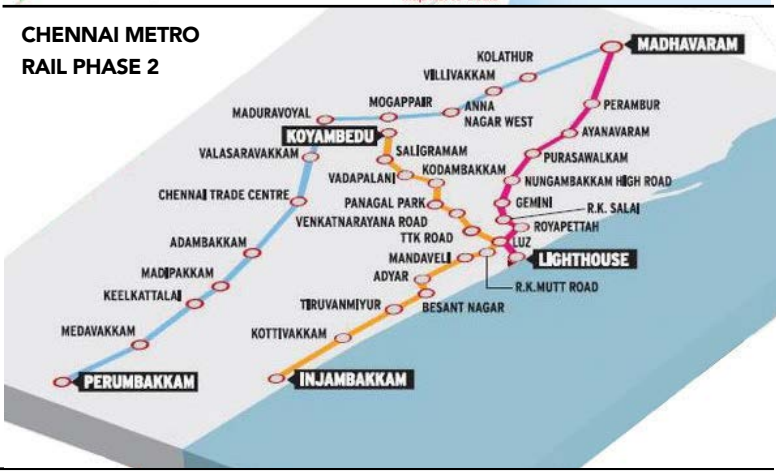
Phase	Name of Corridor	Cost (Rs bn)	Length (km)	Underground length (km)	No. of Stations	Status
Phase I - Corridor I	Washermenpet to Airport	146.9	23.1	14.3	17	10km operational in June-15; 10km by FY17; rest by FY19
Phase I - Corridor II	Chennai Central to St.Thomas Mount		22.0	9.7	17	
Phase I Ext	Washermanpet to Wimco Nagar	37.0	9.0	-	8	Waiting for cabinet approval
Phase II - Corridor I	Madhavaram to Siruseri	420.0	40.2	19.3	NA	DPR being prepared; not expected to start before 2021
Phase II - Corridor II	Nerkundram to Light House		14.0	14.0	NA	
Phase II - Corridor III	Madhavaram to Perumbakkam		34.7	20.7	NA	
	Total	**603.9**	**143.0**	**78.0**	**42**	

Chennai Metro Funding

Funding Source	Rs bn	Share (%)
JICA Loan	85.9	58%
GOI Equity + SD	36.7	25%
GNCTD Equity + SD	24.3	17%
Others		-
Total	**146.9**	

The masterplan for Chennai metro envisages two phases covering a total length of 143km and capex of Rs 600bn. While work on phase-1 started in 2009, the DPR for phase-2 is currently being prepared. The first stretch of phase-1, covering seven stations from Koyambedu to Alandur over a distance of 10km, began operation on 29 June 2015, with a woman driver of the Chennai Metro driving the first train out of Alandhur station. Another stretch of 10km is expected to start operations by March 2017, and the remaining by December 2018.

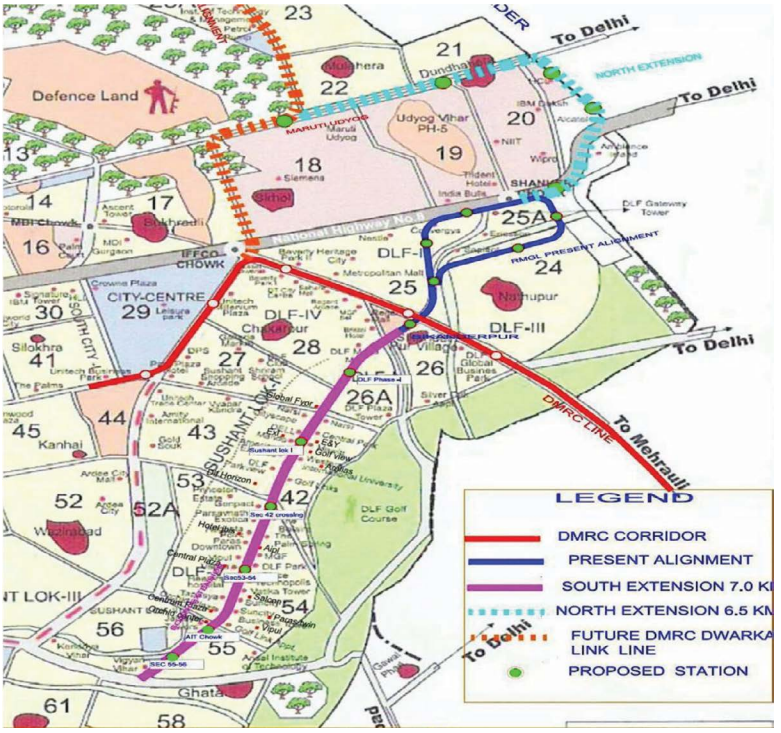




Gurgaon Metro: 'Big brother' lending a helping hand

Gurgaon metro, or Rapid Metro as it is called, is one of the few privately-financed and operated metro networks. It was built by a consortium of ILFS and DLF, but DLF pulled out of the consortium later, making ILFS the sole owner. Currently, it has one operational line (phase-1), which spans 5.1km and covers six stations – connecting the Gurgaon Cyber City to the Delhi Metro Network at the Sikandarpur station. The line commenced operations in November 2013. The 99-year concession agreement with HUDA (Haryana Urban Development Authority) calls for ILFS sharing 5-10% of advertising revenues, along with Rs 7.65bn as 'connectivity charges' over the next 35 years. ILFS had financed the project with Rs 7.6bn of debt and the remaining as equity investment.

Phase-2, which extends 7km along Golf Course Road from Sikandarpur station at Bristol Chowk to Sector 56 in Gurgaon, is currently under construction. There is a proposal to extend the network towards Udyog Vihar in the north, which will increase the network's length to almost 20km.

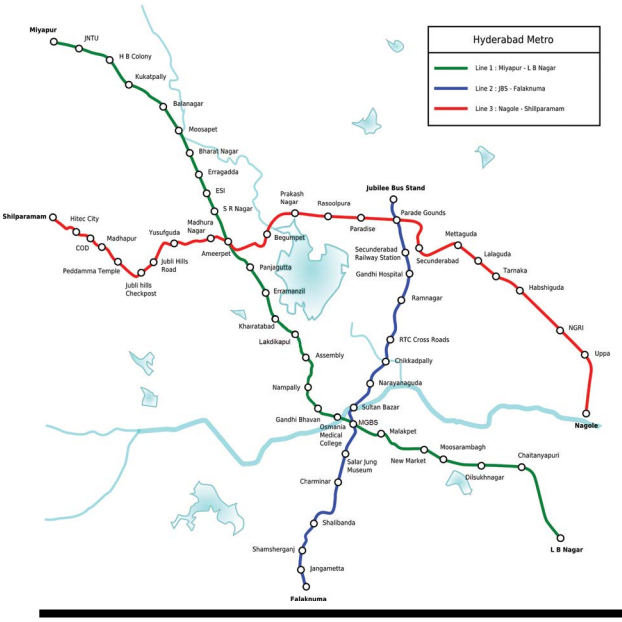


The Rapid Metro currently benefits from its connectivity to the Delhi metro network. Large numbers of commuters travel from Delhi to Gurgaon. Rapid Metro stands to benefit as the Delhi Metro expands its connectivity via phase-3 and phase-4. The Rapid metro SPV generated revenues of Rs 417.3mn in FY15, with loss of Rs 1.35bn.

Gurgaon metro project details

Phase	Corridor	Cost (Rs bn)	Length (km)	No. of stations	Status
Phase I	Cyber City - Sikandarpur	12.3	5.1	6	Operational in Nov'13
Phase II	Sikandarpur - Sector 56	21.4	7.0	5	Under construction
	Total	**33.7**	**12.1**	**11**	

Source: ITNL, HUDA



Hyderabad metro project details

Phase	Name of Corridor	Cost (Rs bn)	Length (km)	Under-ground length (km)	No. of Stations	Status
Line 1	Miyapur – L B Nagar	160.0	29.9	14.3	27	Expected CoD - June-Aug 2016
Line 2	Nagole - Shilparamam		26.5	9.7	23	Expected CoD - June 2017
Line 3	JBS – Falak-numa		14.8	-	16	Expected CoD - June-Aug 2016 (part)
	Total	**160.0**	**71.2**	**24.0**	**66**	

Hyderabad Metro: 'THE' wait is finally about to end

Hyderabad Metro has been, perhaps, one of the most talked about projects in the infrastructure space. Never before was a project of this magnitude and complexity awarded to a private player on a PPP basis (in India). While L&T, with all its technical expertise and financial might, could have been the only Indian company to be able to undertake such a project – the project has tested even the might of the Indian infrastructure Goliath. The project has been delayed by over a year now, with significant time and cost over-runs. Stage-1 is finally expected to begin operations on June 2, 2016 (Telangana Formation Day; Telangana being the new state to which the city now belongs).

The current plan of the Hyderabad Metro is to develop 71.2km of metro network, covering 66 stations, to be serviced by three lines. The initial cost estimate of the project was Rs 141.3bn, but with one-year delay, it is likely to be closer to Rs 160bn. With the change in design scope and realignment, the final project cost may end up even higher than that.

The construction of Hyderabad Metro is being carried out in six stages, across the three lines. Stage 1 and 2 are set to be commissioned in June-16, with almost 100% of the work complete by March16. Next stages are expected to be commissioned in a staggered manner over the next twelve months.

Hyderabad Metro is designed to have stations at an average interval of a kilometre – ensuring maximum convenience to passengers. The stations are designed to have adequate parking space and circulating areas, for multi-modal integration at the stations. When complete, it is expected to carry 1.7mn passenger daily in 2017 and 2.24mn by 2024. L&T expects the initial ridership revenue to constitute around 45% of the total revenues, with the rest coming from real-estate leases and advertising. Media report say that the company has tied up around 70% of the total real estate rentals in four metro stations. Despite this, it is not expected to report operational profits for at least the first five years of operations.

Hyderabad Metro current status

Stage	Target Section	Distance (in km)	Line	Expected CoD	Foundation work*	Piers*	Span erection*
Stage 1	Nagole to Secunderabad	8.0	Line III	June, 2016	100%	100%	100%
Stage 2	Miyapur to S R Nagar	11.9	Line I	June, 2016	100%	100%	100%
Stage 3	Mettuguda to Begumpet	8.3	Line III	TBD	94%	89%	75%
Stage 4	Begumpet to Shilparamam	11.0	Line III	Aug, 2016	74%	71%	35%
Stage 5	SR Nagar to LB Nagar	17.3	Line I	Aug, 2016	91%	89%	75%
Stage 6	JBS to Falaknuma	15.2	Line II	June, 2017	27%	20%	5%
	Total	**71.7**			**78%**	**74%**	**61%**

*As of March 2016

Source: L&T

Kolkata Metro: Legacy is all that remains

Kolkata is the main business, commercial, and financial hub of eastern and north-eastern India. It is also a major commercial and military port, and the only city in eastern India to have an international airport. Once India's prime city, it now bears scarce resemblance to its glorious past.

Only 6.2% of the area of Kolkata is comprised of roads – compared to +20% for other metro cities in India. With a vehicle population estimated at about 1.6mn and 23.5mn transit trips a day in 2011, the city is bursting at its seams. With very little scope to increase the road area in the city, and a projected vehicle population of 3mn and 32mn transit trips in 2025, one can easily visualise the enormity of the problem.

Nevertheless, Kolkata was the first city in India to have a metro network – currently operational 25.1km north-south line from Dum Dum to Kavi Subhash station, which began operations in 1984. This line, developed by Indian Railways, covers a total of 23 stations. Being the country's first and completely indigenous process, the construction of the Kolkata Metro was more of a trial-and-error affair in contrast to the Delhi Metro, which had the involvement of numerous international consultants. As a result, it took nearly 23 years to construct 15 km of underground railway.

Currently, several extensions of Kolkata metro are under construction. Together, these are expected to add over 90km of network length. Among these, the upcoming the 14.7km East-West corridor (Line 2) will provide inter-modal connectivity with IR at Howrah and Sealdah stations, interchange with the existing metro network at the central station, as well as connections to ferry, buses, and trams. A new organisation, Kolkata Metro Rail Corporation Limited (KMRC), started the construction in 2009 – it was originally slated to be completed by 2012, but continuous delays led to the deadline being pushed back to June 2019. However, a stretch of 9km is being pushed to be commissioned by December 2017.

KMRCL, which was earlier a JV between the state and central government (similar to other metro projects across the country), is now governed by Indian Railways and the Urban Ministry - after the state government sought IR's intervention. The challenges that the project faced, have also led to significant project cost escalation - from the earlier estimate of Rs 48.7bn to Rs 90bn.

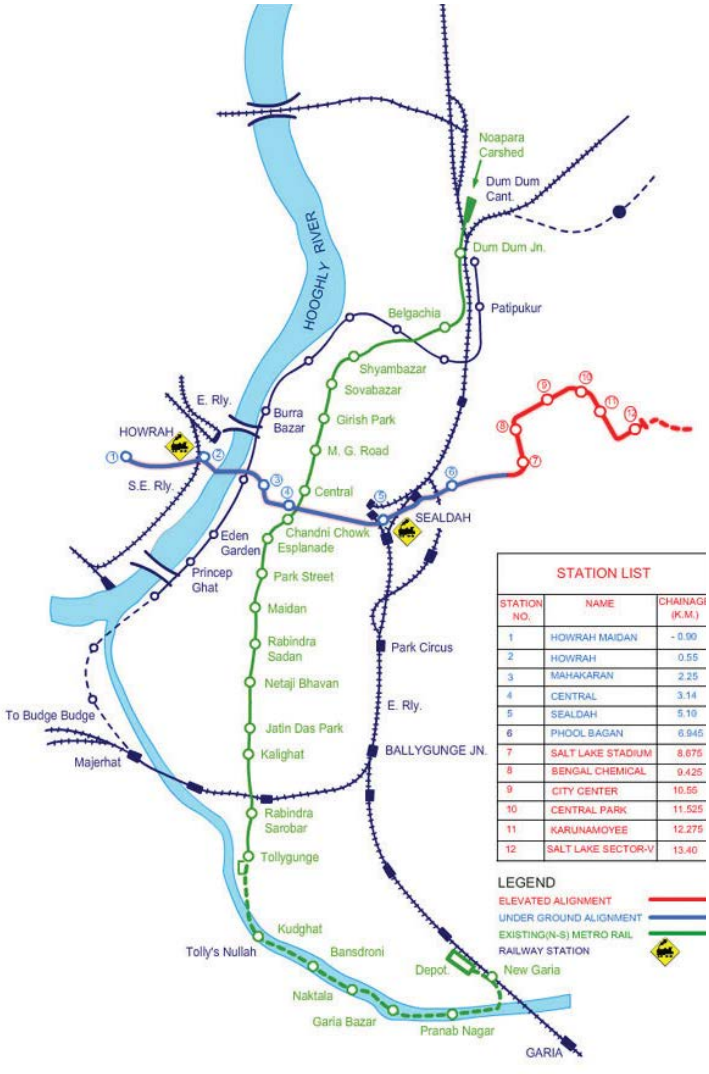
Kolkata metro project details

Line	Name of Corridor	Project Cost (Rs bn)	Length (km)	Underground length (km)	No. of Stations	Status
Line 1	Noapara - Kavi Subhash	18.3	27.2	15.0	24	Operational since Oct 1984
Line 2	Howrah Maidan - Salt Lake Sector-V	48.7	14.7	8.9	12	Expected CoD: Dec-17
Line 3	Diamond Park - Mahakaran - (BBD BAG)	NA	17.1	-	15	Expected CoD: Dec-18
Line 4	Noapara - Barasat	NA	17.1	-	9	Under Construction
Line 5	Baranagar - Barrackpore	NA	12.4	-	11	Under planning stage
Line 5/1	Noapara - Dakshineswar	NA	4.1	-	3	Under planning stage
Line 6	Kavi Subhash - Biman Bandar	NA	29.1	-	24	Under planning stage
Total		**67.0**	**121.7**	**23.9**	**90**	

Kolkata Metro Funding (Line 2, earlier estimates)

Funding Source	Rs bn	Share (%)
Indian Railways	14.6	30%
GOI	12.2	25%
Loan from JBIC	21.9	45%
Total	**48.7**	

Kolkata Metro Line 1 and 2



Kolkata Metro Masterplan

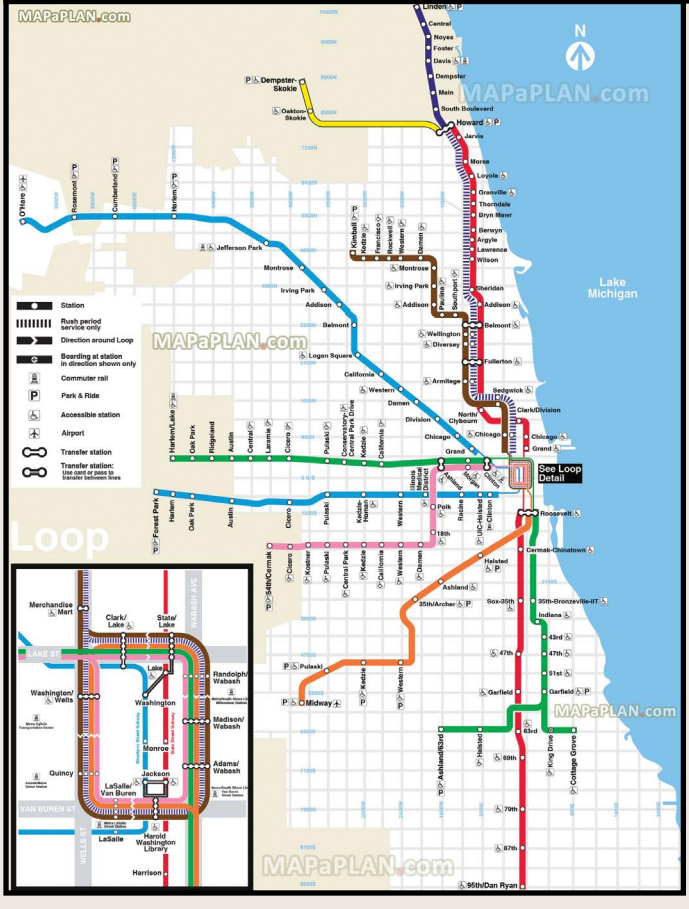
THE Art of Designing METRO MAPS

A metro map often represents the first impression of a city (maybe second, after the airport) to a traveller. If a map is cluttered and confusing, it makes traversing through the city that much more difficult. Conversely, a well designed and pleasant looking map makes travelling much more fun. More importantly, the design of a metro map can directly influence its ridership, and hence the congestion on city roads and the pollution levels too.

Over the years, designing the metro map has evolved into a confluence of art and science. Harry Beck mastered this art-cum-science with his design of the London Underground map in 1931. Keeping geographic accuracy aside, he laid out the map using beveled edges turning at clean 90-45-degree angles. London's metro map has been the bar for metro maps across the world. It truly combines functionality with beauty, and serves as an inspiration to designers, even today.

Avoiding excess information: A metro map can actually be used to provide lot of information – but care needs to be taken to not 'fill-up' the map with excess information, which could make it cluttered and disorganised (e.g., the New York Subway Map) – even if that comes at the cost of setting the geographical accuracies aside (e.g., the London Tube Map).

Using contrast colours with 90-45 degree angles: These angles have been proven scientifically to be much more visually appealing to a viewer's eyes. Also, mostly a light background with dark lines / annotations are used to provide soft and pleasant feeling to a map (with the exception of Montreal map, which uses a black background).



A look at some of the world's best and worst designed metro maps:

London (opposite page): Elegant, beautiful and yet providing as much information as possible about the oldest and one of the largest metro networks in the world

Moscow (top left) : The circular line pops out immediately, drawing your eyes to the centre of the city. The weights of the circles for each station are thicker than the lines, helping give more white space.

New York (Top right): Tries to convey too much information, especially the geographic locations of different stations. Also, not adhering to the 90-45-degree benchmark makes navigation extremely difficult. Desperately needs a makeover.

Chicago (Left) : Despite being a relatively smaller network, it's a map that could have been designed better. Though it is simple to navigate and is surely not ugly, it doesn't seem to be doing justice to the beautiful city of Chicago.

Thinking ahead of times

Quite often, civic authorities are panned for their myopic view – building infrastructure at best for today's needs and at worst, for yesterday's needs. Seldom have infrastructure projects been designed in India taking into account the landscape transformation and the associated needs for the next 10-20 years. The impact is visible in most tier-1 cities today – the metro networks should have been constructed at least a decade ago, and it is not surprising that authorities are finding it extremely difficult to execute them now due the rise in population and traffic over these years.

Learning from the mistakes of the civic bodies of tier-1 cities, or call it the compulsive need of today's politics to showcase development agenda, many of the tier-2 cities that do not need metros today have already started preparing development plans for them to be carried out in the next five years. Few of them have already started execution, and some have already commissioned part of the proposed network, or are close to doing so. Happy times ahead for the citizens of these cities!

Nagpur Metro

The Nagpur Metro Rail Project is envisaged to be 38.2km long with two corridors – North-South (19.6km, 17 stations) and East-West (18.5km, 19 stations). The total project cost of the 100% elevated project is estimated at almost Rs 87bn. More than 80% of the project land is already in possession. Contracts for viaduct on 12km section, from airport to Sitaburdi (intersection point of two corridors) were awarded in June and October 2015 – construction work has already begun. Contracts for 10km section on East-West corridor are expected to be awarded in May 2016.

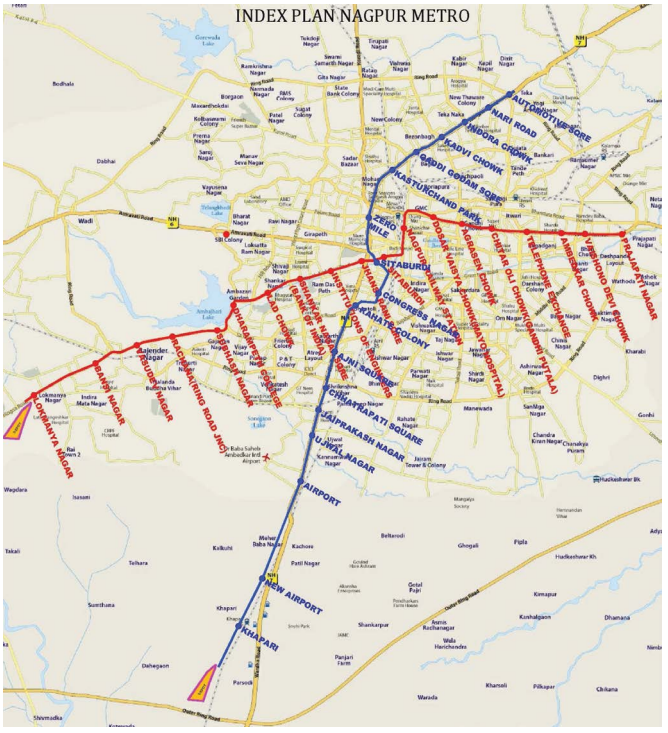
The state government had earlier approached JICA to fund up to 40% of the project. However later, KFW of Germany and AFD of France agreed to provide loans of € 500mn and € 130mn respectively, to fund over 50% of the project cost. The Maharashtra state government intends to commission the first phase by CY18 end and the entire project by CY19.

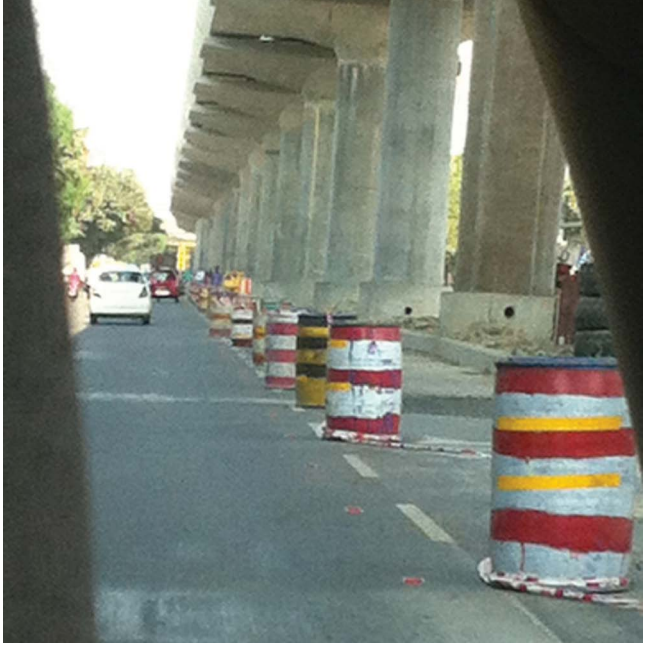
Nagpur Metro project details

Corridor	Name of Corridor	Cost (Rs bn)	Length (km)	No. of Stations	Status
North - South	Automotive Square - MIHAN	86.8	19.7	17	Under construction
East - West	Prajapati Nagar - Lokmanya Nagar		18.6	19	EPC contracts to be awarded in May-16
	Total	**86.8**	**38.2**	**36**	

Nagpur Metro funding

Funding Source	Rs bn	Share (%)
Equity by GOI	11.1	13%
Equity by GOM	11.1	13%
SD by GOI	4.4	5%
SD by GOM	14.9	17%
Loan by KFW and AFD	45.2	52%
Total	**86.8**	**100%**





Lucknow metro project details

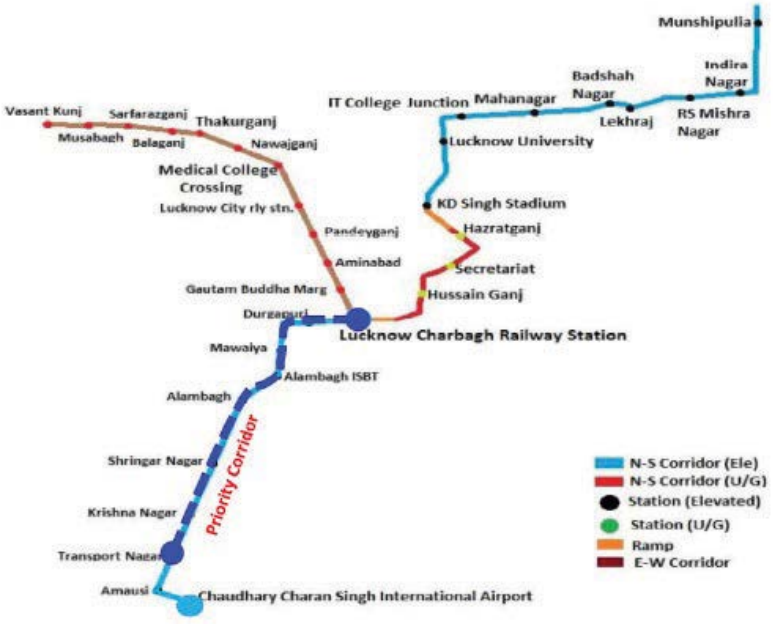
Phase	Name of Corridor	Cost (Rs bn)	Length (km)	No. of Stations	Status
Phase IA	Transport Nagar - Charbagh	68.8	8	8	Expected CoD by Dec-16
Phase IB	Charbagh - Munshipuia		15	13	EPC contarcts to be awarded by June-16
Phase II	Charbagh - Vasant Kunj	48.9	12	12	DPR approved
	Total	**117.7**	**35.0**	**33**	

Lucknow Metro

Lucknow is one of the largest and one of the most congested cities in northern India. The city desperately needs a public transport system; current roads and public buses are largely inadequate to suffice the needs of its citizens. The city has gone through a remarkable facelift over the last few years – first by the various parks built by the then ruling state government (BSP) and thereafter by the cycling lanes built by the current state government (the Samajwadi Party – whose party elections symbol, ironically, is a bicycle). An efficient and convenient metro network is what it needs to befit the rich culture and heritage of the city.

Lucknow is all set to be the first city in Uttar Pradesh to get its metro service (excluding NCR cities, which are connected via the Delhi Metro). EPC contracts for the 8km-long Phase 1A were awarded in September 2014, with a scheduled completion date of March 2017. However, in view of the upcoming state elections, the state government has preponed the commissioning date to December 2016. Work is in full swing and is expected to be complete in time. Tenders for Phase 1-B are expected to be awarded by June 2016 and execution is scheduled to start before December 2016.

The funding for phase-1 (A and B) is tied up – 52% has been arranged from Euro Bank and the remaining as equity from the Government of India and the Government of Uttar Pradesh. The state government expects healthy passenger traffic from the beginning and significant decongestion in road traffic after the metro is commissioned.



Lucknow Metro funding (Phase I)

Funding Source	Rs bn	Share (%)
GoI Total	13.0	19%
GoUP Total	17.0	24%
Loan from Euro Bank	35.0	51%
Total	**65. 0**	
GoUP Sub Debt for land	3.8	5%
Additional PTA for IDC	0.5	1%
Grand Total	**69.3**	**100%**

Jaipur Metro

In June 2015, Jaipur became the sixth Indian city and the first tier-2 city (arguably) to join the metro bandwagon. It was a historic day for the citizens of the city as the first phase of 9.7km connecting Mansarovar to Chandpole was commissioned in record four years – with ZERO time/cost overruns. Currently, the operational network has a daily ridership of 50,772 passengers.

The Jaipur Metro project is unique in many ways – it is one of the projects where the state government offered a higher share of investment (49%) as compared to the usual 20-25% put in by most other state governments. This was made possible due to the innovative financing model of the project, where local authorities like Jaipur Development Authority, Rajasthan Housing Board, and Rajasthan State Industrial Development & Investment Corporation also contributed towards the state's share. This also means the project required lesser funding from external sources (31% loan from ADB) – leading to a much superior FIRR (8.24%).

The land acquisition process for the Jaipur metro was very smooth and most expeditious, with the state government setting up an Empowered Settlement Committee, which worked out mutually agreed rehabilitation packages for every project affected person (PAP). Even in terms of planning, Jaipur Metro is set to become a good example of multi-model integration, as it connects the railway station, inter-state bus terminal, and Jaipur's international airport with inter-change facilities; it is providing for bicycles, cycle rickshaws, auto-rickshaws, and bus-bays in most of its stations.

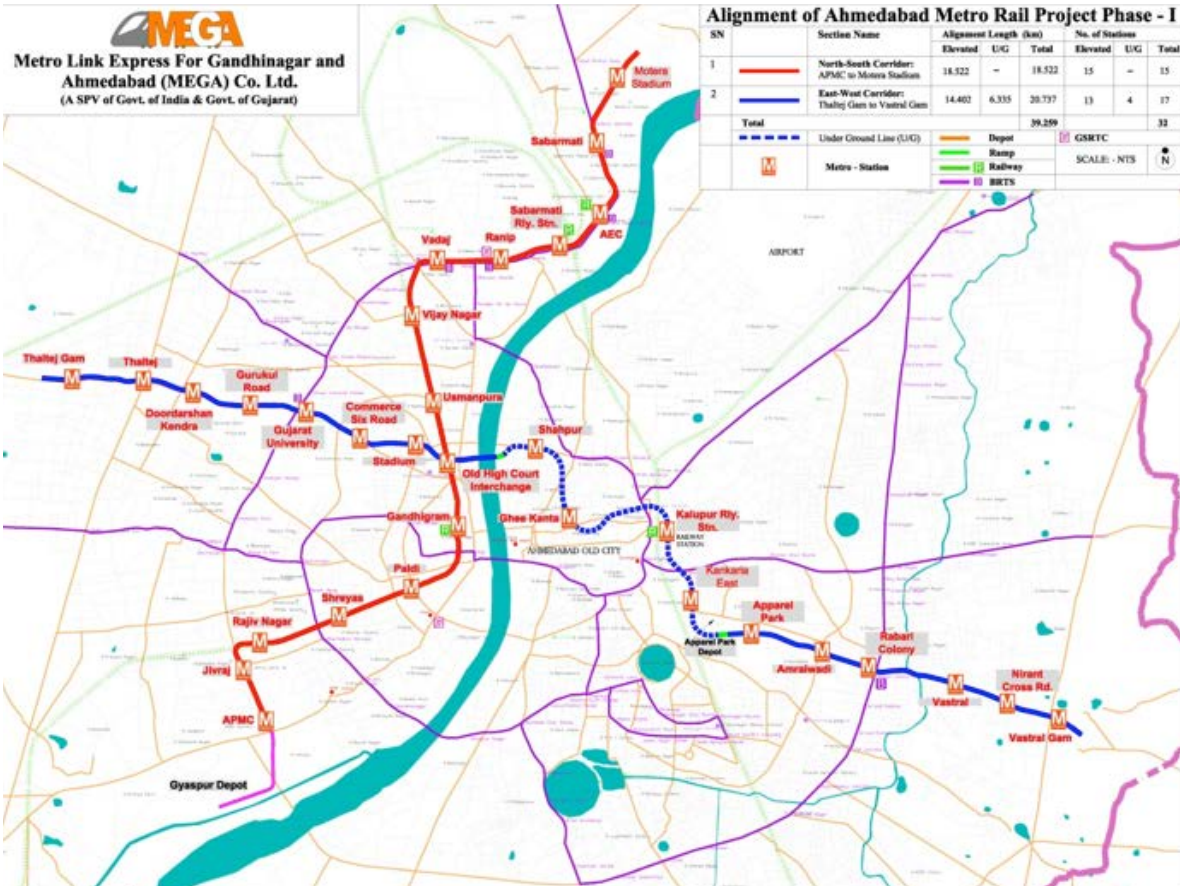
The Jaipur Metro project is likely to cost Rs 135bn and will be executed in two phases covering 35.8km with 31 stations. Of these, 12.1km is being developed in phase-1 and 23.8km will be constructed under phase-2. At present, work on phase-1B (completely underground) is in progress and is scheduled to be completed by March 2018. Construction of phase-2 will be taken up thereafter.

Jaipur Metro project details

Phase	Corridor	Cost (Rs bn)	Length (km)	Underground length (km)	No. of stations	Status
I - Corridor A	Mansarovar to Chandpole	20.2	9.6	0.5	9	Operational in June'15
I - Corridor B	Chandpole to Badi Chaupar	11.3	2.4	2.4	2	Commissioned by Mar'18
II	Sitapura to Ambabari	103.9	23.8		20	
	Total	**135.4**	**35.8**	**2.9**	**31**	

Jaipur Metro funding (Phase I)

Funding Source	Rs bn	Share (%)
GOI Equity + SD	6.3	20%
GOR Equity + SD	15.5	49%
Loan from ADB	9.69	31%
Total	**31.5**	



Ahmedabad Metro

Ahmedabad doesn't really need a metro today. It is the only city in the country that has been able to implement a BRTS (bus rapid transport system) successfully. With a population density of less than 900 people/sq. km, it is one of the relatively sparsely populated cities in India, with superior quality of roads and public infrastructure. However, it has always been the forward-thinking of the authorities in Gujarat that has made the state one of the fastest growing in the country.

The MEGA (Metro-Link Express for Gandhinagar & Ahmedabad) corridor is a 38km metro network that criss-crosses the city along four directions. The two corridors, designed along north-south and east-west direction, aim to connect the far flung areas of the city, apart from providing connectivity to the state capital – Gandhinagar. The ground breaking ceremony for the project was held in May 2015 for the construction of the Vastral-Apparel Park stretch of the east-west corridor. The construction of this stretch is expected to be complete by October 2017. The north-south corridor is expected to be complete by 2019.

Ahmedabad Metro project details

Phase	Name of Corridor	Cost (Rs bn)	Length (km)	Under-ground length (km)	No. of Stations	Status
East - West	Vastral Gam - Thaltej Gam	69.4	19.4	6.3	17	Under construction
North - South	Motera Stadium - APMC	48.0	18.5	-	15	Expected CoD 2019
	Total	**117.4**	**37.9**	**6.3**	**32**	

Ahmedabad Metro funding

Funding Source	Rs bn	Share (%)
GOI Equity + SD	21.2	18%
GOG Equity + SD	30.0	26%
Loan from JICA	59.7	51%
Others	6.6	6%
Total	**117.4**	

WHAT'S THE SECRET OF HONG-KONG METRO'S SUCCESS

Hong Kong Metro (HKMTR) has the envious stature of being the only profitable metro system in the world. While the financials of most major metro systems are not available in the public domain, their ever-increasing debt levels to fund incremental capex clearly allude to their inadequate cashflows, and hence, profits. But how does HKMTR achieve this seemingly impossible task on a network length much smaller than most other major cities?

The answer is a potent combination of highest levels of operating efficiency, high population density of the city, the ecosystem that makes it prohibitively expensive to own private vehicles, and above all, the 'other businesses' operated by the HKMTR. Hence, despite one of the lowest base fares in the world, the HKMTR is able to churn profits, year after year.

The HKMTR system was established as a public entity in 1974 before being privatized as the MTR Corporation in 2000, as the HK government tried to divest its ownership in public utilities to reduce expenditure and boost efficiency. However, the government remains a major shareholder (with 76% stake) of the MTR Corporation.

Running for 20 hours and making 8,000 train trips per day, HKMTR boasts of a staggering 99.9% punctuality rate. Each year, it invests HK$ 5bn (US$ 645mn) in maintenance, upgrades, and renewals to the system. In fact, HKMTR has the world's highest FBRR (fare-box recovery rate) – the percentage of income derived from ticket sales weighed against operating expenses – between 150-180% vs. less than 100% for most other metros across the world (NY Metro's 60%).

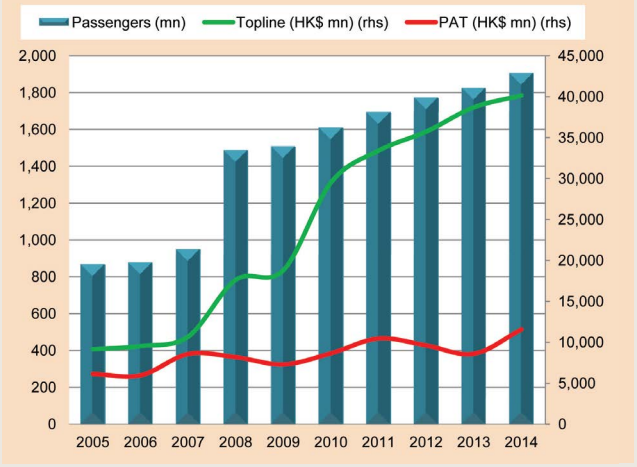
The incredibly high FBRR can be attributed partly to the city's densely packed population (6,500 people per sq. km. – as compared to 5,000 for London). Despite having a lesser track length than other MTRs (London 402km, New York 373km), the 218km HKMTR carries over 5mn passengers daily – the fifth highest in the world – 90% of HK residents use the MTR.

This high level of ridership exists partly due to the ecosystem. There are no suburbs in HK, from where people can commute by car. That, along with other regulations, has kept car ownership low – only six of every 100 vehicles in HK are for personal use, as compared to 70 in the US. HK freeways are also much narrower and streets are much harder to drive through. Parking is prohibitively expensive.

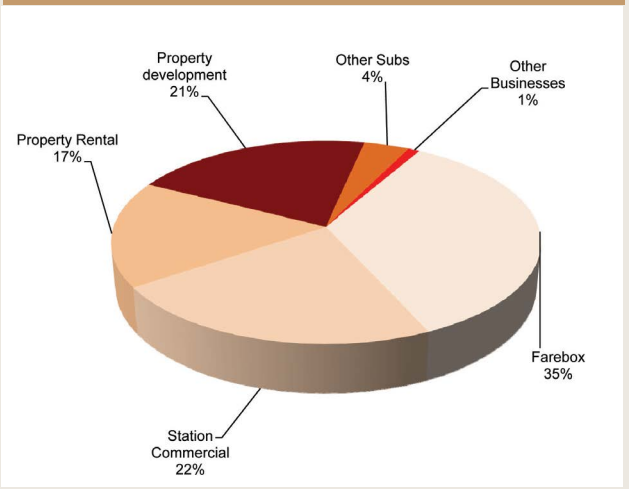
But the company's real profits (60% of operating profits) are derived from its 'other businesses' – primarily, property development. HKMTR owns and manages around 50 major properties across HK, including two of the city's tallest skyscrapers and 13 malls. The HK government provides land to HKMTR at zero cost, allowing it to develop the areas above and around its stations. Almost each station is packed with retail outlets, which either pay rentals or have profit-sharing agreements with HKMTR. "Sometimes critics say it's a property development firm doing a side business of rail," said Tim Hau, a professor at University of Hong Kong's School of Economics and Finance.

Thus, the HKMTR essentially functions like a vertically integrated business through a "rail plus property" model, controlling both the means of transit and the places passengers visit upon departure. Over the last few years, it has spread its wings beyond HK and now operates the London Overground, two lines of the Beijing Metro, parts of Shenzhen and Hangzhou MTR in China, Melbourne Metro, and the Stockholm Metro.

HK MTR financials



HK MTR Operating profit break-up



Source: HK MTR

Metro projects under consideration

Kochi Metro

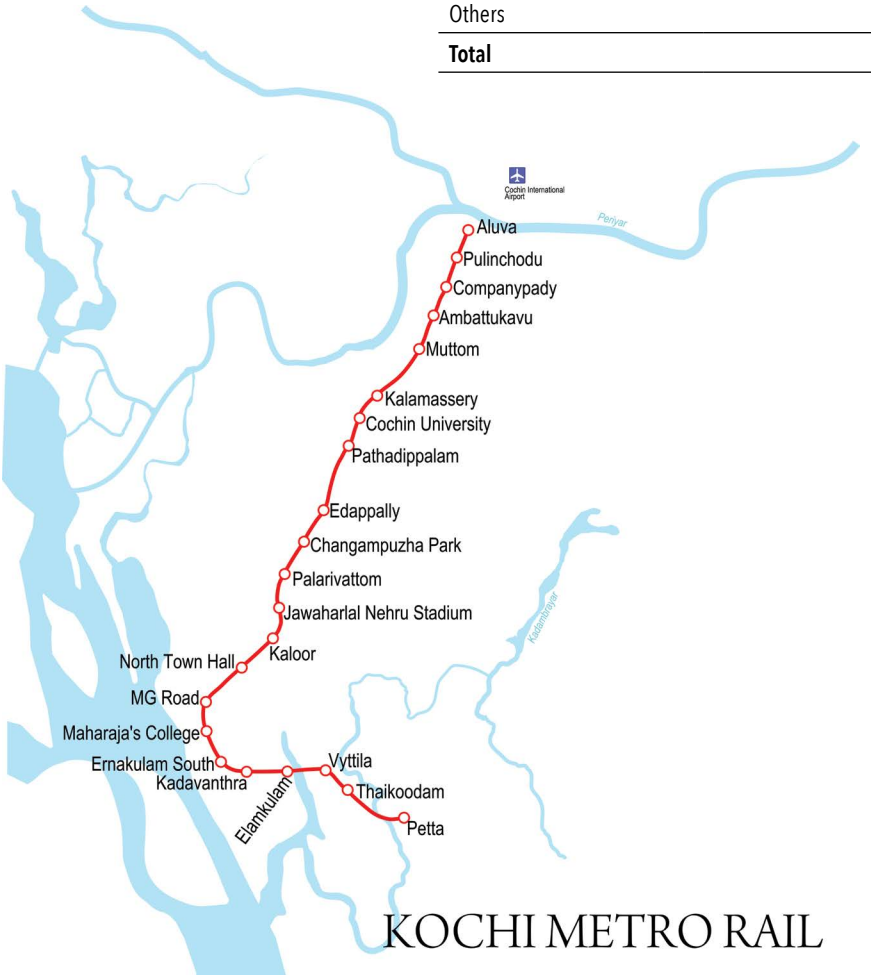
Kochi Metro is a small project with only one line of 26km costing Rs 51.5bn. The foundation stone of the project was laid in 2012 and construction work is already in full swing. The project had earlier been under the limelight for all the wrong reasons – from the role of DMRC (which was eventually approved as the body executing the project) to retendering of rolling stocks contract (after only one bidder remained in the final round). Putting all that behind, the metro is expected to begin operations by 2017 – linking 23 stations through the most congested parts of the city.

Kochi Metro project details

Corridor	Aluva to Pettah
EPC Contractors	L&T, Era, Soma
Signalling / Rolling Stock	Alstom / Alstom
Status	Expected CoD 2017
Cost (Rs bn)	51.5
Length (km)	25.6
No. of stations	23

Kochi Metro funding

Funding Source	Rs bn	Share (%)
GOI Equity + SD	11.8	23%
GOK Equity + SD	15.6	30%
JICA Loan	21.7	42%
Others	2.36	5%
Total	**51.5**	



Pune Metro

In August 2008, DMRC had submitted the DPR for Pune Metro, but it was approved by the Maharashtra government only in 2012. Last year, the centre had also given its approval for the project. However, due to opposition from local residents and political parties for the line-2 being elevated, the layout is now being revised to realign line-2 – this is expected to delay the project even further.

A revised DPR for the Rs 136bn phase-1 of the Pune metro is now being prepared by the DMRC – which has been the its principal consultant ever since the project was envisaged. Phase-1 is to consist of two lines:

- Line 1 – 16.5km – from Chinchwad to Swargate – 75% elevated, 25% underground
- Line 2 – 14.9km – from Vanaz to Ramwadi – completely elevated.

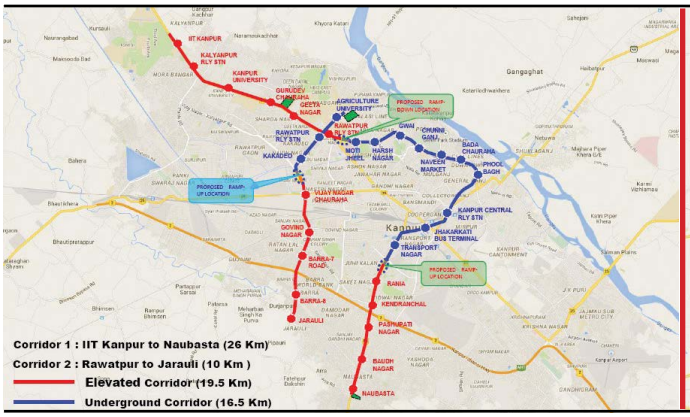
Pune Metro project details

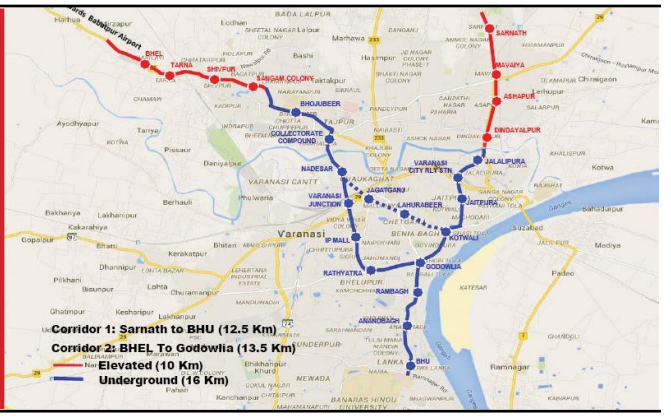
Phase	Corridor 1	Corridor 2	
Corridor	**Chinchwad – Swargate**	**Vanaz - Ramwadi**	**Total**
Cost (Rs bn)	74.2	34.5	**108.7**
Length (km)	16.6	14.9	**31.5**
Underground length (km)	5	-	**5**
No. of stations	15	15	**30**

Pune Metro funding (proposed)

Funding Source	Rs bn	Share (%)
GOI Equity + SD	20.1	18%
GOM Equity + SD	22.9	20%
Loan from JICA	46.7	41%
Loan from Financial Inst	13.4	12%
Others	5.6	10%
Total	**108.7**	

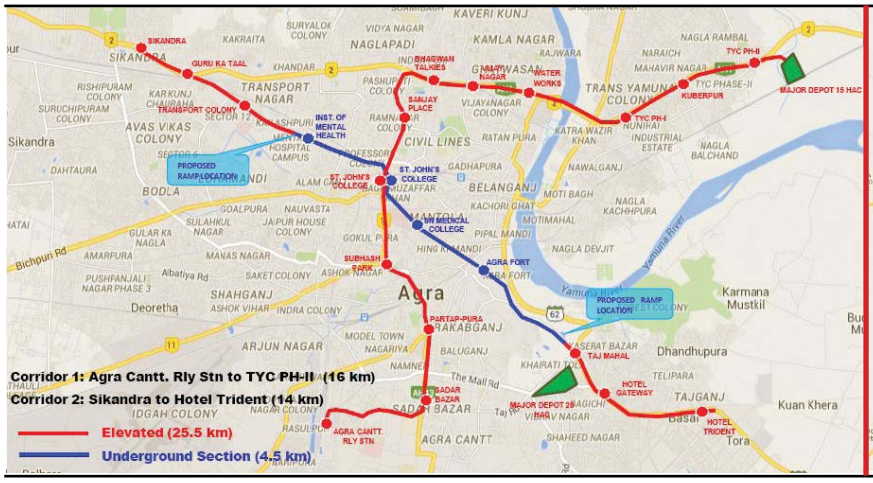
Four metros planned in UP – Kanpur, Varanasi, Agra, and Meerut

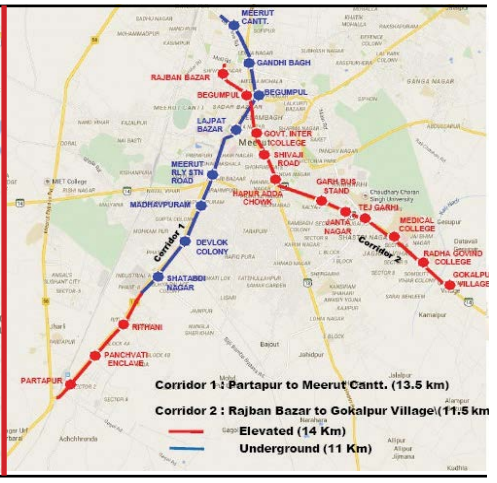




Kanpur: Phase-1 of the metro is being planned to be 26km – from IIT Kanpur to Naubasta (via railway station). The DPR has already been prepared and EPC bids for the project are expected to be called in mid-2016.

Varanasi: Phase 1 is being planned to be 12.5km – from Sarnath to BHU (via Kotwali). Currently, DPR is in late stages of completion. Work on the project has been expedited on request from the PMO (Varanasi being PM's constituency). Ordering is expected to begin towards 2016 end.





Agra: Phase-1 is planned to be 16km – from Cantt Railways Station to TYC-Phase-2. Currently, DPR is being prepared.

Merrut: Phase-1 is planned to be 13.5km – from Partapur to Merrut Cantt (via railways station road). Currently, DPR is being prepared.

Metro projects in other cities in UP

City	Area	Population	Phases	Length	Stations	UG/EV	Cost	Expected PHPDT	
	sq km	mn (2011)					Rs bn	2021	2031
Kanpur	1,041	3.48	IIT Kanpur - Naubasta	26.0	21	Mix	105	15,000	24,000
			Rawatpur - Jarauli	10.0	8	Mix			
Varanasi	260	1.54	Sarnath - BHU	12.5	11	Mix	75	10,000	14,000
			BHEL - Godowlia	13.5	11	Mix			
Agra	520	2.10	Agra Cantt - TYC Ph-II	16.0	12	Elevated	65	10,000	15,000
			Sikandra - Hotel Trident	14.0	10	Mix			
Meerut	565	1.84	Paratpur - Meerut Cantt	13.5	12	Mix	65	10,000	14,000
			Rajban Bazar - Gokalpur	11.5	11	Elevated			

LMRC, which is the de-facto head of any metro project in UP, availed funding for the Lucknow Metro (52% of project cost) from European Investment Bank. It expects an encore for other projects as and when they are approved by the state government.

Two Metros planned in Punjab – Chandigarh and Ludhiana

Chandigarh

Chandigarh is the last city that you would imagine 'needing' a metro network. It is the only planned city in the country, with clearly segregated zones and controlled development, areas called 'sectors' rather than '-purs' and '-ganjs', with most junctions having a round-about rather than a traffic light. However, such is the frenzy of joining the metro bandwagon, that the state governments of Punjab and Haryana have chalked out a plan to build a 37km long metro network in the city. The DPR (revised multiple times) of the project was submitted by the DMRC in October 2015. Interestingly, there would be four stakeholders in this metro project – the govt of India, the union territory, and the state governments of Punjab and Haryana (Chandigarh is a UT and state capital of both Punjab and Haryana). It promises to be a long and messy affair!

Chandigarh Metro project details

Phase	Corridor	Cost (Rs bn)	Length (km)	Underground length (km)
Corridor 1	Capitol Complex to Mohali	28.5	12.5	-
Corridor 2	Panchkula to Mullanpur	107.5	25.1	14.1
	Total	**136.0**	**37.6**	**14.1**

Ludhiana Metro project details

Phase	Corridor	Length (km)	Underground length (km)	No. of stations
Corridor 1	Ayali Chowk to BBMB Chowk	15.8	-	14
Corridor 2	Gill Chowk to Rahon Road	13.0	7.0	13
	Total	**28.8**	**7.0**	**27**

Ludhiana

The Ludhiana Metro is in the early development stage, with its DPR recently approved. The DMRC was appointed to prepare the DPR in 2007, which was finally approved by the Punjab cabinet in June 2011. The total project cost, for the 29km two-corridor metro is estimated to be Rs 87bn. In its DPR, the DMRC has advised the use of light metro rail (LRT), which it deems adequate to meet the traffic needs over the next 20-25 years.

Two Metros planned in MP – Indore and Bhopal

Both Indore and Bhopal metros are in very nascent stages of development. In May 2013, external consultants were appointed by the MP government to prepare detailed project reports for the MRTS of the two cities. Based on the multi-criteria analysis and recommendations of consultants, the state government approved the inception reports prepared by the consultant in June 2014. As on December 2014, geotechnical surveys and formation of the companies are being carried on for the implementation of the projects.

MP Metro project details

	Indore	Bhopal
No of corridors	6	3
Metro Type	Light metro rail	Light metro rail
Total estimated cost (Rs bn)	120	80
Length (km)	107	85
No. of Stations	75	89
Estimated daily ridership	1,90,000	2,20,000
Expected CoD	2,019	2,021

Few basics about metro projects

Metro projects, unlike any other infrastructure project (like roads, ports or airports) are highly complex to design and construct. Right from the choice of which transport system to use (metro, LRT, monorail), to the design (underground, overhead, at-grade), it is a complex decision process. And it does not end there. Once decided, the executing body needs to decide on the tunnelling methodology, the signalling technology, and the kind of rolling-stock / coaches it needs to procure. This section tries to simplify the process by listing few thumb rules for various stages of executing a metro project – at the risk of over-simplifying!

As a thumb rule, cities with expected PHPDT (Peak Hour Peak Direction Traffic) of less than 10,000 passengers should not opt for a metro system – an LRT or monorail is considered sufficient for this. However, other variables, such as expected growth in the population of the city, average trip length, and status of other infrastructure projects also need to be considered.

Choice of a mass transit system

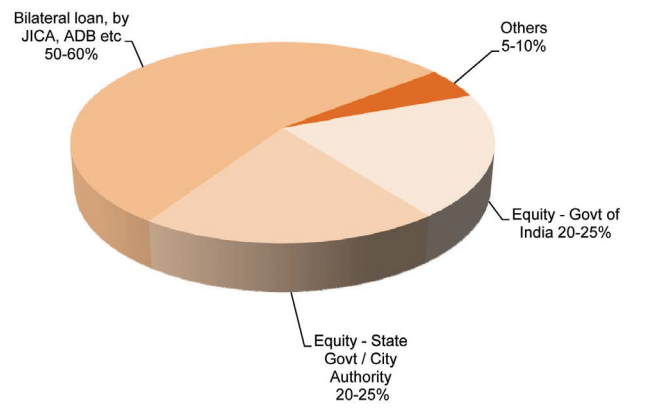
Transport System	PHPDT	Population (mn)	Avg Trip Length
Metro Rail	>=15000	2.0	>= 7km
LRT primarily at grade	=<10,000	1.0	>= 7km
Monorail	=<10,000	2.0	5-6km
Bus Rapid Transit System	4000 - 20000	1.0	>5km
Organised City Bus Service	NA	0.1	2-3km

Typical cost of a metro project

Metro	Cost per km Rs bn	Station cost Rs bn	EPC Cost	Signalling & Transmission	Rolling Stock
Overhead	1.0-2.0	0.5-1.0	50-60%	8-10%	15-20%
Underground	3.0-6.0	2.0-3.0	40-50%	10-12%	20-25%

Source: Companies

Typical funding plan of a metro project



The execution cost of a metro network varies from city to city – in fact it varies at different points inside a city. Lots of factors like nature of soil, population density, and status of underground utilities – determine the final cost. However, as a thumb rule, in a city with an average population density, and assuming no cost/time overruns, an overhead metro is expected to cost Rs 1.0-2.0bn per km, while an underground network almost thrice that.

In terms of types of technology used, there are broad classifications under which most metro projects fall:

Signalling/Train Control System:

ATC (Automatic Train Control), Automatic Train Operation (ATO), ATP (Automatic Train Protectin) and ATS (Automatic Train Supervision). Further, ATC has two variants – CBTC (Communication base train control) or RF-CBTC (Radio Frequency CBTC). Cityflo and Urbalis are proprietary signalling systems deployed by Bombardier and Alstom respectively.

Rolling stock:

Post DMRC Phase-2, all metro systems (excl Ahmedabad) have been designed to run on standard guage (1435mm). The control system technology used by most of these fall into two broad categories – SCADA (Supervisory Control and Data Acquisition) or TIMS (Train Integrated Management System).

Signalling technology used by metro projects

Metro project	Delhi Metro Phase II	Navi Mumbai Metro	Kochi Metro	Lucknow Metro
Signalling technology	Cityflo 350	CBTC	Urbalis 400	Urbalis

Rolling stock specifications used by metro projects

Parameter	Delhi Metro (Phase III)	Kolkata Metro (East-West corridor)	Hyderabad Metro (Phase I)	Chennai Metro (Phase I)	Bangalore Metro (Phase I)	Jaipur Metro (Phase I)
Gauge	Standard gauge (1,435 mm) and broad gauge (1,676 mm)	Standard gauge (1,435 mm)	Standard gauge (1,435 mm)	Standard gauge (1,435 mm)	Standard gauge (1,435 mm)	Standard gauge (1,435 mm)
Technology	SCADA	SCADA	Train Integrated Management System	SCADA	SCADA	SCADA
Capacity per car	~376	356	~330	319	356	~258
Max design speed	80 kmph	80 kmph	90 kmph	80 kmph	80 kmph	80 kmph
Braking system	Regenerative braking system	Electric braking	Electric regenerative braking system	Regenerative braking system	Microprocessor controlled	Electropneumatic regenerative system
Minimum radius of curve	220 metres	-	120 metres	300 metres for underground and 200 metres for elevated	120 metres	120 metres
Maximum super elevation	120 mm	-	125 mm	120 mm	125 mm	-

Source: Companies

Appendix:

Key players competing for metro projects in India

EPC - Domestic	EPC - Foreign	Rolling Stock
UNDERGROUND	Kyivmetrobud	Hyundai Rotem
L&T	Continental Engineering Corporation	Mitsubishi Corp
JKumar	Shanghai Tunnel Engineering	Melco
ITD Cementation	China Railway 25th Bureau Group	Bombardier
Pratibha Engg	China Railway 3 Engineering Group	Alstom Transport
HCC	China Railway Tunnel Group	CAF
OVERHEAD	OSJC Moscow Metrostroy	**Signalling & Transmission**
L&T	Guandong Tuantian Engineering	Alstom
JKumar	Obrascon Huarte Lain	Bombardier
Afcons	Strabag AG	Siemens
ITD Cementation	Skanska	Thales
NCC	Samsung	Sumitomo

Key contracts awarded for metro projects

	Delhi			Mumbai			Chennai	Kolkata
	Phase 1	**Phase 2**	**Phase 3**	**Phase 1**	**Monorail**	**Phase 3**		
EPC	Almost all EPC players in the country			Simplex Infra	L&T	L&T, Jkumar, ITD Cem	L&T, NCC, Gammon	ITD Cem
Signalling / Transmission	Alstom	Alstom, Bombardier	Bombardier	Siemens	NA	TBA	Siemens	Ansaldo
Rolling Stock	Huyn-dai-ROTEM, Mitsubishi Corp, BEML	Bombardier, BEML, CAF	Huyndai-RO-TEM	CSR Nanjing	Scomi	TBA	Alstom	CAF-MEL-CO
	Bengaluru	**Hyderabad**	**Jaipur**	**Gurgaon**	**Lucknow**	**Ahmedabad**	**Nagpur**	**Kochi**
EPC	IVRCL	L&T	ITD Cem, Continental Engg	ILFS Transport	L&T	Jkumar, ILFS	NCC	L&T, Era, Soma
Signalling / Transmission	Alstom	Thales	Alstom	NA	L&T	NA	TBA	Alstom
Rolling Stock	Hyundai-RO-TEM, BEML, Mitsubishi	Hyundai-RO-TEM	BEML	Siemens	Alstom India	NA	TBA	Alstom

Source: Companies

Growth to resume as UNCERTAINITY subsides

BY PRADEEP AGRAWAL

Ms. Subhasri Sriram, Executive Director and CFO, Shriram City Union Finance, has been at the helm for now close to two decades and has taken business to a position where it is now commanding major share of SME and two-wheeler financing market in India. In an open discussion with ground view, she spoke about the current state of SME & two-wheeler segment and outlook for her company.

Credit growth in the MSME segment has moderated to just 9% from a peak of +20% two years ago. The moderation is more acute in the manufacturing segment than in services. What has led to this?

When large industrial activity is not continuous, smaller companies are less enthusiastic to invest in catering to larger industries. So SMEs start depending more on the regional market for growth. Lack of fresh investments has been the primary reason for moderation in credit growth in the MSME segment. With respect to Shriram City, Balance sheet growth was not so visible in the past largely because macroeconomic conditions were not too comfortable for us to keep the money outstanding for long since we were unsure about the direction the wind would blow in. In a situation of the economy tightening further, we did not want to keep too much money outstanding in the system. We took a cautionary view and started lending for a shorter duration. We reduced the loan tenors to 1 to 2 year from 4 years earlier. However, we have now moved back to 3 years duration.

"20% growth is sustainable with the pace with which we are moving; it may accelerate to 25%+ as we roll out an increase in ticket size to a larger customer base".

How do you see the credit demand in the next 2-3 years from the MSME segment and what will drive it?

While the economy remains very tight and we do not see a great level of enthusiasm in our customers at this point in time, there are a few pockets which are doing better. I do not see things deteriorating further from the current levels as there are no negative or detrimental factors with respect to government policies, macro economic conditions or local issues. While today 20% growth is sustainable given the pace at which we are moving, the growth may accelerate further to 25%+ as we roll out higher ticket loans to a larger number of customers who are part of our own existing customer database and also by adding this product line in several of our matured branches. The pilot has already started in Southern India where the average ticket size has increased to Rs1.5mn from Rs1mn earlier. Moreover, loan tenors are also seeing extensions to 5 years from 3 years currently, specifically for higher ticket loans of around Rs.5mn.

What is the market size for small enterprise finance and what is the potential market (target segment) for SCUF within that?

The MSME sector contributes around 45% to India's GDP. However, a large part of the sector is unorganised and receives funding from unorganized sources. Hence, organised market size looks smaller than it actually is because many businesses that are conducted from households never get reported at all. They are not even part of the GDP calculation. I see some of this unorganized business shifting to the organised-financing market, creating lot of opportunity for MSME financiers.

How is the SME business doing in the non-chit regions? What was your experience so far in terms of growth and asset quality?

On every parameter – whether it was balance-sheet growth or asset quality – new SME business in the northern and western regions is doing better than in the south. But there is a reason – on a small base the growth is fast and you take least risk when the portfolio is small. Asset quality in non-south regions is fabulous but that does not mean asset quality in the south is bad. That means we were successful in doing what we attempted to do. We will see a lot of activity in the non-south market and in the south market we will see streamlining and consolidation of the processes. In the south market, the pilot has already started – where ticket size and tenure has been increased.

What is your market share in two-wheeler financing? What is the strategy for two-wheelers?

While we finance around 5% of the total two-wheeler sales in India, in terms of financed two-wheelers, our share is 25-30%. In some part of the south, we have 50% of the financed market. Two-wheeler financing on a standalone basis is a profitable business for us, besides being one of the most promising segments. Until 2008, 70-80% of the two-wheelers sold in India were financed, which fell to as low as 15-20% (between 2008-10), and has now moved back to 30%. The growth engine in two wheelers is not about manufacturers selling more – it is about converting cash sales to credit. Two thirds of the total sales are in cash, so we can still double our business without the OEMs

manufacturing more. While we have good distribution reach, it's a question of educating customers and making them more comfortable about taking finance. There is a need for streamlined and customer friendly-processes to increase productivity.

How is the current financial health of the SME sector? Do you see any segment-specific risk or region-specific risk in this space?

The risk is largely to the over-ambitious financiers, especially in LAP financing, where end-use is not monitored or there are cash-flow mismatches. In a collateral-backed loan, further supported by the borrower's cash flows, you can finance even 110% of collateral, but where there is no cash flow and only collateral, even 10% (LTV) financing is bad. In India, real-estate disposal is a big challenge – you cannot dispose a property in less than three years due to legal hassles. Hence, in a scenario where property prices remain under pressure or remain stable for a prolonged period, even at lower LTVs, financiers would lose, because of accounting for overdue interest.

How big a competition are small-finance banks for an NBFC like you? Will they change the way NBFCs do business?

We do not see any threat from small-finance banks, as their area of operations is very small compared with ours – we are present across the country. In any case, these companies were already doing business as microfinance entities. So nothing changes for us.

When do you intend to migrate to 90dpd norms. Will it be in line with the RBI road map? How does your GNPA, credit cost, and coverage ratio look in this regime. Will it change some of the business decisions like sourcing and recovery?

The transition to tighter NPL norms will be exactly on the same timelines as prescribed by the RBI. We will move to 150dpd in Q4FY16, 120dpd in Q4FY17, and 90dpd in Q4FY18. The transition will result in a 200bps increase in GNPA at every transition phase. It is likely to increase to ~5% by FY16 and to 7% by FY17 and to 9% by FY18. Provision cover will also come down to 70% on 150dpd and further to 50% on 90dpd from the current 80% levels. We are not actively educating customers on tighter NPL norms unlike other NBFCs who we believe propose to do so, and hence we do not expect change in customer behavior to be dramatic.

What's your outlook on the NIMs? What will be the impact of interest reversal on NIMs on account of transition to tighter NPL norms?

Impact on account of additional income reversal is about 50 bps. As it stands now, we are not proposing to reduce our lending rates in our existing segments. However, as we progress further in our effort to cross sell and offer longer term loans to our existing relationship customers, we may look at reducing the yields in those specific segments However, this will be more than compensated by reduced opex and better employee productivity. On a standalone mode, there can be marginal compression in yields. This too, we expect to be more than compensated with some reduction in borrowed funds. Overall, our objective is to protect current NIMs.

Your opex-to-income ratio remains on the higher side at ~39%. What kind of cost ratio are you targeting over the next 2-5 years?

Opex ratio would have come down to 37% on 180dpd basis in a one-and-half year time frame. However, as we move to tighter NPL norms, our income will start shrinking while cost will largely remain the same, so cost as ratio to income will look higher. On 120dpd, opex ratio will continue to be at 40%.

With banks shifting to marginal cost of funds based lending rate, how much benefit do you expect in cost of funds?

There is a bit of uncertainty surrounding MCLR – what rate will the banks charge us under new regime? Even banks themselves are not clear. However, I believe banks would keep it very close to base rates. So we are not expecting any benefit on cost of funds under the new structure – at least not over the next 6-12 months –until banks have a better grip on the new structure.

Where do you see Shriram City in the next 10 years?

We are at a very interesting stage in our organization's lifetime – we have evolved products, a matured business, and much of our groundwork is done. In constructing a building, the foundation is the most difficult part – it takes a lot of time, but the super structure comes up very fast. We are at that stage where the foundation is very strong, all engines are on, we just have to accelerate. Shriram City is well primed for growth. In the next 10 years Shriram City will evolve as an institution to reckon with in the SME financing segment.

Indian Economy – Trend Indicators

Monthly Economic Indicators

Growth Rates (%)	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16
IIP	2.8	4.8	2.5	3.0	2.5	4.2	4.3	6.3	3.8	9.9	-3.4	-1.2	-1.5	-
PMI	52.9	51.2	52.1	51.3	52.6	51.3	52.7	52.3	51.2	50.7	50.3	49.1	51.1	51.1
Core sector	2.3	1.4	-0.1	-0.4	4.4	3.0	1.1	2.6	3.2	3.2	-1.3	0.9	2.9	-
WPI	-0.9	-2.1	-2.3	-2.4	-2.2	-2.1	-4.0	-5.1	-4.6	-3.7	-2.0	-0.7	-0.9	-1.0
CPI	5.2	5.4	5.3	4.9	5.0	5.4	3.7	3.7	4.4	5.0	5.4	5.6	5.7	5.2
Money Supply	10.8	11.2	11.1	11.0	11.0	11.0	11.5	11.3	11.0	10.9	10.7	11.0	11.1	11.3
Deposit	10.9	11.2	11.4	11.4	11.5	11.4	11.8	11.9	11.3	11.1	10.4	10.9	11.1	11.0
Credit	8.9	7.2	8.7	9.7	8.8	9.5	9.4	9.0	7.5	9.0	9.8	11.1	11.4	11.6
Exports	-9.3	-13.3	-21.1	-14.0	-20.2	-15.8	-10.3	-20.7	-24.3	-17.5	-24.4	-14.7	-13.6	-5.7
Imports	-11.2	-14.7	-13.4	-7.5	-16.5	-13.4	-10.3	-9.9	-25.4	-21.2	-30.3	-3.9	-11.0	-5.0
Trade deficit (USD Bn)	-7.9	-6.7	-11.8	-11.0	-10.4	-10.8	-12.8	-12.5	-10.5	-9.8	-9.8	-11.7	-7.6	-6.5
Net FDI (USD Bn)	1.1	1.2	1.8	0.5	0.8	0.8	1.1	1.4	2.0	2.7	3.3	4.8	5.7	-
FII (USD Bn)	6.6	3.8	2.0	3.1	-2.8	-2.0	-0.7	-3.5	-2.4	4.5	-3.8	-2.6	-2.0	-
ECB (USD Bn)	113.6	114.5	115.1	116.4	118.4	119.9	120.6	119.4	121.8	122.5	121.2	122.6	121.7	-
NRI Deposits (USD Bn)	61.9	61.8	62.5	63.4	63.8	63.7	64.1	66.5	65.6	65.3	66.7	66.2	67.8	68.4
Dollar-Rupee	327.9	338.1	341.4	344.6	352.5	355.2	353.3	355.4	350.0	353.6	351.6	352.1	349.2	346.8
FOREX Reserves (USD Bn)	295.8	291.9	293.4	296.4	287.9	284.6	280.2	275.5	276.3	283.0	291.3	295.7	292.2	294.4

Quarterly Economic Indicators

Balance of Payment (USD Bn)	Q2FY14	Q3FY14	Q4FY14	Q1FY15	Q2FY15	Q3FY15	Q4FY15	Q1FY16	Q2FY16
Exports	81.2	79.8	83.7	81.7	85.3	79.0	70.8	68.0	67.6
Imports	114.5	112.9	114.3	116.3	123.9	118.3	102.5	102.2	105.0
Trade deficit	-33.3	-33.2	-30.7	-34.6	-38.6	-39.3	-31.7	-34.2	-37.4
Net Invisibles	28.1	29.1	29.3	26.7	28.5	30.9	30.2	28.0	29.2
CAD	-5.2	-4.1	-1.3	-7.9	-10.1	-8.4	-1.5	-6.1	-8.2
CAD (% of GDP)	1.2	0.9	0.3	1.6	2.0	1.7	0.3	1.2	1.6
Capital Account	-4.8	23.8	9.2	19.2	16.5	23.6	30.7	18.1	7.2
BoP	-10.4	19.1	7.1	11.2	6.9	13.2	30.1	11.4	-0.9

GDP and its Components (YoY, %)	Q3FY14	Q4FY14	Q1FY15	Q2FY15	Q3FY15	Q4FY15	Q1FY16	Q2FY16	Q3FY16
Agriculture & allied activities	3.8	4.4	2.6	2.8	-2.4	-1.4	1.6	2.0	-1.0
Industry	5.5	5.5	8.1	6.2	3.4	7.2	7.1	8.4	11.0
Mining & Quarrying	4.2	11.5	4.3	7.0	9.1	2.3	8.6	5.0	6.5
Manufacturing	5.9	4.4	8.4	5.8	1.7	8.4	7.3	9.0	12.6
Electricity, Gas & Water Supply	3.9	5.9	10.1	8.8	8.8	4.2	4.0	7.5	6.0
Services	8.3	5.6	8.4	9.9	11.7	8.0	8.5	8.3	8.6
Construction	3.8	1.2	6.5	5.3	4.9	1.4	6.0	1.2	4.0
Trade, Hotel, Transport and Communications	12.4	9.9	12.1	8.4	6.2	14.1	10.5	8.1	10.1
Finance, Insurance, Real Estate & Business Services	5.7	5.5	9.3	12.7	12.1	10.2	9.3	11.6	9.9
Community, Social & Personal Services	9.1	2.4	2.8	10.3	25.3	0.1	6.1	7.1	7.5
GDP at FC	6.6	5.3	7.4	8.1	6.7	6.1	7.2	7.5	7.1

Annual Economic Indicators and Forecasts

Indicators	Units	FY8	FY9	FY10	FY11	FY12	FY13	FY14	FY15	FY16E	FY17E
Real GDP growth	%	9.3	6.7	8.6	8.9	6.7	4.5	4.7	7.2	6.8	7.5
Agriculture	%	5.8	0.1	0.8	8.6	5.0	1.4	4.7	0.2	2.0	4.0
Industry	%	9.2	4.1	10.2	8.3	6.7	0.9	-0.1	6.6	5.7	6.7
Services	%	10.3	9.4	10.0	9.2	7.1	6.2	6.0	9.4	8.5	8.8
Real GDP	Rs Bn	38966	41587	45161	49185	52475	54821	91698	98271	104953	112825
Real GDP	US$ Bn	967	908	953	1079	1096	1008	1517	1611	1615	1684
Nominal GDP	Rs Bn	49864	56301	64778	77841	90097	101133	113451	126538	137626	153212
Nominal GDP	US$ Bn	1237	1229	1367	1707	1881	1859	1876	2074	2117	2287
Population	Mn	1138	1154	1170	1186	1202	1219	1236	1254	1271	1302
Per Capita Income	US$	1087	1065	1168	1439	1565	1525	1518	1655	1666	1757
WPI (Average)	%	4.7	8.1	3.8	9.6	8.7	7.4	6.0	2.0	-2.0	4.0
CPI (Average)	%	6.4	9.0	12.4	10.4	8.3	10.2	9.5	6.0	5.0	5.0
Money Supply	%	22.1	20.5	19.2	16.2	15.8	13.6	13.5	12.0	12.0	13.0
CRR	%	7.50	5.00	5.75	6.00	4.75	4.00	4.00	4.0	4.0	4.0
Repo rate	%	7.75	5.00	5.00	6.75	8.50	7.50	8.00	7.50	6.75	6.25-6.5
Reverse repo rate	%	6.00	3.50	3.50	5.75	7.50	6.50	7.00	6.50	5.75	5.25-5.5
Bank Deposit growth	%	22.4	19.9	17.2	15.9	13.5	14.4	14.6	11.4	12.0	13.5
Bank Credit growth	%	22.3	17.5	16.9	21.5	17.0	15.0	14.3	9.5	10.0	12.0
Centre Fiscal Deficit	Rs Bn	1437	3370	4140	3736	5160	5209	5245	5107	5351	5339
Centre Fiscal Deficit	% of GDP	2.9	6.0	6.4	4.8	5.7	5.2	4.6	4.1	3.9	3.5
Gross Central Govt Borrowings	Rs Bn	1681	2730	4510	4370	5098	5580	5641	5920	5850	6000
Net Central Govt Borrowings	Rs Bn	1318	2336	3984	3254	4362	4674	4536	4531	4406	4252
State Fiscal Deficit	% of GDP	1.5	2.4	2.9	2.1	1.9	2.0	2.5	2.4	2.0	1.5
Consolidted Fiscal Deficit	% of GDP	4.4	8.4	9.3	6.9	7.6	6.9	7.1	6.6	5.9	5.0
Exports	US$ Bn	166.2	189.0	182.4	251.1	309.8	306.6	318.6	316.7	270.0	283.5
YoY Growth	%	28.9	13.7	-3.5	37.6	23.4	-1.0	3.9	-0.6	-14.8	5.0
Imports	US$ Bn	257.6	308.5	300.6	381.1	499.5	502.2	466.2	460.9	406.0	428.3
YoY Growth	%	35.1	19.7	-2.5	26.7	31.1	0.5	-7.2	-1.1	-11.9	5.5
Trade Balance	US$ Bn	-91.5	-119.5	-118.2	-129.9	-189.8	-195.6	-147.6	-144.2	-136.0	-144.8
Net Invisibles	US$ Bn	75.7	91.6	80.0	84.6	111.604	107.5	115.2	116.2	118.8	121.1
Current Account Deficit	US$ Bn	-15.7	-27.9	-38.2	-45.3	-78.2	-88.2	-32.4	-27.9	-17.2	-23.7
CAD (% of GDP)	%	-1.3	-2.3	-2.8	-2.6	-4.2	-4.7	-1.7	-1.4	-0.8	-1.0
Capital Account Balance	US$ Bn	106.6	7.8	51.6	62.0	67.8	89.3	48.8	90.0	50.4	75.5
Dollar-Rupee (Average)		40.3	45.8	47.4	45.6	47.9	54.4	60.5	61.2	65.0	67.0

Source: RBI, CSO, CGA, Ministry of Agriculture, Ministry of commerce, Bloomberg, PhillipCapital India Research

PhillipCapital India Coverage Universe: **Valuation Summary**

		CMP	Mkt Cap	Net Sales (Rs mn)		EBIDTA (Rs mn)		PAT (Rs mn)		EPS (Rs)		EPS Growth (%)		P/E (x)		P/B (x)		EV/EBITDA (x)		ROE (%)		ROCE (%)	
Name of company	Sector	Rs	Rs mn	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E
Chambal Fertilisers	Agri Inputs	57	23,534	106,626	105,340	8,258	8,387	3,619	3,692	9	9	36.9	2.0	6.5	6.3	0.9	0.8	6.5	6.2	14.4	13.3	6.9	6.9
Zuari Agrochemicals	Agri Inputs	162	6,811	51,046	54,930	2,470	3,230	181	828	4	20	-66.8	358.3	37.7	8.2	0.8	0.8	11.2	8.0	2.2	9.5	0.6	2.7
Rallis India	Agri Inputs	172	33,410	16,417	18,660	2,433	2,934	1,323	1,638	7	8	-15.9	23.8	25.3	20.4	3.7	3.3	14.1	11.5	14.7	16.4	13.3	15.1
Tata Chemicals Ltd	Agri Inputs	364	92,782	181,331	190,743	23,766	26,245	8,950	10,284	35	40	11.8	14.9	10.4	9.0	1.5	1.4	6.6	5.7	14.6	15.1	8.4	9.2
Kaveri Seeds	Agri Inputs	377	26,034	9,247	11,136	2,080	2,784	1,990	2,842	29	41	-33.9	42.8	13.0	9.1	2.9	2.4	11.5	8.2	22.1	25.7	23.4	27.5
United Phosphorus	Agri Inputs	458	196,301	128,903	141,881	25,315	27,296	11,375	13,489	27	31	-3.3	18.6	17.3	14.6	3.1	2.7	8.5	7.9	18.5	19.8	16.0	16.1
Monsanto India	Agri Inputs	1,630	28,130	4,943	5,764	890	1,043	790	956	46	55	-26.9	21.0	35.6	29.4	7.4	7.5	30.8	26.2	20.6	25.3	17.9	19.8
PI Industries	Agri Inputs	556	76,236	22,849	27,361	4,477	5,355	2,871	3,637	21	27	16.7	26.7	26.5	20.9	6.7	5.3	16.7	13.6	25.3	25.3	26.1	26.0
Coromandel Intl	Agri Inputs	194	56,458	98,386	105,672	7,489	9,763	3,371	4,966	12	17	-16.8	47.3	16.7	11.4	2.0	1.8	9.0	6.5	12.0	16.1	13.7	17.2
Deepak Fertilisers	Agri Inputs	149	13,125	33,995	n.a.	5,176	n.a.	2,610	n.a.	30	n.a.	13.0	n.a.	5.0	-	0.7	-	3.4	-	15.2	-	11.6	-
Tata Motors	Automobiles	377	1,228,254	2,582,235	2,766,233	385,505	456,242	119,825	158,535	37	49	-14.9	32.3	10.1	7.6	1.8	1.4	4.6	4.0	17.4	18.7	8.2	9.4
Bharat Forge	Automobiles	788	183,477	75,839	85,114	15,970	17,919	8,556	10,428	37	45	19.2	21.9	21.4	17.6	4.5	3.8	12.2	10.6	21.0	21.4	15.4	17.3
Mahindra & Mahindra	Automobiles	1,220	757,950	383,840	426,543	52,586	59,716	33,776	39,069	57	66	9.4	15.7	21.4	18.5	3.2	2.9	14.6	12.6	15.2	15.6	12.9	13.8
Ashok Leyland	Automobiles	108	306,074	175,338	212,276	19,077	23,825	8,908	12,375	3	4	280.9	38.9	34.4	24.7	5.3	4.4	16.6	13.1	15.3	17.9	12.7	15.5
Apollo Tyres	Automobiles	173	87,858	118,404	118,681	19,241	18,752	10,269	9,107	20	18	-3.1	-11.3	8.5	9.6	1.5	1.3	4.8	5.3	18.6	14.1	15.8	12.3
Maruti Suzuki	Automobiles	3,573	1,079,347	557,984	678,681	89,875	107,652	47,990	67,041	159	222	29.3	39.7	22.5	16.1	3.9	3.2	12.0	9.8	17.3	20.0	17.4	20.6
Mahindra CIE	Automobiles	190	61,427	60,664	68,334	7,519	9,345	3,171	4,607	10	14	32.9	45.3	19.3	13.3	2.8	2.4	9.7	7.3	14.3	17.7	10.5	14.5
Bajaj Auto	Automobiles	2,395	693,092	224,979	278,066	48,131	59,019	37,355	43,542	129	150	18.4	16.6	18.6	15.9	5.4	4.5	14.1	11.2	29.1	28.2	26.6	26.5
Hero MotoCorp	Automobiles	2,995	598,064	283,477	317,012	44,724	49,335	31,533	34,996	158	175	24.1	11.0	19.0	17.1	7.4	6.2	13.3	12.0	38.9	36.1	38.7	36.0
Cummins India	Capital Goods	875	242,453	48,074	56,014	8,184	10,074	7,992	9,102	29	33	14.9	13.9	30.3	26.6	7.6	6.8	29.5	24.0	25.1	25.7	21.6	22.7
Engineers India	Capital Goods	166	56,016	15,978	15,186	1,736	2,195	2,722	2,803	8	8	-17.6	3.0	20.6	20.0	2.1	2.0	18.1	14.9	10.1	10.1	10.2	10.3
Siemens	Capital Goods	1,131	402,665	103,609	112,998	8,137	10,259	6,169	8,582	17	24	73.7	39.1	65.2	46.9	8.5	7.8	46.4	35.9	13.0	16.6	10.6	13.6
Crompton Greaves	Capital Goods	50	31,275	127,703	142,459	6,220	8,709	1,486	3,578	2	6	-19.3	140.8	21.0	8.7	0.8	0.7	7.7	5.2	3.7	8.4	3.2	6.5
VA Tech Wabag	Capital Goods	519	28,286	28,942	33,622	2,388	2,883	1,225	1,483	23	27	9.6	21.0	23.0	19.0	2.8	2.5	11.4	9.6	12.3	13.4	9.8	10.6
Voltas	Capital Goods	277	91,655	55,468	58,401	3,326	4,615	2,711	3,690	8	11	-18.5	36.1	33.8	24.8	4.0	3.6	27.3	19.1	11.8	14.3	12.0	14.9
BHEL	Capital Goods	114	278,782	258,137	295,131	-10,904	15,208	-5,473	12,262	-2	5	n.a.	n.a.	-50.9	22.7	0.8	0.8	-12.3	10.7	-1.6	3.5	-1.2	2.8
Alstom T&D	Capital Goods	423	108,231	41,950	43,904	3,793	4,236	1,821	2,096	7	8	40.5	15.1	59.4	51.6	7.4	6.9	28.7	25.3	12.4	13.4	12.4	13.1

PhillipCapital India Coverage Universe: **Valuation Summary**

		CMP	Mkt Cap	Net Sales (Rs mn)		EBIDTA (Rs mn)		PAT (Rs mn)		EPS (Rs)		EPS Growth (%)		P/E (x)		P/B (x)		EV/EBITDA (x)		ROE (%)		ROCE (%)	
Name of company	Sector	Rs	Rs mn	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E
ABB India	Capital Goods	1,308	277,219	81,403	92,625	7,125	8,633	2,999	3,885	14	18	15.8	29.6	92.4	71.4	9.2	8.6	38.9	32.1	10.0	12.1	9.5	11.0
Larsen & Toubro	Capital Goods	1,212	1,128,813	1,017,884	1,127,411	119,264	138,973	44,079	54,793	47	59	-0.2	24.3	25.7	20.7	2.6	2.4	17.6	15.0	10.0	11.4	4.4	4.9
KEC International	Capital Goods	126	32,329	87,242	93,074	6,769	7,531	1,807	2,290	7	9	59.4	26.7	17.9	14.1	2.2	2.0	7.9	6.9	12.2	13.8	9.5	10.3
Thermax	Capital Goods	745	88,748	54,828	51,416	4,676	4,543	2,825	2,720	24	23	21.0	-3.7	31.4	32.6	3.8	3.6	19.3	19.0	12.2	11.0	9.6	8.6
Inox Wind	Capital Goods	248	54,936	42,332	49,830	6,764	8,519	4,531	5,715	20	26	71.0	26.1	12.1	9.6	3.2	2.5	9.3	7.3	26.1	26.3	18.0	18.3
Alstom India	Capital Goods	633	42,555	23,144	n.a.	1,174	-26,159	918	-26,429	14	-393	-33.8	n.a.	46.4	-1.6	3.7	-	26.4	-1.1	8.0	-	8.5	-462.5
Dalmia Bharat Ltd	Cement	800	71,017	65,288	80,830	13,495	20,020	1,308	5,202	15	59	1,205.6	297.7	54.2	13.6	1.6	1.6	10.0	6.7	2.9	11.6	5.0	7.7
Shree Cement	Cement	12,408	432,276	60,803	88,591	14,340	25,234	5,323	11,146	204	320	66.5	57.1	60.9	38.8	7.5	6.5	29.4	16.2	12.4	16.7	11.8	17.1
Mangalam Cement	Cement	238	6,360	8,461	9,655	513	1,075	-187	220	-7	8	n.a.	n.a.	-33.9	28.9	1.2	1.2	23.1	10.5	-3.7	4.2	0.9	4.6
OCL India	Cement	470	26,743	25,121	29,245	4,144	5,573	1,878	3,025	33	53	38.2	61.0	14.2	8.8	1.9	1.6	6.5	4.3	13.5	18.7	11.1	16.5
JK Lakshmi Cement	Cement	333	39,155	25,754	32,671	4,009	5,450	705	1,904	6	16	-57.9	170.2	55.6	20.6	2.8	2.6	14.6	10.1	5.0	12.4	5.5	8.4
JK Cement	Cement	670	46,823	34,229	40,965	4,596	6,598	638	1,910	9	27	-48.9	199.5	73.4	24.5	2.8	2.6	16.1	11.1	3.8	10.6	4.6	6.9
HeidelbergCement	Cement	92	20,905	18,151	20,061	2,156	2,962	362	989	2	4	n.a.	173.3	57.8	21.1	2.3	2.1	13.8	9.3	4.0	9.8	4.2	6.8
India Cement	Cement	89	27,446	58,814	65,319	8,224	9,926	966	2,430	3	8	n.a.	151.7	28.4	11.3	0.8	0.7	6.7	5.1	2.7	6.0	4.6	6.4
Ambuja Cement	Cement	229	355,462	217,573	257,518	28,955	41,401	13,506	18,531	7	9	-29.3	37.2	33.6	24.5	2.4	2.3	11.6	8.0	7.2	9.5	10.4	10.7
ACC	Cement	1,428	268,044	114,328	126,246	11,730	15,917	7,520	9,415	40	50	-35.3	25.2	35.7	28.5	3.2	3.1	21.7	16.2	8.9	10.8	8.1	9.7
Ultratech Cement	Cement	3,189	875,050	269,193	323,990	48,321	65,056	22,321	33,557	81	122	6.4	50.3	39.2	26.1	4.2	3.7	19.8	14.1	10.6	14.1	8.2	11.0
LIC Housing Finance	Financials	468	236,006	124,490	147,147	25,186	29,807	16,280	19,248	32	38	17.4	18.2	14.5	12.3	2.6	2.2	9.4	7.9	19.2	19.4	1.3	1.3
DCB Bank	Financials	83	23,480	6,208	7,681	3,553	3,210	1,623	1,298	6	5	-15.1	-20.0	14.3	17.9	1.5	1.4	6.6	7.3	10.0	7.4	0.9	0.6
Indusind Bank	Financials	955	568,450	45,347	54,526	42,493	50,352	22,783	26,948	39	46	14.1	18.3	24.7	20.9	3.3	2.9	13.4	11.3	16.6	14.6	1.9	1.8
Repco Home Finance	Financials	632	39,554	2,508	10,987	2,508	3,196	1,492	1,901	24	30	20.7	-	26.5	20.9	4.2	0.1	15.8	15.8	17.0	18.4	2.2	2.2
Punjab National Bank	Financials	81	159,739	172,775	195,620	127,147	140,053	31,259	43,195	16	21	-3.9	31.7	5.1	3.9	0.5	0.5	1.3	1.1	7.9	9.8	0.5	0.6
Bank of India	Financials	93	75,386	113,051	127,049	63,902	74,176	-31,887	11,076	-21	17	-182.5	-178.1	-4.4	5.6	0.7	0.5	1.2	1.0	-11.5	3.8	-0.5	0.2
Corporation bank	Financials	39	39,468	43,730	49,080	32,989	36,350	-1,921	2,648	22	26	28.4	15.1	1.7	1.5	0.1	0.1	1.2	1.1	-1.8	2.3	-0.1	0.1
Bank of Baroda	Financials	143	330,301	123,908	144,969	85,903	103,271	-15,488	35,224	10	17	-33.2	65.5	14.0	8.5	1.0	0.9	3.8	3.2	-4.0	8.8	-0.2	0.5
State Bank of India	Financials	184	1,427,187	761,480	865,203	504,778	504,629	126,779	145,077	24	28	4.2	15.1	7.7	6.7	1.0	0.9	2.8	2.8	7.3	7.6	0.4	0.7
Union Bank	Financials	128	87,821	82,194	90,635	58,333	63,774	12,762	11,365	34	43	19.7	26.8	3.8	3.0	0.6	0.5	1.5	1.4	6.6	5.4	0.3	0.3

PhillipCapital India Coverage Universe: **Valuation Summary**

		CMP	Mkt Cap	Net Sales (Rs mn)		EBIDTA (Rs mn)		PAT (Rs mn)		EPS (Rs)		EPS Growth (%)		P/E (x)		P/B (x)		EV/EBITDA (x)		ROE (%)		ROCE (%)	
Name of company	Sector	Rs	Rs mn	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E
Canara Bank	Financials	185	100,345	91,757	99,117	69,458	71,508	10,027	14,946	48	65	-15.4	35.3	3.8	2.8	0.5	0.4	1.4	1.4	3.7	5.1	0.2	0.2
Indian Bank	Financials	102	48,966	44,674	48,420	31,614	33,215	7,386	9,103	22	28	5.3	28.6	4.6	3.6	0.5	0.4	1.5	1.5	5.7	6.7	0.4	0.4
OBC	Financials	88	26,327	53,538	59,126	38,913	41,596	547	4,262	31	43	86.7	38.7	2.8	2.0	0.3	0.3	0.7	0.6	0.4	3.0	0.0	0.2
ICICI Bank	Financials	223	1,293,965	211,212	243,027	250,632	256,001	120,868	130,580	21	22	7.9	7.8	10.7	9.9	1.6	1.5	5.2	5.1	14.3	14.0	1.8	1.7
Shriram Transport Fin	Financials	926	210,173	50,117	58,103	36,904	43,284	13,587	14,911	60	66	9.8	9.7	15.5	14.1	92.6	92.6	5.7	4.9	13.9	13.5	2.1	2.0
Shriram City Union	Financials	1,518	100,077	23,845	27,169	13,950	15,987	6,154	6,884	93	104	10.3	11.9	16.3	14.5	2.2	2.0	7.2	6.3	14.3	14.4	3.2	3.2
AXIS Bank	Financials	425	1,011,670	163,255	192,698	159,084	181,827	85,465	99,622	34	37	10.6	7.5	12.4	11.5	2.1	1.9	6.4	5.6	17.7	17.8	1.7	1.7
Cholamandalam Intl	Financials	727	113,440	20,710	24,084	12,220	14,700	5,304	7,224	34	46	12.5	36.2	21.3	15.6	3.1	2.6	9.3	7.7	15.6	18.2	2.1	2.4
HDFC Limited	Financials	1,102	1,741,063	311,386	353,656	100,235	114,400	69,114	79,030	32	38	17.4	-	34.2	28.9	5.0	4.4	17.4	15.2	21.0	21.1	2.6	2.6
Mahindra & Ma	Financials	234	132,977	31,755	35,666	20,160	22,752	5,509	7,602	10	13	-33.8	38.0	23.9	17.3	2.2	2.0	6.6	5.8	9.5	12.3	1.5	1.9
HDFC Bank	Financials	1,062	2,683,670	274,149	324,937	223,351	263,567	124,109	147,056	50	59	21.5	18.5	21.4	18.1	3.8	3.3	12.0	10.2	18.6	19.1	1.9	1.9
SKS Microfinance	Financials	547	69,607	12,614	19,290	4,149	6,085	2,964	4,301	24	34	58.5	45.1	23.2	16.0	5.2	3.9	16.8	11.4	24.9	27.7	4.8	4.2
Andhra Bank	Financials	52	35,421	52,389	59,881	36,449	41,930	4,814	9,668	14	18	32.4	26.6	3.7	2.9	0.4	0.4	1.0	0.8	4.9	8.9	0.2	0.4
Indian Overseas Bank	Financials	30	54,399	73,446	n.a.	48,072	n.a.	11,896	n.a.	8		72.2	-	3.6	-	0.4	-	1.1	-	7.1	-	0.3	-
Asian Paints	FMCG	863	828,075	151,051	172,681	27,732	32,997	17,910	21,074	19	22	25.9	17.7	46.2	39.3	14.8	12.4	29.8	24.7	31.9	31.6	32.6	31.9
Hindustan Unilever	FMCG	872	1,886,304	317,059	350,577	63,333	71,861	41,131	46,775	19	22	6.7	13.7	46.0	40.4	53.5	55.6	29.3	25.8	116.4	137.6	113.6	135.2
Bajaj Corp	FMCG	377	55,585	8,896	9,943	2,751	3,092	2,525	2,754	17	19	12.9	9.1	22.0	20.2	11.1	10.7	19.6	17.3	50.4	53.1	41.0	50.4
ITC	FMCG	326	2,622,585	360,415	394,483	143,426	159,741	96,533	107,593	12	13	5.1	11.5	27.0	24.2	7.5	6.6	17.5	15.6	27.7	27.1	23.6	23.7
Emami	FMCG	933	211,863	26,597	32,691	7,171	9,652	5,737	7,602	25	33	18.2	32.5	36.9	27.9	14.4	11.9	30.3	21.9	39.1	42.8	22.6	20.8
Nestle	FMCG	5,724	551,898	81,236	99,957	16,018	21,369	10,410	12,236	108	127	-12.2	17.5	53.0	45.1	22.7	21.6	34.0	25.3	42.8	48.0	39.5	49.1
Jubilant Foodworks	FMCG	1,227	80,747	24,320	28,923	2,730	3,564	1,081	1,502	17	23	-12.3	38.9	74.3	53.5	10.3	8.6	29.7	22.7	13.9	16.2	14.3	17.0
Marico Industries	FMCG	252	324,994	61,279	67,287	10,714	12,741	7,235	8,663	6	7	29.9	19.7	44.9	37.5	14.3	11.6	30.1	24.9	31.8	31.0	28.7	28.8
Colgate	FMCG	828	225,095	40,943	45,004	9,477	11,306	6,225	7,152	23	26	11.4	14.9	36.2	31.5	26.7	24.2	23.4	19.5	73.9	76.9	77.2	80.7
Agro Tech Foods	FMCG	475	11,575	7,790	8,304	623	760	304	392	12	16	-18.5	29.2	38.1	29.5	3.4	3.1	18.4	14.7	9.0	10.5	9.1	10.8
Dabur India Ltd	FMCG	248	435,915	83,780	95,353	15,307	17,658	12,674	14,537	7	8	18.9	14.7	34.3	29.9	10.6	8.9	28.4	24.2	31.0	29.7	28.5	27.9
Godrej Cons Product	FMCG	1,362	463,637	89,448	98,878	16,194	18,289	11,313	12,983	33	38	24.4	14.8	41.0	35.7	9.0	7.6	29.2	25.3	22.0	21.3	16.8	17.4
Britannia	FMCG	2,707	324,799	86,929	99,112	11,999	14,567	8,528	10,411	71	87	57.2	22.1	38.1	31.2	17.9	13.0	27.1	21.7	47.1	41.8	50.0	45.2

PhillipCapital India Coverage Universe: **Valuation Summary**

		CMP	Mkt Cap	Net Sales (Rs mn)		EBIDTA (Rs mn)		PAT (Rs mn)		EPS (Rs)		EPS Growth (%)		P/E (x)		P/B (x)		EV/EBITDA (x)		ROE (%)		ROCE (%)	
Name of company	Sector	Rs	Rs mn	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E
Apcotex Industries	FMCG	218	4,517	3,940	4,857	491	685	338	440	32	42	37.2	30.0	6.7	5.2	1.9	1.5	8.7	6.5	27.6	28.7	27.1	29.0
Glaxo Smithkline	FMCG	5,871	246,925	42,891	46,973	7,104	7,953	7,023	7,970	167	190	20.4	13.5	35.2	31.0	9.9	8.6	32.0	27.8	28.2	27.8	30.3	29.6
J Kumar Infraprojects	Infrastructure	252	19,034	14,775	18,469	2,719	3,371	1,154	1,614	15	21	4.2	39.8	16.5	11.8	1.5	1.3	6.7	6.0	11.1	11.8	10.8	11.4
PNC Infratech Ltd	Infrastructure	530	27,193	19,512	23,415	2,576	3,091	1,264	1,640	25	32	-2.3	29.8	21.5	16.6	2.1	1.9	10.9	9.4	12.7	12.2	11.6	11.3
GMR Infrastructure	Infrastructure	11	69,112	108,828	94,388	46,076	33,267	-16,983	-28,985	-3	-5	-46.1	70.7	-3.7	-2.2	0.9	1.6	11.0	14.6	-24.9	-73.7	2.2	-0.6
GVK Power	Infrastructure	7	10,976	29,885	48,605	18,897	28,264	-6,809	-3,136	-4	-2	33.8	-53.9	-1.6	-3.5	0.7	0.8	12.7	8.4	-45.7	-21.7	1.2	3.4
MBL Infrastructures Ltd	Infrastructure	156	6,473	21,433	24,648	2,358	2,711	705	783	17	19	-56.0	11.1	9.2	8.3	0.9	0.8	5.9	5.8	10.4	10.5	9.9	9.9
KNR Construction	Infrastructure	502	14,114	10,076	12,594	1,511	1,889	1,160	1,124	41	40	58.9	-3.1	12.2	12.6	2.1	1.8	9.5	7.6	18.5	15.3	17.4	14.6
NCC	Infrastructure	74	41,306	79,658	83,644	7,129	7,737	2,177	3,003	4	5	94.8	37.9	19.0	13.8	1.2	1.1	8.4	7.3	6.4	8.1	10.0	10.4
ITD Cementation	Infrastructure	113	17,463	36,304	41,750	3,086	3,966	1,016	1,532	7	10	957.1	50.8	17.2	11.4	2.9	2.3	8.3	6.6	17.2	20.6	14.1	15.8
Ashoka Buildcon	Infrastructure	136	25,396	26,758	33,201	7,950	10,989	963	1,393	5	7	0.3	44.5	26.4	18.2	1.3	1.2	8.4	6.0	5.0	6.7	4.5	6.1
Adani Ports & SEZ	Infrastructure	224	464,618	69,353	71,132	46,211	49,181	26,677	29,109	13	14	15.1	9.1	17.4	16.0	3.5	3.0	13.7	12.6	20.4	18.5	10.7	11.0
IRB Infrastructure	Infrastructure	225	79,059	49,104	55,492	26,355	31,495	5,904	6,378	17	18	2.8	8.0	13.4	12.4	1.5	1.3	8.2	7.4	11.2	10.1	3.2	3.5
Mindtree Ltd	IT Services	668	112,064	46,226	54,618	8,591	10,911	6,316	7,872	75	94	17.5	24.6	8.9	7.1	2.3	1.8	12.7	9.5	25.6	25.7	27.7	28.1
Wipro	IT Services	558	1,379,148	506,973	556,123	111,307	116,418	88,270	90,298	36	37	2.2	2.3	15.6	15.2	3.1	2.7	12.3	11.5	19.7	17.9	19.3	17.6
NIIT Technologies	IT Services	490	29,978	26,810	29,197	4,749	5,010	2,788	3,010	46	50	144.6	8.0	10.7	9.9	1.9	1.6	6.1	5.2	17.7	16.7	17.9	16.3
Infosys Technologies	IT Services	1,201	2,766,947	617,781	685,081	170,127	191,592	135,486	152,489	59	67	9.9	12.5	20.3	18.0	4.8	4.3	14.1	12.2	23.9	23.9	24.3	25.3
Tata Consultancy	IT Services	2,482	4,890,405	1,078,943	1,179,978	305,586	321,833	242,275	262,189	123	133	23.0	8.2	20.1	18.6	7.2	5.9	15.9	15.0	35.6	31.9	37.2	33.9
HCL Technologies	IT Services	839	1,182,957	424,181	471,306	93,035	104,790	73,388	84,233	52	60	1.0	14.8	16.1	14.1	4.1	3.5	12.7	11.2	25.6	25.2	26.0	26.1
Persistent Systems	IT Services	739	59,124	22,282	24,556	4,210	4,605	2,939	3,350	37	42	1.1	14.0	20.1	17.7	3.6	3.1	13.8	12.4	18.0	17.7	17.2	17.2
KPIT Technologies	IT Services	150	29,546	31,923	33,475	4,241	4,503	2,700	2,822	14	15	12.1	4.5	10.6	10.1	1.8	1.6	6.9	6.1	17.3	15.5	15.8	15.2
Tech Mahindra	IT Services	453	438,418	263,360	285,973	41,873	46,561	28,668	30,070	30	31	7.3	4.9	15.2	14.5	2.8	2.4	9.9	8.4	18.3	16.8	19.0	17.4
Zee Entertainment	Media	388	372,606	59,367	69,706	15,545	20,346	9,985	13,143	10	14	2.1	31.6	37.3	28.3	6.9	6.1	23.1	17.4	18.4	21.7	20.8	23.5
DB Corp Limited	Media	305	56,105	6,208	7,681	-280	-322	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	-	-	651.6	659.5	-200.1	-174.0	0.1	1.1	33.5	34.5
Jagran Prakashan	Media	159	51,865	20,941	23,558	5,991	6,960	3,242	4,109	10	13	41.1	26.7	15.5	12.2	3.1	2.6	8.9	7.2	19.8	21.2	16.3	16.1
HT Media	Media	77	18,015	24,898	27,363	3,077	4,074	1,692	2,431	7	10	-5.9	43.7	10.6	7.4	0.8	0.7	6.9	4.5	7.8	9.9	9.0	11.0
Dish TV	Media	88	93,580	30,925	35,240	9,889	11,321	2,414	3,904	2	4	7,586.6	61.8	38.8	24.0	-129.9	29.4	10.4	8.8	-335.1	122.6	671.4	87.1

PhillipCapital India Coverage Universe: **Valuation Summary**

		CMP	Mkt Cap	Net Sales (Rs mn)		EBIDTA (Rs mn)		PAT (Rs mn)		EPS (Rs)		EPS Growth (%)		P/E (x)		P/B (x)		EV/EBITDA (x)		ROE (%)		ROCE (%)	
Name of company	Sector	Rs	Rs mn	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E
Hindustan Media	Media	250	18,334	9,119	10,193	2,179	2,605	1,747	2,080	24	28	24.2	19.1	10.5	8.8	2.0	1.7	8.0	6.0	19.3	18.9	22.0	21.4
Eros International	Media	170	15,896	18,247	20,035	4,447	5,265	3,190	3,694	34	40	29.1	15.8	5.0	4.3	0.9	0.7	4.3	3.5	17.8	17.3	13.9	14.0
NALCO	Metals	38	98,708	64,688	67,074	7,987	8,334	6,775	7,150	3	3	-67.1	5.5	14.6	13.8	0.8	0.8	6.0	6.8	5.2	5.5	4.7	4.9
SAIL	Metals	43	178,626	372,349	439,027	-22,098	19,294	-31,364	-13,846	-8	-3	-243.8	-55.9	-5.7	-12.9	0.4	0.5	-22.3	26.8	-7.8	-3.6	-2.3	0.1
Tata Steel	Metals	329	319,093	1,236,774	1,324,421	64,736	143,892	3,150	32,223	3	33	9,900.8	922.9	101.3	9.9	1.1	1.0	16.6	7.2	1.0	10.0	1.9	4.6
Vedanta Ltd	Metals	88	259,559	626,550	692,821	156,308	176,309	30,793	45,927	8	12	-62.1	49.1	10.6	7.1	0.5	0.5	6.6	5.9	4.7	6.8	5.3	5.8
JSW Steel	Metals	1,293	312,474	428,642	544,923	62,073	116,228	930	34,716	4	144	-95.0	3,632.7	336.0	9.0	1.6	1.3	11.6	5.9	0.5	14.9	-0.1	8.1
Hindustan Zinc	Metals	162	685,347	138,571	137,004	66,403	63,998	74,829	71,705	18	17	-8.5	-4.2	9.2	9.6	1.4	1.3	5.1	4.7	15.7	13.9	15.1	13.3
Jindal Steel & Power	Metals	62	56,678	205,664	230,731	41,477	51,159	-18,148	-10,757	-20	-12	-386.5	-40.7	-3.1	-5.3	0.3	0.3	11.2	8.8	-8.6	-5.4	3.2	1.3
Hindalco Inds	Metals	89	183,680	1,004,752	1,055,956	86,301	106,340	-4,399	8,081	-2	4	-115.7	-283.7	-41.8	22.7	0.5	0.5	9.1	7.1	-1.2	2.1	2.3	3.4
Havells India Ltd	ELECTRICALS	327	204,521	52,986	62,975	7,110	8,470	3,547	6,023	6	10	-23.7	69.8	57.6	33.9	7.7	7.1	26.8	22.1	13.4	21.0	12.3	19.1
Finolex Cables Ltd	ELECTRICALS	284	43,412	24,029	28,031	3,112	3,802	2,168	2,564	14	17	23.1	18.3	20.0	16.9	-	-	13.3	10.3	15.0	15.6	15.2	15.7
VGuard Industries Ltd	ELECTRICALS	909	27,346	19,436	23,087	1,535	1,921	902	1,142	30	38	27.5	26.6	30.2	23.9	-	-	17.9	14.1	20.0	20.9	18.9	20.7
KEI Industries	ELECTRICALS	99	7,623	24,036	27,954	2,389	2,880	1,146	1,770	-	-	n.a.	n.a.	-	-	-	-	5.2	4.3	32.5	41.3	24.5	29.3
Bajaj Electricals Ltd	ELECTRICALS	215	21,674	47,064	52,624	2,641	3,166	906	1,242	9	12	-749.0	37.1	23.9	17.4	-	-	11.1	9.2	11.9	14.3	10.0	11.4
Allcargo Logistics	Logistics	151	37,966	55,366	64,113	4,983	6,225	2,534	3,189	10	13	28.1	25.9	15.0	11.9	1.8	1.6	8.2	6.6	12.1	13.6	10.4	12.0
VRL Logistics Ltd	Logistics	369	33,646	17,215	19,077	2,851	3,248	1,166	1,454	13	16	33.1	24.8	28.9	23.1	-	-	12.7	10.9	21.7	23.8	15.1	17.6
Container Corp Of India	Logistics	1,270	247,617	57,711	67,724	12,015	14,912	8,856	10,859	45	56	-15.5	22.6	28.0	22.8	2.9	2.7	18.6	14.9	10.5	11.8	10.4	11.7
Sintex Industries	Midcap	79	35,166	79,036	101,178	13,531	17,824	6,156	8,252	14	19	11.8	34.1	5.7	4.3	-	-	6.5	5.0	11.7	13.7	7.3	8.7
KDDL	Midcap	190	1,916	4,658	5,564	394	502	89	132	9	13	31.3	47.3	21.4	14.5	-	-	7.6	6.4	10.5	14.0	8.0	8.8
Pennar Inds.	Midcap	50	6,023	15,098	19,470	1,593	2,235	517	835	4	7	44.0	61.6	11.6	7.2	1.3	1.1	4.3	3.1	11.0	15.6	15.7	19.1
Praj Inds.	Midcap	88	15,659	10,833	13,920	1,128	1,803	696	1,150	4	6	52.5	65.1	22.4	13.6	2.4	2.2	12.8	7.7	10.8	16.5	8.9	13.9
The Byke Hospitality	Midcap	157	6,291	2,137	2,761	449	580	241	329	6	8	20.3	36.7	26.1	19.1	-	-	14.0	10.6	20.6	23.0	19.3	22.5
Indraprastha Gas	Oil & Gas	552	77,238	37,007	32,238	7,797	7,971	4,241	4,463	31	32	-0.3	2.3	17.7	17.3	3.2	2.8	9.8	9.3	18.0	16.2	14.9	14.1
Petronet LNG	Oil & Gas	245	183,638	281,150	272,419	17,250	20,993	10,777	10,919	14	15	22.1	1.3	17.0	16.8	2.9	2.6	11.7	9.5	16.9	15.2	10.0	10.2
Gujarat State Petronet	Oil & Gas	137	77,149	10,252	12,500	8,866	11,003	4,525	6,087	8	11	10.3	34.5	17.0	12.7	1.9	1.7	9.1	7.0	11.4	13.6	9.2	11.2
Gujarat Gas	Oil & Gas	540	74,381	59,933	55,787	7,301	9,779	1,686	3,966	12	29	-62.1	135.2	44.1	18.8	3.6	3.1	13.1	9.9	8.1	16.6	5.6	9.3

PhillipCapital India Coverage Universe: **Valuation Summary**

		CMP	Mkt Cap	Net Sales (Rs mn)		EBIDTA (Rs mn)		PAT (Rs mn)		EPS (Rs)		EPS Growth (%)		P/E (x)		P/B (x)		EV/EBITDA (x)		ROE (%)		ROCE (%)	
Name of company	Sector	Rs	Rs mn	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E	FY16E	FY17E
Cadila Healthcare	Pharma	315	321,967	95,789	103,242	22,747	24,139	14,723	16,509	14	16	24.8	12.1	21.9	19.5	5.9	4.7	14.7	13.7	26.9	24.0	19.4	19.5
Sun Pharma	Pharma	810	1,948,319	283,181	337,829	85,153	120,653	52,444	80,656	22	34	9.8	53.8	37.1	24.1	6.6	5.3	22.2	15.2	17.7	21.8	14.5	18.6
Dr Reddy's Labs.	Pharma	3,001	511,854	157,409	167,520	41,556	44,728	25,296	28,738	148	169	10.9	13.6	20.2	17.8	3.8	3.2	12.7	11.5	18.8	18.1	13.1	13.0
Aurobindo Pharma	Pharma	746	436,449	140,096	158,073	32,418	38,570	20,305	24,219	35	42	23.6	19.3	21.4	17.9	6.1	4.6	14.8	12.1	28.3	25.7	25.4	26.7
Cipla Ltd	Pharma	505	405,669	14,118	17,896	2,958	3,454	1,835	2,040	23	25	44.2	11.2	22.1	19.9	3.2	2.8	137.5	117.9	15.0	14.5	-	-
Ipca Laboratories	Pharma	545	68,801	28,663	37,896	4,152	8,079	1,731	4,786	14	38	-35.3	176.5	39.4	14.3	2.9	2.5	18.0	9.3	7.3	17.2	5.5	13.0
Divi's Laboratories	Pharma	995	264,181	35,701	41,757	13,584	16,076	10,086	11,935	38	45	17.0	18.3	26.2	22.1	6.3	5.2	19.5	16.4	24.1	23.6	-	-
Glenmark Pharma	Pharma	771	217,586	73,190	86,822	16,473	20,148	8,555	11,638	30	41	10.3	36.0	25.4	18.7	4.6	3.7	14.1	11.3	18.1	20.0	12.8	14.7
Lupin	Pharma	1,485	669,161	130,195	163,081	33,541	46,025	21,128	29,307	47	65	-12.1	38.7	31.6	22.8	6.3	5.1	19.7	14.0	19.9	22.3	19.9	-
Biocon	Pharma	532	106,350	33,578	38,674	7,894	9,609	4,537	5,536	23	28	10.1	22.0	23.4	19.2	2.7	2.4	12.6	10.2	11.4	12.6	11.0	-
Titan Company	Retail	348	309,038	119,074	140,492	11,172	13,276	7,991	9,735	9	11	-2.1	21.8	38.7	31.7	8.5	7.0	26.6	21.4	23.6	24.3	24.6	25.3
Bharti Airtel	Telecom	335	1,337,130	982,624	1,065,703	326,641	354,885	51,089	64,256	13	16	-14.6	25.8	26.2	20.8	1.8	1.5	7.8	6.8	7.0	7.4	5.1	5.0
Idea Cellular	Telecom	111	400,017	357,974	390,485	129,395	137,572	34,969	17,126	10	5	9.5	-51.0	11.4	23.3	1.5	1.4	6.8	6.1	13.2	6.1	7.0	4.5
Tata Communications	Telecom	388	110,680	210,530	223,195	33,285	36,087	1,714	2,674	6	9	60.9	56.0	64.6	41.4	18.3	16.1	5.4	4.7	28.3	38.8	4.9	5.6
Bharti Infratel	Telecom	371	704,327	78,669	85,457	53,624	59,588	22,199	26,226	12	14	11.5	18.1	31.6	26.7	4.3	4.5	13.2	11.8	13.7	16.8	10.4	11.9
Reliance Comm	Telecom	51	126,814	234,448	n.a.	82,810	n.a.	14,143	n.a.	7	n.a.	47.7	n.a.	7.4		0.4		5.2		4.8	-	4.2	-
Coal India	Utilities	276	1,740,790	773,545	880,021	163,466	198,241	145,174	166,590	23	26	5.8	14.8	12.0	10.4	3.8	3.3	7.3	5.6	31.4	31.4	33.2	33.2
PTC India	Utilities	63	18,501	137,014	181,612	10,802	13,079	3,126	3,371	11	11	-12.1	7.8	5.9	5.5	0.6	0.5	7.5	7.0	9.5	9.6	9.8	7.7
Power Grid Corp	Utilities	140	730,853	207,959	253,694	183,327	225,368	62,888	75,359	12	14	25.1	19.8	11.6	9.7	1.7	1.5	9.7	8.4	15.5	16.5	6.2	6.7
NTPC	Utilities	126	1,040,578	725,044	798,674	177,772	198,808	85,711	97,729	10	12	2.0	14.0	12.1	10.6	1.2	1.1	10.2	9.9	9.8	10.4	6.1	6.2
Atul Ltd	Specialty	1,629	48,326	25,863	27,678	4,552	5,010	2,715	2,969	91	100	14.2	9.3	17.8	16.3	-	-	10.8	9.5	21.2	19.2	-	-
Camlin Fine Sciences	Specialty	93	9,009	5,044	6,928	872	1,275	366	584	4	6	-7.0	59.7	24.4	15.3	-	-	11.5	8.8	22.0	27.7	-	-
Meghmani Organics	Specialty	27	6,803	12,605	14,363	2,710	2,944	733	850	3	3	62.9	16.1	9.3	8.0	-	-	4.6	4.1	12.2	13.0	10.1	11.0
Vinati Organics	Specialty	402	20,750	6,047	7,189	1,701	2,049	994	1,209	19	23	-14.2	21.6	20.9	17.2	-	-	12.3	10.2	19.4	19.8	-	-
Aarti Industries	Specialty	515	42,910	27,182	32,000	5,328	6,336	2,584	3,169	31	38	29.1	22.6	16.6	13.5	-	-	9.8	8.2	20.6	20.9	-	-
SRF Ltd	Specialty	1,287	73,889	46,189	53,160	9,884	11,855	4,320	5,183	75	90	40.6	20.0	17.1	14.3	-	-	9.7	8.0	16.0	18.2	-	-
PEBS	Midcap	156	5,347	79,036	101,178	13,531	17,824	6,156	8,252	14	19	11.8	34.1	11.3	8.4	-	-	4.3	3.3	11.7	13.7	7.3	8.7

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