



Confederation of Indian Industry

Urbanisation in the National Capital Region

**Overcoming challenges to
improve live-ability**

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Foreword - KPMG in India

India is on the cusp of making a transition from a developing to a developed nation. Interestingly, urbanisation —one of the key parameters of a developed economy — also goes through a similar transition phase, imbibing changes. In this context, the National Capital Region (NCR) presents a classic case of urbanisation on a cusp, being among the world's largest urban agglomeration. With a population base of more than 46 million, NCR is witnessing several challenges with respect to accommodating the rapid population growth.

With 58,332 square kilometre (sq. km) area, NCR has, over the past decade, emerged as one of the foremost economic centers in India. It contributes significantly to India's growth, accounting for about 7–8 per cent of the total Gross Domestic Product (GDP). While the manner in which the level of urbanisation has risen from over 56 per cent in 2001 to about 62.5 per cent in 2011 in this region, can be seen as a positive development, there are areas that still need attention to achieve sustainable development. In fact, the region's urbanisation level is twice the national level; however, lack of integrated development across the vast spread of three states and the National Capital Territory (NCT) of Delhi points towards the unplanned approach, which have left the contours of uneven development. For example, NCT of Delhi achieved the highest urbanisation level in NCR at 97.5 per cent, whereas the Rajasthan sub-region (consisting of Alwar and Bharatpur districts) presents a dismal picture with an urbanisation level at 17.8 per cent.

Between 2001 and 2011, the population of NCR increased by almost nine million and the urban population has increased by eight million. While the standard of infrastructure and basic necessities has improved significantly over the past few decades in NCT of Delhi, other regions fell far behind. Consequently, this further explains the reason why NCT of Delhi is witnessing several challenges — unchecked spatial growth; inefficient utilization of scarce resources such as land and water; rise in pollution levels and other deteriorating basic quality life factors — which have reached alarming levels. As a result of which, there has been a decline in the quality of life, education, sanitation and healthcare.

By 2021, NCR's urban population is expected to reach about 45 million from about 29 million in 2011, which requires swift and planned action to put corrective measures to check unplanned urbanisation. The Government of India has taken several initiatives, such as Smart Cities Mission, Housing for All by 2022 (Pradhan Mantri Awas Yojana), 500 AMRUT cities, and Heritage City Development and Augmentation Yojna (HRIDAY), which are aimed at making cities conducive for better living. In the context of urbanisation, all these initiatives can be integrated in such a manner that regions with low levels of urbanisation can benefit, lowering the burden on key pockets of NCR that currently face saturation. Further, developing new corridors of sustainable living would encourage equitable growth across different regions.

This background paper — 'Urbanisation in the National Capital Region: Overcoming challenges to improve livability'— by KPMG in India and the Confederation of Indian Industry (CII) seeks effective approach pertaining to achieving sustainable urbanisation levels across NCR. It elucidates the challenges of unplanned urbanisation and the way they could be addressed. The paper aims to offer an approach to streamline the growth strategies to check unplanned spatial growth, which has deterred better living conditions for the population in NCR.



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Foreword - Confederation of Indian Industry (CII)

India's Real Estate sector backed by growing urbanisation is poised for tremendous growth, in the near future. With growing urbanisation the market size of the real estate sector is expected to reach USD180 billion by 2020¹, which is one of the major driving forces of the Indian economy. India's urban population is estimated to increase by 50 per cent to reach 60 crore people, by 2030¹. Growth in the sector is dependent on developments in the retail, hospitality and entertainment industries, economic services such as hospitals, schools and Information Technology enabled Services (ITeS) such as call centres etc. and vice versa

Focus on urbanisation is important as cities contribute about 2/3rd of India's Gross Domestic Product (GDP)². It is thus essential that Indian cities are developed and nourished to lead the economic growth of the country.

Key government initiatives such as the 'Smart Cities Mission', AMRUT, HRIDAY, 'Housing for All by 2022', along with industrial corridors, growing PPP projects, can help strengthen urbanisation and thereby positively impact the Indian economy. However, the sector has its own set of challenges which continue to act as roadblocks in enabling Indian cities to achieve their full potential.

Delhi's real estate market, in particular, continue to witness huge re-development activity through builder collaboration. Certain Category-A locations have witnessed declining transaction volumes because of multiple and significant increases in the circle rates, in the recent past to the extent of 15 to 20 per cent³.

The market showcased resilience during the recent times due to demonetisation. Residential real estate prices are expected to decrease owing to the limited demand and purchasing power. Delhi's micro-market is witnessing several redevelopment projects. There is heavy presence of independent villas and row houses. Delhi's realty segment is largely end-user driven with 75 percent and 25 percent end-user and investor mix respectively. Transactions have scaled new levels with rates at over 10 times of the circle rates in most parts of the capital city⁴.

However, the pace of urban infrastructure development has not kept pace with the growth in population of the region resulting in excessive stress and congestion on existing urban infrastructure.

Stressed urban infrastructure has resulted in poor quality of life, especially for the people in the bottom of the pyramid. Further, congestion results in significant inefficiencies resulting in wastage of resources.



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1. Real Estate, IBEF, November 2016

2. The Future of Urban Development & Services, World Economic Forum, March 2015

3. Delhi Development Authority website, accessed on 03 March 2017

4. Resurgent India, September 2014

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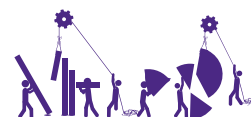
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Urbanisation in Delhi-NCR

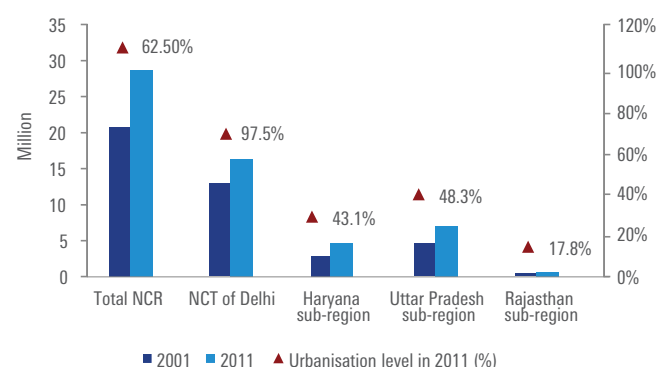




India's National Capital Region (NCR) is among the world's largest urban agglomeration with a population of more than 46 million and a major economic center of India sprawled over 58,332 square kilometer (sq. km) area¹. It accounts for about 7-8 per cent of the total Gross Domestic Product (GDP) of the entire India.² The NCR comprises of National Capital Territory (NCT) of Delhi and parts of Haryana (thirteen districts), Uttar Pradesh (seven districts) and Rajasthan (two districts).

Supported by high economic growth resulting in significant migration from other parts of the country, NCR has witnessed significant growth in its population, most of which has been in the urban pockets over the last few decades. Between 2001 and 2011, the population of NCR has increased by almost nine million, out of which the urban population contributed eight million. Urban population accounts for about 62.5 per cent (28.7 million) of the total population of NCR. By 2021, urban population of NCR is expected to swell by another 17 million to reach 45 million.²

Urban population in NCR

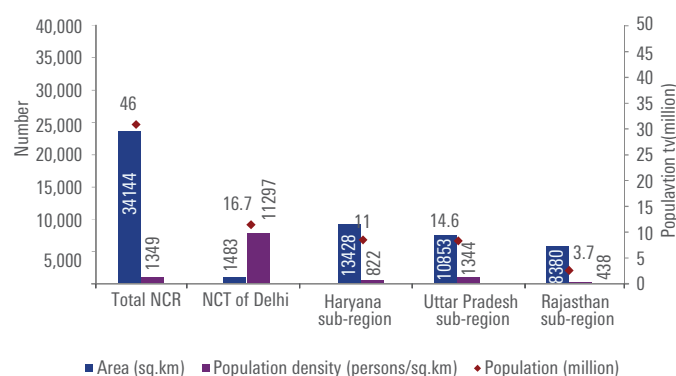


Source: Draft Revised Regional Plan 2021, National Capital Region, National Capital Region Planning Board (NCRPB), July 2013; and KPMG in India's analysis, 2017

Majority of the urban population of NCT is concentrated in the city of Delhi (56 per cent of total urban population) and it continues to witness growth in population. Due to congestion in the city of Delhi, population growth has been spreading out in the neighbouring areas of Gurugram, Faridabad, New Okhla Industrial Development Authority, popularly referred to as Noida and Ghaziabad. These cities – together with Delhi – are now referred to as Central NCR (CNCR) and witness large scale immigration. As of 2011, CNCR accounted for about 21.9 million population, which is almost 6 per cent of India's total urban population.² This is also ahead of the 20.7 million population of the Mumbai Metropolitan Region (MMR) – another important urban cluster in Western India comprising of cities such as Mumbai, Navi Mumbai, Thane, Vasai-Virar, Bhiwandi and Panvel.

The urbanisation level in NCR has risen from over 56 per cent in 2001 to about 62.5 per cent in 2011. This is nearly double the national urbanisation level of 31.2 per cent.² The complexity of the region is due to its vastness and spatial spread over three states and NCT Delhi is a challenge for integrated development. The NCT of Delhi has the highest urbanisation levels in NCR at 97.5 per cent, while NCR has an urbanisation level of 62.5 per cent.²

Area, population and density in NCR (2011)



Source: Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; and KPMG in India's analysis, 2017

Congestion and various other bottlenecks to growth, such as limited land parcel for development in Delhi have led to the emergence and growth of suburbs/satellite towns such as Gurugram, Noida, Faridabad and Ghaziabad.

1. 'NCR Constituent Areas', National Capital Region Planning Board, Ministry of Urban Development, Government of India, accessed on 06 March 2017

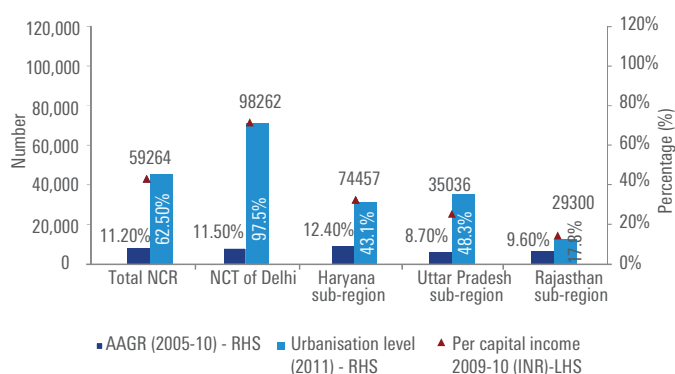
2. Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; and KPMG in India's analysis



NCR – the engine of North India's economy

The NCR contributed nearly 7 per cent to India's GDP in FY2009-10, at 2004-05 constant prices. The per capital income in NCR is the highest in the NCT of Delhi at 98,262, followed by the sub-regions of Haryana, Uttar Pradesh (U.P.) and Rajasthan.³

GDP growth, per capital income and urbanisation



Source: Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; and KPMG in India's analysis, 2017

The estimates released by the Oxford Economics cite that the Delhi Extended Urban Agglomeration (EUA) comprising of Delhi, Gurugram, Faridabad, Noida and Ghaziabad, had the highest GDP (Purchasing Power Parity terms) in India at USD370 billion in 2015, overtaking Mumbai EUA (Mumbai, Thane, Navi Mumbai, Vasai-Virar, Bhiwandi and Panvel) as the economic capital of India.⁴

The NCR derives the highest share of its GDP from NCT of Delhi, which was at 53 per cent in 2009-10, followed by over 27 per cent from Haryana sub-region and 16 per cent from UP sub-region. Rajasthan sub-region contributes the lowest share (4 per cent) in the GDP of NCR.⁵

Physical and social infrastructure in NCR

NCR has a transport network which constitutes road, metro rail and rail corridors which caters to intra-city, inter-city commuters and long-distance traffic. NCR has a road network of about 36,305 km; a large bus fleet of 58,300 buses (registered in NCR), a rail network of more than 1000 km; a metro rail network spanning 213 km; and an International Airport at Delhi.⁶

Road network

Five National Highways (NHs) converge to Delhi which also serve the daily inter-city commuters. Apart from these (NHs), a number of State Highways (SHs) also compliment the regional road network. Furthermore, Major District Road (MDR) and Other District Roads (ODR) act as important linkages to these highways.

Delhi has the highest road density of 2,103 km/100 sq.km, followed by Haryana (59.30 km/100 sq.km). Rajasthan and U.P. sub-regions have almost the same road density of 51 km/100 sq.km.⁶ A comparison of road density of NCR to that of all India level shows that the SHs in NCR (10.17) have more than double the road density of India (4.19), and NHs too in NCR (2.76) have nearly 40 per cent higher road density than the national average (1.99).⁶

Category	NCR	All India
National Highways	2.76	1.99
State Highways	10.17	4.19
Major District Road	4.14	14.23

Bus system

The average number of buses per lakh population in NCR was 132, against the national average ratio of 71. Delhi had the highest bus ratio of 267 in 2011, as it serves intra-city travel demand. The NCR sub-regions of Haryana sub-region had a bus ratio of 64, while Uttar Pradesh and Rajasthan had much lower ratio of 46 and 43 buses respectively.⁶ To improve last mile connectivity, the Delhi Metro Rail Corporation (DMRC) launched Metro feeder services which has a fleet of 269 buses that cover 33 routes across NCR.⁷

Metro rail

The Delhi Metro Rail Corporation (DMRC) has a network of about 213 km completed in Phase I & II with 160 stations. The Phase III network of 136 km has been sanctioned and is presently under execution, some sections of which have already become operational and the rest are expected to be completed by 2017. The DMRC today has 216 train sets of six and eight coaches. The average daily ridership of Delhi Metro is about 26 lakh passengers. The present network covers Noida, Gurugram, Ghaziabad and Faridabad. The Delhi Metro has become the first ever railway project in the world to claim carbon credits for regenerative braking, thereby helping in reducing pollution. Despite wide network of trains the Delhi Metro is overburdened with capacity during peak hours. The average ridership has increased from 80,000 passengers per day when the Metro was introduced in 2002, to over 26 lakh passengers per day in 2016, leading to overcrowded situations during peak hours.⁸

3. Economic Profile of NCR, NCRPB, September 2015; and KPMG in India's analysis

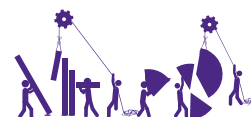
4. Delhi, not Mumbai, India's economic capital, The Economic Times, 27 November 2016

5. Economic Profile of NCR, NCRPB, September 2015; and KPMG in India's analysis, 2017

6. Functional Plan on Transport for NCR-2032, February 2013

7. Delhi government fixes routes of Metro feeder buses to improve last-mile connectivity, Hindustan Times, 18 January 2017

8. Delhi Metro: Steep rise in ridership beats network expansion, Hindustan Times, 07 October 2015



Airport⁹

Indira Gandhi International Airport (IGIA) is a major airport in NCR. It is the biggest airport in the country and is also the 25th busiest airport in the world with an annual passenger traffic of 48.4 million in FY16. The passenger handling traffic at the airport has nearly doubled from over 16 million over the past decade (2005-06). The airport handled over 3.4 lakhs aircrafts during FY16. The Airport connects India to about 120 destinations all across the world through 51 international airlines and nine domestic airlines. Furthermore, it is likely to handle a large quantity of cargo on commissioning of Delhi Mumbai Industrial Corridor (DMIC). The Delhi International Airport Limited (DIAL) is the first airport in India to be awarded the Leadership Energy and Environment Design (LEED) 'Gold' rating.

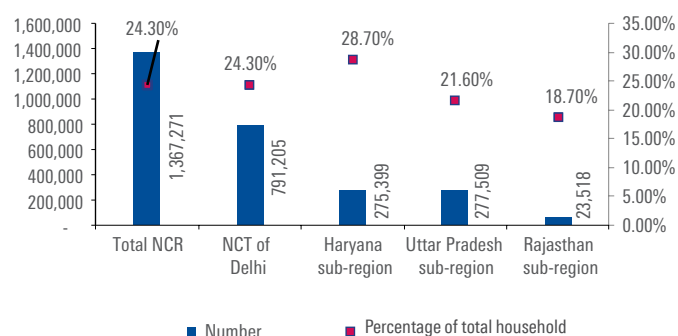
Mobility in NCR

The level of mobility is very low throughout NCR. The average mobility index in NCR is greater than 1.9 for 100 per cent of the traffic zones, thereby showing immense need for improving connectivity throughout the region.¹⁰

Housing demand-supply scenario in NCR

Though, as per Census 2011, there was an excess supply of about 6.32 lakh housing units in the urban regions of NCR. But, the analysis done by the National Council of Applied Economic Research (NCAER) shows that in actual there was a shortage of over 1.4 million housing units in urban NCR in 2011¹¹. The difference was owing to the share of houseless and slum population in the sub-regions of NCR, which was not available in Census 2011 for analysing the demand-supply gap.¹¹

Housing shortage in urban centres



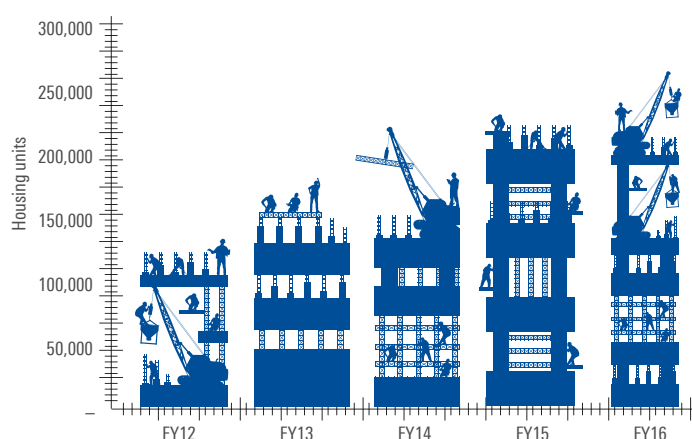
Source: Urbanisation, Development and Housing requirement in the NCR, NCAER, July 2014

Organised housing supply-demand scenario in five major cities of NCR*

(Gurugram, Noida, Greater Noida, Ghaziabad and Bhiwadi)

The NCR has had the highest share of unsold housing units in India with about 150,000 units of unsold inventory as of FY12. This has substantially increased to about 2.5 lakh units at the end of FY16, with Noida-Greater Noida region accounting for over half of this, followed by Ghaziabad, and Gurugram.¹²

Unsold housing inventory in NCR*



Source: Urbanisation, Development and Housing requirement in the NCR, NCAER, July 2014

Electricity

One of the most important infrastructure required for socio-economic development of any nation is access to affordable and reliable electricity, which has now become a basic human need. The northern grid, which supplies power to NCR is unable to supply sufficient electricity to meet the demand of increasing population and growth of economic activities in the region. As a result, power cuts have become a routine norm, impacting daily life and economic productivity of the region.

The data in the below table shows that U.P. region had the highest peak deficit at (-13.6 per cent), followed by Haryana (-9.5 per cent)

Region	Energy (2013)	Peak (2013)
	Oversupply/ deficit (-)	Oversupply/ deficit (-)
Delhi	-0.5	-5.0
Haryana	-7.7	-9.5
Uttar Pradesh (U.P.)	-16.6	-13.6
Rajasthan	-3.0	-4.8
NCR	-9.2	-8.9

It has become essential to augment the power generating capacity, and to improve the transmission and distribution system for the inclusive and sustainable development of NCR.

9. IGI Airport Fact Sheet, accessed on 23 February 2017; and Passenger traffic at Delhi airport to cross 50 million, Hindustan Times, 01 May 2016

10. Functional Plan on Transport for NCR-2032, February 2013

11. Urbanisation, Development and Housing requirement in the NCR, NCAER, July 2014

12. Liasas Foras and PropEquity, accessed on 21 February 2017; and KPMG in India's analysis, 2017



Key issues and challenges in NCR

Unplanned growth

The NCR has witnessed an unplanned spatial growth over the past couple of decades, despite the existence of three master plans of Delhi and two regional plans of NCR¹³. This led to NCT becoming the most urbanised region; it has an urbanisation rate of over 97 per cent, while some of the other areas in NCR have an urbanisation rate of as low as 18 per cent.¹⁴ This shows that there have been several aberrations that have led to deficiencies in the implementation stage which resulted in the existing challenges which the whole of NCR region faces, namely: housing shortage, traffic congestion, water logging, power cuts and water shortage etc. These challenges restrict the potential of economic growth. Cities in the NCR fail to provide basic standards for better quality of life, and fall well short of international benchmarks.

Reasons for unplanned urbanisation:

- Unplanned urbanisation could be attributed to the fact that India continues to follow the UK's Town and Country Planning Act of 1947 for urban planning, even after six decades of independence. The Act emphasises on land-use zoning and all the inflexibility that comes with it. This is in contrast to the current best practices being followed globally, such as flexible planning with local governance bodies accommodating market forces and seeing land use and urban transportation as complementary and simultaneous processes.
- Despite the 74th Constitutional Amendment envisaging devolution of urban governance, the implementation of the same hasn't happened yet, and there is a need to improve accountability and authority at the Urban Local Bodies (ULBs) level.
- There is lack of effective mayoral system which could have made urbanisation process smoother by ensuring accountability and authority.

Vehicular congestion affecting mobility

Delhi has witnessed an overall vehicular growth of 7.6 per cent per annum between 2003-04 and 2013-14. The number of private vehicles in Delhi have increased substantially to 7.9 million from 3.98 million during the same period. However, commercial vehicles have witnessed higher growth rate at 9.4 per cent, as against the growth rate of private vehicles which was at 7.1 per cent.¹⁵

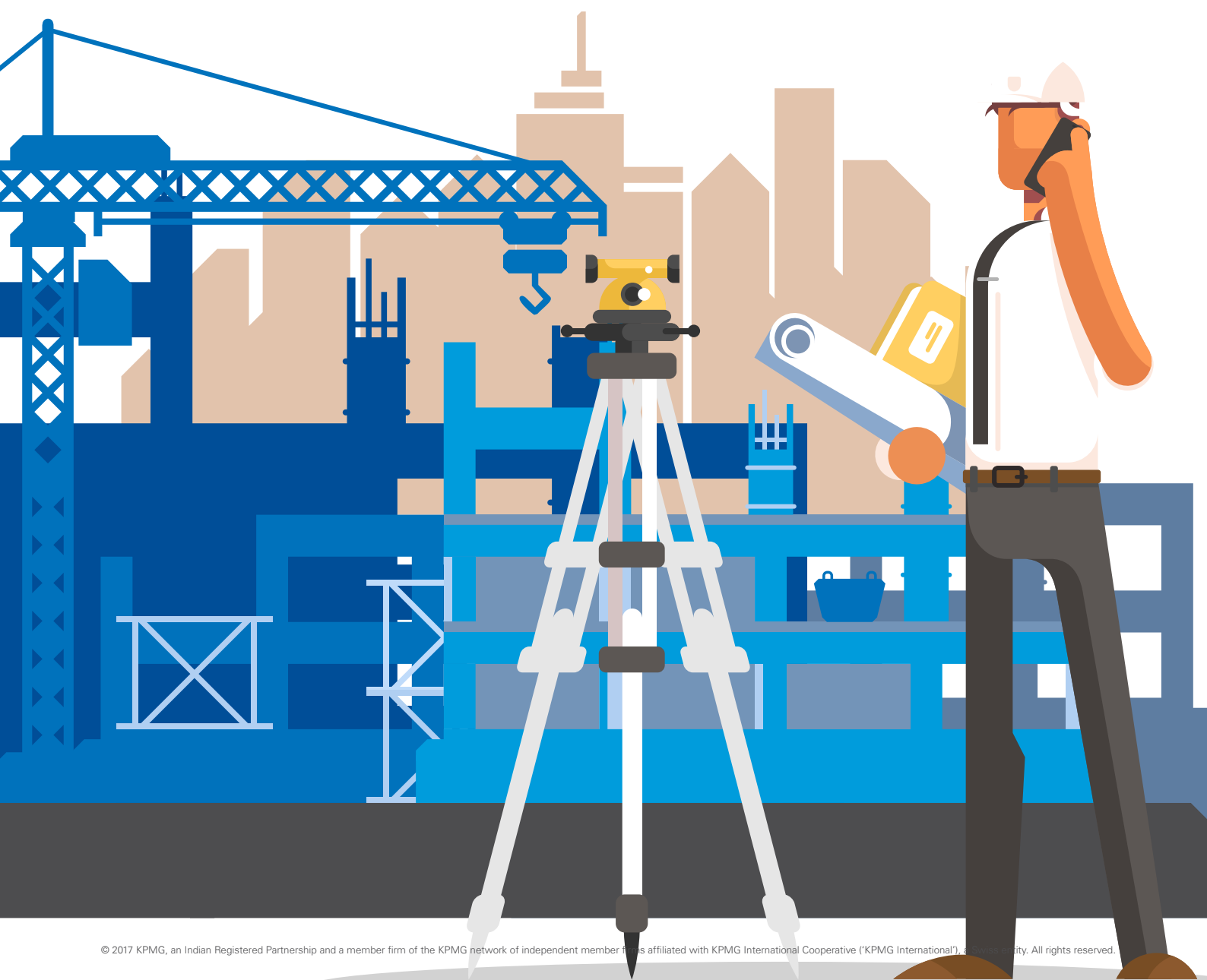
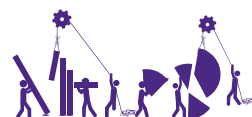
Category of vehicles	No. of vehicles (million)		Compound Annual Growth Rate (CAGR)
	2003-04	2010-11	
Private vehicles	3.98	6.52	7.29%
Commercial vehicles	0.22	0.42	9.42%
Total	4.2	6.93	7.41%

As per the Indian Roads Congress (IRC) norms, the Volume to Capacity (V/C) ratio, which ideally should be less 0.7 for urban roads, varied between 1.01 and 2.83 for major roads in Delhi.7 Corrective measures are required when it exceeds the norms.

13. NCR Urbanisation: Delhi remains the epicenter, The Indian Express, 11 September 2015

14. Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; and KPMG in India's analysis, 2017

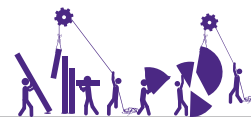
15. Delhi Statistical Handbook, Directorate of Economics & Statistics, Government of NCT of Delhi, 2014



Challenges/issues and initiatives undertaken to resolve them

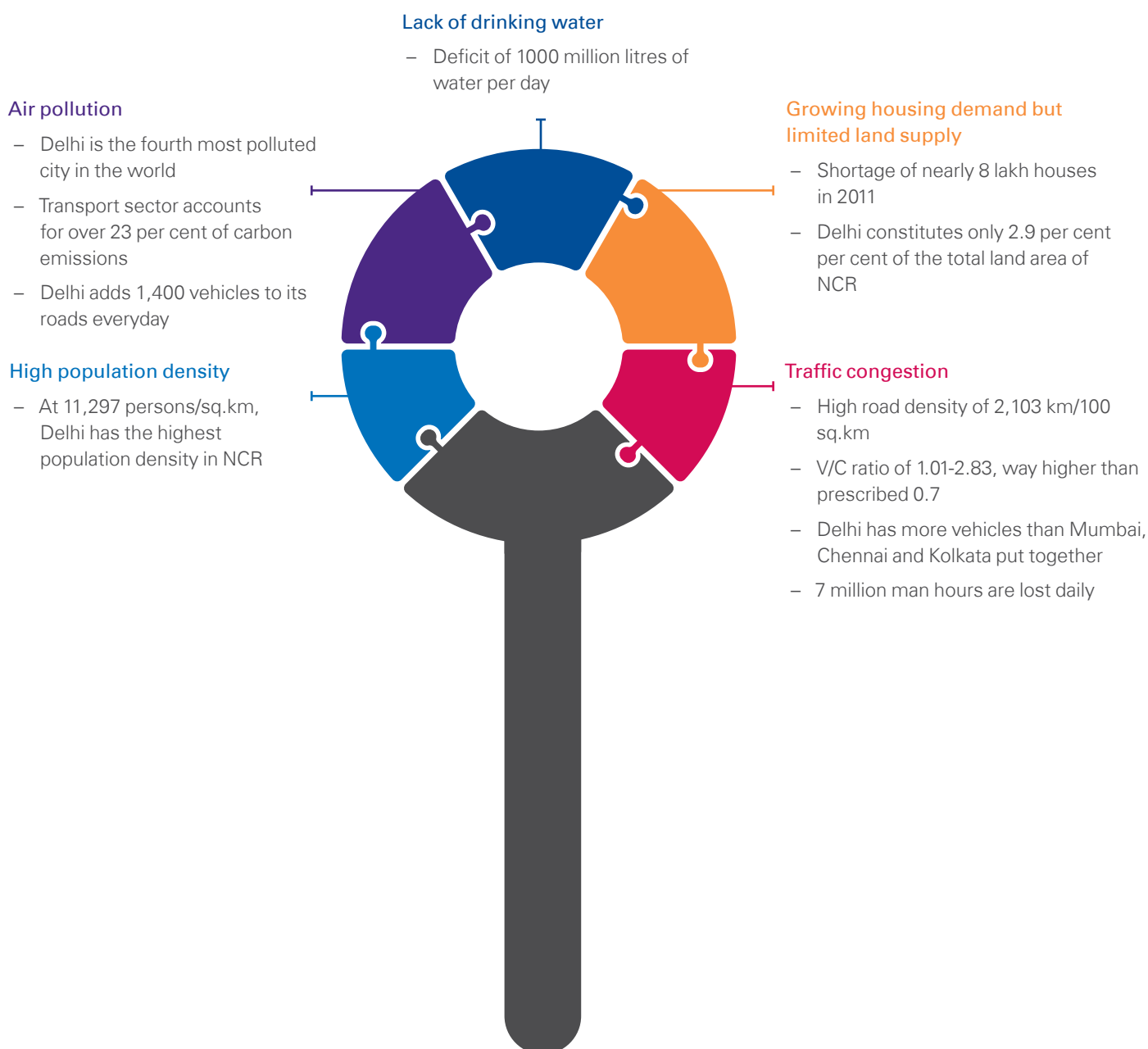
(Focus city - Delhi: Theme - Decongestion)





Key challenges¹

The population of Delhi has more than doubled over the past two decades that made it the world's second most populous city in 2014, with over 25 million population.² The population of Delhi is anticipated to surpass 36 million by 2030,³ which is expected to put further pressure on scarce resources. Even today, the city faces a deficit of about 1000 million litres of water per day. Inappropriate and in-efficient public transport coupled with rise in income levels led to significant rise in private vehicles over the past two decades. This resulted in Delhi becoming the fourth most polluted city in the world, leading to significant degradation of the air quality.



Despite having the most extensive road network in India, and expansion of Metro rail network, traffic woes in Delhi have been consistently on the rise. The large chunk of increased roadway capacity was consumed by additional traffic in five years.

1. Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; and KPMG in India's analysis, 2017; Crawl at 5kmpm: Studies paint horror scenario of Delhi as congestion doubles for the first time in 8 years, Mail Online India, 12 July 2012

2. Delhi now second most populous city in world, The Indian Express, 12 July 2014

3. World Urbanisation Prospects, United Nations, July 2014



Public and private level initiatives

The NCRPB proposed the following initiatives to meet the growing housing demand⁴

To accommodate additional 4.4 million population by 2021 in the existing area by increasing Floor Area Ratio (FAR)

Major changes in building norms have been proposed by the NCRPB in the Master Plan 2021, to increase FAR in order to develop more and spacious houses on the same land parcel.

To accommodate additional 4.8 million population in new areas to be developed under Land Pooling Policy

The Delhi Development Authority (DDA) made a major change in the land policy by approving the land pooling policy in 2014 in the Master Plan 2021. As per this policy, landowners can surrender their land holding into a central pool and become stakeholders in the development proposed on their land. Once the land is pooled, the landowner would get nearly 40-60 per cent of the total land surrendered as developable land. The 40-60 per cent of the land that DDA would retain would be utilised to create infrastructure as well as to monetise it for specific purposes.

DDA announced two basic types of land pooling:

- 0.2 sq km and above, where 60 per cent of the land would be returned to the landowner
- 0.02–0.2 sq km, where 48 per cent of land would be returned to the landowner

Other initiatives undertaken by the state and central government

- Under Sub Mission II Basic Services to the Urban Poor (BSUP), Government of India previously approved the construction of about 67,800 dwelling units in Delhi, at an estimated cost of INR30.8 billion. Over one-third of these units were already constructed till 2014-15⁵.
- The Government of Delhi conferred ownership/freehold rights to about 45 Jhuggi Jhopris (JJ) resettlement colonies, which were held on lease/license basis till 2006, which is expected to allow tenure security to over 1.5 million people.

Transit Oriented Development (TOD)

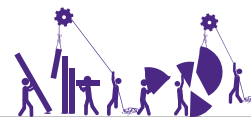
The Ministry of Urban Development (MoUD) in July 2015 approved the TOD Policy for Delhi, with an aim to tackle the increasing issues of congestion, pollution and shortage of housing for the urban poor and middle class. It is a key initiative by the government for high-density, mixed-use and sustainable development by reducing travel time, promoting use of public transport and providing safe environment through Mass Rapid Transport System (MRTS) in Delhi. Hong Kong has used this model to develop more than 1.5 million homes in past four decades and has become successful in creating more than 50% of the jobs within 500 m distance from metro stations.⁶

Corridor	Nature of project and current state of development
Karkardooma Metro station	Nearly 75 acres of land is currently being developed in order to create about 80,000 sq.m of retail, 4,800 dwelling units for the poor, five acre park and open to sky entertainment facilities.
Drawka Mor Metro station to Dwarka Sector 21 Metro station	Originally planned as a TOD, the alignment caters to a wide range of uses along the corridor. Currently, the system caters mainly to residential areas, though there are plans for diversifying the range of uses.
Nehru Place Metro station to Badarpur Metro station	No progress till now except for the development of Metro stations of Nehru Place and Kalkaji as retail hubs, and development of housing for the Lower Income Group (LIG) segment near the Harkesh Nagar-Okhla Metro station

4. Urbanisation, Development and Housing requirement in the NCR, NCAER, July 2014

5. Delhi Economic Survey 2014-15, and India Infrastructure

6. Jens Kandt, Hong Kong's spatial DNA, LSE Cities, November 2011; Earth Observation and Remote Sensing Applications, 2008; Government of Hong Kong



In order to reduce traffic congestion, improve urban transport situation and reduce air-pollution in Delhi, the government has undertaken the following initiatives

Delhi Metro as a mode of public transport

The Delhi Metro which was introduced to strengthen urban mobility in Delhi and NCR region, has a network of about 213 km and carries over 2.6 million passengers daily. It helps keep off nearly four lakh private vehicles from Delhi roads daily, up from 17,000 vehicles in 2007⁷. Also, DMRC has been certified by the United Nations (UN) as the First Metro Rail and Rail based system in the world to get Carbon Credits for reducing green-house gas emissions as it has helped reduce pollution levels in the city by 6.3 lakh tons every year thus helping in reducing global warming.⁸ Despite the substantial increase in average daily ridership in Delhi Metro, about 1,400 extra private vehicles hit the roads of Delhi on a daily basis.⁹

Construction of peripheral expressways such as Eastern Peripheral Expressway (EPE) and Western Peripheral Expressway (WPE)¹⁰

The two expressways – the EPE (135 km long) and the WPE (136 km long), which is being constructed at an estimated cost of over INR 15,000 crore would inter-connect major economic urban centers of NCR and would also act as an Outer Ring Road (ORR) to the NCT of Delhi. Once operational in 2017, these expressways are expected to reduce the traffic congestion significantly by up to 50 per cent. Also, being constructed as completely green roads, these would also reduce the pollution woes in NCR region considerably. Furthermore, these are expected to create new corridors of growth for real estate development and employment, which would help in limiting the migration of workforce to Delhi, thereby helping in achieving sustainable and uniform urbanisation in NCR.

Compulsorily phasing out of vehicles older than 15 years

In order to curb the increasing pollution in Delhi, the National Green Tribunal (NGT) ordered to ban diesel vehicles which are over ten years old. It also ordered to ban commercial vehicles which are older than 15 years¹¹.

Levy of green tax

The Supreme Court in November 2015, levied an 'environment cess' - the Environment Compensation Charge (ECC) on trucks entering Delhi. This is expected to reduce the number of trucks entering Delhi by over 30 per cent, thereby reducing pollution in the region¹².



7. Delhi Metro rides high, keeps 3.9 lakh vehicles off roads, The Times of India, 25 December 2014

8. UN body credits Delhi Metro – 6.3 lakh carbon credits for Modal Shift Project, DMRC, 26 September 2011

9. Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; and KPMG in India's analysis, 2017; Crawl at 5kmpm: Studies paint horror scenario of Delhi as congestion doubles for the first time in 8 years, Mail Online India, 12 July 2012

10. Delhi's Eastern, Western Peripheral Expressways likely by August 2017, Housing.com, 16 December 2016

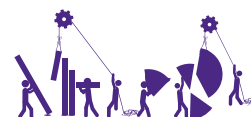
11. Govt. moves Supreme Court against ban on old diesel vehicles in Delhi-NCR, Live Mint, 14 January 2017

12. From today, trucks passing through Delhi to pay 'green tax'; The Indian Express, 07 November 2015

Challenges/issues and initiatives undertaken to resolve them

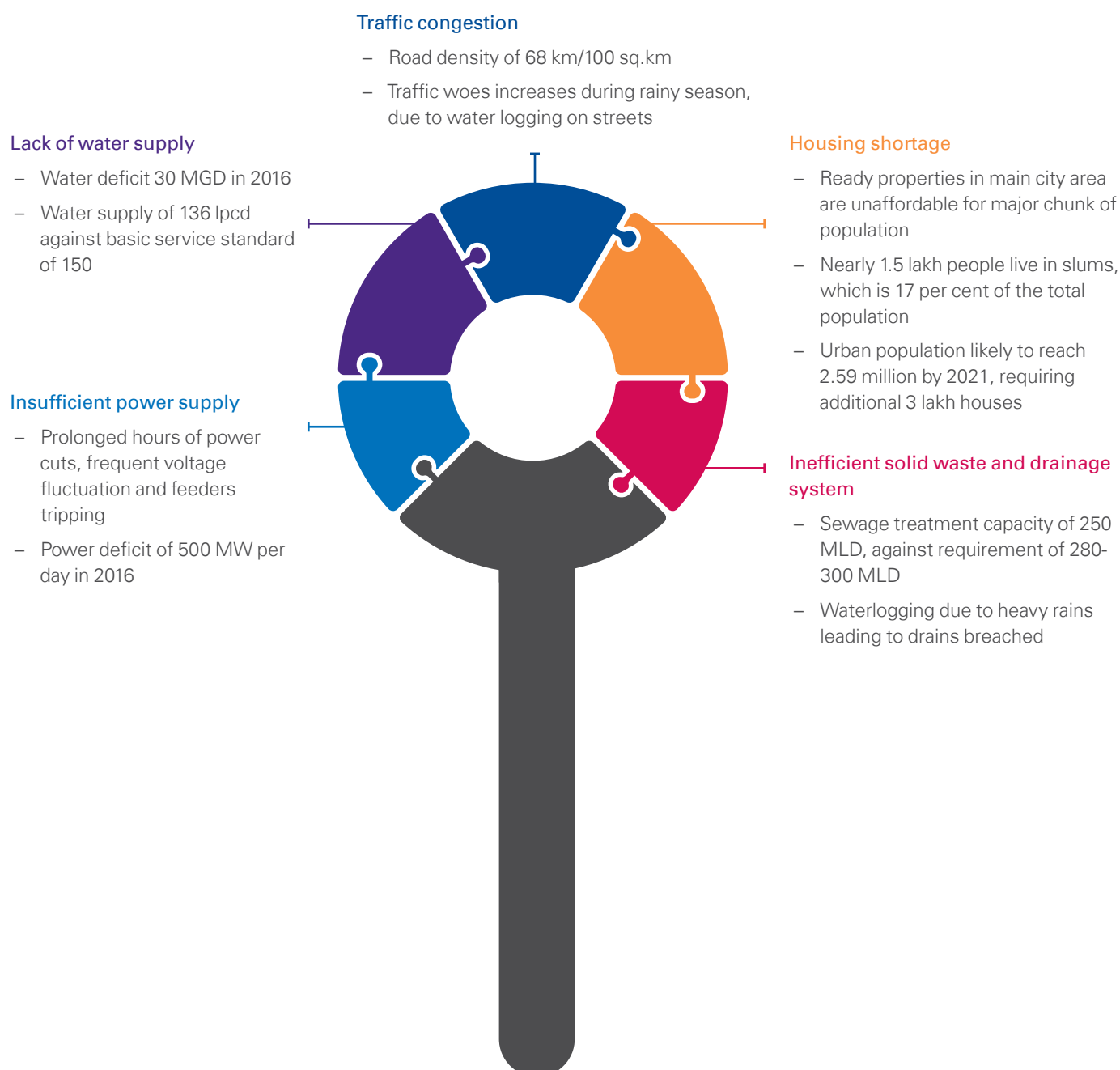
(Focus city - Gurugram: Theme- Affordability and decongestion)





Key challenges¹

Gurugram which contributes about 9 per cent to NCR's GDP, has grown organically due to economic imperatives and incentives; also, it is the largest contributor to Haryana's GDP. With an urban population of over 1.0 million in 2011, the city has witnessed population explosion during the past decade. The growth in physical infrastructure has failed to keep pace with the high growth in urbanisation that the city has been experiencing, leading to its citizens facing several challenges.



Despite having the most extensive road network in India, and expansion of Metro rail network, traffic woes in Delhi have been consistently on the rise. The large chunk of increased roadway capacity was consumed by additional traffic in five years.

1. Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; Sub-regional plan for Haryana sub-region of NCR-2021, NCRPB, May 2014; and KPMG in India's analysis, 2017;



Public and private level initiatives

To tackle the issue of affordability, the state and central governments have launched the following policies and programmes:

Affordable Housing Policy, Haryana, 2013

The policy aims to create over 1.2 lakh dwelling units available in the affordable segment, with apartment sizes of 28-60 sq.m carpet area, in the urban centers of the state by 2018. To achieve this, the private developers have been given incentives such as exemption from license fees and infrastructure development charges, and higher Floor Space Index (FSI). The government cleared 53 licenses till FY16, out of which over 50 per cent (28) were in Gurugram alone.²

New Integrated Licensing Policy (NILP), 2016

The state government in its bid to provide a boost to the real estate sector especially affordable housing segment, released NILP in 2016. According to this policy, 12 per cent of the total area of any colony would be transferred to the government housing board at subsidised rates which would enable in creating housing for the urban poor (EWS and LIG segments)

Indira Awas Yojna

The scheme is sponsored by the central government, under which nearly 56,000 dwelling units are expected to be created. Out of this, over 10,000 dwelling units were constructed till FY16 with an expenditure of INR620 million.³

Priyadarshni Awas Yojna, 2013

The scheme is sponsored by the state government and is demand-based, under which a total of over 145,000 beneficiaries were identified and registered till December 2015.³

Transit-Oriented Development (TOD) Policy

The state government in February 2016 notified TOD Policy, according to which the TOD zone of influence will extend up to 800m on either side from the edge of the Right of Way (ROW). The policy is expected to allow developers higher FAR, which can enable creation of more built-up spaces and can bring down the price of the dwelling units. The concept of TOD could help achieve the following objectives:

- Have higher population density along transit corridors, owing to increased FAR from the existing 1.75 to 3.5 for group housing and mixed-use developments in the intense TOD zones⁴, thereby increasing affordability;
- Enhance mobility of resources
- Raise capital for the development of transit and transport services

To tackle the rising traffic congestion and pollution problems, and increase connectivity, the following projects have been launched by public and private players

Rapid Metro

To tackle the significant rise in population and a multi-fold increase in vehicles over the past decade, which resulted in traffic congestion and pollution. Considering this, Haryana Urban Development Authority (HUDA) decided to develop a metro system, the Rapid Metro for Gurugram. Rapid Metro is India's first fully privately financed Metro system connecting NH-8 to Delhi Metro via Cyber City, Gurugram. In the first phase, it covers a total length of 5.1 km at an estimated cost of INR1,250 crore. The commercial operations were commenced in November 2013, it has a fleet of five trains which carries over 30,000-35,000 passengers daily⁵. The second phase covering total length of 6.7 km is being built at a cost of over INR2,150 crore, is expected to commence operations by March 2017. With this the ridership is expected to increase by over two-fold⁶ and it would provide last mile connectivity towards the posh residential areas of Golf Course Road and Golf Course Extension Road.

Mass Rapid Transport System between Gurugram and Manesar

The Haryana government in February 2017, approved a proposal to set-up a Mass Rapid Transport System (MRTS) between Gurugram and Manesar, to connect the financial and industrial hubs of Gurugram through Metro and was expected to further extend up to Neemrana in Rajasthan. The Mass rapid Transit System (MRTS) is proposed to be developed as a project under the Delhi Mumbai Industrial Corridor Development Corporation (DMICDC), and would be completed in three phases. With a proposed length of over 108 km, the project is being developed as a Public-Private Partnership (PPP) model, with an in-principle commitment from Japan International Cooperation Agency (JICA) to provide INR16,000 crore for the project⁷.

2. Economic Survey of Haryana 2015-16, Department of Economics & Statistical Analysis, Haryana, 2016

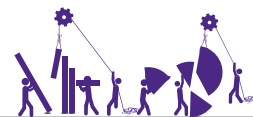
3. Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; Sub-regional plan for Haryana sub-region of NCR-2021, NCRPB, May 2014; and KPMG in India's analysis, 2017;

4. Transit-oriented Development: Tool for transition in Gurgaon, Magicbricks Now, 22 February 2016

5. Rapid Metro Facts, Rapid Metro Website, accessed on 28 February 2017

6. Second line of Rapid Metro expected to open in early 2017, Hindustan Times, 04 November 2016

7. Haryana nod to Gurugram-Manesar Metro, The Times of India, 03 February 2017



16 lane signal free road from DLF Cyber City to Golf Course Road

The project is the first of its kind public-private partnership to develop the civil infrastructure of a city, which is being developed to further upgrade the infrastructure of Gurugram. Started in 2012 and expected to be operational in 2017, the project covers a distance of 10.5 km from the old Toll Plaza on NH08 to Sector 55/56 on the Golf Course Road. It is a 78 meter wide, 16 lane signal free road network with six underpasses, is expected to reduce the traffic congestion and enhance mobility⁸.

Dwarka expressway

Conceived in 2007, Dwarka expressway is an eight lane, 150 m wide, 18 km stretch connecting Dwarka in Delhi to Gurugram. The construction of the project started in 2010 and was planned to be completed in 2012, however hurdles in land acquisition delayed the project. The announcement and subsequent development of Dwarka Expressway over the years led to emergence of new real estate growth corridors. It offers a relatively less expensive residential options, which are available at 25 per cent discount to city weighted average price. The Dwarka Expressway micro-market of Gurugram accounted for approximately 25-30 per cent of the total housing units launched by the organised players in Gurugram over the past decade⁹. However, as the expressway project missed the deadline several times, it impacted livability on this corridor severely due to lack of appropriate physical and social infrastructure.



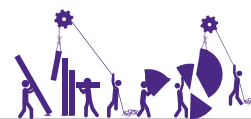
8. DLF Edge, 16TH Edition, January 2017

9. PropEquity and KPMG in India's analysis, 2017

Challenges/issues and initiatives undertaken to resolve them

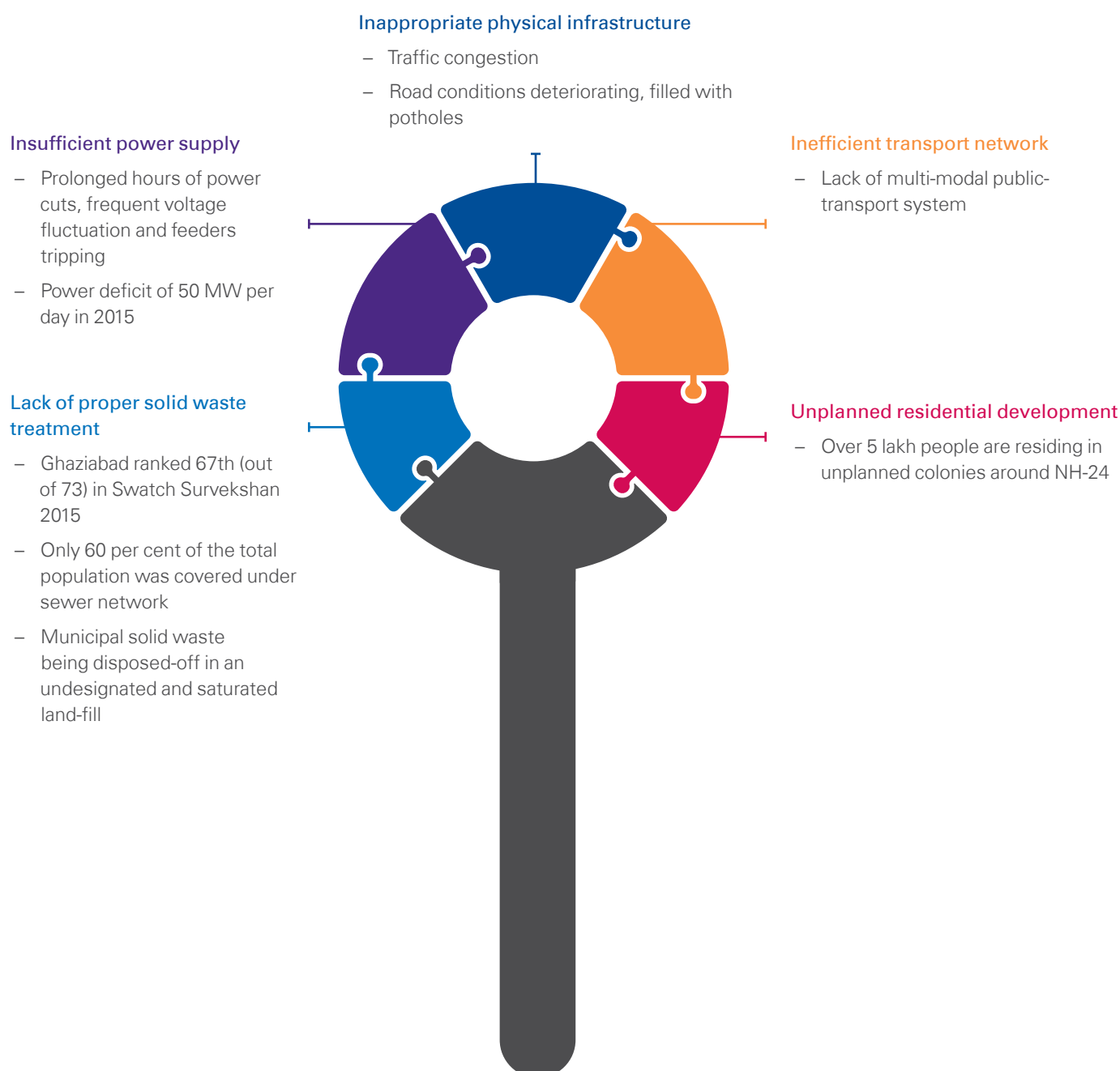
(Focus city - Ghaziabad: Theme - Connecting Ghaziabad)





Key challenges¹

With a population of over 2.1 million and an urbanisation level of over 67.5 per cent, Ghaziabad has evolved as a major residential hub in NCR over the last decade. Given its proximity to Delhi, Ghaziabad has evolved as one of the largest and most affordable mixed-use option for people of NCR and businesses.



With easy access to land and labour, Ghaziabad, has transformed as U.P.'s industrial town with over 6,500 industrial units employing over 20,000 workers in small scale and over 90,000 in large and medium industries². However, it was noticed that city's infrastructure such as roads, power, water, waste management, housing has lagged the fast pace of urbanisation and industrialisation, resulting in unplanned and non-sustainable development.

1. Draft Revised Regional Plan 2021, National Capital Region, NCRPB, July 2013; and KPMG in India's analysis, 2017; Swachh rankings: Ghaziabad among India's 10 dirtiest cities, Hindustan Times, 17 February 2016

2. KPMG in India's analysis, 2017



Public and private level initiatives

Extension of Delhi Metro and proposed Rapid Metro to address the issue of last-mile connectivity

- The second extension of Delhi Metro to Ghaziabad through the on-going and proposed expansion of the Metro network (9.4 km elevated Dilshad Garden Metro Station to New Bus Stand Ghaziabad by mid-2018, and Noida's Sector 62 to Indirapuram) are expected to significantly improve last-mile connectivity³. This would provide support to the high-density urban centers with faster access to Delhi.
- The Board of NCR Transport Corporation (NCRTC) in December 2016 approved the Regional Rapid Transit System (RRTS) for Delhi-Ghaziabad-Meerut corridor. Once complete, the corridor which would cover total length of 92 km, is likely to carry nearly 8 lakh passengers by 2024. This can significantly reduce private-vehicle dependence resulting in promotion of public transport and traffic decongestion.⁴

Improve urban transport

- The U.P. road transport department launched Metro feeder bus services in December 2015 to provide last mile connectivity to Delhi Metro stations in Ghaziabad, which was previously a major challenge.⁵
- In a bid to improve the transportation mode and last-mile connectivity, the Regional Transport Authority (RTA) in November 2016 cleared the proposal of bike taxis in four State districts namely-Ghaziabad, Gautam Buddha Nagar, Hapur and Bulandshahar. The model has been adopted by South-east Asian countries like Thailand and Vietnam. Also, the neighboring city Gurugram in NCR too has more than 300 bikes under this model.

Road Network expansion to address traffic congestion woes

- Widening of NH-24 to 16-lanes between Ghaziabad-Delhi border and Dasna, is expected to reduce the traffic congestion significantly. It is also expected to benefit industrial development and freight movement in the region.
- The development of 4-Lane access controlled Hindon Elevated Road will seamlessly connect Raj Nagar Extension and East of Ghaziabad to Delhi. This would likely spur the development of real estate activity in the area, further strengthening Ghaziabad as the residential hub of NCR.

- The work on the two sections of NH-24-NH-58 3.5 km elevated link road over the Delhi-Howrah section near Ghaziabad is expected to be complete by mid-2017. The project which is part of the Central government scheme Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT), will connect the two major highway stretches of Ghaziabad from Vijay Nagar and Meerut Crossing. This is expected to provide direct connectivity to vehicles from NH-58 towards NH-24, Indirapuram, Noida and Greater Noida.⁶

Policies to enable creation of affordable housing units

Affordable Housing Policy/Samajwadi Awas Yojana

Launched in 2014, the policy aims to provide affordable housing to lower Middle Income Group (MIG) and MIG segments. According to the policy, a developer would have to provide a minimum of 20 per cent of the total dwelling units to EWS and LIG categories. The policy provides incentives such as higher FAR, exemption of statutory levies such as stamp duty on purchase of raw land, change of land-use etc.

State Urban Housing and Habitat Policy

The policy was announced in 2014, with an aim to provide affordable housing to all households, especially those falling under EWS/LIG segments.

Integrated Township Policy

The Policy was first announced in 2005 and later on revised in 2014, aims to promote small townships (25-500 acres) in the State. To achieve this, the government has given incentives to developers such as: exclusive development rights within licensed area, flexible land-usage planning norms, higher FAR and exemption from External Development Charges (EDC) to name a few. The state has attracted an investment of over INR75 billion under this scheme. The state government approved 19 townships under the scheme, out of which 14 are in under-construction stage⁷.

Hi-Tech township policy

First announced in 2003 and then revised in 2005 and 2007, the policy enables development of state-of-the-art townships with world-class infrastructure in the state on a minimum area of 1,500 acres. As of 2015, a total of INR54 billion worth of investments were made in such projects across Ghaziabad, Lucknow, Allahabad and Bulandshahar.⁶

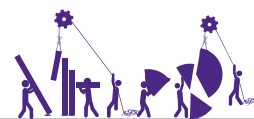
3. Deadline for Metro line in Ghaziabad extended to June 2018, The Times of India, 17 January 2017

4. National Capital Region Transport Corporation approves Delhi-Ghaziabad-Meerut RRTS corridor, The Economic Times, 06 December 2016; and KPMG in India's analysis, 2017

5. Metro feeder bus service launched in Ghaziabad, NDTV, 31 December 2015

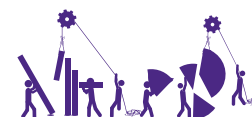
6. Link road connecting NH-24 with NH-58 in Ghaziabad to be ready by July, Hindustan Times, 21 April 2016

7. Housing and Urban Planning Department, Uttar Pradesh



Conclusion

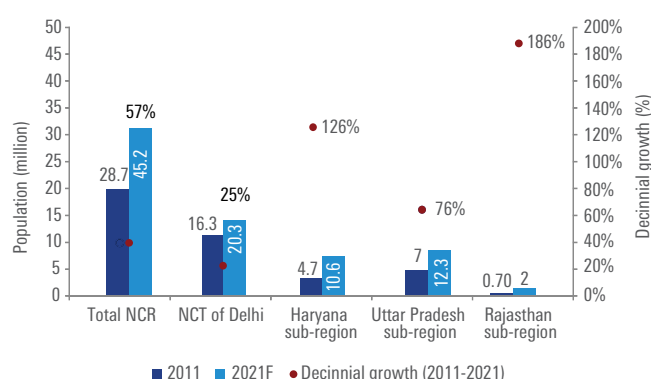




Way forward

The NCR's urban population is anticipated to reach 45.2 million by 2021 from an existing 28.7 million, depicting a decennial growth of nearly 58 per cent. As a result, the urbanisation level in NCR is expected to reach 71 per cent by 2021 from 62.5 per cent in 2011. The highest growth in urban population is expected to be witnessed in the sub-region of Rajasthan, where the urban population is expected to nearly triple (186 per cent increase) to over 2 million from 0.7 million in 2011. This would be followed by the Haryana sub-region, which is expected to witness its urban population more than double (125 per cent increase) to 10.6 million by 2021.

Projected urbanisation in NCR



Source: Urbanisation, Development and Housing requirement in the NCR, NCAER, July 2014

It is noteworthy that all the sub-regions in NCR (barring NCT of Delhi) are expected to witness higher decennial growth in urban population during 2011 to 2021 period as against 2001 to 2011 period. However, NCT of Delhi would be the only region which is expected to witness a lower decennial growth of 24.5 per cent, the lowest in the region. This implies that a substantial chunk of the urbanisation is expected to happen in the surrounding states of NCT of Delhi, namely sub-regions of Haryana, Uttar Pradesh and Rajasthan. These sub-regions are expected to witness their share of urban population in NCR rise to 55 per cent from 43 per cent presently, while the share of that of NCT of Delhi would reduce to 45 per cent from 57 per cent in 2011.

Our recommendations

Considering the high growth in urban population anticipated in NCR, and the existing pace of development of physical and social infrastructure along with the various challenges that each city in NCR is facing, it is essential to seek solutions with a multi-pronged approach since the issues are manifold, notwithstanding inter-related. Some of the possible approach and key recommendations are enlisted below:

Develop and upgrade infrastructure in the peripheral regions

In order to accommodate urban population growth in Delhi and create space for the expected higher growth in urban population in the sub-regions of NCR, the first and foremost task is to develop infrastructure in these sub-regions and peripheral regions of Delhi. Having the basic required infrastructure in place is expected to support employment generation in peripheral regions, which will likely assist in achieving uniform and planned urbanisation.

The central government has taken policy initiatives in this regard through mega programmes such as 'Smart Cities Mission', AMRUT and HRIDAY. These initiatives look far-sighted as they intend to move people away from mega cities to 'satellite' towns having all the basic as well as modern facilities. However, the desired results would depend on an efficient and an effective implementation of these programmes.

Convergence of various mega programmes

The master plans at metropolitan and municipal levels should be integrated. Additionally, the government authorities should converge various mega programmes such as 'Smart Cities Mission', 'Housing for All by 2022', AMRUT, and DMIC etc. to achieve holistic and inclusive growth. This could allow better coordination amongst various implementing agencies, which could lead to better execution of projects.

Improve governance and increase transparency

- States should consider decentralising the decision making by empowering the Urban Local Bodies (ULBs) to expedite infrastructure development. This could enable introduction of reforms at the local level. However, despite 74th Constitutional Amendment which directs states to delegate powers to ULBs, several states have not taken the necessary steps.
- Additionally, capacity of ULBs should be ramped up to improve the physical and social infrastructure across NCR. One of the possible ways to do this is by allowing lateral hiring from private sector.
- Consider implementing mayor rule and Institutionalise metropolitan structure for urban agglomeration with multiple municipalities.

Stable and attractive policy framework to encourage higher private investment in urban infrastructure

Expedite digitisation of land records

The digitisation and clear demarcation of government procedures, forest and private land can help put an end to many disputes related to land. It can also improve third party access to registry information. This is also expected to assist the government in prohibiting illegal settlements from coming into existence. This can be done through faster execution of the Digital India Land Records Modernisation Programme.

Fast-track introduction of land title insurance

The state governments should consider expediting the land title insurance process and make the same available in order to reduce land related litigation, which may help in increasing attracting higher investments. Rajasthan has become the first State in the country to pass the Rajasthan Urban Land (Certification of Titles) Bill. A separate agency will be set up to issue such certificates¹. Other states should also consider enacting the same for inclusive growth.

Formulate an appropriate dispute resolution mechanism

Private investments declined sharply during the Twelfth Plan period, which has severely impacted the development of infrastructure in the country. Therefore, it is imperative to revitalise PPP model to provide the much needed boost to investments in infrastructure. Though, the government has taken cognizance and in this regard, has acknowledged that there is a need to formulate a comprehensive National PPP policy which should clearly outline the objectives, scope and implementing principles of PPP programme envisaged by the government.² However, there is a need to expedite the process to revive private investment cycle.

Release surplus land lying unutilised with various government agencies

Inefficient usage of land has resulted in artificial of developable land resources. Various government agencies hold substantial land in urban regions under ownership of port trusts, the railways, the Ministry of Defence, land acquired under the Urban Land (Ceiling and Regulation) Act, the Airports Authority of India etc. Government shall consider either releasing the surplus land or shall give it on long-term lease for developing physical and social infrastructure.

In Turkey, the government housing agency had acquired land from various government agencies in urban regions. This assisted in creating over half a million affordable housing units in over a decade, which were priced at 30 per cent lower than the market rates³.

1. Rajasthan becomes the first state in India to clear land title bill, Business Standard, 08 April 2016

2. NITI Brief#5, Investment in infrastructure: Strengthening PPP Policy Framework, NITI Aaypg, May 2015

3. Housing Development Administration of Turkey



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