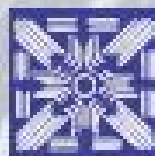
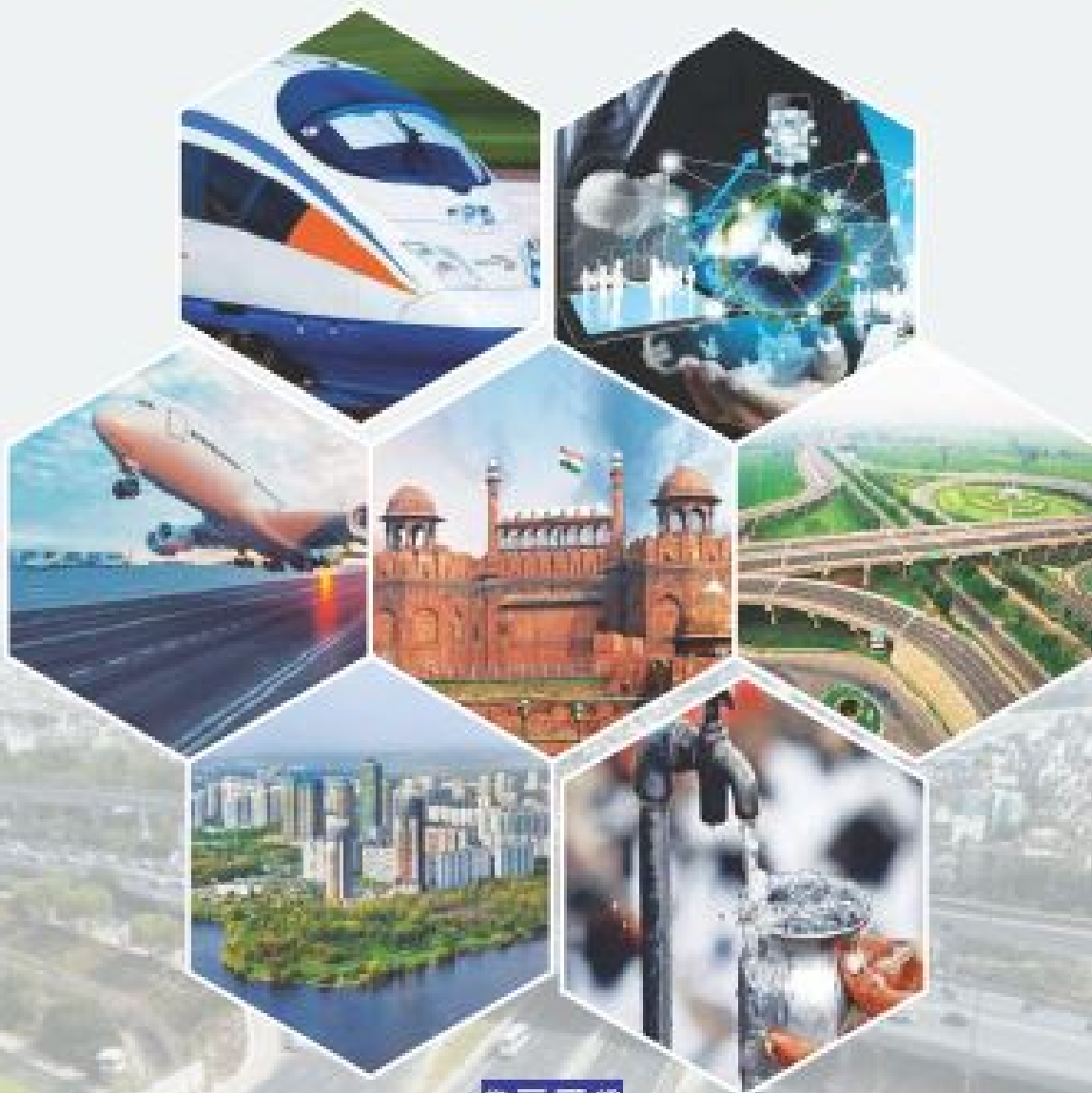


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REGIONAL PLAN-2041 National Capital Region



NATIONAL CAPITAL REGION PLANNING BOARD

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REGIONAL PLAN - 2041
NATIONAL CAPITAL REGION

December 2021



NATIONAL CAPITAL REGION PLANNING BOARD
MINISTRY OF HOUSING AND URBAN AFFAIRS, GOVERNMENT OF INDIA
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VISION OF REGIONAL PLAN-2041

To provide a long term plan for the development of the Future Ready National Capital Region of new vibrant India, the rising global super power, with citizen centric infrastructure which is harmonious, environment friendly, smart-digital technology driven towards building an economically prosperous region, in tune with attainment of Sustainable Development Goals (SDGs).

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1. INTRODUCTION : BACKGROUND AND VISION

1.1 NCR AT A GLANCE

- (i) The National Capital Region (NCR) is a unique example of inter-state regional planning and development for a region with national capital Delhi as its core. The NCR region has been created under the NCRPB Act, 1985 of Government of India, based on authorization of the Parliament by all the four States/UTs. The NCR presently includes NCT-Delhi, and many districts from three adjoining states/ currently including **14 districts of Haryana, 8 districts of Uttar Pradesh, 2 districts of Rajasthan** (refer **Figure 1.1**). The composition of the NCR Planning Board and statutory Planning Committee constituted for harmonized planned development of NCR is given at **Annexure-D-1.1 and D-1.2**, respectively. According to Census 2011 the population of NCR was 5.81 crores. It is expected to grow to around 7 crores by 2031 and to about **11 crores by 2041**. The region will be highly urbanised in the coming decades with urban populations-of about 57% by 2031 and about 67% by 2041.
- (ii) The complexity of the Region increases due to its vastness i.e. **55,083 sq. km.** in area and spatial expanse. The size of the region which was 30,242 sq. km. as per RP-2001 (notified in 1989) has increased to 33,578 sq. km. in 2005 (later revised to 34,144 sq.km.) and further increased to 55,083 sq. km. in 2018. A brief about constituent areas of NCR is presented at **Annexure-D-1.3**. NCR is now more than the size of States like Punjab (50,363 sq.km) & Uttarakhand (53,483 sq.km) and more than the combined area of Sikkim (22,429 sq.km) & Kerala (38,863 sq.km). Further, globally, NCR is larger than the countries like Denmark (42,924 sq. km.), Holland (41,543 sq. km.), Switzerland (41,285 sq. km.), Taiwan (36,193 sq. km.), Costa Rica (51,100 sq. km.), Slovakia (49,037 sq. km.), Bhutan (38,394 sq. km), etc. Hence, planning and development of such a vast area is major challenge.
- (iii) The NCR Planning Board has also identified 9 Counter Magnet Areas (CMAs) spread over 6 adjacent States which are Hisar, Ambala, Kota, Jaipur, Patiala-Rajpura, Kanpur-Lucknow, Bareilly, Gwalior and Dehradun.
- (iv) To support infrastructure development in the region, the Board has part financed 366 projects with an estimated cost of about Rs. 32, 435 crores as of July, 2021. Detail regarding NCRPB funded projects is provided in **Annexure-D-1.4**.

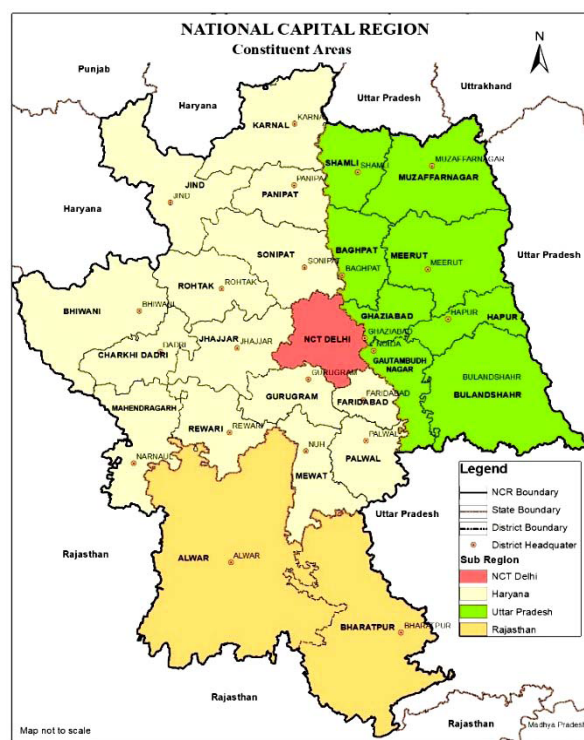


Figure 1.1: Constituent Areas of NCR

2.1 UNIQUE FEATURES OF NCR

The unique features of the national capital region are as follows:

- (i) Delhi-NCR is the seat of governance of the rising super power India and therefore, will continue to be at the focus of the region and lend it unique importance as compares to other Metro Regions in the country.
- (ii) NCR is the largest dry-port and largest Logistics Hub for the entire North India which is largely landlocked.
- (iii) This region is the principal international gateway for 3 Union Territories (Delhi, J&K, Ladakh) and 5 States (UP, Rajasthan, HP, Punjab, Haryana).



- (iv) It is currently home to the second largest population on Earth and by year 2030, it will overtake Tokyo to become the world's largest human settlements agglomeration.
- (v) It is the only Capital Region in the world encompassing 4 States/UT.
- (vi) It is an unique example of cooperative federalism backed by a Central Statute.
- (vii) **The region has emerged as the highest GDP contributor to the Indian economy in past few years and contributes substantially about 8% to the national GDP.**
- (viii) **It is also the sixth highest performing economy among global top 300 metropolitan cities.**
- (ix) **Delhi NCR is the highest employment contributor in the country with about 6.2 lakh jobs during 2014-16, overtaking Mumbai by a third, which generated only 4.7 lakh jobs in the same period.**
- (x) The region has a huge potential to be the biggest contributor to achieve India's dream of US \$ 5 trillion economy (which is currently US \$2.8 trillion on nominal basis in 2019-20 as per provisional estimates), with holistic planning and concerted efforts.
- (xi) This is only region in the country and amongst the few in the world, where Metro rail, Rapid rail and several Expressways are available to provide impetus to mass mobility serving the regional economy.

1.3 KEY CHALLENGES

The key challenges faced for development in the National Capital Region are as follows:

- (i) Multiple laws across four subregions.
- (ii) Different land assembly and change in land use provisions varying vastly across 4 States.
- (iii) Approval processes for different economic activities and even for construction varies vastly across sub-regions.
- (iv) Haphazard growth in various parts despite past 2 long-term Regional Plans.
- (v) Low resource allocation for projects with holistic, macro pan-NCR objectives.
- (vi) Time consuming, complicated, cumbersome and non-digital approval processes across all four regions.
- (vii) Entry barriers between four sub-regions - local priorities.
- (viii) Impending water crisis due to insufficient resources, falling water table, increasing contamination, leakages, sub-optimal reuse of treated waste water, insufficient treatment facilities, poor water user behaviour.
- (ix) High road accidents, poor trauma care network and high percentage of casualties.
- (x) High Pollution levels especially of Air and Water.
- (xi) Huge population with high urbanisation; 67% expected by 2041.
- (xii) Poor sanitation in some areas
- (xiii) Widespread slums.
- (xiv) Inadequate network of quality primary and secondary healthcare.
- (xv) Archaic laws like Delhi Land Reforms Act, etc. hold back development and create islands of chaos like Lal Dora/ Extended Lal Dora, etc.

1.4 NCRPB ACT 1985 AND MANDATE

- 1.4.1 NCRPB Act mandates the Board to prepare long term Regional Plan for NCR development, and coordinate and monitor its implementation. The objective of the Plan is to evolve harmonised policies for (a) Control of land uses and (b) Infrastructure Development, to avoid any haphazard development of NCR. The Act further envisages the **Regional plan to include policies and proposals for the following:**
 - (i) Policies for land use and its allocation for different uses and manner of its use i.e. by development or conservation or otherwise



- (ii) Major urban settlement patterns
 - (iii) Providing suitable economic base for future growth
 - (iv) Transport, communication, including arterial roads, railways
 - (v) Supply of drinking water and drainage
 - (vi) Indication of other “priority areas” requiring immediate attention
 - (vii) Any other matters for growth and balanced development of NCR
- 1.4.2 The Act makes the Board responsible to ensure that all Sub-Regional Plans, Functional Plans, Project Plans should conform to Regional Plan. Section 29(i) of the Act mandates that ‘no development shall take place in NCR in violation of Regional Plan’. Further Section 27 provides that NCRPB Act shall have overriding effect on any existing non-confirming Act/Rules, Judgements, etc.
- 1.4.3 Since its inception, NCRPB has prepared two Regional Plans i.e. Regional Plan-2001 & Regional Plan-2021 for the planned development of NCR.

1.5 VISION OF REGIONAL PLAN-2041

To provide a long term plan for the development of the Future Ready National Capital Region of new vibrant India, the rising global super power, with citizen centric infrastructure which is harmonious, environment friendly, smart-digital technology driven towards building an economically prosperous region, in tune with attainment of Sustainable Development Goals.

1.6 APPROACH OF REGIONAL PLAN 2041 : TOWARDS A NEW VIBRANT INDIA

- 1.6.1 In order to prepare the Regional Plan 2041, the following steps were undertaken:
- (i) Review of Regional Plan-2021 through a Steering Committee assisted by 14 Study Groups having NCR participating States and Experts as Members.
 - (ii) Detailed comprehensive population analysis through Demographic Expert (Ex-Census of India).
 - (iii) An in-house study of 21 Global Metro Plans.
 - (iv) A Conclave at Vigyan Bhavan to kick start the discussion on preparation of Regional Plan-2041
 - (v) Detailed stakeholders consultations, 17 in number, with various Experts, Academicians, NGOs, Industry/ Trade Associations, Officials from various State Government Departments, Officials from Central Ministries, NITI Aayog, etc. A snap shot of stakeholder consultations held for Regional Plan preparation, consisting of sector wise 17 full day workshops, is given at **Annexure-D-1.5**.
 - (vi) Suggestions were invited through the NCRPB website.
- 1.6.2 **Based on the above vision and preparations, and bearing in mind the unique features and challenges in the national capital region**, the following approaches have been adopted for the RP- 2041:
- (i) to ensure that all areas in NCR are governed by principles of planned development; the core areas of Delhi and adjacent central NCR areas to be specially covered by controlled /notified/ development areas of nearest development authorities/municipal bodies etc.
 - (ii) to acknowledge the reality of growing urban development and to provide for appropriate planning norms to meet the future infrastructure requirements. This has logically translated into realistic and need based planning that also meets the core objectives of legislating the NCR Planning Board Act i.e. to have a special planning perspective for the entire NCR area.
- 1.6.3 Efforts have also been made to build upon and leverage the significant economic potential of the region; strategies have been proposed to enable not only NCT-Delhi but the entire National Capital Region to fully exploit the upcoming economic opportunities and to support India play a leading role in Asian and global economy. Ease of doing business, unified economic space in NCR, shift of significant approval processes from physical to online portals, identification of important economic corridors, identification of key economic



pillars etc. are some of the interventions included in the policies and proposals of this Plan.

- 1.6.4 The **goal of the plan is to have people centric planning and ensure harmonious development with conservation**, so as to meet the aspirations of the people. The plan is people centric and strives to provide planning support for primary developmental goals viz modern, basic citizen services of reasonable global standards-clean air ;safe and adequate water; fast, efficient and safe mobility options; security of life and limb; accessible nourishment for soul in terms of sports, leisure, culture facilities; healthcare; social safety nets for infirm citizens, elderly, handicapped etc.; smooth interface with governance systems; and above all reasonable opportunities for self-growth like education, skilling coupled with life sustaining employment avenues.
- 1.6.5 Conscious efforts have been made to **dovetail national priorities and programmes with the regional strategies and interventions**.
- 1.6.6 Special focus has been laid on **widespread use of technology** for service delivery for civic amenities, citizen services and improving business environment along with an aim to expedite Government supported infrastructure projects and infrastructure programmes in NCR.
- 1.6.7 The Plan is inclusive at its core with the philosophy of '*Sabka ka Saath, Sabka Vikas, Sabka Vishwas*' and strives to provide for social services for the aging, the infirm, the working women, with an endeavour to make the region safe, clean, slum free and vibrant for its citizens. Sustainable Development Goals have been followed among the guiding principles.

1.7 SALIENT FEATURES AND PRIORITY AREAS OF REGIONAL PLAN-2041

1.7.1 The salient features of the Regional Plan -2041 are as follows:

- (i) **Demography** - Population in the NCR is expected to grow to around 7 crores by 2031 and to about 11 crores by 2041. The region will be highly urbanised in the coming decades despite having about 24 districts outside Delhi. The urban population is projected to be about 57% by 2031 and about 67% by 2041 of the region. Sub-region wise five yearly projections with district wise estimates are also worked out and given in the regional plan.
- (ii) In keeping with the twin approach of decongesting Delhi and providing for the already burgeoning population, the plan proposes both brown-field re-development of existing settlements and greenfield creation of new settlements at appropriate locations in NCR. Exploration of possibilities of establishing 5 to 8 new greenfield townships are proposed, based on productive economic impulses in UP, Haryana and Rajasthan sub regions. All new settlements, including brown-field, shall have modern smart civic amenities infrastructure like those developed in AURIC City of DMICDC.
- (iii) **Policy Zones:** The 5 policy zones are i) NCT Delhi, ii) Central NCR i.e. CNCR which shall be outside Delhi up to five (05) kilometres beyond the outer edge of the ring of expressways formed around Delhi i.e. by the Eastern Peripheral Expressway and the Western Peripheral Expressway; this CNCR area shall be the Golden Ring of Opportunity in NCR, iii) Highway Corridor Zone and Transit Oriented Development (HCZ and TOD), iv) Conservation Zone, and v) Rest of NCR.
- (iv) **Landuse** -Policies for each of these areas have been reinvented to meet twin requirements of ground realities and futuristic aspirations of the Greatest Global NCR of next decades. Hence realistic and need based planning is proposed.
- (v) The NCR is the largest GDP contributor with 8 percent and has a potential to contribute a major part of the aspired US\$ 5 trillion GDP of our country. Apart from positioning of CNCR as "Golden Ring of Opportunity", **Urban Regeneration** of global standards is proposed for a paradigm transformation of future NCR, considering that NCT Delhi had a density of 11,320 persons per sq. km as per 2011 Census. **Ten Economic Pillars** have been envisaged for harmonised economic development of NCR. These are (i) Industrial development including focus on MSMEs, (ii) Farm Incomes and Traditional Economy (iii) Economic Growth Corridors (iv) Ensuring Ease of Doing Business (v) Multi-Modal Transport & Logistics (vi) Tourism, MICE & Leisure (vii) Creation of Enabling Infrastructure (viii) Skilling and Employment Synergy (ix) Circular Economy (x) Smart & Digital NCR.
- (vi) The plan has also identified and included a list of projects for implementation of the policies. Detailed feasibility and



funding arrangement for these projects shall be taken up during the Plan period.

- (vii) An exercise for delineation/ revision of NCR area/boundary is currently underway. In case there is a change in the current NCR area/boundary due to such delineation, this Regional Plan-2041 shall stand *ipso facto* modified and shall be applicable *mutatis mutandis* immediately from the date of notification of the relevant addendum to this Regional Plan.
 - (viii) It is notable that the 41st Board Meeting of the NCRPB held on 12.10.2021 agreed to redelineate the NCR on the following principles:
 - (A) The National Capital Region should primarily be a contiguous circular region of 100 km radius from Rajghat (Delhi). If any tehsil exists on either side of the 100 km delineation, then the decision to include or exclude whole of the tehsil will be left to the respective State Governments.
 - (B) Beyond 100 km radius and upto existing NCR boundary, all notified cities/ towns along with a corridor of 01 km on either side of connecting Expressways/ National Highways/ State Highways/ Regional Rapid Transit System will be included.
 - (C) Further, the request of Rajasthan for inclusion of future Towns and Highways was discussed. It was agreed that additions in NCR due to future notified towns/ completed Expressways or Highways would be duly taken up at appropriate time.
 - (viii) (a) It is further notable that pursuant to the above deliberations in the 41st Board Meeting, Uttar Pradesh and Rajasthan had conveyed that if any tehsil exists partially within the 100 km radius from Rajghat (Delhi), then the whole of such tehsil should be included in the NCR area. However, Haryana has conveyed its decision to keep only those tehsils within the NCR, which are covered entirely within the 100 km radius from the centre in Delhi.
 - (viii) (b) According to the principles agreed in 41st BM as per (viii) (A, B & C) and the above (viii) (a), Uttar Pradesh has conveyed that there will be no change in NCR in UP Sub-region. The Rajasthan Sub-region of NCR has yet to be worked out. Meanwhile, Haryana has conveyed some tentative details showing that the total area of 14 districts in NCR currently is 25327 sq km of which area proposed in future NCR as covered within 100 km radius, considering only entire tehsils falling within this radius comes to 10546.42 sq km. (details of tehsils proposed for inclusion or exclusion have not been conveyed). In addition 1 km buffer on both sides of National Highways No.9, 11, 44, 48, 148 B, 248 A, 334 B, 352, 709, 709 A and 919 are also proposed for inclusion. Haryana has further conveyed a list of 26 Municipal Committees, 13 Municipal Councils and 07 Municipal Corporations which will continue to be part of NCR along with the urbanisable zones of the Development Plans published by the State in 18 of these ULBs including MBIR, abutting above Highways.
 - (viii) (c) The re-delineated/revised NCR has to be notified by the Central Government as per NCRPB Act, 1985 to become effective. A detailed NCR area assessment is required by NCRPB as per 41st BM decision, this area assessment is proposed to be done before seeking further Board approval on the final proposed NCR area, prior to formal notification by the Central Government. Thereafter all the relevant data in this Regional Plan-2041, including maps, tables, data, etc. will be duly/suitably amended. However, till such time of the above formal notification, all the relevant and applicable maps, tables, data, policy provisions, etc. in this draft RP-2041 document (including Annexures) shall continue to be valid as part of the RP-2041 and as applicable to current NCR area i.e. 55083 sq km.
- 1.7.2 **The major Priority Areas for the Plan are** i) Urban Regeneration, ii) Future Ready Citizen Infrastructure, iii) Multi-Modal Transport & Logistics, iv) Industries & MSMEs, v) Economic Corridors, vi) Tourism, MICE & Leisure, vii) Farm Incomes & Traditional Economy, viii) Skilling & Employment, ix) Smart and Digital NCR, x) Business Enabling Infrastructure
- 1.7.3 The policies and proposals for the above priority areas have been elaborated in the various succeeding Chapters given in this Report.



2. DEMOGRAPHY AND SETTLEMENT PATTERN

2.1 EXISTING STATUS

- (i) As per the World Urbanization Prospects Report 2018, Delhi metropolitan area is slated to become the world's largest metropolis, overtaking Tokyo by 2030. This also means that the NCR would become the most populous region in the world.

2.1.1 Population Distribution and Density

- (i) Total population of the NCR in the current area was 474.13 lakhs in 2001. The NCR population increased to 581.57 lakhs in 2011. The urban-rural population of NCR, is given in **Table 2.1**. The rural population of the region was 242.43 lakh in 2001 and 264.26 lakh in 2011. The NCT of Delhi is with about 99 percent urban population. Sub-region wise analysis indicates that the NCT of Delhi has the highest population density of 11,320 persons per sqkm followed by Uttar Pradesh (1,263 persons per sq km), Haryana (649 persons per sq km) and Rajasthan (463 persons per sq km). The average density of the NCR excluding NCT Delhi is about 772 persons per sq km in 2011, which increased from 627 persons per sq. km in 2001.

Table 2.1: Urban-Rural Population of NCR, 2001-2011

Urban-Rural Component	Population (Person)		Percent share (Percent)	
	2001	2011	2001	2011
Total NCR	47,413,296	58,157,286	100	100
Urban NCR	23,169,390	31,731,165	48.87	54.56
Rural NCR	24,243,906	26,426,121	51.13	45.44
Urban NCR excluding NCTD	10,293,610	15,362,266	19.64	25.69

Source: Census of India (2001, 2011); Report on population projections for National Capital Region 2016-2041.

- (ii) In 2011 NCR had 230 urban settlements of various size (refer **Table 2.2**) and 11,774 villages.

Table 2.2: Urban Settlements in NCR (2011)

Urban Settlement/ Sub Region	Class -I (1 Lakh plus)	Class-II (50,000- 99,999)	Class-III (20,000- 49,999)	Class-IV (10,000- 19,999)	Class-V (5,000- 9,999)	Class-VI (Below 5,000)	Total
Haryana	11	6	27	20	22	3	89
Rajasthan	3	0	10	7	6	0	26
Uttar Pradesh	13	13	27	36	23	2	114
NCT-Delhi	1	0	0	0	0	0	1
NCR	28	19	64	63	51	5	230

Source: Census of India -2011

- (iii) The average population density of the NCR as per Census of India 2011 was about 1,056 persons per sq km, which was about three times higher than the all-India average of 382 persons per sq km. Demography Snapshot of NCR demography alongwith sub-region wise population density is given at **Annexure D-2.1**.

2.1.2 Growth of Population in Sub-regions

- (i) The main components of population growth are natural growth and in-migration. Migration has played an important role in the growth of population of the NCT of Delhi. Analysis of decadal trends in population growth and migration in NCT Delhi and other sub-regions of NCR is given as **Annexure D-2.2**.
- (ii) Component of migrants to NCT Delhi from Rajasthan is lowest i.e. 4.27% among NCR States. Decadal growth of urban Area in Rajasthan sub region is lowest i.e. 36.22% among NCR States. Therefore, Rajasthan sub region presents vast potential to absorb urban growth of NCT Delhi.



2.1.3 Counter Magnet Areas (CMAs)

- (i) In line with the Section 2(f) of NCRPB Act, 1985, CMAs are envisaged as urban areas located sufficiently away from the NCR and with significant economic growth. These identified CMAs are expected to play an important role in attracting population to themselves, the Delhi-bound and the NCR-bound potential migrant population from their respective influence areas. The CMAs are presented as counter weights to the NCR in balancing population and economic activities in the larger region which would further act as interceptors of migratory flows into the NCR.
- (ii) Board in its 31st meeting held on 11 November 2009 decided that CMAs would not limit to urban areas only and development could be proposed in the form of corridors. It was also decided that these counter magnet areas shall consider its zone of influence for migration as the area within about 120 km radius around them. Concerned State governments were to notify their respective CMAs and prepare development plans & related plans of action for implementation. So, few CMAs corridors are falling within multiple jurisdictions.
- (iii) Development plans or Master plans of all the CMAs except Dehradun CMA have been prepared by the respective State governments. The respective State governments have taken little initiative for strengthening of the economic base and regional linkages in these areas to make them as counter magnet areas, which would have enabled them to undertake their assigned roles more effectively. There are nine CMAs to NCR spread over six States presented in **Figure 2.1** and below:
- (i) Hisar and Ambala in Haryana (ii) Kanpur-Lucknow corridor and Bareilly in Uttar Pradesh
 - (iii) Jaipur and Kota in Rajasthan (iv) Patiala-Rajpura corridor in Punjab (v) Gwalior city and surrounding areas
 - (vi) Dehradun in Uttarakhand

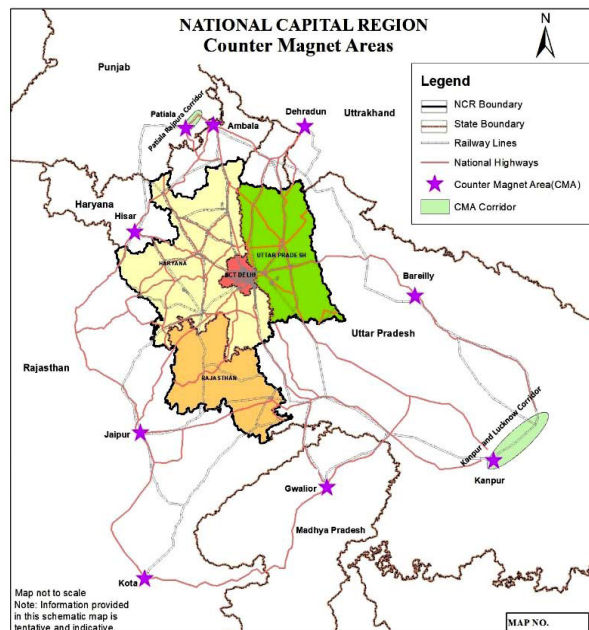


Figure 2.1: Counter Magnet Areas to NCR

2.2 KEY ISSUES AND CHALLENGES

- 2.2.1 The large size and continuing growth of population in NCR adds to burden on infrastructure and natural resources. As per Census of India 2011, there are about 78 census towns (CT) in NCR of which 34 are in the UP Sub-region, 33 are in the Haryana Sub-region and 11 in the Rajasthan Sub-region. Most of these towns are experiencing haphazard construction, adhoc provisioning of infrastructure development, etc.
- 2.2.2 There are many small statutory towns (less than 50,000 population), which need streamlined planning systems with specific development plans.
- 2.2.3 Several towns outside the NCT Delhi and CNCR could not achieve their desired population as proposed in the NCR Plan, 2021. The issues of infrastructure and planned development in villages especially in Delhi, CNCR and urbanisable areas of cities / towns are undergoing significant, physical and functional transformation. Villages are characterized by a mixed landuse, compact built form, narrow circulation space and low rise-high density developments.
- 2.2.4 Migration to urban areas of the NCR continues to be one of the major contributors to population growth in the region. This results in overcrowding of cities, haphazard growth including formation of slums and pressure on city infrastructure.



- 2.2.5 Although, six of the nine identified CMAs are from the NCR participating States, the State governments' initiatives have focused on adding more areas to the NCR rather than focusing on and developing the identified CMAs to counter in-migration towards the NCR, decrease dependency and pressure on the NCR.
- 2.2.6 The CMAs appear to lag behind in preparing the Plans of Action (PoA). The Plans of Action are prepared only for Jaipur and Kota CMAs. The respective State governments have prepared the master/development plans without focusing on the role of these counter magnet areas as interceptors of migration into NCR.
- 2.2.7 So far the concerned State governments have not come up with large development projects. Out of the nine CMAs, only five CMAs have submitted a total of 14 projects to the NCR Planning Board for financial assistance.

2.3 POPULATION PROJECTIONS

- 2.3.1 As per the report on "Population Projections for NCR (2016-2041)" the population of the NCR is projected to be 718.2 lakh by 2021, 895.9 lakh by 2031 and 1130 lakh by 2041. Sub-region wise details are given in Table 2.3.

Table 2.3: Proposed Population of NCR and Sub-regions (in lakhs)

Year	NCR Total	NCT-Delhi		Haryana		Rajasthan		Uttar Pradesh	
		Popu.	Percent to total	Popu.	Percent to total	Popu.	Percent to total	Popu.	Percent to total
2016	645.51	185.23	28.70	182.74	28.31	68.71	10.64	208.84	32.35
2021	718.21	204.64	28.49	204.12	28.42	75.87	10.56	233.58	32.52
2026	801.09	226.33	28.25	229.05	28.59	83.78	10.46	261.93	32.70
2031	895.92	250.59	27.97	258.31	28.83	92.51	10.33	294.52	32.87
2036	1,004.80	277.71	27.64	292.87	29.15	102.15	10.17	332.07	33.05
2041	1,130.26	308.03	27.25	334.00	29.55	112.80	9.98	375.43	33.22

Source: Census of India (2001 and 2011); Report on population projections for the National Capital Region 2016-2041

- 2.3.2 The total urban population of NCR is projected to be 425.9 lakh by 2021 (59.3 % of total population), 570.4 lakh by 2031 (63.6 % of total population) and 766.5 lakh by 2041 (67.8 % of total population). NCT Delhi is expected to be 100% urban by 2031. Uttar Pradesh sub-region shall have more than 50% population in urban areas from 2021 onwards followed by Haryana by 2031. Urbanization level in Rajasthan sub-region, is about 20% in 2021, is expected to be close to 25% by 2041. Further, a number of large rural settlements are also expected to become census towns. The schematic maps showing 230 Urban Centers (Figure 2.2) and Urban Settlement Hierarchy (Population 2011-2041) of major settlements (Figures 2.3, 2.4, 2.5 and 2.6) should be referred. The Projected Population of NCR incl. Master/Dev. Plans Projections of Haryana and Rajasthan are given in Annexure D-2.3.

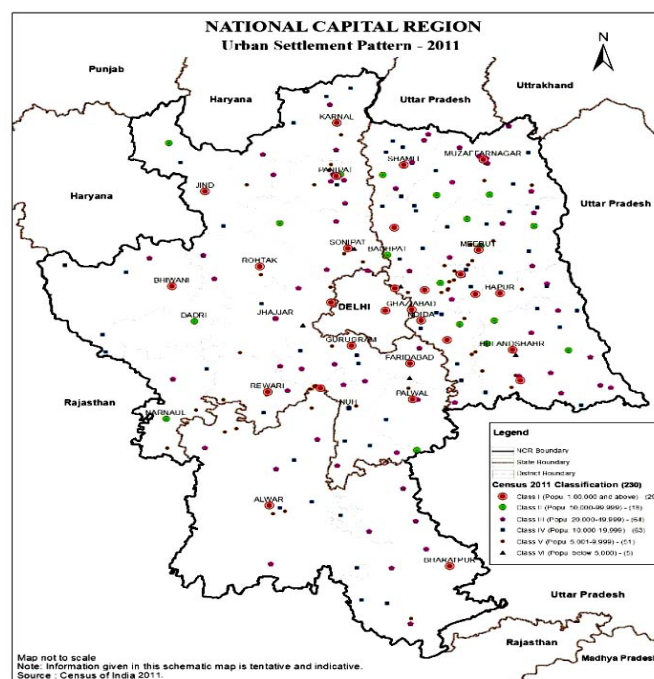


Figure 2.2: Urban Settlement Pattern-2011



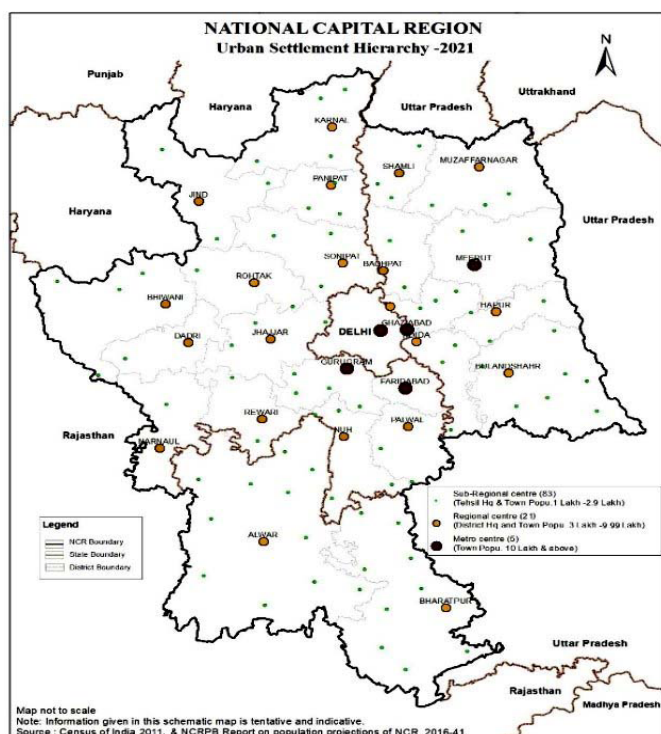


Figure 2.3: Urban Settlement Hierarchy -2011

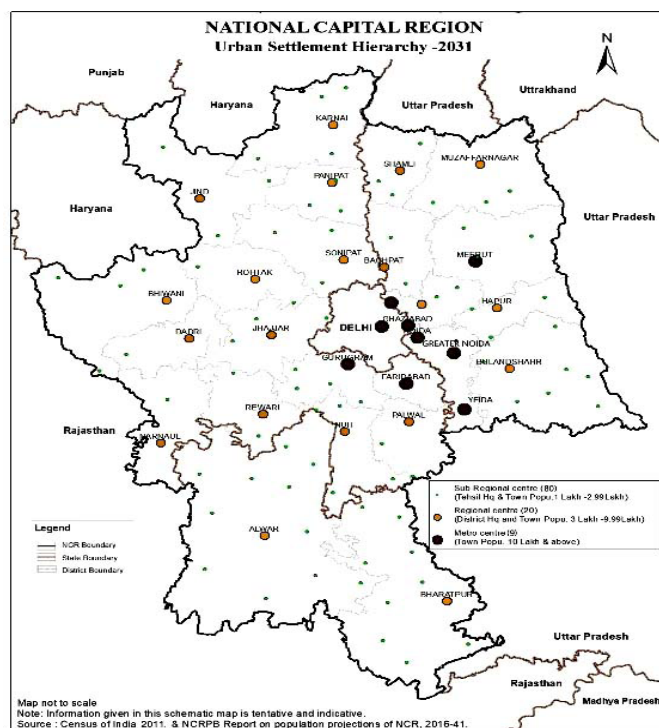


Figure 2.4: Urban Settlement Hierarchy -2021

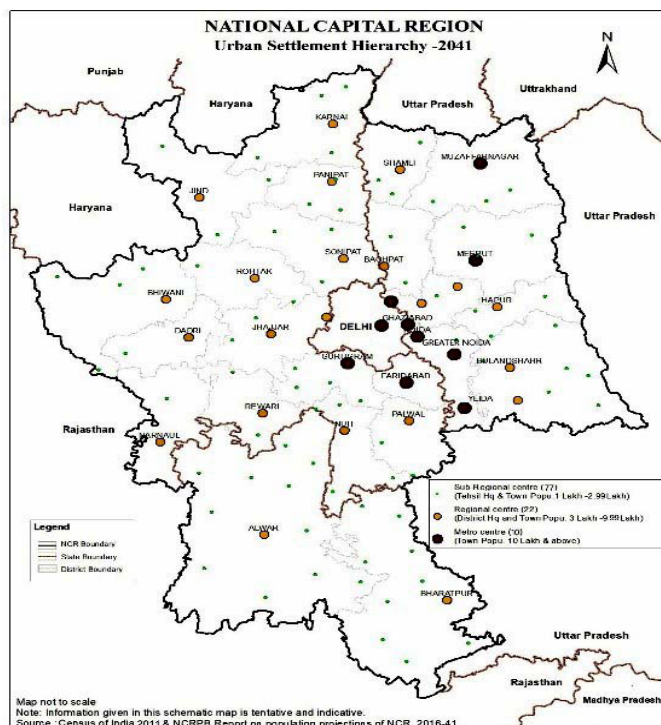


Figure 2.5: Urban Settlement Hierarchy -2031

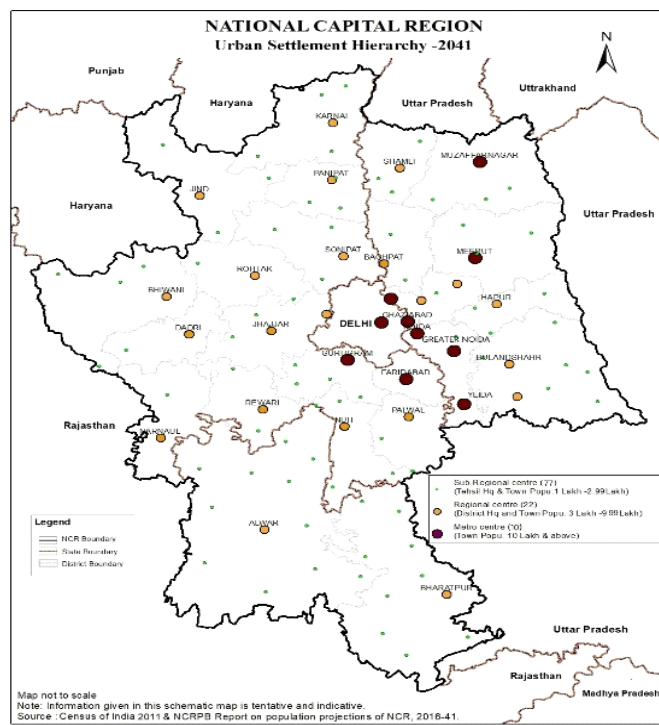


Figure 2.6: Urban Settlement Hierarchy -2041

2.4 POLICIES AND PROPOSALS

2.4.1 Population Policies

- (i) NCR States should endeavor to achieve development of a well-knit regional settlement system based on polycentric approach of planning. All settlements in the region should grow as per respective potential and capacities so as to harness development within the broad framework of the Regional Plan 2041. Population



estimates of the Regional Plan-2041 are indicated and do not imply any restrictions on the States. For instance, the population projections of the Haryana and Rajasthan cities/townships could be considered as per the Development Plans already published by the State which are given in Tables D-2.3.5 (A) and (B) of Annexure D-2.3.

- (ii) NCR States should adopt mixed approach in the development of settlements by undertaking brownfield redevelopment of old areas as well as developing Greenfield townships to achieve sustainable development. New self-contained and self-sufficient Smart township development could be undertaken as growth nodes along the key transport corridors, existing/proposed expressways, orbital rail corridors and other suitable locations either on *less* developed land or as extension of the existing settlements, based on ToD approach with smart elements like land allotment, e-land, smart water and electricity, central smart command system, 24X7 security, rain water harvesting, net zero water consumption areas (recycling of black & grey water), etc.
- (iii) Rural development should be boosted through provision of facilities and services as per appropriate hierarchy to help stimulate production and increase rural income thus facilitating diversification of the regional economy.

2.4.2 Settlement Development Policies

- (i) NCR States should ensure that all census towns (CTs), unless already notified as Industrial Authority or any such other Authority, are recognized as statutory towns and their Master/ Development plans are prepared in a phased and time bound manner. MoHUA has already requested States to take steps for recognizing/ notifying the census towns as statutory towns. (E.g. Maharashtra Govt. has already converted 19 CTs in the State to statutory ULBs).
- (ii) Comprehensive Scheme for redevelopment of villages within urbanisable area should be prepared by the concerned departments/ local bodies, for their required facilities and services, green/open areas, circulation etc., and integration with surrounding areas. This aspect should also be considered while preparing layout plans for development of new sectors for city extension.
- (iii) Following major National Industrial Clusters Development Programme (NICDP) projects falling in NCR be integrated with the overall planning and development of the sub-regions through respective Sub-Regional Plans (SRPs):
 - (a) Integrated Industrial Township at Greater Noida
 - (b) Integrated Multi Modal Logistics Hub at Nangal Chaudhary (Haryana)
 - (c) Multi Modal Logistics Hub (MMLH) & Multi Modal Transport Hub (MMTH) at Gr. Noida
- (iv) Emphasis, should be placed on the development of Metro Centres and Regional Centres in CNCR but outside NCT Delhi, which could be done by providing fast and efficient connectivity, boosting economic activities, and developing state of the art infrastructure.
- (v) To secure a significant impact of large growth centers, the CNCR towns along with identified Metro Centers and Regional Centers should be intensively developed for attracting investment, generation of employment through creation of high quality infrastructure, robust transport and communication linkages, provision of high quality residential areas, industrial and commercial complexes. These growth centres need to act as catalysts for regional development.
- (vi) Small and Medium towns in the region be developed as Sub-Regional Centers or Service Centers, on priority as these towns can play an important role in supporting the socio-economic development in their rural hinterlands. This could be done by providing access to affordable education and health facilities and setting up agricultural extension services and agro-based industries, etc. as per local resources and requirements.
- (vii) NCR States should take necessary steps to integrate the investment regions of Manesar-Bawal Investment



Region (MBIR), Khushkhera-Bhiwadi-Neemrana Investment Region (KBNIR) and Dadri-Noida-Ghaziabad Region (DNGIR), in their respective SRPs in coordination with NICDC.

- (viii) Government of Uttar Pradesh has planned the Yamuna Expressway Industrial Development Area (YEIDA) as a Greenfield city with 20 lakh design population. Keeping in view its development potential, the Yamuna Expressway (Delhi-Noida-YEIDA-Agra-Kanpur) and large projects like International Airport at Jewar and upcoming World Class Film City, YEIDA is proposed to be developed as a Metro Centre outside the CNCR. Further, Haryana has plans to develop areas around KMP Expressway as Panchgrams and these shall be detailed in its SRP as new greenfield townships, as feasible and as applicable.
- (ix) Rural settlements should be developed on the lines of National Rurban Mission (NRuM) and more Rurban clusters should be identified in the sub-regions. SRPs, District Development Plans (DDPs) should be prepared for planned development in the districts.

2.4.3 Policies for Migration Facilitation

- (i) **Migrant Data Platform:** Migrant registration should be mandatory and Aadhar linked to keep track of inter/ intra-regional migrant movement. For this, necessary infrastructure of Migrant Service/Facilitation Centers (MFCs) should be developed at district and preferably also at Tehsil and block levels and data shared through public portals.
- (ii) Migrant workers should also be enrolled under Pradhan Mantri Jan Arogya Yojana (PM-JAY & Ayushman Bharat) to enable access to cashless medical facilities at their workplaces.
- (iii) Details for the above migrant facilitation provisions be included by NCR States in their SRPs, DDPs and Master/Development Plans

2.4.4 Proposed Hierarchy of Settlements

- (i) Regional Plan-2021 focused upon the six tier hierarchy of settlements. The RP -2041 proposes the hierarchy of settlements as presented in Table 2.4.

Table 2.4: Proposed Seven Tier Hierarchy of Settlements, 2041

S. No.	Hierarchical Level	Components and Proposed Population Range by 2041	Role of Settlements
1.	Metro Centre The list of the proposed Metro Centres (metropolis) is at Table 2.5.	All towns with 1,000,000 and above population	Will act as powerful growth nodes to attract capital functions & activities & help in population dispersal from NCT Delhi. Given their special functional status & size, a high level of physical, social & economic infrastructure at par with Delhi, is required to be developed in these urban centres. This would include efficient Intra-Urban Mass Transportation System as well as strong transport & communication inter linkages amongst all towns. Respective participating States & their agencies would be required to create necessary infrastructure themselves in these Metro Centres & also facilitate private sector investment therein. Metro centers be developed in-line with smart cities initiative, on priority.
2.	Regional Centre (RC): Proposed regional centres & their projected estimated populations are given at Table 2.3.2 of Annexure D-2.3.	All district headquarters, and all towns with population ranging from 300,000 to 999,999 RCs /complexes proposed in notified RP-2021 will also be retained in RP-2041 as they are at various stages of planning and development.	Will be well-established urban centre in the region, marked by highly specialized secondary and tertiary sector activities, advanced industrial and other economic activities, having concentration of administrative and higher order service functions, which normally cannot be performed by other lower order centres and providing job opportunities.



3.	Sub-Regional Centre	All tehsil headquarters & towns with population range 100,000 to 299,999.	Functions, identification and role, of other lower hierarchy of settlement, shall have to be dealt and spelt out in the sub-regional plans. An indicative broad role is given at Annexure-P-2.1.
4.	Service Centre or Nodal Point or ICAPs	All block headquarters, & all settlements / clusters with population range 10,000 - 99,999.	
5.	Central Village/ Bazar Village Clusters	All settlements with population ranging from 5,000-9999	
6.	Medium Village	All settlements with population ranging from 2,000 to 4,999	
7.	Small Village	All settlements with pop. < 2,000.	

Table 2.5: Projected Population of Metro Centres

Metro centres	Population (Census 2011)	Projected Population				
		2021	2026	2031	2036	2041
1. NCT Delhi	16787941	20463515	22633050	25058682	27770711	30803207
2. Gurugram	886519	2568260	1326975	4250000	1612748	9622526
3. Faridabad	1414050	2684729	2116604	3955407	2572428	6814332
4. Noida	637272	901544	1072304	1275407	1516981	1804310
5. Ghaziabad	1648643	2332323	2774085	3299521	3924478	4667808
6. Loni	516082	730097	868384	1032863	1228496	1461184
7. Meerut	1305429	1846781	2196577	2612628	3107482	3696066
8. Muzaffarnagar	392768	555646	660890	786068	934957	1112045
9. Greater Noida*	102054	Design population as 12 lakh				
10. YEIDA*	Design population as 20 lakh					
11. MBIR (Manesar Bawal IR)	Design population as 33.15 lakh					

* Govt. of UP (proposed)/NCRPB

2.4.5 Counter Magnet Areas

2.4.5.1 For strengthening of economic base of the CMAs following policies are proposed:

- Linkages with hinterlands as well as with other important metropolitan centers should be strengthened to make meaningful use of economic and physical infrastructure proposed to be developed in the counter magnet areas.
- The central ministries like Ministry of Housing and Urban Affairs, Ministry of Railways, Ministry of Shipping, Ministry of Road Transport and Highways as well as Ministry of Electronics and Information Technology (MiETY) may prioritize CMAs in improving transport linkages by providing high speed connectivity through expressways, national highways, rapid rail transport systems, airports, and by creating robust digital infrastructure as a tool for socio-economic development in these counter magnet areas in a planned manner within a specified time frame.
- Prospects of other CMAs, namely, Gwalior in MP, Kota in Rajasthan and Patiala in Punjab should be evaluated by respective State governments as these were identified as lagging behind areas in comparative potential and accordingly kept at low priority during CMA assessment exercise
- The concerned State governments should develop the counter magnet areas as model industrial estates, technology parks, tourist hubs or nodes (e.g. Jaipur, Patiala, Gwalior), education or coaching hub (e.g. Kota), special economic zones for attracting economic investments.



- (v) Enabling physical and regulatory environment should be created by the concerned States to attract private investors for large scale economic development. For attracting large investments in CMAs, projects should be taken up jointly by the State governments and the concerned central ministries, to start with.
- (vi) The CMAs should be developed as opportunity areas and towns for people in their influence areas. In order to support and sustain the economic infrastructure in CMAs, global scale development of physical and social infrastructure needs to be provided in these areas to attract industries, for which the concerned development authorities and the State governments should jointly prepare development projects, which could be financially supported by NCRPB through its prevailing funding pattern.
- (vii) The State governments should encourage bringing in new investments in the influence zones (120 km radius) of CMAs, identified in their respective States, through State level policies and development interventions integrated with respective financial plans and district development plans considering the needs and aspirations of its inhabitants.
- (viii) The CMAs have high potential and present a wide range of areas that could attract investment. State governments should identify exploitable resources and capabilities available in the regions located close to the CMA cities to promote entrepreneurial initiatives for commercial exploitation for creating employment opportunities for the local population.



3. POLICY ZONES AND LANDUSE

3.1 INTRODUCTION - POLICY ZONES

3.1.1 The Regional Plan 2021 had envisaged four policy zones – NCT Delhi; CNCR; Highway Corridor; Natural Conservation Zone; Rest of NCR; and the same are being retained in RP-2041. The pressing requirement to provide for residential, social and economic needs of this ever increasing 11.3 crores population in a limited area, exploiting the logistical connectivity potential of the national capital region, within the unique framework and mandate provided by the NCRPB Act, 1985 have guided the formulation of the Policy zones and Land Use provisions proposed in this Plan.

3.1.2 The five policy zones envisaged (refer schematic map of Policy Zones as **Figure 3.1**) are described as under:

(i) **NCT Delhi** –The area of NCT Delhi has and shall remain static at 1483 sq.kms. NCT Delhi is surrounded by the NCR States from all sides and has no possibility of horizontal expansion like other parts of NCR.

(ii) **Central National Capital Region (CNCR)** – CNCR area is now being redefined as the area from the boundary of NCT Delhi to the Eastern Peripheral Expressway (EPE) and Kundli-Manesar-Palwal expressway (KMP) up to 5 Km beyond outer edge of the ROW of this first ring of expressways (Circular Regional Expressway-I i.e. CRE-I).

(iii) **Highway Corridor Zones (HCZ) and Transit Oriented Development (TOD)** - To prevent unplanned development along major transport corridors and to harness the development potential of these connectivity alignments, Highway Corridor Zone (HCZ) were proposed in the past plans to enable planned development within 500 metres on both sides of the highways. Now, with the development of Metro rail network, Rapid Rail Transport Systems and expressways, these connectivity corridors and the transit nodes therein, provide unique opportunities for intensive development along these corridors which will also facilitate ease of transport, reduce transportation costs and improve quality of life for much larger population than originally planned by these connectivities.

(iv) **Natural Zone - The major natural features in NCR** which are environmentally important are to be identified as Natural Zone (NZ). Natural Zone is a zone comprising of any natural features such as mountains and hills, rivers and water bodies created by the action of nature. The natural features shall be such as are notified for preservation or conservation under the applicable and relevant Central or State laws and recognised as such in the land records over time.

(v) **Rest of NCR:** All other areas in NCR, not covered by any of the above four zones shall form the Rest of NCR Zone.

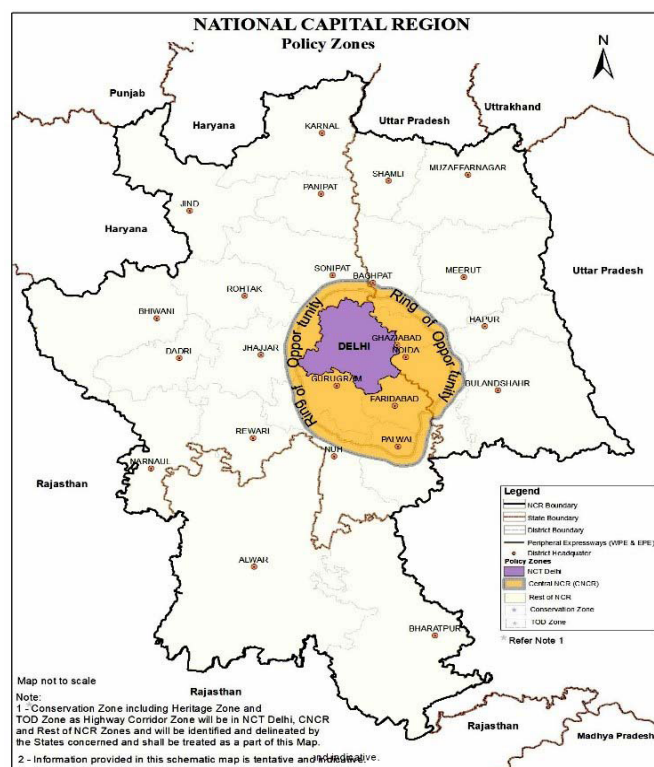


Figure 3.1: Policy Zones



3.2 LANDUSE - EXISTING STATUS

- 3.2.1 Landuse Plan translates broad planning policies and proposals into physical (spatial) form to illustrate the manner in which land in the NCR is to be used for various purposes. However, the reservation of areas for specific land uses, which are of regional or sub-regional or local importance, will be detailed out in the Sub-Regional Plans, District Development Plans, Master/Development Plans and Gram Panchayat Development Plans, etc., which are to be prepared by the States within overall framework of Regional Plan. A brief of key initiatives taken by Govt. of India for better landuse planning and development are given at **Annexure-D-3.1**
- 3.2.2 Regional Plan -2021 has provided six broad categories of the Regional Land Use, namely, Agriculture, Built-Up, Forest, Wasteland, Water Bodies and Others. The same categories were used for carrying out the existing broad land use analysis based on Land Use/Land Cover Analysis of Bhuvan Geo-Platform of NRSC-ISRO¹, GoI based on three season resources ortho rectified LISS-III data of 2015-16, published in 2019 (refer **Table 3.1**).

Table 3.1- Existing Landuse in NCR (2015-16)

Landuse Category	NCR		NCT Delhi		Haryana Sub-region		UP Sub-region		Rajasthan Sub-region	
	Area (Sq.Km)	%	Area (Sq.Km)	% share in NCR	Area (Sq.Km)	% share in NCR	Area (Sq.Km)	% share in NCR	Area (Sq.Km)	% share in NCR
Agriculture	45029.6	81.66	514.1	1.1	21481.6	47.7	12881	28.61	10152.9	22.55
Built-up	4569.2	8.29	850.5	18.6	1995.1	43.7	1377.3	30.14	346.4	7.58
Forest	1800.9	3.27	14.8	0.8	192.6	10.7	98.2	5.45	1495.3	83.03
Wastelands	2511.2	4.55	75.5	3	1010.1	40.2	96	3.82	1329.6	52.95
Water Bodies including wetlands	873.1	1.58	28.1	3.2	322.7	37	386.4	44.26	135.9	15.56
Others	360.1	0.65	0	0	325	90.3	23.1	6.41	12	3.32
Total	55144*	100	1483	2.69%	25327	45.93%	14862	26.95%	13472	24.43%

*The district wise land use/ land cover area published by NRSC on Bhuvan is slightly more (55144-55083 =60.99 Sq.Km) from the recorded area of NCR. Source: Bhuvan Portal

- 3.2.3 NCR States have prepared Sub-Regional Plans for their respective sub-regions. Further, in accordance with the prevailing Acts, the States have prepared Master Plans/ Development Plans for all the Metro Centres and Regional Centres, proposed in RP-2021. NCR States have also prepared Master Plans/Development Plans for sub-regional centres and other towns.
- 3.2.4 Further, in order to protect/ conserve the environmentally sensitive natural area, NCR States have identified/ mapped the Natural Conservation Zones (NCZ) in their respective Sub-Regional Plans and Master/ Development Plans.
- 3.2.5 Tentative spatial distribution of landuse is indicated in schematic Map of Existing Land Use/ Land Cover-2015-16 at **Figure 3.2**.

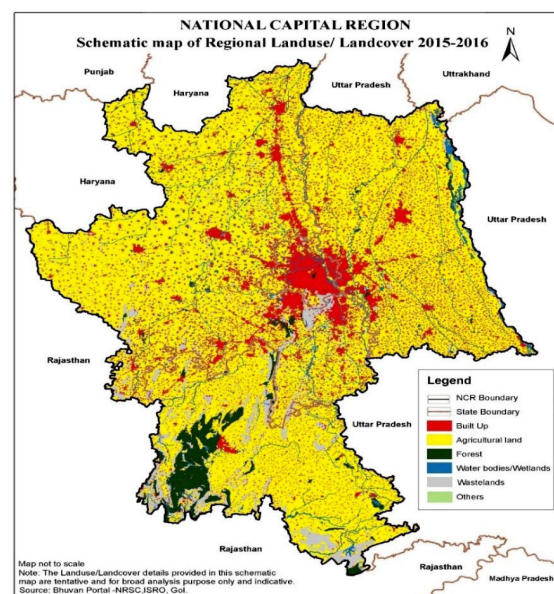


Figure 3.2: Existing Land Use/ Land Cover-2015-16

¹ <https://bhuvan-app1.nrsc.gov.in/2dresources/thematic/LULC503/lulc.pdf>

- 3.2.6 NCR States have declared/ extended the development/ control/ regulated areas to cover the Highway Corridor Zones. Haryana has brought the entire stretch from (a) Delhi boundary to Karnal through Sonapat-Panipat, (b) Delhi boundary to Hodal through Faridabad-Palwal, (c) Gurugram-Manesar-Bawal-Dharuhera-Rewari, (d) Bahadurgarh-Rohtak-Jhajjar-Rewari under “controlled area”. Rajasthan has notified areas from Haryana-Rajasthan border to NCR boundary through SNB complex as urban areas. Similarly, Uttar Pradesh has declared (i) Ghaziabad-Muradnagar-Modinagar-Meerut-Kataauli-Muzzafarnagar (except a small stretch), (ii) Ghaziabad-Hapur-GarhMukteshwar& (iii) Hapur-Bulandshahr till NCR boundary, under development/ regulated area
- 3.2.7 Major initiatives have been taken by Central Govt. agencies and NCR participating States to create physical and social infrastructure across NCR, especially in CNCR towns. States have developed Industrial Townships/ Parks/ Estates, etc. like Manesar, Bawal, Dharuhera, Jhajjar, Rohtak, Greater Bhiwadi, Neemrana, Noida, Greater Noida, Ghaziabad-Loni, Meerut, etc. Each NCR district has planned industrial areas/Parks/ Estates, making the region a major manufacturing hub.
- 3.2.8 As per IFSR 2011 and 2019, a marginal increase in the forest cover and decrease in the density has been recorded in the NCR.

3.3 KEY ISSUES & CHALLENGES

- 3.3.1 The land demand for urban/ industrial/ commercial and expansion of rural settlements and construction of transport networks have to be met from converting agricultural land or other land uses like waste lands, etc.
- 3.3.2 Large scale haphazard development of urban activities /constructions outside notified controlled/ development/ regulated areas, is seen due to lack of any control norms/planned development of such areas causing numerous pockets of unplanned adhoc constructions in the vicinity of even large cities.
- 3.3.3 The Regional Plan-2021 proposed Highway Corridor Zones (HCZ) along National Highways converging to Delhi with a view to encourage planned development. There is a need to identify the growth potential of other highway and expressway corridors which are not converging to Delhi. Other highway and expressway corridors experiencing ribbon development also need to have necessary plans to avoid haphazard development.
- 3.3.4 Conformity of existing Master/ Development Plans of settlements in the region for various perspective years with the Regional Plan policies is crucial.
- 3.3.5 Effective and integrated planning and development of the entire NCR, especially the CNCR and NCT Delhi in view of large population expected to be accommodated by 2041, is a major challenge.

3.4 POLICIES AND PROPOSALS :

3.4.1 POLICY ZONES

Policies related to different Zones envisaged are as given below:

3.4.1.1 NCT of Delhi:

- (i) NCT Delhi shall continue to be the central economic hub. As NCT-Delhi has limited area, the options available are (a) to grow vertically but in a planned way, and (b) to ensure planned development of all parts of NCT Delhi in harmony with its surrounding parts of NCR.
- (ii) The policy option for NCT Delhi is to adopt vertical growth similar to global urban agglomerations, along with massive redevelopment not only in identified areas but also in slums, urban villages, other current low rise areas, etc. along with zero-net discharge buildings, rain water harvesting, ground-water recharge, water recycling and decentralized sewerage systems on the one hand and preservation of identified environmentally sensitive areas along with conservation of Delhi’s rich heritage areas.
- (iii) Delhi shall follow the twin strategies of intensive development of new areas through a forward- looking land pooling policy and other means of land assembly, along with pragmatic futuristic redevelopment of hitherto



- haphazard developed areas like unauthorised colonies, jhuggi- jhopdi clusters, Lal Dora areas, etc. coupled with regeneration of older parts of Delhi, dense areas, heritage/ conservation areas, etc.
- (iv) Mixed land use shall be encouraged not only to meet local requirements, but also to reduce travel times and traffic congestion. Mixed land use will be allowed in both vertical and horizontal i.e. spatial development/ redevelopment/regeneration (including revitalization, etc. or called by any other name) in all the above areas, old and dense parts of Delhi, around hubs of tourism, education, health etc. and TOD areas upto a distance of 0.5 to 1 Km. around such hubs.
 - (v) High Tech industries and industries permitted as per Delhi Pollution Control Authorities shall be allowed in Delhi. Heavy industries shall continue to be banned in Delhi and only industrial activities as permitted by the Delhi Pollution Control Authorities shall be permitted.
 - (vi) Higher FAR of around 400 and above has been recommended for all intensive development and redevelopment/ regeneration areas (including revitalization, etc. or called by any other name) with appropriate ground coverage for adequate ventilation, etc. The biggest barrier to vertical and intensive development of Delhi in the past has been water supply shortage. This has been addressed in the Regional Plan by including a multi-pronged policy/ strategy in the water chapter. However, high rise buildings shall be allowed subject to mandatory rainwater harvesting systems, mandatory decentralised sewage treatment plants (DSTP), mandatory dual piping and a mandatory requirement of hundred percent use of recycled water for all flushing purposes (which consume about 50% water) in all group housing, and all other multi-storeyed structures. Incentives and time bound targets have been proposed for retrofitting existing structures. The building bylaws for Delhi shall be revised to include the above and shall also provide specific clauses prohibiting height restrictions of any kind for all categories of buildings for all purposes including for water/ electricity connections etc. except for security and heritage reasons.
 - (vii) Introduction of Transferable Development Rights (TDR) as a creative tool of resource mobilisation and landuse control in Delhi is envisaged. TDR will be admissible also for conservation and heritage areas and along with innovative Town Planning Schemes (TPS)/ Land Pooling Schemes (LPS) are aimed to transform large parts of Delhi into a futuristic city like Singapore which transformed from urban villages to the Modern Metropolis of today.
 - (viii) Repeal of Delhi Land Reforms Act shall be considered to enable organised and orderly development of hitherto rural areas of Delhi in harmony with their surroundings inside and outside Delhi. This is necessary since despite many committees in last many decades (refer brief note on Lal Dora provisions, Khanna Committee and Expert Committee Reports, important judicial judgements, as provided at **Annexure-D-3.4**), the Lal Dora and extended Lal Dora areas continue to remain islands of haphazard, chaotic development in the midst of planned areas.
 - (ix) NCT-Delhi shall preferably be made free from slums, and in any case it shall be ensured that there shall be no new slums. Implementation of PMAY, ARHC, coupled with redevelopment of Slums and Jhuggi Jhopris, Lal Dora and Extended Lal Dora areas, unauthorised colonies with grant of property/ land titles to such dwellers shall be ensured with not only high FAR and TDR but also non- restrictive amalgamation/ sub-divisions provisions to achieve slum free zone and also ease of development.
 - (x) Reservation of land for a) more land efficient GIS power distribution substations, b) Right of way for combined corridors for underground utilities like sewers, drains, telephone lines , Fibre cables, Power cables, gas pipelines, etc. c) Decentralised STPs, d) waste segregation centres, e) material recovery centres for circular economy, f) blue-green-grey infrastructure, g) water recharge facilities.
 - (xi) The governance in NCT Delhi should be 'smart' to increase the ease of living and to improve the quality of living in Delhi. Smart economic portals will also be provided to improve ease of doing business.
 - (xii) Warehousing and Logistics be given 'industrial' land use, to enable viable and cost competitive development of warehousing and logistics infrastructure. It is notable that Logistic costs in India are almost double the global costs.



- (xiii) Land use conversion in industrial estates to be rational and smooth.

3.4.1.2 Central NCR: – This belt of CNCR around NCT Delhi shall form the “**Ring of Opportunity**” for both **NCT Delhi and rest of the NCR** on its either sides. It is envisaged for intensive development of industries and urban growth.

- (i) To harness the development impulses of the national capital and to prevent the haphazard and lopsided development, the entire CNCR will henceforth be fully planned and covered under the notified development/ controlled/ regulated area of the Authorities/ Bodies located therein, hitherto non-notified areas shall also be brought under development control norms for planned growth and development. In the past, development authorities even adjacent to Delhi have been notifying controlled development areas around central focal towns/cities only and as a result, many pockets are left non-notified between different development authorities with many such non-notified pockets being even 15 to 20 km from Delhi, where no development control norms are applicable and such areas have become pockets of haphazard growth despite being almost in the centre of NCR. Hence mandatory full notification of all areas within CNCR by one authority or the other is proposed with the objective that haphazard development in the numerous, scattered non-notified pockets close to Delhi shall be avoided in future and will be replaced by planned and hence harmonious development henceforth.
- (ii) The Central NCR shall have all industrial development with focus on logistics hubs, warehouses, dry ports, inland container depots, multi-modal logistics integration, etc. This area will leverage its proximity to Delhi international cargo hub, upcoming Jewar and Hisar International Airports, etc. for global reach of NCR made products. Simultaneously, NCR can become a South Asian logistics hub due to the location when coupled with other right policies.
- (iii) Warehousing and logistics land use shall be categorised as 'industrial' activities to reduce land cost component of logistics cost to make NCR logistics costs globally competitive.
- (iv) Land use for intensive industrial-logistics development and 'Urban Regeneration' should be earmarked.
- (v) The activities like logistic parks, multi modal transport hubs, ICDs, dry ports, air cargo terminals, dry ports, recreational/ theme parks, specialized townships (like Medi-cities, tech-cities, Edu-cities, etc.), skilling hubs, MSME clusters and other activities which are not only land extensive but also require support infrastructure, should be encouraged and permitted in these areas and respective master plans should clearly earmark areas for such land uses.
- (vi) This area shall also provide for intensive urban development to decongest Delhi with several knowledge/ product based new and brownfield townships within the ring of expressways (EPE & WPE).
- (vii) **The land use policy shall keep the above objectives in focus in this policy zone and shall preferably have a limited negative list of prohibited activities for ease of doing business and shall specify specific measures if needed in certain sensitive parts of the zone for other activities. No other list of permitted activities etc. shall be laid down in the CNCR area by the sub-regions or their authorities etc.**
- (viii) There shall be a rejuvenation of existing industrial parks and estates in the zone. A policy of co- building industrial areas preferably with private partners and with liberal and industry oriented land use conversion shall be made for these areas by all sub regions.
- (ix) Based on global best practices on land assembly, it is suggested that similar land assembly policies may be introduced as an option in CNCR with shorter land leases of 5-10 years with plug and play facilities instead of long term leases of 30-90 years for facilitation of rapid changes in industrial production as per dynamic global markets. A new category of land aggregators is envisaged across NCR to sustain this nimble land arrangements of future.
- (x) The CNCR zone shall also have similar admissibility of high FAR, TDR, mixed land use, non-restrictive height and amalgamations provisions, slum free provisions, etc. like NCT Delhi with similar conditions attached. This will help development of an urban agglomeration continuum as a virtual extension of NCT



Delhi zone with additional facilities for a strong industrial and economic base.

- (xi) Mixed Land Use should be provided for all Economic Corridors.
- (xii) NCR participating States shall also prepare a separate sub-set of plans in the SRPs for their CNCR area. However, care should be taken to conserve the Govt. of India/State identified environmentally sensitive area.

3.4.1.3 Highway Corridor Zones (HCZ) and TOD:

- (i) HCZs have been envisaged for ensuring planned development along all expressways, National and State Highways, Industrial Freight Corridors of NCR like in the previous Regional Plan 2021. Many HCZs have already been notified by the sub regions in past few years. Now, this RP-2041 provides for notification of Transit Oriented Development areas within/in addition to these HCZs for intensive development including industrial, logistics and urban development with higher FAR, mixed land use both vertical and horizontal, value capture provisions, etc. in these areas.
- (ii) Intense development will be encouraged on both sides of all the rail transit corridors (including RRTS, MRTS, DFC, etc.), Expressways, NHs and their transit nodes in an area up to 01 km on either side. Development should be starting from edge of transit corridors or up to the outer boundary of intervening revenue villages, whichever is earlier.
- (iii) Identification of ToDs shall be done by States based on their assessment and thereafter delineated and notified. The State Governments shall also prepare detailed development layout plans/ development plans for these areas depending up to on the potential of these areas and local conditions. However, these areas should be developed beyond the Right of Way (ROW) of the connectivity network and the green buffer on either side of the Expressways, NHs, SHs as per the prevailing policy of MoRTH and State Governments respectively.
- (iv) TOD corridors shall have dense residential, office, institutional, commercial among other spaces which generally require trunk transport facilities. Accordingly, the TOD corridors shall have high FAR say up to 400 or above (especially in Delhi, Metros & Regional Centres) if justified, with mixed land use both vertically and horizontally.
- (v) Care will have to be taken while planning these zones to ensure that the activities being permitted in this zone are segregated from highway traffic through proper green belts, service roads and controlled access to the highways.
- (vi) Identification of HCZ and ToD areas and outlining of their broad landuse plans are required to be done in SRPs and thereafter detailing to be done in Master/Development Plans within the prescribed time lines for SRPs and MPs/DPs. ToD areas can be 0.5-02 Km or higher depending upon the State specific requirements.

3.4.1.4 Natural Zone:

- (i) The major natural features in NCR which are environmentally sensitive are to be identified as Natural Zone (NZ). Natural Zone is a zone comprising of any natural features such as mountains and hills, rivers and water bodies created by the action of nature. The natural features shall be such as are notified for preservation or conservation under the relevant Central or State laws and recognised as such in the land records over time. This shall include forests notified as such under the Forest (Conservation) Act, 1980, wildlife sanctuaries notified under the Wildlife (Protection) Act, 1972, eco-sensitive zones, wetlands and conservation areas as are duly notified under the Environment Protection Act, 1986. The above Acts shall be applicable as amended from time-to-time, along with the Notifications issued thereunder and will be applied subject to various judgements of Hon'ble Supreme Court/High Courts/NGT, as applicable.
- (ii) The extent of natural features under Natural Zone, will be identified, ascertained and delineated by the NCR participating States in accordance with above definition using ground truthing and revenue records, etc.



- (iii) These environmentally sensitive areas under the Natural Zone shall have the permissible, regulated and prohibited activities as per relevant Central and State laws or any notification/guidelines of the Central or State Government having the force of law and will be subject to all orders/judgements of Hon'ble Supreme Court/High Courts/NGT, as applicable.
- (iv) Any change in such Natural Zone areas, which has been approved by NCRPB in the past as Natural Conservation Zone (NCZ), can be changed by the concerned participating State as per the revenue records, satellite imagery and ground truthing and such NCR participating State shall inform NCRPB about these changes in the area of NCZ/NZ.
- (v) Natural Zone may be promoted and conserved with the help of innovative non-financial instruments like Special Development Rights which may be made transferable and saleable to incentivize the private/public land owners of such areas. Accordingly, transferable and saleable development right for Natural Zone (NZ-TDR) may be provided by the respective NCR participating States.

3.4.1.5 Rest of NCR:

- (i) Land use in this zone should be innovatively planned to support accelerated development. **Land use provisions should preferably specify a negative list of prohibited activities for ease of doing business; however, if detailed lists of permitted activities are specified, then such activities shall keep in mind the special nature of NCR area and also the requirements of landuse to implement various provisions of this Plan.**
- (ii) Land assembly policies and industrial areas policies with land use conversion, warehousing as industrial use, etc. of CNCR, along with similar conditions for sensitive areas shall also be applicable in Rest of NCR zone.
- (iii) Basic policy of Regional Plan for accelerated development of both urban and rural areas will be implemented. Large Rural Investment Areas (RIAs), Special Economic Zones (SEZ), heavy industries, Agro parks and other space intensive activities should be planned in this area.
- (iv) Based on global best practices on land assembly, it is suggested that similar land assembly policies may be introduced as an option as the new concept of short and medium term lease of land for 5-10 years instead of current 70 to 90 years industrial uses and to reduce the burden of high land cost and to simplify changes of industrial land uses in keeping with market impulses through new system of land arrangement from land owners by encouraging third party land aggregators either in Govt. or Private sector or by both. They would undertake land arrangements from land owners and consolidate them on one hand and enter into dynamic 5-10 year lease arrangements with investors/ industries on other. Such arrangements would catalyse economic growth in NCR participating States by enabling fast-footed changes in economic production to adapt quickly to dynamic and fast changing global markets. Fast growing global economies like Vietnam, Taiwan, etc. are already benefiting from such short term land arrangements.
- (v) Fast, efficient and affordable rail (RRTS, ORC-I,II & III, New rail links etc.) road (Expressways, like CRE-II & III, NHs etc.) and air connectivity be provided in this zone. Physical and social infrastructure has to be substantially upgraded at local and regional level (both by State and Central Governments) in order to induce the growth in these areas, specifically in the settlements i.e., Metro Centres, Regional Centres, Sub Regional Centers, etc.
- (vi) Mixed land use, higher FAR/TDR/realistic development control norms in urban areas as per 'Urban Regeneration' needs have to be adopted. Mixed landuse should be considered for Economic Corridors.
- (vii) In this zone focus should be given for the development of MSMEs, startups, industrial clusters like sports, toys, electronic, automobile ancillaries, Handlooms, leather, Agro processing, handicrafts, etc.

3.4.2 LAND USE WITHIN DIFFERENT POLICY ZONES



- 3.4.2.1 Policy provisions have been developed in RP 2041 for the five policy zones referred above. NCRPB Act being an unique instrument for National Capital Region Land Use Planning, an innovative land use planning approach to Regional Plan-2041 is required for the next two decades to provide for the requirements of most populous agglomeration on the planet. First step would be to recognise the realities of growth and to accommodate the needs while also planning for better organised future growth in NCR. States shall elaborate the details of broad land uses indicated in Regional Plan according to the Policy Zones outlined above and as per detailed land uses, mentioned in the policy zones section. States shall also mention details of phasing, for development and zoning regulations in their respective SRPs, DDPs and Master/Development Plans, etc.
- 3.4.2.2 This Regional Plan has outlined many policies and proposals covering multiple sectors in various chapters. Many of these policies and proposals have land use implications. It has also been required in these various policies that areas/lands be earmarked for current as well as future use for certain needs. Hence the NCR participating States shall ensure that their Sub Regional Plans, District Plans, Master Plans/Development Plans etc. shall necessarily not only provide for the land uses as envisioned under the Policy Zones section of this chapter but shall also ensure that the land use provisions are made as required for implementing the policies and proposals given in the various chapters of this Regional Plan.
- 3.4.2.3 Description and definitions of Land Use and Land Cover Classes as per ISRO and as considered in this Plan are provided at **Annexure-D-3.3**. However, it is proposed to add another category of green cover apart from the above 6 categories. Distinction shall be made between “forests” and “green cover” wherein areas categorized as “forests” shall continue to be conserved, as per the prevailing statutes and various courts orders whereas areas now categorised as green cover need not be conserved mandatorily. Definition of green cover shall be as per existing laws.
- 3.4.2.4 Subject to the provisions of the preceding three paras, and provisions in the policy zones related paras under 3.4.1 before, the land use plans in entire NCR shall broadly be under the following categories, however, NCR being special planning area, these land use categories shall be detailed in an innovative way to meet the mandate and requirement of the Regional Plan:
- Urbanisable areas (including existing Built-up/urban areas),
 - Rural Zone within notified (controlled/development/regulated) areas
 - Green Cover including Green buffers
 - Rural Zone outside notified (controlled/development/regulated) areas
- 3.4.2.5 Keeping in view rapid urbanisation, environmental degradation and to ensure orderly development in the region, a legislative tool in the form of Zoning Regulation is proposed under four broad zones for land use control & development and for enabling preparation for detailed Plans (SRPs DDPs, Master/Development Plans etc. Elaboration of land uses and zoning regulations need to be incorporated in such Plans by the respective NCR States. The various cities/towns of NCR, the rural areas within notified areas and the areas beyond notified areas, have been in the previous Regional Plans, generally been detailed out as follows, in the respective Master Plans/Development Plans, etc. This shall continue to be indicated accordingly, subject to the preceding paras, and shall, in addition to the land use as per the provisions of the preceding paras, be also guided as per provisions indicated herein under.
- 3.4.2.6 **Notified Areas i.e. Controlled/development/regulated zone:** Development in the notified zones i.e. controlled/development/regulated zones should be undertaken in accordance with the Master/ Development Plans for the respective areas duly notified by the State Governments provided these plans are made as per the provisions of this RP-2041 and those in preceding five paras. The sub zones of this zone are:
- Urbanisable areas (including existing Built-up/urban areas),



- ii. Rural Zone within controlled/development/regulated areas
- iii. Green Cover including Green buffers

i. Urbanisable areas (including existing Built-up/urban areas)

- a) Existing and proposed built-up areas be regulated and guided by Master/Development Plans and Local Area Plans including GDPD within the framework of RP-2041 and respective SRPs -2041, provided they are made as per provisions in preceding paras 3.4.2.1 to 3.4.2.5. New areas should be identified as development promotion zones, existing areas be marked for intensive development as per this Regional Plan 2041 population projections and detailed Plans need to be prepared by respective NCR States.
- b) It is to be ensured that proposed developments are not permitted in environmentally sensitive areas except as per statutes/ notifications/ policies/ guidelines of the respective Ministers/ Departments of Govt. of India.
- c) Land needs to be reserved in the Master/Development Plans and GDPDs for activities, such as local level utility services (such as power plant, grid station, water and sewage treatment plants, SWM etc.) dairy farming, horticulture, inter & intra-urban transport system and other essential infrastructure and other amenities as per different chapters of this Regional Plan.
- d) Tree cover be created /maintained within Urbanisable Areas as per the Urban Greening Guidelines, 2014 of MoHUA (refer **Annexure-D-3.2**).
- e) Fixation of density norms should be based on multiple parameters and the task should be settlement specific. For overall planning approach, settlement size wise density ranges are suggested as per URDPFI Guidelines, 2014-15 of MoHUA. However, while planning for compact and TOD development, these densities should be modified to suit requirement and should be based on detailed analysis.
- f) Hazardous industries and trading activities involving obnoxious, hazardous, inflammable substance or processes, will be prohibited, in this sub zone.
- g) Detailed list of prohibited activities may be prepared and incorporated in SRPs and respective Master/ Development Plans so as all other activities not mentioned therein would be deemed permitted subject to applicable laws. For NCT-Delhi, such list of prohibited activities may be prepared and incorporated in MPD-2041.
- h) The local authority according to the prescribed uses in the Master/Development Plans will govern the detailed land uses within the urbanisable area including Master Plan area of Delhi. The Master/Development Plans of all urban areas to be prepared within the framework of the Regional Plan-2041 specially as per preceding paras 3.4.2.1 to 3.4.2.5 with special emphasis on innovation and ground realities to ensure inclusion of the provisions in chapter relating to Housing and Habitat of this Regional Plan.

ii. Rural Zone within controlled/development/regulated areas

- a) Policies and proposals for Rural zone within the controlled/ development/ regulated areas of urban centres provided in the Master/Development Plans of the respective controlled/development areas should be strictly adhered to, provided these plans are made as per the provisions in preceding paras 3.4.2.1 to 3.4.2.5. No activities other than those defined in notified Plans, be permitted.

iii. Green Cover including Green buffers

- a) Distinction shall be made between “forests” and “green cover” wherein areas categorized as “forests” shall continue to be conserved, as per the prevailing statutes and various courts orders whereas areas now categorised as green cover need not be conserved mandatorily.
- b) Green buffers shall be created/ maintained outside urbanisable limits of urban areas. Green buffers should be developed beyond the Right of Way (ROW) on either side of the Expressways, NHs, SHs, and Railway Lines or as per the prevailing policy of MoRTH, State Governments and Railways respectively.
- c) No residential/ institutional activities will be permissible except agriculture/horticulture/fuel station/EV



charging/highway amenity centre/emergency medical care/trauma care/emergency evacuation services/disaster vehicle recovery services/service roads/approach roads/toll plaza/police and security posts/bus queue shelter.

3.4.2.7 Rural Area outside controlled /development/regulated areas

- (i) Such area will include not only rural areas but also such urban areas which are yet to be notified as controlled/development areas like non statutory census towns etc. These areas of the NCR have to be regulated and guided by Sub-Regional Plans, District Development Plans and GPDs/Village Plans, etc. subject due to the provisions of the preceding paras in 3.4.2.1 to 3.4.2.5 above. While agriculture and allied activities including agro processing, etc. shall be the primary land use in these areas, large investment zones, rural investment zones, special economic zones, industrial zones in areas identified/planned/permitted by the central and/or NCR State Governments shall be permissible with adequate pollution mitigating measures. Heavy and hazardous industry shall be permitted only in such zones.
- (ii) Large Educational, health, and training institutions / colleges will be permitted only with planned layout and adequate infrastructure and utilities.
- (iii) **Subject to 3.4.2.6 (i)(a) above, preferably a negative list/ list of non-permissible activities may be prepared and expanded in the respective Sub Regional Plans so that all other activities not mentioned therein would be deemed permitted, subject to applicable laws.**
- (iv) At Regional level, agriculture (rural) zone be designated for primary sector production and as open area comprising of farmlands, orchards & pastures, etc.
- (v) However, owing to new employment opportunities in non-agriculture sector and consequent population pressures on agricultural land and land from other non-urban uses for urban expansions, following is proposed:
 - a) Existing cropland be conserved for agriculture use as far as possible. Efforts be made to increase production through intensive cultivation, by providing irrigation facilities and other necessary infrastructure. Irrigated land with multi-cropped production shall be avoided from urban activities, as far as possible.
 - b) Measures be taken for protection of prime agricultural land and ensure its needless conversion into non-agricultural/urban use.
 - c) Utilisation of land with low biological potential for farming may be earmarked/ allocated for non-agriculture purposes incase such land is under agricultural use.

3.4.2.8 Other Planning and Design Guidelines

- (i) NCR Cities and towns shall be planned with optimum high rise and high density norms; innovative use of TDR concept shall be the key.
- (ii) Infrastructure requirement in residential, institutional, educational, health and other sectors necessitates that FAR norms should be as per best practices in similar global cities. The water scarcity problem should be handled imaginatively and effectively like Singapore which turned from huge water importer to net water surplus in few decades.
- (iii) Mixed land use areas to be identified in existing urban and urbanisable areas of Master Plans. Mixed land use be permissible both vertically and horizontally. Older areas of NCR cities and towns should be permitted to have mixed use since separate residential/commercial/institutional and similar segregated land uses may not be feasible. Mixed land use regulations may be prepared and incorporated in all Master /Development Plans.
- (iv) Owners should have authority to cut/ replace planted trees on their private land. Any permission in this regard be duly granted by district administration except where prohibited under any GoI/State Govt rules.
- (v) All new townships across NCR should be developed incorporating the Smart Cities elements/ components



e.g. DMIC smart city Dholera (Gujarat), AURIC city (Maharashtra). NCR States to take initiatives to refurbish the exiting Cities/ Towns or townships on the above lines, in a phased manner by 2030.

- (vi) Greenfield self-contained smart new cities with all amenities and smart features of development like Auric city (Maharashtra) are proposed to be explored with about 2 to 3 in each sub region to act as new nuclei for modern polycentric urban development and to facilitate a more planned population assignment in Greatest NCR of future. These are expected to be about 8 in entire NCR, and located on growth nodes along the key transport corridors-eways, rail corridors, etc either on virgin land or as extension of current small settlements based on feasibility of productive activities.
- (vii) Every village to have at least two water bodies (one for drinking and second for other uses) as far as possible. Sufficient area for water recharge should be provided for. Village deity/sacred forests recognized by community at large should be clearly demarcated and conserved. Alongside, spaces for ceremonies, play grounds, festival & fairs and last rites, etc, be identified and demarcated at the Village, Block, Tehsil and District level. Efforts be made through creation of 'iconic places' as per local requirements at each settlement level.
- (viii) Identify and develop more Rurban Clusters in respective sub-regions in line with the MoRD's Rurban Mission initiative. Model Planning Guidelines² for Rurban Cluster, 2019 may be followed. The details of such identified Rurban Clusters be provided in each SRP.
- (ix) RADPFI Guidelines, 2017 which provides specific land use provisions for rural areas be followed while undertaking planning of rural areas and districts. GPDPs be prepared as per the GPDP guidelines 2018 for ensuring effective spatial planning at grass root level. Further, in order to protect rural areas from unauthorized activities, state governments should make necessary provisions in the existing local government statutes by adopting the provisions of the Model Spatial Planning Guidelines adopted in March 2019 by the Ministry of Rural Development, Government of India.
- (x) Though NCT Delhi, CNCR and Rest of NCR are separate Policy Zones, planning and development through an integrated plan needs to be prepared for CNCR area along with NCT Delhi jointly by the Governments of Haryana, U.P. and NCT Delhi incorporating the transport linkages and infrastructure networks and utilities.
- (xi) NCR States to prepare Master/Development Plans for all small, medium and non-statutory Census towns and GPDP for rural areas, for ensuring the planned development. Further, DDPs be put in place for overall integrated planning and development at district level.
- (xii) Initiatives be taken by States to identify & develop cities/ towns in line with AMRUT mission. All district & tehsil headquarters and cities/ town above 01 lakh population be identified and developed on priority, under such initiatives by 2025. The required financial assistance can be obtained from MoHUA, NCRPB, HUDCO & other Financial Institutions.
- (xiii) Delineation of various broad features and land uses shall have to be undertaken by the concerned Departments/ Authorities/ Bodies of the NCR States. This shall have to be clearly demarcated in SRPs/ Master or Development Plans/ local level Plans, etc. There is an urgent need to prepare Master /Development Plans for all small, medium and Non-statutory Census towns for ensuring the planned development.
- (xiv) In order to implement the policies of Regional Plan 2041, notified/ published under the provisions of NCRPB Act, 1985, necessary amendments, if required, shall be made by the respective NCR State Governments appropriately.
- (xv) All plans be prepared/ available on digital platforms/ based on GIS technologies with integration of both spatial & attribute data. Design Standards prepared by TCPO, MoHUA for AMRUT be utilized while preparing the plans. Maps should as far as feasible have working/input scale of 1:10,000 for SRP & DDPs and 1:4,000 for Master/Development Plans but the scale in signed/published maps can be suitably decided

² Model Planning Guidelines for Rurban Cluster, 2019 <http://rurban.gov.in/doc/Model%20Planning%20Guidelines%20for%20Rurban%20Cluster.pdf>



by the State Government which could be as far as feasible, be 1:50,000 scale or better.

- (xvi) For Urban Areas a stock taking exercise be initiated, with regards to layout plans in place and areas for which it is still left, to understand the present/current situation, as Stage I, with the help of TCPO. This exercise may be carried out within next 6 months with use of latest technology. Similar stock taking exercise be undertaken as first stage for all Master/Development Plan preparation works, in all Metros and Regional Centers across NCR. NCRPB can also consider providing financial assistance as reimbursement. AMRUT/ GoI funds may also be considered for such exercise being undertaken with drone technology.
- (xvii) Availability of land for power plants and transmission lines is a major constraint. At ground level the primary challenges in NCR concern the cable laying and ROW issues as, (a) difficulties in laying new cables due to congestion, (b) road cutting permission constraints, (c) trench less cable laying for crossing main roads, (d) time consuming fault identification & restoration, (e) high cost of fault repair, (f) cables resulting in safety issues etc.
- (xviii) To reduce land requirement for power plants adopt “compact plant design”, set up integrated projects for fly ash utilization and adopt multi-storey concept for townships, etc. Lower level plans should earmark space for sub-stations, as suggested by power agencies.
- (xix) Dedicated utility corridors should be constructed preferably along roads and 100% underground cabling shall be ensured by NCR participating States in their respective Metro and Regional centers in 1st phase by 2030; all other towns in 2nd phase by 2035; and remaining urban areas by 2041.
- (xx) Planning for the areas outside controlled/regulated/development shall be part of the SRPs/ District Development Plans by the respective NCR constituent states/ districts.
- (xxi) Dairy farming and related activities should be shifted from city cores to peripheries. Areas designated for placing and shifting dairies should be considered under agriculture land use and suitable mechanisms should be developed.
- (xxii) Special land costing policies be made for social infrastructure safeguards and landuse provisions be rationalized. Development Authorities should freeze land costs for upto secondary education and secondary health facility along with other social infrastructure like old age homes, housing for the poorer section of the society, terminal care facilities, hospices, mental health care facilities, special schools, working women hostels, crèches, etc.
- (xxiii) Deliverables and time frames for preparation, submission, notification & revision of lower hierarchy Plans shall have to be followed as given in **Chapter 13: Implementation Strategies and Resource Mobilisation.**



4. ECONOMIC GROWTH

4.1 EXISTING STATUS

- 4.1.1 Delhi NCR, with 370 Billion USD GDP, is the largest economy in India and contributes about 8% to National economy and attracts a large number of people from across the country. NCR is also one of the most vibrant global economic regions. Delhi NCR had attracted 20% of Foreign Direct Investment (FDI) in the country amounting to Rs. 2,49,023 Cr (USD 49,410 million) during 2010-15. This further increased to about 25% of FDI received by the country during April-December 2018-19. **Table 4.1.1 of Annexure D-4.1** captures GDP of NCR from 2011-12 to 2016-17 which shows that GDP of the region has increased from Rs. 21.5 trillion in 2011-12 to Rs. 31 trillion in 2016-17.
- 4.1.2 Average per capita income (PCI) of NCR in 2017-18 was about Rs. 1.37 lakh. Information on the average PCI of the sub-regions indicates that the highest PCI is that of NCT Delhi (Rs. 3.66 lakh) sub-region, followed by Haryana, U.P. and Rajasthan sub-regions respectively.
- 4.1.3 Delhi ranks 6th amongst the world's top 10 best performing metro economies as per Brookings (2018) Global Metro Monitoring covering 300 global cities. Delhi was on 5th position for GDP per capita growth with average rate of 6.6% during 2014-16. It has been included as U20 (Urban 20) global urban forum as adjunct of G-20 group.
- 4.1.4 For the vision to make India USD 5 trillion economy by 2024 and grow beyond, it requires a national driven effort, and the mega region of NCR would have to play a prominent role. A brief note on economic scenario of NCR participating States is given at **Annexure-D-4.1**.
- 4.1.5 The economic structure of NCR is undergoing rapid transformation due to economic forces such as changes in economic/fiscal policy, legislation, rapid urbanisation, etc. The organized industrial sector consisting of large and medium units and SSI in NCR has developed both in terms of number of units as well as in terms of types of different industries, trade and commerce which form important components of the economic base of the region.
- 4.1.6 The region has multiple special economic zones and industrial clusters, including Noida and Gurugram, known for their IT services sectors; Faridabad, an industrial centre; Meerut, an education hub; and Ghaziabad, Alwar, Sonapat, Panipat amongst others. It has more than 100 industrial estates with Delhi having 25 industrial estates. In rest of NCR, most of the clusters are in Meerut, Ghaziabad, Gautam Budh Nagar, Bulandshahr, Gurugram, Faridabad, Panipat and Alwar districts which are mainly related to auto components, textiles, general engineering, power looms, etc. (refer **Annexure D-4.1.1**).
- 4.1.7 Some of the significant industries in NCR include automobile industry, metal industry (basic & fabricated), textiles, apparel & footwear industry, animal production (dairy industry); computers, consumer electronics & electric equipment, rubber & plastic industry, MSMEs, tourism, real estate, startups, etc. (refer **Annexure-D-4.1.1**). There are more than 42 lakh MSMEs in the region. The major manufacturing clusters and Small & Medium Enterprises (SMEs) with Industrial Estates, Inland Container Depots (ICDs), Agro-Clusters, etc. in NCR are shown in **Figure 4.1** and **Figure 4.2**). Industries such as Sports Goods, Dairy Products and Brassware also present numerous opportunities in NCR.
- 4.1.8 Compared to national workforce participation rate (WPR) of 39.79% the WPR for UP, Haryana, Delhi and Rajasthan are 43.6%, 35.17%, 33.28% and 32.94% respectively, as per Census 2011. The percentage contribution of Primary Sector (Agriculture and Allied) to the Gross State Value added at basic prices has declined from 0.94 % in 2011-12 to 0.39 in 2017-2018. The contribution of Secondary Sector (Industry Sector) and Tertiary Sector (Service sector) was 15.91% and 83.70% respectively in 2017-2018.



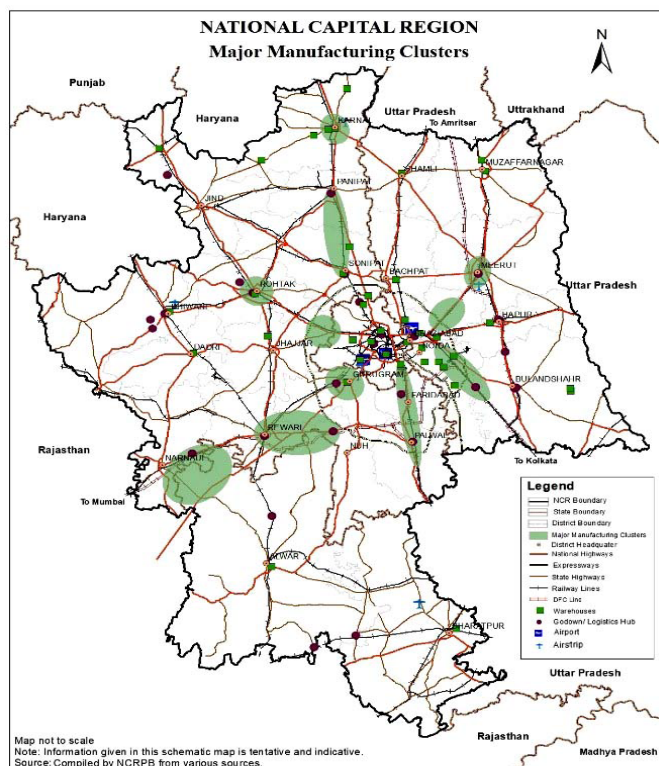


Figure 4.1: Major Manufacturing Clusters

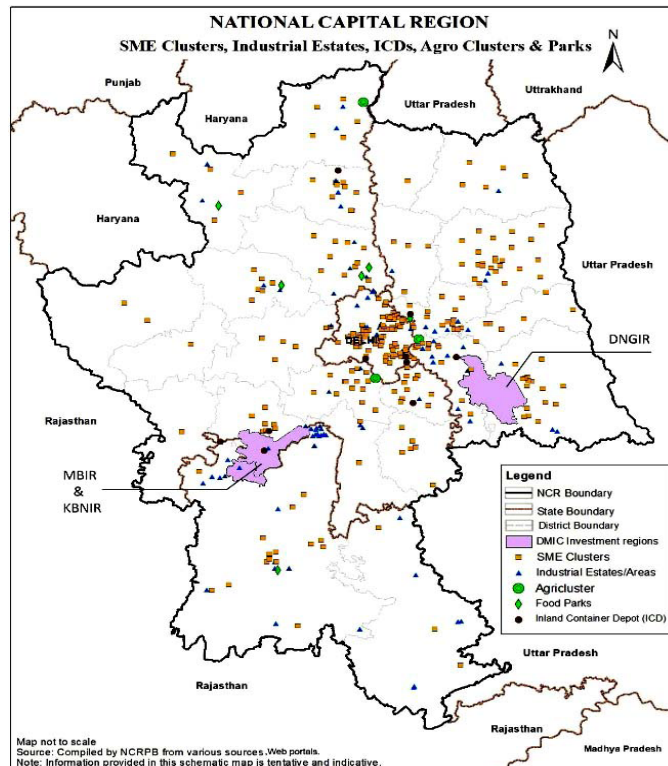


Figure 4.2: Small & Medium Enterprises (SMEs) with Industrial Estates, Inland Container Depots (ICDs), Agro-Clusters

4.1.9 Over the years, various Ministries/ Departments of Government of India have introduced several schemes that have not only helped citizens improve their financial situations but have also contributed to the overall economic development. Similarly, various steps have been also taken by the NCR participating State Governments. These joint efforts will lead to economic growth and development of the country including NCR. A brief of major government initiatives for economic development and income generation is given at **Annexure-D-4.1.2**.

4.1.10 Power and Energy are the key elements that fuel the economy of the region. Reports indicate that the per-capita energy consumption in NCR is 1,694 kWh (2018-19), which is much higher than the Northern Region (i.e. 953 kWh). NCR energy demand density is 1.9 MU/km²/year³. As per the Report on 19th Electric Power Survey (19th EPS) of India (Volume-II) (NCR) prepared by CEA, Ministry of Power, total electricity consumption of NCR in year 2018-19 was 83,849 MU (with 14.68% T&D losses), against the requirement of 98,271 MU. During 2013-14 to 2017-18, NCR has observed annual growth rate of 4.87% in terms of electrical energy requirement. Peak Demand for the region was 15,430 MW in year 2018-19. Domestic sector was the biggest consumer of electricity (35%) followed by HT Industry sector and Commercial sector consuming about 22% & 15% respectively of the total electricity consumption of NCR.⁴ A brief note on NCR status of power generation, transmission, distribution, renewable energy, etc. is placed at **Annexure-D-4.3**.

4.2 KEY ISSUES AND CHALLENGES

- 4.2.1 Economic growth is heavily skewed in favour of NCTD (constitutes more than half of GDP of NCR) and Central NCR (Noida, Gurugram, Ghaziabad, Faridabad, etc.) compared to rest of NCR.
- 4.2.2 High cost of logistics, i.e. 14-16% compared to ~8% globally, is making our industries globally non-competitive. High cost of land assembly caused by high land sale price/ long 90 years lease price coupled with

³ Power Systems Corporation of India (POSOCO)

⁴ Report on 19th Electric Power Survey of India (Volume-II) (National Capital Region), CEA, MoP, GoI

time-consuming land acquisition makes investments of large manufacturing facilities globally uncompetitive, further reducing appetite for such investments.

- 4.2.3 Strengthening of MSMEs in NCR is a challenge. Many enterprise/ clusters in the region face numerous problems related to availability of physical infrastructure, procurement of raw material, purchase of machinery & equipment, design & technology, access to credit, marketing of products and institutional support, etc.
- 4.2.4 Different economic structures in the four participating States especially different non-GST taxes, different approval processes, multiplicity of authorities, greatly impede economic growth in NCR. There are several other management concerns such as, lack of wide spread use of technology for public interface/ approvals, non- convergence of development schemes, lack of coordinated planning, and unorganized labour market along with heavy, unmanaged in-migration.
- 4.2.5 Poor rural economy in NCR due to inadequate rural infrastructure like Mandis and marketing facilities, common storage, cold storage facilities and inadequate food, fruits and vegetables processing facilities/ industries is another important issue.
- 4.2.6 Distribution of vegetables, fruits, milk, flowers and other perishables, pose a huge logistics challenge. Further, trucks movement is restricted in Delhi. Hence, cold chain logistics assumes greater importance.
- 4.2.7 Limited non-farm sector employment is prevalent due to sub optimal development of non-farming activities (manufacturing and services) in rural NCR outside Delhi/CNCR.
- 4.2.8 Most of the Industrial Estates and Industrial Parks in NCR are very old and are in urgent need of re modelling as per current and future requirements of industries.
- 4.2.9 Key challenges that need to be addressed regarding Logistics Sector in NCR include inadequate & ill designed terminal infrastructure, storage facilities, O&M protocols, regulations on logistics, land, bottleneck, tariff structure, and skilled manpower. Various types of approval and licenses (non-exhaustive) required for setting up of a Multi Modal Logistics Parks (MMLP), is also challenge for the logistics sector.
- 4.2.10 The prime concern is development and management of various forms of energy for meeting the growing energy needs of society at a reasonable cost. The high cost of industrial power along with high transmission charges are among the two primary power cost issues. NCR is hub of commercial activities and security of uninterrupted power availability is critical for other important sectors like transport, health and security of strategic locations.
- 4.2.11 Supply of uninterrupted power at required voltage coupled with frequent transformer breakdowns remains a challenge. Continued dependence on Captive power sources and diesel gensets by industrial, institutional and commercial establishments is sign of this unreliable power supply. High transmission losses (about 20%) coupled with large unmetered connections in sectors like agriculture, non-separation of feeders for different categories of consumers has contributed to the chronic problem of poor financial health of DISCOMs despite launch of Ujwal Discom Yojana (UDAY).
- 4.2.12 Nearly 60% of power generation in NCR area is coal-based that leads to increase in greenhouse gas emissions and pollution levels.
- 4.2.13 NCR's preparation regarding Crisis Management Plan (CMP) and identification of Critical Infrastructure (CI) is lagging.
- 4.2.14 Potential of smart metering and Distribution Automation and Development of Smart Grid in NCR, especially beyond urban areas to enable optimization of energy generation, transmission, distribution and consumption, is yet to be realized.



4.3 FUTURE PERSPECTIVES

- 4.3.1 For the vision to make India USD 5 trillion economy by 2024 and grow beyond, it requires a national driven effort, and the mega region of NCR can play a prominent role.
- 4.3.2 National target is of increasing combined exports of goods and services by at least twice from USD 478 billion in 2017-18 to USD 800 billion by 2022-23. NCR participating States should work with the above target, by increasing export -oriented manufacture and by converting NCR into a Logistics Hub of northern India. Because of its unique location, NCR has the potential to be the export and logistic hub for the entire northern India which is largely land locked.
- 4.3.3 NCR is a hub of automotive & light engineering industry, producing 30% of cars and 50% of two-wheelers in the country. Further, proximity to government institutions, availability of a business-friendly infrastructure, skilled professionals, start-up incubators and accelerators, robust connectivity and infrastructure also makes the NCR a viable IT hub.
- 4.3.4 Self-Reliant India Movement – “*Atmanirbhar Bharat*” along with “Production Linked Incentive” scheme for 10 Champion sectors presents huge opportunities and impetus to NCR wherein colossal presence of MSMEs in NCR can assist in “Assemble in India for the World”. Further, NCR is catering to the intrinsic warehousing demand and is also a key storage and warehousing hub for the neighboring states and North India.
- 4.3.5 The total production of around 6,690 thousand MT (2015-16) of fruits, vegetables and spices can be further increased to play a major role in growth of agro-processing industry and employment in NCR. With estimated demand of 05 million litres per day growing at an annual growth rate of 6-8 per cent, NCR is biggest milk market in the country. Thus, Agro & Food Processing Industries, having vital linkages & synergies between two major pillars of the economy i.e., agriculture and industry, have huge potential in economic growth of NCR.
- 4.3.6 E-commerce can be the driver of overall economic growth over the next decade through its impact on generating demand, expanding manufacturing, employment generation and greater transparency. The development of logistic hubs in NCR aided by two international airports by 2026 will enhance the potential for making NCR the e-commerce hub of India for both domestic and international purposes.
- 4.3.7 Circular economy has vast potential in India (refer **Figure 4.3**) and in NCR There is US \$1bn of value that can be realized from the extraction of gold from e-waste in India. Currently, ~ 40% of plastic waste in India ends up being uncollected for recycling. Proper management of this waste can create ~ 14 lakhs jobs and could potentially represent a ~ US \$2bn opportunity. There is over 8mn tons of steel that can be potentially extracted from end-of-life vehicles in India in 2025, representing a ~ US \$2.7bn opportunity.
- 4.3.8 Peak Demand of power in NCR is expected to reach 29233 MW in year 2029-30 with a CAGR of 5.78%. Key findings of CEA Report on Nineteenth Electric Power Survey of India (Volume-II) (National Capital Region), providing power forecasts for NCR and its sub-region (FY 2019-20 to 2029-30, are as presented in **Annexure-D-4.3** and graphically shown in **Figure 4.4 & 4.5** below. States need to keep this in view to avoid any hinderance in economic growth of NCR.

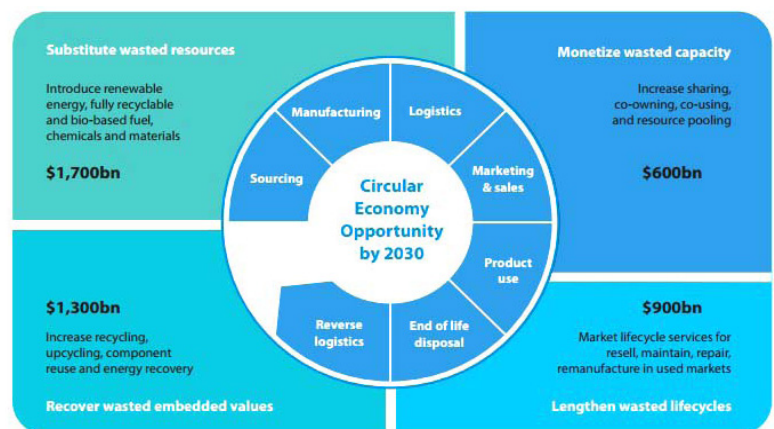


Figure 4.3: Value realization potential from circular business models by 2030
Source: Accelerating India's Circular Economy Shift, FICCI – 2018



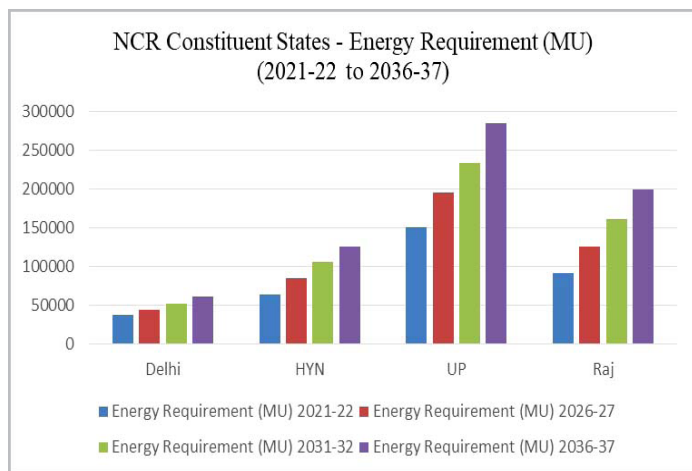


Figure 4.4: Energy Requirement (MU) of NCR Constituent States (2021-22 to 2036-37)

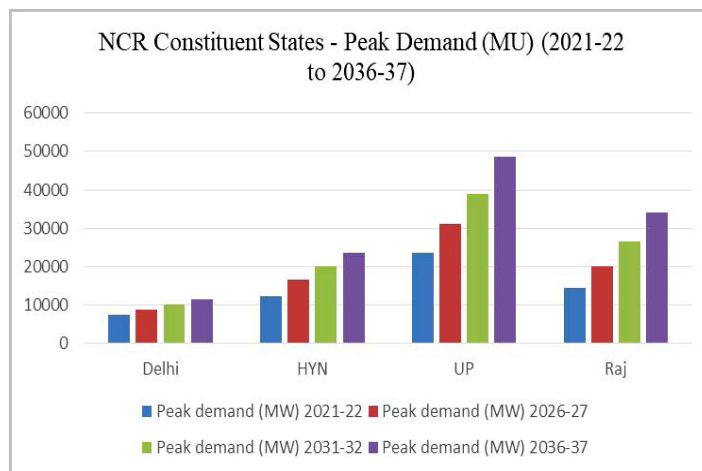


Figure 4.5: Peak Demand (MW) of NCR Constituent States (2021-22 to 2036-37)

4.4 POLICIES AND PROPOSALS

- 4.4.1 Economy of NCR should be seen in a regional context bridging the imbalance between central NCR and rest of the NCR.
- 4.4.2 Regional projects of NICDP and NICDC including Industrial Township, Multi Modal Logistics & Transport Hubs, MBIR, KBNIR, DNGIR, DMIC and Dedicated Freight Corridor (DFC), etc. be development and implemented on priority.
- 4.4.3 Low Work Force Participation Rate (WFPR) implies low per capita savings and low standards of living.
- 4.4.4 (a) To tackle these major strategies include – (a) Formalization of informal sector activities, to ensure disbursement of benefits to all workers who are eligible for government’s labour welfare programmes.
- (b) Promotion of females in workforce, ensuring equal pay for equal work at all levels, making work spaces gender sensitive, and including day care centres within these spaces could foster female inclusion.
- 4.4.5 Multi-pronged strategy should be continued for balanced economic growth of NCR covering (i) NCT Delhi (ii) Central National Capital Region (CNCR) (iii) Highway Corridor Zone and ToD (iv) Conservation Zone and (v) Rest of NCR as also detailed out in previous chapter on Landuse policies.
- 4.4.6 **Urban Regeneration** of global standards is proposed for a paradigm transformation of future NCR. Apart from positioning of CNCR as “the Ring of Opportunity”, **TEN ECONOMIC PILLARS** have been envisaged for harmonised economic development of NCR. These are (i) Industrial development including focus on MSMEs, (ii) Farm Incomes and Traditional Economy (iii) Economic growth corridors (iv) Ensuring Ease of Doing Business (v) Multi-Modal Transport & Logistics (vi) Tourism and MICE & Leisure (vii) Creation of Enabling Infrastructure & Services (viii) Skilling and Employment Synergy (ix) Circular Economy (x) Smart & Digital NCR.
- i) **Industrial Development and MSMEs**
- 4.4.7 NCR States may take necessary initiatives to integrate their economic initiatives with Central schemes of “Assemble in India for the world” and “Make in India”, to help the country in achieving its target of raising the export market share to about 3.5% by 2025 and 6% by 2030 and accordingly work with a motto of “Make in NCR/ Assemble in NCR”.
- 4.4.8 Industrial Brown-field Redevelopment should be undertaken in a mission mode by NCR States. Existing 300 plus industrial estates/industrial parks of NCR and industrial plots should be revitalised and redeveloped with rational land use conversion policies to enable new industrial investment. If needed mechanism for



an Escrow Account can also be used. Infrastructure deficiencies in existing Industrial Estates (IEs), should be addressed and all IEs across NCR should be equipped with modern support infrastructure & facilities. High potential areas for redevelopment of Industrial areas in sub-region wise are Okhla & Badli in Delhi; Faridabad & Bahadurgarh in Haryana and Ghaziabad, Modinagar & Meerut in Uttar Pradesh. Indicative strategies for Redevelopment of Industrial Areas are as outlined in para 4.4.9.

4.4.9 Strategies for Revitalization of Existing Industrial Estates/ Parks:

- i) **Identification of Land Parcels** [only Previously Existing Industrial Land/Estates in -NCR]
 - a) Large land parcels under non-conforming zones or surplus land within existing industrial units.
 - b) Sick/underutilized land parcels for functional industrial units.
 - c) Large vacant land within jurisdiction of state industrial development corporation/authority.
- ii) **Buy-in of Stakeholders** [Demand Led for Existing Land Owner]
 - a) Incentives to industries moving from above industrial estates to invest in economic generator.
 - b) Alignment of authority and government expectations from social and commercial aspects.
- iii) **Redevelopment Planning** [Alignment with Sustainable Principles]
 - a) Conversion of existing industrial land (change of land use/freehold).
 - b) Oversight in implementation to balance concerns of authority and land owner.
 - c) Align with framework of sustainable development principles.
- iv) **Fund Management** [Incentives through Escrow Account]
 - a) First stage release in favour of land owner for investing in new industry / shifting to new industrial area.
 - b) Partial funds to be released to government / state for redevelopment assistance/conversion.
 - c) Balance fund, if any, be released to land owner after successful establishment of industrial units.
- v) **Responsibilities** [Balanced Policy with Stringent Oversight]
 - a) Government/ state – facilitate rehabilitation; identify industrial hubs outside city center areas, oversight in implementation.
 - b) Land Owner – file relevant applications, identify industrial activity/location for transition, and carry-out redevelopment process.
 - c) Acquisition vs Private Sector Partnerships
 - d) Partner with Land Owner for Redevelopment
 - Potential options and partnerships
 - Running units with surplus land – ensure only surplus land is put to better use
 - Units under non- conforming zone – Rehabilitate to new zone
 - Sick units – provide option to provide alternate economic activity
 - Congested areas – provide land pooling options
- vi) **Advantages Social & Infrastructure Improvement**
 - a) Better use of such estates more suited to needs of surrounding catchment.
 - b) Slow development on Greenfield areas around Delhi-NCR.
 - c) Monetization of land parcels which have been underutilized/shut for a decade or more.
 - d) Live-work-play environment and more inclusive development with surrounding districts.
 - e) Increase in employment/entrepreneurship.



vii) **Commercial Advantage**

- a) Higher revenues for government in the form of transfer fee / conversion charges / property taxes / direct and indirect taxes because of economic activity on unutilized land parcel.
- b) Efficient financial planning for landowner by utilizing underutilized land plots for alternate uses.

- 4.4.10 Large industrial areas can easily be developed in under developed districts like Baghpat, Mewat, etc. as Industrial Estates. New Industrial Estates (IEs) or Industrial Parks (IPs) or Industrial Areas (IAs) at Strategic Industrial Locations (SILs) be established across NCR.
- 4.4.11 It is required to promote and support co-building industrial parks, for incubation & duplication in NCR. State governments may set up plug and play parks (flatted factories) as per international standards.
- 4.4.12 Clusters such as Film City, Aero City, Tech-City, Medi-City, Knowledge city, Electronics Manufacturing, IT city, etc. be promoted and development of new clusters such as Clean-Tech innovation clusters, Creative Enterprise Zones, film, fashion and design clusters, etc. be supported. All proposed ESDM clusters should be developed in a time bound & planned.
- 4.4.13 There are new opportunities like defence production & aerospace sector. Future of mobility has changed and new dimensions such as energy efficient products, green technologies, service skilling, etc., have emerged. Products for women, millennial, finance and health are new age requirements. Fintech, data analysis, artificial intelligence are amongst others. Hence, related business, Institutes & Industries to support this kind of requirement need to be set up in region.
- 4.4.14 Identify key sectors and work with academic institutions, business incubators, venture capitalists, and others to attract or create new companies while simultaneously supporting and expanding existing companies in those sectors.
- 4.4.15 Establishment of “Plug and Play” manufacturing zones complete with basic infrastructure facilities (power, water, sewage, Effluent treatment, roads, security) for in-house industries as well as housing, skill development and healthcare for workers should be done.
- 4.4.16 Support infrastructure for encouraging e-Commerce/ e-Business be created in NCR.
- 4.4.17 Economic development in CNCR and rest of NCR can be encouraged by focused attention to specific industries/ sectors in the 24 districts in the participating States, surrounding NCT Delhi. Sector-specific recommendations for industrial development and employment generation in NCR are provided in **Appendix-4.1.**

MSMEs

- 4.4.18 MSMEs mega parks and manufacturing clusters in labour intensive sectors with common facilities be setup to reduce costs and improve quality. Credit linkage to MSMEs should be facilitated through district level bankers committee meeting (DLBC), Pradhan Mantri Mudra Yojana, etc.
- 4.4.19 In the MSMEs sector, a serious fall in demand as many micro-industries cannot cope with the changing consumer preference and many units close down as they are unable to repay their debts. In this regard, following Strategies be taken into consideration:
- a) Compliance burden on MSME units needs to be drastically reduced to facilitate their EoDB.
 - b) To decrease cost of production in MSMEs, governments should ensure smooth and constant supply of power and water to these units. Constructing plug and play complexes to accommodate MSMEs could ensure an efficient supply chain for inputs.
 - c) Ensure availability and wide disbursal of formal credit to micro enterprises along with credit schemes focused on female entrepreneurs. Loan be easily available for MSMEs.



- d) Start-ups to be promoted through government Incentives to boost employment
- e) Policies, guidelines, schemes of GoI and NCR States related to various sectors should be timely implemented in all NCR districts to benefit from convergence of different schemes.
- f) New Common Facility Center for MSMEs be established at regional and sub-regional levels and previously established CFC Centers be improved so that SME can be benefitted.
- g) Micro, Small & Cottage Industries in Villages of NCR should be promoted with provision of rebate, less obligations and statutory requirements.
- h) Micro Enterprises play important role in employment and income generation. Micro enterprise, has two parts - livelihood and services. Necessary actions should to be taken to improve the condition of Micro Enterprises.
- i) Publicize, at home and abroad, traditional crafts and agricultural produce harvested in NCR, to promote the NCR brand.

ii) Farm Incomes & Traditional Economy

4.4.20 Existing Scenario: Agriculture is a primary activity of rural NCR being undertaken on about 82% of its land. Haryana, Western Uttar Pradesh and Alwar & Bharatpur have large areas cultivated for growing food grains like wheat, paddy, cash crops, sugarcane and others like mustard, pulses, vegetables, fruits, etc. Crops grown in Delhi include paddy, wheat, vegetables, some mustard, etc. The NCR is also marked by vibrant dairy activities. Total area under various crops in the NCR is given in **Table 4.1**. Area under wheat is the largest followed by rice, bajra, jowar, maize and barley in the NCR. In the NCR the average yield during 2017-18 was about 3,668 kg per hectare. Major Agricultural markets in NCR are as presented at **Figure-4.6** below.

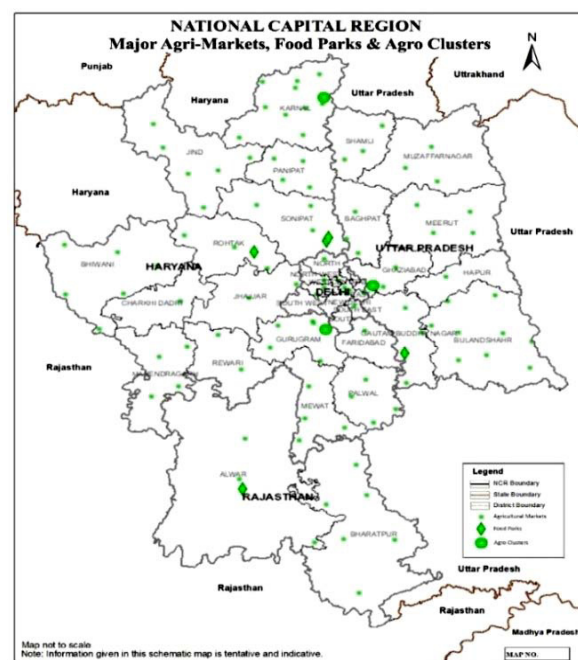


Figure-4.6: Major Agricultural Markets, Food Parks & Agro Clusters

Table 4.1: Area and Average Yield of Major Crops in the NCR, 2017

S. No.	Crop Categories	Area in '000 hectares	Average Yield (Kg per hectare)	Percentage share of area under different crops
1.	Food Grains	4,215.79	2,441.42	72.5
2.	Pulses	100.88	481.50	1.7
3.	Oilseeds	864.33	595.53	14.9
4.	Commercial Crops	632.05	11,155.22	10.9
Total Area		5,813.05	3,668.42	100.0

Source: Delhi Statistical Handbook, 2017; Statistical Abstract of Haryana 2017-18; Statistical Diary and District Statistical booklets, of UP, 2017 and Statistical Abstract of Rajasthan 2015

- 4.4.21 The NCR regional milk market is poised to grow from about 100 lakh litres per day to 650 lakh litres per day by 2041. The requirement of the number of milk booths is also very high (**Table 4.2**).



Table 4.2: Market Size of Milk /Milk Products & Milk Booth Needs in NCR, 2018-2041

Parameters	Units	18-19	20-21	25-26	30-31	35-36	40-41
Market Size*	LLPD	100	120	183	280	429	656
Per capita Consumption**	Grams per day	350	369	464	560	655	750
Milk Sales per booth	Liters per day	1,000	1,048	1,286	1,524	1,762	2,000
Milk Booths required in future	Numbers	-	5,825	7,938	11,120	15,868	22,943

Source: AMUL

* It is estimated that the NCR market size will grow at a CAGR of 9 percent by 2041.

**It is estimated that per capita consumption will grow at a CAGR of 3.7 percent. Note: Currently one booth's capacity is around 1,000 liters per day and is selling about 10 percent of total pouch milk sales.

Note: Currently one booth's capacity is around 1,000 liters per day and is selling about 10 percent of total pouch milk sales.

- 4.4.22 Micro and household enterprises have huge potential in rural settlements. Some of micro and household enterprises functioning in rural settlements in the NCR include pottery, food processing, sports goods, textiles, carpets, murtikari, scissors and blades, leather works, artificial ornaments, zari works, etc.
- 4.4.23 India processes only about 25% of its agricultural produce; NCR needs to take a lead in agro-processing to exploit its proximity to national logistic facilities.
- 4.4.24 **Agro-Food Processing Parks** including **Dairy and Export Zones** be developed and promoted in NCR as per appropriate district potential with special focus in U.P & Rajasthan sub-regions, in line with initiatives of Haryana. The should be equipped with the state of art facilities and infrastructure. Ministry of Food Processing Industries, Govt. of India and NCR States have already identified certain areas for Food Processing Parks (refer para B&C of Appendix-4.2). Sub-regional plans should encourage development of **agro-processing clusters** and enhance processing and preservation capacities, and develop markets with modern facilities at appropriate locations. Focus is also critical on skill development, other processing and packaging infrastructure.
- 4.4.25 States may develop **export-oriented clusters** containing a functional, end-to-end cold chain system along with processing facilities with the assistance of APEDA (refer Annexure-D-4.2 regarding APEDA).
- 4.4.26 States should encourage other **diversified agricultural activities** like dairy, poultry, bee keeping, fresh water fisheries, goat-sheep rearing, etc.
- 4.4.27 Every village/ group of villages with population of 2000 or more should have **primary processing facilities** of vegetables and milk facilitation center with a **Bulk Milk Cooler (BMC)** based milk procurement system set up by the nearest Milk Processing Plant. These Agro-primary processing facilities and BMCs should preferably be in Panchayat Ghar.-
- 4.4.28 A **network of milk procurement and processing facilities** should be set up in all NCR States outside Delhi. Milk Procurement and Processing Plant with **UHT (Ultra High Temperature) pasteurization facility** with long shelf life aseptic packaging facility be set up in every district of NCR. It is also important that there shall be at least one Milk Powder facility in addition, in every such milk procurement and processing plant at least for a cluster of 2-3 districts or at a radius of 30 kms, whichever is less. Milk procurement should be based on transparent automatic quality/SNF (solid not fat) testing with sharing of online reports with dairy farmers on the spot along with software/system alert based immediate online transfer of procurement price in their accounts. Land should be earmarked for such facility.
- 4.4.29 **Diversification of dairy plant facilities** to produce processed milk products like cheese, dairy whiteners, ice-cream, whey, etc. will further increase viability of such plants and improve farmers' incomes in turn. Further for detailing of this sector Functional Plan on Dairy be prepared by 2023.
- 4.4.30 States should take necessary **steps for empowering farmers** by adopting appropriate agri- marketing policies which may include (a) fair remuneration of farmer produce, (b) providing accessible competitive



markets, (c) export clusters, value chain, traceability, storage & transportation, (d) market information & intelligence, (e) fallback mechanisms like procurement system & price deficiency payment system.

- 4.4.31 Activities like **pisciculture, hydroponics**, along with water based crops like water-chestnut, fox-nuts, etc., **freshwater pearl farming**, horticulture, horticulture tourism/ therapy, floriculture, etc. be promoted wherever feasible. Central Inland Fisheries Research Institute model of feeding dead animals to fish be adopted.
- 4.4.32 **Non-conventional crops** like mushroom, broccoli, baby corn, bamboo shoot, etc. and crops like flowers, strawberry, etc. should be promoted in the NCR. Farmers should be encouraged to develop biological insecticides or botanical insecticides. Efforts should be made to maximize agricultural area under organic farming in all districts. AgMark certification facilities be set up for all agricultural produce and compost in every tehsil headquarter by 2026.
- 4.4.33 **High value crops** should be identified and promoted as they are linked with increasing incomes of farmers. It should be understood that food grains are necessary for food security. Export production should be done alongside cultivation of high value crops like spices, and medicinal plants. Hydroponics in agriculture should be encouraged.
- 4.4.34 Possibility be explored to **change in production of crops**, i.e. from cereals to horticulture crops (fruits, vegetables, floriculture, medicine, aromatic plants, etc.), and additional activities like beekeeping (in parks/ farms) and its nursery development, which would increase the income of the farmers.
- 4.4.35 **Plug-tray nursery** rising and high-quality vegetable production technologies should be adopted. Vegetables like cucumber, tomato and capsicum, etc., which give high tonnage per acre, with good benefit cost ratios should be also promoted in the NCR.
- 4.4.36 Conversion of rural haats into **Gramin Agriculture Market (GrAM)**, and their eventual linkage with electronic farmer market place, ENAM platform to sell their produce in a regional and pan India context, shall be done by NCR States in a time bound manner.
- 4.4.37 Special cropping areas like Ratul Mango area in Baghpat district should be identified and conserved for saving historical and regional identity across the NCR. Such areas should be promoted as part of **agro-tourism** as well as strategic rural investment zones.
- 4.4.38 **Weather based crop insurance** for food crops, oil seeds and perishable fruits and vegetables be adopted across NCR. This should preferably be Automatic Weather Station (AWS) based. AWS should be set up in all tehsils across NCR by 2026 through utilizing CSR funds and other sources. More number of AWS be setup specifically in NCR and crop insurance for weather sensitive crops be promoted and adopted in the region.
- 4.4.39 Energy Efficiency in water pumping should be adopted and promoted in NCR and states may undertake projects for energy efficiency (EE) improvement of water pumps in Agriculture and Municipal sector. Use of solar pumps be also promoted for irrigation in agriculture sector.
- 4.4.40 In order to diversify the market linkages agri-sector aggregators should be involved for better marketing of farm products/produce in NCR. Such aggregators can organise multiple marketing activities including agri-expo, road shows, etc.
- 4.4.41 Reinforcing of agri.-marketing development of Delhi with special attention to Ghazipur, Azadapur, Mehrauli, Okhla, Arya Pura, Ghanta Ghar, Mandawali, Old Delhi and Shahdara markets may be considered.
- 4.4.42 The NCR districts should ensure increase in agri-produce certification facilities. Certification of manure produced from compost and waste should be adopted for safer use. Concerns of farmers regarding use of certified seeds for better yield should be addressed.



- 4.4.43 To increase the productivity protected cultivation, polyhouses, etc. should be practiced in NCR. **‘Low tunnels technology’** should be adopted for off season crop production as this provides better benefit cost (BC) ratio for muskmelon, summer squash, bitter gourd, bottle gourd, etc.
- State of the Art Fish Markets, marketing infrastructure are proposed in Delhi and other major cities, wherever feasible.
 - Hygienic market places should be made available so that farmers themselves could sell their agricultural produce as well as livestock products. Industries and Bulk Retailers to integrate farmers with retail chain of Delhi and other major cities.
- 4.4.44 All steps should be undertaken to control disease through vaccinations program, tagging of animals, traceability of products, and breed improvement. Mobile veterinary units should be promoted across the NCR to keep animals healthy at all times. There should be ambulatory Veterinary services with control room facility. For breed improvement Artificial Insemination and Embryo Transfer Technology may be encouraged in NCR.
- 4.4.45 Fodder should be produced in NCR, outside Delhi, on commercial basis. Each village of the NCR should produce fodder and the same should be mandated in District Development Plans. Districts should be made self-sufficient in fodder and plans should spell out efforts to increase farm revenue. Waste land in the NCR districts should be taken up for fodder cultivation under technical supervision of the Indian Grassland and Fodder Research Institute (IGFRI), Jhansi.
- 4.4.46 At least one Veterinary Institute along with the hostel facilities, auditorium etc. in each sub-region should be established for training and research purpose.

iii) Economic Growth Corridors

- 4.4.47 Economic Growth Corridors and Opportunity Areas as identified/ mapped (refer **Appendix-4.2**) based on Industrial corridors & Economic hubs be developed on priority ensuring that identified growth potential is fully realized.
- 4.4.48 Proposed Industrial corridors & Economic hubs which are better connected and more competitive should have: (a) Prioritised public transport investments to deliver 30-minute city objective for strategic centres along the economic corridors, (b) Prioritised transport investments that enhance access to economic corridors & between centres, & (c) Co-located health, education, social & community facilities in strategic centres along economic corridors.
- 4.4.49 **Economic growth corridors** should be developed along all major Expressways, ORCs, NHs, freight corridors, etc. Major identified/ proposed connectivity investments which could be studied for establishment of intensive Economic Growth Corridors in NCR (refer **Figure 4.7**) are.
- Circular Regional Expressway (CRE) Rings i.e. (a) CRE-I (b) CRE-II (c) CRE-III
 - Concentric Orbital Rail Corridors: (a) ORC-I (b) ORC-II (c) ORC-III.
 - DFCs passing through NCR i.e. DMIC and AKIC
 - Other important Expressways and Bharatmala projects i.e. (a) Yamuna Expressway (b) Delhi-Meerut (c) Delhi-Dehradun, (d) Delhi-Amritsar-Katra (e) Other Bharatmala projects (refer **Appendix-4.3**).

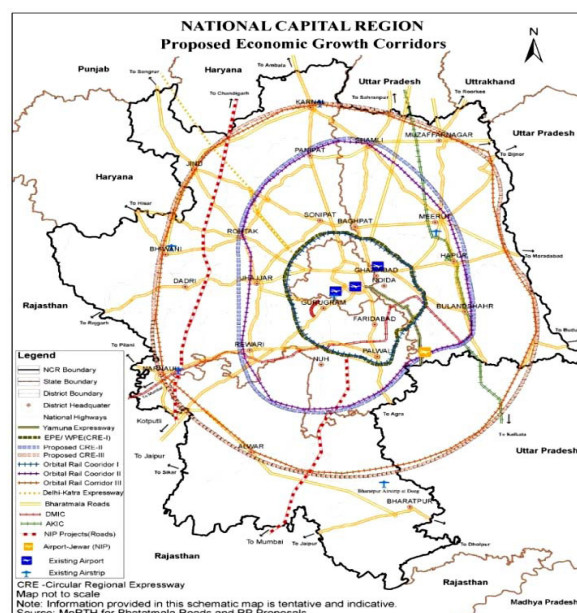


Figure 4.7: Proposed Economic Growth Corridors



- v) National Infrastructure Pipeline (NIP) Projects i.e (a) Delhi-Mumbai Expressway (b) Dwarka Expressway (c) Trans Haryana North South Expressway (d) New International Airport at Jewar
- 4.4.50 Land should be reserved along both sides of the economic corridors and suitably planned for future growth for industrial, logistics and urban development. This reservation of land and earmarking for planned intensive industrial and urban development is necessary to prevent encroachment and haphazard growth.
- iv) **Ease of Doing Business**
- 4.4.51 NCR be treated as a **Unified Economic Space (UES)** giving suitable coordination and synergy among political and legal entities (States, Districts, Local Bodies, etc.) with respect to interstate toll, pollution tax, regional tax sharing, approval processes, and movement of people & vehicles, etc. and for seamless coordination across NCR for individual or multiple sectors e.g. industrial clusters, logistics, tourism, health, etc. may be examined and explored. NCR participating States should develop necessary policies/ amendments/ initiatives for enabling the region to become a UES, by 2026. NCRPB can play a coordinating role.
- 4.4.52 A **pan - NCR Nivesh Mitra Portal** should be set up after stakeholder consultations as a 'single window' (SW) system for all investment related government/ authority permissions including environment, land, etc.
- 4.4.53 The compliance burden on all categories of industries in NCR needs to be reduced significantly to enable realisation of its potential.
- 4.4.54 **MSME Portal** for each district and sub-region of NCR should be considered, preferably collated at NCR level as NCR MSME Portal.
- 4.4.55 Intellectual Property Rights (IPR) help desks for filing Intellectual property Rights–patents applications may be set up in each DIC (District industries Centre) in all districts of NCR.
- 4.4.56 Provide access to **digital payment services** and its necessary training to help increase its penetration across NCR. Simultaneously, implement the payments of wages through cheque or Aadhaar- enabled payments for all as mandatory by 2025.
- 4.4.57 All sub-regions should adopt **GIS based mapping to create pre-approved land banks** for development activities with standards relating to (i) environmental requirements (ii) building byelaws, (iii) safety and other norms, etc.
- 4.4.58 For EoDB various policies are suggested for simplification and standing approvals under various sections of this Plan which includes, logistics landuse, E-land management system, PAN NCR Nivesh Mitra, MMLP Logistics-online access to all stakeholders, Digital platform for all licenses/ permissions, E-Right of Way (RoW) permissions, NCR Unified Economic Space Portal/ NCR Mega Portal, amongst others.
- 4.4.59 The World Bank EoDB indicators for country level are given in **Appendix-4.4**. Since there are no indicators for States globally, it is imperative for NCR, which is largest GDP contributor for the economy, to have a special EoDB framework. This framework for NCR can be made by DPIIT or the NCR participating States can formulate EoDB framework for their sub-regions as per the World Bank indicators as given in the Appendix.
- v) **Multi-Modal Transport & Logistics**
- 4.4.60 NCR being a land locked region, an appropriately located network of dry ports, inland container depots (ICDs), multi-modal logistic hubs, etc. in close proximity to airports, freight corridors, industrial centres, etc. should be designed and implemented in a time bound manner. The Transport Functional Plan should include this as a major aspect.
- 4.4.61 Due attention be given to **development of logistics** in line with frame-work of Wholesale Market policy documents of Ministry of Commerce, Govt. of India.



- 4.4.62 NCR should have its own **Integrated Logistics Action Plan (ILAP)** and NCR Logistics forum to coordinate activities of concerned stakeholders.
- 4.4.63 Possibilities of converting existing warehouses into multi-storied be explored to achieve increased warehousing space. CNCR may be given special emphasis for development of warehousing & logistic infrastructure.
- 4.4.64 **Warehousing and Logistics be given ‘industrial status’** to enable viable and cost competitive development of warehousing and logistics infrastructure. This can give option for Warehousing to setup in Industrial Estates, reduce costs of operations and provide for more optimal usage of unused plots. Warehouses be preferably developed especially along the expressways and major highways.
- 4.4.65 NCR States should work towards achieving the objectives of National Logistics Policy.
- 4.4.66 **Multi-Modal Logistics Parks (MMLP)** and dry ports should be developed to ensure seamless movement of freight.
- 4.4.67 The process of approvals for warehouses, MMLP should be simplified, NCR States should have an on line portal for this or integrate all concerned approvals with the proposed pan NCR-Nivesh Mitra portal. Such approvals should also be time bound.
- 4.4.68 **NCR States should expedite implementation of respective stretch of already planned connectivity-logistic corridors like DMIC and AKIC.**
- 4.4.69 Explore possibilities of having **‘Food Processing Park’** in each Tehsil headquarters and running on its own at cost of work basis. Possibilities of opting for PPP mode may also be explored. State Governments may have pilot projects in each sub-region at district Headquarters.
- 4.4.70 Necessary initiative should be taken to ensure faster movement of perishable products to consumers. **Cold chains** may be preferred if harvesting and selling cycle is beyond 48 hours. Cold Chain facilities under modern scientific agro logistics may be developed such that the facility acts as Hub and produce supply points and consuming markets act as spokes around the hubs. About 4-5 hubs may be created in and around Delhi in NCR.
- 4.4.71 Multi-chambered, differential temperature controlled cold storages for non-potato/onion based Fruits, vegetables and flowers will still be required at central sale points/ Terminal Markets, to prevent wastage, be planned.
- 4.4.72 For quick transport of perishable items, the required epoxy containers could be added in rail coaches/ Ring Rail and possibility of having Cool Chambers at loading and unloading points as transit arrangement could also be investigated. Agencies like APEDA, and others concerning perishable goods can utilize the Ring railway.
- 4.4.73 To **prevent post-harvest loss**, adequate initiatives should be taken to provide infrastructure for short-term storage (particularly at the farm level) and for intermediate processing in the production catchments. APEDA may be associated with pre and post-harvest interventions, infrastructure and logistics, etc. for improvement of Agri Export in the NCR. States may develop export oriented clusters containing a functional, end-to-end cold chain system along with processing facilities with the assistance of APEDA.
- 4.4.74 Special facilities both for transfer, storage as well as after use treatment should be planned for flowers grown for economic purpose.
- 4.4.75 NCR participating States & their agencies should act towards improving business environment for logistics & warehousing sector specifically to stimulate economic activity in urban centres, and their rural hinterland to promote ‘Make in India’. More details of required infrastructure with respect to logistic is provided in Chapter on Transport & Mobility.



4.4.76 Efforts should be made to expand Region's Connections to the Global Economy by: (a) Promoting international trade and increase exports from the region, (b) Attracting additional foreign direct investment, (c) Improving domestic and international mobility connections to the nation and world. Expand production capacity and improve international connections, (d) Enhancing utilization of the region's dry ports and overall leverage of the region's multi-modal infrastructure.

4.4.77 Due attention should be given by all concerns towards development of logistics in line with existing potential, future expectations, wholesale Market policy of Ministry of Commerce, Govt. of India and follow up policies of Haryana, Rajasthan and UP. It should cover start-ups, incentives on investment, fiscal (stamp duty/electricity duty) concessions, and interest subvention, development of e-Market place, Retail Centres, Cross-regional trade, e-Commerce platform and viability gap funding. These initiatives can minimize costs in logistics to the tune of 10% to 12%. Further, the development of suitable logistics (warehousing and transportation etc.) may reduce agricultural waste from current line of 25-30% to 20-25%. It will minimise rural urban divide and imbalance in the regional development⁵.

vi) Tourism: Economic Multiplier Benefit

4.4.78 A mega project initiative to develop **75 "Smart Tourist Destination Sites"** showcasing tourism, heritage and natural sites in NCR may be taken jointly by the Central & NCR Participating States. These may include **"World Class Museums"**⁶ also. Entertainment theme parks such as Disneyland, Kingdom of Dreams, etc., should be encouraged and can be a great boost for tourism sector.

4.4.79 NCR States may initiate steps, including amendments in banking regulations as necessary to enable Tourism projects, involving investment of Rs. 1 crore, or more, to be considered eligible for priority **'infrastructure lending'** by banks and financial institutions, by 2022.

4.4.80 Sub Regions may Consider the following when preparing plans for tourism and visitation:

- a) encouraging the development of a range of well-designed and located facilities
- b) enhancing the amenity, vibrancy and safety of centres and township precincts, improving public facilities and access and supporting appropriate growth of the night-time economy
- c) supporting the development of places for artistic and cultural activities
- d) protecting heritage and biodiversity to enhance cultural and eco-tourism
- e) developing industry skills critical to growing the visitor economy
- f) Incorporating transport planning to serve the transport access needs of tourists.

4.4.81 Local crafts persons, masons, carpenters and labourers should be engaged for heritage conservation & restoration activities to create jobs. Support private sector institutes in tourism regulated by government to create required talent pool. This can be done by expanding the number of private sector institutes or bodies recognized as implementing agencies for delivering Ministry of Tourism's 'Hunar Se Rozgar Tak' initiative to create employable skills.

vii) Enabling Infrastructure and Services

4.4.82 Strive to Provide 24x7 quality power to all by 2025 and promote smart grid and smart meters across NCR.

4.4.83 Further, establishment of National Gas Grid be expedited and city gas distribution be promoted to provide piped natural gas (PNG) in NCR.

4.4.84 Adequate investment/fund allocation be made on the infrastructure, necessary to support region's businesses, including highways, transit, dry ports, airports, high speed broadband and wireless internet, and pipelines.

4.4.85 **Non-logistics key projects** including those identified under NIP (refer **Annexure D-4.1.3**) for NCR

⁵ IIPA, RP-2021 Review Report recommendation

⁶ Guidelines for Museums adopted by ASI in 2013 should be practiced for Museum Development for all site museum of ASI



participating States should be implemented on priority which include Healthcare, Education and Skilling-Construction of AIIMS and medical institutes, IITs, Central Universities, NITs, IIMs, IISc, IISERs, MHRD institutions, better school infrastructure, regional institute of education, upgradation of government medical colleges, setting up of special education and research blocks at government hospitals and Urban & Rural Infrastructure with a focus on affordable housing, mass rapid transit system, Smart City Mission, AMRUT, Jal Jeevan Mission, all rural households to have toilets and all villages to be ODF.

- 4.4.86 States should prepare Action Plans and implementation timelines along with a monitoring mechanism to monitor implementation of projects in NCR for “**12 Champion Services Sectors**” as identified for focused attention by the Department of Commerce, Govt. of India. These include (i) information technology & information technology enabled services (IT & ITeS), (ii) Tourism & hospitality services, (iii) medical value travel, (iv) transport and logistics services, (v) accounting and finance services, (vi) audio-visual services, (vii) legal services, (viii) communication services, (ix) construction and related engineering services, (x) environmental services, (xi) financial services and (xii) education services. NCRPB can play a coordinating/facilitating role.
- 4.4.87 All districts of the NCR to mandatorily have **Collection Centres for agricultural produce** based on productions and Terminal Markets. All Collection Centres be linked directly to farmers and feed to main/terminal market (Hub).
- 4.4.88 **Direct Marketing licenses** may be issued to Agro-Industries and Bulk Retailers to integrate farmers with retail chains of Delhi and other major cities.
- 4.4.89 To address the global problem of food loss and waste, all NCR states may follow the **Sustainable Development Goal (SDG) 12.3**, which aims at halving per capita global food wastes at the retail and consumer levels and reduce food losses along production and supply chains including post-harvest losses.
- 4.4.90 **Power and Energy Efficiency**
- 4.4.90.1 Distribution system strengthening alongwith uninterrupted, quality 24x7 Power Supply is the foremost requirement in NCR in the foreseeable future.
- 4.4.90.2 Energy efficiency, demand side management, coupled with smart metering should be the focus areas for NCR power management in the coming years.
- 4.4.90.3 As per CEA/POSOCO estimates, the current transmission capacities in the Northern region are sufficient for NCR in the near future; however, strengthening of transmission network may be required by 2026.
- 4.4.90.4 CEA has prepared an NCR specific 19th Electric Power Survey of India (EPS), major findings and data sets including engery requiriements, category wise forecasts, peak demand not met, are comprehensively covered in **Annexure-D-4.3**. A brief status of power generation, transmission, distribution alongwith renewable energy sector is given at **Annexure-D-4.3.1** wherein details of central/ State/ Private power projects for power allocation to Northern region and NCR States are also included.
- 4.4.90.5 Adequate space for substations, cables/RoW and associated equipment, etc. be provided and also encroachment of power infrastructure be prevented for reliability, safety and power theft issues and to achieve the objective of 24 x 7 power. Support from Land owning agencies and departments should be given to address the issues. Further, NCR States shall ensure earmarking/priority allocation of land for substations/lines/ RoW for power equipments and systems e.g. Delhi has long pending land requirement of 18 Grid sub-stations and about 600 distribution facilities.
- 4.4.90.6 Power agencies may explore designing and offering incentives to encourage participants & contributors to its DSM programmes, as implementation of these programmes may result in reduction in electrical energy requirement & peak electricity demand.
- 4.4.90.7 While high voltage systems have lower losses, they also require higher clearances. In urban areas, planning



by land development agencies has to be done considering such clearances. Also rampant illegal extension of buildings significantly reduces clearances even for LV systems. Active role of civic agencies are required to address this serious issue.

- 4.4.90.8 Suggestive DSM solutions are provided at **Annexure-P-4.2**. Automatic DSM which includes SCADA, EMS, etc. be taken up by concerned DISCOMs of other NCR participating States to enable 100% ADSM implementation in NCR by 2025.
- 4.4.90.9 Efforts should be made to bring down the Distribution Losses to around/ apprx. 5% by 2041 (currently 12.51% in UP). CEA has estimated to bring the T&D losses in NCR to about 11.51 % by 2024-25 and 10.30% by 2029-30 (refer **Annexure-D-4.3**).
- 4.4.90.10 Aggregate Technical & Commercial (AT&C) loss and T&D (Transmission & Distribution) loss, reduction road map be prepared and implemented by each of the NCR States as part of their Sub-Regional Plans. NCR States should take necessary initiatives to improve the health of DISCOMS.
- 4.4.90.11 NCR Sub-regions should have adequate earmarked reserves with black-start capabilities for contingencies. NCR should explore possibilities of having pumped storage hydro power plants dedicated to NCR, in UP and adjacent hilly States of Uttarakhand, Himachal Pradesh, etc. apart from assigning high capacity black-start generators for NCR contingencies
- 4.4.90.12 Delhi may explore possibility of using their existing gas based plants for power back-up and black-start facility for GNCT.
- 4.4.90.13 For improving the efficiency of the power distribution system the urban feeders must be separated from rural feeders and further agriculture feeders be separated from non-agricultural rural feeders in a time bound manner.
- 4.4.90.14 All NCR States may prepare Business Plans for their respective areas up to 2041 giving phasing for every five year in line with 13th Business Plan of Delhi (2017-2018 to 2021-2022).
- 4.4.90.15 NCR needs to developed as a clean, environment friendly region and promoted as a Renewable Energy hub, a Smart Hub through adoption of solar power generation, Waste to Energy, bio-energy, automated and smart grid initiatives etc.
- 4.4.90.16 Adequate cyber security measures need to be implemented for ensuring secure power supply across NCR. Crisis Management Plan (CMP) be mandatorily prepared by all Utilities and implemented in a phased manner. Further, Critical Infrastructure (CI) should be identified/ listed by the Utilities, as per the directions of the Ministry of Power, Govt. of India. Critical power infrastructure mapping and safety systems should be ensured across NCR.
- 4.4.90.17 Adoption and implementation of 'smart grid' and 'smart metering' be done in NCR. To manage demand for power 100 percent metering, net metering and metering of electricity supplied to agriculture with adequate digital infrastructure/ IT, control systems be ensured.
- 4.4.90.18 Expedite establishing the National Gas Grid (NGG) and promote city gas distribution to provide Piped Natural Gas (PNG) in a phased manner. All Metro and Regional Centers be covered in 1st phase by 2030; all other towns in by 2035; and all remaining urban areas by 2041. State may explore possibilities of promoting PNG supply in rural areas as well.
- 4.4.90.19 'Balancing Power' should be secured to tackle intermittency and time of day availability through options like Pumped-Hydroelectric Energy Storage (PHES), Battery Energy Storage (BES), etc. Policy support can drive the scale for the battery industry including augmentation of technology through R&D programs.
- 4.4.90.20 Promotion of Renewable/ Green Energy: Renewable Purchase Obligations (RPO) should be strictly enforced and inter-state sale of renewable energy should be facilitated amongst NCR States and efforts be made to



meet RPO trajectory as notified by the M/o Power (refer Para 10 of **Annexure D-4.3.1**).

- 4.4.90.21 Concept of 'Solar Parks' & 'Bio-Fuel Parks', be promoted. NCR States may come up with detailed Solar Energy Policy to promote '**Mega Solar Parks**' in the region. Mega Solar Parks can be set-up in different districts of NCR e.g. Bharatpur, Nuh, Bulandshahr, etc. for meeting power needs of Delhi and other areas in NCR.
- 4.4.90.22 Actions need to be taken by all cities and towns of NCR in terms of promotion of solar rooftop installation through Single Window clearance and accordingly, all ULBs/ Authorities may accordingly mandate solar roof top installation for public buildings in their building bylaws. Private building owners be encouraged for adopting solar installation by giving appropriate incentives like TDR, additional FAR, etc.
- 4.4.90.23 Ground mounted and solar roof top installation especially on all Government buildings and vacant roof tops need to be promoted. The solar policies should be implemented across NCR. Roof top solar installation should be done in all govt buildings by 2024.
- 4.4.90.24 Biofuels policy aimed at taking forward the target of achieving 20% blending of biofuels with fossil-based fuels by 2030, needs priority implementation even if on a pilot basis in NCR to reduce pollution. Ensure mandatory use of ISI marked motor pump sets, power capacitors, and foot-reflex valves in the agricultural sector.
- 4.4.90.25 Energy Auditors be appointed in each DISCOM subdivision and at each district under the respective DC/DM. 35% improvement in energy efficiency should be achieved by 2025 and this should be further improved up to 40% by 2031 & 50% by 2041. It should be obligatory for all big industries and utilities to carry out energy audits of their system.
- 4.4.90.26 Promote the mandatory use of LED and replacement of old appliances in government buildings with five-star appliances. Possibilities may be explored to increase the number of appliances being covered under the Standards and Labelling (S&L) programme. Efforts be made to achieve 100% lighting of city facilities and streets through LED lighting by 2026 in all Metro and Regional centres and by 2030 across rest of NCR. States may benefit from the UJALA (Unnat Jyoti by Affordable LEDs for All) programme on lower-income households and small commercial establishments.
- 4.4.90.27 To reduce dependency on conventional vehicle fuel, NCR States should promote electric powered public transport system and have time bound targets to convert its complete public transport fleet to EVs with the provision of necessary charging stations and support infrastructure. States may expand the Corporate Average Fuel Efficiency Standards⁷ (CAFE) beyond passenger cars to other vehicle segments.
- 4.4.90.28 NCR States may adopt, promote and set annual targets for getting 'Green Rating' for all large non-domestic structures and accordingly work towards Zero-Energy Building (ZEB) i.e. buildings with zero net energy consumption through energy efficiency and use of renewable energy and should also aspire and explore options for utilization of 'Hydrogen Energy' wherever possible.
- 4.4.90.29 Various methods and steps to reduce the technical and non-technical losses should be adopted across the region. Some of the indicative suggestions to reduce the T&D losses are elaborated as given at para 29 of **Annexure-P-4.2**.
- 4.4.90.30 Mandatory implementation of ECBC energy efficiency building codes in all multi-storey & high rise non-domestic establishments/buildings in NCR.
- 4.4.90.31 Mandatory Energy Audit of all Government buildings and multi-storey & high rise non domestic establishment buildings may be carried out.
- 4.4.90.32 Pan-NCR online approval process should be adopted for RoW related matters of power & energy projects for systematic processes.

⁷ <https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy>



- 4.4.90.33 Land should be reserved for distribution GIS substations in all wards and preferably all settlements with 2,000 plus population (as per Census 2011).
- 4.4.90.34 A Separate SPV for shifting of Power Utilities in NCR be considered.
- 4.4.90.35 Efforts shall be made by all sub-regions to have underground cabling of power lines in all Metro Centres and cities with 03 lakh plus population by 2026.
- 4.4.90.36 The Plan recommends building of common utility duct by the land development agency to optimize expenditure. In case utility duct is not made available, underground cable repairs in case of fault takes a long time due to delays in obtaining ROW from civic agencies. The process needs to be streamlined further to increase availability of network.
- 4.4.90.37 Govt. of UP has worked out district wise proposals for electrical networks/infrastructure and GNCT Delhi has worked out system improvement requirements for transmission and distribution for Delhi NCT, which are given in **Appendix-4.5**. This should be taken up expeditiously for feasibility and implementation. Further, certain suggestive norms for strengthening the transmission network are provided in **Annexure-P.4.2**.
- 4.4.90.38 Further, energy conservation activities and efforts towards reduction of carbon emissions be undertaken by NCR States as per suggestion at para 30 of **Annexure-P.4.2**.

viii) Skilling and Employment Synergy

- 4.4.91 The large potential of handicraft-based informal sector to improve incomes should be benefitted from. Publicize, at home and abroad, traditional crafts and agricultural produce harvested in NCR, to promote the “NCR brand”.
- 4.4.92 All-inclusive upskilling and training centres with sector specific programme be planned at district level with the support of NSDC.
- 4.4.93 Market and skill-centres may be connected in a hub and spoke model. Skilled artisans should be certified preferably under a common identity to allow them to access markets spaces on priority and get product premium.
- 4.4.94 Existing District Skill Councils would be central to planning with the support of NSDC. Their participation and representation in rule-making process must be formalized.
- 4.4.95 The list of ten **suggested sectors for special focus** in NCR for skilling are 1) Construction 2) Retail 3) Fintech 4) Paramedical Services 5) Domestic Services 6) Tourism 7) Driving (including modern Cargo Driving) 8) Care for Special Needs 9) E-commerce linkages services 10) Soft Skills. However, these sectors can be reviewed regularly and updated accordingly.
- 4.4.96 Sector Skill Councils act as interfaces to match skill demand and supply. Their role in sectors such as hospitality, tourism (guide), health (elderly care, para medical staff), construction, FinTech, support staff (domestic and managerial staff) must be formalised
- 4.4.97 **Skill Coordinator** may be appointed at every village (above 2000 population) and every ward who would liaise with all skill councils and also with MFCs of the district.
- 4.4.98 Skill coordinator and leaders of Migration Facilitation Centre (MFCs) must be individuals of eminence. Local leaders, School principals etc can be part of the coordinator selection committee. Adequate female and SC/ST/OBC representation must be ensured as well.
- 4.4.99 State may take joint initiative to create a Pan NCR “**Job-Portal of NCR**”. Adequate filters can be used within ASEEM Portal (Atamnirbhar Skilled Employees Employer Mapping) to access region wise jobs wherein prospective employers & employees can share their details and interact. Other privately run portals with good services and reach can also be used for pro-bono services.
- 4.4.100 Ensure increase in Women Labour Force Participation Rate (LFPR) of NCR that can be measured as a



performance indicator. Women LFPR be targeted to be at least 30 percent by 2022-23 in line with the ‘NITI Aayog Strategy for New India @ 75’ and this is to be further increased to 35 percent by 2025.

- 4.4.101 NCR States should take necessary actions for generating more employment opportunities to make “**NCR an employment hub**”. Major employment generating sectors could be tourism, circular economy, construction, financial services, manufacturing, event management, e-commerce, logistics, etc.
- 4.4.102 To protect vendors’ livelihood rights and social security, a ‘**Plan for Street Vending**’ be prepared by every local body as also mandated in the “Street Vendors Act, 2014”. Further, with regard to informal sector and poverty alleviation, various national level policies and schemes to improve incomes of the poor persons and informal vendors need to be implemented.
- 4.4.103 Education Frameworks and **National Vocational Education Qualifications Framework (NVEQF)**⁸ / National Skills Qualifications Framework (NSQF)⁹ should be put together for synergy and development of lifelong education facilities in NCR.
- 4.4.104 Vocational training & internship programs be designed at district level to push for innovation and entrepreneurship right from the school level.
- 4.4.105 Specialized institutions should be created to offer courses in skill enhancement viz. health care, beauty & wellness, nursing, house help, baby sitters, old age care, handyman, handlooms, food processing, agriculture and local food systems, etc and other courses in consultation with NSDC and are openly networked to leverage technology for wider propagation.
- 4.4.106 **NSDC/SSC backstopped courses** should be introduced in every educational institutions i.e. high school and onward.
- 4.4.107 **Soft skills training** preferably video based, be imparted in NCR for various aspirational job roles like Elderly Caretaker, Child Caretaker, Household Multipurpose Executive, Home Cook, Private Tutor/ Governess, Household Supervisor, Supervisor-Day Care/Old Age home/Special Needs home, Tiffin Service Provider, Gardener, Landscapers, etc. for increasing employability.
- 4.4.108 NSDC should have a special role in NCR. There should be NSDC coordinator in each NCR district to assist DM/DC in working of District Skill Registry Centers along with other staff for better synergies.
- 4.4.109 NSDC may explore possibilities of working with States, towards creation of a **Multi-Sector Training Centers** demonstrating aspirational value for training in every NCR district as per its skill needs.
- 4.4.110 Each District should have **District Skill Coordinator**, to be appointed by the NSDC or Sector Skill Councils. He should be in-charge of the MFC/ will closely liaison with MFC or should be located within MFC. MFCs could be located physically in ITI, etc. in the district headquarter or any other locations as decided by the respective DC/DM or the State Govt.
- 4.4.111 **Modern ITIs** should be setup preferably in every block of NCR. Further, **Tele-Education/ E- Education** should be made mandatory in all primary schools, middle and high schools in NCR with central video content.
- 4.4.112 Convergence of all skill development related initiatives/programmes (e.g. Mudra, Start up, Stand up India) is required as the students are not well aware due to information asymmetry.
- 4.4.113 District Skill Development Committee (DSDC) should prepare District Skill Development Plans (DSDP) for each district of NCR as derivative of State Skill Development Plan. DSDP should be part of District Development Plan and Sub-Regional Plan (SRP).

⁸ <https://www.mhrd.gov.in/nveqf>

⁹ https://www.mhrd.gov.in/sites/upload_files/mhrd/files/NSQF%20NOTIFICATION.pdf



- 4.4.114 The **District Skill Registry** should be linked to Swayam Portal for further learning, to NSDC portal for further skilling and for getting certification. It should also be linked to soft skill training videos, and should be used for assisting migrants (going out & coming) and should be having details of ration cards, etc. too for buying.
- 4.4.115 Notification for ITI or Polytechnic at district headquarter in all NCR districts, to house District skill registry and Migrant facilitation centre backstopped by NSDC with the help of sector skill councils. Trades in Industrial Training Institute (ITI) and Polytechnics be reviewed and upgraded. Smart and latest infrastructure be provided in ITIs and Polytechnics.
- 4.4.116 All **Gig workers** need police verification and for this MoHA may be requested to establish a process leading to a NCR Portal for Police Verification, with request for police verification being simply routed to concerned police stations through this portal.
- 4.4.117 Industries should be encouraged/ incentivized to offer **internships and apprenticeship** to the students. Industries may consider NCR villages as internship assignments/ locations. Industry visits by school and collages should be mandatory across NCR and internship without stipend, but with credits could be looked into.
- 4.4.118 **Apprenticeship** by all NCR industries to all eligible students of vocational trades in all Govt. and private education institution should be mandatory in NCR districts. Industrial exposure visits in different companies of NCR should be organized compulsorily in the region. DM/Collector of each districts shall monitor such linkages for effective implementation.
- 4.4.119 Infrastructure like Film city with single window clearance and industry friendly policy are needed and may be planned in NCR where in the Media & Entertainment Skill Council (MESCC) arranged skilled manpower in coordination with state/district administration can be provided with better opportunity in the industry.
- 4.4.120 Sub-regional plans should promote '**incubation centers**' by providing infrastructural, management and networking support and encourage 'agri-entrepreneurship' in the NCR.
- 4.4.121 **Skill development courses** for dairy farmers, fish farmers, horticulture, poultry, apiculture, floriculture, agri-entrepreneur, veterinary health assistants, animal health workers, etc. should be organized on a regular basis in each district with the help of respective skill development councils, academic professional institutions, NGOs, etc.
- 4.4.122 Traditional crafts should be encouraged in the villages as part of AtamNirbhar Bharat.

ix) **Circular Economy**

- 4.4.123 All NCR States should come up with Circular Economy schemes/ initiatives especially about Cities & Construction, Food & Agriculture and Mobility & vehicle manufacturing, by 2023. Further, States should develop strategies to achieve circular economy led by reuse-recycle-replenish of materials consumed.
- 4.4.124 Organizations can adopt five distinct models to introduce circular initiatives in their operations: (i) Circular Supply Chain (ii) Recovery & Recycling (iii) Product Life Extension (iv) Sharing platform, and (v) Product as a service. Few highlights of Circular Economy in India are provided at **Annexure-D-4.4**.
- 4.4.125 **Extended Producer Responsibility (EPR)** where producers are given a significant responsibility for the treatment and disposal of post-consumer products should be applied in the NCR at least for e-waste, plastic waste, and bio-medical waste Make EPR nodal coordinators in each district headquarters, and also preferably each ward in town & cities and in each 2000 plus population villages for all companies. EPR coordinator shall work closely with pollution control offices and supervised by District Magistrates. Steps like EPR cess going into escrow account of ULBs to cater to budgetary requirements for waste management and sanitation may be adopted by states as per feasibility..
- 4.4.126 '**Close the Loop-buy Recycled**' buying products made from recycled or recyclable materials to ensure the



continuum of recycling process by creating sustainable markets for goods.

- 4.4.127 Local and district authorities should plan for creating separate collection of construction and demolition (C&D) waste and biodegradable waste from source. Other C&D related policies are as mentioned in the relevant section of waste management.
- 4.4.128 All cities with 50,000 and above population should have **C & D waste recovery facilities**, which can be set up by respective municipalities and RWAs. Such C & D waste recovery facilities should also cater to nearby small towns and villages. Concerned authorities should also encourage large groups with experience to start C & D recovery and recycle facilities and biodegradable wastes separation and processing facilities across all districts of the NCR. All metro and regional centres to have this facility by 2026. Use of recycled C&D waste should be encouraged by states in the SRPs.
- 4.4.129 **Material recovery facilities** should be set-up in each ward of the town and at least one material recovery facilities should preferably be made mandatory for each 2000 plus population villages (2011 census) by 2026. Collection and recycling of used paper shall be given special focus, some details are provided at **Annexure-D-4.4.1**.
- 4.4.130 CPCB has come up with guidelines for managing **end of life vehicles**. It has been made available to manufacturers and recyclers. It is important to set up infrastructure for recycling end of life vehicles as per the guidelines.¹⁰ In this regard, possibilities for setting up infrastructure for recycling can be explored in Nuh areas of Haryana or in Rajasthan sub-region.

x) **Smart and Digital NCR**

Table 4.3: Scientific Research Institutions (SRIs) / R&D Hubs in NCR

- 4.4.131 NCR should aspire to be a leading Global Innovation hub, to enable the country to be amongst the top 50 nations in the Global Innovation Index by 2025-26. At least existing 10 of NCR Scientific Research Institutions (SRIs) may be amongst the top 100 in the world (refer **Table 4.3** and category wise list of SRIs provided at **Annexure-D-4.5**).

S. No	Areas of Research	Total
1.	Agricultural Sciences	10
2.	Biological and Medical Sciences	14
3.	Physical Sciences and Mathematics	05
4.	Earth Sciences	02
5.	Engineering Sciences	04
6.	Multi-disciplinary and Other Areas	05
Total		40

Source: DST list of Indian Institutions.

- 4.4.132 NCR should have an Innovation Synergy Council (ISC) for NCR like Tokyo, to foster close collaboration between academia, business and government.
- 4.4.133 Measures for enhancing technology commercialization by public funded R&D and technology institutions are:
- Value Addition Centres may be set up in each of these institutions for (i) up-scaling technologies, (ii) improving technologies from Technology Readiness Level (TRL) 4 to TRL 6/7, (iii) demonstrating industrial scale pilot production, (iv) coordinating with investors to incubate entrepreneurs, (v) bridging the gap between industry and technology development teams, (vi) enabling formal technology transfer, (vii) enabling commercialization and marketing and (viii) providing technology support during production.
 - National Technology Data Bank should be created in NCR in coordination with all publicly funded R&D institutions. This will provide a central database for technologies that are ready for deployment or under development.
 - Shift focus to development and deployment of socially relevant technologies in areas such as clean drinking

¹⁰ https://mpcb.gov.in/sites/default/files/standing_orders/Guidelines_Handling_Processing_and_Recycling_ELV_26092019_0.pdf



water, sanitation, energy, affordable healthcare, organic farming, etc. These technologies have large potential for commercialization.

- 4.4.134 To realise higher yields at lower cost and ensure and efficient utilization of fertilizers, the Soil Health Card Scheme of Government of India should be adopted by NCR States and soil health cards be issued to farmers accordingly.
- 4.4.135 Embrace Technology by developing and orienting strategies to adapt to and leverage changing digital ecosystem led growth.
- 4.4.136 Four things having impact on business are globalisation, technology, sustainability & scalability. In case of automobile sector, now the electric vehicles are becoming the priority. Study says that India has 22 cars per 1000 people. Compared to BRIC countries, China has 179, Brazil as 360, Russia has more than 300 cars. Changing the fuel from diesel / petrol to electric, about 2000 parts of a normal car would become redundant. Lot of other industries, not related will have to close down. Therefore, alternatives be planned for such industries.
- 4.4.137 The fourth industrial revolution, Industry 4.0 (I4.0) is poised to happen on a global scale, taking the automation of manufacturing processes to a new level by linking the cyber & physical, incorporating AI and enabling customized and flexible mass production technologies. Industry 4.0 enables minimising wasteful processes and actions and optimizing use of energy and other inputs. This is achieved based on capturing data, its analysis and using the analysis to improve functioning of machines, factories and systems. The focus of Indian programme for Industry 4.0 is on using technology to make products for the global markets at competitive rates and to be embrace I4.0 technology with latest technological advancements. NCR should also prepare for this.
- 4.4.138 Implementation Strategies**
- 4.4.138.1 **District wise blue print for economic development** be prepared / mapped for each sub-region based on the local potential and policies of the Regional Plan-2041.
- 4.4.138.2 **Inter-State Coordination Committee (ISCC)** of Principal Secretaries and other stakeholders on the lines of CoTS for coordination of implementation of economic policies and proposals may be constituted at NCRPB level, to promote regional economic development through improved coordination and exchange of expertise and experience on productivity promotion across NCR.
- 4.4.138.3 **Special financial and budgetary allocation for NCR** by all relevant Ministries/ Departments of Govt. of India would be necessary for development of infrastructure in the region to prepare a future ready NCR.
- 4.4.138.4 **Potential of ULBs and PRIs** (local government) should be fully utilised to achieve overall economic development of the region. In this regard, horizontal imbalance among the local bodies in terms of finances and services should be minimised through revenue sharing mechanism covering the overall framework of the city and its neighbouring regions.
- 4.4.138.5 Best practices and innovations of local governments in the region, nation and elsewhere be suitably shared. NCR Local Forum (NCRLF) may be created to involve local (all sections) governments interaction and sharing of experience & expertise on different aspects of economic development. The forum may have Annual Work Plan activities covering meetings, fairs, workshops, seminars, research and capacity building..
- 4.4.139 **Key identified projects** envisaged to be taken up in NCR related to Economic Growth but not limited to, are given in **Appendix - 13.2**.
- 4.4.140 Certain suggested policies related to economic growth and income generation alongwith other policies which could also be elaborated/ detailed out in Sub-Regional Plan and local level plan like Master/ Development Plans, etc., suggested policies for power and energy efficiency, agriculture sector, education and skilling are given in **Annexure-P-4.1, P-4.2, P-4.3 and P-4.4 respectively**.



5. TRANSPORT AND MOBILITY

5.1 EXISTING STATUS

5.1.1 Road Network

- 5.1.1.1 The broad objective for transport sector development would be to provide an adequate, accessible, and affordable Integrated Multi Modal Transport System in NCR to cater for the needs of passengers, goods, and services in an equitable and sustainable manner to make NCR future ready.
- 5.1.1.2 The existing road network in NCR is largely on 'radial' pattern. It comprises of Expressways, National Highways, State Highways, Major District and Other District roads (refer **Figure 5.1** for schematic map of Existing Transport Network).
- 5.1.1.3 Five National Highways (NH-44, NH-48, NH-9 and NE3) converge on Ring Road of Delhi and one Highway (NH-34) meets NE3 at Ghaziabad. In addition, erstwhile NH-703, NH-709, NH-919 and NH-34 also pass through the region. Delhi - Meerut Expressway has been opened for traffic in early 2021.
- 5.1.1.4 Apart from National Highways, state highways also serve in strengthening the regional road network. Other than these highways, MDRs and ODRs also act as important linkages among these highways. Delhi has a major road network of about 2531 kms (NH 69 km) and total network of 17882 km. The sub-region wise road networks with lengths in the NCR (other than Delhi) are presented in **Table 5.1 & Table 5.2**.

Table 5.1: Sub-Region Wise Road Network in NCR (in km)

Category of Roads	Haryana	Uttar Pradesh	Rajasthan
Expressway	182	273	-
National Highway (NH)	961	893	311
State Highway (SH)	3,469	660	1,247
Major District Road (MDR)	893	518	503
Other District Road (ODR)	10,223	31,849	918
Village Roads	1,455	8,020	7,370
Total Roads	17,183	42,213	10,350

Table 5.2: Category wise- Road Density (km.) per 100 sq. km of Area and per 1000 People

Sub Region	Length (kms)	Area (sq. kms)	Road Density (kms) per 100 sq. kms	Population (2011)	Road Length per 1000 people
Haryana	17,183	25,327	67.31	2,10,99,559	0.80
Uttar Pradesh	42,213	14,826	269.51	2,91,92,777	1.37
Rajasthan	10,350	13,447	76.97	95,06,695	1.09
NCR	69,746	53,600	125.66	5,97,99,031	1.13

Source: NCR Monitoring and Planning Cell, Govt. of Haryana, Govt. of Uttar Pradesh, and Govt. of Rajasthan

5.1.2 Railway Network

- 5.1.2.1 The railway network in NCR serves the National capital – New Delhi and operates as a transit point for passengers and freight volumes moving between Punjab, Haryana, Himachal, J&K and Rajasthan on one side and rest of the country on the other. Eight major Radial Railway lines connecting Delhi and the NCR are collectively served by about 180 trains (85 mail/express, 34 passenger and 61 EMUs) between Delhi and the NCR Towns. Schematic map of existing EMU and MEMU network provided in **Figure 5.2**.
- 5.1.2.2 Among the major radials converging in Delhi, the Delhi-Ghaziabad line has the highest number of trains



operating per day (42) whereas Delhi-Hapur has the least number of trains operating in the route per day (2). **Table 5.1.1 of Annexure-D-5.1** gives the stations wise total passenger footfalls on Delhi stations in year 2017-20. With respect to total number of originating commuters, Ghaziabad has the highest number of originating commuters with 40,830 commuters, followed by New Delhi with 37,960 and Delhi Main with 36,960 commuters.

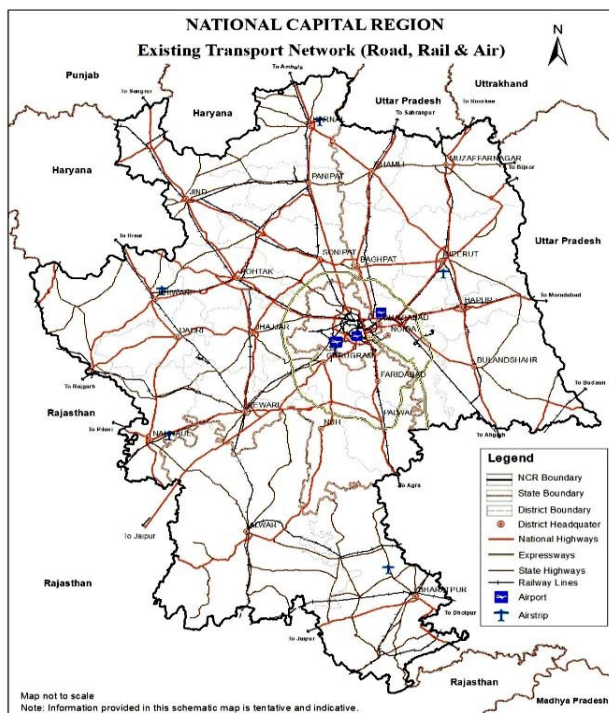


Figure No. 5.1: Existing Transport Network

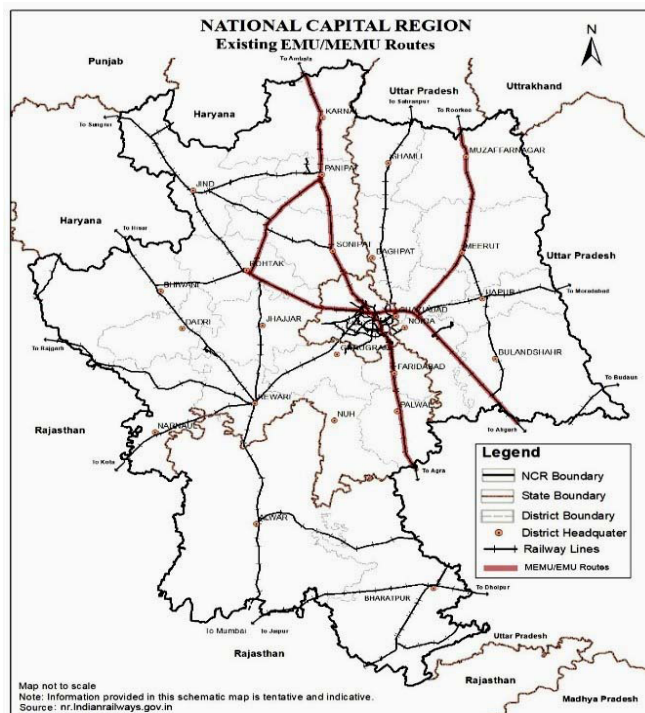


Figure No. 5.2: Existing EMU/MEMU network

5.1.3 Metro Rail System

5.1.3.1 The Delhi Metro is a mass transit metro system. Regional Plan-2021 for NCR had proposed the extension of Delhi Metro Rail System to NCR towns and accordingly was extended from initial Delhi to Noida, Gurugram, Ghaziabad, Faridabad and Greater Noida. A total of 396.89 km of metro rail network exists in NCR of which 291km is in Delhi, 34.2 km in Haryana and 71.6 km in Uttar Pradesh respectively (**Table 5.1.2 of Annexure D-5.1**)

5.1.4 Public Transport System

5.1.4.1 Intercity buses between Delhi and NCR/other states and within NCR are operated by the Delhi Transport Corporation (DTC), Uttar Pradesh RTC (UPSRTC), Haryana Roadways (HR), PEPSU Road Transport Corporation (PRTC), Punjab Roadways (PR), Himachal RTC (HRTC), J&K RTC (JKRTC), Rajasthan State RTC (RSRTC) besides some private bus operators. There are 33 bus terminals and 133 bus depots in NCR (given at **Table 5.1.5 of Annexure D-5.1**).

5.1.5 Regional Rapid Transit System - RRTS

5.1.5.1 The NCRPB's Functional Plan for Transport had recommended setting up of NCR Transport Corporation (NCRTC) on the lines of Mumbai Rail Vikas Corporation (MRVC) for overall development of integrated Multi-Modal Transport System in NCR. The Functional Plan 2032 has identified eight Regional Rapid Transit corridors in NCR and prioritised three corridors are namely Delhi-Meerut, Delhi-Panipat and Delhi-Alwar in Phase -1 which are under construction.

5.1.6 Air Transport:



5.1.6.1 Indira Gandhi International Airport, Delhi is the busiest airport of the country since 2015 and is Gateway to the country. In 2018, it was the 12th busiest airport globally, and 6th busiest airport in Asia. **In 2019-20, total traffic handled was 67.30 million of which international passengers were 17.83 million. The airport handled a cargo of 0.955 million tons. It is expected to handle 100 million passengers per annum and 2 to 2.5 million tonnes of cargo by 2034.**

5.1.7 Existing Travel Pattern

5.1.7.1 As per the NCR Functional Plan study surveys (2007) for Transport, the average daily traffic (ADT) at outer cordons was observed to be about 2,21,575 (3,50,694 PCU).

5.2 KEY ISSUES AND CHALLENGES

- 5.2.1 Due to continuous increase in population, employment opportunities and number of vehicles, there is a constant increase in travel demand in the region but infrastructure has not grown in adequate proportions, making the existing network system function beyond its capacity. This has led to serious traffic problems of congestion, delays, safety, pollution, and system management.
- 5.2.2 Lack of adequate Regional Public Transport and its low frequency, lack of integration of system and multiple interchanges are major issues faced by the commuters in the region. In addition, there are issues pertaining to congestion in the region due to high share of private transport (63%) leading to situations of vanishing off-peak hours, in major towns and cities.
- 5.2.3 Further the integration of IT solutions with public transport system is still to pick pace in city/ towns across region. Attempts have been made to link the bus system and the metro with “common mobility card”, but a lot can still be done in this direction.
- 5.2.4 Bus related infrastructure facilities such as bus terminals, shelters etc. are inadequate and partially /poorly developed in terms of passenger amenities etc. in most of the cases. The inter-modal accessibility such as between railway station and bus stand etc. is lacking except in some cases in Delhi.
- 5.2.5 There is dire need of a comprehensive policy and a designated authority for planning /development / operation / maintenance of bus terminals in the NCR particularly for the Private Operators’ buses.
- 5.2.6 A massive urban agglomeration such as NCR needs buses, metro rail and the forthcoming rapid rail system to be in sync. At present, the multiple modes of public transport often function without adequate coordination.
- 5.2.7 Key challenges that need to be addressed regarding logistics sector in NCR include inadequate & ill designed terminal infrastructure, storage facilities, O&M protocols, regulations on logistics, land, bottleneck, tariff structure, and skilled manpower (refer para B of **Annexure-D-5.1**). Large number of approvals and licenses (non-exhaustive) required for setting up of a Multi Modal Logistics Parks (MMLP), is also challenge for the logistics sector. These include 5 for Rail Operations, 13 for DTA Warehouse (State Government approvals), 13 for ICD Operations and another 13 for HR/Admn./Safety security/fire-fighting/pollution control, etc.
- 5.2.8 There are about 08 existing unserved/ underserved small airports/ airstrips in NCR (Karnal, Bhiwani, Narnaul, Meerut, Alwar & Bharatpur) and in CMAs (Bareilly, Kota & Patiala). The small airports lack basic facilities like that of hangars. Most small airports also do not have adequate night-landing capabilities.
- 5.2.9 It is observed that about 22% population moves in private cars which remain mostly idle and increases the demand for parking areas. Large areas of Delhi, especially roads, are occupied by parking spaces.
- 5.2.10 Influx of Intermediary Public Transport (IPT) like auto rickshaws, e-ricks, cycle rickshaws have added to the congestion on the roads as some of them are non-registered and frequently flout traffic and parking



norms.

- 5.2.11 Optimum utilization of existing and upcoming connectivity through expressways, NHs & SHs and other major roads is yet to be achieved due to lack of adequate interchanges.
- 5.2.12 As per the Reports of MoRTH (2016 and 2018), road safety is a major concern in NCR, with Delhi experiencing 1591 accident deaths in year 2016, which was highest among top 50 Indian cities with million plus population. Over speeding is responsible for 44.3% of the road accident deaths in Delhi.
- 5.2.13 Vehicular Pollution in NCR is also a major concern. As per Ministry of Earth Sciences, Delhi has experienced about 40% increase in vehicular pollution during 2010-2018. Vehicles in the NCR region contribute to 40% to 50% of the pollution. Non-availability of CNG across NCR especially in areas beyond CNCR is another issue.
- 5.2.14 The COVID pandemic has highlighted the issues caused by inter-state blockage/ border checks as part of traffic management at borders by states in NCR.

5.3 POLICIES AND PROPOSALS

A. General Policies and Proposals

- 5.3.1 NCR should move towards creating a smart connected region where people and goods can move smoothly and safely. Efforts should be directed towards easing out traffic congestions and create a more integrated, user-centric, accessible, and affordable transportation system.
- 5.3.2 Further it would be imperative to prioritize transport investments that enhance access to the economic corridors and between Metro / Regional Centres. Necessary steps be taken to strengthen connectivity amongst CMAs, Metro Cities and Regional Centres through Air, Rail, RRTS and NH/ Expressways. All CMAs should connect to RRTS by 2035, based on feasibility.
- 5.3.3 It is necessary to minimize journey times across NCR and make travel times across NCR limits, under 30 minutes by superfast trains and Heli-taxis, within 60 minutes by other trains and two to three hours by car preferably. **Delhi should have 30-minute connectivity through Super fast trains with major cities of NCR .**
- 5.3.4 All missing links needs to be taken up on priority for completion both at intra city, inter- city as well as intra and inter region levels.
- 5.3.5 There is a need to review Taxes imposed on commercial passenger vehicles in NCR States by Transport/ Municipal authorities/ULBs in order to encourage modal shift from private to public mobility.
- 5.3.6 Sub-urban passenger transport should preferably not be developed as a separate system but should get integrated with other transit networks to create a seamlessly connected network of networks, where in all transport systems are seamlessly integrated and complement each other.
- 5.3.7 Delhi needs a more streamlined road management by creation of a local overarching body for its roads wherein this body could have different sub-agencies if needed.
- 5.3.8 Steps shall be taken to prevent closure of interstate borders by States in NCR area, except in emergency situations like crime control etc. Delhi has 9 major locations contributing to 75% of total entry traffic. These entry points should be kept congestion free all the year around for a seamless NCR. Public and Commercial vehicle movements have to be seamless across State borders.

B. Road Network Proposals

- 5.3.9 The road network hierarchy of the NCR should follow the Reticular Grid pattern with the Ring and Radial pattern for rail-road connectivity with strong connect from NCT Delhi to Metro cities and further connect from metro cities to sub- regional level cities. This reticular netowrk is necessary to prevent over



congestion/unnecessary congestion at the centre in a radial network.

- 5.3.10 In addition to Eastern & Western Peripheral Expressway [i.e. Circular Regional Expressway No.1 (CRE-I)], two more regional Expressways be developed as “Growth Corridors and Opportunity Area”, (refer **Figure No. 5.3**) for balanced development of NCR based on feasibility as follows:
- Circular Regional Expressways No.2 (CRE-II) - connecting Panipat-Shamli-Meerut-Jewar-Nuh-Bhiwadi-Rewari-Jhajjar-Rohtak-Panipat
 - Circular Regional Expressways No.3 (CRE-III) - connecting Karnal- Muzaffarnagar –Gharmukhestwar – Naraura – Aligarh – Mathura – Deeg – Alwar – Mahendragarh – Charkhi Dadari -Bhiwani-Jind-Kaithal-Karnal.
- 5.3.11 Have extensive Bypass system around all urban and large settlements above 50,000 minimum populations (as per Census 2011) in NCR. This should be done for all 01 lakh plus population cities by 2026 on priority. Areas along such bypasses be notified as controlled/regulated areas to avoid adhoc/haphazard development.
- 5.3.12 Up-gradation of NH falling in NCR be carried out by the MoRTH or as part of NHDP or other programmes, as per schedule and requests of respective State requirements be taken up on priority.
- 5.3.13 The implementation of following should be expedited:
- Delhi-Meerut Expressway be made fully operational by 2022.
 - Delhi-Mumbai Expressway (a green-field highway) project under Bharatmala Pariyojana connecting Delhi-Vadodara via Sohna, Alwar, Dausa, Sawaimadhopur, Bundi, Kota, Ratlam be made fully operational preferably by 2025.
 - New Ganga Expressway connecting Meerut with Prayagraj be completed preferably by 2025.
 - Delhi-Amritsar-Katra Expressway
 - Six-lane Trans-Haryana Highway (From Ambala to Kotnautli (Pai))
- 5.3.14 States to take necessary initiatives to construct missing road links (both Inter and Intra-State) on priority to ensure radial and reticular road network in NCR, based on necessary investigation (refer **Figure 5.4**).
- 5.3.15 Based on appropriate feasibility criteria, an Elevated or at grade Outer Ring Road (EORR) parallel to outer ring road in Delhi with suitable slip roads for entries and exits as required is proposed. Schematic map of tentative alignments of EORR is given at **Figure 5.3**.
- 5.3.16 Elevated road from Chilla border to Mahamaya Flyover and Ghaziabad elevated Road may be considered to include in elevated ring for comprehensive development of CNCR area. This shall be based on feasibility studies followed by DPRs.
- 5.3.17 For better connectivity of CNCR area, the EORR should have spurs to major economic hubs like Jewar & Hisar Airports, etc. In addition, based on feasibility, possibility of an elevated ring road beyond NCT Delhi may also be explored.
- 5.3.18 Service lanes be mandatorily provided along all NH, SH and Expressways, etc. for Non-Motorised Transport (NMTs), all non-four wheelers, etc. by 2026. Vehicles accident Recovery lanes shall also be provided in 2 years on all NHs/ Expressways and in 05 years on all SHs, across the region.

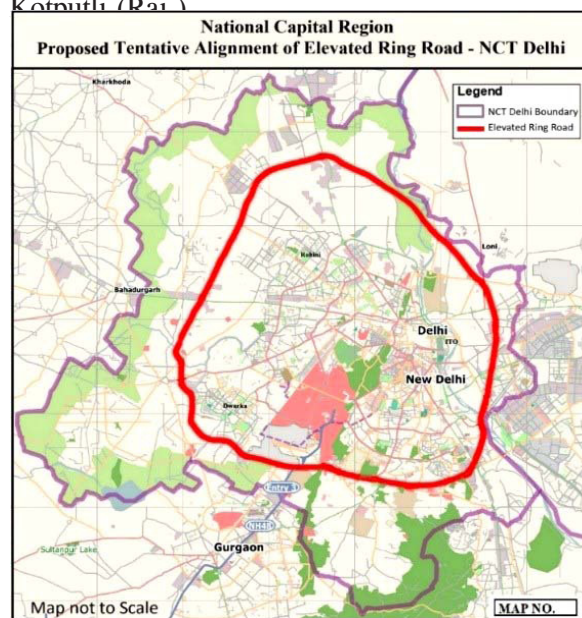


Figure 5.3: Tentative alignments of Elevated Outer Ring Road (EORR)



- 5.3.19 Have **Trauma Centre** on each NH/ SH/ Expressway, set up at an interval of not more about 50-60 km or within travel time of 1 hour (Golden Hour) with all the facilities including Blood Bank. Areas around fuel stations at an interval of 20-40 km stretch could also be utilized to develop the trauma centres. Efforts should also be made to locate Trauma Care Centres preferably with helipad for air ambulance facilities within close proximity of **Highway Facility Centres (HFCs)**.
- 5.3.20 All Expressways should have Helipad/ airstrip at every about 100 km stretch for availing Heli/ Air ambulance service for emergency evacuation.
- 5.3.21 To enhance connectivity, linking a loop of villages by a ring road/ highways having about 15km radius with frequent bus services, thus integrating population of all connected village into one market, may be thought of, to support local market clusters. This can be helpful for **polycentric development** by forming new markets and nuclei of future cities. This can be linked with Integrated Cluster Action Plans (ICAP) in NCR.
- 5.3.22 Optimum utilisation of existing road transport investments by inclusion of suitable interchanges at each intersection/crossing of Expressways with other expressways and NH/SH and vice-versa should be provided at priority as feasible in a time bound manner.
- 5.3.23 **Roads in NCR should be smart and user friendly.** Road illumination should be done through energy efficient source like LED, solar lighting, etc.
- 5.3.24 Access control is required to be provided at important road intersections enabled with full or partial grade separated interchanges. Detail interchanges be identified at Sub-regional and local level and implemented on priority by 2026, in phases as per **Table 5.3**. An indicative list of interchanges identified for Functional Plan on Transport for NCR-2032 is placed at **Annexure-D-5.1**.

Table 5.3: Proposed phases for the development of Interchanges

1	Between Expressway & Expressway	Full Interchange	By 2023
2	Between Expressway & Regional Arterial–(National Highways)	Full or Partial Interchange	By 2024
3	Between Regional Arterial & Regional Arterial	Partial Interchange	By 2025
4	Regional Arterial & Regional Collector (State Highway)	Partial Interchange	BY 2025
5	Between Regional Collector & Regional Collector	At Grade (with proper signal free design)	By 2026

C. Bicycles and Pedestrian Facilities

- 5.3.25 Spatial sizes/spread of all new city/urban settlements be decided based on having “15- minute city” (like Paris) concept wherein all essential services and daily needs items as required by the citizens is available within a 15-minutes radius on foot/ bike or Non-Motorised Transport (NMT).
- 5.3.26 **Unhindered** cycle riding infrastructure should be implemented by each NCR State as a part of sustainable transport system focusing on cycle tracks, its continuity at intersections, etc. in all major urban areas across NCR.
- 5.3.27 Streets should be "disabled friendly" across NCR. This should be done on priority in all Metro and Regional Centres.

D. Rail Network Proposals

- 5.3.28 Need to develop a high-capacity, high-speed, high-frequency transit network in the region Explore feasibility of a “**30 minute fast high quality limited stop mass transit rail system**” from nearest NCR boundaries to Delhi. All RRTS tracks should be “**Fast Track**”. Further possibilities be explored to utilise **Fast Track RRTS lines** for ‘**Bullet Trains**’ thus enabling the “**30 Minutes NCR**”.
- 5.3.29 Three priority Regional Rapid Rail Transit System (RRTS) corridors i.e. Delhi-Meerut; Delhi-Panipat; and Delhi-Rewari-Alwar be executed in a time bound manner in the first phase. The work of Delhi-Meerut



corridor be completed by 2023 and work on remaining two corridors should be expedited. On remaining 05 RRTS corridors i.e., Delhi-Shahdara-Baraut; Delhi – Hapur; Delhi – Khurja; Delhi–Ballabgarh–Palwal; and Delhi – Rohtak work should also be undertaken in a time bound manner.

5.3.30 Indian railways may explore the possibilities to operate commuter rail service to connect with metro centres, regional centres and CMAs by 2031.

5.3.31 Network of 03 “**Orbital Rail Corridor (ORC)**” is proposed to be developed based on feasibility as per following tentative alignments:

- a) **ORC-I:** Haryana developing ORC by 2025 connecting Palwal-Sonipat. Uttar Pradesh should take necessary action to develop ORC connecting Palwal-Khurja-Meerut-Bagapat-Sonipat, to complete the Orbit/ Circle. This be made fully operational by 2028.
- b) **ORC-II:** As “**Regional Orbital Rail Corridor (RORC)**” connecting Panipat- Shamli- Meerut- Jewar- Nuh- Bhiwadi- Rewari- Jhajjar- Rohtak- Panipat (along CRE-II) to enable fast regional movement of passenger and goods avoiding CNCR area.
- c) **ORC-III:** As “**Outer Orbital Rail Corridor (OORC)**” along CRE-III, by 2041. Ministry of Railways may consider following 04 missing links for conducting feasibility studies in this regard:
 - i) Karnal – Jind - Bhiwani - Mahendergarh - Narnaul - Behror - Alwar
 - ii) Alwar - Deeg - Kurja (may be via Mathura)
 - iii) Khurja - Garhmukhteshwar –Hastinapur- Muzaffarnagar - Karnal

5.3.32 Expedite electrification and broad gauging of Alwar to Bandikui line (serving Alwar District); Rewari to Loharu (serving Mahederharh District) and Alwar to Deeg line (be double guaged).

5.3.33 All railway lines in NCR should be 4 tracks by 2030 and 06 tracks by 2040, 100% electrified, broad gauge and of high speed, with latest safety systems, Train Autonomous Circumambulation System (TACS), Centralised Traffic Control (CTC), etc. Delhi – Hastinapur will be directly connected in case Meerut – Bijnaur line is taken up on priority.

5.3.34 Steps be taken to ensure that the Dedicated Freight Corridors (DFC) especially NCR portions of Delhi Mumbai Industrial Corridor (DMIC) are completed on scheduled time and fully commissioned by 2032 and feeder routes to DFC be completed simultaneously in NCR. DMIC corridors including the link from Gurugaon–Manesar -Rewari, Dharuhera and Bawal, be implemented on priority.

5.3.35 All level crossings including cattle crossings should be eliminated in the region through developing ROB/ under pass and fenced railway tracks in areas with high level of activity, to prevent accidents.

5.3.36 Overall initiatives should be in the direction of development of inter-city railway lines, particularly high-speed railway lines.

5.3.37 The implementation High Speed Rail (HSR)/ Bullet Train corridors passing through NCR i.e. Delhi-Agra-Lucknow-Varanasi; Delhi-Chandigarh-Amritsar and Delhi-Jaipur-Ahmedabad (4 stations namely, Dwarka, IMT Manesar, Rewari and Behror falling in NCR) should be expedited. Further, possibilities should be explored for having HSR connectivity between Delhi to major Metros & Regional Centres and CMAs to NCR.

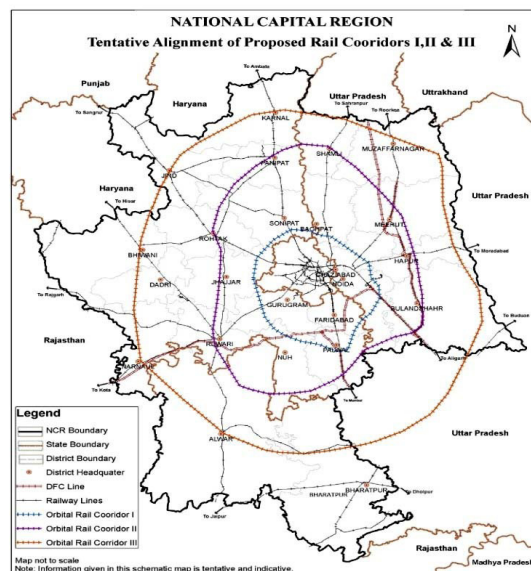


Figure 5.4: Tentative alignments of Orbital Rail Corridors (ORCs)



- 5.3.38 Revival of existing Ring Rail infrastructure in Delhi be done by resolving ingress /outgress issues and bottlenecks. It can also be used for cargo.
- 5.3.39 Explore possibilities of increasing the speed¹¹ of Metro rail in NCR from existing average speed of 32 - 35 km/hr to about 50 Km/ hr by 2022 and further up to 70 Km/ hr by 2025. Possibility may be explored by options of skipping stations, or may be at certain period of day, amongst stations with major footfall specifying the limited stoppages. National rail plan also mentions high speed rail connectivity to major cities; Delhi and other major Metros and Regional centres of NCR should have high speed rail connectivity on existing tracks by above steps or by converting existing alignments to high speed by addition of new set of tracks alongside or by building entirely new sets of high speed rail corridors for NCR and Delhi. City to city connections shall preferably be high speed for all new trains with intracity connectivity to slower metro systems.
- 5.3.40 Metro Rail Corporations should undertake following corridors for development by 2030 i) Sonipat-Panipat, ii) Ghaziabad-Meerut, iii) Faridabad-Palwal-Jewar (TIA), iv) Faridabad-Gurugram, v) Bahadurgarh-Rohtak, vi) Gurugram-Manesar-Rewari.
- 5.3.41 All metro extensions etc. shall be based on feasibility studies followed by DPRs.
- 5.3.42 Efforts be made to develop a separate suburban passenger transport from the rest of the network and put a light rail transit system, metro lite, rubber-tyred Metro rail, Monorail, Neo Metro etc. in place in all major urban areas under local governments across NCR.¹² Possibilities may also be explored to have Hyper Loop and Pods facilities in NCR towns for quick movement between city and its airport /rail stations, etc.
- 5.3.43 Railway junction/ station planning should be done considering aspects like cleanliness, public amenities, safety, convenience, self-sustaining, TOD, etc.
- 5.3.44 Tier-II cities (as per MoHUA classification) should explore possibilities to get supported by MoHUA funds for Metro Lite (30-40% of cost of Metro) and Metro Neo (20-25% of cost of Metro).
- 5.3.45 The Metros and RRTS (existing /proposed) should connect with the proposed ORCs to make reticular grids. The navigation on these routes should be easy and user friendly.
- 5.3.46 Utilisation of spare/idle time and off-peak capacities of Metros, RRTS, EMUs, etc. for cargo movement can be explored gainfully in NCR, like airlines sector.

E. Air Connectivity Proposals

- 5.3.47 Like other global Metropolitan regions more airports be developed in and around Delhi/ CNCR to expand capacity of Airport Network. Possibilities be explored to have one Airport in Karnal or Panipat and Meerut or Muzaffarnagar.
- 5.3.48 Development of “**International Airport at Jewar**” and a large “**Aviation Hub at Hisar**” (CMA) be taken on priority and alongside constrained infrastructure at Delhi airport be expanded. With this NCR will have the potential to become the air transit hub for South Asia.
- 5.3.49 The six-existing unserved/ small airports/ airstrips in NCR namely, Karnal, Bhiwani, Narnaul, Meerut, Alwar & Baratapur and three in CMAs namely Bareilly, Kota and Patiala should be developed by 2025 and made fully operational. Private players could be incentivized to develop these airports and airstrips. The existing and proposed Air network for NCR is provided in **Figure 5.5**.
- 5.3.50 Connect all existing and future airports with various mass transit systems rail, RRTS, High Speed Rail

¹¹ Gatimaan Express is Indian Railways' fastest train, attaining speeds of 160 kmph between Delhi and Agra. Vande Bharat Express, a world-class engine-less train has the potential to hit 180 kmph, but the maximum operational speed on its routes is 130 kmph. Besides, the speed on Delhi Mumbai and Delhi Howrah routes is also planned to be raised to 160kmph by 2022-23. Passenger trains have also got approvals to raise 60% increase in average speed.

¹² Based on NITI Aayog Strategy for New India @ 75



(HSR) and metro rail stations and bus terminals to enhance the accessibility.

- 5.3.51 Ensure good connectivity between district headquarters, towns, tourism destinations and airports/ airstrips/ helipads. There should be operational air strips in each NCR district. Facilities in airports/ airstrips be provided as per the Ministry of Civil Aviation norms.
- 5.3.52 Support Infrastructure could be created via Govt. initiatives, while connectivity services could be left to private players. As per National Civil Aviation Policy¹³ (NCAP) 2016, Helicopters are free to fly from point to point without prior ATC clearance in airspace below 5000 feet. Accordingly, on-demand helicopter services be considered and integrated in City & State Transport Services (e.g., Voom, Uber Copter and Blade etc.). Heli taxi service be provided at each district headquarters & tourist destinations to promote tourism.
- 5.3.53 All-important high-rise buildings may explore possibilities of having helipads after due permissions¹⁴.
- 5.3.54 “UAV/ Drone, helipads and UAV launch/ parking areas” be established at all District headquarters by 2026 to meet requirements of future air policing, e-commerce, aerial surveys, etc.
- 5.3.55 “At least one Water Aerodromes” (refer Figure 5.5) in each of the sub-region be established to provide integrated air –water transport infrastructure by 2030. Design requirements of Water Aerodromes are given at **Annexure-D-5.1.1** for reference. NCRPB shall consider a study as part of Functional Plan on Transport with regard to ‘Water Aerodromes’.
- 5.3.56 Promote air cargo growth by also adopting “Fly-from-NCR” concept through creation of trans-shipment hubs in the region.

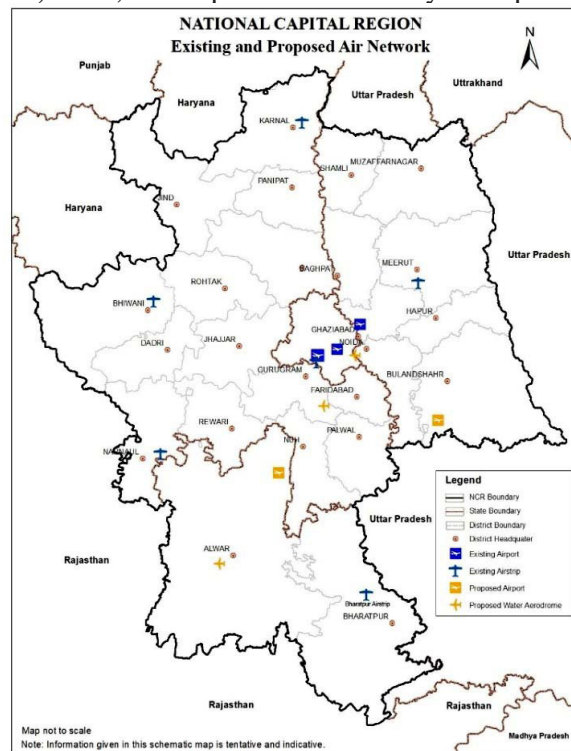


Figure 5.5: Existing and Proposed Air network

- 5.3.57 All district and divisional headquarters should have direct and efficient airport connectivity and preferably also have separate **facilities for Chartered Planes**.
- 5.3.58 All Multispecialty Hospitals, Trauma Centres and Multi-level parking facilities across NCR be encouraged to be equipped with on-site helipads for **24 hours Air Ambulance Medical Emergency Services** and disaster management point of view.

F. Inland Waterways Proposals

- 5.3.59 Implementation of passenger and cargo ferry service on Inland National Waterway (NW)-110 (Yamuna River) should be expedited and made fully operational by preferably 2025. Possibilities of ferry service in the river Yamuna between Wazirabad and Sonia Vihar may be looked in to and project be implemented suitably.
- 5.3.60 Possibilities be explored to develop passenger and bulk cargo (especially of non-perishables) ferry service on major canal network in NCR like Agra Canal, Upper Ganga Canal, Western Yamuna Canal, etc. Need to maintain minimum water levels in Rivers and Canals of NCR to enable round the year boating and

¹³ https://www.civilaviation.gov.in/sites/default/files/Final_NCAP_2016_15-06-2016-2_1.pdf

¹⁴ Tokyo has 80 buildings having roof top helipads, while Seoul has 77, Busan-South Korea has 50, Osaka has 43 and Los Angeles has 41 buildings with roof top helipads.



navigation and its potential further use.

- 5.3.61 NCR States should jointly develop networks of greens and blues (waterways) in NCR like of Singapore and Shanghai. States may identify water transport crossover points across Yamuna and develop road linkages to existing networks.

G. Intra urban public transport system

- 5.3.62 Cities with population more than 05 lakh may be provided with appropriate mix of integrated transport system. The proposed MRTS network at intra urban level should integrate with regional level network for seamless interchange.
- 5.3.63 Shared mobility provided by Cab aggregators, shared auto/cycles and electric cycles along with feeder buses/minibuses for first-last mile connectivity and improving accessibility should be promoted.
- 5.3.64 Last mile connectivity should be a mandatory provision for considering completion of major transport projects in NCR.
- 5.3.65 Phase-I of Mobility-as-a-Service (MaaS) can be introduced in NCR by integrating all the data of various modes operating and proposed to operate in the region for seamless travel.
- 5.3.66 Metropolitan Passenger Terminals (MPT) as were also proposed in Master Plan of Delhi-2021 be developed on priority, incorporating the requisite elements of a MPT. The locations include Anand Vihar; Bijwasan; Holumbi Kalan ; Tikri Kalan; Hazrat Nizamuddin, and Kashmere Gate.
- 5.3.67 Need to ensure that all city fleets (bus, minibus, waste collection and other cars and trucks) ply on and utilize green energy/fuel sources, across NCR as per availability.

H. Multi-Modal Integration

- 5.3.68 Multimodal Integrated Transit Interchanges should be developed covering Rail (Trains, RRTS, MRTS, etc.), Road (Bus/ IPT/ NMT), Air (Aeroplane/Helicopters), Water (Speed boats/ Streamers, etc.). Initially, 60 stations / interchanges are identified by the DMRC & RRTS (refer list presented at Table 5.1.6 of **Annexure-D-5.1**) and more such areas should be identified for improving multi-modal integration in the region.
- 5.3.69 All points where overlapping of road/rail/metro/RRTS/ Air network, etc. exists should be developed in an integrated manner, on priority, to enable seamless movement of traffic and transfer of passengers and goods.
- 5.3.70 Potential station areas like Sarai Kale Khan and Anand Vihar with bus, rail and RRTS interchange should be developed as major transport hubs and similar hubs be developed in all Metro and Regional Centers and CMAs.
- 5.3.71 All interstate/ intra-region and all City level Bus Terminals should be developed and modernized with a state of art amenities and facilities, by 2025. An indicative list of amenities and facilities is given at **Annexure-P-5.1**.

I. Warehouse and Logistics facilities

- 5.3.72 NCR can become a South Asian logistics hub due to the location when coupled with other right policies.
- 5.3.73 Areas for logistics zones be identified with suggested land use etc. in the Sub-Regional Plans and local level Plans.
- 5.3.74 Vehicle Tracking be made mandatory for all cargo/ commercial vehicles entering and moving in NCR.
- 5.3.75 In line with the objectives of National Logistics Policy, NCR States should work to (i) Reduce Cost of logistics to 10% from 13-14% of GDP, (ii) Help the country to Improve India's rank in Logistics



Performance Index (LPI) to <30, (iii) Contribute to Logistics employment and help in achieving the Country target of Creating additional 10-15 Million jobs, (iv) Facilitate Single point for all logistics data in the NCR coordinated with rest of country, and (v) Strengthen Warehousing industry and improve Cold Chain efficiency, reduce agri-losses to <5%.

- 5.3.76 The logistic parks in rural CNCR are proposed to be developed between Ist & IInd ORCs/ Expressways which will serve NCT Delhi and investments zones proposed to be developed in rest of the NCR. Suggestive Logistic areas be earmarked around CRE-I, II & III ORC-I, II & III (refer Figure 5.6 & 5.7), around IGI, Jewar, Hisar, all the airports and appropriate places between Industrial areas and ICDs etc.

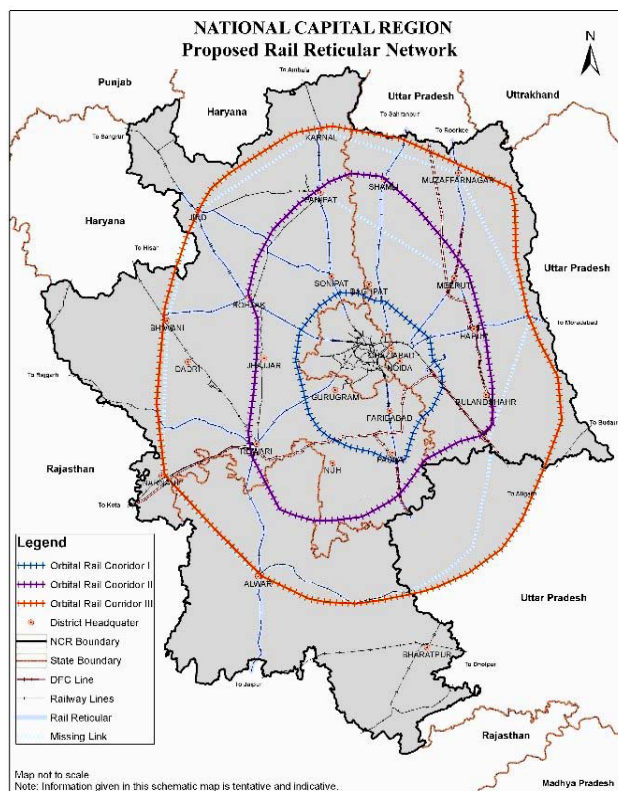


Figure 5.6: Proposed Reticular Rail Network

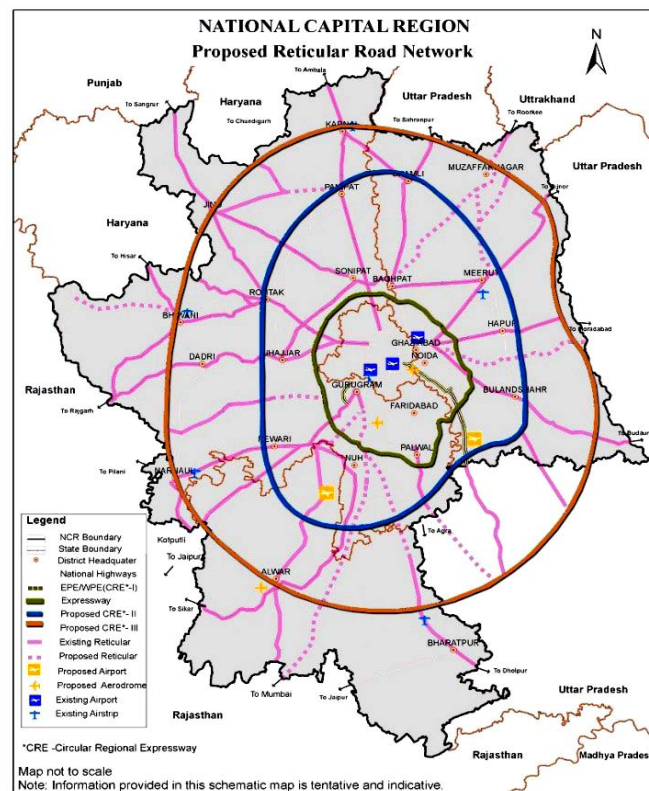


Figure 5.7: Proposed Reticular Road Network

- 5.3.77 For development of warehousing and logistics infrastructure the following should be developed on priority:

- Increase coverage & quality of roads/ to enhance connectivity & internal & external trade. EPE & WPE be used as growth corridor synchronising CNCR with rest of NCR.
- By 2025, NCR should have a rail network that is not only efficient, reliable and safe, but is also cost-effective and accessible, both with respect to the movement of people and goods. Augment the capacity of existing railway infrastructure. All tracks in NCR should be made high speed. Further, develop networks of mass rapid transport system like extension of Delhi Metro to other towns, RRTS and Orbital Rail.
- Enhance availability and affordability of International & Regional air connectivity. More transshipment hubs should be created in NCR e.g. at CMAs like Hisar and Jaipur. Improve flight connectivity to tourist destinations Cities and towns across NCR should be well connected with larger cities like Delhi, Mumbai, Kolkata, Bangalore, Ahmedabad & Chennai and such cities should be converted into efficient and seamless transit hubs.
- Develop Inland Water Transport (IWT), water sports and water related tourism by Rejuvenating Yamuna, other natural channels & water bodies across NCR.
- Physical digital connectivity across all districts, cities/ towns and Gram Panchayats (GPs) across NCR



should be ensured through OFC/ WiFi connectivity by 2025 with delivery of government services digitally preferably by 2022-23. More details regarding digital Infrastructure are provided in Chapter on Smart & Digital NCR.

J. Integrated Freight Complexes (IFC)

- 5.3.78 All Metro Centres, Regional Centres, Sub-regional centres, and urban areas with 1 lakh & above population should have Integrated Freight Complexes at the urban peripheries to serve heavy goods traffic, to be integrated with road and rail systems within and outside NCR. IFCs shall be taken up on priority and completed by 2026 in the NCR towns of Sonapat, Palwal, Bahadurgarh, Jhajjar, Gurugram, Jind, Karnal, Bhiwani, Mahendragarh, Bulandshahr, Baghpat, Ghaziabad, Muzzaffarnagar, Alwar, Behror and Shahjahanpur or Neemrana.
- 5.3.79 Five IFCs namely Madanpur Khadar, Ghazipur, Narela, Dwarka and New site in Urban Extension (Rohtak Road) Tikri Kalan, located on various highways and were also proposed in MPD-2021 for integration of goods movement by road and rail in Delhi, need to be implemented expeditiously.
- 5.3.80 Plans where these provisions are not kept need to be reviewed and revised to provide land for IFCs and integrating them with intra-urban transport network system.

K. Support Infrastructure for Transport System

- 5.3.81 **Highway Facility Centres (HFC)** need be planned and developed on a comprehensive basis. This would include parking, fuelling, pollution check points, servicing and repairs, restaurants, medical, police, godown, Weighbridge, entertainment, banking (ATMs), and a host of other needed services.
- 5.3.82 HFCs should be developed along the Expressways and Highways, spread over an area of about 2 to 5 ha. with a spacing of 50-60 km. These can also be developed on PPP basis. Efforts should also be made to locate Trauma Care Centres preferably with helipad for air ambulance facilities within close proximity of HFCs.
- 5.3.83 For encouraging “**Electric Vehicles**”, along with adequate trunk e-vehicles charging infrastructure (passenger/cars, interstate e-buses, etc.), in a grid of 3-by-3 km. at least one public charging station be set up in urban areas across NCR. **For highways, at least one fast charging station should be planned and set up for every 100 km.** A network of charging stations is required in NCR which should be set up as per CEA suggestion in Report of the Committee on “Technical Aspects on Charging Infrastructure for EVs”¹⁵ and the guidelines and standards issued by the Government from time to time. NCR States may take initiatives similar to ‘EV policy’ formulated by NCT Delhi and NCR should aim to achieve 25% EV target by 2024.
- 5.3.84 **Vehicular pollution** must be checked effectively with more fitness tests and pollution tests at highways and stiff e-penalties be levied.
- 5.3.85 Energy Efficient fuels like hydrogen cells, ethanol, etc. should be encouraged and possibilities of having **Green Hydrogen Refueling Stations** in major cities of NCR be explored.
- 5.3.86 For details MoHUA report of the Sub-Committee on Urban Transport, National Mission on Sustainable Habitat (NMSH) can be referred for strengthening public transport.

L. ICT and Smart Mobility

- 5.3.87 Bus Terminals and Rail Terminals, enabling integration and smooth transfer in terms of fare, physical, operational amongst modes and agencies using Intelligent Transport System (ITS) should be undertaken on priority by the NCR States.
- 5.3.88 Integrated Smart Mobility and Transport System should be necessarily created for sustainable future of

¹⁵ Source: http://www.cea.nic.in/reports/others/planning/rpm/ev_cea_report.pdf



NCR.

- 5.3.89 National Common Mobility Card Ecosystem be implemented and promoted on priority.
- 5.3.90 Efforts should be made to expand ITS devices and traffic management capabilities to support weather responsive traffic management strategies. Further Advanced Traffic Management System (ATMS) should be adopted for managing traffic.
- 5.3.91 An integrated Mobility Options App should be created for the entire NCR so as to provide all available options across various modes for a given origin and destination. All routes of metros, buses etc. should be digitized and software should support a wide variety of services.

M. Road Safety

- 5.3.92 Speed limits should be enforced across NCR, as per IRC norms applicable to the hierarchy of respective roads to prevent accidents and improve road safety in the region. Speed Governors should be mandatory and be strictly enforced.
- 5.3.93 Adopt an integrated approach to road safety through improvements in vehicle technology with complementary intelligent transport systems, better road design and maintenance, improved drivers training, (including modern cargo driving) and enforcement of traffic regulations.
- 5.3.94 States should move towards achieving **Zero Road Deaths in NCR** targets, by strengthening various aspects such as sufficient driver training schools, mandatory installation and monitoring of speed governors, efficient road/intersection designs, street furniture, street lighting, zero unmanned crossings, regular safety audits of railway lines, strict check on overloading, efficient traffic management plan implementation during project execution etc. In this regard, brief note on is placed in **Annexure-D-5.1.3**.
- 5.3.95 Studies in Delhi NCR have indicated that 58% parents fear road safety as the greatest risk to their children when going to school, especially considering that about 70% of the students walk to school. Therefore, safety of school children should be considered by all NCR participating States and necessary actions should be taken on priority.
- 5.3.96 All districts must have modern driver training facilities/ driving schools having at least one simulator based training school (with cargo driving focus), to facilitate qualified drivers on NCR roads. Driving schools Land may be earmarked (about 2-3 ha.) in the Sub-Regional Plans. Private investment may also be considered for expeditious establishment and management of these driver training facilities.
- 5.3.97 Linkage of accident history with costs of vehicle insurance and cancellation of licenses, use of ITS, better road design, accident enquiry system, conversion of accident flash points on highways into access control stretches, and a NCR level pan-subregion accident hand holding e-platform using convergence of all 112 services with ambulances etc and serviced by Delhi police including all stakeholders is proposed.
- 5.3.98 A pan NCR **Blood Bank Portal** and SOPs for fast creation of Green Corridors in NCR for critical patients are also envisaged, in order to utilize critical travel time of 1 hour (Golden Hour).
- 5.3.99 Each sub-region should prioritize safety over speed by adopting low urban speed-limits, pedestrian zones and barriers to separate cars from bikes as some of the key measures. Like Sweden, methods such as speed limit of 30 km/hour, (built 1,500 km of) “2+1” roads where each lane of traffic takes turns to use a middle lane for overtaking, built safer crossings along with strict policing, etc. can be adopted to saved lives.
- 5.3.100 In Finland, Sweden, Norway and Switzerland, the amount of the fine is decided on the basis of the net income of the offender and children as well (Finland). Paris has announced a maximum speed limit of 30 km/hour on all city streets. Careless driving can be fined up to UK £100 and points are added to the licence number. Further in few cases, department of transport restricts motorists to a speed of 15 mph, a fine of UK £100, and three penalty points for overtaking cyclists. Such measures can be adopted by the NCR sub-



regions.

- 5.3.101 Have NCR wide **Accident Response Facilitation Centre** housed perhaps in Delhi Police for reducing fatalities from accidents.

N. Institutional arrangement

- 5.3.102 Regulatory systems for logistics in NCR should be simplified & all approvals for various modes and categories of transport projects be accessible through “**Online-Platform**” on a time-bound deemed approval basis, unless rejected for recorded reasons in time.
- 5.3.103 Multiplicity of authorities for transport sector in NCR be managed by creation of an umbrella Transport Coordinating Body for NCR which should be empowered to examine, monitor, facilitate approvals and execution of all sectors of transport projects including road, rail, water, air etc.
- 5.3.104 **Transport Policy and Planning Group (TPPG)** be established to function specifically at the Sub-regional level to plan and coordinate with agencies at the State level through existing Committee of Transport Secretaries (CoTS) housed within NCRPB.
- 5.3.105 All road & rail alignments of NCR should be finalized by CoTS (Committee of Transport Secretaries).
- 5.3.106 **Coordinating Agency for NCR**, having long-term goal of planning and development of coordinated network of transport services of all modes (road/ rail/air/water), be constituted with representatives from various Transport Authorities. NCRTC may take this role under collaboration with CoTS.
- 5.3.107 Idle time of each cargo vehicle be monitored by a Central Agency in MoRTH or E-Logistics Desk of Commerce Ministry or by a special body for NCR for coordination of all transport modes in NCR. Such body can also create a **NCR Logistics Cell**.
- 5.3.108 SPV formation could be explored for implementation and integration of NCR’s rail infrastructure with National Rail Plan.

O. Transit Oriented Development (TOD)

- 5.3.109 Possibilities be explored for promoting commercial/property developments at all stations allowing high-rises and supporting transport systems in their efforts for being self-reliant in terms of financing.
- 5.3.110 “**TOD and Value Capture**” mechanisms along/ around transit routes and interchanges both at urban and regional level should be adopted. Land value capture can be done through enhanced or additional land value tax or one time betterment levy, development charges or impact fee, transfer of development rights (TDRs), or other such mechanisms which have been adopted in various States across the country. It is proposed that TOD policy provisions be elaborated, and major TOD areas be identified in each Sub-Regional Plan.
- 5.3.111 To discourage the use of private vehicles and to manage parking in TOD, it is essential that the supply of parking is reduced and made expensive within the influence zone of TOD.
- 5.3.112 Promote planned development along the Growth Corridors namely, CREs (I, II, & III), RRTS corridors, ORCs (I, II & III), highways, etc.
- 5.3.113 The provision of increased FAR may also be considered at future metro stations to improve non fare box revenue. Similarly, these benefits should also be applicable to the plots at metro station or in the vicinity of metro station for commercial development.

P. Parking

- 5.3.114 To restrict unauthorized parking & avoid congestion caused due to on-street parking, strict enforcement mechanism should be followed. NCR cities should have a parking policy with heavy penalty for unregulated parking.
- 5.3.115 Parking should have price variations according to time of day and duration of parking.



- 5.3.116 Multi-level parking complexes preferably with modern mechanized parking systems should be a mandatory requirement in city centres that have high rise commercial complexes and be given priority.
- 5.3.117 Designated parking spaces be developed in periphery of Delhi near entry/exit points, for mandatory overnight parking of Commercial vehicles, Public Transport vehicles including Buses, Cabs etc. instead of their overnight parking inside Delhi, which itself should be avoided. Other districts may monitor the availability and promote the adequate supply of overnight truck parking, outside urban limits.
- 5.3.118 Encourage car pooling to reduce the number of cars in circulation in the region. Permission to buy /have new cars be only given when the owner ensures availability of parking space and gradually should work towards reducing ownership and use of personal vehicles.
- 5.3.119 Entry/ Exist points of all Metro and Regional Centers be kept congestion free 24x7.

Q. Other Aspects

- 5.3.120 MMLP and IFCs with time bound online simplified approval process are proposed in all one lakh plus population cities (2011 Census) on peripheries to unlock the logistics potential of NCR.
- 5.3.121 Possibilities should be explored regarding formulating and implementing Transportation Demand Management (TDM) practices like home - based working facilities, flexible working hours, and flexible working opportunities that reduce transport demand, and ensuring more balanced distribution of traffic throughout the day.
- 5.3.122 To reduce the need of long commutes and to bring people closer to their jobs - a growth model based on the public transportation system, through “**Structuring Axis of Urban Transformation**”, be attempted in new areas being developed.
- 5.3.123 Construction of the roads should preferably start from outer edges towards inside, to safeguard the right of ways and also avoid encroachments. Spaces be earmarked for underground common ducts/utility trenches along the roads, with space for future increase in utility needs. For the upcoming developments only multi-utility trenches/ducts should be laid in all 1 lakh plus population towns. Storm water trenches along with permeable spaces along roads to capture surface runoff, be ensured.
- 5.3.124 Govt. of India has taken various initiatives with regard to road, rail and aviation sectors to transform the Transport and Mobility sector (refer **Annexure-D-5.1.2**), which shall be implemented across all sub-regions by the NCR participating States.

R. Major Projects and Implementation Strategies

- 5.3.125 Detailed Mobility plans may be made later, but broad Action plans should be part of SRP, which can be detailed in respective Mobility plans.
- 5.3.126 For development of Multi Modal Transport Hubs in NCR, State Govt. authorities may consult with Indian Railway Stations Development Corporation (IRSDC) which is single agency for railway station development.
- 5.3.126.1 **Key identified projects** envisaged to be taken up in NCR related to Transport & Mobility, but not limited to, are given in **Appendix-13.2**.
- 5.3.126.2 Certain suggested policies related to Transport and Mobility alongwith other policies which could also be elaborated/ detailed out in Sub-Regional Plan and local level plan like Master/ Development Plans, etc., are given in **Annexure-P-5.1**.



6. TOURISM AND HERITAGE

6.1 EXISTING STATUS

- 6.1.1 India has 40 World Heritage Sites, of these 04 sites exist in NCR and about 06 sites are within close proximity to NCR. Furthermore, NCR has around 295 centrally protected monuments under ASI and more than about 70 state protected monuments under State Archaeological Departments. All these monuments are preserved with funding from central (ASI) and as well as CSR activity.¹⁶ About 65% of the tourists who come to India (about 12 million annual foreign travellers) visits only five places in India, even if they stay in India for 15 days. Two of these places are in NCR, namely Red Fort and Qutub Minar whereas another two i.e. Taj Mahal and Agra Fort are in close proximity. Brief of World Heritage Sites, Centrally & State Protected monuments/ sites and museums in NCR, and sub-region wise status is given at **Appendix-6.2** and **Annexure-D-6.1** respectively.
- 6.1.2 Multicultural NCR has influences from North and North Central Cultural Zones which mostly includes Punjab, Haryana, Rajasthan and Gangetic Uttar Pradesh and has blended to a unique vibrant culture with distinct socio-cultural phenomenon. Delhi, the capital of India is one of the key arrival destinations for both foreign and domestic tourists. It is among top tourist destinations in the country with the number of domestic tourists rising continuously. It grew from 18.49 million in 2012-13 to 22.62 million in 2014-15. In 2018, Foreign Tourist Arrivals (FTAs) at Delhi Airport was 28.83% amongst top 10 Indian international check posts accounting for 83.75% FTAs (i.e. 8.84 million out of total FTAs of 10.55 million).¹⁷ As per survey conducted by NSSO (72nd round, 2014-15) on tourism, the majority of tourists (95 per cent) visited Delhi during the year for 'holidaying, leisure and recreation'.¹⁸ The three NCR States i.e. Delhi, Rajasthan and UP are among top 10 foreign tourist visited States in 2018 and UP State ranks in top 10 domestic tourist visited States in the same year. The spread of Heritage & tourism sites in NCR is provided at **Figure 6.1** and brief about NCR's tourism activities is given at **Annexure-D-6.1**.
- 6.1.3 Major initiatives on Tourism including Swadesh Darshan, PRASAD, HRIDAY, IRCTC packages, "Apni Dharohar- Apni Pehchan", Toll Free Multilingual Tourist Info Line (1800111363 or on a short code 1363) etc. along with a brief of schemes & initiatives of Government of India (Tourism and Culture ministries), Tourism & Hospitality Skill council and NCR participating States is provided at **Annexure-D-6.1.1**.

6.2 KEY ISSUES AND CHALLENGES

- 6.2.1 Major hurdles being faced by tourism sector include (a) lack of awareness amongst people about website showcasing monuments and heritage sites of india; (b) high GST and high Visa fee, although e-visa has helped; (c) missing air connectivity, although efforts like private airlines getting international licenses, UDAN scheme of Govt. of India where small cities are integrated, are of great help; (d) comfort, security & safety issues; (e) pollution; (f) cleanliness specially hygienic rest room facilities of international standards; (g) missing informative signage; (h) areas around iconic sites not of international standards; and (i) management measures, etc.
- 6.2.2 The existing Archaeological Act (Ancient Monuments and Archaeological Sites and Remains- AMASR Act) and heritage zone provisions are very stiff, and cause delay in eve repairs and civic amenities at these sites for tourists and staff. Other key issues and challenges related to development of Heritage, Culture & Tourism activities in NCR are provided at para 6 of **Annexure-D-6.1**.

¹⁶ Source: ITDC

¹⁷ Source: India Tourism Statistics at a Glance, 2019

¹⁸ Source: Economic Survey of Delhi, 2018-19, Chapter 21-Tourism in Delhi



6.3 POLICIES AND PROPOSALS

Making NCR - A Tourism Hub

- 6.3.1 Tourism is globally acknowledged as a great economic multiplier and has been a great economic pillar in many Indian states and regions. NCR can greatly increase employment and catalyse economic growth across sub-regions with additional advantage of inclusive growth and economic progress through the forward and backward linkages.
- 6.3.2 NCR can be developed as a ‘**Smart Tourist Hub**’ equipped with ultra-modern and state of the art soft and physical infrastructure. More heritage sites of the region can be maintained as per the guideline of UNESCO, so as to increase total number of World Heritage sites from 4 to 10 by 2041.

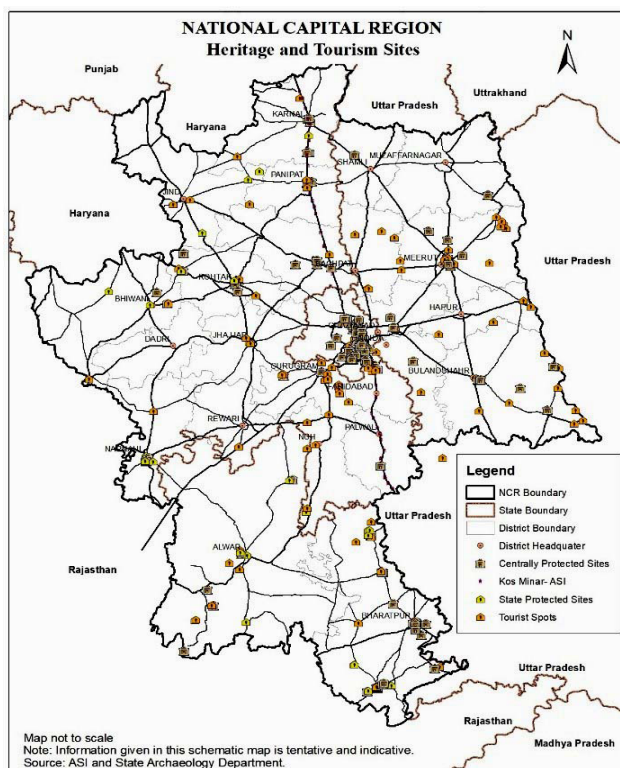


Figure 6.1: Heritage and Tourism Sites

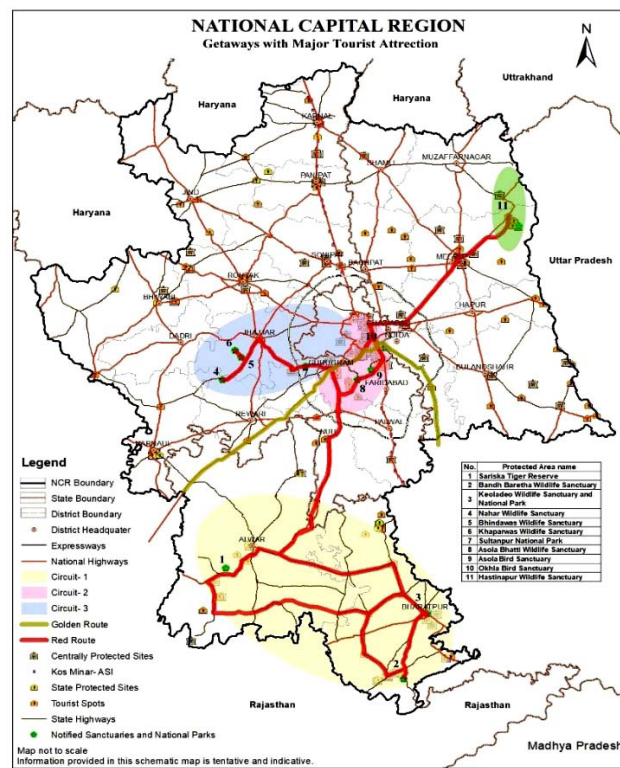


Figure 6.2: Blue Green Getaways Circuit with Major Tourist Attraction

- 6.3.3 NCR participating States to identify and develop at least **75 “Smart Tourist Destination/Sites”** and **at least 5 world class circuits in every sub-region, with “End to End Packaging”** and **“Unique Local Experiences”** showcasing theme-based museums, heritage and natural beauty, etc. Indicative list of Tourist Destination/Sites which can be developed is provided at **Annexure-P-6.1**. Indicative list of tourist circuits which may be developed as globally competitive and world-class Tourism circuits is provided at **Appendix-6.1**. In NCR, many **Blue Green Getaway Circuits** may be identified and developed with sustainable yet global level tourism infrastructure. Details of three such **tentatively identified Blue-Green Nature Getaway circuits** are at **Table-P-6.1.5 Annexure-P-6.1** and outlined in **Figure 6.2**. An indicative list which could act as database for cultural resources of a place is provided at para (H) of **Annexure-P-6.2**. The interlinking of all the green trails of the Aravalli Range and river Yamuna running in the region should be part of an **integrated cycle trails and drive corridors** in the region.
- 6.3.4 Develop **“World Class Museums”** on the lines of Bilbao or the Asian Civilization Museum in Singapore, in each sub-region. Every district in NCR may have a Museum (refer **Table 6.1.7 of Annexure-D-6.1**). On world sites **“Virtual Museum”** may be aspired for all ASI protected and world heritage, as these becomes



an immersive experience, especially for showcasing living heritage as done in Varanasi recently. Virtual Museums be set up in all Metro Centres. The Banaras Virtual Experiential Museum located in historic Man Mahal next to Dashashwamedh Ghat can be followed as a best practice. State of the Art Fish Aquarium are proposed in Delhi and other major cities, wherever feasible. The ICAR-National Dairy Research Institute (NDRI), near Karnal, Haryana has the only working model of Dairy Plant in the country and should be appropriately converted into a museum.

- 6.3.5 Key actions for the development of sector would require working towards: (a) Ensuring safe and secure Tourist Destinations across NCR, (b) Attracting Private Investment for Heritage conservation, Cultural and Tourism activities, (c) Infrastructural Development to support sector requirements, (d) Development of Tourism Destinations and Tourist Circuits - inter & intra-regional, (f) Seamless Travel within Circuits, (g) Joint Marketing Programs, & (h) Human Resource Development for skilling.
- 6.3.6 Rigorous efforts would be required to capitalize on cities /area's unique cultural, heritage and tourism potential and establish a 'hook of attraction' and "unique experiences" along with "total experience planning from arrival to departure" to attract the target market. People of NCR along with their cultural heritage shall have to be inextricably linked to their present as well as future and also shall have to be vibrant instead of staying static¹⁹, to achieve vision of becoming a 'Smart Tourist Hub'.
- 6.3.7 Religious spots of Delhi and the entire region maybe connected to tap the religious tourist potential of NCR and for boosting tourism. Dedicated circuits can be part of the outreach plan. For instance, Buddhist Circuit in the NCR region connecting Buddhist Vihar in Majnu Ka Tila, Buddhist Temple at Mandir Marg, Shanti Stupa in Indraprastha Park, Tibet House, Cultural Centre of his Holiness the Dalai Lama, Stupa and Monastery at Agroha in Hisar etc.
- 6.3.8 For Heritage & Tourism sites, achieving international level for four key quality aspects (4Qs) i.e. (1) Quality of infrastructure/ services (2) Quality of monument/site, (3) Quality of intangibles & (4) Quality of people, have to be ensured.
- 6.3.9 Approach of focusing on '**3Cs of Tourism**' i.e. Conservation, Conversion & Creation shall have to be jointly followed to transform NCR as a 'Smart Tourism Hub' in the future. This would involve synergy amongst heritage, tourism & culture along with digital technology for further necessary integration.
- 6.3.10 Iconic Places: Global Metros have signature buildings which are Iconic and modern. NCR should also have modern world class Iconic Structures , befitting India's rising global influence. All NCR Metros, Regional Centres or cities with 3 lakh plus population to have at least one such World class, new age, Iconic Place/ Structures by 2024. All other 2000+ settlements may also develop Iconic Places as "Places of Local Pride" by Coverting existing local attractions or creating New places by 2026 through use of CSR or other local sources of funds.
- 6.3.11 Entertainment hubs and theme parks like Disneyland, Kingdom of dreams, Film city, shall be encouraged with good connectivity and appropriate incentives especially in areas with large land availability. Concessional land along with fast track online approval process be considered for such projects which can be money-spinners, and can be located viably in Rest of NCR, outside CNCR. (e.g Bulandshar, Baghpat, Mewat, Alwar, Bharatpur etc).
- 6.3.12 **Tourism infrastructure projects**, viz., hotels, resorts, equipment, parks etc., involving investment of Rs. 1 crore be recognized as 'infrastructure' and necessary amendment be made to enable promoters to avail loans on a priority basis.²⁰
- 6.3.13 NCR States may develop special tourist zones with around 300 acres of land parcels (based on smart cities models) for theme parks, etc.

¹⁹ Source: INTACH

²⁰ NITI Aayog - Strategy for New India @ 75 - https://niti.gov.in/writereaddata/files/Strategy_for_New_India.pdf



- 6.3.14 Tourism is the biggest non-Industry economic pillar after urban development and is a large economic multiplier. In order to strengthen this sector and diversify leisure tourism, NCR States should identify, promote and develop niche tourism like, Adventure, Medical, Wellness, Golf, Polo, Meetings Incentives Conferences & Exhibitions (MICE), blue-green nature getaways, theme parks, rural tourism, Eco-tourism, Film Tourism, Sustainable Tourism, Cruise, home-stays, spiritual, traditional crafts & sports, step wells, havelis, camping-hikes, culture shows, food streets, etc. to achieve the round the year among their tourism activities. A year round events calendar of food-theatre can also be considered.
- 6.3.15 Specialized tourism realms like pilgrimage tourism, medical tourism, village/ rural tourism, agri-tourism, sports tourism, leisure tourism, eco-tourism, adventure tourism (like balloon safari, aerial tours, night aerial tours, water sports, etc.), walking tours, bistros, souvenirs shops, appropriate nightlife in cities, etc. may be the new focus along with the traditional focus area. Walking tours be mandatory for each city above one lakh population and all tourist places.
- 6.3.16 Appropriate actions be taken in every sub-region to involve-educate-incentivise locals to boost the tourism activities of world class standards.
- 6.3.17 NCR participating States shall regularly review buildings and monuments to be categorised as heritage sites. Maintenance and upkeep along with restoration/re-development of these sites with world class amenities, etc. are critical to optimum utilization of their tourism potential and shall be undertaken by subregions through various measures.
- 6.3.18 Encourage and incentivize preservation of heritage areas and creation of cultural facilities by introduction of non-financial incentives like Transfer of Development Rights (H-TDR) for all heritage site owners, whether private or public. Experience shows that such efforts are more successful if undertaken as part of imaginative Local area plans (LAPs) etc. Such TDR use can be very effective to revitalize the Old city areas through Selective Redevelopment, Rehabilitation and Preservation of Traditional Heritages.
- 6.3.19 ASI approach to conservation of monuments should be reoriented, if necessary by amendment in the ASI rules, to facilitate world class restoration, and comfortable hygiene and amenities to tourists and staff. **“Conservation and Management Committee”** under DCs/DMs of each district could be assigned the responsibility of local level regular monitoring and granting permissions regarding repair, maintenance and upkeep of ASI monuments and their surroundings. ASI to be mandatory consultant in works relating to protected monuments.
- 6.3.20 Reorientation of ASI should be done to facilitate tourist amenities on all sites/ monuments protected by it.
- 6.3.21 Regeneration of areas/plazas around tourism sites should be done for all tourist sites including proposed 75 Smart Tourist Destination/Site and all ASI/ State owned sites/ areas.
- 6.3.22 Sub-region wise portals for single window clearance for tourism sector should be developed which would help investors get seamless online approvals including for land allotment etc, without any physical interface. These Sub-region wise Tourism Approvals Portals could be collated very usefully to leverage synergies across sub-regions to form a **Unified Pan-NCR Tourism Single Window** for tourism.
- 6.3.23 GNCTD is in process of enacting Heritage Building Act for preservation of 100 years old buildings. GNCTD has so far notified 1462 Heritage buildings in Delhi. Other NCR states could also take similar steps towards protection of their culture and heritage.
- 6.3.24 An year long Calendar of Events for each major tourist destination be made and be well publicized to address seasonality challenge. Adequate deployment of knowledgeable, soft skills trained tourist guides, preferable with elementary multi-lingual competence and from locals, should be ensured. Development of craft bazaars, multi- cuisine hygienic cafeterias with emphasis on local cuisine and variety of souvenirs will increase unique experiences for return visits. Adequate medical aid centres, trained tourist police and women safety centres around tourist sites are necessary.



- 6.3.25 Tourism support infrastructure such as airports, railways, roads, waterways, including upgradation of entry/departure points, electricity, water supply, drainage, sewerage, solid waste disposal systems, services and security systems should be developed along with other amenities like hygienic rest-rooms, first aid centres, ATM/ Money exchange counters, public conveniences merged with lockers, cloak room facilities, waiting rooms/ changing rooms, etc. Further tourist satisfaction could be increased by use of modern facilities providing eco-friendly modes of transport, parking facilities, tourist activities such as Light & Sound Show, water and adventure sports, telephone booths, mobile services, internet connectivity, Wi-Fi hotspots, etc.
- 6.3.26 A network of air transport across NCR with heliports and operational airports at every NCR district headquarter is proposed to promote **“Fly-from-Delhi NCR”** through creation of world-class air travel facilities and aviation hubs. International and regional air connectivity of NCR should be enhanced through increasing capacity of existing Airport, developing International Airports like Jewar, implementing Regional Connectivity Scheme–Ude Desh Ka Aam Naagrik (RCS-UDAN) and reviving/ upgrading unserved airports and unserved helipads in NCR.
- 6.3.27 IRCTC can also play a larger role by increasing focus on creation of tourist circuits in hitherto untouched NCR. It can plan different packages depending on the destinations in NCR, which can be a group of destinations or standalone destinations apart from circuits. For example - Promoting Rewari area through a steam train, a joy ride and Rail museum and Locomotor shed.
- 6.3.28 Imaginative use of TDR facility along with implementation of the Govt. of India initiative – **“Adopt a Heritage: Apni Dharohar, Apni Pehchaan”** across NCR will provide great impetus to heritage tourism. . State Departments may identify old buildings for conservation and heritage/ tourism and as being promoted in Rajasthan, conversion of old Forts, Palaces and Havelis into Heritage Hotels, boutique resorts etc. could be promoted in NCR for: (a) Quality accommodation and Royal experience to tourists, (b) Theme Wedding Destinations, (c) Exotic sets for Film Shooting, (d) Ethnic Culinary Experience, etc.
- 6.3.29 NCR participating States should focus on mapping of **‘Unsung Heros’** for their respective sub-regions of NCR. This should be done on priority by 2022 as India is going to celebrate the 75th Years of its Independence.
- 6.3.30 Tourism Facilitation Committees be set up in each States and at NCR level.
- 6.3.31 Provisions should be made for Tourist Facilitation/Tourist Interpretation Centers at the Monuments and in the key markets which are frequently visited by the tourists. At every popular monument (ASI or State ASI), it should be mandatory for Tourism Department/Government to conduct “guided walks”. It would help us to showcase our rich cultural heritage in the better way.
- 6.3.32 It is proposed that all NCR Metros and Regional centers should consider introducing Hop-On-Hop -Off buses (HoHO Buses).
- 6.3.33 Alighting point for tourists be made near the entry gate of each monument/tourist attraction. After dropping tourists, tourist vehicles may go to their designated parking lot.
- 6.3.34 At the exit point of monuments there should be car/vehicles calling facility, so that tourist may call their vehicle from the parking lot to pick them up.
- 6.3.35 Adequate shaded pedestrian path from parking lot, bus stop and metro station to the monuments/tourist attractions should be provided. This pedestrian way should be hawker free and pothole free and safe.
- 6.3.36 Monuments should be no hawker zone. An area should be earmarked for them with similar facade and looks.
- 6.3.37 Provisions of street furniture at monuments and in prominent markets to ease out visiting children, senior citizens and pregnant ladies.



- 6.3.38 Visitor friendly signage system at metro station and at tourist hub (monuments and key markets).
- 6.3.39 Stress should be given on environmental landscaping, especially in and around monuments and prominent tourist markets.
- 6.3.40 Street lighting and CCTV cameras should be mandatory at all prominent points in colonies, markets, monuments, parkings, roads etc.
- 6.3.41 Way finding Information Maps at every monument should be provided by using same material of frame/ structure and colour scheme for easy identification by tourists.
- 6.3.42 **Meetings, incentives, conferences and exhibitions (MICE) Infrastructure and Leisure**
- 6.3.42.1 MICE and leisure activities are intrinsically connected to tourism and entertainment facilities.
- 6.3.42.2 NCR States would benefit by providing interesting combinations of accommodation and other conference support facilities to hold conferences, meetings and exhibitions. High-tech facilities matching global standards be offered at such conference and meeting venues in the region. More such infrastructure needs sector specific expertise to excel in MICE tourist management including interpersonal, creative, organizational and technical skills.
- 6.3.42.3 The IICC project once fully commissioned would be the largest exhibition and convention facility in the country and will be a major catalyst in development of the MICE Industry in the country. Policy intervention like development of these locations as TOD nodes, providing Multi Modal Connectivity, incentives with respect to additional development potential, etc. should be made.
- 6.3.42.4 MICE economic potential should be leveraged with synergies from tourism and leisure/ entertainment sectors
- 6.3.42.5 NCR States should leverage the strengths and expertise of NCR talents in the film and television industries, promote cooperation among the film and television industries. Further, efforts should be made enhance NCR's status as a high-end convention, exhibition and sourcing centre, globally.
- 6.3.43 NCRPB has constituted a Committee of Tourism Secretaries (CoTS) of NCR participating States under the Chairpersonship of Member Secretary, NCRPB. This protocol has been worked out, for a high level of lateral co-ordination among Centre, State, local government & other related agencies to integrate new tasks that are required for the NCR. The Committee (CoTS), shall act as an Inter Departmental/Ministerial Platform for promotion of Tourism activities across NCR through related Tourism Boards, other stakeholders including bodies like PHDCCI and FICCI who already have their respective Tourism Committee to promote tourism activities both nationally and internationally.
- 6.3.44 Key identified projects envisaged to be taken up in NCR related to Heritage, Culture and Tourism sector, but not limited to, are given in **Appendix-13.2**.
- 6.3.45 Certain suggested policies related to Heritage, Culture and Tourism sector alongwith other policies which could also be elaborated/ detailed out in Sub-Regional Plan and local level plan like Master/ Development Plans, etc., are given in **Annexure-P-6.2**.



7. WATER, DRAINAGE AND SANITATION

7.1 EXISTING STATUS

- 7.1.1 NCR is endowed with four perennial rivers namely the Yamuna, Hindon, Kali and the Ganga. Main sources of water supply in the region are surface and ground water. While the U.P. Sub-region has abundant ground water, the area west of river Yamuna comprising the districts of Gurugram, Rohtak, Sonapat, Jhajjar, Charkhi Dadri, and most parts of Faridabad district in Haryana, Alwar and Bharatpur in Rajasthan and large parts of NCT Delhi have insufficient ground water, which is often brackish with poor quality. Delhi meets its water needs mostly from the Yamuna and Western Yamuna canal and partly from Ranney wells and tube wells in Yamuna belt and Upper Ganga canal system. There is generally a wide demand-supply gap of water in the NCR and the problem becomes acute in dry summer months.
- 7.1.2 To meet the current water demand, the NCR is dependent on outside water sources. Allocation to Delhi is based on the Upper Yamuna Agreement between six states. For example, Delhi gets most of its water supply from Bhakhra Yamuna system. Renuka Dam is the project from where dedicated supply of water is planned for Delhi. A major part of water in Alwar comes from Sahibi, Ruparail and Banganga river basin in Rajasthan sub-region. In Bharatpur there are Banganga, Gambir and Ruparail basins. All the rivers in these two districts flow only in the monsoons and these are seasonal rivers and in rest of the seasons there is no water.
- 7.1.3 A snapshot of water scenario of NCR, especially regarding urban water supply, ground water table and unaccounted for water, etc. is as presented at **Annexure-D-7.1**.
- 7.1.4 **Figure 7.1, 7.2, 7.3 and 7.4** below indicate the locations of existing water treatment plants, canal network, drains falling in Yamuna and the STP & SWM sites in NCR.

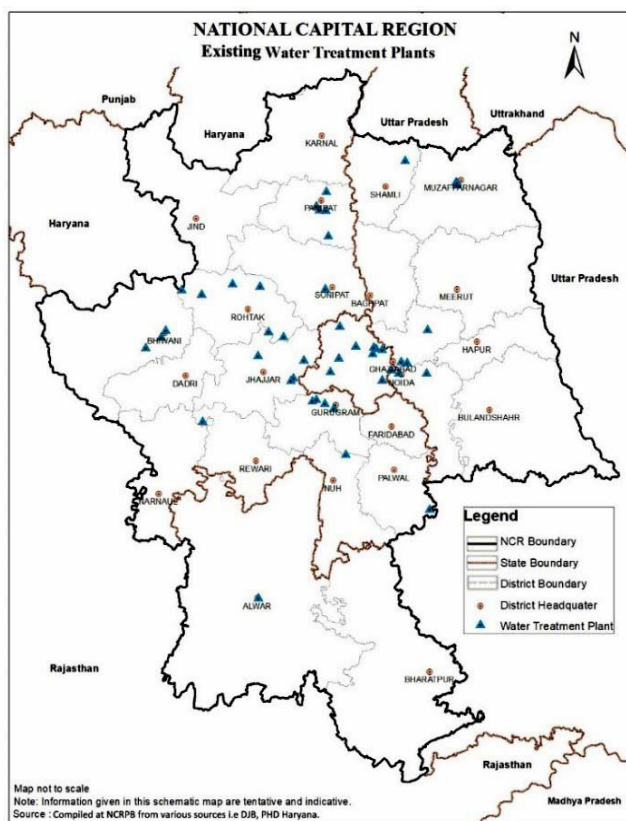


Figure 7.1 Towns with WTPs in NCR, 2019

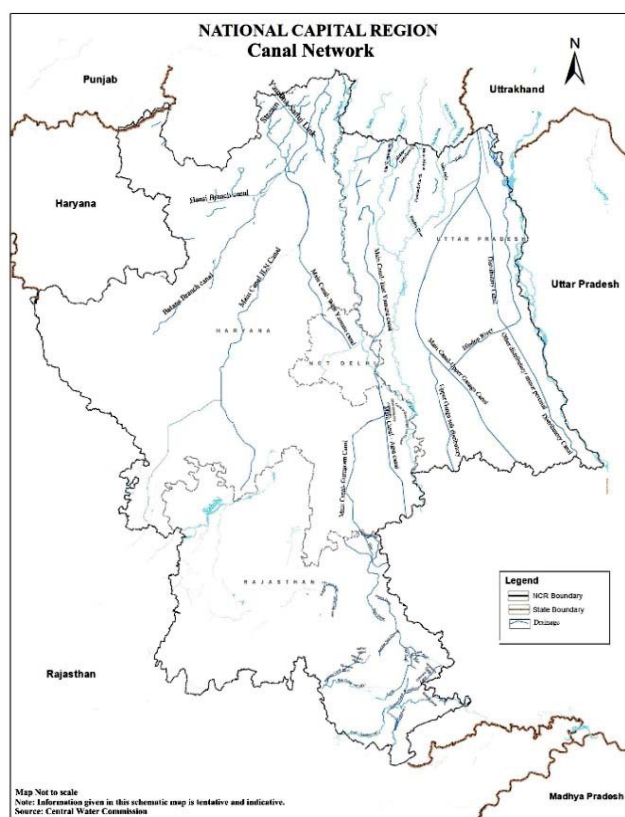
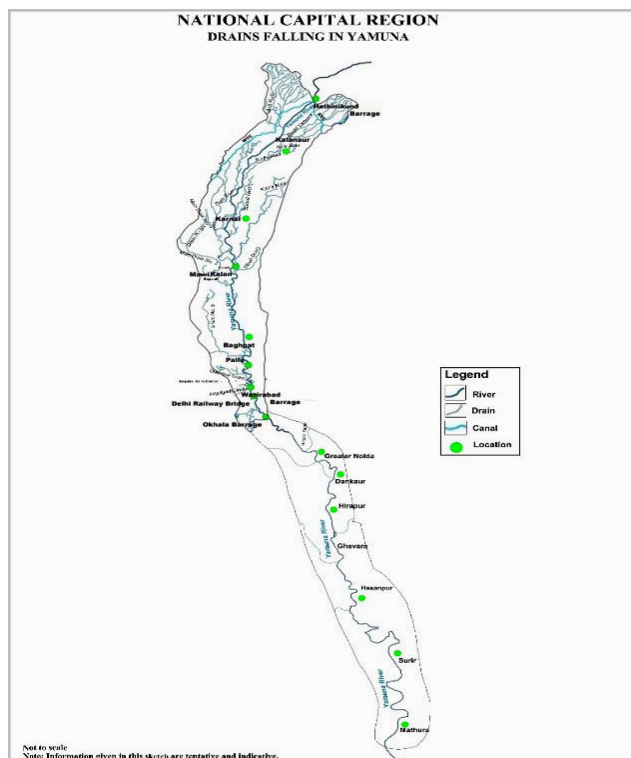


Figure 7.2: Canal Networks in NCR





Note: Map not to scale and the information given are tentative and indicative.
Figure 7.3: Drains falling in Yamuna River

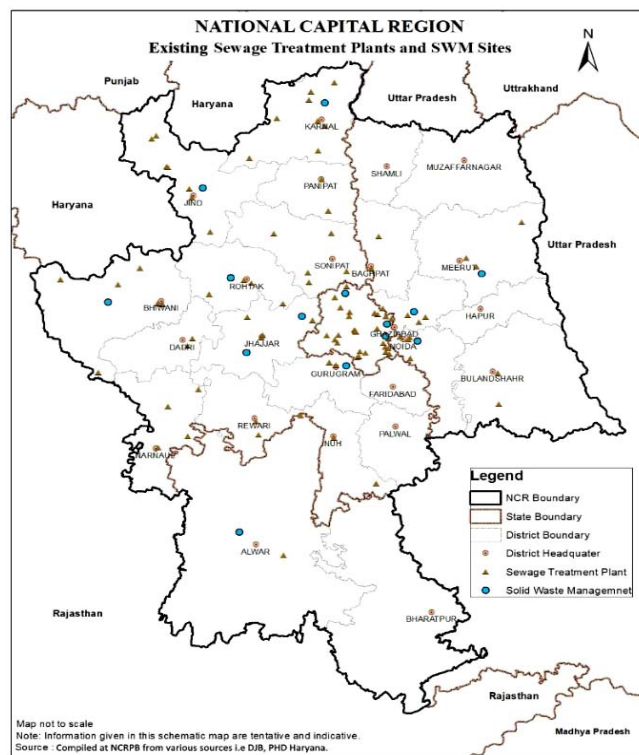


Figure 7.4: Sewage Treatment Plants (96) and SWM Sites (14) in NCR

7.1.5 In the NCR total solid waste generated is 20,099 metric tons per day (MT/D) of which the NCT of Delhi Sub-region has the highest share of 66 percent. A brief on solid waste generation status and sewage generation alongwith installed treatment capacities of NCR, is as presented at Annexure-D-7.4.

Table 7.1: Quantum of Water used for Irrigation/Agriculture purposes

(a) Haryana Sub Region

S. No.	District	CCA (In lakh Ha)	Demand of water supply		Area irrigated (In lakh Ha)	Actual supply of water	
			(In MAF)	(In MCM)		(In MAF)*	(In MCM)
1.	Faridabad	0.35	0.151	186.257	0.04	0.007	8.634
2.	Gurugram	0.22	0.095	117.181	0.03	0.005	6.167
3.	Mewat	0.62	0.268	330.575	0.16	0.028	34.538
4.	Rohtak	1.50	0.649	800.534	1.45	0.254	313.306
5.	Sonepat	1.57	0.680	838.773	1.13	0.200	246.698
6.	Rewari	1.00	0.433	534.101	0.07	0.012	14.802
7.	Jhajjar	1.47	0.636	784.499	0.50	0.087	107.314
8.	Panipat	0.68	0.294	362.646	0.43	0.075	92.512
9.	Palwal	0.35	0.151	186.257	0.09	0.016	19.736
10.	Bhiwani	3.03	1.310	1615.871	1.35	0.236	291.103
11.	Charkhi Dadri	0.91	0.394	485.995	0.26	0.046	56.740
12.	Mahendragarh	1.37	0.593	731.459	0.10	0.017	20.969
13.	Jind	2.40	1.040	1282.829	2.78	0.487	600.709
14.	Karnal	1.44	0.623	768.464	0.70	0.123	151.719
Haryana Sub Region Total		16.91	7.317	9,025.439	9.09	1.593	1,964.948



(b) Rajasthan Sub Region

S. No.	District	CCA (in hectare)	Demand of water supply (In MCM)	Area irrigated (in hectare)	Actual supply of water (In MCM)
1.	Bharatpur	1,26,486	379.458	30,288	146.02
2.	Alwar	21,546	138.023	502	5.47
Rajasthan Sub Region Total		1,48,032	517.481	30790	151.49

Source: CWC, 2020; *1 Million Acre Foot = 1,233.489 Million Cubic Meter (MCM).

Data not received for U.P. Sub-region; U.P. does not have water shortage

7.2 KEY ISSUES AND CHALLENGES

- 7.2.1 A critical aspect of water management in the NCR is that ground water resources are getting depleted, potentially causing further dependence on water resources from outside the region. Further quality of water is also affected due to pollution in many parts.
- 7.2.2 The NCR is facing the ever rising water demand due to increasing population. Domestic use of water is also increasing with greater speed than other uses.
- 7.2.3 Water coverage is uneven among sub-regions and level of service also remains below prescribed standards both in urban and rural areas.
- 7.2.4 Local sources of water supply such as ground water are dwindling and at the same time due to pollution, water quality is deteriorating.
- 7.2.5 Reliance on external water sources to meet major part of water demand in the NCR exposes the sub-regions to uncertainties of supplies from areas outside their jurisdiction.
- 7.2.6 The NCR does not have adequate number of water treatment plants and a large majority of towns do not have even a single water treatment plant. Some districts in the NCR like Shamli, Muzaffarnagar, etc. do not have Sewage Treatment Plants (STPs). Reuse of treated sewage water is not being practiced in all the districts of the NCR, creating more pressure on use of freshwater sources and also have polluted freshwater sources.
- 7.2.7 Little reuse of wastewater and insufficient infrastructure for the treatment of wastewater hinders augmentation of water supplies through reuse. It also causes pollution of freshwater sources.
- 7.2.8 Implementation of three proposed dams for water supply to NCR, namely, Renuka dam, Lakhwar dam and Kishau dam along with the proposed Sharda-Yamuna linkage project have been long delayed. A brief note about proposed dams for Delhi NCR Water Facilitation is provided at Annexure-D-7.7.
- 7.2.9 Encroachments around water bodies and pollution of river, streams and other water bodies, excessive focus on ground water extraction, etc. are leading to reduction of available sources of water and over exploitation of groundwater aquifers in many areas of the NCR. This clearly shows that conservation of water bodies and measures to regulate the ground water extraction are

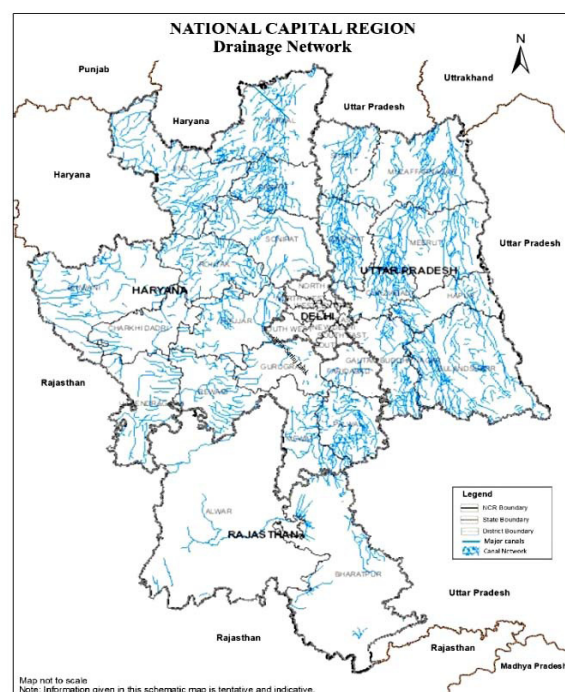


Figure 7.5: Drainage Networks in NCR
Source: Open Source Data

important to attain sustainability.

- 7.2.10 About 18 drains fall into river Yamuna in Delhi. There are instances of high level of ammonia pollution in the river water during winter season. Wastewater from Panipat in Yamuna is the main source of pollution carrying entire sewage of Panipat town. Drain No.-6 also carries industrial wastes. De-silting of the storm water drains is a very important activity to keep drains working effectively. Although, cities spend money every year for de-silting, effectiveness of drains remain a challenge. **Figure 7.5** shows the drainage network of the NCR.
- 7.2.11 Details of water consumption for irrigation in the NCR provided in **Table 7.1** for the districts of Haryana sub-region together consumes 1,963.715 MCM and Rajasthan sub-region consuming 151.49 MCM. Flood-irrigation is the normal practice in NCR, which leads to high consumption of water for irrigating agricultural fields and is considered wasteful and inefficient, this is clearly borne out in the **Table 7.1**.
- 7.2.12 More than 85 percent of the water is used for flood-irrigation purposes and less water is available for other uses like domestic and industrial. To meet the growing demand of water for domestic and industrial use, water used for ground water extraction for irrigation need to be brought down and use of more water efficient irrigation practices need to be encouraged.
- 7.2.13 Dumping of solid wastes in storm water drains, natural drains and water bodies reduces their capacity to absorb or convey the storm water effectively. This problem needs to be addressed across the NCR.
- 7.2.14 Instances of urban flooding are increasingly becoming common as paved areas are increasing considerably. This has led to increase in the runoff volume generated for the same amount of rainfall.
- 7.2.15 Due to constantly falling water table on account of over-extraction of ground water for irrigation, industrial and domestic water supplies, the NCR faces major implications on its environmental health, and it is gradually heading towards water insecurity. As per water extraction status of Blocks in NCR, as per CGWB Report 2017, 20 out of 24 blocks of Rajasthan sub region (83%), 7 of the 11 district of Delhi (64%), 44 out of 77 blocks in Haryana sub-region (55%); and 24 out of 60 blocks of UP sub-region were over exploited. So, it is important to analyze water demand versus availability in the NCR and explore ways and means to bring the overall demand below water availability using primarily options of water demand management.
- 7.2.16 Climate change may, in particular, increase short period rain intensity and frequency, which affects urban drainage. Mapping of the NCR's water and drainage systems for ensuring effective planning and management is a massive challenge. The existing national standards may not be suitable for the NCR for 2041. BIS standards formulation and revision at the National Standards is not an exhaustive process. So evolving new protocols suited for various relevant works should be explored.
- 7.2.17 The lack of adequate awareness and non-adoption of Decentralised Sewage Treatment Plant (DSTP) facilities coupled with non-existence of dual pipelines is a big hindrance to the resolution of this problem. Further, unsafe disposal practices are an issue of faecal sludge and septage.
- 7.2.18 Due to non-availability of land for garbage dump, attempts are being made to locate such facilities in the flood plains of rivers, along roads outside urban limits or inside forests, which are responsible for deteriorating surface and groundwater quality.
- 7.2.19 The rivers, mainly Yamuna, Hindon and Kali Nadi and various seasonal streams and drains in NCR are under severe water quality threat due to untreated sewage polluting downstream areas.
- 7.2.20 Absence of statutory guidelines for reuse of treated wastewater is an issue demanding immediate attention.
- 7.2.21 Some of the major issues related to the crisis of the sewerage system in the NCR are inadequate sewerage network, frequent puncturing of storm water drains with sewerage, inadequate capacity of STPs, lack of investment for the rehabilitation and phasing out of the existing sewerage network and STPs, general lack of



operations and maintenance, non-existent sewerage facilities in peri-urban and rural areas, lack of treatment of industrial and hotel wastes, non-availability of land for STPs, non-availability of accurate & relevant data and wide prevalence of manual cleaning of sewer.

- 7.2.22 Other major issues related to waste management include little or no segregation of wastes at source, poor public awareness and capacity building, inadequate financial resources, piecemeal approach towards handling of solid wastes, lack of appropriate training and knowledge of municipal staff, exclusion of informal sector, non-adoption of circular economy concept etc.
- 7.2.23 The crisis in sewerage and sanitation sector has clear links to the imbalanced urban development and poor provision of wastewater infrastructure.
- 7.2.24 The “Not in my Backyard” (NIMBY) syndrome has further deterred acceptance of decentralized solutions in NCR, whereas other developed countries have successfully made mandatory and implemented decentralized treatment and local reuse provisions.
- 7.2.25 **Water logging** is one of the major challenges of urban areas in NCR which can be a result of both natural and man-made factors. Natural factors may include poor natural drainage as a consequence of unfavourable sub-soil geology like existence of hardpan at shallow depths; spilling of rivers resulting in submergence of agricultural lands; heavy storm rainfall coupled with poor natural drainage etc. However, it is observed that water-logging is, caused mainly because of manmade factors poor upkeep of watersheds; unplanned developmental activities resulting in choking of natural drainage; hydraulic pressure of water from upper irrigated areas resulting in seepage outcrop in low lying areas; introduction of irrigation without taking into account characteristics of soils and sub-soils for their irrigability; seepage from canals, distributaries and watercourses; excess application of irrigation water; poor “On Farm Water Management” resulting in poor water-application efficiencies; unrealistic cropping patterns; inadequate drainage and poor maintenance of existing drainage systems and outlets; lack of conjunctive use of surface and ground water, etc.
- 7.2.26 **Ground Water Contamination:** The specific conductance of shallow ground water varies greatly in the NCR area from being as low as 290 micro siemens /cm at 25°C to as high as 16,000 micro siemens /cm at 25°C. In a major part of the area, the shallow ground water is fresh (EC up to 3000 micro siemens /cm at 25°C). Areas with brackish quality of water (EC between 3000-6000 micro siemens /cm at 25°C) occur in north western parts of Sonapat district, northern and north western parts of Rohtak district, northwestern and south western parts of NCT of Delhi, north-west and northern parts of Gurgaon district, western parts of Rewari district, southwest parts of Faridabad district and southwestern parts of Bulandshahar district, etc. Saline ground water (EC more than 6000 micro siemens /cm at 25°C) also occurs in almost the same areas as those of brackish water areas excepting Bulandshahar district. Mewat District has shortage of potable water and its groundwater is saline. Bulandshahr, Khurja, Faridabad (Part), Ghaziabad, Noida and Loni fall in the second category of area with adequately thick fresh ground water aquifers and are underlain by saline ground water.

7.3 POLICIES AND PROPOSALS

A. WATER AND DRAINAGE

- 7.3.1 Sub-regions should implement measures for efficient use of available potable water like SCADA based smart water metering till consumer end, water audits, along with measures for conserving more water from rains from road run-off, separation of storm water drains from sewerage drains and also setup sufficient number of recharge wells in Yamuna flood plains.
- 7.3.2 **Agricultural Water Demand**
- (i) Water consumption levels in agriculture sector should be managed through the right choice of crops, in accordance with water availability and priorities. All efforts should be made to use treated recycled or



wastewater or sewage water for agriculture purposes.

- (ii) Agriculture Water Demand be managed by adopting combination of all the water saving measures and considering socio-economic conditions of farmers, their adaptability to accept new innovations, capacity building, availability of resources, etc. and by giving judicious spatial distribution for implementing various conservation methods. 5% of irrigation water may be saved by year 2026, 10% by year 2031, 15% by year 2036 and 20% by year 2041. Efforts be made to reduce water consumption under agriculture by 75-80%.
- (iii) In order to monitor water supply and conservation of water, water metering of agricultural supplies should be made mandatory in the NCR. Tariff rates regarding water and electricity for agriculture should be reviewed and revised. Farm water supply tariff rates to have slabs introducing stiff rates for high consumption in areas declared dark and grey blocks and also provide significant rebates if water is being reused and recycled. 100% smart water metering shall be implemented for all for all sectors including agricultural supplies in NCR; subsidies if given should be accounted for thereafter, like Delhi. Necessary action be taken by all NCR participating States with preferably one year including metering.
- (iv) **Irrigation Management Plan** indicating norms of treated water suitable for irrigation should be prepared by the agricultural scientists of agricultural departments.

7.3.3 Extraction of Ground Water

- (i) **Registration & Geo-Tagging of all bore wells/ tube wells/ other wells** and sensor monitoring of ground water status should be carried out across NCR. Permission should be mandatory for new bore wells which would require building of a groundwater recharge structure. Such permissions in critical ,near critical and over exploited areas, shall be given only on net zero discharge basis i.e. ensuring equal water recharge annually in the vicinity.
- (ii) Regular monitoring of ground water levels and ground water quality should be undertaken in NCR. In certain areas where there is occurrence of some harmful chemical and heavy metals, such areas should be strictly monitored across the region and boring in such areas should get stiff penalties. Sub-regional Plan should give special focus to such areas and issues.
- (iii) Ground water should not be extracted from over exploited area. As far as possible, water supply should be made from surface water resources and ground water from flood plain aquifers. This need to be seen as per the guidelines of CGWA/DoWR/MoJS and local drinking water requirements of the States. There should be mandatory equal recharge to ensure zero net discharge of ground water. Some incentives may be introduced to implement this.
- (iv) Permissions for new wells in over-exploited areas be given only on zero net discharge basis.
- (v) A total of 1,347.7+ MCM/year water can be extracted from flood plain aquifers by constructing 1,275 shallow tube wells. These areas includes, (a) Garh Mukteshwar Jaithal and Sarurpur-Bhaghpur areas of Ganga River Flood Plain, (b) Hindon Flood Plain aquifer of river Hindon and (c) Baghpat-Murad Nagar-Jainl area of Upper Ganga Canal Flood Plain.
- (vi) **Construction of Tube Wells:** 300 Nos. of Wells can be constructed in flood plains of NCR every year so that 51.1 MCM of water can be drawn and utilized from ground water resources every year, as suggested by WAPCOS study for NCR.
- (vii) Subsequently **“Unified Ground Water Plan for the NCR”** be prepared as part of the related Functional Plan. Further all sub-regional Plan shall prepared water balance tables including water demand, availability, usage efficiency, water reforms, etc. for the entire sub-region. Functional Plan on Water should be published by 2022-23.
- (viii) Strict restrictions should be imposed for illegal extraction of ground water in over exploited and critical areas in NCR.
- (ix) Alwar, Bharatpur, Palwal, Gurugram and Panipat districts are water stressed as per CGWB Report, 2017.



These districts should device mechanisms to monitor and control percent of water to be withdrawn and maximum limit of withdrawal should be fixed for such areas. Such districts should identify suitable sites to act as water percolation points.

7.3.4 Ground Water Recharging

- (i) Recharging of aquifer should be taken up immediately by constructing suitable rain water harvesting structures such as recharge pits, recharge trench, recharging dug wells, recharge shaft, shaft with recharge well, trench with recharge well, check dam and percolation tanks.
- (ii) For water sustainability, construction of porous and permeable pavements & open public spaces in new developments and replacement of existing non-porous pavements & open public spaces should be made mandatory in NCR. Replacement of existing pavements and open public spaces be carried out in phases by 2026 in all Metros and Regional Centres.
- (iii) Initiatives regarding inducing recharge along rivers should also be undertaken.
- (iv) NCR States should undertake promotion of **artificial groundwater recharge** including recharge in areas such as ridges, **roof-top rain water harvesting, rainwater harvesting of runoff from roads and flyovers, deepening and rejuvenation** of village ponds and lakes, etc.
- (v) Groundwater recharge policies and guidelines for rural and urban areas should be prepared by each participating State considering local elements and contexts.
- (vi) Ground Water extraction permission supply should not be given in areas with regular water supply.
- (vii) Ground water extraction and restoration charges as defined by Hon'ble NGT in its Order in OA No. 176 of 2015 and notified by Central Ground Water Authority vide notification dated 24th September, 2020, should be imposed.
- (viii) Ground water extraction should be subject to rainwater harvesting and use of treated wastewater at site.

7.3.5 Revival and rejuvenation of rivers/water bodies by 2026

- (i) **Revival and rejuvenation** of river Yamuna should be taken up as a priority project jointly by Delhi Jal Board and Delhi Development Authority, along with other concerned NCR State Govts. and Central Govt. A viable financial strategy may be worked collaboratively for its implementation.
- (ii) In compliance to directions of Hon'ble NGT in OA673/2018 titled "More river stretches are now critically polluted-CPCB" a committee has been constituted to prepare an Action Plan for bringing 22 km stretch of River Yamuna flowing through Delhi i.e. Wazirabad to Village Asgarpur to be fit at least for bathing purpose. Such initiatives should also be taken in the other sub-regions.
- (iii) Revival & rejuvenation of all water bodies/ wetlands should be undertaken on priority and ground water quality/quantity be improved.
- (iv) An integrated approach for revival and rejuvenation of rivers and major drains in the NCR should be adopted. For example, river like Yamuna, Hindon, Kali & Sahibi, and Najafgarh drain, etc. should be taken up for revival and rejuvenation in next 05 years after the approval of Regional Plan-2041.
- (v) For **revival** of river Yamuna, authorities should make all efforts and focus on the stretch upstream of Wazirabad Barrage and stretch between Wazirabad and Okhla Barrages (Delhi segment), on priority. Indicative strategies and actions to be adopted for the rejuvenation of river Yamuna are placed at **Annexure-D-7.8**.

7.3.6 "Water Sensitive Planning"

- (i) Clear identification of natural drainage systems and watersheds should be done on the principles of water sensitive planning. Creating blue-green-grey infrastructure in NCR should be mainstreamed by the State Govts for primary water treatment, water harvesting and ground water recharge.



- (ii) Adequate funds be made available to incentivise and ensure mandatory water-secure planning across NCR.
- (iii) Spatial planning of blue-green-grey infrastructure should be carried out in an integrative manner across NCR for water security and sustainable development in the region.
- (iv) Blue infrastructure like rivers, canals, ponds, wetlands, floodplains, water treatment facilities, etc. should be integrated with green infrastructure like trees, lawns, hedgerows, parks, fields, forests, etc. for seamless nature. Green storm water infrastructure is designed to mimic nature and capture rain water where it falls. Green infrastructure reduces and treats storm water at its source while also providing multiple community benefits such as decreasing the local flooding and its socio-economic impact, improving community aesthetics, encouraging more neighbourhood socialisation, improving economic health by increasing property values while giving other benefits like more walkable streets, traffic calming, green public spaces, shades, enhanced foot traffic in retail areas thus providing more jobs opportunities for small businesses, etc. 'Greening the Grey' is the proposed futuristic approach to storm water management.
- (v) Blue-Green refers to infrastructure that aims at restoring the naturally oriented water cycle while contributing to amenity by bringing water management and green infrastructure together, while Grey infrastructure refers to human-engineered traditional approaches to water management such as water permeable roads-pavements, pipes, drains, parking lots, roof tops, water treatment plants and other hard surfaces. A snapshot of international and national initiatives of blue green infrastructure initiatives is given at **Appendix-7.1**.

7.3.7 Reuse of wastewater

- (i) Necessary **augmentation of water treatment plants** and other water infrastructure should be carried out by the NCR States.
- (ii) In order to meet the water requirements of Delhi, the DJB proposes that 150 MGD to 240 MGD water can be spared from Ganga Canal near Muradnagar, UP, as there is no shortage and surplus water can be given to Delhi (**refer Annexure-D-7.2**). The DJB can provide treated water of good quality to UP for purposes in lieu of the water exchange from Ganga Canal. The DJB is developing water treatment plant at Okhla with modern technology. However, Delhi should ensure that they adhere to the norms in terms of quality of water and in case of violation, penalties are to be paid. Joint inspection committee may be constituted for quality monitoring.
- (iii) **Reuse of wastewater** should be adopted as one of the main water policies for augmentation of increasing water demand in all urban settlements by preparing a time bound plan for implementation of this policy. This will reduce heavy reliance on freshwater sources from outside NCR and groundwater within NCR. NCR should promote the dictum of '**Not a Drop to Waste**'. **Recycle and Reuse of water** shall be made mandatory for all NCR districts. Reuse of treated water for agriculture and horticulture purposes, recreational purposes, industrial purposes, and large scale irrigation should be made mandatory.
- (iv) Wastewater and recycled wastewater supplied for irrigation purposes should conform to the CPCB quality norms and must be strictly enforced by imposing large financial penalties and even jail terms.
- (v) Water Reuse to be increased from 30% in Delhi to 50% in all urban areas by 2026, 70% by 2031 and 85% by 2036.
- (vi) A **network of decentralized wastewater treatment plants** should be set up to generate useable water at local level particularly in urban areas. Each ward of all Metros and Regional Centres in NCR should have an FSTP by 2024 and other 10,000 plus population settlements by 2026.
- (vii) All new group housing and multi storey buildings should mandatorily have DSTP and it should be linked to FSTP.
- (viii) In-situ treatment and use of wastewater in housing complexes and dual-pipe system supplies through potable or non-potable systems should be promoted. Alongside, piped water supply networks should be timely refurbished to reduce distribution losses.



7.3.8 Augmentation of Water

- (i) New sources of water for the NCR population should be also explored. This should be done by promoting **inter-basin transfers** as one of the sources of water. Possibilities be explored for inter-linking rivers such as Sharda-Yamuna River Link (SYRL) Project, to draw certain amount of water. SYRL project should be expedited to provide water to NCR.
- (ii) Further, implementation of Eastern Rajasthan Canal (ERC) project be looked into & expedited for supplying irrigation and drinking water to Alwar and Bharatpur districts along with other districts of Rajasthan.
- (iii) Completion of **Renuka, Lakhwar & Kishau dam** projects by concerned agencies be done on priority in order to **augment water resources** for the region.
- (iv) Possibilities to bring sea water through pipeline to Delhi / CNCR from the nearest sea water source (e.g. Kandla) may be explored in order to meet the non-potable water requirements especially for large size industries, commercial establishment, etc. so that the fresh water available in NCR can be reserved for potable purpose. However, it is also important to take all steps to conserve the available water and ground water.
- (v) NCR should be a “**Water Secure Region**”. For achieving this all natural and manmade water bodies in NCR should be identified and revived in a phased manner by 2031 to rejuvenate water table and prepare five yearly water budgets for each sub-region. The Sub-Regional Plans and Master/ Development Plans should detail out specific policies, proposals and projects for realization of this policy.

7.3.9 Water use efficiency in Agriculture- Irrigation

- (i) Water and electricity for agriculture should not be provided free of charge in the NCR; at least a token fee should be charged, enabling monitoring of quantum of water and electricity supply. State governments should evolve farm water supply charges in the form of slabs for imposing water charges, and higher rates should be charged for high consumption of water especially in water shortage areas like dark and grey blocks. Farms using recycled water should be given significant rebates in water charges. Hours of water supply for irrigation should be fixed as per local requirements.
- (ii) Groundwater extraction should be strictly monitored in NCR. Registration of all wells/bore wells of all types and their Geo-tagging shall be mandatory in NCR. The existing bore wells of all types and sizes be identified, Geo-tagged and registered by 2023 across NCR by respective States as directed by the National Green Tribunal (NGT) in its order of 25 February 2020 in M.A. No. 26/2019.
- (iii) The PMKSY's 'per drop more crop' motto should be followed and accordingly, efficiency of water use should be promoted through micro irrigation systems. Crop wise status and demand may be assessed and water budgeting should be carried out accordingly. Department of Agriculture could be approached for micro irrigation funds. Districts where currently flood irrigation is in practice, state governments should encourage farmers to explore possibilities of adopting micro irrigation systems. For increased water productivity, drip (orchards, oilseeds) and sprinkler-based irrigation systems (cereals, pulses, spices and field crops) should be preferred over flood irrigation methods. The NCR constituent states should prepare State Irrigation Plans (SIPs) and District Irrigation Plans (DIPs) as per the “Operational Guidelines of per drop more crop component of PMKSY2017 formulated by the Ministry of Agriculture and Farmers Welfare.
- (iv) For balancing reservoirs and farm ponds, use of solar pumps has been found suitable in irrigation methods, and should be adopted by all states.
- (v) Rainwater harvesting structures should be constructed in agricultural fields for providing irrigation during dry seasons.
- (vi) **Special taskforces** should be set up in NCR States for comprehending use of water for irrigation in the agriculture sector. Agriculture disproportionately being largest consumer of water (over 75 percent), its demand and supply management should be assessed separately by the proposed taskforces within one year after the approval of RP-2041.



- (vii) Irrigation departments in each State should be also entrusted with the task of monitoring water demand efficiency for agriculture and irrigation.
- (viii) Concerned departments should promote agricultural practices like hydroponics, which is dirt-free, space-saving, and water-effective method of growing without soil. Further, micro-irrigation techniques should be adopted for enhancing water use efficiency in agriculture sector in the NCR.
- (ix) States shall make efforts to reduce agricultural water consumption by 75–80% from current consumption level as part of their strategy in respective SRPs. Drip irrigation should be promoted.
- (x) **Irrigation** water efficiency should be evaluated in the rural areas.
- (xi) Concerned water management and planning departments in NCR should organize regular training programs, and awareness campaigns regarding water status, efficient water utilization, benefits and ways of **rainwater harvesting, groundwater recharge** and more income per drop of **water for agriculture** to promote water conservation and efficient water use and bring about required behavioral changes in users.

7.3.10 Drainage and Storm Water Management

- (i) Prepare & implement **Storm water Drainage Plans** for all towns.
- (ii) Localization of storm water runoff be made integral part of urban & rural development plans for recharging aquifers. States to start a drive in mission mode to **separate storm water drains from sewage drains** so that **storm water is used for groundwater recharge**.
- (iii) Efforts should also be made for groundwater recharge from storm water run-off on roads and footpaths through installation of pre-fabricated structures between road carriageways and footpaths.
- (iv) All cities and towns in NCR shall endeavour to have 100 percent coverage of storm water drains and this facility need to be extended to rural clusters where the work should preferably be completed by 2031 in a phased manner.
- (v) Phase wise five year targets for reducing ‘percent runoff’ beyond local areas should be prepared and monitoring of progress should be assessed throughout the plan period of twenty years.
- (vi) **Digital storm water management** should be promoted to help practitioners to scale up **rainwater harvesting** and improved storm water management for sustainable water management including urban flooding in the NCR.
- (vii) **No new storm water drains** should be designed in isolation and without studying the overall impact of new proposal on the existing storm drainage system.
- (viii) **Drainage issues need to be looked at from regional and sub region level** as developments in the natural drainage areas of the three water basins of NCR ultimately results in flooding.
- (ix) Ensure flood prevention through protection of flood flow zones like khals and ponds, rivers and flood water retention areas, etc.
- (x) **Promote use of Green Storm Water Infrastructure (GSWI)** in development and redevelopment of streets and land parcels so that spaces get created for infiltration of storm-water, reduce water flows, and improve water quality. Use of GSWI to capture and cleanse rainfall runoff and incorporate green infrastructure into urban storm water management systems to reduce flooding should be promoted.
- (xi) Dumping of solid wastes and carrying of sewage in **storm water drains, rivers** or into water bodies should be legally prohibited in the NCR. Adequate monitoring mechanisms including digital surveillance methods like use of CCTVs, drones, etc. with provisions of stiff penalties on defaulters should be also developed. Zero-discharge of untreated sewage in NCR rivers be ensured by 2026.
- (xii) De-silting of drains should be made technology based, involving GIS mapping, drones for monitoring, robots for clearing and unclogging with clearly laid down schedules for efficient drainage management.



The schedule of de-silting by the contractors segment-wise and jurisdiction-wise along with crucial details such as time schedules of de-silting and the amount of silts and debris removed should also be captured and displayed on departmental portals and websites (refer para 1.28 of **Annexure-P-7.1**).

- (xiii) No construction and encroachments should be allowed inside or on any storm drain and natural drain.
- (xiv) All encroachments should be removed and slums should be resettled locally. No peripheral resettlement, as is the practice today, is permitted as it destroys existing infrastructure of water and sanitation.
- (xv) Concerned authorities should ensure that the quality of water flowing through drains and falling into rivers and water bodies is allowed only if it is treated according to CPCB standards and norms.
- (xvi) Pollution levels of wastewater entering into river Yamuna through diversion drain 8, diversion drain 6 and diversion drain 2 in Haryana need special attention. Similarly, wastewater and polluted water from Panipat drain falling into diversion drain 2 entering in river Yamuna at Khojkipur should be analyzed. Only treated water (as per CPCB norms) of these diversion drains should be allowed into river Yamuna. This work should be completed in one year from notification of RP-2041.
- (xvii) Delhi has formulated **Drainage** Master Plan for NCT Delhi, using simulation modelling approach and GIS, analysing all drains of NCT for their adequacy in the present form for rainstorms of 02 years and 05 years return periods. Similar plans should be prepared for all urban areas in NCR, also considering climate change effects, and implemented.
- (xviii) **Watersheds**, sub-watersheds and micro-watersheds are identified and mapped by the CGWB. These should be utilized by concerned authorities to facilitate cities, town and villages to formulate storm **drainage** master plans, which should be also integrated with ICAPs prepared under the Rurban programme.
- (xix) **Planning of drainage** networks and land uses should be done simultaneously. No city, town and village should be developed without having requisite planned drainage networks.
- (xx) **Drainage networks** should be placed on a GIS framework following the AMRUT guidelines. It should identify the stretches of natural drainage system that are encroached and a definite plan for tackling these encroachments should be put in place. Such information should be made public for awareness and public participation to check future encroachments.
- (xxi) All natural **drain** big or small should be maintained in their natural form and any engineering interventions in such drains are discouraged.
- (xxii) Except in large agricultural tracts, the primary, secondary and tertiary storm **drains** should be covered with free flow pipes and barrels. Only trunk drains shall be kept open.
- (xxiii) Flood control measures such as flood control reservoirs and proper drainage arrangement are to be provided to minimize water logging. Further, the construction of drainage should be in such a way that there may not be hindrance in the efficient flow of water.

7.3.11 Rainwater harvesting

- (i) **Rainwater harvesting** plan should be implemented through appropriate mix of incentives and rules and should include all possible ways including roof tops and public open spaces. A brief note regarding steps taken by the Central Govt. to control water depletion and promote rain water harvesting and conservation are provided at **Annexure-D-7.3**. All efforts should be made to "catch the rain, where it falls, when it falls".
- (ii) Rural areas should be engaged in water harvesting by tapping into water from rainfall, through steps like constructing '**village panchayat ponds**' to collect water to be used for promoting animal husbandry, dairy farming, and even for irrigation in fields meant for subsistence agriculture.
- (iii) All districts in NCR are required to take appropriate steps to provide land for ground water recharge. As proposed was proposed in Regional Plan 2021, at least 2 to 5 percent urban area should be earmarked for water bodies, which would include natural as well as manmade water bodies, ponds, etc.



7.3.12 Water Management and Administration Systems

- (i) To be a water + region, “**water balance table**” for each sub region, district and towns of the NCR should be prepared, as part of each sub-regional Plans. Efforts should also be made to include these elements in Master Plans and District Development Plans.
- (ii) State level agencies should be directed by states for preparing the **Water Balance Plan** and funding for same may be sourced through Jal Jeevan Urban mission of MoHUA.
- (iii) All urban areas in NCR should be made “**100% water secured**”. In this regard, target be set in the SRPs and funds available with MoHUA in this regard, be utilized.
- (iv) **Service Level Benchmarks (SLBs)** should be decided by the States in their SRPs. These SLBs should be adopted by Master/Development Plans and funding available under Jal Jivan Mission (Urban) should be tapped to achieve the required service level benchmark.
- (v) Water ATM should be facilitated / set up in areas where piped water supply is not feasible and areas where water is contaminated due to industrial activities or waste landfills in vicinity (areas nearby solid waste management sites, saline areas, etc.)
- (vi) All states should amend the existing laws to regulate **development along rivers and natural drains** in order to maintain their natural state as well as render rivers, lakes and canals attractive.
- (vii) All four states should work on a definite timeline and prepare status reports on groundwater in their respective sub-regions. NCR States to prepare their ‘**Water Balancing Plan**’ and same be submitted to NCRPB within 02 years after publication of Regional Plan-2041. CWC and CGWB to assist and guide NCRPB in examination of Water Balancing Plan submitted by the States.
- (viii) A “**single digital platform for resolving all water and drainage issues**”, including interstate issues, should be set up.
- (ix) All sub-regions and cities should prepare map of all existing water networks and water sources along with estimates by quantifying available water.
- (x) District wise maps of water quality status should also be prepared and made available to planners and other policy makers.
- (xi) Supervisory Control & Data Acquisition (SCADA) systems should be installed for monitoring and management of water supply systems.
- (xii) Further, for comprehensive monitoring and evaluation, a separate cell should be set up in each State for water resource tapping and utilization with the aim of achieving water security in respective sub region.
- (xiii) GIS database based planning should to be adopted for integrated development of NCR in water management as well as other sectors.-
- (xiv) In order to estimate quantity of water received at various WTPs, each WTP should have water meters. For measuring the exact amounts of water received in different areas, district water meters should be installed. This will give agencies better idea about per capita water supplied on a daily basis.
- (xv) Water statutes should be amended to guarantee prescribed water quality for humans at the level of water works as well as at the level of water consumers. Water providers and distributors should be held accountable in the event of deviations from prescribed standards of BIS.
- (xvi) All districts and settlements should prepare plans for replacing and improving existing underground water distribution networks and making them leakage free to avoid large scale loss and water contamination. These plans should be implemented in a phased manner within a specified time but before 2041.
- (xvii) Under no circumstances potable water supplies should mix with treated wastewater supplies. Programmes should be devised to increase water-use efficiency in commercial and institutional sectors.
- (xviii) Implement SCADA based 100% smart **Water Metering** and **Water Auditing** across NCR.



- (xix) For water related issues like leakage, quality, etc. online labs facilities can also be explored. Testing of water should be ensured at least at main supply offtake and main supply intake points.
- (xx) **Water auditing** should be carried out to find out whether water demand was met efficiently. All major water use sectors such as domestic, agriculture and industry, and other large developments should carry out water auditing for efficient water utilization.
- (xxi) All sub-regional plans should identify water polluting activities and zones and strictly monitor for gradual improvements.
- (xxii) **District Metering** Areas could be developed by the NCR states in in each division of an urban area including the NCT of Delhi in order to reduce non-revenue water and unaccounted for water as per guidelines issued by the MoHUA.
- (xxiii) Metering of water consumption and billing by volume should be mandatory and mechanical meters should be replaced with digital meters with remote reading systems. Mechanisms for auto alerts against any tampering, leakages, deviation from quality norms, etc. should be developed and implemented. This should be implemented in all sub-regions in a phased manner by 2026.
- (xxiv) State may take initiatives towards adopting conservation pricing to ensure recovery of costs of water service maintenance, delivery, and infrastructure replacement.
- (xxv) **A High Powered Standing Committee** comprising of drinking water specialists, urban and regional planning and development experts, water engineers, and engineers working in irrigation departments of NCR states should be constituted for achieving integrated water resource management and water security for the NCR.
- (xxvi) **“Water Smart Portal”** be created for use of residents and staff to see hourly water use in their homes and facilities. Such water smart platforms should also send leak alerts when it detects continuous hourly use, allowing users to quickly resolve leaks and prevent water waste.
- (xxvii) Land Pooling areas in NCR should have their own water treatment and recycling facilities.
- (xxviii) ‘Drink from Tap’ and ‘24X7’ drinking water facilities should be implemented in all Metro and Regional Centres by 2026, inline with the initiative of Puri (Odisha). Further, efforts be made to achieve 100% urban and rural piped water supply by 2026.
- (xxix) Water roster reforms be done regarding timings to ensure water efficiency
- (xxx) Works related to water channels repair and segregation from drains should be undertaken on priority. Further, drainage segregation from sewer lines also be done and penalties be imposed for puncturing.
- (xxxi) Single authority for all drains for each city should be created to address all drainage related issues.
- (xxxii) Complete replacement to ensure earthquake-resistant joints for water supply pipes in all supply routes to the cities, and in emergency medical centers, etc. should be achieved in a phased manner by 2030. All Metros and Regional Centres to achieve this by 2026.
- (xxxiii) Multiple use of water should be adopted/promoted across NCR.

B. SANITATION

7.3.13 Sanitation and Liquid Waste Management

- (i) **Law for Private Sewage Disposal:** Dual intake and triple outlets to enable reuse/recycle of water be made mandatory in NCR by amending building bye laws for institutions, shopping complexes, malls and hotels etc.
- (ii) All large area housing societies, institutions, industries, hospitals etc. should mandatorily follow required water quality guidelines, before disposing its used water to sewerage system. This shall also reduce the load on municipal sewer and STPs.
- (iii) **Decentralized STPs** with 40-70% local reuse of recycled water facility mandatory for new group housing



and high rise construction/redevelopment. There should be zero water discharge. Only black water should go to FSTP. The target of recycled water use of 40-70% should be achieved in all Metro Centres and towns/cities with 3 lakh plus population on priority, considering that Chennai has already achieved 40% of recycled water reuse.

- (iv) NITI Aayog released a book on 'Faecal Sludge and Septage Management in Urban areas' developed jointly with the National Faecal Sludge and Septage Management Alliance. The document contains 27 best practices witnessed across several states which may be benefited from by the NCR States and local bodies.
- (v) Further, in order to promote PPP model for Integrated Solid and Liquid Waste Management. Model Concession Agreement²¹ for RfP/RfQ etc. has been attempted by NITI Aayog and the same may be used appropriately for boosting private sector participation.
- (vi) Comprehensive waste management of solid and liquid wastes for a **"Clean NCR/ Swacch NCR"** should be targeted by 2025. Functional Plan on this aspect should be published by 2022.
- (vii) **Sanitation and Waste Management Plans** for all cities/towns to be prepared in line with regional/sub-regional strategies.
- (viii) Target 100 percent **sewerage network** coverage in all urban areas/ settlements by adopting appropriate technologies. Retrofitting of existing sanitation and liquid waste management infrastructure should be carried out in all cities across NCR on phased timelines. Further, new sewerage systems be built for current gaps and future needs.
- (ix) Areas where construction of sewerage networks is not feasible, low-cost sanitation measures should be adopted.
- (x) Manual scavenging/ cleaning of machine-holes and sewers should be completely eliminated/ banned across NCR.
- (xi) All metro, regional centres, Municipal Corporations /ULBs and District Headquarters should mandatorily have 100% mechanical cleaning of all sewerage system and machines holes (erstwhile termed as manholes) by 2023 and in rest of NCR by 2026.
- (xii) Public health/ related departments may explore possibilities of introducing guided rails for moving camera and related equipment inside sewers for remote inspection and sensors to monitor flow of sewage and blockage.
- (xiii) All Master/ Development plans should earmark land for STPs/DSTPs, ETPs, CETPs, etc. For towns and large rural settlements, which do not have relevant plans, DCs/DMs of respective districts to ensure that suitable land is earmarked for such facilities/ infrastructure.
- (xiv) NCR states to develop **decentralized sanitation system (DSS)** by providing suitable incentives or subsidies, followed by semi decentralized systems and thereafter the large systems. It is proposed to promote multiple smaller STPs, which enable spreading of discharges to natural drains or water bodies and also minimize travel length of sewage conveyance and its pumping requirements.
- (xv) Replace soak pits with decentralized STPs to prevent groundwater contamination and also to help in recycling water.
- (xvi) **Faecal Sludge and Septage Management** practices should be promoted. To handle sludge from septic tanks, septage management should be considered for adoption. The **National Policy on Faecal Sludge and Septage Management** be mandatorily implemented in NCR so that this acts as deterrent for high BOD, COD and phosphorous levels in treated wastewaters meant for reuse.

²¹ NITI PPP model for Integrated Solid and Liquid Waste Management: <http://www.niti.gov.in/sites/default/files/2020-09/Bidding-Documents-for-PPP-in-Integrated-Solid-Waste-Management-and-Integrated-Liquid-Waste-Management.pdf>



- (xvii) Concerned authorities should ensure substantial improvement in the **quality of treated effluents for discharge** from sewage treatment and industrial effluent treatment facilities, so that discharged water could be safely reused or discharged into natural water bodies.
- (xviii) Sanitation programs including **Swachh Bharat Mission (SWM)** should be implemented in NCR.
- (xix) The NCR sub-regions have to adopt **ODF+ and ODF++ policy**. As per the *Swachh Bharat Mission (Grameen)* all villages, gram panchayats, and districts of sub-region should prepare necessary action plans to declare them 'open-defecation free' (ODF) and progress towards ODF ++. NCR should become ODF+ by 2023, all Metro & Regional Centers should become ODF++ by 2026 and rest of the NCR should achieve ODF++ by 2030.
- (xx) Constructed wetland treatment should be promoted for low cost, green footprints, easy maintenance and employment benefits.
- (xxi) Treated wastewater from STPs in urban or rural areas should be channelized and reused through suitable natural systems like Phytotrid Technology, which a highly efficient and structured way for treating sewage developed by NEERI.
- (xxii) Bioprocessing and biotechnology based waste and wastewater treatment should be also promoted as it uses low energy and provides more scope for energy production.
- (xxiii) Discharge norms for STPs, ETPs and CETPs should be made more stringent in order to protect water sources and new protocols should be worked out.
- (xxiv) It should strictly ensured that only treated wastewater with requisite BOD reaches the rivers like Yamuna, Hindon and Kali Nadi, etc. and other water bodies.
- (xxv) Building byelaws should be amended or formulated such that all new buildings have separate networks for grey water and should have mandatory **dual piping** both at inlet and outlet levels. Above amendments in required laws/ byelaws be ensured by 2022.
- (xxvi) Sewerage charge should be imposed on every household in all urban areas and preferably also in large villages having population of 5,000 or more in the NCR in line with the NGT order²² of 6th July 2020 for the NCT of Delhi.
- (xxvii) GIS mapping of existing sewerage systems with installed and operational capacities as well as proposed networks should be prepared and updated.
- (xxviii) Create a '**common cleanliness complaint forum**' for all water, sanitation and waste related services in each sub-region where calls are recorded, documented and followed up and tracked till satisfactory resolution.
- (xxix) Citizen audit of cleaning regarding sewerage and sanitation systems be adopted.
- (xxx) Necessary training should be provided on regular intervals for all ULBs, departments and health & sanitation workers. Public awareness campaigns should be organized at various levels for encouraging sewage connections, reuse of treated water, need for hygiene, use of low-cost sanitation methods and available latest technologies.

7.3.14 Sanitation and Solid Waste Management

- (i) Concept of '**nothing is waste**' and '**circular economy**' to use wastes as raw materials should be implemented on priority in NCR. Specialized plants can be set up in the region with state-of-the-art technologies to utilize various types of wastes as raw material, generated within and even outside NCR.
- (ii) Solid Waste treatment and disposal with 'wealth from waste' and 'energy from waste' practices should be

²²https://images.assettype.com/barandbench/2020-07/999755b9-1aa2-4a90-a8f3-623f18aae99f/Manoj_Mishra_vs_UOI__NGT_order_on_Yamuna_rejuvenation_.pdf



adopted through use of appropriate technologies and smart infrastructure.

- (iii) All local authorities should prepare a roadmap for waste management. All cities and towns should practice 100 percent door to door collection and segregation at source of solid wastes.
- (iv) Zero waste concept to be adopted by institutes, office complexes, etc.
- (v) Delhi Government is in process of setting up of TSDF for disposal of hazardous waste of Delhi at Bawana. Such initiatives should also be taken in the other sub-regions.
- (vi) Efforts be made such that 90% of waste should be re-used and only 10% should go out/ landfill site.
- (vii) Waste generation charges above a limit be considered/ set, as appropriate, for all sub-regions, as already in practice in South Korea.
- (viii) The sanitary landfill sites shall have to meet all specifications. Local authorities may prepare a timely plan for remediation and bio-mining of existing dump sites/ landfills. Toxic waste treatment facilities should be developed for Delhi as well as other NCR areas, jointly. NCR states may identify land to develop such facilities collaboratively.
- (ix) State Pollution Control Boards may need to ensure that there is sufficient capacity for treatment of biomedical waste being generated in the NCR. If required setting up of new Common Biomedical Waste Treatment facilities should be supported.
- (x) Waste prevention techniques of 4 Rs i.e. Reduce, Recycle, Reuse and Recover should be adopted for making the NCR a '**Zero Waste NCR**' by 2035. Some of global examples of Wastes Taxing are provided at **Annexure-D-7.5**.
- (xi) Implementation of **Swachhta Survekshan** parameters should be ensured in NCR and 07 star rating against 'Garbage Free Indicators' of SWM-Urban of MOHUA should be achieved by all metro centres by 2023 and all regional centres & urban areas with 01 lakh and above population by 2024. Rest of the areas in NCR should achieve 03 star rating by 2025.
- (xii) SRPs should set targets for SWM and **zero legacy waste** by targeting 90% recycling and local management by 2022-23 in all Metro centers, by 2023-24 in Regional Centers and by 2024-25 in all Sub-Regional centers.
- (xiii) To address **legacy waste** issue on priority, the Standard Operating Procedures (SOP) of CPCB for implementation of bio-mining and bio-remediation of legacy solid waste, as per direction of NGT²³ should be mandatorily adopted in all cities/towns and large rural settlements (with 2000+ population as per latest Census) by 2025. A brief on Legacy Waste guidelines is given at **Annexure-D-7.6**.
- (xiv) Efforts should be made to ensure that both organic waste and C & D waste does not go to the landfill site, which shall lead to considerable decrease in requirement of land for landfill sites. A mechanism should be devised for handling and managing surplus wastes at district, sub-regional and regional level. State government /agencies may enter into partnerships and come forward to take care of surplus compost, C & D waste etc., and this will encourage others and public in general to follow.
- (xv) Material recovery facilities should be set-up in each ward of cities/towns. At least one material recovery facilities should be made mandatory for each village.
- (xvi) Adopt '**Pay-as-you-throw policy**' whereby consumers have to pay for volume of garbage that they generate and nothing or a minimal fee for recycling. Further, develop a structure to provide incentives to citizens for recycling.
- (xvii) Authorities and ULBs may utilise plastic wastes to create '**eco-friendly tiles**' and other construction materials.

²³ https://greentribunal.gov.in/sites/default/files/all_documents/Orders_in_Compliance_of_Municipal_Solid_Waste_Management_Rules-2016.pdf



- (xviii) Efforts be made to create '**pockets of excellence in waste management**' in industrial areas, gated complexes, food grain mandis, dairy colonies, institutional areas, medi cities, residential colonies, etc. so that other areas may learn and implement accordingly.
- (xix) For promoting sustainable and environment friendly composting of natural organic wastes, different composting options like NADEP method, Bangalore method, Indore method, Vermi Composting, Biogas Technology, Rotary drum composting, etc. should be explored and implemented.
- (xx) Livestock excreta/dung disposal units like vermi compost, biogas plants, etc. should be encouraged in all settlements, for which possibilities be explore to set up 'Gobar Kharid Kendra' across districts. Commercial selling of compost/vermi composting should be adopted & promoted.
- (xxi) On-site composting should be made mandatory for all mega events, fairs, festivals, etc. Further, for all religious places in the NCR, segregation and recycling of waste at source should be mandatory.
- (xxii) Further, initiatives should be taken by Authorities/ ULBs for providing home composting kits to bulk waste generators producing 50-100 kg of waste per day, which may include hotels, hostels, educational institutions, gated communities and function halls.
- (xxiii) '**Create market linkages for compost**' in order to incentivize households that are treating wet waste at source through composting.
- (xxiv) Computer/electronic waste management to be provided for. Details on the same are provided in waste management section of Environment chapter.
- (xxv) In order to address NIMBY syndrome, efforts should be made for beautification of waste management sites/ waste clusters so that such areas can become a picnic spot, public space, etc.
- (xxvi) Adopt and promote 8Rs approach i.e. Rethink Your Choices, Reduce Consumption, Refuse Single Use, Reuse Everything, Refurbish Old Stuff, Repair Before You Replace, Repurpose should be Creative and Recycling, amongst all stakeholders.
- (xxvii) Prohibition on open burning of waste/garbage to be strictly enforced on ground.
- (xxviii) All Ragpickers or erstwhile waste collection workers should be mandatorily equipped with basic safety gears, which may include gloves, helmet, etc. and. They should be properly trained and provided with necessary **medical insurance**.
- (xxix) GIS based database creation should be done for entire process of solid waste generation, collection and disposal (sources as well as final disposal points, including landfill site and segregation plant).
- (xxx) Authorities/ULBs should explore possibilities for deploying and maintaining smart infrastructure like capacity sensors in waste bins, wireless networks for data transferring, etc. All cities/ towns in NCR may undertake IT initiatives on lines of smart cities guidelines of MOHUA.
- (xxxi) More 'Waste Treatment Plants', 'Waste to Energy Plants', etc., should be installed based on wastes generation capacity at local/ district level.
- (xxxii) Promote multiple smaller SWM processing sites based on biodegradation of organic waste. NCR states / agencies may take up incubation models for 50 and 100 TPD SWM modules based on biodegradation of organic waste.
- (xxxiii) Privatization of waste management sites and commercialization of waste management should be promoted.
- (xxxiv) CSR participation should be promoted and supported as it can help in the process of switching from garbage dumping to bioprocessing. '**CSR Portal for NCR**' be considered.
- (xxxv) To evaluate systems' performances against stipulated norms, information regarding sanitation and SWM should be uploaded on **Web Portal** for public participation with monitoring and feedback facilities.



7.3.15 Major Proposed Projects and Implementation Strategies

- (i) All concerned authorities in the NCR should adopt source reduction or waste prevention. Waste management related rules (amended from time to time) like SWM Rules, 2016; Plastic Waste Management Rules, 2016; Construction & Demolition Waste Management Rules, 2016; Hazardous and Other Wastes (Management & Trans-boundary Movement) Rules, 2016; E-Waste Management Rules, 2016; Bio-Medical Waste Management Rules, 2016; etc., should be implemented by all ULBs/ authorities in NCR. Time frame provided under Rule 22 of SWM Rules, 2016 should be followed.
 - (ii) Target of 100 percent guarantee of **‘water quality at water works’ and ‘water quality at consumer end’** should be achieved in a phased manner in next 5 years i.e. by 2026 in all cities and towns and in all rural areas across NCR by 2031.
 - (iii) States should adopt the Model Groundwater Bill, 2017 and enact suitable groundwater legislation and regulate and control development and management of groundwater across NCR by the end of 2021.
 - (iv) Model Building Byelaws, 2016 of MoHUA recommend **rainwater harvesting** for all types of building of plot size of 100 sqm or more. Further, all building having a minimum discharge of 10,000 litres and above per day shall incorporate wastewater recycling systems. These byelaws should be made mandatory across the NCR. Implementation of these byelaws should be ensured across the NCR by 2025.
 - (v) Earmarking of flood plains be carried out by the NCR participating states in their respective sub-region as being in NCT Delhi.
 - (vi) Explore usage of existing abandoned dry canals for laying pipelines etc. so as to avoid extra cost of land for fresh water related projects. Suitable measures be taken in this regard and an action plan be prepared and incorporated in the Sub-Regional Plan-2041 of each sub-region.
 - (vii) Implement reuse of wastewater, double piping in all projects and rain water harvesting in all urban areas.
 - (viii) Annual star rating of cities, towns and rural areas in the NCR should be done mandatorily for Swachhta on the lines of Swachh Survekshan by MoHUA. Swachh Survekshan should be done every 6 month in the NCR. On the line of states like Chhattisgarh, the NCR states should come up with schemes for Gobar Kharid Kendra.
 - (ix) Key identified projects envisaged to be taken up in NCR related to Water, Drainage and Sanitation sector, but not limited to, are given in **Appendix 13.2**.
- 7.3.17 Certain suggested policies related to Water, Drainage and Sanitation sector alongwith other policies which could also be elaborated/ detailed out in Sub-Regional Plan and local level plan like Master/ Development Plans, etc., are given in **Annexure-P-7.1**.



8. URBAN REGENERATION - HOUSING AND HABITAT

8.1 EXISTING STATUS

- 8.1.1 Rapid urbanization and white-collar migration is expected to ensure strong growth for the commerce in the NCR, which in turn will increase residential demand. Further, the traditional concept of luxury housing in the suburbs will also witness a major shift affected by the demands of the new age home buyers. The luxury housing will evolve to accommodate a holistic and elevated living experience that the developers will have to incorporate. With concepts like 'Housing for All', affordable housing will continue to be the key growth driver and sub-urban cities will get more traction. Simultaneously, focus shall have to be shifted towards specific housing requirement such as those for neglected, differently abled, elderly, etc.
- 8.1.2 The concept of 'Co-living' is gaining widespread acceptance. This trend is giving impetus to an organized rental market in cities across the country, including NCR as well, in the same way as co-working spaces did for shared office space. The rise in gig economy has led to high demand in co-working spaces in large cities. This trend is expected to grow in the coming decades.
- 8.1.3 For improved quality of life in NCR, concerted efforts would be required to achieve a "Liveable", "Happy" and "Inclusive" region. As one solution cannot fit all, different cities, towns and villages would be required to be treated differently as per the demand and future requirements.
- 8.1.4 According to Census of India 2011, there were around 1.06 Crore households in NCR while the number of houses primarily used for residential purpose were about 97.7 lakhs. Further, about 15 lakh houses were lying vacant, about 3.6 lakh houses were in dilapidated condition and around 1.09 Crore total dwelling units were available for residential use. While the urban housing surplus in urban areas of NCR was about 5.45 lakh, the rural areas had rural housing shortage of about 2.54 lakh i.e. about 1.59 lakh in Uttar Pradesh sub-region & about 1.16 lakh in Haryana sub-region. Hence, there was net housing surplus of around 2.9 lakh houses in the region. The percentage of dilapidated houses was more in the rural areas of the NCR (about 55%). In terms of ownership, it was found that about 79 percent of the houses in the NCR were self-owned while 18 percent were rented. The housing scenario of NCR is given at **Annexure-D-8.5**.
- 8.1.5 Delhi has almost 110 lakh population residing within core areas while urban extension areas have another 30 lakh population. As per MPD-2021, 42% of residential allocation is in group housing. Beside there are a large number of temporary shanties or 'jhuggies' or slum pockets in various towns of the NCR (refer **Figure 8.1**). As per Census 2011, about 7.4 percent of the total population of the NCR live in slums. As of 2019, there are approximately 200 slum pockets in the NCR.
- 8.1.6 In Delhi, land owners/group of owners can pool land parcels of any size for development as per prescribed norms and guidelines of the Master Plan. The Land Pooling Policy for Delhi mandates that in each land pooled parcel, 60% of the land is to be developed by land owners/consortium for residential, commercial, partly Public Semi Public (PSP) land uses and balance 40% is to be used for various city level infrastructure requirements including roads, greens, public-semi-public (PSP) facilities, development of utilities i.e. water, sewerage, electricity etc. with involvement of private sector.



Figure 8.1: Urban areas with slums



- 8.1.7 Major objectives of the National Housing and Habitat Policy (NUHHP), 2007 are:
- facilitating accessibility to serviced land and housing for EWS and LIG
 - land assembly, development and disposal to be encouraged by both private and public sectors
- 8.1.8 National Urban Rental Housing Policy (2015) has been formulated by MoHUA with the vision to create a vibrant, sustainable and inclusive rental housing market in India. The policy targets the shelter for the homeless, social rental housing, need based rental housing (for migrants, working men, students etc.) and market based rental housing (employees of ULBs/State/PSUs/NGOs etc.). Further, some global examples for encouraging affordable housing in London (Built to Rent Model) and Sydney (Affordable Rental Housing Strategy) are also provided as **Annexure-D-8.4**.
- 8.1.9 National Urban Policy Framework (NUPF), 2018 is an integrated and coherent approach formulated by MoHUA towards the future of urban planning that could be an Opportunity for course correction. In addition, the national housing policy clearly articulates the difference between affordable and social housing.
- Social Housing- For these homes, full financing is made available to vulnerable segments of society that meets the eligibility criteria set up the govt.
 - Affordable Housing- Cost is benchmarked at rates deemed as 'affordable' by the government. These rates vary in accordance to the real income structure of the concerned area.
- 8.1.10 Different agencies and countries have defined "affordable housing" as the economic potential of an individual to buy a house. In India, the Reserve Bank of India (RBI) had tweaked the affordable housing definition in July 2014. According to RBI the cost of a house now could be INR 6.5 million and INR 5 million in the metros and non-metros respectively, to be qualified as affordable housing. A brief note on different views about Affordable housing, its definition and elements is at **Annexure-D-8.3**.
- 8.1.11 The National Real Estate Development Council (NAREDCO) under the MoHUA in 1998 is mandated to induce transparency and ethics in real estate business and transform the unorganized Indian real estate sector into a mature and globally competitive business sector.
- 8.1.12 Real Estate (Regulation and Development) Act, 2016 (RERA Act) is considered as one of the landmark legislations. Its objective is to address grievances of buyers and to bring transparency and accountability in country's real estate sector. This is in line with the vast and growing economy of India as in future many people will be investing in real estate sector.
- 8.1.13 The Pradhan Mantri Awas Yojana (PMAY) Housing for All has also been implemented in the towns of NCR. PMAY (Urban) launched in 2015 in mission mode aims to provides housing in all urban areas by 2022. It provide Central assistance to implementing agencies for about 1.12 Cr. houses through four verticals or options. One of the options is in-situ slum redevelopment with private participation using land as a resource where extra FSI/ TDR/ FAR is given if required to make the project financially viable. Another option is affordable housing in partnership with private/ public sector where 35% of constructed houses are of EWS category. Similarly, the PMAY (Gramin) aims to provide pucca house with basic facilities to all houseless or kachha/ dilapidated householders by 2022. A brief note on Govt. initiatives in NCR is at **Annexure-D-8.1**.
- 8.1.14 To promote private investment in housing sector, Government had allowed 100% FDI in housing sector and the budget (2014-15) has gone one step further in this direction by listing slum redevelopment as an accepted component under the Corporate Social Responsibility (CSR) to attract more private funds.
- 8.1.15 In various sub-regions of the NCR, the policies and programmes for new housing provision and slum improvement by the respective state governments is given at para (B) of **Annexure-D-8.1**.
- 8.1.16 It must also be noted that the NCR also has many unauthorized colonies / land sub-divisions being undertaken by people who are not in a position to afford the formal housing supply systems. This is a huge and



affordable informal housing market.

- 8.1.17 Considering land acquisition as an expensive, tedious and time consuming affair, new/ innovative models for development like Redevelopment, in-fill development, land pooling, Town Planning Schemes (TPS), Joint Development, Transferable Development Rights (TDR), Private Land Pooling model, etc. are other emerging alternatives for the development of housing and related infrastructure. A brief note about some of the major Land Supply Models being followed in India is given at **Annexure-D-8.2**.

8.2 KEY ISSUES AND CHALLENGES

- 8.2.1 Although, as per Census-2011 there was an excess of housing in urban areas of NCR and substantial number (15 lakh approx.) of houses were vacant, affordability remains a major concern. Further, while there is currently an excess of supply in urban areas and a shortage in the rural areas, the situation by the year 2041 would demand additional housing in both urban as well as rural areas and therefore, the agencies concerned need to gear up to the projected demand for housing, in terms of size, as well as location and affordability.
- 8.2.2 Huge population growth despite past efforts in 10-15 years to shift out offices, industries, etc. from Delhi is one of the concerns.
- 8.2.3 While urban housing shortage in India has come down from 18.78 million units in 2012 to 10 million units in 2019, the issue related to urban housing shortage continues to be a major challenge. Most of the housing shortage (over 95%) lies in the Economically Weaker Section (EWS) and Lower Income Group (LIG) segment.²⁴
- 8.2.4 India is expected to gain a staggering 218 million people in its urban areas from 2011 to 2030 (United Nations 2012)²⁵ which will increase pressure on the existing housing infrastructure and demand for new.
- 8.2.5 The Royal Institution of Chartered Surveyors (RICS) & Knight Frank report, 2019 estimated that there will be demand for 25 million additional affordable units by 2030.²⁶ However, to address the huge demand, a subsidy-based approach may not be enough for maintaining sustained growth in the affordable housing segment. An analysis of the demand-supply shows, that on an average, nearly 0.6 million homes are required every year in the top eight cities (including Delhi) against supply of 0.2 million units per year. There is a huge supply gap for urban housing and more so in the EWS and LIG category.
- 8.2.6 Large scale unauthorised land colonization continues to be a major concern. Since it is more affordable as compared to the formal supply, demand for the same is high and flourishes on account of a lack of strict controls.
- 8.2.7 The Lal Dora and extended Lal Dora in Delhi and surrounding areas in NCR like Haryana etc. continue to present a chronic problem of disorganized development in the NCR.
- 8.2.8 Urban villages – The existence of more than 300 urban villages within Delhi presents an anachronism and a planning challenge in Delhi. Situation is compounded by presence of multiple (16) land owning agencies in Delhi and ambiguity in their categorization and land ownership details.
- 8.2.9 Availability of water for potable and non-potable uses is often quoted as a reason for non-allowance of higher FAR in Delhi. The problem of water availability is genuine however, instead of restricting FAR and building heights, other practical coordinated solutions are urgently required and critical for future growth of Delhi.

- 8.2.10 FSI/FAR along with other factors, such as maximum building heights, set-back requirements, plot-coverage

²⁴ <http://www.businessworld.in/article/Additional-25-Million-Affordable-Units-Will-Be-Required-By-2030-Reports/05-08-2019-174391/>

²⁵ <https://www.pdpu.ac.in/downloads/SPM-JEM2020Chapter4.pdf>

²⁶ <https://content.knightfrank.com/news/13251/6506-article-1.pdf>



ratios, and minimum parking requirements are aspects to be dealt with carefully as they often impact the efficiency with which households and businesses are able to make use of available land. Efficient functioning of land markets is further hampered by weak systems for appraising land values, determining property rights, and conducting public land acquisitions.

- 8.2.11 Large construction workforce - NCR attracts a very large construction workforce, mostly migrant labour, however, shelter provisions for them are minimal. Towns with proximity to NCT Delhi, like Gurugram, Faridabad, Noida, Greater Noida, Ghaziabad, Bhiwadi- Neemrana, etc. and two major industrial belts (Noida & Greater Noida and Manesar-Bhiwadi-Bawal-Daruhera & Rewari) are hubs of industrial and commercial activities while Rohtak, Meerut, etc. are developing as Institutional hubs. These cities are attracting a large number of workers, students and young singles that need shelter in terms of one room accommodation with good transport facilities. Further, housing for the elderly people and other special groups is another aspect which needs attention.
- 8.2.12 Redevelopment - Core areas and substantial housing stock of cities/ towns like Delhi, Gurugram, Faridabad, Noida, Ghaziabad, Meerut, etc. across NCR are getting older (more than 50 years) and need redevelopment and refurbishment. Currently, most of the redevelopment is being undertaken by individual families on bungalow plots. Estimates indicate that redevelopment can help cater about 40% of the housing demand of Delhi. For example, out of total area of Delhi of 1483 sq. kms. The urban areas of Delhi in 2005-06 was 290 sq.km, thereby the area of rural Delhi stood at 558 sq. km i.e. 37.65% The population share in rural Delhi is much less than the urban part of Delhi.
- 8.2.13 Land requirement to meet future housing needs is a major concern as there is limited access to suitable land banks for affordable housing projects. For example, in Rajasthan sub-region about 2.97 lakh dwelling units (DUs) are estimated to be required till 2031 with land requirement of around 9758 Ha. by 2031 to develop the required housing stock.
- 8.2.14 There are numerous difficulties and delays in land acquisition for housing and other provisions. Land acquisition for RoW for utilities and for major transportation projects has also led to avoidable delays. Further, the land pooling model has not been adequately explored and it is felt that the same be adopted in the NCR.
- 8.2.15 Construction practices - Predominance of conventional construction practices that result in delayed progress in urban areas and the limited use of prefabricated and pre-engineered materials. Further, there are insufficient numbers of trained masons despite the operation of the Construction Sector Skills Development Council since 2013.
- 8.2.16 Completion of unfinished projects and filling up of vacant housing is a major challenge and the governments concerned, along with the respective RERAs and the Ministry of Finance, Government of India should consider strategies to achieve resolution of the same.
- 8.2.17 Further, the authorities continue to give permission as and when developer comes, often with little consideration to city scenario as a whole while creating lopsided development is a matter of concern. Certain completed residential apartment projects have negligible occupancy due to lack of 'last mile connectivity' in terms of public transport and unavailability of basic support system. Number of housing projects/ units are lying vacant and unsold due to various reasons.
- 8.2.18 Lack of revenue - Despite Urban areas being responsible for generating close to 70% of revenue, not much of it is being shared with the ULBs. Only about 1% share of GDP is spent by ULBs in India compared to 10% share in other comparable countries. Lack of revenue disables the ULBs to work effectively. ULBs also have capacity constraints to formulate and design mass housing projects. Continued rise in the number of slum dwellers is a resultant issue that needs to be tackled efficiently.



8.3 POLICIES AND PROPOSALS

A. General

- 8.3.1 The global experiences prove that great agglomerations of populations which are adequately served have very dense and very high rise buildings, adequately planned with green spaces, ventilation, amenities and provision of major services and facilities close by. The population projections by UN for Delhi-NCR, clearly warrant a similar strategy for Delhi and NCR.
- 8.3.2 Urban **Regeneration** of global standards is proposed for a paradigm transformation of future NCR, considering that NCT Delhi had a density of 11,320 persons per sqkm as per 2011 Census which is projected to grow to 13,798 persons per sq km by 2021, 16,897 person per sq km by 2031 and 20,770 persons per sq km by 2041.
- 8.3.3 Entire NCR has got ample potential for the development of green field townships. These townships can not only help in taking pressure out from Delhi and other major cities but can form nuclei of future polycentric development. These new green field townships can be specialised townships like medi-cities, tech-cities, edu city, entertainment cities with multiple theme parks, etc.
- 8.3.4 **Sub-Regional Housing Action Plans** - The concerned departments in the sub regions need to assess local housing market conditions, by tenure, including assessing housing supply, demand and affordability and prepare district wise Housing Action Plans. The housing typologies and densities should result in compact, walkable neighborhoods & plazas, continuous cycling tracks related to public transportation. Different cities, towns and villages should be treated differently for their demand and future requirements.

B. Planned Housing along Transport (TOD) Corridors

- 8.3.5 In NCR, housing projects should be planned and developed to address the requirements at agglomeration level and not limited to the specific city or town. These projects should involve building of adequate housing units in urban and rural areas and provide every family with a pucca house, with piped water connection, 24x7 electricity supply & access and toilet facilities, etc. States may identify the preferred locations/ areas of its population for residing and general public tendency in this regard and develop such areas on priority. Areas beyond Gurugram, Faridabad, Rewari, Ghaziabad, Meerut, Hapur, Rohtak, Panipat, etc. and along transport corridors like Metro Rail, RRTS and Expressways could be looked at for future housing projects so that housing and transportation are interlinked. Transit Oriented Development (TOD) with incentives would go a long way in creating projects which are easily accessible and will get occupied quickly.
- 8.3.6 **Transited Oriented Development (TOD)**-To leverage Optimum use of high volume transport corridors like expressways, highways, mass transit railways, Metros/RRTS/ORCs, etc. and to ease the cost of feeder transport system, many countries have made provisions which not only encourage but mandate, construction of all new residential, institutional, office complexes within the designated distance from such mass transit corridors. For example Hong-Kong has significant housing, office and commercial spaces within 500 mts radius of the mass/rapid transit corridors. MoHUA has also notified a TOD policy. NCR region has a large metro network and plans to have many RRTS corridors in future. Hence it is proposed that all the transit corridors and transit nodes shall be the axes of urban densification. Intensive development with high FAR, mixed land use, exemption from height restrictions, if any, shall be permissible in entire NCR along such high volume transit corridors and TOD nodes and land be reserved for planned industrial and intensive development activities.
- 8.3.7 As the population in housing pockets evolves, the amenities provided must also respond to meet their changing needs. Housing supply needs to be in the right areas and should be of the right type while taking into consideration unique character of local neighborhoods. New towns need to be planned and designed with technology as enablers to bring convenience and nature closer to residents, for their well-being.

C. Efficient Use of Land and TDR



- 8.3.8 Since land is in limited supply and is further constrained by challenges of acquisition, forest resources, etc., it is imperative that the available land be used to the optimal level. For this, high densities need to be promoted. Further, lands lying idle with various sick/loss making public sector undertakings (PSUs) of the central/ state governments may be used for affordable housing projects under **‘Housing for All’**
- 8.3.9 Development rights can be used in a very structured yet imaginative manner. **Transfer of Development Rights (TDR) should be permitted in NCR so that people who cannot develop land at a certain place can transfer development rights to another place. Further these Transferable Development Rights should also be saleable to others to ensure optimum utilization of FAR/FSI /TDR provisions.** Each sub-region should have a policy for TDR and the same should be implemented by the all concerned stakeholders in order to ensure the optimum use of land.
- 8.3.10 In view of the difficulties associated with conventional land acquisition for housing provision, alternative methods of land assembly may also be adopted simultaneously so as to implement projects in a timely manner.
- 8.3.11 The Gujarat Town Planning Scheme (TP Scheme) approach with Local Area Plan system (LAP) can also be useful and fruitful in NCR. Land Pooling Models should be developed and adopted in various towns of the NCR. Local Area Plans should be prepared for larger city parts using TDR, high FAR, realistic controlled norms along with choice of area with respect to setbacks or open courtyard areas inside the structures.
- 8.3.12 Natural /heritage areas should be viewed as per their intrinsic values and conservation of such areas be incentivised based on market principles. Conservation TDRs for heritage and natural areas be permitted to both public as well as private properties.
- 8.3.13 Urban governance reforms are also required to alleviate the challenges to achieving the goal of ‘housing for all’ by 2022-23. Separate land conversion permission shall not be required for residential construction if conversion charges are paid in areas marked for residential purposes in master plans. Mixed land use provisions shall be permissible upto 1-2 kms (distance as decided by master plans) around educational and medical hubs, tourist sites and in all parts of all cities below one lac population as per 2011 census and in all old parts of all larger cities to ensure rational development norms and to reduce citizen hardships. Mixed use and also liberal FAR should be allowed for an organized development of such facilities in such areas around educational/health hubs and tourist sites.
- 8.3.14 The provisions of FAR/FSI should be utilized efficiently so as to avoid further land acquisitions. A mechanism should be evolved for each sub-region to ensure proper utilization of FAR/FSI and no fresh land acquisitions should be proposed/undertaken for developments, until the FAR/FSI norms are fully utilised.

D. Affordable Housing

- 8.3.15 For achieving **‘end of homelessness’**, better quality of housing and safe liveability in the NCR, necessary steps have to be taken to create affordable housing by creating conditions for emergence of appropriate size, quantity and price of supply in a balanced manner, along with all support physical and social infrastructure, across the region. NCR participating Governments should encourage and facilitate affordable housing development through measures such as reduced parking requirements, streamlined and prioritized approval processes, below market rate leases for publicly owned property, and fiscal measures.
- 8.3.16 In Indian context, one of the four options of PMAY (U) allows extra FSI/ TDR/FAR for project viability to private developers using land as a resource for in-situ redevelopment. Whereas the financial support from the Govt. is permissible for affordable housing option in PMAY (U), it is suggested that since cost support through interest subsidies or financial assistance have a higher financial implication than permitting extra FSI or extra FAR, hence, at least for NCR area extra FSI or extra FAR should be made available for both public/ private developers to provide for affordable housing in NCR, provided these high rise building are



made on a net zero discharge model with decentralized dedicated STPs on site with dual inlet and dual outlet networks for water/ sewerage and mandatory usage of locally recycled water for flushing purposes; **it is notable that water utilised for flushing purposes in domestic areas constitutes about 50% of total water consumed for domestic purposes.**

E. Rental Housing

- 8.3.17 NCR is one of the most important economic growth engines, attracts huge number of migrants. These migrants will need place to stay as they are important for economic growth. In order to address housing need for migrants, rental housing market should be developed instead of ownership based housing model.
- 8.3.18 NCR participating States should launch Rental Housing Schemes for NCR area. The effort should also be supported through CSR activities and those benefitting from such facilities. Affordable Rental Housing Complexes (ARHC) scheme and Model Tenancy Act, 2021 of the MoHUA, GoI should be implemented.
- 8.3.19 Supply of affordable rental units for households with low or low to moderate incomes should be supported through policies, such as density bonus provisions like FAR, TDR, inclusionary zoning or other mechanisms, particularly in areas that are well served by transit. Concessions on property tax could be given to encourage people to offer their properties on rent. Aggregators for different kinds of rentals need to be encouraged through appropriate policy measures.
- 8.3.20 Local Bodies/ Development Authorities should earmark and arrange land for effective and efficient rental housing in the form of hostel/dormitory at an affordable rate and there should also be a provision of basic services like food, adequate toilets, bathrooms/washing spaces, safe drinking water, crèche and recreational spaces etc.

F. Vacant Properties Portal

- 8.3.21 A portal for vacant properties including houses, flats, office spaces, etc., should be made for each urban area and town/ city in NCR. Survey for vacant properties should be undertaken and non-occupancy of such vacant houses should be discouraged. All the Development Authorities, ULBs, para-statal PSU/ agencies and all the developers/ agencies registered with RERA and Authorities/ ULBs of the States should register and provide details of their vacant properties. This portal should be made at each sub-regional level and could be linked with NCR portal for vacant properties. This will help in easy identification of vacant properties. This portal should have details of super areas, built up area, carpet areas along with rate and stage of completion and readiness for possession, details of the last rental, etc. These portals could be managed by the respective District Magistrates and supervised by local development authority/municipal body/SDM. A system of third party verification of the properties listed on this portal should also be there. This will facilitate market intelligence about available rental spaces and can also act as an aggregator for rental offices space, rental houses, rental commercial spaces, etc. and will boost ease of business and economic development in NCR.
- 8.3.22 **Common Rental Pool: This shall be an integral part of the Vacant Properties Portal.** Housing properties, both government and private, be put in Common Rental pool, if not rented/ occupied in five years. The respective Municipal Corporation, Development Authorities, Housing Boards etc. may take up this aspect and monitor it, as applicable.

G. Slum Improvement and Low Income Housing: Towards Slum Free NCR

- 8.3.23 Specific mapping of all slums in NCR and action plans to convert them into modern redeveloped areas through TDR, PMAY, etc. shall be prepared by States in their SRP and its implementation in a time bound manner. All existing slums in Metros and Regional centres of NCR shall be replaced with redeveloped areas by 2026 on priority. Other NCR cities shall ensure this by 2028. NCR should be made **slum free**. It is proposed to be achieved by using the TDR tool and reserving 10-15% of developed land area or 20-25% of FAR whichever is more for EWS and LIG. The PMAY scheme if extended should be considered alongwith



innovative use of non-financial instruments like TDR with LAP/TP schemes.

- 8.3.24 In NCR about 97,376 dwelling units were constructed, 82,911 were under construction and 3,90,806 dwelling units were proposed to be constructed for households, as on January, 2021 under PMAY (refer **Table 8.1.1** of **Annexure-D-8.1**). However as per Census 2011, slum population of NCR was about 43,22,468 (i.e. about 8,64,493 households) which indicate a gap of about 3 lakh houses ($8,64,493 - 5,71,093 = 2,93,400$) required for making NCR slum free as per 2011 census or to avoid new slum population/pockets in NCR. In this regard, a special scheme like **‘special PMAY’ for NCR** can be considered.
- 8.3.25 Complete the social housing system by providing low-rent housing, public rental housing and resettlement housing, etc. Low-income housing should account for 8%-10% of all housing across each city/ town in NCR. Adequate reservations need to be made in housing projects so that ‘small size-low price’ housing is created for the low income families.
- 8.3.26 ULBs/ Authorities should identify the slum areas and prepare in-situ development scheme or alternatively earmark required land where rehabilitation of slums could be carried out and initiatives be taken accordingly. For in-situ Slum redevelopment, MoHUA funds can be sourced apart from imaginative use of non-fiscal resources like TDR, higher FAR coupled with LAP, TPS, etc. States should make necessary amendments/ provisions for providing rebates for social housing and mixed use residential developments. Necessary framework for land readjustment/ pooling to enable mixed-use development shall be created.
- 8.3.27 Unauthorized colonies, slums, Jhuggi-jhopari clusters, in Delhi and other parts of NCR should be redeveloped. Voluntary redevelopment shall also be allowed and similar TDR and FAR facilities be given in these projects.
- 8.3.28 States may come up with collaborative programme with agencies/ organization like ULBs. Development Authorities, Housing Boards, DUSIB, NBCC, NHB, HUDCO, RERAs, BMTPC, NAREDCO, CREDAI, etc. and should develop social housing in NCR via multiple channels. Such collaborative plans for social housing should be prepared/ developed by 2023 and implemented across all NCR Metros and Regional centres by 2026. .
- 8.3.29 Further Transfer of Houses allotted to weaker sections should ideally be banned, and be considered void if still done. However, it should be ensured that in case the transfer does happen and is to be allowed, it should only be considered only for persons of weaker section. Special provisions be made at the point of registration. Such efforts shall help in achieving envisaged benefits of housing for all. NCR States may bring out necessary laws/ rules in this regard, if needed. Idea is to discourage transfer and/or usage by non-targeted sections of infrastructure specifically created for weaker section.
- 8.3.30 Each sub-region should take strict actions against unauthorized colonization; illegal shelter consolidation and proliferation of slums. Alternative housing units should be provided to people affected from infrastructure expansion projects like road widening, new roads, etc. providing these DUs within the same area or nearby or direct compensation based on consultation.

H. Housing for Industrial and Construction Workers

- 8.3.31 In industrial areas of the NCR like Noida, Greater Noida, Manesar-Bhiwadi-Bawal-Daruhera, Rewari, etc., shelter arrangements for industrial workers/ labourers should be made by the concerned authorities/ agencies locally, to avoid proliferation of slums. Land could be allotted to large industries and they could be encouraged to develop housing for their own employees/workers so that they can stay close to their place of work and thereby reduce work commute and increase productivity. Land use for industrial plots should also have provision for residential and other support services within the plot.
- 8.3.32 Construction Workers Fund under the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 should be used for acquiring lands/dwelling units for workers. Also,



the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979, as in-force, should be duly adhered to. This fund should be utilised for constructing housing facilities for construction workers which are prominently the migrants. The utilisation of this fund should be monitored by State RERA or the State Labour Departments, acting through the District Magistrate. The housing size for the construction of houses can be upto 30 sq. mt. or as per the EWS parameters of PMAY (Urban). Such constructions can be carried out through private developers under strict supervision.

8.3.33 Affordable Rental Housing Complexes (ARHCs) should be encouraged and funds of MoHUA may also be utilized for workers housing wherever possible.

8.3.34 The respective ULB/ authority, in coordination with Migrant Facility Centers (MFCs), should maintain a detailed account of construction workers with Aadhaar based skill mapping and temporary shelter to these construction workers and their families should be facilitated at local level as per the requirement. Strict compliance from the contractor side, who is hiring/ bringing the construction workers, should be ensured by the respective ULB/ Authority in NCR

I. Institutional Housing

8.3.35 All institutions across NCR should create the required housing facilities preferably on their institutional plots so as to cater to their various housing needs through residential apartments, hostels and transit housing, etc. About 15-20% of the land allotted to the institution shall be eligible for residential use for all people working or studying in such institutions. Residential use should be permitted along with the institutional uses so that walk-to-work facilities could be developed and facilitate housing opportunities for students and workers within 15 minutes of the precinct, by 2025.

8.3.36 **Housing for Special Groups:** (Students, Single Men/Women Workers, Elderly, Terminaly ill, Specially abled) – There are many special requirement groups such as students, single workers, elderly, hospice, terminal care homes, supported housing, assisted living homes, retirement homes, etc. who have specialized requirements. Projects should be developed to have these components, either on ownership or rental basis, as may be feasible, with suitable concessions. Non-financial incentives form Govt. like extra FAR/ extra FAR could be considered for these groups. **Special rates of land for such disadvantaged and vulnerable groups with appropriate Service Level Agreements (SLAs) should be considered across all Metros and Regional Centres in NCR for fair and transparent service delivery.**

J. Redevelopment & Upgradation

8.3.37 The residential, commercial, industrial and institutional requirements for the largest human agglomeration on earth in the next 10 years, clearly require a massive redevelopment of the Delhi and NCR urban areas since land is a limited resource. This may be achieved by the following strategies:

(i) Floor Space Index (FSI)/ Floor Area Ratio (FAR) are non-financial instruments available with govt. to encourage development in required uses in any spatial area. These should be used imaginatively in NCR to meet future multifarious requirements. While provision of utilities like road, electricity, etc. is comparatively easier the utilities like water supply, sewerage present a larger challenge. These twin challenges of water and sewerage shall be address by mandatory following of the provisions below:

a) All new high-rise building shall be permitted only if they are made on a zero-net water consumption / discharge basis and have a dedicated, on site, decentralised sewerage treatment plant (DSTP) of adequate capacity and further provided that such buildings have dual piping both at inlet and out let levels for water supply and sewerage and that at least all flushing water requirements in such buildings are met from locally recycled water. The black water from the toilets should have a separate outlet line to be taken to the FSTP (Faecal Sludge Treatment Plant) on site which could be on site for each individual high rise or made for a cluster of such high rises. The potable water supply form Delhi Jal board/city water supply/ local underground water sources should preferably be only for potable purposes and should supply only in



the kitchens or pantry of residential/other buildings. Water from all the other sources in a building should be treated adequately in the on site decentralised STP to CPHEEO standards or NCR standards whichever are cleaner. This will solve both the issues of water supply availability and sewage disposal.

- b) Such high-rise buildings should have mandatory adequate rain water harvesting and ground water recharge facilities as laid down for that plot and building size as per MoHUA formulated Model Building bylaws 2016 which include provisions for rain water harvesting for all type of buildings and waste water recycling system. All the future buildings especially high-rise buildings should have engineered structures mandatorily as almost complete NCR is in seismic zone IV. All Metros and Regional centres to ensure this by 2026. Efforts should be made to also retrofit existing high rise buildings
 - c) To improve quality of living and reduce transport cost and pressure on transportation infrastructure, a “15 minutes neighborhood” by walk or cycle and walk to work should be planned in all new developments and also in all redevelopment areas including in slums, etc. across NCR. This will necessarily require creation of mixed-use zones both spatially -horizontally and vertically as well as earmarking a mixed-use areas by recognition/permission of mixed-use in existing areas/redeveloped areas, TOD areas and another areas as required.
 - (ii) Parking requirements for such massive development required for the future most populous NCR requires major rationalization. No parking of any kind shall be allowed in entire NCR at night other than designated parking lots. Arrangement shall be made by the NCR States for imposing deterrent penalties and towing away of such vehicles.
 - (iii) Every such high-rise building will have multi-level underground parking or separate adequate high rise for multi-level parking which should be preferably mechanized. There should be preferably at least one helipad for emergency evacuations for each cluster of such high rise buildings. All high rise building in NCR shall also be energy efficient as per Bureau of Energy Efficiency (BEE) guidelines by 2026.
- 8.3.38 Currently height restrictions of different MCs in Delhi prohibit water and electricity connections by respective authorities beyond certain heights which is 15 mts. in most places, and in some areas goes up to 21 mts. In a future ready NCR these height restriction should be removed such height restrictions should be applicable only for security reasons and identified heritage areas, not only in Delhi but also across NCR.
- 8.3.39 Flexible FSI, ground coverage, setbacks (options for courtyards instead of setbacks), height etc. related control norms should be provided by all Development Authorities/ ULBs in NCR.
- 8.3.40 No height-restriction or footprint instructions should be imposed on redevelopment/ regeneration/ rejuvenation activities of any kind in non-conservation areas, except for security/ civil aviation norms.
- 8.3.41 Amalgamation and subdivision of plots irrespective of sizes, and explicit removal of all height restrictions except for security reasons, have been envisaged to remove bottlenecks and to facilitate paradigm shift in urban redevelopment and growth of NCR. NCR growth for the burgeoning population has to go vertical, intensive and redrawing of footprints without restrictions except for identified iconic heritage structures.
- 8.3.42 All new developments of neighborhoods or redevelopment of old neighborhoods shall necessarily provide for quality education, quality health care, quality recreation and vibrant commercial spaces along with good playgrounds and sports facilities. These shall also provide ample green spaces, walking areas along with blue green infrastructure.
- 8.3.43 All concerned Authorities & ULBs across NCR should identify old areas of various cities and town and prepare **Redevelopment Plan** for large parts of cities including slums, old housing projects/ areas (50 years above), with a scope for more housing and allied facilities towards more intensive and serviceable uses of such land parcels. Options for In-fill Development should be explored to maximise the housing



stock or the required infrastructure. Redevelopment in large cities can include an optimal mix of voluntary redevelopment and mandatory redevelopment. Further, the redevelopment can be incentivized. High FAR, mixed use both spatially and vertically should be allowed in ToD and economic corridors etc. also.

- 8.3.44 While undertaking redevelopment/ regeneration/ rejuvenation activities some mixed use be considered. Mixed use should be allowed selectively especially in old parts of Metro and Regional Centres, small towns around educational, health, tourism and ToD hubs.
- 8.3.45 Unauthorized colonies, slums, Jhuggi-jhopari clusters, in Delhi and other parts of NCR should be redeveloped. Voluntary redevelopment shall also be allowed and similar TDR and FAR facilities be given in these projects.
- 8.3.46 Increase in number of **dilapidated houses** in NCR is a major concern. Retrofitting norms should be decided as per local requirement by the respective urban local bodies within two years by 2023. To deal with Targeted 'High Risk Buildings', a multi-faceted approach within the City be adopted to identify, target and upgrade 'high risk buildings' that pose health and safety threats.
- 8.3.47 Façade maintenance and aesthetics of structures should be ensured at least on identified stretches and main thoroughfares of all Metros, Regional centres, and other towns above one lakh population as per 2011 Census.

K. Development of Residential Heritage Areas

- 8.3.48 Heritage residential areas need to be identified in the NCR towns and an appropriate strategy to conserve them needs to be worked out.
- 8.3.49 Heritage areas and heritage buildings shall be entitled to special FAR part of which could be used for the development of the place and significant part of the FAR can be used as TDR to be used by the Heritage Conservationist Investors (HCI) elsewhere in the same city in designated areas such as new development areas or redevelopment areas. Where such building and zones are ASI protected or identified, ASI shall be among the mandatory consultants for such projects. The streets in such areas should be well planned with pedestrian facilities, adequate lighting, resting places & rest rooms, drinking water spouts, adequate CCTV surveillance, open air cafes, hygienic eateries etc.
- 8.3.50 Further, heritage conservations areas and building which are owned by private/public entities are required to be conserved. Heritage places which present situations where the owner of such places has no incentive to conserve these areas as heritage places due to economic reasons and it is seen that many such heritage buildings have been destroyed/modified /restructured by their past and current owners. Such heritage place owner should be eligible for the Heritage Transferable Development Rights (HTDR) which can be transferred to other appropriate place provided that the heritage place is simultaneously restored and preserved as required.

L. Stalled Projects

- 8.3.51 Unfinished projects need to be monitored taken over and completed so that possession can be handed over to the purchasers. Necessary steps need to be initiated in this regard by the state governments/ authorities/ agencies as well as the central government. Legal provisions for the same are already available in the RERA legislation. Further, ensuring safe and quick public transportation links and adequate physical and social infrastructure would help project occupancy. All stalled and unfinished residential apartments in NCR sub regions should be completed by 2025 and the respective state governments, preferably in association with the respective RERAs and the central government, should prepare strategies towards achieving this goal in their SRPs.

M. Support Infrastructure



- 8.3.52 To ensure fast development of NCR towns, it must be ensured that the projects are well populated. This can happen only when there is good support infrastructure in terms of schools, public transportation and safety. Adjoining areas of Delhi particularly Meerut, Baghpat, Noida, Greater Noida, Ghaziabad, YEIDA, Gurugram-Manesar-Sohna, Faridabad-Bahadurgarh, Sonapat-Kundli, Ballabhgarh, Bhiwadi-SNB Complex, etc. should be connected with a high quality and high speed inter & intra-city train and bus services. Adequate social infrastructure like education, health, daily needs, recreational facilities, etc., should be created at local level and security of residential areas and housing complexes must be ensured. This will also help in fast occupancy of vacant housing.
- 8.3.53 Each NCR participating States should ensure that the required infrastructure is developed within and outside the housing projects. The External Development Charges (EDC) may be effectively utilised for this purpose.
- 8.3.54 All Metros and Regional Centres of NCR should have comparable and good quality civic infrastructure. Common utilities should be planned and implemented in an integrated manner. Completion of external trunk infrastructure in a systematic and complete manner shall be made mandatory for certifying completion of any group housing, or high rise, or large project. This shall be ensured by the local body/development authority.
- 8.3.55 In case of group housing being developed by the parastatal agencies or by the private developers, the necessary support infrastructure is some times either missing or not developed or not fully operational. Hence external trunk services like roads, drainage, street lights, sewerage, etc. should be developed along with internal utilities before possession in the residential group housing/other large commercial or institutional project. Housing projects in all the NCR towns should mandatorily be made to adopt various '**green building**' features and this should be provided for in the respective building bye laws. In all the new projects for all kind of uses, green building, solar lighting and rain water harvesting provision should be mandatorily followed and enforced. For existing structures, necessary interventions be made and possibilities be explored to have such provisions
- 8.3.56 All new Group Housing projects/ large commercial or institutional complexes across NCR should mandatorily have decentralized sewerage and water treatment systems/ facilities (STPs/ WTPs) on site.
- 8.3.57 **Pandemic sensitive planning** - Housing infrastructure/ Townships, all group housing, multi storeys buildings, etc. should be developed in such a manner that COVID-19 like pandemics be handled effectively in the future. Special care should be taken to design ventilation, spacing between towers, air conditioning systems, etc. in an appropriate manner.

N. Safe and Livable Residential Neighborhoods

- 8.3.58 Mixed-use buildings with active façades that bring life to the streets should have incentives especially near public transportation corridors or stations, where the city's development and growth is oriented through self-applying rules, optimizing urban land and allowing the preservation of residential neighborhoods in-between.
- 8.3.59 'Façade regulations' should be notified and implemented bearing in mind the safety and aesthetic considerations of residential areas.
- 8.3.60 Decaying facades should be discouraged in all Metros & Regional Centers initially and later across NCR.
- 8.3.61 Create accessible, pedestrian-friendly neighborhoods where families with children, seniors, and the disabled can safely walk, bike, and take public transit to jobs and services.

O. Housing Technologies

- 8.3.62 Sixteen new emerging technologies have been identified, evaluated and promoted under PMAY(U).²⁷ These alternate and sustainable technologies offer safer and disaster resilient affordable housing and will also

²⁷ NITI Aayog Strategy for New India



improve the quality of construction in a cost effective and environment friendly manner across states/regions and achieve economies of scale in urban areas. These technologies should be adopted in NCR. The NCR States should get benefited from the Global Housing Technology²⁸ Challenge launched by Govt. of India which will bring in internationally proven construction technologies for adoption and enable all stakeholders to learn from the best practices around the world. At the same time, prefabricated structures, BMTPC recommended technologies and local construction technologies should also be promoted to fulfill and suit the local demand.

- 8.3.63 3D Printing of houses should be encouraged to ensure speedy execution; slum redevelopment, affordable housing, PMAY, Affordable Rental Housing etc should especially adopt this technology by 2026.
- 8.3.64 Authorities/ ULBs should use technology including drones, geo-fencing, etc. for protecting government land, so that informal settlements / squatting on such land parcels can be avoided.
- 8.3.65 Fiscal support should be provided to agencies that use recycled products made from waste. The use of such products should be standardized and can also be adapted to shortlisted design types and pre-fabricated technologies.
- 8.3.66 Housing Information System (HIS) – It is necessary that a Housing Information System should be developed for the whole of NCR. This should be an interactive web-portal for public, government agencies and the private sector. This would be a ‘one stop shop’ for all housing related data so as to help the consumers, planners, government agencies, real estate developers, etc.

P. Lal Dora and Extended Lal Dora

- 8.3.67 Lal Dora (LD) and Extended Lal Dora (ELD) in Delhi and other parts of NCR have been presenting a chronic problem specifically due to complex mix of very old revenue and newer municipal laws. Despite interventions by various courts and even by the Hon’ble Supreme Court situation in these areas has continued to deteriorate. Delhi of today, has for long had over 200 sub-standard, cramped pockets of insanitation and haphazard growth, which pose grave threats of fire safety and possibilities of clandestine ways of earning money. Tejinder Khanna Committee Report and the report of the Expert Committee (2007) on LD & ELD in Delhi have highlighted in detail the complex situations in these areas.
- 8.3.68 The Expert Committee (2007) has recommended TDR and transferable FAR shall be given in such areas as rational mechanism to implement this and an FAR of 400 to 500 with 40% ground coverage for plot sizes 2000/4000 sq. mt. and above respectively to enable group housing for the residents of the villages to pool their small plots for high-rise group housing with minimum 12 mt. wide road. The Committee has repeatedly recommended mixed land use in such areas except villages with heritage structures and those in reserve forest and ridge area which need special planning and development.
- 8.3.69 The Delhi Lal Dora/ ELD areas are subject to sections in the relevant Acts for notification of such areas as urban areas; The Delhi Land Reforms Act is applicable in such areas which are not notified as urban areas. It is notable that DDA has incrementally notified all such villages under LD/ELD as urban areas except 23 villages as of July, 2021. DDA has also made special regulations in its MPD-2021 for erstwhile LD/ ELD areas now declared urban areas. However, these LD/ELD areas declared as urban have continued to witness haphazard and chaotic development. It is now proposed that the relevant revenue law which were framed more than 50 years ago should be reviewed according to the current times and future requirement of Delhi and NCR. Accordingly, for the harmonious development it is recommended that the Delhi Land Reforms Act, 1954 may be reviewed and amended to give the same rights to its villagers as in the villages of NCR States adjacent to Delhi, in terms of ownership, usage of the land, mortgage, transfer, end usages post transfer, dwelling units improvement, mixed use of the land, etc. **In fact it is necessary to repeal Delhi Land Reforms Act and to bring all the villages of Lal Dora and extended Lal Dora land under**

²⁸ Global Housing Technology Challenge - https://ghhc-india.gov.in/Content/ConceptNote_on_GHTC-India.pdf



the under the planned development of DDA initially and thereafter, as per current practice, respective ULBs. However, the villages having area with special character like heritage structures should be developed in line with heritage areas, and settlements in reserve forest or in ridge area should be developed with appropriate tourism/conservation activities as per provisions indicated in the heritage and conservation of development provision of this chapter or as per the policies of MoEF&CC regarding forest settlement/ridge area. In such villages where industrial activities are prevalent, they should conform to the admissible industrial permissibility norms of this Regional Plan. It is also recommended that redevelopment of Lal Dora and Extended Lal Dora areas and these villages should be undertaken rigorously as in other areas of Delhi for a harmonious development.

- 8.3.70 Non availability of land ownership details of properties in urban areas has been a persistent problem where largely property tax registers denote ownership. With modern survey technologies like drones, GIS mapping etc. this gap in urban land management can be easily rectified. Hence it is proposed that **urban land ownership records shall be created for each individual plot** and for each group housing/commercial complex etc. expeditiously. All urban areas of NCR should have land record management system on a digitized mode with GIS based cadastral Maps in phases. **All parts of Delhi including existing Lal Dora/ Extended Lal Dora areas, all metro centres and all regional centres shall prepare and operationalized an Electronic Land Record Management System (E-LRMS) as above till 2024 and the remaining urban areas shall complete this by 2026.**
- 8.3.71 All NCR towns and cities shall include redevelopment policies as above as part of their Master/ Development Plans.
- 8.3.72 Provision for Ownership of plot in urban areas should be adopted and to be made on e-mode. Cadastral Maps should be on GIS platform and all land records be mandated for all urban and rural abadi areas across NCR.

Q. Other Aspects

- 8.3.73 All Sub-Regional Plans and Master Plans should also secure the land for hierarchy of public open spaces and identified critical open spaces that need to be protected from the development and should create institutional structure to protect them. All SRPs and Master/Development Plans should also ensure reserving land/ acquiring the rights of ways for arterial transport grid for future.
- 8.3.74 All urban areas of NCR shall include policy provisions for mixed landuse development in their Master/ Development Plans. In NCR cities/ towns, mixed land use shall be adopted and cities/towns should focus on vertical growth. High density of population need to be compatible to a high-density urban development.
- 8.3.75 In order to improve the neighborhoods, all roads, other than National Highways and Expressways, in Metros and Regional Centres especially in Delhi, including their maintenance should be under one Authority. This Authority can have sub-agencies. If needed, similarly for drains there should be one common agency for all drains with such sub-agencies as required.
- 8.3.76 The Construction sector professionals, builders in NCR should take out mandatory insurance for 10 years to compensate their buyers against any faults in their construction/ consultancy.
- 8.3.77 Key identified projects envisaged to be taken up in NCR related to housing infrastructure, but not limited to, are given in **Appendix 13.2**.
- 8.3.78 Certain suggested policies related to housing sector alongwith other policies which could also be elaborated/ detailed out in Sub-Regional Plan and local level plan like Master/ Development Plans, etc., are given in **Annexure-P-8.1**.



9. RURAL DEVELOPMENT

9.1 EXISTING SITUATION

- 9.1.1 As per the Census of India 2011, the NCR has 2.64 crore rural population, which constitutes 45.44 percent of region's total population living in 11,774 villages, of which 4659 villages have 2000 plus population. A large area and population will be left out of planned development unless the rural areas of the NCR are included in the regional plan. It is notable that NCRPB has been mandated to prepare Regional Plan for harmonious growth of NCR. Rural NCR area accommodated about 43.61 percent of population in 1991, with an increase to 45.44 percent in 2011 (as per Census of India, 2011). Sub-region wise number of villages in the NCR is shown in **Table 9.1**.

Table 9.1.: Number of Villages in the NCR Sub-Regions

S. No.	Region and Sub-region	Number of Villages	Percent share of villages	No. of villages with 2000 + population (Census 2011)
1	Delhi	357	3.03	07
2	Haryana	3,987	33.86	1958
3	Uttar Pradesh	3,790	32.19	1939
4	Rajasthan	3,640	30.92	755
Total NCR		11,774	100.00	4659

Source: Census, 2011; Haryana Statistical Abstract, 2018-19. NCR Planning and Monitoring Cell, UP and Haryana 2019, and http://rajpanchayat.rajasthan.gov.in/Portals/_default/tree-example/pr_dir_eng_2020.html

- 9.1.2 Decadal increase of rural population in the NCR is less but there will be huge increase in absolute rural population in the NCR (**Table 9.2**).

Table 9.2: Sub Region Wise Projected Rural Population, 2041

Year	Delhi		Haryana Sub- Region		Uttar Pradesh Sub- Region		Rajasthan Sub Region	
	Population	%	Population	%	Population	%	Population	%
2011	419,042	1.59	10,439,814	39.51	10,494,174	39.71	5,073,091	19.20
2016	274,248	0.99	10,961,931	39.5	10,978,441	39.56	5,538,428	19.96
2021	179,486	0.61	11,510,160	39.39	11,485,056	39.30	6,046,448	20.69
2026	117,467	0.38	12,085,807	39.21	12,015,049	38.99	6,601,067	21.42
2031	76,878	0.24	12,690,244	39	12,569,499	38.62	7,206,560	22.14
2036	50,314	0.15	13,324,910	38.74	13,149,536	38.23	7,867,592	22.88
2041	32,929	0.09	13,991,316	38.47	13,756,338	37.82	8,589,259	23.62

Note: Exponential growth of population has been considered for projection purposes.

- 9.1.3 Rurban Mission has covered 12 clusters in NCR which have total approved investment of Rs. 1,526 crore and about 4.55 lakh population is benefited. A brief analysis about the Rurban clusters in the NCR is given in **Annexure-D-9.1**.

9.2 KEY ISSUES AND CHALLENGES

- 9.2.1 Low-income levels, lack of universal access to quality education, lack of good basic healthcare, unsafe drinking water, and lack of adequate sanitation services characterizes the rural NCR. It is likely that improvement of income levels and availability of basic services may significantly improve the quality of rural life in the NCR. Unemployment appears to be the most significant issue in the rural NCR.



- 9.2.2 No District Development Plan as per 74th Constitutional Amendment Act has been prepared in the NCR. With respect to districts, which are part of the NCR, the NCRPB Act of 1985, mandates preparation of a Regional Plan for the NCR. While Regional Plan 2001 and 2021 were in place, Regional Plan 2001 provided for improvement of amenities in rural areas and Regional Plan, 2021 advocated for the preparation of district development plans for districts falling within the NCR. However, concerned states have not prepared district development plans.
- 9.2.3 With a total of 357 villages in the NCT of Delhi, it becomes difficult to carry out regulated development in these rural areas. No Integrated Cluster Action Plans are prepared under Rurban Mission for rural areas of the NCT Delhi.

9.3 POLICIES AND PROPOSALS

A. Planning and Development

- 9.3.1 SRPs to identify relatively less developed districts based on carefully selected development parameters (e.g. income, employment, resources, land, literacy, life expectancy, infant mortality, productivity and per capita income, etc.) and recommend strategies for balanced development of these districts.
- 9.3.2 Vast part of the NCR is outside notified controlled/ regulated areas and is prone to haphazard development. It is desirable to have planned development in the entire Sub-region through existing/ future rural/ urban structures in each NCR participating States and set up appropriate sub-regional level planning and development mechanism to exercise landuse and development control to prevent haphazard growth and to facilitate harmonious development. This may be done gradually in areas currently outside the purview of regulated areas in Rest of NCR.
- 9.3.3 All NCR districts to have the **District Planning Committees (DPCs)** in place as mandated under Article 243 ZD of the Constitution of India. The DPCs may facilitate preparation and consolidation of plans prepared by the panchayats and municipalities in the district and accordingly, the draft development plan for the entire district. The preparation of **Village Development Plan (VDP)** and spatial **District Development Plans (DDP)** be carried out by States, as per the 73rd Constitutional Amendment Act. Gram Pradhan (elected representative) to have an active role in preparation as well as implementation of the VDP. RADPFI, Guidelines, 2017 and GPDP Guidelines, 2018 of Ministry of Panchayati Raj, should be referred to for preparation of DDPs and VDPs.
- 9.3.4 While undertaking spatial planning in DDPs and VDPs/ GPDPs, space for grazing, last rites, fairs, festivals, celebrations, iconic places be earmarked. Districts may, in addition, identify land and areas to facilitate shifting of mandis from the urban core areas to rural areas.
- 9.3.5 States should work towards developing multiple growth centers that meet people's aspirations. Growth centres can be developed with spirit of Hon'ble PM's vision "*Atma gaon ki ho aur suvidhayein shehar ki ho*". Aspects for identifying and building more Growth Centres that retain and attract people should get immediate attention.
- 9.3.6 While preparing Development Plans for the towns, infrastructure (physical and social) plans for the large villages within urbanisable area and outside may be prepared and integrated with the proposed urbanisable areas of the respective town.
- 9.3.7 Rural-Urban '**Transitional Areas**' in the NCR be identified in SRP & DDP and Growth dynamics of these areas be looked into at micro level. Districts may identify how and why the changes are occurring, the outcome of this transition.
- 9.3.8 SRPs should indicate preferred areas for economic development which could be called **Rural Investment Areas (RIAs)** to promote development through strategic partnerships between relevant government agencies, private sector, NGOs and CBOs. These areas should be further detailed out in DDPs and village



development plans. **RIAs** can be developed in rural areas for large land consuming activities like Mandis, Warehouses and Godowns (supporting E-commerce), Cold storage, Educational Institutions (institutions or colleges planning to expand hostel facilities), Solar Parks etc. Such activities can be located in fringe areas and in peripheral villages of urban settlements.

- 9.3.9 **A 4-tier system of rural settlements** i.e. Nodal, Big (Bazaar), Medium & Small Village (NBMS) could be looked into to make settlement structure more concrete, scientific and natural, as illustrated in **Annexure-P-2.1** of Demography & Settlement Pattern Chapter.
- 9.3.10 Every SRP and DDP should present a blue print for digital integration of the villages.
- 9.3.11 Agro-climatic zones would be useful in planning for agriculture and allied activities alongside sub-agro-climatic zones, which should be defined and mapped in each of the sub-regional plans in the NCR. The NCR States could take help from the ICAR to demarcate these zones.
- 9.3.12 Every village, town, settlement with more than 2000 population should preferably have a **local iconic place** which should be a symbol of local culture, heritage, aspirations, etc., centrally located and where all people should feel good, cutting across diverse sections. Such iconic places should act as a “Pride of the Settlement”. This should be incorporated in the programs and Plans of Village Development and such iconic place should be created by 2026. CSR funds, MP funds, Gram Nidhi, funding from Voluntary sources, etc. should be utilised for the development of such iconic spaces.

B. Rural Infrastructure

- 9.3.13 To institutionalize the Gram Panchayats, as well as, to bring transparency in their functioning, as planned by Govt. of Haryana Gram Sachivalayas be set up for every Gram Panchayat. This should be mandatorily followed in all Gram Sabha across the NCR. These Gram Sachivalayas should also house IT centres with CSC and health service centres, daily milk collection centers and Bulk Milk Coolers, primary agriculture and horticulture processing center, packing center for perishable marketable surplus, skilling coordinator center, etc.
- 9.3.14 In order to provide doorstep governance in rural NCR, the multi-facility village secretariat should have revenue & development department staff along with JE, skilling experts, health workers, agri-marketing aggregators, agri-insurance worker, vet-worker, govt schemes help desk, good common hall, etc.
- 9.3.15 Every group of five-seven revenue villages should have a **modern packaging unit** and centre for small quantities for quality stamping, safe and hygienic packing with high tech traceability, etc. This should be preferably coterminous with the coverage area of each CSC and CSCs should be used for E-marketing. Such modern packaging unit/ centres be developed within 3 years.
- 9.3.16 Exploit natural resources, and set up of agro-processing units, reinvigorate handloom industry with CSR interventions. Attract & incentivize private sector investments as well as CSR Trusts/Foundations in identified cluster developments and Rurban clusters through MSMEs/MNCs already having bases in the NCR.
- 9.3.17 Sub-regions should adopt the policies of the **Rurban Mission** across the rural NCR including its idea of convergence. ICAPs should be prepared in all districts with a priority given to less developed districts within one year. Service centres and central villages should be identified in sub-regional plans and in the DDPs leading to preparation and implementation of ICAPs. An indicative list of deficiencies and identification of needs for a Cluster is given in **Annexure-P-9.3** which should be followed along with the indicative list of Central Sector and Centrally Sponsored Schemes for possible Convergence for desirable components within rural clusters as given in **Annexure-P-9.2**.
- 9.3.18 Projects for rural electrification should be undertaken providing separate feeder for Agriculture, rural domestic use, rural industries and rural investment areas (RIAs).



- 9.3.19 A common digital platform be created for each sub-region where all rural related schemes, running under different Ministries/ agencies be brought, analysed and monitored. Baseline data of district and projects/ schemes being implemented in district, should also be maintained. Block office shall be custodian of such data for their areas and Chief Development Officer/ADM(D) should developed various schemes in SRPs/ DDPs. **100 percent tapped water supply** should be ensured for every rural house.
- 9.3.20 Providing **urban facilities in rural areas** such as affordable safe housing and house sites for the landless, public health and sanitation, education and skilling, water supply, communication system, better connectivity, 24x7 electricity, social infrastructure, irrigation facilities, etc. be mandatory, in a time bound manner. Amenities and facilities such as online mandis, health care and agriculture support, etc. could be aspirational, to improve the quality of life in rural/rurban/ semi urban (Mofussil areas).
- 9.3.21 All rural areas should have smart utilities (smart water and power meters), smart school, anganwadi with tele-teaching facilities, vocational training option from class 6, telemedicine, medical store, pucca drains, DSTP, waste management facilities, etc.
- 9.3.22 Linking a loop of villages by ring road about 15 km in radius will require land acquisition and construction of Greenfield road. Such development would incur cost and therefore it is vital to streamline institution that would pay for such development. In this regard, it is proposed that PMGSY in NCR may be considered to be amended to implement this task since its original mandate of connecting habitations with upto 500 populations is already achieved.

C. **Research and Development, Technology and Skills Upgradation**

- 9.3.23 **Regular Training programmes** in micro-entrepreneurship, processing of local produce, vocational skills upgradation etc., allied agro-economic activities such as poultry, dairy, pottery, handlooms, handicrafts and rural tourism should be encouraged. Financial incentives and loan schemes for starting micro-enterprises should be worked out and delivered through district plans.
- 9.3.24 About 30 percent of the NCR area has saline water. Areas in which saline water is found should be identified in the sub-regional plans and possibilities of practicing pisciculture involving saline fishes like milk fish, soul fish, etc. should be explored. Further, fishes like singi, pabda, etc. should be grown in areas with very low dissolved oxygen and cultivation of such fish can be promoted in village ponds. Village ponds should be built as a part of the ICAPs.
- 9.3.25 **MFCs and CSC** should be used to impart training in all villages. CSC coordinator can be the ex-officio skilling mitra/ skilling coordinator in village. Where CSCs are not available, the Gram Panchayat/ Gram Sachivalayas should have such training facilities. OFC network connectivity should be ensured to all such facilities.
- 9.3.26 100% OFC connectivity should be ensured to all villages in NCR on priority. Further 5G network coverage should be ensured for NCR on priority.
- 9.3.27 Facilities of both offline and online soft skilling opportunities, through Mobile Skill Centres or Village Cyber/IT Hubs through mass video films, etc. need to be arranged in rural areas. MFC should arrange for hands on training on cashless transaction and digital applications use, for all in rural areas. Seminars/ workshops be organized periodically in identified Nodal Villages by concerned departments and District Administration.
- 9.3.28 The huge scope in rural tourism in the NCR because of the proximity with Delhi and the aspiration of metro residents to experience idyllic rural life should be leveraged by proper development and marketing of such possibilities.

D. **Agricultural Waste Management**

- 9.3.29 Several organizations have made recommendations for the management of *parali* or stubble burning. Indian Agricultural Research Institute (IARI)²⁹ PUSA has developed affordable technique (which involves use of

²⁹ <https://krishijagran.com/agriculture-world/this-5-rs-capsule-will-solve-stubble-burning-problem-reduce-pollution-make-soil-fertile/>



bio-organism to dissolve Stubble) for tackling the problem of stubble burning which further reduce pollution and make soil fertile by maintaining the moisture of fields for longer duration. NCR states may collaborate with IARI for mandatory adoption of such techniques and to reap benefits from these.

E. Other Aspects

- 9.3.30 Key identified projects envisaged to be taken up in NCR related to Rural Development, but not limited to, are given in **Appendix 13.2**.
- 9.3.31 Certain suggested policies related to Rural Development, alongwith other policies which could also be elaborated/ detailed out in Sub-Regional Plan and local level plan like Master/ Development Plans, etc., are given in **Annexure-P-9.1**.



10. FUTURE READY CITIZEN INFRASTRUCTURE

10.1 OVERVIEW

- 10.1.1 The fast urbanisation trend with urban population share of about 55% in NCR requires special focus on the citizen services apart from utilities like Power Water, Drainage, Sanitation and Waste Management. Separate sections have been detailed elsewhere in this plan on these aspects.
- 10.1.2 Many other aspects of civic life need to be addressed for a convenient citizen life in future ready NCR. Health, education, sports, special social care systems, leisure and entertainment are among such other priority citizen infrastructure requirements.
- 10.1.3 The National Capital Region of India should be comparable if not better in the social and civic infrastructure in other national capitals. India is a rising super power and this NCR shall soon be the largest agglomeration on this Planet, overtaking Tokyo.

10.2 SAFETY AND DISASTER RESILIENCE

10.2.1 EXISTING STATUS - SAFE & DISASTER RESILIENT NCR

- (i) Safety of citizens is the first priority of any State , hence policies are needed for safety and security of NCR citizens from natural or man-made disasters and crime and are primary requirement of any planning.
- (ii) All NCR States are covered under Crime and Criminal Tracking Network and Systems (CCTNS) using Investigation Tracking System for Sexual Offences (ITSSO). As per IPC crime data for NCR in 2018, the total number of cognisable IPC Crimes in NCR was 4,02,509; sub-region and State wise break up is given at **Annexure-D-10.1**.
- (iii) In Delhi, the Delhi Police have different Control Rooms, workshops & training centers, etc. and at present all its systems are integrated by Cyber Highway Connectivity (**Annexure D-10.1.1** regarding Delhi Police initiatives). Brief of Initiatives of Uttar Pradesh Police in this direction are as placed at **Annexure D-10.1.2**. In case of Uttar Pradesh, Digital mapping has been done for village boundaries and jurisdiction of police station.
- (iv) NCR is home to strategic institutions of National Importance and cyber security should be the priority of the Government.
- (v) **Earthquakes:** As per the Vulnerability Atlas of India (VAI) (refer **Figure 10.1**), published by Building Material and Technology Promotion Council (BMTPC), Ministry of Housing and Urban Affairs, fault lines of consequence are Great Boundary Fault (GBF), Mahendragarh-Dehradun Sub Surface Fault (MDSSF), Moradabad Fault, Delhi Sardodha Ridge (DSR), Sohna Fault and Mathura Fault. According to the above, Delhi falls under category IV according to VAI and NCR is susceptible to earthquake disaster due to fault lines and nearness to Himalayan range (tectonic plates).
- (vi) **Other Disaster Risks:** NCR is vulnerable to high seismic risk, flood risk, and manmade hazards like fire, CBRN (Chemical, biological, radiological and Nuclear) hazards. A brief note on these including incidence, reasons , existing infrastructure to combat ,etc. is provided at



Figure 10.1: Earthquake Hazard Zones of NCR



Annexure-D-10.1 and Annexure-D-10.1.4 & D-10.1.5. Fires are more recurrent and extensively damaging due to poor infrastructure. In NCR, one fire station serves about 4.10 lakh population; inadequate compliances and poor equipment add to the problem. One National Disaster Response Force (NDRF) battalion is located in NCR in Greater Noida. Emergency Operations Centres have been set up only in 60% of NCR districts; disaster management provisions are largely yet to be incorporated in Master/Development plans in non-Delhi NCR.

(vii) **Other Safety Concerns:**

- a) One of the major concerns for achieving liveability and good quality of life in NCR is the safety of the vulnerable category i.e. women, child and elderly.
- b) Road accidents and crime issues are also under the safety and security concerns of citizens in NCR. Disregard of traffic rules, over speeding, rash driving, road rage lead to accidents and fatality.
- c) Inter-State & Inter-District Coordination, Inter-Agency Coordination and balance between conflicting interests of various agencies is one of the concerns across NCR. Delayed responses for a public safety situation and loss of life/property is accounted for by multiplicity of public safety agencies like the police, fire agency, disaster management agencies, health emergency services, help-lines, reliable 24*7 Citizen Assistance Services, and social NGOs, local gas dealers, etc.

10.2.2 POLICIES AND PROPOSALS

- (i) NCR should be developed as a **safe, secure and resilient region**. Efforts should be aimed towards improving the perception of safety about NCR at both national as well as international level, and attaining international standards on citizen safety.

10.2.2.1 Fire Safety:

- (i) Provision of more fire stations across NCR with one station at every ward in Metros/Regional centres by 2024 and other urban wards and all 2000+ villages by 2026 is necessary for combating this recurrent menace.
- (ii) Planning for availability of non-water extinguishers along with latest global fire-fighting equipment at all fire stations like chemicals, high rise ladders, firemen safety sets, etc needs good resource allocation and fast track procurement.
- (iii) Widening of narrow lanes etc coupled with abolition of Lal Dora restrictions for improving fire safety of older Delhi areas is necessary.
- (iv) Provision of roof top helipads for emergency evacuation and relief in all congested areas starting with government buildings initially in all Metros and regional centres etc. Singapore has around 700 such helipads on high rise buildings.
- (v) All sub-regions should adopt modernised Fire fighting systems with trained staff. All dense localities and preferably all villages should be adequately equipped with chemical based, globally best safety equipments including air fire-fighting systems.
- (vi) Proactive approach requires a team of dedicated officers for examination of the building plans as per the relevant building bye laws/ National Building Code of India, issue of fire safety guidelines, verification of the fire safety systems and issue of fire NOC.
- (vii) Mechanism should be developed so as the data pertaining to fire and life safety of **each and every building be recorded on the GIS** enabled digital platform. The scale of fire prevention and **inspection officers** shall be based upon the number of Occupancies likely to cause risk of fire in a district/ ward and may be kept 500 buildings per officer. Further, **officers are required to be equipped with the latest technology** like tablets loaded with the software for recording the visuals or video of the inspections to match the pace with the developed nations.



- (viii) As the fire services are the first responder to almost each and every emergency such as fire, building collapse, accidents etc. therefore the strengthening of the fire services in terms of equipment and manpower is also an inevitable requirement. In order to improve the response time, dedicated fire/ emergency lanes, **one fire station per 01 lakh population**, specialized equipment's such as hydraulic platforms, firefighting robots/UAVs, fully computer aided dispatch systems, etc. are required to be undertaken.
- (ix) State of the art training center needs to be developed in each Sub-region of NCR to keep the firefighter updated in use of the technology and also ensure the highest level of fitness. These training center need to have the dedicated staff/team of fire engineers, trainers exclusively deployed for research and training purposes.

10.2.2.2 Natural Hazards Resilience (Seismic, Floods):

- (i) Land use planning, Regulation and Enforcement of building codes through Robust Building Permit System need to be ensured at Sub-Region / District level and local level to reduce impacts of natural disasters.
- (ii) **Engineered structures** shall be mandatory for all new high rise structures and retrofitting of existing ones across NCR since major parts of NCR lie in hazardous seismic zones.
- (iii) Encourage modifications in the building permission laws based on global best practices and introduction of technology based solutions like those of Tokyo, Hong-Kong, Singapore with all the safety measures even for riverine areas.
- (iv) Flood resilience is proposed by recognising right of way for all natural drainages in NCR, preservation of active flood plain zones, timely cleaning of drains with full public knowledge and audit, separation of drainages and sewage lines with penalties for violation, etc.
- (v) Regarding the man-made disasters, certain areas which lead to proliferation of diseases; areas with high communicable diseases (if any); areas that are affected by toxic ground water, areas having industrial hazards, etc. need to be identified and planned for,

10.2.2.3 Road and Rail Safety:

- i) NCR should move from being the current accident fatality capital of India to a “Zero-Road Accident Death” region.
- ii) By 2026, all NCR states should ensure that only GPS and speed governor enabled public transport & goods vehicles are on roads.
- iii) A network of well-equipped ambulances, air ambulance at trauma centres may be created at strategic locations at every 50-60 kms on all highways and integrated with 112 ERS.
- iv) Improve road engineering for both vehicles and pedestrians (i.e. signages, road markings and traffic controls, lighting); install technology based traffic regulatory system
- v) Explore possibility of having dedicated lanes for two-wheelers (as per modal split data of the town); develop unhindered cycle tracks throughout NCR(with cycle stands at all public places) for providing last mile connectivity and reduction of pollution and congestion; spread car pool lanes to encourage car-pooling for improvement of traffic system and security
- vi) Improve driver training through more numbers of driving schools with simulators especially for cargo drivers, having one driving school per district.
- vii) Enforcing strict licensing procedures.
- viii) **Safety for pedestrians**, rail operators, and motorists need to be enhanced at highway-railroad grade crossings.

10.2.2.4 Smart Policing:

- (i) **Security system of NCR should essentially be modern and non-invasive though it should be futuristic and technology-driven.**



- (ii) Strengthening of Zonal Integrated Police Network (ZIPNet) introduced in 2004 with the main objective to share Crime and Criminal Information (CCI) in real-time and adoption across NCR by 2022 (refer **Annexure D-10.1.3**).
- (iii) Drone and helicopter based air policing for smart policing, emergency response, evacuations etc. based on a network of Heliports and Drone parking areas across NCT Delhi and each NCR district, is proposed phase wise to be set up in each Metro Centre, Regional Centre by 2024 and in NCR district headquarter and eventually in all remaining towns/ cities by 2026.
- (iv) **A network of CCTV/PTZ cameras** i.e. automated incident detection capabilities is proposed to be installed and should be inter-linked for sharing of critical information and comfort and safety for international visitors/ tourists especially on the inter-state/ City entry/ exit points and in markets, in and around education institutions and health facilities, major intersections, transportation hubs, recreational areas, mandis, business centres, tourists spots, etc. This is proposed initially in all Metro Centres and Regional Centres by 2024 followed by the remaining areas/ cities & towns of NCR by 2026.
- (v) Explore possibilities of establishing Emergency Camera Image Transmission System (ECITS), which enables use of private security cameras to grasp the situation of damage at the site in the event of a large-scale disaster such as terrorism.
- (vi) A Centralized command and control center room for seamless policing be set up in all NCR sub-regions. Haryana has yet to implement the Emergency Response System (ERS). Digitisation of village boundaries and police station boundaries would be very useful in smart policing. UP has already done this.
- (vii) Adequate and fully equipped **Women Police Stations** in all NCR districts in a phased manner along with improvement of Infrastructure in existing Women Police Stations across NCR is imperative. Increase the safety and security of women in the region and make cities/ region women and child friendly including measures that help victims of stalking and domestic violence. Further Nirbhaya Fund has not been fully utilized by some sub-regions like Haryana for strengthening DNA analysis and Cyber forensic facilities.
- (viii) Initiatives for control of Scams targeting senior citizens, dangerous drugs are also essential to give a firm sense of safety in NCR.
- (ix) Policies aimed to provide safe and convenient travel including late night travel options and secure transport for vulnerable groups like children, women, old and physically challenged also need to be implemented while also making parks and public spaces more accessible, well lit and, visible from the streets.
- (x) Setting up a **Centralized Tourist Support/ Assistance Centre** for crime control is essential in NCR with Police and Tourism Ministry officials that would act as a single window for tourist related Crime/Case related information and also provide Soft skills training for police/ immigration/ airport security officials at cutting edge.
- (xi) Dedicated Command & Control Centres is required to be setup in each town/ settlements which should be inter-linked for sharing of critical information and comfort and safety for international visitors/ tourists; further facilitation is needed by way of removing language barriers through multilingual support at transit hubs (such as major railway stations and stations that offer direct airport access),

10.2.2.5 Cyber Security:

- (i) NCR State Govts. should follow the National Cyber Security Strategy 2020 (draft) as finalised.
- (ii) States should implement initiatives under the Indian Cyber Crime Coordination Cell (I4C) of Central Government, for spreading awareness on cybercrime, issue cyber related alerts/ advisories, promote capacity building etc. to prevent cybercrime and expedite investigations.
- (iii) Sub-regional synergies are necessary for effective citizen benefits of the National Cybercrime Reporting Portal.



- (iv) All CISO and IT security executives of NCR state departments may mandatorily start using the dashboard for Chief Information Security Officers (CISO) and IT industry should take all initiatives to ensure security of apps, being put forth for public use.
- (v) Special focus must be accorded towards protecting safety and security of the data sets generated by the smart infrastructure.

10.2.2.6 Critical Infrastructure Safety:

- (i) Structural Safety Assessment of Critical infrastructure and selective retrofitting coupled with training of Engineers, Masons, bar-benders etc. is necessary.
- (ii) Concerned departments of NCR states to actively engage with the National Critical Information Infrastructure Protection Centre (NCIIPC), the designated National Nodal Agency in respect of Critical Information Infrastructure Protection; identify critical infrastructure installations in each district which may include power/ energy generation/ distribution centres, treatment plants, IT hubs, mandis, food storage, hospitals, business centres, Airport/ Transport corridors, etc. and make specific infrastructure protection plans
- (iii) State governments may take action/initiatives for a Resilient Self-Healing Cyber Security Framework for the Power grids .
- (iv) Conducting regular Safety audits across the spectrum including buildings, roads, schools, hospitals etc.
- (v) Preparation of an inventory of historic buildings facing disaster risk and chalking out initiatives for preservation, protection and risk mitigation should be taken up on priority.

10.2.2.7 Synergies in Safety Planning & Coordination:

- (i) NCR Crime Coordination Support Office/ Cell at NCRB is also proposed to be set up.
- (ii) A pan-NCR Integrated and Common Policing Centre for coordination and hand-holding is envisaged to be set up covering all 4 sub-regions to facilitate seamless citizen security in any part of NCR; this will greatly enhance security perception both for citizens and business. This can be serviced by Delhi Police and can have senior police officers as rotational heads.
- (iii) All emergency services to be brought under one umbrella like NDRF police, medical services and fire services and Agency wise Responsibility Matrices for Disaster Risk Response should be publicised at state & district level.
- (iv) Quick Incident/ Accident Response systems pertaining to the State Security systems need to be enabled.
- (v) It is proposed that justice system in NCR should move towards virtual hearings especially in revenue courts, in order to expedite justice delivery system.
- (vi) Forensic Science Laboratory which is an integral part of modern scientific criminal/civil justice delivery system, needs to have adequate infrastructure provisions for mobile forensic set up in the range/district wise scientific support to Police/Investing Agency. Further, there is also a need for development of Forensic Science Infrastructure for training and development of modern scientific methods to augment the system. Therefore, necessary infrastructure requirement should be taken into consideration in the SRPs.
- (vii) The Institutional mechanism under the Ministry of Earth Sciences to support the other agencies needs to be beneficially used by other concerned departments in NCR.
- (viii) Capacity development in terms of training pertaining to the scope and approach of recovery process the reconstruction & rehabilitation should be imparted to officials of various agencies and also other stakeholders including communities.
- (ix) NCR States should adopt smart interventions for ensuring safety and security of NCR citizens. Some smart interventions for safe city which can be adopted in NCR are provided at **Appendix-10.1**.
- (x) Suggested policies for Safety and Security, and Disaster Risk Management which could be detailed out in SRPs and other Local level plans are given at **Annexure-P-10.1 and Annexure-P-10.2**.



- (xi) Key identified projects envisaged to be taken up in NCR related to Safety & Security and Disaster Management, but not limited to, are given in **Appendix-13.2**.

10.3 HEALTH, SPORTS & FITNESS:

10.3.1 EXISTING STATUS - HEALTH

- (i) Recent Covid-19 pandemic has painfully highlighted the overarching importance of health and related infrastructure for any civic settlement. India is specially vulnerable since major out-of-pocket expenses of lower and middle classes relate to illness related opportunity costs and medical expenses. The overwhelming crowds at major hospitals, challenges of medical reach in remote villages, and increasing international preference of Delhi-NCR as medical tourism centre, etc. present further challenges. Innovative planning is necessary to resolve these challenges.
- (ii) NCR has about 150 Govt. hospitals, more than 200 CHCs, and above 580 PHCs. There are over 2000 private and charitable health facilities, about 19 trauma centers in NCR with bed capacity of about 426, and about 177 blood banks both government owned (50) and private sector operated (127) in the region. Besides NCR is also part of the National eRaktKosh portal - a Centralized Blood Bank Management System³⁰ Sub-region wise Status of Health infrastructure in NCR along with assessment of Blood bank and trauma centers in NCR is at **Annexure-D-10.2**.
- (iii) Snapshot of best practices of PPP in Healthcare sector in India and abroad are placed in **Annexure-D-10.2.1**. Comprehensive facts about health sector related initiatives of the Govt. of India are placed at **Annexure-D-10.2.2**.
- (iv) There is a huge opportunity in healthcare sector as World Bank predicts a shortage of 80.2 million workers by 2030 globally and India will need 2 million doctors and 6 million nurses by that time. As per Directorate of State Health Services & National Health Profile, 2018, against the WHO standard of 1 doctor /1000 persons, the NCR states of Uttar Pradesh (1/ 19,962), Haryana (1/10189), Rajasthan (1/10,976) and even NCT of Delhi (1/2203) lag far behind. A brief note on Shortage of Doctors is also provided at **Annexure-D-10.2.3**. However, during 2017, 1.33 billion of Indian population was being served by 1.8 million registered medical graduates if we include both modern medical doctors and ayush doctors. So, the ratio was 1.34 doctors for 1,000 Indian citizens as of 2017.³¹ However, modern medical graduates are less than WHO norms. Further, most of them prefer to live and work in urban areas leading to huge shortage in backward districts and rural areas. Situation in NCR is similar.
- (v) The NITI Aayog in-depth assessment of the Indian healthcare system shows that the India's health system and accordingly the NCR is lagging behind comparable countries on various aspects such as Current Health Expenditures as percentage of GDP; Fiscal Health Expenditures as percentage of GDP; Out-of-pocket expenditure percentage of current health expenditure; Neo-Natal Mortality; Global Healthcare Rank; Burden of Disease (DALYs per 100,000 population) Healthy Life Expectancy (HALE) index, etc.
- (vi) Burgeoning NCR population, unorganised facilities for floating patients/families around big hospitals, patient safety, doctors' safety are some other issues.

10.3.2 POLICIES AND PROPOSALS- HEALTH

10.3.2.1 Smart E-Health Infrastructure:

- (i) **Referral system** with Online First Consultation should be mandatory in NCR, except in emergencies, pregnancies, and security reasons.

³⁰ <https://www.eraktkosh.in/BLDAHIMS/bloodbank/about.cnt>

³¹ <http://www.jfmpc.com/article.asp?issn=2249-4863%3Byear%3D2018%3Bvolume%3D7%3Bissue%3D5%3Bspage%3D841%3Bepage%3D844%3Baulast%3DKumar#:~:text=World%20Health%20Organization%20%28WHO%29%20has,population%20ratio%20as%201%3A1%2C000>



- (ii) Every 2000+ Village Citizen Service Centres (CSCs) and/or Village secretariat in NCR should have tele-medicine facility. A Jan Aushadhi Kendra alongside the tele-medicine centre in each 2000+ village can play a big role in reducing medical and transportation costs for villagers.
- (iii) **All 20+ bed hospitals should have a publicized roster wherein their consultants are available for teleconsultation.**
- (iv) **Universal Telemedicine platform** be created/ expanded through awareness. To reduce waiting times, a pool of volunteer doctors/ paid partially or fully by govt., could be created. IMA/district health committees may explore this possibility, through recruitment/enlisting of young graduates for NCR. Online registration system and prior patient data collection via online system/web portals, can streamline online referral mechanism.
- (v) NCR States/subregions should take necessary steps for setting up of **E-Health Record System/ E-Health Registry and Health Mapping System** on E-Cloud. Every patient living in NCR should have their medical records in their phone so that they need not carry thick files during out-patient visit. Patient medical records in the phone should be part of electronic medical records of the hospital.
- (vi) Every patient who gets discharged from hospital should be ensured an online consultation with the responsible doctor of that hospital within a week of discharge.
- (vii) **Critical care** in non-peak hours of hospitals- After 6 pm till next 8 am should be managed by Intensivists from home, each intensivist working for just four hours in on-line shifts, and each Intensivists can cover several hospitals. Intensivists should have access to patient **Electronic Medical Records (EMR)** from anywhere from their mobile phones.
- (viii) Establish an '**NCR Health Registry**' with details of hospitals and their infrastructure, type of patients and doctors and location or residence, etc., amongst others. Efforts be made to upgrade Electronic Health Record System in coordination with National Health Mission which includes the Health Management Information System.
- (ix) For NCR a '**medical registry for patients**' and a '**registry for health service providers**', should be created which may be aligned with National Digital Health Mission (NDHM). These registries are the building blocks of NDHM and are to be developed by National Health Authority (NHA) at the Central level.
- (x) Every hospital should have Hospital Management System (HMS) along with electronic medical records on cloud which could be paid on "**Software as a Service (SAAS)**" model. Health departments through IMA may develop brief, standardized data entry protocols suitable for different platforms (mobiles, smart phones, tablets, PCs, etc.) and data flow that can be coordinated through the District Program Management Units (DPMUs).
- (xi) Functional Plan for Health Sector targeting door step health facilities in NCR to be published by 2022.

10.3.2.2 Emergency & Trauma Care Network:

- (i) All NCR Hospitals must follow the National Ambulance Code (refer **Annexure-D-10.2.5**) with the required four variants of road ambulances. In addition, Air Ambulances facility should also be introduced by all 100+ bed hospitals.
- (ii) Every 50+ hospital be equipped with the capability to provide disease specific acute care and Trauma Care Centre with all diagnostic and treatment facilities for accident cases etc. along with adequate number of ambulances.
- (iii) Ambulances movement be allowed across state borders as emergency vehicles at all times.
- (iv) **Trauma Care network** – Considering the very high accidents and mortality rate in NCR, it is recommended to have Trauma Care facilities with air ambulances in around every 50 to 60 km on highways, on Public Private Partnership (PPP) or any model, with facilities like 24x7 blood banks, residential/ rest facilities for emergency doctors, diagnostic facilities, x-ray, CT scanning, pathology, other basic facilities, etc. Vehicle



recovery facilities with cranes also be provided 24x7. Further, Telemedicine link up with super specialist, a tertiary care centre which may be required in few cases, should also be considered. Such Trauma care facilities should also have helipads for air ambulance evacuation of patients. There can be a NCR level Portal for these Trauma Care Facilities with mapping of locations and distances from roads etc. Portal could also have the ambulances network (with details of types); network of government dispensaries in NCR, linked with it.

- (v) Indian Red Cross Society under its efforts benefiting people in NCR may be engaged to maintain a dynamic Online **NCR Blood Donors Portal**, getting real-time updating of available number of units of different blood groups, screened for diseases, etc., along with lists of active blood donors with their updated phone and contact details.

10.3.2.3 Augmentation of Medical Facilities & Professionals:

- (i) Every sub centre and PHC in NCR be made into health and wellness centre by 2023, as per Niti Aayog guidelines. Wellness centres be set up at each NCR block. All public and private health centers in NCR should conform to IPHS standards by 2024 in phased manner.
- (ii) Community Clinic in each ward, Medical first-aid centre accessibility within a radius of 3 km in the main city and new townships, and within a radius of 5 km in suburbs/rural areas be ensured.
- (iii) At least **one Hospice/terminal illness care facility** should be created **in each district** for rural areas and separately in each town/ city in the districts.
- (iv) All public and private hospitals with 50+ beds must have Geriatric Clinics and Palliative Care Clinic for addressing the need of ailments arising because of ageing and non-communicable diseases.
- (v) Large hospitals be planned in city periphery, the Cluster Approach with Ancillary facilities/services (diagnostic, therapeutic, and custodial etc.), along with hospitals be adopted for all existing/proposed Health Care Facilities. Brief of ancillary services is given in **Appendix-10.2**.
- (vi) Pandemic readiness of health systems is another emergent requirement. Life saving utilities like oxygen plants etc should be part of in-house infrastructure of at least all hospitals with 50 beds and above and these shall be treated as utilities and exempted from FAR calculations.
- (vii) Special incentives can be given for setting up intensivists, oxygen plants, labs, etc. as part of in-house infrastructure in hospitals.
- (viii) **Incentives should be introduced for rural based women and child specialist doctors. Covid-19 pandemic shortages require special emphasis on increasing qualified Intensivists, pulmonologists, infectious diseases specialists, labs, etc.**
- (ix) Setting up one **more AIIMS** in UP sub-region and one in Rajasthan sub-region would ease burden from these areas into AIIMS Delhi and other referral hospitals.
- (x) Each district should also have a Medical College and Nursing training centre. Such college & Nursing training centre be equipped with quality hostels/ accommodation facilities.
- (xi) NCR participating States should get benefits of the scheme to establish new Medical Colleges attached with existing District/ Referral hospital. A brief of centrally sponsored scheme for establishment of new medical colleges attached with existing district/referral hospitals is provided at **Annexure-D-10.2.6**. All district hospitals in NCR can be upgraded to teaching hospitals may be with a brief bond period of 2-3 for serving in rural areas of same district in lieu of preference marks in Post graduate admissions³².
- (xii) Every hospital with 100 beds should start diploma medical courses (DNB) through National Board of Examination, especially in Govt. hospitals. All 100 bedded hospitals can also be deemed medical colleges for their specialty.
- (xiii) Similarly, every hospital with 50 beds and above should be deemed as nursing and paramedical college to



train workforce, with preference to eligible local population from within 5-10 KMs from such hospitals. Necessary rules may be framed/ amended in this regard by the NCR States by 2022 so that quality workforce is available within NCR to cater to domestic as well international patients.

- (xiv) Establish an **International Level Central Public Health University in NCR** for monitoring and standardization of existing courses as well as affiliation for distance education.
- (xv) Medical store and E-Health facility in all villages–Panchayat office/SHC should be setup. Further, rural health infrastructure for all deliveries/ NICU/ oxygen supply/ critical medicines reserves, etc. should be created at block level.
- (xvi) Scientific Research Institutions in NCR may ensure that they provide facilities for drug development and novel health technologies to address technological gaps in health systems.
- (xvii) The Disease Surveillance Systems may be strengthened by the NCR States and Central Agencies to manage any public health emergencies/ pandemics in the future in NCR.

10.3.2.4 Other Aspects:

- (i) **Malnutrition** is an issue which is a national priority, NCR should aim for parity with best Indian standards in Infant and Maternal Mortality Rates (IMR & MMR). Zero Malnutrition deaths, <1% IMR and <4% MMR should be aspired for by 2026. Sub-Regions may refer to the National Nutrition Strategy released by Niti Aayog (refer para 12 of Annexure-P-10.3).
- (ii) Yoga, naturopathy and healthy lifestyles may be promoted in NCR. Yoga parks and meditation centres may be established/ upgraded to promote health-conscious lifestyle behaviors.
- (iii) **Food safety and drugs:** Regulations of the FSSAI should be followed and enforced strictly. Possibilities of having globally benchmarked food standards and practices should be explored and food testing with standardized testing methods and protocols should be carried out.
- (iv) National Patient Safety Implementation Framework (NPSIF) be implemented by 2022 in NCR.
- (v) Medical insurance is another focus area to make health affordable to all in NCR. A new category of medical insurance scheme for lower and middle classes can be considered.
- (vi) 100 percent enrolment be undertaken of all eligible persons in all sub-regions of NCR in time bound phases for medical insurance schemes like PM Suraksha Bima Yojana, PM Jan Arogya Yojana under Ayushman Bharat and other labour related insurance schemes like ESIC, RSBY etc. Settlement of such claims shall be monitored at district and sub regional level and digital portals for all such enrolments, claims and their monitoring should be done at district, sub-regions while collaborating at NCR level.
- (vii) **Medical insurance including CGHS in NCR should be cashless to be meaningful and ensure speedy and willing attention by private hospitals. Competition of CGHS and insurance patients for beds is with other well healed and cash paying patients of NCR. Ease of processing claims in cashless insurance is a major motivator for private hospitals versus tardy and painful CGHS claims as seen even in Covid-19 pandemic. This can be viewed as a national pilot in NCR.**
- (viii) Availability of land at reasonable costs with good Service Level Agreements (SLAs) can help reduce medical costs on common man in NCR. Mandatory **earmarking /allocation of adequate Land** and allotment through lottery only to reputed medical institutions (every two years, if unallocated) on land prices frozen on current level till next RP, on condition of reasonably priced health services must be done by authorities. This may be considered for every ward of Metros and Regional centres and for every town with more than one lac population to ensure quality primary and secondary Health care facilities.
- (ix) Mixed land use should be permitted in area upto 1-2 kms around medical hubs in all one lac plus NCR towns, to ensure organised facilities around such hubs.
- (x) Health infrastructure in NCR as identified by States could be taken up for improvement and up-gradation by dovetailing the resources of NCRPB with that of MoHFW under its National Urban Health Mission



(NUHM).

- (xi) Other traditional health systems like Yoga, Ayurveda, Unani, Homeopathy, Acupuncture etc. shall also be considered for awareness and non-chronic diseases care.
- (xii) 100% enrolment for low & middle classes families should be ensured under RSBY-Ayushman Bharat. A brief about Ayushman Bharat is provided at **Annexure-D-10.2.4**
- (xiii) Suggested policies for Health & Fitness sector which could also be detailed out in SRPs and other Local level plans are given at **Annexure-P-10.3**.
- (xiv) Key identified projects envisaged to be taken up in NCR related to Health & Fitness, but not limited to, are given in **Appendix 13.2**.

10.3.3 EXISTING STATUS - SPORTS AND FITNESS:

- 10.3.3.1 India is deemed as the world's capital of diabetes, with diabetic population in the country expected to be close to hitting the alarming mark of 69.9 million by 2025 and 80 million by 2030. Obesity is another problem which is on the rise. Hence, sports sector deserves due importance, to ensure healthy, active and productive life to citizens in NCR.
- 10.3.3.2 The Sports Authority of India (SAI), which is a apex national sports body, has various Training Centers, Centers of Excellence and Academic Institutions, in the country. Patiala, which is already a designated Counter Magnet Area (CMA) of NCR, has one of the two Sports Academic Institutions of SAI, namely Netaji Subhash National Institute of Sports. One of the ten "SAI Regional Centres" (SRC) of SAI are in NCR -at Sonipat and another one at Lucknow, which is also one of the CMAs of NCR. SAI's Sports Training Centres in NCR and its CMA include those at Lucknow (UP), Patiala (Punjab), Hisar, Sonipat, Bhiwani (in Haryana), Jaipur & Alwar (in Rajasthan) and Bawana in Delhi. A brief of sport infrastructure in NCR is provided at **Annexure-D-10.2.7**.
- 10.3.3.3 NCR has more than 300 Sports Training Institutes imparting sports education and training to national and international sports persons. Delhi Development Authority (DDA) has a network of 14 Sports Complexes in Delhi catering to the sports requirements. Uttar Pradesh and Haryana sub regions of NCR also have good number of sports facilities, in the form of sports clubs and stadiums. Rajasthan too, has a stadium at district level and there is a Multipurpose Indoor Stadium in Alwar, which is also part of NCR. Sports infrastructure scenario and types of sports played in NCR is provided in **Table 10.1**.

Table 10.1: Sub-region wise Sports facilities and Training Capacity in NCR, 2019

Sub Region	No. Sports Institutions	Ownership			Training Capacity		
		Central Govt.	State Govt.	Private	National	International	Others
NCT Delhi	91	83	8	280	NA	NA	NA
* Haryana	193	NA	173	20	621	88	7362
* UP	22	2	18	2	460	212	450
* Rajasthan	1	NA	1	NA	NA	NA	NA
NCR	307	85	200	302	1081	300	7812

Source: NCR Monitoring and Planning Cell, Govt. of NCT Delhi, Govt of Haryana, Govt of UP and Govt of Rajasthan

*Note: NCTD- Excluding Data on Training Capacity, HSR: Excluding Data for Faridabad and Panipat w.r.t Sport facilities and Rohtak, Mahendragarh, Mewat and Palwal districts for training capacity, UPSR: Excluding Data for Hapur district, RSR: Excluding Data for Bharatpur district

- 10.3.3.4 Delhi-NCR has hosted many sports events over the years, including the Asian Games in Delhi in 1951 and 1982 and the Commonwealth Games and Hockey World Cup in 2010. Delhi and its surrounding region has always played very important role in organising major sports events in the country.



- 10.3.3.5 In NCR about 212 international players and more than 600 national level players are being trained in various sports facilities available in Uttar Pradesh and Haryana sub-regions.
- 10.3.3.6 With the rising stature of India globally, NCR needs to take the lead to host key multi - sports events like Commonwealth Games, Summer Youth Olympics, Para Olympic Games and the Asian Games and even the Summer Olympics, etc. in coming decades. (refer types of sports in NCR is given at **Annexure-D-10.2.7**).

10.3.4 POLICIES AND PROPOSALS - SPORTS AND FITNESS:

- (i) Health and Sports be viewed as complementary to ensure fit citizens.
- (ii) Schools and colleges should have only qualified sports instructors.
- (iii) Sports facilities can be optimized by co-sharing and utilization in non-teaching hours.
- (iv) All group housing schemes should have playground in addition to currently stipulated indoor sports and green areas.
- (v) Delhi has hosted Asiad and other global sports events. The National Capital may now consider bidding right away for hosting Olympics post 2030.
- (vi) **A Sports University** is proposed to be established in Meerut district of UP Sub-Region.
- (vii) Setting up more sports colleges and optimum utilization of existing sports training facilities is critical to grooming young sports persons.
- (viii) Women and girl participation in sports may be encouraged, through awareness and education. Sports competitions for children left out from the formal education system should be organised. Such '**Open Sports Competitions**' can be organised at Block level every six months .
- (ix) Traditional Sports and Games Park could be created to support the traditional games like Kabbadi, Kho Kho, Mallakhamb, etc. Traditional games requiring fewer infrastructures can help fill the requirement of children getting involved in play activities, which in turn can help in positive channelization of youth energies.³³
- (x) Efforts be made to formulate norms to ensure that sports infrastructure is accessible to all irrespective of social and economic status.
- (xi) **PPP for sports infrastructure** development be encouraged. Further, NCR States may include appropriate provisions/ norms in the SRPs for facilitating setting up/ starting of private Sports Academies in their respective sub-regions.
- (xii) Sports persons may be offered benefit of low cost of houses or reservation in government housing projects. Mumbai Metropolitan Regional Development Authority (MMRDA) has such provisions.
- (xiii) Investment prospects in the sports sector are dispersed across the entire supply chain, including the manufacturing and retail of equipment and apparel as well as in advertising, talent management, and training. This potential should be tapped by NCR districts, especially those having specialisations in sports goods production, etc. like Meerut.
- (xiv) Active efforts are needed to increase and attract investment in high-performance sports infrastructure to have world-class facilities in NCR where players can be trained for international level competitions.
- (xv) Efforts should be made to develop **NCR as an "International Sports Destination"**. NCR States should make necessary arrangements to organize International/ National sport events like IPL in Cricket, Pro Kabaddi, etc. regularly . NCR may come up with Annual NCR Sports Calendar to encourage sports events in NCR.
- (xvi) State of Mizoram has accorded 'industry' status to sports. NCR participating States should consider similar steps for promoting sports in NCR.

³³ Brazil is such an example where Night crimes reduced when children are involved in various activity like night sports



- (xvii) Suggested policies for Sports sector which could be detailed out in SRPs and other Local level plans are given at **Annexure-P-10.4**.
- 10.3.1 Key identified projects envisaged to be taken up in NCR related to Sports sector, but not limited to, are given in **Appendix 13.2**

10.4 EDUCATION:

10.4.1 EXISTING STATUS AND CHALLENGES:

- 10.4.1.1 As per 2011 Census, among 23 districts and NCT of Delhi constituting the NCR, New Delhi district of NCT of Delhi has the highest literacy (89.4 percent) while Mewat district in Haryana with 56.1 percent and Shamli district in Uttar Pradesh sub region with 58.7 percent are the two districts with the lowest literacy rates. As per 2016-17 UDISE data, NCR has 45,261 elementary schools and 12,200 secondary/ Higher Secondary schools. Number of elementary schools per lakh population was 74.44 in 2016-17. **Annexure-D-10.3** gives a snapshot of Elementary and Secondary schools in NCR.
- 10.4.1.2 The Delhi/NCR region comprises of several multi-national companies owing to its close proximity to almost 6 northern states of India. Hence, the students can gain vital exposure from the regular collaborations that these companies have with various educational institutes in the vicinity. Out of 903 Universities in the country, around 25 per cent of Universities and out of 39,050 colleges, more than 28 per cent colleges are located in 4 NCR states. The spread of education facilities and literacy in NCR is provided in **Annexure-D-10.3.1** and **Table 10.3.3 of Annexure-D-10.3** gives snapshot of higher educational institutions in NCR states.
- 10.4.1.3 There is a very high degree of educational disparity among the districts and social groups in the region. The region also faces high incidence of migration from other states to the National Capital for education and employment. There exists a big gap between educational institutions in terms of quality of education imparted in the institutions.
- 10.4.1.4 The COVID-19 pandemic had significantly disrupted various sectors in India including education. Only few of private schools could adopt online teaching methods and the low-income private and government school counterparts, on the other hand, remained largely non-functional for not having access to e-learning solutions.
- 10.4.1.5 Paucity of land causes problems in locating new institutions and expanding the existing facilities, as education infrastructure is land intensive.
- 10.4.1.6 The estimated demand for skilled labour in Delhi alone stands at about 28.2 lakh.³⁴ Prominent sectors requiring the skilled labour include transport & logistics, retail, healthcare, media and entertainment, telecom, elderly care etc.
- 10.4.1.7 As per Periodic Labour Force Survey (PLFS) 2017-18 report, UP has shown highest number of unemployed persons in the country and Rajasthan was at 8th position. Countrywide, almost 61% of the unemployed persons are in the age-group 21 to 30 years. unemployment in the NCR can be reduced by appropriate skilling and education synergies.

10.4.2 POLICIES & PROPOSALS

- 10.4.2.1. Skill education should be mandatory in all NCR schools after Class 5.
- 10.4.2.2. Modern Industrial Training Institutes (ITIs) be set up in every NCR block by 2024. **Vocational education** in secondary schools in NCR should be modernized. In most of the schools one or two trades offered are outdated. The review of trades as per the market requirements should be undertaken in every five years. Further, even in existing Industrial Training Institute (ITI) and Polytechnics, there is a pressing need to not only review the trades but also to upgrade and provide new infrastructure in many of the older ITIs and

³⁴ Source: National Skill Development Council (NSDC)



Polytechnics.

- 10.4.2.3. NCR participating States should leverage educational institutions to develop and attract talent for next wave of digital led growth. Education institutes should be made barrier-free learning spaces so as to make education accessible for all. Linkages should be built between various higher education institutions and Industry to encourage education institutions to offer greater flexibility to students in pursuing on-job-experience along with theoretical academic practice and Industries to offer internships and apprenticeship to the students. Apprenticeship Act be implemented effectively in all NCR districts through DMs and DICs (District Industries Centres) .
- 10.4.2.4. District Skill Registry along with Migrant Facilitation Centres backstpped by Sector Skill Councils (SSC) and National Skill Development Corporation (NSDC) as described in Chapter on Economic Growth under Skilling and Employment Synergy section shall be very useful in skill mapping and skill upgradation. NSQF compliant training with soft skills to be imparted through these MFCs.
- 10.4.2.5. Use of labour welfare fund for training, insurance, housing (affordable rental housing -ARHCs to be promoted) needs of migrants and labour be ensured through monitoring by District Collectors. PDS needs, jobs help etc also to be organized by these MFC offices for migrants.
- 10.4.2.6. Skilling Movement in NCR will get a push with Skill Mitras provision by NSDC/SSCs for all urban wards and every 2000+ villages.
- 10.4.2.7. Exposure and employment facilitation by MFCS/ Skill Mitras through Rojgar melas, other Events, Industrial visits, along with job-matching facilitation through GoI's ASEEM and other portals will help both skilled workers and industries.
- 10.4.2.8. Smart Education through E-platforms and shared central content for all Primary , middle and high schools in NCR should be made mandatory . A **special NCR Smart Education Initiative** can be launched. High quality courses to democratize education through digital platforms should be made. Digital innovation and integration of schools education in NCR coupled with good digital learning content is recommended to transform formal schools education. Digital Integration of schools should be achieved through internet and IoT to make teaching data driven through enabling sharing of learning data and digital resources across schools. Globally, EdTech (refer **Annexure-D-10.3.2**) is being used to tackle multiple challenges and with different cases. EdTech may be used extensively in Schools in NCR .
- 10.4.2.9. Paucity of land for educational institutions can be addressed by enabling vertical rise of such institutions like in western Countries. Provision of mixed land use for upto 1-2 kms around educational hubs shall also help in organised development around such hubs.
- 10.4.2.10. Provision of land at reasonable rates for quality education with good SLAs, should be considered in all Metros/ Regional Centres on the pattern of health facilities. Suitable land allocation be made in Master Plans/Development Plans for educational and skilling institutions.
- 10.4.2.11. **Create Institutional hubs** and allow sharing of infrastructure like grounds and laboratories and other equipment, amongst institutes and benefit the student community. Explore possibilities of 24x7 opening of the laboratories of engineering colleges and medical colleges. A Dual-Use Scheme, may be devised enabling opening up of school facilities like play grounds and sports facilities for public use.
- 10.4.2.12. Promote distance/online learning including **DIKSHA Portal** and locations be planned in each 2000+ village, and all wards of other 1lac plus cities of NCR and made operational by 2026 across NCR.
- 10.4.2.13 Creating avenues for lifelong learning by expanding access to higher education institutions through Open and Distance Learning, Multiple Open Online Courses (MOOCs) and hybrid system of learnings and Certification in specialized areas could be offered to increase access to certification courses. These along with flexible credit based certifications should be piloted at least in the NCR.



- 10.4.2.14. States to explore possibility of having **another IIM in NCR** possibly in Bharatpur district of Rajasthan sub-region or districts of UP sub region. Haryana Sub-region has 11 M Rohtak.
- 10.4.2.15 A **Joint Task Force** comprising of educational and skill development functionaries from the NCR districts should be constituted to oversee and manage related activities in NCR to improve and expand linkages amongst high schools and vocational training, technical certification programs, community colleges, and other higher education institutions of the region.
- 10.4.2.16 An Innovation Synergy Council (ISC) on the lines of Tokyo be formed for active collaboration between NCR research /higher educational institutions, industries and government to spur market led innovation in this 8% GDP contributing region.
- 10.4.2.17. IPR help desks for filing Intellectual property Rights –patents applications shall be set up in each DIC (District industries Centre) and all districts of NCR.
- 10.4.18. Focus on imparting future ready Industry 4.0 related skills is suggested to remain in-step with changing global practices and requirements. Independent agencies/ organisations specialising in related technology such as Internet of Things, Big Data, Artificial Intelligence can be brought on board as training partners to ensure that skilling modules are up to date and address market requirements.
- 10.4.2.18. Based on the population projections for 2041, future requirement needs to be assessed and the future requirement of schools, colleges, etc. as per URDPFI Guidelines needs to be presented in the Sub-regional Plans.
- 10.4.2.19. Suggested policies for Education sector which could also be detailed out in SRPs and other Local level plans are given at **Annexure-P-10.5**.
- 10.4.2.20. Key identified projects envisaged to be taken up in NCR related to Education sector, but not limited to, are given in **Appendix 13.2**.

10.5 SOCIAL CARE INFRASTRUCTURE:

10.5.1 EXISTING STATUS AND CHALLENGES

- 10.5.1.1 Major Initiatives of NCR participating State governments regarding Social Support Systems created in the sub region are as briefed at **Annexure-D-10.4.2**. Social Support infrastructure scenario of NCR is provided at **Annexure-D-10.4**. Spread of hostel facilities and Old Age homes across NCR is presented at **Annexure-D-10.4.1**.
- 10.5.1.2 The future demands Age-friendly cities through anticipating and responding flexibly to ageing-related needs and preferences, respecting their decisions and lifestyle choices; and promoting their inclusion in and contribution to all areas of community life. Cities/ habitations are required to be age friendly cities, with adequate provisions for physically and mentally challenged , while being participatory/ inclusive and protective to those who are most vulnerable. With more working women and rise in nuclear families, adequate child care centers, crèches in each tehsil and district headquarter and other urban centers are the needs of immediate future.

10.5.2 POLICIES & PROPOSALS -CARING NCR:

- 10.5.2.1 NCR and its sub-regions should have working women focus. Adequate number of working women hostels and creches as per population estimates should be planned at every tehsil and district headquarter. These can be viable as PPP enterprises in groups with appropriate service level agreements (SLAs) and adequate security and surveillance systems for safety of women and children with remote video login facilities. Have and encourage Safe Places such as “after-school Clubs” for children after school hours.
- 10.5.2.2 Efforts be made for creating support centres with counselling , health and modern skills/ vocational training



for widows & war widows, dowry & rape survivors ; acid attack survivors and burn victims; domestic violence victims and even women hoping to restart their careers.

- 10.5.2.3 Globally largest agglomeration should also be elderly friendly. Adequate Old Age Homes, Retirement Homes, Aged Care Centres and Elderly Clubs need to be set up as per population projections in each sub-region district and tehsils. This can again be a viable PPP venture for families with earning children . In addition subsidized rental scheme may also be launched/ made for the elderly.
- 10.5.2.4 Schools for specially abled children and homes for mental health and Divyangjan should be planned and set up in every district of NCR. NCR has several such special schools , but more are needed.
- 10.5.2.5 With increased longevity and advent of terminal illnesses requiring prolonged medical care at home, NCR needs to provide hospices like global cities which would be fully equipped to provide long paid medical care in home-like atmosphere to residents. Each NCR district should aim for at least one such facility; all Metros and all Regional centres should set up such Hospices by 2024.
- 10.5.2.6 Technology use for digital connectivity with families as well as for tele-counselling, tele-medicine, etc. should be in-built in all such hospices, elderly care homes and shelters and schools for specially abled. Door step delivery services also be ensured.
- 10.5.2.7 Ensure Disabled friendly and Elder Friendly Planning, Design and Construction of building as well as other infrastructure in public places (transport, lifts, shopping centres/markets, walkways, steps in buses, healthcare institutions, recreation facilities, etc.).
- 10.5.2.8 Integrated Drug Rehabilitation/Reform Centers should be planned in NCR districts in coordination with Dept. of Social Justice and Empowerment and their National Action Plan for Drug Demand Reduction (NAPDDR) (refer para VIII to XI of **Annexure-D-10.4.2**)
- 10.5.2.9 Innovative land cost policies with availability of land at reasonable costs ,on the pattern of health infrastructure, shall be considered for providing quality social care infrastructure in NCR with appropriate SLAs. The Metros and Regional Centres shall set up such facilities on priority by 2026.

10.5.2.10 Other Happy City Policies :

- (i) The concept of “**Happy City**” be adopted across NCR and Mental Wellbeing Mapping be introduced to gauge the happiness status on regular interval.
- (ii) All **Green spaces and walkways/pavements** be well-maintained, safe, elder friendly with adequate accessible shelter, toilet facilities and seating. All walkways in public/private areas be pedestrian-friendly (even level with anti-skid tiles and wide enough to accommodate wheelchairs with low curbs that taper off to the road), be free from obstructions (e.g. street vendors, parked cars, trees, garbage, droppings, etc.) and supported by easily accessible public conveniences.
- (iii) Hassle free seamless connectivity of walking & cycling network be ensured with public transport.
- (iv) Efforts be made to have good quality/ hygienic **paid toilets in non-public places, including such facilities separately for women and handicapped**, preferably within every 01 km stretch in urban areas or other areas wherever such facilities are required.
- (v) Facilities of ‘**mobile toilets**’ in very market/ public gathering areas be provided, especially in winter season.
- (vi) Outdoor seating particularly in parks, transport facility stops and public spaces be spaced at regular intervals and patrolled to ensure safe access by all.
- (vii) Buildings be accessible and be equipped with features like elevators, ramps, adequate signage, railings on stairs, Highlighters on the stair case, Stairs with low risers, Anti-skid flooring, Rest areas with comfortable chairs & changing room facilities, etc.
- (viii) Roads be provided with adequate non-slip, regularly spaced pedestrian crossings, well-designed and



appropriately placed traffic islands, overpasses or underpasses, to assist pedestrians to cross busy roads. Pedestrian crossing lights to allow sufficient time for older people to cross the road and with both visual & audio signals. First Right of way to pedestrians at conveniently placed zebra crossings be ensured.

- (ix) Transport stops and stations be accessible, with ramps, escalators, elevators, appropriate platforms, public toilets, and legible and well-placed signage, with shelter from weather, clean and safe, and adequately lit. Accessibility be enhanced in MRT/RRT stations and have ramps connecting building at intermodal interchanges.
- (x) Buses should be equipped with ramps to get on to as well as having an automated step which lowers to the ground to allow for ease of access.
- (xi) All outdoor spaces including green spaces, walkways, transport terminals should be universally accessible, safe, have rest room facilities and be well maintained. At least one working women hostel should be setup in each district and tehsil headquarter.
- (xii) Plan for Orphanages/ Night Shelters/ Multipurpose Community Hall; Yoga Meditation, Spiritual & Religious Discourse Centres; Music/ Dance and Drama Training Centre, Adult Education Centre, etc.
- (xiii) Plan for accessible and certified/approved '**Distributive Services**' like Milk (Booth)/ Milk and Fruit & Vegetable Booth, LPG godowns, etc. as per habitation sizes.
- (xiv) Plan for cremation ground, burial ground & cemetery with latest facilities like electric/CNG crematoriums with approved/ trained staff, providing required services including shelter, etc.
- (xv) **Provision of Post Offices** (as per URDPFI guidelines), Revival of the postal infrastructure and utilization of the infrastructure with value addition through offering '**Citizen Centric Services**' and all e-Sewa services and usage of drone facilities should be taken up in the NCR. The infrastructure be community driven entity and Haryana model where Panchayat buildings house post office, could be adopted in rest of NCR.
- (xvi) Necessary amendments for implementation of the Street Vendors Act 1974 be made in the existing Master Plans/Development Plans, Zonal Plans, etc. and significant steps be taken towards regulation of street vending in the Region.

10.5.2.11 Helplines are also proposed in each district, coalesced at sub region and thereon at NCR level for assisting all the special categories of population in addition to socially and psychologically challenged sections of NCR residents.

10.5.2.12 Cheaper land for social care, health and education facilities be provided with good SLAs.

10.5.2.13 Action Plan for the development of adequate physical infrastructure for Social Support Infrastructure should be prepared by the respective NCR participating States in their Sub-regional Plans and Master/development plans. Such Action Plan should also include **mapping of Social Care Facilities**.

10.5.2.14 Suggested policies for Social Support System which could also be detailed out in SRPs and other Local level plans are given at **Annexure-P-10.6**.

10.5.2.15 Key identified projects envisaged to be taken up in NCR related to Social Support System-Caring NCR, but not limited to, are given in **Appendix 13.2**.

10.6 SUSTAINABLE DEVELOPMENT GOALS(SDG) ORIENTATION:

10.6.1 Considering that world is at the brink of a global transformation, United Nations has set in motion a historic plan in the form of 17 Sustainable Development Goals – that aims to build a more prosperous, more equal, and more secure world by the year 2030.

10.6.2 The 17 SDGs along with 169 indicators/targets are part of the 2030 Agenda for Sustainable Development adopted by 193 Member States at the UN General Assembly Summit in September 2015, and came into effect on 1 January 2016. The SDGs aim to stimulate action in the critically important areas of poverty, hunger, health and well-being, education, gender equality, water and sanitation, energy, economic



growth and decent work, infrastructure, industry and innovation, reducing inequalities, sustainable cities, consumption and production, climate action, ecosystems, peace and justice, and partnership.

- 10.6.3 At the core of this global agenda is the principle of universality: ‘Leave No One Behind’ which is critical to the implementation of targets that they should be relevant to all stakeholders. Development in all its dimensions must be inclusive of all people, everywhere, and should be built through the participation of everyone, especially the most vulnerable and marginalized.
- 10.6.4 India including NCR is strongly committed to the 2030 Agenda/ SDGs. India’s national development goals and its “Sab Ka Saath, Sab Ka Vikas” or “Development With All, And For All,” policy initiatives for inclusive development converge well with the SDGs. As the Hon’ble Prime Minister noted, “these goals reflect our evolving understanding of the social, economic and environmental linkages that define our lives.”
- 10.6.5 NITI Aayog, has been entrusted with the task of coordinating the SDGs and it has also undertaken a mapping of schemes as they relate to the SDGs and their targets, and has identified lead and supporting ministries for each target. They have adopted a government-wide approach to sustainable development, emphasizing the interconnected nature of the SDGs across economic, social and environmental pillars. States have been advised to undertake a similar mapping of their schemes, including centrally sponsored schemes. In addition, the Ministry of Statistics and Programme Implementation (MoSPI) has been leading discussions for developing national indicators for the SDGs. NITI Aayog has developed a SDG India Index & Dashboard 2020-21 for the country giving detailed framework with target against each SDG. The implantation of this framework for achieving the targets is to be done by the respective State Governments.
- 10.6.6 Policy and proposals given in each chapter of the Regional Plan-2041 for NCR strives towards achieving of SDGs targets in the region and to have harmonized & planned development. It gives due cognizance of SDGs and plans to take it forward with a collaborative and inclusive approach, and towards making NCR a key example to demonstrate related initiatives at a regional scale in a country.
- 10.6.7 Based on NITI Aayog SDG framework and India Index 2020-21, targets for each SDG have been set for NCR which are advisory in nature and have to be detailed out for each district and city in each Sub-Regional Plan-2041/ Master Plans or Development Plan by the concerned States. The State governments also need to pay required attention to visioning, planning, budgeting, and developing implementation and monitoring systems for the SDGs. NCR States may work towards achieving above SDGs key targets as given in **Annexure-P-10.7**, through specific ICT initiatives, to ensure sustainability of services deliveries for social, environmental as well as economic sectors. These SDGs key targets can be utilized by the States as KPIs-2030 and be used to devise the Regional Plan/ SRP’s implementation framework in the respective SRPs in line with the policies of the Regional Plan. However, these shall remain aspirational and non-mandatory, being advisory in nature by NITI Aayog.
- 10.6.8 All the 17 SDG Goals are being complied with in the Regional Plan -2041 except Goal no 14 which is not relevant to landlocked NCR since this goal pertains to “Life under water”.



11. SMART AND DIGITAL NCR

11.1 EXISTING STATUS

- 11.1.1 It is widely recognized that digital technology is an important component of infrastructure for economic development and so has special importance for the mega Delhi-NCR. NCR has a large network of digital infrastructure and it has always been a leader in development of new technologies for various sectors. This role of leadership needs to be continued in the new era of 'Smart Cities' and 'Digital India'. The role of planning for the NCR cannot be over emphasized in context of new technologies such as deployment of fifth generation Cellular Network (5G Network), Internet of Things (IoT), machine to machine communication etc.
- 11.1.2 At NCR level, there are 25.66 lakh Wireline connections, i.e Dedicated Exchange Line (DELs), 16.05 lakh wireline Broadband connections, 4.17 Cr wireless Broadband connections, 49,605 Public Call Offices (PCOs) and 1354 village Public Telephone (VPT) connections. Further, there are 45,500 Base Transceiver Station (BTSs) installed in NCR, out of which about 14,000 (33%) are connected through Optical fibre. In all the 166 Block Head Quarters (BHQs) (excl. Delhi) are connected with Fibre in Sub-Region/Districts under NCR, the major players providing the service include BSNL, Airtel, Vodafone-Idea, RCom, RJio and Tata. Brief of existing digital infrastructure and facilities in NCR is provided in **Annexure-D-11.1**. The Status of implementation of Right of Way Rules policy in NCR States is given in Table 11.1.6 of **Annexure-D-11.1**. Various initiatives taken for E-Governance or E-Services by the NCR States are provided at **Annexure-D-11.2**.
- 11.1.3 The Ministry of Electronics & Information Technology is currently implementing Common Services Center (CSC) Scheme (current phase of implementation i.e. CSC-2.0: a way forward) under pillar-III of "Digital India Programme" to cover all 2.50 lakh Gram Panchayat in country by establishing at-least one (1) functional CSC for dissemination of e-services mainly G2C, B2C and others to citizens within their locality. The model adopted under implementation of the current phase is self-sustainable, service delivery and transaction oriented. The updated roll-out status of CSCs in NCR along with a list of e-services currently available on CSC's Digital Sewa (DS) portal for citizens is presented at **Annexure-D-11.1**.

11.2 KEY ISSUES AND CHALLENGES

- 11.2.1 Availability of land and permissions for Right of Way (ROW) for laying fibre to facilitate last mile connectivity, construction of common ducts for laying fibre to save time, costs and efforts is also a challenge. Provisions of ducts, earmarking of spaces for installation of digital telecom infrastructure such as In-Building Solutions need to be ensured.
- 11.2.2 In order to bridge rural-urban divide digital, it is a huge task to provide digital connectivity in each and every village, town and city and it will involve connecting more than 230 towns cities/ towns and about 13000 villages (about 6000 are 2000+ by 2011 census) of NCR through National Optical Fibre. Another challenge shall be to ensure that each ULB and Panchayat point of broad band is fixed up and functional.
- 11.2.3 High speed of internet shall also be a core utility to facilitate online delivery of various services. NCR has been long experiencing low internet speed.. Low and delayed telecom infrastructure development across NCR to tackle digital transition is another challenge for achieving Digital Fit and Smart NCR.
- 11.2.4 NCR Service Area is very fragmented.

11.3 POLICIES & PROPOSALS

A. Emerging Policy Thrust

- 11.3.1 NCR should develop into a Smart NCR wherein all citizen -government interface shall be smart ie digital,



smooth and hassle-free. Smart Villages and Smart Urban Centres are integral to this Smart NCR. All NCR residents should have digital access to seamless and intelligent services.

- 11.3.2 Necessary set-up & infrastructure should be created for a **“Smart NCR”** with seamless digital infrastructure for (a) bridging digital divide, (b) achieving SDGs (c) safe & secure Cyberspace, (d) seamless connectivity of systems-promoting interoperability features and (f) citizen participation.
- 11.3.3 Three primary focus areas of the **‘Digital India’** program to be implemented for making **NCR a smart region are as follows:**
- Digital Infrastructure to every citizen** –ensuring **high speed internet**, unique digital identity, mobile phone and bank account, access to a Common Service Centre, private space on Cloud, and secure cyberspace.
 - Digital Services and Governance on demand**–through integrated services, availability of services through online and mobile platforms, portable citizen entitlements on Cloud, EODB, financial transactions be electronic and cashless,etc.
 - Digital Empowerment of citizens**–though digital literacy & resources, collaborative digital platforms, on-line building plan approvals, & no physical submission of documents.
- 11.3.4 Use of Digital Infrastructure & Artificial Intelligence (AI) based on Internet of Things (IoT), Cloud, Blockchain, Big Data, Virtual Reality, etc. should be adopted and promoted to transform NCR from a data rich to a data intelligent region. ‘Digital as a Service’ would be its enabler by providing interconnection, integration and virtualization of Space, Services and Structure (3S).
- 11.3.5 High speed internet as a core utility for future need should be ensured. Collaborated efforts of Central Ministries/ Departments/ agencies and NCR States, shall transform the region into a digitally empowered society and knowledge economy. The digital divide between urban and rural areas should be bridged by connecting towns/ cities and panchayats through high capacity OFC network which should be supported by and collaborate with other similar infrastructure. Effective implementation of different schemes, initiatives and ambitious projects of the Government of India such as Smart Cities and BharatNet, etc. should be ensured on priority in NCR.
- 11.3.6 Achieving high level of digital **literacy** and awareness shall be a major milestone for the success of Digital India Programme in NCR.

B. Smart Citizen Centric Infrastructure & Digital Platforms

- 11.3.7 Digital technology be recognized as an essential infrastructure for developing NCR as an economic hub and enhancing Ease of Living (EoL) and Ease of Doing Business (EODB) in the region. Accordingly, key elements that need to be focused on for a healthy Digital Service Sector are illustrated in **Figure 11.1**. Further, quality of life can improve by 10-30% through various smart infrastructure applications as illustrated in **Figure 11.2**.

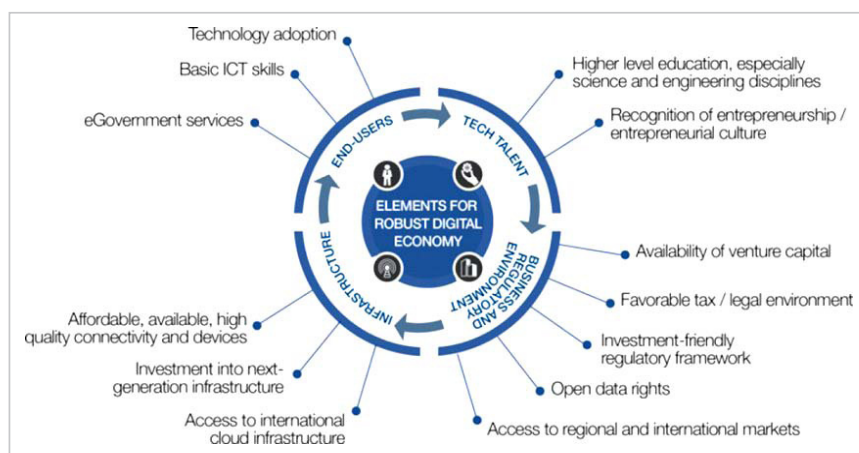


Figure 11.1: Elements Required for a Healthy Digital Service Sector

- 11.3.8 Standard Operating procedure may be defined/ revised to incorporate use of data which will be produced



through AI in the process of planning and decision making by the concerned departments.

11.3.9 Elements of a Smart Village and Smart Town/City:

11.3.9.1 A responsible Public Digital Platform (PDP) be created for Public Service Delivery (PSD) by each State for their respective sub-region. A brief for PDP based approach to public service delivery can be referred as provided at **Annexure-P-11.1**. Citizen and business services should be available in English, Hindi and other local languages of NCR.

11.3.9.2 The Common Service Centres (CSCs) across NCR villages and towns, as in India, are already providing numerous government services online. All such citizen services which are currently available online through CSCs should be reoriented in NCR to be provided at citizen's mobiles/computers irrespective of location. Adhaar authentication of citizens as well as Digital signing /Adhar based e-signing by government authorities to be the fulcrum of such e-citizen services.

11.3.9.3 **Smart Utilities:** Civic utilities like power, water, sanitation, gas, internet, television content, etc. should be smart. NCR residents should be able to apply and get online approvals for connections, modifications, surrenders, etc and receive online automatic alerts for utility breaks, leakages, shutdowns etc on his mobile /mail. Smart metering of all such utilities is critical. Online billing and payments of utilities is quite easily available even now. However, smart utilities of future also entails online complaints redressal enabling online lodging of complaints and online feedback by utility providers till resolution of issues.

11.3.9.4 **Smart Citizen Services:** E-Banking, E-medicine, E-education, E-fitness, E-entertainment, E-commerce including E-food deliveries, E-handymen for various jobs, Smart traffic ticketing, E-ticketing for travel, entertainment, tourism , Smart policing and E-Emergency Response Sytsems(ERS) etc are all elements which reduce drudgery of citizens and service providers and allow more productive use of time and resources. All villages and Urban Centres in NCR should have access to such facilities; appropriate infrastructure should be created to facilitate this in NCR.

11.3.9.5 **Smart Approvals and Licenses:** Citizen and business (private as well as public) approvals, permissions, licences etc. across all categories including those for gunlicenses, pharmacy licenses, buildings, projects, Right of way (RoW), land allotment, environmental clearances, etc. should be fully on e-platforms.

11.3.9.6 E-platforms for business and citizen permissions, approvals, licences should have seamless networking between various departments and stakeholders requiring negligible/ minimum physical interface requirements not only between citizen/business and government, but also between government to government for inter-departmental consultations etc.

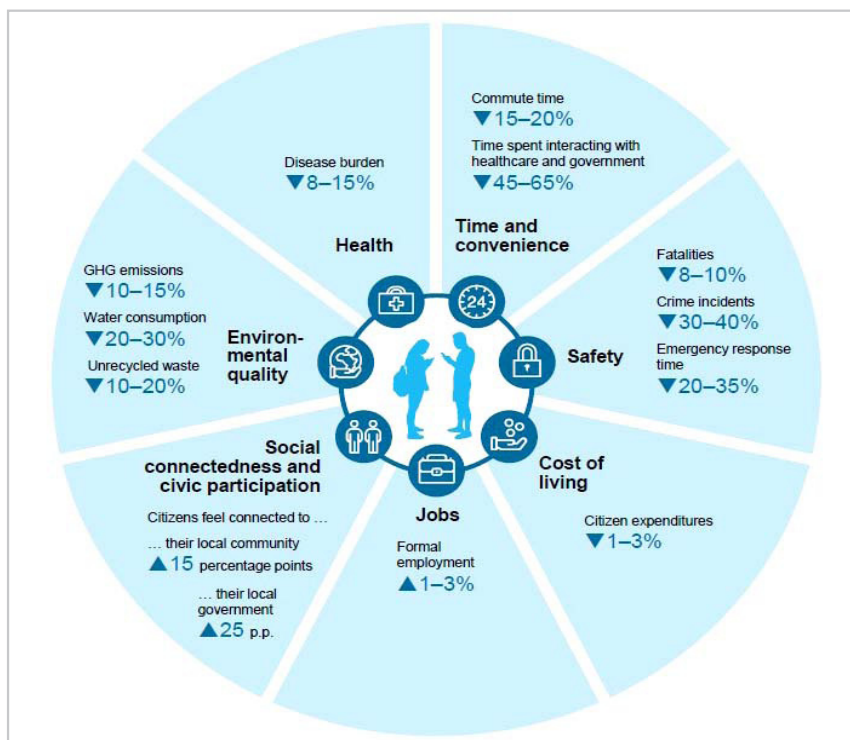


Figure 11.2: Smart Infrastructure/ Applications: To Improve Some Key Quality-of-Life Indicators by 10 to 30 percent³⁵

³⁵ Source: <https://www.enisa.europa.eu/topics/iot-and-smart-infrastructures/smart-infrastructure>

- (i) Digital Platforms should be created as required to provide Citizen Centric Services with a view to provide Quality of Living and to enable Ease of Living to Citizens of Tomorrow's Greatest Agglomeration on Earth. **Appendix-11.1** (Smart Cities - Outcomes for Citizens) outlines the huge potential for citizen benefits by implementation of digital and smart services.
- (ii) Further, Digital Platform should not only be web based but shall also be compatible with phones. Further, if these platforms are interactive response based with voice, SMS formats in local languages, then their utility shall increase manifold for the users.
- (iii) The suggested list of Digital/E-Platforms which can be considered and implemented in the next five years by 2025 in NCR is indicated in **Table 11.1** below:

Table 11.1: Suggested List of Digital Platforms for NCR

Sl. No.	Citizen Friendly Digital Portals for NCR
1.	NCR Tourism Platform Portal- Online Tourism bookings & ticketing should be feasible for all sites in NCR States including ASI sites and also enable ticketing in foreign currencies and online tourism ticketing of all tours and sites in the NCR Sub-Regions/States. The NCR Sub Regional/States Portals can be further clubbed as NCR Tourism Portal.
2.	Job Portal of NCR – The Central Skill Registry at District Level in each NCR Sub-Regions along with Migrant Facilitation Centres at each district of NCR should be online and combined as district-wise job sub-portals with district sector skill councils. These district-wise job portals should be collated at the NCR sub-regions/states level and further at the NCR level to form NCR Skill Portal. On the other hand, the ASEEM Portal (Atamnirbhar Skilled Employees Employer Mapping), Govt. of India should also create its Sub-Portal at NCR Level. The ASEEM NCR Sub-Portal and the NCR Skill Portal should be again merged as coordinating Digital Platforms to provide macroskill-sets mapping with skill-sets requirements, for the benefit of both skill-holders and skill-consumers.
3.	Web portal with GIS mapping of the existing & proposed sewerage systems – with Monitoring and Feedback facilities.
4.	Waste Management System: Web portal with GIS mapping of the existing & proposed Waste Management systems – with Monitoring and Feedback facilities.
5.	Common cleanliness complaint forum- for all water, sanitation & waste related services. Existing and Proposed Water Supply Management System: Web portal with GIS mapping of the existing & proposed Water Supply systems – with Monitoring and Feedback facilities.
6.	CSR Portal for NCR be created.
7.	EV Charging Infrastructure Portal be created.
8.	NCR Health Portal: Mapping of all NCR Health facilities with creation of E-Health Record System and E Hospital Management System with cloud based services on a “pay as you use” software.
9.	NCR Trauma Care Network Portal with Air Ambulances, Blood Bank, etc. should be created.
10.	District-Wise Portal of Government Schemes which may be clubbed at NCR Sub-Region/State Level and further collated at NCR level.
11.	Online Traffic Challan Portal for entire NCR is crucial for ease of traffic movement. Existing NIC Software which is free can be used with support from States for Internet gaps or another Vendor created Portal with 100% reliability and 24X7 availability can be created.
12.	NCR Virtual Courts (Revenue) Portals: Portal for Virtual Court, for Revenue matters initially, can be considered for NCR regions, for each district level and state level in NCR. This will greatly help reduce the traffic congestion. Only 20% cases may require physical hearing according to an estimate, once Virtual Court Portal is implemented. E-filing of documents may need to be specifically permitted by Law Departments.
13.	NCR Home Buyers Portal: This is proposed for each NCR Sub-Regions clubbed further for entire NCR Region. RERAs, Government Authorities/ Organizations selling the dwelling units as well as the private Real Estate Players along with home buyers can be registered on this Portal where issues which are not being taken up by RERAs currently can be taken up in a transparent, time-bound manner.



Sl. No.	Citizen Friendly Digital Portals for NCR
14.	E-Right of Way (RoW) Permission Portal for all linear utilities like IT, Telecom, Power, Roads, Rails, Gas etc. at both District/State and NCR Level. E-ROW Portal is needed for online & time-bound RoW permissions for each NCR State Level clubbed at NCR level.
15.	E-Land Management System Portal: All the Authorities/Organizations managing land in each sub-region, each district and state level of NCR should be registered into this Portal for land use allotment, change in land use etc. and these permissions should be facilitated through this Portal for entire sub-regions of NCR.
16.	Online Building Approvals, Construction Permits Portal should be created.
17.	Environmental permissions portal for NCR should be created.
18.	NCR wide Emergency Response System for police, ambulance, fire should be created.
19.	NCR Crime Monitoring Portal should be created.
20.	Portal for Project Monitoring of Implementation including approvals etc. for all Government projects above Rs.10 crores being implemented or proposed under the earlier Regional Plans or Regional Plan-2041. This Portal should also have inherent links with NCR sub-regions/state wise online Portal/ RoW Portal and other Portals as indicated above.
21.	NCR Unified Economic Space Portal or NCR Mega Portal – This should be prepared specifically for NCR, as an Super App for all the Portals above and also include such existing other Portals as needed.
22.	Citizen Complaint Interactive Web-Portal as well as Mobile App like ‘AirSewa’

11.3.9.7 NCR will require supportive digital infrastructure like High Speed and reliable Internet connectivity with high bandwidths to all villages and urban centres of NCR, Comprehensive Digitisation of databases across districts, offices, departments on standardized formats, development and main-streaming of protocols for online processing and approvals, enabling digital signatures, by Adhaar or DSC (Digital signature Certificates) to all government functionaries (frontdesk or otherwise) across districts and departments in NCR sub-regions including those of Central Government, coupled with widespread use of payment gateways by government departments with designing of protocols for sharing proceeds at backend with different stakeholders (for instance, in case of single tourism ticket for entire NCR or even for one sub-region) .

11.3.9.8 The widespread use of E-Office for internal file movement in all Central government Ministries with digital signatures should be universalized to all central government offices, and also to all state government offices down to district level including various para-statal bodies, local bodies and other private partners engaged by such state/parastatal offices.

11.3.9.9 Such massive digitization will not only require a very high capacity and very reliable internet backbone, but shall also require stringent cyber security measures and real-time, huge capacity data recovery /mirror data centres .

C. Other Features of Smart NCR:

11.3.10 All cities/towns and villages in NCR should be smart and operating on Networked Information including Online Networked labs for real time analysis.States should come up with specific targets and phasing in their SRPs to achieve 100% digital connectivity with support infrastructure. In phase-I (2021-23) all district HQs & Major Cities (10,000 and above population) along with all identified Rurban Clusters and rural areas with 2000 & more population shall have smart infrastructure. Similarly, in phase-II (2024-26) all Teshsil/ Sub-divisional HQs, Block HQs & other towns & rural clusters shall have smart infrastructure. Bharat Net OFC spread should also be ensured within these phases.

11.3.11 Digital Services Platform for NCR’: NCR States may jointly plan and promote smart applications for future. Sector wise smart infrastructure/application are provided at **Annexure-D-11.3** which can be together put



under in a broad framework. Each NCR districts and ULBs could play a pivotal role for creating common platform and common database in this regard. NCR sub-regions should respectively prepare specific projects on this aspect to achieve the target.

11.3.12 NCR sub-regions should **utilise common digital platform for sharing of data** which is an important factor. Flow of information be ensured through this platform for various Govt. initiatives such as Government Land Information System (GLIS), Mining Surveillance System (MSS) of Ministry of Mines; Industrial Information System (IIS) of DPIIT; Road Information System of MoRTH, etc. Similar programmes be developed by the States to support and improve efficiency of common digital platform.

11.3.13 **Master database/ big data repository** be created towards development of a regional Big Data integrated pilot zone for NCR and be managed properly for its effectiveness. All IT platforms in NCR should follow Service Oriented Architecture (SOA) model. SOA model should be ensured by NCR States and all other stakeholders. Coordinated efforts amongst agencies from all sectors like industries, storm-water, utilities and other users be ensured so that aggregated data has applicability across purposes.

11.3.14 Other Features of Smart NCR:

- (i) Delhi Service Area (metro circle which includes Delhi adjoin cities of UP & Haryana) shall have to be extended to whole of NCR, to guarantee seamless & uniform regulatory framework in the region.
- (ii) NCR Subregions to frame mandatory provisions for multi-utility smart trenches/ducts for all utilities ,like power, water, OFC cables, IBS, FTTx, gas etc and provide for common spaces for utility spaces like mobile towers, Cells on Wheels(CoW), micro-sites, Wi-Fi Hotspots, GIS power substations, within residential, industrial and commercial areas. These are critical to deploy sharable digital infrastructure. The SRPs and Master Plans should detail these.
- (iii) Technological/ smart initiatives should be taken by the local Governments for sharing of infrastructure like network, CCTV, sensors for traffic/ waste management (streetlight pole can be used for CCTV, parking sensor, traffic light controller, etc.) and all information should flow on common infrastructure.
- (iv) Taking inspiration from Smart Cities Mission of MoHUA, NCR States may establish an “Integrated Command and Control Centres” (ICCC) system in all towns having 3 lakh plus population with common ICT facilities like Unified Data Centre, high speed communication network, GIS Portal, and sensor networks following common protocols and standards. This be done by 2024 and other major towns by 2025.
- (v) Public Wi-Fi hotspots may be set up in all urban areas above 10 thousand population and rural areas of 2000 population by 2023. Further preferably at least 10 such spots be set up by 2023 in each Metro and Regional centres in NCR. All railway stations, bus terminals, metro/ RRTS stations should have public Wi-Fi hotspots by 2024 along with all Central/ State Archaeological sites and protected monument locations/ spots, all tourist places with high tourist foot fall per year.

D. Digital Technologies & Service Delivery Platforms for Ease of Doing Business (EODB)

11.3.15 100% Online Building Plan Approval System (OBPAS) be adopted and made operational across NCR in all metro centres and regional centres by 2023 and all remaining urban settlements by 2026. The authorities/ agencies/ ULBs where OBPAS is already in operation may offer handholding assistance to other towns/ areas which are lagging behind and which are yet to adopt the same.

11.3.16 Similarly, 100% online permissions with deemed approval and time bound decision, be ensured across NCR for economy related matters, including roads (like Telegraph RoW), power, industries, etc. across NCR by 2022.

11.3.17 RoW rules 2016 of Indian Telegraph (IT) Act should be 100% mandatory in NCR.

11.3.18 Aadhar be utilized as a tool for good governance across the region and Aadhaar Biometrics be utilised for



individual authentication.

- 11.3.19 Initiatives like UMANG (Unified Mobile Application for New-age Governance) App which enables varied user applications across different sectors of government across India., should be mainstreamed and popularized by Sub-regions.
- 11.3.20 Digital payment modes like NETC FASTag, BHIM UPI, NCMC, etc. be implemented and followed across NCR for various services like, toll plaza (all National Highways, State Highways, Expressways), city toll plazas, enforcement vehicle linked fines, fuel payments, parking fees, payments of utilities bills/ dues, ticketing, etc.
- 11.3.21 Promote, support, and introduce services of Drones or UAVs for safety surveillance, firefighting, emergency services/ responses, humanitarian aid and disaster relief, conservation and protection of natural resources, healthcare, agriculture, waste management, construction monitoring and infrastructure development, urban planning, transport, telecommunication, advertising, service deliveries, etc.
- 11.3.22 Appropriate guidelines for Drones or UAVs be formulated for operation, monitoring and control and related infrastructure by each NCR States by 2023.
- 11.3.23 Adopt use of robot services (BOTs) in NCR for domestic and industrial functions, elderly care, healthcare in diseases involving physical social human diseases like Covid-19, etc.
- 11.3.24 Public health/ related departments may explore possibilities of introducing guided rails for moving camera and related equipment inside sewers for remote inspection and sensors to monitor flow of sewage and blockage.
- 11.3.25 Efforts be made such that AI assist and co-exist with manual activities especially in utilities like power, water, sewerage, medical care etc. AI may also be explored to replace physical manual involvement in 4Ds i.e., Dull, Dirty, Dear, Dangerous works. These activities could include scavenging of sewers, disaster management, bomb disposal, waste segregation and activities that increase overall efficiency and helping in reduction of cost.
- 11.3.26 Government e-Marketplace (GeM) be widely used across NCR for providing end-to-end services and advantages to buyers and sellers.
- 11.3.27 Smart logistic solutions be developed, especially for Agricultural sector. States should collaborate with specialized organizations like IFFCO, NAFED, APEDA, to create innovative and smart solutions for their respective areas. E-Nam facility be widely adopted & promoted in NCR for welfare, development and help of the farmers. It should have linkages to reach every block headquarters in the region.
- 11.3.28 Use of Electric and autonomous vehicles for smart and environment friendly mobility be promoted in NCR.
- 11.3.29 All departments/ agencies/Authorities/ULBs/Panchayats to work towards providing Sustainable Cities Services. In order to cover various sectors Management Systems such as Smart Water/ Energy/Transportation/ Waste/Healthcare/Education/Security, Buildings Management Systems can be looked into.
- 11.3.30 Sub regions shall utilize GIS platforms while planning for Sub-Regional/ District/ City/ Town plans. Efforts may also be made to use GIS for rural areas planning. / Village/ local level. Alongside such efforts GIS based Land and Asset Management System be also created.
- 11.3.31 Monetization of data is source of non-traditional revenues and this aspect could be explored by concerned State departments.

E. Cyber Security & Resilience

- 11.3.32 Taking firm steps towards security, all services sectors/ agencies may identify each critical data and devise related disaster recovery plan.
- 11.3.33 All Departments may mandatorily ensure that all their IT platforms are backed up by a Data Centre and Mirror Data Centre.



- 11.3.34 NCR can be sandbox for digital pilots.
- 11.3.35 Level of cyber security protection be enhanced by all concerned departments through:
- (i). protection of communication networks, information systems and data resources,
 - (ii). reliability of information infrastructure, and raised level of information security & protection,
 - (iii). proactive use of advanced technology and facilitate use of secure communication technology in government departments and financial institutions, etc.
 - (iv). put in place a robust notification and warning mechanism for cyber and information security matters,
 - (v). step up real-time surveillance, notification and warning as well as emergency response, and establish a comprehensive cyber security defence system.
- 11.3.36 MeitY with its partnering knowledge experts may take NCR specific initiative for Platform (including UPI like) based Delivery of Public Services and address digital citizen centric requirements.
- 11.3.37 NCR States may also consider implementation of digital solutions for a more liveable future as given in **Appendix 11.1**. These should be implemented by 2031 for the expected outcomes as indicated in the Annexure.
- 11.3.38 Suggested policies for Smart/Digital infrastructure which could also be detailed out in SRPs and other Local level plans are given at **Appendix P-11.2**.
- 11.3.39 Key identified projects envisaged to be taken up in NCR related to Smart/Digital infrastructure, but not limited to, are given in **Appendix 13.2**.



12. ENVIRONMENT

12.1 EXISTING STATUS

12.1.1. The NCR has two major rivers, Yamuna and Ganga, flow from north to south direction. River Yamuna passes almost through the middle while River Ganga forms the eastern boundary of the region. Situated in Semi-Arid Bio-Geographic Zone NCR falls under Upper Ganga plains and Trans Ganga Plains and supports, dry deciduous to thorn forests, numerous wetlands, lakes, ponds and 11 notified wildlife sanctuaries/National Parks and is endowed with other environmentally rich natural features such as ridge, forest, rivers, green areas, etc. 11 Protected Areas i.e. Notified Sanctuaries and National Parks in NCR, notified by MoEF&CC are shown in **Figure 12.1** and listed in **Table- 12.1.2** of **Annexure-D-12.1**.

12.1.2. Pollution of air and water, noise pollution, water stress, inadequate sewerage treatment capacities, river encroachments, reducing forest cover, and conservation challenges are some of the issues facing NCR. A snapshot is given as **Annexure-D-12.1**.

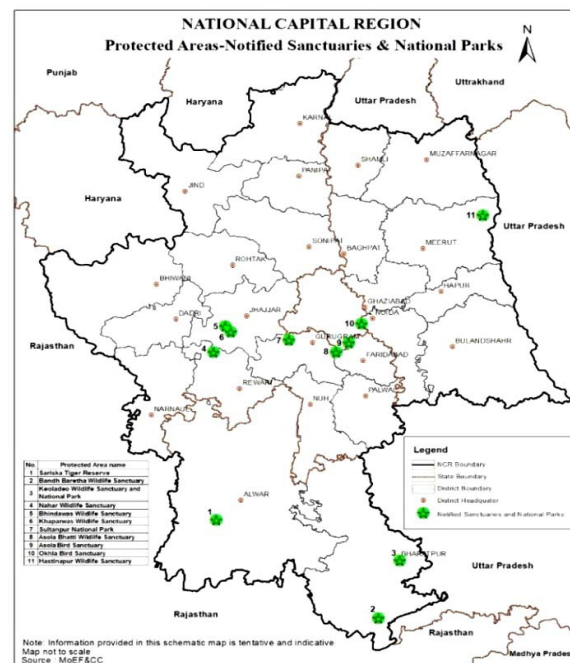


Figure-12.1: Notified Sanctuaries and National Parks

12.2 POLICIES AND PROPOSALS

(i) The main focus of sustainable environment for any region like NCR should be clean air, clean water, calm atmosphere, clean rivers, proper sanitation involving comprehensive solid and liquid waste management, along with conservation of existing natural resources, adequate green cover and ample opportunities for NCR residents to engage with and enjoy nature in its myriad colours. This Plan strives to provide all these and also aims to conserve natural resources in line with Central and state government rules.

12.2.1 General Policies

12.2.1.1 NCR States should ensure that development and construction activities are carried out in the region safeguarding environment and improving regional ecosystems.

12.2.1.2 NCR states should ensure that **Environmental Monitoring** is being carried out regularly and adequate number of well-equipped laboratories for air, water, noise quality analysis are set up across urban and rural areas of NCR and online Real Time Monitoring System (RTMS) for monitoring of various environmental qualities is effectively and efficiently implemented and made operational.

12.2.1.3 Continuous automatic weather monitoring stations be mandatorily established at each district of NCR by 2024 and in each tehsil headquarter by 2026.

12.2.1.4 For maintaining requisite environmental flow in river Yamuna downstream of barrage at Hathnikund in Haryana and at Okhla in Delhi, States should follow recommendations of 2014 report of Principal Committee under the Chairmanship of Secretary Water Resources GoI which was also considered by NGT in 2015, so that there is enough fresh water flowing in the river till Agra for restoration of river's ecological functions and can help in preservation & rejuvenation of Yamuna Flood Plains in NCT Delhi along with adjoining tracts in UP and Haryana. These recommendation may also be followed for Hindon and other



rivers, as applicable.

- 12.2.1.5 **Social auditing** should be mandatory for all CETPs, STPs, WTPs, etc. in the region.
 - 12.2.1.6 All dried/depleting lakes³⁶ and water bodies in NCR be revived in a phased manner by cleaning natural drainage channels and desilting, followed by plantation of appropriate species type³⁷.
 - 12.2.1.7 Policies and plans being devised at district and local level, shall keep in view, the values of ecosystem services. Urban biodiversity should be considered as an integral part of overall planning, as it gives back value. Efforts be made to rejuvenate the deteriorated green spaces across NCR.
 - 12.2.1.8 Every urban area should have optimum green open spaces for its citizens. Each urban area shall have earmarked adequate open spaces in its residential areas, with appropriate land reserved as green in each residential sector or any planned urban spaces, as per the URDPFI Guidelines of MoHUA. Banks of all water bodies should be developed in a manner that they are lined with trees.³⁸
 - 12.2.1.9 Promote better utilization of recreational areas by planting trees along streets, creating more green urban spaces, green facades, rooftop gardens or green roofs, and providing incentives to use green elements in new ways. Another similar activity could be better cleaning and maintenance of parks and open spaces.
 - 12.2.1.10 States should ensure that **Environmental Monitoring** is carried out regularly and adequate number of well-equipped laboratory for Air, Water, Noise quality analysis are set up across urban and rural areas of NCR and online **Real Time Monitoring System (RTMS)** for various environmental qualities, is effectively and efficiently implemented and made operational.
 - 12.2.1.11 Continuous **Weather Monitoring Station** be mandatorily setup at each district of NCR.
 - 12.2.1.12 For better utilization of crop residue generated in NCR and to follow “**waste to energy mission**”, the biogas plants for managing crop residue be adopted in NCR. It is estimated that large scale industrial biogas plants can generate about 5000 cubic mtr of bio gas per day and small family type biogas plants can generate 01 to 10 cubic mtr biogas per day.
 - 12.2.1.13 Various environment friendly measures like congestion pricing on transport networks on weekends can be with in the sub regional plan as applicable.
 - 12.2.1.14 In each SRP, provisions should be made for interlinking of large greens at regional level to conserve the overall green spaces.
 - 12.2.1.15 While preparing Master/ Development Plans and demarcating urbanisable area boundaries in each sub-region, the respective State Governments should ensure that hazardous industries should be located in most optimum/ strategic manner in suitably planned industrial areas, taking into consideration the future growth directions and economic profile of settlement(s), so that adverse environmental impacts of such hazardous industries on settlement, can be mitigated.
- 12.2.2 Ambient Air Quality**
- 12.2.2.1 States should set minimum area for land to be required for green in each residential area should be as per the URDPFI Guidelines of MoHUA in the overall land use in Master/ Development Plan level, which shall not be categorized as forest. This should be broadly outlined in the SRPs.
 - 12.2.2.2 Plantation by private individuals and institutions must be encouraged. Permissions to cut trees on non-protected forest lands shall be given as per extant government policies. Conservation of protected forests on private lands may be incentivized in NCR by grant of TDR in lieu of the forest conservation in land parcel, in public interest and to combat climate change.
 - 12.2.2.3 **Green corridors/ Tree barriers** should be developed wherever possible along roads to act as buffer and to enable reducing air and noise pollution impacts, especially in residential and institutional areas.

³⁶ Chennai restoring its Otteri 18 acre dried lake.

³⁷ Chennai has restored its Otteri 18 acre dried lake.

³⁸ Naya Raipur Development Plan



- 12.2.2.4 In order to reduce vehicular pollution, clean vehicle fuel (CNG, electricity, solar batteries, hydrogen fuel, etc.) be adopted across the region.
- 12.2.2.5 States should take initiatives to change harvesting technology and encourage farmers to use environment friendly harvesting techniques and/or bacterial slurry based mulching in place of combines which results in longer stem portion being left uncut due to height of fittings.
- 12.2.2.6 To **handling stubble burning** every village or group of villages should have bank/pool of harvesting equipment. Each Gram Sabha/ Panchayat should explore options to buy one or two happy seeder machines and leasing to farmers via roster and it can be used as an income generation activity.
- 12.2.2.7 States may adopt **better harvesting techniques** like in-situ management which involves ploughing back the stubble in ground, happy seeder machine or simply cut, bail and transport the straw to cardboard factories or bio-mass based power plants, etc. Options being offered be tied with an appropriate financial or institutional mechanisms.
- 12.2.2.8 Indian Agricultural Research Institute (IARI)³⁹. PUSA has developed affordable/cheap technique of bio-decomposer capsule to dissolve Stubble for tackling the issue of Stubble Burning which further reduces pollution and make soil fertile by maintaining moisture of fields for longer duration. NCR States may collaborate with IARI for mandatory adoption of such techniques.
- 12.2.2.9 IARI technology of biodecomposer capsules should be made available to all villagers/ farmers at least 15 days before the start of harvesting time, along with detailed guidelines, methods, etc. for its proper use. This can be distributed by Agriculture Department of the States as they supply seeds and other agriculture related items. Gram Panchayat Pradhan/ PRI and Agriculture Departments should work closely on it. Brief note on IARI recommendations regarding crop residue management for better environment and soil health is provided at **Appendix-12.1**.
- 12.2.2.10 Norms and standards stipulated by the MoEF&CC/ CPCB or any other competent authority for SPM and other emissions should be strictly enforced.
- 12.2.2.11 Achieve 30% reduction in Ambient Air Quality levels by 2024 and increase number of moderate, satisfactory and good air quality days. Broad Recommendations of “Comprehensive Study on Air Pollution and Green House Gases (GHGs) in Delhi” are given at **Appendix-12.2**
- 12.2.2.12 State agencies should identify sources and hotspots of Air Pollution in each districts/ urban areas and formulate action plan for reducing air pollution.
- 12.2.2.13 Maximize mechanical sweeping of major roads (2 lane & above) in all NCR towns during early morning hours or night sweeping.
- 12.2.2.14 Implement robust compliance mechanism for industrial emission. Reliable **Continuous Emission Monitoring System (CEMS)** data may be used for self-monitoring and reporting by industries.
- 12.2.2.15 Fully covered and closed carriages/ *freight* should only be allowed for sand, coal, flyash, construction material, and other such items in the region.
- 12.2.2.16 Promote Pollution under Control (PUC) checks at entry of vehicles in plants and bulk material handling in rakes to reduce pollution by road transportation related to large industries.
- 12.2.2.17 Air quality monitoring equipment should be setup in all urban wards and villages in NCR in a time-bound manner and should be on-line for entire NCR. CPCB may undertake this task or may designate any agency.
- 12.2.2.18 Effective public grievance redressal platform such as mobile apps should be developed for immediate action on violation in each sub-region.
- 12.2.2.19 State Pollution Control Boards (SPCBs) should undertake regular air quality monitoring and set-up necessary equipment in their respective sub-regions.
- 12.2.2.20 Road dust suppressants should be used by road construction agencies as suggested by CPCB.

³⁹ <https://krishijagran.com/agriculture-world/this-5-rs-capsule-will-solve-stubble-burning-problem-reduce-pollution-make-soil-fertile/>



- 12.2.2.21 State should mandatorily adopt norms for automatic and continuous air quality readings in all industrial locations, all water bodies, major traffic intersections, near hospitals/schools, etc. in time bound and phased manner. Funds for this can be arranged from NCRPB / CPCB or SPCBs.
- 12.2.2.22 Air quality monitoring equipment should be modernized by adopting improved technology, reliability of their readings and public disclosure of their reports on a regular basis.
- 12.2.2.23 States agencies ensure that all city fleets (bus, minibus, waste collection and other cars and trucks) ply on and utilize green energy/fuel sources, across NCR.
- 12.2.2.24 To support carbon-free travel, provision for **hydrogen re-fueling stations** along with **rapid e-vehicle charging points** be made. The Biofuels Policy aiming at achieving 20% blending of biofuels with fossil-based fuels by 2030,⁴⁰ be implemented in NCR to reduce pollution. **Adopt Clean and smart technologies** like mechanical collectors, wet scrubbers, fabric filters (baghouses), electrostatic combustion systems (thermal oxidizers), condensers, absorbers etc. and fuel switch over – to cleaner fuels.
- 12.2.2.25 Other Air pollution controlling measures like installation of electrostatic precipitators in all NCR Thermal power plants, NCAAP compliance by all NCR thermal power plants, mandatory coal/fly ash transport etc. in NCR in only covered/closed weagons/trucks, etc. shall be strictly ensured by the NCR participating States. Further existing provisions for mandatory fencing/covering of all construction sites in NCR to minimize pollution around such sites shall also be ensured by sub-regions and respective local authorities and building plan sanctioning agencies.
- 12.2.2.26 Pollution mitigation technologies like smog towers, smog guns should be set up. Delhi has already initiated installing smog towers in 2020 and other urban areas in NCR should follow the same.
- 12.2.2.27 Explore adoption of air filter technology, ionization etc. to bring in air filters for micro climate-based interventions. It may be installed at major traffic intersections in order to bring down PM levels.
- 12.2.2.28 Awareness among drivers (Transporters) on vehicle maintenance, safe & fuel-efficient driving and importance of PUC checks, should be created, to manage vehicular pollution.
- 12.2.2.29 With rising air pollution in the region, 05 cities in NCR i.e. Delhi, Ghaziabad, Noida, Khurja and Alwar are identified as Non-Attainment cities under the National Clean Air Action Plan.⁴¹ NCR participating States may ensure that these 5 cities of current NCR shall expeditiously implement all measures required by the National Clean Air Action Plan and appropriate policies shall be outlined in the respective sub-regional plans and detailed in the Master/Development Plans.

12.2.3 Noise Pollution

- 12.2.3.1 All highways shall have noise barriers/ tree corridors, especially when they are passing through or close to residential areas, hospitals, old age homes, educational institutions, courts, religious places, etc. The elements of noise/tree corridors should be included as part of overall highway construction/development/improvement costs, as applicable. Appropriate dense plantation should be done in such areas along roads.
- 12.2.3.2 Noise level norms should be strictly enforced in all religious places as per respective location, by bringing in awareness and not just by force.
- 12.2.3.3 Limits on noise emission of vehicles should be introduced.⁴² Limits on sound pressure levels for vehicles reduce the noise emission from the engines. However, the main noise from traffic on highways is rolling noise. This may be reduced by quiet road surfaces (porous asphalt, “drain asphalt”) or by promoting use of quiet tyres for smooth ride on any road.
- 12.2.3.4 Area comprising not less than 100 metres around places like residential, hospitals, old age homes, educational institutions, courts, etc. should be designated as “**Silent zone**” wherein noise limits should be

⁴⁰ <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1532265>

⁴¹ CPCB – <http://cpcb.nic.in/list-of-non-attainment-cities/>

⁴² In Europe, the maximum permissible noise levels range from 69 dBA for motor vehicles to 77 dBA for cars, and 83 dBA for heavy two-wheeled vehicles to 84 dBA for trucks.



below 50 dB during day time and 40 dB during night time.⁴³ Indicative ambient noise standards are given at **Appendix-12.4**.

12.2.3.5 Many countries have banned honking and it has proved to be very effective way of preventing noise pollution. Similar steps be taken by the States and honking be banned in NCR in phases. Central Business Districts (CBDs) and dense residential area should be taken up first.

12.2.3.6 Continuous real time noise monitoring network should be developed.

12.2.3.7 Noise levels to be maintained at construction sites, industries etc, with proper peripheral barricading to reduce inconvenience to neighbours.

12.2.4 Surface Water Quality

12.2.4.1 States should adopt global norms of clean water supply and TDS norms should be comparable with world standards. ULB/concerned agencies should be supported by the respective State Governments in this regard. Global norms of clean water supply are provided at **Appendix-12.3**.

12.2.4.2 Dredging and regular cleaning of rivers and natural channels should be carried out and the waste should be properly disposed of, so that it could not get back into river/ channels.

12.2.4.3 All concerned departments/ district administration/ ULBs should take necessary action for **revival**, clean up and beautification of water bodies in their respective Sub-regions, as stated in chapter on water, drainage and sanitation.

12.2.4.4 MoEF&CC has taken initiatives for rejuvenation of 13 rivers including forestry interventions. River Ganga and Yamuna are part of this initiative. Similarly, possibilities be explored to investigate rejuvenation and revival as applicable, of Sahibi River in Rajasthan and Haryana sub-region. An **revival/ rejuvenation** Action Plan can be prepared by CPCB by 2022, so as to resolve the issues by 2024.

12.2.4.5 **Zero discharge of un-treated sewage & industrial discharge** into Rivers (Yamuna, Hindon, Kali) should be promoted by all NCR states across the region by 2026.

12.2.4.6 Efforts should be made to achieve required water quality and permissible for bathing purposes in Yamuna, Hindon and Kali rivers.

12.2.4.7 Water quality monitoring of all important surface water bodies and treatment plants should be carried out on regular basis. Efforts should be made to re-cycle and re-use of treated sewage effluent.

12.2.4.8 Use of **floating water drones/ robot technology** should be promoted for cleaning and collecting garbage from rivers and water bodies. Autonomous Drones technology like Waste-Sharks/ Aqua-drones⁴⁴ which work similar to vacuum cleaners should be adopted by NCR States for cleaning of rivers/ channels & water bodies and to help in reducing water pollution.

12.2.4.9 GNCT Delhi has taken initiative to rejuvenate waterbodies in a planned manner and has formulated a standard set of operating procedures (SOPs) for rejuvenation of waterbodies for its City of Lakes project wherein, instead of taking up the projects individually, 30-50 waterbodies of similar parameters shall be clubbed under a package and projects will be executed after floating bids in parallel. Similar initiatives could be taken up by NCR States for rejuvenation of all water bodies in towns and cities of NCR. Each of such sites shall have recharge pits for 50% of STP capacity based on Delhi project for Najafgarh area.

12.2.4.10 Issues of various canals, especially unlined and perennial canals need to be assessed to check their contribution to ground water recharge. Agra Canal carries polluted water and its impact needs to be assessed.

12.2.4.11 Wetland Authority of Delhi has been constituted which is monitoring restoration and conservation of water bodies in Delhi. Such initiatives should also be taken in the other sub-regions.

⁴³ <https://tspcb.cgg.gov.in/Environment/Ambient%20Noise%20Standards.pdf>

⁴⁴ <https://en.reset.org/blog/wastesharks-how-floating-drones-are-helping-clean-our-seas-09262018and> <https://www.delltechnologies.com/en-us/perspectives/how-trash-eating-drones-are-taking-on-water-pollution/#scroll=off>



12.2.5 Ground Water Quality

- 12.2.5.1 In certain areas of NCR, some harmful chemical and metals are found which leads to skin & other diseases. Heavy metal/ chemical occurrence in water should be strictly monitored across the region and boring in such areas should get stiff penalties. Sub-regional Plan should give special focus to such areas and issues.
- 12.2.5.2 Norms and standards stipulated by MoEF&CC/ CPCB or any other competent authority, regarding permissible chemical emissions/release be strictly enforced.
- 12.2.5.3 All identified water recharge structures in NCR be well maintained and kept clean.
- 12.2.5.4 For sustainability, States may take necessary steps to protect identified environmentally sensitive areas of water channels across NCR

12.2.6 Waste Management

- 12.2.6.1 ‘Waste to Energy’ and ‘circular economy’ concept should be widely adopted across NCR and necessary actions including incentivization should be taken by the respective States in this regard.
- 12.2.6.2 NCR sub-regions should incentivize reduction of emissions by all industries.
- 12.2.6.3 Latest and new collection and disposal technologies should be adopted by all ULBs/ Authorities and dealing agencies in NCR.
- 12.2.6.4 Chemical waste (e.g. oily sludge, halogenated solvent, etc.) should be properly handled according to the prescribed norms. The disposal of chemical and hazardous waste into the air, soil and waters should be prevented and penalised in NCR areas.
- 12.2.6.5 As electronic waste is emerging as a serious public health and environmental issue.⁴⁵ NCR should lead by an example for the country in properly managing e-waste in an organized manner and promote reuse as far as possible.
- 12.2.6.6 Extended Producer Responsibility (EPR) should be strictly enforced across NCR with district level EPR coordinator working closely with pollution control offices and supervised by DC/DM.
- 12.2.6.7 CPCB has come up with guidelines for managing end of life vehicles. It has been made available to manufacturers and recyclers. It is important to set up infrastructure for recycling end of life vehicles as per the guidelines⁴⁶ preferably in Nuh (Haryana), Bharatpur (Rajasthan), Bulandshahr & Baghpat (U.P), etc. which have lot of vacant lands.
- 12.2.6.8 Efforts should be made to construct conveyance system (pipeline) in the industrial areas to carry industrial waste water from individual industries to the CETP. To utilize CETP treated water in house by the industries themselves reverse pipeline (i.e. from CETP to individual industry) be provided.
- 12.2.6.9 The existing treatment facility at CETP should be upgraded by providing Reverse Osmosis (RO) System, so that the treated water can be used in process itself by the industries⁴⁷. This can also be done in institutional and residential complexes including universities and colleges. This shall be mandatory for every industrial cluster/estate, etc. in NCR.
- 12.2.6.10 Closed conveyance system, RO system, reverse pipeline, etc. be mandatory as per the capacity of each industrial area, apart from mandatory compliance with parameters of CPCB/SPCBs.

12.2.7 GREEN NCR : Forest and Biodiversity

- 12.2.7.1 Efforts be made to improve canopy cover in Reserve and Protected forests through determined afforestation and conservation programmes. Afforestation drives in reserve forests can be done by respective State Forest Departments.
- 12.2.7.2 States may introduce incentives for restoring degraded forests which can also provide a fillip to rural

⁴⁵ India is the “third largest electronic waste producer in the world” after China and USA, as per UN’s Global E-waste Monitor 2020

⁴⁶ https://mpcb.gov.in/sites/default/files/standing_orders/Guidelines_Handling_Processing_and_Recycling_ELV_26092019_0.pdf

⁴⁷ As done in case of Industrial Area Bhiwadi.



employment.

- 12.2.7.3 Necessary initiative be taken by states to remove any /all transportation-related barriers to wildlife crossings and reconnect key wildlife habitat corridors by providing 'animal bridges' and 'animal underpasses' for smooth movement of wildlife wherever possible. SRPs should make special provision for this as applicable.
- 12.2.7.4 NCR has many protected areas in form of Wildlife/ Bird Sanctuaries, National Parks which includes Asola Bhatti Wildlife Sanctuary, Sultanpur National Park, Nahar Wildlife Sanctuary, Bhindawas Wildlife Sanctuary, Khaparwas Wildlife Sanctuary, Okhla Bird Sanctuary, Hastinapur Wildlife Sanctuary, Sariska Tiger Reserve, Bandh Baretha Wildlife sanctuary and Keoladeo Wildlife Sanctuary, etc. The Eco-Sensitive Zones⁴⁸ of these have been identified and notified. They have to be incorporated in the Land use and Land cover maps and the development would have to be regulated within the zone, as per applicable rules/ guidelines.
- 12.2.7.5 There are 07 **Biodiversity parks** in Delhi (area ranging from 100 acres to 700 acres). Similarly, Biodiversity parks are developed in Gurugram and Noida. Authorities/ ULBs in NCR should develop similar Biodiversity parks in other areas and work towards achieving high standards in biodiversity in NCR.
- 12.2.7.6 Efforts should made by NCR States/ agencies/Development Authorities/ULBs, etc. to have at least one **Botanical Garden and preferably a Zoo** in each of the Metro and Regional centres by 2030.
- 12.2.7.7 Efforts be made to **earmark and protect views of scenic and cultural landscapes** areas.
- 12.2.7.8 Native species should be given preference for plantation drives and landscaping.
- 12.2.7.9 SRPs/ DDPs/Master/ Development Plans should define areas that must be protected for providing important environmental services such as, Biodiversity Preservation, Flood Control, Water Production, Erosion Control & Mitigation of Heat Islands, etc.
- 12.2.7.10 Earmarking and mapping of areas in SRPs/ DDPs/ Master Plan, etc. be done indicating that how ecologically important areas and natural features will be managed (e.g. slopes and ravines, and other natural features). Make efforts for conserving and protecting environmentally-sensitive areas and increasing the amount and connectivity of green-space.
- 12.2.7.11 Road side plantation and social plantation programmes need to be undertaken by involving all concerned agencies and community such as eco-clubs of schools, RWAs, etc. to increase the overall green/ tree cover in the region. NCR districts should work towards establishing an **urban-rural park system** that centers on national parks, regional parks, urban parks, local parks and community parks.
- 12.2.7.12 Efforts be made by all NCR States to develop linear parks and Green areas along the watercourses. The blue-green network shall be seamlessly intertwined with nature trails across districts and subregions of NCR to create long stretches of proximity to nature for families and hikers alike.
- 12.2.7.13 NCR States should investigate opportunities to provide new open space so that all residential areas are within 400 metres of open space and all high density residential areas (over 60 dwellings/Ha.) are within 200 metres of open space.
- 12.2.7.14 Efforts be made by NCR States to **develop linear parks and Green areas along water-courses**. Catchment areas along rivers/ channels and around large water bodies should have an appropriate buffer preferably about 100 mtr green buffer and should be kept clean.
- 12.2.7.15 The Natural Zone of each sub-region shall be as identified, ascertained and delineated by the respective State Government as per Para 3.1.2 (iv) and Para 3.4.1.4. These environmentally sensitive areas under the Natural Zone shall have the permissible, regulated and prohibited activities as per applicable and relevant Central and State laws or any notification/guidelines of the Central or State Government having the force of law and will be subject to all orders/judgements of Hon'ble Supreme Court/High Courts/NGT, as applicable. Any change in such Natural Zone areas, which has been approved by NCRPB in the past as

⁴⁸ Reference - <http://moef.gov.in/rules-and-regulations/esz-notifications-2/>



Natural Conservation Zone (NCZ), can be changed by the concerned participating State as per the revenue records, satellite imagery and ground truthing and such NCR participating State shall inform NCRPB about these changes in the area of NCZ/NZ.

12.2.7.16 All efforts are to be made to make NCR a Green NCR and a Nature Lovers Paradise.

12.2.8 Key identified projects envisaged to be taken up in NCR related to Environment, but not limited to, are given in **Appendix 13.2**.



13. IMPLEMENTATION STRATEGIES AND RESOURCE MOBILIZATION

13.1 INTRODUCTION

- 13.1.1 The economic potential of the region can be leveraged through a number of economic drivers - commercial, industrial and services, as well as the availability of qualified, educated, skilled and mobile population. Simultaneously, NCRPB while promoting regional economic development, has to uphold the federal identity of the constituent sub-regions.
- 13.1.2 The benefits of development arising from rapid urbanisation in NCT-Delhi and the Central National Capital Region (CNCR) metros have to spread evenly to the other parts of the region. While the development of towns like Gurugram, Faridabad, Ghaziabad and NOIDA has been extremely visible, infrastructure status in provision of both physical and social heads has not kept pace with the rapidly rising demand for civic services, in the region. The benefits of growth, measured in terms of provision and access to basic infrastructure, are still unevenly distributed, thereby creating environmental stresses.
- 13.1.3 The NCRPB Act entrusts the Board with the responsibility of preparation of the Regional Plan. Further, the Act, through Section 7(c), also mandates NCRPB to 'coordinate the enforcement and implementation of the Regional Plan, Functional Plans, Sub-Regional Plans and Project Plans through the participating States and the Union Territory'.
- 13.1.4 The Sub-Regional Plans (SRPs) prepared by the NCR States are required to be examined by the Board under Section 19 to ensure that the SRP is in conformity with the Regional Plan. The implementation of the duly finalized SRPs and the Project Plans is the responsibility of the each NCR participating State/ Union Territory as per Section 20 of the NCRPB Act.
- 13.1.5 Accordingly, mobilization of resources for the implementation of the policies, proposals and projects in the Regional Plan, Functional Plans, SRPs, Project Plans, etc. is also largely the responsibility of the participating states; however, the coordinating role of NCRPB with the monitoring objective of the Act, enables NCRPB to involve other parastatal agencies of the States along with Central Government Ministries/ Departments/ Agencies. NCRPB is also empowered to set up a Fund comprising Grants from GoI/ States, loans from Central Government, other sources including borrowing, etc. This fund can also be used to provide financial assistance to the NCR States and Counter Magnet Areas for implementation of the SRPs, Project Plans, etc. NCRPB has so far mobilized a total amount of Rs. 5,572.72 crore till September 2020 of which, Plan funds from Central Govt. are Rs.1,501.60 crore, contribution from Govt. of NCT Delhi as well as Rs. 350.75 crore through Bonds, and Rs. 3,720.35 crore through lines of Credit from ADB/KfW. Year wise details are given in **Annexure-D-13.1**.
- 13.1.6 Section 29(1) mandates that once the Regional Plan is notified for implementation, no development can take place in NCR, in violation of this plan. In case of violation of the Regional Plan, as per the provisions of the Section 29 (2) of the NCRPB Act 1985, the Board may direct the concerned participating state or the union territory to stop such activity and withhold financial assistance to the concerned participating state or the union territory. Another provision of the NCRPB Act i.e. Section 27, gives overriding effect to this Act over any other Act, law or rule in force, at the time of enactment of this Act. It is notable that the Act, under Section 33, empowers the Board with the power to enter any premises in NCR for the limited purposes of survey, etc. However, these provisions alone may not be enough to sufficiently empower NCRPB in discharge of its monitoring objectives. Moreover, in the past judicial interventions including NGT decisions have influenced functioning of the Board. Since the date of its enforcement, the Regional Plan has been taken up for implementation by the NCR participating States and during this course of implementation, while going through the relevant provisions under the NCRPB Act, 1985, various Courts have considered the Regional Plan a major instrument of regional development. Extracts of some of the major Court Orders/ Directives are at **Annexure-D-13.2**.



13.2 KEY ISSUES

13.2.1 Preparation of Hierarchy of Plans

- i) Implementation of past Regional Plans show that all NCR States have not been able to finalize their respective Sub Regional Plans (SRP) in time. Further, although states did take initiative in preparing master and development plans, not all towns and cities could be covered. Moreover, the horizon period also varied from SRP and RP horizons, which resulted in avoidable issues. Little focus could be given by states regarding preparation of District Development Plans or constitution of DPCs and MPCs.

13.2.2 Management Structure and Institutional Arrangements

- i) It was observed that State Level Steering Committees (SLSC) could not be very effective may be due to non-involvement of different departments that are to actually implement the policies and proposals on ground. It was also observed that the meetings of the SLSCs could not be held regularly.
- ii) Mechanism of Planning & Monitoring Cells (PMCs) could not achieve the desired results. Delhi has not filled any vacancy in its Cell. Rajasthan, UP and Haryana have many vacancies for the past many years against the sanctioned posts, even after reorganization of posts. These PMCs have largely also not been able to ensure preparation of master plans for water, sewerage, drainage and comprehensive waste management for the towns in the sub regions.

13.2.3 Resource Mobilisation

- i) Resources, both capital and skilled manpower, are the most important elements required for achieving success of a Plan. Financing of various projects is critical to the success of the Plan. It is necessary to have large investments in infrastructure such as transportation, power, water and sanitation, data management and also in social sectors such as health and education. Alongside having skilled/qualified manpower for the same is important.
- ii) As per Regional Plan reviews, NCRPB funds are quite meagre and prevents NCRPB from leveraging its strategic position to play an effective role in the planned development of the region. The Parliamentary Standing Committee on Urban Development (2008-09) observed that this [corpus] could hardly benefit the satellite towns and CMAs to be able to work as pull centers which would prevent in-migration into Delhi'. Therefore, there is a need to substantially enhance the budgetary support of NCRPB.
- iii) Hence, it is clear that there have been resource constraints with NCRPB in financing large-scale projects in the region due to which implementation of the regional infrastructure as envisaged in the Regional Plan-2021 has been hampered. In view of the resource constraints with the NCRPB in financing development programmes in the region and in light of the existing modalities of jointly funded projects, the NCRPB can do little to offer the facility of providing any financial assistance to its constituent states as grants.
- iv) A comprehensive view of the fund available from all the sources is required to be taken so as to integrate development activities undertaken by various agencies. Without a mechanism of a dedicated fund, it would not be feasible to effectively undertake various activities envisaged in the Regional Plan 2041.

13.2.4 Manpower Constraints

- i) The implementation of Regional Plan requires a multi-disciplinary approach, which involves tremendous amount of coordination and monitoring not only of the policies and proposals of the Regional Plan but also monitoring of the projects being implemented in NCR including those funded by the NCRPB. However, the manpower requirement approved in the Regional Plan 2021 has never been sanctioned. This manpower constraint has resulted in serious organizational issues in NCRPB and has affected effective and smooth coordination of implementation of Regional Plan 2021. The problems have only increased phenomenally in the last decade since the geographical area and population of NCR has almost doubled.



13.3 POLICIES AND PROPOSALS

The various policy provisions and major projects pertaining to each element of Regional Plan 2041 are indicated in in this report. Presented below are other key implementation and resource mobilization strategies.

13.3.1 Preparation of Hierarchy of Plans

- i. Regional Plan for NCR be considered as agglomeration strategy for the region, focusing on improving the level of infrastructure and services. Responsibility of the respective State Govts. shall be to work out and implement detailed plans for achieving Regional Plan strategies. Since the Regional Plan-2041 policies and proposals are to be implemented through lower hierarchy plans of State Govt. (e.g SRP, DDP, Master/ Development Plans and Project Plans), NCR participating States also need to ensure that these Plans are prepared and finalized in a time bound manner.
- ii. NCR participating States need to ensure that no development is undertaken in their respective Sub-region in contradiction with published RP-2041 and respective SRP-2041.
- iii. In view of Section 27 of NCRPB Act, NCR States should ensure that all related State legislation applicable on areas under NCR are in line with NCRPB Act, 1985, through amendments, as may be necessary. Further, where amendments are required in Central laws, such amendments may be initiated as per due process.
- iv. The Regional Plan policies and proposals, be further elaborated by NCR States and with detailing in the respective SRPs. These are to be further detailed out in DDPs, Master/ Development Plans, GPDPs and Village Development Plans, etc. by respective Departments/Authorities/ULBs/Gram Panchayats etc. to address local planning and development requirements at respective level. These plans need to be in conformity with the Regional Plan and respective Sub-Regional Plan.
- v. The timelines for various plans, with elements to be detailed out and other aspects are as presented in **Table 13.1** below:

Table:13.1 Timelines for preparation of lower hierarchy plans



Plan	Timeline	Description/Remarks
Draft Sub-regional Plans (SRPs) - 2041 for NCR Sub-regions- shall be in sync with RP 2041	<ul style="list-style-type: none"> To be submitted to NCRPB by NCR participating States within 12 months from date of notification of the final RP- 2041. 	<ul style="list-style-type: none"> Maps should, as far as feasible, have working/input scale of 1:10,000 for SRPs but the scale in signed/ published maps can be suitably decided by the State Government which could as far as feasible, be 1:50,000 scale or better. Provide detailed Action Plan and details for various RP-2041 policies and provisions. SRPs shall be reviewed & revised every 05 years in line with RP & appropriate steps shall be initiated in advance. SRP in conformity with Regional Plan will be prepared by the NCR participating States/UT. These will be put up to the Board for observations if any.
District Development Plans (DDPs) - to be prepared by each district	<ul style="list-style-type: none"> To be finalized by State Govt. within 06 months from the date of notification of the final SRP, or within 01 year of notification of final RP-2041, whichever is earlier. 	<ul style="list-style-type: none"> Maps should, as far as feasible, have working/input scale of 1:10,000 for DDPs but the scale in signed/ published maps can be suitably decided by the State Government which could as far as feasible, be 1:50,000 scale or better. Based on Spatio-economic aspects within the overall framework of RP- 2041 and respective SRP- 2041. Detail out elements of SRP Focus should be on Citizen Centric Services through tele-medicine, e-learning, e-skilling, as Citizen Service Centers (CSC) etc. are to act as hubs to provide such services. Elements may include transport, water, waste management, power, health, education, economy, tourism & heritage, irrigation, social infrastructure (including old age homes and sports), skilling, landuse in sync with SRP Rural Clusters be identified/ established at the level of Zila Panchayats (ZPs) for integrated & coordinated rural development & resource allocation.
Functional Plans (FPs) for perspective year 2041	<ul style="list-style-type: none"> To be finalized within 01-02 year & studies be commissioned for preparation of FPs immediately after the notification of final RP -2041, if not earlier. 	<ul style="list-style-type: none"> Shall be prepared on priority for selected elements / sectors of RP -2041 including but not limited to Transport for NCR (with a micro level plan for CNCR); Water; Drainage; Sewage & CWM; Housing, Health, Tourism, MSME, Skill Development; Redevelopment (of older areas including Slum redevelopment). SPV formations could be explored in areas like Water, Sewerage, Tourism etc. by NCRPB & NCR States, under supervision of various representative committees like CoTS in Transport.
Master / Development Plans in Sub Regions	<ul style="list-style-type: none"> To be notified within 18 months from the date of the final notification of Regional Plan 2041, or within 06 months from the date of the notification of their final Sub-regional Plans 2041, whichever is earlier. 	<ul style="list-style-type: none"> To be prepared for perspective year 2041 in conformity with perspective years Regional Plan & SRPs. All Master/ Development Plans including MPD -2041 shall be compulsorily prepared on GIS platform Maps should, as far as feasible, have working/input scale of 1:4000 for Master/Development Plans but the scale in signed/ published maps can be suitably decided by the State Government which could as far as feasible, be 1:50,000 scale or better. and all Master/ Development Plans shall be in conformity/ sync with the RP-2041 policies and its horizon year. In case of AMRUT towns in NCR, second phase of Master Plans be targeted for the horizon year 2041, in sync with the RP-2041. Elements To include transport, water, waste management, power, health, education, economy, tourism & heritage, irrigation, social infrastructure (including old age homes and sports), skilling, landuse in sync with RP/SRP. While detailing the elements of RP/SRP, the plan should also focus on Citizen Centric Services through tele-medicine, e-learning, e-skilling etc. In keeping with the spirit of Section 29(1) of NCRPB Act, 1985 Master Plans/ Development Plans will be prepared by the NCR participating States and sent to NCRPB with a certificate of conformity with the Sub-Regional Plan (SRP). If SRP is not published by the State as per the NCRPB Act, 1985 'certificate of conformity' with Regional Plan be given by the States regarding Master/ Development Plans. With regards to Master/Development Plans, NCR Planning & Monitoring Cells of the respective States will help the State Government in ensuring conformity of Master/ Development Plans with the Sub-Regional Plan and Regional Plan. NCRPB will ensure necessary capacity building of NCR Planning & Monitoring Cells of the States/UT to assist States/UT regarding preparation of Master/ Development Plans in conformity with SRP/Regional Plan.

- vi. Each city/town of NCR shall prepare its Master/Development Plan based on spatio-economic aspects within overall framework of the RP-2041/respective SRP 2041.
- vii. Checklists for SRPs, DDPs and Master Plans/Development Plans have been placed at **Annexure-P-13.1**. These are meant to facilitate preparation of these lower hierarchy plans, but are not exhaustive. Hence, each sub-region/Development Authorities/ULBs should undertake their own detailed analysis of this Regional Plan for preparation of their respective plans and accordingly prepare strategies in conformity with the policies of this Plan.



- viii. Coordination Matrix for overall coordination of RP-2041 shall be prepared.

13.3.2 Management Structure and Institutional Arrangements

- i. Implementation of the policies and proposals stated in the Regional Plan will be delivered primarily by Central/State departments and local authorities working in close partnership, under the overall coordination with GoI and concerned State and Local Governments.
- ii. For effective monitoring at State level, it is suggested that The State Level Steering Committees (SLSC) with Secretary, Urban Development and In-charge of the NCR Planning and Monitoring Cells, at State level as nodal department for NCRPB, should play a more dynamic role to coordinate with all State Departments/agencies, for implementation of policies, proposals and projects as provided in the Regional Plan-2041.
- iii. For coordination in provision of public services, various State and Central Govt. departments should ensure that their working in NCR is not in silos and/or cross purposes due to lack of information. The Autonomy and powers of each departments be mutually respected while implementing works for common goals in mutual and public interests. NCRPB has been created as a unique organization to perform the role of a facilitator amongst them.
- ix. Performance indicators with respect to urban services and other infrastructure should be institutionalized so that monitoring of the projects is benchmarked against these indicators.
- x. NCR participating State Governments should proactively coordinate and cooperate among themselves on the basis of mutual respect, and jointly formulate inter -state projects. They should jointly pursue specific plans/projects in areas including, infrastructure, development of industries, water, transport, tourism, digital services, health, EoDB, skilling, environmental protection, etc.
- xi. An NCR Unified Economic Space (UES) has been envisioned to boost economic growth and encourage income generating employment by leveraging opportunities and synergies of NCR sub regions.
- xii. A UES coupled with common NCR wide online, time bound single window clearance platform for all economic activities, building permissions, land arrangements etc. across the NCR sub regions can enable NCR to leap frog into the top five Global economic regions within next five to ten years. It is strongly recommended to establish such a UES with a NCR wide NiveshMitra Platform.
- xiii. Public sector to take the lead in implementation of at least certain preliminary stages of regional infrastructure, (e.g road /rail network, assembling land for expressways, social infrastructure of higher educational and medical institutions, shelter, and provide essential support facilities like R&D and policy regulations, etc.)
- xiv. To maintain the desired landuse, the land owners be given saleable transferable FAR/ Development Rights to compensate their economic loss due to the policy of maintaining prescribed landuse and density.
- xv. NCR participating States should adopt necessary digital initiatives to create transparency. Live reporting of real-time information will allow for transparency. Use of emerging technologies, IT, ICT, 5G, digital payment modes, etc. should be effectively utilised to facilitate the people and towards achieving 'ease of living' throughout the region.
- xvi. Performance indicators provided in "Ease of Living Index" and "Municipal Performance Index" 2020 of MoHUA should be followed and achieved in all Metro and Regional Centres across NCR by 2026.
- xvii. Immediate steps, therefore are required for:
 - a. Establishing Online and Single Window System for processing official clearances/approvals/NOCs for all NCR projects
 - b. Setting up machinery for quick redressal of grievances of targeted beneficiaries (consumers) of various project components
 - c. Governance and monitoring of plans should be ensured to achieve the desired results and ensure smooth implementation.



- xviii. The following inter-regional anchoring actions have been suggested to strengthen NCR economic base:
- Cross regional policies/plans for interstate economic convergence
 - Plan for Unified Economic Space
 - Integrated Logistics Action Plan for NCR
 - Economic Corridor Development /Expressway Follow up
 - NCR MSME Facilitation Council-Right to Business Act
 - Special/NCR Plan for Economic Development by all relevant Central Ministry and State Governments.
 - Investment, interest subvention, retail centres, e-commerce platform ,VGF
 - Farmers/Producers/APMC/Marketing issue resolutions using ENAM
 - State Logistic Plan using Wholesale Market Policy of MoC
 - Ease Regulatory Business Compliance
- xix. Local skill and local brand of each NCR district as applicable, be supported, highlighted promoted and benefitted from. The Citizen/ Migration Facilitation Centers, to play key role in collecting, analyzing skill set data and guiding people for right skills that have potential, the related skilling and upgradation centres and act as key facilitators for skilled manpower for development activities in the region.
- xx. The **Table 13.2** indicates the mechanisms of monitoring and coordination at different Central levels:

Table 13.2 Mechanisms of monitoring and coordination at Central level

NCR Board Meeting	<ul style="list-style-type: none"> ● NCR Planning Board is the highest-level decision making authority for NCR at Central level Chaired by Hon'ble Minister for MoHUA, GoI ● Members include Hon'ble Chief Ministries of NCR States & concerned Union Ministers ● Meeting of the Board shall be held at least once in 06 months.
Empowered Committee (EC)	<ul style="list-style-type: none"> ● Under the Chairpersonship of Secretary, MoHUA, GoI ● Constituted to resolve various inter-state issues in consultation with the Chief Secretaries of the NCR participating States. ● Scope of EC may be expanded to include formulation and monitoring implementation of inter-State projects and such other aspects. ● Meetings shall take place once in 06 months, so that implementation of the Regional Projects be monitored and their timely completion be ensured.
Planning Committee (PC) is a statutory committee	<ul style="list-style-type: none"> ● Under the Chairpersonship of Member Secretary, NCRPB ● Constituted to assist the NCR Planning Board, as per Section (4) of the NCRPB Act, 1985 ● Functions are stipulated under Section (9) of the said NCRPB Act, 1985. ● Meetings shall be convened regularly in every quarter to effectively discharge its functions.
Project Sanctioning & Monitoring Groups (PSMG)-I and II, meetings	<ul style="list-style-type: none"> ● PSMG-I under the Chairpersonship of Secretary, MoHUA, GoI for sanctioning financial assistance for Projects with an estimated cost of over Rs. 20 Crs. , and to commission surveys & studies on behalf of the Board worth Rs. 50 lakh and more. ● PSMG-II under the Chairpersonship of Member Secretary, NCRPB for sanctioning financial assistance for Projects with an estimated cost of uptoRs. 20 Crs., and to commission surveys & studies on behalf of the Board worth uptoRs. 50 lakh. ● Constituted to identify individual projects against schemes approved by the Board for funding by the Board, to release installments for the same and for carrying out a constant review of the progress of the projects. ● Meetings of the PSMG shall be convened regularly in every quarter to effectively discharge its functions.

- xxi. At NCRPB level, Committees shall be constituted on the lines of Committee of Transport Secretaries/ Commissioners (CoTS), for other important sectors such as Health, Heritage & Tourism, Water, Skill, IT, Railways & Aviation, Economic growth, Housing & Habitat, sanitation, road safety, slum-free, pollution combat, skilling, RoW, utility shifting, telemedicine & E-health registry, multi-modal transport integration & interchanges, Energy efficiency, tourism , EV charging , e-education, waste treatment and others which may be felt to be taken on priority from time to time. Similar committee can also be constituted to monitor the approvals and implementation of important infrastructure projects across different sectors as outlined in



Regional Plan 2041 etc. For all Citizen Centric Civil Infrastructure including those mentioned in various chapters of this plan and under implementation strategy SPVs be created with appropriate Service Level Parameters (SLAs/SLBs)

- xxii. A system of submission of quarterly reports of Regional Plan implementation status to Chairman, NCRPB, shall be initiated.
- xxiii. In order to ensure that the policies and strategies get converted to results on ground, it is required to have an efficient management system for (a) speedy implementation and monitoring of the Plan policies and proposals, (b) proper monitoring of the projects. The policies and proposals of RP 2041 pertaining to Central Ministries/ Departments/ Agencies like Railways, MoRTH, Power, Environment etc. has to be implemented by the respective Departments. Hence, the following need to be undertaken:
- xxiv. Suitable arrangements like designation of a Senior Officer in each concerned Ministry /Department/Agency/ concerned secretariat of Central Govt. as per RP 2041 sectors, as Nodal Officer, who could liaison with NCRPB to provide inputs and monitor implementation of policies/proposals RP 2041, be made and effective monitoring and reporting of the status of implementation of the policies and proposals of RP-2041 pertaining to central Sectors be ensured. In particular, nomination of Executive Director level officers of NHAI, Railway Board, NeGD/MeitY, Tourism, Health, Rural Development, Skill Development, Water Resources, etc. as Nodal Officers for Regional Plan implementation would be very useful in smooth coordination.
- xxv. Designated Nodal Officer may also be a special invitee to the Planning Committee meetings of the Board like State Nodal Officers, who will provide both inputs for planning and also provide regular update/report the status of implementation of policies/proposals and projects being executed in NCR to NCRPB.
- xxvi. The **Table 13.3** indicates the sub-regional mechanisms of monitoring and coordination:

Table 13.3 Mechanisms of monitoring and coordination at Sub-Regional level

State Level Steering Committees (SLSCs) are	<ul style="list-style-type: none"> • Under the Chairpersonship of Chief Secretary, of the respective NCR participating State • Constituted for effective implementation of the Regional Plan & monitoring wherein all concerned agencies/ departments/ authorities shall be the members. • Shall ensure regular meetings at least thrice a year. Participation through VC be encouraged. • To co-ordinate enforcement & implementation of the Regional Plan, FPs, SRPs, DDPs and Project Plans, Master/ development Plans and such other Plans in their respective sub-region and keep updating NCRPB on regular basis. • Members may include all concerned Principal Secretaries & officers related to Regional Plan elements. Committee may accordingly be re-constituted within 03 months from the date of Notification of final RP-2041. Responsibility for same be that of respective State Nodal Officers in each sub-region. • Should ensure that State Laws / bye-laws for their respective Sub-region are in tune with Regional Plan 2041 requirements and perceived goals.
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- xxvii. Since NCR participating States have been mandated by the NCRPB Act, 1985 to implement the policy of Regional Plan, hence all NCR participant State Government implementing agencies shall ensure the implementation of Regional Plan
- xxviii. SLSCs be used more efficiently regarding preparation of SRPs, District Development Plans and Master/ Development Plans and implementation of these plans through various agencies and State Urban Development/ Town Planning Department which is nodal department for NCRPB can also become the anchor point for all state departments, on behalf of the Steering Committee.
- xxix. Divisional Commissioners and District Collectors/ District Magistrates shall be responsible for enforcement and implementation of RP, FPs, SRPs and Project Plans in respective districts.
- xxx. A broad framework of reporting the performance and changes in the region is suggested. Indicative Performance Monitoring Parameters can be developed into measurable outcomes by NCR participating states in their SRPs and Master/Development Plans and DDPs.

13.3.3 Financial Resource Mobilisation



- i. Concerned Central Ministries/Departments should formulate appropriate strategies and implement policies, proposals and projects of Regional Plan 2041, for NCR development.
Concerned Central Ministries/Departments need to undertake shared initiative and implement RP 2041 policies, projects and proposals through their physical and financial effort, reflecting these in their respective Annual Plans and work programmes.
- ii. To make NCR among top 5 preferred global destinations the following funding mechanisms are proposed
- iii. Inter-state Fiscal Policy can be streamlined based on the following:
 - a) Cognizance of NCR as special entity
 - b) State and Local Taxation policy frame work review
 - c) Review of uneconomic fee and toll
 - d) Improving Resource Imbalance-Local finance /SFC
- iv. All Central Ministries to earmark 8-10% funds for development of NCR
- v. All states to ensure local spending of at least 50-75% revenues from NCR
- vi. Market borrowings, multi-lateral –bilateral borrowings;
- vii. Regional Plan -2041 being SDG oriented, can be usefully leveraged by domestic and international investors to source SDG focused funds for its implementation.
- viii. Central and State sovereign guarantees be provided to NCRPB
- ix. Other infrastructure development funds from DEA, DoE to NCRPB
- x. Subordinate loans with nil or nominal interest and long tenures
- xi. PSMG could include DoE too if above considered.
- xii. NCRPB should leverage funds from various schemes / missions launched by the Central Government. Since NCR is the largest GDP contributing region and contributes about 8% of the National GDP, about 8-10% funds of all Central Ministries could be earmarked for development of NCR so that this region could contribute substantially towards the national goal of USD 5 trillion economy.
- xiii. Developing an institutional mechanism of dedicated fund for NCR may include earmarking of developmental funds specifically for NCR by concerned departments/ agencies at Centre and NCR state levels, especially for elements referred/mentioned in RP-2041, and could be a '**Greatest NCR Development Initiative**'.
- xiv. NCR should be considered as a "Special Metropolitan Area" for special funding as was considered earlier for Mumbai Metropolitan Region. This would accelerate the infrastructure development in NCR, the world's largest urban agglomeration. NCR can also leapfrog to reach among top five cities in next decade if supported through concerted strategy and dedicated resources. Rough estimates show that about INR 1.00 lakh Cr. may be required per year for next 20 years to provide world class civic and business infrastructure to this region.
- xv. Requisite fund allocations, specific to NCR under various budget heads could be separately collated under NCR budget head through NCRPB under MoHUA. This shall help for better monitoring and efficient utilization of funds allocated for NCR development.
- xvi. The massive amount of funds required for provision of basic necessities and for provision of smart citizen services required for Ease of Living coupled with huge infrastructure for transport connectivity, power distribution, other social infrastructure, will require large investments in NCR. Facility of significant amounts of **Subordinate Loan** with little or no interest to NCRPB, would be a major contribution for bringing the infrastructure of this best performing economic hub of India at par with similar global capitals.
- xvii. The Urban Development Fund (UDF) with the MoHUA, Govt. of India be accessed to supplement investment efforts in the respective urban areas of NCR.



- xviii. Private sector, exclusively and/or jointly with Central/State agencies, can be involved for leveraging more funds and encouraged for efficient delivery of variety of infrastructure and services including land development, industries and wholesale trade, social infrastructure, local and trunk services, housing, construction of expressways, training institutes, mass transport system, power generation, power transmission and distribution, telecom services.
- xix. Non-financial instruments like FAR, TDR etc. be used imaginatively and effectively to undertake urban redevelopment and natural conservation and heritage restoration & beautification.
- xx. Some of the methods through which land could be used as a viable resource for financing various development programmes in the region, could include:
 - a) Creation of land banks by public agencies for utilization for future requirements
 - b) Land pooling
 - c) Value Capture: Permitting the private sector to develop land and recovering a part of value added on account of such permitted development
 - d) Permitting commercial use of precious land by private sector and deriving returns in form of social housing/ development for the occupants of that land
 - e) Land recycling to facilitate shifting/relocating industrial unit/markets etc., located thereon.
- xxi. Single point taxation regime is recommended for all kinds of vehicles in NCR. This tax should be levied digitally at NCR entry points and States could share the proceeds, proportionately.
- xxii. More innovative mechanism of resource generation be explored in addition to normal budgetary support and IEBR (Internal and Extra Budgetary Resources), so that envisaged development programmes could be implemented within a reasonable time-frame.
- xxiii. Market based funds through accessing the capital market and involvement of private sector, by making the projects, commercially viable should also be looked into.
- xxiv. Access to infrastructure and private finance cannot be sustained on a piecemeal/ case to case basis. Reforms in institutional, fiscal and economic systems of settlements will be necessary to achieve management efficiency and credit-worthiness that sustains long-term programme of infrastructure investments. Further, options like municipal bonds should be used to raise funds.
- xxv. Amongst the non-tax sources, “User Charges”, happens to be the most important mechanism of cost recovery, however, in actual practice the municipal governments are not recovering even the O&M costs, besides as ULBs generally do not levy rational user charges, may be impressed to recover at least the O&M costs.
- xxvi. Central Ministries can consider using NCRPB as a partner for NCR under their various Schemes/Missions for urban and rural areas like Smart Cities, AMRUT, Swachh Bharat Mission, PMAY- U &G , DAY-NULM, Tourism, HRIDAY, Urban Transport, Gram Swaraj Abhiyan, RURBAN (NRuM), Swachh Gram, etc. through NCRPB. This will facilitate a more focused intervention in NCR sub regions, even by respective State Govts. by effectively earmarking these funds for NCR.
- xxvii. Efficient, effective and structured utilization of funds under Corporate Social Responsibility (CSR) needs to be looked into for NCR, at both Central and State level. CSR portal for NCR could help in focused interventions.
- xxviii. Project components with comparatively lower Financial Internal Rate of Return (FIRRs), may be clubbed together with other project components having higher rate of returns, so that composite profits of both could make the whole project viable. Expressways can be proposed to be taken up through private sector on BOT basis with TOD benefits in NCR, enabling good returns and improving their FIRR's.
- xxix. NCR could be used as a pilot for various futuristic interventions.



- xxx. PPP route with appropriate service level benchmarks could be considered for sectors like fire-fighting systems, security surveillance systems, waste collection, segregation and recycling/material recovery facilities, decentralised STPs and Faecal STPs, energy audits and energy efficiency, telemedicine centres for rural areas and congested urban wards, quality primary and middle school education facilities in each ward /village, etc.
- xxxi. Appropriate incentives should be given in PMAY (Urban & Rural) projects in NCR for their timely completion.
- xxxii. Mismatch between functions and finances of ULBs be addressed through efforts towards increasing funding of ULB and improving their revenue resource generation capabilities. Alongside, regular skill upgradation of ULBs manpower be ensured. In this regard following actions, but not limited to, are proposed:
 - a) Each NCR district to have an Annual Plan for skill upgrading of ULBs
 - b) Zone Survey for tax base enhancement shall be undertaken by ULBs every two years.
 - c) Funds should be directly transferred to NCR located ULBs like for Gram Panchayats.

13.3.4 Manpower Resources

- i. As suggested by NITI Aayog, assessment of the human resource capacity of NCRPB, its Planning and Monitoring Cells in each sub-region as well as local planning bodies should be undertaken, as per relevance. This may include identification of present capacity in terms of number of technically qualified staff and technical capacity for undertaking/ implementing 'Futuristic' plans. Model team structures and job descriptions may be developed based on the skills required to achieve the vision of NCR plan in its entirety. (Global best practices of organizational structures and capacities of Tokyo, Singapore, etc. may also be referred in this regard).
- ii. Currently, NCRPB is functioning with skeletal staff of about 40 persons, out of which a meagre 7 planning staff is available as technical staff.
- iii. Based on strengthening of technical section, requirement of support staff and staff in Finance and Administration and Project wings will have to be strengthened adequately. Details of sanctioned strength on rolls and proposed total strength of NCRPB Secretariat have been given in **Appendix-13.1**. NCRPB strengthening is a must and staff structure needs to be pyramidal with more Planners, Sector Experts, Planning Assistant and Technical Assistants, GIS Experts, and Project Planning/Monitoring Experts, etc.
- iv. Restructuring and strengthening of the NCR Planning and Monitoring Cells, which are under the administrative control of respective NCR participating states at Sub-regional level shall also be required. Further, their functioning should be ensured in a manner that facilitates single line command and control, based on merit consideration.
- v. NCR PMG (Project Monitoring Group) is suggested for monitoring and problem resolution required for speedy execution of major projects (above Rs.10 crores) of Central and state governments in NCR, it can be serviced by NCRPB to leverage its coordination with centre and states.
- vi. NCRPB shall fund all SRP preparation costs, reimbursing these costs like before. To avoid delays, it is proposed that such reimbursement may be considered to be reduced by 10% of costs for every one quarter delay.
- vii. NCRPB can also consider reimbursement of partial costs for preparation of Master plans after ensuring that they are in conformity with provisions of Regional plan 2041.

13.3.5 Regulatory Changes Proposed

- i. In keeping with the spirit of Section 29(1) of NCRPB Act, 1985 Master Plans/ Development Plans will be prepared by the NCR participating States and sent to NCRPB with a certificate of conformity with the Sub-Regional Plan (SRP). If SRP is not published by the State as per the NCRPB Act, 1985 'certificate of conformity' with Regional Plan be given by the States regarding



Master/ Development Plans.

- ii. With regards to Master/Development Plans, NCR Planning & Monitoring Cells of the respective States will help the State Government in ensuring conformity of Master/ Development Plans with the Sub-Regional Plan and Regional Plan. NCRPB will ensure necessary capacity building of NCR Planning & Monitoring Cells of the States/UT to assist States/UT regarding preparation of Master/ Development Plans in conformity with SRP/Regional Plan.
- iii. Creation of NCR as Unified Economic Space (UES) for all economic related activities to fully unlock the potential of Delhi and its surrounding areas for placing this largest GDP contributor in top 5 global economic capital hubs in next decade and to help the nation achieve its target of a US \$ 5 billion economy.
- iv. Pan-NCR economic activities should have permissions based on exclusively online and seamless approval processes, including for land arrangement, construction, modification, tree cutting, etc.
- v. Classification of warehousing/logistics as industrial and not commercial activity should be done.
- vi. Mandatory smart metering of power, water including agricultural water connections, however, existing or proposed subsidy on any or all of these are not to be affected.
- vii. Amendment of relevant urban development laws to mandate conformity to Regional Plan/Sub-regional Plans if published as per NCRPB Act in finalisation of all Master Plans in NCR to ensure non-violation in letter and spirit of NCRPB Act. This is especially critical to implementation of the game changing provisions proposed in the RP section relating to Modern Township, housing and slum free NCR.
- viii. Repeal of Delhi Land Reforms Act 1954, to smoothly integrate Lal Dora & extended Lal Dora areas and their villages in mainstream Delhi's growth, since all other efforts since 1980s have not been fully successful.
- ix. Mandatory implementation of ECBC energy efficiency building codes in all Group Housing and all multi storey non domestic buildings like institutional, industrial and commercial structures in NCR.
- x. Mandatory registration and Geo-tagging of all bore wells in NCR and requirement of permissions for new bore wells.
- xi. Permission for telemedicine should continue in NCR beyond current pandemic. Tele- medical consultation should be made mandatory as first level of consultation except in pregnancies, accidents and other emergencies etc. This will provide health services at doorstep of citizens while also help to ease the burden of premier referral institutions of NCR. All hospitals including private, having indoor facilities shall have roster of tele-consultation availability of their expert doctors.
- xii. Mandatory E-health records to be maintained by all with 10+ beds medical establishments in NCR; mandating creation and maintenance of E-Health Registry in NCR.
- xiii. Modification of recognition provisions to mandate all district hospitals and 100 bedded hospitals to upgrade to Teaching hospitals and speciality teaching hospitals respectively to provide quality health services nearer-to districts.
- xiv. Similarly modification of paramedical colleges recognition provisions to enable and mandate all NCR 50 bedded hospitals to train and certify paramedical staff, to greatly boost quality health care and provide local employment opportunities.
- xv. Notification for ITI or Polytechnic at district headquarter in all NCR districts to house District skill registry & Migrant facilitation centre backstopped by NSDC with the help of sector skill councils.
- xvi. Regulations to facilitate sustainable and concessional land cost on good Service Level Agreements (SLAs) by development authorities for good quality social infrastructure like hospitals, education , elderly care, assisted living, crèches and working women's hostels, hospices etc.
- xvii. NCR wide Accident Response Facilitation Centre serviced perhaps by Delhi Police for reducing fatalities from accidents.



- xviii. NCR Crime Coordination Support Office serviced by perhaps NCRB, to assist and coordinate with all NCR States to improve overall safety in NCR.
- xix. **Tourism infrastructure projects**, viz., hotels, resorts, equipment, parks etc., involving investment of more than Rs. 1 crore be recognized as 'infrastructure' and necessary amendment be made to enable promoters to avail loans on a priority basis.⁴⁹
- XX. NCR States to make policies to support and develop special tourist and leisure zones with 300 acres of land parcels (based on smart cities models) for theme parks, like Disneyland, Kingdom of Dreams, Siam Niramit (Thailand)', etc.
- xxi. All citizen interface processes in NCR to be digital and concerned officials/staff to have digital/Aadhar enabled signing facilities mandatorily.
- xxii. PMGSY in NCR may be considered to be amended to implement rural highway connectivity goal by linking a loop of villages by ring road of about 15 km radius, since PMGSY original mandate of connecting habitations with upto 500 populations is already achieved in NCR.
- xxiii. **Refining of several sectoral rules has been provided for in this Plan in the relevant chapters especially Health (Telemedicine, E-Health Registry, Medical and nursing colleges in every NCR district, Agricultural water metering, provision of smart utilities, digital Platforms for all approvals, sustainable land cost for social infrastructure, skilling land use including mixed land use and warehousing land use, industrial estates policies SPV based implementation of utilities and other social sector services, etc.**
- xxiv. Strengthening of NCRPB- The office of NCRPB should be adequately strengthened with qualified technical and non-technical staff. Further, NCRPB need to be considered for optimum financial resources, delegation of powers, etc. MoHUA should fast track processes in this regard.

13.3.6 KEY PROJECTS

- (i) The various policy measures advocated in the document have been attempted to be formulated into a key list of projects, which on timely implementation, can help NCR realize its mission of being Future Ready, in the coming decades. These range from proposals that may require immediately need of being taken up on ground to those requiring Feasibility Studies prior to proceeding with Detailed Project Reports for implementation. The spectrum of projects also covers low cost high impact projects to capital intensive initiatives intended to play a major role at National and international level.
- (ii) Besides, there are a series of Regulatory Reforms and Platforms proposed for the envisioned better and more inclusive and harmonious NCR.
- (iii) While the timelines for some of the projects listed have been specified in the respective or corresponding sections, especially with respect to Metro Centres and Regional Centres, most the of the key projects are suggested to be completed and operational by 2030. The implementation of all projects including time-bound projects will be subject to project feasibility where necessary and also availability of funds.
- (iv) The ball park cost estimates have been provided (excluding land cost) as an attempt to present a very broad idea of the capital investments that would be required for the NCR for the major projects proposed under the plan. The list of key identified projects for a Future Ready National Capital Region are provided at **Appendix-13.2**.

⁴⁹ NITI Aayog - Strategy for New India @ 75 - https://niti.gov.in/writereaddata/files/Strategy_for_New_India.pdf



Appendix-4.1

SECTOR-SPECIFIC RECOMMENDATIONS FOR INDUSTRIAL DEVELOPMENT AND EMPLOYMENT GENERATION IN NCR

S. No.	Sector	Recommendations
I	NCT Delhi	<ul style="list-style-type: none"> a. Non-hazardous industries as permitted by Delhi Pollution Control Authorities b. Vertical development and massive re-development of urban, commercial, institutional, residential spaces and old areas. c. Re-development of industrial areas with ease of land use conversion.
II	CNCR – Ring of Opportunities	<ul style="list-style-type: none"> a. Logistic Parks, Multi-Modal Transport Hubs, ICDs, Dry Ports, Recreational Theme Parks, Specialized Townships, Service sector, High value manufacturing etc. b. Re-development of industrial areas with ease of land use conversion. c. Vertical development and massive re-development of urban, commercial, institutional, residential spaces and old areas.
III	Rest of the NCR	<ul style="list-style-type: none"> a. Large rural investment areas, SEZs, Heavy Industries b. New concept of 5-10 years land lease for economic activities including industries, agro-parks, etc. c. Third party land aggregators to enable dynamic changes in landuse, etc. as per global market conditions d. Fast and efficient road, rail and air connectivity
1.	Agro-based and Food Processing Industry	<ul style="list-style-type: none"> a. Food testing laboratories in Haryana sub-region. b. Fruit and Vegetable Processing Park in Bulandshahr and Jhajjar for horticulture produce. c. Oil seed processing units in Bharatpur. d. Sugar Industry Muzzafarnagr and Shamli e. Dairy industry in Meerut and Bulandshahr f. Rice mills/ paddy processing Hapur-Philkhuwa g. Panipat
2.	Electronics and Information & Communication Technology	<ul style="list-style-type: none"> a. Considering the gap between number of approved and operational IT/ITES SEZs in NCR, it is recommended that appropriate policy interventions are made for operationalization of the approved SEZs to boost export. b. Software Development in NCT-Delhi, Gurgaon, Alwar and Noida (need intensification especially in case of NCT-Delhi).
3.	Automobiles & Automotive Components	<ul style="list-style-type: none"> a. Induced cluster at IMT Manesar and Bawal for automobiles and auto components (need skilled manpower and infrastructure like workers' hostel etc.) b. Adequate level of support infrastructure, including forward and backward linkages, is to be established for the Auto-Park (e.g., upcoming Auto-Park at Alwar) and Research Institutes (e.g., upcoming National automotive testing, research, and development infrastructure project in Haryana). c. Infrastructure support for auto component for Faridabad, Gurgaon, NOIDA, Meerut and Alwar.
4.	Handloom, Hosiery, Textile and Garments Manufacturing	<ul style="list-style-type: none"> a. Apparel park in Gurgaon SEZ and at Barhi (Sonapat) under the Apparel Park for Exports Scheme of Government of India. b. International Trade and Convention Center at Panipat. c. International Trade Center at Gurgaon for promotion of garments. d. Textiles Park in Alwar District. e. Dyeing Houses in Faridabad and Ghaziabad Districts. f. Textile Skill Development Centre at Okhla. g. Handloom in Baghpat, Hapur-Philkhuwa
5.	Footwear, leather garments and accessories	<ul style="list-style-type: none"> a. Infrastructure for leather development at Bahadurgarh, Haryana. b. Alwar (Ramgarh/ Rajgarh)
6.	General Engineering	<ul style="list-style-type: none"> • Faridabad, NOIDA, Gurgaon - Most of the units are MSME nature and require support in the areas such as marketing initiatives, technology, and availability of raw materials.



S. No.	Sector	Recommendations
7.	Logistics	<ul style="list-style-type: none"> a. Key districts: Jhajjar, Sonipat, Gurugram, Charkhi-Dadari, Ghaziabad, GB Nagar, Bulandshahr, Baghpat, Alwar b. Considering the DFC and the DMIC projects which includes part of Haryana and Uttar Pradesh sub-regions, it is recommended that logistics infrastructure such as Inland Container Depots (ICDs), Container Freight Stations (CFS), Integrated Freight Complexes be set up in these sub-regions at strategic locations. c. Multi-Modal Logistics Hub (IMLH) at Nangal Chaudhary, Mahendragarh
8.	Tourism and Hospitality	<ul style="list-style-type: none"> • Alwar, Bharatpur, Hapur (Garmukteswar), Gurugram, Hastinapur (Meerut), Karnal, Muzafarnagar
9.	Medical and Health Support Services	<ul style="list-style-type: none"> • Noida, Ghaziabad, Gurugram, Faridabad, Rewari, Meerut.
10.	Construction sector	<ul style="list-style-type: none"> • Gr. Noida, YEIDA, Ghaziabad, Gurugram, Faridabad, Sonipat
11	Circular economy including material/waste recovery facilities, C&D, e-waste, steel recovery from end-of-life Vehicles.	<ul style="list-style-type: none"> • Baghpat, Bulandshahr, Nuh (Mewat), Jhajjar, Alwar/ Bharatpur.
12	Sports Goods	<ul style="list-style-type: none"> • Meerut - For technical upgradation there is already a technical institute dedicated for this purpose.
13	Pottery	<ul style="list-style-type: none"> • Khurja, Mewat
14	Handicraft	<ul style="list-style-type: none"> • Alwar (Murti/Sculpture), Rewari (Brass ware), Mewat (Crochet)
15	Toys	<ul style="list-style-type: none"> • Meerut, Greater Noida, Sonipat.
16	Large Circular Economy Projects	<ul style="list-style-type: none"> a. Scrap recovery facilities from old vehicles – Nuh, Baghpat, Bharatpur, Alwar, Bulandshahr, Bhiwani b. C&D waste recovery facilities - Bharatpur, Baghpat, Nuh c. E-Waste recovery – Baghpat, Nuh, Rewari, Jhajjar
17	Tourism	<ul style="list-style-type: none"> • Potential lies in all districts across NCR
18	Solar power parks	<ul style="list-style-type: none"> • Bharatpur, Bulandshahr

Source: Functional Plan for Economic Development of NCR (2016) and market research



Appendix-4.2

ECONOMIC DEVELOPMENT PROJECTS OF NCR

A. Growth Corridors and Opportunity Areas - In terms of Economic Corridor/ Node or Industrial Estate/ clusters, artisans' clusters & services, towns in the rest of NCR have been identified for revival and promotion of economic activities and to operate as a service centre to their rural hinterland.

Matrix of Growth Corridors (GCs) and Opportunity Areas (OAs)

Economic Corridor/ Node or Industrial Estate as GCs & OAs	
Delhi Mumbai Industrial Corridor (DMIC)	Remarks
1. Integrated Industrial Township Project at Greater Noida	<ul style="list-style-type: none"> Land 747.5 acres Investment about 634.40 Cr.
2. Global City Project	<ul style="list-style-type: none"> SPV - "DMIC Haryana Global City Project Ltd." Master Plan approved by GoHry GoHry to implement project on its own
3. Mass Rapid Transit System (MRTS) Project	<ul style="list-style-type: none"> SPV - "DMIC Haryana MRTS Project Ltd." DPR approved by GoHRY
Smart Community Projects: 4. Model Solar Project, Neemrana, Rajasthan: 5MW Solar Power Plant commissioned 2015 & 1MW Micro Grid Solar Power Plant commissnd. 2017	<ul style="list-style-type: none"> Project completed
Amritsar Kolkata Industrial Corridor (AKIC)	Remarks
5. Integrated Manufacturing Cluster (IMC) - Punjab (Rajpura-Patiala)	
6. Integrated Manufacturing Cluster (IMC) - Haryana (Saha Ambala)	
7. India International Convention & Expo Centre (IICC) at Dwarka by DPIIT - incl. Exhibition & Convention spaces, arena, trunk-infrastructure, Metro/NHAI connectivity, hotels, office and retails spaces, etc.	<ul style="list-style-type: none"> Estimated cost of Rs. 25,703 crore To be completed by 2025
Road/ transport based Corridors	Remarks
8. Yamuna Expressway Industrial Development Area (YEIDA), by GoUP	<ul style="list-style-type: none"> YEIDA notified area covers approx. 2,689 sq. kms. falling in six districts 165 km Yamuna Expressway {6 lane (extendable to 8lane)} connects international tourist destinations of Delhi, Agra.
9. PANCHGRAM by GoHRY - (Five-city project)-proposed along KMP Expressway	
10. Eastern & Western Peripheral Expressway Corridor	Completed
11. Proposed Orbital Rail Corridor - by GoHry	
Economic Corridors in NCR under Bharatmala project by MoRTH	
12. North-South Corridor	13. Delhi – Kanpur - (424 Km: Delhi - Ghaziabad - Aligarh - Kannauj – Kanpur)
14. Sirsa - Hissar - Rohtak – Delhi (278 km)	15. Bilaspur - New Delhi - (302 Km: Bilaspur - Jagadhri - Yamunanagar - Saharanpur - Roorkhe - Muzzafarnagar - Meerut - Ghaziabad – Delhi)
16. Delhi-Lucknow-(494 Km: Delhi-Moradabad -Bareilly-Shahjahanpur-Hardoi-Lucknow)	17. Jaipur - Dausa - Bharatpur – Agra (240 Km)
Inter Corridor Routes in NCR under Bharatmala project	
18. Gurgaon – Sikar (210 Km)	19. Jaipur-AgraBranch (Bharatpur-Alwar) (86 Km)
20. Rohtak – Rewari (78 km)	21. Rohtak – Panipat (56 km)



Feeder Routes in NCR under Bharatmala project			
22. Bhiwani - Narnaul (130 km)		23. Gurgaon - Pataudi - Rewari (55 Km)	
24. Karnal - Meerut (101 km)		25. Delhi - Sirsa (Branch to Bhiwani) (38 KM)	
26. Sikandra - Rewari - Branch 2 (76 km)		27. Gurgaon - Jhajjar (38 Km)	
28. Bilaspur - New Delhi : Branch to Rishikesh and Dehradun (60 km)		29. Dharuhera - Sohna (28 Km)	
30. Rohtak – Jind (58 km)		31. Delhi - Sirsa (Branch to Jhajjar) (23 Km)	
Greenfield Expressways		Remarks	
32. Delhi-Meerut Expressway (96 Km)		Completed.	
33. Delhi-Amritsar-Katra (600 Km with 135km in Hry)		Upcoming Project Cost 30,000 Cr.	
34. Delhi – Jaipur (274 Km)			
35. Delhi- Mumbai Expressway (1261 Km)		Under construction (Cost Rs.90,000 Cr.)	
36. Ganga Expressway – Meerut to PrayagRaj (602 Km – Ist phase) {6 lane (extendable to 8 lane) }		To be completed by 2025	
Aviation Hubs by GoUP & GoH		Remarks	
37. International Airport at Jewar			
38. Integrated Aviation Hub Hisar		Over 4200 acres of land	
39. Six Lane Controlled access Highway from Delhi to Hisar			
40. Rapid Rail Connectivity is under construction (to be extended up to Airport)			
41. International Airport and Aviation University & Training Centre and Aerospace Manufacturing			
42. IGI Delhi to Chandigarh link (240 Km)		Highway/ Expressway proposed by GoHaryana for reaching Delhi to Chandigarh in 2 hr. at 120 kmph speed - to be completed by 2023. Use under-construction expressways, completed links and the upcoming Delhi-Katra Expressway	
43. 06 Lane Trans-Haryana Highway (304 Km) from Ambala to Kotputli (via Ismailbad)			
Major Warehousing Clusters ⁴⁸			
44. Bahadurgarh	45. Dhankot	46. Tauru	47. Pilkhuwa
48. Jhajjar	49. Kulana-Luhari	50. Sohna	51. Ghaziabad-Hapur
52. Badli	53. Pataudi-Jamalpur Road	54. Palwal	55. Sonipat
56. Farukh Nagar	57. Dharuheda – Bhiwadi	58. Dadri-Gr.Noida-Noida	
Major Manufacturing Hubs ⁴⁹			
59. Panipat	60. Okhala	61. Faridabad - Ballabgarh	62. Bawal-Rewari
63. Sonipat-Kindli	64. Meerut	65. Palwal	66. Rohtak
67. Bahadurgarh	68. Ghaziabad	69. Gurugram-Manesar	70. Alwar (Tapukhera)
71. Bawana	72. Dharuhera & Bhiwadi		
Electronics System Design and Manufacturing (ESDM) Clusters ⁵⁰			
73. Bhiwadi	74. Ghaziabad	75. Gurugram	76. Sonipat
77. Neemrana	78. Yamuna Expressway area	79. Bawal	80. Jhajjar
81. Noida - Greater Noida	82. Faridabad – Palwal	83. Dharuhera	
Multimodal logistics parks (MMLP)		Remarks	
84. Multi Modal Logistics Hub (MMLH) at Dadri Greater Noida (DMIC)		• State Govt. moving forward with remaining parcels land acquisitio	
85. Multi Modal Transport Hub (MMTH) at Boraki in Greater Noida (DMIC)		• -do-	

⁵⁰ Knight Frank Research, India Warehousing Market Report 2019⁵¹ Knight Frank Research, NCR WAREHOUSING MARKET REPORT⁵² <https://meity.gov.in/writereaddata/files/Notification-EMC-Gazette.pdf>

86. Integrated Multi Modal Logistics Hub (IMLH) at Nangal Chaudhary, District Mahendergarh (DMIC)	<ul style="list-style-type: none"> Land approx. 886 acres SPV “DMIC Haryana Multi Modal Logistic Hub Project Ltd.” Investment app Rs.5000 Cr.(Rs. 1852 Cr. GoI)
Dry ports	Remarks
87. Garhi Harsaru (Gurugram)	Inland Container Depot
88. Ballabharg - Faridabad	Inland Container Depot
89. Tughlakabad	Inland Container Depot, Exim Terminal
90. Okhala	Inland Container Depot, Dom. Terminal
91. Rewari	Combined Terminal
92. Kathuwas (Neemrana)	Combined Terminal
93. Babarpur (Panipat)	Exim Terminal
94. Dadri	Combined Terminal
95. Inland Container Depot-Loni, CWC	

SME Clusters - UNIDO ⁵³	Remarks
96. Wazirpur, Badli - North West Delhi	Stainless Steel Utensils & Cutlery
97. Okhla, Mayapuri - South & West Delhi	Chemicals
98. Naraina & Okhla - West & South Delhi	Electrical Engineering Equipment & Electronic Goods; Paper Products; Plastic Products
99. Lawrence Road- North Delhi	Food Products
100. Okhla, Wazirpur Flatted Factories Complex - South Delhi	Leather Products
101. Okhla, Mayapuri, Anand Parbat - South, West Delhi	Mechanical Engineering Equipment
102. Naraina, Okhla, Patparganj - West, South, East Delhi	Packaging Material
103. Naraina, Okhla, Shivaji Marg, Najafgarh Road - West, South, North West Delhi	Rubber Products
104. Shahdara & Vishwasnagar - North East Delhi	Wire Drawing
105. Mayapuri & Wazirpur	Metal Fabrication
106. Kirtinagar & Tilak Nagar - West & North East	Furniture
107. Wazirpur- North West Delhi	Electro Plating
108. Okhla, Mayapuri, Naraina, Wazirpur Badli & G.T. Karnal Road - South, West, & N-W Delhi	Auto Components
109. Shahdara, Gandhinagar, Okhla & Maidangari - North East Delhi, East Delhi & South Delhi	Hosiery
110. Okhla & Shahdara - South & North East	Readymade Garments
111. Okhla, South Delhi	Sanitary Fittings
112. Bhiwani	Powerloom & Stone Crushing
113. Faridabad	Auto Components, Engineering Cluster, Stone Crushing
114. Gurgaon	Auto Components, Electronic Goods, Electrical Engineering Equipment, Readymade Garments, Mechanical Engineering Equipment
115. Karnal	Agricultural Implements; Rice Mills
116. Panipat- Samalkha	Rice Mills, Powerloom, Shoddy Yarn, Foundry, Cotton Spinning, Nuts/ Bolts
117. Alwar	Chemicals

⁵³ <https://dcmsme.gov.in/clusters/clus/smelist.htm#clus>



118. Khurja – Bulandshahr	Ceramics
119. Noida- Gautam Buddha Nagar	Electronic Goods, Toys, Chemicals, Electrical Engineering Equipment, Garments, Mechanical Engineering Equipment, Packaging Material, Plastic Products
120. Ghaziabad	Chemicals, Mechanical Engineering Equipment, Packaging Material
121. Meerut	Sports Goods, Scissors,
122. Muzaffarnagar	Rice Mills

B. Major Mega Food Park Projects (as on 27.02.2020⁵²) in NCR (Source: MoFPI)

State	SPV/IA Name	City Name	Status
Haryana	Haryana State Industrial & Infra Dev. Corp Ltd (HSIIDC)	Sonipat	Under Implementation
	Haryana State Coop. Supply and Marketing Federation Ltd (HAFED)	Rohtak	Under Implementation

C. Agro-processing Clusters approved by MoFPI for Infrastructure for Agro-processing Clusters (MoFPI)

Project Execution Agency	Location of the Project	District & State	Status
M/s K R Food APC	Village Bhiravati, Tehsil & District Nuh, Mewat, Haryana	Mewat, Haryana	Under Implementation
M/s Karnal Food Pack Cluster Limited	Agro Park, Mugal Majra Road, Kunjpura, Distt. Karnal, Haryana	Karnal, Haryana	Under Implementation

D. International Mandi Project at Ganaur, Sonipat is under consideration.

⁵⁴ <https://dcmsme.gov.in/clusters/clus/smelist.htm#clus>



Appendix-4.3

LIST OF BHARATMALA PROJECTS

Economic Corridors falling in NCR	
1.	North-South Corridor
2.	Sirsa - Hissar - Rohtak – Delhi (278 km)
3.	Delhi-Lucknow-(494 Km Delhi-Moradabad -Bareilly-Shahjahanpur-Hardoi-Lucknow)
4.	Delhi – Kanpur - (424 Km Delhi - Ghaziabad - Aligarh - Kannauj – Kanpur)
5.	Bilaspur - New Delhi - (302 Km Bilaspur - Jagadhri - Yamunanagar - Saharanpur - Roorkhe - Muzzafarnagar - Meerut - Ghaziabad – Delhi)
6.	Jaipur - Dausa - Bharatpur – Agra (240 Km)
Inter Corridor Routes falling in NCR	
7.	Gurgaon – Sikar (210 Km)
8.	Jaipur-AgraBranch (Bharatpur-Alwar) (86 Km)
9.	Rohtak – Rewari (78 km)
10.	Rohtak – Panipat (56 km)
Feeder Routes falling in NCR	
11.	Bhiwani - Narnaul (130 km)
12.	Karnal - Meerut (101 km)
13.	Sikandra - Rewari - Branch 2 (76 km)
14.	Bilaspur - New Delhi : Branch to Rishikesh and Dehradun (60 km)
15.	Rohtak – Jind (58 km)
16.	Gurgaon - Pataudi - Rewari (55 Km)
17.	Delhi - Sirsa (Branch to Bhiwani) (38 KM)
18.	Gurgaon - Jhajjar (38 Km)
19.	Dharuhera - Sohna (28 Km)
20.	Delhi - Sirsa (Branch to Jhajjar) (23 Km)
Greenfield Expressways	
21.	Delhi-Meerut Expressway (96 Km)
22.	Delhi-Amritsar-Katra(600Km with 135km in Hry)
23.	Delhi – Jaipur (274 Km)
24.	Delhi- Mumbai Expressway (1261 Km)
25.	Ganga Expressway – Meerut to PrayagRaj (602 Km – Ist phase) {6 lane (extendable to 8 lane) }



Appendix-4.4

EASE OF DOING BUSINESS SUGGESTIVE INDICATORS (WORLD BANK)

To further improve the ranking of India in EODB climate, government of India has taken various initiatives at central level and has come up with State Business Reform Action Plan (BRAP) 2019 to guide the states/UTs in implementing various guidelines. This will help the states to implement the regulatory processes, policies and process spread across 10 reform areas spanning the lifecycle of a typical business and to streamline inspections and set the nation free from ‘inspector raj’. The implementation Guide⁵⁵ under BRAP provides overview of following 12 major sections:

1) Access to information and transparency enablers	2) Single window system
3) Land administration & transfer of land & property	4) Land availability and allotment
5) Construction permit enablers	6) Environment registration enablers
7) Labor Regulation Enablers	8) Obtaining Utility Permits
9) Paying Taxes	10) Inspection Enablers
11) Contract enforcement	12) Sector specific

Further, the World Bank Group in its report - “Doing Business 2020, Economy Profile India”, has listed certain indicators, which can be adopted in NCR and further elaborated by each of the NCR participating States to have a competitive EODB climate in NCR. The EODB indicators are as following:

1. Starting a business	Procedures, time, cost and paid-in minimum capital to start a limited liability company
2. Dealing with construction permits	Procedures, time and cost to complete all formalities to build a warehouse and the quality control and safety mechanisms in the construction permitting system
3. Getting electricity	Procedures, time and cost to get connected to the electrical grid, and the reliability of the electricity supply and the transparency of tariffs
4. Registering property	Procedures, time and cost to transfer a property and the quality of the land administration system
5. Getting credit	Movable collateral laws and credit information systems
6. Protecting minority investors	Minority shareholders’ rights in related-party transactions and in corporate governance
7. Paying taxes	Payments, time, total tax and contribution rate for a firm to comply with all tax regulations as well as post filing processes
8. Trading across borders	Time and cost to export the product of comparative advantage and import auto parts
9. Enforcing Contracts	Time and cost to resolve a commercial dispute and the quality of judicial processes
10. Resolving insolvency	Time, cost, outcome and recovery rate for a commercial insolvency and the strength of the legal framework for insolvency
11. Employing workers	Flexibility in employment regulation and redundancy cost

Source: Doing Business 2020, Economy Profile India, World Bank Group

⁵⁵ https://dipp.gov.in/sites/default/files/Implementation_Guide_2019_dated_04022019.pdf



Appendix-4.5**PROPOSAL FOR ELECTRICAL NETWORKS IN U.P. AND NCT DELHI SUB-REGION**

District wise proposal for electrical networks (new sub-stations and infrastructure required to be added) includes the following:

- a) 33/11 KV sub-stations (total no. 926 & total cost Rs. 5986 Cr.)
- b) 33 KV line (total length 8480 km & total cost Rs. 6546 Cr.)
- c) 11 KV feeder (total length 13462 km & total cost Rs. 9933 Cr.)
- d) Underground Cable (total length 13000 km & total cost Rs. 14550 Cr.)
- e) AB Cable (total length 36500 km & total cost Rs. 5850 Cr.)
- f) Distribution T/F (total No. 87280 & total cost Rs. 15355 Cr.)
- g) Auto Re-closer / RMU with SCADA work (total No. 7035 & total cost Rs. 10500 Cr.)

1. Delhi Transmission Network

The summary of Delhi Transmission Network proposals is given at under:

Voltage Level	Existing substations (S/s)	S/s under implementation	Proposed S/s	Associated ROW requirement
765kV	01	01	02	67m ROW for overhead (O/H) Transmission line (T/L)
400kV	07 (including Mandola)	03	09	52m ROW for overhead (O/H) Transmission line (T/L)
220kV	41	04	37	35m ROW for O/H T/L or 2x2 mtr for U/G Cable.



Appendix-6.1

INDICATIVE LIST FOR DEVELOPMENT AS GLOBALLY COMPETITIVE AND WORLD-CLASS TOURISM CIRCUITS

A. Circuits in trans-NCR, of various categories like:-

1. **Religious circuit**
 - a) **Mahabharata circuit** - Sinauli, Hastinapur, Kila Parikshitgarh, Baranwa, Garhmukteshwar, Shukratal – covering Meerut & Saharanpur Regions (Cover Most of Western UP Viz. Meerut, Baghpat, Ghaziabad, Gautam Budhnagar, Bulandshehar, Saharanpur And Muzaffarnagar) - Mahabharata sites of Hastinapur, and the five villages proposed by Lord Krishna to be given to Pandavas, for the sake of peace and to avert a disastrous war, which included Indraprastha (Delhi), Swarnprastha (Sonipat), Panprastha (Panipat), Vyaghrprastha (Baghpat) and Tilprastha (Tilpat)
 - b) **Braj Bhoomi Relegious Circuit, Bharatpur Rajasthan⁵⁶**: Whole of Bharatpur represents the Braj culture in Rajasthan, with the Govardhan Parbat being the centre of the Braj 84 Kos Parikrama which runs through Bharatpur for almost half its length.

2. Circuit for natural sites within NCR like – Sariska, KeolaDev, Okhla, Sultanpur National Park, etc.

B. A network of greens and waterways be developed around Delhi and also other major cities as far as possible. Some of the Proposed Blue Green Getaways Circuits in NCR.

Circuit Name	Destinations
NCR Blue Green Getaway Circuit –I	5 No-Okhla Bird Sanctuary, Suraj Kund Lake-Badkal Lake- Damdama Lake-Asola Bhatti Wildlife
NCR Blue Green Getaway Circuit –II	9 No-Okhla Bird Sanctuary -Asola Bhatti Wildlife Sanctuary -SurajKund Lake - Badkal Lake-Damdama Lake-Sultanpur Bird Sanctuary -Khaparwas Wildlife Sanctuary- Bhindwas Wildlife Sanctuary-Nahar Wildlife Sanctuary.
NCR Blue Green Getaway Circuit –III	4 No-Keoladeo National Park-Band Baretha Wildlife Sanctuary- via Rajghar Siriska Tiger Reserve- Siliserh Lake

Some variegated circuits in each sub-region:-

1. **NCT Delhi, the following two circuits have been identified for integrated development.**
 - a) **Circuit 1:** Heritage circuit covering the heritage monuments and structure in the NCR
 - b) **Circuit 2:** Religious circuit, covering the important places of worship such as Akshardham, Bahai Temple, Jama Masjid, Nizamuddin Dargah, Gurdwara Bangla Sahab, etc.
2. **Rajasthan sub-region**, a Bharatpur Tourist Circuit covering the bird sanctuary as well, the Siliser lake of Alwar, should be developed.
 - a) Sanctuary and wetlands circuit: Sariska – Siliser-KeolaDev-Baretha
3. **U.P. sub-region**
 - a) Hastinapur sanctuary and Surajpur wetlands circuit
 - b) Garhmukteshwar & Brii Ghat circuit
4. **Haryana sub-region**
 - a) Badkhal Lake – Surajkund-Basai Wetland -Damdama Lake circuit
 - b) Sultanpur National Park - Masani barrage - Khaparwas Wildlife Sanctuary circuit

⁵⁶ Source: <https://devasthan.rajasthan.gov.in/Braj/braj84parikrama.pdf> & <https://devasthan.rajasthan.gov.in/Braj/braj.htm>



- c) Karna Lake - Rohtak Tilyar lake - Bhindawas Wildlife Sanctuary circuit
- C. **Circuits of various categories including complementary sites outside NCR, to leverage the synergies**
 - 1. Golden triangle tourist circuit – connecting national capital Delhi, Agra and Jaipur.
 - 2. Circuits including wetlands and nearby sanctuaries outside but closer to NCR
- D. **Other circuits may be in line with circuits like Textiles, handicraft, etc.**
- E. **Circuits can be also planned where Tourism sector service provider agencies like IRCTC can play major role.**



Appendix-6.2

WORLD HERITAGE SITES, CENTRALLY & STATE PROTECTED MONUMENTS/ SITES IN NCR**World Heritage Sites within NCR and within close proximity to NCR**

World Heritage Site in NCR	Year*	Location
1. Keoladeo National Park	1985	Bharatpur, Rajasthan
2. Humayun's Tomb	1993	Delhi
3. Qutub Minar and its Monuments	1993	Delhi
4. Red Fort Complex	2007	Delhi
World Heritage Site around NCR		
1. Agra Fort	1983	Agra, U.P.
2. Taj Mahal	1983	Agra, U.P.
3. Fatehpur Sikri	1986	Agra, U.P.
4. Jantar Mantar	2010	Jaipur
5. Hill Forts of Rajasthan	2013	Rajasthan
6. Jaipur City	2019	Rajasthan

Source: Incredible India Portal, Ministry of Tourism - *Year of Recognition as World Heritage Site.



Appendix-6.3

INTERNATIONAL AND NATIONAL INITIATIVES OF BLUE GREEN INFRASTRUCTURE

1. Select Global Blue-Green Infrastructure Initiatives

Location/ Area (in Sq.Kms) / Population (in Lakhs)	Initiative	Scale	Agency	Intent
<ul style="list-style-type: none"> • Vancouver, Canada • Area-114 • Population -6.31 	Rain City Strategy Action plans: streets and public spaces; building and sites; parks and beaches	City	Board of Parks and Recreation, City of Vancouver	Improve and protect Vancouver's water quality. Increase Vancouver's resilience through sustainable water management. Improve Vancouver's livability by improving natural and urban ecosystems.
<ul style="list-style-type: none"> • Singapore • Area – 718 • Population -56.90 	Active, Beautiful, Clean (ABC) Waters Program	City	Public Utilities Board, Ministry of Environment and Water Resources, Government of Singapore.	To realise the full potential of the progressively developed drainage network of 17 reservoirs and 8,000 km of drains, canals, and rivers by integrating them to improve the quality of water, life and boosting recreational value.
<ul style="list-style-type: none"> • Hoeksche Waard, The Netherlands • Area-325.8 • Population -6.53 	Agro-land Improvement through Blue-Green Networking	Regional	Dutch government, local stakeholders	Optimise agro-biodiversity, reducing pesticides, efficient resource management, and greater multifunctional value to land
30 Locations, The Netherlands	Room for the River	Regional	19 partners, including the provinces, municipalities, regional water authorities and Rijkswaterstaat	Manage higher water levels across four rivers and prevent flooding in cities along the rivers, improve river retention capacity during flood events. Room for the River approach is to restore the river's natural flood plain in places where it is least harmful to protect those areas that need to be defended
<ul style="list-style-type: none"> • Portland, US • Area -375.5 • Population -6.65 	Grey to Green Initiative To alleviate loadings on the piped Infrastructure system and reduce adverse impacts on urban watercourses and help implement the Portland Watershed Management Plan. For protecting natural resources, restoring Critical ecosystems, and implement storm water solutions that integrate the urban area with the natural environment.	City	Environmental Services, and other departments in co-ordination with local stakeholders, City of Portland Oregon.	30,000 planted street and yard trees capable of capturing 18 million gallons of storm water annually, 867 new street planters added, 7,400 acres of land treated for invasive plant species, five culverts replaced, 398 eco-roofs covering an area greater than 11 acres added, 406 acres of natural land parcels acquired, and indigenous vegetation restored on up to 4,100 acres in consultation with private and public property owners



Location/ Area (in Sq.Kms) / Population (in Lakhs)	Initiative	Scale	Agency	Intent
<ul style="list-style-type: none"> • Wuhan, China • Area-8569 • Population -106 	Sponge City Programme Ensuring absorptive Capabilities in urban Infrastructure Providing 20 percent land with sponge features (for absorbing and utilising up to 70 percent rainfall) by 2020, increasing to about 80 percent land by 2030.	City	Ministry of Housing and Urban-Rural Development, Ministry of Water Resources, Ministry of Finance, private sector, and city Municipalities	Wuhan set technical targets related to annual rainwater absorption, and pre-zoning sponge regions

Source: Observer Research Foundation, Occasional Paper, Issue No.317, May 2021

2. Indian Blue-Green Infrastructure Initiatives

Location/ Area (in Sq.Kms) / Population (in Lakhs, as per Census 2011)	Initiative	Scale	Responsible Agency	Intent
<ul style="list-style-type: none"> • Delhi • Area - 1483 • Population - 167 	Blue-Green Masterplan	City	Delhi Development Authority	To ensure that blue and green features are synchronously planned, mitigating pollution, and adapting to climate challenges.
<ul style="list-style-type: none"> • Bhopal • Area -1017 • Population - 18 	Blue-Green Masterplan	City	Bhopal Municipal Corporation and Bhopal Smart CityLtd	To maintain and grow the green cover, create an environmentally sustainable city, and improve health.
<ul style="list-style-type: none"> • Madurai • Area- 148 • Population -10.2 	Blue-Green Action Plan	City	Madurai Municipal Corporation	To mitigate and adapt to flooding and accelerate economic growth via climate compatible development projects.
<ul style="list-style-type: none"> • Bengaluru • Area - 1307 • Population -91 	Blue-Green Action Plan that culminated in the Water and Sewerage Master plan 2050	City	Bangalore Water Board and Bangalore Municipal Corporation	To achieve resource security, climate resilience, a move to a low carbon economy, and ecosystem protection.

Source: Observer Research Foundation, Occasional Paper, Issue No.317, May 2021



Appendix-10.1

SMART INTERVENTIONS FOR SAFE CITY

Safe city services may include policing services, traffic management and mass transportation systems, incident response, community policing, emergency and disaster management, surveillance and monitoring, safety and security of critical infrastructure and security of public places, amongst others.

All city services needs to be integrated to increase collaboration among various public safety and security agencies to provide integrated response for any incident.

Some of the key Smart City technologies relevant for Safe City include:

1. **Panic buttons in public places and SoS mobile application:** To trigger alert to police in case of emergency situation. Panic buttons can be provided as physical buttons at key public places. SoS mobile application can trigger alerts and incident reporting with geo location to provide effective response during an emergency situation. The alerts could not just be routed to the Police Control Room but also to certain selected numbers from the phone book.
2. **Video analytics-enabled integrated city command and operations centre:** Video surveillance cameras are used to monitor the city. But it become practically difficult for public safety agencies to 24X7 monitor these thousands of cameras in a command center for any incidents. So most of the time, video surveillance is used only for post investigation purpose only.

Video analytics runs on live camera feeds and automatically detects and raise alerts for public safety issues like left object, suspicious behavior etc which makes it easier for public safety agencies to proactively detect public safety issues and take action to avoid incidents. Video analytics enabled Integrated city command and operations centre can monitor emergencies and disasters to provide effective collaborative response in case of emergency.
3. **Helpline:** 24x7 emergency helpline number to raise any events/issues/concerns to a centralised/localised call centre which is integrated with police stations, hospitals, etc.
4. **Remote FIR centres:** Many times First Information Report (FIR)/Police complaint is not registered due to various reasons. Kiosks/systems to help citizens file a First Information Report (FIR) remotely, irrespective of the location of the jurisdiction where the offence has occurred in the city. The complainant can sign, print and scan documents virtually as part of the experience.
5. **Community volunteer networks platform:** Social media and mobile enabled platform for community/ community groups to collaborate with police for local safety and security issues.
6. Policies to improve road engineering, install technology-based traffic regulatory system, promote lane driving campaign, provide for well-equipped ambulances and trauma centres, develop cycle tracks throughout NCR, spread car pool lanes to encourage car-pooling for improvement of traffic system and security be detailed out in the Sub-Regional Plans.



Appendix-10.2**ANCILLARY HEALTH SERVICES WHICH COULD BE DEVELOPED IN MEDICAL FACILITIES HUBS:**

Ancillary Health Services may include following amongst others:

1. Diagnostic

- a) Laboratory services
- b) Genetic Testing
- c) Audiology services
- d) Cardiac monitoring
- e) Dialysis services
- f) Mobile diagnostic services
- g) Radiology/diagnostic imaging

2. Therapeutic

- a) Acupuncture
- b) Behavioral Health and Cognitive Therapy
- c) Interventional Pain Management
- d) Massage Therapy
- e) Nutrition Services
- f) Physical Therapy
- g) Substance-abuse services (inpatient and outpatient)
- h) Wellness and Complementary Medicine

1. Custodial

- a) Home health care services
- b) Home infusion therapy services
- c) Hospice care services
- d) Personal care assistant services
- e) Private duty nursing
- f) Skilled nursing services
- g) Medical day care (adult and pediatric)
- h) Rehabilitation services (inpatient and outpatient)
- i) Sleep laboratory services

2. Others

- a) Ambulance services
- b) Ambulatory surgery center (ASC) services
- c) Durable medical equipment (DME)
- d) Hearing services
- e) Orthotics and prosthetics
- f) Speech services
- g) Ventilator services
- h) Wound-care services



SMART CITIES - OUTCOMES FOR CITIZENS



Source: McKinsey Global Institute, McKinsey & Company, report on "Smart Cities: Digital Solutions for a More Livable Future, 2018



Appendix-12.1

CROP RESIDUE MANAGEMENT FOR BETTER ENVIRONMENT AND SOIL HEALTH (ICAR-IARI)**1. Crop residue burning problem:**

- 1.1 In late September to early November each year, farmers mainly in Punjab, Haryana and west UP burn an estimated 35 million tons of crop residue from their fields after rice harvesting, as a low-cost straw-disposal practice to reduce the turnaround time between harvesting and sowing for the second (winter) crop.
- 1.2 As per NITI Aayog (2018), Biomass burning is one of the major sources of air quality deterioration in Delhi in the months of October and November is burning of agricultural biomass residue, or Crop Residue Burning (CRB) in the neighboring states of NCR.

Table 12.1.1: Residue generated, residue surplus and burned in Major States (Million tons)

S.N.	States	Residue generation	Residue surplus	Residue burned
1	Haryana	27.83	11.22	9.08
2	Punjab	50.75	24.83	19.65
3	Rajasthan	29.32	8.52	1.78
4	Uttar Pradesh	59.97	13.53	11.92

Source: National Policy for Management of Crop Residues

2. Reasons for Crop residue burning

- There is very little turn-around time between rice harvesting and wheat sowing
- Lack of proper technology for recycling.
- Other management options costlier and labour intensive.
- Labour availability constraints
- Rice straw is considered poor feed for animals.

3. Crop Residue Management Alternatives/ Options:

- Biochar/Gasification
- Fodder/mushroom ,other purposes
- Incorporation in soil and Mulching/Composting
- Direct Seeding by Zero-Till or Happy Seeder/Super Seeder
- Briquetting -Baling Binder for domestic/industrial use as Fuel

4. Biochar production which has high carbon material as a fertilizer, stabilize and reduce emissions of harmful gases. It release of energy-rich gases for liquid fuels or directly for power/heat generation. Plays major role in the long-term storage of carbon and increases the fertility, water retention and increases nutrient mineralization.

5. Composting of Crop Residues by In-situ/Ex-situ methods :IARI, Pusa has developed specific bacterial cultures called Pusa Decomposer Capsules for use as slurry (with jaggery etc) for mulching . This has given good results. This is very little time consuming since it takes only about 20-25 days from application of slurry to decomposition of straws reducing the time from three months. Further it is very cheap costing only Rs 20 for 4 capsules enough for one hectare. It is notable that NCRPB stakeholders consultation workshop on Environment in December, 2019 included a special session by this IARI Pusa scientist who develop Pusa Decomposer Capsules for stable problem.

6. Fodder/Mushroom cultivation Use: Paddy straw can be used as fodder after mixing with other sources or



through value addition. Further Use of Paddy Straw for Mushroom Production is also common.

7. **Briquetting for Fuel :** Briquette is compressed bio-mass in nearly 6:1 ratio. Compression is done through mechanical or hydraulic pressing machines. The loose biomass is converted to compressed briquettes which are 3-4 inch long cylinders. Various shapes can be produced by changing the dye. The combustion of briquette in a controlled environment in presence of ample oxygen at high temperature generates low emissions. About 13 T of biomass is able to produce 10 T of briquettes daily, assuming the unit will operate for approx. 10 hours per day.

8. **Implements Use in Residue Management:**

- i) Combine harvester with/without additional straw management tool (Rs 16-20 Lacs)
- ii) Baler Harvester (Rs -2.25 to 18.00 Lacs)
- iii) Paddy straw chopper/mulcher-(Rs 2.00 Lacs)
- iv) Zero-Till Sowing (Rs 0.35-0.40 Lacs)
- v) Happy Seeder (Rs 1.50 lacs)

9. **Other methods of Crop Residue Management:**

- i) Liquid fuels from biomass
- ii) Bio-ethanol from Paddy-straw
- iii) Bio-power from paddy-straw
- iv) Rice bio-park
- v) Compressed Bio Methane (BioCNG)

10. **Recommendations for Promotion of Residue Management**

- i) Create value of crop residue and make farmers aware about its uses
- ii) Coordinated efforts by Centre & State Governments and more assistance for promotion through awareness by way of demonstration, training and capacity building
- iii) Revisiting the subsidy system for procurement of machinery by farmers
- iv) More Custom hiring centres may be promoted for easy reach of costly equipment for small and marginal farmers at village level
- v) Incentivize farmers for adoption of various residue management operations
- vi) Support for funding R&D/technological up-gradation
- vii) Promotion of short duration varieties of rice
- viii) Better coordination between Research-Extension-Engineering-Policy makers
- ix) Farm mechanization components in different schemes like NFSM, NMOOP, MIDH etc. be brought under single umbrella for effective implementation and uniformity of assistance



Appendix-12.2

RECOMMENDATIONS OF COMPREHENSIVE STUDY ON AIR POLLUTION & GREEN HOUSE GASES (GHGS) IN DELHI⁵⁷

The study recommends that the following control options for improving the air quality, these must be implemented in a progressive manner.

- 1) Stop use of Coal in hotels/restaurants
- 2) LPG to all
- 3) Stop MSW burning: Improve collection and disposal (landfill and waste to energy plants)
- 4) Construction and demolition: Vertically cover the construction area with fine screens, Handling and Storage of Raw Material (completely cover the material), Water spray and wind breaker and store the waste inside premises with proper cover. At the time of on-road movement of construction material, it should be fully covered.
- 5) Concrete batching: water spray, wind breaker, bag filter at silos, enclosures, hoods, curtains, telescopic chutes, cover transfer points and conveyer belts.
- 6) Road Dust : Vacuum Sweeping of major roads (Four Times a Month), Carpeting of shoulders, Mechanical sweeping with water wash
- 7) Soil Dust: plant small shrubs, perennial forages, grass covers
- 8) Vehicles:
 - a) Retro Fitment of Diesel Particulate Filter
 - b) Implementation of BS – VI for all diesel vehicles including heavy duty vehicles (non-CNG buses and trucks) and LCVs (non-CNG)
 - c) Inspection/ Maintenance of Vehicles
 - d) Ultra Low Sulphur Fuel (< 10 PPM)); BS-VI compliant
 - e) 2-Ws with Multi Point Fuel Injection (MPFI) system or equivalent
 - f) Electric/Hybrid Vehicles: 2% of 2-Ws, 10% of 3-Ws and 2% 4Ws: New residential and commercial buildings to have charging facilities
- 9) Industry and DG Sets:
 - a) Reduce sulphur content in Industrial Fuel (LDO, HSD) to less than 500 PPM
 - b) Minimize uses, uninterrupted power supply, banning 2-KVA or smaller DG sets
- 10) De-SO_x-ing at Power Plants within 300 km radius of Delhi
- 11) De-NO_x-ing at Power Plants within 300 km radius of Delhi
- 12) Controlling Evaporative Loss during fuel unloading and re-fueling through Vapour Recovery System at petrol pumps
- 13) Managing crop residue burning in Haryana, Punjab and other local biomass burning, Potential alternatives: energy production, Biogas generation,
- 14) commercial feedstock for cattle, composting, conversion in biochar, Raw material for industry
- 15) Wind Breaker, Water Spraying, plantation, reclamation

⁵⁷<http://environment.delhigovt.nic.in/wps/wcm/connect/735190804acf830c8eec8f09c683c810/Final+Report09Jan2016.pdf?MOD=AJPERES&mod=1109294014&CACHEID=735190804acf830c8eec8f09c683c810>



Appendix -12.3

GLOBAL NORMS OF CLEAN WATER SUPPLY

Table 12.3. 1: Guidelines of parameters for interpretations of water quality for irrigation

Potential Irrigation Problem	Units	Degree of Restriction on Use		
		None	Slight to Moderate	Severe
Salinity (affects crop water availability)				
EC _w	dS/m	< 0.7	0.7-3.0	> 3.0
[or]				
TDS	mg/l	< 450	400-2000	> 2000
Infiltration affects infiltration rate of water into the soil. Evaluate using EC _w and SAR together) ³				
SAR = 0 – 3 and EC _w =		> 0.7	0.7 – 0.2	< 0.2
= 3 - 6 =		> 1.2	1.2 – 0.3	< 0.3
= 6 – 12 =		> 1.9	1.9-0.5	< 0.5
= 12 – 20 =		> 2.9	2.9- 1.3	< 1.3
= 20 – 40 =		> 5.0	5.0 – 2.9	< 2.9
Specific Ion Toxicity (affects sensitive crops)				
Sodium (Na) ⁴				
surface irrigation	SAR	< 3	3 – 0	> 9
sprinkler irrigation	me/l	< 3	> 3	
Chloride (Cl) ⁴				
surface irrigation	me/l	< 4	4-10	> 10
sprinkler irrigation	me/l	< 3	> 3	
Boron (B) ⁵	mg/l	< 0.7	0.7 - 3.0	> 3.0
Trace Elements (see Table 21)				
Miscellaneous Effects (affects susceptible crops)				
Nitrogen (N _{0₃} - N) ⁶	Mg/l	< 5	5 – 30	> 30
Bicarbonate (HCO ₃)				
(overhead sprinkling only)	Me/l	< 1.5	1.5 – 8.5	> 8.5
pH		Normal Range 6.5 – 6.4		

Source: Developing a Global Compendium on Water Quality Guidelines & modified from Ayers & Westcot, 1985.

Table 12.3.2: Comparison of drinking water quality guidelines across selected parameters from guidelines provided by WHO, the EU and national ministries from the US and Australia. Source: UNEP & GEMS, 2007, BIS-2020

Parameter	WHO	EU ^r	USEPA	Australia	India
Ammonia	1.5 mgL ⁻¹	0.50 mg L ⁻¹	No GL	0.50 mg L ⁻¹	0.5 mg/l
pH	6.5-8	No G L ⁻¹	6.5-8.5	6.5-8.5	6.5-8.5
Chloride	250 mg L ⁻¹	250 mg L ⁻¹	250 mg L ⁻¹	250 mg L ⁻¹	250 mg/l
Iron	0.3 mgL ⁻¹	0.2 mg L ⁻¹	0.3 mg L ⁻¹	0.3 mg L ⁻¹	0.3 mg/L
Lead	0.01 mgL ⁻¹	0.01 mgL ⁻¹	0.015 mg L ⁻¹	0.01 mg L ⁻¹	0.01 mg/L
Arsenic	0.01 mgL ⁻¹	0.01 mgL ⁻¹	0.01 mg L ⁻¹	0.007 mg L ⁻¹	0.01 mg/L
Copper	2.0 mgL ⁻¹	2.0 mgL ⁻¹	1.3 mg L ⁻¹	2.0 mg L ⁻¹	0.05 mg/L
Faecal Coliform bacteria	0 counts / 100 mL	0 counts / 100 mL	0 counts / 100 mL	No GL	0 counts / 100 mL



Table 12.3. 3: Designated Best Uses of Water

Designated Best Use	Class	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	1.Total Coliforms Organism MPN/100ml shall be 50 or less
		2. pH between 6.5 and 8.5
		3. Dissolved Oxygen 6mg/l or more
		4. Biochemical Oxygen Demand 5 days 20 °C, 2mg/l or less
Outdoor bathing (Organised)	B	1.Total Coliforms Organism MPN/100ml shall be 500 or less
		2. pH between 6.5 and 8.5
		3. Dissolved Oxygen 5mg/l or more
		1. Biochemical Oxygen Demand 5 days 20 °C, 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	1. Total Coliforms Organism MPN/100ml shall be 5000 or less
		2. pH between 6 and 9
		3. Dissolved Oxygen 4mg/l or more
		4. Biochemical Oxygen Demand 5 days 20 °C, 3mg/l or less
Propagation of Wild life and Fisheries	D	1. pH between 6.5 and 8.5
		2. Dissolved Oxygen 4mg/l or more
		3. Free Ammonia (as N)
		1. Biochemical Oxygen Demand 5 days 20 °C, 2mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	1. pH between 6.0 and 8.5
		2. Electrical Conductivity at 25 °C micro mhos/cm, maximum 2250
		3. Sodium absorption Ratio Max. 26
		a) Boron Max. 2mg/l
	Below-E	Not meeting any of the A, B, C, D & E criteria

Source: Central Pollution Control Board (CPCB).



Appendix-12.4

INDICATIVE AMBIENT NOISE STANDARDS

Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area / Zone	Limits in dB (A) Leq.	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

Note : -

1. Day time shall mean from 06:00 a.m. to 10:00 p.m. and night time from 10:00 p.m. to 06:00 a.m.
2. Silence zone is an area comprising at least 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authorities.
3. Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authorities.

dB(A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.



Appendix-13.1

**DETAILS OF SANCTIONED STRENGTH, ON ROLLS AND PROPOSED TOTAL STRENGTH OF
NCRPB SECRETARIAT**

S. No.	Name of Post	Sanctioned*	On roll	RP 2041 proposal
1	Member Secretary	1	1	1
2	Director (A&F)	1	1	1
3	Chief Regional Planner	1	1	1
4	Addl. Chief Regional Planner			1
5	Joint Director (Tech.)	2	0	4
6	Joint Director (Fin.)			1
7	Joint Director (PMC)			1
8	Joint Director (Admin.)			1
9	Law Officer	1	0	1
10	Dy. Director (Tech.)	2	4	8
11	Dy. Director (Fin.)			1
12	Dy. Director (PMC)			0
13	Finance & Accounts Officer	1	1	1
14	Dy. Director (Admin.)	1	1	2
15	Assistant Director (Tech.)	4	2	16
16	Assistant Director (PMC)			0
17	Assistant Director (FM/ SG)	2	0	2
18	Assistant Director (Legal)			1
19	Pr Private Secretary			1
20	Private Secretary	1	1	2
21	Assistant Director (FinanceAdmin.)	4	3	6
22	Planning Assistant (GIS skilled)	1	0	4*
23	Hindi Translator	1	1	1
24	Assistant Gr.I/Acct. Assistant	2	2	6
25	Legal Asst.			1
26	Stenographer Gr. 'C'	6	6	8
27	Stenographer Gr. 'D'	6	6	9
28	Draftsman (civil)	1	0	2*
29	Assistant Gr.II (UDC)	7	6	7
30	Staff Car Driver	1	1	1
31	Jr. Assistant (formerly Gr. 'D' employee)	7	7	7
	Total	53	44	98

* GIS Skilled



Appendix-13.2

KEY IDENTIFIED PROJECTS FOR A FUTURE READY NATIONAL CAPITAL REGION

Summary of Sector Wise Identified Projects:

Sl. No.	Sector	Project where cost is estimated		Project where cost is yet to be estimated	Total no. of Projects
		No. of Projects	Total Estimated Cost (Rs. in Cr.)	No. of Projects	
1	Economic Growth & Income Generation	17	3,44,084	19	36
2	Transport and Mobility	24	12,07,574	9	33
3	Tourism and Heritage	2	3,500	8	10
4	Water, Drainage and Sanitation	16	3,13,841	15	31
5	Urban Regeneration – Housing and Heritage	1	10,900	6	7
6	Rural Development	3	7,951	11	14
7	Future Ready Citizen Infrastructure	16	52,508	18	34
8	Smart and Digital NCR	-	-	5	5
9	Environment	8	15,806	3	11
	Total	87	19,56,164	94	181

1. Economic Growth

S. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A.	<i>Projects requiring Feasibility Study before Execution</i>	
1	Feasibility Studies for development of Economic Corridors along the following Concentric Transport Rings: (a) E&W peripheral Expressway(270km) (b) Panipat-Shamli-Meerut-Jewar-Nuh-Bhiwadi-Rewari-Jhajjar-Rohtak-Panipat, and(508km) (c) Karnal-muzaffarnagar-Gharmukhestwar-Narauna-Aligarh-Mathura-Deeg-Alwar-Mahendragarh-CharkhiDadari-Bhiwani-Jind-Kaithal-Karnal(744 km)	11,263
2	Terminal agri-market scheme along-with collection centers in surrounding districts.	6,000
B.	<i>Projects which may not require Feasibility Study before Execution</i>	
3	Projects for development of Mega Agro-Food Processing Parks including dairy and Export Zones	2,640
4	Projects for developing Industrial clusters like Film City, Aero city (Jewar), Hisar aviation hub, Tech-City, Medi-City, Knowledge city, etc.	
a	Film city	400
b	Medi City	3,000
5	Projects for the development of ESDM (Electronic System Design and Manufacturing Sector) clusters and making them fully operational	800
6	Projects for development of MSMEs mega parks and manufacturing clusters	10,200
7	Projects for identification & development of Multimodal Logistics Parks (MMLP) & Dry Ports	18,000
8	Schemes for mega agro-processing parks & export zones should be prepared in association with APEDA.	2,640
9	Projects for C&D waste recovery facilities should cater to nearby small towns and villages.	800
10	Projects for material recovery facilities at city and village level	1,038
11	E-waste recovery facility by Extended Producer Responsibility (EPR)	3,200
12	Projects for setting up of recycling plants for “end of life vehicles”	80
13	Development of Migration Registration/ Facilitation centres (MFCs) and Skill Mapping	230
	Total Cost	60,291



S. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
C.	Projects for which cost estimates are to be worked out:	
1	Development of a pan NCR-Nivesh Mitra Portal for approval of all Economic Activities	
2	Projects for up-gradation of existing Industrial Estates/ Parks.	
3	Projects for setting up plug and play parks (flatted factories) as per international productivity standards.	
4	Projects to upgrade at least 10 Scientific Research Institutions	
5	Projects for Establish R&D centers for manufacturing and Incubation Centres (ICs) for start-ups.	
6	Food testing laboratories in each NCR District.	
7	Construction of Mandis at Strategic Locations in NCR.	
8	Scheme on usage of Solar Water in Residential, Commercial and Govt. Buildings.	
9	International Trade Center at Gurgaon for promotion of garments.	
10	Project on Footwear, leather garments and accessories	
11	Regional Exhibition Center based on local products and Warehouses in each sub-region.	
12	Sub Region Wise construction of Container Depots	
13	Development of Multi-chambered, differential temperature controlled cold storages for different perishable agro products.	
14	Establishment of Custom Hiring Centres for easy reach of costly equipment for small and marginal farmers	

1.1 Power & Energy sector:

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	Projects which may not require Feasibility Study before Execution	
1	Project for Schemes to have 'Mega Solar Parks' in NCR Districts.	1,68,000
2.	Schemes for strengthening of power distribution system in UP sub-region	68,720
3.	Projects for Metering of all 11 KV feeders and transformers in NCR Sub-regions	13,173
4.	Projects for to ensuring 100% 'smart metering'	33,900
	Total Cost	2,83,793
B.	Projects for which cost estimates are to be worked out:	
1	Transmission network for Delhi	
2	Completion of National Gas Grid (NGG) to ensure PNG in Urban areas across NCR.	
3	Sub-region wise schemes for dedicated utility corridors incorporating 100% underground cabling in Metros and Regional Centres in NCR.	
4	Initiate Scheme for Rooftop PV System across Metros and Regional Centres of NCR.	
5	Project for GIS Mapping of complete primary and secondary distribution system with all parameters such as conductor Size, Line Lengths etc. to reduce power loss and system improvement.	

2. Transport and Mobility

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	Projects requiring Feasibility Study before Execution	
1.	Projects for the development of Circular Regional Expressway No.2 - (CRE-II) app.508km	5,080
2.	Projects for the development of Circular Regional Expressway No.3 - (CRE-III) app.744 km	7,440
3.	Projects for the construction of RRTS connecting Metro centers and Regional centers (around 675 km)	2,36,000
4.	Construction of intra-urban transit system likes Metro Rail/ LRT/ Monorail (MRTS)/ BRTS, etc.	2,40,000
5.	Projects for the development of missing rail links/ new rail lines. Broadly identified links are: a) Karnal – Jind - Bhiwani - Mahendergarh - Narnaul - Behror - Alwar 295km b) Alwar - Deeg - Kurja (may be via Mathura) 185km c) Khurja - Garhmukhteshwar - Muzaffarnagar – Karnal 230km d) Meerut – Panipat 90km e) Farrukh Nagar and Jhajjar 40km	33,600



Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
6.	Projects for construction of ORC (ORC-I) 260km	10,400
7.	Construction of Regional ORC (ORC-II) 500km	20,000
8.	Construction of Outer ORC (ORC-III) 733km	29,320
9.	Fast Rail Connectivity Projects for 30 minutes rail connectivity from NCR limits to Delhi	1,50,000
10.	Develop inland waterways over rivers and major Canals.	170
B	<i>Projects which may not require Feasibility Study before Execution</i>	
11.	Projects for Setting up of EV Charging Station and related infrastructure across NCR.	1,700
12.	Development and modernization of Bus Terminal/ Metropolitan Passenger Terminals	11,200
13.	Development of Multi Modal Integrated Stations	55,000
14.	Projects covering construction of Inter/ Intra-State missing link projects necessary to have radial and reticular network in NCR: 1) Rajgarh (Alwar) –Kherli (Bharatpur) 42km 2) Tijara (Alwar) – Nuh(Mewat) 25km 3) Tijara (Alwar)- Nagina (Mewat) 14km 4) Kaman (Bharatpur)- Punhana (Mewat) 24km 5) Nangal Chaudhary- Behror 17km 6) Bhakali (Rewari) – Farukhnagar (Jhajjar) 35km 7) Karnal- Jalalabad (Shamli) 42km 8) Palwal – Jewar 38km 9) Bagapat – Doghat 30km 10) Bhokarhedi - Sikenderpur –Mawana - Garhmukteshwar –Siana – Anupshahr (140km part of CRE III) 11) Yamuna Bridge linking Tronica City in Ghaziabad to Burari area of Delhi with necessary links 10km Connectivity from NH-48 to Northern Peripheral E Way be improved esp. at UdyogVihar and Sector 18 Gurgaon locations.(80km part of CRE II)	3,072
15.	Development of emergency service lane/ accident recovery lanes along Expressways/ NH/SH in NCR	2,712
16.	Projects for rural Highway connectivity by loops of 15 Km radius.	33,908
17.	Construction of bye-passes around urban and major rural settlements	30,900
18.	Elevated Outer Ring Road in Delhi	9,350
19.	Project for development of District Level Airports/ Airstrips	2,88,000
20.	Helitaxi services between all major NCR towns	1,248
21.	Develop New Helipads/ Heliports	2,500
22.	Schemes to have network of UAV (Drone) and parking areas across NCR	35,000
23.	Development of Highway Facility Centres (HFC)	525
24.	PTZ cameras , ITS in traffic + reduction in accident	449
	Total Cost	12,07,574
C.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Development of Interchanges w.r.t. E-way/NH/SH/ Arterial Roads in NCR	
2	Projects for connecting CMAs with Expressways	
3	Projects for the construction of RRTS connecting CMAs	
4	Development & augmentation of Ring Railway in Delhi	
5	Development of water Aerodromes one in each sub-region.	
6	Projects for development of Airports/ Airstrips in CMAs	
7	Projects for ensuring seamless, multimodal at all Metros/RRTS/ISBT terminals.	
8	Comprehensive walking and cycling network in all Metros, Regional Centres.	



Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
9.	Other Road projects as identified by NHAI for completion by 2025	
9.1	Four Laning of Rewari Bypass Pkg-IV (length 14.4 km)	
9.2	Dwarka Expressway Package-II (length 4.2 Km)	
9.3	Paniyala Mor (NH-48 Jn) to Narnaul Sec. of NH-148B & Narnaul to Pachheri Kalan Sec. of NH-11 (Pkg-I) (length 45.3 km)	
9.4	Upgradation of 4 lane of Rewari-Ateli Mandi Section of NH-11 from Km 11.780 to Rewari to Ex. Km 43.445 near Ateli Mandi (length 30.45 km)	
9.5	Six lane access controlled highway (NH-152D) starting from Ismailabad on NH-152D to Junction with Karnal –Pehwa Road (SH-9) near Dhand section of NH-152D Greenfield Alignment on EPC-(Ch. 0+000 to 23+000; (length 23 Km)	
9.6	Construction of Six-lane access controlled highway (NH-152D) starting from Junction with Karnal-Pehwa road near Dhand village to Junction. (Ch. 23+000 to 56+000; (length 33 Km)	
9.7	Construction of Six-lane access controlled highway (NH-152D) starting from junction with Kaithal-Safidon road near Rajaund to Junction with Jind Safidon Road. (Ch. 56+000 to 80+000; (length 24 Km)	
9.8	Construction of Six-lane access controlled highway (NH-152D) starting from Junction with Jind Safidon road near Kheri Village to Junction NH-352 (Jind-Gohana Section) near Julana (Ch. 80+000 to 108+000; (length 28 Km)	
9.9	Construction of Six-lane access controlled highway (NH-152D) starting from Junction with Jind Safidon road near Kheri Village to Junction NH-352 (Jind-Gohana) near Julana to Junction with NH-9 (Rohtak-Jind Section) Near Kharkara (Ch. 108+000 to 131+000; length (length 23 Km)	
9.10	Construction of Six-lane access controlled highway (NH-152D) starting from Junction with NH-9 (Rohtak-Jind Section) Near Kharkara to Junction with NH-334B (Charkhi Dadri – Jhajjar Section) near Charkhi Dadri (Ch. 131+000 to 165+000; (length 34 Km)	
9.11	Construction of Six-lane access controlled highway (NH-152D) starting from Junction with NH-334B (Charkhi Dadri – Jhajjar Section) near Charkhi Dadri to Junction with Rewari-Kanina road (SH-24) near Kanina (Ch. 165+000 to 200+000; (length 35 Km)	
9.12	DND Flyover to Faridabad-Ballabgarh Bypass to interchange of Delhi Vadodara Expressway at KMP (Km 0.00 to Km 9.00) (length 9 km)	
9.13	DND Flyover to Faridabad-Ballabgarh Bypass to interchange of Delhi Vadodara Expressway at KMP (Km 9.00 to Km 33.00) (length 24 Kms)	
9.14	DND Flyover to Faridabad-Ballabgarh Bypass to interchange of Delhi Vadodara Expressway at KMP (Km 33.00 to Km 66.00) (length 27.00 kms)	

3. Tourism and Heritage

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects requiring Feasibility Study before Execution</i>	
1	Smart Tourism Hubs in NCR.	2,000
B	<i>Projects which may not require Feasibility Study before Execution</i>	
2	75 World class tourism sites including onsite amenities: End to end experiences, Weekend getaways, Guides , signages , first aid ,audio visual Restoration of heritage sites	1,500
3	Virtual museums (atleast one in each sub-region)	
4	Restoration of Heritage Sites etc.	
5	Development of Iconic Places in NCR, all Metros and Regional Centers.	
	Total Cost	3,500
C	<i>Projects for which cost estimates are to be worked out:</i>	
1	Blue Green Getaways in all sub-regions	
2	Development of one heritage Site in each sub-region to qualify as a World Heritage Site	
3	Project on Reinventing of Tourist facilities for attracting repeat visits of tourists.	
4	Projects to make tourist spots more viable and inviting, by developing aesthetics of the site and surrounding areas.	
5	Projects for Promotion of Rural Tourism, Horticulture Tourism and Natural Therapy in NCR.	



4. Water, Drainage and Sanitation

4.1 Water and Drainage

S. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1.	Completion of work related to Renuka Dam.	6,946
2.	Completion of work related to Lakhwar Dam.	5,747
3.	Execution, Completion of works related to Kishau Dam	11,550
4.	Execution, Completion of Sharda-Yamuna River Link Project.	35,405
5.	Scheme for revival, rejuvenation and river front development of the river Yamuna.	15,930
6.	Implementation of Eastern Rajasthan Canal (ERC) project	40,000
7.	Project on Water Treatment Plants in NCR	20,000
8.	Water Metering of all balance households in NCR	650
9.	Project on Water Recharge structures and shallow wells	560
10.	Repair of Drainage Systems across NCR	1,68,800
11.	Project on development of customer helpline portals for water & Sanitation status and grievance redressal and monitoring	7
	Total Cost	3,05,595
B.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Geo-tagging and registration of all bore-wells and other wells across the NCR.	
2	Monitoring stations in each block for ground water	
3	Schemes to store flood water of the rivers Yamuna, Hindon and Ganga by way of construction of barrages, regulated floodplain reservoirs, and green storm water infrastructure (GSWI), etc.	
4	Projects for the treatment of drains water before entering into the river Yamuna.	
5	Schemes for 100 percent water metering and water auditing for the key water guzzling sectors.	
6	Schemes for the replacement of the existing non-porous and permeable pavements across the major cities of NCR.	
7	Mapping of Water Demand and Water Quality in NCR.	
8	Project for setting up SCADA based online real time monitoring system for water quality and water pressure of critical points of water management system in all 1 lakh plus towns of NCR.	
9	Project on Desilting and Fencing of Drains.	

4.2 Liquid Waste Management

S. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1.	Repair of Sewage Systems across NCR	5,520
2.	Projects for replacing soak pits with decentralized STPs in the NCR – Metros, Regional Centres, 1 lakh plus cities a priority.	1,200
3	Projects for FSTPs and Development of SCADA systems (for sanitation services)	550
4	Project on Sewage Cleaning Mechanical Equipment in all NCR cities	736
	Total Cost	8,006
B.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Projects for STPs/DSTPs	
2	Common Effluent Treatment Plants (CETP)	
3	Project on a water network to distribute treated waste water of high quality in urban areas.	
4	GIS mapping of Sewerage and Drainage Systems across NCR	



4.3 Solid Waste Management

S. No	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1	Safety Equipment for Swacchata Warriors in all NCR towns	240
	Total Cost	240
B.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Common biomedical waste treatment facilities in all metros, regional centres and towns with 1 lakh plus population in NCR	
2	Project for ensuring 100 percent segregation of wastes at source and door to door collection.	

5. Urban Regeneration – Housing & Heritage

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects requiring Feasibility Study before Execution</i>	
1.	Projects for redevelopment/ urban rejuvenation/ renewal	10,900
	Total Cost	10,900
B.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Projects for “Slum Free NCR” through in-situ development/ redevelopment	
2	Projects for augmenting/ developing hostel facilities (student/ youth hostels, crèches, working men & women hostels, special need hostels, etc.)	
3	Projects for development of Social Housing and Supported & Specialized Accommodation (either on ownership or rental basis, retirement homes, hospices, terminal care center etc.)	
4	Projects for the development of rental housing	
5	Projects for the development of construction workers housing	
6	Projects for setting up efficiently functioning Integrated Rehabilitation/ Reform Centres in each district of NCR	

6. Rural Development

S. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1	Projects for the setting up of the Village Secretariat including a Common Service Centres (CSC) in all rural areas.	7,653
2	Projects for ensuring optical fibre cable (OFC) connectivity in all rural areas of the NCR.	256
3	Development of public portals for all ULBs and Panchayats in NCR for data, service delivery, peoples’ feedback, etc.	42
	Total Cost	7,951
B.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Projects for the development of rural clusters with growth centers through ICAPs at least one in each NCR block.	
2	Projects for Rural Water Supply	
3	Projects for Rural Housing other than PMAY.	
4	Model Agricultural Market/Terminal Markets esp. in perishable agri produce (F&V, Fish & Flowers etc.)	
5	Project on 100 percent metering of water supplied for agriculture.	
6	Schemes for rainwater harvesting structures.	
7	Project for developing warehouses and cold chain along the expressways and highways in the NCR.	
8	Project for linking of the Gramin Agriculture Markets (GrAMs,) with e-NAM.	
9	Project to build agri-produce certification centers in all NCR districts	



10	Project to build compost or waste-based manure certification centers in all NCR districts
11	Project for creation of Food Bank in all one lac plus cities to reduce wastage of food

7. Future Ready Citizen Infrastructure

7.1 Safety & Disaster Management:

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1.	Setting up Fire service stations	3,960
2.	Upgradation of infrastructure of each District Disaster Management Authorities (DDMAs) to establish an “Integrated Command and Control Centres” at each district level	1,250
	Total Cost	5,210
B	<i>Projects for which cost estimates are to be worked out:</i>	
1.	Forensic science laboratory with infrastructure of training facilities and mobile forensic setup in each district.	
2.	Upgradation of fire safety and fire fighting equipment, hydraulic ladders, chemical extinguishers etc.	
3.	Project to set up NCR Crime Coordination Support Office/ Cell at NCRB	
4.	Project for smart air policing using drones and helicopters for emergency response, evacuations etc.	
5.	Project for installation of Radars (including Radar Rain Gauge)	
6.	Implementation of Panic Buttons at key public places.	

7.2 Health & Fitness:

Sl. No	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1	Project for upgrading/ improving or having Community Clinic and/or Healthcare Wellness Centres in each block	2,400
2	Project for constructing 2 new AIIMS	4,500
3	Development of Trauma Center facilities/ hospitals on all National & State Highways and Expressways at above 50km distance (total approx.. length 10363km)	2,102
4	Telemedicine facilities in all 2000 + villages and urban wards	11,770
5	Project for having Medical College and Nursing college in each district	9,200
6	Construction of blood banks	2,815
7	Projects for E Health Registry and Record System	13
8	Project for setting up Air ambulance - with equipment and other costs	260
	Total Cost	33,060
B.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Projects for services in all NCR districts for Oxygen Plants in NCR- all 50 + bed hospital	
2	Project for creating Medical facilities agglomeration areas with Ancillary facilities/ services (diagnostic, therapeutic, and custodial etc.)	
3	Project for having Nursing hostels and accommodation for para- medical staff.	
4	Project to Establish an International Level Central Public Health University in NCR	

7.3 Sports:

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Projects for having fitness centers, open gymnasiums in the parks in all urban wards, 2000+ villages.	
2	Projects for Establishing Traditional Games Park (Traditional Games, Martial Arts, etc.) in each District	
3	Projects for Sports injury related Medical/ Rehabilitation Centres in each district.	



7.4 Education:

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1	Projects for developing world-class universities	1,600
2	Projects be prepared to establish/ upgrade it is/Polytechnic, in each NCR block	6,620
3	Smart Schools in all NCR 2000+ Villages.	3,050
4	Projects for establishing Sports Research Centres & laboratories in NCR	2,028
5	Project for establishing/ developing a Sports University	700
	Total Cost	13,998
B.	<i>Projects for which cost estimates are to be worked out:</i>	
1	Projects/ Schemes for Special Needs School	
2	Projects for having Multi-Sector Training Centers in consultation with NSDC in each District and Tehsil Hq.	
3	Projects to establish/ upgrade Teachers' Training and Faculty Development Institute	
4	Establishment of Foreign Language Institutions across NCR.	
5	Veterinary University in each sub region, with hostels, training centers etc.	

7.5 Social Caring

Sl. No.	Proposed Projects	Est. Cost (Rs. in Cr.)
A	<i>Projects which may not require Feasibility Study before Execution</i>	
1	Projects for improvement of Infrastructure in Women Police Stations and establishing new Women Police Stations in all NCR districts	240
	Total Cost	240

8. Smart and Digital NCR*Projects for which cost estimates are to be worked out:*

Sl No.	Proposed Projects
1	Development of digital platforms as per RP-2041 (tentative list of 21 projects given)
2	Development of wi-fi hotspots in NCR
3	OFC connectivity in all NCR villages
4	Digital signature /E-signing capability of all NCR public offices.
5	Implementation of Projects and creation of E-Platforms.

9. Environment

Sl. No.	Proposed Projects/Policies	Est. Cost (Rs. in Cr.)
A	<i>Projects requiring Feasibility Study before Execution</i>	
1	Floodplain Development of Yamuna River: Haryana Section NCT Delhi Section U.P. Section	100
2	Development of Bio-diversity parks	48
B	<i>Projects which may not require Feasibility Study before Execution</i>	



3	Work in order to convert non-attainment cities to attainment cities in NCR	2,500
4	Projects for setting up Air quality monitoring stations and modernization of equipment	6,941
5	Project to combat Parali: Bioculture treatment, Leased equipment, Smog Towers etc	4,055
6	Projects for setting up Noise level monitoring stations across NCR	518
7	Projects for setting up Water quality monitoring stations across NCR	819
8	Plantation : Along highways, Urban Forests, Project for development of Zoos & Development of Bio-diversity parks	825
	Total Cost	15,806
C. Projects for which cost estimates are to be worked out:		
1	Projects for revival of the major water bodies including cleaning and beautification.	
2	Floodplain Development of Hindon and Kali River	
3	Projects for the development of new common effluent treatment plants (CETPs)	



GLOSSARY OF TERMS & DEFINITIONS

Chapter-2-Demography and Settlement Pattern

1. **Natural increase** of urban populations results from an excess of births over deaths in urban areas.
2. **Migration** to cities from rural areas or from abroad contributes to urban growth whenever the number of in-migrants exceeds the number of out-migrants. Migrants are often younger, on average, compared to the populations living in areas of origin or destination.
3. **Reclassification** contributes to urban growth by enlarging the size of urban areas. When cities grow in area, they incorporate neighbouring settlements and their populations, which were formerly classified as rural. Population growth in rural areas may result in reclassification of settlements from rural to urban, thus accelerating the pace of urbanization.
4. **Definitions of TOWN** as given in the Census of India 2011 is as follows;
 1. All places with a municipality, corporation, cantonment board or notified town area committee, etc.
 2. All other places which satisfied the following criteria:
 - i) A minimum population of 5,000;
 - ii) At least 75 per cent of the male main working population engaged in non-agricultural pursuits; and
 - iii) A density of population of at least 400 persons per sq. km.

The first category of urban units is known as Statutory Towns. These towns are notified under law by the concerned State/UT Government and have local bodies like municipal corporations, municipalities, municipal committees, etc., irrespective of their demographic characteristics as reckoned on 31st December 2009. The second category of Towns (as in item 2 above) is known as Census Town.

Chapter-4-Economic Growth

1. **Labour Force** refers to the number of persons actually working or willing to work.
However, workforce refers to the number of persons actually working. Thus, workforce does not account for those who are willing to work. The difference between labour force and workforce is the total number of unemployed persons.
2. **Workforce** does not take into account the wage rates. On the other hand, labour supply refers to supply of labour corresponding to different wage rates.
Number of Persons unemployed = Labour Force – Workforce
3. **Labour force participation rate (LFPR)** is calculated as the labour force divided by the total working-age population. The working age population refers to people aged 15 to 64. This indicator is broken down by age group and it is measured as a percentage of each age group. LFPR is defined as the number of persons in the labour force per 1000 persons. For example, if population is 1000, and there are 400 people actually working while 300 people willing to work; then, LBPR would be 700. LBPR can also be shown in percentage, whereby the above figure would become 70%.
4. **Worker Population Ratio (WPR)** – Worker Population Ratio (WPR) is defined as the number of persons employed per 1000 persons.
5. **Strategic Industrial Locations (SILs)** can be designated as a spatial development strategy setting out an economic, environmental, transport and social framework for the development. SILs provides a sufficient number of quality sites, in appropriate locations, to meet the needs of industrial and related sectors, such as logistics, waste management and environmental industries, utilities, wholesale markets, and so on. SIL can be of two types: (a) Preferred Industrial Locations (PILs), which are particularly suitable for general industrial, light industrial, waste management, and so on and (b) Industrial Business Parks (IBPs), which are particularly suitable for research and development and other activities that require a better-quality environment. As per



London Plan most SILs are more than 20 hectares in size, although some smaller areas of around 10 hectares can be of strategic importance where there is pressure on industrial land. Generally, SILs are located close to strategic transport infrastructure such as roads, rail, rivers, canals and safeguarded wharf.

6. **Industrial Estate** - industrial estate is defined as, a planned clustering of industrial enterprises, offering developed sites, pre-built factory accommodation and provision of services and facilities to the occupants. It can also be referred as a planned clustering of industrial enterprises offering standard factory buildings erected in advance of demand and a variety of services and facilities to the occupants
7. **Industrial Parks** can be referred as “self contained island providing high-quality infrastructural facilities. Integrated industrial parks offer industrial, residential, and commercial areas with developed plots/ pre-built factories, power, telecom, water and other social infrastructure”.
8. **Logistics** is defined as the broad range of activities concerned with effective and efficient movement of semi-finished or finished product from one business to another or from manufacturer/distributor/retailer to the end consumer. It relates to freight transportation, warehousing material handling, protective packaging inventory control, order processing, and marketing, forecasting and other value added services.
9. **Multi-Modal Logistics Parks (MMLP)** is the refined form of Logistics Park where various value added services are rendered in addition to rail/road based transportation. It is now-a- days a globally identified supply management and known by different names in different countries.
10. **Incubator** can be defined as a process of nurturing early stage startups by providing them infrastructural, management and networking support through incubation centres. Business incubation centres provide support to startup companies in terms of Consultation, Business Plan assistance, growth acceleration, product prototyping, office space, infrastructure, mentorship and seed funding.
11. **Co-building industrial parks** refer to **Incubation** through high tech parks, universities and research institutes started to build incubators in part of the region which is followed by **Duplication** through High-Tech Park, with successful experience and ample resources, take a copy-paste approach to create new parks. Production is further extended through **Enclaves** wherein one area/ city based companies moves to other area/ cities and enjoy the same policy treatment as counterparts incorporated in main city in terms of development support funding, and preferential treatment regarding regulations, etc.
12. **“Electronic business (e-business)”** describes efforts a company makes to expand business operations on the Internet. It is an overarching term, refers to any method of utilizing digital information and communication technologies to support or streamline business processes – from preparation to implementation.
13. **“e-commerce”** refers to trading products and services online, and so is strictly only speaking of one aspect of e-business.
14. **Smart Tourist Destination Sites-** The idea of smart tourism destination is derived from the concept of smart city, where smartness is incorporated in mobility, living, people, governance, economy, and environment (Giffinger et al., 2007).

‘Smart tourism destination’ can be defined as an innovative tourism destination built on an infrastructure of the state-of-the-art technology, which guarantees the sustainable development of tourist areas, facilitates the visitor’s interaction with and integration into his or her surroundings, increases the quality of the experience at the destination, and improves residents’ quality of life (Avila, 2015). In a smart destination, government should function as smart hubs that coordinates all relevant information and makes it easily accessible for users to access them in real-time. By digitalisation of core business processes, precise market targeting, service provision, and proactiveness, it cocreates a tourism experience (Hedlund, 2012). It should be the centre of excellence, as well as innovation leader in tourism. The role of local government is to support open data, regulate data privacy and support public private partnership (Buhalis & Amaranggana, 2015; Hedlund, 2012). Smart tourism destinations more emphasizes on the enhancement of tourists’ experiences rather than its residents.

15. **Perform Achieve and Trade (PAT)** scheme is a flagship programme of Bureau of Energy Efficiency under the National Mission for Enhanced Energy Efficiency (NMEEE). NMEEE is one of the eight national missions under



the National Action Plan on Climate Change (NAPCC) launched by the Government of India in the year 2008.

16. **Balancing power** is used to quickly restore the supply-demand balance in power systems. Balancing power is used to quickly restore the supply-demand balance in power systems. The need for this tends to be increased by the use of variable renewable energy sources (VRE) such as wind and solar power.
17. **Peaking power plants**, also known as peaker plants, and occasionally just “peakers”, are power plants that generally run only when there is a high demand, known as peak demand, for electricity
18. **A synchronous condenser** or a synchronous compensator is a synchronous motor running without a mechanical load. It can generate or absorb reactive volt-ampere (VAR) by varying the excitation of its field winding. It can be made to take a leading current with over-excitation of its field winding.

Chapter-6-Tourism and Heritage

1. Tourist Circuit

Tourist Circuit is defined as a route having at least three major tourist destinations which are distinct and apart. Circuits should have well defined entry and exit points. A tourist who enters should get motivated to visit most of the places identified in the circuit.

A Circuit could be confined to a State or could be a regional circuit covering more than one

State/Union Territory. These circuits may have one dominant theme and other sub-themes.

Projects under the scheme shall be under the following identified themes; Ecotourism, Wildlife, Buddhist, Desert, Spiritual, Ramayana, Krishna, Coastal, Northeast, Rural, Himalayan, Tribal and Heritage

2. **Monuments - The Ancient Monuments and Archaeological Sites and Remains Act, 1958 defines an ‘Ancient Monument’ as follows:-X.25** Monument means any structure, erection or monument, or any tumulus or place of interment, or any cave, rock-sculpture, inscription or monolith which is of historical, archaeological or artistic interest and which has been in existence for not less than 100 years and includes—

Remains of an ancient monument,

Site of an ancient monument,

Such portion of land adjoining the site of an ancient monument as may be required for fencing or covering in or otherwise preserving such monument, and

The means of access to, and convenient inspection of, an ancient monument;

“Archaeological site and remains” means any area which contains or is reasonably believed to contain ruins or relics of historical or archaeological importance which have been in existence for not less than one hundred years, and includes—

- o Such portion of land adjoining the area as may be required for fencing or covering in or otherwise preserving it, and
- o The means of access to, and convenient inspection of the area;

3. **Hibted and Regulated Areas (Section 20 A and 20 B)-** Every area, beginning at the limit of the protected area or the protected monument, as the case may be, and extending to a distance of one hundred meters in all directions shall be the prohibited area in respect of such protected area or protected monument.

Provided that the central Government may, on the recommendation of the Authority, by notification in the Official Gazette, specify an area more than one hundred meters to be the prohibited area having regard to the classification of any protected area.

4. **Regulated Area -** Every area, beginning at the limit of prohibited area in respect of every ancient monument and archaeological sites and remains, declared as of National importance and extending to a distance of 200 meters in all directions shall be regulated area in respect of every ancient monuments and archaeological sites and remains.
5. **Heritage Bye-Laws (Section 20 E(1) -** The competent authority, in consultation with the Indian National Trust for Arts and Cultural Heritage, being a trust registered under the Indian Trusts Acts, 1882, or such other expert heritage



bodies as may be notified by the Central Government, shall prepare heritage bye-laws in respect of each protected monument and protected area.

The Heritage bye-laws include matters relating to heritage controls such as elevations, facades, drainage systems, roads and service infrastructure (including electric poles, water and sewer pipelines).

The Central Government shall, by rules specify the manner of preparation of detailed site plans in respect of each protected area or protected monument or prohibited area or regulated area, the time within which such heritage bye-laws shall be prepared and particulars to be included in each such Heritage bye-laws.

6. **Agritourism or agrotourism** normally occurs on farms. It gives travelers an opportunity to experience rural life, taste the local genuine food and get familiar with various farming tasks. This type of tourism is also referred to as farm stays in Italy. Some of the types of agritourism are direct market agritourism, experience and education agritourism, and event and recreation agritourism.
7. **Alternative tourism**, also known as specific interest tourism (SIT) involves travel that encourages interaction with local government, people and communities. Many travelers choose alternative tourism because they love nature and want to preserve it. Some of the approaches by alternative tourism involve ecotourism, **adventure tourism**, rural tourism, sustainable tourism, solidarity tourism, etc.
8. **Solidarity tourism** is an ethic for travelling that holds as its central goals the creation of economic opportunities for the local community, positive cultural exchange between guest and host through one-on-one interaction, the protection of the environment, and political/historical education
9. **Value Capture Financing (VCF)** is a type of public financing that acts as a tax collection mechanism and aims to recover part or full of the value that infrastructure generates for private landowners. It owes to act as a funding source for investment.

Chapter-7-Water, Drainage and Sanitation

1. **Water supply** in most Indian cities refers to the layout of infrastructure, i.e. piped water supply lines, drainage lines, sewage lines and sewage treatment plants (STPs).
2. **Drainage system** is a network of channels, hydraulic control structures or levees that drain land and protect it from potential flooding. They can be man-made or natural. Importantly, they also provide the benefit of harvesting rainfall, allowing water to easily percolate into the aquifers. A drainage system refers to the network of channels, drains, hydraulic control structures, levees, and pumping mechanisms that drain land or protect it from potential flooding.
3. **Green Stormwater Infrastructure (GSI)** is a nature-based solution to water quality issues that urban stormwater runoff causes and provides greater benefits than conventional (or “Gray”) stormwater solutions. GSI combines economic and environmental sustainability, adaptability, resiliency, and social equity. GSI is defined as soil-water-plant systems that intercept stormwater, infiltrate a portion of it into the ground, evaporate a portion of it into the air, and in some cases release a portion of it slowly back into the sewer system. In addition to better stormwater management practices and improved water quality, GSI provides benefits such as beautified communities, improved public health, creation of ecological habitat, and enhanced local economic vitality.
4. **Unaccounted for water (UfW)** represents the difference between “net production” (the volume of water delivered into a network) and “consumption” (the volume of water that can be accounted for by legitimate consumption, whether metered or not).water delivered into a network and billed authorized consumption.
5. **Conservation pricing** involves finding the best water rate structure for water utility that reduces consumer demand, is fair and equitable for all users and recovers the costs of water service maintenance, delivery, and infrastructure replacement.
6. **Sanitation** refers to the provision of facilities and services for the safe management of human excreta from the toilet to containment and storage and treatment onsite or conveyance, treatment and eventual safe end use or disposal. More broadly sanitation also included the safe management of solid waste and animal waste as per World Health Organization (WHO) .
7. **Solid Waste Management** may be defined as the discipline associated with the control of generation, collection,



storage, transfer and transport, processing and disposal of solid wastes. It is comparatively much easier to maintain solid wastes in rural areas than in urban areas.

8. **Decentralized sanitation systems** were defined to be limited to single or several households with a maximum capacity of up to 20 persons. The two decentralized sanitation systems selected were household pit latrine and household septic tank. It was assumed that pit latrines can be constructed and maintained by the users and are operated as a dry or pour flush system.
9. **Semi-centralized systems** are defined in various ways in the literature. They generally can be categorized by their number of connections of households, or by the outline of the sewer system relative to the central sewerage system. (e.g., settlements, villages, small towns and suburbs).
10. **Centralized systems** generally have a wide range and high number of people connected.

Chapter-11-Smart and Digital NCR

1. **Digital Infrastructure**—refers to one of the key enabling technologies for an interconnected and instrumented world which enables what we call ‘Internet of Things’ (IoT). Digital infrastructure typically consists of an ecosystem of connected devices exchanging information with each other. It includes:
 - a) Hardware components such as sensors, cameras, and microphones to extract and collect data by detecting movements, capturing images, etc
 - b) Semiconductors to analyses and process the information
 - c) Telecom network and information-exchange to connect one device with another, and further bind them to a cloud based network.
 - d) Software applications and platforms to integrate data and create user interface, analytics, automation technology, etc.

It can also be understood as a joint fiber-optic and wireless- based advanced information and communication technology platform with embedded multi-functional application services that facilitate 24/7 online real-time connectivity between nodes in the operational network to allow remote management of production assets.
2. **‘Internet of Things’ (IoT)** – is the term used to describe a phenomenon where physical objects such as devices are both smart and connected, with the ability to collect and share data, which can create new interactions that will help unleash a new era of technology.
3. **C.O.W.** is a common acronym used in the telecommunications industry to stand for “cell on wheels.” The C.O.W is a mobile cell site product that includes a tower and transceiver as well as all other necessary equipment, carefully constructed on a trailer or truck.
4. **Service-Oriented Architecture (SOA)** - A service- oriented architecture is essentially a collection of services. These services communicate with each other. The communication can involve either simple data passing or it could involve two or more services coordinating some activity. Some means of connecting services to each other is needed. Service-oriented architecture (SOA), defines a way to make software components reusable via service interfaces. These interfaces utilize common communication standards in such a way that they can be rapidly incorporated into new applications without having to perform deep integration each time.
5. **IT/ OT convergence** is the integration of IT systems used for data-centric computing with operational technology (OT) systems used to monitor events, processes and devices and make adjustments in enterprise and industrial operations.



ABBREVIATIONS

3D	Three Dimensional
ACI	Airports Council International
ACS	Actual Cost of Supply
ADSM	Automatic Demand Management System
AI	Artificial Intelligence
AKIC	Amritsar Kolkata Industrial Corridor
AMASR	Ancient Monuments and Archaeological Sites and Remains
APEDA	The Agricultural and Processed Food Export Development Authority
APMC	Agricultural produce market committee
ARR	Average Revenue Realized
ASI	Archaeological Survey of India
ASSOCHAM	Associated Chambers of Commerce and Industry of India
AT&C	Aggregate Technical And Commercial
B2C	Business to Consumer
BBNL	Bharat Broadband Network Limited
BEE	Bureau Of Energy Efficiency
BES	Battery Energy Storage
BHIM	Bharat Interface for Money
BHQ	Block Head Quarters
BOT	Robot
BTSS	Base Transceiver Station
CAFE	Corporate Average Fuel Efficiency Standards
CAGR	Compound Annual Growth Rate
CCTV	Closed-circuit television
CCA	Cultivable Command Area
C-DAC	Centre for Development of Advanced Computing, India
CEA	Central Electricity Authority
CEZ	Common Economic Zone
CI	Critical Infrastructure
CIL	Coal India Limited
CMP	Crisis Management Plan
CNCR	Central National Capital Region
CoTS	Committee of Tourism Secretaries
COW	Cell on Wheels
CSR	Corporate Social Responsibility
CTC	Centralised Traffic Control
DDA	Delhi Development Authority
DDUGJY	Deen Dayal Upadhyay Gram Jyoti Yojana
DELS	Dedicated Exchange Line
DEPA	Data Empowerment and Protection Architecture
DFC	Dedicated Freight Corridors
Discom	Distribution Company
DMIC	Delhi-Mumbai Industrial Corridor



DoT	Department of Telecommunications
DPIIT	Department for Promotion of Industry and Internal Trade
DSTP	Decentralised Sewage Treatment Plant
DSM	Demand Side Management
EE	Energy Efficiency
EMC	Electronics manufacturing cluster
EMF	Electro Magnetic Field
EMS	Energy Management System
eNAM	National Agriculture Market
E-Nam	Electronic National Agriculture Market
EODB	Ease of doing business
EPS	Electric Power Survey
ER	Eastern Region
ESCert	Energy Saving Certificate
ESCO	Energy Service Companies
ESDM	Electronics System Design and Manufacturing
EVs	Electric Vehicles
FDI	Foreign Direct Investment
FGD	Flue Gas Desulfurization
FICCI	Federation of Indian Chambers of Commerce and Industry
FMB	Field measurement books
FMCG	Fast-Moving Consumer Goods
FSA	Fuel Supply Agreements
FSTP	Fecal Sludge Treatment Plant
FTA	Foreign Tourist Arrival
FTTx	Fiber To The X
FY	Financial Year
G2C	Government to Citizen
GDP	Gross Domestic Product
GeM	Govt. E-marketplace
GIL	Gas Insulated Lines
GIS	Gas Insulated Substation
GIS	Geographic Information System
GLIS	Government Land Information System
GNCTD	Government of National Capital Territory of Delhi
GST	Goods and Services Tax
GVA	Gross value added
GW	Gigawatt
HRIDAY	Heritage City Development and Augmentation Yojana
HSR	High Speed Rail
HVDC	High-Voltage, Direct Current
IBS	In-Building Solution
ICTs	Information Communications Technologies
IEs	Industrial Estates



IIS	Industrial Information System
IoT	Internet of Things
IRCTC	Indian Railway Catering and Tourism Corporation
ISTS	Inter-State Transmission System
IT	Information Technology
KPI	Key Performance Indicator
kWh	Kilowatt-Hour
LED	Light-Emitting Diode
IICC	India International Convention & Expo Centre
LPI	Logistics Performance Index
LSA	Licensed Service Area
LT	Low Tension
LTE	Long Term Evolution
Mbps	Megabits per Second
MeitY	Ministry of Electronics and Information Technology
MESC	Media & Entertainment Skill Council
MHA	Ministry of Home Affairs
MICE	Meetings, Incentives, Conferences & Exhibitions
MLLP	Multi-Modal Logistics Parks
MNRE	Ministry Of New And Renewable Energy
MoC	Ministry of Commerce
MoHUA	Ministry of Housing and Urban Affairs
MoP	Ministry Of Power
MoU	Memorandum of understanding
MRF	Material Recovery Facilities
MSH	Meity's Start-up Hub
MSME	Micro, Small & Medium Enterprises
MSS	Mining Surveillance System
MT	Metric Tonne
MU	Million Unit
MUDRA	Micro Units Development & Refinance Agency
MW	Megawatt
NCR	National Capital Region
NCRLF	NCR Local Forum
NCT	National Capital Territory
NDC	Nationally Determined Contributions
NER	North Eastern Region
NETC	National Electronic Toll Collection
NGG	National Gas Grid
NGO	Non-profit organization
NIUA	National Institute of Urban Affairs
NICDP	National Industrial Clusters Development Program
NICDC	National Industrial Corridor Development Corporation



NPCI	National Payments Corporation of India
NPE	National Policy on Electronics
NR	Northern Region
NSDC	National Skill Development Corporation
NSSO	National Sample Survey Office
OMC	Oil Marketing Companies
PAT	Perform, Achieve And Trade
PFA	Power For All
PHDCCI	PHD Chamber of Commerce and Industry
PNG	Piped Natural Gas
PPA	Power Purchase Agreement
PPP	Public-Private Partnership
RICS	Royal Institution of Chartered Surveyors
PRASAD	Pilgrimage Rejuvenation and Spiritual Augmentation Drive
PRASHAD	Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive
ROW	Right Of Way
RPO	Renewable Purchase Obligations
SCP	Special Component Plan
SDA	State Designated Agencies
SDG	Sustainable Development Goals
SEZ	Special Economic Zones
SII	Social Impact Initiative
SIL	Strategic Industrial Locations
SIT	Specific interest tourism
SLA	Service Level Agreements
SW	Single window
T&D	Transmission And Distribution
TDR	Transfer of Development Rights
THSC	Tourism & Hospitality Skill council
ToD	Time Of Day
TOD	Transit Oriented Development
TACS	Train Autonomous Circumambulation System
UDAN-RCS	Ude Desh ka Aam Naagrik - Regional Connectivity Scheme
UDAY	Ujwal Discoms Assurance Yojana
UES	Unified Economic Space
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention On Climate Change
VSC	Voltage Sourced Converters
WR	Western Region
YEIDA	Yamuna Expressway Industrial Development Area/ Authority
ZEB	Zero-Energy Building



CONVERSIONS**Non-Metric to Metric**

Linear	
<i>To convert</i>	<i>Multiply by</i>
Inches into millimetres	25.4
Inches into centimetres	2.54
Inches into metres	2.54 x 10
Feet into centimetres	30.48
Feet into metres	0.3048
Yards into metres	0.9144
Miles into metres	1609.344
Miles into kilometres	0.609344

Area	
<i>To convert</i>	<i>Multiply by</i>
Square inches into square centimetres	6.4516
Square feet into square centimetres	929.03
Square feet into square metre	0.092903
Square yards into square metres	0.8361
Square miles into square kilometres	2.58999
Square miles into hectares	258.999
Acres into square metres	4046.856
Acres into hectares	0.4069

Volume and capacity	
<i>To convert</i>	<i>Multiply by</i>
Cubic inches into cubic centimetres	16.3871
Cubic inches into litres	0.016387
Cubic feet into cubic metres	0.028317
Cubic yards into cubic metres	0.7646
Pints into litres	0.56826
Quarts into litres	1.13652
UK gallon into litres	4.54609
US gallon into litres	3.7854

Linear	
<i>To convert</i>	<i>Multiply by</i>
Millimetres into inches	0.03937
Millimetres into feet	3.281x10
Centimetres into inches	0.3937
Metres into feet	3.281
Metres into yards	1.09361
Kilometres into yards	1093.61
Kilometres into miles	0.62137

Area	
<i>To convert</i>	<i>Multiply by</i>
Square millimetres into square inches	1.550x10
Square centimetres into square inches	0.1550
Square metres into square feet	10.7639
Square metres into square yards	1.19599
Square metres into acres	2.47105x10
Square kilometres into square miles	0.3861
Square kilometres into acres	247.105
Hectares into acres	2.47105

Volume and capacity	
<i>To convert</i>	<i>Multiply by</i>
Cubic centimetres into cubic inches	0.06102
Cubic metres into cubic feet	35.3147
Cubic metres into cubic yards	1.30795
Litres into cubic inches	61.03
Litres into pints	1.7598
Litres into quarts	0.8799
Litres into UK gallon	0.219976
Litres into US gallon	0.264178

1 MCM/ day = 1000 million litre per day (MLD) 1 million acre foot = 1,233.489 MCM

Mass	
<i>To convert</i>	<i>Multiply</i>
Ounces into grams	28.3495
Pounds into grams	453.6
Pounds into kilograms	0.4536
Ton into kilograms	1016.047
Tahils into grams	37.799
Kati into kilograms	0.60479
Grains into grams	0.648

Velocity	
<i>To convert</i>	<i>Multiply</i>
Feet per second into centimetres per second	30.48
Feet per second into metres per second	0.3048
Miles per hour into kilometres per hour	1.609344

Power	
<i>To convert</i>	<i>Multiply</i>
Horsepower into kilowatts	0.7457
Horsepower into metric horsepower	1.01387
Foot pounds force/Second into kilowatts	0.001356

Force	
<i>To convert</i>	<i>Multiply</i>
Pounds force into newtons	4.44822
Pounds into newtons	0.138255

Degree Fahrenheit = $9/5 (^{\circ}\text{C} + 32)$

Metric to Non-Metric

Mass	
<i>To convert</i>	<i>Multiply</i>
Grams into ounces	0.3527
Grams into grains	15.4324
Grams into tahils	0.02646
Kilograms into pounds	2.2046
Kilograms into tons	0.0009842
Kilograms into katis	1.553
Kilograms into stones	0.1575
Kilograms into hundredweights	0.01968

Velocity	
<i>To convert</i>	<i>Multiply</i>
Centimetres per sec. into feet per second	0.03281
Metres per second into feet per second	3.281
Metres per second into feet per minute	196.9
Kilometre per hour into miles per hour	0.6214

Power	
<i>To convert</i>	<i>Multiply</i>
Kilowatts into horsepower	1341
Metric horsepower into horsepower	0.98632
Metric house power into feet pounds force/second	542.48

Force	
<i>To convert</i>	<i>Multiply</i>
Newtons into pounds force	0.2248
Newtons into pounds	7.2330

Degree Celsius = $9/5 (^{\circ}\text{F} - 32)$

UNITS

ha.- Hectare

MCM- Million Cubic Metre

MT- Metric Tonnes

KM - Kilometre

MGD- Million Gallon per Day

MW- Mega Watt

KV- Kilo Volt

mld- Million Litre Per Day

sq km- Square Kilometre

lpcd- Litre Per Capita Per Day



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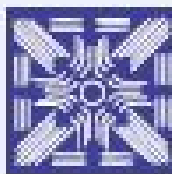
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