

REVIEW OF REGIONAL PLAN

TRANSPORT SECTOR

NATIONAL CAPITAL REGION

**NCR Planning Board
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NATIONAL CAPITAL REGION PLANNING BOARD

REVIEW OF REGIONAL PLAN : TRANSPORT SECTOR

1.0 BACKGROUND

National Capital Region Plan has been conceived to gain optimum growth of the Region through planned development and also to mould and refashion the Region both physically and economically, for a fuller realisation of wider and deep social values. Traffic system has been identified as one of the basic factors determining the type of development in terms of its spatial organisation and concentration. While existing transport network structure attracts further activities and envisages concentrated development, new lines would aid dispersal of activities and subsequently balanced development. This calls for a strategy to gain an organised transport network in conformity to the objectives to be attained in the National Capital Region. This plan envisages the transportation sector to 'lead' development rather than to 'follow' and as such programmes envisaged are to be 'futuristic' rather than problem solving.

In the context of the developments proposed in the Regional plan, there is going to be intense traffic movement between NCR towns and Delhi and also among each other. This shall also be supported from the fact of enhanced role envisaged for these towns. As such, total transportation system of region must be viewed as a single multi-mode system and strategies for transportation planning should be evolved treating the region as a single zone for planning. Further, the existing transport infrastructure should be optimized for maximum output in terms of capacity and efficiency of traffic operations and for better transport environment.

2.0 THE REGION:

The National Capital Region (NCR) extends over an area of 30,242 sq.km., comprising Delhi Union Territory and parts of the three adjoining States namely, Haryana, Rajasthan and Uttar Pradesh as under:

- a) Union Territory of Delhi (1,483 sq.km.).
- b) Haryana Sub Region (13,413 sq.km.) comprising Faridabad, Gurgaon, Rohtak and Sonapat Districts; Rewari and Bawal Tehsils of Mahendragarh District and Panipat Tehsil of Karnal District, constituting 30.33% of the area of the State.
- c) Rajasthan Sub-region (4,493 sq.km.) comprising six tehsils of Alwar district, namely, Alwar, Ramgarh, Behror, Mandawar, Kishangarh and Tijara constituting 1.31% of the total area of the State.
- d) Uttar Pradesh Sub-region (10,853 sq.km.) comprising three districts, namely, Meerut, Ghaziabad and Bulandshahr, constituting 3.68% of the area of Uttar Pradesh.

3.0 THE REGIONAL PLAN - 2001:

3.1 OBJECTIVE:

The main objective of the Regional Plan - 2001 is to evolve harmonised policies for control of land use and development of infrastructure in the region so as to avoid any haphazard development of the region; and contain the growth of Delhi by deflecting 2 million population from Delhi to the region.

3.2 POLICY ZONES

Three distinct zones have been identified viz., Delhi UT, Delhi Metropolitan Area (DMA) and rest of the region stipulating a restricted growth of Delhi, moderate growth of DMA towns and induced growth of the priority towns and complexes in the rest of the region.

3.3 DISPERSAL OF ECONOMIC ACTIVITIES

3.3.1 Policy on Industries :

- a) no more large and medium industries to be located in Delhi UT;
- b) restriction of large and medium scale industries in the long term but to be permitted in the first ten years in DMA; and
- c) incentives to be given for location of all types of industries in the rest of NCR.

3.3.2 Policy on Central Government and Public Sector Offices :

The policy for Central Government and public sector enterprises envisages that only those offices performing ministerial, protocol and liaison functions may continue in Delhi, with incentives being provided for locating new offices in DMA and priority towns in the rest of NCR.

3.3.3 Policy on Trade and Commerce:

The policy on wholesale trade and commerce envisages

- a) rationalization of tax structure and adoption of minimum floor level of taxation;
- b) decentralization of non-essential and space extensive trades from Delhi; and incentives for location of various wholesale trades in DMA and the rest of the region.

4.0 THE FUNCTIONAL PLAN

4.1 BACKGROUND

The section 16 of the National Capital Region Planning Board Act 1985 provides for preparation of functional plans by the Board, with the assistance of the Planning

Committee, for the proper guidance of the participating States and the Union Territory after the Regional Plan has come into operation. Section 2 (d) of the National Capital Region Planning Board Act defines 'Functional Plan' as a plan prepared to elaborate one (or) more elements of the 'Regional Plan'. Functional plan for the Transport Sector is one of such plans. As in the case of the Regional Plan, which is a statutory document, the Functional Plan for the transport sector also is statutory and therefore, the policies and programmes contained in the document, after due process of approval by National Capital Region Planning Board and notification thereafter, would be binding on all concerned.

4.2 NEED

In the context of the developments proposed in the Regional plan, there is going to be intense traffic movement between NCR towns and Delhi and also among each other. This shall also be supported from the fact of enhanced role envisaged for these towns. As such, total transportation system of region must be viewed as a single multi-mode system and strategies for transportation planning should be evolved treating the region as a single zone for planning. Further, the existing transport infrastructure should be optimized for maximum output in terms of capacity and efficiency of traffic operations and for better transport environment.

The functional plan for transport sector stems from the following considerations :

- a) The Regional Plan-2001 is a policy document, wherein certain broad policies and strategies for the transport sector have been mentioned but not sufficiently elaborated ;
- b) Problems faced by implementing agencies in projectizing these strategies in the absence of such detailed elaboration ;
- c) Need for proper institutional, regulatory and fiscal framework support for the transport sector plan ; and
- d) Need to integrate various mass transport systems being planned for Delhi.

4.3 OBJECTIVES :

To plan a transport system by treating the region as a single zone for planning purposes especially with a view to :

- a) Provide a transport planning framework that is robust and clear and responsive to the inevitable and changing circumstances.
- b) Provide direction and priority for specific transport projects identified in the plan.
- c) Identify the implementing agencies and fixing the responsibility for the development of transport projects.
- d) Provide a broad financial strategy for financing the transport projects

5.0 EXISTING TRANSPORT CHARACTERISTICS

5.1 TRANSPORT NETWORK

The existing primary road transport network in National Capital Region exhibits a pattern of "radial corridor" development. There are at present five national highways and twelve state highways in the region forming the backbone for the traffic movement in the region. In addition, there are seven orbitals which provide the linkages among important urban centres of the region. Delhi has been the nucleus with major corridors converging into it.

The rail network in the region comprising both Broad Gauge (BG) and Metre Gauge (MG) lines covering three zonal railways and five divisions. The inter-city rail system presently operates on eight radial track alignments leading to and from Delhi.

These roads are :

1. Delhi - Ghaziabad - Hapur - Garhmukteswar (NH 24)
2. Delhi - Faridabad - Palwal - Hodal (NH 2)
3. Delhi - Gurgaon - Behror (NH 8)
4. Delhi - Bahadurgarh - Rohtak - Meham (NH 10)
5. Delhi - sonapat - Panipat (NH 1)
6. Delhi- Ghaziabad - Meerut (SH 45)
7. Delhi - Ghaziabad - Bulandshahr - Khurja (SH 22)
8. Delhi - Gurgaon - Sohna - Alwar (SH 20)
9. Delhi - Loni - Baghpat - Baraut (SH 57)

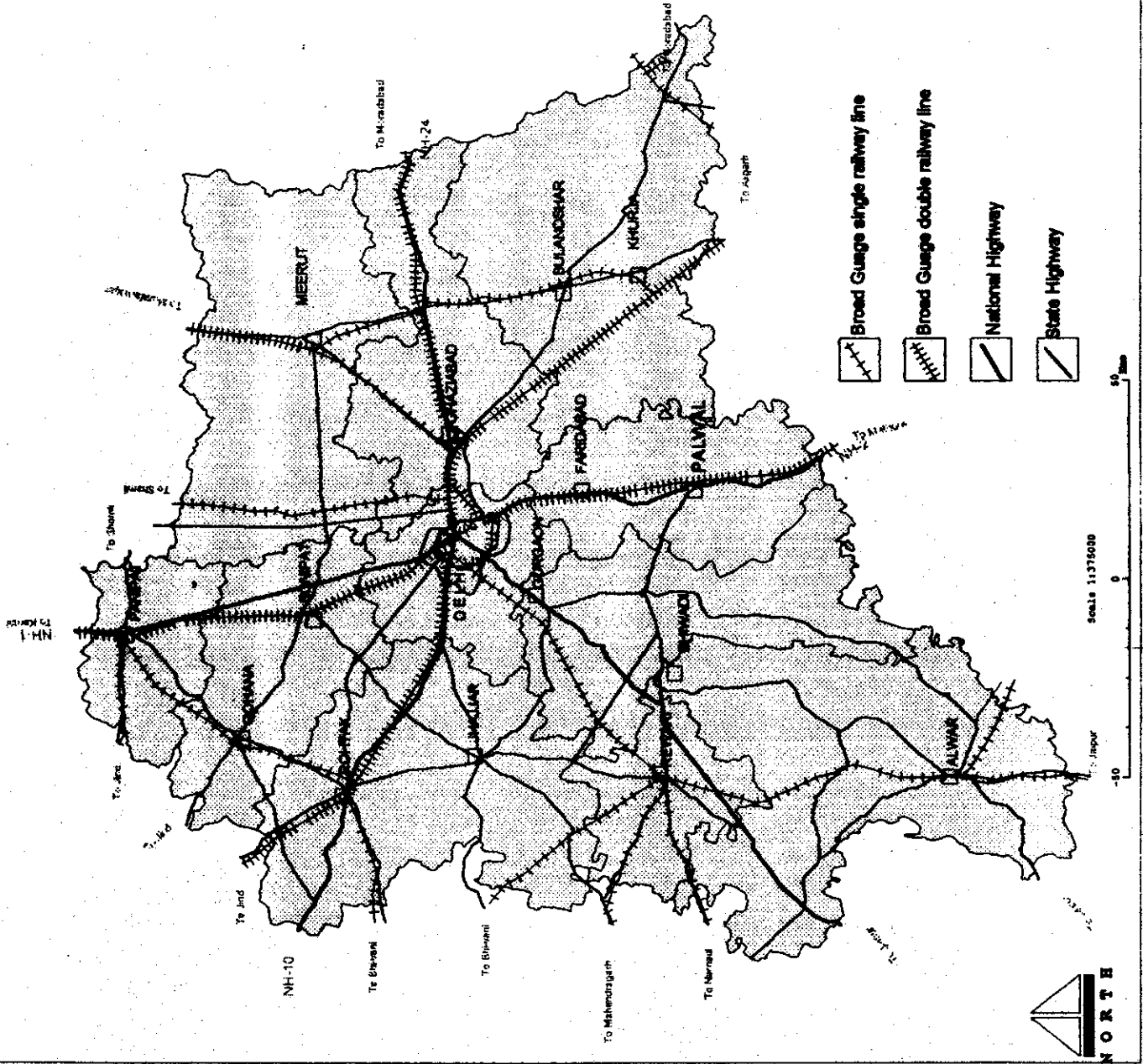
Traffic Volume Trends on Major Road Corridors

Sl. No.	Road Corridor	Number of Vehicles		Annual Growth Rate(percent)
		1987	1991	
1	Delhi-Sonipat(NH1)	8302	12254	10.22
2	Delhi-Faridabad(NH2)	30316	31740	3.20
3	Delhi-Gurgaon(NH8)	14995	17025	4.70
4	Delhi-Bahadurgarh(NH10)	6974	11672	13.70
5	Delhi-Ghaziabad	42751	50709	4.05
6	Delhi-Hapur(NH24 bypass)	N.A.	7697	-
7	Delhi-Loni	7901	13573	14.14
8	Delhi-Noida	20307	30481	10.68
9	Ghaziabad-Loni	N.A.	9682	-
10	Ghaziabad-Shahdara	N.A.	N.A.	-
	Average	-	-	8.72

N.A. - Not Available

Source: Improvement of Transport Facilities in Delhi Metropolitan Area
RITES, May 1991

NCR EXISTING TRANSPORT NETWORK



The seven orbital links are :

1. Panipat - Gohana - Rohtak (SH 16)
2. Rohtak - Jhajjar - Rewari (SH 15)
3. Rewari - Sohna - Palwal (SH 12 - 18 - 28)
4. Palwal - Khurja
5. Bulandshar - Hapur - Meerut (SH 18)
6. Meerut - Baghpat
7. Baraut - Panipat

Traffic Levels on the Sections of the Regional Roads

S.No.	Name of the Section	Traffic Level (PCUs/Day)			Optimum Traffic level Two Lane (PCUs/Day)
		1991	2001	2011	
1	Panipat - Gohana	12479	23788	43415	15000
2	Meerut - Baghpat	9323	19429	31984	15000
3	Khurja - Bulandshahr	14450	33171	53279	15000
4	Hapur - Meerut	9083	18533	27906	15000
5	Rohtak - Jhajjar	11915	21521	38719	15000
6	Sonepat - Kharkhoda	12115	21258	22705	15000
7	Bulandshahr - Hapur	10435	18337	31993	15000
8	Gohana - Rohtak	9365	17785	32632	15000
9	Rewari - Sohna	8848	18129	31207	15000
10	Jewar - Khurja	7186	8568	13215	15000
11	Kharkhoda - Rohtak	6534	11735	19869	15000
12	Baghpat - Sonepat	4675	8186	15938	15000
13	Jhajjar - Rewari	6087	11463	21199	15000
14	Sohna - Palwal	5568	11348	20787	15000
15	Palwal - Jewar	2443	3861	6839	15000
16	Jhajjar - Farruknagar	3626	8002	12824	15000
17	Gurgaon - Faridabad	3626	6124		15000
18	Farruknagar - Gurgaon	3626	5829		15000

Source : DPR on Regional Roads

5.2 TRANSIT NETWORK

The existing public transit system is made up of a bus network and a commuter rail network. The bus network currently operates on a number of routes in the NCTD and the region.

5.3 TRAFFIC FLOW CHARACTERISTICS IN NCR - Road and Rail: 1987

- ◆ The generation of total daily passenger movement by all modes in the Region is 0.88million trips. The share of rail to the total traffic generated is 23.7% and of public transport about 32%.

- ◆ Of the total passenger traffic by buses and by private vehicle, the share of intra-regional passenger traffic by buses is 60% and by private vehicle 40% and, the share of through traffic is very small.
- ◆ The total volume of goods moved on the regional network is about 0.19 million tones of which the share of Delhi bound traffic is about one-third.
- ◆ The total traffic projected to move by bus and passenger vehicles are 1.39 million trips and 0.47 million trips respectively by 2001.

5.4 RAIL NETWORK

The rail network in the region consists of the following radial lines converging in Delhi

1. Delhi Area (Broadgauge)
2. Delhi - Shakur Basti - Rohtak (70 km-Broadgauge Double line unelectrified)
3. Delhi - Shahdara - Shamli (94 km - Broadgauge Single line unelectrified)
4. Delhi - Ghaziabad - Meerut (68 km- Broadgauge Double/Single line unelectrified)
5. Delhi - Ghaziabad - Hapur (57 km-Broadgauge Single line electrified)
6. Delhi - Ghaziabad - Khurja (Broadgauge Double line electrified)
7. Delhi - Tuglakabad - Palwal (61 km - Broadgauge Tripple line electrified)
8. Delhi - Sonapat - Panipat (89 km - Broadgauge Double line electrified)
9. Delhi - Gurgaon - Rewari - Alwar (83 km - Broadgauge/Metergauge Single line unelectrified)

The following feeder routes converge in Delhi Area:

- | | | |
|----|--------------------------|-----------------------|
| 1. | Mughal Sarai-Delhi | at Ghaziabad |
| 2. | Moradabad-Delhi | at Ghaziabad |
| 3. | Saharanpur-Delhi | at Ghaziabad |
| 4. | Saharanpur-Shamli-Delhi | at Delhi Shahdara |
| 5. | Ambala Cantt-Delhi (DUK) | at Delhi/New Delhi |
| 6. | Bathinda-Delhi (SPR) | at Delhi/New Delhi |
| 7. | Mathura-Delhi (C.Rly) | at Tuglakabad |
| 8. | Rewari-Delhi (BG Line) | at Delhi Cantt. |
| 9. | Rewari-Delhi (MG Line) | at Delhi Queen's Road |

5.4.1 Delhi Area - Sub Sections:

S.No.	SUB-SECTIONS	EXISTING STATUS
1.	Delhi-Delhi-Shahdara	Double Line
2.	Delhi-Shahdara-Sahibabad	Double Line Contd..

S.No.	SUB-SECTIONS	EXISTING STATUS
3.	Sahibabad-Ghaziabad	Quadruple Line
4.	Sahibabad-Tilak Bridge (26 km)	Double Line (GAL)
5.	New Delhi-Tilak Bridge (2.8 km)	(Main line and GAL) (Quadruple Line)
6.	Tilak Bridge-Nizamuddin (3.55 km)	(GAL) Double Line
7.	Nizamuddin-Okhla (3.66 km)	(GAL) Double Line
8.	Okhla-Tughlakabad (6.85 km)	(GAL) Double Line
9.	Nizamuddin-Lajpat Nagar(2 km)	(DAL) Double Line
10.	Okhla-Lajpat Nagar (3 km)	(DAL) Double Line
11.	Lajpat Nagar-Patel Nagar (17.39km)	(DAL) Double Line
12.	Patel Nagar-Rampur Cabin (2.51 km)	(DAL) Double Line
13.	Rampura Cabin- Naya Azadpur (3.2 km)	Single Line
14.	Rampura Cabin-Shakurbasti	Double Line
15.	Delhi-Kishanganj-Dayabasti	Double Line
16.	Subzimandi-Naya Azadpur	Double Line
17.	Tilak Bridge-Nizamuddin	(Main Line) Double
18.	Nizamuddin-Tughlakabad	(Main Line) Double
19.	Delhi-New Delhi	Double Line
20.	Delhi-Subzimandi	Double Line
21.	New Delhi-Subzimandi	Double Line
22.	New Delhi-Kishanganj	Tripple Line
23.	Delhi-Delhi-Kishanganj	Double Line

5.4.2 Commuter Rail Network:

Commuter rail services run primarily during the AM and PM peak periods. They serve Delhi from many of the surrounding towns in the NCR utilizing the same corridor and in some cases, the same tracks as the Inter-City Rail. A commuter 'loop' line also exists within Delhi. This system known as the 'Ring Rail' or the Delhi Goods Avoiding Line was primarily constructed for goods traffic.

The following passenger services are running in Delhi area :

- i) EMU services
- ii) Suburban shuttle trains
- iii) Long distance passenger trains

The EMU services are running on the following corridors :

- i) Delhi/New Delhi - Ghaziabad;
- ii) Delhi/New Delhi - Patwal;
- iii) Delhi/New Delhi - Shakurbasti; and
- iv) On ring railway between Nizamuddin-New Delhi - Patel Nagar/Shakurbasti -Safdarjung-Nizamuddin in-clock-wise and anti-clockwise directions.

The sub-urban shuttle trains are running on the following corridors :

- i) Delhi/New Delhi - Palwal/Mathura
- ii) Delhi/New Delhi - Rohtak/Bhiwani
- iii) Delhi/New Delhi - Panipat/Kurukshetra
- iv) Delhi/Delhi Shahdra - Shamli/Saharanpur
- v) Delhi/New Delhi - Meerut Cantt
- vi) Delhi/New Delhi - Hapur
- vii) Delhi - New Delhi - Aligarh

5.4.3 Current status of passenger carrying trains on each radial (1994)

Name of the radial	Sub urban	EMU	Total
1. Ghaziabd - Aligarh	4	-	4
2. Delhi - Palwal	2	11	13
3. Delhi - Panipat	5	-	5
4. Delhi - Rohtak	8	-	8
5. Ghaziabad - Meerut		1	-
6. Ghaziabad - Hapur	1	-	1
7. Delhi - Rewari (BG)	1	-	1
8. Delhi - Ghaziabad	2	15	17
9. Ring railway	1	5	6
Total eachway	25	31	56
Total bothways	50	62	112

5.4.4 Existing and Projected Sub-Urban Passenger Traffic

S.No	Name of Radial	Base year 1992-1993 Each way	Anticipated No. of suburban passengers per day	
			2000-01	2010-13
1	Ghaziabad-Aligarh	18509	25913	34242
2	Delhi-Palwal	27665	38731	51180
3	Delhi-Panipat	20309	28433	37572
4	Delhi-Rohtak	16790	23506	31062
5	Ghaziabad-Meerut	13723	19212	25388
6	Ghaziabad-Hapur	7228	10119	13372
7	Delhi-Rewari	15247	21346	28207
8	Delhi-Shamli	7703	10784	14251
9	Delhi-Ghaziabad	25497	35696	47169

Source : Northern Railways study

5.5 RAILWAY STATIONS AND INTEGRATED FREIGHT STATIONS

The National Capital Region freight movement demands are two fold, those directly related to the region's consumption and production and those in transit. The NCTD has traditionally functioned as a central re-packaging and clearing house even though approximately 66% of the total freight movements are destined elsewhere. The Delhi Master Plan proposal includes the construction of Integrated Freight Centres (IFCS) on its urban periphery. The centres would filter all rail and truck freight traffic allowing only the traffic destined to within Delhi or the Priority and DMA towns to use the secondary road system.

5.6 GOODS MOVEMENT - Road and Rail : 1987

The total no of goods moved on the regional road network of the NCR is about 1.92lakh tonnes (1.84 lakh tonnes excluding through traffic) of which the share of Delhi bound traffic is about one-third while that of the other urban centres in relation to the DUT is very small. In the case of railway goods traffic, the importance of Delhi is more overwhelming (60%) as compared to that of road. However, there are quite a few urban centres of significance namely Ghaziabad, Panipat and Meerut. Share of railways in total goods traffic attracted by the NCR (excluding through traffic) is only about 14%.

About 63.4% of the goods movement by road is inter-regional and 33% is intra-regional in nature while railways goods movement is inter-regional. The through traffic of goods movement by road is a mere 4%.

Goods flow	Road(%)	Rail(%)
Intra-regional	32.40	0.40
Inter-regional	63.40	99.60
Through	4.20	N.A.

In intra-regional traffic movement by road, DUT followed by other DMA towns are the important centres and, in the inter-regional movement, vicinity States of the NCR account for a sizeable share. For railway movement, the largest contributor to inward movement is the Eastern Railway followed by the Northern Railway.

Existing and Projected Freight Traffic

S.No.	Name of Radial	Base year (1992-993) No. of Trains	Anticipated No. of freight trains (per day each way)	
			2000-01	2010-13
1	Ghaziabad-Aligarh	24	39	51
1A	Aligarh-Ghaziabad	31	42	55
2	Delhi-Palwal	22	30	40
2A	Palwal-Delhi	21	28	37
3	Delhi-Panipat	16	22	29
3A	Panipat-Delhi	16	21	28
4	Delhi-Rohtak	8	11	15
4A	Rohtak-Delhi	11	15	20
5	Ghaziabad-Meerut	3	4	5
5A	Meerut-Ghaziabad	1	2	2
6	Ghaziabad-Hapur	1	1	2
6A	Hapur-Ghaziabad	2	2	3
7	Delhi-Rewari	-	6	8
7A	Rewari-Delhi	-	6	8
8	Delhi-Shamli	2	3	3
8A	Shamli-Delhi	6	9	13

Source: Northern Railway Study

Projection of Goods Trains to be handled in Delhi area -Daily

S.No.	Design Year	Anticipated No. of goods trains daily eachway			
		Coal for Power Houses in Delhi Area	Other than Delhi Area	Coal for Ghaziabad Area	Total Projected trains
1.	1992-93 (base year)	6.0	19.5	3.6	29.1
2.	2000-01	6.0	26.5	4.9	37.4
3.	2010-11	7.0	35.3	6.5	48.8
4.	2020-21	8.0	42.1	7.8	57.9
5.	2030-31	8.0	49.0	9.0	66.0

6.0 STRATEGY FOR DEVELOPMENT

The regional transport strategy for the National Capital Region should promote and support the economic development of the Region and relieve the capital of traffic congestion. As such it requires:

- i. to inter-connect among each other the regional urban centres lying in the outer areas of the National Capital Region.
- ii. to connect them with the Capital by fast mode of transport which would require better road and rail connections.
- iii. to integrate road and rail services in the intra-urban area of Delhi and also in DMA.
- iv. to develop new loading and unloading facilities outside Delhi Union Territory for goods coming from outside the Region for distribution in Uttar Pradesh and Haryana so as to avoid unwanted load of good traffic on the roads of Delhi urban area.

7.0 DEVELOPMENT PROPOSALS -ROAD

i) Upgradation (4-laning) of the following National Highways

- | | |
|--------------------------|------------------------------|
| - National Highway No.1 | - Delhi to Panipat; |
| - National Highway No.24 | - Delhi to Hapur; |
| - National Highway No.2 | - Delhi to Palwal; |
| - National Highway No.8 | - Delhi to Behror and |
| - National Highway No.10 | - Delhi to Rohtak and Hansi. |

ii) Construction of Expressways:

The Expressway System envisaged is shown in the Fig..... It consists of the following:

a) Faridabad - Noida - Ghaziabad Expressway

A detailed feasibility study was conducted with the technical assistance of Asian Development Bank. Prequalification for the prospective bidders is completed. The salient features of the study are:

Length :	56 Km.
Construction Cost :	Rs. 623 Cr.
Land Acquisition Cost:	Rs. 129 Cr.
Total Cost	Rs. 751 Cr.
EIRR (Include. Time benefits)	36.26 %

b) Ghaziabad-Meerut (with a spur to Delhi) Expressway (60 Km)

c) Delhi -Panipat Expressway (parallel to NH 1).

At the border of Delhi, it is proposed to branch off into two segments, one will connect to the orbital expressway in Delhi at Kundli/Narela with a spur to outer ring road and the other will take off to Ghaziabad (on a new alignment) to meet F-N-G and Ghaziabad - Meerut expressways.(120 km approx.)

d) Perimeter Expressway

There is a need to develop a peripheral road corridor of expressway standard along the southern and western periphery of Delhi (120 km) to siphon off the inter-city traffic. The Peripheral Expressway would have interchange connections with, the Radial Expressway, with the ongoing FNG Expressway and, with selected major arterial roadways. It also interconnects the proposed three Metropolitan Passenger Terminals and three Freight Complexes.

e) Elevated Expressway on the Existing Ring Road in Delhi

Traffic projections for Delhi for the year 2005 and beyond indicate heavy radial flows. There is limited possibility of widening roads and intersections within Ring Road. In order to avoid overloading and congestion on major radial arterials it is essential to improve the Ring Road to a very high level of service to an Urban Expressway standard by providing two tier system(Elevated Expressway) along the existing corridor.

In addition to the above expressways, following expressways are suggested on new alignment beyond 2001:

**1. Delhi - Loni - Noida - Surajpur - Bulandshahr -Khurja (To Aligarh)
(150 Km)**

Following measures to be adopted with respect to above expressways in NCR:

- i) The Ministry of Surface Transport should declare these expressways as National Expressways (as special case) and take up the responsibility of developing them. Since they are interconnecting the National Highways and diverting their through traffic from converging to Delhi.
- ii) If needed, the M/o Surface Transport may amend their legislation to declare NCR Expressways as National Expressways.
- iii) Accordingly, M/o Surface Transport may provide requisite funds in their budget for contributing to atleast 25% of their cost towards land acquisition as equity while the rest of the funds could come from private sector.

iii) Widening (4 laning) of Grid Roads

a) Inner Grid:

- i) On new alignments to connect Murthal to Baghat, and
- ii) Strengthening and widening of existing alignments on Rohtak - Sonapat-Murthal, Baghat-Meerut and Jhajjar-Gurgaon-Faridabad stretches.

b) Outer Grid:

Strengthening and widening of existing alignment on Palwal-Sohana- Rewari - Jhajjar, Rohtak - Gohana - Panipat, Meerut - Hapur-Bulandshahr -Khurja-Palwal, Khurja-NCR boundary (South), Meerut-NCR boundary (North) and Bhiwadi-Tijara-Kishangarh-Alwar stretches (2 lane initially with ultimate capacity of 4 lanes divided highway with 60 m R/W).

iii) Other Proposals

Rajasthan Sub-Region

- a) Linking of settlements of same order directly and the lower order settlements with their nearest higher order settlements.
- b) Regional bus depot with workshop facilities at Behror and Khairthal
- c) A new state highway category road to be constructed along the railway line between Alwar and Rewari via. Khairthal, Harsoli, Ajarka and Bawal.
- d) Approach road to Bhiwadi industrial area from NH-8 on Dharuhera-Sohana road (length 6 km).
- e) Upgradation of Rewari-Kasaula-Bolni-Ujauli-Budhibawa-Tapookhra-Sare-Khurd(Kharkhari)Bhogipur-Taoru road.(with a R/W of 40-60m).

Uttar Pradesh Sub-Region

- a) Upgradation of NH-24 from Ghaziabad to Garmukteshwar upto 6 lanes.
- b) Upgradation of state highway no.57 leading Baghat and Baruat from Loni.

- c) Upgradation of MDR leading to Garmukteshwar from Meerut via Kithaur and from Bulandshaher.
- d) Widening and upgradation of MDR leading to Dasna from Syana via Gulavathi, Muradnagar to Bhagpat, Meerut to Barnava, road leading to Secunderabad from Chaula via Dankaur, distt. wise road from Bulandsher to Anoopshaher, main district road leading to dadri from Hapur, Modinagar via Sapnavat.

Haryana Sub-Region

a) BYE-PASSES

Following Bye-passes are proposed on the Inner and Outer Grids in order to reduce the congestion of traffic within the urban shelters

- i. Panipat Bye-pass
- ii. Gohana Bye-pass
- iii. Rothak Bye-pass
- iv. Jhajjar Bye-pass
- v. Rewari Bye-pass
- vi. Sohana Bye-pass
- vii. Palwal Bye-pass

b) EXPRESSWAY

Fariadabad-Noida-Ghaziabad Expressway to be further extended from Ghaziabad to Kundli-Bahadurgarh-Gurgaon-Faridabad to make it an effective bye-pass of Delhi.

8.0 DEVELOPMENT PROPOSALS -RAIL

8.1 Regional Rapid Transit System (RRTS)

There are about 4 lakh commuters come into Delhi every day from NCR. This will increase to 7.5 lakh by 2001. This figure will be even higher with the implementation of NCR plan, which aims at deflecting 2 million population out of Delhi. Out of the total number of commuters about 40% come by rail. The commuters from NCR use 5 main rail corridors viz. Palwal, Rewari, Rohtak, Panipat and Ghazibad/Meerut/Khurja. Railways are running only token services on these lines. In the absence of any integration with the ring rail system, the commuters are literally on the roads straining road transport system of Delhi.

A larger and broader complementary system which would connect the central portions of Delhi with the NCR towns can provide relief to the over crowded core of Delhi and help in the dispersal of various activities to the NCR Towns. The strategy is based on the utilization of the following elements :

- i) Ring Rail
- ii) Underground Rail line from Viswa Vidyalaya to Central Secretariat
- iii) Radials (Rail) from Delhi to Regional towns
- iv) High Speed Tramway System (HSTS) in Delhi to feed the above ring and radials
- iv) High Speed Tramway System in the Regional towns
- v) Directional Rail Terminals
- vi) Perimeter Rail Corridors

In order to satisfy the future commuter traffic requirements the following are required to be done :

- a) Construction of two additional (dedicated) lines along the existing ring rail (34 km)
- b) Construction of two additional (dedicated) electrified lines along the radials upto Priority Towns

Electrification :

- 1. Delhi - Rewari- Alwar (120 Km)
- 2. Delhi - Rohtak (59 km)
- 3. Ghaziabad - Meerut (47 Km)
- 4. Ghaziabad - Hapur (37 Km)
- Total 263 Km

Additional Lines :

Trips (Assignment - 2011)

1. Delhi -Ghaziabad (20 Km)	4,60,000
2. Ghaziabad - Khurja (83 km)	400,000
3. Delhi - Palwal (61 Km)	300,000
4. Delhi - Panipat (89 Km)	300,000
5. Delhi - Rohtak (70 Km)	300,000
6. Ghaziabad - Meerut (47 km)	200,000
7. Ghaziabad - Hapur (37 Km)	140,000
8. Delhi - Rewari-Alwar (120 Km)	300,000
Total	527 Km

- c) Provision of appropriate HSTS in Delhi to act as a feeder system to the Ring and Radial Rail Transport System

- d) Construction of Under Ground Rail Corridor from Viswavidyalaya to Central Secretariat via ISBT
- e) Provision of HSTS network in regional towns to satisfy intra-urban transport needs
- f) Construction of Rail Directional Terminals in Delhi

Presently, the long distance passengers are being served at New Delhi, Old Delhi, Hazrat Nizamuddin and Sarai Rohilla Railway Stations and ISBT's at Kashmiri Gate and Sarai Kale Khan. In order to accommodate the future traffic the Delhi Master Plan suggested four Rail Directional Terminals in Delhi. They are located at four directional locations in Delhi viz. Anand Vihar, Tuglakabad, Bhartal and Holambikalan. Out of these, Anand Vihar is being developed as a Passenger Terminal to cater to the long distance passengers from the East as well as for the Trans Yamuna population of Delhi. Land for this terminal has already been acquired. The proposal to develop the rest of the terminals is being considered by the Ministry of Railways.

- g) Perimeter Rail Corridor :

In order to segregate Inter city and Intra-city rail passenger/freight traffic, it is proposed to have an orbital rail corridor (approx. 150 Km) circumscribing Delhi inter-connecting Directional Rail Terminals(DRTS) and Integrated Freight Complexes(IFCS) envisaged in the Delhi Master Plan. As per the traffic assignments, the demand on this corridor was worked out to be 130,000 passenger trips/day.

To accommodate both the road and rail corridors, it is suggested to have 300 metre Right of Way .

Immediate requirements

- a) Dual Track along Northern portion of the ring rail from Dayabasti to Nizamuddin via New Delhi.
- b) Dedicated rail tracks from Delhi to DMA towns (Ghaziabad, NOIDA, Faridabad, Bahadurgarh, Gurgaon and Sonapat)
- c) Additional rail tracks along Ghaziabad-Meerut, Ghaziabad-Khurja & Delhi-Palwal line
- d) North-south underground corridor in Delhi
- e) Feeder Transit System in Delhi (HSTS)

The entire rail component including underground railway of the RRTS will be under the control of Ministry of Railways

8.2 Other Proposals

Rajasthan Sub-Region

- a) Electrification of Delhi-Rewari-Alwar-Jaipur rail link (BG)
- b) Electrification of Alwar-Mathura rail link (BG)
- c) Regional Railway bye-pass Palwal-Bhiwadi-Rewari to be taken up on priority
- d) Provision of single broadgauge railway line between Harsoli and Narnaul via Mundawar and Behrur.

Uttar Pradesh Sub-Region

- a) Electrification of Ghazi-Meerut and Guradnagar-Meerut Cantonment stretch of railway line (laying one extra line is already started).
- b) Provision of two extra railway line between Ghazi-Khurja. Required land is available with the Railway Ministry for the development of this scheme.
- c) A regional railway line between Khurja-Jevar-Palwal-Zajjar and Rothak is proposed to join the existing Meerut-Hapur-Khurja railway line.
- d) Under sub-regional plan there was a proposal to provide railway facility to the industrial city Noida in Delhi Metropolitan Region. Noida-Maripat-Dadri-Dasna link is proposed to integrate with the Delhi MRTS.

Haryana Sub-Region

- a) A direct rail link of Gurgaon with Alwar via Nuh-Ferozpur Jhirka to be provided.
- b) Construction of a rail link between Rothak and Hissar.
- c) The rail corridors covering towns of Khurja-Palwal-Dharuhera-Rewari-Jajjar-Rothak as provided in the Regional Plan-2001 may be completed at the earliest. In this corridor the stretch between Rothak and Panipat should also be included.
- d) Construction of an inner rail corridor connecting Faridabad-Gurgaon-Jhajjar-Sampla-Kharkhoda-Sosepat.
- e) Provision of a rail link for Manesar from main Delhi-Rewari railway line.

9.0 OPERATIONAL POLICIES :

In order to have uniform transport operations in the region, we suggest a Uniform Transport Policy and rational fare structure immediately followed by a single transport zone for inter state transport and intermediate public transport vehicle operations ultimately.

At present in NCR, the bus services are provided by Delhi Transport Corporation (DTC), Haryana Roadways, Uttar Pradesh State Road Transport Corporation and Rajasthan State Road Transport Corporation under a bilateral agreement. For uniformity of the services in the region, the entire region should be a single zone for planning, routing and scheduling of services for avoiding duplication of services and competition among each other. For this purpose all the State Road Transport Undertakings can either enter into an agreement in lines of NOIDA with DTC or the number of services should be increased under the existing bilateral arrangements among Delhi, U.P, Haryana and Rajasthan.

As the supply of Bus services under Public Sector would not be able to meet the growing travel demands in the region, introduction of private bus services under fixed schedules and routes similar to private bus operation system under DTC should be identified and a proper framework may be evolved.

10.0 PROPOSAL FOR AIRPORTS:

With the growing air traffic within the region, we suggest the development of an International Airport at a suitable location within NCR to act as an alternative to the existing International Airport in Delhi. In addition, it is also suggested to develop domestic air terminals within NCR.

11.0 URBAN TRANSPORT SYSTEM WITHIN NCR TOWNS:

Beyond the year 2001 the intra-city traffic within the major NCR Towns as well as Counter Magnet Towns would increase tremendously, which requires an integrated mass transport system within these towns. The following towns will constitute the family to have an intra-city mass transport system beyond 2001.

1. Meerut
2. Ghaziabad
3. Faridabad
4. Noida
5. Panipat
6. Rohtak
7. Rewari - Dharuhera - Bhiwadi
8. Gurgaon
9. Alwar
10. Bulandshahr-Khurja

Counter Magnet Towns :

1. Bareilly
2. Kota
3. Gwalior

The NCR Planning Board suggests development of a High Speed Tramway System (HSTS) the towns, where the population would be in the range of 5 to 8 lakh by 2011. In Meerut, already there is a proposal to develop LRT system costing Rs. 1300 Cr.

12.0 FINANCING STRATEGIES

The projects listed for being taken up in the first phase of the Investment Plan are in fact required to be implemented under the aegis of either the Central Ministries (i.e. M.O.S.T., Railways, etc.) or the State Government or both. However in view of the limited resources available with the Government, for the financing the Regional Transport Projects, which are likely to cost around 13,900 crores, an alternative financing strategy has been conceived. Accordingly these projects are being divided into three categories:

(A) Developmental Projects

These projects are absolutely essential for the basic development of transport activities in the NCR but may not be commercially viable. As such, in view of their necessity and importance they are required to be taken up through the Central and State budgetary sources. Of course, in certain cases where budgetary sources are not immediately available, for their immediate financing, help may be taken from the international financing agencies like World Bank, ADB, OECF, etc. and the repayment of these loans may be made in due course out of the future plans.

(B) Semi-Commercial Projects

The projects which are either commercially viable in the long run or indirectly help in giving a boost to the development of the area and are required to be implemented immediately, are proposed to be taken up on sharing basis according to the CIDCO formula, whereby the total project cost would be shared as under :

- | | | | |
|------|--------------------------------|---|------------|
| (i) | Implementing agency (Railways) | - | 1/3rd cost |
| (ii) | State Govt. and NCRPB | - | 2/3rd cost |

The Implementing Agency would recover its cost through surcharge on tickets etc., whereas the State Govt. would be provided loan on normal terms (i.e. 78% share of the NCRPB & 22% of the state govt.) to contribute to the 2/3rd cost of the project, which would ultimately be recovered by them through property development and paid back to the NCRPB.

(C) Commercially Viable Projects

These projects like the Expressways, etc. are proposed to be taken up in the private sector on build operate and transfer basis. Though the complete investment on these projects would be recoverable, however, because of the heavy investment required it may not be possible for the private operator to be able to initially invest the total amount up front. As such in some of the cases, 20% of the project cost has been kept in the budget of the sponsoring agency so that the same could be provided as an equity (mostly to meet the cost of land acquisition). This is a flexible amount and can be varied, if the viability of the project is improved by allowing the operator to commercially exploit some adjoining land / property.

Based on the above strategy the following financial package has been worked out for Projects included in the Investment plan:

12.1 National Highways:

Regarding upgradation of National Highways, the Ministry of Surface Transport has taken the full responsibility of completing the 4-laning of all the National Highways traversing in NCR by the year 2001. The VIII Plan programme of Ministry of Surface Transport for upgradation of these National Highways from 2-lane to 4-lane envisages:

- National Highway No.1 - Delhi to Panipat:
(An on-going Seventh Plan Programme). Widening and upgradation of this stretch to be completed by 1994-95.
- National Highway No.24 - Delhi to Hapur:
Provision for land acquisition made in 1991-92 budget. Work to be taken up immediately and completed by 1996-97.
- National Highway No.2 - Delhi to Palwal
Widening of this stretch is in progress since 1990 (under the Asian Development Bank Assistance) and will be completed in 1995-96.
- National Highway No.8 - Delhi to Behror:
Work on the Delhi-Gurgaon section (which is the only stretch to be widened to 6-lane) will commence in 1995-96 and on the Gurgaon-Behror stretch in 1993-94. Both these projects will be completed by 1998-99 (IX Plan).
- National Highway No.10 - Delhi to Rohtak and Hansi:

Work on the stretch extending from Bahadurgarh to Rohtak is to commence in 1993-94 and be completed by 1998-99 (IX Plan) while the stretch beyond Rohtak upto NCR boundary at Hansi is proposed to be both taken up and completed during the IX Plan.

The total cost of Rs.540 crores for the upgradation these National Highway projects is proposed to be met out of the central budget of the Ministry of Surface Transport, since these are essential developmental projects.

12.2 Expressways:

Regarding Expressways, since they have not been declared as National Expressways, the MOST has declined to take up these projects. However, initiatives should be taken to declare these expressways as National Expressways immediately. These expressways can be taken up on Build, Operate and Transfer (BOT) basis.

The feasibility study for one of the Expressways (F.N.G. Expressway) has shown that though ultimately the Expressway starts to pay for itself but initially some inputs in the form of equity are required from the Govt. side.

12.3 Regional Grid Roads:

The investment plan for the 8th five year plan prepared by NCRPB has stipulated that the development of regional roads (outer grid and inner grid) would be the responsibility of the NCR participating State Governments namely, Govt. of Haryana and Govt. of Uttar Pradesh. The NCR Planning Board keeping in view the meager resources available with these Governments has requested the MOST to finance these roads through World Banks assistance. Further, the NCR Planning Board is willing to finance the cost of the land acquisition for these roads as per the following pattern:

a)	Share of NCR Planning Board	75%
b)	Share of Concerned State Government	25%

12.4 Development of Perimeter Multi Mode Transport Corridor along with the Directional Terminals:

The 300 Mt. wide perimeter corridor encircling Delhi provides for Perimeter Expressway, Perimeter Railway and the Directional Terminals. In the Phase-I it is proposed to acquire the land for the entire 300 metre wide corridor along with the directional terminals at an expected cost of around Rs.800 Crs. and construct a 2-lane expressway. The cost of land acquisition (app.Rs.800Cr) would have to be borne by the Govt agencies whereas the construction of the expressway in the Phase-I, its expansion in the Phase-II, and ultimately construction of the perimeter rail and development of directional terminals are proposed to be taken up through the private sector on B.O.T./B.O.L.T basis..

12.5 Regional Rapid Transit System:

The RRTS has a number of components which are to be executed by different agencies. Each of these projects falls in different financing pattern according to its requirements as given below:

- i) Laying of dedicated tracks upto DMA towns, dual tracks along the Northern Ring and additional tracks along Ghaziabad-Meerut, Ghaziabad-Khurja and Delhi-Palwal tracks, are the projects that are essential required to be executed by the Railways and are proposed to be taken up on sharing basis (CIDCO Pattern). Accordingly, the Railways would share one-third of the cost (Rs.610 crores) and the rest of the two-third of the cost (Rs.1220 crores) would be jointly shared by the NCR Planning Board and the participating NCR States.
- ii) North-South Underground Metro Corridor has to be taken up through Central Government funds (Equity and Loan) as per the proposal of the MRTS., already under consideration of the Government of India.
- iii) The Elevated Expressway and the Feeder Transit System can be directly taken up on BOT Basis by the Private Sector.

12.6 Tramway System in NCR towns:

This would be taken up on BOT mostly in the private sector.