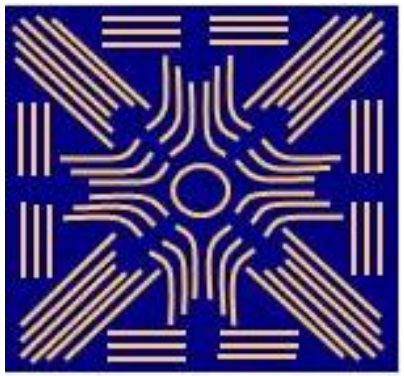
Regional Rapid Transit System (RRTS) for National Capital Region



National Capital Region Planning Board
Ministry of Urban Development
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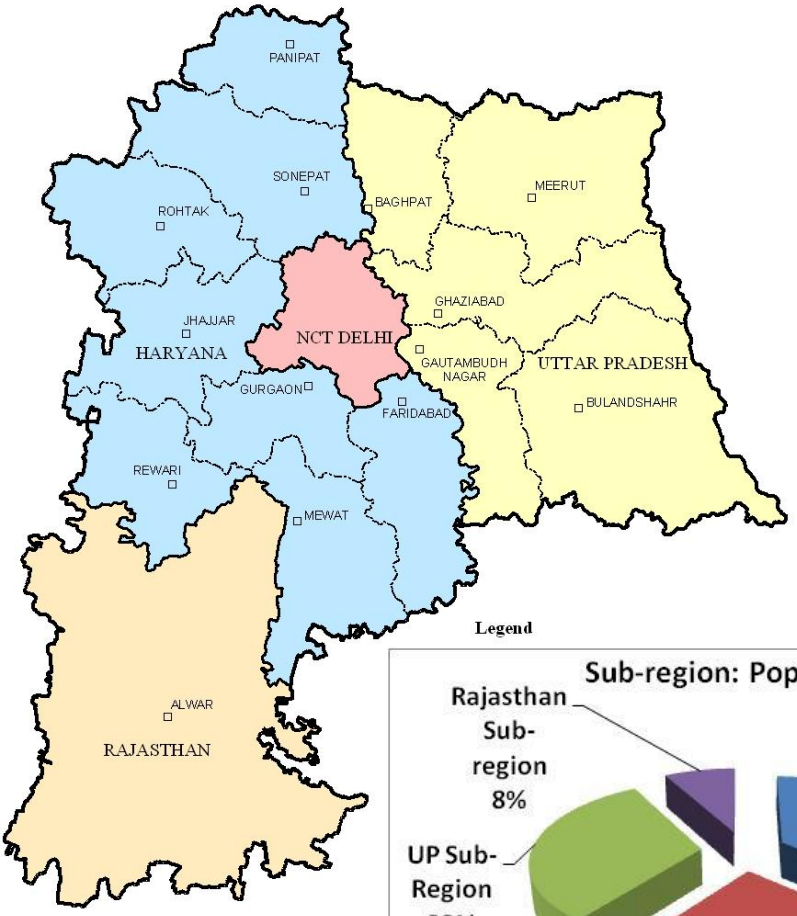
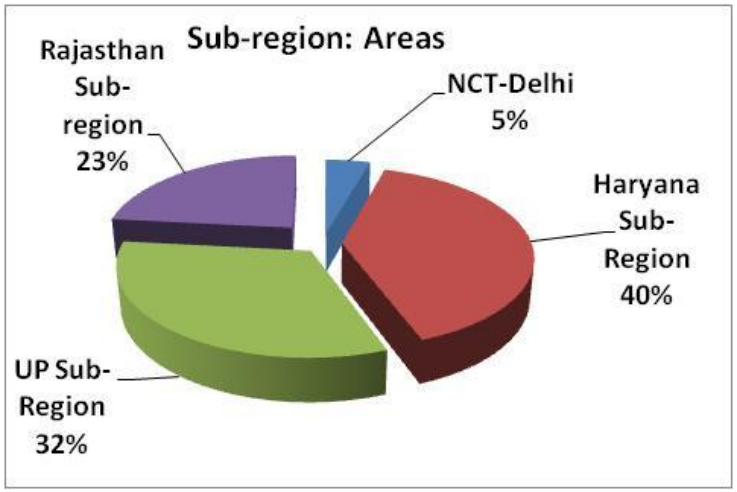
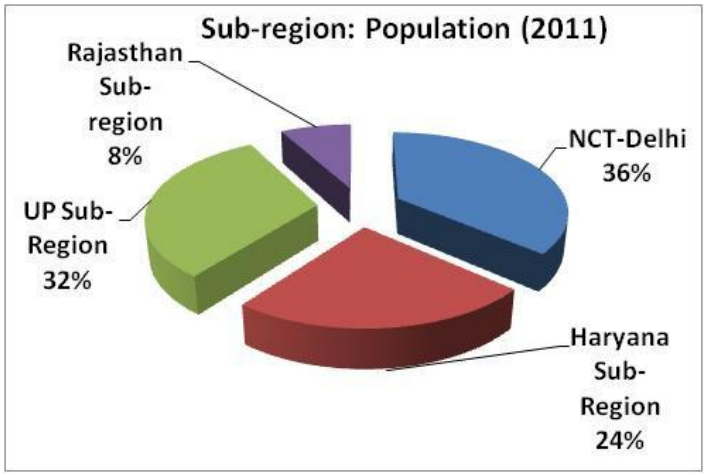
6.12.12

Entire NCR is an Urban Agglomeration (62%)

Total Area :33,578 sqkm with Population of 4.6 Crs (2011)







Year	Population (in Lakhs)				
	NCR	Delhi	Har-yana	Rajas-than	U.P.
2001	371	138	87	30	116
2011	460	167	110	37	146

Introduction

Good Transport System	
Provides seamless journey	Is Rapid, time saving
With Affordable fares	Is Comfortable, secure
Has Low carbon footprint	Has first and last mile connectivity
Has High capacity	

Sustainable Cities have Integrated Public Transport System…

which is a combination of pedestrian friendly sidewalks, high cycling opportunities, commuter friendly buses, an efficient metro system and…

Integrated Metro and Regional Rail Around World

- **World over : Integrated Metro and Regional Rail Systems**
- **Best practices are**
  - i. **S-Bahn (Berlin),**
  - ii. **BART (San Francisco),**
  - iii. **RER (Paris),**
  - iv. **New York (USA)**
  - v. **Overground (London)**

  – **These systems have evolved by *integrating the Regional railways into the urban transport system.***

- ***Suburban railways can never be well integrated into the urban network if the suburban trains terminate at a hidden sidetrack at railway terminals located at the very edge of the City area.***
- ***Suburban services have to operate right into the beating heart of the cities.***

Integrated Transport Plan for NCR 2032

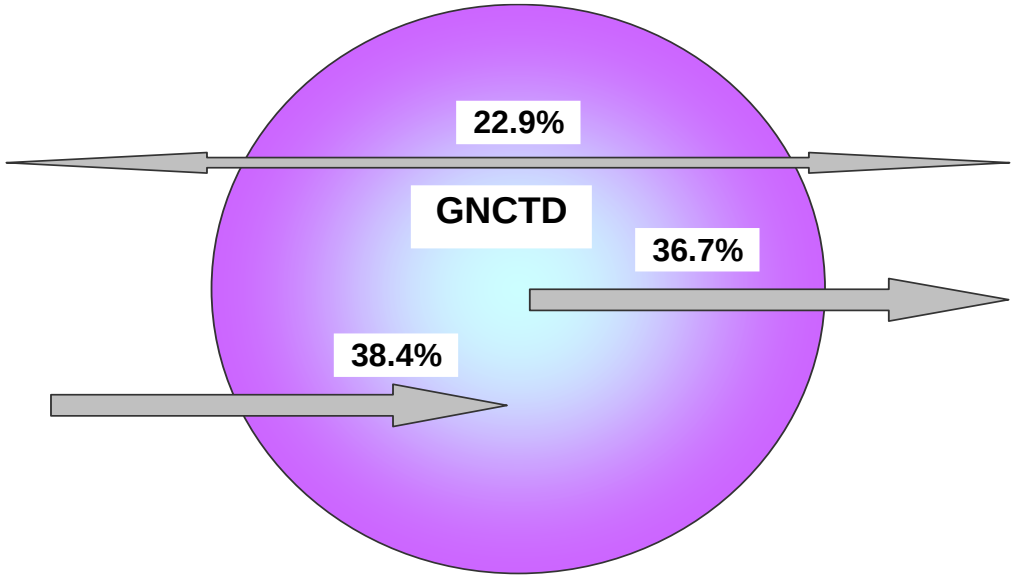
- **National Capital Region Planning Board prepared Integrated Transport Plan for NCR 2032 (approved in 31st Board meeting in 2009)**

Along with the approval, the Board directed the Task Force to:

- **Prioritize RRTS corridors**
- **Commission feasibility study**
- **Institutional Arrangement for SPV between MoUD, Railways, NCRPB, GNCT-Delhi, U.P., Haryana and Rajasthan**
- **Finalize funding pattern for implementation**

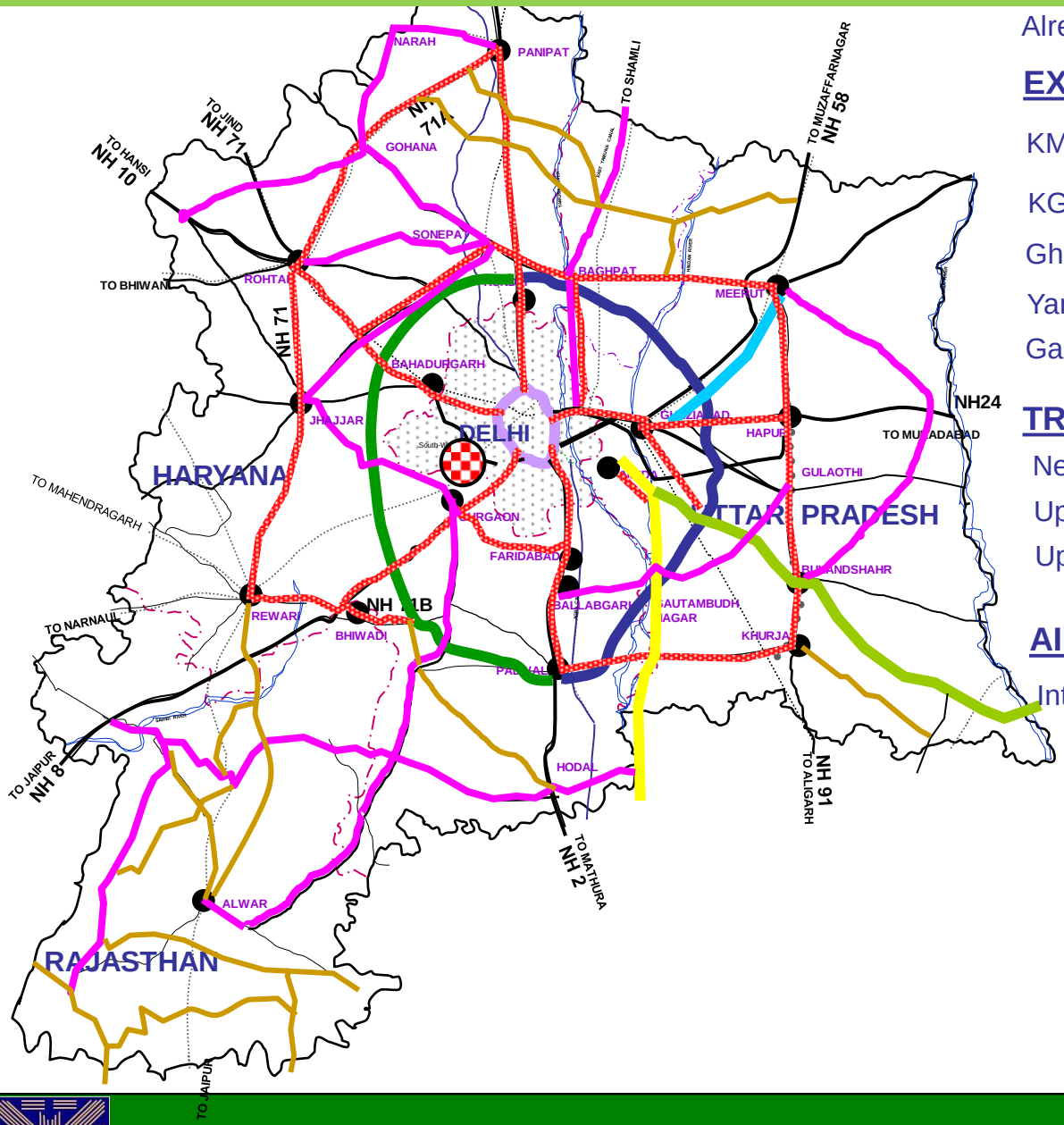
- **11 million Vehicles cross Delhi Borders every day (2007)**

Internal-External (IE)	: 36.7% (Origin within NCTD)
External-Internal (EI)	: 38.4% (Destination within NCTD)
External-External (EE)	: 22.9% (both O & D outside NCTD)



- **Therefore, need for high speed sub-urban commuter system**

Integrated Transportation Plan for NCR-2032: Road Network & Airports



Already 4-lane Highways

EXPRESSWAYS ALREADY PROPOSED

- KMP (Western Peripheral) Expressway
- KGP (Eastern Peripheral) Expressway
- Ghaziabad-Meerut (GM) Expressway
- Yamuna Expressway
- Ganga Expressway

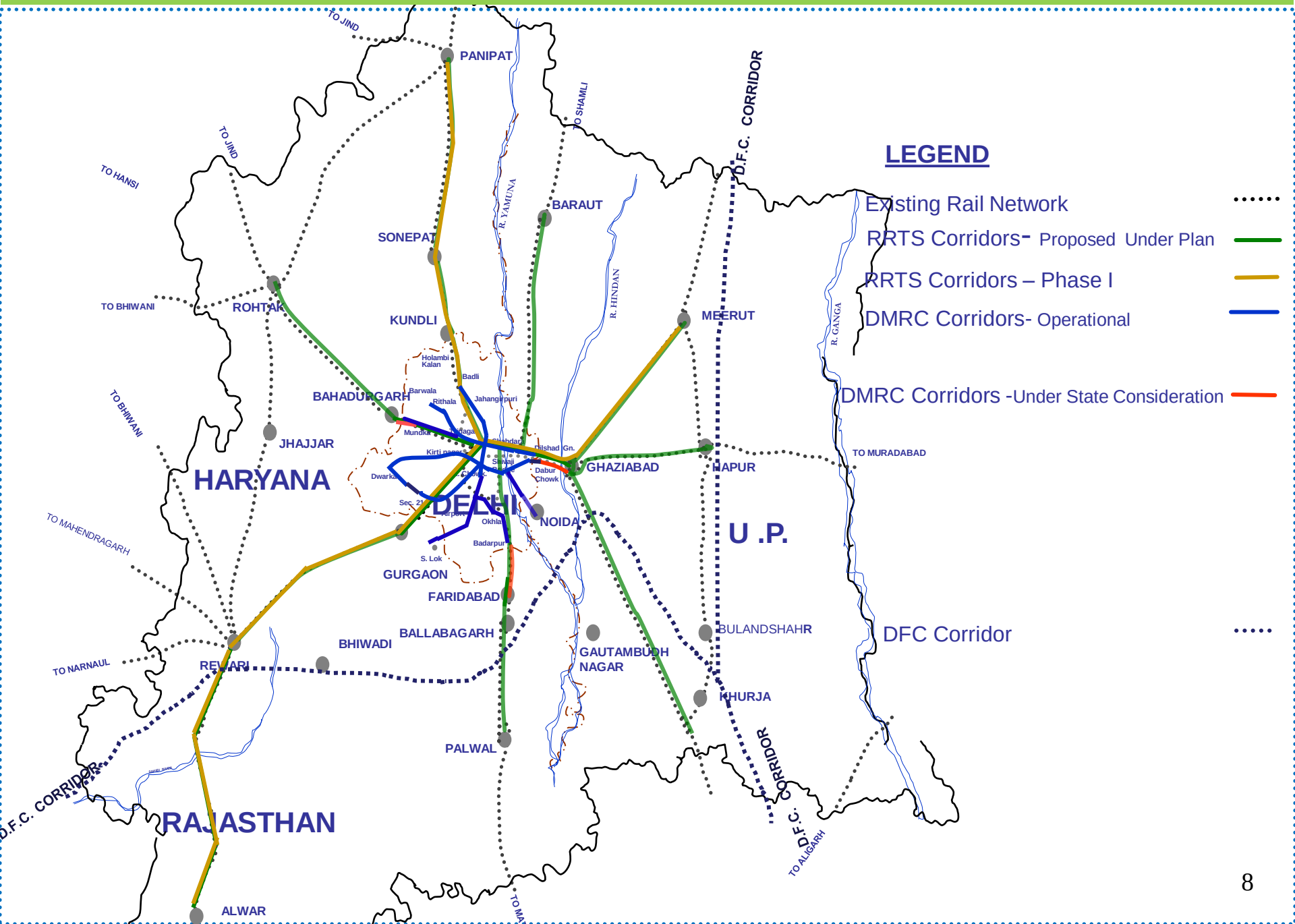
TRANSPORT PLAN PROPOSALS

- New Expressways
- Up-gradation of Major Highways
- Up-gradation of Other Highways

AIRPORTS

- International Airport-Existing

RRTS & DMRC Network in NCR

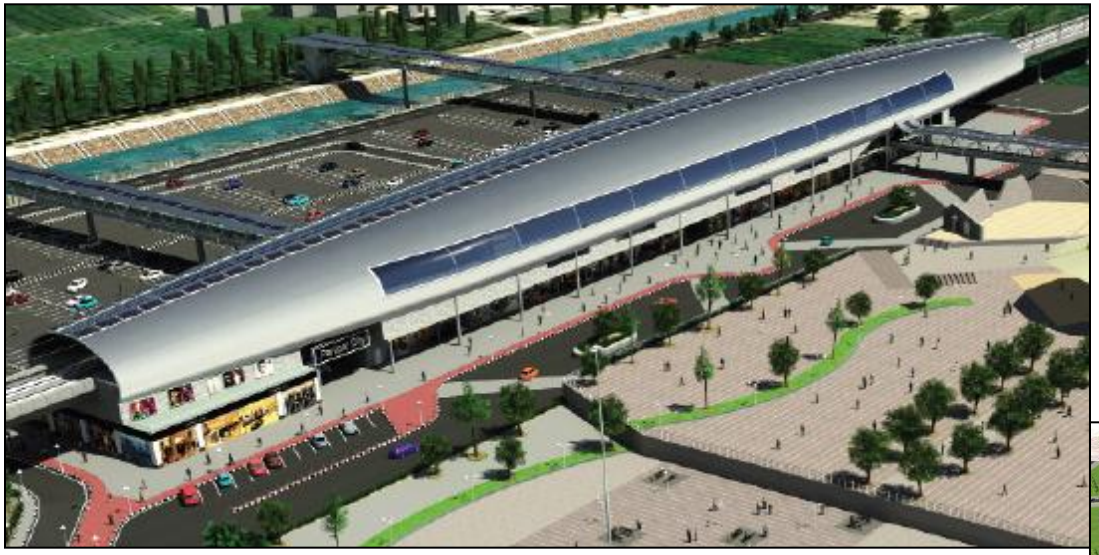


Proposed RRTS Corridors and Prioritized Corridors

Sl. No.	Corridor
	Phase-I
1	**Delhi – Sonipat – Panipat : 111 km**
2	**Delhi - Ghaziabad -Meerut : 90 km**
3	**Delhi - Gurgaon – Rewari - Alwar : 180 km**
	Phase-II
4	Delhi – Faridabad – Ballabgarh - Palwal
5	Ghaziabad – Khurja
6	Delhi - Bahadurgarh - Rohtak
7	Ghaziabad-Hapur
8	Delhi-Shahadra-Baraut

Vision of RRTS

- Hi-speed, high quality system, seated accommodation
- Non-stop journey : 45-50 min to cover 100 km



- Interchange with existing Metro
- Broad gauge track and coaches

Salient Features of Three RRTS Corridors

Parameters	Delhi - Meerut	Delhi - Panipat	Delhi -Alwar
Length (km)	90	111	180
Speed (km/h)	160		
Travel Time (min)	62	74	117
No. of Stations	17	12	19
Frequency (min)	5		
Stations in Delhi	▪ Sarai Kale Khan ▪ Anand Vihar	▪ Kashmere Gate ▪ Mukarba Chowk ▪ Narela	▪ Kashmere Gate ▪ New Delhi ▪ Sarai Kale Khan ▪ INA ▪ Dhaula Kuan ▪ Mahipalpur
Length in Delhi (km)	9.7	29	32
Underground	*9.7*	*2.7*	*32*
Elevated	*0*	*26.3*	*0*

Total Daily Ridership on RRTS corridor

Year	Total daily ridership (in lakhs)			
	Delhi - Panipat	Delhi - Meerut	Delhi - Alwar	Total
2016	3.77	5.7	6.9	**16.37**
2021	5.47	7.4	9.1	**21.97**
2031	7.79	9.2	12.5	**29.49**
2041	9.83	11.4	15.1	**36.33**

Capital Cost Summary

Rs Crs

Components	Delhi – Panipat*	Delhi - Meerut	Delhi - Alwar**	Total
Total Base Project Cost including land **(without Taxes)**	**14,638**	**16,592**	**24,595**	**55,825**
Total Base Project Cost including land **(with central and State Taxes)**	**16,552**	**19,084**	**27,206**	**62,842**
Total Project cost including escalation and IDC **(with central and State Taxes)**	**18,755**	**21,274**	**32,141**	**72,170**

**** The alignment of this corridor has been moved out of the RoW of NH-1 at the request of NHAI***

*****The alignment of this corridor has been moved out of the RoW of NH-8 at the request of NHAI leading to increase in the base cost by Rs.1700 crores (not included above)***

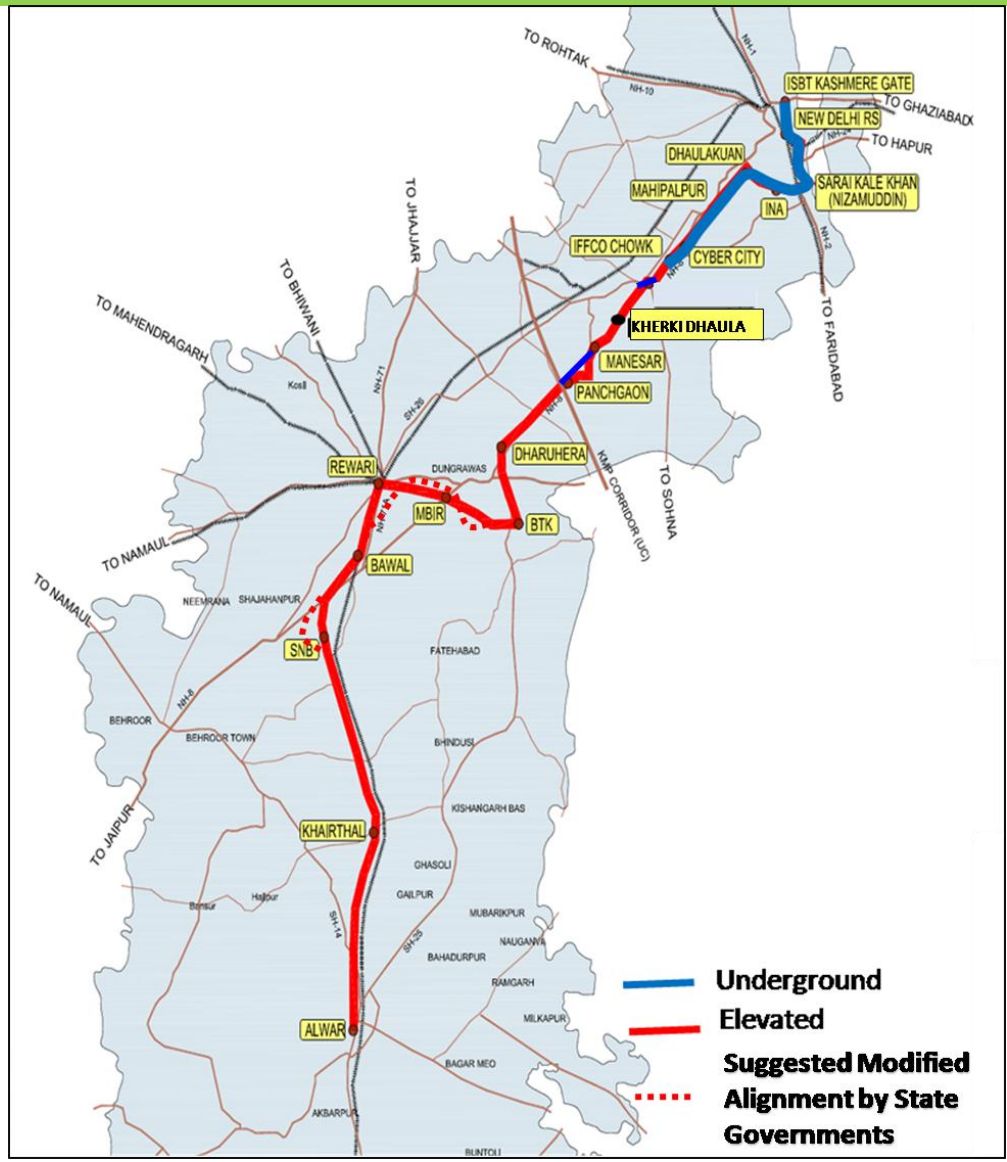
Cost Comparison

Projects	Length (km)	Project Cost (Rs. Cr.)	Cost /km (Rs. Cr.)	GOI + GOS (%)	Soft Loan (%)	Pvt. Sector (%)
DMRC Phase I	65.0	10,571	163	40	60	Nil
Phase 2	124.3	18,894	152	40	46	Nil
Phase 3	103.5	35,242	341	60	40	Nil
Delhi Airpt Lnk	22.7	3,869	170	54	Nil	46
Bangalore	42.3	11,609	274	55	45	Nil
Chennai	45.0	14,600	324	41	59	Nil
Kolkata	14.7	4,874	332	55	45	Nil
Mumbai L1	11.0	2,356	214	28	Nil	72
Mumbai L2	32.0	8,250	258	20	Nil	81
Hyderabad	71.6	12,132	170	12	Nil	88
Panipat RRTS	**111**	**14,638**	**130**	**30**	**40**	**30±10**
Meerut RRTS	**90**	**16,592**	**182**	**30**	**40**	**30±10**
Alwar RRTS	**180**	**24,595**	**137**	**30**	**40**	**30±10**

Proposed Alignment: Delhi-Alwar Corridor

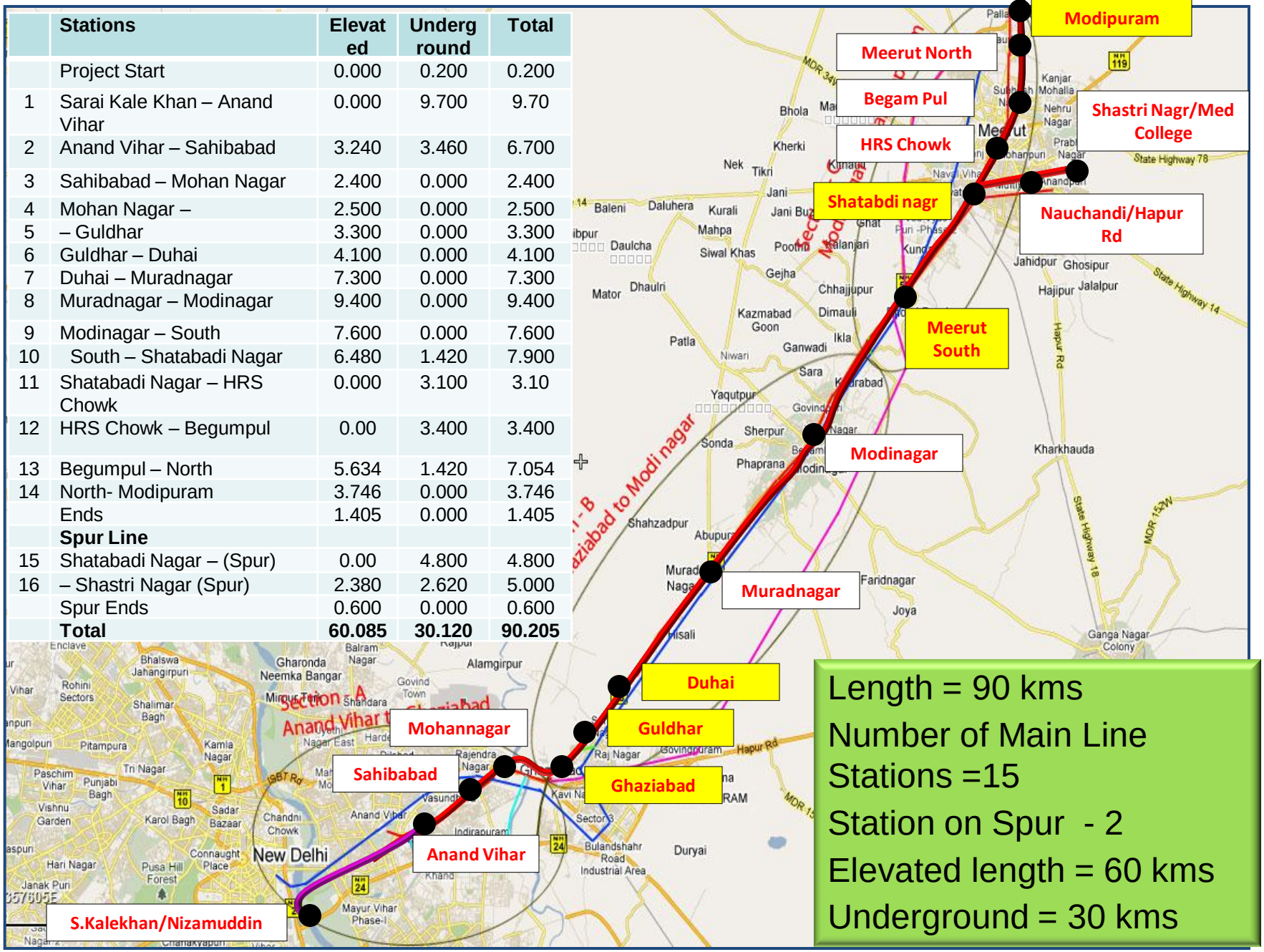
S. No	Station Name	Inter-station Distance (KM)	Distance (Cumulative)
1	ISBT (Kashmere Gate)		00
2	New Delhi RS	3.50	3.50
3	Sarai Kale Khan (NZM)	7.00	10.50
4	INA	5.00	15.50
5	Dhaula Kuan	4.50	20.00
6	Mahipalpur	6.50	26.50
7	Cyber City	7.50	34.00
8	IFFCO Chowk	3.20	37.20
9	Kherki Dhaula	12.3	49.50
10	Manesar	6.00	55.50
11	Panchgaon	8.50	64.00
12	Dharuhera	13.00	77.00
13	BTK	9.00	86.00
14	MBIR	15.00	101.00
15	Rewari	5.50	106.50
16	Bawal	12.50	119.00
17	SNB	7.00	126.00
18	Khairthal	29.50	155.50
19	Alwar	24.50	180.00

Distances are approximate

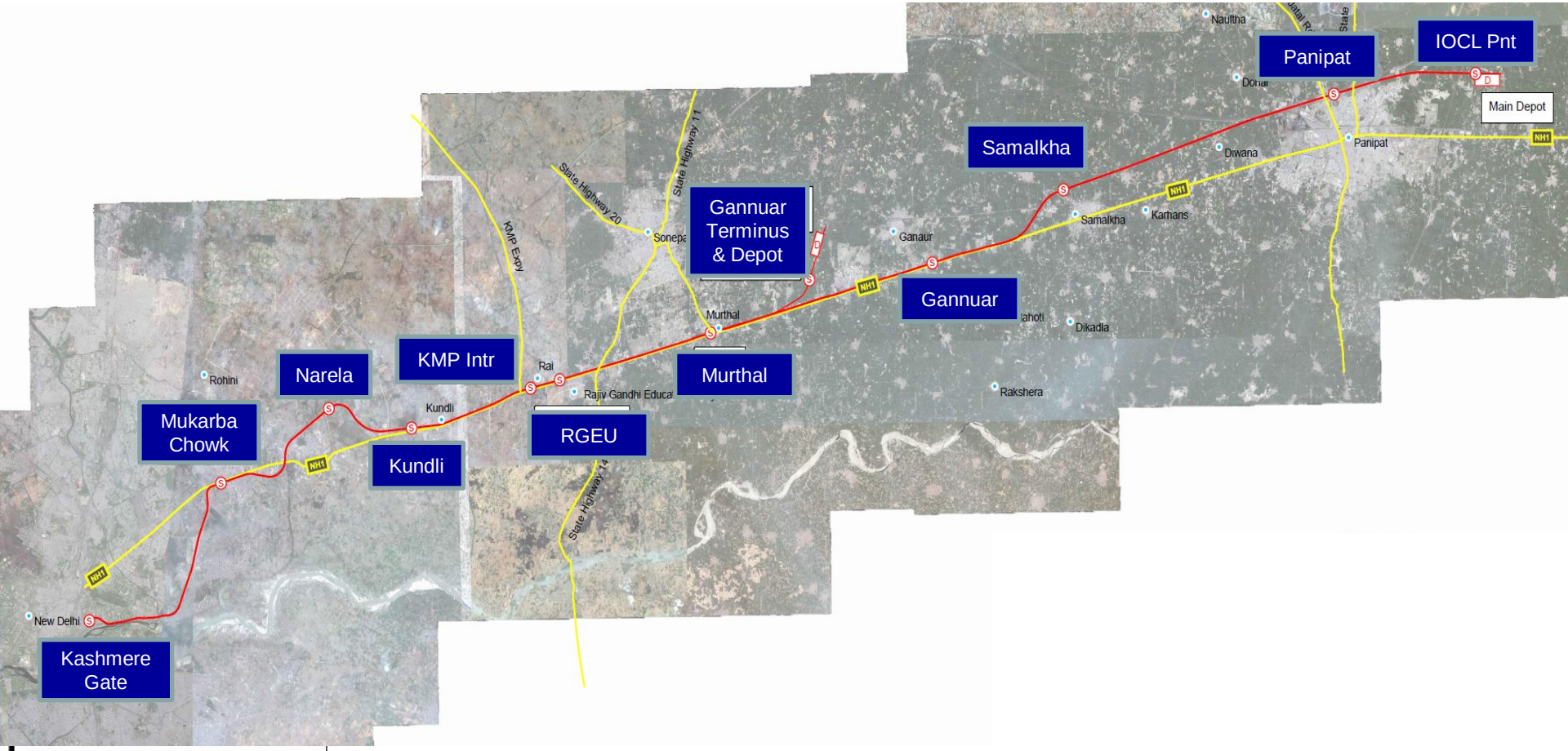


Proposed Alignment: Delhi-Meerut Corridor

	Stations	Elevated	Underground	Total
	Project Start	0.000	0.200	0.200
1	Sarai Kale Khan – Anand Vihar	0.000	9.700	9.70
2	Anand Vihar – Sahibabad	3.240	3.460	6.700
3	Sahibabad – Mohan Nagar	2.400	0.000	2.400
4	Mohan Nagar –	2.500	0.000	2.500
5	– Guldhar	3.300	0.000	3.300
6	Guldhar – Duhai	4.100	0.000	4.100
7	Duhai – Muradnagar	7.300	0.000	7.300
8	Muradnagar – Modinagar	9.400	0.000	9.400
9	Modinagar – South	7.600	0.000	7.600
10	South – Shatabadi Nagar	6.480	1.420	7.900
11	Shatabadi Nagar – HRS Chowk	0.000	3.100	3.10
12	HRS Chowk – Begumpul	0.00	3.400	3.400
13	Begumpul – North	5.634	1.420	7.054
14	North- Modipuram	3.746	0.000	3.746
	Ends	1.405	0.000	1.405
	Spur Line			
15	Shatabadi Nagar – (Spur)	0.00	4.800	4.800
16	– Shastri Nagar (Spur)	2.380	2.620	5.000
	Spur Ends	0.600	0.000	0.600
	Total	**60.085**	**30.120**	**90.205**



Proposed Alignment: Delhi-Panipat Corridor



Total length of alignment : 111.2 km

Daily Boarding, Alighting & Dispersal by Modes (2016)

Station	Daily Boarding & Alighting (in '000)	Dispersal (%)				
		Public Tpt.	IPT *	Pvt. Veh.	NMT	Total
RRTS Corridor : Delhi - Panipat						
Kashmere Gate	65	81.0	5.0	7.0	7.0	100.0
Mukarba Chowk	35	70.0	12.0	14.0	4.0	100.0
Narela MMTC	20	44.0	20.0	28.0	8.0	100.0
Sub-total	**120**					
RRTS Corridor : Delhi - Alwar						
Mahipalpur	66	60.9	28.2	6.5	4.4	100.0
Dhaulakuan	6	61.2	27.0	7.4	4.4	100.0
INA	25	66.1	22.5	6.9	4.5	100.0
Sarai kale Khan	38	64.0	24.2	7.5	4.3	100.0
New Delhi	26	64.6	23.8	7.4	4.2	100.0
Kashmere Gate	20	71.6	18.7	5.4	4.3	100.0
Sub-total	**181**					
RRTS Corridor : Delhi - Meerut						
Anand Vihar	62	72.0	9.0	12.0	7.0	100.0
Sarai Kale Khan	143	79.0	11.0	7.0	3.0	100.0
Sub-total	**205**					
Grand Total	**506**					

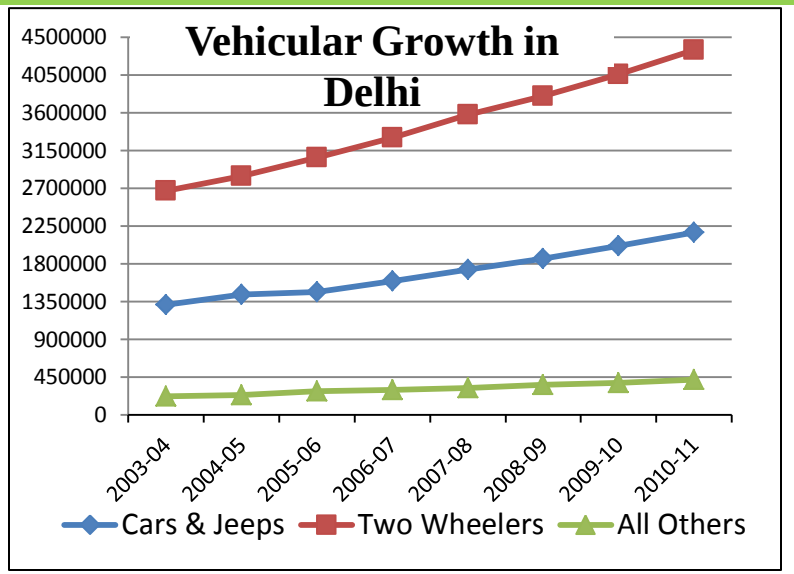
**IPT-Intermediate Public Transport (Taxi, Auto, etc.)*

Transport Scenario in Delhi

Vehicular Growth in Delhi

i. Annual Growth Rate of Vehicles in Delhi – 7.52% (1999-09)

ii. Annual Growth Rate of Vehicles in Mumbai & Kolkata – 6.6% & 4.5% (2002-09)



Increase in Road Network in Delhi

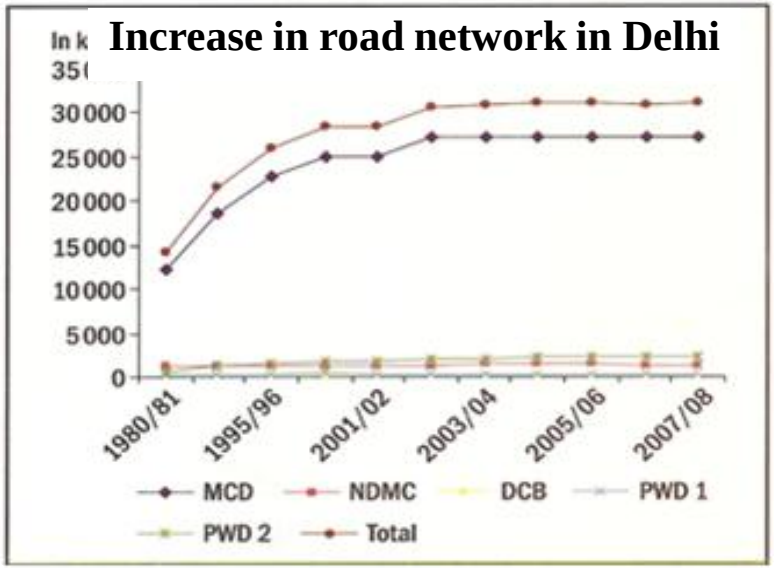
i. Road length increased 1.1 times (2000-07)

ii. Vehicles increased 1.9 times (2000-07)

iii. Resulted heavy traffic congestion and low speed

iv. Road Density -2,103 km/100 sq km

v. V/C ratio in 2007 for Major Delhi Roads:1.01 to 2.83 against 0.7 (IRC Norm for Urban Roads)

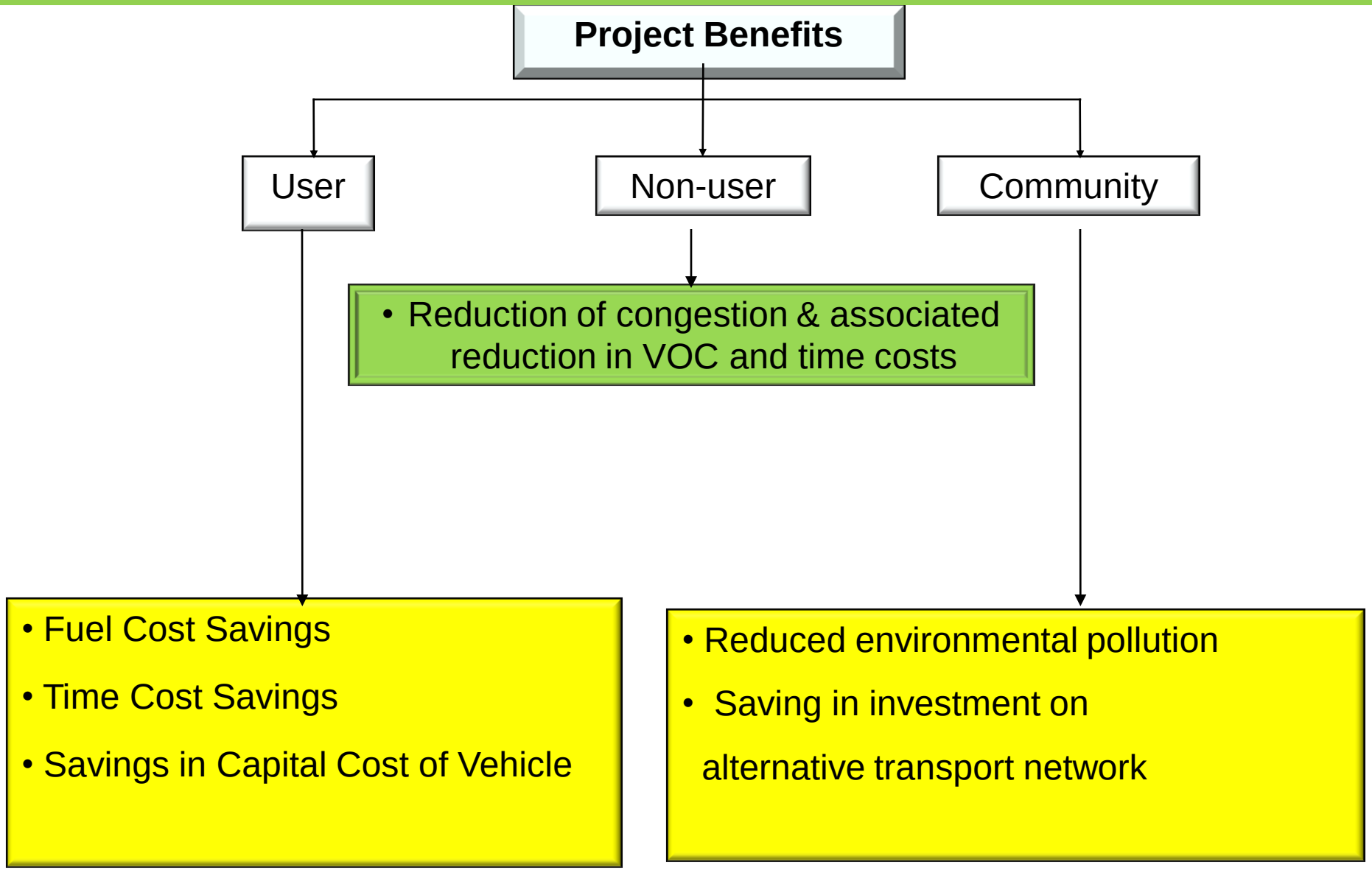


Project Structuring for RRTS – Equity Participation

- All four states and GoI signed MoU in June, 2011 for Equity participation in NCRTC
- In-principle approval from Ministry of Railways received with commitment of 22.5% equity for NCRTC
- Planning Commission agreed to grant in-principle approval subject to resolution of minor issues with MoRT&H related to alignment
- NCRTC will be the holding company for the three RRTS corridors with an initial corpus of Rs. 100 crores to be shared in the following manner:

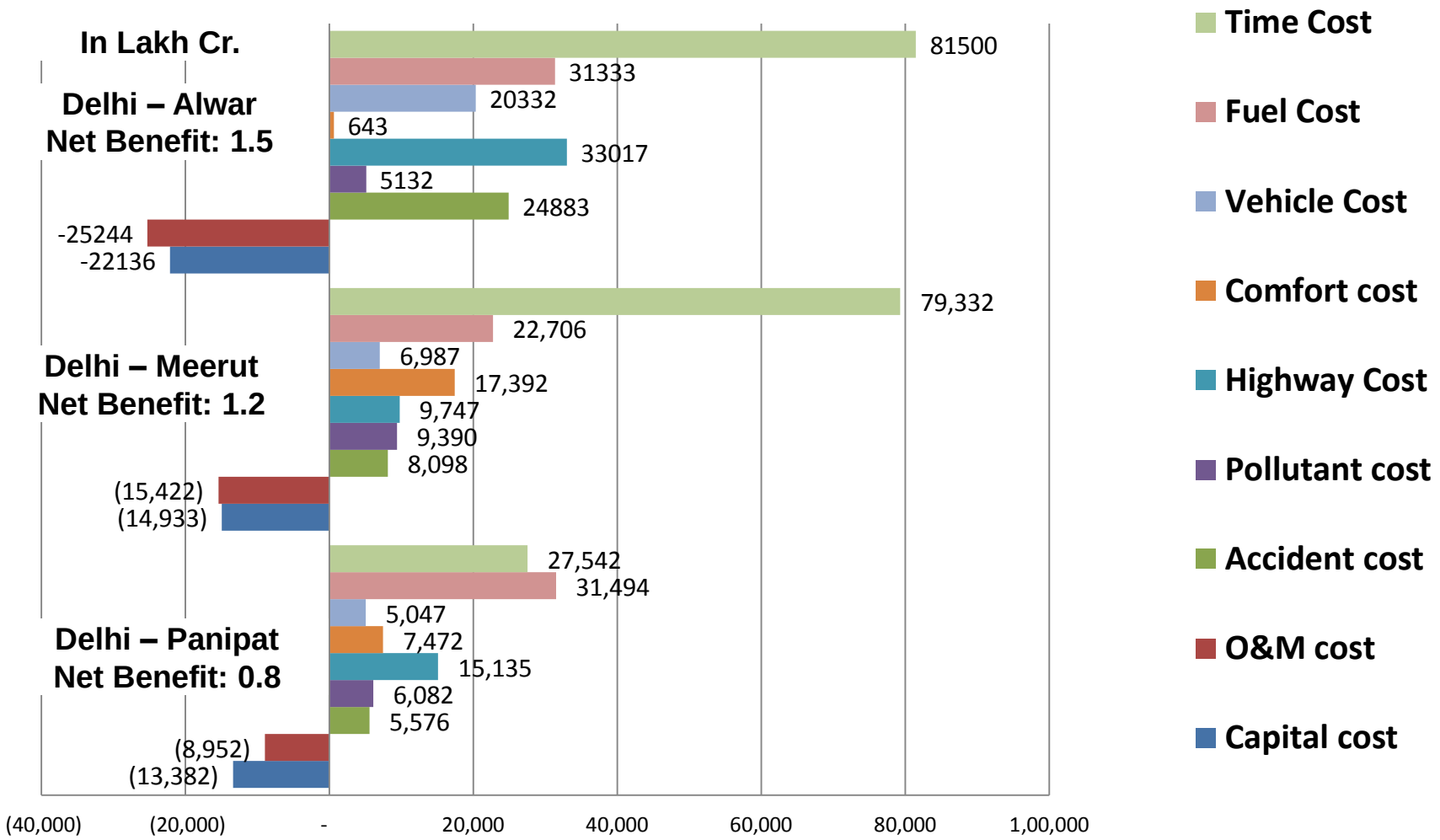
Name of the Entity	Share in NCRTC (%)
Govt of India (MOUD + MoR + NCRPB)	50
Govt. of National Territory of Delhi	12.5
State Govt. of Uttar Pradesh	12.5
State Govt. of Haryana	12.5
State Govt. of Rajasthan	12.5
Total	100

Economic Benefits



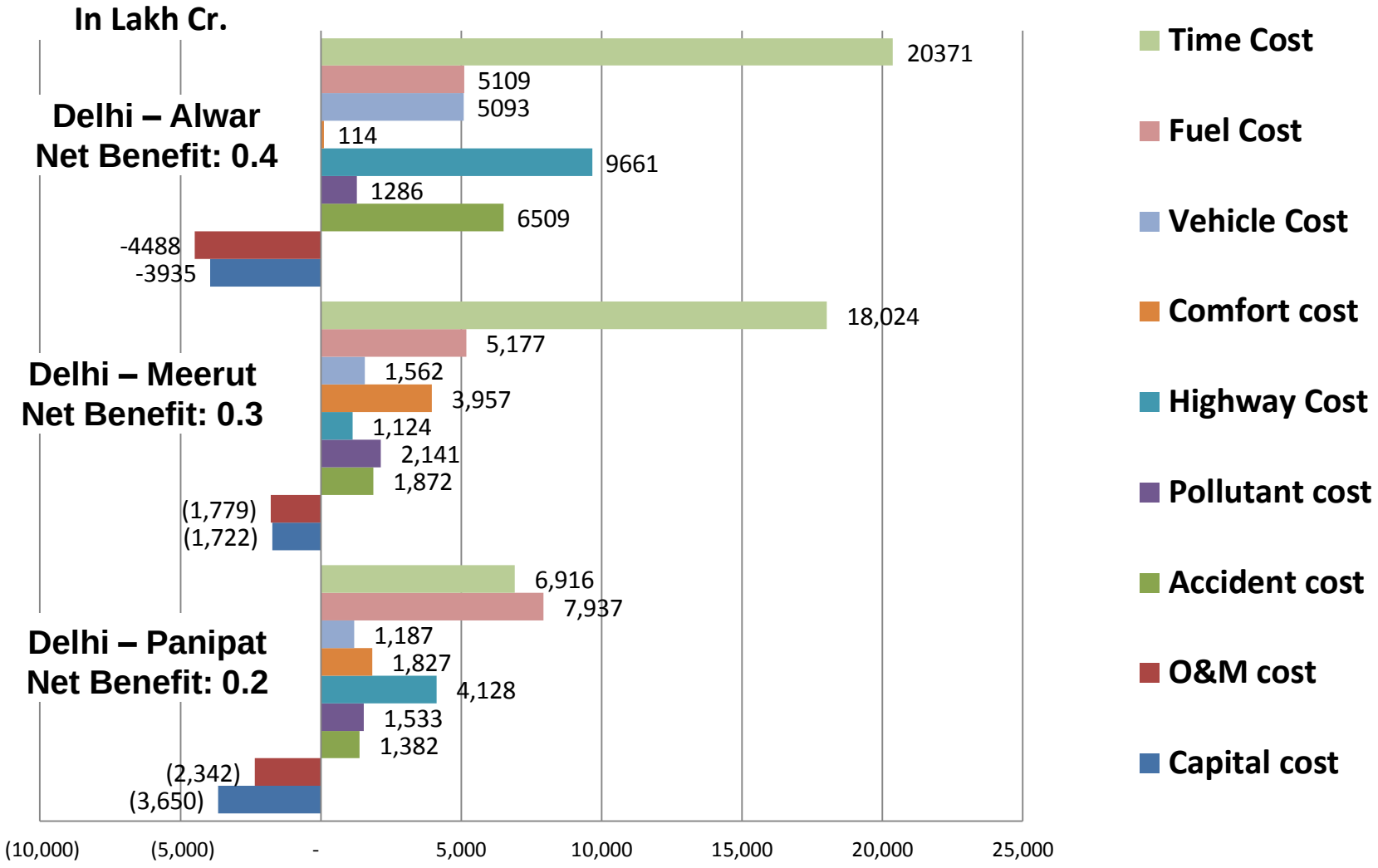
Net Economic Benefit (Full Alignment)

Net Economic value – Rs.3.5 lakh Cr. (at Current Cost)

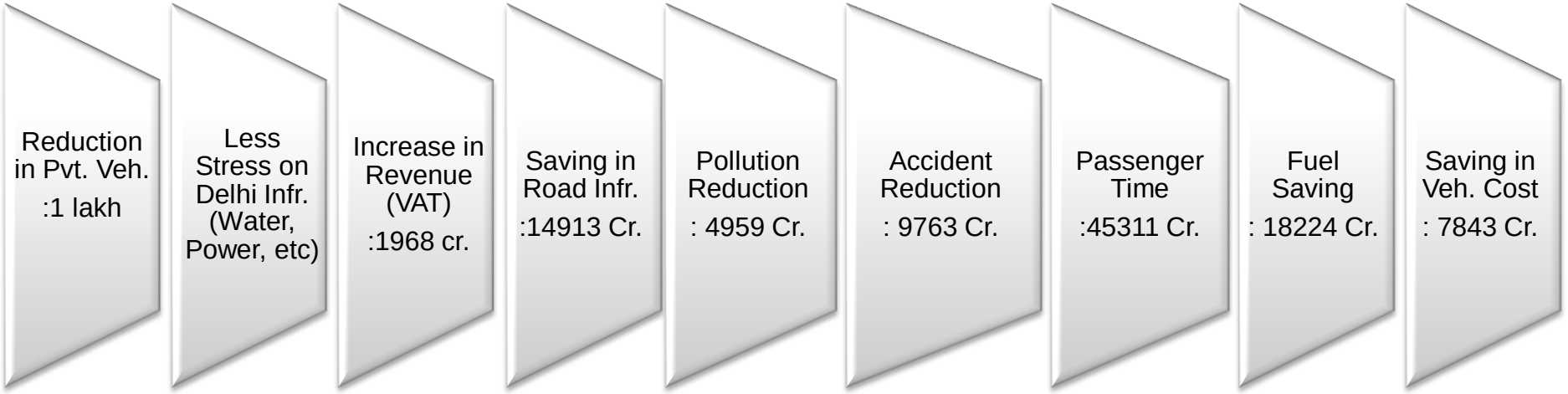


Net Economic Benefit for Delhi

Net Economic value – Rs.0.9 lakh Cr. (at Current Cost)



Benefits to Delhi



Distinct improvement in the Quality of Life due to

1. **Reduction of number of Vehicles on roads**
2. **Reduction in Pollutants**
3. **Less stress on Civic Infrastructure, specially on Water & Power**
4. **Increase in revenue- both VAT and Works contract tax**

Financial Feasibility: Project IRR & Economic IRR

Description	Delhi - Alwar	Delhi – Panipat	Delhi – Meerut
Project IRR (post Tax)	10.66%	5.78%	4.25%
Economic IRR	18.5%	22.31%	24.10%

Comparison with DMRC Phase 3 (with Central tax)

Project IRR – 0.08%

Economic IRR – 15.70%

Way Forward

- Obtaining all approvals: EFC, PIB, Cabinet
- Formation of NCRTC
- Integration of RRTS with Delhi Metro
- Identification, marking and notification of alignment in the Master Plans

Thank You

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