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ROAD NETWORK AND TRANSPORT ENVIRONMENT

By

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BACKGROUND

- Road Transport accounts for a share of 4.5% in India's GDP.
- GDP originating in Road Transport sector during 1999-2000 to 2006-2007 grown at annual average rate of more than 9% which is higher compared to overall GDP growth.
- A world class road network crucial for sustaining growth target of 9% GDP.
- India had 100 million motor vehicles in 2009 compared to 0.31 million in 1951.

BACKGROUND

- Personalized vehicles accounted for about 85% in 2009 compared to 60% in 1951.

- Current vehicle ownership level per 1000 persons in India is still low at around 22 compared to 500 plus for most of high income countries.

- With rising income and greater need for mobility, personalized mode of transport is likely to further grow having serious implications for traffic congestion, energy efficiency and pollution.

BACKGROUND

- As per statistics, India's road safety situation is a cause for concern.
- Massive highway/road development programme is being implemented.
- NHDP Phase I TO VII , PMGSY , Road Programmes financed by ADB/World Bank/State Governments /CRF

GROWTH OF ROAD NETWORK IN INDIA

Road Category	1951	1961	1971	1981	1991	2001	2004	2010
National Highways	19811 (5.0)	23798 (4.5)	23838 (2.6)	31671 (2.1)	33650 (1.4)	57737 (1.7)	65569 (1.8)	70934 (1.7)
State Highways	173723 (43.4)	257125 (49.0)	56765 (6.2)	94359 (6.4)	127311 (5.5)	132100 (3.9)	133177 (3.7)	150342 (3.5)
Other PWD Roads			276833 (30.3)	421895 (28.4)	509435 (21.9)	736001 (21.8)	719257 (19.9)	863241 (20.4)
Rural Roads	206408 (51.6)	197194 (37.6)	354530 (38.7)	628865 (42.3)	1264154 (54.2)	1972016 (58.5)	2140569 (59.1)	2577396 (60.8)
Urban Roads		46361 (8.8)`	203013 (22.2)	308631 (20.8)	396536 (17.0)	475666 (14.1)	362935 (5.5)	574516 (13.6)
Total	399942	524478	914979	1485421	2331086	3373520	3621507	4236429

Note: Road Network in KM.
Figures within parenthesis indicate per cent to total road length in each road category.

STATUS OF NATIONAL HIGHWAYS (as on 31.3.2010)

LANE STATUS	LENGTH In KM
6 lane and above	731 (1%)
4 lane (2 lane dual carriageway)	14,584 (22%)
2 lane (7 meters)	37,488 (52%)
Single/Intermediate lane	18,131 (25%)
Total length of National Highways	70,934

SHARE OF DIFFERENT MODES OF TRANSPORT IN GDP

Sector	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
Transport of which	5.9	6.0	5.9	6.2	6.3	6.6	6.5	6.4	6.4	6.4
Railways	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.0
Road Transport	3.8	3.9	3.8	4.1	4.3	4.5	4.5	4.5	4.5	4.5
Water Transport	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Air Transport	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Services	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

As percentage of GDP (at factor cost and constant prices)
Source: Central Statistical Organization

GROWTH OF VEHICLE POPULATION

Year end March	2 Wheelers	Cars, Jeeps etc.	Buses	Goods Vehicle	Others
1951	8.8	52.0	11.1	26.8	1.3
1961	13.2	46.6	8.6	25.3	6.3
1971	30.9	36.6	5.0	18.4	9.1
1981	48.6	21.5	3.0	10.3	16.6
1991	66.4	13.8	1.5	6.3	11.9
2001	70.1	12.8	1.2	5.4	10.5
2002	70.6	12.9	1.1	5.0	10.4
2003	70.9	12.8	1.1	5.2	10.0
2004	71.4	13.0	1.1	5.2	9.4
2005	72.1	12.7	1.1	4.9	9.1
2006	72.2	12.9	1.1	4.9	8.8
2007	72.4	13.5	0.5	5.0	8.6
2008	71.0	15.3	0.7	5.1	7.9
2009	70.0	16.7	0.7	5.4	7.2

* Vehicle Population in percentage of total

EXISTING MODAL SPLIT IN INDIAN CITIES (as a % of Total Trips)

City Population(in million)	Walk	Mass Transport	IPT Fast	Slow	Car	Two-Wheeler	Bicycle	Total
0.10-0.25	37.1	16.4	10.4	20.1	3.3	24.1	25.7	100.0
0.25-0.50	37.8	20.6	8.9	17.2	2.6	29.8	20.9	100.0
0.50-1.0	30.7	25.4	8.2	12.0	9.5	29.1	15.9	100.0
1.0-2.0	29.6	30.6	6.4	8.1	3.3	39.8	12.1	100.0
2.0-5.0	28.7	42.3	4.9	3.0	5.0	28.9	15.9	100.0
5.0+	28.4	62.8	3.3	3.7	6.1	14.8	9.4	100.0

Source: Ministry of Urban Development, Government of India, New Delhi.

DESIRABLE MODAL SPLIT FOR INDIAN CITIES (as a % of Total Trips)

City Population(in millions)	Mass Transport	Bicycle	Other Modes
0.1-0.5	30-40	30-40	25-35
0.5-1.0	40-50	25-35	20-30
1.0-2.0	50-60	20-30	15-25
2.0-5.0	60-70	15-25	10-20
5.0+	70-85	15-20	10-15

Source: Ministry of Urban Development, Government of India, New Delhi.1998.

ILLs OF INCREASING TRANSPORTATION

- Large network of highways/roads requires strengthening and capacity augmentation
- As per World Bank studies, economic loss due to inadequate capacity/poor riding quality > Rs 30000 crore per annum.
- > 5 lakh motor vehicle accidents every year.
- > 1.3 lakh persons killed every year
- > 5 lakh persons injured every year
- Economic loss due to accidents > Rs 4000 crore every year

VEHICULAR POLLUTION

- High volumes of traffic and urban population dynamics.
- Excessive increase in private / personal vehicles.
- Improper maintenance of vehicles.
- Growing traffic bottlenecks.
- Less eco-friendly mode of transport and fuel technologies.
- Lack of comprehensive fiscal strategies to check the increase of private/ personal vehicles

VEHICULAR POLLUTION - contd

- As per World Bank report more than 40,000 people die prematurely per year in India due to health problems caused by air pollution.
- Studies reveal that the cases of respiratory diseases and allergies have almost doubled since 1990.
- Nearly 80-90 percent lead in ambient air is attributed to the composition of leaded petrol. Unleaded petrol in India contains a very high level of benzene, which may cause lung cancer.

REMEDIAL MEASURES FOR SUSTAINABLE PUBLIC TRANSPORT SYSTEMS

- Shift from private / personal transport to mass public transport.
- Priority should be given for the design and development of modern and sophisticated bus transport systems to increase their use in the megacities of India.
- Movement of buses with relatively safer speeds. This can be ensured by adjusting of trip times and introduction of speed limiting devices in buses.

SEGREGATED LANES FOR NON MOTORIZED TRANSPORT AND SAFE PEDESTRIAN MODES

- Comprehensive adherence to road design characteristics to ensure the safety of pedestrians and bicyclists.
- Construction/provision of segregated bicycle lanes on all arterial roads in megacities.
- Construction of convenient sub-ways and crossing facilities for pedestrians.

NATIONAL ROAD SAFETY AND TRAFFIC MANAGEMENT BOARD

Proposed to be constituted by Government consisting of a chairperson and 3-5 members having expertise in :

- Road engineering , construction and management and traffic engineering
- Automobile engineering
- Traffic laws, operations, management and enforcement,
- Data collection, reporting and analysis
- Accident related medical care

FUNCTIONS OF NATIONAL ROAD SAFETY AND TRAFFIC MANAGEMENT BOARD

- Recommend minimum design, construction, operation and maintenance standards for the national highways.
- Recommend minimum standards for establishing and operating trauma facilities
- Conduct safety audits to monitor compliance with the standards notified by the Central Government.
- Make recommendations or issue guidelines relating to standards for design, construction, operation and maintenance of the national highways.

FUNCTIONS OF NATIONAL ROAD SAFETY AND TRAFFIC MANAGEMENT BOARD - CONTD

- Recommend minimum safety requirements and standards for the design and manufacture of mechanically propelled vehicles

- Recommend minimum conditions for safe usage of mechanically propelled vehicles including specifying the maximum load bearing and capacity limits

- Recommend standards for vehicular traffic on the national highways including the schemes for segregation of various classes of vehicles in separate speed lanes and their right of way.

SALIENT ENGINEERING MEASURES FOR IMPROVING ROAD SAFETY

- Improvement to geometrics
- Improvement to junctions
- Traffic aid posts, ambulance services, trauma centers
- Bus Bays and Truck Laybys
- Road over bridges to replace railway crossings
- Traffic safety barriers. Delineators
- Traffic signs and pavement marking
- Removal of encroachments and reduction of direct access points on main roads
- Hard shoulders on main roads
- Safety audit in design, construction and operation of highways

EXISTING INSTITUTIONAL SET UP FOR ROAD SAFETY

- Ministry of Road Transport and Highways responsible for Road Safety efforts in the country
- National Road Safety Council headed by Union Minister of Road Transport and Highways is apex advisory body in road safety
- Transport Development Council chaired by Union Minister of Road Transport with Ministers of Commerce, Industry, Railway – high level forum for formation of common policies for Road Transport.
- Roads Wing of MoRTH deals with Engineering aspects of safety in design, construction and operation of roads. Also sets standards of safety in consultation with IRC.

EXISTING INSTITUTIONAL SET UP FOR ROAD SAFETY

- NHAI entrusted with implementing NHDP – Many of its activities outsourced to consultant and contractors and engineering measures to ensure road safety are required to be built into projects.

- State PWDs/Rural Road departments/ Development authorities/ Municipal corporations etc. responsible for Road development in their jurisdiction.

SHORTCOMINGS IN PRESENT SYSTEM

- Hugh requirement for road development but limited resources
- Resources being thinly spread to cover more roads/ areas
- Less importance to road safety works in planning and design
- Lack of skilled professionals dedicated to road safety
- Absence of special cells in MoRTH/ State PWDs to coordinate and ensure implementation of Engineering measures for road safety.

SUGGESTIONS FOR IMPROVEMENT

- Ensuring necessary road safety works in all projects at time of approval.
- Review of manuals for two/four/six lanes of highways to provide for mandatory provisions of engineering measures for road safety.
- Introduction of safety audit in design, construction and operation in all major projects and implementation of measures identified through the same.
- Enforcement of contact provisions for traffic management and safety during construction and operation of highways.

SUGGESTIONS FOR IMPROVEMENT

- Introduction of stringent penalties for non-compliance of safety measures.
- Creation of Traffic Cells in all highway departments so that engineering safety measures are not lost sight of during planning and design.
- Ear marking a specified percentage of highway budget (3%-5%) for road safety works.

THANK YOU