Opportunities in Roads & Highways Tolling Operation and Management

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The Road Network in India

Road Network	Length (km)	Percentage of Total		Connects
		Length	Traffic	
National Highways	58,112	1.8	40.0	Union Capital, State Capitals, Major Ports, Foreign Highways, Strategic Locations
State Highways	137,119	4.1	40.0	State Capital, District Centres, Important Towns, National Highways, Other States
Major District Roads	470,000	14.2	20.0	Production Centres, Markets, Highways, Railway Stations, etc.
Village & Other Roads	2,650,000	79.9	--	
Total	3,315,231	100.0	100.0	

The Institutional Arrangement

Current Status

Phenomenal growth in freight and passenger traffic …

- During 1951 to 2003, freight on Indian roads increased 101 times (from 6 billion-ton-km to 607.2 billion-ton-km)
- Passenger traffic increased 87 times (from 23-billion-passenger-km to 1,990 billion-passenger-km)
- The share of road sector in freight and passenger traffic increased from 12% to 64.5% and 25.8% to 86% respectively

… **as well as growth in vehicle population …**

- The number of registered vehicles have grown 192 times - at a CAGR of 10.86% (from 0.306 million to 58.86 million)
- Commercial that vehicles account for the majority of the freight traffic increased at 40 times at a CAGR of 7.34%, to 3.05 million

… not matched by a commensurate growth in road network …

- The road network increased 8.3 times, from 0.4 million km to 3.3 million km
- The National Highway network (that accounts for nearly 40% of the total freight traffic) increased by 2.93 times, from 19,811 km to 58,112 km
- Of the total 195,200 km of state and national highways, only 1.2% is 4-laned and 32% is 2-laned, while more than two-thirds still comprises single lane roads

… resulting in …

- Congestion on nearly 25% of the National and State Highways
- Commercial Vehicles in India traverse only 250 – 300 km (average speed of 30 km/h) a day against 600 km (average speed 60 km/h) in the developed countries
- The Overall Economic Loss due to the lack of Efficient National Highway System is estimated at USD 4.5 – USD 6.5 Billion a year

The Road Development Programs

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The Road Development Programs

- The Government of India has taken several initiatives to expand the road network
  - The National Highway Development Project (NHDP)
    - Comprises the Golden Quadrilateral (GQ), the North South East West Corridors, Port Connectivity and Other Works
  - The Pradhan Mantri Bharat Jodo Pariyojana (PMBJP)
    - 10,000 Km of Roads Linking Major Cities to Highways
  - The Pradhan Mantri Gram Sadak Yojana (PMGSY)
    - Rural Roads
- Several States have initiated programs to expand the road network in their respective states

- **The initiatives combine:**
  - New Institutional Arrangements
  - International highway engineering standards
  - A sustainable revenue model comprising tolls and cess on fuel

The National Highway Development Project (NHDP)

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The NHDP

- The NHDP is being implemented by the National Highways Authority of India (NHAI)
- The NHDP comprises of three programs:
  - The Golden Quadrilateral (GQ)
  - The North-South & East-West (NSEW) Corridor
  - Port Connectivity and Other Works
- The program involves the strengthening and 4/6 laning of approximately 14,253 km of National Highways

At an estimated Project Cost of USD 14 Billion, the NHDP is the largest public works program under taken in the Road Sector after WW II

The Golden Quadrilateral (GQ)

The North–South & East–West Corridor

Port Connectivity and Other Works

Capital Expenditure and Means of Finance

Capital Expenditure on NHDP		
Year	**Capex (USD Billion)**	**Percentage of GDP**
1999-00	0.16	0.04
2000-01	0.28	0.06
2001-02	0.88	0.18
2002-03	1.45	0.21
2003-04	2.09	0.33
2004-05(Projected)	2.71	NA
2005-06 (Projected)	2.94	NA

Means of Finance	
Source of Finance	**Amount (USD Billion)**
Cess on Fuel	5.19
World Bank/Asian Development Bank Loan / Assistance	5.19
Market Borrowings	2.59
Private Sector	1.04
Total	**14.00**

NHDP Progress

Status as on June 30, 2004

Project	Length (km)	Already 4-Laned	Under Implementation	To be Awarded
GQ	5846	2892	2954	-
NS&EW	7274	638	425	6211
Port Connectivity	356	56	229	58
Others	777	153	127	462
Total by NHAI	**14253**	**3256**	**3735**	**6731**

The Pradhan Mantri Bharat Jodo Pariyojana (PMBJP)

(The PM's "Connect India" Program)

The PMBJP

- The 10,000 km project envisages linking all State Capitals and important commercial centers not covered by the NHDP with 4/6 lanes highways by 2009
- The program consists 48 new road projects to be implemented on BOT basis with government subsidy provided during construction and operation under Viability Gap Funding (VGF) mechanism
- NHAI has identified 7 projects aggregating 622 km as Phase I
- Estimated total outlay on the project is USD 9 billion

Notable State Level Initiatives

Maharashtra

- To accelerate the development of transport infrastructure facilities in the State, the Maharashtra State Road Development Corporation Ltd. (MSRDC) was set up in 1996
- More than 250 projects have been identified under BOT
- 122 projects, costing USD 900 million have been taken up
- 56 projects, costing USD 400 million have been completed

- Bids for 34 projects, costing USD 520 million have been invited
- 50 flyovers (Mumbai Traffic Improvement Mega Project): 35 are operational
- The Mumbai-Pune Expressway: The 95-km, 6-lane concrete expressway cost USD 400 million

Gujarat

- Road development in Gujarat has been under the aegis of the Roads and Buildings Department (R&BD) of PWD
- Successfully completed the USD 77 million World Bank Assisted Gujarat Rural Road Project involving the improvement of 6,100 km of rural roads in 13 districts out of the 19 districts in the State
- Gujarat State Highway Project (GSHP): The World Bank sanctioned a 20-year loan of USD 381 million for the USD 533 million Project
- The GSHP is to be implemented in two phases:
  - Phase-I: widening and strengthening of 246 km of the State Highways
  - Phase-IIA: 244 km
  - Phase-IIB: 393 km

Madhya Pradesh

- The Madhya Pradesh Rajya Setu Nirman Nigam is implementing a BOT expressway development program - 15 projects to build 2100 km of roads have been awarded

- The state government meeting half the estimated costs, USD 110 million in the form of capital subsidy
- Remaining money to be raised via bond issues
- Work has commenced on 13 of the 15 projects
- Work on the USD 800 million World Bank funded bypass projects has been completed
- The USD 1 million from Asian Development Bank

Karnataka

- Set up in 1999, the Karnataka Road Development Corporation Ltd. (KRDCL), was mandated to develop and maintain the roads in Karnataka, and promoting private sector participation through BOT projects
- Karnataka State Highway Improvement Project: upgrading and strengthening 2,269kms of roads
- Program started in May 2001, with financial support from the World Bank
- The cost is pegged at USD 4.4 billion with the World Bank funding 80% of the costs, the state government will contribute the remaining

Other States

- Andhra Pradesh
- Chhattisgarh
- Delhi
- Haryana
- Jammu & Kashmir
- Kerala
- Orissa
- Rajasthan
- Tamil Nadu
- Uttar Pradesh
- West Bengal

Highways Under Development

As on June 30, 2004

	NHDP			Port Connect & Others	Total by NHAI	Non NHDP	State High ways	Total
	GQ	NSEW	Total					
Total Length (Km)	5,846	7274	13,120	1,133	14,253	10000	7000	31,253
Completed	2,892	638	3,530	257	3,787	--	800	4,587
Under Implementation (km)	2,954	425	3,379	356	3,735	--	1020	4,755
Contracts to be Awarded (km)	--	6,211	6,211	520	6,731	10000	5180	21,911

Pradhan Mantri Grameen Sadak Yojana (PMGSY)

(The PM's "Rural Connectivity" Program)

Pradhan Mantri Grameen Sadak Yojana (PMGSY)

- The USD 29 billion project, implemented by the Ministry of Rural Development aims at upgrading 500,000 km of existing rural roads
- USD 4.4 billion is expected to be available from cess on diesel
- The Resource Gap is expected to be bridged by access to Multilatral Funds and raising funds from the Domestic Market
- Proposals worth USD 2.0 billion have been cleared

Bridging the Gap

Central Government Policy Initiatives

- Land required for construction and operation to be provided by the Government of India (GoI), free from encumbrances
- Exemption from corporate tax for 10 years
- Housing & real estate development that are an integral part of the National Highways Development Project (NHDP) to be entitled to the same benefits
- 100% Foreign Direct Investment (FDI) allowed in road sector projects
- NHAI/GoI to provide a capital grant up to 40% of the project cost
- A concession period of upto 30 years
- Imports of specified equipment for highway construction are exempt from import duty

State Government Policy Initiatives

- Several State Governments have taken initiatives to facilitate Private Sector Participation (PSP) of state roads on BOT basis by
  - Enacting Infrastructure Development Acts
  - Making Appropriate Amendments to Motor Vehicle Tax Act
  - Making Appropriate Amendments to Indian Tolls Act

- Several States have set up State Road Development Corporations (SRDCs) for development and implementation of projects

Some Issues Persist…

- Absence of a Comprehensive National Transport Plan
- Poor Historical Data and Traffic Studies
- Absence of a Tolling Policy
- Project Financing
- Environment and Social Impact Assessment
- The Concession Agreement
- Supervision
- User Fee
- Design

The Opportunities

The Opportunities

Development

- Sponsorship
- Bid Advisory
- Project Management
- Merchant Banking

Operations

- Tolling
- Toll Auditing
- Maintenance

Consolidation

- Buyouts
- Consolidation
- Derisking
- Sell Down
- Commoditisation

SHORT TERM

MEDIUM TERM

Existing Toll Roads in India

As on September 31, 2003

State	State Highways (km)	National Highways (km)	Total (km)
Madhya Pradesh	18.40	215.00	233.40
Maharashtra	43.61	84.63	128.24
Rajasthan	84.53	267.05	351.58
Tamil Nadu	33.00	113.00	146.00
Gujarat	226.26	93.90	320.16
Andhra Pradesh	181.40	35.90	217.30
Uttar Pradesh	18.00	0.00	18.00
Total	**605.20**	**809.48**	**1414.68**

In future:

Toll Roads in Europe : 22,000 km

Toll Roads in India by 2010 : 30,000 km

Sponsorship

- Over 22,000 km of Highways yet to be awarded
- Till date 192 contracts have been awarded
  - Under 40 km comprise 58%
  - 40 – 80 km comprise 33%
- Over 200,000 km of PMGSY yet to be awarded

Typical size of Contracts Awarded on NHDP				
	Number of Contracts			
USD Million	**GQ**	**NSEW**	**Port Connectivity & Other Works**	**Total**
< 11	4	19	1	24
11 – 22	22	14	9	45
23 – 45	41	2	6	49
46 – 65	23	0	2	25
66 – 88	6	0	3	9
89 – 110	6	0	1	7
> 110	4	0	0	4
Total	106	35	22	163

Tolling

- Entire GQ and the Port Connectivity & Other Works are Toll Roads
  - NHAI toll revenue in 2003 at USD 55 million (does not include the private sector BOT projects)
  - NHAI toll revenues estimated at USD 85 million in 2007; USD 250 million in 2008; USD 11,000 million for the period 2001 – 30

- NSEW Corridor
  - NHAI toll revenues estimated at USD 150 million in 2009; USD 6,050 million for the period 2001 – 30 (does not include the private sector BOT projects)
- BOT Projects
  - The NHAI has awarded USD 725 million worth of projects till date
  - Estimated toll collection in 2003 for 1400 km: USD 160 million
- Estimated number of toll plazas required: 1200

Tolling Technologies

- There are multitudes of tolling systems operating in India. These systems will need to be integrated and/or made compatible
  - OBUs and smart cards
  - Tolling transaction processes
  - Vehicle classification processes
  - Image capture (violation) systems
  - Enforcement processes
  - Back-end systems
  - Computer systems
  - Vehicle location systems
  - Video monitoring systems
  - Environmental monitoring systems
  - Other equipment

Operations and Maintenance (O&M)

Road Surface Condition in India

International Roughness Index	National Highways	State Highways		
		Single Lane	Intermediate Lane	Two Lane
	% of Total Length			
< 4 (Good)	50.7	11.0	10.8	11.2
4 – 6 (Fair)	23.6	23.4	31.8	48.4
6 – 8 (Poor)	25.7	35.3	34.6	35.5
> 8 (Very Poor)	0.0	30.4	22.7	4.6

- The lack of proper maintenance results in a loss of USD 3.5 billion per annum (including an increase of 10 – 15% per annum fuel consumption)
- USD 1 spent in maintenance of roads saves USD 2 – 3 on Vehicle Operating Costs
- Nearly 70% of all projects executed by NHAI has been through Cash Contracts (where the contractor builds the road and hands it over to the NHAI)
- NHAI funds these projects through funds from Multilateral Agencies, Cess and Market Borrowings

… 2

- Estimated expenditure on the maintenance of National Highways in 2003: USD 450 million
- Funds available: USD 180
- In order to raise efficiencies and raise alternative sources of Finance, the government is expected to contract the maintenance activity to the Private Sector
  - The GQ is due for completion by 2004. All of the 5600 km less a few under a BOT framework will be bid out for O&M
  - The NSEW will be completed by 2007, another 7000 km will be bid out for O&M
  - BOT projects being implemented by various developers in the GQ and NSEW will be seeking for partners to undertake O&M activities
  - State Government Projects

Buyouts

- Most of the projects under operation are small to medium sized ranging from USD 1.2 million to USD 2.5 million
- These projects have been awarded to small contractors who may be willing to exit after commissioning. This would ease their cash flows and permit them to take on new projects
- Most of these projects are doing well and offer stable and predictable cash flows which can be leveraged to attain higher returns through efficient financial structuring
- These projects provide a low risk and ready entry strategy for foreign companies wishing to test the Indian market

Unsolicited Bids

- Various State Governments have enacted laws which allow independent entities to submit unsolicited bids for projects
- The State would subject the unsolicited bid to a Swiss Public Challenge and permit the unsolicited bidder to match the lowest bid

- If unable to match the lowest, the unsolicited bidder is reimbursed expenses of preparing the original bid

Advisory Services

- Project Management
  - Provide Program Management and oversight to government agencies
  - Provide Value Added Project Management Services to Contractors, Developers etc.

- Financial Advisory
  - Financial Restructuring
  - Merchant Banking
  - Mergers, Acquisitions and Joint Ventures
  - Lending, Securitisation Etc.

Other Surface Transport Initiatives

- Other Roads
  - Special Economic Zones
  - Large Industrial Estates
- Urban programs
  - Mumbai Urban Transport Project (MUTP)
  - Other Metropolitan and Class ‘A’ cities
- Traffic Solutions
- The Railways
  - GQ – Port Connectivity
  - Ticketing Systems
- Urban Rail Transit - Light/Mass
  - Mumbai
  - Chennai
  - Bangalore

In Conclusion

- The growth in road transportation requirement is estimated at 1.5 times of GDP growth for freight and 2 times of GDP growth for passenger traffic
- The Government of India realizes that the expansion of the Road Network is critical for sustained economic growth
- The Government has maintained a sustained reform process
- There has been a growing acceptance of User Charges…
- … and Greater Investor Confidence
- The Multilateral Agencies have been making funds available for investment…
- … and a significant sector participation by the domestic banks and FIs

The Political Will to develop World-Class Infrastructure, the Continued Reform Process, the Robustness of the Indian Economy, the Indian Consumers' Willingness to Pay and the Availability of Finance have created Substantial Investment Opportunities in the Road Sector

Thank you

A View on User Fee

Issues

- User fee: The savings shared with the service provider
- Already High Vehicle Ownership and Operating Costs
- Cost of Infrastructure vs. the Ability to Pay
- A Low “Willingness to Pay”
- A Long User Learning Curve

A View on Design

Service Level Determinants

- Number of lanes
- Composition of traffic
- Design
- Safety features
- Enforcement

Measures to Enhance Road Capacity/Service Levels

- Geometric correction of the critical curves
- Banking to increase speeds
- Replacement of Railway Level Crossings by RoBs / RuBs
- Rehabilitation / reconstruction of existing bridges
- Construction of Flyovers and Bypasses to decongest bottlenecks
- Provision of overtaking lanes in specific sections
- Plantation of two or more rows of trees to the edge of the RoW to avoid encroachment
- Edge of carriageway to be kept free from any development

- The provision of reflective road studs (Cat's Eye) along the entire stretch for illuminated guiding
- The provision of traffic guide posts and delineators at regular intervals
- The provision of crash barriers and chevron signs along the curves
- Extensive use of diamond grade signages for enhanced driver comfort / information

The Engineering Solution Vs. The Elegant Solution

(The Most Bang for the Buck)