Challenges to Sustainable Road Freight Transport in India

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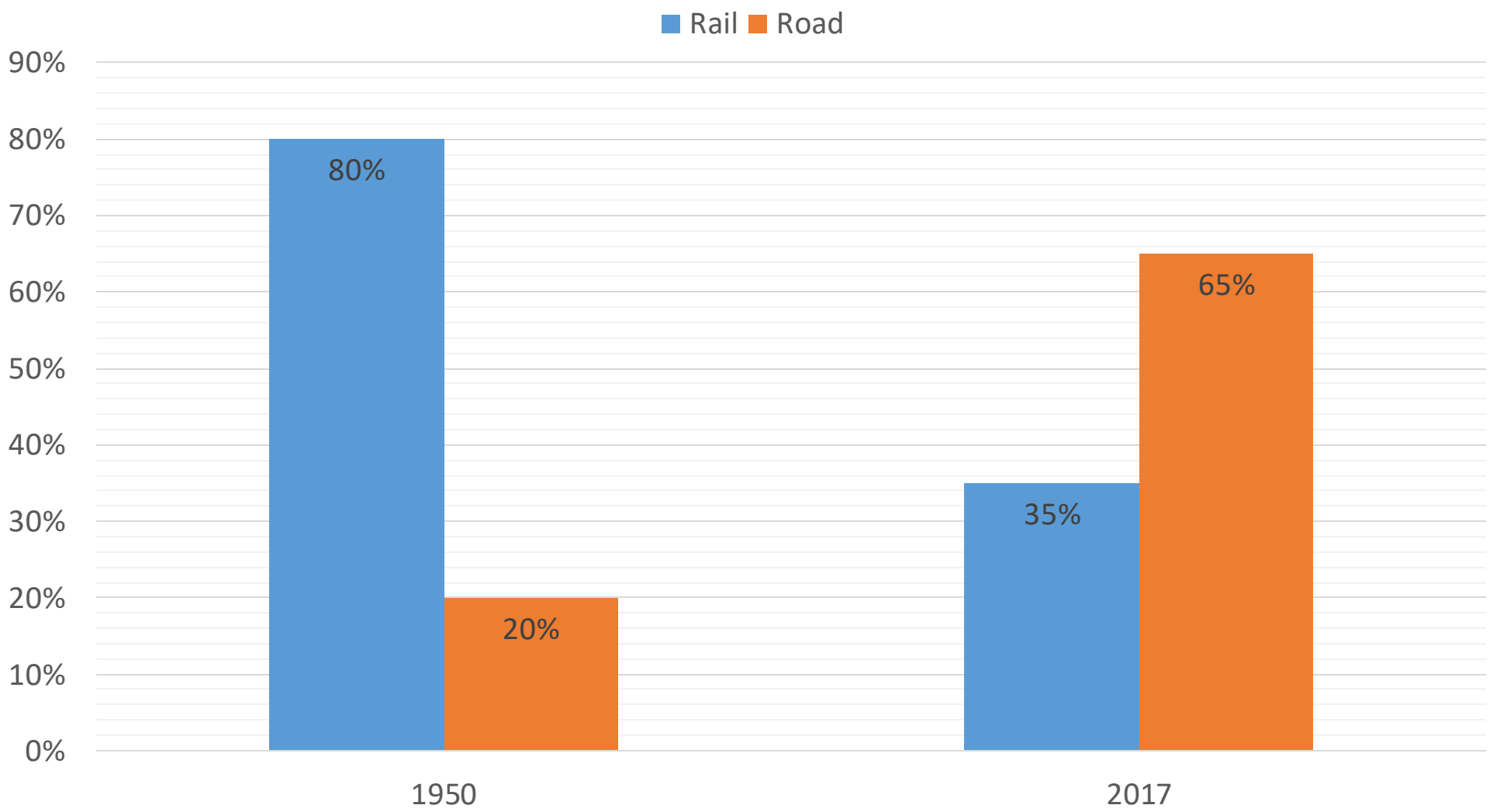
Outline

- **Diagnostics**
  - **Share and Significance**
  - **Industry Structure**
  - **Five 'S' framework**
- Challenges
  - Infrastructure (roads)
  - Vehicles
  - Warehousing
  - Driver
- Conclusion

Share and Significance

- Road freight has gained a strong foothold in India, thanks to its basic offerings of:
  - Door to door service
  - Ability to handle smaller parcel sizes
- This has to be set in the context of Indian Railways' handling of freight:
  - Not being so customer friendly:
    - Increase in parcel sizes due to insistence on rake load movement (efficiency at the cost of effectiveness)
    - Lack of agility due to being a large bureaucracy
  - Not having capacity on key routes
- Net consequence: modal share has shifted in favour of roads

Rail Road Share (tkms)



Source: Various policy documents

Share of Different Modes of Transport in GVA

Note: GVA is at 2011-12 prices

Sector	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Transport (% share of total)[1]	4.92	5.02	5.01	4.99	4.98	4.85
Segmental Breakup						
Railways[1]	0.75	0.81	0.80	0.81	0.82	0.77
Road Transport[1]	**3.24**	**3.30**	**3.30**	**3.28**	**3.26**	**3.12**
Water Transport[1]	0.09	0.08	0.08	0.08	0.08	0.07
Air Transport[1]	0.05	0.05	0.05	0.05	0.06	0.16
Services Incidental to Transport[1]	0.78	0.78	0.77	0.77	0.77	0.74
Total allocation to transport [2] (Rupees in Crore)	397,318	433,376	457,152	490,335		
Total of GVA at basic prices [2] (Rupees in Crore)	8,195,546	8,599,224	9,169,787	9,827,089		

Source: 1. Central Statistical Organisation & Road Transport Yearbook (2016-17): https://morth.nic.in/sites/default/files/Road%20Transport%20Year%20Book%202016-17.pdf accessed on 27th October 2020

2. Sector-wise contribution of GDP of India, Planning Commission, Government of India http://statisticstimes.com/economy/sectorwise-gdp-contribution-of-india.php accessed on 20th November, 2016

Share and Significance

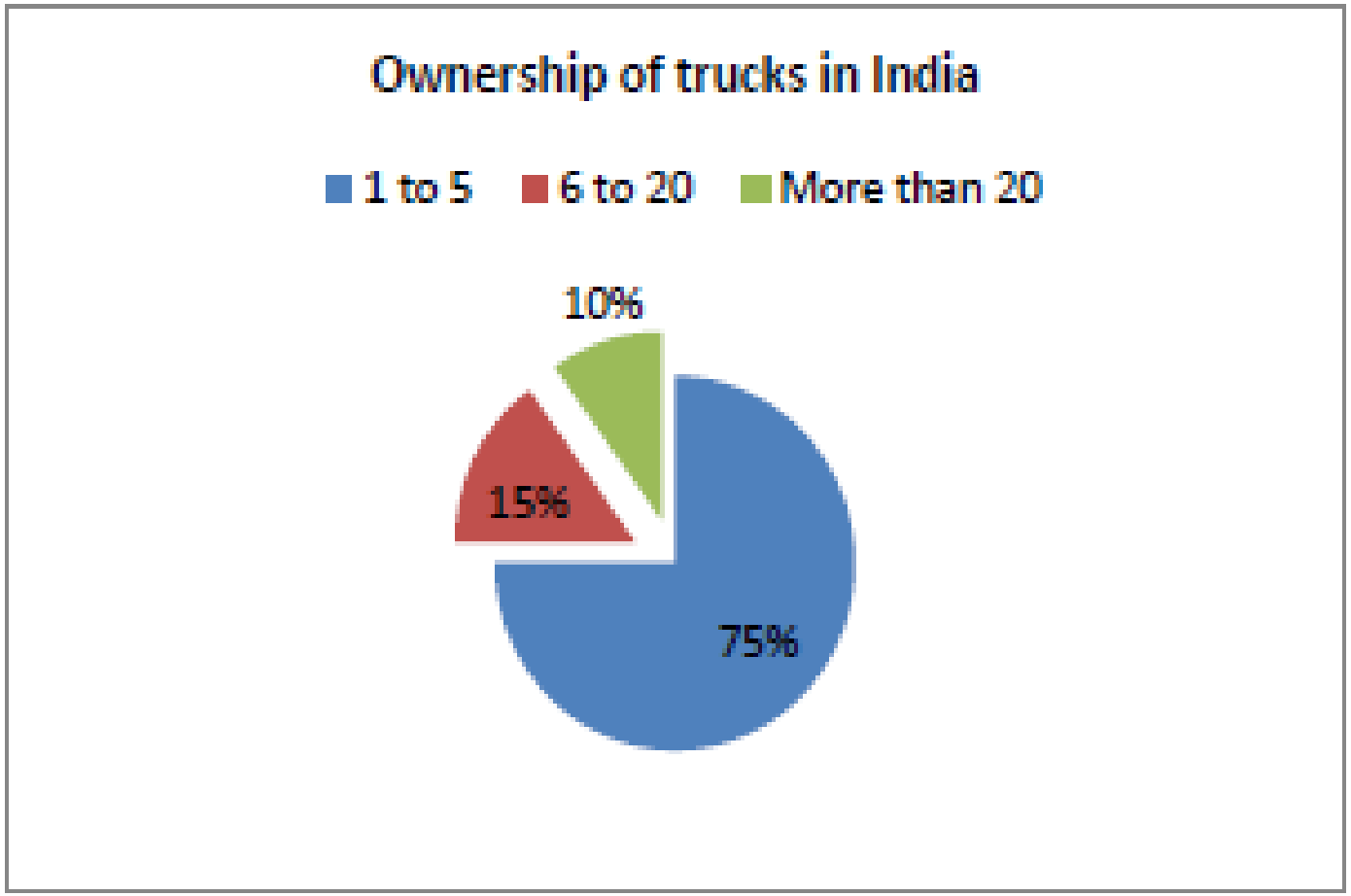
- While the ratio of road to rail in tkms is about 1.9, the ratio in terms of value addition (monetary terms) is 4.1.
- In other words, even though road freight charges are higher, the total logistics cost by road is viewed to be lower than by rail by customers.
- As a share of the overall economy, road transport (as well as overall transport) is marginally reducing.
- *There is a possible data problem since air transport share is being shown as having gone up substantially, either due to an error or a reclassification*

Industry Structure

- The increasing volume and modal share of road freight in India is complemented by a fragmented Industry Structure.
  - Disaggregated ownership
  - Separation between ownership and marketing

- This does not augur well.

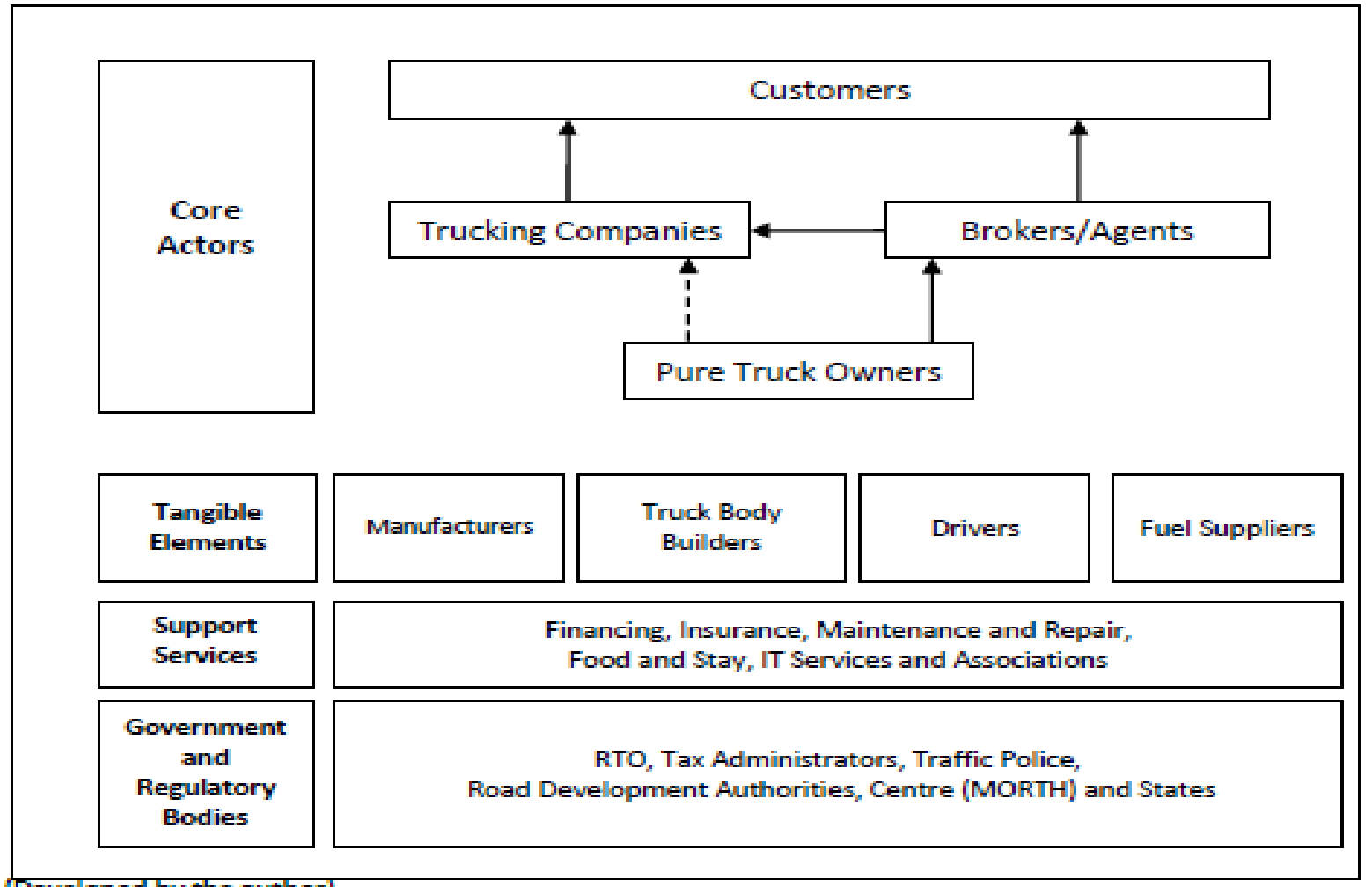
Industry Structure
Truck Ownership Profile



(The International Institute for Sustainable Development, 2013)

Source: Crisil (2010) as reported in The Impacts of India's Diesel Price Reforms on the Trucking Industry, June 2013 accessed from https://www.iisd.org/gsi/sites/defaults/files/ffs_india_irade_trucking.pdf on 15.12.2015

Industry Structure



(Developed by the author)

Government Policy and Regulation

- Regulatory check points, even though reducing after introduction of GST (Goods and Service Tax).
- Motor Transport Workers Act (duty hours, rest requirements etc.)
- Financing incentives for small sized truck owners
- Motor Vehicles Act (driver licensing, over loading, emission norms etc.)
- Front line regulatory functionaries compromise on policy implementation.

Core Attributes and Externalities

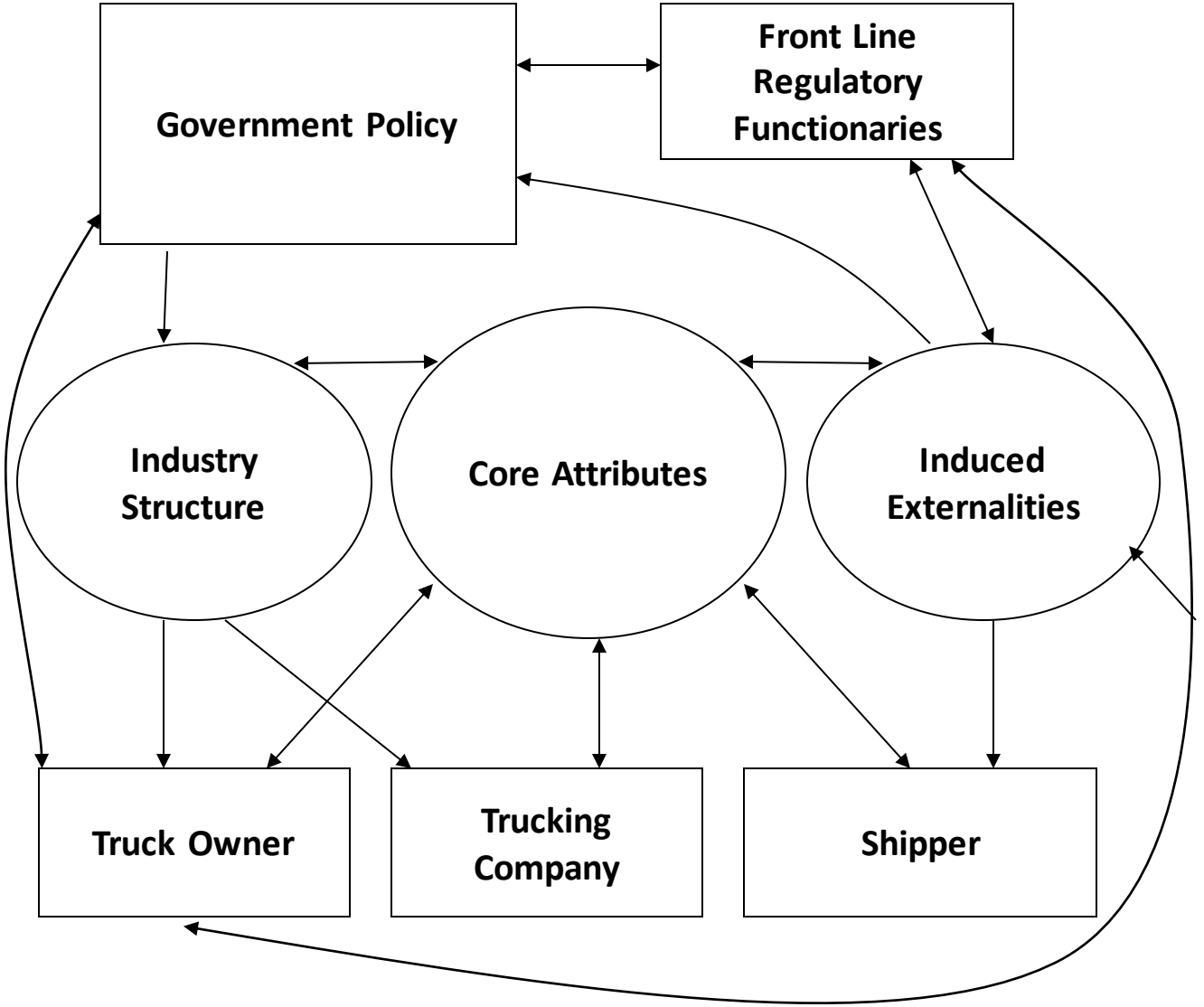
- Price based competition
- Low transportation cost
- Poor logistics service quality
- No commercial entry barrier
- Induced externalities:
  - Safety
  - Pollution
  - Damage to roads

Truck Owner
- Overloading of vehicles
- Poor truck maintenance
- Side payments

Trucking Company
- Hire on lowest rates
- No monitoring of supply side service quality

Shipper
- Focus on direct transportation cost only
- Reduced expectation from service provider

Unholy Equilibrium in the Road Transportation Sector



Source: Raghuram, G., & Shah, J. (2004)

- This leads to concerns which can be conceptualized into five S's.

'Five S' Framework
1. S = Safety.
2. S = Security.
3. S = Stresslessness.
4. S = Sustainability.
5. S = Speed.

Data Challenge

- To address the concerns, the first challenge one faces is that of reliable data.
- There is no data on Origin-Destination flows for the trucking sector and consequently, a reliable estimate of total tkms (even the earlier tkms modal share between rail and road is at best arrived at by a ‘guesstimate’ of road tkms using sample data and aggregate validation through surrogates like diesel and tyre consumption).
- A decadal sample survey has been carried out to assess road movement. The last available published data is of a survey carried out in 2007-08.

Total Transport System Study RITES, 2009

Mode	2007-08 (RITES)	
	BTKM	% Share
Road	**706**	**50.11**
Rail	508	36.06
Pipeline	105	7.45
Coastal	86	6.10
IWT	3.5	0.25
Airways	0.3	0.02
Total	**1408.8**	**100.0**

Source: Total Transport System Study(TTSS) by RITES Limited, as reported in NTDPC 2013

- In 2007-08:
  - Road share was about 50% of domestic tkm movement.
  - Between rail and road, the share was 42:58.
- Based on assessed growth rates linked with GDP growth, it was estimated that in 2016-17, the share would be 35:65.
- The National Transport Development Policy Committee (NTDPC) has tried to estimate the overall freight traffic until 2031-32, using a growth rate of 1.2 times the GDP growth rate. Further, an intervention to ensure a higher modal share in favour of rail has been considered.

Significance of Road Transport

- Based on this multiplier of 1.2:

Projection of Freight Traffic

Year	GDP growth (%)	(btkm)	Rail:Road share	**Road (btkm)**
2011-12	-	2053	-	**1028**
2016-17	6.9	3056	35:65	**1986**
2021-22	8.0	4834	39:61	**2949**
2026-27	8.5	7856	45:55	**4321**
2031-32	9.0	13118	50:50	**6559**

Source: NTDPC.(2014).India Transport Report. Routledge. Retrieved 15.12.2015, from http://planningcommission.nic.in/reports/genrep?NTDPC_Vol_01.pdf

- It is now expected that the:
  - GDP growth rate
  - Multiplier
  - Expectation of a higher rail share

  are all over estimates.
- While the first two would cause a reduction in the expected road movement, the third would cause an increase.
- This leads to a set of challenges to enable the road movement.

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  - **Warehousing**
  - **Driver**
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Classification of Roads

Road Network	July 2015 Total Length Completed (km)	Share (%)	March 2017 Total Length Completed (km)	Share (%)
National Highways	100,475	1.92	114,158	1.94
State Highways	147,868	2.83	175,036	2.97
Other PWD Roads/ District Roads	1,066,747	20.39	586,181	9.94
Rural Roads	3,159,639	60.39	4,166,916	70.65
Urban Roads	446,238	8.53	526,483	8.93
Project Roads	310,955	5.94	328,897	5.58
Total	**5,231,922**	**100**	**5,897,671**	**100**

Source: Basic Road Statistics of India,2016-17, Ministry of Road Transport and Highways (MoRTH), GoI and Crisil Report April 2016, NHAI, India Infrastructure Research 2016, accessed on October 27, 2020

Categorization of National Highways

Lane wise	Kms as on 31st March 2017	% share
Less than two	28,901	25.3
Two	58,910	51.6
Four and above	26,347	23.1
Total	**114,158**	**100**

Source: Basic Road Statistics of India,2016-17, Ministry of Road Transport and Highways (MoRTH), GoI and Crisil Report April 2016, NHAI, India Infrastructure Research 2016, accessed on October 27, 2020

- Second largest in the world (USA has 6.6 million kms).
- Road density is 1.8 km/sq.km – compares favourably with developed countries.
- Road density is 4.87 km/1000 population – does not compare favourably.
- 40% of the ton kms move on national highways (1.94%): **Opportunity**
- **PPPs have a become a significant source for developing national highways and major state highways, including some as expressways.**
- There is a big thrust on increasing the share of all weather rural roads.
- The road development is expected to have a positive impact on speed and safety. The average kms per truck per day (kmpd) on long haul movements is estimated to have increased from 275 kmpd to 375 kmpd over the decade. Some trucking companies also claim to have crossed an average of 500 kmpd.

Number of Registered Vehicles in India by Category

In '000

Year (as on March 31)	All vehicles	Two-wheelers	Cars, Jeeps and Taxis	Buses	Goods vehicles	Others
2011	**141,866**	101,865	19,231	1,604	**7,064**	12,102
2012	**159,491**	115,419	21,568	1,677	**7,658**	13,169
2013	**176,044**	127,830	24,056	1,814	**8,307**	14,037
2014	**190,704**	139,410	25,998	1,887	**8,698**	14,712
2015	**210,023**	154,298	28,611	1,971	**9,334**	15,799
2016	**230,031**	168,975	30,242	1,757	**10,516**	18,541
2017	**253,311**	187,091	33,688	1,864	**12,257**	18,411
CAGR 2007-17	**10.11**	**10.47**	**10.29**	**3.28**	**9.12**	**8.09**

Source: Road Transport Year Book 2016-17: https://morth.nic.in/sites/default/files/Road%20Transport%20Year%20Book%202016-17.pdf page 43 accessed on 27.10.2020.

Break up of Goods Vehicles as of 31st March 2017

Type	Number (000's)	Commercial (000's)	% of base fleet	Permit
Multiaxled/Articulated	1018	308	30.3	State (SP)
		191	18.8	National (NP)
Sub total		499	49.0	
Trucks (lorries & tankers)	4345	1995	45.9	Lorries SP
		849	19.5	Lorries NP
		237	5.5	Tankers SP
		136	3.1	Tankers NP
Sub total of trucks		3217	74.0	
LMV four wheelers	3657	1985	28.8	LMV
LMV three wheelers	3237			
Total	**12,257**	**5701**	**46.5**	

Source: Road Transport Year Book 2016-17: https://morth.nic.in/sites/default/files/Road%20Transport%20Year%20Book%202016-17.pdf page 44-45 accessed on 27.10.2020.

- Only 46.5% of the total goods fleet are used commercially in a third party sense.
- Commercial use of LMV segment fleet is only 29%.
- To the extent national permit is required for cross country movement, only 20% of the commercially plying vehicles have national permit. This further accounts for only 9% of the total goods vehicles.

- Share of heavy axle vehicles is going up, as also LMVs.
- Better truck design targeted at:
  - Sensors for vehicle (most fleet owners would know the location of their trucks on a real time basis) and goods tracking.
  - Driver comfort
  - Fuel efficiency
  - Reduction of emissions
- This is expected to improve security, stresslessness and sustainability.

Warehousing

- Modern warehousing through PPPs:
  - Agriculture
  - E-commerce
  - ICDs (Inland Container Depots) and CFSs (Container Freight Stations)
  - Multimodal Logistics Parks
- This is likely to reduce the overall road freight movement, and within road freight, increase the multiaxle and LMV movements.

Driver

- Culturally not viewed as a self respecting profession.
- Availability is an issue. Increasingly, trucks idle for want of a driver.
- Change of driver vs same driver on long haul routes:
  - Experiments on change of driver have not penetrated the larger road freight ecosystems.
  - Even in time definite cargo movement, the two driver model is more prevalent than change of driver.
- While there is “talk” of improving facilities for drivers on long haul routes, both, the expectations and services are not upto the mark.

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Conclusion

- The outlook for road freight to be an economically sustainable mode is positive.
- The same, however, cannot be said on environmental considerations. If policies are right and implemented well, rail share can start increasing, though it cannot become the primary freight mode.
- There is significant room to improve service parameters for road freight movement. Scale of fleet ownership to reduce the fragmentation, branded play and developing niche markets would be the way to go.
- Some policy and cultural changes remain to be effected.

Thank You