Towards a Sustainable Logistics Network in India – Why Road and Rail need to grow together?

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Plan for Today

- Sustainability in Transport
- Share of various transport modes – Current, 2020 projected
- 2020 Transport Scenarios & Sustainability
- Towards “Greener” Logistics Network in India – Impact of future sustainable transport network in 2020

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Sustainability in Transport

- Sustainability becoming prominent globally due to increasing:
  - Green House Gases (Carbon) Emissions
  - Fuel Consumption , esp. fossil fuels
  - Road Accidents – Huge costs to economy
  - Land Consumption – Need to optimize on land
- Huge external costs need to be taken into account to optimize logistics network

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Greenhouse Gases Emissions

- India (2007): 1728 Million Tons of CO2 equivalents
- Transport – 142 Million Tons (7.5%), up from 6.0% in 1994
- Road = 123 Million Tons (87%)
- Rail = 6.8 Million Tons (4.8%)
- Air = 10.2 Million Tons (7.1%)
- Water = 1.43 Million Tons (1%)
- ***Source – MOEF (INCCA 2010 Study – India: GHG Emissions 2007***

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Freight – Throughput

- Freight Total (All Modes) = 1409 Billion NTKMS, 2.6 Billion Orig. Tons
  - 3450 Billion NTKM (2020)
- Road = 706 Billion NTKMS (50%), 1558 Million Tons (61%)
  - up from 11% in 1951, 34% in 1979 and 46% in 1987
- Rail = 508 Billion NTKMS (36%), 768 Million Tons (30%)
  - down from 89% in 1951, 65% in 1979 and 53% in 1987
- Coastal Shipping + IWT = 89 Billion NTKMS (6%)
- Pipelines = 105 Billion NTKMS (7.5%)
- **Source: RITES, Mckinsey**

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Passenger Throughput; Share

- Road = 4251 Billion Passenger KMS (87%)
  - up from 64% in 1971
- Rail = 615 Billion Passenger KMS (12%)
  - down from 36% in 1971
- Road Share = Freight + Passenger = (50%+87%)/2 = 68%
- Rail = Freight + Passenger Share = (36%+12%)/2 = 24%
- Rail overall share is 24%, but GHG emissions is only 4.8%
- If Rail share is doubled (24% to 48%), huge reduction in GHG emissions = Sustainable Transportation in India

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Fuel Consumption

- Transport - 60% of 3420 million tons of oil equiv. globally
- Road – 76%; Air – 12%; Marine – 10%; Rail – 1.7%
- India: 120 Million Tons – 76% Import, Transport ~ 40 MT
- Freight: (Mega Joules/NTKM): Rail = 0.06; Road = 0.30 (5X)
- Passenger: (MJ/PassKM): Rail = 0.18; Bus = 0.23; Car = 0.36

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Accidents

- “Road Accidents cost Rs. 1 Lakh Crore per year – 1.5% of GDP”
  - Planning Commission
- Road Accidents (2010) – Deaths 1.6 lakh; Injured 5.5 lakh – Highest in the world
- Rail Accidents, in comparison, are far less
- Better designing of roads, driver education may halt the rapid increase in road accident deaths and injuries
- **However, such measures may not result in rapid decrease in loss of lives and injuries – need for redesigning logistics network**…

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Land Consumption & Cost

- 4-Lane Road
  - Land Width = 21 meters (3.5* 4 + 2 + 2.5*2)
  - Throughput 60,000 PCU's (20,000 Trucks per day) = 200,000 tons per day
- Double track Rail
  - Land Width = 15 meters (6 + 2*4.5)
  - Throughput 120 trains per day = 300,000 tons per day
- Throughput capacity of double-track rail corridor is 1.5X the capacity of 4-lane highway while land consumption is 30% less.
- **Thus, throughput capacity of Double track Rail Corridor = 8 Lane Highway (35 m), which consumes double the land**

- Cost: Capital Cost of 8 Lane Highway = Minimum Rs. 18 Crore per KM = Capital Cost of Double Rail Track with Electrification

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Road Increasing, Rail Lagging

- "Worrying trend – Freight rail share (Ton-Km) may go down to 25% if rail capacity does not grow" - Mckinsey
- Result = Increased GHG's, oil consumption, land consumption
- Rail is best for long lead , heavy haul while road best for short-haul, door-to-door movement
- Traffic which should go on rail or road-rail-road, flows purely on road – increased congestion in inter-city and intra-city travel
- **Road and Rail need to partner for best and most sustainable logistics network** – Road alone cannot take the burden of future traffic growth and is leading to unsustainable logistics network in India

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Sustainability – 2020 Scenarios

- 2020 Transport Demand: Freight = 3450 Billion NTKM; Passenger = Billion PassKM

- Scenario 1: 2020
  - Transport GHG emissions = 246 million tons of CO2 equiv
  - Fuel Consumption = 70 Million Tons of oil equivalent
  - Accidents Costs – 1.5% of 2020 GDP
  - Land Consumption – 1.31 lakh Acres
- Scenario 2: 2020 – Sustainable Logistics Network
  - Transport GHG Emissions = 165 million tons of CO2 equiv.
  - Fuel Consumption: 47 million tons of oil equiv.
  - Accident Costs – lower than 1.5% of 2020 GDP
  - Land Consumption – 64583 Acres

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Sustainable Logistics in 2020

- Create an intermodal logistics network both for freight and passenger for both inter-city and intra-city transport and storage
- India needs 8 more Electrified DFC's quickly with intermodal terminals at every 100-150 Km. where Rail/Road/Air/Sea linkages are established with required storage built-in.
- India needs "High Average Speed" dedicated rail corridors that run trains at 150-200 kmph for 500 Km/4 hour connection for day commute and overnight travel between metro cities.
- Government to enhance sustainable network and Industry to adopt quickly sustainable, green logistics – Marco Polo program in Europe

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2020: Impact of Sustainable Logistics Network

- Green House Gases Emissions **– 80 million tons of CO2 equivalent less per year – Greener India**
- Fossil Fuel Consumption – **23 million tons of oil equivalent less per year– over 50% of current transport oil consumption!!**
- Land Consumption – **64583 Acres of Land saved, can be used in agriculture etc.**
- Accidents: **Deaths and injuries reduced by shifting traffic to rail**
- **Reduced congestion on roads in both inter-city and intra-city travel**

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Thanks

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