RIVIGO

REIMAGINING GOODS MOBILITY IN INDIA

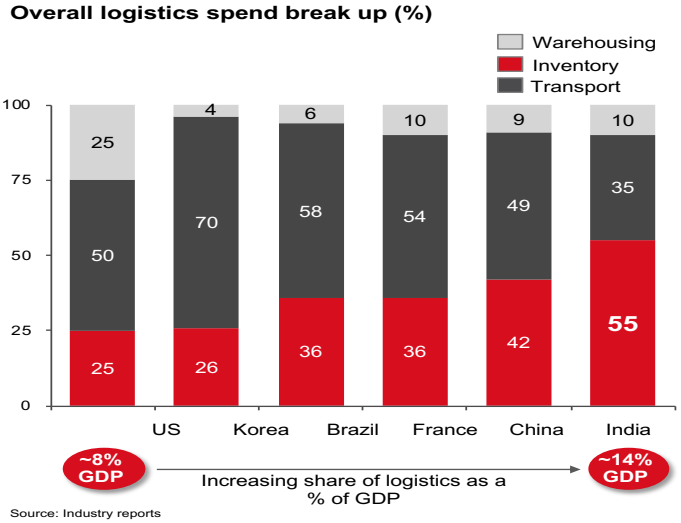
I. Logistics is the largest mobility sector, contributing to 14% of India's GDP and ~10% of the world GDP

Logistics is one of the largest contributors to the national GDP with a total spend base of USD 350 bn in FY 2018. It is one of the largest job creators and the backbone of the Indian economy.

As per industry reports it is expected to grow at a CAGR of 13 % over the next 3 years. This growth in logistics is being driven by economic growth and benefits from GST implementation; enabled by investments in logistics infrastructure.

Yet logistics in India continues to be highly cost inefficient as compared to the developed economies of the world (~8% of the GDP) mainly due to:

- Higher inventory and warehousing costs which is a result of the layered distribution structure in supply chain. GST has created an enabling environment for the industry to move to leaner supply chain networks.
- The sector has remained highly unorganized till date. In the last few years the share of organized logistics has been growing, led by service demand of the new user (in e-commerce, cold chain, 3PL warehousing) and technology led ease of large operations management. This outsourcing of non-core activities like warehousing and associated activities to integrated players is leading to strengthening of the organized players, a trend that will bring efficiencies and reduce overall cost of logistics.



We should aim to bring down the cost of logistics through the right and timely investments in technology and an enabling policy environment. This would help boost the overall competitiveness of this sector and ensure future growth.

II. Core problems in the goods mobility space in India

- **A chronic shortage of truck drivers which is aggravating with each passing day**
  Over the decades there has been a rapid decline in the availability of truck drivers in India. There is a 46% shortage of truck drivers today i.e. for every 1000 trucks the number of drivers available is only 540[1]. Overall economic losses due to driver shortage resulting in trucks lying idle is estimated to be USD 63 billion annually.

[1] Article 'The case of the vanishing drivers' published on May 22, 2016, Business World

This supply demand gap has put pressure on the logistics companies. Every transporter or a logistics company cites recruitment and retention of truck drivers as the biggest growth inhibitor for them. This has been also being highlighted in the draft National Logistics Policy council in their latest report[2].

India requires more than a million truck drivers every year for logistics sector to keep up with the economic growth. This is the second largest skill gap in the country after construction workers and 10% of the overall employment agenda in the country.

Conventional wisdom has led to the creation of a large number of driver training institutes and incentivisation of corporates and OEM's to skill truck drivers. This has failed to solve the problem of shortage in supply of drivers. This is because the root of the problem lies deeper.

- **Poor lifestyle:** A truck driver on an average spends 25 days in a month away from his family and that too in severe conditions. Many get HIV+ or start substance abuse as a result of this lifestyle. Average life span of truck drivers is lesser than an average Indian by 10 years due to multiple health disorders. Truck driving features in the list of 10 worst jobs in the country today.

- **Lack of respect and dignity:** A large percentage of them don't get married. They lose social respect, leading to them being called the "37th caste" in the Indian village.

- **High risk:** 20% of all fatalities on Indian roads in 2014 were those of truck drivers. There is a 10x higher fatality rate in India amongst truck drivers as compared to US and other developed countries. This is mainly due to having to drive under fatigued conditions – long driving hours, inhospitable working conditions and lack of sleep.

Therefore, the problem is not in truck driver's income or skill gaps, but the problem is deep rooted in his terrible lifestyle away from his family leading to social disrespect, stigma and a risk perception of the job which makes their families push them to quit their job.

The increasing shortage of truck drivers is alarming and a threat to the logistics sector as it could wipe off the benefits which GST promises to bring.

- **Lack of usage of technology and data science leading to inefficient planning, collect and management.**
  Logistics sector generates a huge amount of data on a continuous basis but fails to leverage from such data for solving for the complex logistics management and transportation networks. This leads to inefficiency and non-reliability.

  There is a lack of use of technology or advanced systems backed by A.I. to collect and evaluate data in this sector which leads to inefficiency and non-reliability. For e.g. there is no common database available which indicates the road freight live rates and the historical trends of spot price movements in the industry. There are no systems to track the long queue of the unloading lines of the warehousing industry. As a result, there are a minimum 2 levels of intermediation which can go upto 3-4 with sub-agents/brokers involved. People in the local markets who have better pricing information become intermediaries and agents leading to sometimes several layers of intermediation in a transaction. A lot of time and energy is wasted in getting the price information resulting in the focus on the quality of service being reduced.

[2] Draft National Logistics Policy, published on February 5, 2019

If this data is analysed, ready-made solutions to the challenges faced by the trucking industry can be provided such as optimized operations, improved pricing, identification of new revenue streams and increased safety of vehicle/goods/drivers.

- **Antiquated policy environment and poor compliance standards**
  The legislation governing this sector are either historic or have management practices which are age-old. For instance, safety laws do exist, but their implementation and enforcement is very problematic.

  The reforms which have come up in the commercial world needs a framework of policy which supports or governs the new changes, particularly in the e-commerce and technology sector.

  We have outdated regulations which are not catering to the technology based or A.I. supported transactions, such as regulations for governing the e-wallet transactions, regulations for digital documents etc. Department are not being upgraded and no trainings are provided to enhance the skills of officials deployed in the government. Technology in terms of use of sophisticated computers for information or communication is conspicuous by its absence.

  The government has taken numerous policy and legislative initiatives to support. the logistics sector:
  - Setting up a logistics division in the Ministry of Commerce.
  - Introduction of GST and e-way bill.
  - Granting infrastructure status to logistics industry.

  There is still a long way for policy and regulations to catch up with the technological advancements in the sector. Policy reforms are needed under commercial laws, regulatory sector, enforcement of technology laws. All these issues need to be addressed to enable technological solutions to the challenges facing the logistics sector.

III. India should aspire to lead goods mobility revolution and leap from rank 46 in Logistics Performance Index to top 5 nations in the world in the next 10 years

India has been able to demonstrate a significant improvement in Logistics Performance Index (LPI) in the last two years - our ranking has moved up from 54 in 2014 to 35 in 2016[3].

We must continue this upward trajectory and aspire to be amongst the top 5 nations in logistics in the world. This leap will require us to focus and implement solutions along 5 priority areas which will have the largest impact and where we are lagging currently:

- **Seamless movement of freight:** To achieve this we need a) simplification and automation of regulatory processes, and b) integration amongst the various government departments providing speedy clearances to reduce the waiting hours. This would help prevent multiple enroute checks and inspection of goods by different agencies, which leads to inefficiencies in transit. A certification by one agency can be done and made available live to other agencies for their verification.
- **Reliability in logistics through technology adoption and automation:** To ensure faster, reliable delivery of goods we need the ability to track and trace consignments live and this can be brought by having mandatory track and trace facility for each and every freight under movement. This is possible if each and every vehicle is equipped with sensors for location tracking.
- **Move existing paper systems digital platforms**: Highly critical to achieve the objective of efficiency and seamless freight movement. With E-waybill we have started the journey of

[3] Deloitte Report – Logistics ease across different states

paperless supply chains and same should be extended to e-POD (electronic - Proof of delivery) immediately to unblock the credit trapped due to non-availability of POD instantly.

- **Availability of trained manpower (truck drivers, loaders)**: Making their life human by giving them clean and maintained facilities in transit and at warehouses; making truck driving a viable job by bringing dignity to the profession and integrating truck drivers back into the society.
- **Compliance with safety standards**: Government should also bring mandatory norms to bring the reforms targeting high driver comfort and safety in the long haul trucking equipment. Make installation of advanced driver assistance systems and safety sensors mandatory in the vehicles.

India should lead the logistics revolution to make goods transportation faster, digital, safer and human over the next decade.

IV. Re-imagining the goods mobility space in India through process innovation, deep technology and enabling policy framework

There are currently four ongoing trends in the logistics space which are creating the perfect backdrop to re-imagine the goods mobility space in India:

- **Fast changing end customer preferences**: The new age Indian consumer is digital, wants everything and wants now. This end customer demand for large number of SKUs and faster fulfillment is fueling the demand for logistics ecosystem that enables full transparency/visibility, speed and lower inventory.
- **GST as a paradigm shift**: Perfect opportunity for companies in India to step back and relook at their supply chain distribution networks and fundamentally redesign them for efficiency, effectiveness and experience.
- **Data penetration across the length and breadth of the country**: Logistics footprint covers the entire nation – warehouses in tier II, III cities; truck drivers who come from rural population. In the last 2-3 years they have got an unprecedented access to data.
- **Exponential increase in the applications of IoT**: Availability of low cost sensors, combined with low cost and high speed data has allowed us to measure and track all equipment data, GPS, Tyre, engine parameters, temperature parameters and safety. This has led to creation of unique and massive data sets which can be used for solving complex problems in the sector through AI/ML and predictive modeling.

Presented with this need and opportunity, logistics sector must take a leap ahead with process innovation, deep technology and an enabling policy framework.

- **Emerging Game changing process innovations are:**
  - **Relay trucking**

    The solution to curb the unprecedented shortage of truck drivers in India is clear - to make truck driving a regular day job using Relay Trucking.

    Relay Trucking is an operating model innovation where drivers change over after every few hundreds kilometres of driving through a network of change over stops “Relay pit-stops” and then get rostered back to their home base to return to their families every single day. The ‘relay pit-stops’ can be equipped with facilities like canteens, recreation rooms, basic medical dispensary, resting room, vehicle check-up points, sale points for vehicle insurance, tyres, various vehicle related gadgets etc. This would multiply the benefits from this model.[4]

    The model also provides an opportunity for adoption of technology to ensure swift shift changeovers, fuel and mileage management, safety for pilots/drivers, improvised utilisation

[4] Introduced by Rivigo in 2014, currently operates 3000 trucks through this model. Has changed the lives of 10000 truck drivers through this journey

of capacity, etc. Relay pilots (drivers) use relay pilot app on their smart phones to seamlessly track his upcoming trips, vehicle details, travel reports, QR codes for trips, details of the handover driver, among other things. Technology (through this app) becomes integral to their everyday life.

Technology led Relay Trucking is the only scalable and sustainable way to solve for chronic truck driver shortage. It is safer, more efficient and human. By bringing each truck driver home every day it integrates them back into their communities, enabling them to lead meaningful lives.

- **Zero base warehousing**
  Warehousing networks are highly consolidated globally. Post GST, companies are beginning to question the need for warehousing. The more the warehouses in a supply chain network, the more the inventory required to be maintained at various nodes. Therefore, supply chain networks must be designed to as few warehouses as possible basis value density of the goods being shipped and desired customer service levels**.** The higher the value density the more consolidated the warehousing network should be to avoid high working capital and inventory costs. A high value density item such as laptop (Rs. 21,000/kg) should ideally operate from a single national distribution center or direct plant fulfillment, whereas commodities like construction materials (value density of Rs. 25/kg) can have multiple state warehouses.

  The move to zero warehousing companies would need fast, reliable logistics partners enabled through technology as the backbone so that high customer service levels are maintained as companies consolidate warehouse networks. Need for 'rapid transit times' in transportation will increase. Innovative tech based solutions and improved logistics infra will drive transit time reduction and 50% lower transit times will become the new norm.

  As per our estimate, zero base warehousing can help unlock ~ 200 bn USD of capital blocked in inventory from supply chains, which can be pumped back into the economy for growth.

- **Pull based supply chains**
  Traditional companies have started adopting pull based order to fulfilment processes which is bringing change in the supply chain design. It is based more on actual current customer orders (dynamic due to changing customer preferences) and less on forecasts or traditional predictions which are made from historical sales data.

  The "pull based approach" has minimized warehouse inventory, improved efficiency, enhanced visibility and responsiveness of the supply chain industry. Pull based supply chains have higher service levels and lower carrying costs, decreased inventory levels and fewer markdowns.

  Such a breakthrough in supply chains was only possible by embracing IoT in day to day supply chain operations – warehouse automation, live visibility, track and trace. New cloud based technologies have helped companies schedule key production programs, optimize the unloading of containers and manage inventory in a better and efficient manner. These technologies have even provided systematic mechanism to maintain stocks in the right quantities in the right condition and at the right time.

  The government must recognize and incentivize these business process innovations.

- **Advanced trucks e.g. Tractor-trailer led efficiencies**
  OEMs need to bring in the advanced tractors and a separate trailer which can be attached and detached at the designated terminals.

With 'Relay Trucking' drivers may be empowered to be able to swap the trailer at the meeting point then turn around and head to their home city terminals with the new trailer attached to the tractor. The trailer moves towards its final destination through these tractor swaps at various terminals.

Adopting such 'advanced trucks', new advanced warehouse management systems, efficiency would increase as there will be reduction of the empty haul back trips and waiting hours for unloading / loading at the warehouses. This will also empower single fleet owners or truck drivers to become a fleet owner. To achieve this, amendments in the policy framework would be needed to bring easiness to change the consignment note, e-way bill and partial delivery receipt.

- **Deep technology through data science and AI**
  - **Smart trucking – fuel, safety, route optimization, rostering, platooning**

    Smart trucking includes the use of IoT sensors in the truck to help capture data of truck running and its various parts. This data once measured can be analysed using data science and AI based predictive modelling to reduce costs or improve efficiencies. In addition, deep backend technology systems can drive optimization of costs, reduction in transit times. Some Smart trucking solutions which a have high impact are:
    - Trucks equipped with 'fuel monitoring system' designed for precision fuel level measurement. These systems as a part of telematics system are used to obtain the reliable information about current fuel volume in vehicle tank, define the vehicle fuelling volume, detect the fuel theft from the tank and determine the fuel consumption. When mapped to the driver driving data, these systems can also help guide personalized insights for driver to nudge driving behaviour change for better mileage. Fuel monitoring systems alone can help drive 20-25% better mileage. At a macro level, fuel monitoring systems can potentially help reduce one fifth of India's fuel consumption towards mobility thereby reducing our import bill and a cleaner environment!
    - Intact advanced driver-assistance systems (ADAS). ADAS assists in monitoring, warning, braking, and steering tasks. This also enhances safety for the driver and the vehicle. Government needs to mandate that all vehicles (old and new) be equipped with autonomous emergency-braking systems and forward-collision warning systems.
    - Adoption of route optimisation software which creates efficient routes from the given orders, creates and assigns routes to the trucks in a single step and assist in optimising the fleet utilization.
    - Auto-rostering systems which monitor driving hours of truck drivers and roster work orders / driving duties based on driving hours and mandatory rest requirement.
    - Truck platooning holds great potential to make road transport safer, cleaner and more efficient in the future. It lowers fuel consumption and CO2 emissions and given that trucks can drive closer together; the air-drag friction is reduced significantly. This would bring more safety and cost efficient structure.

  - **India data stack for goods mobility (national freight index/exchange)**

    There is a need for an all-inclusive indicator of the road freight which could offer live rates and historical trends of spot price movements in the road freight industry. Such index shall act as digitized platform to integrate supply chain right from the demand forecasting to load consolidation, truck routing, dispatch scheduling and eventually reducing the delivery time and costs. To have such a digital platform it is important to centralize the entire data nationwide.

With the centralization of data, demand forecasting through big data, digitization of distribution network and warehouse processes can be made effective. These platforms via such design digitization and comprehensive indicators shall bring price transparency to platform users.

- **Using data science in every step of supply chains**
  Data science can assist in solving problems across the entire supply chain. This requires collecting data through use of IoT sensors in machinery/equipment and products (e.g. truck driver app) for capturing usage data. These datasets can be used to solve problems in supply chain and help drive marginal efficiencies. Specifically, this can be used for delivery path optimization - also known as shortest path or traveling salesmen problem, basically to find the most cost-effective routes for fleets; dynamic price matching of supply to demand in real time; warehouse optimization- estimating total delivery time from warehouse to customer.

  Data model and train algorithms on all the known cases but also unknown cases (events that have never happened before) can be built.

- **Enabling policy framework**
  - **Making logistics human**
    As mentioned earlier there is an increasing dearth of truck drivers resulting from a poor lifestyle and social stigma. Relay model solves this problem by changing the driver's job from an "away from home" job to a "day job". Following Initiatives should be taken to encourage this model:
      - Build infrastructure for changeover stops equipped with all amenities;
      - Removing regulatory hurdles from the operation and integration of truck – trailer model with relay driving;
      - Launch financial schemes to enable truck drivers to become truck owners.

    The existing legislations – Motor Vehicle Act 1988, Central Motor Vehicle Rules and Motor Transporter Workers Act 1961, do provide with the provision of minimum hours of working, facilities for the drivers, safety of vehicles and yet the problem exists in relation to the availment of these benefits.

    The policy makers should focus on bringing quality and regulatory norms rather than focus only on 'quantity and revenue generation'. Main focus should be on:
      - Training facilities for truck drivers;
      - Inclusion of drivers in insurance schemes and health benefits;
      - Utilisation and integration of technology/ A.I. with "relay-trucking" model;
      - Introduction of technology to ensure driver hours are logged properly and measured;
      - Bringing ADAS and safety sensors in the vehicles and making installation of these sensors mandatory.

    Reference to foreign legislations such as ELD, implemented successfully last year in America by Federal Motor Carrier Safety Administration; and Pilot Flying J pit stops in the US.

  - **Reforms to bring uniformity in maintaining loading/unloading lanes for all Warehouses.**
    As on date, a lot of time is wasted while waiting for the loading of goods in the vehicles, at premises both covered or not under the ambit of Warehousing (Development & Regulation) Act, 2007 (37-2007). Infrastructure of warehouses lack in:
      - Warehouse management systems to track the loads, predict deliveries, and optimize routes to ensure that waits at the dock are kept to a minimum;
      - Lack of provision of monitoring the maintenance of "standard lane structuring";
      - Lack of facilities for the drivers and labourers.

To solve this, the existing Warehousing (Development & Regulation) Act, 2007 (37-2007) ("WRDA") be amended so that all storage houses, godowns, and warehouses fall under the ambit of WRDA. Regulations under WRDA be strengthened to provide for efficient warehouse management systems, detention charges/ penalty for the excessive detention of vehicles, checks and controls so that the facilities for drivers and labourers are kept maintained.

- **RTO / Municipal Council/ Police Check-posts.**
  Various organizations like Asian Institute of Transport Development (AITD) have conducted field surveys on road transport, focusing on the challenges faced by the transporters, drivers during the trip. The topmost challenge which has come out of such studies is the harassment faced by the drivers while they stop at multiple RTO/ check posts which further leads to long waiting hours, over speeding by drivers in order to cover up the waiting time, etc.[5].

  One of the initiatives by the government has helped in overcoming this challenge partially, by introducing GST. However, similar reforms should be introduced to remove R.T.O. and municipal council entry check posts. This will bring down the transit time and help in eliminating the harassment of drivers and the transporters.

  Reforms in the legislation can be introduced such as introduction of IDs in the start of a trip which would act as receipt of all applicable taxes and tolls for the trip; confirmation on the vehicle quality i.e. valid and effective pollution certificate, fitness certificate, insurance certificate; confirmation on the registration of the vehicle; confirmation on the driver's valid and effective DL; GPS device to track and trace the driver and the vehicle.

- **Making logistics digital**
  Make track and trace mandatory (GPS, safety sensors)
  All vehicles should be equipped with sensors for location tracking, engine monitoring to ensure safety and security. Vide Vehicle Location Tracking Device and Panic Buttons, notification dated October 31, 2018 Government has made it mandatory for new vehicles, but no timelines have been given for the vehicles registered before 31st December 2018. This should be mandatory for all.

  Electronic documentation (e-POD)
  The introduction of trip IDs and digitisation of documents has already been dealt with earlier. Besides these a huge amount of unpaid cash is locked up due to delay in the submission of POD hard copy. E- POD should be introduced and its acceptance mandated for cashless settlement of dues.

  Freight marketplace
  Trucking industry has no pricing transparency and there is a high level of intermediation as explained in the paper above and this leads to inefficient operations leading to poor truck economics

  There are rare platforms which provide an end to end solution. The existing legislation also does not support functioning of such platforms. An AI led algorithmic platform or a 'Freight Marketplace' platform (via website or mobile app) can easily overcome the existing challenges and provide multiple benefits, such as:
  - Improved capacity utilisation - entire supply available and visible on digital platforms;
  - Competitive pricing – Multiple suppliers compete for orders in a transparent manner;

[5] 'Road barriers to Inter-state trade and commerce – the case of road transport', published by Dr. Bibek Debroy and Dr. P.D. Kaushik,

- Increased digital transactions – Platforms accept only cashless transactions thus bringing in the logistics sector dominated by cash transactions into the banking system.

Freight marketplace also provides one-stop solution to single and multiple fleet owners, transporters by making services such as repairs, enroute-maintenance, Pit-stop, Facilities, Warehousing, Insurance industry, fuel stations, regularising permits/licenses, verifying documents, base for 'relay services' easily accessible to them.

This platform shall support consumers, service recipients, for services related to transparency in booking orders, tracking the vehicles, tracking warehouse temperature (if its cold storage requirement) and seedy custom clearances.

To encourage the usage of Freight Marketplaces, reforms are required under the existing legal framework. GST levied on the 'service/brokerage fee' for the transactions on marketplace should be exempted. This would bring the transactions on the marketplace at par with offline transactions wherein no GST is levied on services from one GTA to another.

Other regulatory hurdles in making the marketplace a single stop shop for businesses/ transporters and fleet owners should also be looked into.