Enhancing Visibility in the Indian Logistics Spot Market

A Path to Real-Time Tracking and Efficiency in Logistics

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1 Executive Summary

In India's dynamic logistics landscape, the spot market plays a crucial role in fulfilling on-demand transportation needs. However, achieving end-to-end vehicle visibility in this fragmented market presents significant challenges. Traditional tracking methods, such as phone calls, FASTag data, and SIM-based tracking, often fall short of providing the accuracy, reliability, and comprehensive insights required for efficient logistics operations.

This whitepaper explores the limitations of current tracking methods for spot market vehicles and highlights the benefits of a GPS-based tracking. Furthermore, in order to make GPS data more accessible to the spot market, we explore the potential of a data integration platform. The platform facilitates the discovery and connection to existing telematic devices in vehicles, thereby increasing widespread adoption of GPS data, which was previously limited to fleet owners. This ensures enhanced data quality, increased tracking frequency, improved ETA accuracy, and proactive violation detection for the market vehicles compared to existing tracking methods. By leveraging the access to GPS data via the data integration platform, logistics companies can optimize their operations, reduce costs, and improve customer satisfaction.

Bosch Mobility Platform and Solutions (MPS) is uniquely positioned to realize this integrated vision for logistics visibility with its Logistics Operating System (L.OS) platform. L.OS provides a unified, versatile, and trustworthy solution that integrates data from various sources, enabling real-time tracking and data-driven decision-making. Through strategic partnerships and a focus on data security and innovation, Bosch MPS aims to transform vehicle tracking in the Indian logistics industry.

This whitepaper also outlines Bosch MPS's strategy for building both the supply side (acquiring tracking data) and the demand side (increasing adoption from logistics companies) of the L.OS platform. By collaborating with fleet management solution (FMS) providers, aggregators, industry bodies, original equipment manufacturers (OEMs), visibility solution partners, and independent software vendors (ISVs), MPS aims to ensure the widespread adoption of L.OS and transform the way goods are transported and monitored in India.

Logistics companies seeking to enhance their vehicle visibility, optimize their operations, and gain a competitive edge in the market should consider the benefits of GPS-based tracking and the comprehensive solution offered by Bosch MPS and the L.OS platform.

2 Introduction

Logistics is a critical component of modern supply chains, encompassing the planning, implementation, and control of the flow and storage of raw materials, semi-finished goods, and finished products. Players in the industry strive to ensure that goods and related information move seamlessly from the point of delivery to the point of receipt, all in accordance with customer requirements.

A key aspect of logistics is **visibility**, which refers to the ability to track, monitor, and access detailed, real-time information about the status, location, and movement of goods as they traverse the supply chain from origin to destination. In this whitepaper, we will focus specifically on the visibility of trucks procured from the spot market in India, exploring how this system currently operates, the challenges it faces, and the opportunities that lie ahead.

India stands as one of the largest players in the global logistics landscape, with road transportation accounting for approximately 71% of the overall freight movement in the country as of 2024. This translates to around 4,200 billion ton-kilometers (BTKM) of freight transported by road. Within this framework, logistics operations are primarily conducted through two models: **contract logistics**, which involves long-term agreements between shippers and logistics providers, and **spot market logistics**, characterized by on-demand transportation where vehicles are hired for individual shipments based on real-time availability and pricing.

ⓘ According to a 2021 RedSeer report, the spot market accounts for a significant 63% of inter-city road logistics spending in India. However, the transportation industry in India is heavily fragmented, with a large percentage of fleet owners operating five or fewer vehicles. Many of these fleet owners rely on the spot market as their primary source of revenue, highlighting the importance of effective visibility in this sector.

3 Understanding the Spot Market

The spot market in India is a dynamic and crucial component of the country's road transportation network. It serves as a platform for on-demand transportation services, catering to immediate shipping needs with real-time pricing and vehicle availability.

To truly grasp the significance and the opportunities related to the market, we need to understand how it functions and who the key players are.

3.1 Shippers

Shippers are entities that require transportation of goods from one location to another. Due to the cost and operational complexities involved in managing transportation in-house, shippers often outsource this function to third-party logistics (3PL) and logistics service providers (LSPs).

3.2 Logistics Service Providers (LSPs)

LSPs come in various forms – asset-heavy, asset-light, or hybrid.

3.2.1 Asset-Heavy LSPs

These providers use their own fleet of vehicles to move goods based on shipper requirements.

3.2.2 Asset-Light LSPs

They do not own vehicles. Instead, they procure them from the market or through contracts with fleet owners.

3.2.3 Hybrid LSPs

As the name suggests, these LSPs combine both models, operating some of their own vehicles while also relying on market vehicles. A large proportion of transporters in India operate on this hybrid model.

3.3 Brokers

To source vehicles from the spot market, LSPs typically work with intermediaries known as brokers. Brokers maintain networks of fleet owners who own vehicles and operate them on specific routes or for specific types of goods. The broker is responsible for arranging loads for these vehicles and plays a crucial role in price negotiation. Given that transporters and fleet owners rarely deal directly with each other, brokers add a vital trust element to the process.

3.4 Fleet Owners

Fleet owners own and operate the vehicles. Their primary goal is simple: to maximize vehicle utilization while minimizing operational costs. In India, there are around 3.5 million truck operators running fleets consisting of around 12.5 million trucks. More than 75% of these operators run smaller fleets, consisting of 5 trucks or lesser.

4 How the Spot Market Operates

Shippers communicate their vehicle requirements to transporters daily. The transporters begin the planning process by assessing their own fleet inventory. Based on the availability of their vehicles, they determine the number of additional vehicles they need to procure from the spot market.

Brokers then gauge the demand and begin price negotiations accordingly. Once the price is agreed upon, vehicles are assigned to the transporters. The assigned vehicle is then contacted by the transporter for loading, and final documentation checks are completed before the trip commences.

This intricate process, characterized by numerous stakeholders and real-time coordination, highlights the need for effective visibility solutions in the spot market.

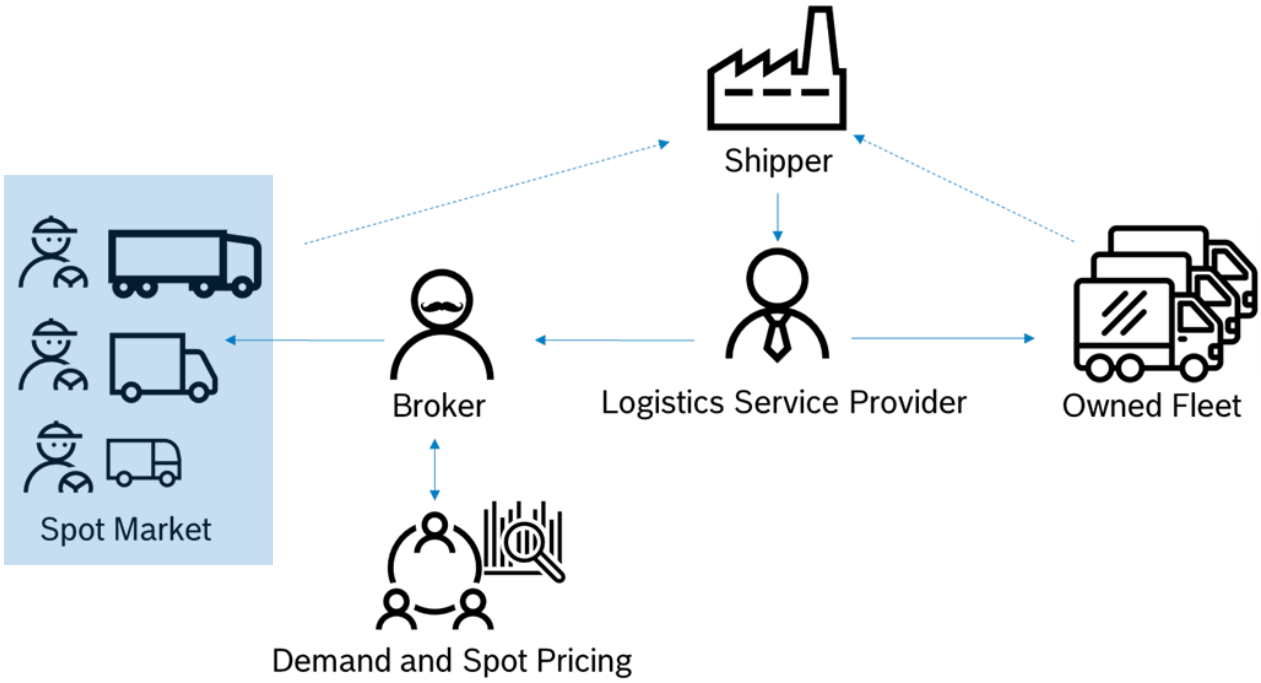

Figure 1
Representation of the Spot Market in Indian Logistics

5 The Challenge of Visibility in the Spot Market

The very nature of the spot market, with its on-demand vehicle procurement and reliance on numerous intermediaries, presents significant challenges to achieving end-to-end visibility. Once a vehicle is en route with its cargo, tracking its progress becomes a complex endeavor.

While the spot market ensures the *availability of vehicles* for immediate needs, it often lacks the structured, integrated systems that provide *seamless tracking* capabilities. This deficiency can lead to various operational and strategic issues for shippers, LSPs, and even fleet owners.

The absence of real-time, accurate visibility can result in:

- **Delays in Delivery**: Without precise tracking, it's difficult to anticipate and address potential delays, leading to missed delivery windows and customer dissatisfaction.
- **Increased Operational Costs**: Inefficient tracking methods, such as frequent phone calls and manual data entry, are resource intensive, increasing labor costs and reducing overall efficiency and accuracy.
- **Higher Risk of Theft and Loss**: Lack of visibility can increase the risk of cargo theft or loss, as it becomes more difficult to monitor the vehicle's location and status.
- **Difficulty in Performance Evaluation**: Without accurate data, it's challenging to evaluate the performance of individual vehicles, drivers, or routes, hindering continuous improvement efforts.
- **Reduced Customer Satisfaction**: Inability to provide customers with accurate updates on their shipments can lead to dissatisfaction and loss of business.

In the Indian spot market, vehicle tracking often relies on methods that are less than ideal, resulting in incomplete or unreliable information. These methods, while functional to some extent, fall short of delivering the comprehensive, real-time visibility needed for efficient logistics operations. In the next section, we will explore the current tracking methods used in the Indian spot market and their respective limitations.

6 Current Tracking Methods and Their Limitations

In the Indian spot market, despite the critical need for visibility, current tracking methods often fall short of providing comprehensive and reliable data. These methods range from fully manual processes to technology-assisted solutions, each with its own set of limitations.

6.1 Phone Calls

The most basic and common method involves contacting the driver periodically via phone to inquire about the vehicle's current location. The transporter then updates the shipper based on this information.

Limitations: This method is highly unreliable. If the driver is unreachable, uncooperative, or provides inaccurate information, the transporter is left without any means of knowing the vehicle's whereabouts. Furthermore, it's cumbersome and unreliable.

6.2 FASTag Data

Using FASTag data involves integrating with the FASTag system to retrieve toll-crossing information, which can be used to estimate the vehicle's location.

Limitations: This method is severely limited. Consequently, only a small percentage of transporters use FASTag-based tracking. FASTag-based tracking only provides updates when the vehicle passes through a toll booth, leaving large gaps in visibility for routes without many toll roads. The updates are infrequent since toll booths are far apart, and the data coming from the Unified Logistics Interface Platform (ULIP) server can be as irregular as *once every few hours*.

6.3 Portable GPS Trackers

Some transporters use portable GPS trackers, which are temporarily installed in spot-market vehicles and removed after the trip. These trackers provide more accurate location data compared to phone calls or FASTag data.

Limitations: While more accurate, this method is expensive due to the cost of the trackers themselves and the logistical challenges of retrieving them after each trip, making them operationally difficult to manage.

6.4 SIM-Based Tracking

SIM tracking is currently the most widely used method for tracking spot market vehicles in India. When a vehicle arrives at the loading point, the transporter collects the driver's mobile number and creates a trip in a tracking system. A consent request is sent to the driver, and once granted, the driver's SIM card is tracked for the duration of the trip. Location updates are typically available every 15 to 30 minutes.

Limitations: Despite its popularity, SIM tracking has several limitations:

- Tracking is impossible if the driver refuses consent.
- Tracking is lost if the phone is switched off, out of network, or if the driver changes mid-trip.
- Estimated times of arrival (ETAs) are not always accurate due to variable traffic conditions and other factors.
- Tracking becomes less reliable in urban areas with high network and movement density.

7 Optimizing Visibility with GPS Tracking

While SIM-based tracking and other methods provide a functional solution for vehicle tracking in the Indian spot market, they fall short of delivering the accuracy, reliability, and comprehensive insights needed for optimal logistics management. A superior solution lies in leveraging the tracking data from dedicated GPS trackers installed directly within vehicles.

GPS tracking offers several significant advantages over other conventional approaches:

- **Enhanced Data Quality:** GPS data is inherently more accurate and reliable than information derived from stop-gap methods. For instance, while GPS signals provide precise location information, SIM-based tracking relies on cell tower triangulation, which can be less accurate.
- **Increased Tracking Frequency:** GPS trackers offer more frequent updates, enabling near real-time visibility of vehicle movement. This allows for better monitoring of progress and quicker responses to unexpected events.
- **Improved ETA Prediction:** The higher accuracy and frequency of GPS data contribute to more precise ETAs. Accurate ETAs enable better planning and coordination, reducing delays and improving customer satisfaction.
- **Proactive Violation Detection:** Real-time tracking allows for the earlier identification and mitigation of potential violations, such as deviations from planned routes, unauthorized stops, or delays. This proactive approach helps in preventing losses and ensuring compliance.
- **Better Planning:** With accurate real-time tracking data, fleet owners and transporters can optimize their operations, improve resource allocation, and enhance overall efficiency. This leads to cost savings and better service delivery.

In summary, transitioning from traditional stopgap tracking solutions to GPS-based tracking represents a significant leap in visibility capabilities for the Indian logistics market. The enhanced data quality, increased tracking frequency, improved ETA accuracy, proactive violation detection, and better planning capabilities collectively contribute to a more efficient, reliable, and secure logistics operation.

8 Bosch L.OS: Realizing 100% Visibility With Technology

At Bosch MPS, we recognize the critical need for enhanced visibility in the Indian logistics sector. Our flagship platform, L.OS, is designed to realize the vision of tracking 100% of all goods vehicles in the country. Much like the government-backed Open Network for Digital Commerce (ONDC) platform which fosters an open and interoperable environment that allows seamless interactions between buyers, sellers, and service providers across different platforms and applications, L.OS aims to provide a similar experience for the logistics industry by providing a data integration platform for service providers and service consumers.

L.OS is a platform where different, often siloed, logistics solutions can be integrated to offer greater value to all stakeholders. It also features a marketplace where solution providers and consumers can come together to solve for use cases in the market, fostering collaboration and innovation.

8.1 Key Features and Capabilities of L.OS

- **Composable Design:** L.OS is highly composable by design, making it easily extensible to offer a unified interface for vehicle discovery and tracking. This modularity allows for seamless integration with various existing systems and data sources.
- **Solution Integrations:** L.OS is a horizontal integration layer for digital products in logistics to form value-added solutions. Several integrated solutions are already in production, including the discovery and booking of secure parking areas, load board aggregation, fleet health and asset tracking.
- **Industry Engagement:** To realize the vehicle tracking use case, the platform can leverage an extensive connect with industry players and aggregate services offered from various providers. These include fleet management systems (FMS), open Track-and-Trace aggregation platforms, and cloud-based transport exchange platforms offered by both vehicle OEMs and aftermarket independent software vendors (ISVs).

8.2 Benefits Offered by Bosch L.OS

- **Unified Experience:** Provides a unified interface over different transport layers, making it easy for any service to consume the vehicle discovery and tracking service
- **Versatility:** Utilizes service adapters to integrate with existing interfaces and protocols offered by different network participants, minimizing onboarding friction
- **Neutrality and Trust:** Ensures that all participants have equal representation on the marketplace, leaving the decision of which service provider to engage with the consumer
- **Privacy:** Ensures compliance with seamless consent management built into the workflows
- **Security:** Provides secure interactions hardened with industry-best security practices
- **Insights:** Being a cloud-based data hub, L.OS generates valuable insights for all participants, enabling data-driven decision-making

8.3 Stakeholder Benefits

Stakeholder	Benefits	Motivation
FMS Tracking Providers	**Technical Benefit:** ▪ Easy one-time integration that provides ready access to consuming services like TMS, ERP systems **Economic Benefit**: ▪ Additional sales channel for the FMS product ▪ Additional value-add for their customers by enriching FMS service with other value-added-services such as Route Planning, Vehicle Maintenance etc. ▪ Demand-Supply matching wherein the vehicle availability can be advertised for on-demand contracting via L.OS	▪ Enables product extension without conflict of market interests ▪ Boosts margins and customer retention
TMS providers	▪ Customer satisfaction due to an integrated experience of getting visibility of consignments ▪ Value-add for their customers by enriching FMS service with other value-added-services such as cold chain temperature monitoring, journey risk alerts, etc.	Helps win more business from visibility-conscious shippers
Carriers	Improve shipping efficiency by reducing empty/half-load miles	▪ Improved bottomline performance through efficient loading ▪ Ratings and reviews on platform help build trust with enterprise customers
Shippers / Transporters	▪ Faster reaction to incidents ▪ Better reliability of tracking data ▪ Increased operational efficiency	▪ Closes the visibility gap in spot freight ▪ Improves planning and customer satisfaction

▪

9 Workflow: Vehicle Discovery and Tracking

To provide a clear understanding of how L.OS enhances vehicle visibility, let's walk through the platform's workflow for discovery, tracking, and termination.

9.1 Discovery

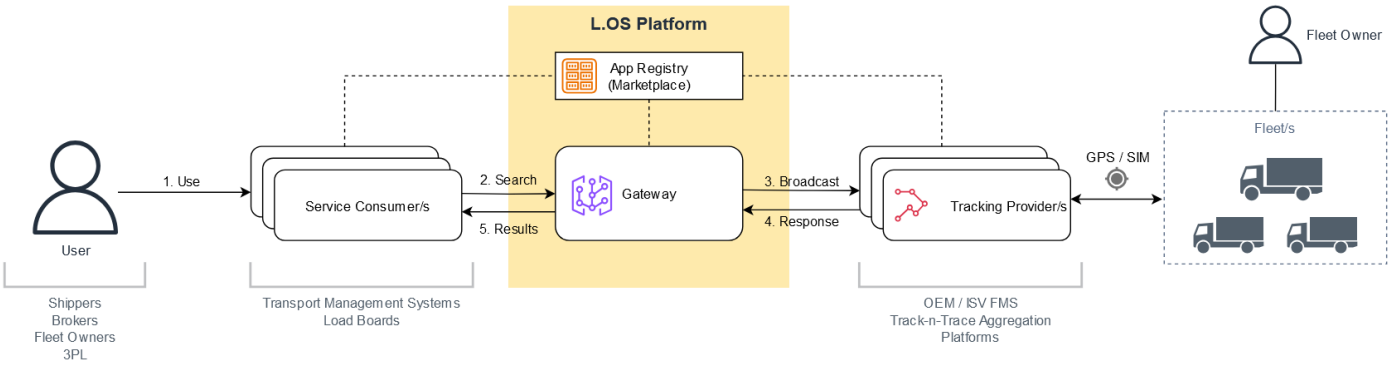

Figure 2
L.OS Platform Discovery Workflow

- When a client needs to track a vehicle, the servicing app makes a discovery call to the L.OS gateway. This call includes essential details like the vehicle number plate or vehicle identification number (VIN).
- Upon receiving the request, the L.OS platform performs necessary authentication and authorization.
- L.OS then broadcasts the request and waits for acknowledgment from one or more participants on the network.
- The responses contain vital information such as the mode, frequency, and reliability of tracking, which can be used for shortlisting and decision-making.

9.2 Tracking

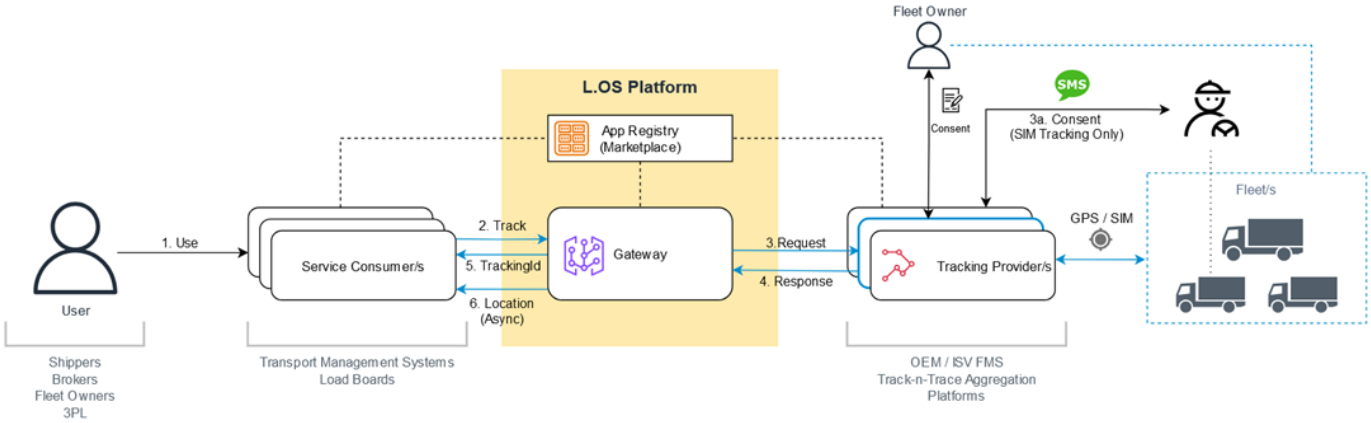

Figure 3
L.OS Platform Tracking Workflow

- Once the consumer has selected a vehicle and a service provider (if there are multiple options), a request is sent to the platform to initiate tracking.
- This request is relayed to the specific service provider.
- Depending on the tracking mode (e.g., SIM tracking or GPS tracking), a consent request is made to the relevant party, such as the driver (for SIM tracking) or the fleet owner (for GPS tracking).
- The platform waits for the tracking provider to create the trip.
- Upon receiving confirmation, the platform registers the tracking request and provides a unique tracking ID to indicate that tracking has been initiated.
- From here, the consumer is asynchronously notified of the vehicle's location at the specified frequency, or the maximum frequency supported by the service provider, whichever is faster.
- Consumers can also request the live location of the vehicle at any time between the regular reporting intervals.

9.3 Termination

- The tracking is automatically terminated when the vehicle enters the destination geo-fence.
- Alternatively, tracking can be terminated manually by sending an explicit request to the platform, which is then relayed to the service provider.

10 Enhancements and Innovation Opportunities

Beyond the immediate benefits of enhanced data quality and real-time tracking, GPS trackers, combined with the L.OS platform, offer a foundation for future innovation and value creation in the logistics industry.

Here are some potential future enhancements:

- **Environmental Monitoring:** Integration of sensors allows for real-time monitoring of parameters like cabin temperature, which is crucial for cold chain logistics. This ensures the integrity of temperature-sensitive goods during transportation.
- **Automated Incident Reporting:** GPS trackers can be configured to automatically detect and report accidents, facilitating rapid coordination between fleet owners, transporters, and emergency services.
- **Precise Over-speeding Data:** Accurate GPS data provides granular insights into over-speeding events and driver behavior, helping transporters make informed decisions about vehicle procurement and driver training.
- **Trip Attestation Services:** L.OS can provide verifiable trip attestation for fleet owners, enabling them to leverage trusted performance data to secure new contracts with reputable shippers and transporters.
- **Data-Driven Innovation:** Further data analysis can unlock a multitude of unexplored use cases that have the potential to revolutionize the logistics industry in India. By leveraging the rich data generated by GPS trackers, L.OS can provide insights for predictive maintenance, route optimization, and other value-added services.
- **Agentic AI Applications:** L.OS platform can offer complimentary services such as providing insights to command-and-control centers to minimize disruptions in the supply chain. The operational costs and efficiency can be improved for large scale transporters.

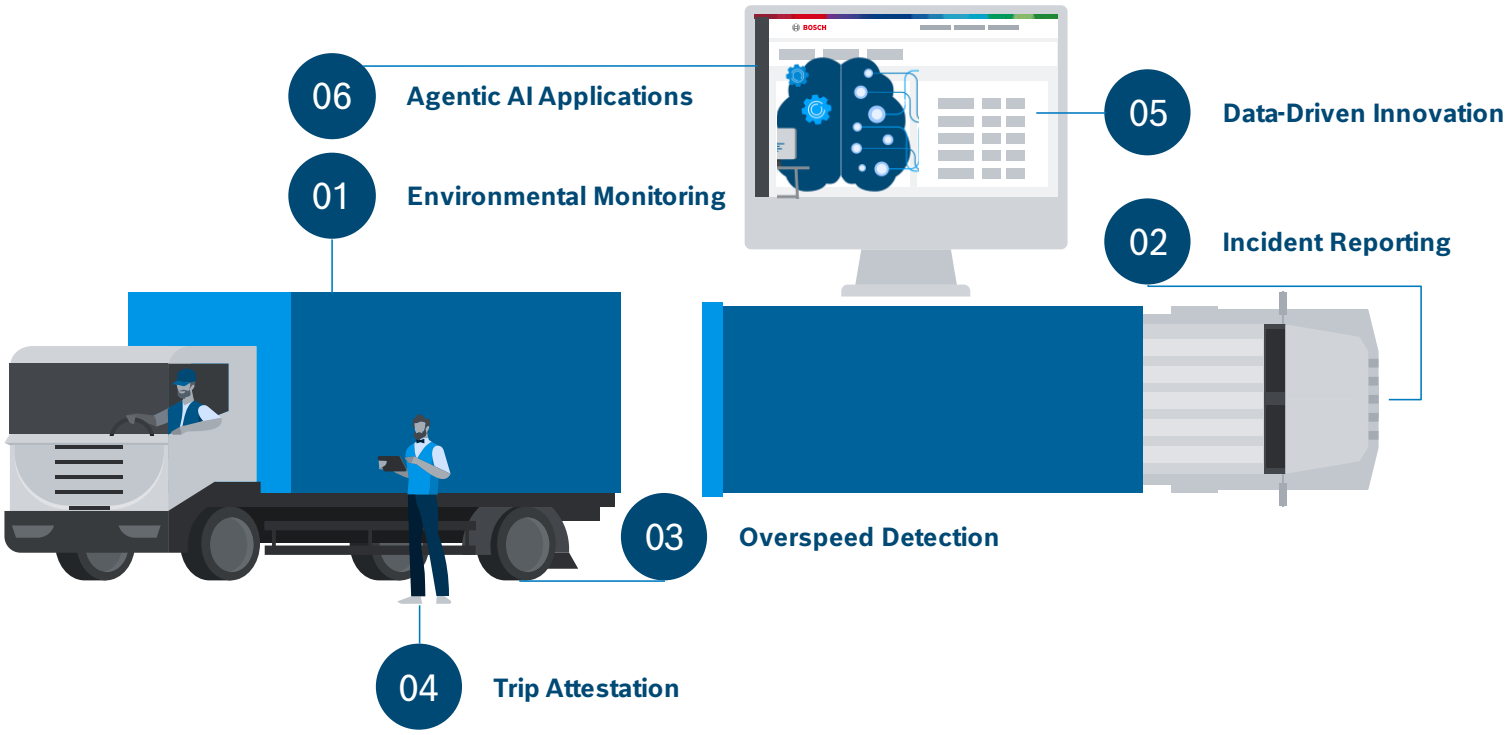

Figure 4
L.OS Visibility Opportunities

11 Why Bosch Mobility Platform and Solutions?

The aggregation and integration of data from a vast network of GPS trackers across India–while maintaining data security and the trust of all stakeholders–presents a significant logistical and technological challenge. However, an organization with the scale, expertise, and established reputation for data management and security, such as Bosch, is uniquely positioned to successfully implement such a comprehensive and transformative vehicle tracking solution.

Here's why Bosch Mobility Platform and Solutions (MPS) is the ideal choice:

- **Proven Expertise:** Bosch has a long-standing history of developing and implementing innovative solutions in the automotive and technology sectors.
- **Scalability:** The scale and resources of Bosch enable it to handle the aggregation and processing of large volumes of data from numerous sources across India.
- **Data Security:** Bosch has a strong reputation for maintaining data security and adhering to industry best practices.
- **Trust and Reliability:** As a trusted and established brand, Bosch inspires confidence among stakeholders in the logistics industry.
- **Innovation:** Bosch is committed to continuous innovation and is well-positioned to leverage emerging technologies to further enhance its vehicle tracking solutions.

By choosing Bosch MPS, stakeholders in the logistics industry can be confident that they are partnering with a reliable, experienced, and innovative organization capable of delivering a comprehensive and transformative vehicle tracking solution.

11.1 Strategy to Build the Supply

To effectively scale our vehicle tracking use case, we have identified strategic approaches to build the supply side–that is, to increase the number of vehicles contributing GPS tracking data to the L.OS platform.

Our strategy encompasses:

- **Integration With FMS Partners:** We collaborate with our FMS partners to facilitate data exchange through API integrations, ensuring seamless connectivity and enhanced tracking capabilities.
- **Partnerships With Aggregators:** We aim to partner with organizations that have already aggregated multiple FMS providers in the market. This approach will streamline our integration efforts, allowing us to avoid repetitive one-to-one integrations.
- **Collaboration With Industry Bodies:** Engaging with industry bodies like regional transport and logistics associations will enable us to influence both supply and demand towards adopting our platform approach, fostering broader acceptance within the logistics community.
- **Collaboration With OEMs:** We will also work with Original Equipment Manufacturers (OEMs) that have GPS devices installed in their vehicles. These devices can share tracking data with the owner's consent, enhancing our data collection capabilities.

11.2 Strategy to Build the Demand

To ensure the successful adoption of the L.OS platform, we have developed a comprehensive strategy to build demand among logistics companies and other stakeholders.

Our strategy encompasses:

- **Partnerships with Visibility Partners and TMS ISVs:** We collaborate with our visibility partners and ISVs that deliver TMS solutions to generate demand for GPS tracking solutions, leveraging their existing customer bases (shippers / transporters).
- **Leveraging FMS Partners for Demand:** Our FMS partners can also drive demand, as fleet owners utilizing a hybrid model will seek to track both their own vehicles and spot market vehicles from a single application.
- **Integration with Load Board Platforms:** L.OS will provide tracking information to load board platforms that facilitate the matching of supply and demand for load and vehicle requirements, enhancing visibility for vehicles that are procured on the platform
- **Mobile Application for Small Transporters:** We aim to co-create with our partners a mobile application tailored for small transporters who currently lack tracking solutions. This application will address their specific needs and facilitate easier access to tracking capabilities.

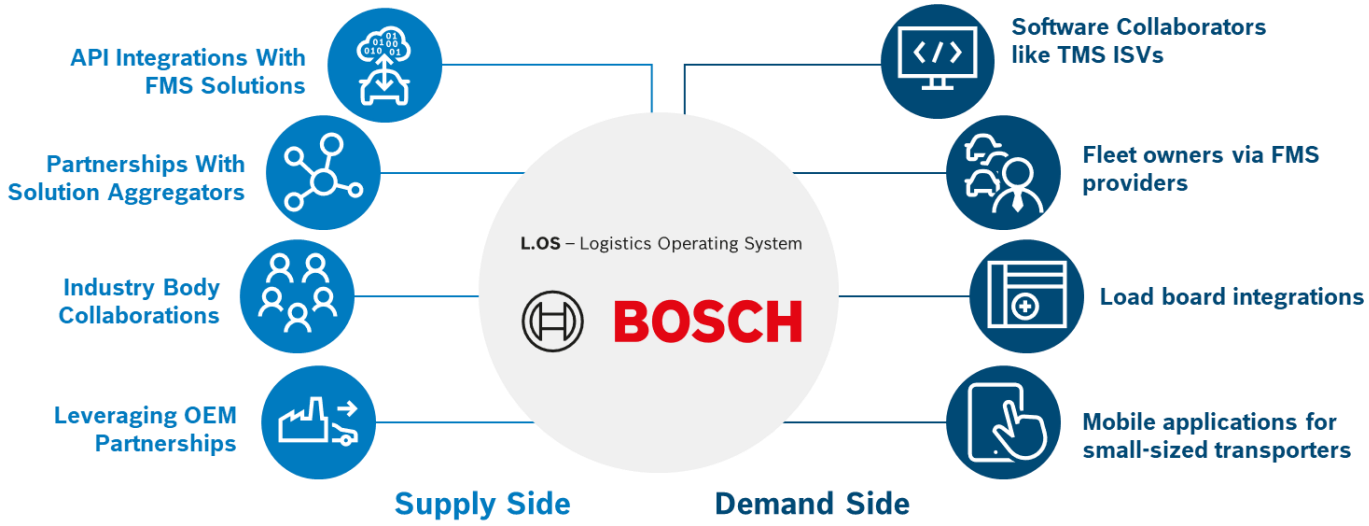

Figure 5
Bosch MPS Strategy to Build Supply and Demand on L.OS for Visibility Solutions

12 Conclusion

In summary, the Indian spot market faces distinct challenges in attaining comprehensive vehicle visibility. Existing tracking methods, including phone calls, FASTag data, and SIM-based tracking, present opportunities for improvement. There is an imperative to switch to more efficient solutions like GPS to enhance operational efficiency for customers. Furthermore, in order to drive widespread adoption of GPS-based visibility enhancement in logistics, we need a data integration platform that would not only aggregate the supply of such GPS data but also appeal to the demand side for consumption and realizing business results. Bosch MPS, through its innovative L.OS platform, is uniquely positioned to realize the vision of 100% vehicle visibility in India.

The L.OS platform offers a unified, versatile, and trustworthy solution that integrates data from various sources, enabling real-time tracking and data-driven decision-making. By partnering with FMS providers, aggregators, industry bodies, OEMs, visibility partners, and TMS ISVs, Bosch MPS aims to build a robust supply side for the platform. Simultaneously, by collaborating with visibility partners, TMS ISVs, and co-developing a mobile application with its partners for small transporters and brokers, Bosch MPS aims to drive demand and ensure widespread adoption of L.OS.

The visibility integration on Bosch L.OS provides significant benefits for all stakeholders in the logistics ecosystem. FMS tracking providers can monetize data and add value for their customers, TMS providers can enhance customer satisfaction and appeal to a wider market, carriers can build credibility and trust, and shippers / transporters can improve reliability and operational efficiency. The platform itself acts as a neutral enabler, integrating multiple data sources and creating a network effect.

With its commitment to innovation and data security, Bosch MPS, in collaboration with industry partners, is set to transform vehicle tracking in the Indian logistics sector. By playing the role of an enabler, Bosch MPS aims to work with the entire ecosystem to improve operational efficiency and reduce logistics costs, ensuring gains for every participant involved. Together with our partners, we are poised to enhance the way goods are transported and monitored, driving value creation and building trust across the logistics industry.

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