

# TECHNOLOGY FRAMEWORK FOR INDIA'S ROAD FREIGHT TRANSPORT

COMPLIANCE AND ENFORCEMENT ARCHITECTURE REFORM

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## Technology Framework for India's Road Freight Transport: Compliance and Enforcement Architecture Reform

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## ABBREVIATIONS

|         |   |
|---------|---|
| CAG     | Comptroller and Auditor General             |
| CBIC    | Central Board of Indirect Taxes and Customs |
| CCP     | composite check post                        |
| CCTV    | closed-circuit television                   |
| CMV Act | Central Motor Vehicle Act                   |
| GPS     | Global Positioning System                   |
| GST     | goods and services tax                      |
| GSTN    | Goods and Services Tax Network              |
| GVW     | gross vehicle weight                        |
| IIZ     | integrated inspection zone                  |
| IMIU    | Integrated Mobile Inspection Unit           |
| MORTH   | Ministry of Road Transport and Highways     |
| NHAI    | National Highway Authority of India         |
| NIC     | National Informatics Centre                 |
| ODC     | over-dimension cargo                        |
| OWC     | overweight cargo                            |
| PUC     | Pollution Under Control                     |
| RFID    | Radio Frequency Identification Device       |
| RMS     | Risk Management System                      |
| RTA     | Regional Transport Authority                |
| VTS     | Vehicle Tracking System                     |

## ABSTRACT

In India on-road inspection of road freight in transit is done by several agencies such as tax, transport, police, and forest officials, leading to unscheduled stoppages and delays that add to operational transaction costs. The existing level of digitalization provides the necessary tools for moving toward data-based identification of potential noncompliance, minimizing the need for multiple physical inspections that the current enforcement model entails. The process of physical scrutiny could also be rationalized, limited to designated zones, and undertaken with greater transparency. This paper presents a comprehensive alternative model for all on-road enforcement agencies with regulatory mandates applicable to the movement and conveyance of cargo. Given the overwhelming importance of road freight in India, the reforms discussed in this paper represent a critical element of domestic trade facilitation.

**JEL Classification:** R410, O330, K420

**Keywords:** Domestic trade facilitation, road freight, enforcement, noncompliance, digital integration, regulation, institutional coordination, GST E-waybill, VAHAN, FASTag, RFID, inspection, cargo



## EXECUTIVE SUMMARY

Road freight is India's most important mode of domestic cargo transport. However, road freight in the country is also plagued by inefficiencies leading to lower average speeds, underutilization of vehicles, higher pollution per unit of cargo transported, and higher transit times compared to regional and international benchmarks. While some of these inefficiencies are the result of infrastructure bottlenecks related to roads and the transit of cargo vehicles within large urban and industrial clusters, significant on-road hurdles arise due to regulatory issues.

Poorly enforced regulations related to the collection of indirect taxes and legislation on standards related to vehicular, environmental, and human-health impose a number of on-road checks on vehicles, both random and at designated check posts. This paper delves into operational challenges posed to road freight operators and identifies specific institutional and process-oriented gaps based on internal analysis, discussions with domain experts, and consultations with transport operators.

The paper suggests an alternative system that integrates multiple agency databases, such as the Goods and Services Tax (GST) E-way bills, the national vehicles database (VAHAN), and presents a process flow that includes intelligent technology-enabled cross-departmental integrated mobile squads that provide single window enforcement of tax and nontax regulations related to road freight transport.

The salient features of the proposed enforcement design are

1. utilization of goods declaration database of the GST network and VAHAN database on vehicle-related information to create a common database and intelligence system for all regulations relevant to road freight movement;
2. development of a robust risk management system leveraging this integrated database and intelligence to allow for targeted inspections, thus ensuring that most goods carriers are not stopped while in transit;
3. use of technology such as weigh-in motion and in-camera dimension checks to enforce specific rules related to overweight and over-dimensional cargo;
4. system-based issuance of fines, penalties, and alerts minimizing the need for human discretionary decisions to ensure maximum transparency; and
5. setting up of a robust system of checks and balances to minimize
  - a) collusion between noncompliant players and officials,
  - b) loss of public revenue,
  - c) safety and security hazards, and
  - d) harassment of compliant trade.

These goals are in sync with the Government of India's vision of digital India setting new global benchmarks in ease of doing business. The model creates truly integrated domestic supply chains, adding strength to major government campaigns such as Make in India and Atmanirbhar Bharat Abhiyan (Self-Reliant India Campaign). It also serves the mandate of developing multimodal logistics parks in and around the main economic nodes of the country, linked by highly efficient road transport corridors.

This paper flows from an Asian Development Bank (ADB) supported study in 2017 across Assam, Gujarat, Karnataka, and Telangana, which examined micro-level operational issues of road freight and the consequent challenges posed to the transporters and industry. Recommendations are based on the GST reforms, ongoing digital integration efforts, as well as best practices across other states. The paper

presents plausible solutions to ease the enforcement challenges faced by both the government and private operators.

Furthermore, it explores a technology-based solution for simplifying and strengthening road freight enforcement across the country. For that, it introduces the concepts of Integrated Mobile Inspection Unit (IMIU) and Integrated Inspection Zone (IIZ) for the harmonization, simplification, and standardization of processes to achieve the target of “One Country–One Mechanism” for compliance and enforcement. It concludes by making a case for piloting the model and refining it before pan-India adoption.

## I. INTRODUCTION

1. Road transportation is the dominant mode of freight movement in the country and constitutes about 65% of the total freight transported domestically.<sup>1</sup> In addition, domestic air and rail movement also have a road component (door-to-door) in the first and last leg of their journeys. International freight in and out of India also has a significant road component connecting the hinterland to gateway ports and airports.

2. The total road network in India is 5.4 million kilometers (km), out of which, approximately 100,000 km, or 1.8%, comprises national highways that represent the major arterial roads connecting the critical economic nodes of the country. State highways account for around 2.9% of the total road network.<sup>2</sup> While national highways represent a very small share of the overall road network of the country, given their role in connecting key economic nodes, they account for a disproportionate share of the overall road freight movement. If state highways are also taken into account, then together with national highways they would account for over 80% of India's freight movement by road. From a logistics network development perspective, innovative institutional and process improvement solutions that enhance operational efficiency in national and state highways would have a significant impact on the ease of doing business for the road freight transportation sector.

3. Based on feedback from some of the larger fleet operators, the average speed of trucks in India is around 30–40 km per hour, allowing a vehicle to cover a maximum of 600–800 km per day. However, only the large aggregators who manage to run their trucks 20 hours a day can achieve this by employing certain quality standards. The dominant segment of small- and medium-sized transporters cover 300–325 km per day, even after factoring in the initial efficiency gains since the implementation of the Goods and Services Tax (GST).<sup>3</sup> These numbers are much lower than global average speeds of around 60–80 km per hour with a daily maximum distance covered of 1,200–1,400 km.<sup>4</sup>

4. Such relatively high transit times also include delays due to several mandatory stops where trucks have to wait in queues to meet regulatory compliance requirements and pay tolls. The opportunity cost of lost time and operational inefficiency adds a significant burden on the road freight industry and on the economy, which is highly dependent on this mode of transport for freight movement.

5. This working paper flows from an Asian Development Bank (ADB) supported study in 2017.<sup>5</sup> One of the components of the study (across Assam, Gujarat, Karnataka, and Telangana) examined the micro-level operational issues of road freight and the consequent challenges posed to the transporters and industry. Based on stakeholder interactions, the study undertook an institutional gap analysis to suggest the building blocks for an efficient, seamless, safe, and high-capacity road freight enforcement ecosystem. The working paper builds on those recommendations to provide a detailed revised enforcement model leveraging the currently available Government of India digital tools and databases,

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<sup>1</sup> Government of India. Planning Commission. National Transport Development Policy Committee. 2014. *India Transport Report: Moving India to 2032*. [https://niti.gov.in/planningcommission.gov.in/docs/sectors/index.php?sectors=National%20Transport%20Development%20Policy%20Committee%20\(NTDPC\)](https://niti.gov.in/planningcommission.gov.in/docs/sectors/index.php?sectors=National%20Transport%20Development%20Policy%20Committee%20(NTDPC)).

<sup>2</sup> Government of India. Ministry of Road Transport and Highways. 2017. *Annual Report 2016–17*. [https://www.morth.nic.in/sites/default/files/other\\_files/Annual-Report-2016-17.pdf](https://www.morth.nic.in/sites/default/files/other_files/Annual-Report-2016-17.pdf).

<sup>3</sup> Government of India. Ministry of Road Transport and Highways. 2017. *GST is Good and Simple Tax: A Booklet on GST in Transport Sector*. [https://morth.nic.in/sites/default/files/Booklet\\_on\\_GST.pdf](https://morth.nic.in/sites/default/files/Booklet_on_GST.pdf).

<sup>4</sup> Study team analysis based on experience and discussions with managers involved in global operations.

<sup>5</sup> ADB. 2018. ADB Submits Jogighopa Multi-Modal Logistics Park Study Report. 19 June. <https://www.sasec.asia/index.php?page=news&nid=885&url=jogighopa-mmlp-submission>. | <sup>5</sup> Sabyasachi Mitra, Hoe Yun Jeong, Kavita Iyengar, Bhuwan Bhaskar Agrawal, Shreyans Jain, Atul Sangneria. 2020. Developing Multimodal Logistics Parks in India. ADB Briefs. No. 142. June. <https://www.adb.org/sites/default/files/publication/614876/adb-brief-142-multimodal-logistics-parks-india.pdf>.

integrated into a specially designed application that enables on-ground institutional coordination across enforcement agencies.

6. It is important to summarize the key aspects of the study and its findings before presenting the proposed enforcement design. According to the terms of reference, the study aimed to

- a) identify and analyze the gaps in existing regulatory frameworks and processes in view of best practices and stakeholder expectations;
- b) evaluate the impact of the GST law and the GST Network (GSTN) on the logistics sector, and suggest means of leveraging the GSTN and the new national rules in place for on-road compliance with tax-related regulations;
- c) take into account significant improvements in procedural aspects of transport regulations pertaining to road freight, and the digitalization of transport registries, including a national database of vehicle registration and records, as part of the solution;
- d) consult stakeholders in identifying the issues impacting the logistics sector and in developing solutions for improving logistics efficiency; and
- e) suggest solutions based on the above aspects.

7. Thus, the objective of the study was to explore the road transport regulatory compliance architecture and associated reforms to improve operational efficiency and reduce transaction costs across national corridors. This remains an important area of reform. While a lot of attention has been given to the facilitation of international trade, facilitating intra-national trade in a continent-sized country like India remains equally significant. Given that road freight carries the lion's share of intra-national trade in goods, governance structure reform of truck movement would be a critical element of domestic trade facilitation.

8. This working paper leverages the findings of the study and takeaways from related discussions and engagements in different forums to develop a case for enforcement design reform.<sup>6</sup>

9. India is undergoing significant economic reform in terms of ease of doing business and evolution of GST. The GST regime has subsumed different state and central level indirect tax components in the country into a single tax system. As an outcome of the introduction of GST almost all states since 1 July 2017 have done away with the physical check posts and barriers that were being used to enforce compliance with indirect tax-related rules. In its preliminary assessment of the impact of the elimination of these check posts on road transport, the Ministry of Road Transport and Highways (MORTH) has found that the travel time of interstate long-haul trucks and other cargo vehicles has been reduced by at least one-fifth<sup>7</sup>

10. Rules related to the E-waybill serve as the national tax declaration for goods transport, and procedures for checks and inspections have had a major impact in this regard. Another major reform was introduced by the Government of India in December 2019 when the radio-frequency identification (RFID) enabled FASTag became compulsory for payment of toll. A more detailed discussion on the impact of the introduction of GST and the implications of the compulsory use of E-waybill follows in Section II.

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<sup>6</sup> Based on discussion with the Federation of Indian Chambers of Commerce and Industry on issues related to the roll-out of the GST E-waybill and deliberations with the Taskforce for Seamless Road Transport Connectivity constituted by the Government of India.

<sup>7</sup> Footnote 3.

11. Compliance with tax laws represents just one aspect of the on-road laws and rules that apply to the movement of goods in India. There are at least 16 different regulations governing movement of freight by road (Table 1). While three taxation-related regulations have been subsumed into GST and associated E-waybill rules, the delays and associated transaction costs of suboptimal governance and on-road enforcement related to the other laws remain. There is also considerable scope for the improvement of GST and E-waybill related enforcement on-road, as there is still significant diversity in terms of both quality and design of enforcement across states.

**Table 1: Regulations Governing Movement of Freight by Road**

| Fiscal   | Transport  | Traffic and Toll   | Product-Specific  |
|--|--|--|---|
| <ul style="list-style-type: none"> <li>• Goods and Service Tax Act 2017</li> </ul> | <ul style="list-style-type: none"> <li>• Carriage by Road Act 2007</li> <li>• Central Motor Vehicles Act 1988</li> </ul> | <ul style="list-style-type: none"> <li>• Central Motor Vehicle Rules</li> <li>• State Motor Vehicle Rules</li> </ul> | <ul style="list-style-type: none"> <li>• Essential Commodities Act</li> <li>• Hazardous Goods Acts (two)</li> <li>• Forest Related Acts</li> <li>• Quality and Product-Specific Acts (seven)</li> </ul> |
| One Act and one regulation   | Two Acts and two regulations   | Two regulations with 60 offenses   | 11 Acts with associated rules   |

Source: Study team analysis.

12. The major nontax-related regulations in India pertain to commercial goods and passenger vehicles. Section 213 (1) of the Central Motor Vehicle (CMV) Act, 1988 enables states to establish motor vehicles departments, which are also known as transport departments.<sup>8</sup> A transport department further notifies jurisdiction-wise state regional transport authorities (RTAs) for implementing the provisions of the CMV Act, 1988; CMV Rules, 1989; and specific state-level motor vehicle legislations to administer home-state vehicles and control transit and entry of vehicles from other states.<sup>9</sup>

13. For the movement of commercial goods vehicles, these statutes lay down conditions to operate a vehicle and the processes to obtain vehicle registration, a fitness certificate, a pollution-under-control (PUC) certificate, and a permit for the intra- and interstate carriage of goods. These statutes also indicate overload cargo or overweight cargo (OWC) and over-dimension cargo (ODC), restrictions and permissions, enforcement aspects including classification of offenses, departmental actions, and penalties therein. The carrier-related rules and guidelines for the movement of dangerous and hazardous goods are also issued under these statutes with additional insurance (other than third party) mandated on such movements under the Public Liabilities Insurance Act, 1991.<sup>10</sup>

14. State RTAs levy motor vehicles taxes and fees under the State Motor Vehicle Taxation (SMVT) Act, which mandates quarterly home state taxes on goods vehicles and a green tax in addition to taxes and fees related to a goods carriage permit, temporary permit, counter signatory permit, and the national permit. In cases of noncompliance, the act empowers the RTA “flying squads” (on-road mobile inspection units) and border check posts to penalize, seize, and detain the vehicle. Another major statute that involves on-road enforcement is the Carriage by Road Act, 2007 and the associated Carriage by Road Rules, 2011 that cover matters such as determining contractual obligations between the operator and consignor or consignee, and the role of intermediaries, among others.<sup>11</sup>

<sup>8</sup> Government of India. Ministry of Road Transport and Highways. 1988. Central Motor Vehicles Act 1988. <http://morth-roadsafety.nic.in/index1.aspx?lsid=508&lev=2&lid=461&langid=1>.

<sup>9</sup> Home-state goods vehicles are registered in the state where the vehicle is purchased or intended to operate in.

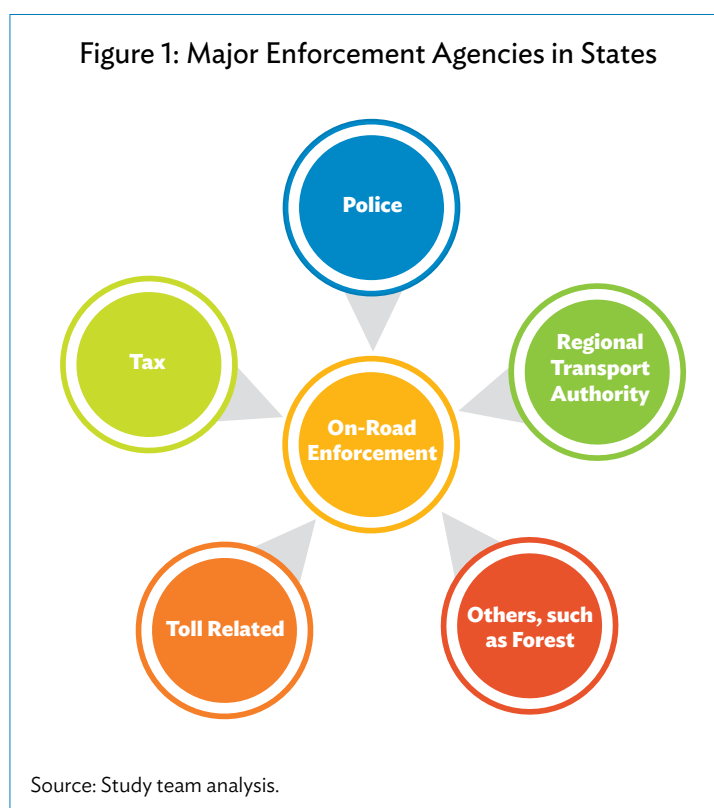
<sup>10</sup> Government of India. 1991. The Public Liability Insurance Act 1991. <https://www.indiacode.nic.in/bitstream/123456789/1960/1/A1991-06.pdf>.

<sup>11</sup> Government of India. 2007. The Carriage by Road Act 2007. <https://www.indiacode.nic.in/handle/123456789/2043?locale=en>.

15. In addition to transport-related regulations covering goods-carrying vehicles, and tax-related regulations pertaining to the goods themselves, there are other laws related to quality standards, safety, and environmental aspects. A good example of such regulations is the state forest department holding special authority to prevent smuggling of forest products and to issue and vet transit passes for imported and permitted goods. At the state level, agriculture and animal husbandry departments also maintain check posts to monitor the movement of interstate agriculture products and livestock. The state excise department maintains its own check posts to monitor and regulate the movement of alcohol and liquor.

16. State police have their check posts and stoppage points to perform special administrative measures to monitor illegal mining such as unauthorized sand or limestone mining, enforce traffic regulations such as restricted urban entry, and upkeep road safety and general security measures. The police may also detain OWC and ODC cargo to prevent safety hazards in urban areas and assess penalties on suspicions raised by intelligence inputs received from state-level departments with jurisdiction over excise, forests, drug control, and revenue intelligence.

17. The post-GST institutional mechanism whereby state agencies with authority over sales tax and excise tax are integrated into the GST framework is presented in Figure 1.



18. The major enforcement issues can be grouped under two main categories. The first represents compliance with transport-related regulations that include (i) payment of tolls and taxes relevant for transporters, (ii) safety and security of the vehicle itself, and (iii) issues related to operational safety.

19. The second category represents enforcement related to the goods themselves. The two main areas of compliance relate to (i) taxation of goods; and (ii) all other compliance with standards, safety, and the legitimacy of the goods being carried by the conveyance (i.e., prevention of smuggling of banned or restricted items).

**Table 2: Tax and Vehicle Regulatory Enforcement Practices**

| Compliance Requirement Incumbent on Goods being Carried |  | Transport and Traffic Related Compliance Requirements  |  |   |  |  |
|---|--|--|--|---|--|--|
| Tax   | Nontax (Product Market)  | Safe Management of Cargo   | Traffic-Related Offenses (Documentation)   | Driving-Related Offenses  | Minor Vehicle Related Offenses   | Traffic Offenses and On-Road behavior  |
| Goods and Services Tax Compliance                       | Movement of hazardous goods  | Five different requirements related to   | Seven different requirements related to driver   | Eight different violations relating   | 11 different requirements related to   | 30 specific violations related   |
| Compliance with Other Indirect Taxes                    | Movement of restricted goods, for example, forest produce<br><br>Movement of controlled goods, such as essential commodities | weighment and loading, e.g., overload, over-dimension, dangerously loaded, etc. Also unauthorized carriage of people or live animals | not having original document (fitness certificate, registration certificate, permit, insurance, license) | to driving behavior, e.g., driving under the influence of alcohol or driving without seatbelt | vehicle fitness and safety, including not having (damaged) essential accessories | to driving behavior and noncompliance with traffic regulations (say, no-entry or no-parking violation) |

Source: Study team analysis.

20. Major enforcement issues relate to permits, overloading, over-dimension, invoices, vehicle pollution and fitness, traffic violations, toll payments (avoidance of tolls), no-entry, alcohol abuse, parking, driving without co-drivers, and other issues (e.g., changes in vehicle seat design, tire conditions, and carrier lights). The goods stated in the invoice may differ from the actual goods carried by the vehicle. This generally happens when a carrier, under the guise of carrying normal goods, transports restricted items requiring special permission, additional taxes, and special conditions (e.g., hazardous cargo), or when there is a misdeclaration of the quantity or value of the goods being carried.

21. The National Highways Authority of India (NHAI) and the State Public Works Department are additional pillars of road freight governance in terms of determining road user fees (tolls) and employing measures to prevent unauthorized movement of OWC and ODC cargo on highways. These toll structures are under varying categories of public-private partnerships. Some of the NHAI toll gates have weighing systems. A weight above the stipulated gross vehicle weight (GVW) is subject to a penalty of up to 10 times the toll (fees).

22. The objectives of tax and vehicle regulatory enforcement practices are to ensure revenue-compliant cargo and vehicular movement; road, human, and environmental safety; avoidance of cargo and livestock smuggling, and of human trafficking; and minimization of risk to public security by regulating the movement of dangerous and hazardous goods (Table 2). There are 66 different offenses defined under these regulations which are subject to scrutiny and enforcement by different agencies on the road (Appendix).

23. However, this has led to a plethora of en route enforcement agencies and structures with siloed enforcement practices. In addition, suboptimal corridor infrastructure and the relative lack of technology use make enforcement more challenging.

24. Assessments and accounts from India's Comptroller and Auditor General (CAG) and accounts of various state transport departments indicate that critical motor vehicle enforcement violations (e.g., overloading, lack of fitness or PUC certificate) and those related to obtaining legitimate permits remain

largely undetected due to deficits in enforcement design and related administrative and institutional capacities. These increase the probability of unauthorized movement and lead to a higher number of accidents and deaths due to the violation of safety norms such as OWC and ODC.<sup>12</sup>

25. For example, information related to the national permit can be retrieved through VAHAN software with the help of the permit number.<sup>13</sup> In the composite structure, the national permit has two components: (i) the mother state permit and (ii) the annual authorization.<sup>14</sup> Section 81 of the CMV Act provides that the validity of a permit is 5 years. However, as per Rule 87(3) of the CMV Rules, authorization of the national permit is for 1 year. There have been several cases of nonrenewal of national permit authorization leading to a loss of the composite fee to the exchequer every year. It was reported that more than 20,000 vehicles in Rajasthan did not renew the national permit authorization.<sup>15</sup> This default either remains undetected or the renewal of authorization after issuing a challan (receipt for payment of penalties or fines for non-compliance) is not adequately enforced.

26. Instances of vehicles running without renewal of fitness certificates also continue to be observed. This not only damages the environment, but also risks public safety. The CAG reports that in some cases a fitness certificate is missing but vehicle taxes are being realized (Footnote 12). The seamless and safe movement of trucks has been a challenging task for authorities to achieve, especially in the absence of robust infrastructure and institutional linkages. It may, therefore, be concluded that there are regulatory process issues related to freight vehicle movement across states that need to be addressed.

## II. E-WAYBILL, VAHAN AND FASTAG: DIGITIZATION REFORMS IN PROCESS AND INFORMATION MANAGEMENT

27. The key to any smart enforcement design is having access to credible information in advance that helps decision making for the enforcers on field. Two key digitization initiatives of the Government of India have provided the means for regulators to access critical information that will help all the different agencies (identified in Figure 1) to enforce all regulatory requirements identified in Table 2 (with some exceptions).<sup>16</sup> These two initiatives are the GST E-waybill and the MORTH VAHAN database.

### A. The Goods and Services Tax E-Waybill

28. The GST E-waybill is essentially a declaration of goods being carried in a vehicle, along with details of the consignor and consignee, origin and destination of these goods, and the transporter entity responsible for this transport of goods (Figure 2).

29. The introduction of the national E-waybill did away with the need for transporters to file separate state-level declarations prior to entry into every state while carrying goods across the country. Such state-level declarations were mandatory even if the truck was simply transiting through the state and not picking up or dropping cargo in its

<sup>12</sup> Comptroller and Auditor General of India. 2013. Chapter IV: Motor Vehicle Tax. Audit Report (Revenue Sector) for the year ended 31 March 2012. pp: 85–96. For Government of Assam and Government of Meghalaya (Transport Sector). [http://agasm.cag.gov.in/forms/audit\\_report/2011-12/report\\_no\\_2\\_2011-12\\_govt\\_of\\_assam\\_report\\_of\\_the\\_cag\\_on\\_rev/Chap\\_4.pdf](http://agasm.cag.gov.in/forms/audit_report/2011-12/report_no_2_2011-12_govt_of_assam_report_of_the_cag_on_rev/Chap_4.pdf). <sup>12</sup> Comptroller and Auditor General of India. 2016. Chapter III: Taxes on Vehicles, Goods and Passengers. Audit Report (Revenue Sector) for the year ended 31 March 2015. pp: 47–64. For Government of Rajasthan (Transport Sector). [https://cag.gov.in/uploads/download\\_audit\\_report/2016/Chapter\\_3\\_Taxes\\_on\\_Vehicles\\_Goods\\_and\\_Passengers.pdf](https://cag.gov.in/uploads/download_audit_report/2016/Chapter_3_Taxes_on_Vehicles_Goods_and_Passengers.pdf).

<sup>13</sup> VAHAN and SARATHI were conceptualized to capture functionalities as mandated by the CMV Act, 1988, as well as state-level motor vehicle rules, with customization of the core product to suit the requirements of 36 states and union territories. See <https://sarathi.parivahan.gov.in/SarathiReport/sarathiHomePublic.do>.

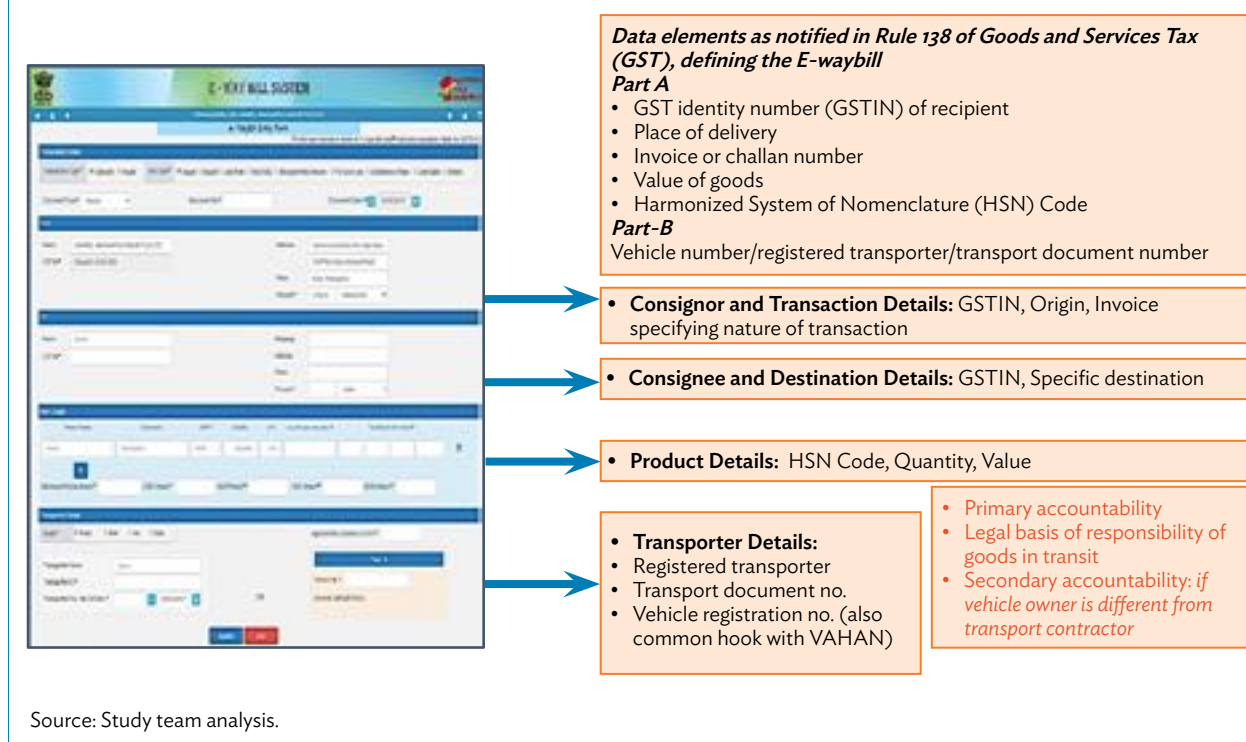
<sup>14</sup> Government of India. Ministry of Road Transport and Highways. 2010. Circular on Implementation of the New Composite Fee Regime for National Permit. 25 May. [https://morth.nic.in/sites/default/files/National\\_Permit/Circular\\_dated%2025th%20May.pdf](https://morth.nic.in/sites/default/files/National_Permit/Circular_dated%2025th%20May.pdf).

<sup>15</sup> *The Times of India*. 2017. 22,439 Goods Vehicles Found without Renewal of National Permit in Raj. 30 March. <https://timesofindia.indiatimes.com/city/jaipur/22439-goods-vehicles-found-without-renewal-of-national-permit-in-raj/articleshow/57902067.cms>.

<sup>16</sup> Exceptions are related to on-road traffic violations that can only be monitored real time while they occur. This is discussed in detail in Section V.



Figure 2: Goods and Services Tax Network E-Waybill Pro Forma: Overview of Variables Captured



territory. Some states had not fully digitized this process of filing of waybills, and in many states, which did have an online system, truckers often resorted to using agents to file for online waybills and transit passes at the point of entry to avoid the hassle of dealing with multiple and often complicated data entry requirements.<sup>17</sup>

30. By replacing 29 different systems with a single, more streamlined national electronic declaration for goods, the E-waybill has been a significant step towards greater transparency and simplification. The introduction of the GST and rollout of the E-waybill, along with the rationalization of check posts and border procedures related to goods movement in trucks has led to at least 20% reduction in travel time for interstate long-haul trucks and other cargo vehicles. From the perspective of developing more advanced enforcement design, the greatest potential of the E-waybill lies in the fact that it captures all data of interest to the regulator vis-à-vis the goods being carried, and the transporter carrying it (Figure 2).

31. The announcement by the Central Board of Indirect Taxes and Customs (CBIC) that the electronic invoice (known as INV-01) shall be compulsory for all business houses having a turnover of more than ₹1 billion effective 1 April 2020 adds further digital data capture capability within the GSTN system.<sup>18</sup> The Government of India could, therefore, gradually make the e-invoice compulsory for all but the smallest of businesses (with annual turnover less than ₹10 million). Since the e-invoice would be tagged to the E-waybill, this will allow digital visualization of the original invoice for any authorized officer checking a truck on the road and the goods it is carrying.

<sup>17</sup> Government of India. Taskforce for Seamless Road Transport Connectivity. Unpublished report.

<sup>18</sup> Government of India. Ministry of Finance. Department of Revenue. Central Board of Indirect Taxes and Customs. 2019. Notifications 68, 69, 70, 71 and 72 / 2019 - Central Tax, 13 December. Given the spread of the COVID-19 pandemic in India from early March 2020, and its subsequent impact, the mandatory roll-out of e-invoice has been postponed. Subsequently, in November 2020, the CBIC notified that e-invoicing will be mandatory for business-to-business (B2B) transactions for taxpayers having turnover of over ₹1 billion from 1 January 2021. At present, issuing electronic invoices is mandatory for businesses with turnover of ₹5 billion or more, with effect from 1 October 2020.

## **B. VAHAN**

32. VAHAN is an application created by MORTH in 2011 under the National e-Governance Policy which is designed, maintained, and supported by the National Informatics Centre (NIC), the information technology development entity of the Government of India. VAHAN serves as a data repository of all vehicles registered in the country. Over 280 million vehicles are registered in VAHAN, which is close to 100% of the vehicles on road in the country.<sup>19</sup>

33. VAHAN provides a digital repository for the following crucial data related to a vehicle:

- a) Owner Name
- b) Registration Date
- c) Registering Authority
- d) Make Model
- e) Fuel Type
- f) Vehicle Age
- g) Vehicle Class
- h) Insurance Validity
- i) Fitness Validity
- j) Chassis Number
- k) Engine Number

34. In addition, VAHAN has the ability to capture motor vehicle tax and PUC certificate related information.

## **C. FASTag**

35. A FASTag is a sticker containing an embedded passive RFID chip and antenna. It is affixed on a vehicle's windscreen to enable automatic collection of toll charges when the vehicle passes through a toll plaza, without the need to stop at the toll booth. At the front-end, the FASTag employs RFID technology to help recognize the passing of a vehicle along with details such as the vehicle class (commercial or private) and the status of the tag.

36. Since FASTag works using passive RFID technology, any passive RFID reader would be able to confirm the vehicle registration number through a scan. Essentially then, the FASTag architecture potentially allows vehicle recognition by any enforcement agency which is so enabled, at any location. As discussed in Section V on solution design, this is actually a game-changer for the Indian ecosystem of on-road enforcement of rules and regulations. As pointed out earlier, the FASTag has now been made compulsory for all vehicles effective 15 January 2020 by the MORTH.

## **III. REPORT OF THE TASK FORCE ON SEAMLESS ROAD TRANSPORT CONNECTIVITY**

37. As discussed, the introduction of the GST led to improvements in the movement of goods transportation vehicles with the removal of interstate commercial tax barriers. However, vehicles were still stopped by other agencies such as the transport department, the police, state excise and forest officials. Moreover, while the GST E-waybill created a single digital declaration document, and introduced some process improvements, it was not backed by a proper system-driven risk assessment framework for enforcement on ground. The field officer is still expected to make discretionary decisions to flag down vehicles and inspect their documents.

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<sup>19</sup> As of March 2020.

38. It is with these concerns in mind that the GST Council in its 12th meeting held on 16 March 2017 decided to constitute a task force of officers to suggest measures for creating an ecosystem for seamless road transport connectivity across the country.<sup>20</sup> The task force was expected to

- a) identify the agencies carrying out checks on goods and passenger transport vehicles during their movement across the country and to assess whether such checks should be continued;
- b) examine the feasibility of abolishing check posts altogether for all agencies, and if the same is not possible, suggest retention of check posts for a limited set of government agencies that may be identified by the task force as absolutely essential and to suggest a mechanism for co-locating them;
- c) recommend data sharing protocols with agencies to reduce their need for check posts; and
- d) recommend a uniform risk-assessment strategy for checks on transport vehicles carrying goods or passengers.

39. After deliberations with stakeholders, both governmental (including state administrations) and private, key recommendations that emerged are as follows:

- a) The VAHAN database can be integrated with the E-waybill database to extract vehicle related information. Ideally, the system should allow E-waybill generation when the data from VAHAN databases flags the vehicle as fit-to-ply.
- b) To facilitate checking of vehicles based on risk assessment, information captured from databases of E-waybill, VAHAN, SARATHI, and National Crime Records Bureau should be shared through application programming interface with relevant agencies on a “need-to-know” basis.
- c) All enforcement agencies must be mandated to record every instance of inspection or checking. The E-waybill system can be used to create user identities for all departments to enable them to create reports based on verification.
- d) The MORTH has mandated the fitment of Vehicle Tracking System (VTS) devices using Global Positioning System (GPS) technology on all goods transport vehicles (Box 1).<sup>21</sup> A legal provision has been made under the Central Motor Vehicles 1989 to mandate GPS service providers to share data with the transport department and NIC.

### **Box 1: Compulsory Vehicle Tracking System for Commercial Vehicles with National Permits**

The Ministry of Road Transport and Highways (MORTH) has made fitment of a Global Positioning System (GPS) device compulsory for all commercial vehicles that apply for a national permit through an amendment to Rule 90 of the Central Motor Vehicles 1989. The GPS device must adhere to the Automotive Industry Standard 140 (AIS 140) for intelligent transportation systems developed by the Automotive Research Association of India.

This requirement makes it even easier to roll out an advanced digital framework for enforcement, as is proposed in this paper. Over time, as a VTS becomes a common requirement for all commercial vehicles, the need for a FASTag dependent scanning mechanism could be replaced by real-time tracking and full integration of information from GST E-waybill and VAHAN with the VTS. Enforcers can then move to a system of zero physical stops and inspections and take a remote control-tower based approach to enforcement.

Source: Study team analysis.

<sup>20</sup> Government of India. GST Council. 2017. Agenda Item 4.3. Minutes of the 12th GST Council Meeting held on 16 March 2017. <http://www.gstcouncil.gov.in/sites/default/files/gst%20rates/Signed%20Minutes%20-%2012th%20GST%20Council%20Meeting.pdf>.

<sup>21</sup> Government of India. Ministry of Road Transport and Highways. 2018. Gazette Notification (G.S.R. 643(E)). 12 July. <http://egazette.nic.in/WriteReadData/2018/187278.pdf>.

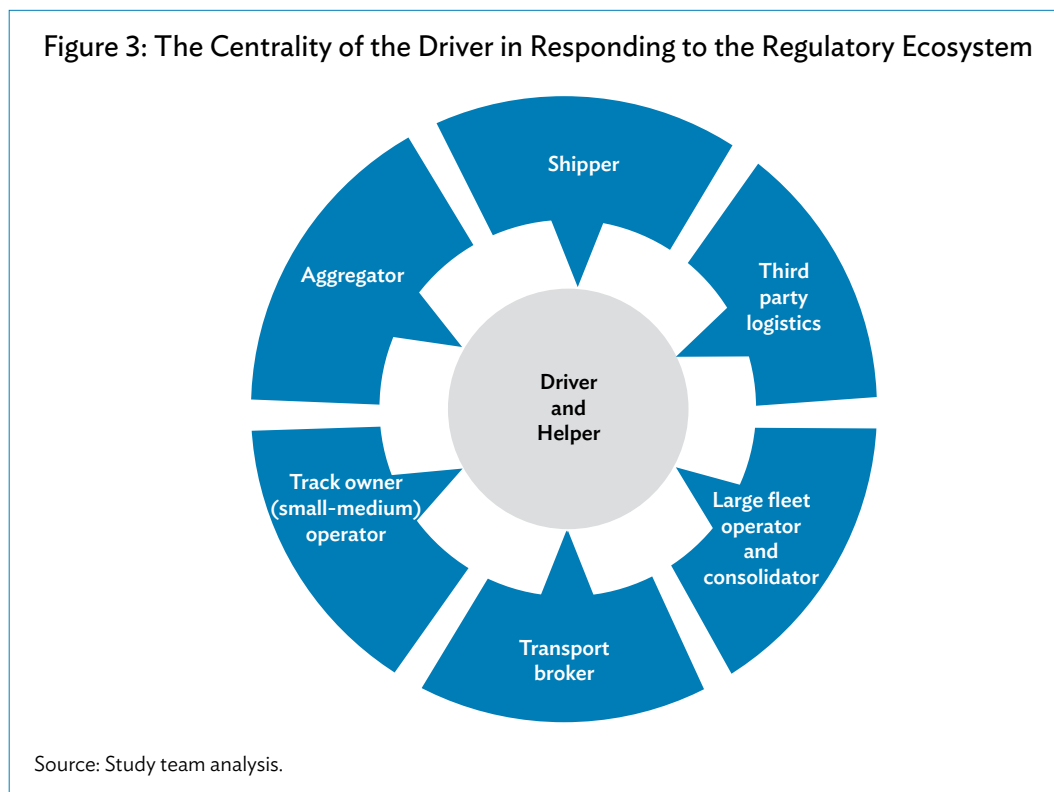
40. The problem definition of the task force is therefore fully aligned with the problem statement in this working paper. The solution design proposed in Section V is also in full concordance with the recommendations of the task force.

#### IV. CHALLENGES FACED BY PRIVATE USERS AND OPERATORS

41. A key objective of the ADB study was to analyze the state of play in the enforcement of regulations on road in India and to understand the micro perspectives of private operators. The study provided some interesting insights that have helped inform the proposed design of enforcement (Section V). This section provides a succinct summary of the key observations emerging from the private operators in road freight identified in the ADB study.

42. The road freight transport sector includes several private stakeholders, including users and operators. Service providers range from large and small fleet operators and transport brokers to cargo consolidators (including courier companies running ground transport operations). The road freight sector remains fragmented as there are single truck owners cum drivers who also form a part of the ecosystem. There is also a shift from asset (truck) based consolidators to technology-based aggregator platforms. It is a complex ecosystem in which different stakeholders provide and sell their services to each other.

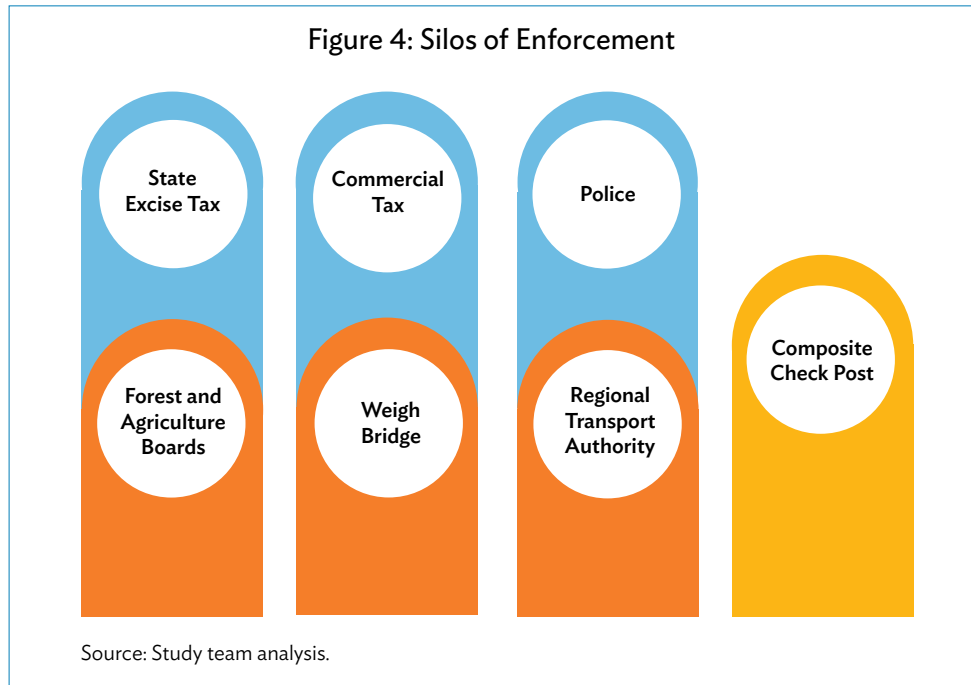
43. Irrespective of the nature of the transactional relationships in this ecosystem, the driver and the assistant-helper are the most critical stakeholders in the on-road operational environment. They play multiple roles, and are responsible for safety, security of the shipment, and management of all regulatory compliance and documentation en route. Thus, they are the central, common link to all stakeholders in this multi-relationship ecosystem (Figure 3).



44. Generally, the driver and the assistant-helper have barely functional literacy with little in-depth knowledge of the documents they possess and the regulations that exist. The regulations vary across the states, and in the absence of complete system integration, they tend to fall prey to unregulated brokers and unscrupulous officials. Enforcement agencies functioning in silos stop the freight for checking at multiple points along the way, slowing down traffic and increasing the burden of compliance.

#### A. Silos of Enforcement

45. Different states have different systems and technology to implement their regulations. Some states attempted to improve upon the system by creating composite check posts (CCPs) housing all enforcement agencies under one roof. Even though they are physically co-located, interagency coordination is still wanting, with duplication of processes and transporters and drivers being compelled to devote a lot of time to ensuring compliance (Figure 4). In addition, the flying squads of the revenue department are not under the purview of the CCP. At many state borders there are no CCPs and processes are still manual.



46. Gujarat has developed a system integration model where the database of the Road Transport Authority (RTA) is streamlined and integrated with the check posts, and in Telangana, the RTA is integrated with the police system. However, none of these states have operationally integrated with the interstate tax (GST or Excise) system or with the forest or agriculture boards.

47. The varying state capabilities in information and communication technology and diverse institutional mechanisms for enforcement have also led the drivers to carry physical copies of documents related to the vehicle, driver, and cargo, and produce them to transport and police authorities and flying squads multiple times in a single journey.

48. The driver of the cargo vehicle remains uncertain about the number of times his vehicle will be stopped on a certain route. Given that there is no requirement for transport officials to mandatorily log in (let alone electronically communicate) the reason for stopping a vehicle, or for clearing or penalizing the vehicle, there is also little control or transparency in this process.

49. This results in a system that requires drivers to settle all fines and penalties with cash. The driver of a cargo vehicle must therefore carry sufficient money with him as he may have to make payments at multiple check points. Such a system of manual recording and payment through cash leads to a lack of transparency and resultant loss of revenue for the state. In addition, it encourages rent-seeking and predatory behavior, and the mushrooming of “agents” and “facilitators” on the ground, adding to transaction costs and reducing the ease of doing business in road transport operations.

## **B. Major Issues**

50. One of the major issues lies with the enforcement of ODC and OWC norms. Matters get complex if the cargo list bears mention of hazardous or excisable material (such as liquor or alcohol), agricultural produce, or forest goods. The vehicle is flagged down many times over for same check, namely, the validity of national and state permits, driver’s license, appropriate fitness certificate, insurance, and PUC certificate.

51. Weighbridge accreditation among state departments across India is generally not robust. Weak RTA check post infrastructure (e.g., absence of weighbridges or poor cross-utilization of NHAI assets) does not provide an opportunity for a quick and accurate resolution of the matter. Vehicles carrying automobiles are mostly inspected physically at check posts to ensure that the number of units being carried and declared matches. Food grain trucks are checked physically too to safeguard against the possibility of taxable goods being moved under the cover of food grains (which are nontaxable).

52. Facilities for drivers or helpers to rest, wash, bathe, cook their food, and meet other daily needs are inadequate. Medical assistance in case of an emergency is not readily available on the road.

53. The limitations of the regulatory system have bred a system where noncompliance is a common and profitable activity. Some transporters try to profit through unofficial payments to corrupt officials in exchange for bypassing the compliance checks of overloading; using expired permits, fitness, and insurance certificates; and other means such as deputing only one driver per truck even for long hauls (where two are mandated) and avoiding payment of routine costs.

54. The ODC and OWC norms vary. In certain states overloading entails penalties while in others it is completely banned for onward journey. Even if penalties are paid, state taxes are not recomputed based on changed (increased) quantity of cargo. There is a network of NHAI toll plazas with inbuilt (roadside) weighbridges for the prevention of overloading on national highway sections. As part of the NHAI mandate, private concessionaires are authorized to penalize 10 times the toll charge in cases of overloading and to detain the excess load. It has been observed, however, that even if penalties are collected, the detention of excess loads remains unworkable owing to issues such as land availability, cargo safety, and security at toll plazas.

55. Some state governments have been proactive in setting up systems. For instance, the System Integration Project (SIP) in Gujarat integrates the transport department in Gujarat with vehicle- and driver-related processes through the latest versions of VAHAN and SARATHI. The Shamlaji check post at the Gujarat–Rajasthan border is equipped with an automated vehicle measurement system, automated number plate recognition system, electronic weighbridge, and database integrated with state regional transport and MORTH databases. The main functions of the automated check post include lane operation, generation of vehicle check report, wanted vehicle master, compounding receipt generation and cancellation, lane-slip listing, checking report listing, and reprint utility. The camera-based measurement grid captures width, length, and axles. However, this system is not well equipped to handle the load of peak traffic. In practice, manual operation takes half the time compared to this automated system at the

peak hour. Similarly, the Citizens Friendly Services of Transport Department (CFST) application renders services relating to driver's license, check-post functionality, fitness transaction slot booking, online quarterly tax payment, and online green tax payment, among others. However, the manual verification of documents beats this system as well.

### **C. Ways to Improve the System**

56. Transparency and accountability can be increased by re-engineering processes, the re-orientation of regulations (such as harmonization of OWC and ODC regulations), and the use of modern technology. To adopt suitable deterrent measures within a system that identifies repeat offenders, the development of a risk management system (RMS) is necessary. The system should incorporate the ratings of carriers, drivers, and other stakeholders with alerts and warnings across highways and states, as well as the risk parameters related to the movement of types of goods to and from certain destinations. A suitably designed RMS may not stop all vehicles for checks. Thus, there is a need for uniform digitization and enforcement.

57. Given the availability of extensive resources to prevent overloading at national highway sections, an automated and integrated border solutions and mobile inspection system using toll plazas (with weighing systems), as described in Section V of this paper, could be introduced. This would enable the common usage of weighbridge facilities for overload enforcement under national and state regulations.

58. There is a need to develop facilitation centers and grievance redress systems. The facilitation centers should enable the drivers to establish contact with the transporter. Any penalty to be paid should be made electronically by the transporter and no cash transaction should be made by the driver. Electronic receipts and documents should be generated and maintained. In-transit mitigation measures for strikes and closures, accidents or breakdowns should be in place. Development of driver rest stops with a secure parking terminal and medical facilities are also mandated.

## **V. DESIGN FRAMEWORK OF COMPLIANCE AND ENFORCEMENT ARCHITECTURE**

59. Any proposed reform of enforcement systems should balance two critical objectives. The suggested reform will have to ensure that the regulatory objectives of enforcement are not compromised. It should also ensure that the new design of enforcement suggested in this paper leads to significant procedural improvement and efficiency. The change in enforcement model being proposed here can potentially meet both these objectives.

60. The proposed new enforcement model is an integrated one in the sense that it provides for a single point enforcement structure (on ground) for all the different regulatory compliances required of road freight operations. Not only does this rationalize the deployment of often scarce enforcement manpower, it also substantially reduces the number of times the vehicle operator has to stop and interface with enforcement authorities, thereby significantly reducing transit time and improving transparency and ease of doing business.

61. The proposed new enforcement design also brings in automation and digitization of the procedures, which enables smart enforcement based on risk management principles, leading to better targeting of potential risks for enforcement agents on the ground. Risk targeting also leads to much greater facilitation for a vast majority of vehicles operating on the road, which would now not be interdicted, checked or inspected.

62. Essentially then, smart deployment and risk-based focused targeting allows enforcers achieve improved results on their regulatory objectives to plug revenue leakage and prevent infractions related to transport regulations, while vehicle operations become more efficient and there is much greater transparency and ease of doing business.

63. The new enforcement design is based on the following key principles:

- a) development of a comprehensive enforcement procedure covering all substantive regulations relevant to freight transport by road, i.e. institutional coordination among enforcement agencies to optimize the already scarce enforcement resources on ground;
- b) integration of databases (GTSN E-waybill, VAHAN, and FASTag) that allow risk-based targeting of vehicles on the road, leading to optimization of the number of checks based on risk management principles;
- c) adoption of app-based digital solutions that help enforcers access all required information and manage the procedural aspect of enforcement in a transparent manner with digital record-keeping;
- d) development of digitally-enabled infrastructure, which also helps automate some of the check-post related procedures and rationalizes the system of on-road checks and inspections by developing dedicated infrastructure for such activities; and
- e) integrating checks and balances in system design to ensure fairness and transparency.

#### **A. Synchronization of Tax and Nontax Regulations Enforcement**

64. As indicated earlier, all enforcement is related to ensuring that goods being carried and their vehicles comply with transport regulations. Thus, any system that proposes to integrate these two aspects must have full visibility of the data related to both the goods and the vehicle. The GST E-waybill has all relevant details related to the goods being carried that would be required by enforcement agencies to meet both tax and nontax (product market regulations, contraband, forest, etc.) regulatory objectives.

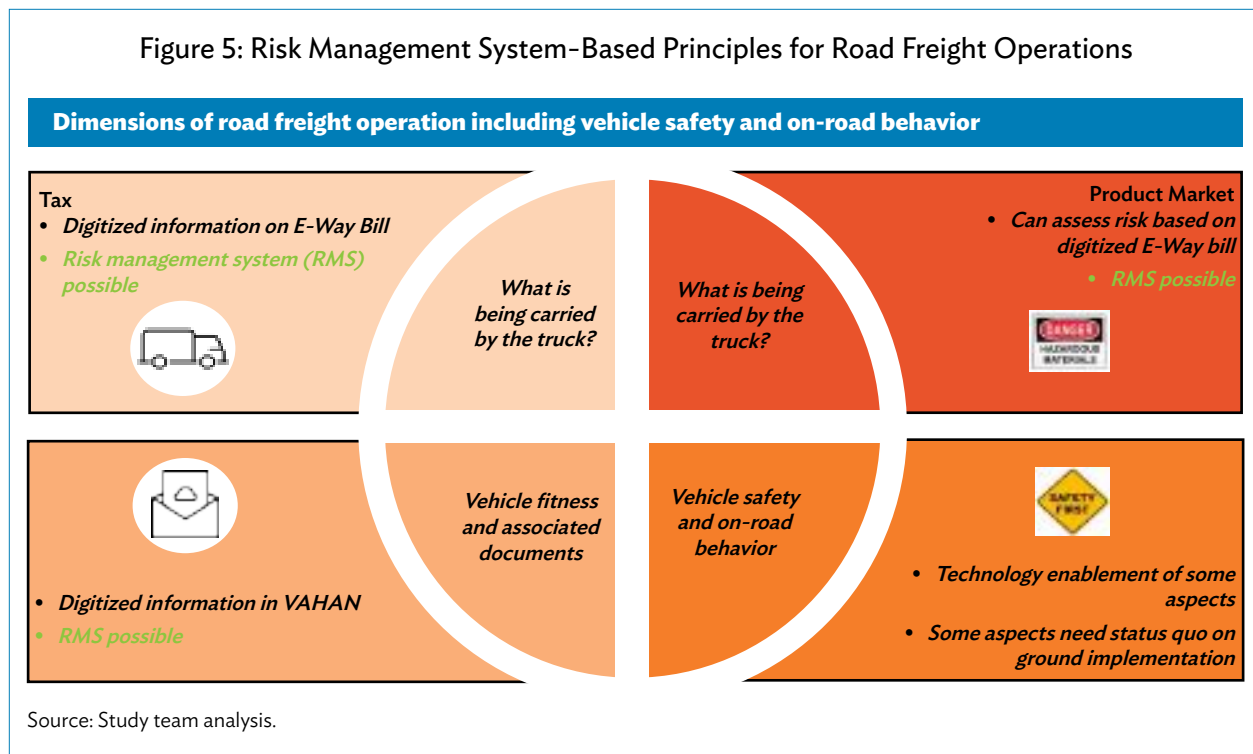
65. Similarly, the VAHAN database covers most vehicle-related details of interest to regulators—registration certificate, fitness certificate, updated record on payment of taxes and permit-related dues, and insurance validity. In addition, it allows verification of vehicle identity (matching of registration number with chassis identification). Integration of PUC data is work in progress and in time this information will also be available via VAHAN.

66. There are two key missing elements in the enforcement framework that is unrelated to either the goods being carried or the carrier vehicle and has to do with actual on-road behavior of the transporter or vehicle operator. The first has to do with OWC and ODC without requisite permits and safety measures. The second has to do with unsafe driving behavior and other traffic-related infractions. Examples of traffic-related infractions unrelated to driving behavior include driving with damaged headlights and taillights, malfunctioning muffler or other such vehicle accessory or machinery-related offences. It needs to be pointed out that statute books include several such traffic-related infractions.

67. The proposed enforcement design will be able to ensure regulatory enforcement of OWC and ODC infractions in an efficient manner (the details are discussed later in the next section related to operational aspects of the proposed enforcement design) (Figure 5). However, the other aspects of on-road driver behavior or noncompliance with other traffic infractions are, by definition, on the spot. In most cases it literally should be on the spot. For example, enforcement agencies need to be present on the spot to observe speeding or unsafe overtaking (physical presence is also by proxy in the form of cameras but will not cover all stretches of the road). These aspects will have to continue to depend on on-spot enforcement resources. Figure 5 provides a graphical summary of a road enforcement system



focusing on risk-based intervention, drawing on data from GST E-waybill, VAHAN, and on-road sensors to check dimension and weight of trucks.



68. While outside the primary scope of this working paper, there is also a need for rationalization of the enforcement response to traffic-related infractions. Traffic infractions vary in terms of seriousness and the risks posed to people and traffic. The enforcement philosophy needs to take this into account, and specific standard operating procedures (SOPs) related to the consequences of infractions need to be put in public domain and strictly enforced.

## B. Building Blocks of the Proposed Enforcement Design

69. The proposed enforcement design includes a software solution (application) integrating data from GSTN E-waybill, VAHAN, and a selected network of weighbridges, and has a risk management algorithm built into it. It also has some infrastructure design elements to support smart enforcement.

70. As a key point of departure, the new enforcement design proposes single point enforcement for all agencies, without separate risk assessment, stoppage, checks and inspections by different agencies.

71. Both the digitization element (with comprehensive risk assessment features to address the concerns of all regulators) and the common enforcement infrastructure are therefore essential to this new design. A brief discussion on the key features of the digitization and infrastructure design elements is necessary prior to outlining the detailed operational model for enforcement.

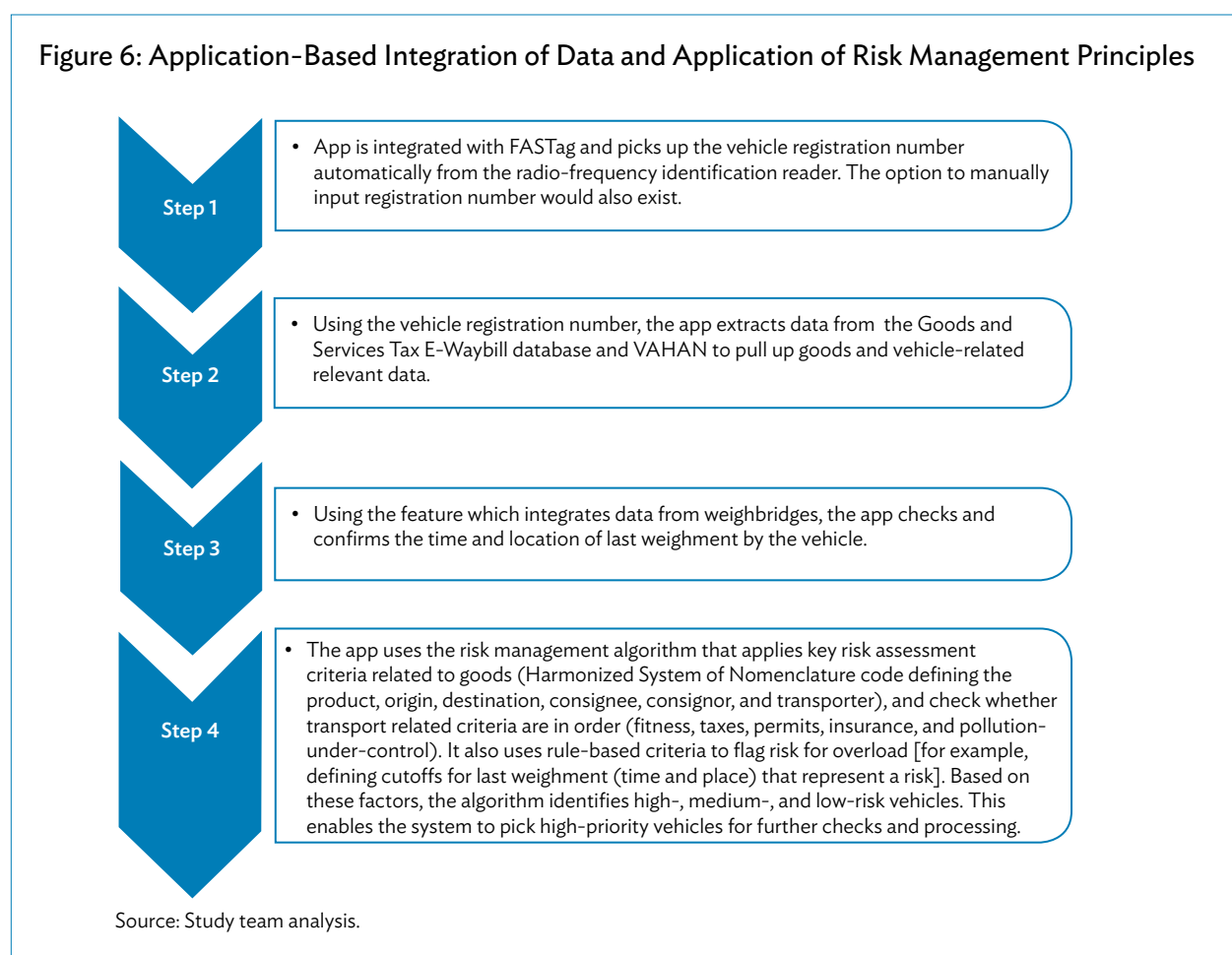
### **The digitization element**

72. The digitization element has four key components.

- a) It allows integration with FASTag RFID readers at tollbooths and mobile autonomous readers (easily installed on roadsides) that use FASTag to capture the vehicle registration number.

- b) It includes an application that uses the vehicle registration number to extract key data elements from
  - i) GST E-waybill [product being carried (Harmonized System Nomenclature code), origin, destination, time of E-waybill generation, transporter, consignee, consignor, etc.]
  - ii) VAHAN (motor vehicle tax, permits, insurance, fitness, PUC certification, etc.)
- c) The application allows for integration with designated weighbridge operators, updating the last weighment and result for a truck (again based on the registration number).
- d) The risk management randomization algorithm built into the application uses key risk factors for goods- and transport-related infraction. Using the data from the E-waybill (related to goods) and VAHAN (related to vehicle) it identifies high-risk vehicles (that need to be checked further) and low-risk ones that could be allowed to travel without checks.

A brief description of application-based integration of data and application of risk management principles is outlined in Figure 6 below.



### ***Risk management principles applied by the digitization element***

73. It is important to elaborate on the risk management principles being applied and to explain how they meet the regulatory enforcement requirements of all agencies concerned (the key to the integrated enforcement approach). The risk assessment factors related to tax authorities primarily center on the nature of goods being carried, for example, raw materials such as metal ores or agricultural commodities. Many of these risks are specific to states or regions. For example, tax avoidance related to ores might be

more common in Odisha, Jharkhand, Chhattisgarh, Bihar, and Eastern Uttar Pradesh whereas timber might be a concern in Madhya Pradesh and Chhattisgarh, while Goa, Kerala, Karnataka, and Tamil Nadu focus on the movement of cashew nuts. Thus, origin and destination are important factors in risk assessment from a tax perspective. The risk management algorithm will assign appropriate weights in consultation with authorities for consignments related to certain commodities or certain origin–destination pairs.

74. The risk management principles will therefore reflect the current methodology of enforcement focusing on certain origin–destinations and border points, looking closely at a few specific commodities. It would adopt a systemic and consistent application of risk assessment based on comprehensive data available and not a case-by-case discretionary approach of the officer on ground.

75. The risk assessment factors for other agencies, such as those regulating forest produce, the movement of hazardous materials, or other regulated products, are also informed by the nature of commodity and the origin–destination pairs. The associated routes or corridors indicate where such movements are most likely or present higher risk of noncompliance. Over a period, the risk management related database may be expected to gain in sophistication with historical data presenting patterns related to consignor, consignee, and transporters, allowing for greater accuracy in pinpointing of risk.

76. In the case of risk assessment related to transport regulations, the availability of original data for all areas of concern (tax, vehicle fitness, insurance validity, etc.) is in itself a validation of compliance. In cases where data is either unavailable or indicates non-compliance (say, a three-wheeler vehicle reports a large consignment of goods), risk can be flagged and communicated. Here too, historical data may lead to better pinpointing of consignee, consignor and transport-related risks based on past behavior.

77. Historical data will also provide details of the type of goods that are most likely to be overloaded or pose over-dimension dangers, and also the corridors where such noncompliance is most rampant. Knowing the patterns of transporter and consignor behavior will make noncompliance risk assessment more accurate.

78. Like any robust risk management system, the proposed algorithm will also include a purely random element. This implies that a small percentage of such trucks will also be marked for scrutiny for which data from the E-waybill and VAHAN databases did not point to any concerns. The existence of the random element acts as a big deterrence to noncompliance.

### ***Infrastructure and information technology hardware***

79. The proposed infrastructure includes fixed installations at toll plazas equipped with technology and hardware for automated booms regulating vehicular movement and provides for dedicated inspection zones. The information technology hardware envisaged allows smart enforcement by mobile units. Essentially the following elements of infrastructure and hardware are required:

- a) a dedicated lane for goods carriers in major toll plazas, redesigned to meet the requirements of the integrated enforcement mechanism;
- b) technology-enabled mobile units for enforcers of random checks in between large stretches of national highways between two toll booths, or in state highways with few toll booths; and
- c) dedicated inspection zones for vehicles.

### **C. Operational Model for Enforcement**

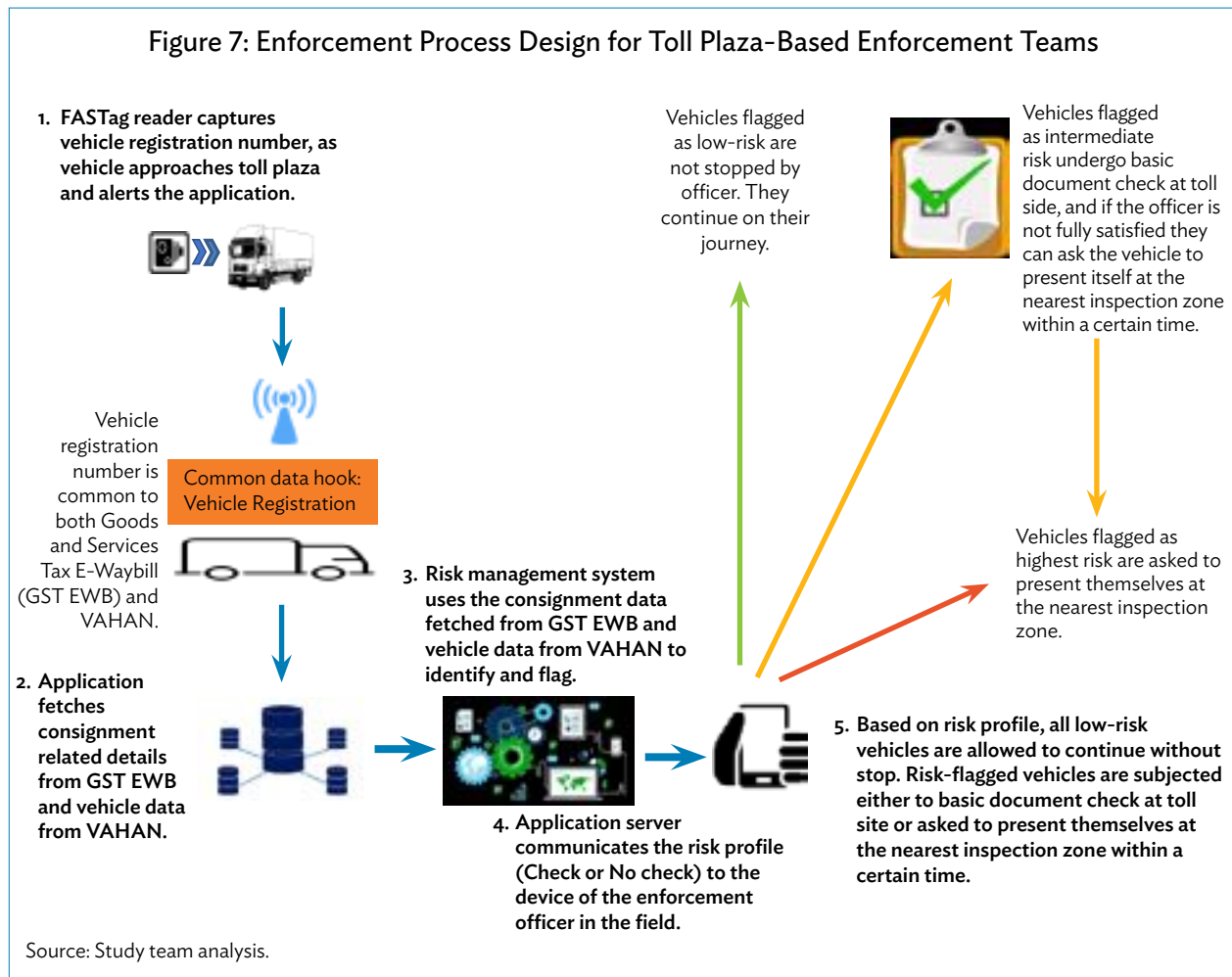
80. A two-layer system of enforcement is suggested. The two layers are mutually reinforcing and include technology-enabled fixed installations and integrated mobile inspection units (IMIUs) to create an effective enforcement model that minimizes noncompliance with rules and regulations and identifies

most noncompliant behavior, while providing for adequate checks and balances in the system to make enforcement transparent and minimize harassment of vehicle operators.

81. The specific operational models at the fixed installations at toll plazas and the mobile unit, include (i) the sequence of data capture by the technology hardware; (ii) the application of the risk management principle in operational terms; and (iii) the role of the enforcement officers.

**Fixed installations at toll booths**

82. Under the proposed enforcement design, commercial cargo vehicles are directed to “dedicated” lanes, preferably not congested by private or passenger commercial vehicles (Figure 7).



83. As the vehicle approaches the toll, the FASTag readers placed about 3 km from the toll plaza capture and convey its registration number to the enforcement application (enforcement app).<sup>22</sup> As explained in Figure 6, the application then fetches information from the GST E-waybill and VAHAN, and applies the risk management algorithm. Based on risk identification factors in the algorithm (such as origin or product type), vehicles representing regulatory risks for any of the agencies (that is, tax, transport, or product market) are identified and selected for further screening. Some vehicles are also identified based on a randomization exercise (for instance, one in 40 vehicles headed for destination A).

<sup>22</sup> The assumption is that conveyance of the data to the RMS application would take 60–120 seconds. A truck travelling at even a high speed of 80 km per hour would need about 130 seconds to cover a distance of 3 km.

84. If a vehicle is not identified for further screening, then it crosses the toll and continues its journey unimpeded. If a truck is flagged either due to risk factors or the randomization exercise, then the toll boom in the lane remains closed as the truck comes through, requiring it to stop. The toll executive directs the truck to a sideway parking (as indicated in Figure 6) if the system indicates basic document verification. However, if the system indicates concerns of overloading, possible undeclared goods, potential smuggling, or transport-related infractions, the toll executive shall direct the truck to the nearest inspection zone for thorough physical inspection of the cargo, weighment, vehicle, or documents as appropriate.

85. Typically, the algorithm should be programmed to flag weighment risk (overloading) only if the last weighment from a weighbridge (which is integrated into the application as discussed earlier) is either a certain distance away, or some substantive amount of time has elapsed between the last weighment and the vehicle arriving at the toll plaza.

86. If the officer verifying the documents is satisfied, she gives a clearance in the system and allows the truck to continue its journey. If the officer is not satisfied, however, she red-flags the vehicle in the system stating the reason, and directs it to the nearest inspection zone. If the basic check and inspection identifies noncompliance, the officer may issue an e-challan in the system.

87. A truck is not expected to remain in the sideway parking area [equipped with closed-circuit television (CCTV) cameras] for more than 10 minutes. Exceptions will be tracked daily.

88. A truck flagged for further checks and inspections at the inspection zone will have to appear at that zone within a reasonable stipulated time. Delayed appearance should typically be fined and nonappearance should trigger a red alert, leading the truck to be apprehended either by the nearest mobile unit or at the next toll booth (whichever is earlier). The red alert remains in the system till the time the truck has been intercepted. Severe fines and penalties are imposed for such nonappearance.

### ***Integrated mobile inspection units***

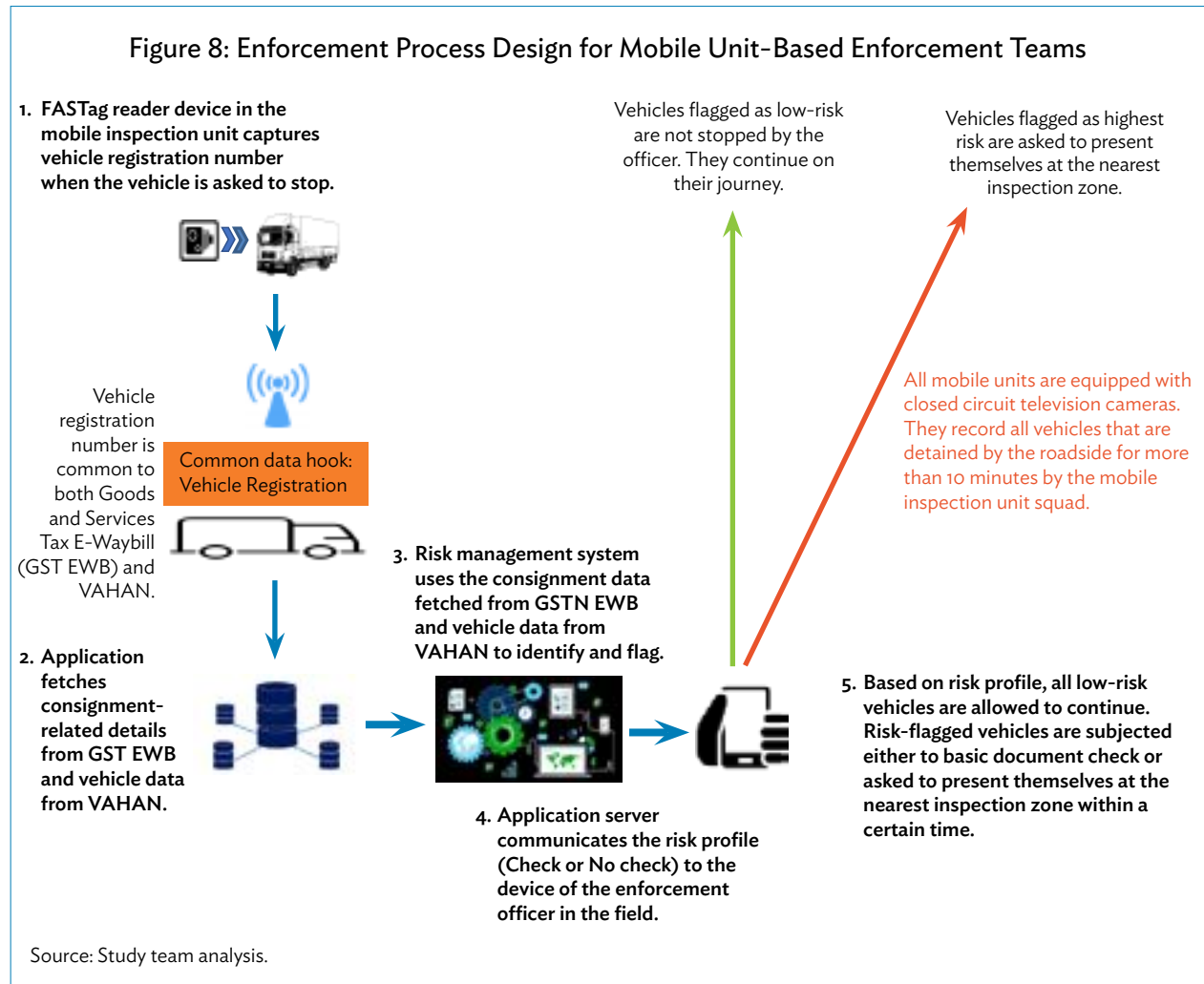
89. All IMIUs should have officials from tax, transport, police, and forest departments bringing with them discrete areas of expertise.

- a) **Tax Department officials.** They will have expertise to verify compliance with tax regulations, inevitably seeking to know “what is being carried and how much”, thus automatically supporting the verification for all other product market regulations as well.
- b) **Transport Department officials.** They will have expertise to verify compliance with transport regulations.
- c) **Police Department officials.** They will have expertise to address security-related concerns.
- d) **Forest Department officials.** In areas that fall under the jurisdiction of the Forest Department (general vicinity of reserve forests and other notified forest areas), a forest department officer may also be included in the IMIU team.

90. The process followed by IMIUs is identical to that followed at the fixed installation toll plazas as mentioned in paragraphs 83–88 above (Figure 8).

91. If the system indicates concerns of overloading, possible undeclared goods, potential smuggling, or transport-related infractions, the IMIU shall direct the truck to the nearest inspection zone without carrying out any inspection by the roadside.

92. All basic inspections and checks carried out by the IMIU officials at the roadside will be mandatorily done under CCTV recording including audio.



### ***Integrated inspection zones***

93. The state government shall identify a few locations as integrated inspection zones (IIZs). Like the IMIU, the IIZs shall have official representation from tax, transport, and police departments. Some zones might have special needs, i.e. forest officers or officers of the Department of Mines to check special cases of smuggling or contraband. The IIZs must be large enough to accommodate at least 20 trucks, basic offices, toilets, and two empty forty-foot equivalent unit (FEU) containers. Given that the Government of India has prioritized road safety, these facilities could be integrated with highway basic first aid and emergency care infrastructure and house an ambulance.

94. All IIZs will be equipped with at least five basic truck bays designed to allow for easy physical inspection of goods, including unloading of trucks if required. Other technology which makes the inspector's life easier, such as electronic weighment, cameras to read chassis number, etc., shall also be made available.

95. The truck bays where the inspections take place should be equipped with CCTV cameras including voice recording. Full recording of each inspection shall be retained in the database till all cases arising from it are resolved. Also, a recording of the inspection shall be mandatorily made available to the consignor, consignee and the transporter in question.

96. A couple (or more) empty containers with locks should be made available in IIZs. These would be specifically provided for the use of part-load goods (i.e. consignments in a multi-consignment truck) that run into compliance issues with tax or other departments. Such part-load consignments that come under scrutiny can be offloaded at the IIZ and stored at these temporary facilities, and the truck with the rest of the consignments that are in the clear can continue toward its destination. This would ensure that one consignment does not hold up all the rest. The responsible consignor or transporter can approach the proper officers and get their goods released and evacuated from the temporary facility at IIZs after due process.

97. The gateway to the IIZ would be equipped with FASTag readers to confirm the entry and exit of the red-flagged truck. This will ensure that only those trucks flagged by the system appear at the zone, and that all such flagged trucks actually appear, i.e. no form of collusion allows these trucks to get a free pass and not appear at the zone at all. It would also track the time at which the flagged truck left from the IIZ. Records will be kept of the average amount of time it takes to process vehicles flagged to these IIZs. The entry and exit points of the IIZ will also be equipped with CCTV cameras.

#### **D. Summary of Transparency Measures**

98. As discussed in preceding sections, a range of transparency measures has been envisaged to ensure that enforcement mechanisms minimize rent-seeking, collusion, and harassment by unscrupulous officers. Reliance on the risk algorithm and system-led randomization for identifying trucks for scrutiny is the central transparency measure. If it is no longer up to the officer to decide which truck to stop, scope for poor governance, collusion, and rent seeking in the on-road enforcement of rules and regulations associated with road freight is minimal.

99. Of course, sovereign functions of enforcement require officers to act upon their experience, intuition, and on-the spot assessment to prevent noncompliance, vesting the officers with the right to override systems-based decisions from time to time. This right also remains firmly in place in the revised tech-led enforcement design suggested here. Officers would retain the right to overrule the system-based decision, but only in those cases where the system has not identified a truck for scrutiny. If a truck has been identified as representing risk and identified for scrutiny by the system, the officer cannot overrule that guidance and give the vehicle green-channel treatment.

100. Whenever an officer overrules the system in marking a truck for scrutiny, they must log the reason for doing so in the system. The record of such overruling by each officer may be tallied against instances of actual noncompliance found in such cases at any time. This data would allow the senior management in these departments to take a call on the officer's performance in balancing ease of doing business objectives with the preventive aspects of enforcement.

101. The suggested new enforcement model also requires that all major inspection and checks, including the cumbersome physical inspection of goods or thorough inspection of the truck (checking documents in detail or physically confirming chassis numbers, etc.) take place only at designated locations, that is, IIZs. This would not only reduce unnecessary congestion on the roadside when sudden ad-hoc inspections are carried out by mobile units, but also increase transparency of such processes.

102. The CCTV camera and audio recordings deter both officials and transporters from malpractice because all interactions between them, whether at the sideway parking at tollbooth, the roadside when the truck is stopped by the IMIU, or at the IIZ itself are recorded. Since recordings are maintained in the database (and available to all parties including the consignor, consignee, and transporter in case of IIZ processing) till all procedures or cases related to the incident are closed, transparency is only enhanced.

103. Since the system will be designed to keep a record of officers' decisions to overrule the system, or to send a truck to IIZ post initial scrutiny, along with reasons, it will increase accountability. At the micro-level, individual officers can be held accountable by their seniors for their decisions. At the macro-level, the performance of officers along particular stretches of roads or at the state level may be assessed, along with benchmarking of governance by departmental field formations.

104. If state-wise data on performance parameters of enforcement (including specific stretches of national and state highways within each state) were to be placed in public records, this would improve the culture of accountability and incentivize good governance by field formations.

## VI. PILOT APPLICATION OF THE CONCEPT

105. In order to test for the efficacy of the proposed enforcement model, it is recommended that pilots be initiated in collaboration with the relevant state governments in select corridors. Through pilots clarity may be gained on

- a) the difficulties faced by enforcement officers in adopting technology solutions;
- b) the challenges to intra- and interstate institutional cooperation across agencies; and
- c) usefulness of the model in improving domestic trade facilitation via road freight.

106. Selection of corridors for the pilot should be based on a "three-factor analysis" of

- a) the importance of road freight along them, measured by the frequency of truck movement (based on FASTag data collected at NHAI toll plazas);
- b) the number of large trucks using these routes; and
- c) their significance as interregional corridors between key economic clusters (not just along the relatively busy north-west, north-south, and intra-south corridors, but also including eastern and central India).

107. Applying these factors, the following stretches could be prioritized for pilots:

- a) National Highway 48 (NH-48): Delhi-Mundra, Delhi-Jawaharlal Nehru Port Trust, Mumbai-Bengaluru
- b) NH-53: Bhilai-Paradip
- c) NH-52: Jaipur-Hubli
- d) NH-19: Agra-Kanpur-Delhi
- e) NH-67: Hubli-Krishnapatnam
- f) NH-16: Kolkata-Visakhapatnam

108. Since these corridors are hundreds of kilometers long (and in some instances over 1,000 km), a specific stretch of 200-300 km could be selected for the pilot. Care should be taken to ensure that the selected stretch crosses at least one state border so that the pilot can adequately test interstate interagency coordination.

109. The findings of the pilot could be used to refine the enforcement design and improve the enforcement app workflow. Most importantly, the pilot would demonstrate to state governments the feasibility and efficacy of this model in securing better enforcement while deploying lesser staff and other resources, at the same time, ensuring more efficient freight movement.



110. Once the model is validated by the pilots, it could be adopted more broadly across the country with some variation across states. Variants are fine as long as they subscribe to the basic premise of leveraging digitally available information and using principles of risk-targeting to minimize physical stoppages, scrutiny and inspection.

111. Appropriate technological changes are underway. As was pointed out in Section III, GPS-enabled VTS is already compulsory for commercial vehicles that have a national permit and the Central Motor Vehicle Rule No. 90 has been suitably amended to reflect this change. It is expected that VTS would become compulsory for all commercial vehicles in a relatively short time, and original equipment manufacturers of heavy vehicles have already started embedding such devices in the chassis of new commercial vehicles. Since VTS would become ubiquitous, the proposed model would serve as a building block of a zero physical intervention enforcement ecosystem (Box 2).

### **Box 2: Future Models of Enforcement for Road Freight**

Once GPS-enabled VTS provides a unique digital identifier for every commercial vehicle and corresponding digital information is accessible from the VAHAN and GST E-waybill databases, state governments will no longer need to deploy personnel on roads to enforce rules and regulations. A digital control tower and the risk identifier algorithm would suffice, as illustrated below.

#### **Enforcement of regulations related to tax and product market**

- Real time tracking of the truck route will enable the digital control tower to identify deviation from declared origin–destination.
- Integration with the E-waybill database will allow risk targeting based on declaration parameters (origin, destination, HSN classification, value, consignee location and type, etc.) and historical patterns of noncompliance.
- A truck that is deemed risky would be directed to the nearest inspection zone at the next toll plaza it crosses. If any issues are found at the inspection zone, an e-challan would be issued.
- If the flagged truck does not appear at the inspection zone, an e-challan would be issued anyway, the nonpayment of which would result in blacklisting.
- The vehicle would be seized at the next toll plaza it tries crossing post the blacklisting.

#### **Enforcement of regulations related to transport and traffic**

- Smart-sensors and CCTV cameras set up in mobile units and fixed installations at key sections of highways would capture instances of speeding or erratic driving without having to stop the vehicle.
- E-challans could be issued accordingly and, in some cases, red alert issued to stop such trucks at the next check point for seizure of the drivers' license.
- Less critical incidents of noncompliance, such as missing or dysfunctional accessories (broken bumpers or taillights) or illegal ferrying of people in a cargo vehicle, could also be electronically registered and handled on similar lines (through e-challans or red alerts).

#### **Enforcement of regulations related to overweight and over-dimension cargo**

- The model integrates data from all weighbridges and cameras digitally with the enforcement application, fully automating enforcement related to overloading and over-dimension cargo.
- Cargo that is over the stipulated weight or dimensions or dangerously loaded can be electronically logged, photo-evidence stored in the database, and e-challan issued.
- Where correction is urgently needed, the vehicle may be red-flagged for compulsory reporting to the nearest inspection zone within a stipulated time.

CCTV = closed circuit television, GPS = global positioning system, GST = Goods and Service Tax, HSN = Harmonized System of Nomenclature, VTS = vehicle tracking system.

Source: Study team analysis.

## VII. CONCLUSION

112. Reforms to facilitate domestic freight movement will be effective only if enforcement models are harmonized across states, enforcement methodology standardized, and on-ground processes simplified to achieve the goal of “One Country–One Mechanism” for compliance and enforcement.

113. The mechanism proposed in this paper suggests a way to potentially meet the need for harmonization, standardization, and simplification across states. Since the model rides on existing governmental digital databases accessible to enforcement agencies across the country, a harmonized system of information flow in a standardized format is embedded in it at the outset. The model uses these databases to define a process flow with SOPs for different compliance-related scenarios. It thus provides a standardized enforcement methodology which is relatively simple to enforce.

114. A well-defined SOP that minimizes arbitrariness in enforcement will be seen by both transporters and their clients as a major improvement on the current system, marking a significant step forward in intra-country trade facilitation.

115. Restrictions on road freight movement in India in the wake of the COVID-19 lockdown highlighted the need for a comprehensive remotely-managed digital system of approvals, minimizing on-ground checks and enforcement. During the lockdown, in the absence of a clear system or protocol for vehicles crossing into a state, city, or district, border check posts became congested and chaotic. The authorities were especially hard pressed to regulate the movement of empty trucks as they could not verify whether such a vehicle was on a legitimate trip to pick up goods or violating lockdown orders. Confusion at check posts choked the efficient movement of even essentials like food and medicines.

116. The system proposed in this paper could facilitate management of domestic road freight by simply integrating an additional feature into the enforcement app allowing truckers to obtain online permits for movement between two points. States would be able to work through the central control tower to digitally approve such permits. Any permit request made in the app would be routed to the local officer, who in turn would provide the approval through the app. The sensors in any physical barrier post would recognize the truck undertaking a valid movement, as would mobile police teams on the ground by simply scanning the RFID FASTag using their smartphones.

117. Any enforcement model that makes substantial changes to the existing methodology requires adoption of new technology solutions and institutional changes, which must be tested in the real world. This is essential to identify and understand operational and implementation issues including but not limited to level of comfort the enforcement officials have with the new system and the confidence they repose in the new methodology meeting the enforcement needs. Thus, pan-India adoption of the new system must be preceded by a series of pilots, the learnings from which are used to improve upon the proposed enforcement design.

118. Such an enforcement model would be systemically integrated through technology and digital databases nationally, and would follow a nationally-accepted SOP. Each state government would then enforce the model subject to its risk priorities being incorporated appropriately into the risk algorithm applicable to the stretches of road within its jurisdiction.

119. Developing such a model would therefore require a lot of effort and coordination between the centre and the states, as well as across state agencies. The returns to such effort, however, would be substantial. Facilitation gains for India’s domestic trade (which is largely road-freight dependent), rationalization of human, financial, and technical resource deployment by state governments for enforcement, and prevention of noncompliant behavior including revenue leakage would bring rich

returns on this investment. Mostly importantly, the work environment would improve substantially for the millions of road transport workers and operators. Their key role in running the lifeline of the economy was never understood more keenly by India than during the pandemic.

### Appendix: Requirements and Offenses by Regulatory Touch Points

#### GST AND PRODUCT MARKET OFFENSES

- Misdeclaration
- Mismatch between declaration and invoice
- Travelling without E-waybill
- Product market
- Controlled product (e.g. forest)
- Regulated product (e.g. hazardous goods/ alcohol for human consumption)

#### VAHAN-RELATED OFFENSES

- Driving without a valid auto insurance
- Driving without a valid permit
- Driving without valid vehicle fitness certificate
- Pollution-under-control certificate not updated
- Vehicle without registration certificate
- Driving without carrying a valid driving license

#### MINOR VEHICLE-RELATED OFFENSES

- Vehicle is not painted in required color and design format
- Vehicle is without wiper
- Vehicle has missing or damaged side mirror
- Vehicle does not have functioning horn
- Vehicle does not have fixed silencer
- Vehicle is emitting noise (silencer or muffler emitting noise)
- Vehicle is emitting pollution or noxious exhaust
- Rear number plate is not illuminated
- Vehicle is without seatbelt
- Vehicle has dark or tinted glasses
- Driving with two fuel tanks

#### CARGO-RELATED OFFENSES

(Over-dimensioned/Overloaded/Dangerous)

- Cargo carried more than 11 feet high
- Overloading
- Oversized load
- Unsafe carriage of goods
- Loading on tail board

#### DRIVING-RELATED OFFENSES

- Driving under influence of alcohol or other intoxicants
- Driving when physically or emotionally unfit
- Driving without seatbelt
- Driving by a minor or allowing a minor to drive
- Driving by person not licensed
- Disobeying traffic police in uniform
- Use of horn in silence or No-Horn zone
- Use of shrill or loud horns

#### TRAFFIC AND ON-ROAD OFFENSES

- Driving above speed limit
- Overtaking hazardously
- Overtaking from the wrong side
- Taking improper U-Turn
- Not driving in proper lane
- Failure to slowdown at junctions or intersections
- Signal jumping
- Failure to give proper signal
- Not complying with signals
- Violating traffic lines
- Not keeping to left side of the road
- Not carrying on left of traffic island
- Driving on footpath
- Stopping at pedestrian crossing or crossing a Stop Line (Zebra Cross)
- Driving against one-way flow
- Reversing without due caution and care
- Not taking adequate care while taking a "Turn"
- Leaving a vehicle in untenanted engine
- Violating NO ENTRY
- Improper use of headlights or taillight
- Using a high beam when it is not needed
- Parking on pedestrian crossing or traffic island
- Parking in a manner to cause obstruction to people or traffic
- Parking on a bridge
- Parking in a NO PARKING zone
- Parking within 15 meters on either side of a bus stop
- Abandoning a site of accident without due care



Source: Study team analysis.

## **Technology Framework for India's Road Freight Transport**

### *Compliance and Enforcement Architecture Reform*

In India, different agencies conduct inspections on road freight in transit, which can cause unscheduled stoppages that result in delays and add to operational costs. Compliance and enforcement architecture reform involving road freight transport in the country involves the application of data-based and integrated digital tools that can enable inspection facilities and units to immediately identify potential noncompliance and minimize multiple physical inspections that the current enforcement model entails. This paper presents an alternative model for enforcement agencies with regulatory mandates on the on-road movement and conveyance of cargo. The importance of road freight transport in India can benefit from a technology-based reform, which has become critical to improving the efficiency of domestic trade facilitation.

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