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Discussion Paper # 210

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Developing a Logistics Facilitation Monitoring Mechanism
The Next Step in Trade Facilitation Reforms

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Abstract: Trade facilitation has been focused on addressing issues related to customs clearance and regulatory processes of other agencies dealing with clearance of goods. However, addressing the overall incidence of transaction costs and systemic inefficiencies requires a much more holistic view of cross border movement of goods that include ground level challenges of port and airport operations. Even regulatory bottlenecks are often related to implementation issues at the ground level rather than policy. This paper discusses an alternative bottom-up approach for logistics facilitation based on monitoring ground level operational issues, and an institutional mechanism that can use this information to address facilitation challenges quickly in the Indian context.

Keywords: Trade Facilitation, Logistics Facilitation, Big Data, Time Release Study, Reforms, Logistics Efficiency, Customs Reforms, Port Operations, Airport Operations, Cargo Management.

1. Trade Facilitation: Thinking Holistically

The 'Make in India' initiative can help India's greater integration into global value chains through exponential increase in trade and investment. This pre-supposes that global and Indian investors are confident of servicing their global production networks and consumer markets from facilities in India. Given India's relatively inefficient ports and airports, and poor reputation for regulatory transparency and quality of governance on the ground, this is where 'Make in India' hits a very important roadblock that needs to be overcome urgently.

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Investors will not judge India's improvement over its own past performance, but according to facilitation yardstick of our competitor countries

Indian policy-makers also need to understand that despite significant improvements in the Indian cross-border trading environment in the last two decades, both on the regulatory and infrastructure side, the country will not be benchmarked against its past performance, but regional and global comparators in the present time. To use an illustrative example, a potential investor would not benchmark the operational efficiency and regulatory environment of customs and other clearances at JNPT in 2017 with how things were in 2007 in India, but with how a port in Vietnam compares with JNPT in the present time.

It is to the current administrations credit that doing business reforms and trade facilitation has received significant policy attention in the last 2.5 years. Several of the recommendations made by various taskforces and working groups in the area of trade facilitation reforms have been expeditiously implemented. A case to the point is the ambitious customs single-window (Single Window Interface for Facilitating Trade or SWIFT). This project goes a long way in creating a truly integrated and paper-minimum[1] goods declaration and clearance platform.

Box 1: Moving to Micro Operations Approach in Facilitation

The traditional approach in trade facilitation is of using global models to reform borders procedures. However, in order to ensure that the overall experience of trade is positive, all aspects of export and import, i.e. service quality of ports/airports, customs and other administrations, and ancillary logistics services must be addressed. In other words there is need move to a micro level operations perspective of facilitation instead of a top down regulatory reform agenda

While these are very positive developments, it needs to be understood that trade facilitation is much more than administrative reforms to reduce the paper trail and create greater transparency. Effective trade facilitation requires granular detailing of the 'nuts and bolts' of actual performance on the ground through the real time monitoring of implementation at ports and airports.

It is also critical to understand that customs and other clearances is just one leg of the entire process of logistics that supports connectivity to global value-chains. Thus, the concept of trade facilitation needs to address the infrastructural and regulatory bottle-necks all along the complete chain of transport, port and airport gateways, freight movement system in the railways, and ancillary services that make up the overall logistics solution for trading across borders from India (Box 1).

Box 2: Trade and Logistics Facilitation for Today's World

In a world where people can track their taxi ride or their courier package real-time using apps in their handheld phones, the framework to address facilitation has to adopt technology and have the ability to problem solve quickly. This means that the following 3 principles need to be adopted:

- **Not to approach problems in silos**: Have the ability to understand the process flow of operations in ports and airports, i.e. how delays or challenges in one part impacts another
- **Monitor the trade process real-time**: Has the visibility of operations at the ground level
- **Dynamic and proactive governance framework**: Has the ability to identify problems and offer solutions within days not weeks

The three are inter-related. Only a system designed to understand and account for ground level operations can understand the precise process flow of how things move in and out of ports and airports. Likewise a dynamic governance framework requires precise operational data that allows quick problem identification at the ground level and finding the right solution

Thus, there is a need to move away from what might be a limited perspective of trade facilitation to the broader concept of logistics facilitation that integrates both the 'soft' regulatory and 'hard' infrastructural performance measures and the means to monitor and improve them. A key first step in this process would be to establish a holistic framework that can identify the key elements of these individual activities in the logistics chain, and find an effective way to monitor their performance. Box 2 summarizes the key principles of such a framework.

2. Developing a Comprehensive Logistics Monitoring Facilitation Mechanism

In order to integrate the three principles outlined in Table 2, this working paper proposes a 'Logistics Facilitation Monitoring Mechanism' or LFMM (Box 3) that creates a technology enabled data capture mechanism for all of these 'hard' infrastructural and 'soft' regulatory micro-processes that a shipment of goods arriving/leaving a port or airport in India has to undergo.

Developing and implementing such a LFMM would not just require a framework that integrates existing methodologies with some new ones, but also require technology and institutional solutions. A critical challenge would be to find a governance structure that can analyze the granular level data of micro-processes in the logistics chain, identify problems at the operational level of such activities from such data, and implement solutions. Since the responsibility for the operational issues in the logistics chain are spread over several line ministries and departments, the institutional leadership for such reforms cannot be left to an individual line ministry, but should come from the very top.

A related challenge would be to make the process of data capture a continuous and real time one. This would be a key differentiator between existing methodologies being implemented to study efficiency of cross-border trade processes today and the proposed methodology. This would require the development of a robust mechanism that can do real-time

Box 3: Why we need LFMM: Understanding the Gains

- **Reducing Transaction Costs:** By addressing bottlenecks across the logistics cycle and ensuring redress of not just regulatory issues, but also efficiency of ports/airports operations, quality of logistics services and administrative performance of government personnel in the ground, such a mechanism will help reduce transaction costs of trade across the board.
- **Responsive Governance mechanism and 'doing business' perceptions:** By developing a system that allows real time problem identification on the ground, and quick response to problems, it will help rectify the perception that things 'take a long time' in India, and that redress process is slothful and bureaucratic. Such perceptions are behind India's relatively poor 'image' in Doing Business issues, far in excess of the ground realities in the country.
- **Integration into global value chains**: Reduced transaction costs and positive perceptions will help India attract greater investment in manufacturing related to global production networks and integrate into global value chains that depend on efficient and low cost logistics solutions that support an integrated global manufacturing operation.
- **Adding force to 'Make in India':** Since 'Make in India' is about global manufacturers selecting India as a manufacturing destination of choice, such reforms would be critical force multipliers to this initiative.
- **Empowering SMES:** SMEs are the worst hit by high transaction costs. Such reforms would pave the way for Indian SMEs to start exploring global opportunities. It would also enable them to proactively seek investment from global investors more credibly
- **Reducing cost of governance:** By developing a data driven, real time ground level monitoring mechanism. Regulators like customs, port authorities, civil aviation security etc. can eliminate duplication and bring down the overall costs of governance through deployment of lesser personnel and eliminating redundant procedures
- **Accountability in the logistics chain:** Such a system makes ALL stakeholders; public and private accountable to those who depend on their services. That fact that they are being monitored real time would automatically create incentive for greater care in their service quality and responsiveness to their users

monitoring of ground level operational and regulatory performance of India's key ports, airports, freight movement by the railways, internal container depots (ICDs), land customs stations (LCS), and ancillary facilities such as container freight stations (CFS) near ports, free trade warehousing zones (FTWZs), and major bonded warehouses. Fortunately, developments in big data, especially techniques now available for easy quantification of visual data, and falling costs of technology can provide the solution for this seemingly mammoth task.

2. Logistics Facilitation Monitoring Mechanism vs. Existing Methodologies

It is important to point out that there are existing tools or methodologies that are already being used for mapping trade related procedures and their impact on movement of goods across borders. The most commonly used tool is the Time Release Study (TRS) typically conducted by customs administrations. World Customs Organization (WCO) has a fully developed methodology for TRS[2], which has further been refined by countries such as Australia[3]. Indian customs have periodically conducted a few TRS in specific ports and airports.[4]

The proposed LFMM however is radically different from TRS type of analysis and reporting mechanism. The LFMM has similarities and overlap with TRS, but there are critical differences that need to be fleshed out. The following sub-sections provide that differentiation.

The essential difference between the proposed LFMM and TRS are three fold.

- TRS is focused on capturing only the time related parameters (i.e. time spend on) of the various specific steps and processes a shipment of goods travelling by ocean/air/land has to undergo. LFMM on the other hand focuses not just on time but also efficiency and productivity parameters. Efficiency parameters are related to the performance of human and capital resources (e.g. number of containers handled (twenty feet equivalent unit or TEUs) per hour

a ship spends at a berth at port). Productivity parameters are related to the utilization of human and capital resources (e.g. number of workers required per ton of cargo moved in an airport cargo terminal)

- TRS focuses on processes that a shipment of goods has to undergo from the time it 'arrives' at the gateway to the point the goods are in the physical possession of the actual consignee or her agent. Unlike TRS, LFMM proposes to investigate time and efficiency parameters that are related purely to the operational aspect of a port/airport/landport. These include issues related to congestion and availability of berths/parking bays at ports and airports, time to enter wharf/pilot to apron, efficiency of terminal handling/ground handling operations etc.
- While TRS is essentially a 'snapshot' in time, LFMM is proposed to be a continuous real-time data capture mechanism. As discussed in the section 2, this would involve integrating technology in a manner that facilitates continuous data capture and its analytics. A discussion on how this can be implemented follows in section 4.
- In order to provide a better understanding of the overlap between TRS and LFMM, the discussion on developing the specific indicators for LFMM in the next section would clearly identify the indicators that are already part of typical TRS, and those that are not.

3. Next Steps to LFMM 1: Developing Indicators

The main objective of this section is to discuss the building blocks of a robust and comprehensive facilitation methodology (drawn largely from the TRS but with additional data parameters that covers infrastructural performance). It needs to be re-emphasized that the data elements and methodology presented here are just suggested building blocks, and would need re-fining based on context of the port/airport in question.

This issue of contextualization with reference to the port/airport is an important one. It essentially means that importance of monitoring certain performance measures and their related data elements might differ

between ports/airports. For example, container handling parameters are relatively less relevant to a port that handles mostly break-bulk. The issue of contextualization is also critical to an area that remains largely missing or hidden in traditional TRS or other trade facilitation studies, i.e. the quality of logistics services (in terms of pricing, efficiency and productivity) at ports and airports.

Building on the discussion in the preceding section, this is also an important aspect where the LFMM framework being proposed here goes beyond traditional methodologies. A TRS or related studies do not fully address the transaction cost aspect of cross-border trade. The transaction costs incurred in cross-border trade incorporates payments made by trade to import or export, including the cost of services used in ports/airports Since LFMM proposes to integrate the pricing, productivity and efficiency parameters and their monitoring, it provides a powerful tool to benchmark the quality of logistics services being offered, the specific cost elements of such services and their pricing.

The cost of services in a port or airport is a transaction cost for trade and is directly related to efficiency of productivity of human and capital resources deployed. By including these indicators, the LFMM goes far beyond TRS in its ability to map the transaction costs of trade operations; that too in real time. It also serves to bring greater accountability to port/airport operations

LFMM methodology would have three types of data elements that would need to be captured. These would fall under the following distinct heads:

- Operational Indicators: Mapping the efficiency of port and airport management in terms of traffic management within and outside port/ airport including management of congestion
- Regulatory Procedural indicators: This is replication of TRS type indicators with some refinements. These indicators provide insight

on the how quickly and how efficiently customs and other partner government agencies handle all administrative and regulatory functions in the trade process.

- Efficiency and Productivity Indicators: Mapping the productivity of human and capital resources deployed in ports/airports and the efficiency of their utilization. These have a direct relation to the cost of port/airport services and logistics quality.

Table 1 provides a list of some of the key indicators and relevant data points relevant to both operational and regulatory aspects of logistics facilitation. It is important to note that the list of indicators are illustrative and not an exhaustive list. A much more detailed list of operational and regulatory aspect can be developed based on whether it is an port or airport that is being considered, and the nature of the process flow of customs clearance.

Table 1: Efficiency Indicators Examples: Operational and Regulatory Process Flow Management

Operational Indicators	Regulatory Procedural Indicators (overlaps with TRS)	Efficiency and Productivity Indicators
Time in the queue to the port of discharge (Ports)	Time between arrival (at wharf or airport parking bay) to time consignment is fully reported and declared to customs	Dwell times at terminals
Time between approaching Air Traffic Control (ATC) for landing permissions to wheels down	Arrival to completion of customs risk assessment, evaluation and processing	Fraction of time berthed ships worked

Table 1 continued...

Table 1 continued...

Average waiting time for a pilot into port	Arrival to completion of PGA processing (for consignments where this required, by specific PGA)	Number of gangs employed per ship per shift
Average taxiing time to parking bay	Arrival to completion of physical inspection (where this has been mandated)	Tons/TEUs per ship hour at berth
Port charges per TEU/ton	Time required between identification by customs for physical inspection, and time where officer actually inspects	Tons/TEUs per gang hours
Landing charges for aircraft per ton of cargo handled	Time between when consignment has completed all formalities, and requires payment of duties and charges to the time when payment is actually made	Fraction of time gangs idle
Port dredging charges per ton/per TEU	Time between which customs gives formal release of goods and actual physical out of charge	Waiting time per wharf
Ground handling charges per ton (at airport)	Time taken for consignment to be taken from terminal wharf-side stack to container freight station	Time to Stack (from time ship along-side wharf to stacking)
Aircraft wheels down to wheels up	Percentage of direct port delivery and time between arrival at port and off-board ship	Time from stack to gate-out (time between when stacked to when moved out of terminal gate)

Table 1 continued...

Table 1 continued...

Port operation man hours per ton/TEU	Percentage of direct port handover to shipping line (export), and time between arrival at port and on-board ship	Average cost per container move in terminal/air cargo terminal
Airport operation man hours per ton		Terminal operating cost per container/per ton (port/ airport)
Schedule reliability (port and airport)		Air terminal man hours per ton
Time at which trucks join queue to enter the port/ airport to actual unloading		Time to stack in terminal (from time aircraft parked)
		Time spend in X-ray queue (port and airport)
		Time between unloading and formal entry of cargo into terminal
		Cargo throughput per sq.m of storage space in air cargo terminal

Source: Developed by authors based on Key Performance Indicators used by port and airport operators and by indicators used in standard Time Release Studies.

Table 1 is only an illustrative list of indicators for all the three specific aspects of logistics facilitation that involves three key stakeholders in the process, i.e. port and airport operators, customs and other partner government agencies (PGAs), and airport and port terminal/container freight stations operators. Other stakeholders that are indirectly involved and responsible for performance include customs brokers, shipping lines, airlines, ground handlers, and air express companies.

As was emphasized earlier a lot would depend on the context of gateway operations and in many cases additional indicators might

need to develop based on the on-ground process flow of movement of goods between different stages of arrival, regulatory processing, and handover. In fact it is precisely this huge contextualization of such flows that impacted by several quantifiable and sometimes not apparently quantifiable issues is where visualization based big data becomes useful.

Visualization and 'Big Data' Indicators

Besides the three types of indicators discussed above, a fourth type of indicator relates to 'big visual data' that helps fight the 'tyranny of averages', i.e. pin-points the specific 'work flow' and management challenges in the various steps between the ship/aircraft queuing up for entry to gateway to the point when consignee gets physical handover of the goods.

To use a few illustrative examples, consider that in the majority of terminals, the crane operator is making operations only one quarter of the time. He is usually waiting rest of the time waiting to get a container ready to load or waiting for an empty truck to unload a container on. The idling time of the crane cannot simply be solved by increasing the number of trucks and creating a traffic jam. Visualization of process flow using cameras, quantification of visual data and applying analytics can provide critical clues to the bottleneck and its solutions. It could also monitor whether optimal solutions agreed upon by different sets of operation teams are being adhered to in the ground level.

Another example is related patterns of container stacking, and time taken for such operations. Visualization data can develop predictive models of optimal stacking based on most efficient use of yard space and equipment. It could also ensure that wharf side efficiency in stacking is terms of operational discipline and meeting agreed upon operational principles are being adhered to.[4] Table 2 provides a basic overview of the elements of such big visual data.

Table 2: Examples of Visual Data and Analytics Based Indicators

Port/Airport Overview	Terminal Operations Overview	Customs and other PGA Overview
Visual data of tarmac and apron management at airports	Visual overview of wharf operations at port: including equipment utilization and deployment of workers	Visual overview of customs personnel deployment
Visual data of ship queue management and pilot-in process	Visual overview of container stacking operations at terminal side	Visual overview of physical inspection process
In and out of trucks at terminal	Visual overview of stacking operations at terminal side tarmac at airport and deployment of equipment and personnel	Visual overview of 'out-of-charge process' where this remains manual
Ground handling operations at airport: route optimization and deployment of equipment and personnel	Stacking and shelving operations inside the air cargo terminal and visual overview of inventory management and deployment of manpower and equipment	Visual overview of customs seal check process
Visual overview of truck movement in and out of port and airport, and where applicable movement between port and adjacent CFS (through GPS tracking or google map realtime view technologies)	Visual overview of process flow and inventory management at Container Freight Stations (CFS)	
	Visual overview of X-ray operations at port and airport	

Source: Developed by the authors based on a survey of business literature on the subject

Like Table 1, Table 2 is an illustrative set of indicators, and greater sophistication in defining and developing them can be achieved through micro-level assessment of relevant factors in India's key gateways.

4. Next Steps to LFMM 2: Integrating Technology and Big Data Parameters

The next logical step to developing the LFMM would be the integration of technology that enables electronic data capture of both the operational and procedural process flow indicators discussed in Table 1 and visual data discussed in Table 2 in a real-time basis and developing an analytical framework that can develop a comprehensive report on performance at various port and airports. Data capture real-time and continuously are the two key elements of this and critical to the concept of LFMM.

The first step would be to put in place 'autonomous' data collection infrastructure. This would require creating port and airport community data systems that report on the different indicators identified in the preceding section 3. Such a data system would integrate the electronic data already available with customs (filing of documents by shipping/ airlines, filing of shipping bills/bills of entry, clearance and potentially even out of charge) with that of airport and ports and terminal operators. Given that Indian custom's proposed single-window (SWIFT) would integrate other partner government agencies (PGAs) and also proposes accept electronic copies of all supporting documents and make procedures like 'out of charge' from manual to electronic, SWIFT on its own would therefore be capable of capturing quite a few of the data points.

This would need to be supplemented by developing a system of electronic 'time stamps' for operational indicators that currently not tracked real time. This would include a variety of operational indicators, e.g. time at which a consignment joins the queue for x-ray and time at which it completes the process, or time at which ship is along-side wharf to the time container stacking operations are complete.

An electronic 'time stamp' is an automatic system generated data point marking the time at which a process was started and completed. For e.g. an x-ray scanning machine can be programmed to record the start and end times when an container was entered into queue for scanning

Data for some of these operational indicators are already being captured, e.g. time at which aircraft approaches ATC and wheels-down, but these discrete elements would need to be brought into a single data processing and reporting platform. This is the key driver for the need for developing an integrated airport or port community system.

In addition, efficiency and productivity related indicators would require port/airport and terminal/Container Freight Station (CFS) operators to reports number related to deployment of personnel and equipment on a regular basis, and the sharing of their operational costs data. This might require regulatory or even legislative cover, and need for some data privacy and protection arrangements.

Given that several of the indicators related to operational efficiency would depend on the quality of reporting by the port/airport/terminal operators, a 'second check' validation would help. This would also be true of some of the regulatory aspects undertake at gateways. For example, the customs process of conducting physical inspections, or time taken for a PGA official to actually reach required location to do a physical inspection or collect a sample, or merely the fact that all officials who are supposed to be on their 'posts' are actually there.

This is where the concept of random 'time stamp' tracking and visual data comes into play. Given the rapidly falling costs of sensors, occasional 'silent' checks on the system can easily be undertaken by inserting sensor chips in containers, and tracking their movement from the time the container enters port. This actual movement of the container can then be validated by data reported by the port/airport community system to see how long each leg of the process took.

An even stronger check would be the visually captured data that would show actual movement of the container during various operational phases, and capture real-time information on human and equipment deployment, quality of service being rendered, actual speed of movement in queues etc. Combined with strong data analytics that integrates his information with what is captured by customs and port/airport community systems, this would provide a state-of-the-art database to benchmark performance. In addition, the predictive abilities of this data would help provide insights into a variety of aspects; from optimal deployment of personnel and equipment to route optimization and traffic management at port/airport as well as city-side for trucks and terminal management.

While putting this autonomous data capture together and working on creating integrated platforms by connecting customs systems with port and airport electronic data systems might seem like a daunting task, it actually is not. Given the falling costs of technology, ease of creating patches that can easily combine data from different electronic platforms, and 'off-the-shelf' solutions for analytics, doing this today is substantially less complicated and much less costly than even five years ago.

Much of the visual data defined in this section is already being captured by CCTV cameras at ports and airports. Security and operational reasons dictate the presence of such cameras in port berths, airport tarmacs, cargo terminals, and entry points into ports and airports. Using this footage to generate data and analyzing is only the next logical step. In other words, the incremental effort to put this system together might not be as daunting or complicated as it seems.

The government of India can consider piloting such a system in India's 2 largest container ports and 2 largest airports (in terms of cargo volumes) as a start. India's 2 largest container terminals (JNPT and Chennai Port) handle close to two-thirds of containerized cargo traffic, and piloting the program here would give significant coverage of the overall ocean borne trade. Similarly, India's 2 larges

airports, Delhi and Mumbai, handle close to two-third of the international air cargo. A pilot implemented here would again result in significant coverage of the air borne trade. At a later stage, the program can be expanded to cover all important ports and airports.

But all of this effort would be useless if this data is not constantly monitored by the senior most decision makers and regulators, and used to hold all stakeholders in the international trade process accountable and make adhere to performance benchmarks. This would require developing an institutional mechanism to regularly monitor this data and a governance structure for accountability of all stakeholders. This is the topic of discussion for the next section.

5. Next Steps to LFMM 3: Developing an Institutional Mechanism

While what has been described in sections 3 and 4 represent data capture related innovations in the Indian context in the area of trade facilitation. What is being discussed in this section is essentially governance related innovation in the same area. In the last decade and a half, several efforts to benchmark trade facilitation, as well as targeted efforts to come up with facilitation related recommendations have been undertaken by the government of India. These efforts have been spearheaded by different ministries and departments, and have often worked in silos with duplication of efforts.

All of these efforts did partially achieve their goals, but did not create a dynamic system that can sustainably and incrementally address the challenge of trade facilitation. They were further limited by the fact that 'closed' departmental approaches led to reforms in specific areas while being less proactive in addressing facilitation issues in others that were not the remit of the department that was leading the effort in that particular instance.

In order to achieve all the three things; i.e. being holistic (covering governance, operational, cost and management related facilitation challenges), being incremental (constantly pushing for improvements to existing benchmarks), and sustainable (not being a 'one off' effort), a permanent governance structure or institution needs be put in place.

Since the responsibility for the operational issues in the logistics chain are spread over several line ministries and departments, the institutional leadership cannot be left to an individual line ministry, but should come from the very top. Such monitoring from the top could happen either through a special cell set up in the PMO secretariat or through Cabinet secretariat. This would empower this institution to hold all stakeholders, in government and outside, accountable.

What the data development and data capture aspects discussed in sections 3 and 4 essentially does is further empower this institution with real-time data and facts allowing greater transparency and focus in decision making as it works to enforce benchmarks and make stakeholders accountable for their performance.

Conclusion: Substantiate and Develop LFMM and Initiate Pilot Project

The government of India can consider piloting such a system in India's 2 largest container ports and 2 largest airports (in terms of cargo volumes) as a start. India's 2 largest container ports (JNPT and Chennai Port) handle close to two-thirds of containerized cargo traffic, and piloting the program here would give significant coverage of the overall ocean borne trade. Similarly, India's 2 largest airports, Delhi and Mumbai, handle close to two-third of the international air cargo. A pilot implemented here would again result in significant coverage of the air borne trade. At a later stage, the program can be expanded to cover all important ports and airports.

First step towards initiating the pilot would be discussions with industry and other domain experts to refine the data points and collection methodologies would need to take place. All the major stakeholders in

the port and airport environment would also need to be brought together, and firm commitment to cooperate and implement their respective roles in LFMM would need to be put in place.

As pointed out earlier, all of this effort would be useless if this data is not constantly monitored by the senior most decision makers and regulators, and used to hold all stakeholders in the international trade process accountable and make adhere to performance benchmarks. This would require developing an institutional mechanism to support the pilot by regularly monitoring this data and ensuring a governance structure that demands accountability of all stakeholders.

In our current government framework the ability to demand accountability across ministries is institutionally present in the PMO and the Cabinet Secretariat. It therefore makes sense if this institutional mechanism is part of either the PMO or Cabinet Secretariat. It needs to be noted that the ministries involved go beyond the transport related ministries (i.e. ports and shipping, civil aviation, rail and road), and thus even a future integrated Ministry of Transport would not be the right place as an institutional base for the LFMM.

Separate Data Monitoring Office (DMO) and a project management group (PMG) can be set up to assist responsible officers in the PMO or Cabinet Secretariat. The PMG should consist of domain experts from industry, data experts, and senior officials from line ministries.

The DMO would be responsible for capturing and analyzing real time data based on methodologies discussed earlier, and creating data reports on weekly basis. The PMG would be responsible for analyzing the weekly reports and providing monthly summaries with recommendations and corrective actions needed to be taken different actors in the entire logistical chain, including regulatory participants such as customs and PGAs. The responsible officers in the PMO or the Cabinet secretariat would be tasked with following up to ensure that the recommendations for corrective action made by the PMG have been acted upon, i.e. the

accountability chain has been maintained and duly enforced. The Prime Minister could chair periodic meetings to take stock of the working of the LFMM and seek accountability from PMG and designated officers (in either the PMO or Cabinet Secretariat, depending on where the LFMM mechanism is institutionally based).

In summary, a strong real-time data management and reporting system coupled with autonomous data collection technology and institutions that enforce mandatory reporting requirements would establish a platform to develop a system of operational yardsticks and fact based accountability for all stakeholders in the logistics chain. If this platform is then effectively used by establishing governance system administered from the very apex of central government any deviation from performance standards would stand to be quickly rectified and allow India to achieve the world's highest standards in logistics efficiency.

Endnotes

1 It envisages a single universal declaration for customs and all major partner government agencies that have a role in clearance of goods, extending the customs risk management system by integrating parameters of these PGAs, and allowing a majority of supporting documents required for clearance today (such as an invoice or license) to be submitted in electronic form

2 World Customs Organization(2011). Guide to Measure the Time Required For Release of Goods Version 2

3 Australian Customs and Border Protection Service (2013). Time Release Study: 2013

4 For example Time Release Study for Janaury to June 2014 Conducted by Jawaharlal Nehru Customs House, Nhava Sheva available at http://www.jawaharcustoms.gov.in/time-release/TRS2014-Jan-June.pdf

4 Draws from discussions available in

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