Vehicle and Cargo Tracking System under Free Transit Regime

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Preface

This study investigates the current state of cargo and vehicle tracking and tracing systems in Bangladesh to facilitate international trade. The study has five key objectives in this regard. These include identifying gaps in the current guidelines for vehicle and cargo tracking systems, proposing automated solutions for border management and customs procedures, assessing the impact of the cargo tracking system on the Logistics Performance Index (LPI), examining the Transports Internationaux Routiers (TIR) Convention and the Electronic Cargo Tracking System (ECTS), and analysing relevant policies and regulatory frameworks.

Aligned with the Government of Bangladesh's strategic vision to advance its logistics sector, this study examines the challenges in implementing vehicle and cargo tracking systems and explores ways to enhance trade relations using cross-country examples. It focuses on: (1) identifying gaps in existing regulations, including the Bangladesh Telecommunication Regulatory Commission guidelines, the Electronic Seal and Lock Rules 2024, and the National Development Logistics Policy (NDLP) 2024, to improve Bangladesh's tracking system; (2) proposing automated border management and customs procedures by assessing land ports and recommending modern technologies such as electronic locks, seals, and tracking devices; (3) analysing Bangladesh's position in the Logistics Performance Index (LPI), particularly in the tracking and tracing dimension, and evaluating how improvements in this area could positively impact other LPI dimensions like customs, infrastructure, and timeliness; (4) exploring the utilisation of the Transports Internationaux Routiers (TIR) convention and Electronic Cargo Tracking System (ECTS) by Bangladesh and neighbouring countries, highlighting regional practices and experiences; and (5) identifying regulatory, logistical, and other impediments to implementing tracking systems, while offering comprehensive policy recommendations to overcome these challenges. The study ultimately aims to enhance Bangladesh's trade efficiency and integration into global logistics networks.

The study reviews Bangladesh's current vehicle and cargo tracking systems, highlighting key gaps and challenges within existing guidelines and practices. This involves a close examination of regulatory frameworks issued by the National Board of Revenue (NBR), the Bangladesh Telecommunication Regulatory Commission (BTRC), and other government policies including recent policies such as the Electronic Seal and Lock Rules 2024 and the National Logistics Development Policy (NLDP) 2024.

Building on this analysis, the study proposes optimal strategies to automate border management and customs procedures, taking inspiration from the successful implementations of the One Stop Border Posts (OSBPs) and the Regional Electronic Cargo Tracking System (RECTS) in East African countries. Best practices from international frameworks, like the Transports Internationaux Routiers (TIR) Convention and the Electronic Cargo Tracking System (ECTS), are analysed to assess their relevance and potential for adaptation within the Bangladeshi context.

The study also investigates how a modernised cargo tracking system could enhance Bangladesh's performance in the Logistics Performance Index (LPI). The LPI, published by the World Bank, ranks countries based on their trade logistics performance, including infrastructure quality, customs

efficiency, logistics competence and quality, and timeliness of shipments. By integrating sophisticated tracking and tracing systems, Bangladesh could improve its customs procedures and transport timeliness. The report highlights that improvements in these areas would not only boost Bangladesh's LPI ranking but also enhance its competitiveness in regional and global trade.

We are hopeful that the policy recommendations of this study will be beneficial to the policymakers and other relevant stakeholders with a view to enhancing the institutional strength, policy reforms, and efficient infrastructure that accelerates trade and development of the country.

Shaila Yasmin

Project Director (Joint Secretary)

Bangladesh Regional Connectivity Project 1 (BRCP-1)

Ministry of Commerce

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Dr Mohammad Abdur Razzaque

Chairman

Research and Policy Integration for Development (RAPID)

Acronyms

8FYP	8th Five-Year Plan
ACCS	Automated Cargo Clearance System
ACE	Automated Commercial Environment
ACTS	ASEAN Customs Transit System
ADB	Asian Development Bank
AEO	Authorised Economic Operator
AMS	ASEAN Member States
APR	Automatic Number Plate Recognition
AR	Advance Ruling
ASEAN	Association of Southeast Asian Nations
ASYCUDA	Automated System for Customs Data
AU	African Union
BASIS	Bangladesh Association of Software and Information Services
BBIN	Bangladesh, Bhutan, India, and Nepal
BBIN MVA	Bangladesh, Bhutan, India, and Nepal Motor Vehicles Agreement
BFTI	Bangladesh Foreign Trade Institute
BGMEA	Bangladesh Garment Manufacturers and Exporters Association
BLPA	Bangladesh Land Port Authority
BOT	Build, operate, and transfer
BRCP-1	Bangladesh Regional Connectivity Project-1
BSTI	Bangladesh Standards and Testing Institution
BTRC	Bangladesh Telecommunication Regulatory Commission
BWA	Broadband Wireless Access
CAGR	compound annual growth rate
CARs	Central Asian Republics
CBIC	Central Board of Indirect Taxes and Customs
CBP	Customs and Border Protection
CEVA	China Electric Vehicle Association
CMC	Centralised Monitoring Centre
CMS	Customs Management System
COMESA	Common Market for Eastern and Southern Africa
CPAP	Customs Portal, Pre-Arrival Processing
CPEC	China-Pakistan Economic Corridor
DAE	Department of Agricultural Extension
DLS	Department of Livestock Services
eCMS	Electronic Customs Management System
ECTS	Electronic Cargo Tracking System
EDI	Electronic Data Interchange
ePayment	Electronic Payment
EPB	Export Promotion Bureau
eTIR	Electronic Transports Internationaux Routiers
EU	European Union
EU CSW-CERTEX	EU Customs Single Window Certificates Exchange System
EXIM	export-import
FBR	Federal Board of Revenue
FGD	focus group discussion
GCC	Gulf Cooperation Council
GDP	gross domestic product
GPRS	General Pocket Radio Service
GPS	Global Positioning System

GTFP	Global Trade Facilitation Programme
ICEGATE	Indian Customs Electronic Commerce/Electronic Data Interchange Gateway
ICES	Indian Customs Electronic System
ICPs	Integrated Check Posts
ICT	Information and Communication Technology
IMF	International Monetary Fund
INSTC	International North-South Transport Corridor
IRU	International Road Transport Union
KCS	Korean Customs Service
KIIs	key informant interviews
KPIs	key performance indicators
KSA	Kingdom of Saudi Arabia
LDB	Logistics Data Bank
LDCs	least developed countries
LPAI	Land Ports Authority of India
LPI	Logistics Performance Index
LPMS	Land Port Management System
MACCS	Myanmar Automated Cargo Clearance System
MoC	Ministry of Commerce
MRA	Mutual Recognition Arrangement
MVA	Motor Vehicle Agreement
NBR	National Board of Revenue
NCAS	Nepal Customs Automation System
NCTS	Union's Electronic Transit System
NECAS	Nepal Customs Automation System
NEP	National Enquiry Point
NII	Non-Intrusive Inspection
NLDP	National Logistics Development Policy
NLP	National Logistics Policy
NSW	National Single Window
NTIP	National Trade and Transport Facilitation Committee
NTIP	Nepal's National Trade Information Portal
NTTFC	National Trade and Transport Facilitation Committee
OGA	Other Government Agencies
OLAP	Online Analytical Processing
OSBPs	One-Stop Border Posts
OTL	One-time seal
PAP	Pre-Arrival Processing
PGA	Partner Government Agencies
PIDA	Programme for Infrastructure Development in Africa
PP2041	Perspective Plan 2021-2041
PwC	Pricewaterhouse Coopers
RECTS	Regional Electronic Cargo Tracking System
RFID	Radio Frequency Identification
RRU	rapid response unit
SASEC	South Asia Subregional Economic Cooperation
SDGs	Sustainable Development Goals
SECO-WCO	State Secretariat for Economic Affairs of Switzerland-World Customs Organization
SGS	Société Générale de Surveillance
SWOT	Strengths, Weaknesses, Opportunities, and Threats

TFA	Trade Facilitation Agreement
TIR	Transports Internationaux Routiers
TMEA	TradeMark East Africa
TRS	Time Release Study
TSC	Tariff Specification Code
UAE	United Arab Emirates
UMIC	upper middle-income country
UNECE	United Nations Economic Commission for Europe
UPU	Universal Postal Union
USAID	United States Agency for International Development
VTSPAB	Vehicle Tracking Service Providers Association of Bangladesh
WB	World Bank
WBG	World Bank Group
WCO	World Customs Organization
WTO	World Trade Organization

Contents

Preface ... ii

Acknowledgement ... iv

Acronyms ... v

Executive Summary ... 1

Chapter 1: Introduction ... 9

1.0 Background ... 9

1.1 Introduction ... 11

1.2 Objectives and Scope ... 12

1.3 Approach and methodology of the study ... 12

Chapter 2: Identifying the Gaps in the Existing Guidelines on the Vehicle and Cargo Tracking System ... 17

2.0 Landscaping of Policy Commitments ... 17

2.1 Electronic Seal and Lock Rules 2024 ... 17

2.2 National Logistics Policy (NLP) 2024 ... 20

2.3 Bangladesh Telecommunication Regulatory Commission (BTRC) ... 22

2.4 Bangladesh Perspective Plan 2021–2041 (PP2041) ... 25

2.5 Global logistics sector policies including cargo tracking systems across different countries ... 26

2.6 Findings from the field survey ... 30

2.7 Synthesising the findings from the desk research and the field ... 31

Chapter 3: Suggesting Automated Border Management and Customs Procedures ... 33

3.0 Automated border management in Bangladesh's land ports ... 33

3.1 Automated customs procedures in Bangladesh ... 37

3.2 Automation in the land ports border management and customs procedures of regional countries ... 39

3.3 Timeline for automation in Bangladesh border management and customs (based on global examples) ... 53

3.4 Advancements in port management and customs procedures ... 55

3.5 Findings from the field survey ... 57

3.5 Synthesising the findings from the desk research and the field ... 59

Chapter 4: Analysing the Impact of the Cargo Tracking System on the Logistics Performance Index (LPI) 61

4.0 Impact of the Cargo Tracking System on the Logistics Performance Index (LPI) 61

4.1 Impact of tracking and tracing on each of the dimensions of the Logistics Performance Index (LPI) 62

4.2 Econometric analysis of the Logistics Performance Index (LPI) 65

4.3 Findings from the field survey 69

4.4 Synthesising the findings from the desk research and the field 70

Chapter 5: Discussion on Transports Internationaux Routiers (TIR) Convention and Electronic Cargo Tracking System (ECTS) 72

5.0 TIR Convention 72

5.1 Initiation of the Electronic TIR (eTIR) project 73

5.2 How the Electronic TIR (eTIR) works 73

5.3 Advantages of the TIR Convention 75

5.4 Requirements to be a member of the TIR Convention 75

5.5 Bangladesh's neighbouring country benefitting from the TIR Convention 76

5.6 Electronic Cargo Tracking System (ECTS) 79

5.7 Regional Electronic Cargo Tracking System (RECTS) in African Countries 81

5.8 Differences between the TIR convention and the Electronic Cargo Tracking System (ECTS) ... 85

5.9 Current status of Bangladesh in the TIR Convention 86

5.10 Findings from the field survey 86

5.11 Synthesising the findings from the desk research and the field 87

Chapter 6: Analysis of Policies and Regulatory Measures 89

6.0 Policy and regulatory measures analysis 89

6.1 Challenges and constraints regarding vehicle and cargo tracking system, automated border management, and customs procedure in Bangladesh 97

6.2 Recommendations regarding vehicle and cargo tracking system, automated border management, and customs procedure in Bangladesh 100

Key recommendations of the study 105

References 108

Annexure 114

Annex A2: Effects of tracking and tracing on overall LPI and its components 114

Annex A3: List of Authorised Economic Operators (AEOs) as of 6th June 2024 115
Annex A4: Criteria for becoming an Authorised Economic Operator (AEO) 115
Annex A5: Benefits for an Authorised Economic Operator (AEO) 116
Annex A6 (a): AEO MRA programmes in China 116
Annex A6 (b): AEO MRA programs in the European Union (EU) 119
Annex A6 (c): AEO MRA programmes in India 121
Annex A6 (d): AEO MRA programmes in Singapore 122
Annex A7: Recommendations on BTRC guidelines for vehicle tracking services in Bangladesh.. 124

List of Figures

Figure 2. 1: Results from field survey.....31
Figure 3. 1: New Technologies in Action: How Technologies are Reshaping Current Processes in South Korea.. 51
Figure 3. 2: Evolution of Automation in Border Management and Customs: A Timeline for Bangladesh 55
Figure 3. 3: Results from field survey.....58
Figure 4. 1: Tracking and tracing dimensions in different countries in relation to overall trade 64
Figure 4. 2: Impact of tracking and tracing on overall LPI and other dimensions of LPI.....66
Figure 4. 3: Percentage of “Yes” responses to the questions: Do you believe that the tracking and tracking dimension can impact other dimensions of the Logistics Performance Index (LPI)? 70
Figure 5. 1: Participants in the TIR Convention 72
Figure 5. 2: eTIR process under the TIR Convention 74
Figure 5. 3: Steps to be a member of the TIR Convention 76
Figure 5. 4: Trade between the users of the Regional Electronic Cargo Tracking System (RECTS) 84

List of Tables

Table 1. 1: Distribution of key informant interviews (KIIs) among different stakeholders 13
Table 1. 2: Distribution of focus group discussions (FGDs) among different stakeholders.....14
Table 1. 3: A summary of the proposed methodologies 15
Table 2. 1: SWOT analysis of the Electronic Seal and Lock Rules 2024.....19
Table 2. 2: SWOT analysis of the National Logistics Development Policy (NLDP) 2024 22
Table 2. 3: SWOT analysis of the Bangladesh Telecommunication Regulatory Commission's initiatives 24
Table 2. 4: SWOT analysis of the Bangladesh Perspective Plan 2021-2041.....26
Table 2. 5: Policies regarding the logistics sector including cargo tracking systems in different countries.....28
Table 3. 1: List of Bangladesh's land ports 34
Table 3. 2: ICT-related activities to improve ease of doing business in different land ports of Bangladesh 36
Table 3. 3: Difference between the ASYCUDA World and the National Single Window System 38
Table 3. 4: Automation in the land port border management and customs procedures in different countries and alliances.....45
Table 4. 1: Bangladesh's performance in the Logistics Performance Index (LPI) 62
Table 4. 2: Summary statistics: Comparison between Bangladesh and the average country's LPI performance 67
Table 4. 3: Percentage change in overall LPI and other dimensions due to tracking and tracing 68
Table 4. 4: Impact of tracking and tracing on the trade.....68
Table 5. 1: How the Electronic Cargo Tracking System (ECTS) Works 80
Table 5. 2: Differences between the TIR convention and the Electronic Cargo Tracking System (ECTS) 85

List of Boxes

Box 1. 1: Trade Facilitation Agreement 10
Box 2. 1: Electronic Seal and Lock Rules 2024 18
Box 3. 1: Initiatives by the Association of Southeast Asian Nations (ASEAN) regarding port management 40
Box 3. 2: One-Stop Border Posts (OSBP) in African countries 42
Box 3. 3: Smart Ports in the EU countries 44
Box 3. 4: Initiatives by the Gulf Cooperation Council (GCC) to facilitate trade 45
Box 3. 5: Terminologies associated with port management and customs procedures 49
Box 3. 6: One-stop border posts (OSBPs) in the ASEAN, the EU, and GCC 52
Box 3. 7: Authorised Economic Operators (AEO) in various countries 53
Box 3. 8: The Border Box Swap: A Manual Intervention in Transitional Trade Operations 59
Box 4. 1: Logistics Performance Index (LPI) of the European Union (27 countries) 65

Executive Summary

Chapter 1: Background and Introduction

Background

The growing use of vehicle and cargo tracking systems has enhanced trade facilitation globally, with many countries adopting these systems to monitor goods movement. In Bangladesh, the government mandated GPS trackers in covered vans to prevent cargo theft. This tracking system could reduce operational costs, streamline customs clearance, and improve efficiency, positively impacting the Logistics Performance Index (LPI) of the country. To facilitate trade, the National Board of Revenue (NBR) has introduced Information and Communication Technology (ICT) applications and measures to simplify clearance procedures, including Automated System for Customs Data (ASYCUDA) World, and align with Trade Facilitation Agreement (TFA) commitments. For NBR, the World Customs Organization (WCO) conducted a national Time Release Study (TRS) workshop in 2022, facilitating the identification of bottlenecks and performance improvement in import or export processes. Additionally, the NBR's "Electric Seal and Lock Rules 2024" aim to safeguard goods at customs. Furthermore, to support the overall logistics sector, Bangladesh published the National Logistics Development Policy (NLDP) in 2024. To boost activities in both trade and transport sectors, the National Trade and Transport Facilitation Committee (NTTFC) has been formed. Beyond domestic initiatives, development partners such as the Asian Development Bank (ADB) and the World Bank (WB) have been supporting Bangladesh to facilitate trade.

This study aims to address gaps in tracking system guidelines, propose automated border management and customs procedures, evaluate the impact on the LPI, discuss the Transports Internationaux Routiers (TIR) Convention and Electronic Cargo Tracking System (ECTS), and regulatory measures.

Objectives

The main objective of the study is to address the challenges of implementing vehicle and cargo tracking systems and enhance trade relations using cross-country examples. It focuses on five key areas: identifying gaps in existing guidelines by evaluating documents like the Bangladesh Telecommunication Regulatory Commission (BTRC) guidelines and Electronic Seal and Lock Rules 2024; suggesting automated border management and customs procedures for all land ports using modern tracking devices; analysing the impact of cargo tracking on Bangladesh's Logistics Performance Index (LPI) across various dimensions; discussing the Transports Internationaux Routiers (TIR) convention and Electronic Cargo Tracking System (ECTS) with examples from neighbouring countries; and analysing policies and regulatory measures to identify and overcome barriers, providing comprehensive policy recommendations.

Chapter 2: Identifying the Gaps in the Existing Guidelines on the Vehicle and Cargo Tracking System

Desk findings from various policies in Bangladesh reveal concerted efforts to enhance efficiency and security in the transport and logistics sector. The National Board of Revenue's (NBR) Electronic Seal and Lock Rules 2024 represent a pivotal step towards ensuring cargo security through Global Positioning System (GPS) tracking and electronic seals, aimed at curbing theft and enhancing transparency in transit. Despite these initiatives, challenges such as opposition from trade bodies regarding service charges and concerns over data privacy persist, potentially hindering widespread adoption. The Bangladesh Telecommunication Regulatory Commission (BTRC) provides foundational guidelines for vehicle tracking services, yet it lacks detailed provisions for managing cargo tracking systems comprehensively. Similarly, while the National Logistics Development Policy (NLDP) 2024 sets ambitious goals for a modern logistics ecosystem, it requires clearer directives on integrating tracking systems nationwide to align with broader developmental strategies and optimise logistical efficiencies, thereby reducing trade costs. The Bangladesh Perspective Plan 2021-2041 (PP2041) outlines strategic objectives for sector transformation, emphasising the need for seamless transport systems without explicit provisions on integrating tracking technologies, necessitating alignment with broader developmental goals to enhance logistics infrastructure and competitiveness.

Field findings underscore significant gaps in stakeholder awareness and readiness regarding regulatory changes, particularly concerning the NBR's Electronic Seal and Lock Rules 2024 and the NLDP 2024. Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs) reveal widespread uncertainty and limited understanding among stakeholders, highlighting a critical need for enhanced communication and educational efforts from regulatory authorities. The synthesis between field and desk research underscores the imperative of addressing stakeholder awareness gaps, regulatory ambiguities, and infrastructural deficiencies to effectively implement tracking systems in Bangladesh. These efforts are important for modernising logistics practices, bolstering economic competitiveness, and aligning with global standards in transport and trade. By bridging these gaps and fostering stakeholder collaboration, Bangladesh can navigate challenges related to infrastructure, regulatory compliance, and technological integration, thereby enhancing the overall efficiency and reliability of its logistics sector.

Chapter 3: Automated Border Management and Customs Procedures in Bangladesh

The Bangladesh Land Port Authority (BLPA), established in 2001, aims to enhance export-import activities with neighbouring countries. As of now, 24 Land Customs Stations have been declared as land ports, with 16 operational. The BLPA manages 11 ports, and five are operated by Private Port Operators on a Build, operate, and transfer (BOT) basis. Eight more ports are under development, and plans are underway for two additional ports. Bangladesh's land ports face challenges due to inadequate infrastructure, poor communication, and deficient transportation networks, hindering service efficiency. Exporters struggle to obtain clearance certificates at ports like Benapole due to the

absence of local offices for essential agencies. Additionally, congestion in India and prolonged clearance processes further affect port performance.

Despite these challenges, the BLPA is committed to enhancing port management through modern technology. Initiatives include the implementation of an e-filing system and automation software to streamline operations at key ports like Benapole and Bhomra. Efforts are also underway to develop an e-port management system at Burimari and Sonahat land ports. The "Smart Land Port Management System" aims to streamline import-export activities and passenger services, with implementation targets set for 2025, 2031, and 2041. The ASYCUDA system, a UNCTAD-developed solution, is extensively used across the country, with continuous upgrades to ensure user-friendliness and leverage the latest technology. The National Single Window (NSW) system is being implemented to revolutionise trade handling by providing a one-stop platform for all trade-related needs. This system aims to reduce processing time, lower trade costs, and enhance transparency and efficiency in trade procedures.

Regional countries like India, Nepal, and Myanmar have made significant strides in enhancing border management and customs procedures through automation. India has established Integrated Check Posts (ICPs) and implemented the Land Port Management System (LPMS) and the Indian Customs Electronic System (ICES) to streamline processes. Nepal has adopted the ASYCUDA World system and developed the Nepal Customs Automation System (NECAS) to enhance efficiency. Myanmar has developed the Myanmar Automated Cargo Clearance System (MACCS) to automate customs operations. The European Union (EU) has embraced digital technologies like the EU Customs Union and the Single Window Environment for Customs to streamline trade compliance and enhance data exchange between customs authorities.

Bangladesh can learn from global examples to develop a phased approach to adopting automation processes. The proposed timeline includes: Phase 01 (1-2 years): Develop infrastructure and establish a legal framework, Phase 02 (2-3 years): Implement core automation processes like the Automated Cargo Clearance System (ACCS), Phase 03 (3-5 years): Integrate customs systems with other border agencies and introduce data analytics tools, and Phase 04 (ongoing): Regularly review and update automation processes, exploring emerging technologies like AI and blockchain.

The field survey reveals strong support for automation in border management and customs procedures. Users of the ASYCUDA World system report significant benefits, but the current customs procedures are only semi-automated, leading to inefficiencies. Survey respondents emphasised the need for comprehensive training programmes for effective system utilisation. Both desk research and field surveys highlight the importance and benefits of automation in border management and customs procedures. While recognising the positive impact of automation, challenges such as achieving full automation and addressing logistical issues at land ports remain. The survey highlights the emphasis on modernising for improved trade efficiency and identifies practical challenges like driver changes at land ports, suggesting biometric or digital authentication systems, and stringent regulations for improvement.

Chapter 4: Analysing the Impact of the Cargo Tracking System on the Logistics Performance Index (LPI)

Analysing the impact of the cargo tracking system on the Logistics Performance Index (LPI) is significant for evaluating the effectiveness of transportation infrastructure and logistics operations within a country. Developed by the World Bank, the LPI measures trade logistics efficiency based on several factors, including customs clearance, infrastructure quality, and shipment tracking. By assessing how the implementation of a cargo tracking system influences these components, policymakers can understand its overall impact on trade facilitation and competitiveness. A well-functioning cargo tracking system can lead to reduced transit times, lower costs, and increased reliability in supply chains, thereby positively impacting a country's LPI score. Enhanced visibility into the movement of goods can improve transparency, reduce delays and theft, and boost overall trade performance. Therefore, a thorough analysis of the cargo tracking system's influence on the LPI is essential for identifying areas of improvement and implementing targeted interventions to optimise logistics efficiency and enhance economic competitiveness.

The Logistics Performance Index (LPI) evaluates the efficiency of the logistics industry in a country, considering factors such as infrastructure, customs performance, international shipments, logistics services quality, tracking and tracing, and timeliness. In 2023, Bangladesh's LPI score was 2.6, ranking 88th out of 139 countries, reflecting a slight improvement from 2018. Real-time tracking and tracing can significantly streamline customs clearance processes by providing accurate and timely information about the status and location of shipments. This can expedite the clearance process, reducing delays and potential bottlenecks. Efficient tracking systems also contribute to better infrastructure utilisation by allowing optimal planning and allocation of resources such as storage space, transportation assets, and personnel. This leads to a more efficient and resilient infrastructure network capable of meeting business and consumer needs.

For international shipments, tracking and tracing ensure visibility throughout the supply chain, reducing the risk of lost or delayed shipments. This increased visibility positively impacts the reliability of international shipments. Real-time tracking provides transparency across various modes of transport and borders, enabling stakeholders to monitor progress, identify potential delays or bottlenecks, and proactively address issues. This significantly reduces the risk of lost or misplaced shipments and improves timely delivery, which is very important for customer satisfaction. Accurate tracking enhances logistics operations' overall competence by enabling logistics providers to demonstrate a high level of precision in managing shipments, leading to improved service quality. Consistency in tracking also contributes to building a positive reputation for logistic competence. Real-time information allows logistics providers to identify and address potential delays promptly, improving overall supply chain timeliness. This visibility facilitates communication and collaboration among all parties involved, ensuring coordinated efforts to ensure timely delivery.

Field surveys and focus group discussions with logistics stakeholders revealed significant perceived benefits of tracking and tracing systems. All respondents indicated improvements in customs clearance efficiency and delivery timeliness due to tracking systems. Additionally, 80 per cent

reported positive impacts on infrastructure utilisation and international shipments, while 92 per cent attributed advancements in logistics competence and quality to tracking systems. The survey findings support the literature's assertion about the practical benefits of real-time tracking in reducing delays and optimising customs procedures. This alignment confirms the literature's assertion about the practical benefits of real-time tracking in reducing delays and optimising customs procedures.

Chapter 5: Discussion on Transports Internationaux Routiers (TIR) Convention and Electronic Cargo Tracking System (ECTS)

The TIR Convention, formally known as the Customs Convention on International Transport of Goods under cover of TIR Carnets 1975, serves as a multilateral international transit treaty supervised by the United Nations Economic Commission for Europe (UNECE) and managed by the International Road Transport Union (IRU). This convention streamlines the cross-border movement of goods, reducing delays and costs associated with international trade. With 78 Contracting Parties, including the European Union, the TIR system facilitates approximately 1.5 million transports annually, employing over 33,000 authorised operators. The convention specifies goods in a TIR carnet, sealed within cargo compartments and authenticated by customs authorities, allowing for seamless transit without the need for physical inspections at borders. This system significantly reduces trade transaction expenses and fosters growth in both intra-regional and inter-regional trade. The electronic TIR (eTIR) system enhances the TIR Convention by enabling secure and efficient information exchange between national customs systems regarding the global transit of goods, vehicles, or containers. This system facilitates better risk management, reduces fraud, and improves international collaboration, thus minimising administrative burdens and maximising supply chain efficiency.

To become a member of the TIR Convention, a country must designate a national guaranteeing association, incorporate the convention's provisions into national laws, and undergo a verification process by the International Road Transport Union (IRU). Upon fulfilling these requirements, the country can join the convention and benefit from the streamlined international transport system. India, Pakistan, and China have ratified the TIR Convention, reaping various benefits. India's participation simplifies border crossings, reduces transportation costs, and promotes regional integration, enhancing trade with neighbouring countries. Pakistan's strategic location facilitates trade with Central Asian Republics, although the country faces operational challenges in fully implementing the TIR system. China's accession to the TIR Convention aligns with the Belt and Road Initiative, creating faster transport opportunities between China and Europe and reducing transport costs and times.

The Electronic Cargo Tracking System (ECTS) is a web-based solution for monitoring cargo during transportation, employing electronic devices and communication technologies to provide real-time information on cargo location, status, and condition. ECTS enhances security, improves efficiency by streamlining customs clearance processes, and offers benefits such as real-time tracking and tamper alerts. The Regional Electronic Cargo Tracking System (RECTS) in African countries like Kenya,

Uganda, Rwanda, and the Democratic Republic of the Congo facilitates electronic tracking of transit goods, reducing transit times and improving security. The system's real-time monitoring capabilities and collaboration among partner states enhance regional trade efficiency and economic integration.

A field survey in Bangladesh revealed limited awareness of the TIR Convention and ECTS among stakeholders. However, once informed, stakeholders recognised the potential benefits of these mechanisms for Bangladesh's trade sector, including smoother cross-border movements, reduced transit times, and lower transportation costs. The alignment between the literature review and field survey indicates significant economic opportunities for Bangladesh by adopting these international trade facilitation mechanisms.

Chapter 6: Analysing of policies and regulatory measures

The government of Bangladesh is committed to developing a comprehensive cargo tracking system to enhance logistics, security, and transportation management. Despite existing regulations, significant changes are needed for effective implementation. The National Board of Revenue (NBR) introduced the Electronic Seal and Lock Rules 2024 to secure trade and prevent cargo theft, addressing previous high fee issues with a focus on transparency and potentially lower costs. Successful implementation requires stringent regulations, transparent pricing, robust quality control, and stakeholder collaboration.

The National Logistics Development Policy (NLDP) 2024 aims to revolutionise the logistics sector by leveraging technology, enhancing infrastructure, and improving connectivity. Although it emphasises vehicle and cargo tracking systems, it lacks specific implementation details. A dedicated chapter on tracking systems is recommended to ensure clarity and encourage adoption. Meanwhile, the Bangladesh Telecommunication Regulatory Commission (BTRC) provides general guidelines for licensing vehicle tracking services but needs to detail operational specifics like real-time monitoring and data collection protocols.

Bangladesh faces several challenges in implementing an efficient vehicle and cargo tracking system. Previous attempts at implementing NBR's tracking rules were hindered by high costs and lack of awareness. Business owners and cargo handlers resist adopting tracking systems due to concerns about costs, technology integration, and driver availability. The absence of a tracking system necessitates the physical escort of dutiable goods, increasing operational costs. Additionally, manual processes, inadequate automation, and poor infrastructure impede effective border management and customs procedures.

To address these challenges, phased implementation strategies, cost subsidies, awareness campaigns, and mindset alignment among stakeholders are essential. Establishing a cross-functional task force and improving telecommunication systems will enhance coordination. Implementing automation in port management, biometric authentication for drivers, and one-stop border posts will improve efficiency. Rapid deployment of the National Single Window platform will streamline customs procedures. Expanding the Authorised Economic Operator (AEO) programme will simplify customs processes, and joining the TIR Convention will boost international transport and trade

relationships. Continuous publication of the Time Release Study will maintain transparency and guide policy adjustments.

Conclusion

Bangladesh must enhance its vehicle and cargo tracking systems to meet global trade facilitation standards, addressing challenges such as high costs, lack of awareness, and infrastructural deficiencies. Despite existing regulations, comprehensive improvements are necessary to reduce operational costs, improve customs clearance, and boost logistics performance, thereby positively impacting the Logistics Performance Index (LPI). Drawing on international best practices, adopting automated border management and the TIR Convention, and implementing the Electronic Cargo Tracking System (ECTS) are vital steps. Additionally, by focusing on stakeholder collaboration, phased implementation strategies, cost subsidies, and awareness campaigns, Bangladesh can modernise its logistics sector, enhance trade efficiency, and ensure sustainable economic growth and competitiveness on a global scale.

Recommendations

The efficient management of vehicle and cargo tracking systems, alongside streamlined border management and customs procedures, is essential for enhancing Bangladesh's trade competitiveness. This report presents a series of strategic recommendations aimed at overcoming current challenges in these areas.

Recommendations for implementing vehicle and cargo tracking system

Bangladesh faces challenges in implementing a robust vehicle and cargo tracking system. Key recommendations include the phased implementation of the National Board of Revenue's (NBR) Electronic Seal and Lock Rules 2024, beginning with pilot programmes to address potential issues. Financial accessibility can be improved through subsidies and tiered pricing models to mitigate the high costs that deter businesses. A comprehensive awareness campaign is essential to educate stakeholders on the benefits of the new regulations. Targeted efforts to align the mindset of business owners and cargo handlers, using case studies and industry testimonials, will help foster acceptance of tracking technologies. Offering operational incentives such as priority in customs and port queues will further drive adoption.

Coordination among relevant government agencies is essential to the system's success, and the reliance on labour-intensive escort services can be reduced through real-time tracking technologies. A reliable telecommunication system is paramount to ensuring uninterrupted monitoring, especially in remote areas. Moreover, integrating the Electronic Seal and Lock Rules 2024 with the Central Logistics Tracking Platform (CLTP) will enhance overall supply chain visibility. To improve Bangladesh's global standing, efforts should focus on increasing the country's tracking and tracing score, currently at 2.4, and fostering regional coordination for cross-border cargo tracking.

Recommendations for automating border management and customs procedure

Bangladesh's economic future relies heavily on efficient border and customs management. The current system, deterred by manual processes and limited automation, needs urgent attention. Recommendations emphasise the adoption of comprehensive automation in port management to reduce delays and costs. Introducing biometric authentication for cargo drivers will address the issue of unauthorised driver changes, and greater coordination between customs and port management is needed to ensure seamless operations.

Establishing one-stop border posts (OSBPs) along key border points can significantly expedite cross-border trade. Addressing infrastructure bottlenecks, such as electricity shortages, is equally needed. Training field-level staff on automated systems is recommended to ensure effective operation. Accelerating the implementation of the National Single Window (NSW) platform will further streamline customs procedures, consolidating them into a unified digital platform.

Increasing the number of Authorised Economic Operators (AEOs) and joining the TIR Convention will streamline international trade and customs processes, providing economic benefits. Finally, continuing the publication of the Time Release Study (TRS) will ensure transparency, identify bottlenecks, and guide policy improvements.

Chapter 1: Background and Introduction

1.0 Background

The Bangladesh government has mandated the use of GPS trackers in covered vans to curb cargo theft on roads (Nayel, 2021). This decision was made due to the concerns raised by the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) regarding the theft of export goods from covered vans en route to Chittagong docks. The leading exporters' group reported instances of imported goods being stolen on roads and highways while en route from ports to factories.[1] Besides, in terms of regional connectivity, Bangladesh, Bhutan, India, and Nepal (BBIN) Motor Vehicle Agreement (MVA) is designed to establish regulations governing the movement of passenger, personal, and cargo vehicles among and between the four countries. The installation of a tracking system on motor vehicles as well as containers has also been highlighted in the MVA.[2]

Regarding vehicle and cargo tracking in Bangladesh, the Bangladesh Telecommunication Regulatory Commission (BTRC) issues licensing guidelines for vehicle and cargo tracking services within the country. However, while companies must adhere to BTRC's approval process for vehicle tracking solutions, there is a gap regarding guidelines for establishing effective tracking systems. It's imperative for the organisation to develop comprehensive guidelines for both vehicle and cargo tracking systems in addition to complying with licensing regulations.

Vehicle and cargo tracking systems offer numerous advantages, including reduced operational costs and removal of non-tariff barriers. This system enables logistics companies to analyse real-time data identifying optimal shipment routes to decrease fuel costs and expedite customs clearance. With cargo tracking, customs officials can evaluate shipment risks, ensuring regulatory compliance. These systems streamline customs clearance through automation, reducing paperwork, minimising manual inspections, and accelerating the clearance process. Electronic access to shipment data for customs authorities enhances efficiency and reduces transit times. Moreover, cargo tracking impacts various dimensions of the Logistics Performance Index (LPI), a benchmarking tool by the World Bank (WB), including infrastructure, customs performance, international shipments, quality of logistics services, tracking and tracing, and timeliness.[3]

Trade facilitation is needed for Bangladesh's steady economic growth rate. In response to this need, considering customs as the primary agency responsible for facilitating international trade, the National Board of Revenue (NBR), serving as Bangladesh's Chief Revenue Authority, has introduced Information and Communication Technology (ICT) applications and trade-friendly innovations to streamline and simplify clearance procedures for ensuring seamless trade operations. These include Customs Computer System: Automated system for Customs Data (ASYCUDA) World, Bonded Warehouse management, Authorised Economic Operator (AEO), National Enquiry Point (NEP), Non-

[1] https://container-news.com/bangladesh-makes-gps-tracker-mandatory-to-stop-cargo-theft-at-highways/
[2] Regional Road Connectivity Bangladesh Perspective. (2016, January). Retrieved from https://rthd.portal.gov.bd/sites/default/files/files/rthd.portal.gov.bd/page/9b7d5069_9a30_4fe4_85ec_9db4f2f3966b/rrcbp.pdf
[3] https://lpi.worldbank.org/international

Intrusive Inspection (NII), Advance Ruling (AR), Customs Portal, Pre-Arrival Processing (PAP), E-auction, de-minimis, etc.[4]

The National Board of Revenue released the findings of its first sector-focused Comprehensive Time Release Study (TRS) aiming to measure and report the average release time across various import clearance processes at three major ports of Bangladesh: Benapole Land Port, Chattogram Seaport, and Dhaka Airport. The World Customs Organization (WCO) conducted a national Time Release Study (TRS) workshop for Bangladesh's National Board of Revenue (NBR) from March 29 to 31 March 2022 within the framework of the State Secretariat for Economic Affairs of Switzerland-World Customs Organization (SECO-WCO) Global Trade Facilitation Programme (GTFP).[5] TRS, endorsed by the World Customs Organization (WCO), serves as a method for assessing the time taken by authorities to release import or export cargo, facilitating the identification of bottlenecks and performance improvement in import or export processes.[6]

Bangladesh has been actively working to enhance trade facilitation in alignment with its Trade Facilitation Agreement (TFA) commitments (See Box 1.1). To effectively coordinate all trade- and transport-related policies and activities, as well as oversee initiatives pertaining to the TFA, the National Trade and Transport Facilitation Committee (NTTFC) was formed, and chaired by the Minister of Commerce.[7] Moreover, Initiatives led by development partners including the Asian Development Bank (ADB), the United States Agency for International Development (USAID), and the World Bank (WB) have significantly supported key activities aimed at bolstering trade facilitation in Bangladesh.[8]

Box 1. 1: Trade Facilitation Agreement

The Trade Facilitation Agreement (TFA), established by the World Trade Organization (WTO), aims to simplify, modernise, and harmonise export and import processes.

Purpose of the TFA: The TFA seeks to expedite the movement, release, and clearance of goods across borders, including goods in transit. It also promotes effective cooperation between customs and other relevant authorities on trade facilitation and customs compliance issues.

Provisions of the TFA: Goods Movement: The TFA contains provisions to streamline the movement of goods, making trade more efficient. Customs Cooperation: It encourages collaboration between customs authorities and other relevant agencies. Technical Assistance: The agreement includes provisions for technical assistance and capacity building to help countries implement trade facilitation measures.

Source: RAPID's Presentation.

[4] https://nbr.gov.bd/uploads/public-notice/Bangladesh_Customs_Capacity_Building_Strategy,_Need_and_Action_Plan.pdf
[5] https://www.wcoomd.org/en/media/newsroom/2022/april/wco-national-trs-workshop-in-bangladesh.aspx
[6] Press_release_TRS_2022.pdf (nbr.gov.bd)
[7] https://documents1.worldbank.org/curated/en/872701568293805165/text/Bangladesh-First-Regional-Connectivity-Project-Modernizing-Trade-Logistics-Improving-Integration-and-Competitiveness.txt
[8] TFAD PDF (tfadatabase.org)

For the fourth time, the National Board of Revenue (NBR) has issued a notification regarding the implementation of the "Electric Seal and Lock Rules 2024" to safeguard goods at all customs.[9] These rules can be extended to all types of containers, trucks, and covered vans, aiming to address issues related to goods theft and illicit trade activities.

In the light of aforementioned aspects, this study aims to address five board objectives to be examined. These objectives include identifying the gaps in the existing guidelines on the vehicle and cargo tracking systems, suggesting automated border management and customs procedures, analysing the impact of the cargo tracking system on the Logistics Performance Index (LPI), discussing Transports Internationaux Routiers (TIR) convention and Electronic Cargo Tracking System (ECTS), and analysing policies and regulatory measures.

1.1 Introduction

Vehicle and cargo tracking system is a technology that uses a combination of hardware and software to monitor and track the real-time location of vehicles and cargo. It typically employs Global Positioning System (GPS) technology to pinpoint the exact location of a vehicle and transmit this information to a central database or a monitoring system. The system may also utilise additional technologies, such as cellular or satellite communication, to relay the location data.

To stay ahead in logistics, vehicle and cargo tracking has emerged as a significant element in facilitating global trade. Globally, there is a growing demand for such tracking systems to streamline trade operations. Many countries have been using tracking and tracing mechanisms to monitor the movement of goods during trade. The popularity of vehicle and cargo tracking systems has surged, driven by a convergence of technological advancements and practical benefits across diverse sectors. Businesses with vehicle fleets leverage these systems for enhanced fleet management, optimising routes, and achieving cost efficiencies. The real-time monitoring capability improves operational efficiency and contributes to heightened security measures, providing a prompt response in case of theft. Moreover, integrating GPS technology, communication modules, and advanced software has made these systems more accessible and user-friendly. Individuals, too, are increasingly adopting vehicle tracking systems for personal use, citing concerns about safety, theft prevention, and monitoring the driving habits of family members. As regulatory environments evolve and technology continues to advance, the popularity of vehicle tracking systems is poised to grow further, offering a multifaceted solution for businesses and individuals alike.

According to a report by Grand View Research, in 2022, the market size of the global vehicle tracking system reached USD 21.54 billion, and projections indicate a robust growth trajectory with an anticipated compound annual growth rate (CAGR) of 14.1 per cent over the forecast period from 2023 to 2030.[10] The increasing adoption of intelligent transport systems, coupled with the incorporation of 5G technology for vehicle connectivity, is expected to be a driving force behind the expansion of

[9] NBR issues 'electric seal and lock rules' for fourth time | The Daily Star
[10] https://www.grandviewresearch.com/industry-analysis/vehicle-tracking-systems-market

the market. Additionally, the growing demand for semi-autonomous and autonomous vehicles is playing a pivotal role in fostering the need for advanced and standardised vehicle tracking systems.

Various East African countries have embraced vehicle tracking systems as a part of their regional trade initiatives. The region has significantly improved both security and operational efficiency, reducing the cost of doing business and facilitating smoother trade flows between countries like Kenya, Uganda, Rwanda, and the Democratic Republic of the Congo. This has also supported the broader objectives of the East African Community (EAC), which aims to promote regional integration and economic growth through seamless trade connectivity.

1.2 Objectives and Scope

The study describes the challenges in the implementation of vehicle and cargo tracking systems and explains how trade relations with other countries can be enhanced using cross-country examples. The objective of the study can be specified within the five broad areas.

1. **Identifying the gaps in the existing guidelines on the vehicle and cargo tracking system:** Evaluate the current guidelines of the Bangladesh Telecommunication Regulatory Commission and other national documents such as Electronic Seal and Lock Rules 2024, National Development Logistics Policy (NDLP) 2024 to identify gaps for the improvement of Bangladesh's vehicle and cargo tracking system.
2. **Suggesting automated border management and customs procedures:** Explore all the land ports of Bangladesh to propose how the country can automate its border management and customs procedures using modern tracking devices, electronic locks, and seals.
3. **Analysing the impact of the cargo tracking system on the Logistics Performance Index (LPI):** Identify Bangladesh's ranking in the tracking and tracing dimension, along with other dimensions of LPI, such as customs, infrastructure, international shipments, logistics competence, and quality, and timeliness. Examine how the tracking and tracing dimension can impact other dimensions.
4. **Discussion on Transports Internationaux Routiers (TIR) convention and Electronic Cargo Tracking System (ECTS):** Explore whether Bangladesh and its neighbouring countries are part of the TIR convention and utilise the ECTS. Identify a few good practices and regional experiences from neighbouring countries.
5. **Analysis of policies and regulatory measures:** Recognise and assess the impediments to the implementation of the vehicle and cargo tracking system, including regulatory barriers, logistical challenges, and other constraints. Suggest relevant, contemporary, and all-encompassing policy recommendations.

1.3 Approach and methodology of the study

The study team uses both qualitative and quantitative techniques to attain the study's objective and recommend pragmatic policies to overcome the challenges. The methodological approach for the proposed study on the vehicle and cargo tracking system under a free trade regime, with the goal of formulating guidelines for implementation in Bangladesh, consists of three pivotal phases.

a) **Desk Research:** In the initial phase, the research team conducted extensive desk research, delving into literature and reports concerning procedures and policies essential to establishing vehicle and cargo tracking systems. This phase served as the foundation, fostering a deep understanding of the current guidelines set by the BTRC for vehicle and cargo tracking systems. This phase also concentrated on reviewing the government's relevant plans for developing vehicle and cargo tracking systems. Landscaping of policy commitments is also examined such as policies taken by the Bangladesh Telecommunication Regulatory Commission (BTRC), the Bangladesh Perspective Plan 2021-2041 (PP2041), and the National Logistics Development Policy (NLDP) 2024.

b) **Stakeholder Mapping and Interviews:** The second phase entails stakeholder mapping and interviews. A systematic approach is developed to identify and chart key stakeholders involved in vehicle and cargo tracking services, as well as border management and customs procedures. This encompasses officials from the Bangladesh Telecommunication Regulatory Commission (BTRC), vehicle service providers, customs officials, exporters, and the Bangladesh Association of Software and Information Services (BASIS). Interviews were conducted with registered vehicle service providers by BTRC, including Autonemo Ltd. BD Com, Bondstein Technologies Ltd, Dupno International Ltd, Impressive Security Ltd, and Monico Technologies Ltd. By engaging with stakeholders from diverse fields, such as government officials, logistics service providers, and customs offices, the study aims to uncover legal and policy constraints, along with challenges in formulating guidelines for vehicle and cargo tracking.

Table 1. 1: Distribution of key informant interviews (KIIs) among different stakeholders

Stakeholders	Designation	Number of KIIs
Port Officials	Assistant Director (Traffic), Terminal Manager (Traffic), and Surveyor	4
Customs Officials	Assistant Commissioner	2
National Board of Revenue (NBR) Official	Deputy Director	1
Exporters	Trader	4
Ministry of Commerce (MoC)	Deputy Secretary and Joint Secretary	3
Bangladesh Telecommunication Regulatory Commission (BTRC)	Deputy Assistant Director	1
Clearing and Forwarding Agents (C&F agents)	President and Senior Vice President	2
Vehicle Tracking Service Providers	Director, Managing Director, General Manager, Chief Technology Officer	6
Bangladesh Truck Covered Van Malik Samity	Joint General Secretary and Assistant Secretary	2
Bangladesh Association Software and Information Services (BASIS)	Director and Joint Secretary	2
Total KIIs		**27**

Table 1. 2: Distribution of focus group discussions (FGDs) among different stakeholders

Stakeholders	Designation	Number of FGDs
Traders (in Akhaura)	Exporters	1
Officials of various levels (in Dhaka)	Different designated officials	2
Total FGDs		**3**

Source: RAPID Presentation.

c) **Quantitative analysis:** The study analyses data through qualitative surveys and secondary sources.

- ✓ Primary data collection: Key informant interviews (KIIs), focus group discussions (FGDs), and public consultations (PCs) are utilised to gather primary data for each objective of the study.
  Key informant interviews (KIIs): KIIs are in-depth, one-on-one interviews with individuals who possess specialised knowledge, relevant experience, or a vested interest in the research topic. These interviews provide valuable, expert-level insights and help reveal detailed perspectives that may not be obtained in group discussions. KIIs are particularly useful for gathering specific, technical, or insider information that is essential to addressing the study's objectives.
  Focus group discussions (FGDs): FGDs are structured group conversations where participants discuss their experiences, opinions, and insights related to the research topic. The group setting encourages interaction, revealing shared ideas, disagreements, and diverse viewpoints. This method is effective for exploring community attitudes, social norms, and group behaviours, offering a broader understanding of how the topic affects various segments of the population.
  Public consultations (PCs): PCs involve gathering input from a wider audience, including community members, stakeholders, or the general public, to ensure diverse perspectives are represented. These sessions allow for open dialogue where participants can voice their concerns, preferences, and suggestions. Public consultations are especially useful for gaining broader community feedback, increasing transparency, and fostering engagement in the decision-making process.
- ✓ Data analysis and findings: This research compiled data from the World Bank on the Logistic Performance Index (LPI) and its components. Employing statistical tools, a comprehensive analysis has been conducted to identify trends, patterns, and correlations between tracking and tracing component of LPI and other components of LPI and the overall LPI. Additionally, a multiple regression analysis is estimated to identify the effect of improved tracking and tracing on the overall LPI and its components.
- ✓ Survey instruments: KIIs have been conducted using a semi-structured checklist of questions. The checklist varies for different stakeholders. Besides, several FGDs are organised.
  1. The study utilises standardised questionnaires for the KIIs and the FGDs with the government bodies, vehicle tracking service providers, transport specialists, land port customs officials, exporters and importers, and other stakeholders.

2. A border management and customs procedures assessment checklist is utilised.

This methodological approach aims to ensure a comprehensive assessment by covering a diverse range of stakeholders and institutions from different fields associated with vehicle and cargo tracking systems. This enables a robust understanding of the project's impact on building proper guidelines.

A summary of the methodologies to achieve the broad objectives is provided in Table 1.3

Table 1. 3: A summary of the proposed methodologies

Broad Objectives	Linked to specific research questions	Methodology and tools
1) Identifying the gaps in the existing guidelines on the vehicle and cargo tracking system	1.1 What are the existing policy guidelines for the vehicle and cargo tracking system in Bangladesh; 1.2 Identify the gaps in the existing guidelines	- Desk review - Key informant interviews (KIIs)
2) Suggesting automated border management and customs procedures	2.1 Identify the current state of border management and customs procedures of Bangladesh's land ports; 2.2 Compare the border management of Bangladesh with that of landlocked countries; 2.3 Discuss methods to automate border management and customs procedures	- Desk review - Key informant interviews (KIIs) - Secondary data analysis
3) Analysing the impact of the cargo tracking system on the Logistics Performance Index (LPI)	3.1 Evaluate Bangladesh's performance in the LPI; 3.2 Explain how tracking and tracing can affect other LPI dimensions; 3.3 Suggest ways in which Bangladesh can enhance the tracking and tracing dimension to improve its ranking on the LPI and other logistics performance indices	- Desk review - Key informant interviews (KIIs) - Secondary data analysis
4) Discussion on Transports Internationaux Routiers (TIR) convention and Electronic Cargo Tracking System (ECTS)	4.1 Discuss how Bangladesh's neighbouring countries, such as China, India, and Pakistan, benefit from the TIR convention; 4.2 Explain how the landlocked countries benefit from the ECTS; 4.3 Explore Bangladesh's current status in the TIR convention and examine whether the country utilises ECTS, highlighting benefits and differences	- Desk review - Key informant interviews (KIIs)
5) Analysis of policies and regulatory measures	5.1 Describe major legal and policy constraints and challenges in the proper establishment of the vehicle and cargo tracking system in Bangladesh; 5.2 Mention the applicable comprehensive policy guidelines or regulatory measures for the vehicle and cargo tracking system in Bangladesh	- Desk research - Key informant interviews (KIIs)

Source: RAPID Presentation.

Chapter 2: Identifying the Gaps in the Existing Guidelines on the Vehicle and Cargo Tracking System

2.0 Landscaping of Policy Commitments

The landscaping of policy commitments of the Bangladesh Government concerning vehicle and cargo tracking systems underscores a concerted effort to improve efficiency, transparency, and security in the transport sector. The functions of logistics are to employ digital solutions in managing its operations to reduce theft cases while making sure that the goods are delivered on time. Encouraging the implementation of another set of laws and emerging technologies like GPS tracking and electronic monitoring systems for cargo shipments in particular, the government's goal is to monitor the movements of vehicles as efficiently as possible. These objectives do not only contribute to the enhancement of the logistics infrastructure of the nation but also spearhead wider goals of economic growth and trade. This will entail a focus on the use of proper tracking measures that Bangladesh intends to enhance the development of commercial logistics and adhere to global standards in transportation.

2.1 Electronic Seal and Lock Rules 2024

The National Board of Revenue (NBR) of Bangladesh introduced the Electronic Seal and Lock Rules 2024 under the Customs Act 1969 in April 2024 (NBR, 2024). This is the fourth attempt by the NBR to implement such a system, after facing opposition in the past from the trade bodies including exporters and importers regarding service charges. The rules aim to achieve enhanced security for goods through the implementation of electronic seals and locks on containers, trucks, and other cargo vehicles, effectively preventing theft or tampering during transit. Additionally, the system will leverage GPS technology for real-time tracking, ensuring that goods are monitored throughout their journey and reach their intended destinations without any disruptions. Moreover, by preventing tampering and illegal sales from bonded warehouses, the National Board of Revenue (NBR) anticipates a significant reduction in revenue leakage, thereby enhancing revenue collection efficiency and bolstering the integrity of the supply chain.

Box 2. 1: Electronic Seal and Lock Rules 2024

- Committees may inspect and audit service providers, and disciplinary action may follow if irregularities are found.

Termination:

- Contracts can be cancelled for proven negligence or serious irregularities.

Service Recipient Responsibilities:

- Follow instructions for using electronic seals and locks.
- Ensure the security of goods during transfer.

Duties of Customs Officers and Agencies:

- Monitor the sealing and locking process.
- Report discrepancies and take necessary actions.

Rapid Response Team:

- Take immediate action on misuse or damage reports.

Central Monitoring Center:

- Ensure real-time tracking of seals and locks.

Law Enforcement Assistance:

- Customs and service providers may seek assistance from law enforcement for secure transportation.

Service Fees:

- The Board will prescribe fees for electronic seal and lock services.

Violation Actions:

- Violations will result in actions as per relevant laws.

Revocation of Previous Rules:

- Ensure data security and comply with customs requirements.

Monthly Statements:

- Service providers must submit quarterly activity statements.

Inspection and Audit:

Source: NBR (2024).

The rules apply to all customs houses in Bangladesh and cover import, export, and transit and transhipment goods across various transportation modes sea, river, or land customs stations, including containers, cargoes, covered vans, trucks, railway wagons, and cargo vessels. However, the implementation of mandatory e-seals and tracking is currently limited to goods moving in transit or transshipment through Chattogram and Mongla ports between Bangladesh and India, in accordance with the existing agreement between the two countries.[11] While the fee structure for these services is outlined in the 2018 rules, the latest notification indicates that the charges will now be determined jointly by the NBR and the service provider, suggesting that a new fee structure is yet to be finalised. Additionally, a new requirement mandates a substantial security deposit of Tk5 crore from companies offering e-seal and lock services, aiming to ensure the reliability and integrity of the service providers in facilitating secure and efficient transit processes. Overall, the Electronic Seal and

[11] https://today.thefinancialexpress.com.bd/last-page/nbr-makes-e-seal-mandatory-for-transit-goods-1713203223

Lock Rules 2024 aim to improve security and transparency in cargo movement across Bangladesh. However, some aspects like fee structure and the wider implementation need to be ironed out.

Implementing Electronic Seal and Lock Rules 2024 presents significant challenges and potential threats. Foremost among these is the persistent opposition from trade bodies, primarily driven by concerns over the imposition of service charges (Table 2.1). This opposition could impede the smooth adoption of the system, particularly among smaller businesses, impacting their competitiveness. Moreover, ensuring the reliable and consistent functioning of the electronic seal and tracking system nationwide poses a formidable challenge. Technical glitches, network issues, and other unforeseen disruptions could hamper trade processes, leading to delays and inefficiencies. Additionally, the risk of unreliable service providers introduces another layer of complexity. If these providers fail to deliver on their commitments or if their systems prove unreliable or insecure, it could undermine trust in the entire system, potentially derailing its implementation efforts. To address these threats, the NBR must adopt stringent regulations, transparent pricing structures, and robust quality control mechanisms while fostering collaboration with stakeholders and service providers to ensure the successful implementation of the Electronic Seal and Lock Rules 2024.

Table 2. 1: SWOT analysis of the Electronic Seal and Lock Rules 2024

Strengths:	**Weaknesses:**
• Electronic seals and locks will significantly reduce theft and tampering of goods during transit. • GPS technology will provide real-time location data, ensuring goods reach their destinations without disruptions. • By preventing tampering and illegal sales, the NBR expects improved revenue collection efficiency. • The system will bolster the integrity of the supply chain by minimising illegal activities. • The rules cover import, export, transit, and transhipment of goods across various transportation modes and customs stations.	• Mandatory e-seals are currently limited to goods moving between Bangladesh and India through specific ports. • The final fee structure for e-seal and tracking services is yet to be determined. • The Tk5 crore security deposit requirement might limit participation from potential service providers. • The NBR faced resistance from trade bodies regarding service charges in the past, which could resurface.

Opportunities:	Threats:
• The NBR can gradually expand the mandatory use of e-seals and tracking to cover all customs stations and goods. • A transparent and standardised fee structure can address concerns from trade bodies and ensure efficient service delivery. • The NBR can explore alternative mechanisms or collaborations to encourage participation from qualified service providers. • Enhanced security and transparency can facilitate smoother trade relations with neighbouring countries.	• Trade bodies might continue to oppose the implementation due to concerns over service charges. • Ensuring reliable and consistent functioning of the electronic seal and tracking system across the country is challenging. • Unreliable service providers could disrupt implementation and erode trust in the system.

Source: RAPID's analysis

2.2 National Logistics Policy (NLP) 2024

The draft of the Logistics Policy (NLP) 2024 was published on the Prime Minister's Office website on January 30, 2024, and the final version of the policy was released on May 2, 2024. The National Logistics Policy (NLP) aims to achieve sustainable and targeted economic growth by increasing domestic and international trade and investment capacity by developing world-class technology-based, time and cost-effective, efficient, and environment-friendly logistics systems. Key objectives include reducing delays and costs by enhancing overall efficiency in logistics services, creating an integrated logistics ecosystem, developing multimodal infrastructure, implementing state-of-the-art digitalised management, facilitating coordination of trade-related regulations, fostering skilled human resources, attracting investment, improving performance indicators, ensuring safety and compliance, and encouraging global participation through inclusive, gender-sensitive, and environmentally friendly logistics infrastructure and services. The policy also emphasises the adoption of innovative technologies and global good practices for the future.

A Canadian online publication, Visual Capitalist reported on the global economic landscape in 2022. Its report, titled "Top Heavy: Countries by Share of the Global Economy", used International Monetary Fund (IMF) data to show that Bangladesh's economy ranked 35th in the world, based on the gross domestic product (GDP).[12] According to Pricewaterhouse Coopers (PwC) projection, Bangladesh will be the 28th fastest-growing economy in 2030 and the 23rd fastest-growing economy in 2050.[13] According to a 2020 analytical report titled "Moving Forward: Connectivity and Logistics to Sustain Bangladesh's Success" by the World Bank Group (WBG), logistics service costs in Bangladesh vary

[12] Koop, A. (2022, December 29). Top Heavy: Countries by Share of the Global Economy. Retrieved from https://www.visualcapitalist.com/countries-by-share-of-global-economy/

[13] PwC. (2019, August). Destination Bangladesh. Retrieved from https://www.pwc.com/bd/en/assets/pdfs/research-insights/2019/destination-bangladesh.pdf

significantly, ranging from 4.5 per cent to 48 per cent across different sectors[14]. These costs are notably higher than those of other trading partners and competitors.

By implementing short- and medium-term reforms in specific logistics areas, it is possible to boost national export earnings by 19 per cent. Additionally, even a modest 1 per cent reduction in transport and logistics costs can lead to a substantial 7.4 per cent increase in the demand for Bangladeshi products in the export market.[15] After transitioning from least developed country (LDC) status, there may be an 8-12 per cent increase in duties for goods exported to European Union countries. Consequently, the prices of Bangladesh's export products will rise in the destination country. However, by focusing on logistics system development, this increased cost can be mitigated, allowing Bangladeshi export products and services to maintain their competitiveness.

One of the goals of this policy is to establish an integrated logistics infrastructure harnessing the advantages of artificial intelligence, machine learning, and modern information technology digitalised logistics management, including world-class tracking and tracing capabilities. To maximise benefits, it is essential to interconnect all digital methods currently utilised by ministries, departments, and offices, as well as domestic and foreign government and private organisations in this sector. This necessitates ensuring data sharing and interoperability among service providers. Additionally, Bangladesh needs to implement a real-time tracing and tracking system to monitor goods' movement from inception to delivery, aligning with the standards of developed countries worldwide. In fact, the National Logistics Development Policy 2024 refers to a strategic framework or plan developed at the national level to enhance logistics operations within Bangladesh. Such policies typically aim to improve the efficiency, reliability, and cost-effectiveness of transportation and supply chain management systems in the country.

The weaknesses and threats associated with implementing vehicle tracking systems underscore several critical challenges (Table 2.2). The implementation of such systems necessitates robust infrastructure, including comprehensive GPS coverage and reliable communication networks. However, ensuring universal coverage across diverse geographical areas can be a daunting task, potentially leading to gaps in tracking capabilities and data accuracy. Moreover, the initial setup and ongoing maintenance of the system present financial burdens, particularly for small logistics operators with limited resources. The substantial investment required may deter some operators from adopting these systems, thereby hindering the widespread adoption of tracking technologies. Protecting system data from cyber threats is paramount, as the proliferation of sophisticated cyberattacks poses a significant risk to data security and system reliability. Establishing clear guidelines and policies for vehicle and cargo tracking systems can be time-consuming to mitigate threats.

[14] Dappe, M. H., Kunaka, C., Lebrand, M., & Weisskopf, N. (2020). Moving Forward Connectivity and Logistics to Sustain Bangladesh's Success. Retrieved from https://openknowledge.worldbank.org/server/api/core/bitstreams/d788b6ec-77d8-5434-8cbf-d4235079079c/content

[15] National Logistics Development Policy 2024 (Draft). (2024, January 30).

Table 2. 2: SWOT analysis of the National Logistics Policy (NLP) 2024

Strengths:	**Weaknesses:**
• The policy leverages artificial intelligence, machine learning, and modern information technology for logistics management, enhancing efficiency and accuracy. • By focusing on tracking and tracing, Bangladesh aims to achieve world-class logistics capabilities. • The goal of interconnecting digital methods across ministries, departments, and organisations can lead to seamless data exchange and collaboration.	• Implementing vehicle tracking systems requires robust infrastructure, including GPS coverage and reliable communication networks. • Setting up and maintaining the system can be expensive, especially for small logistics operators. • Balancing data collection for tracking with privacy rights is a challenge.
Opportunities:	**Threats:**
• Real-time tracking and tracing enhance cross-border trade, benefiting both domestic and foreign businesses. • Aligning with developed countries' standards can improve international competitiveness.	• Protecting vehicle tracking system data from cyber threats is essential. • Ensuring consistent implementation and enforcement of vehicle tracking system policies can be difficult.

Source: RAPID's analysis.

The Bangladesh National Logistics Policy recognises the significance of an effective vehicle and cargo tracking system. However, it currently lacks comprehensive guidelines on the implementation and operational procedures for such a system. To bridge this gap, a dedicated chapter should be included in the policy document. This chapter will outline the essential steps, technologies, and best practices necessary for establishing a robust tracking system.

2.3 Bangladesh Telecommunication Regulatory Commission (BTRC)

The Bangladesh Telecommunication Regulatory Commission has the authority, as outlined in section 36 of the Bangladesh Telecommunication Act 2001 (Act No. XVIII of 2001), to issue licenses for telecommunication services, including tracking services. Additionally, the Commission is tasked with establishing the criteria for eligibility and specifying the general terms and conditions of these licenses.

In accordance with Section 31 (2) I of the Act, the Commission is authorised to provide instructions and guidelines for licensees and service providers pertaining to the diverse apparatus defined in the legislation.

Considering the principles of transparency, fairness, non-discrimination, and other pertinent principles, the Commission has opted to release guidelines concerning the licensing procedure for

Vehicle Tracking Services, as outlined in the Licensing (Procedure) Regulation of 2004. Any organisation, company, or entity that can obtain the wireless data transmission facility from a licensed Cellular Mobile & BWA Operator is eligible to seek this license. Additionally, Cellular Mobile and Broadband Wireless Access (BWA) operators have the eligibility to apply for the approval of vehicle tracking services.[16]

Objectives of BTRC guidelines on vehicle tracking services:

1. Guidelines are created to align with the government's goals of introducing a modern telecommunication service in Bangladesh, specifically the Vehicle Tracking System, to enhance the transport sector.

2. Guidelines aim to give a summary of the licensing and regulatory framework for applicants looking to acquire a license or permission.

3. The Vehicle Tracking License/permission granted according to these guidelines allows operators to set up, operate, and maintain Vehicle Tracking Services in Bangladesh. Without a valid license/permission from the Commission, no individual or business entity is permitted to offer Vehicle Tracking Services.

The licenses or permissions are initially valid for a period of 5 years. After the initial term expires, they may be renewed for subsequent 5-year terms, subject to approval from the Commission. If any law or condition of the license is violated, the licensee will face prosecution under the relevant legal provisions (BTRC, 2009). Broadly speaking, the Bangladesh Telecommunication Regulatory Commission (BTRC) offers general guidance on licensing for vehicle tracking services. However, the specific details on how Bangladesh can effectively oversee and manage vehicle tracking systems, particularly in the context of cargo and vehicles, are not explicitly outlined in the provided guidelines. Table 2.3 shows a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis of the current BRTC regulation regarding the licensing of VTS.

[16] https://btrc.portal.gov.bd/sites/default/files/files/btrc.portal.gov.bd/page/1c1ea1c0_f8ef_4cdf_9005_d8a34b9ca554/2022-11-20-05-16-3ebbef59e85e2b5630d8a274bc6fcde1.pdf

Table 2. 3: SWOT analysis of the Bangladesh Telecommunication Regulatory Commission's initiatives

Strengths:	**Weaknesses:**
• BTRC has the authority to issue licenses for telecommunication services, including vehicle tracking systems. • The guidelines emphasise transparency, fairness, and non-discrimination in licensing procedures. • Eligible organisations, companies, and entities can obtain licenses for vehicle tracking systems. • Leveraging wireless data transmission facilities from licensed Cellular Mobile & BWA Operators enhances VTS implementation.	• Implementing vehicle tracking systems requires robust infrastructure, including GPS coverage and reliable communication networks. • Setting up and maintaining vehicle tracking systems can be expensive, especially for smaller operators. • Adhering to regulatory terms and conditions may pose challenges for licensees.
Opportunities:	**Threats:**
• Vehicle tracking systems align with the government's goal of introducing modern telecommunication services in Bangladesh. • Vehicle tracking systems can significantly enhance the transport sector by improving vehicle tracking and management.	• Balancing data collection for tracking with privacy rights is essential. • Ensuring consistent adherence to guidelines by all licensees can be challenging.

Source: RAPID's analysis.

Implementing vehicle tracking systems presents several weaknesses that are important to consider. Firstly, a robust infrastructure is needed for the effective operation of these systems, necessitating reliable GPS coverage and communication networks. Without adequate infrastructure, the accuracy and reliability of tracking data may be compromised, leading to inefficiencies and potential errors in monitoring vehicle movements. Furthermore, the initial setup and ongoing maintenance of vehicle tracking systems can be financially burdensome, especially for smaller operators with limited resources. The costs associated with acquiring the necessary hardware, software, and subscriptions can pose significant challenges and may deter some businesses from investing in such technology.

Additionally, compliance with regulatory terms and conditions presents another weakness for licensees. Navigating the complex landscape of regulations governing data privacy, security, and transportation can be daunting, requiring careful attention to ensure legal compliance while operating vehicle tracking systems. Failure to adhere to these regulations can result in penalties, fines, or legal repercussions, adding another layer of complexity and risk for businesses utilising this technology. Overall, addressing these weaknesses effectively is essential for maximising the benefits of vehicle tracking systems while minimising potential drawbacks and risks. Moreover, ensuring consistent adherence to guidelines by all licensees poses a challenge, as varying interpretations or levels of compliance could undermine the effectiveness and credibility of the entire industry. Vigilance and proactive measures are essential to address these threats and maintain the integrity of the vehicle tracking systems market.

2.4 Bangladesh Perspective Plan 2021–2041 (PP2041)

The Bangladesh Perspective Plan 2021–2041 unfolds in four 5-year phases. The initial phase commences with the 8th Five-Year Plan (8FYP). The primary objective of the 8FYP is to initiate the implementation of the Perspective Plan, steering Bangladesh toward achieving upper middle-income country (UMIC) status, meeting significant Sustainable Development Goals (SDGs), and eradicating extreme poverty by 2031. The Bangladesh Perspective Plan 2021-2041 outlines the country's long-term development vision and strategies aiming to transform Bangladesh into a higher-middle-income country by 2031 and a developed country by 2041. It emphasises various sectors, including transport and communication. It envisions a future where transportation operates seamlessly, serving both passengers and goods on demand. Citizens have access to efficient and affordable transport choices, with fair competition among service providers and no entry or exit barriers. Robust connectivity spans districts, regions, and neighbouring countries, facilitating diverse transport modes. Stringent safety standards are established and enforced through legal provisions.

Urban traffic management combines mass rapid transit systems and private options, ensuring smooth transit while avoiding congestion. Additionally, consistent enforcement of parking and traffic laws applies to all, regardless of political or administrative affiliations. While the perspective plan outlines visions for the transport sector, including strategies like reinforcing long-term planning and priority setting, securing sustainable financing for transport infrastructure, formulating, and executing policies to ensure the quality and reliability of transport services, and enhancing the management capabilities and efficiency of public transport authorities, it does not explicitly provide specific details about a transport tracking system. However, vehicle and cargo tracking systems can be integrated with other initiatives within the plan, such as digital infrastructure, not only to modernise the transport system but also to improve the country's logistic performance and reduce trade costs. Thus, it is imperative to understand the necessity and challenges of incorporating the VTS into the perspective plan as a part of an efficient transport system.

Executing vehicle and cargo tracking systems across the entire country encompasses several significant challenges (Table 2.4). The implementation of such systems demands substantial investment, coordination, and overcoming bureaucratic hurdles. This involves not only the financial commitment required for acquiring and installing the necessary tracking infrastructure but also navigating through administrative processes and regulations, which can be time-consuming and complex. Additionally, ensuring seamless tracking and real-time data exchange may encounter technical challenges, particularly in areas with inadequate infrastructure or connectivity issues. This includes addressing issues such as signal coverage gaps, data transmission delays, and compatibility between different tracking systems and platforms. Moreover, raising awareness among stakeholders and encouraging the adoption of vehicle and cargo tracking systems by transport operators is essential but can be challenging. Many operators may be unfamiliar with the benefits of such systems or may be resistant to change due to concerns about costs, operational disruptions, or perceived complexities and existing systems and stakeholders may resist adopting these systems due to inertia or fear of disruption. The increasing adoption of tracking systems by other countries and regions poses a competitive threat. As more countries invest in similar tracking technologies, competition in

the global marketplace intensifies. This competition could lead to challenges such as pricing pressures, technological innovation, and differentiation strategies.

Table 2. 4: SWOT analysis of the Bangladesh Perspective Plan 2021–2041

Strengths:	**Weaknesses:**
• The Perspective Plan underscores the government's commitment to modernise and enhance various sectors, including transportation. • The plan provides a long-term vision for sustainable development, which can guide the implementation of vehicle and cargo tracking systems. • Vehicle and cargo tracking systems can be integrated with other initiatives within the plan, such as digital infrastructure.	• Executing vehicle and cargo tracking systems across the entire country requires substantial investment, coordination, and overcoming bureaucratic hurdles. • Ensuring seamless tracking and real-time data exchange may face technical challenges. • Raising awareness among stakeholders and encouraging the adoption of vehicle and cargo tracking systems by transport operators is essential.
Opportunities:	**Threats:**
• A well-implemented tracking and tracing can boost economic growth by improving logistics efficiency, reducing transit times, and minimising fuel consumption. • This can streamline cross-border trade by enhancing customs processes and ensuring cargo security. • Collaborating with private sector players can accelerate vehicle and cargo tracking systems deployment and innovation.	• Existing systems and stakeholders may resist adopting tracking and tracing systems due to inertia or fear of disruption. • Balancing data collection for tracking with privacy rights is needed. • Other countries and regions also invest in similar tracking systems, increasing competition.

Source: RAPID's analysis.

2.5 Global logistics sector policies including cargo tracking systems across different countries

The National Logistics Policy (NLP) was introduced in India on September 17, 2022.[17] The NLP aims to boost the nation's economic growth and enhance its business competitiveness by establishing a unified, smooth-running, efficient, dependable, eco-friendly, sustainable, and economical logistics system. This will be achieved by harnessing cutting-edge technology, streamlined processes, and a proficient workforce, resulting in reduced logistics expenses and enhanced operational efficiency. To guarantee the tracking and tracing of every containerised export-import (EXIM) cargo in India, the Logistics Data Bank (LDB) was developed. This supply chain visibility platform has resulted in

[17] pib.gov.in/PressReleaseIframePage.aspx?PRID=1957407

reducing India's average dwell time to just 2.6 days and has improved the efficiency of logistics overall.[18]

Nepal's transit cargo movement is governed by a Treaty of Transit with India, which entails a cumbersome documentation process involving eight documents, including six copies of the Customs Transit Declaration along with an additional five supporting documents, a legal undertaking, and insurance. Additionally, a one-time seal (OTL) must be affixed before cargo release from the port. At the exit border station, the integrity of the OTL is verified before allowing further cargo movement into Nepal. However, this transit system relies on manual procedures and excessive paperwork, resulting in delays and a lack of shipment visibility. Furthermore, the OTLs fail to assure regulators of reliability, prompting them to impose stringent terms and conditions for cargo and revenue security. Consequently, Nepali traders are compelled to excessively depend on intermediaries in India, thereby escalating their costs. In June 2017, India and Nepal agreed to initiate a trial of a tracking system to facilitate the transportation of cargo via road and rail from Kolkata to four significant customs points in Nepal: Kolkata-Birgunj via Raxaul, Kolkata-Sirsiya inland container depot via Raxaul, Kolkata-Biratnagar via Jogbani, and Kolkata-Bhairahawa via Sonauli corridors. The pilot programme for the Electronic Cargo Tracking System (ECTS) in both India and Nepal commenced in August 2018, supported by the Asian Development Bank (ADB).[19] [20]

China has introduced its inaugural five-year blueprint aimed at advancing the modernisation of the logistics sector until 2025. The key objectives include promoting digital transformation, enhancing business competitiveness, and improving the overall quality and efficiency of logistics services. As part of its logistics development plan, China aims to enhance modern logistics systems by accelerating the digital and smart upgrading of transportation, storage, delivery, and packaging sectors. As of 2021, China boasts the largest logistics sector globally, surpassing all other countries in terms of cargo transport volume and the sheer number of shipments. The total revenue generated by this sector amounted to an impressive 12 trillion yuan (approximately $1.74 trillion), as reported by the National Development and Reform Commission.[21]

Vietnam’s electronic manifests for imported cargo have been revolutionised by the completion of a comprehensive system by the General Department of Vietnam Customs. This system is designed to efficiently receive, scrutinise, and confirm electronic manifests for goods imported through land and inland waterway border gates.[22] To ensure seamless implementation, Customs Departments of border provinces have been tasked with overseeing Customs Branches of land and inland waterway border gates. Their responsibility lies in supervising the preparation and timely submission of

[18] pib.gov.in/PressReleaseIframePage.aspx?PRID=1944005

[19] India, Nepal to Launch Electronic Tracking of Transit Trade | Asian Development Bank (adb.org)

[20] The Asian Development Bank (ADB) actively supports the South Asia Subregional Economic Cooperation (SASEC) program. SASEC is a collaborative initiative that unites countries such as Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, and Sri Lanka in a project-based partnership.

[21] https://english.www.gov.cn/policies/policywatch/202301/04/content_WS63b4ba00c6d0a757729e50e6.html

[22] https://logistics.gov.vn/policy/vietnam/businesses-can-make-manifest-of-cargo-through-the-land-border-gate-via-an-electronic-system

manifests for imported cargo, ensuring compliance with the new electronic system. Truck owners, drivers, and individuals authorised by the truck owner, such as goods owners or customs brokers, play a pivotal role in this process. They are mandated to generate a manifest of imported cargo, commonly referred to as the manifest, before entering Vietnamese territory. This requirement emphasises the importance of proactive compliance with the new regulations governing cargo imports.

The Vietnam Logistics Services Development Strategy for the 2025-2035 period, with a vision extending to 2045, underscores the Ministry of Industry and Trade's prioritisation of significant tasks during its drafting phase. These include fortifying legal frameworks, bolstering infrastructure, enhancing business competitiveness, fostering market development, embracing technology adoption, and facilitating human resource training. The latest version of the draft delineates ambitious development objectives for the logistics sector by 2035. Among these are elevating the contribution of logistics services to GDP to 6-8 per cent, targeting an average annual growth rate of 15-20 per cent in logistics services, reducing logistics costs to 12-15 per cent of GDP, achieving a global Logistics Performance Index (LPI) ranking of 35th or higher, and facilitating the adoption of digital transformation solutions by 80 per cent of logistics businesses.[23] Moreover, it aims for 30 per cent of logistics vehicles to transition to green energy, while ensuring that 70 per cent of workers receive professional training, with 30 per cent possessing university degrees or higher (Quang & Hue, 2024). Looking ahead to 2045, the strategy envisages even loftier milestones. By then, logistics services are expected to contribute 12-15 per cent to GDP, with an anticipated average annual growth rate of 10-12 per cent (Quang & Hue, 2024). The outsourcing rate for logistics services is projected to soar to 80-90 per cent, and logistics costs are forecasted to decrease to 10-12 per cent of GDP (Quang & Hue, 2024). Furthermore, all vehicles in the logistics sector are anticipated to transition entirely to green energy sources.

Table 2. 5: Policies regarding the logistics sector including cargo tracking systems in different countries

National Logistics Policy (NPL) of India • The National Logistics Policy (NLP) was introduced in India on September 17, 2022. • To ensure the monitoring and tracing of all containerised export-import (EXIM) cargo in India, the Logistics Data Bank (LDB) was created. This platform for supply chain visibility has led to a decrease in India's average dwell time to just 2.6 days and has enhanced overall logistics efficiency.
Electronic Cargo Tracking System (ECTS) in India and Nepal • In June 2017, India and Nepal entered into a memorandum of intent to pilot a tracking system aimed at facilitating cargo transit by road and rail. • The focus was on easing the movement of goods from Kolkata to four key customs points in Nepal, namely Kolkata-Birgunj via Raxaul, Kolkata-Sirsiya inland container depot via Raxaul, Kolkata-Biratnagar via Jogbani, and Kolkata-Bhairahawa via Sonauli corridors.

[23] https://theinvestor.vn/digital-transformation-green-development-focuses-of-vietnam-logistics-official-d9881.html#:~:text=While%20drafting%20a%20prime%20ministerial,legal%20institutions%2C%20improving%20infrastructure%20to

- The pilot implementation of the Electronic Cargo Tracking System (ECTS) in India and Nepal commenced in August 2018, supported by the Asian Development Bank (ADB).

China's first five-year plan for a modern logistics sector

- China's five-year plan focuses on advancing its logistics sector until 2025.
- China aims to enhance modern logistics systems by accelerating the digital and smart upgrading of transportation, storage, delivery, and packaging sectors.
- The total revenue generated by cargo transport volume and number of shipments amounted to 12 trillion yuan (approximately $1.74 trillion) in 2021, as the National Development and Reform Commission reported.

Vietnam's electronic manifests for imported cargo

- The General Department of Vietnam Customs has completed the development of a comprehensive system for receiving, scrutinising, and confirming electronic manifests for goods imported through land and inland waterway border gates.
- Customs Departments of border provinces are instructed to oversee Customs Branches of land and inland waterway border gates in the preparation and submission of manifests for imported cargo ahead of time.
- Truck owners, drivers, or persons authorised by the truck owner (such as goods owners or customs brokers) are required to generate a manifest of imported cargo (referred to as the manifest) before entry into Vietnamese territory.

Vietnam Logistics Services Development Strategy for the 2025-2035 period (with vision until 2045)

- While drafting a decision on Vietnam's Logistics Services Development Strategy for 2025-2035 (with vision until 2045), the Ministry of Industry and Trade emphasised the urgency of tasks like enhancing legal frameworks, infrastructure, business competitiveness, market development, technology adoption, and human resource training.
- The latest version of the draft outlines significant development goals for the logistics industry by 2035, including:
  - ✓ Increasing the contribution of logistics services to GDP to 6-8 per cent by 2035.
  - ✓ Aiming for an average annual growth rate of 15-20 per cent in logistics services.
  - ✓ Reducing logistics costs to 12-15 per cent of GDP (down from 16-18 per cent).
  - ✓ Attaining a global ranking of 35th or higher in the Logistics Performance Index (LPI).
  - ✓ Adopting digital transformation solutions by 80 per cent of logistics businesses.
  - ✓ Transitioning to green energy by 30 per cent of vehicles.
  - ✓ Receiving professional training by 70 per cent of workers, with 30 per cent possessing university degrees or higher.
- The latest version of the draft outlines significant development goals for the logistics industry by 2045, including:
  - ✓ Logistics services are expected to contribute 12-15 per cent to GDP.
  - ✓ The anticipated average annual growth rate for logistics services is 10-12 per cent.
  - ✓ The outsourcing rate for logistics services is projected to reach 80-90 per cent.
  - ✓ Logistics costs are forecasted to decrease to 10-12 per cent of GDP.
  - ✓ All vehicles are expected to switch to using green energy.

Source: RAPID's presentation.

The existing gap in the policies regarding cargo tracking systems can be highlighted by comparing various national logistics policies. India's National Logistics Policy focuses on overall logistics efficiency and the promotion of technology use in logistics but does not explicitly mandate the

implementation of a specific cargo tracking system. Similarly, China's first five-year plan for a modern logistics sector emphasises digital transformation within the industry. Although it doesn't prescribe a specific cargo tracking system, it strongly implies the development and use of advanced tracking solutions. Vietnam's logistics plan also emphasises digital transformation, laying the groundwork for cargo tracking system implementation, yet it does not mandate a specific solution.

Bangladesh's National Logistics Development Policy could benefit from a more explicit mandate regarding cargo tracking systems. The current emphasis in India's, China's, and Vietnam's policies on digitalisation and technological advancement implies a recognition of the importance of cargo tracking but falls short of enforcing a standardised system. In contrast, Bangladesh's National Logistics Development Policy could address this gap by explicitly mandating the implementation of a specific cargo tracking system. By establishing a clear standard for cargo tracking, Bangladesh could ensure a more robust and transparent logistics infrastructure. By prioritising the establishment of a standardised cargo tracking system, Bangladesh would elevate its standing in logistics innovation and efficiency.

2.6 Findings from the field survey

Through the process of conducting key informant interviews (KIIs) and focus group discussions (FGDs), it has become evident that private stakeholders, alongside certain government officials, are not adequately informed about the Electronic Seal and Lock Rules 2024 issued by the National Board of Revenue (NBR) and the National Logistics Development Policy 2024.

Key informant interviews (KIIs) typically involve one-on-one conversations with individuals who possess specialised knowledge about the topic of interest. In this context, KIIs were conducted with key representatives from various government officials and private sector entities. These interviews revealed a significant gap in awareness and understanding regarding the new Electronic Seal and Lock Rules 2024. Many interviewees, who are expected to be well-versed with regulatory changes affecting their operations, demonstrated a lack of familiarity with the specifics of these new regulations. This includes not only the technical aspects of the electronic seals and locks and the National Logistics Development Policy 2024 but also the compliance requirements and potential implications for their businesses.

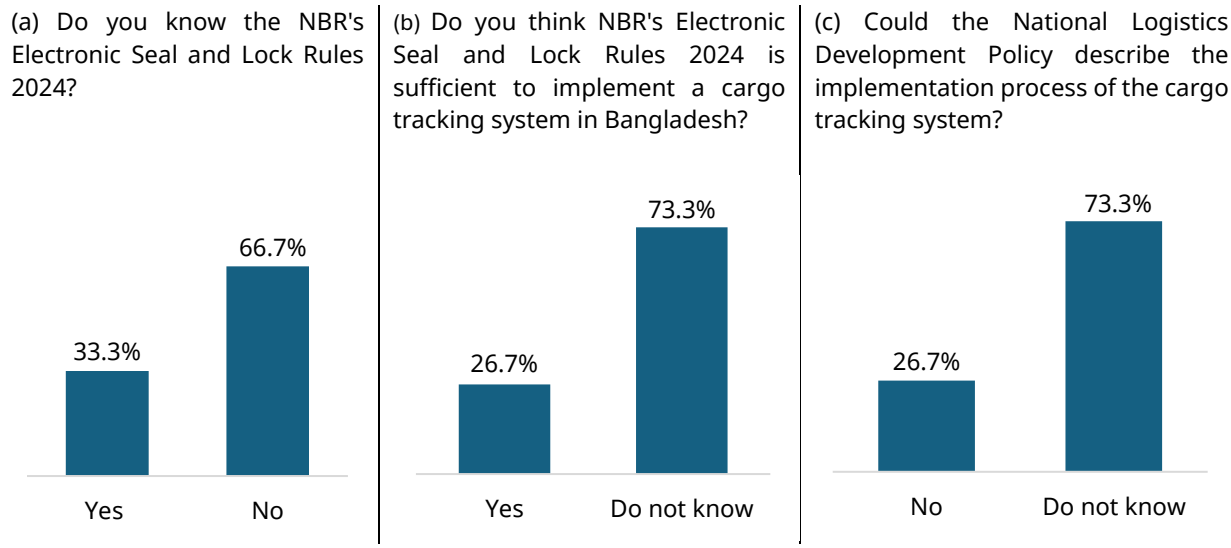
Figure 2.1 (a) shows that a significant majority of the respondents (66.7 per cent) indicated that they are not aware of the NBR’s Electronic Seal and Lock Rules 2024. This suggests that there is a substantial gap in awareness among the key stakeholders about these new regulations. Only a third of the respondents (33.3 per cent), mostly government officials are familiar with the rules, highlighting a need for more effective communication and outreach from the NBR to ensure broader awareness and understanding.

Figure 2.1 (b) shows that a large portion of the respondents (73.3 per cent) are unsure whether the NBR’s Electronic Seal and Lock Rules 2024 are sufficient to implement a cargo tracking system in Bangladesh. This uncertainty reflects either a lack of detailed knowledge about the rules or

scepticism about their effectiveness. Only 26.7 per cent of respondents believe that the rules are adequate for this purpose, indicating that there may be concerns or doubts regarding the comprehensiveness and practicality of the regulations as they currently stand.

Figure 2.1 (c) describes that a significant majority of the respondents (73.3 per cent) do not know whether the National Logistics Policy 2024 adequately describes the implementation process of the cargo tracking system. This suggests a lack of clarity or awareness about the policy details among stakeholders. Additionally, 26.7 per cent of the respondents believe that the policy does not describe the implementation process, indicating potential gaps in the policy documentation or communication regarding this aspect.

Figure 2. 1: Results from field survey



Source: RAPID's field survey.

The results from the field survey indicate a considerable lack of awareness and understanding among stakeholders about the NBR's Electronic Seal and Lock Rules 2024 and their sufficiency in implementing a cargo tracking system. Furthermore, there is significant uncertainty regarding whether the National Logistics Development Policy 2024 adequately outlines the implementation process. These findings underscore the need for the NBR and relevant authorities to enhance their outreach and educational initiatives to ensure stakeholders are well informed and adequately prepared for the new regulations and their implementation.

2.7 Synthesising the findings from the desk research and the field

The current guidelines provided by the Bangladesh Telecommunication Regulatory Commission (BTRC) offer a foundational framework for vehicle tracking services. However, these regulations fall short when it comes to the specifics required for overseeing and managing cargo tracking systems. The Electronic Seal and Lock Rules 2024, introduced by the National Board of Revenue (NBR), aim to

enhance cargo security and transparency. Yet, these rules face resistance from trade bodies worried about potential service charges and data privacy concerns.

Infrastructure is another critical factor highlighted in the literature. Effective cargo tracking requires comprehensive GPS coverage and reliable communication networks. Unfortunately, certain areas in Bangladesh lack this essential infrastructure, resulting in gaps in tracking capabilities and potentially inaccurate data. The financial burden associated with implementing and maintaining cargo tracking systems is also significant. Smaller logistics operators, in particular, may find the initial investment and ongoing maintenance costs troublesome. Moreover, navigating regulatory and bureaucratic hurdles adds complexity and can deter companies from adopting these systems.

These field survey findings both support and contradict the literature review. They support the literature review by highlighting the lack of specific guidelines and the resultant uncertainty for companies and authorities. The field survey findings underscore the need for more effective communication and outreach from the NBR to ensure broader awareness and understanding among stakeholders. This aligns with the literature's emphasis on the necessity of clear regulations and comprehensive awareness to facilitate the adoption of cargo tracking systems.

On the other hand, the survey findings reveal an even deeper level of unawareness and uncertainty among stakeholders than the literature suggests. While the literature review acknowledges the challenges posed by inadequate infrastructure and financial burdens, it does not fully capture the extent to which stakeholders are uninformed about new regulations. The significant lack of awareness and understanding among stakeholders indicates that the challenges go beyond financial and infrastructural issues. This suggests that effective implementation of cargo tracking systems in Bangladesh will require not only addressing infrastructural and financial challenges but also ensuring that stakeholders are well-informed and prepared to comply with new regulations.

In conclusion, both the desk and field research highlight significant challenges in implementing cargo tracking systems in Bangladesh, including regulatory ambiguities, infrastructural deficiencies, financial burdens, and a substantial lack of awareness among stakeholders. By addressing these challenges, Bangladesh can effectively modernise its logistics sector and enhance its competitive position in the global marketplace.

Chapter 3: Suggesting Automated Border Management and Customs Procedures

Automating borders as well as customs operations remains pivotal in increasing the efficiency level, security, and ease of doing business as well as trade across the world. As the global economy becomes even more integrated, and with trade being a key driver for global economic prosperity, it is critical that customs systems in the global value chain be as efficient as possible to enhance the flow of products across borders while adhering to the legal standards. Trade transactions in modern systems are more dynamic because they localise the trading procedure and automatically analyse and control the respective trades without involving excessive bureaucracy which results in time delays at borders. However, artificial intelligence, machine learning, and data analytics can be used to improve countries' risk management, mitigate unknown threats, and maintain efficient security measures at borders. To sum it up, integration and automation of borders and the customs process are not only for promoting cross-border trade but also for the promotion of general goals of economic growth and cooperation among countries in the security sphere.

In this context, the necessity of automated border control and customs processes is especially significant for Bangladesh as the country is experiencing a rapid development of trade relations. As the economy of the countries continues to grow, coupled with the increasing number of cross-border transactions, the roll out of automated systems plays a vital role in enhancing customs activities. Thus, introducing the idea of complete electronic clearance mechanisms, effective risk assessment and management tools, as well as documentation and record-keeping systems would significantly help in accelerating the customs clearance process in Bangladesh and consequently help the country to improve the competitive advantage of its trade sector. Also, through the implementation of automatic border control systems, there is improved coordination with all envelope actors such as customs, port authorities, and the respective regulatory departments to ensure that there are enhanced cross-border movements without compromising revenue losses. Thus, due to shifting globalisation and development in economic freedom, Bangladesh still needs to invest in automated border management and customs to perpetuate further economic growth, focus on trade liberalisation, and maintain national security.

3.0 Automated border management in Bangladesh's land ports

The Bangladesh Land Port Authority (BLPA) was established under the Bangladesh Sthala Bandar Kartipaksha Act, 2001 (Act 20 of 2001). Its purpose is to facilitate and enhance export-import activities with neighbouring countries through land routes.[24] Since its inception, the BLPA has functioned as a statutory body under the Ministry of Shipping. Currently, there are 24 Land Customs Stations that have been declared as land ports.[25] Among these, sixteen land ports are fully operational, of which BLPA's own management is operating eleven land ports, and Private Port Operators are operating five on a BOT (Build, operate, and transfer) basis. At present, there are eight land ports in the process

[24] The combined length of Bangladesh's land borders totals 4,246 kilometers, encompassing 4,053 kilometers along the border with India and an additional 193 kilometers with Myanmar.
[25] https://bsbk.gov.bd/

of being developed. Additionally, plans are underway to establish two more land ports, one in Mujibnagar, Meherpur district, and the other in Pragpur, Kushtia district (Table 3.1).

Table 3. 1: List of Bangladesh's land ports

Current status of the port	Name of the port	Name of Bangladesh's part	Name of India/Myanmar's part
Running (own operated)	Akhaura land port	Akhaura, Brahmanbaria	Ramnagar, Agartala, Tripura, India
	Benapole land port	Benapole, Sharsha, Jessore	Petrapole, Bongaon, 24-Parganas, West Bengal, India
	Belonia land port	Belonia, Parshuram Feni	Muhuri Ghat, Tripura, India
	Bhomra land port	Bhomra, Satkhira Sadar	Gojadanga, 24-Parganas, West Bengal, India
	Burimari land port	Patgram, Lalmonirhat	Changrabandha, Mekhaliganj, West Bengal, India
	Dhanua Kamalpur land port	Bakshiganj, Jamalpur	Mohendragonj, Ampoti, Meghalaya, India
	Gobrakura-Karaitali land port	Haluaghat, Mymensingh	Gachhuapara, Tura, Meghalaya, India
	Nakugaon land port	Nalitabari, Sherpur	Dalu, Barangapara, Meghalaya, India
	Sheola land port	Beanibazar, Sylhet	Sutarkandi, Karimganj, Assam
	Sonahat land port	Bhurungamari, kurigram	Sonahat, Dhubri, Assam, India
	Tamabil land port	Gowainghat, Sylhet	Dauki, Shillong, Meghalaya, India
Running (BOT operated)	Banglabandha land port	Tetulia, Panchagarh	Fulbari, Jalpaiguri, West Bengal, India
	Bibir Bazar land port	Bibir Bazar, Comilla Sadar	Srimantapur, Sunamura, Agartala, Tripura
	Hili land port	Hakimpur, Dinajpur	Hili, South Dinajpur, West Bengal, India
	Sonamosjid land port	Shibganj, Chapainawabganj	Mahadipur, Maldah, West Bengal, India
	Teknaf land port	Teknaf, Cox's Bazar	Mungdu, Myanmar
Under Development	Balla land port	Chunarughat, Habiganj	Paharmura, Khoai, Tripura
	Bholaganj land port	Bholaganj, Companiganj, Sylhet	Bholaganj, Cherrapunjee, Meghalaya
	Birol land port	Birol, Dinajpur	Radhikapur (Goura), West Bengal, India
	Chilahati land port	Domar, Nilphamari	Holdibari, Cooch Behar, West Bengal, India
	Darshana land port	Damurhuda, Chuadanga	Gede, Krishnanagar, West Bengal, India

	Daulatganj land port	Jibannagar, Chuadanga	Mazdia, Nadia, West Bengal, India
	Tegamukh land port	Barkal, Rangamati	Demagri, Mizoram, India
	Ramgarh land port	Ramgarh, Khagrachari	Sabroom, Tripura, India
Proposed land port	Mujibnagar land port	Mujibnagar, Meherpur	Hridoypur, Chapra, Nadia, West Bengal
	Pragpur land port	Daulatpur, Kushtia	Shikarpur, Karimpur, South Dinajpur

Source: BLPA.

The state of land ports in Bangladesh is characterised by insufficient and poorly coordinated infrastructure. Internal factors like inadequate infrastructure, deficient communication, and poor transportation networks have failed to meet the growing demands of service seekers. Exporters encounter obstacles in obtaining clearance certificates at the Benapole land port due to the absence of local offices for essential agencies such as the Export Promotion Bureau (EPB), Department of Agricultural Extension (DAE), Department of Livestock Services (DLS), and Bangladesh Standards and Testing Institution (BSTI).[26] External factors such as congestion in India and the prolonged commodity clearance certification process also impact the performance of Bangladesh's land ports.

Despite facing various challenges in Bangladesh's land ports, the Bangladesh Land Port Authority (BLPA) remains committed to enhancing its port management systems. Through the utilisation of modern technology, the authority aims to streamline operations, making it easier to conduct business by providing efficient and cost-effective services.

According to the annual report 2022-23 of the Bangladesh Land Port Authority (BLPA), the BLPA is engaged in a series of initiatives to advance the country's digital landscape and enhance the ease of doing business.[27] These efforts, integral to the vision of Digital Bangladesh, are centred around leveraging modern technology to deliver efficient and cost-effective services. One such initiative involves the implementation of an e-filing system, which is currently operational at the authority's headquarters and is slated to extend gradually to major land ports like Benapole, Bhomra, Burimari, and Tamabil (Table 3.2).

Under the South Asia Subregional Economic Cooperation (SASEC) Road Connectivity Project, significant strides have been made to modernise import-export operations at Benapole land port. This includes the development of automation software comprising 14 modules, aimed at enhancing operational efficiency. Efforts are underway to further refine and improve the software's user-friendliness through collaboration with a software company.

[26] Bangladesh Foreign Trade Institute (BFTI) & Keystone Business Support Company Ltd. (2022, May). Study 3: Review and Reforming the "Bangladesh Land Port Authority Act, 2001." Retrieved from http://brcp-1.gov.bd/wp-content/uploads/2022/11/Final_Report_Study_3_20-July_2022.pdf

[27] https://bsbk.gov.bd/sites/default/files/files/bsbk.portal.gov.bd/annual_reports/9e5de80e_cc07_459e_89a1_c6288275fd0c/2023-10-15-13-29-ad052b16a32d2baf5b50ca97e4eb7d34.pdf

Similar efforts are being made at the Bhomra land port, where a dedicated software company is engaged in developing an e-port management system under the digitalisation of the Border Procedures project. This ongoing development reflects the commitment to digitisation and efficiency in border operations.

Furthermore, initiatives such as the development of an e-Port management system at Burimari land port, funded internally by BLPA, underscore the broader drive towards digitalisation and streamlining import-export activities across various ports.

In tandem with these technological advancements, the Bangladesh Regional Connectivity Project-1 (BRCP-1) has seen the deployment of a comprehensive security surveillance system at Benapole land port. Comprising 375 IP cameras and a dedicated data center, this system ensures continuous monitoring to safeguard goods and prevent theft, both within and outside the port premises.

Moreover, the efforts extend to Sonahat land port, where BLPA is set to initiate development activities for an e-port management system application using internal funding. These concerted efforts across multiple fronts reflect a holistic approach towards modernising Bangladesh's land ports and fostering a conducive environment for trade and business.

An endeavour known as the "Smart Land Port Management System" at BLPA is designed to promote aimed at streamlining import-export activities and passenger services. Anticipated milestones include reaching 30 per cent of the implementation goal by 2025, followed by targets of 60 per cent and 100 per cent by 2031 and 2041, respectively.

Table 3. 2: ICT-related activities to improve ease of doing business in different land ports of Bangladesh

In the endeavor to develop Digital Bangladesh, various activities by the Bangladesh Land Port Authority have been and are being undertaken to implement efficient and cost-effective services (ease of doing business) using modern technology. • Currently, the e-filing process is conducted on the live server located at the headquarters of the Bangladesh Land Port Authority. The implementation of the e-Filing project will commence gradually at Benapole, Bhomra, Burimari, and Tamabil. • As a part of advancing import-export operations at Benapole land port and contributing to the digitalisation of Bangladesh under the South Asia Subregional Economic Cooperation (SASEC) Road Connectivity Project, automation software for Benapole land port has been developed. This initiative, included within the Operational Efficiency of BLPA package, comprises 14 modules. Presently, efforts are underway to enhance the software's modernity and user-friendliness through the process of engaging a software company. • As a part of advancing import-export operations at the Bhomra land port and contributing to the digitalisation efforts in Bangladesh, a software company has been tasked with developing e-port management under the Digitalisation of the Border Procedures at the Bhomra Land Port project. The development of the software is currently in progress. • The e-Port management system application has been developed using BLPA's internal funding, aiming to streamline import-export activities at Burimari land port and contribute to the nation's digitalisation efforts.

- As part of the Bangldesh Regional Connectivity Project-1 (BRCP-1) project, a comprehensive security surveillance system has been deployed across the entirety of Benapole land port to safeguard stored goods and deter theft. This system comprises 375 IP cameras along with a dedicated data center. Consequently, continuous monitoring is enabled both within and outside the port premises.
- In its efforts to streamline import-export operations at Sonahat land port and contribute to the digitalisation of Bangladesh, BLPA will commence development activities for an e-port management system application using its internal funding.
- An initiative titled "Smart Land Port Management System" at BLPA has been planned to foster the implementation of smart Bangladesh with a view to facilitating import-export activities and services for passengers. It is expected that 30 per cent of the implementation goal will be achieved by 2025, and 60 per cent and 100 per cent are targeted by 2031 and 2041, respectively.

Source: Annual report 2022-23, BLPA.

3.1 Automated customs procedures in Bangladesh

Bangladesh is actively transforming its customs landscape by embracing automation. This shift aims to streamline processes, enhance transparency, and ultimately facilitate smoother trade operations. Bangladesh customs has been making strides towards automating their procedures to improve efficiency and transparency.

Bangladesh began its automation journey by computerising customs offices and automating procedures at the Chattogram Custom House. This process gradually expanded to other major stations. Today, the automated System for Customs Data (ASYCUDA) system, a UNCTAD-developed customs management solution, is used extensively across Bangladesh by 6 Custom Houses, 38 Customs Stations and 20 Off-docks.[28]

According to the National Board of Revenue, Bangladesh's commitment to progress is evident in their continuous upgrades of the ASYCUDA system. They began with ASYCUDA 2.6 in 1993, followed by ASYCUDA++ in 2003, and finally migrated to ASYCUDA World in the Customs Houses of Benapole, Chattogram, and Dhaka in 2013. Further upgrades in 2016 and 2021 ensured the system remained user-friendly and leveraged the latest technology. Today, ASYCUDA World operates 24/7, consolidating real-time data, and offering solutions for customs operations, including tariff classification, valuation, and statistical reporting. In 2021, Bangladesh embarked on a significant project to enhance its customs automation system. This ambitious six-stage upgrade transformed server infrastructure, storage systems, network infrastructure, data centers, and internet connectivity.

Bangladesh is taking a big step towards simplifying international trade with the implementation of a National Single Window (NSW) system. This system aims to revolutionise the way imports and exports are handled in the country. The NSW system is a one-stop for all trade-related needs. Currently, traders have to submit information and applications to various government agencies, a process that can be time-consuming and cumbersome. With the NSW system, all this information will be

[28] Customs Automation Branch, NBR. (2023, October). Recent Initiatives of Bangladesh Customs Automation. Retrieved from https://nbr.gov.bd/uploads/publications/Final_Newsletter_Design_for_NBR_Customs.pdf

submitted through a single electronic platform. This eliminates the need for duplicate submissions and reduces the overall processing time for imports and exports.

The benefits of the NSW system go beyond just speed. It is expected to significantly lower trade costs for businesses. Additionally, the system will bring more transparency and efficiency to trade procedures. The project is being spearheaded by the National Board of Revenue (NBR) of Bangladesh. NBR has been partnered with Webb Fontaine, a trade technology company, to develop the NSW platform.[29]

Table 3.3 shows the difference between the ASUCUDA World and the National Single Window System. ASYCUDA World and National Single Window Systems, while related, serve different purposes. ASYCUDA World acts as a specialised tool for customs officials, focusing on automating customs clearance procedures. It handles tasks like processing trade documents, calculating duties and taxes, and managing risk assessments. In contrast, a National Single Window System takes a broader approach, aiming to facilitate trade as a whole. It functions as a central platform where traders can interact with various government agencies involved in import and export activities. This might include obtaining permits, licenses, and certificates alongside completing customs clearance. While independent entities, ASYCUDA World can be a core component of a National Single Window System. This means the National Single Window System could leverage ASYCUDA World's functionalities specifically for customs aspects of trade.

Table 3. 3: Difference between the ASYCUDA World and the National Single Window System

Feature	ASYCUDA World	National Single Window System
Purpose	Customs management software	Trade facilitation platform
Scope	Focuses on customs clearance procedures	Integrates various government agencies involved in trade
Functionality	Processes trade documents, calculates duties and taxes, manages risk assessments	Provides a single point of access for permits, licenses, certificates, and customs clearance
Implementation	Developed and maintained by UNCTAD	Developed and managed by individual countries
Users	Primarily customs officials, traders, and brokers	Customs officials, traders, brokers, and other government agencies involved in trade
Relationship	ASYCUDA World can be the core component of a National Single Window System	National Single Window System may utilise ASYCUDA World for customs functionalities

Source: RAPID's presentation.

While ASYCUDA World offers valuable customs management functionalities, Bangladesh can reap significant benefits by implementing a National Single Window System that goes beyond ASYCUDA World's capabilities. This broader platform would streamline trade processes by offering a central

[29] https://webbfontaine.com/2023/12/15/webb-fontaine-and-bangladesh-nbr-propel-national-single-window-project-sensitization-workshop/

hub for interacting with all government agencies involved in import and export. This will help reduce time and costs for businesses, improve transparency, and ultimately, a more efficient and competitive trading environment for Bangladesh.

3.2 Automation in the land ports border management and customs procedures of regional countries

India has made significant strides in enhancing its border management and customs procedures through various initiatives. One such initiative is the establishment of Integrated Check Posts (ICPs) at different border crossings, aiming to streamline trade and passenger movement (Table 3.4).[30] [31] These ICPs function as comprehensive hubs, housing customs, immigration, and border security facilities, providing a convenient "one-stop shop" experience. Notably, the Petrapole ICP serves as a critical gateway for land-based trade between India and Bangladesh, facilitating trade worth nearly $3.8 billion in 2021-22.[32]

Another advancement is the implementation of the Land Port Management System (LPMS) by the Land Ports Authority of India (LPAI). LPMS digitises operations at ICPs, enabling secure electronic information flow among stakeholders. This digitisation has significantly improved efficiency, reducing dwell time from 57 days to less than 24 hours.[33] Furthermore, LPMS promotes regional trade and fosters people-to-people contact, contributing to economic growth and integration.

The Indian Customs Electronic System (ICES) simplifies customs clearance in India using Electronic Data Interchange (EDI) to share customs-related data.[34] It moves many required documents for customs clearance online, making the process quicker and more efficient. ICES modernises customs procedures, making them more transparent and accountable.

India's commitment to digital transformation in customs procedures is evident through initiatives such as the Indian Customs Electronic Commerce/Electronic Data Interchange Gateway (ICEGATE).[35] ICEGATE facilitates the electronic filing of customs documents, online duty payments, and real-time consignment tracking. These digital solutions streamline processes, reduce paperwork, and enhance transparency, thereby facilitating smoother trade operations.

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[30] India has Integrated Check Posts (ICPs), which serve as designated entry and exit points for cross-border movement of people, goods, and vehicles.

[31] https://lpai.gov.in/en

[32] Vijayakumar, S., & Nikore, M. (2023, March 30). Turning it around: How India's busiest land port also became its most efficient. Retrieved from https://blogs.worldbank.org/en/transport/turning-it-around-how-indias-busiest-land-port-also-became-its-most-efficient#:~:text=Petrapole%20ICP%20is%20a%20%E2%80%9Cone,and%20Bangladesh%20going%20through%20it.

[33] https://pib.gov.in/PressReleasePage.aspx?PRID=1977859

[34] What is ICES | icegate

[35] ICEGATE, the national portal of Indian Customs operated by the Central Board of Indirect Taxes and Customs (CBIC), offers electronic filing services to traders, cargo carriers, and other trading partners.

Box 3. 1: Initiatives by the Association of Southeast Asian Nations (ASEAN) regarding port management

Association of Southeast Asian Nations (ASEAN)

ASEAN countries have established dry ports (inland terminals) to enhance connectivity and facilitate cargo handling. Examples include dry ports in Brunei Darussalam, Vietnam, Thailand, Cambodia, Indonesia, and the Philippines. Recently, all 10 Customs Administrations of ASEAN Member States (AMS) signed the Mutual Recognition Arrangement (MRA) for their respective Authorised Economic Operator (AEO) Programs. This arrangement aims to streamline trade customs clearance and enhance efficiency.

The rollout of the Digital and Innovation Master Plan in different ASEAN countries:

Manila International Container Terminal (Philippines):

- Employs iPad terminals for trucks, rubber-tired gantry (RTG) cranes, and other cranes to boost operational efficiency.
- Adopted 5G technology for data exchange with external stakeholders, ensuring faster and more reliable communication.

Port of Singapore:

- Launched digitalPORT@SG™, a centralised platform for maritime data exchange and collaboration.
- Rolled out DigitalOCEANS™, aimed at establishing open and standardised communication and information exchange systems across the maritime industry.
- Uses DigitalSHIP™ to integrate ship and shore systems seamlessly, improving communication and coordination between vessels and port facilities.

Haiphong International Container Terminal (Vietnam):

- Adopted the ePort system, which includes features like digital documentation, real-time container tracking, and vessel scheduling.
- Employs the Electronic Warehouse Management System (eWMS) to optimse warehouse operations, improving storage and logistics management.

Source: RAPID's presentation.

Moving to Nepal, the country has embraced the Automated System for Customs Data (ASYCUDA) World system in 2016, a computerised platform for managing cross-border shipments.[36] This system aims to streamline customs processes, reduce paperwork, and enhance efficiency in cargo clearance. The customs administration has ushered in a new era of modernisation, with the implementation of a system across 28 customs offices. Known as the Nepal Customs Automation System (NECAS), this system boasts features such as centralisation and a web-based online platform, high-level security measures, data exchange capabilities, online analytical processing (OLAP), document uploading, barcode utilisation, Tariff Specification Code (TSC) integration, risk-based selectivity, automated information on customs procedures, log files for each process, electronic payment options (ePayment), and the inclusion of digital signatures, among others.[37] Additionally, Nepal has introduced a Single Window Environment, allowing seamless data exchange among government agencies involved in customs and border management (World Bank, 2020). This integrated approach

[36] The World Bank. (2020, May 19). Nepal Strategic Road Connectivity and Trade Improvement Project. Retrieved from https://documents1.worldbank.org/curated/en/814981592100022780/pdf/Nepal-Strategic-Road-Connectivity-and-Trade-Improvement-Project.pdf

[37] https://www.customs.gov.np/page/asycuda-system-implementation-status

simplifies trade procedures, enhances transparency, and facilitates smoother cross-border transactions.

Nepal's National Trade Information Portal (NTIP) serves as a centralised access point for trade-related information, providing the business community with essential data on regulatory requirements, trade procedures, and fees. This portal enhances transparency and efficiency in trade operations, supporting economic growth and development in the country.[38]

In Myanmar, the Automated Cargo Clearance System (MACCS) has been developed to automate various aspects of customs operations, including user registration, goods clearance, and payment processing.[39] This system aims to enhance efficiency and reduce delays in cargo clearance at key border areas which was implemented in 2013 and used in the Yangon area in 2016.[40]

Bhutan has implemented the Electronic Customs Management System (eCMS), a web-based application accessible to citizens and businesses involved in international trade.[41] eCMS modernises customs procedures, reduces clearance time, and assists traders in fulfilling customs procedures while maintaining necessary border controls.

In African countries within the Common Market for Eastern and Southern Africa (COMESA), customs administrations have automated their clearance systems, leveraging technologies like ASYCUDA World.[42] One-Stop Border Posts (OSBPs) have also been successful models, co-locating customs, immigration, and border security facilities to streamline trade and passenger movement across borders (See Box 3.2).

[38] https://nepaltradeportal.gov.np/
[39] The Myanmar Automated Cargo Clearance System (MACCS) is a digital platform designed to streamline the import and export process at border checkpoints in Myanmar.
[40] https://www.gnlm.com.mm/myanmar-automated-cargo-clearance-system-launched/
[41] https://www.ecms.gov.bt/about-us
[42] https://www.comesa.int/wp-content/uploads/2022/01/CUSTOMS-DIGITALIZATION-AND-DEEPENING-INTRA-COMESA-TRADE.pdf

Box 3. 2: One-Stop Border Posts (OSBP) in African countries

The African Union (AU) Agenda 2063 highlights the pivotal role of infrastructural development in fostering intra-regional trade, facilitating the movement of people, goods, and services, and promoting regional integration. In 2012, the AU embraced the Programme for Infrastructure Development in Africa (PIDA) along with its Priority Action Plan (PAP). These initiatives prioritise continental programs aimed at tackling Africa's infrastructure deficit, which significantly impedes the continent's competitiveness in the global market.

The implementation of transport projects within PIDA-PAP and the advancement of market interconnectivity and regional integration across the continent are significantly bolstered by the pivotal role of One-Stop Border Posts (OSBPs). One-Stop Border Posts (OSBPs) refer to streamlined processes and facilities where various border-related procedures, such as customs, immigration, and other regulatory requirements, are consolidated into a single location or integrated system. This approach aims to enhance efficiency and convenience for travelers, importers, exporters, and other stakeholders by reducing bureaucratic hurdles and minimising delays at border crossings. It facilitates smoother movement of goods and people across borders while ensuring compliance with relevant regulations and security measures.

One-stop border posts (OSBPs) are designed to achieve several key objectives:

- ✓ Alleviating congestion: By consolidating border control procedures, OSBPs mitigate congestion and lengthy wait times at border crossings, enhancing the efficiency of goods and passenger flow.
- ✓ Minimising time delays: OSBPs aim to expedite customs and immigration procedures, reducing the time required for goods and people to cross borders.
- ✓ Enhancing agency coordination: OSBPs foster collaboration among various border agencies, promoting smoother operations and improved information sharing.
- ✓ Simplifying border processes: OSBPs work towards standardising and streamlining border control procedures, reducing administrative complexities, and enhancing transparency in operations.

The One-Stop Border Post (OSBP) approach has been gradually implemented over the past decade, particularly in Africa, where numerous landlocked countries face challenges related to trade facilitation, such as delays and high logistics costs stemming from inefficiencies at land border crossings. According to TradeMark East Africa (TMEA), the collaboration between the governments of Uganda and Rwanda has led to the establishment of one-stop border posts aimed at streamlining border processing. These one-stop border posts seek to diminish transit costs associated with cross-border movements. They consolidate the operations of border agencies from both countries at a single location in either direction, ensuring public safety and revenue collection. This development is particularly beneficial for traders, transporters, travellers, customs agents, and the border community, as it brings about a more efficient border processing system.

Source: RAPID's presentation.

Overall, the adoption of data-driven technologies and the establishment of integrated systems and platforms signify a concerted effort by these countries to modernise customs procedures, enhance trade facilitation, and promote regional integration and economic development.

Introduced with the support of the European Union (EU), the ASEAN Customs Transit System (ACTS) represents a cutting-edge online Customs transit management solution. Its primary objective is to

streamline the movement of goods via road within the ASEAN region.[43] Established in 2017 by ASEAN Economic Ministers, the system is pivotal in achieving ambitious trade goals set forth: a 10 per cent reduction in trade transaction costs by 2020 and the doubling of intra-ASEAN trade between 2017 and 2025.[44] The ACTS facilitates seamless operations for businesses by allowing them to electronically submit transit declarations directly to ASEAN Customs Authorities. This electronic platform enables companies to meticulously track their goods' journey from the point of loading at departure to their final destination, enhancing efficiency and transparency in regional trade. Under the ACTS, businesses can submit one Customs transit declaration for moving goods across multiple ASEAN countries, eliminating the need for multiple declarations or vehicle changes at each border.

The European Union (EU) has embraced digital technologies to streamline trade compliance, with initiatives like the EU Customs Union and the Single Window Environment for Customs facilitating smooth communication between businesses and customs authorities through digital trade-related information exchange.[45] The EU Customs Union simplifies trade for EU businesses by standardising customs duties on goods from outside the EU while also tackling tax and duty fraud.[46] Similarly, the EU Single Window Environment for Customs aims to enhance interoperability between customs and non-customs sectors, simplifying the electronic exchange of necessary documents and information for goods clearance.[47]

Another significant advancement is the EU Customs Single Window Certificates Exchange System (EU CSW-CERTEX), a centralised platform connecting Member States' import, export, and transit systems with Union non-customs systems, aiming to enhance data exchange between economic operators and authorities in real-time (European Commission, n.d.).

Every member state within the European Union (EU), including the Union itself, is bound by the terms of the Transports Internationaux Routiers (TIR) Convention of 1975. This agreement ensures standardised procedures for international transit. The Union's electronic transit system (NCTS) serves as a platform for seamless data exchange among customs authorities across EU member states, facilitating efficient border management and trade facilitation.[48] Under the TIR procedure, the EU is treated as a unified territory, allowing for the application of TIR solely for international movements within its borders. This means that TIR can be utilised when the movement originates from or ends in a third country, or when goods traverse between two or more EU member states through the territory of a third country.

[43] ASEAN members are Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.

[44] https://www.eeas.europa.eu/eeas/asean-and-eu%E2%80%99s-new-online-customs-transit-system-set-boost-trade-asean-region_en

[45] https://tradecouncil.org/driving-cross-border-trade-compliance-europes-strategic-approach/

[46] https://european-union.europa.eu/priorities-and-actions/actions-topic/customs_en

[47] https://taxation-customs.ec.europa.eu/eu-single-window-environment-customs_en

[48] TIR (Transports Internationaux Routiers, International Road Transport) - European Commission (europa.eu)

Box 3. 3: Smart Ports in the EU countries

Smart Port Innovations: EU countries are adopting smart technologies like Artificial Intelligence, Internet of Things (IoT), Big Data, blockchain, and 5G to drive port innovation, aiming to improve environmental standards and integrate community into port activities. Fully automated terminals are being developed, utilising IT systems and remotely operated equipment to streamline container handling from dockside to pickup areas.

Netherlands: The Port of Rotterdam is a leader in smart port development. It has implemented a number of initiatives to improve efficiency, safety, and sustainability, including:

- Using sensors and data analytics to track cargo in real time and optimise port operations.
- Developing automated guided vehicles (AGVs) to transport cargo around the port.
- Investing in renewable energy sources to power port operations.
- Rotterdam's status as a digital hub is supported by the Netherlands' top-notch digital infrastructure, featuring 98 per cent fast broadband, 99 per cent 4G coverage, and expanding 5G and fiber networks.

France: The Port of Marseille Fos is another major European port that is making strides in smart port development. They are focusing on:

- Developing a digital platform to connect all the different stakeholders in the port community.
- Using artificial intelligence to optimise port traffic flow.
- Neptune Port: The Neptune port is designed by the Port of Marseille Fos which is a fully-automated information system that streamlines administrative procedures for arriving and departing vessels.
- Cargo Intelligent System (Ci5): Developed by Marseille Gyptis International (MGI), Ci5 acts as a central

Source: RAPID's presentation.

Norway, despite not being a member of the European Union, shares a thousand-mile border with Sweden, making it the longest land border of the EU. Nordnet, a system utilised in Norway, facilitates the coordination of around 1,300 customs officials in efficiently managing border policing across the region.[49] This technology not only streamlines processes but also enhances efficiency, consequently reducing waiting times for freight companies. Additionally, Automatic Number Plate Recognition (ANPR) technology is employed to identify suspicious vehicles and potentially enable the seamless passage of trucks with pre-declared goods, minimising the need for stopping (BBC, 2017).

Société Générale de Surveillance (SGS) Sweden offers extensive e-Customs services, encompassing customs transit and guarantees, import and export declarations, as well as automation and data exchange solutions.[50]

In the United States, the Automated Commercial Environment (ACE) acts as the central electronic platform for all trade processing.[51] It manages a range of trade tasks such as submitting manifests, releasing cargo, post-release procedures, exports, and exchanging data with Partner Government Agencies (PGAs).

[49] Frictionless borders: learning from Norway (bbc.com)
[50] e-Customs Services | SGS Sweden
[51] https://www.cbp.gov/trade/automated/how-to-use-ace

Box 3. 4: Initiatives by the Gulf Cooperation Council (GCC) to facilitate trade

The Gulf Cooperation Council's (GCC) Authorised Economic Operator (AEO) programs offer benefits to businesses operating in the United Arab Emirates (UAE), Kingdom of Saudi Arabia (KSA), Bahrain, Oman, Kuwait, and Qatar. These programs streamline customs procedures and enhance logistics efficiency.

Among the GCC, the UAE and KSA are leading by developing advanced smart ports. These countries utilise state-of-the-art technologies including AI and machine learning for operational efficiency and predictive analytics of the port, IoT for real-time monitoring and resource optimisation, blockchain for secure and transparent transactions, and automated systems for container handling, revolutionising port operations to be more efficient, rapid, and eco-friendly.

- UAE's Smart Port Ambitions: Dubai's Jebel Ali Port is incorporating advanced technologies like blockchain-based logistics, AI-driven traffic management, and IoT for real-time monitoring, setting a high standard for smart port operations.
- KSA's Vision 2030 and Port Modernisation: Saudi Arabia is modernising ports, including King Abdullah Port, with advanced digital technologies as part of its Vision 2030, aiming to become a global logistics hub connecting three continents.

Source: RAPID's presentation.

Trade participants can use ACE through two avenues: the ACE Secure Data Portal (ACE Portal), a free web-based interface linking Customs and Border Protection (CBP), trade partners, and PGAs; and ACE Electronic Data Interchange (EDI), a communication system establishing electronic data exchange standards (CBP, n.d.).

Table 3. 4: Automation in the land port border management and customs procedures in different countries and alliances

India
Integrated Check Posts (ICPs) • India established Integrated Check Posts (ICPs) at various border crossings to streamline trade and passenger movement. • These ICPs serve as "one-stop shops" housing customs, immigration, and border security facilities. Notably, the Petrapole ICP handles a substantial portion of land-based trade between India and Bangladesh, with nearly $3.8 billion worth of trade passing through it in 2021-22. **Land Port Management System (LPMS)** • The Land Ports Authority of India (LPAI) implemented the Land Port Management System (LPMS). • LPMS digitises operations and facilitates secure electronic information flow among all stakeholders at the ICPs. • It enhances efficiency, reduces dwell time, and promotes regional trade and people-to-people contact. • LPAI has been successful in reducing the dwell time from 57 days to less than 24 hours. **Indian Customs Electronic System (ICES)** • ICES is designed for customs clearance in India. • It uses Electronic Data Interchange (EDI) to exchange customs-related information. • Many documents required for live customs clearance are now processed online. **Digital Transformation**

- India has embraced digital solutions for customs procedures.
- The Indian Customs Electronic Commerce/Electronic Data Interchange Gateway (ICEGATE) enables electronic filing of customs documents, online payment of duties, and real-time tracking of consignments.
- The Customs Automated System further streamlines processes and reduces paperwork.

Nepal

Automated System for Customs Data (ASYCUDA) World

- Nepal has adopted the ASYCUDA World system, which is a computerised platform for managing cross-border shipments.
- This system aims to streamline customs processes, reduce paperwork, and enhance efficiency in cargo clearance.
- The customs administration introduced a new era of modernisation through the Nepal Customs Automation System (NECAS). This system includes centralisation and a web-based online platform, enhanced security measures, data exchange capabilities, online analytical processing (OLAP), document uploading, barcode usage, integration of Tariff Specification Code (TSC), etc.

Single Window Environment

- Nepal launched a single window system for trade facilitation.
- This integrated approach allows for seamless data exchange among various government agencies involved in customs and border management.
- The web interface facilitates the official procedures for export and import through an online system and helps make available information on the harmonised system code of various products and tax-related issues.

National Trade Information Portal (NTIP)

- The National Trade Information Portal (NTIP) is a single point access for all trade, economic and regulatory information.
- It provides the Nepal business community with a secure and personalised single entry point to all Nepal trade-related information, such as information about regulatory requirements, trade procedures, and fees.

Myanmar

Automated Cargo Clearance System (MACCS)

- Myanmar Customs has developed the Automated Cargo Clearance System (MACCS). This system is currently operational in Yangon, Myawady border, Muse border, and Chinshwehaw border areas.
- MACCS aims to automate several areas of customs operations, including user registration, clearance of goods, cargo management, payment processing, information technology, and helpdesk services.

Bhutan

Electronic Customs Management System (eCMS)

- Bhutan has implemented the eCMS, a web-based application accessible to all citizens and businesses involved in international trade.
- The objectives of eCMS are to modernise and improve customs procedures to reduce customs clearance time, facilitate the trade of goods across Bhutan's borders while maintaining necessary border controls, and assist traders in fulfilling customs procedures.
- eCMS users include declarants (citizens engaging in international trade), traders, transporters (airlines and haulers), and warehouse operators.
- The system integrates with various agencies to ease clearance procedures at entry and exit points.

African countries

Automation Used by the Common Market for Eastern and Southern Africa (COMESA)

- Within COMESA, customs administrations have automated their customs clearance systems. This includes manifest and declaration processing, electronic payments, and bonds and exemption management.
- Most member states use the Automated System for Customs Data (ASYCUDA) World system, which streamlines customs processes and enhances efficiency.

One-Stop Border Posts (OSBPs)

- A model that has seen success in sub-Saharan Africa is that of One-Stop Border Posts.
- OSBPs serve as "one-stop shops" where customs, immigration, and border security facilities are co-located.
- They aim to streamline trade and passenger movement across borders.

Data-Driven Technologies

- Countries like Botswana have transitioned from the Automated System for Customs Data (ASYCUDA++) to a new integrated Customs Management System (CMS).
- This digitalisation of processes and procedures improves data management and enhances customs operations.
- The new CMS also provides for a Single Window platform, through the "other government agencies" (OGA) module. The module enables other government border agencies to receive the required data.

Association of Southeast Asian Nations (ASEAN)

ASEAN Customs Transit System (ACTS)

- With the support of the European Union, a new online Customs transit management system known as the ASEAN Customs Transit System (ACTS) has been introduced.
- This system aims to expedite the movement of goods by road within the ASEAN region.
- In 2017, ASEAN Economic Ministers established two primary objectives: reducing trade transaction costs by 10 per cent by 2020 and doubling intra-ASEAN trade between 2017 and 2025. To achieve these goals, the ASEAN Customs Transit System has been developed.
- This system enables businesses to electronically submit transit declarations directly to ASEAN Customs Authorities and monitor their goods' movement from loading at departure to delivery at the final destination.

European Union (EU)

The European Union (EU) has adopted digital technologies to streamline trade compliance. Programs such as the EU Customs Union and the Single Window Environment for Customs facilitate smooth communication between businesses and customs authorities by digitally exchanging trade-related information.

EU Customs Union

- The EU Customs Union simplifies trade for EU businesses by standardising customs duties for goods originating from outside the EU.
- EU customs also combat tax and duty fraud perpetrated by both businesses and individuals.

Single Window Environment for Customs

The EU Single Window Environment for Customs aims to enhance interoperability between customs and non-customs sectors, simplifying the electronic exchange of necessary documents and information for goods clearance.

EU Customs Single Window Certificates Exchange System (EU CSW-CERTEX)

- EU CSW-CERTEX is a centralised system linking Member States' import, export, and transit systems with Union non-customs systems handling non-customs procedures.

- This system aims to boost the exchange and handling of data provided to both customs and non-customs authorities by economic operators, ensuring they receive the original data in real-time instantly.

Tranports Internationaux Routiers (TIR) Convention 1975 for the European Union (EU)

- Every member of the European Union (EU), including the Union itself, is a contracting party to the TIR Convention of 1975.
- The Union's electronic transit system (NCTS) is designated for the electronic sharing of data among the customs administrations of EU Member States.
- The European Union is treated as a single territory under the TIR procedure. Consequently, TIR is applicable within the Union solely for international movements. These include instances where the movement either originates from or terminates in a third country, or when goods are transported between two or more EU Member States via the territory of a third country.

Norway

Nordnet

- Nordnet, enables approximately 1,300 customs officials to efficiently coordinate border policing across this vast region.
- It streamlines processes, enhances efficiency, and reduces waiting times for freight companies.

Automatic Number Plate Recognition (ANPR)

- Automatic Number Plate Recognition (ANPR) identifies suspicious vehicles and may eventually allow trucks with pre-declared goods to be waved through without stopping.

Sweden

e-Customs services

- Société Générale de Surveillance (SGS) Sweden provides comprehensive e-Customs services. These include various services such as customs transit and guarantees, Import and export declarations, and automation and data exchange.

United States

Automated Commercial Environment (ACE)

- ACE serves as the U.S. electronic Single Window platform for all trade processing.
- It handles various trade activities, including manifest submission, cargo release, post-release processes, exports, and data exchange with Partner Government Agencies (PGAs).
- Trade users can access ACE through two channels:
    - ✓ ACE Secure Data Portal (ACE Portal): A free, web-based access point connecting CBP, trade partners, and PGAs.
    - ✓ ACE Electronic Data Interchange (EDI): A communication framework that defines standards for exchanging data electronically.

Source: RAPID's presentation.

Box 3. 5: Terminologies associated with port management and customs procedures

A Regional E-Clearance System aims to streamline customs and border clearance processes across multiple countries by integrating technology and promoting automation. The system enhances the efficiency of cross-border trade through the following components.

Automated customs: Automated customs streamline and digitise customs procedures, enhancing efficiency, accuracy, and security in trade operations. By reducing manual processes, they minimise delays, cut costs, and lower the risk of human error. Real-time tracking and data integration with electronic data interchange (EDI) systems improve transparency and coordination among stakeholders. Automation also supports compliance with international standards, such as those from the World Customs Organization (WCO) and the WTO's Trade Facilitation Agreement (TFA). Additionally, it enables targeted risk management, allowing low-risk goods to clear quickly while focusing on high-risk shipments.

Electronic Data Interchange System (ACEDIS): The Electronic Data Interchange System (ACEDIS) is a digital platform that facilitates the seamless exchange of trade-related information between businesses, customs authorities, and other stakeholders. By replacing traditional paper-based documentation, ACEDIS enables the real-time transmission of standardised electronic data, streamlining the entire customs clearance process. This system reduces manual errors, speeds up transactions, and improves accuracy, allowing for quicker decision-making and more efficient handling of goods at borders.

NSW (National Single Window) Online Release: As part of the Trade Facilitation Agreement (TFA), the NSW allows traders to submit all required documents electronically through a single entry point. This system simplifies the clearance process and minimises delays by providing a unified platform for documentation.

Authorised Economic Operator (AEO): According to the World Customs Organization (WCO), an Authorised Economic Operator is a party involved in international goods movement, approved by or on behalf of a national customs administration. They comply with World Customs Organization (WCO) or equivalent supply chain security standards. The AEO programme aims to enhance security, streamline customs processes, and foster efficient trade.
AEO in Bangladesh: The National Board of Revenue (NBR) in Bangladesh has been actively implementing the AEO program. The NBR is committed to expanding the programme by including more economic operators interested in joining it.

Source: RAPID's Presentation.

Korean Customs Service (KCS): Korean Customs Service (KCS) initiated its computerisation efforts in the 1970s, steadily enhancing its ITC capabilities over the years. As a result, KCS has automated 93 per cent of its business processes and fostered a data-driven culture among its employees.[52]

[52] CHOI, Y. (2021, October 24). Blockchain, Artificial intelligence and Big Data: How Korea Customs Service leverages technology to supervise e-commerce. WCO News. Retrieved from https://mag.wcoomd.org/magazine/wco-news-96/blockchain-artificial-intelligence-and-big-data-korea/#:~:text=From%202018%20to%202020%2C%20KCS,manual%20(see%20Figure%202).

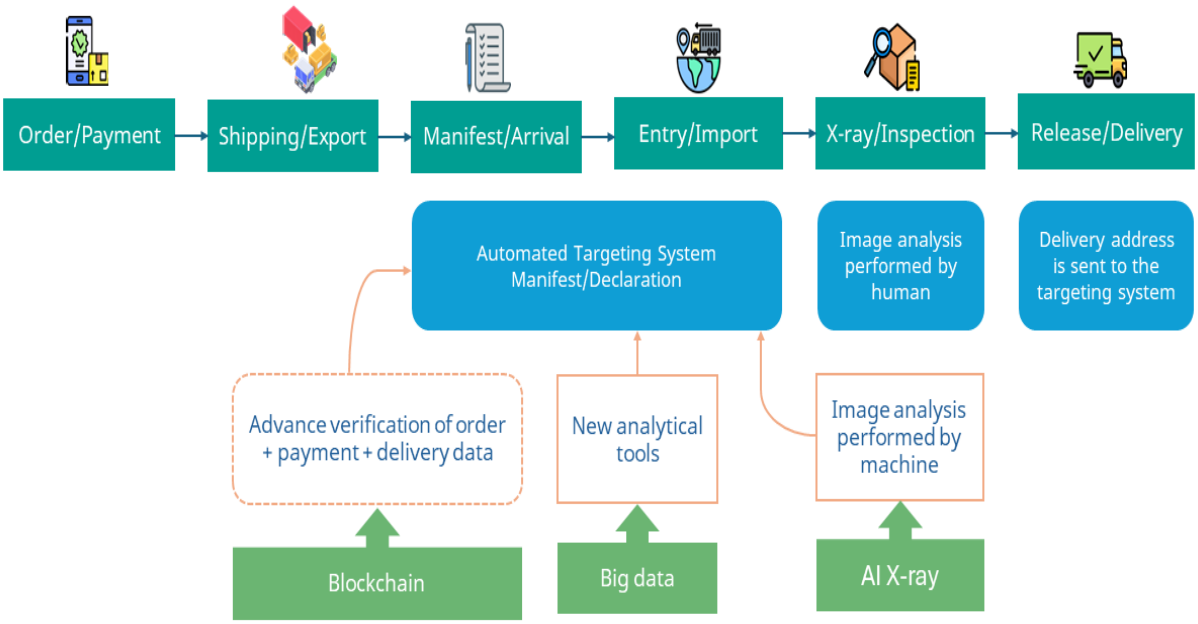
Figure 3.1 illustrates the process of capturing and processing data related to online cross-border transactions, from order placement to payment. Currently, KCS collects data from manifests and Customs declarations and analyses it using its automated targeting system. Postal operators and couriers are required to electronically submit the necessary information for clearance, facilitating pre-advice and potential pre-clearance of items. This is achieved using the electronic versions of the CN 22 and CN 23 forms developed by the WCO and the Universal Postal Union (UPU). All expedited cargo and international mail undergo X-ray inspections. If the risk management system flags a package, the Customs officer handling the inspection can view all the relevant data, including the X-ray image, on their computer screen. For small and medium-sized courier companies lacking modern facilities, KCS has established the Express Cargo Logistics Centre, equipped with advanced facilities including automatic X-ray scanners integrated into the conveyor system.

Since 2014, delivery service providers have been mandated to report the final destination of express cargo to KCS upon completion of delivery. This requirement aims to prevent the misuse of the de minimis facility by vendors who might deliberately split consignments to exploit tax exemptions and simplified procedures for low-value goods. After delivery, the destination information is re-entered into the automated targeting system, which performs an additional risk analysis focusing on the delivery address.

From 2018 to 2020, KCS conducted a successful pilot project using blockchain technology to enhance transparency, and trust among data creators, and automate the partly manual data entry process. The project enabled the direct sharing of transaction information with Customs via blockchain. Its success was attributed to the simplicity and computerised nature of e-commerce transactions, with each participant holding precise data at specific transaction points.

Since 2017, KCS has leveraged big data by identifying key problems and the necessary data to address them. After ensuring the collection and acquisition of this data, KCS developed analysis models to effectively solve these issues.

Figure 3. 1: New Technologies in Action: How Technologies are Reshaping Current Processes in South Korea



Source: WCO News.

Bangladesh can learn a great deal from the success of the Korean Customs Service (KCS). A key takeaway is the importance of embracing automation and a data-driven culture. Just like KCS, Bangladesh can significantly boost efficiency by investing in modern IT infrastructure for customs operations. This will allow for automation of many processes, freeing up personnel and speeding up clearance times. Furthermore, training customs officials to analyse data for risk assessment can lead to smarter targeting of suspicious activities, while facilitating faster clearance for legitimate goods.

Transparency and security are also vital. Bangladesh can implement mandatory electronic submission of customs declarations and manifests, just like Korea. This streamlines data collection and allows for pre-clearance procedures. Additionally, adopting X-ray scanners and other advanced inspection systems can ensure faster and more efficient cargo screening. Furthermore, exploring pilot projects utilising blockchain technology, like KCS, can enhance trust and transparency in data exchange between customs and businesses.

Finally, Bangladesh can address the challenges of e-commerce by learning from Korea's approach. Implementing systems to track express cargo deliveries and analyse delivery address data can help prevent the misuse of exemptions for low-value goods. By following KCS's lead and focusing on data-driven problem solving, Bangladesh can identify key bottlenecks in its customs operations and develop solutions through targeted data collection and analysis. By adopting these lessons and adapting them to its specific context, Bangladesh can significantly improve its customs efficiency, transparency, and security.

Box 3. 6: One-stop border posts (OSBPs) in the ASEAN, the EU, and GCC

The concept of one-stop border posts (OSBPs) is not as widely implemented in the ASEAN, the EU, and the GCC as in some other regions like East Africa .

One-stop border post in the ASEAN countries

Malaysia-Thailand Border Crossing at Bukit Kayu Hitam-Sungkai: It is designed to streamline customs and immigration procedures between the two countries by having both Malaysian and Thai authorities conduct their checks at a single location. This helps reduce duplication and processing time, improving the efficiency of the border crossing for goods and travelers.

Singapore-Malaysia Causeway, Indonesia-Malaysia Border Crossing at Tebrau, Thailand-Laos Border Crossing at Vientiane are not officially the OSBPs, but operateing customs and immigration processes efficiently.

One-stop border post in the EU countries

The EU has not widely adopted the OSBP model. Instead, the EU focuses on integrated border management and cooperation among member states to ensure effective border crossings.

One-stop border post in the GCC

The specific OSBP model doesn't seem to be widely adopted by the GCC. However, The King Fahd Causeway between Bahrain and Saudi Arabia has integrated border control facilities to streamline customs and immigration procedures for travelers and goods. This setup aims to reduce delays and enhance efficiency.

Source: RAPID's Presentation.

Box 3. 7: Authorised Economic Operators (AEO) in various countries

The Authorised Economic Operator (AEO) concept was launched by the World Customs Organization (WCO) in 2007. During a General Meeting in June 2005, the WCO unanimously approved the SAFE Framework of Standards, which laid the legal groundwork for the AEO program. Authorised Economic Operators (AEOs) are businesses involved in international trade that meet World Customs Organization (WCO) standards for secure supply chains and customs compliance. AEO status offers benefits like smoother and more efficient trade processes, enhancing global trade security. When customs authorities from different countries agree to recognise each other's AEO programs, it is called an Authorised Economic Operator Mutual Recognition Agreement (AEO MRA).

China: According to the 6th WCO Global AEO Conference, China has over 5,800 enterprises with AEO status. In 2023, these AEOs accounted for 37.1 per cent of the country's foreign trade value and 37 per cent of the total tax payment. They also receive over 40 incentives, such as "green channel" access, loan interest discounts, and simplified procedures from various departments. The World Customs Organization (WCO) states that China has 30 AEO Mutual Recognition Agreements (MRAs) with countries including Uruguay, Switzerland, Hong Kong, Iran, and the United Kingdom, with 14 currently operational.

European Union (EU): Over 18,000 entities in the EU hold Authorised Economic Operator status, covering more than 70 per cent of the EU's import and export activities. The EU currently has operational Mutual Recognition Agreements (MRAs) for AEO programs with Norway, Switzerland, Japan, the US, China, and the United Kingdom. Further negotiations with key trading partners are ongoing or set to begin soon. Additionally, the EU is providing technical assistance to several nations in developing their own AEO programs.

India: According to the Customs Board of Indirect Taxes and Customs of India, the Indian AEO Programme, initiated in 2011, now includes nearly 5,000 AEO entities. This programme has significantly accelerated the movement of goods at Indian ports, leading to substantial time and cost savings for Indian trade. The World Customs Organization (WCO) reports that India has 13 AEO Mutual Recognition Agreements (MRAs). Of these, 3 are operational with South Korea, Taiwan, and the United Arab Emirates. Additionally, joint action plans have been signed for 6 MRAs, which are currently in progress.

Singapore: Singapore Customs is the first customs authority in Southeast Asia to establish mutual recognition agreements for AEO programs with other customs administrations. As of January 2024, 76 companies are certified as AEOs by Singapore Customs under the Secure Trade Partnership Plus (STP-Plus). According to the WCO, there are 10 AEO MRA operational with other countries such as Canada, the USA, Thailand, China, and so on.

Source: RAPID's Presentation.

3.3 Timeline for automation in Bangladesh border management and customs (based on global examples)

Bangladesh can learn from the experiences of other countries to develop a phased approach for adopting automation processes in border management and customs procedures. Here's a possible timeline outlining the key stages involved:

Phase 01: The first phase, lasting one to two years, would focus on laying the groundwork. This involves developing the necessary infrastructure, such as upgrading IT systems within customs and border agencies. Additionally, it's essential to establish a legal framework that supports electronic data interchange (EDI) and the use of digital signatures. Examples from other countries show similar timelines. Singapore's TradeNet system, for instance, took two years to develop the core infrastructure.[53] [54]

Phase 02: The next phase, spanning two to three years, would see the implementation of core automation processes. This could involve introducing an Automated Cargo Clearance System (ACCS) that allows for the electronic submission of trade documents. A risk management system for cargo selection and inspection can also be implemented during this time. Malaysia's Single Window Platform, which offers similar functionalities, took around three years to implement.[55] Dubai Customs serves as another example, achieving a significant reduction in clearance time within three years of automation decreasing the total inspection time from two hours to 20 minutes per container, cutting costs by 54 per cent, and increasing the number of clients at Jebel Ali Port by 33 per cent.[56]

Phase 03: Following this initial automation, a period of three to five years can be dedicated to implementing advanced automation practices. Here, the focus would be on integrating the customs system with other border agencies, such as immigration and quarantine. Additionally, data analytics tools can be introduced to improve risk assessment and trade pattern analysis. The Netherlands' Port Community System, which took four years to achieve complete integration with all stakeholders, exemplifies this stage.[57]

Phase 04: The final phase underlines the importance of continuous improvement. This ongoing process would involve regularly reviewing and updating automation processes. Bangladesh can also explore emerging technologies like artificial intelligence and blockchain to achieve further efficiency gains. South Korea's investment in blockchain technology serves as an illustration for this phase (CHOI, 2021).

By following a phased approach that incorporates learnings from other countries, Bangladesh can establish a robust and efficient automation system for its border management and customs procedures. This will not only expedite trade but also enhance security and transparency. It's important to remember that the specific timeline for Bangladesh may vary depending on factors like resource allocation and stakeholder engagement.

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[53] Case Study-Singapore-updated in Apr10 (unece.org)

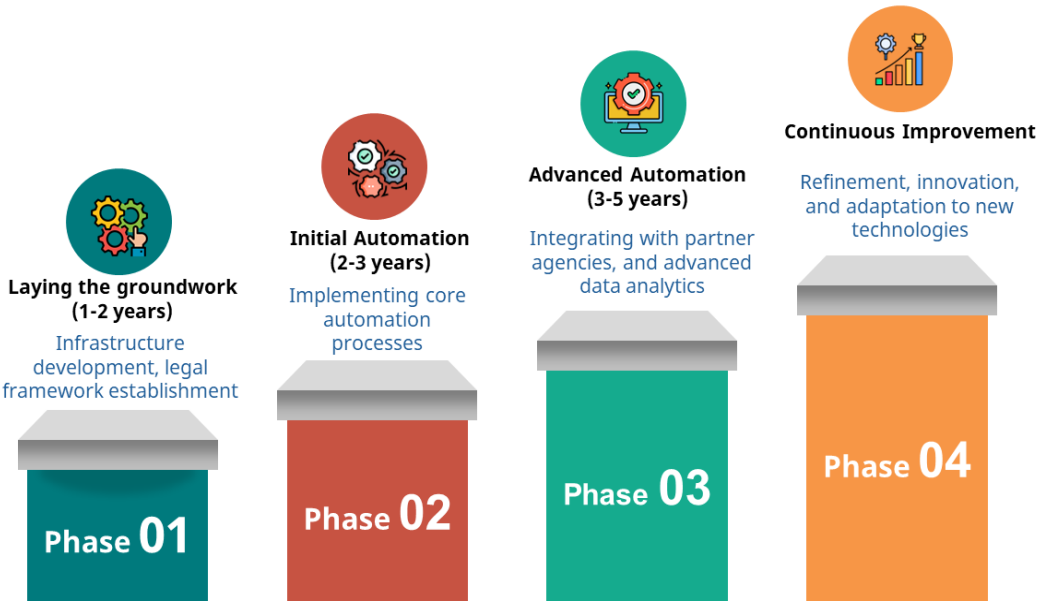
[54] Singapore's TradeNet system, which serves as the National Single Window for trade declaration.

[55] https://www.unescap.org/sites/default/d8files/event-documents/Malaysia%20experience_Malaysia%E2%80%99s%20National%20Single%20Window%20Experience.pdf

[56] Dubai Customs: Journey towards a 'Customs of the future' – WCO (wcoomd.org)

[57] Srour, F. J., Oosterhout, M. V., J. Baalen, P. J. V., & Zuidwijk, R. (2008). Port Community System implementation: Lessons learned from International Scan. ResearchGate, Vol. 08–2041, 7. Retrieved from https://www.researchgate.net/publication/236278299_Port_Community_System_Implementation_Lessons_Learned_from_International_Scan

Figure 3. 2: Evolution of Automation in Border Management and Customs: A Timeline for Bangladesh



Source: RAPID's presentation.

3.4 Advancements in port management and customs procedures

To foster international trade and enhance economic cooperation, effective port management and customs procedures are essential. Efficient management of ports at borders ensures the movement of goods and services, boosting trade flows between countries. This leads to the reduction of trade time and costs. Globally, there has been significant advancement in port management and customs procedures, driven by innovations in technology and digitalisation. Advancement in technologies reduces human error, expedites documentation, and minimises the time spent in the inspection process at the border point. Bangladesh is gradually shifting towards the adoption of technology in port management and customs procedures to streamline operations and enhance trade efficiency. As Bangladesh continues to invest in digital infrastructure, including the development of smart ports and integrated border management systems, the country is positioning itself to better manage its growing trade volumes and enhance its competitiveness in regional and global markets. There are several factors that impact the management of ports and customs, such as technology such as cargo tracking and tracing with modern tracking devices, information exchange processes, transit and transshipment, Time Release Studies (TRS), and cross-border paperless trade.

Cargo tracking and tracing with modern tracking devices: Cargo tracking and tracing involve monitoring the movement and status of goods from the point of origin to the final destination. Modern tracking devices, such as Global Positioning System (GPS), Radio Frequency Identification (RFID) tags, and Internet of Things (IoT) sensors, facilitate real-time visibility and management of cargo. Bangladesh's major ports, particularly Chittagong and Mongla, handle a substantial volume of imports and exports. Implementing advanced tracking systems can significantly enhance the efficiency and security of cargo handling. Currently, the adoption of such technologies is gradually increasing, driven by initiatives to modernise port operations. Challenges include the high initial

investment costs, the need for skilled personnel to manage these technologies, and ensuring interoperability with existing systems. However, successful implementation can lead to reduced theft, minimised delays, improved inventory management, and better compliance with international trade standards.

Information Exchange Processes: Information exchange processes refer to the seamless sharing of data among various stakeholders involved in port and customs operations, including shipping lines, freight forwarders, customs authorities, and government agencies. Efficient information exchange is vital for reducing processing times and enhancing transparency. Bangladesh has made strides in digitising customs procedures through systems like ASYCUDA World. However, challenges remain in achieving full integration among all stakeholders and ensuring data accuracy and security. Enhancing information exchange can lead to faster clearance times, reduced paperwork, and better decision-making, ultimately improving the overall trade environment.
Information exchange processes enhance the coordination between multiple agencies involved in cross-border trade, preventing procedural overlaps and facilitating better risk management by allowing authorities to conduct targeted inspections based on shared data. By integrating with regional trade platforms, Bangladesh can strengthen its trade relations with neighbouring countries, particularly India, and tap into the growing markets of Northeast India (NEI).

Transit and transshipment: Transit refers to the movement of goods through a country without being offloaded or stored, whereas transshipment involves transferring goods between different modes of transport, typically for further shipment to another destination.Transit and transshipment significantly influence port management and customs procedures by requiring efficient handling and streamlined processes. Transit cargo passes through without being offloaded for local use, demanding quick processing and minimal customs checks to avoid delays. Transshipment involves transferring cargo, requiring advanced infrastructure and coordination. Both processes rely on accurate documentation and real-time tracking to ensure security and compliance. Effective management enhances port competitiveness, reduces costs, and improves trade flow, while inefficiencies can lead to delays and increased operational costs.

Time Release Study (TRS): The Time Release Study (TRS), a method endorsed by the World Customs Organization (WCO), measures the time it takes authorities to release import and export cargo, helping to identify bottlenecks and improve the efficiency of these processes. Following the implementation of the WTO Trade Facilitation Agreement (TFA) in February 2017, member countries are required to measure and publish the average release times for goods. The National Board of Revenue has now released the results of its first sector-specific Comprehensive Time Release Study (TRS 2022), which examines the average release times for different import clearance processes at three major ports in Bangladesh: Benapole Land Port, Chattogram Seaport, and Dhaka Airport. According to TRS 2022, the average release time for sea cargo is about 11 days 6 hours 23 minutes, for air cargo around 7 days 11 hours 19 minutes, and for land cargo about 10 days 8 hours 11 minutes.

Cross-border paperless trade: Cross-border paperless trade involves the digitalisation of trade documents and processes, allowing for the electronic exchange of information between trading partners and customs authorities. For example, the Single Window System (SWS) facilitates the electronic submission of documents, reducing the need for physical paperwork and minimising processing times. Bangladesh's National Single Window (NSW) system represents a significant step towards modernising and improving its trade processes. By creating a unified platform for managing trade-related documentation and procedures, the system aims to streamline operations, reduce costs, and enhance overall trade efficiency.

3.5 Findings from the field survey

Every respondent who is related to trade unequivocally agrees that automation is essential in border management and customs procedures. This survey underscores a strong recognition among stakeholders of the benefits of automation, such as increased efficiency, reduced human error, and improved processing times.

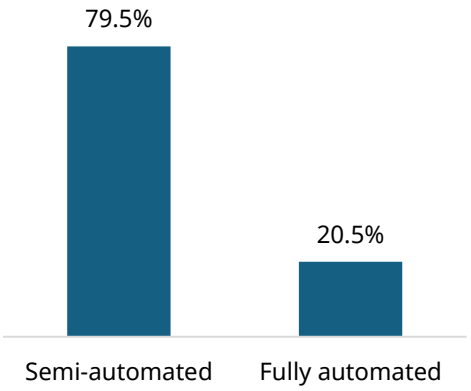
All users of ASYCUDA World report that it has been beneficial for customs procedures. This positive feedback indicates that ASYCUDA World effectively enhances customs operations, likely through streamlining processes, improving accuracy, and facilitating better data management.

However, the current customs procedure is semi-automated. While documents are initially submitted through the ASYCUDA World system, additional physical documents are still required from other organisations. This semi-automation leads to inefficiencies and delays as businessmen need to gather certificates from multiple non-automated organisations, which then need to be physically attached to ASYCUDA World documents and resubmitted to customs.

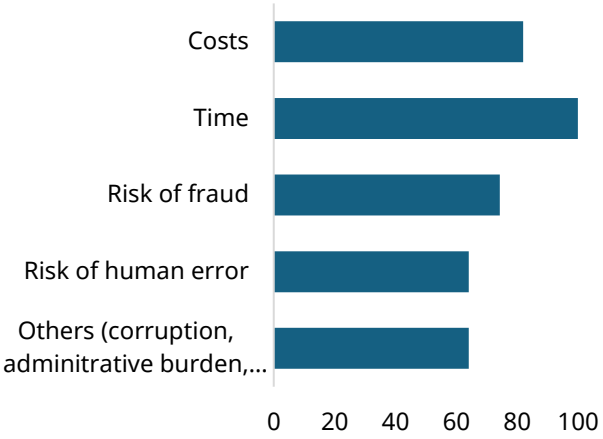
The field survey results indicate that 79.5 per cent of respondents observed customs procedures as semi-automated, involving a mix of manual and automated processes, while only 20.5 per cent reported fully automated procedures (Figure 3.3 (a)). Figure 3.3 (b) reveals that automation in customs procedures significantly helps to reduce various factors: 100 per cent of respondents noted a reduction in time, 82.1 per cent observed a decrease in costs, 74.4 per cent reported a lower risk of fraud, and 64.1 per cent saw reductions in both the risk of human error and other issues such as corruption, administrative burden, delays in the supply chain, and complexity in documentation. This indicates that automation greatly enhances efficiency, cost-effectiveness, and security in customs operations.

Figure 3. 3: Results from field survey

(a) In your observation, what is the level of automation in the current customs procedures?



(b) What factors does automation in customs procedures help to reduce?



Source: RAPID's field survey.

Users of ASYCUDA World unanimously support the implementation of the Single Window System. This strong support suggests that those familiar with digital customs solutions recognise the added value that a Single Window System could bring, such as further streamlining processes, enhancing inter-agency coordination, and reducing administrative burdens.

Those in favour of implementing the Single Window System emphasise the necessity of training programs. This highlights an important consideration: for the Single Window System to be effective, stakeholders need proper training to understand and utilise the system efficiently. It indicates a proactive approach among stakeholders, recognising that adequate training is essential to fully leverage the benefits of new systems and technologies.

The practice of changing drivers at land ports, especially when it involves drivers from village syndicates, introduces significant logistical challenges (See Box 3.7). Furthermore, the lack of necessary infrastructure at land ports to facilitate smooth driver changes, such as designated areas for driver rest and vehicle inspections, can lead to congestion and operational delays. Implementation of stringent regulations and oversight mechanisms is essential to address the issue of driver-changing, ensuring compliance with standardised procedures and enhancing security measures at the land port.

Box 3. 8: The Border Box Swap: A Manual Intervention in Transitional Trade Operations

In the land port of Akhaura, a practice unfolds daily, shedding light on the complex dynamics between local communities, transportation logistics, and the limitations of current technological infrastructure. Termed the "Border Box Swap," this practice involves a deliberate substitution of drivers as cargo approaches the border, a phenomenon born out of the intersecting needs and constraints within the region.

At its core, the Border Box Swap emerges as a response to the scarcity of employment opportunities in the nearby villages surrounding the port. As cargo shipments from specific origins arrive, accompanied by designated drivers, the local populace seizes the opportunity for economic engagement. The substitution of drivers is not arbitrary but rather a strategic tactic aimed at integrating the village workforce into the transitory trade processes facilitated by the port's operations.

The incumbent driver, upon nearing the border, cedes control to a resident from the adjacent village, who then assumes responsibility for guiding the cargo through the intricate web of border protocols and customs regulations. This manual intervention ensures the seamless continuation of the cargo's journey, mitigating potential delays or complications that may arise during the transition across borders.

However, the rationale behind this labor-intensive practice lies in the absence of advanced automation systems within the port infrastructure. In a landscape where technological advancements have yet to integrate into operational protocols, the reliance on manual substitutions persists as a pragmatic solution to overcome logistical impediments.

The envisioned future, marked by the advent of automation, promises a transformative shift in the dynamics of cross-border trade facilitation. With the implementation of electronic registration systems, the need for manual driver substitutions would become obsolete, paving the way for a streamlined and efficient process. Thus, as stakeholders aspire towards a future characterised by technological efficacy, the villagers of Akhaura continue to navigate the present realities, hopeful that manual driver substitutions will soon be a thing of the past.

Source: RAPID's field survey.

3.5 Synthesising the findings from the desk research and the field

The findings from the field survey align with the insights derived from the literature review on the automation of border management and customs procedures in Bangladesh. The literature review highlights several key initiatives by the Bangladesh Land Port Authority (BLPA) to modernise operations through technology. These initiatives include the implementation of an e-filing system and the development of custom-designed software to enhance operational efficiency at key ports such as Benapole. Additionally, the BLPA's focus on security through advanced surveillance systems and the planned development of an e-port management system for Sonahat land port underscore a comprehensive approach to modernisation. Similarly, in customs procedures, the adoption of the ASYCUDA World system and the ambitious upgrade of customs automation infrastructure demonstrate Bangladesh's commitment to leveraging technology for efficiency and transparency. The introduction of a National Single Window (NSW) system aims to streamline trade-related processes further, reducing the need for multiple submissions to different agencies.

Field survey results strongly support these findings, revealing unanimous agreement among respondents on the necessity of automation in border management and customs procedures. Users of the ASYCUDA World system report significant benefits, such as increased efficiency, reduced human error, and improved processing times. However, the survey also uncovers that the current customs procedures are only semi-automated, with additional physical documents required from non-automated organisations. This mixed system creates inefficiencies and delays, as businesses must gather and resubmit these physical documents.

Despite these challenges, the survey findings align with the literature review in recognising the positive impact of automation. All respondents noted that automation reduces time, and the majority observed decreases in costs, fraud risk, human error, and other administrative burdens. Support for the Single Window System is strong among users of ASYCUDA World, who believe it will streamline processes further and enhance inter-agency coordination. However, they also emphasise the need for comprehensive training programs to ensure stakeholders can effectively use the new systems.

The survey also highlights practical challenges not extensively covered in the literature review, such as logistical issues related to the practice of changing drivers at land ports. These challenges include the lack of infrastructure for driver rest and vehicle inspections, leading to operational delays. Implementing biometric or digital authentication systems and establishing stringent regulations and oversight mechanisms can address these issues, enhancing security and efficiency at land ports. Additionally, businessmen advocate for one-stop border posts to consolidate customs clearance processes, reduce administrative burdens, and expedite the movement of goods, further supporting the literature review's emphasis on modernisation for improved trade efficiency.

In conclusion, the field survey findings support the literature review's observations on the importance and benefits of automation in border management and customs procedures. They also reveal areas needing further improvement, such as achieving full automation and addressing logistical challenges at land ports. Together, these insights highlight a clear path forward for enhancing the efficiency, security, and overall effectiveness of Bangladesh's border and customs operations.

Chapter 4: Analysing the Impact of the Cargo Tracking System on the Logistics Performance Index (LPI)

Analysing the impact of the cargo tracking system on the Logistics Performance Index (LPI) is important for understanding the effectiveness of transportation infrastructure and logistics operations within a country. The LPI, developed by the World Bank, assesses the efficiency of trade logistics based on various factors, including customs clearance, infrastructure quality, and shipment tracking. By evaluating how the implementation of a cargo tracking system influences these components, policymakers can gauge its overall impact on trade facilitation and competitiveness. A well-functioning cargo tracking system can lead to reduced transit times, lower costs, and increased reliability in supply chains, thereby positively impacting a country's LPI score. Additionally, by providing greater visibility into the movement of goods, such a system can enhance transparency, reduce the incidence of delays and theft, and improve overall trade performance. Therefore, a thorough analysis of the cargo tracking system's influence on the LPI is essential for identifying areas of improvement and implementing targeted interventions to optimise logistics efficiency and enhance economic competitiveness.

4.0 Impact of the Cargo Tracking System on the Logistics Performance Index (LPI)

The Logistics Performance Index (LPI) is a benchmarking tool by the World Bank (WB) that measures the efficiency of the logistics industry in a country, considering factors such as infrastructure, customs performance, international shipments, quality of logistics services, tracking and tracing, and timeliness. Bangladesh had an overall score of 2.6 out of 5, ranking 88th out of 139 countries in 2023, while the score was 2.58, with a rank of 100 out of 160 countries in 2018.[58]

The customs dimension within the Logistics Performance Index (LPI) evaluates the efficiency and effectiveness of customs procedures. In 2023, a score of 2.3 indicates a moderate level of performance in customs-related activities. The infrastructure dimension assesses the quality and development of a nation's transportation and utility infrastructure, with a score of 2.3 during the same year, suggesting a moderate level of infrastructure development. Regarding international Shipments, which gauges how well a country manages cross-border movements, Bangladesh demonstrates relatively better performance with a score of 2.6 out of 5. Ranked 81st out of 139 countries, Bangladesh scores 2.7, indicating a moderate to good level of logistics competence and quality.

Timeliness evaluates the punctuality and reliability of logistics services. Bangladesh, holding the 87th position in 2023, achieves a score of 3.0, signifying a relatively good performance in terms of timely logistics services. The Tracking and Tracing dimension focuses on a country's logistics system's capability to provide effective tracking and tracing of shipments for real-time information. Positioned 105th among 139 countries, Bangladesh scores 2.4, suggesting a moderate level of performance in

[58] https://lpi.worldbank.org/international/global

this aspect. Changes are observed in the ranking and scoring of the tracking and tracing dimension over the years, indicating fluctuations in its performance (Table 4.1) (The World Bank, n.d.).

Table 4. 1: Bangladesh's performance in the Logistics Performance Index (LPI)

Dimensions	2007		2010		2014		2016		2018		2023	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Overall	87	2.47	79	2.74	108	2.56	87	2.66	100	2.58	88	2.6
Customs	125	2	90	2.33	138	2.09	82	2.57	121	2.3	101	2.3
Infrastructure	82	2.29	72	2.49	138	2.11	87	2.48	100	2.39	108	2.3
International Shipments	96	2.46	61	2.99	80	2.82	84	2.73	104	2.56	91	2.6
Logistics Competence and Quality	103	2.33	96	2.44	93	2.64	80	2.67	102	2.48	81	2.7
Timeliness	54	3.33	70	3.46	75	3.18	109	2.9	107	2.92	87	3
Tracking and Tracing	88	2.46	92	2.6	122	2.45	92	2.59	79	2.79	105	2.4

Source: World Bank.

4.1 Impact of tracking and tracing on each of the dimensions of the Logistics Performance Index (LPI)

The tracking and tracing of shipments play a vital role in impacting different dimensions of the Logistics Performance Index (LPI). Systems designed for tracking and tracing have the capacity to affect each specific dimension within the index positively.

Impact on customs: Real-time tracking and tracing can streamline customs clearance processes. When customs authorities have access to accurate and timely information about the status and location of shipments, they can expedite the clearance process, reducing delays and potential bottlenecks. The impact of real-time tracking and tracing on customs clearance processes is profound and multifaceted.

Improved visibility: Knowing the exact location and status of shipments allows customs authorities to prepare for arrivals. They can anticipate arrivals, gather necessary documentation, and allocate resources efficiently for inspections and clearances. It also reduces delays. Potential bottlenecks or issues can be identified and addressed proactively, minimising clearance delays. It enhances security. Deviations from planned routes or unexpected stops can be flagged, helping to identify smuggling attempts or unauthorised access.

Improved compliance and trade facilitation: Tracking and tracing can ensure Verification of declared goods, quantities, and values becomes easier, reducing the risk of fraudulent activities. It can help improve the enforcement of regulations like product labeling and documentation standards.

Benefits for all stakeholders: Tracking and tracing can help stakeholders by streamlining processes that translate to reduced delays, improved predictability, and better planning of logistics, minimising inventory costs and meeting customer demands efficiently. Data-driven decision-making is enabled through insights gained from tracking data, allowing for continuous process optimisation.

Impact on infrastructure: Efficient tracking systems contribute to better infrastructure utilisation. Knowing the location of shipments in real-time allows for optimal planning and allocation of resources, such as storage space, transportation assets, and personnel. These benefits contribute to a more efficient and resilient infrastructure network that can better meet the needs of businesses and consumers.

Impact on international shipments: International shipments involve multiple handovers and cross-border processes. Tracking and tracing ensure visibility throughout the supply chain, reducing the risk of lost or delayed shipments. This increased visibility positively impacts the reliability of international shipments. Moreover, Real-time tracking provides transparency throughout the complex journey of international shipments, across various modes of transport and borders. This visibility allows stakeholders to monitor progress, identify potential delays or bottlenecks, and proactively address issues, significantly reducing the risk of lost or misplaced shipments. In addition, Timely delivery is an important factor for customer satisfaction in international logistics. Tracking empowers customers to track their orders and receive updates, fostering confidence in the service and enhancing overall satisfaction.

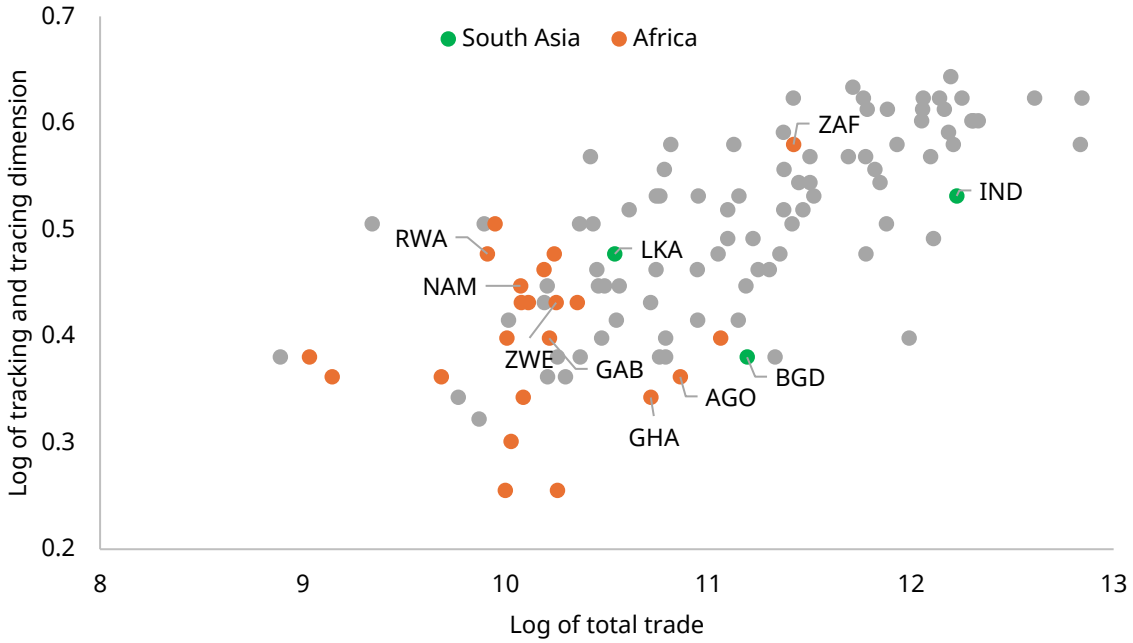
Impact on logistics competence and quality: Accurate tracking enhances the overall competence of logistics operations. It enables logistics providers to demonstrate a high level of precision in managing shipments, leading to improved service quality. Consistency in tracking also contributes to building a positive reputation for logistic competence. Real-time tracking allows both logistics providers and customers to proactively address any issues and ensure on-time delivery, leading to higher customer satisfaction and loyalty.

Impact on timeliness: Timeliness is a critical factor in logistics, and tracking and tracing systems contribute significantly to meeting delivery deadlines. Real-time information allows logistics providers to identify and address potential delays promptly, improving overall supply chain timeliness. By providing visibility into shipment status, these systems facilitate communication and collaboration among all parties involved (shippers, carriers, customs, and recipients). This allows for coordinated efforts to ensure timely delivery, such as expediting clearance processes at ports when delays occur.

While tracking and tracing generally have positive effects, it's important to note that the effectiveness of these systems depends on their implementation, integration with other logistics processes, and the overall infrastructure of the country. Due to the relatively lower ranking and scoring for Bangladesh, it is essential for the country to focus on the implementation and enhancement of a robust Vehicle and cargo Tracking System. The implementation of a robust vehicle tracking system

will provide real-time visibility into the location and status of shipments and allow for tracking shipments at different stages of the supply chain, from the point of origin to the final destination.

Figure 4. 1: Tracking and tracing dimensions in different countries in relation to overall trade



Source: World Development Indicators, World Bank.

Note: Countries are indicated as AGO–Angola, BGD–Bangladesh, GAB–Gabon, GHA–Ghana, IND–India, LKA–Sri Lanka, NAM–Namibia, RWA–Rwanda, ZAF–South Africa, ZWE–Zimbabwe.

In figure 4.1, the "Log of trade" indicates the logarithmic representation of the combined value of exports and imports for each country and the "log of Tracking and Tracing Dimension" reflects the logarithmic representation of the tracking and tracing dimension value. Among the three South Asian nations - Bangladesh, India, and Sri Lanka, Bangladesh lags behind in improving its vehicle tracking system. Some African nations like Gabon, Namibia, Rwanda, and Zimbabwe, despite having smaller trade volumes compared to Bangladesh, boast a more robust tracking and tracing capacity.

Box 4. 1: Logistics Performance Index (LPI) of the European Union (27 countries)

EU 27	Overall LPI			
	Score (2007)	Score (2023)	Rank (2007)	Rank (2023)
Global average	2.7	3.0	-	-
EU 27 average	3.4	3.6	-	-
Austria	4.1	4.0	5	7
Belgium	3.9	4.0	12	7
Bulgaria	2.9	3.2	55	51
Croatia	2.7	3.3	63	43
Cyprus	2.9	3.2	49	51
Czech Republic	3.1	3.3	38	43
Denmark	3.9	4.1	13	3
Estonia	2.9	3.6	47	26
Finland	3.8	4.2	15	2
France	3.8	3.9	18	13
Germany	4.1	4.1	3	3
Greece	3.4	3.7	29	19
Hungary	3.2	3.2	35	51

EU 27	Overall LPI			
	Score (2007)	Score (2023)	Rank (2007)	Rank (2023)
Ireland	3.9	3.6	11	26
Italy	3.6	3.7	22	19
Latvia	3.0	3.5	42	34
Lithuania	2.8	3.4	58	38
Luxemburg	3.5	3.6	23	26
Malta	-	3.3	-	43
Netherlands	4.2	4.1	2	3
Poland	3.0	3.6	40	26
Portugal	3.4	3.4	28	38
Romania	2.9	3.2	51	51
Slovak Republic	2.9	3.3	50	43
Slovenia	3.1	3.3	37	43
Spain	3.5	3.9	26	13
Sweden	4.1	4.0	4	7

Source: WDI.
Note: Data for Malta in 2007 is unavailable.

The improvement in the Overall LPI for the EU 27 can be attributed to several strategic initiatives. Key among these is the significant investment in transportation infrastructure, which has enhanced the efficiency and capacity of logistics networks. Additionally, the EU has focused on harmonising customs procedures and regulations across member states, facilitating smoother cross-border trade and logistics operations. The adoption of advanced technologies such as digital tracking, automated warehousing, and logistics management systems has also played a critical role in improving efficiency and reliability in supply chains.

Source: RAPID's presentation.

4.2 Econometric analysis of the Logistics Performance Index (LPI)

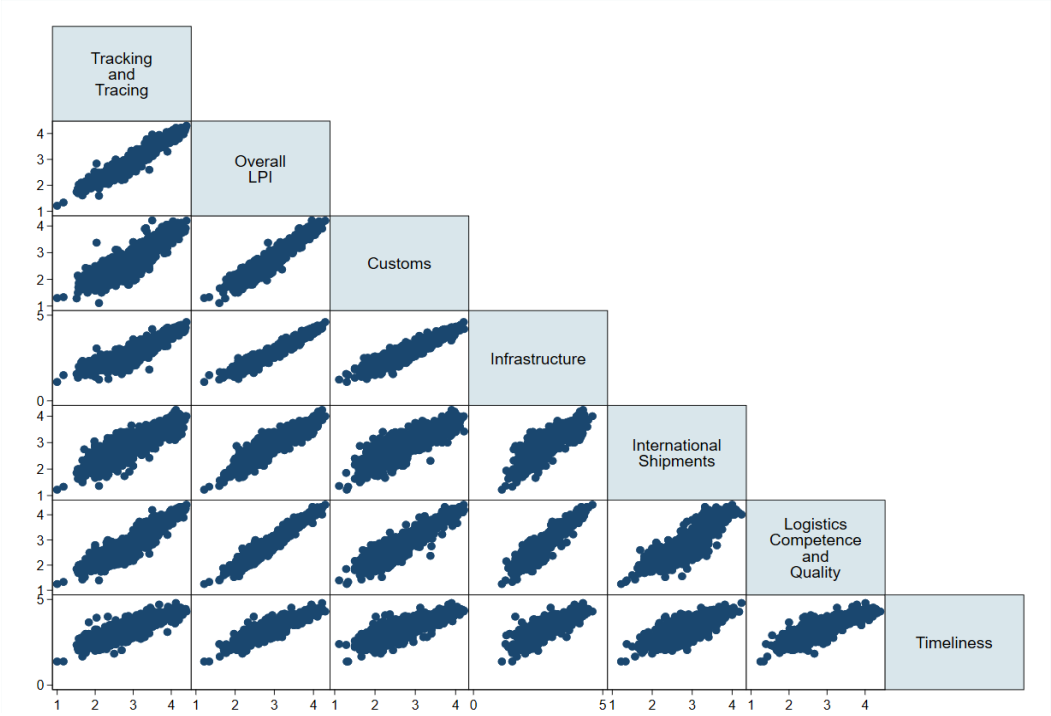
The Logistics Performance Index (LPI) ranges from 1 to 5, with 5 indicating the highest performance. In analysing the impact of tracking and tracing on the overall LPI and its various dimensions within the context of global scenarios using LPI data for 2007, 2010, 2012, 2014, 2016, 2018, and 2023, several key observations can be made.

Figure 4.2 shows that tracking and tracing exhibit a consistent and positive linear relationship with each of the dimensions of the LPI. This implies that as tracking and tracing capabilities improve, there is a corresponding enhancement across all aspects of logistics performance.

Moreover, when plotting the impact of tracking and tracing on the overall LPI and logistics competence and quality, a notable pattern emerges. Specifically, tracking and tracing activities tend to follow a 45-degree line, indicating a direct correspondence or one-to-one movement with the tracking and tracing dimension itself.

This alignment suggests that improvements in tracking and tracing have a proportional impact on overall logistics performance and other dimensions. In essence, as tracking and tracing capabilities increase, there is a concurrent elevation in the efficiency and effectiveness of logistics operations, leading to a higher LPI score.

Figure 4. 2: Impact of tracking and tracing on overall LPI and other dimensions of LPI



Source: RAPID's analysis using data from the World Bank.

Table 4.2 compares Bangladesh's logistics performance index (LPI) across various components with the average values for other countries. Bangladesh's overall LPI score (2.60) is slightly below the average (2.87), with specific weaknesses in customs efficiency (2.27 compared to 2.67) and infrastructure quality (2.34 compared to 2.73). Although Bangladesh's performance in international shipments (2.69) is closer to the average (2.84), it still lags behind. The country's logistics competence (2.54) and tracking and tracing capabilities (2.56) also fall below the average scores of 2.83 and 2.89, respectively. However, in terms of timeliness (3.13), Bangladesh is relatively close to the average

(3.26). Overall, while Bangladesh performs reasonably well in certain areas, significant improvements are needed in customs, infrastructure, and tracking to enhance its logistics performance.

Table 4. 2: Summary statistics: Comparison between Bangladesh and the average country's LPI performance

Value	Overall LPI	Customs	Infrastructure	International shipment	Logistic competence and quality	Tracking and tracing	Timeliness
Bangladesh							
Mean	2.60	2.27	2.34	2.69	2.54	2.56	3.13
Max	2.74	2.57	2.49	2.99	2.70	2.40	3.46
Min	2.47	2.00	2.11	2.46	2.33	2.79	2.90
Average country							
Mean	2.87	2.67	2.73	2.84	2.83	2.89	3.26
Max	4.30	4.21	4.60	4.24	4.40	4.40	4.80
Min	1.21	1.11	1.10	1.22	1.25	1.00	1.38

Source: RAPID's analysis using data from the World Bank.
Note: Max=Maximum value, Min=Minimum value

Table 4.3 illustrates the percentage change in various dimensions of the Logistics Performance Index (LPI) due to improvements in tracking and tracing for Bangladesh compared to an average country. By holding other factors constant, a 1 unit increase in tracking and tracing can significantly enhance different aspects of logistics performance.

For the overall LPI, a 1 unit increase in tracking and tracing results in a 6.15 per cent improvement for Bangladesh, compared to a 5.57 per cent increase for an average country. This suggests that enhancements in tracking and tracing have a slightly greater impact on the overall logistics performance in Bangladesh than in other countries on average.

When examining specific dimensions, we see varied impacts. In the customs dimension, Bangladesh experiences a 2.21 per cent increase due to improved tracking and tracing, while the average country sees a 1.87 per cent increase. The impact of tracking and tracing on customs is the lowest compared to other dimensions (Table 4.3). Additionally, panel data analysis reveals that tracking and tracing has no significant impact on customs when controlling for all other dimensions (see Annex A2).

Infrastructure improvements due to tracking and tracing also show notable differences. For Bangladesh, a 1 unit increase in tracking and tracing results in a 2.99 per cent enhancement in infrastructure, whereas the average country experiences a 2.56 per cent increase. This suggests that Bangladesh's infrastructure benefits slightly more from advancements in tracking and tracing than other countries do on average.

The international shipment dimension sees a 5.57 per cent increase in Bangladesh due to a 1 unit improvement in tracking and tracing, compared to a 5.28 per cent increase for the average country.

This indicates that tracking and tracing improvements are important for enhancing the efficiency of international shipments in Bangladesh.

The most significant impacts are seen in the logistics competence and quality, and timeliness dimensions. Bangladesh experiences a 9.43 per cent increase in logistics competence and quality and a 9.26 per cent increase in timeliness, compared to 8.49 per cent and 8.89 per cent increases, respectively, for the average country. These figures highlight that tracking and tracing improvements are particularly beneficial in enhancing the quality and reliability of logistics operations in Bangladesh.

Table 4. 3: Percentage change in overall LPI and other dimensions due to tracking and tracing

Country	Overall LPI	Customs	Infrastructure	International shipment	Logistic competence and quality	Timeliness
Bangladesh	6.15	2.21	2.99	5.57	9.43	9.26
Average country	5.57	1.87	2.56	5.28	8.49	8.89

Source: RAPID's analysis using data from the World Bank.

Therefore, tracking and tracing has a greater impact on each dimension of LPI, except customs (see Annex A2). While tracking and tracing offers significant advantages in many areas of logistics, their impact on customs operations is somewhat limited. This is because customs operations are deeply rooted in regulatory compliance, documentation verification, and security protocols, which are not fundamentally altered by the ability to track or trace goods in real time.

In conclusion, while improvements in tracking and tracing universally enhance logistics performance, the magnitude of these benefits can vary. Bangladesh, in particular, shows greater improvements in several dimensions, indicating that its logistics system is highly responsive to advancements in tracking and tracing technologies. This underscores the importance of investing in tracking and tracing improvements to boost overall logistics efficiency, especially in countries like Bangladesh where the impact can be more pronounced.

The key finding from Table 4.4 is that the coefficient for the log of the tracking and tracing score is 0.225. This coefficient represents the elasticity of trade with respect to tracking and tracing scores, meaning it measures how sensitive trade volume is to changes in tracking and tracing capabilities. A 1 per cent increase in the log of the tracking and tracing score is associated with a 0.225 per cent increase in the log of trade when excluding other LPI dimensions.

Table 4. 4: Impact of tracking and tracing on the trade

Variable	Dep var = log of trade	Dep var = log of trade
Log of Tracking and tracing	0.225***	0.082
Log of Customs score		0.218**

Log of Infrastructure score		0.133
Log of International shipment score		0.253***
Log of Logistic competence and quality score		0.386***
Log of Timeliness score		0.172*
Country fixed effect	Yes	Yes
Year fixed effect	Yes	Yes
Number of observations	935	935
Number of groups	165	165
R-squared	0.0992	0.1856

Source: RAPID's analysis using data from the World Bank.

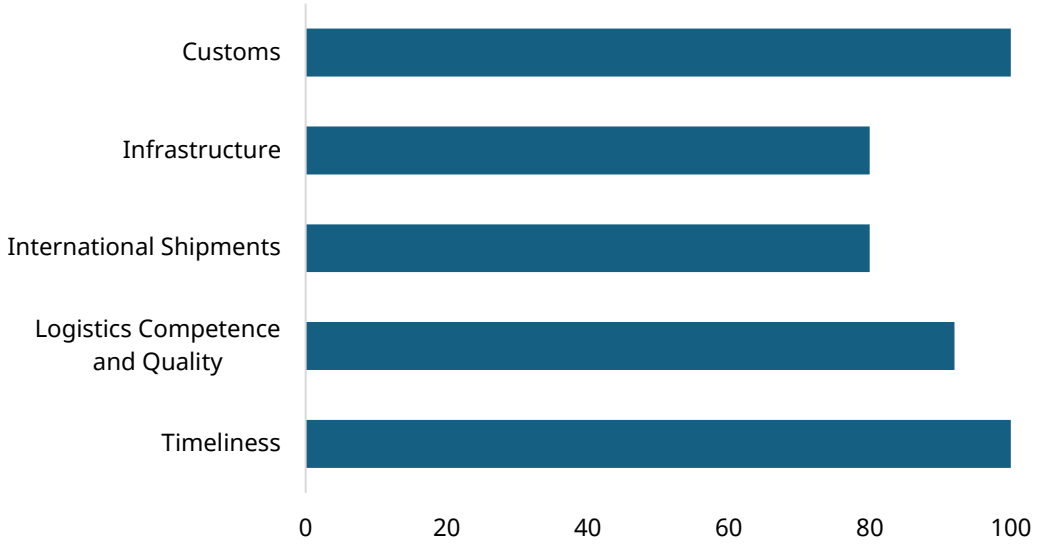
There is a positive significant relationship between tracking and tracing and trade. A 1 per cent increase in the log of the Tracking and Tracing score corresponds to a 0.082 per cent increase in the log of trade; however, this 0.082 per cent increase is not statistically significant.

4.3 Findings from the field survey

Leveraging in-depth interviews and focus group discussions (FGDs) with key stakeholders in the logistics industry, this survey explores the impact of tracking and tracing systems on Logistics Performance Index (LPI) metrics. Through targeted discussions with stakeholders from different field, the research delves into the perceived influence of tracking and tracing on various aspects of logistics performance, aiming to illuminate its potential contribution to an improved LPI score. By capturing the insights and experiences of those directly involved in logistics operations, the study seeks to provide a nuanced understanding of how tracking and tracing technologies are shaping the landscape and contributing to overall logistics efficiency.

The survey examining the impact of tracking and tracing on logistics performance produced highly promising findings. Significantly, all respondents (100 per cent) indicated that tracking and tracing systems improve both customs clearance efficiency and delivery timeliness. This reinforces the technology's capability to optimise processes and expedite shipments. Positive views extended to other areas as well. 80 per cent of respondents reported a beneficial influence on infrastructure utilisation and international shipments. The survey further revealed a substantial positive impact on logistics competence and quality, with 92 per cent attributing advancements in these areas to the adoption of tracking and tracing. Stakeholders held the firm belief that tracking and tracing plays a significant role in enhancing performance across several key dimensions.

Figure 4. 3: Percentage of "Yes" responses to the questions: Do you believe that the tracking and tracking dimension can impact other dimensions of the Logistics Performance Index (LPI)?



Source: RAPID's field survey

Findings strongly suggest that tracking and tracing systems hold significant potential to enhance a nation's overall Logistics Performance Index (LPI) score. Moreover, by leveraging modern tracking and tracing systems, Bangladesh can enhance its reputation as a reliable trading partner, fostering stronger relationships with international stakeholders. Therefore, prioritising the adoption of these systems is essential for Bangladesh to unlock its full potential and propel its logistics industry towards greater success on the global stage.

4.4 Synthesising the findings from the desk research and the field

The findings from the field survey strongly support the conclusions drawn in the literature review regarding the impact of tracking and tracing systems on Logistics Performance Index (LPI). Both sources highlight the critical role of these systems in enhancing various logistics dimensions, particularly customs procedures, infrastructure quality, and shipment tracking. The literature review emphasises that a robust cargo tracking system can significantly improve customs clearance efficiency by providing real-time shipment information, allowing better resource allocation and expedited processes. This is supported by the field survey, where all respondents indicated that tracking and tracing systems indeed improve customs clearance efficiency and delivery timeliness. This alignment confirms the literature's assertion about the practical benefits of real-time tracking in reducing delays and optimising customs procedures.

Additionally, the literature review discusses the potential of tracking systems to optimise infrastructure utilisation by enabling strategic planning and resource allocation. The field survey

supports this, with 80 per cent of respondents acknowledging the positive influence of tracking systems on infrastructure utilisation and international shipments. This reinforces the literature's claim that accurate tracking contributes to a more efficient and resilient logistics infrastructure, better equipped to handle business and consumer demands.

Moreover, the literature highlights the importance of tracking systems in improving logistics competence and quality, leading to higher service quality and customer satisfaction. The survey findings further support this, with 92 per cent of respondents attributing advancements in logistics competence and quality to the adoption of tracking and tracing systems. This agreement underscores the literature's point that accurate tracking enhances the overall reliability and efficiency of logistics operations.

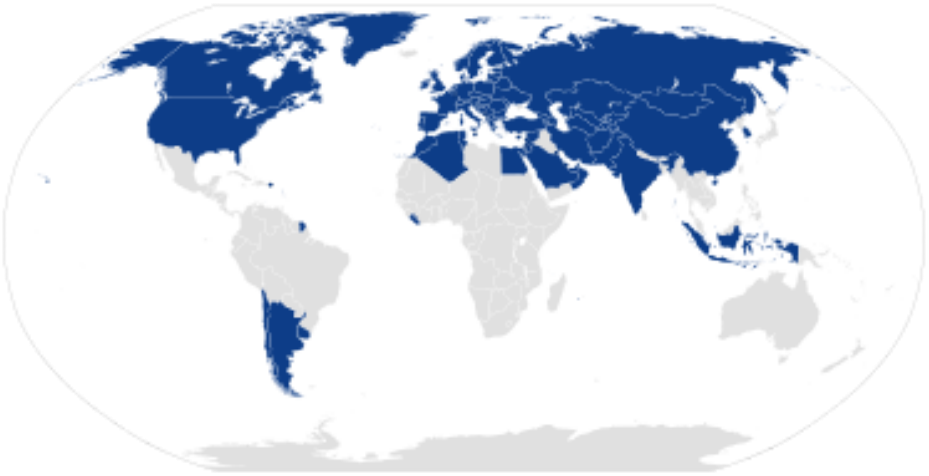
In conclusion, the field survey findings substantiate the literature review's conclusions about the significant benefits of tracking and tracing systems for improving LPI. The practical experiences and perceptions of stakeholders in the field affirm the theoretical advantages outlined in the literature, emphasising the critical role of these systems in enhancing logistics performance and competitiveness.

Chapter 5: Discussion on Transports Internationaux Routiers (TIR) Convention and Electronic Cargo Tracking System (ECTS)

5.0 TIR Convention

The Customs Convention on International Transport of Goods under cover of TIR Carnets 1975, commonly known as the TIR Convention 1975, operates as a multilateral international transit treaty. This is also known as Transports Internationaux Routiers (TIR), which operates under the supervision of the United Nations Economic Commission for Europe (UNECE) and is managed by the International Road Transport Union (IRU). The TIR Convention is designed to facilitate the smooth and efficient transit of goods across international borders, providing a framework for seamless cross-border movement within the international customs transit system. TIR offers a standardised process for customs clearance and transit activities, diminishing both delays and expenses linked to cross-border transportation. To date, the TIR Convention has 78 Contracting Parties, including the European Union (EU).[59] It covers the whole of Europe and reaches out to North Africa and the Near and Middle East. With over 33,000 authorised operators utilising the TIR system, around 1.5 million TIR transports take place each year (UNECE, n.d.). The convention permits the specification of goods in a TIR carnet, which are then sealed within the cargo compartments. Customs authorities authenticate the carnet and inspect the seals, eliminating the necessity for physically examining the contents. This streamlined process enables shipments to traverse countries without undergoing border inspections. This approach has proven to be an effective strategy in lowering trade transaction expenses and fostering increased growth in both intra-regional and inter-regional trade.

Figure 5. 1: Participants in the TIR Convention



Source: Wikipedia

[59] https://unece.org/transport/tir

5.1 Initiation of the Electronic TIR (eTIR) project

In 2003, the TIR Convention contracting parties initiated the "Electronic TIR (eTIR) Project" with the objective of establishing an exchange platform for all stakeholders engaged in the TIR system, known as the "eTIR international system".[60] In 2014, the push to digitise the TIR process gained momentum, with progress in both technical and conceptual aspects leading to the initiation of pilot projects and the formation of a specialised expert group to draft the necessary legal framework for integrating eTIR into the TIR Convention. Furthermore, in 2015, the TIR Contracting Parties adopted a Joint Statement, pledging to expedite the computerisation of the TIR procedure. Two pilot projects for eTIR were launched to evaluate and refine the conceptual and technical aspects. The initial pilot project, conducted between Turkey and Iran (Islamic Republic of), concluded successfully in February 2017, meeting all stakeholders' satisfaction and demonstrating the viability of a paperless TIR procedure. The second pilot project, linking Georgia and Turkey, aimed to showcase the practical feasibility of securely exchanging TIR-related data electronically between customs authorities.[61]

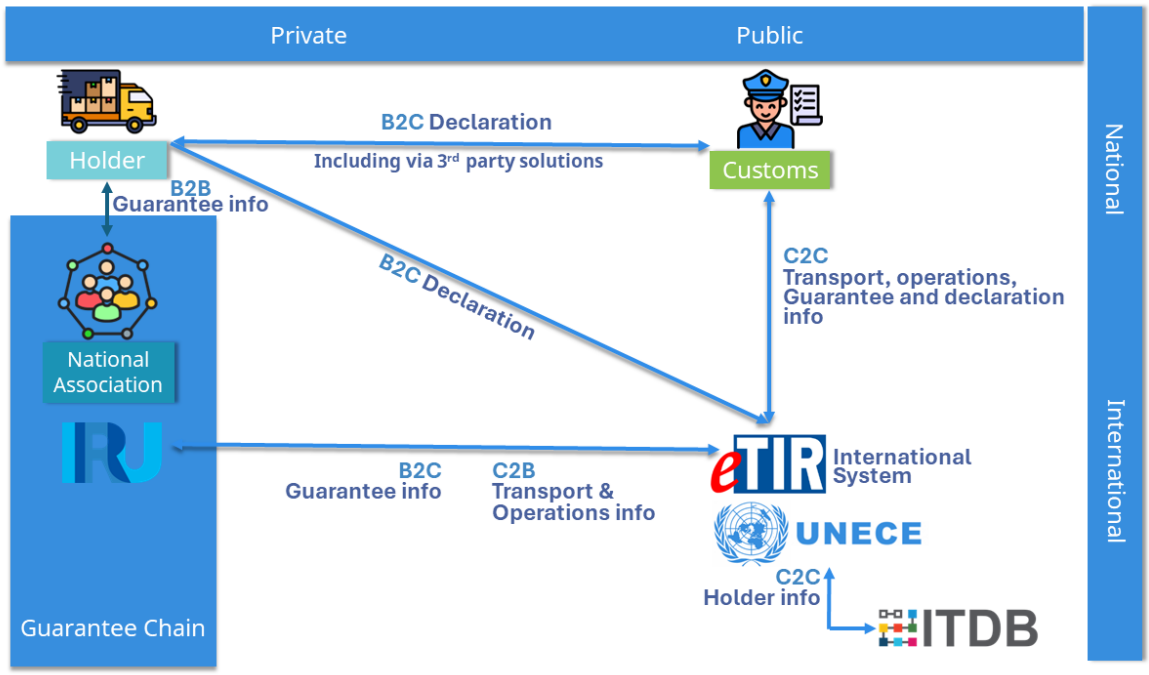
On February 7, 2020, these contracting parties formally adopted legal provisions enabling TIR transports to operate under the eTIR Procedure, eliminating the need for the traditional TIR Carnet.[62] The e-TIR system allows the involved countries to access comprehensive information at any time, offering visibility into cargo details before delivery. This proves beneficial for both parties, reducing the risk of deception, expediting customs formalities, and cutting down costs.

5.2 How the Electronic TIR (eTIR) works

The electronic TIR (eTIR) international system aims to facilitate the safe and efficient transfer of information between national Customs systems concerning the global transit of goods, vehicles, or containers, in adherence to the regulations outlined in the TIR Convention (UNECE, n.d.). Additionally, it enables Customs authorities to oversee the management of guarantees data issued by authorised guarantee chains to holders permitted to utilise the TIR system. The effectiveness of the eTIR system relies on coordinated endeavors between Contracting Parties and guarantee chains to establish, enhance, or synchronise connections with both national and private systems. Implementing the eTIR system brings advantages to all actors involved in the TIR system. Firstly, it strengthens security and opens doors to better risk management, reducing the likelihood of fraud. Secondly, enhanced international collaboration allows all participants to significantly reduce administrative burdens and reap the maximum benefits of integrated supply chain management. Finally, sharing cargo information in advance and enabling real-time information exchange expedites the TIR procedure.

[60] https://unece.org/about-etir
[61] https://unece.org/DAM/tir/handbook/english/newtirhand/TIR-6Rev11e.pdf
[62] https://etir.org/

Figure 5. 2: eTIR process under the TIR Convention



Source: United Nations Economic Commission for Europe (UNECE).

Before moving goods internationally with eTIR, a company (holder) needs a guarantee from a guarantee chain (UNECE, n.d.). If approved, the guarantee chain gives the company a reference number. Then the guarantee chain registers the guarantee electronically in the eTIR system. Next, the holder proceeds by sending a standard advance cargo information message, encompassing all details from the declaration, to the Customs authorities at the departure office.

This is accomplished through a national declaration mechanism, facilitating the performance of necessary risk assessment procedures by the authorities.

The holder presents the vehicle, goods, and guarantee references at the Customs office of departure to lodge the declaration. This declaration is based on the advance cargo information message already present in the national Customs system. Customs authorities conduct inspections on vehicles and goods based on risk assessments. They verify the guarantee status using the eTIR international system. If all checks are satisfactory, Customs accepts the declaration and transmits relevant TIR transport data (including declaration details, check results, and seal numbers) to the eTIR system. This system then shares TIR transport information with all Customs administrations involved in the declared itinerary. It serves as advance cargo information for subsequent Customs authorities. Additionally, the guarantee chain, responsible for issuing the guarantee, receives notifications about any changes in guarantee status and can access the eTIR system for information on guarantees issued by them. When a TIR transport arrives at a subsequent Customs office of entry, the process is repeated. This is based on the advance cargo information accessible through the eTIR international system and the risk assessment conducted by the relevant Customs authorities. Specific procedures are outlined for TIR transports that involve multiple loading or unloading locations. Whenever a TIR

transport arrives at a Customs office of exit or destination, the Customs authorities notify the eTIR international system about the conclusion of the relevant TIR operation. This identical process also applies when discharging each TIR operation.

5.3 Advantages of the TIR Convention

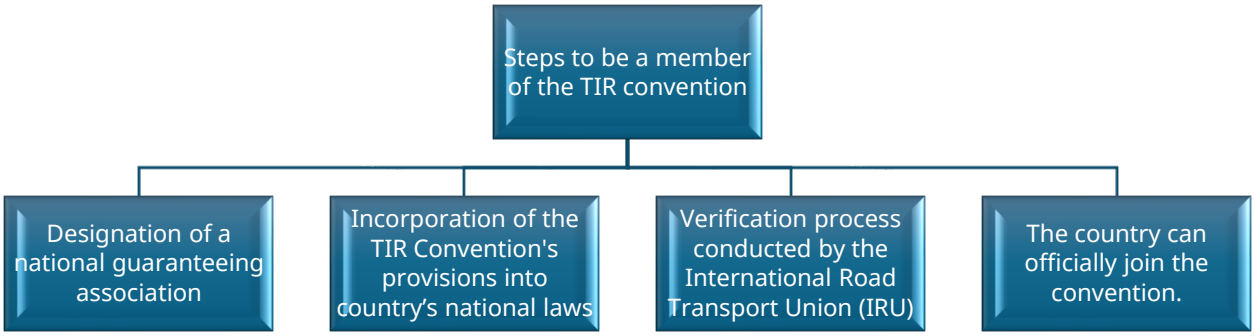
According to the International Road Transport Union (IRU), the advantages of TIR are considerable.[63] Initially, it saves time and money for both transport operators and customs authorities by facilitating quicker border crossings. This efficiency extends to benefiting national economies and communities at large. By implementing customs control measures in the departure country and ensuring acceptance by all transit and destination countries, physical border controls become unnecessary. Instead, customs need only inspect the TIR seals. This streamlined process allows for more transports to pass through borders daily, thereby cutting transportation costs and time for traders, ultimately lowering prices for consumers worldwide. TIR has demonstrated impressive reductions in transport times by up to 80 per cent and costs by up to 38 per cent (UNECE, n.d). Moreover, security is a prominent aspect of TIR. With the customs seal remaining intact throughout the international journey, goods are safeguarded against tampering. Additionally, TIR contributes significantly to the road transport industry's efforts to minimise its environmental impact, which is increasingly vital. Lengthy queues of trucks at border crossings result in substantial carbon footprints for companies. By expediting border crossings, TIR helps reduce emissions associated with truck journeys. It also promotes the adoption of intermodal transport, allowing goods to be transported via the most efficient routes.

5.4 Requirements to be a member of the TIR Convention

To become a member of the TIR Convention, a country needs to go through a few steps. First, the country needs to designate a national guaranteeing association. This association serves as a guarantor, assuming financial responsibility for any customs duties or taxes that remain unpaid on the goods being transported. The country needs to ensure this association is financially stable and meets the requirements outlined by the TIR Convention. Second, the country needs to incorporate the TIR Convention's provisions into their national laws. This guarantees that the country's laws and procedures are aligned with the international standards set by the TIR Convention. Once the national framework is in place, the International Road Transport Union (IRU) conducts a verification process. This process assesses the country's compliance with the TIR Convention's technical and operational requirements. After fulfilling these requirements, the country can officially join the convention by going through a process involving the United Nations Secretary-General. This process formalises the country's commitment to the TIR Convention and allows them to participate in the benefits of the streamlined international transport system.

[63] The global benefits of TIR | IRU | World Road Transport Organisation

Figure 5. 3: Steps to be a member of the TIR Convention



Source: RAPID's presentation.

5.5 Bangladesh's neighbouring country benefitting from the TIR Convention

India, along with neighbouring countries such as Pakistan and China, ratified the TIR convention. India ratified the convention in 2017.[64] This international customs transit system plays an important role in facilitating India's trade relations with both its eastern and western neighbours. Specifically, on the eastern front, the TIR convention aids in the integration of India with Myanmar, Thailand, Bangladesh, Bhutan, and Nepal. Meanwhile, on the western front, it allows India to efficiently transport cargo along the International North-South Transport Corridor (INSTC), leveraging the Chabahar port in Iran. This strategic route enables India to connect with landlocked Afghanistan and tap into the energy-rich Eurasian region. The first shipment under the TIR Convention arrived in India from Afghanistan via Iran's Chabahar Port in 2019.[65]

By joining this convention, India unlocked a range of benefits that are propelling its trade forward. One of the key advantages is the simplification of border crossings. Traditionally, moving goods across borders involved extensive paperwork and lengthy inspections. The TIR system replaces these complexities with a single TIR carnet, a secure document accepted by all member countries. This translates to faster clearance times, reducing delays and saving exporters and importers significant time and money.[66]

The TIR convention also promotes cost-effectiveness. By eliminating the need for guarantees at each border, TIR reduces the financial burden on businesses. Additionally, faster clearances lead to lower transportation costs associated with delays and demurrage charges. This improved efficiency makes

[64] Bagchi, I. (2017, June 19). India joins UN TIR Convention. The Times of India. Read more at: http://timesofindia.indiatimes.com/articleshow/59220976.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst.

[65] First shipment under TIR convention reaches India from Afghanistan via Iran's Chabahar port. (2019, March 13). ANI. Retrieved from https://www.aninews.in

[66] https://infra.economictimes.indiatimes.com/news/ports-shipping/first-inter-modal-digital-tir-based-transport-from-india-to-iran-flagged-off/94039345

Indian exports more competitive in the global marketplace. Furthermore, the TIR convention fosters regional integration. India's participation in the convention strengthens its trade ties with neighbouring countries, particularly those in South Asia. This paves the way for increased trade flows within the region and positions India as a key player in overland trade routes. Overall, India's decision to join the TIR Convention has been a strategic move that is contributing to the country's economic growth. By streamlining customs procedures, reducing costs, and promoting regional integration, TIR is helping India achieve its trade goals and integrate more seamlessly into the global trading system.

In 2015, Pakistan deposited its instruments of accession to the TIR convention and the convention entered into force for the country in 2016.[67] Leveraging its advantageous geographical position, Pakistan has the opportunity to engage with landlocked Central Asian Republics (CARs) such as Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan, situated in the northern region. This allows these countries to facilitate trade through Pakistani ports. The TIR convention permits Pakistani trucks to carry goods to Central Asian nations without being checked by Afghanistan at the Pak-Afghan border, ensuring a smooth and uninterrupted flow of trucks. Pakistan Customs processed its first-ever TIR consignment from Karachi at Torkham, destined for Tashkent via Afghanistan in 2021. The consignment, consisting of herbal medicines, crossed into Afghanistan after completing all Customs formalities at Torkham.[68]

Despite the potential benefits, Pakistan's journey with TIR has faced challenges. The Federal Board of Revenue (FBR) notified rules for TIR implementation in October 2017, causing a delay of several months since ratification.[69] Even after the rules were notified in 2017, operational challenges might have persisted. These could involve integrating the TIR system with existing customs processes, ensuring proper communication between border checkpoints, and training personnel on the specificities of the TIR system. However, there are positive signs. The International Chamber of Commerce's Pakistan National Committee has been a strong advocate for TIR, highlighting its advantages.[70] Additionally, with neighbouring countries like Afghanistan and China now active TIR members, the pressure to fully embrace the system is likely to grow. A streamlined transit system like TIR could unlock this potential, allowing Pakistan to become a link in global trade routes. Businesses would benefit from faster and more cost-effective movement of goods, boosting Pakistan's trade competitiveness. Continued efforts to address challenges and leverage its strategic location could enable Pakistan to emerge as a key player in the TIR system, ushering in a new era of efficient and cost-effective trade.

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[67] Accession of Pakistan to the TIR Convention, 1975. (n.d.). Retrieved from https://unece.org/accession-pakistan-tir-convention-1975

[68] Zeb Khan, M. (2021, May 1). First shipment under TIR convention for Uzbekistan leaves. DAWN.COM TODAY'S PAPER. Retrieved from https://www.dawn.com

[69] https://iccpakistan.com.pk/wp-content/uploads/2021/10/TIR-Rules-with-amendments-SRO-1066-1-2017-and-SRO-1433-1-2020.pdf

[70] https://iccpakistan.com.pk/

In August 2023, Pakistan and China launched an international road transport trade route under the TIR Convention.[71] This marked a significant step in boosting bilateral trade between the two countries. The trade route starts from China's inland city of Kashgar and extends to the Pakistani capital city of Islamabad. The first convoy of five trucks departed from Kashgar after an inaugural ceremony attended by Chinese and Pakistani officials. This event underscores the cooperation and commitment of both nations to strengthen trade ties. To facilitate this new trade route, the National Logistics Corporation of Pakistan, and China Electric Vehicle Association (CEVA) Logistics of China have signed an agreement under the TIR convention. This agreement aims to reduce additional customs expenses during cross-border transportation, making trade more efficient and cost-effective. In 2022, the trade volume between China and Pakistan stood at $12.06 billion, reflecting the robust economic relationship between the two countries. The launch of this inaugural TIR trade route is a historic achievement, marking the first such route between China and Pakistan. It highlights a fresh mode of cross-border transport for Xinjiang and sets a potential precedent for future trade routes within the China-Pakistan Economic Corridor (CPEC). This development signifies enhanced connectivity and economic cooperation between the two nations, paving the way for further growth and collaboration in the region.

In 2016, China became the 70th country to ratify the TIR convention, signifying a significant step forward. This accession presents China with new and more efficient transportation opportunities and routes, potentially aligning with the objectives of the Belt and Road Initiative, a key component of China's strategic vision.[72] China's accession creates faster transport opportunities between China and Europe, potentially having a significant impact on international trade. In September 2018, China and Kazakhstan inaugurated a new border crossing at Khorgos, with the goal of enhancing transportation and trade along an 8,445 km expressway that connects western China to western Europe. In that same year, the first TIR truck journey from China to Europe successfully reached Poland in a record time of 13 days.[73]

Cross-border transport between China and countries along the Belt and Road corridor has surged since the commencement of the TIR, establishing a fourth logistics channel in addition to the existing sea, air, and rail routes. Industry estimates indicate that road transport is five to ten times less expensive than air transport while being equally fast. Additionally, TIR transport from China to Europe can reduce delivery times by at least ten days compared to rail transport.[74] It is estimated that utilising TIR will enable China and countries along the Belt & Road route, especially those in

[71] First international road transport trade route between Pakistan-China launched. (2023, August 23). Daily Pakistan. Retrieved from https://en.dailypakistan.com.pk

[72] Can, Y. (2016, July 28). China's accession to TIR to boost "Belt and Road" projects. Retrieved from http://en.people.cn/n3/2016/0728/c90000-9092392.html

[73] First China to Europe TIR truck secures trade flow in record time. (2018, November 27). Retrieved from https://www.iru.org/news-resources/newsroom/first-china-europe-tir-truck-secures-trade-flow-record-time

[74] https://www.iru.org/news-resources/newsroom/china-pushes-ahead-tir-implementation

Eurasia, to reduce transport time by up to 80 per cent and cut international road transport costs by 30 per cent.[75]

After COVID-19 disruptions, China's TIR system bounced back in early 2023.[76] The year saw a significant expansion with over 15 new routes opening up, connecting China to countries like Afghanistan, Central Asia, Mongolia, and Pakistan. This widens trade options across the region. Successful journeys along key routes like the China-Kyrgyzstan-Uzbekistan route and the China-Pakistan Economic Corridor (CPEC) corridor have boosted regional connection and economic growth. To further ease trade, eleven new customs checkpoints have been established, mostly in inland logistics centres. These centres offer companies smoother border crossings, secure deliveries, and other advantages. The year 2023 marked a milestone with the first-ever complete TIR operation by a Chinese company. With growing confidence in international trucking and the TIR system, the number of Chinese TIR hauliers doubled this year.

The TIR Convention demonstrates its potential to significantly impact trade dynamics across regions. Despite initial challenges faced by some nations in implementing the convention, its benefits are becoming increasingly evident. Streamlined customs procedures, reduced costs, and enhanced regional integration are common themes among the countries involved. As trade routes expand and operational efficiency improves, the TIR system holds promise for fostering greater connectivity and economic growth on a global scale. Continued efforts to address challenges and enhance cooperation among member states will be essential in maximising the benefits of the convention for all involved parties.

5.6 Electronic Cargo Tracking System (ECTS)

An Electronic Cargo Tracking System (ECTS) is a web-based technological solution designed to monitor and track the movement of cargo and shipments during transportation.[77] This system employs electronic devices and communication technologies within the cargo to provide real-time information about the location, status, and condition of cargo in transit. Under the ECTS, Prior to commencing a journey, the cargo container is electronically sealed and secured so that the electronic seal can be connected to the ECTS platform, providing users with complete visibility throughout the transportation phase of the supply chain. Users can monitor the real-time location of their cargo and receive alerts for any tampering or deviations in the route during transportation. Upon reaching the designated destination for the trip, authorised personnel can remove the electronic seal.

The Electronic Cargo Tracking System encompasses several benefits.

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[75] https://www.iru.org/zh/system/files?file=uibe-report-final-en.pdf
[76] https://www.iru.org/news-resources/newsroom/new-horizons-10-tir-system-developments-2023
[77] https://www.trademarkafrica.com/project/electronic-cargo-tracking-system-ects/#:~:text=The%20Electronic%20Cargo%20Tracking%20System,transit%20cargo%20under%20Customs%20control.

- ✓ Real-time Tracking: Leveraging Global Positioning System (GPS) or General Pocket Radio Service (GPRS) or Radio Frequency Identification (RFID) technology, ECTS precisely locates cargo throughout its journey, empowering stakeholders—such as customs authorities, shippers, and consignees—to monitor progress and anticipate potential delays.
- ✓ Enhanced Security: Some ECTS implementations integrate an electromagnetic lock with the tracking system, ensuring the physical security of cargo containers. This feature prevents unauthorised access and provides tamper alerts, enhancing overall security.
- ✓ Improved Efficiency: ECTS streamlines customs clearance processes by electronically managing documentation and enabling real-time monitoring. This reduces paperwork, expedites approvals, and minimises delays at borders.

Table 5.1 shows how the Electronic Cargo Tracking System functions. The functionality of an Electronic Cargo Tracking System (ECTS) varies based on its design and the technology it employs. Generally, the process begins with the installation of tracking devices, such as GPS trackers or RFID tags, on cargo containers, vehicles, or packages. These devices are equipped with sensors to collect data on various parameters, including location, temperature, humidity, and sometimes even shock or vibration. This ensures that comprehensive data about the cargo's condition is continuously gathered.

Table 5. 1: How the Electronic Cargo Tracking System (ECTS) works

Stage	Description	Technology Used
Installation	Tracking devices are installed on cargo.	GPS trackers, RFID tags
Data Transmission	Devices send data wirelessly.	Cellular networks, Satellite communication, RFID
Data Processing	Received data is processed and stored.	Central Monitoring System
Real-time Monitoring	Authorised users track cargo movement and status.	User Interface, Dashboard, Mobile App
Alerts & Notifications	System sends alerts for pre-defined events.	User-configured alerts
Data Analysis & Reporting	System generates reports on key metrics.	Key performance indicators (KPIs), Trend analysis

Source: RAPID's presentation.

Once the data is collected, it is transmitted wirelessly using various communication technologies like cellular networks, satellite communication, or Radio Frequency Identification (RFID). The transmission can be set to occur at predefined intervals or be event-driven, triggered by specific occurrences such as movement or changes in condition. This flexibility in data transmission ensures that stakeholders receive timely updates on the cargo status.

The data collected by the tracking devices is then sent to a central monitoring system or platform. This system processes the incoming data and makes it accessible to authorised users through a user

interface, dashboard, or mobile application. This allows for real-time monitoring, where stakeholders such as shippers, carriers, and logistics managers can track the movement and status of the cargo. They can view the current location, route history, estimated time of arrival, and any deviations from the planned route, ensuring they have up-to-date information at all times.

Additionally, the tracking system can be configured to send alerts and notifications to stakeholders in the event of predefined occurrences. For example, if the cargo deviates from its planned route, experiences temperature fluctuations beyond acceptable limits, or if there are attempts at tampering or theft, the system can promptly alert the relevant users. This feature enhances the security and reliability of the cargo transport process.

Finally, an ECTS often includes data analysis and reporting features. It can generate reports on key performance indicators (KPIs) such as transit times, delivery accuracy, and compliance with regulatory requirements. These insights help stakeholders identify trends, optimise logistics processes, and make informed decisions to improve supply chain efficiency. Overall, an Electronic Cargo Tracking System provides end-to-end visibility and control over the movement of goods throughout the supply chain, enhancing security, efficiency, and transparency in logistics operations.

5.7 Regional Electronic Cargo Tracking System (RECTS) in African Countries

The Regional Electronic Cargo Tracking System (RECTS) is an information technology platform designed to facilitate the electronic tracking of transit goods for the revenue authorities of Kenya, Uganda, Rwanda, and the Democratic Republic of the Congo.[78] The initiative commenced in Uganda in 2014, extending to Kenya and Rwanda in the same year. Subsequently, in 2019, it was successfully expanded to include the Democratic Republic of Congo. This expansion empowered all four customs authorities to seamlessly monitor the movement of sensitive transits across the Northern Corridor on a unified platform. The unified platform allows partner states to have a single watch and an overview of cargo through its journey.

In RECTS, one type of seal is used by all partner states. The trucks are equipped with electronic seals provided by RECTS, rendering them visible in real-time at the Centralised Monitoring Centre (CMC). Security alerts triggered by the electronic seals are promptly addressed at the CMC. Once activated, the seals ensure continuous monitoring of the goods until they reach their destination through collaboration with partner states. Every event related to the cargo is meticulously recorded and reported in real-time, with each incident time-stamped, aided by GPS or GPRS for accurate location tracking. Any breach, such as deviating from the predefined route or tampering with the seal, is swiftly detected and reported to the Central Monitoring Centre (CMC), triggering alerts via both email and SMS to predefined individuals. The rapid response unit (RRU), strategically stationed, responds to alerts as directed by the CMC. This advancement empowers customs officials to electronically

[78] https://www.digitalizetrade.org/projects/regional-electronic-cargo-tracking-system

oversee their cargo even before its arrival, enhancing their ability to strategically plan customs interventions.

Transit time has been reduced by more than 50 per cent with the electronic monitoring system.[79] To bolster the system, various advanced technologies are anticipated to be implemented. For instance, "smart gates" will enable truck drivers to use barcode scanners, which will recognise the truck and its cargo, and then direct the driver to the correct pickup location. Additionally, CCTV cameras will be installed at Customs stations to increase transparency and curb corruption. Moreover, trucks carrying petroleum products will be equipped with sensors to provide data on the volume of the product and verify the integrity of the cargo.

The Regional Electronic Cargo Tracking System (RECTS) offers several significant benefits, each contributing to a more efficient, secure, and optimised logistics and transportation network. Such as:

Reduced time: RECTS significantly reduces the time required for cargo transit by streamlining various processes.

- ✓ Faster Customs Clearance: Electronic tracking allows customs authorities to pre-clear cargo, reducing the time spent at border checkpoints.
- ✓ Minimised Delays: Real-time updates help in identifying and addressing potential delays immediately, ensuring that cargo moves swiftly through its journey.
- ✓ Efficient Route Planning: The system provides data that helps in optimising routes, avoiding congested or problematic areas, thus cutting down travel time.

Real-Time monitoring of transit cargo: The system provides real-time visibility of cargo movements.

- ✓ Tracking and Alerts: Cargo can be tracked throughout its journey, with alerts for any deviations from the planned route or unexpected stops.
- ✓ Proactive Issue Resolution: Real-time data enables quick response to issues such as delays, theft attempts, or route deviations.
- ✓ Transparency: All stakeholders, including shippers, consignees, and customs officials, can monitor the status of the cargo, ensuring transparency and accountability.

Safe and Secure Arrival of Goods: Ensuring the safety and security of cargo is a critical benefit.

- ✓ Theft Prevention: Continuous tracking deters theft and allows for a quick recovery if an incident occurs.
- ✓ Tampering Alerts: Any attempt to tamper with the cargo can be detected and reported immediately.
- ✓ Insurance Benefits: Enhanced security measures can lower insurance premiums, as the risk of loss or damage is minimised.

[79] Dongo, D., Rono, L., & Nuwagaba, D. (2020). Exploring the impact of the Regional Electronic Cargo Tracking System on the key stakeholders in the East Africa community along the Northern Corridor. ATCR Publishing, Vol. 1, (No. 3), 5. Retrieved from https://atcr.kra.go.ke/index.php/atcr/article/view/60/1

Better coordination and cooperation: RECTS fosters improved coordination and cooperation among all parties involved in the cargo movement.

- ✓ Stakeholder Integration: Shippers, carriers, customs, and consignees can work together more effectively with shared access to tracking information.
- ✓ Unified Platform: A single platform for all stakeholders reduces misunderstandings and miscommunications.
- ✓ Collaborative Problem Solving: Shared data allows for collaborative approaches to addressing any issues that arise during transit.

Information sharing: The system enhances the sharing of vital information.

- ✓ Data Transparency: Open access to tracking data helps in building trust among stakeholders.
- ✓ Regulatory Compliance: Easier compliance with regulations through accurate and timely data sharing with authorities.
- ✓ Market Insights: Aggregated data can be analysed to gain insights into market trends and improve business strategies.

Resource optimisation and capacity building: Effective use of resources and capacity building are key advantages.

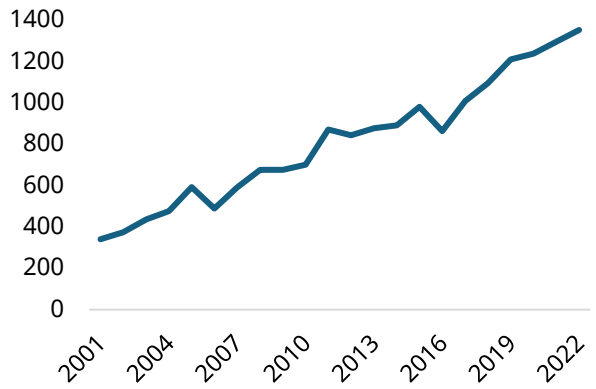
- ✓ Efficient Resource Utilisation: Better planning and real-time tracking help in utilising vehicles and other resources more efficiently.
- ✓ Training and Development: Access to advanced technology and data can drive capacity-building initiatives, improving skills and knowledge among staff.
- ✓ Cost Savings: Optimised resource use leads to significant cost reductions in terms of fuel, labour, and overall operational expenses.

The implementation of a Regional Electronic Cargo Tracking System brings about numerous benefits that enhance the efficiency, security, and effectiveness of cargo transportation. By leveraging real-time data and fostering better collaboration, and resource utilisation, RECTS not only streamlines operations but also builds a more resilient and responsive logistics infrastructure.

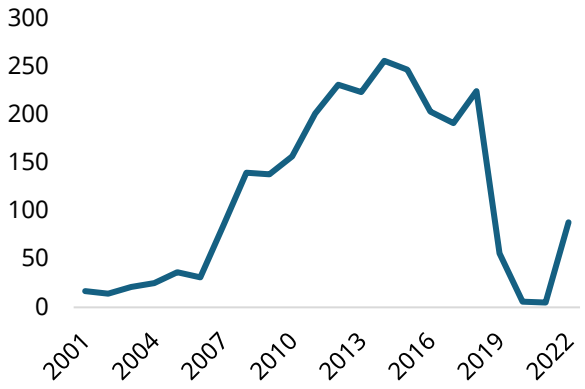
Trade between the users of the Regional Electronic Cargo Tracking System (RECTS) is shown in figure 5.4. The implementation of the Regional Electronic Cargo Tracking System (RECTS) in Uganda, Kenya, and Congo, starting in 2014 and extending to Congo in 2019, has likely played a significant role in shaping the observed trade dynamics in the region. The steady growth in trade volumes between Uganda and Kenya could partly be attributed to the improved efficiency and security provided by RECTS, facilitating smoother cross-border trade operations and reducing transit times. This enhanced trade facilitation mechanism may have also contributed to the increasing trade flows between Rwanda and its neighbouring countries, including Congo, by streamlining customs processes and minimising transit-related delays. The anomalies in trade data, such as the abrupt declines in Uganda's trade with Rwanda in recent years, could potentially be linked to political tensions and economic factors. Nonetheless, the overall trends suggest that RECTS has played a pivotal role in fostering regional economic integration and trade expansion, underscoring the importance of continued investment in such collaborative initiatives to sustain and amplify the positive impacts on regional trade relationships.

Figure 5. 4: Trade between the users of the Regional Electronic Cargo Tracking System (RECTS)

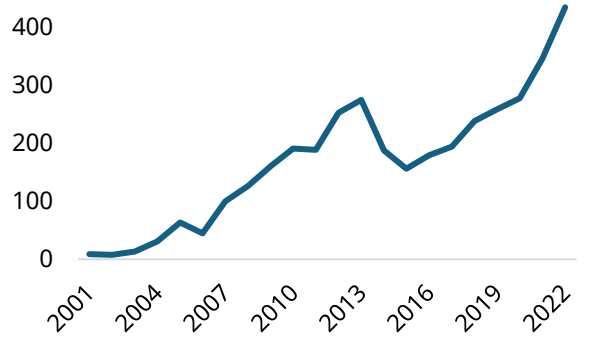
(a) Trade between Uganda and Kenya (million $)



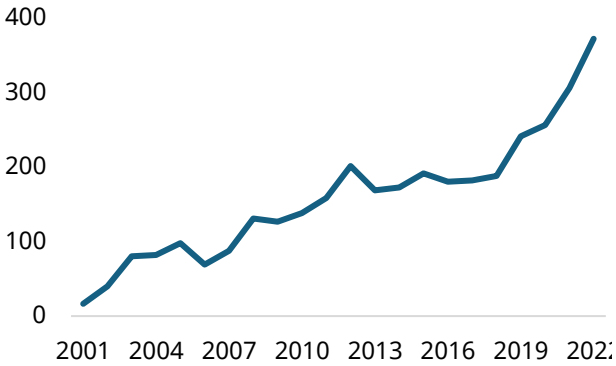
(b) Trade between Uganda and Rwanda (million $)



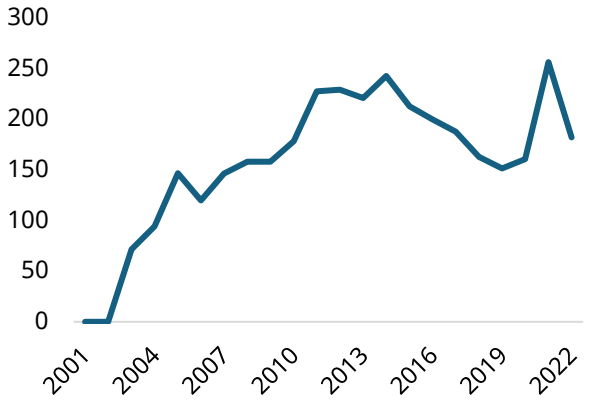
(c) Trade between Uganda and the Democratic Republic of Congo (million $)



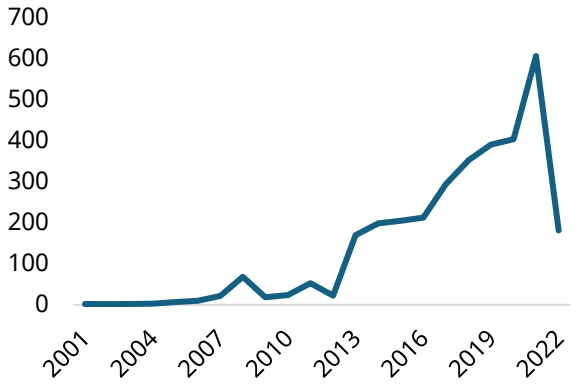
(d) Trade between Kenya and Rwanda (million $)



(e) Trade between Kenya and the Democratic Republic of Congo (million $)



(f) Trade between Rwanda and the Democratic Republic of Congo (million $)



Source: ITC Trademap.

5.8 Differences between the TIR convention and the Electronic Cargo Tracking System (ECTS)

The TIR Convention and the Electronic Cargo Tracking System (ECTS) are both initiatives aimed at improving international trade, but they target different aspects of the process. The TIR Convention is a long-standing international agreement that facilitates the movement of goods across borders. It allows for the duty-free and quota-free transit of goods between countries that have signed the convention. This is achieved through a system of TIR carnets, which act as a guarantee for customs duties and taxes. The TIR Convention helps to streamline border procedures, reducing delays and costs for businesses. On the other hand, the ECTS is a technological solution that focuses on tracking and monitoring cargo movement. It utilises electronic seals and GPS tracking to provide real-time information on the location and status of cargo. This can help improve security by deterring theft and pilferage, as well as expedite customs clearance by providing greater transparency. In essence, the TIR Convention deals with the administrative and financial aspects of international transit, while the ECTS is a technological tool that enhances security and efficiency within the supply chain. They can be seen as complementary measures, working together to create a smoother and more secure environment for international trade.

Table 5. 2: Differences between the TIR convention and the Electronic Cargo Tracking System (ECTS)

TIR Convention	Electronic Cargo Tracking System (ECTS)
Objective: To simplify cross-border trade, reduce transit time, and enhance customs cooperation.	**Objective:** To prevent smuggling, theft, and unauthorised diversions of goods, as well as to improve overall supply chain security.
Purpose: The TIR Convention facilitates the international transport of goods under customs control.	**Purpose:** The ECTS is designed to enhance the monitoring and security of transit goods during their journey across borders.
Authority: United Nations Economic Commission for Europe (UNECE).	**Authority:** Individual governments or regional trade bodies.
Coverage: The TIR system operates globally, covering multiple countries that are parties to the convention.	**Coverage:** ECTS is implemented at specific border crossings or along designated transport corridors.
Functionality: • **It allows goods to move across borders without immediate payment of duties and taxes.** • **Goods are covered by a TIR Carnet (customs transit document) that ensures their secure transit.** • **Customs duties and taxes are settled at the destination customs office.**	**Functionality:** • It involves the use of electronic tracking devices (such as GPS or RFID) attached to cargo containers or vehicles. • These devices provide real-time information on the location, movement, and condition of goods. • Customs authorities and transport operators can track cargo remotely, ensuring compliance with transit regulations.

Payment of Duties and Taxes: TIR ensures deferred payment of duties and taxes, streamlining international transit procedures and facilitating smoother cross-border trade.	**Payment of Duties and Taxes:** ECTS does not address the payment of customs duties and taxes. Instead, it focuses on monitoring and security.
Benefits: Faster border crossings, lower costs, and increased security for international trade.	**Benefits:** Enhanced security, reduced smuggling, improved visibility for businesses, and potentially faster customs clearance.

Source: RAPID's presentation.

5.9 Current status of Bangladesh in the TIR Convention

Bangladesh currently is not a part of the TIR Convention, a global system that simplifies customs procedures for international goods transport. Bangladesh has the opportunity to significantly boost trade and regional economic integration by joining the TIR Convention, a global system that simplifies customs procedures for international goods transport. Inclusion in the TIR Convention would reap significant benefits for Bangladesh. An agreement known as the Bangladesh, Bhutan, India, and Nepal Motor Vehicles Agreement (BBIN MVA) was signed in 2015 by Bangladesh, Bhutan, India, and Nepal.[80] This agreement aims to streamline the movement of vehicles and people across these South Asian nations. The TIR system could significantly complement the BBIN MVA by reducing border delays and costs. According to a World Bank (WB) report on transport integration in eastern South Asia, establishing seamless transport connectivity between Bangladesh and India could lead to a remarkable increase of up to 17 per cent in Bangladesh's national income and 8 per cent in India's national income.[81] TIR, as the only global transit solution, could significantly improve this situation. Including Bangladesh in the TIR Convention is seen as a key step to not only boost trade with India but also facilitate wider regional trade benefits.

5.10 Findings from the field survey

The facilitation of international trade through streamlined customs procedures is essential for economic growth and development. In this context, the TIR Convention and the Electronic Cargo Tracking System (ECTS) play pivotal roles in facilitating cross-border trade. However, awareness about these mechanisms among stakeholders in Bangladesh appears to be limited. This study aims to assess stakeholders' knowledge, perceptions, and suggestions regarding the TIR Convention and ECTS, with the objective of understanding their potential impact on Bangladesh's trade landscape.

The field survey revealed a lack of awareness among stakeholders in Bangladesh regarding the TIR Convention and the ECTS. Most respondents, except a few government officials, have little to no knowledge about these mechanisms. However, upon being informed about the benefits and

[80] http://bangladeshcustoms.gov.bd/download/BBIN-Motor-Vehicle-Agreement.pdf

[81] https://www.worldbank.org/en/news/press-release/2021/03/09/seamless-transport-connectivity-can-create-major-economic-gains-for-bangladesh-and-india

functioning of the TIR Convention and the ECTS, stakeholders expressed keen interest and recognised their potential significance for Bangladesh's trade sector.

Many respondents highlighted the need for Bangladesh to become a party to these conventions, emphasising the benefits they could bring in terms of facilitating smoother cross-border movements, reducing transit times, and cutting down on transportation costs. Additionally, stakeholders noted that accession to these conventions could enhance Bangladesh's attractiveness as a trading partner, fostering increased international trade partnerships and economic growth.

The positive response from stakeholders upon learning about these mechanisms indicates a significant opportunity for enhancing trade facilitation in the country. By leveraging the advantages offered by these international trade facilitation mechanisms, Bangladesh can unlock new opportunities for economic prosperity and sustainable development.

5.11 Synthesising the findings from the desk research and the field

The findings from the field survey provide support for the insights gathered from the literature review on the TIR Convention and the Electronic Cargo Tracking System (ECTS). Both sources emphasise the critical role these mechanisms play in facilitating international trade by simplifying customs procedures and enhancing the efficiency of cross-border movements.

The literature review highlights the TIR Convention's ability to streamline customs clearance through the use of the TIR carnet and tamper-evident seals, which significantly reduce delays and costs. It underscores the convention's benefits, such as faster border crossings, lower transportation costs, and enhanced security for goods in transit. Real-world examples from countries like India, Pakistan, and China illustrate the tangible improvements in trade efficiency and economic integration resulting from the TIR system. Similarly, the potential advantages for Bangladesh, if it joins the convention, are noted, suggesting that it could significantly boost the country's trade prospects by complementing existing regional agreements like the BBIN MVA.

The field survey findings reflect these benefits, as seen through the perceptions of stakeholders in Bangladesh. Despite the current limited awareness about the TIR Convention among Bangladeshi stakeholders, the survey reveals a strong interest and recognition of its potential once the stakeholders are informed. This indicates a clear alignment between the literature's emphasis on the convention's advantages and the stakeholders' positive response upon learning about it. The stakeholders' feedback underscores the need for Bangladesh to accede to the TIR Convention to facilitate smoother cross-border movements, reduce transit times, and cut transportation costs, ultimately enhancing the country's appeal as a trading partner.

Similarly, the literature review on the ECTS showcases its role in providing real-time cargo tracking, enhancing security, and streamlining customs clearance. The successful implementation of the Regional Electronic Cargo Tracking System (RECTS) in East Africa is highlighted as a case study demonstrating reduced transit times, improved cargo security, and increased regional trade. The

literature suggests that adopting a similar system could benefit Bangladesh by standardising procedures and simplifying cross-border trade, thus attracting more trading partners.

The field survey supports these findings by showing that Bangladeshi stakeholders, once informed about the ECTS, express a keen interest in its potential benefits. The survey indicates that stakeholders believe that implementing ECTS could significantly enhance trade efficiency and security, mirroring the improvements seen in regions where such systems are already in place. The stakeholders' positive reactions suggest a readiness to embrace technological advancements in trade facilitation, aligning with the literature's depiction of ECTS as a transformative tool for economic integration and trade efficiency.

The alignment between the literature review and field survey underscores the potential for Bangladesh to unlock significant economic opportunities by adopting these international trade facilitation mechanisms.

Chapter 6: Analysis of Policies and Regulatory Measures

6.0 Policy and regulatory measures analysis

The government of Bangladesh has been actively engaged in developing and implementing a comprehensive cargo tracking system. This initiative is highlighted in various national policy documents, underscoring its importance for improving logistics, enhancing security, and streamlining transportation management. Despite the existence of numerous regulations and guidelines designed to facilitate this system, several significant changes need to be made to foster the implementation of the vehicle and cargo tracking system.

Electronic Seal and Lock Rules 2024: The National Board of Revenue's (NBR) Electronic Seal and Lock Rules 2024 are a promising step towards a more secure and efficient trade environment in Bangladesh. These electronic devices aim to prevent cargo theft and tampering during transport, potentially leading to fewer losses and faster customs clearances. However, previous attempts faced challenges due to the high fee structure which was not accepted by the traders. The rules aim to address these concerns with a focus on transparency and potentially lower costs compared to the earlier iteration. While the final service charges and implementation details remain to be seen, the Electronic Seal and Lock Rules 2024 have the potential to positively affect Bangladesh's trade sector.

The National Board of Revenue (NBR) is the central authority for the selection and appointment of service providers under the Electronic Seal and Lock Rules 2024. This process follows the Public Procurement Act and Rules, with potential regional variations in appointments. Service providers are appointed for a term of five years, with an option for a one-year extension if justified. Before full-scale operation, trial runs are mandatory. Providers are required to submit a performance security of 5 crore taka through a bank guarantee, which must remain valid for 90 days after the contract ends.

The rules outline detailed service procedures: service recipients must pay the set fees, and sealing and locking must occur in the presence of relevant parties, with provisions for handling various logistical scenarios. Service providers have specific responsibilities, including tax payments, ensuring the functionality of devices, real-time monitoring, training, data security, and compliance with customs requirements. They must submit quarterly activity statements and are subject to inspection and audit by committees, with possible disciplinary actions for discrepancies. Contracts can be terminated for serious irregularities.

Service recipients must adhere to instructions for using electronic seals and locks and ensure the security of goods during transit. Customs officers and agencies are tasked with monitoring the sealing process, reporting any issues, and taking corrective measures. A Rapid Response Team (RRU) will address reports of misuse or damage, while a Central Monitoring Center will oversee real-time tracking. Law enforcement assistance may be sought to secure transportation. Service fees will be set by the Board, and violations will be addressed according to applicable laws. The 2024 rules supersede the previous 2018 regulations, although actions taken under the old rules remain in effect.

To ensure the successful implementation of the Electronic Seal and Lock Rules 2024, the NBR must adopt stringent regulations that clearly define compliance requirements and enforcement protocols. Transparent pricing structures are essential to address previous concerns from trade bodies and to ensure that all stakeholders understand and accept the costs involved. Robust quality control mechanisms must be established to guarantee the reliability and effectiveness of the electronic seals and locks, preventing tampering and theft effectively.

Additionally, fostering collaboration with stakeholders, including exporters, importers, and service providers, is essential. This collaboration will facilitate the smooth integration of the new system into existing logistics and supply chains. Engaging with these stakeholders early and often will help address any concerns and incorporate valuable feedback, ensuring that the system is practical and widely accepted.

By combining these elements—stringent regulations, transparent pricing, robust quality control, and collaborative engagement—the NBR can create a secure, efficient, and trusted cargo tracking system that enhances overall supply chain integrity and revenue collection.

National Logistics Development Policy (NLDP) 2024: Bangladesh recently unveiled its first National Logistics Development Policy (NLDP) in 2024. This policy aims to transform the country's logistics sector by establishing a world-class system that's efficient, cost-effective, and environmentally friendly. It focuses on leveraging technology to streamline operations and improve connectivity across all transportation modes. The policy also emphasises infrastructure development, including logistics hubs, economic zones, and improved ports. By addressing these areas, Bangladesh hopes to reduce delays and costs throughout the supply chain, ultimately boosting trade and investment.

The Bangladesh National Logistics Development Policy (NLDP) recognises the value of vehicle and cargo tracking systems for improving efficiency and transparency. A key objective of this policy is to develop an integrated logistics infrastructure that leverages artificial intelligence, machine learning, and advanced information technology to achieve digitised logistics management with world-class tracking and tracing capabilities. Real-time tracking and tracing provide substantial advantages for cross-border trade, creating valuable opportunities for both domestic and international businesses. Moreover, the policy's objective of interconnecting digital systems across ministries, departments, and organisations is a notable strength, as it facilitates seamless data exchange and collaboration, thereby promoting overall efficiency in logistics operations.

The successful implementation of vehicle tracking systems requires a robust infrastructure, including extensive Global Positioning System (GPS) coverage and dependable communication networks. The costs associated with the setup and maintenance of such systems can be prohibitive, especially for smaller logistics operators. Additionally, there is a challenge in balancing effective data collection for tracking purposes with the protection of privacy rights. Ensuring the security of data against cyber threats is essential for maintaining the integrity of the vehicle tracking system.

However, the NLDP 2024 lacks specific details on implementation of the vehicle and cargo tracing system. To address this gap, a dedicated chapter outlining essential steps is recommended. This chapter would detail the importance of tracking, explore technology options and data standardisation, and suggest best practices for real-time monitoring and data management. Including such a roadmap would provide clarity, encourage adoption by logistics companies, and ensure the policy remains relevant with future advancements in tracking technology.

Bangladesh Telecommunication Regulatory Commission (BTRC): The Bangladesh Telecommunication Regulatory Commission (BTRC) provides general guidance on the licensing process for vehicle tracking services. This guidance is essential for setting a regulatory framework and ensuring that service providers comply with national standards. However, the provided guidelines lack specific details on how Bangladesh can effectively oversee and manage vehicle tracking systems, especially concerning cargo and vehicles. By addressing these areas with detailed and explicit guidelines, BTRC can enhance the effectiveness of vehicle and cargo tracking systems in Bangladesh. This will not only improve logistics and transportation management but also bolster security and regulatory compliance across the sector.

The objectives of the BTRC guidelines on vehicle tracking services are designed to align with the government's ambition of modernising telecommunication services in Bangladesh, specifically through the implementation of a Vehicle Tracking System to enhance the transport sector. These guidelines provide a comprehensive summary of the licensing and regulatory framework for individuals or entities seeking to acquire a license or permission to operate vehicle tracking services. According to these guidelines, the Vehicle Tracking License or permission allows operators to establish, manage, and maintain Vehicle Tracking Services within Bangladesh. Offering such services without a valid license or permission from the Commission is prohibited. Initially, licenses or permissions are valid for five years and may be renewed for additional five-year terms, subject to the Commission's approval. Violations of any laws or conditions associated with the license can result in prosecution under relevant legal provisions (BTRC, 2009).

While BTRC’s general guidance establishes the foundational requirements for obtaining licenses to operate vehicle tracking services, it does not delve into the operational specifics needed for robust oversight and management. Key aspects such as real-time monitoring, data collection protocols, enforcement mechanisms, and integration with other national transportation systems are not comprehensively addressed

Bangladesh, Bhutan, India, Nepal (BBIN) Motor Vehicle Agreement (MVA): The BBIN MVA aims to govern the movement of passenger, personal, and cargo vehicles among the four member countries, was initially signed on June 15, 2015, in Thimphu, Bhutan.[82] It is a sub-regional initiative designed to enhance connectivity and economic collaboration among Bangladesh, Bhutan, India, and Nepal. This agreement focuses on eliminating obstacles and simplifying procedures, thereby promoting trade, tourism, and cultural exchange between the member countries.

[82] https://www.sasec.asia/index.php?page=news&nid=1557&url=bbin-meet-dhaka-2024

The BBIN MVA includes several salient features aimed at improving regional connectivity and facilitating smoother cross-border transportation, including:

- ✓ ***Streamlined cross-border movement:*** The agreement establishes a standardised procedure for issuing permits, aligns customs processes, and mutually recognises driving licenses, facilitating easier vehicle crossings.
- ✓ ***Boosted trade and economic collaboration:*** By cutting down transit times and transportation costs, the BBIN MVA is designed to enhance both bilateral and multilateral trade opportunities, thereby promoting regional economic growth.
- ✓ ***Encouragement of tourism and cultural exchange:*** Enhanced connectivity is anticipated to promote tourism and cultural exchange among the member countries, leading to a deeper appreciation of each other's traditions and heritage.
- ✓ ***Focus on environmental protection and road safety:*** The BBIN MVA prioritises environmental protection and road safety standards, advocating for sustainable transportation practices and safer travel for all.

Although Bangladesh, Bhutan, and India have ratified the agreement, Bhutan remains an observer. However, Bhutan is actively contemplating rejoining the BBIN MVA process soon.[83] The BBIN Motor Vehicles Agreement would eliminate the need for cargo transshipment at international borders between the countries, allowing vehicles from each nation to travel continuously through designated corridors.[84] Besides, the BBIN MVA underscores the importance of robust cargo tracking systems as a central element of its cross-border trade facilitation efforts. This initiative is designed to enhance the efficiency of trade processes, minimise transit times, and bolster transparency across the region.

A key feature of the BBIN's cargo tracking approach is the integration of Electronic Cargo Tracking Systems (ECTS). These systems enable real-time monitoring of goods in transit, allowing stakeholders to track their cargo's journey with precision. This real-time tracking is essential for maintaining the flow of goods and addressing any potential disruptions promptly.

The emphasis on cargo tracking also serves to enhance transparency and accountability in the trade process. By offering visibility into the movement of goods, these systems help to mitigate delays, reduce the likelihood of losses or irregularities, and ensure a more accountable trading environment. Furthermore, by pinpointing bottlenecks and inefficiencies, accurate tracking allows for timely interventions, which can significantly shorten transit times.

The benefits of these cargo tracking initiatives extend beyond improved efficiency. They also contribute to enhanced security by providing up-to-date information on the location and movement of goods, thereby reducing the risks associated with theft and smuggling. Additionally, by fostering transparency and accountability, cargo tracking systems build greater trust and confidence among traders and government authorities in the region.

[83] https://www.dhakatribune.com/bangladesh/foreign-affairs/341185/bhutan-mulls-rejoining-bbin-mva
[84] https://www.business-standard.com/article/economy-policy/bbin-initiative-kolkata-dhaka-agartala-cargo-transport-trial-run-flagged-off-115110100331_1.html

Trade costs between Bangladesh, Bhutan, India, and Nepal are exceptionally high due to several factors. These include inadequate infrastructure at border crossings, cumbersome paper-based procedures, restrictive policies and regulations, and inefficient cargo handling logistics. The region's challenging geography also complicates matters, with Bhutan and Nepal being landlocked and mountainous, and India's northeastern states being connected to the mainland by just one road that traverses the narrow Siliguri Corridor, or Chicken's Neck.

Although trade between these four nations expanded, significant potential remains untapped, with trade potential still at 93 per cent for Bangladesh, 50 per cent for India, and 76 per cent for Nepal. The trade process is currently slowed down by extensive documentation and thorough customs inspections at some borders, where up to 100 per cent of goods are checked. Adopting more advanced risk management practices could significantly speed up customs clearance. According to World Bank analysis, the implementation of the BBIN MVA could reduce the travel time for a truck from Agartala in India's northeast to Kolkata port by 65 per cent and cut costs by 68 per cernt.[85] Early adoption of the BBIN MVA is expected to lead to shorter transport routes, quicker travel times, reduced costs, and a smaller carbon footprint.

In summary, the BBIN Motor Vehicles Agreement places substantial emphasis on trade, recognising their role in creating a more efficient, secure, and transparent trade environment. Through the adoption of ECTS, data sharing, and a commitment to transparency, BBIN aims to streamline cross-border trade and strengthen economic ties among its member countries.

Customs Act 2023: The Customs Act 2023 of Bangladesh is a significant piece of legislation aimed at modernising the country's customs procedures and aligning them with international best practices. The Act replaces the outdated Customs Act 1969 and introduces several key reforms (National Board of Revenue). It simplifies import and export processes, improves transparency, and enhances revenue collection. The Customs Act 2023 introduces several significant features designed to modernise and improve Bangladesh's customs framework. One of the key elements is the streamlining of procedures for import and export clearance. This aims to simplify the often time-consuming and costly processes involved in clearing goods, making trade operations more efficient. By reducing bureaucratic delays, it will help businesses lower their transaction costs and improve the overall ease of doing business.

Another important feature is the emphasis on enhanced transparency in customs operations. The Act promotes the adoption of advanced technologies to facilitate seamless information sharing between customs authorities, businesses, and other stakeholders. This digital approach is expected to reduce opportunities for corruption by making customs processes more visible and accountable, thereby fostering a fairer and more predictable trading environment.

The Act also focuses on improving revenue collection by introducing measures such as risk-based assessments. These assessments allow customs authorities to focus their resources on high-risk transactions, reducing the need for extensive checks on low-risk goods. This targeted approach not

[85] https://byjus.com/current-affairs/bangladesh-bhutain-india-nepal-bbin-initiative/

only ensures more efficient customs control but also helps minimise fraud and evasion. Additionally, the Act imposes stricter penalties for non-compliance, ensuring greater accountability and adherence to regulations.

A significant advancement under the new Act is the alignment of Bangladesh's customs procedures with international standards, particularly those outlined by the World Trade Organization's (WTO) Trade Facilitation Agreement (TFA). By integrating globally accepted best practices, the Act strengthens Bangladesh's ability to participate more effectively in international trade. This alignment helps facilitate smoother cross-border trade, attract foreign investment, and ensure that Bangladesh remains competitive in the global marketplace.

The Customs wing details the qualifications required for authorised economic operator (AEO) status, the privileges granted to approved AEOs, audit processes, penalties for violations, and additional related provisions under the Authorised Economic Operator Rules 2018. The Authorised Economic Operator (AEO) programme in Bangladesh is designed to streamline trade processes and enhance security by identifying and accrediting trusted traders. Companies that achieve AEO status are recognised for their reliability in adhering to customs regulations and maintaining secure supply chains, which contributes to the overall efficiency and safety of global trade.

To qualify for AEO status, companies must meet a set of stringent criteria, which ensures that only businesses with a strong track record of compliance and security are granted this designation. These criteria include financial solvency, ensuring that companies are financially stable and capable of handling the responsibilities associated with international trade. Customs compliance is another key requirement, as companies must demonstrate consistent adherence to customs regulations, such as timely payment of duties and accurate declaration of goods. Additionally, firms must implement robust security measures to safeguard the integrity of their supply chains, including physical security. The programme also emphasises trade facilitation, meaning companies must show they are capable of moving goods efficiently through the global trading system, with minimal delays or complications.

Being granted AEO status comes with several significant benefits that give companies a competitive edge in international trade. These advantages include prioritised customs clearance, allowing AEOs to move goods through ports more quickly, reducing time spent in customs. AEOs are also subject to reduced inspections, meaning fewer physical checks or documentation reviews, which accelerates the overall clearance process. In addition, AEOs benefit from simplified documentation requirements, reducing the administrative burden typically associated with import and export activities. Another major advantage is the lower customs bonds requirement, which reduces the financial costs linked to securing goods in transit.

The National Board of Revenue (NBR) oversees the application process, conducting thorough evaluations of businesses to ensure they meet the necessary qualifications for AEO status. Once a company is accredited, the NBR carries out regular monitoring and audits to ensure continued compliance with the program's criteria. This ongoing oversight ensures that AEOs maintain high

standards of security, customs adherence, and trade facilitation, reinforcing their status as trusted partners in the global trade network.

Regarding the cargo tracking system, while the Customs Act 2023 doesn't explicitly address cargo tracking, it creates a favorable environment for its implementation and operation. The act's emphasis on electronic record keeping, trade facilitation, revenue collection, and security aligns with the objectives of cargo tracking systems. By leveraging these provisions, customs authorities can establish efficient and effective cargo tracking mechanisms to improve the transparency, efficiency, and security of international trade in Bangladesh.

Policy guidelines for vehicle and cargo tracking system in Bangladesh: The vehicle and cargo tracking system is essential for enhancing trade development by improving the efficiency and security of cargo movement across Bangladesh. Successful implementation of this system requires comprehensive policy guidelines that clearly outline the roles and responsibilities of various authorities and stakeholders involved in its deployment and management. These guidelines should cover key aspects such as licensing, financial requirements, skill development, e-commerce integration, logistics, data intelligence, security, and legal considerations.

Licensing and certification

Bangladesh Telecommunication Regulatory Commission (BTRC) issues licenses to vehicle service providers. The authority must be tasked with ensuring that all licensed tracking systems are interoperable with national customs and border control systems, and any cross-border trade facilitation platforms and develop standardised technical specifications that all tracking service providers must comply with, ensuring seamless integration and data sharing using real-time data during cargo travel. Vehicle service providers who maintain consistent compliance with system standards will be given government-backed incentives, such as tax breaks or grants for technology upgrades. Non-compliant service providers or users of the tracking system will face fines, license suspensions, or revocation based on the severity of the breach. Repeated violations may result in a permanent ban from providing tracking services.

Finance and investment

Finance: The Ministry of Finance (MoF) will identify and secure funding sources, including government budgets, international aid, and public-private partnerships (PPPs). It will allocate funds from the national budget, designating specific amounts for the development and expansion of tracking projects, ensuring these investments align with the country's economic plans and national priorities. Besides, it will seek financial support from international development partners, donor agencies, and multilateral financial institutions. This may include grants, concessional loans, or technical assistance aimed at integrating vehicle and cargo tracking system with customs procedures to enhance cross-border trade and foster regional integration. In addition to government and international financing, the MoF will encourage private sector participation through Public-Private Partnerships (PPPs). These partnerships will allow the government to share both the financial risks and rewards of the tracking

projects with private investors. Through PPPs, the MoF can attract investment in areas such as the construction of necessary infrastructure, technological upgrades, and system operations.

Investment: The Bangladesh Investment Development Authority (BIDA) will play the role of encouraging private sector investments in the Vehicle and Cargo Tracking System by offering a range of incentives designed to attract and retain investors. BIDA may offer direct subsidies or financial grants to private companies involved in the development, installation, and operation of tracking infrastructure. These subsidies could be used to offset the costs of technology procurement, staff training, or system maintenance.

Driving license and skill development

Bangladesh Road Transport Authority (BRTA) will ensure that all vehicle operators involved in cargo transportation have valid driving licenses. This involves regular checks and inspections to ensure compliance with licensing regulations across the transport sector. BRTA will develop and roll out training programs for drivers. These programs will cover a range of topics, including how to operate vehicles equipped with tracking devices, the importance of tracking cargo securely, and the use of digital systems for real-time communication with authorities and logistics managers.

Training programmes

The Ministry of Commerce (MoC) will be responsible for the design and implementation of comprehensive training programs to ensure the effective and efficient operation of tracking system. These training initiatives will target all key stakeholders, including vehicle operators, logistics personnel, and system administrators, equipping them with the necessary knowledge and skills to handle tracking and tracing technologies and processes.

E-commerce integration

The Information and Communication Technology (ICT) division will take the lead in ensuring that the cargo tracking system is fully compatible with existing e-commerce platforms (Amazon, eBay, Alibaba) and logistics management systems used across Bangladesh. It will develop secure data exchange protocols to ensure that sensitive information, such as cargo details, shipment routes, and delivery times, is shared with e-commerce platforms without the risk of data breaches or unauthorised access. This will involve implementing encryption technologies, firewalls, and other cybersecurity measures to protect data integrity.

Logistics

The Ministry of Shipping (MoS) will integrate the tracking system with national and regional logistics networks to enhance cargo management and tracking efficiency. It will work to align the tracking system with the existing logistics infrastructure. Additionally, the MoS will address potential bottlenecks in the logistics chain, ensuring that cargo flows smoothly from origin to destination and that any issues are promptly resolved.

Data intelligence

Bangladesh Bureau of Statistics (BBS) will play a significant role in the data intelligence for the vehicle and cargo tracking system by utilising advanced data collection and analysis tools. BBS will gather comprehensive data on system performance, operational metrics, and user feedback, employing both automated and manual methods. It will analyse this data to evaluate performance, identify trends, and assess the impact of the tracking system. Insights will be presented through detailed reports and data visualisations, supporting informed decision-making and continuous system improvements.

Security and protection

Data Security: The National Cyber Security Agency (NCSA) will implement comprehensive cybersecurity measures to safeguard trakcing data from unauthorised access and potential cyber threats. This will involve deploying advanced data encryption technologies and establishing secure communication protocols to ensure that all information transmitted through the tracking system remains confidential and protected. The agency will also develop robust security frameworks and regular monitoring processes to detect and respond to any vulnerabilities or breaches, thereby maintaining the integrity and security of the data.

Physical Security: To ensure the physical security of cargo and vehicles, Bangladesh Police and the Border Guard Bangladesh (BGB) will undertake a range of protective measures. This will include surveillance operations, such as the deployment of security cameras and monitoring systems, as well as regular patrolling of transportation routes and cargo handling facilities. Additionally, these agencies will implement secure tracking mechanisms to monitor and protect cargo throughout its journey, thereby reducing the risk of theft, tampering, or other security breaches. Through these coordinated efforts, both data and physical security will be effectively maintained.

To successfully implement the vehicle and cargo tracking system in Bangladesh, it is important to address data protection, device standards, and liability guidelines. Compliance with transportation and trade regulations and robust cybersecurity measures are essential. Setting up dispute resolution mechanisms, defining sector roles, and ensuring vehicle service receiver’s protection and cross-border coordination will enhance efficiency and security, contributing to economic growth.

6.1 Challenges and constraints regarding vehicle and cargo tracking system, automated border management, and customs procedure in Bangladesh

Challenges and constraints regarding vehicle and cargo tracking system: In the rapidly evolving landscape of logistics and transportation, efficient vehicle and cargo tracking systems are indispensable for ensuring timely delivery, reducing operational costs, and enhancing overall supply chain transparency. While many countries have successfully integrated advanced tracking technologies, Bangladesh faces unique challenges and constraints that impede the full realisation of these benefits.

Implementation of NBR’s Electronic Seal and Lock Rules 2024: The National Board of Revenue's (NBR) Electronic Seal and Lock Rules hold significant promise for enhancing security and efficiency in the transportation and storage of goods. However, its successful implementation is key to realising these

benefits. NBR has made three attempts to enforce these rules, which were not successfully implemented, issuing notifications on three separate occasions to mandate the adoption of the Electronic Seal and Lock Rules before issuing the fourth notification in 2024.

High service charges: Tracking services come with associated costs that must be kept at marginal levels to avoid imposing financial burdens on businesses. If the service charges are too high, businesses may be discouraged from adopting these tracking systems. This reluctance can undermine the overall objective of improving cargo tracking and security. The implementation of the Electronic Seal and Lock Rules was unsuccessful during the issuance of prior notifications due to traders' unwillingness to accept them, primarily because of the high service charges.

Lack of awareness about the Electronic Seal and Lock Rules 2024: A significant issue that may hinder the successful implementation of NBR's Electronic Seal and Lock Rules 2024 is the widespread lack of awareness among stakeholders. Many individuals and organisations, both in the private and public sectors, are not informed about the details and requirements of these new regulations. This gap in knowledge can lead to resistance, misunderstandings, and non-compliance, ultimately obstructing the effectiveness of the initiative.

Lack of harmonisation among ministries and government agencies: The absence of coordination among ministries and government bodies poses a significant challenge. Such as the National Development Logistics Policy (NDLP) of 2024, which underscores the significance of vehicle and cargo tracking systems. However, this policy lacks the necessary specificity regarding the implementation and operationalisation of such tracking systems. This lack of alignment among various stakeholders hampers the effective execution of policies and undermines the intended outcomes.

Resistance to vehicle and cargo tracking system among business owners and cargo handlers: The reluctance of businessmen and cargo owners to adopt vehicle and cargo tracking systems stems from various factors. Initially, the implementation of the electronic seal and lock regulations faced obstacles due to pressure exerted by businessmen. Furthermore, there exists a resistance to embracing tracking devices, primarily driven by a lack of willingness to incorporate new technologies into their operations. Additionally, concerns are raised regarding the potential impact on driver availability, with some fearing that drivers may be disinclined to work with such systems due to unfamiliarity and perceived privacy issues. These factors collectively contribute to the challenge of fostering acceptance and integration of tracking technologies within the industry.

Reliance on escort services for the delivery of dutiable goods: The absence of a cargo tracking system necessitates the physical escorting of dutiable goods, a process demanding considerable labor and resources.[86] This dependency not only escalates operational costs but also introduces complexities in managing and ensuring the security of the goods throughout the journey.

[86] Escort services in the context of cargo and transportation typically refer to the practice of using security personnel or vehicles to accompany shipments, especially high-value or sensitive goods, to ensure their safety and prevent theft or loss.

Challenges and constraints regarding border management and customs procedures: Effective border management and customs procedures are vital for the facilitation of international trade, the protection of national security, and the efficient movement of goods and people. However, these processes are burdened with numerous challenges and constraints that can impede their effectiveness and efficiency. These challenges stem from a variety of sources, including technological limitations, regulatory complexities, and operational inefficiencies.

Lack of automation in port management: Manual processes dominate the handling of cargo, documentation, and customs procedures, leading to delays, increased costs, and higher susceptibility to errors and corruption. The absence of digitalisation means that the coordination among various stakeholders, including port authorities, customs officials, and logistics providers, is often inefficient and prone to miscommunication. This inefficiency not only slows down the turnaround time for cargo but also impacts the overall competitiveness of Bangladesh's ports on the global stage.

Driver-changing issue: When cargo shipments come in with their assigned drivers, local residents seize the opportunity for economic involvement in ports such as Akhaura and Bhomra land ports. There is a group of individuals at these ports who prevent the assigned driver from unloading the goods. Instead, a selected driver from this group takes the opportunity to unload the goods. As a result, the assigned driver is deprived of the payment they would have received from unloading the goods. Therefore, by swapping drivers strategically, the village workforce becomes part of the port's trading operations, reducing the port's efficiency and increasing the time needed for operations. The absence of biometric or digital authentication systems contributes to these issues.

Unavailability of one-stop border posts: One-stop border posts, essential for streamlined border operations, are currently lacking along the borders. Exporters and importers eagerly await the establishment of these facilities, which would centralise trade services and expedite cross-border transactions.

Semi-automated customs procedures: The customs procedure lacks full automation, relying partly on the ASYCUDA World system for document submission. However, additional physical documents are still necessary from various non-automated organisations. This semi-automated process causes inefficiencies and delays for businessmen who must collect certificates from multiple sources and physically attach them to ASYCUDA World documents before submitting them to customs.

Unavailability of electricity and adequate infrastructure: The unavailability of electricity and inadequate infrastructure presents significant challenges for the smooth operation of port and customs activities in Bangladesh. Without a reliable power supply, operations such as processing documentation can be severely disrupted. Additionally, insufficient infrastructure, including poorly maintained roads, outdated facilities, and inadequate transportation networks, further compounds these challenges.

Lack of coordination between customs and port management: The lack of coordination between customs and port management in Bangladesh results in delays and inefficiencies in cargo handling

and clearance. Poor communication, disjointed procedures, and inadequate data sharing contribute to processing delays and resource mismanagement.

6.2 Recommendations regarding vehicle and cargo tracking system, automated border management, and customs procedure in Bangladesh

Recommendations regarding vehicle and cargo tracking system: As Bangladesh navigates the complexities and limitations associated with implementing vehicle and cargo tracking systems, it is essential to address these challenges through strategic recommendations that ensure seamless integration with existing infrastructure, robust data privacy and security measures, and effective cost management.

Strategies for the implementation of NBR's Electronic Seal and Lock Rules 2024: A successful implementation of NBR's Electronic Seal and Lock Rules 2024 is needed as soon as possible. NBR should consider phased implementation with pilot programs to identify and resolve potential issues early, thereby building confidence and compliance among users before full-scale enforcement.

Setting marginal service charges: To ensure the adoption and successful implementation of the Electronic Seal and Lock Rules 2024, it is vital to address the high service charges that have previously deterred businesses. By subsidising initial costs, offering tiered pricing based on usage (based on week, month, and year), and negotiating with service providers for more competitive rates, the National Board of Revenue (NBR) can make these tracking systems financially viable for traders.

Building awareness among the stakeholders: To overcome the widespread lack of awareness regarding NBR's Electronic Seal and Lock Rules 2024, a comprehensive awareness campaign targeting stakeholders across the private and public sectors is needed. This campaign should utilise various communication channels such as seminars, workshops, online platforms, and official publications to disseminate clear and accessible information about the regulations, their benefits, and compliance requirements.

Rationalisation of licence fees and deposit requirement: Although licence fees are manageable to some extent, The Tk5 crore security deposit requirement might limit participation from potential service providers. Therefore, it's important to rationalise the licence fees and deposit requirement so that no potential service providers miss the luxury of cargo tracking services.

The field survey findings revealed a significant gap in awareness regarding important regulations such as the Electronic Seal and Lock Rules 2024 and the National Logistics Development Policy. Many stakeholders, including logistics operators, exporters, and customs officials, appear to have limited understanding of these rules. Therefore, it is essential to initiate targeted awareness campaigns and training programs. Spreading knowledge about these regulations would not only help ensure

compliance but also enable stakeholders to take full advantage of the benefits offered by these policies, such as faster clearance procedures and improved security in logistics.

While the survey findings reveal a greater level of unawareness and uncertainty among stakeholders, the literature review acknowledges challenges like inadequate infrastructure and financial burdens. To address this issue, Bangladesh should focus on improving stakeholder awareness and understanding of these regulations, as well as enhancing infrastructure and addressing financial constraints.

Monitoring real-time data by BTRC: BTRC collects quarterly data from vehicle tracking service providers, which helps monitor overall system performance and compliance. However, it should focus more on real-time monitoring to improve the efficiency and responsiveness of these systems. Real-time tracking would enable more immediate oversight, helping identify and address issues such as vehicle theft, unauthorised detours, or delays in cargo transport. By incorporating real-time monitoring protocols, BTRC could enhance the effectiveness of vehicle and cargo tracking, ensuring a more dynamic and secure system that benefits both logistics management and regulatory enforcement.

Persuading businessmen and cargo handlers to embrace cargo tracking technology: It is needed to tailor the messaging to address specific concern and priorities of businessmen and cargo handlers. For instance, addressing concerns about driver availability by showcasing how tracking systems can enhance driver safety and efficiency, leading to improved working conditions. Additionally, providing case studies or testimonials from industry peers who have successfully integrated tracking systems into their operations can offer real-world examples of the benefits and reassure sceptics about the feasibility and practicality of the technology.

Incentivising traders to adopt cargo tracking systems through operational benefits: Offering operational benefits would be beneficial in driving the adoption of cargo tracking systems among traders. Traders who utilise the tracking system can receive priority in port queues and customs clearance processes. Therefore, by providing these benefits, their shipments will likely be processed faster, reducing waiting times and potentially streamlining the overall logistics.

Enhancing coordination among ministries and agencies: It is necessary to establish a cross-functional task force comprising representatives from relevant ministries and government agencies to coordinate efforts related to vehicle and cargo tracking systems. Improved coordination will facilitate the effective execution of policies and enhance logistics management outcomes.

Mitigating reliance on escort services: To alleviate the reliance on escort services for the delivery of dutiable goods, the implementation of a comprehensive cargo tracking system that ensures real-time monitoring and security throughout the transportation process is significantly needed. By investing in modern tracking requirements such as electronic seals and locks, authorities can streamline operations, reduce labour-intensive escort requirements, and enhance security measures.

Ensuring a robust telecommunication system: To efficiently track cargo, it is essential to implement a robust telecommunication system with extensive network availability. The tracking devices installed on cargo typically rely on SIM cards to transmit location and status data. A network with board coverage and minimal downtime will enable continuous and accurate monitoring of cargo, providing real-time updates even in remote or challenging locations. This level of network availability is vital for reducing the risk of lost or misplaced shipments and for maintaining overall supply chain efficiency.

Integration with Central Logistics Tracking Platform (CLTP) authority: To effectively implement the electronic seal and lock rules of 2024, establishing a connection with the Central Logistics Tracking Platform (CLTP) authority is recommended. CLTP is under development with the help of Aspire to Innovate (a2i) which aims to access data for resolving disputes reported by users regarding e-commerce and logistics services.[87] Connecting with the CLTP authority will effectively facilitate real-time tracking and improve overall supply chain visibility and security.

Establishing a Central Tracking and Logistic Platform (CLTP) that integrates the Bangladesh Telecommunication Regulatory Commission (BTRC), Road and Highway Department (R & HD), National Board of Revenue (NBR), and clearing and forwarding (C&F) agencies will be highly beneficial. By fostering close cooperation among these entities, the platform can streamline operations through shared data access and coordinated efforts. BTRC will provide the necessary telecommunications infrastructure for real-time tracking, while R & HD will offer up-to-date road conditions and traffic management insights. NBR will ensure customs compliance and streamline documentation, and C&F agents will facilitate efficient cargo handling. This integrated approach will enhance overall logistics efficiency and regulatory compliance.

Continuing efforts to target an increase in the tracking and tracing score: Bangladesh's tracking and tracing score in 2023 was 2.4, indicating significant room for improvement. To enhance this score, the authorities responsible for the Electronic Seal and Lock Rules 2024 should prioritise initiatives that boost tracking and tracing capabilities. Such focused efforts will improve logistics efficiency leading to higher scores in the near future.

The field survey revealed that all components of the Logistics Performance Index (LPI), including customs, infrastructure, international shipments, logistics competence and quality, and timeliness, are positively affected by improvements in the tracking and tracing score. Bangladesh currently lags in this component, with its tracking and tracing score falling short of the global average of 3.1 and the European Union 27 average of 3.7. To address this gap, Bangladesh should prioritise enhancing its tracking and tracing capabilities. The literature review highlights the potential of tracking systems to optimise infrastructure utilisation through better strategic planning and resource allocation. This underscores the need for improving tracking and tracing capabilities.

[87] The Central Logistics Tracking Platform (CLTP), an integrated system managed by the Ministry of Commerce, seeks to improve the efficiency and effectiveness of logistics companies in managing their transportation operations. It also functions as an interoperable digital platform that tracks the destination of cargo.

Advancing regional coordination for electronic cargo tracking beyond domestic borders: There is a need for a regional contract to address the Electronic Cargo Tracking System (ECTS). Electronic Seal and Lock Rules 2024 is primarily designed for domestic tracking. Extending the rules to cover regional cargo movement would significantly foster efficient cross-border logistics and safeguard against potential security risks associated with international cargo transport.

Recommendations regarding border management and customs procedures: Bangladesh's economic success hinges on smooth international trade. Recognising this, the government prioritises streamlining border management and customs processes. However, current inefficiencies – paper-based systems, limited automation, and complex regulations – hinder trade. To unlock Bangladesh's full potential, strategic recommendations are needed to address these challenges and create a more efficient trade environment.

Implementation of effective automation procedures in port management: To address the critical issue of manual processes dominating port management in Bangladesh, it is necessary to implement comprehensive automation and digitalisation strategies. Integrating advanced technology in the handling of cargo, documentation, and customs procedures can significantly reduce delays, lower costs, and minimise errors and corruption. Attracting various development partners is essential in this regard.

Biometric authentication for cargo drivers: It is essential to implement biometric or digital authentication systems for cargo drivers to address the driver-changing issue. This will prevent unauthorised driver swaps by ensuring assigned drivers handle cargo, thereby reducing inefficiencies and operational delays.

Increasing coordination between customs and port management: The coordination between customs and port management can expedite the workflow of trade. To establish the coordination between customs and port management in Bangladesh, it is essential to establish integrated information systems, harmonise regulations, and encourage cross-departmental collaboration.

Implementation of one-stop border posts: To enhance cross-border trade efficiency, it is essential to establish one-stop border posts along key border points. These facilities will centralise trade services, significantly expedite cross-border transactions, and provide substantial benefits to exporters and importers. Bangladesh can learn lessons from East African countries that have implemented one-stop border posts.

Ensuring the supply of electricity and establishment of infrastructure: To improve port and customs operations in Bangladesh, addressing electricity shortages and infrastructure issues is essential. Investing in power generation, infrastructure upgrades, and technology solutions is recommended, with collaboration among stakeholders essential for effective implementation.

Investment in generating skilled manpower and providing training for the field-level staffs: In addition to the implementation of automation in port and customs operations, it is vital to invest in developing a skilled workforce and organising comprehensive training programmes for field-level

staff. This investment will ensure that employees are well-equipped to manage and operate the new automated systems effectively.

Training programs should focus on developing technical skills for staff to operate and troubleshoot automated systems, such as digital customs tools and cargo handling machinery. Employees also need to be trained in data management and analysis to efficiently process and interpret the large amounts of data automation generates. Cybersecurity training is crucial to help staff identify potential digital threats and follow the necessary protocols to protect sensitive information.

Implementation of the National Single Window (NSW) platform: As current customs procedure is semi-automated, the rapid implementation of the National Single Window (NSW) platform is needed for ensuring seamless customs procedures.[88] This innovative solution will consolidate various trade-related processes onto a unified digital platform, streamlining administrative processes, and reducing paperwork. By implementing NSW, semi-automated customs procedures will be eliminated.

Field findings indicated that stakeholders agreed that the current customs procedures are semi-automated. This semi-automated system, while a step towards modernisation, still involves significant manual processing and administrative tasks. As a result, the efficiency of customs operations is constrained, leading to delays and potential errors. In light of these findings, implementing a National Single Window (NSW) system is deemed essential. The literature review also supports the necessity of implementing the NSW system.

Increasing the number of Authorised Economic Operators (AEOs): To streamline customs procedures in Bangladesh, it is recommended that the number of Authorised Economic Operators (AEOs) be increased. As of June 6, 2024, Bangladesh has 15 Authorised Economic Operators (AEOs). To qualify as an AEO, a company must have operated continuously in Bangladesh for at least five years, maintained satisfactory compliance with Customs, VAT, and Income Tax regulations, demonstrated no legal violations in the three years preceding the application, and ensured a clean record of duty and tax payments at the time of application, among others (see Annex A4). Being an AEO offers several benefits, including having goods examined at the company's premises instead of ports or land customs stations, the opportunity for direct clearance or loading of goods onto ships, and assistance from a special customs team, among other advantages (see Annex A5). Therefore, Expanding the AEO programme will enhance trade facilitation by allowing more businesses to benefit from simplified customs processes, reduced inspection rates, and faster clearance times.

Joining the TIR Convention: Joining the TIR Convention will significantly enhance Bangladesh's trade by streamlining and facilitating international transport and customs procedures. Additionally, strengthening trade relationships with BBIN countries (Bhutan, Bangladesh, India, Nepal) as well as Thailand and Myanmar will further boost economic growth and regional integration.

[88] The National Single Window system (NSW) enables traders to submit all import, export, and transit information needed by customs and other key regulatory agencies through a single electronic gateway. This system eliminates the need to repeatedly provide the same information to various government agencies, many of which still rely on paper-based processing systems.

The field survey shows that Bangladeshi stakeholders, despite limited current awareness, recognise the potential benefits of the TIR Convention once informed. This aligns with literature highlighting the convention's advantages. Stakeholders advocate for Bangladesh to accede to the TIR Convention to improve cross-border movement, reduce transit times, and lower costs, enhancing trade appeal. Additionally, the literature review highlights the TIR Convention's efficiency in customs clearance with the TIR carnet and tamper-evident seals, reducing delays and costs. It shows benefits like faster border crossings and enhanced security, with examples from India, Pakistan, and China. Joining the convention could boost Bangladesh's trade and complement regional agreements like the BBIN MVA.

Continuing the publication of Time Release Study (TRS): In 2022, the National Board of Revenue (NBR) published its initial sector-specific Time Release Study (TRS).[89] Continuing to publish the Time Release Study (TRS) is essential for maintaining transparency and accountability in customs procedures while providing valuable data to enhance trade facilitation. Regular publication enables continuous monitoring and identification of bottlenecks, guiding policy adjustments and operational changes for more efficient and streamlined processes.

Key recommendations of the study
✓ *Seamless integration with existing infrastructure:* Implement vehicle and cargo tracking systems that align with current infrastructure to minimise disruptions and ensure smooth operation.
✓ *Robust data privacy and security:* Establish strong data protection protocols to safeguard information transmitted through tracking systems, ensuring privacy and security for all stakeholders.
✓ *Cost management:* To prevent high operational costs, adopt financial strategies such as subsidies, tiered pricing models, and negotiations with service providers for cost-effective solutions.
✓ *Phased implementation of the Electronic Seal and Lock Rules 2024:* NBR should begin with pilot programs to troubleshoot issues and build user confidence, leading to smoother nationwide rollout.
✓ *Marginal service charges:* NBR should subsidise initial costs and create flexible, tiered pricing models to encourage traders to adopt the Electronic Seal and Lock Rules.
✓ *Awareness campaigns:* Launch awareness programs using seminars, workshops, and online platforms to educate stakeholders about the benefits and compliance requirements of tracking systems.
✓ *Mindset alignment for businessmen and cargo handlers:* Address specific concerns of stakeholders, such as driver safety, with tailored communication and success stories of tracking system benefits.

[89] The Time Release Study (TRS) evaluates and reports the average time required for various import clearance processes at three major ports in Bangladesh: Benapole land port, Chattogram Seaport, and Dhaka Airport.

- ✓ *Operational benefits as incentives:* Traders who adopt tracking systems could be prioritised for faster processing at ports and customs, reducing waiting times and enhancing logistics efficiency.
- ✓ *Enhanced coordination among ministries and agencies:* Establish a cross-functional task force to improve coordination between government entities and ensure effective execution of cargo tracking policies.
- ✓ *Reduce reliance on escort services:* Implement real-time monitoring systems with electronic seals and locks to reduce the need for labor-intensive escort services for sensitive goods.
- ✓ *Telecommunication infrastructure:* Develop a reliable telecommunication system with wide network coverage for continuous cargo tracking, ensuring real-time updates even in remote areas.
- ✓ *Integration with Central Logistics Tracking Platform (CLTP):* Collaborate with the CLTP authority for better dispute resolution and improved supply chain visibility, ensuring seamless tracking operations.
- ✓ *Tracking and tracing score improvement:* Focus on boosting Bangladesh's tracking and tracing capabilities to improve the current score of 2.4 and enhance logistics efficiency.
- ✓ *Regional coordination for cross-border tracking:* Extend the scope of the Electronic Seal and Lock Rules 2024 to include regional cargo movement, fostering secure and efficient cross-border trade.
- ✓ *Automation in port management:* Invest in automation technology for cargo handling, documentation, and customs to reduce delays, errors, and corruption in Bangladesh's port management.
- ✓ *Biometric authentication for drivers:* Introduce biometric authentication for cargo drivers to prevent unauthorised driver changes, ensuring secure and efficient cargo handling.
- ✓ *Coordination between customs and port management:* Establish integrated information systems and cross-departmental collaboration to enhance the workflow between customs and port management.
- ✓ *One-stop border posts:* Learn from East African countries and implement one-stop border posts at key locations to centralise trade services and expedite cross-border transactions.
- ✓ *Infrastructure and electricity supply:* Invest in electricity and infrastructure upgrades at ports to improve the efficiency of customs and border operations.
- ✓ *Skilled workforce and training:* Develop training programs for field staff to manage new automated systems effectively, ensuring a smooth transition to digital customs operations.
- ✓ *National Single Window (NSW) platform implementation:* Prioritise the implementation of the NSW platform to eliminate semi-automated customs procedures, streamline administrative processes, and reduce paperwork.
- ✓ *Increase in Authorised Economic Operators (AEOs):* Expand the AEO programme to benefit more businesses with simplified customs procedures, reduced inspections, and faster clearance times.

✓ *Joining the TIR Convention:* Enhance Bangladesh's trade by adopting the TIR Convention to streamline international transport and customs procedures, and strengthen relationships with BBIN countries and Southeast Asia.
✓ *Publication of Time Release Study (TRS):* Continue publishing the Time Release Study (TRS) to provide transparency, monitor customs efficiency, and guide necessary policy changes.

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Annexure

Annex A1: Matrix of correlations

Scores	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Tracing and Tracking	1.000						
(2) Overall LPI	0.965	1.000					
(3) Customs	0.901	0.958	1.000				
(4) Infrastructure	0.920	0.969	0.944	1.000			
(5) International Shipment	0.880	0.933	0.861	0.873	1.000		
(6) Logistic Competence and Quality	0.939	0.976	0.932	0.949	0.888	1.000	
(7) Timeliness	0.890	0.929	0.851	0.864	0.845	0.882	1.000

Source: RAPID's analysis using data from the World Bank.

Annex A2: Effects of tracking and tracing on overall LPI and its components

Variable	Dep. Var. = Overall LPI score	Dep. Var. = Customs score	Dep. Var. = Infrastructure score	Dep. Var. = International shipment score	Dep. Var. = Logistic competence and quality score	Dep. Var. = Timeliness score
Tracking and tracing	0.16***	0.05	0.07***	0.15***	0.24***	0.29***
Customs score	0.17***		0.38***	0.11***	0.14***	0.08*
Infrastructure score	0.15***	0.45***		0.12***	0.28***	0.01
International shipment score	0.19***	0.07***	0.06***		0.12**	0.09***
Logistic competence and quality score	0.16***	0.19***	0.31***	0.27***		0.31***
Timeliness score	0.17***	0.04*	0.01	0.08***	0.12***	
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes

Number of observations	1079	1079	1079	1079	1079	1079
Number of groups	173	173	173	173	173	173
R-squared	0.9996	0.9068	0.9303	0.8180	0.6044	0.5390

Source: RAPID's analysis using data from the World Bank.

Note: *p-value<0.1, **p-value<0.05, ***p-value<0.01

Annex A3: List of Authorised Economic Operators (AEOs) as of 6th June 2024

1. Beximco Pharmaceuticals Ltd.
2. Incepta Pharmaceuticals Ltd.
3. Square Pharmaceuticals Ltd.
4. Popular Pharmaceuticals Ltd.
5. Omera Cylinders Ltd.
6. Fair Electronics Ltd.
7. Towa Personal Protective Device Bangladesh Ltd.
8. Jihan Footwear (Pvt.) Ltd.
9. Cutting Edge Industries Ltd.
10. MBM Garments Ltd.1
11. ACI Goodrej Agrovet Private Ltd.
12. Shoenivers Footwear Ltd.
13. M/s Footsteps Bangladesh Ltd.
14. GPH Ispat Ltd.
15. Bangladesh Steel Re-Rolling Mills Ltd.

Source: NBR.

Annex A4: Criteria for becoming an Authorised Economic Operator (AEO)

The applicant is required to have the following qualifications mentioned below: 1. Conduct uninterrupted business for 5 years in Bangladesh; 2. Satisfactory compliance records of the Customs, VAT, and Income Tax Act; 3. Evidence of non-violation of the provisions of existing laws for the last three years from the time of submission of application; 4. Clean record of payment of duties and taxes at the time of submission of application; 5. The amount of penalty in any case related to Customs, VAT & Income Tax (except those under trial at courts) should not be above one percent of the total value of the goods and services of last three years; 6. The amount of authorised capital should be at least 15 crore & paid up capital 5 crore or the annual total turnover has to be 3 crore continuously for the last five preceding years from the time of submission of application; and 7. If the applicant is an importer the average total amount of import for the preceding three years should not be less than 5 crore and if the applicant is an exporter the total average amount of export for the same period should not be less than 5 crore.

Source: NBR.

Annex A5: Benefits for an Authorised Economic Operator (AEO)

The following will be the benefits of accredited AEO:
1. Examination of goods at the premises of the accredited AEO instead of the Ports or Land Customs Stations;
2. Opportunity for direct clearance or loading of goods onto the ship;
3. Assistance from the special team formed by the officials of Customs;
4. Opportunity for submission of Bill of Entry or Bill of Export and completion of necessary formalities before the arrival of the goods at the port;
5. Completion of assessment by submission of the relevant documents;
6. Opportunity for e-mail or other means of electronic communication with the Customs authority;
7. Issuance of special ID to the employees of the AEO for easy access to any Custom House;
8. Payment of Duty Drawback within the shortest possible time;
9. Faster settlement of litigation lying at ADR or any other places; and
10. Publication of names and addresses of the AEOs in Customs website.

Source: NBR.

Annex A6 (a): AEO MRA programmes in China

SL	MRA	Status	Type	Parties	Date signed
1	Decision of the Joint Customs Cooperation Committee of 16 May 2014 regarding mutual recognition of the EU AEO programme and the Measures on Classified Management of Enterprises Programme in China	Operational	Bilateral	China, EU	May 2012
2	Mutual Recognition Arrangements/Agreements	Operational	Bilateral	China, Uruguay	April 2019
3	Agreement between the Government of the People's Republic of China and the Swiss Federal Council on MR of the Customs Enterprise Credit Management Programme and Customs AEO Programme	Operational	Bilateral	China, Switzerland	January 2017
4	Arrangement Between the General Administration of Customs of the People's Republic of China and the Customs Administration of China Hong Kong (SAR) regarding Mutual Recognition of the AEO Program	Operational	Bilateral	China, Hong Kong, China	October 2013
5	Arrangement Between the GACC and the Islamic Republic of Iran Customs Administration regarding Mutual Recognition of the Enterprise Credit Management Programme in	All parties signed	Bilateral	China, Iran	May 2021

	China and the AEO Programme in Iran				
6	Arrangement Between the GACC and the Customs General Administration of Mongolia regarding Mutual Recognition of the Enterprise Credit Management Programme in China and the AEO Programme in Mongolia	All parties signed	Bilateral	China, Mongolia	April 2019
7	Arrangement Between the GACC and the SRC of the Ministry of Finance of Kazakhstan regarding the Mutual Recognition of the AEO Program	All parties signed	Bilateral	China, Kazakhstan	April 2019
8	Agreement Between GRS and the GAC Regarding Mutual Recognition of the Authorised Economic Operator Programme of Georgia Revenue Service and the Enterprise Credit Management Programme of China Customs	In progress	Bilateral	China, Georgia	Negotiations underway. Evaluation of the AEO programme operation of the respective administrations is currently being planned.
9	Arrangement between the Customs Authority of the United Kingdom of Great Britain and Northern Ireland and the Customs Authority of the People's Republic of China on Mutual Recognition	Operational	Bilateral	China, United Kingdom	December 2020
10	Arrangement Between the Israel Tax Authority of the Ministry of Finance of the State of Israel and the General Administration of Customs of the People's Republic of China	Operational	Bilateral	China, Israel	November 2017
11	Secure Exports Scheme	Operational	Bilateral	China, New Zealand	June 2017
12	Arrangement Between the Korea Customs Service of the Republic of Korea and the General Administration of Customs of the People's Republic of China	Operational	Bilateral	China, Korea (Rep. Of)	June 2013

13	Mutual Recognition of The Secure Trade Partnership Programme in Singapore and The Interim Measures On Enterprise Credit Management Programme In China	Operational	Bilateral	China, Singapore	June 2012
14	Arrangement Between the GACC and the Customs Administration of Japan on Mutual Recognition of the Enterprise Credit Management Programme in China and the AEO Programme in Japan	Operational	Bilateral	China, Japan	October 2018
15	Mutual Recognition Agreement	Operational	Bilateral	China, Brazil	October 2019
16	Arrangement Between the GACC and the NCS regarding the Mutual Recognition of the Enterprise Credit Management Programme in China and the AEO Programme in Chile	Operational	Bilateral	China, Chile	March 2021
17	Arrangement Between the GACC and the FCA of UAE regarding Mutual Recognition of the Enterprise Credit Management Programme of China Customs and the AEO Programme of the UAE Customs	Operational	Bilateral	China, United Arab Emirates	July 2019
18	Mutual Recognition of the Authorised Economic Operator Programme in Thailand and the Enterprise Credit Management Programme in China	In progress	Bilateral	China, Thailand	Official name is to be agreed due to under negotiation.
19	Mutual Recognition Arrangement between the GACC of China and the BOC of Philippines on AEO Programme	All parties signed	Bilateral	China, Philippines	January 2023
20	Mutual recognition of Authorised Economic Operators	In progress	Bilateral	China, Qatar	
21	The Agreement on Mutual Recognition of the AEO programme of the Republic of Belarus and the programme of the People's Republic of China on managing of fair enterprises	Operational	Bilateral	China, Belarus	April 2019
22	Mutual Recognition of the Enterprise Credit Management Programme of China Customs and the AEO Programme of the South African Revenue Service	All parties signed	Bilateral	China, South Africa	June 2021

23	Agreement regarding Mutual Recognition of the Enterprise Credit Management Programme and the AEO Programme	All parties signed	Bilateral	China, Serbia	February 2021
24	Mutual Recognition Arrangement	Initiated	Bilateral	China, Burundi	
25	Mutual Recognition Arrangement	All parties signed	Bilateral	China, Russian Federation	February 2022
26	Mutual Recognition of the Australian Trusted Trader Programme in Australia and the Enterprise Credit Management Programme in China	All parties signed	Bilateral	China, Australia	November 2017
27	Arrangement regarding Mutual Recognition of the Enterprise Credit Management Programme of China Customs and the AEO Programme of Uganda Revenue Authority Between the GACC and the URA	All parties signed	Bilateral	China, Uganda	May 2021
28	Arrangement between the Customs Committee Republic of Uzbekistan and the General Administration of Customs of the People's Republic of China	Initiated	Bilateral	China, Uzbekistan	
29	AEO Mutual Recognition Arrangement	In progress	Bilateral	China, Costa Rica	
30	Arrangement Between GACC and SARS Regarding Mutual Recognition of the ECM Programme of China Customs and the AEO Programme of the SARS	All parties signed	Bilateral	China, South Africa	June 2021

Source: WCO.

Annex A6 (b): AEO MRA programs in the European Union (EU)

SL	MRA	Status	Type	Parties	Date signed
1	Decision of the EU-Canada Joint Customs Cooperation Committee concerning the Mutual Recognition of the Partners in Protection Programme of Canada and the AEO Programme of the EU	In progress	Bilateral	EU, Canada	

2	Decision of the EU-Singapore Joint Customs Cooperation Committee concerning the Mutual Recognition of the Secure Trade Partner Plus Programme of Singapore and the EU AEO Programme.	In progress	Bilateral	EU, Singapore	
3	Trade and Cooperation Agreement between the EU and the UK - Annex CUSTMS-1 on AEO	Operational	Bilateral	EU, United Kingdom	December 2020
4	The decision of the Joint Customs Cooperation Committee of 16 May 2014 regarding mutual recognition of the EU AEO programme and the Measures on Classified Management of Enterprises Programme in China.	Operational	Bilateral	EU, China	May 2012
5	Decision of the US-EU Joint Customs Cooperation Committee of 4 May 2012 regarding mutual recognition of the C-TPAT programme in the US and the AEO programme in the EU.	Operational	Bilateral	EU, United States	June 2012
6	Agreement between EU and Swiss Confederation on customs security measures	Operational	Bilateral	EU, Switzerland	July 2009
7	Decision of the EEA Joint Committee no.76/2009 amending Protocol 10 on simplifications of inspections and formalities in respect of carriage of goods.	Operational	Bilateral	EU, Norway	September 2009
8	Decision no. 1/2010 of the Joint Customs Cooperation Committee on mutual recognition of AEO programmes in the EU and Japan	Operational	Bilateral	EU, Japan	June 2010
9	Decision of the EU-Moldova Joint Customs Cooperation Committee concerning the Mutual Recognition of the AEO Programme of Moldova and the AEO Programme of the European Union.	In progress	Bilateral	EU, Moldova	

Source: WCO.

Annex A6 (c): AEO MRA programmes in India

SL	MRA	Status	Type	Parties	Date signed
1	Arrangement Between the Korea Customs Service of the Republic of Korea and the Central Board of Excise and Customs of the Republic of India	Operational	Bilateral	India, Korea (Rep. Of)	October 2015
2	Arrangement between the United States of America & the Republic of India regarding Mutual Recognition of their respective Authorised Economic Operator Programs.	All parties signed	Bilateral	India, United States	September 2021
3	India-Taiwan AEO MRA	Operational	Bilateral	India, Chinese Taipei	December 2018
4	India-Japan MRA	In progress	Bilateral	India, Japan	Joint Action Plan signed on 24.06.2023.
5	India-South Africa MRA	In progress	Bilateral	India, South Africa	The Joint Action Plan was signed on 17.12.2020.
6	India-Uganda MRA	In progress	Bilateral	India, Uganda	Joint Action Plan signed on 03.12.2018. Programme Comparison completed.
7	India-EAC MRA	In progress	Plurilateral	India, Burundi, Congo (DR of the), Kenya, Rwanda, South Sudan, Tanzania, Uganda	Joint Action Plan with EAC signed on 12.08.2021. Programme Comparison completed.
8	India-Australia AEO MRA	All parties signed	Bilateral	India, Australia	April 2024
9	Mutual Recognition of the Authorised	All parties signed	Bilateral	India, Hong Kong, China	November 2013

	Economic Operator Programme in India and the Authorised Economic Operator Programme in Hong Kong				
10	India-Russia MRA	All parties signed	Bilateral	India, Russian Federation	May 2024
11	India-UAE AEO MRA	Operational	Bilateral	India, United Arab Emirates	June 2023
12	India Bahrain AEO-MRA	In progress	Bilateral	India, Bahrain	Joint Action Plan signed with Bahrain on 13.11.2023
13	India Singapore AEO-MRA	In progress	Bilateral	India, Singapore	Joint Action Plan signed on 19.02.2024.

Source: WCO.

Annex A6 (d): AEO MRA programmes in Singapore

SL	MRA	Status	Type	Parties	Date signed
1	Decision of the EU-Singapore Joint Customs Cooperation Committee concerning the Mutual Recognition of the Secure Trade Partner Plus Programme of Singapore and the EU AEO Programme.	In progress	Bilateral	Singapore, EU	
2	Arrangement Between Singapore Customs and The Canada Border Services Agency Regarding Mutual Recognition of Their Customs Supply Chain Security Programs	Operational	Bilateral	Singapore, Canada	June 2010
3	Arrangement Between Singapore Customs and U.S. Customs and Border Protection Regarding Mutual Recognition of Their Customs Supply Chain Security Programs	Operational	Bilateral	Singapore, United States	December 2014
4	Mutual Recognition of The Secure Trade Partnership Programme in Singapore and The Authorised Economic Operator Programme in Thailand	Operational	Bilateral	Singapore, Thailand	June 2018

5	Mutual Recognition of The Secure Trade Partnership Programme in Singapore and The Interim Measures on Enterprise Credit Management Programme in China	Operational	Bilateral	Singapore, China	June 2012
6	Mutual Recognition of The Secure Trade Partnership Programme in Singapore and The Australian Trusted Trader Programme in Australia	Operational	Bilateral	Singapore, Australia	May 2018
7	Mutual Recognition of The Secure Trade Partnership in Singapore and The Authorised Economic Operator Programme In Hong Kong	Operational	Bilateral	Singapore, Hong Kong, China	June 2014
8	Arrangement Between Singapore Customs and The New Zealand Customs Service Regarding Mutual Recognition of The Secure Trade Partnership - Plus in Singapore and The Secure Exports Scheme In New Zealand	Operational	Bilateral	Singapore, New Zealand	June 2019
9	Mutual Recognition of the Secure Trade Partnership Programme in Singapore and the Authorised Economic Operator Programme in Taiwan	Operational	Bilateral	Singapore, Chinese Taipei	July 2013
10	Arrangement Between Singapore Customs and Korea Customs Service Regarding Mutual Recognition of the Secure Trade Partnership Programme in Singapore and Authorised Economic Operator Programme in Korea	Operational	Bilateral	Singapore, Korea (Rep. Of)	June 2010
11	Mutual Recognition of Secure Trade Partnership Programme in Singapore and The Authorised Economic Operators Programme in Japan	Operational	Bilateral	Singapore, Japan	June 2011
12	Mutual Recognition of the Authorised Economic Operator Programme in Malaysia and the Authorised Economic Operator Programme in Singapore	In progress	Bilateral	Singapore, Malaysia	
13	India Singapore AEO-MRA	In progress	Bilateral	Singapore, India	Joint Action Plan signed on 19.02.2024

Source: WCO.

Annex A7: Recommendations on BTRC guidelines for vehicle tracking services in Bangladesh

Recommendations- Regulatory and licensing guidelines (amended) for issuing license for establishing, operating and maintaining vehicle tracking services in Bangladesh				
Section Number & Title	Related provisions	Unchanged	Extension/ modification	New Addition
1. Introduction	**1.01** The Bangladesh Telecommunication Regulatory Commission ("the Commission") is empowered under section 36 of the Bangladesh Telecommunication Act 2001 (Act No. XVIII of 2001) ("the Act") to issue Licenses for the operation and provision of telecommunication services, and to determine the eligibility criteria and other general terms and conditions of Licenses. In pursuance of Section 31 (2) (r) of the Act, the Commission is empowered to issue instructions/guidelines to be followed by the licensees and service providers relating to various apparatus as defined in the Act. **1.02** Having given due consideration to the principles of transparency, fairness, non-discrimination and all other relevant principles, the Commission has decided to issue Guidelines on Licensing Procedure of Vehicle Tracking Services as envisaged in the Licensing (Procedure) Regulation 2004. **1.03** These Guidelines, along with the terms and conditions of the License, should be read in conjunction with the Act, any subsequent legislation, and prevalent laws or sector policies framed by the Government, and other rules, regulations, decrees, orders, decisions, guidelines,	N/A	N/A	Include language emphasising the need for integrating vehicle tracking with cross-border logistics policies, as per findings from the BBIN MVA and Bangladesh Perspective Plan (2021-2041) for regional trade facilitation.

	directives and documents of general application issued by the Government or the Commission from time to time. The Act specifically provides, under Section 35 and 55, that the establishment, operation or use of telecommunication system including radio apparatus and provision of telecommunication services in Bangladesh without a License is an offence, punishable with imprisonment or a fine or both. **1.04** These Guidelines may be withdrawn, revised, updated or amended from time to time, without any prior notice, to take into consideration various factors including, but not limited to, any threat to public health, national security and change of statute or Court orders.			
2. Interpretations and definition	**1.** "Act" means the Bangladesh Telecommunication Act, 2001 (Act No. 18 of 2001). **2.** "Cellular Mobile & BWA Licensee" means a Cellular Mobile & BWA Operator having a license issued by the Commission for ANS services; **3.** "Cellular Mobile & BWA Operator" means a Cellular Mobile & BWA Operator, licensed by the Commission to provide wireless telecommunication services to the end-user without any limitation on mobility. **4.** "Commission" means the Bangladesh Telecommunication Regulatory Commission established under the Bangladesh Telecommunication Act, 2001;	N/A	Expand on GPS definitions to include integration with electronic seals and locks.	Include provisions for blockchain-enabled data sharing among logistics stakeholders to ensure secure and immutable tracking records.

	5. "Data service" means a telecommunication service that involves electronic transfer of non-voice content; **6.** "GPS" means Global Positioning System; **7.** "GPS Transponder device" means a portable device mounted in vehicle which acquires vehicle data (position, vehicle condition, etc.), and transmits the data via wireless networks to a designated Vehicle Tracking server; **8.** "Gross revenue" means turnover or gross income exclusive of trade discount, shown on invoice of bills, derived from sale of goods or from rendering, giving or supplying services or benefits or from execution of contracts, for the licensed services or business. **9.** "LBS" means Location Based Service; **10.** "License" means an authorisation issued by the Commission under Section 36 of the Act, and Regulations issued by the Commission for establishing, operating and maintaining BWA systems and services; **11.** "Organisation" means any organisation other than Telecommunication Operator that intends to offer Vehicle Tracking Service in Bangladesh; **12.** "Regulation" means the regulations made under the Bangladesh telecommunication Act 2001; **13.** "Service provider" means any Organisation or Cellular Mobile & BWA Operator, who obtains license/permission to offer Vehicle Tracking Services in Bangladesh;			

	14. "Telecommunication service" carry the same meaning as defined in the Bangladesh telecommunication Act 2001; **15.** "Telecommunication network" means a combination of a set of nodes and links that establish telecommunication between two or more points; **16.** "Value-added service (VAS)" is a non-core telecommunication service. Services beyond standard voice calls and fax transmissions generally fall under VAS. In mobile industry, technologies like SMS, MMS and GPRS are usually considered value-added services; **17.** "Vehicle Tracking Services (VTS)" means a telecommunication service used for locating and managing the movement of a vehicle by installing a terminal equipment in the vehicle tracked using GPS satellites, and sending data via a wireless data network.			
3. Objectives	**3.01** These Guidelines have been prepared taking into account the objectives of the Government to facilitate the introduction of a modern telecommunication service in Bangladesh namely Vehicle Tracking System, thus improving the transport sector. **3.02** These Guidelines are intended to provide an overview of the licensing and regulatory framework for Applicant(s) seeking to obtain license/permission. **3.03** Vehicle Tracking License/permission to be	N/A	Include the goal of improving Bangladesh's Logistics Performance Index (LPI).	This should incorporate guidelines for focusing on real-time monitoring to improve the efficiency and responsiveness of these systems and integrating automated alerts for rule violations and geofencing capabilities to enhance operational efficiency and security.

	issued under these Guidelines will authorise an operator to establish, operate and maintain Vehicle Tracking Services in Bangladesh. No person or business entity shall be allowed to provide Vehicle Tracking Services without a valid License/permission issued by the Commission.			
4. Scope	**4.01** These guidelines will provide an overview of the service as well as act as a framework to govern the organisations and Cellular Mobile & BWA Operators that intend to offer Vehicle Tracking Services in Bangladesh. **4.02** No organisation shall be allowed to offer Vehicle Tracking Services in Bangladesh without obtaining license from the Commission by following the procedure as described in this Regulatory and licensing guidelines. Under the existing licenses Cellular Mobile & BWA Operators qualify to offer such telecommunication services subject to the Commission's permission including tariff approval.	N/A	Require domestic and cross-border functionality.	1. Cellular Mobile & BWA Operators must be required to provide service not only within the domestic border but also across the cross-border. 2. Establishing a Central Tracking and Logistic Platform (CLTP) that integrates the Bangladesh Telecommunication Regulatory Commission (BTRC), Road and Highway Department (R & HD), National Board of Revenue (NBR), and clearing and forwarding (C&F) agencies will be highly beneficial.
5. Description	**5.01** Vehicle Tracking System is a value-added service or Service provided through a GPS Transponder device installed in a vehicle which enables a vehicle owner or a third party to track the vehicle's movement and other activities while both in stationary and running modes. The system is a convergence of an on board automotive device, wireless communication and global positioning system (GPS), to	N/A	Highlight Location-Based Services (LBS) improvements for regional connectivity.	Incorporate predictive analytics for maintenance and route optimization using AI/ML.

	track vehicles via digital mapping application and reporting information system by using a web-interface, mobile phone and/or computer network. **5.02** This service can also be provided through Location Based Service (LBS) on the mobile network's ability to locate the geographical position of the SIM/RUIM or mobile device without employing GPS.			
6. Benefits of the service	**6.01** The Vehicle Tracking System would be a useful solution to gain considerable operational efficiency in managing a large fleet of vehicles. It will help mitigating the major safety concerns that exist in the transport sector in Bangladesh. The service will offer its customers an innovative Vehicle Tracking and management solutions that will bring efficiency in their vehicle fleet operations. **6.02** Vehicle Tracking System will allow offering of a range of services, like managing fleet of vehicles, locating roaming sales professionals and tracing stolen vehicles in an easier, productive and efficient manner. It will create opportunities for new businesses and employments, benefit the government and corporate bodies, road transport industry, motorists, vehicle owners and individual private users by helping them to reduce road traffic accidents and unauthorised or inefficient vehicle usage and as well as generate revenue for the exchequer. The use of a simple cost-effective Vehicle Tracking	N/A	For 6.02.01- Emphasise real-time incident reporting, including alerts for accidents or abnormal vehicle behaviours (e.g., overturning, sudden stops).	1. Incorporation of Artificial Intelligence (AI) and predictive analytics for route optimisation and maintenance forecasting to ensure proactive operational planning. 2. Leverage geofencing to trigger automated alerts when vehicles exit designated zones, enhancing theft prevention capabilities.

	Solutions will certainly increase productivity, reduce operational cost, improve customer service and enhance security for both driver and vehicle. The significant benefits offered by the service would be as follows: **6.02.01** Increase vehicle safety and security: Vehicle Tracking Services will increase vehicles and driver Safety. In case of an emergency the driver or the passenger can press the Panic Button to alert the vehicle owner. **6.02.02** Ensure operational efficiency: The service will allow managing and controlling the vehicle from a central point that helps to reduce fuel and maintenance costs and ensure operational efficiency **6.02.03** Reduce unauthorised vehicle use: The service allows to set rules against 'Speed Violations' and 'Harsh Braking' and helps to implement discipline against the drivers thus reduces the possibilities of rough and dangerous driving and unauthorised vehicle use. **6.02.04** Operational Control: The service may also reduce excessive 'Idle Time' and 'Overtime claims' that mainly happens with companies with large number of vehicles. **6.02.05** Stolen Vehicle Recovery: The service will allow the vehicle owner to track his/her vehicle through web or mobile. Using this service will increase the chances of recovering stolen vehicle.			

	6.02.06 Asset Management: Cargos and assets can be watched on a constant basis. **6.02.07** Driver location management: Through the LBS offer, a vehicle owner/user can obtain the general location of a driver reporting to him (based on SIM/RUIM location via BTS coverage area), so he can monitor the driver/driver pool more efficiently. **6.02.08** This system can also be used for managing Roaming Field Force efficiently.			
7. Eligibility	**7.01** Any organisation/Company/Entity, which can source the wireless data transmission facility from a licensed Cellular Mobile & BWA Operator shall be eligible to apply for this license. **7.02** Cellular Mobile & BWA Operators are eligible to apply for approval of VTS.	N/A	N/A	Applicants must not have any history of regulatory violations or financial misconduct that could compromise service reliability or user trust.
8. General requirements	**8.01** The following are the principal legal statutes governing the telecommunication industry in Bangladesh: (i) The Bangladesh Telecommunication Act, 2001 (ii) The Wireless Telegraphy Act, 1933 and The Telegraph Act, 1885, for matters that are not covered by the Bangladesh Telecommunication Act, 2001. **8.02** In case of a Cellular Mobile & BWA Operator, the Commission may issue the 'Service Approval', subject to the operator's request. **8.03** In case of an Organisation, which does not hold a Cellular Mobile & BWA License, the Commission will	N/A	Add cybersecurity compliance for data protection.	Introduce 24/7 customer support with multilingual capabilities for cross-border stakeholders.

	issue license by following an open licensing procedure, subject to satisfying minimum financial and technical criteria set by the Commission, **8.04** Licensees may be subject to additional terms and conditions where deemed necessary to be imposed in accordance with the public interest or in accordance with the National Telecommunications Policy 1998 and ILDTS Policy, 2007. **8.05** Applicant(s) shall be disqualified from obtaining a License if any provision listed in sub clauses (i) to (vii) below applies to its owner(s) or to any of its director(s) or partner(s) or to the Applicant(s) himself (i) he is an insane person; (ii) he has been sentenced by a court under any law, other than this Act, to imprisonment for a term of 2 (two) years or more, and a period of 5 (five) years has not elapsed since his release from such imprisonment; (iii) he has been sentenced by a court for committing of any offence under the Act and a period of 5 (five) years has not elapsed since his release from such imprisonment; (iv) he has been declared bankrupt by the Court and has not been discharged from the liability of bankruptcy; (v) he has been identified or declared by the Bangladesh Bank or by the court or by a bank or financial institution as a defaulter loanee of that bank or institution; (vi) his license has been cancelled by the Commission at any time during the last 5 (five) years; (vii) if prosecution is going on against the applicant(s) or its			

	owner(s) or shareholder(s) or any of its director(s) or partner(s) for any violation of the Act or license conditions or any other illegal activities. **8.06** In addition to the mandatory grounds for disqualification from applying for a License referred to in Section-8.05, the Commission shall also consider whether the applicant satisfies other criteria including: (i) whether the applicant has sufficient financial capacity to operate the activities for which the application has been submitted and whether the applicant is likely to acquire the space for necessary installations and whether efficient manpower will be available; (ii) how far the issuance of the License will be consistent with the broad objectives of the Commission; and (iii) how far the issuance of the License will serve the public interest and National Security. **8.07** The Commission, on receipt of any application, shall examine and evaluate its acceptability in relation to the prevailing market situation and any other considerations that it may find necessary. **8.08** The "Vehicle Tracking Operator" shall maintain the promised level of accuracy/timeliness to customers. Except for force major event, the Vehicle Tracking Operator shall provide 24/7 client support facility through web-interface as well as call centre with queue management facility specialised for providing this type of service.			

9. Documents to be submitted with application	Applicant(s) shall furnish the following information/documents (in English) as is applicable: (i) Letter of Application (in letterhead pad). (ii) Application Form (dully filed in, furnished, signed and sealed).	N/A	N/A	N/A
10. License/permission awarding process	**10.01** Depending on whether the applicant already holds a license for Cellular Mobile & BWA or not, the following procedures will be applied: (i) If the applicant already holds a Cellular Mobile & BWA license, the "Service Approval Process" will be followed, whereby, after an evaluation of the proposed service, an "Approval" will be granted to the applicant to provide the Vehicle Tracking Services. (ii) If the applicant does not hold a Cellular Mobile & BWA Operator license, the applicant will provide to The Commission a detailed business model, along with details on infrastructural preparedness while seeking the license for Vehicle Tracking Services. (iii) After issuing the license awarding notification from the Commission the VTS applicant shall submit the proposed/draft agreement with Cellular Mobile/BWA Operator along with License Acquisition fee within 30 (thirty) days from the date of issuance of license awarding notification. The applicant also submit the proposed GPRS tariff for approval of the Commission.	N/A	N/A	N/A
11. Duration of license/permission	The duration of the Licenses/Permission, shall initially be for a term of 5 (five) years. Upon expiry of the initial term, the	N/A	Add performance evaluation criteria for renewal.	Add an option for automatic renewal if the licensee meets all performance,

	License/Permission may be renewed for subsequent terms, each of 5 years in duration, subject to the approval from the Commission and to such conditions, including the payment of any fees, as may be specified herein and/or by the Commission under the Act.			financial, and compliance requirements, reducing administrative burden.
12. Fees and charges	Following fees and charges shall be applicable to the Licensees. **12.01** Application fee: The non-refundable Application fee shall be Taka 5000/-(Taka five thousand) only to be submitted to the Commission in the form of pay order/bank draft for the applicants in favour of Bangladesh Telecommunication Regulatory Commission. **12.02** The License Acquisition Fee: The License Acquisition Fee for Vehicle Tracking Operator License and acquisition fee for Approval for Cellular Mobile & BWA operator is Tk. 3 (three) lac shall be paid after the license awarding notification issued by the Commission. **12.03** Annual License Fee: A sum of BD Taka 2 (two) lac payable by the Licensee (including Cellular Mobile Operators & Broadband Wireless Access Operators) in advance on each anniversary of the date of the License; and **12.04** Gross Revenue Sharing: (i) No Revenue (0%) shall be shared for the first year by the Vehicle Tracking Operator licensee. A sum equivalent to 1 per cent of the annual audited gross revenue of the	N/A	N/A	N/A

	Licensee, which shall be paid on a quarterly basis of calendar year within the first 10 (ten) days at the end of each quarter. The total amount shall be reconciled on an annual basis based on the Licensee's audited accounts for that year and if there has been any underpayment, the balance must be paid within 90 (ninety) days of the financial year-end of the Licensee. In the event of any overpayment by the Licensee, the Licensee may set off any excess amount against quarterly payments in the next year. (ii) The Cellular Mobile and BWA Operators those who will be accord for approval of VTS shall pay revenue to the Commission as per the existing revenue sharing rate and arrangements prescribed under their respective licenses. (iii) The percentage of revenue to be shared may be changed from time to time by the Commission and the licensee shall abide by it.			

A list of questions used in Key Informant Interviews (KIIs)

Key informant interview (KII) questions for the Bangladesh Telecommunication Regulatory Commission (BTRC) representative
1. Can you provide an overview of the current guidelines and regulations governing the vehicle and cargo tracking system in Bangladesh? 2. What specific technologies and methodologies are currently recommended or mandated for vehicle and cargo tracking within the existing guidelines? 3. In your assessment, what are the key strengths of the current guidelines in ensuring effective vehicle and cargo tracking? 4. What are some of the challenges or limitations that have been identified in the existing guidelines concerning vehicle and cargo tracking? 5. Have there been any notable incidents or issues related to vehicle and cargo tracking that have highlighted potential gaps in the existing guidelines?

6. How does the BTRC collaborate with other relevant agencies and stakeholders, such as law enforcement agencies and industry associations, to address gaps in the existing guidelines for vehicle and cargo tracking?
7. Are there any emerging technologies or best practices in vehicle and cargo tracking that the BTRC is considering incorporating into the existing guidelines?
8. How does the BTRC assess the effectiveness and compliance of telecom operators and other stakeholders with the existing guidelines on vehicle and cargo tracking?
9. Are there any plans or initiatives underway to review and update the existing guidelines for vehicle and cargo tracking in light of technological advancements and evolving industry standards?
10. How does the BTRC ensure that the guidelines for vehicle and cargo tracking remain flexible and adaptable to address new challenges and emerging threats in the transportation and logistics sector?
11. What role does the BTRC envision playing in the implementation of automated border management and customs procedures in Bangladesh?
12. How does the BTRC plan to collaborate with relevant government agencies, such as customs authorities and immigration departments, to facilitate the adoption of automated border management systems?
13. How does the BTRC plan to address concerns related to data security and privacy in the context of automated border management systems?
14. How does the BTRC plan to engage with stakeholders, including border security agencies, customs brokers, and international trade organisations, to gather input and ensure the successful implementation of automated border management procedures?
15. How does the BTRC perceive the relationship between the implementation of a cargo tracking system and improvements in Bangladesh's Logistics Performance Index (LPI)?
16. Are there any plans or initiatives underway to further enhance the cargo tracking system in Bangladesh to better align with the country's logistics needs and improve its LPI ranking?
17. What role does the BTRC envision playing in promoting the integration of technology-driven solutions, such as the cargo tracking system, to boost logistics efficiency and competitiveness in Bangladesh?
18. Are there any specific challenges or barriers identified in the analysis of policies and regulatory measures for vehicle and cargo tracking systems, and how does the BTRC plan to address them?
19. Are there any plans or initiatives underway to review and update existing policies and regulations for vehicle and cargo tracking systems in light of technological advancements and emerging industry trends?

Key informant interview (KII) questions for the Vehicle Tracking Service Providers Association of Bangladesh (VTSPAB) representative

1. Can you tell me about the current size and growth of the vehicle and cargo tracking market in Bangladesh?
2. How many companies are currently members of VTSPAB, and what types of services do they offer (GPS tracking, fleet management, etc.)?
3. What are the different types of vehicle tracking devices available in Bangladesh, and what are their strengths and weaknesses?
4. How does the accuracy of GPS tracking systems vary depending on location and terrain?
5. What security measures are in place to protect vehicle tracking data from unauthorised access?
6. How do cargo tracking systems differ from standard vehicle tracking systems?
7. Can cargo tracking systems be integrated with other logistics management software?

8. How familiar are you with tamper-proof seals or other measures used to prevent cargo theft?
    1. Not familiar at all 2. Slightly familiar 3. Moderately familiar 4. Very familiar 5. Extremely familiar
9. To what extent do you understand how vehicle tracking systems address fuel management, maintenance alerts, and driver behavior monitoring?
    1. No understanding 2. Limited understanding 3. Moderate understanding 4. Good understanding 5. Excellent understanding
10. What are the key regulations governing vehicle tracking systems in Bangladesh, and how does VTSPAB ensure its members comply?
11. How does the association collaborate with government agencies, such as the Bangladesh Telecommunication Regulatory Commission (BTRC), to ensure compliance and standardisation?
12. How do VTSPAB member companies address data privacy concerns related to vehicle and cargo tracking information?
13. Does VTSPAB collaborate with the Bangladesh government on initiatives related to vehicle tracking, such as traffic management or stolen vehicle recovery?
14. Are there any specific technology standards that VTSPAB recommends for vehicle and cargo tracking systems? (e.g., GPS accuracy, data security)
15. Are there any ongoing research or development initiatives to enhance tracking systems further?
16. Can you share success stories or case studies where vehicle tracking systems have significantly improved cargo security and reduced transit times?
17. What are some of the biggest challenges facing the vehicle and cargo tracking industry in Bangladesh? (e.g., cost, infrastructure, awareness)
18. How do you see the vehicle and cargo tracking industry evolving in the next few years? Are there any emerging technologies or applications you're excited about?
19. What role does the association play in educating businesses and consumers about the benefits of vehicle tracking technology?
20. What efforts does VTSPAB undertake to raise public awareness about the benefits of vehicle and cargo tracking systems?

Key informant interview (KII) questions for the Bangladesh Association of Software and Information Services (BASIS) representative

1. Does BASIS have a specific committee or working group focused on vehicle and cargo tracking systems?
    1. Not at all 2. Slightly 3. Moderately 4. Very much 5. Absolutely
2. How many BASIS member companies are involved in developing or offering vehicle and cargo tracking solutions?
3. From BASIS's perspective, how much growth potential do you see in the Bangladesh market for vehicle and cargo tracking systems?
4. Are there any initiatives by BASIS to encourage the development and adoption of locally-made vehicle and cargo tracking solutions?
    1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
5. Is BASIS involved in discussions or efforts to establish any national standards for vehicle and cargo tracking systems in Bangladesh?
    1. Not at all 2. Slightly 3. Moderately 4. Very much 5. Absolutely
6. Does BASIS offer any resources or programs to help businesses connect with BASIS members who specialise in vehicle and cargo tracking systems?
    1. Not at all 2. Slightly 3. Moderately 4. Very much 5. Absolutely

7. How can BASIS facilitate better integration between vehicle tracking systems and other logistics or supply chain management software used in Bangladesh?
8. Are there any specific industry standards or government regulations that BASIS members need to adhere to when developing and deploying vehicle and cargo tracking systems?
   1. Not at all 2. Slightly 3. Moderately 4. Very much 5. Absolutely
9. How do you see emerging technologies like IoT and AI impacting the development and use of vehicle and cargo tracking systems?
10. Can BASIS share any case studies or success stories showcasing how BASIS member companies have implemented effective vehicle and cargo tracking systems for businesses in Bangladesh?
11. What are the biggest challenges BASIS sees for the software and IT industry in Bangladesh regarding vehicle and cargo tracking systems?
12. How does BASIS plan to advocate for policies or regulations that support the growth and innovation of vehicle and cargo tracking solutions in Bangladesh?
13. What are your thoughts on the future of the vehicle and cargo tracking industry in Bangladesh? Are there any emerging trends or technologies that you see having a significant impact?

Key informant interview (KII) questions for the vehicle tracking service providers

1. What types of tracking data does your system offer for vehicles and cargo (e.g., real-time location, speed, fuel level, temperature)?
2. Can your system be customised to meet the specific needs of my business (e.g., geofencing, alerts for unauthorised stops, cargo condition monitoring)?
   1. Not at all 2. Slightly 3. Moderately 4. Very much 5. Absolutely
3. What hardware options do you offer for vehicle and cargo tracking (fixed vs. mobile units, different sensor integrations)?
4. How is the data collected by your system stored and secured? Do you comply with any data privacy regulations?
5. What kind of installation and setup support do you provide for your vehicle and cargo tracking systems?
6. Do you offer 24/7 customer support for technical issues and troubleshooting?
   1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
7. How do you handle data visualisation and reporting for tracking data? Can I access reports easily through a web-based platform?
8. What is your pricing structure for vehicle and cargo tracking services? Are there different tiers with varying functionalities?
9. What is the typical contract length for your services? Are there any early termination fees?
10. Do you offer any discounts for bulk deployments or long-term contracts?
    1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
11. For cargo tracking specifically, what types of sensors or monitoring solutions do you offer to ensure cargo condition (e.g., temperature, humidity, shock)?
12. Can your system track cargo containers throughout the entire supply chain, from origin to destination?
    1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
13. What happens if a vehicle loses cellular signal? Will the tracking data still be recorded?
14. Do you offer integration with existing logistics management software for seamless data flow?
15. Can your tracking systems be integrated with existing logistics management software used by companies in Bangladesh?
    1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

16. What level of customer support do you provide for installation, troubleshooting, and ongoing maintenance of the tracking systems?
17. Do you offer different data security and privacy options for your customers? How do you ensure the safety of sensitive cargo information?
    1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
18. How do your vehicle and cargo tracking systems address the challenges of connectivity and infrastructure in rural areas of Bangladesh?
19. Are your tracking solutions compliant with any relevant regulations or standards set by the Bangladesh government?
    1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
20. Can you share any success stories or case studies of how your vehicle and cargo tracking systems have benefited businesses in Bangladesh?

Key informant interview (KII) questions for the transport specialists

1. How does the tracking system provide visibility into our cargo's status and condition during transportation (e.g., temperature, humidity, security)?
2. Can the system be used to optimise delivery routes and schedules based on real-time traffic conditions and vehicle location?
   1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
3. Do the tracking systems offer any functionalities beyond location tracking, such as fuel level monitoring or temperature control for refrigerated containers?
   1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
4. What kind of data and reports does the tracking system generate, and how can we leverage this information to improve efficiency and decision-making?
5. How does the tracking system ensure the security of cargo data and prevent unauthorised access?
6. Does the system comply with any relevant industry regulations or data privacy laws?
   1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
7. How can the system be monitored and maintained to ensure its accuracy and functionality?
8. How do you anticipate the system will contribute to a positive return on investment (ROI) for our transportation operations?
9. What kind of training should be provided to drivers and staff on using the tracking system effectively?
10. How does the system integrate with emergency response protocols in case of an incident?
11. What are the biggest advantages of using vehicle and cargo tracking systems for transportation operations?
12. How can these tracking systems help improve efficiency and optimise delivery routes?
13. What features are most important to consider when choosing a vehicle and cargo tracking system?
14. Are there any legal requirements or industry standards that we need to consider when choosing a tracking system?
    1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
15. Have you had any experience with specific vehicle and cargo tracking system providers that you would recommend?

Key informant interview (KII) questions for the land port customs officials

1. How do you envision vehicle and cargo tracking systems improving efficiency and security at the land port?
2. Would real-time tracking information on incoming vehicles and cargo expedite the customs clearance process?

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

3. Do you see these tracking systems playing a role in reducing customs fraud and improving border security?
   1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
4. How could these systems be integrated with existing customs documentation and processing systems?
5. How would these systems address issues like cargo diversion or smuggling attempts?
6. Are there any data privacy concerns regarding the tracking of commercial vehicles and cargo crossing the border?
   1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
7. Are there any preferred standards or technologies for vehicle and cargo tracking systems used by customs agencies?
   1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
8. How would compatibility be ensured between tracking systems used in different countries for cross-border movement of goods?
9. How would collaboration with customs authorities in origin and destination countries be facilitated through vehicle and cargo tracking systems?
10. What role can customs authorities play in encouraging the adoption of standardised tracking solutions?
11. How do you see vehicle and cargo tracking systems evolving to further enhance land port security and trade facilitation?
12. Could these systems be used to collect data for risk assessments and improve targeting of high-risk shipments?
    1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
13. What training or capacity building would customs officials need to effectively utilise these tracking technologies?
14. What infrastructure upgrades or changes to existing customs procedures might be necessary to effectively utilise tracking systems at the land port?
15. How would you address the potential for technical glitches or disruptions that could compromise the tracking data?
16. How would customs officials access and utilise the tracking data for verification purposes?
17. What challenges do you foresee in implementing vehicle and cargo tracking systems for land port customs operations?
18. In your perspective, what are the long-term benefits of widespread adoption of vehicle and cargo tracking systems for land port customs operations?
19. How do you see these tracking systems evolving in the future to further enhance border security and trade facilitation?
20. Are there any ongoing pilot programs or initiatives related to vehicle and cargo tracking systems that you can share information about?
21. Are you familiar with the TIR Convention and its role in facilitating international road transport?
22. What are the biggest challenges for Bangladesh to join the TIR Convention?
23. Is Electronic Cargo Tracking System (ECTS) currently in use at this port?
    1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
24. If yes, how has ECTS affected the efficiency of cargo movement through this port?
25. How do the TIR Convention and the ECTS complement each other in streamlining cross-border trade?

Key informant interview (KII) questions for the traders (exporters and importers)

1. Are you familiar with vehicle and cargo tracking systems offered by logistics companies?
   1. Yes, definitely 2. Yes, usually 3. Neutral / Unsure 4. No, usually not 5. No, definitely not
2. Does your company currently use any type of vehicle or cargo tracking system for your shipments?
3. If yes, what type of tracking system do you use (GPS, RFID, etc.)?
4. What features of a tracking system would be most valuable to you (e.g., real-time location updates, temperature monitoring, tamper alerts)?
5. What features of a tracking system would be most valuable to you (e.g., real-time location updates, temperature monitoring, tamper alerts)?
6. How important is real-time visibility of your cargo's location during transportation for your business?
7. In your opinion, what are the biggest benefits of using vehicle and cargo tracking systems for international trade?
8. How would improved visibility and data on your shipments impact your decision-making processes (e.g., route optimisation, inventory management)?
9. Have you faced any challenges or drawbacks in using vehicle and cargo tracking systems in the past?
10. What are your biggest concerns regarding the security and privacy of your cargo data during transportation?
11. Are there any additional features or functionalities you would like to see in vehicle and cargo tracking systems?
    1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
12. How important is the cost of implementing a vehicle and cargo tracking system when making your decision?
13. Would your company be willing to pay a premium for enhanced tracking capabilities and real-time data access?
    1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
14. What type of support or training would be most helpful for your company when implementing a new tracking system?
15. Imagine a situation where a shipment is delayed. How would real-time tracking information from a vehicle tracking system help you address this issue?
16. How could improved cargo tracking help reduce the risk of theft or loss of your goods during transportation?
17. In your opinion, how will vehicle and cargo tracking systems evolve in the future of international trade?

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