GUIDE ON ESTABLISHING
AN AUTOMATED CUSTOMS
TRANSIT TRANSPORT SYSTEM
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TABLE OF CONTENTS

TABLE OF CONTENTS ..............................................................................................................i
TABLE OF FIGURES ..................................................................................................................ii
TABLE OF TABLES ....................................................................................................................ii
I. EXECUTIVE SUMMARY ...........................................................................................................1

II. BACKGROUND ........................................................................................................................3

III. REVIEW OF OPERATIONAL AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEMS ............................................................................................................................6

IV. SYSTEM ARCHITECTURE OF AN AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM ...........................................................................................................................13
   A. Component Architecture .........................................................................................................13
   B. Network Domains ....................................................................................................................18
   C. Functional Map .......................................................................................................................20
   D. Process workflows ..................................................................................................................25
   E. General view of the system ......................................................................................................32
   F. Design principles ...................................................................................................................33

V. GUARANTEE MANAGEMENT SYSTEM– KEY ELEMENTS ..................................................37

VI. LEGAL AND REGULATORY FRAMEWORK FOR AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM ...........................................................................................41
   A. Legal regulatory framework ......................................................................................................41

VII. BENEFITS OF AN AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM FOR THE REGION ..................................................................................................................46

VIII. IMPLEMENTATION FRAMEWORK FOR DEVELOPMENT OF AN AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM ..........................................................................49
   A. Suggested contents of the feasibility study .............................................................................50
   B. Approach and methodology ....................................................................................................50
   C. Tasks and activities for the development of feasibility study ..................................................51
   D. Timeline of the implementation of the complete system ..........................................................52
   E. Estimated effort and cost for developing feasibility study .........................................................53

IX. CONCLUSIONS .....................................................................................................................55
TABLE OF FIGURES

Figure 1. Automated customs transit transport system – component architecture .................. 14
Figure 2. Automated customs transit transport system – network domains..............................18
Figure 3. Automated customs transit transport system – functional map.................................20
Figure 4. Automated customs transit transport system – high level overview .........................26
Figure 5. Declaration processing at departure workflow ..........................................................28
Figure 6. Declaration processing at the international border crossings (transit) workflow ...... 30
Figure 7. Declaration processing at destination workflow .....................................................31
Figure 8. Automated customs transit transport system – general view ....................................33

TABLE OF TABLES

Table 1. Mapping of functional map, network domains and logical system components.......17
I. EXECUTIVE SUMMARY

Despite recognizing the importance of freedom of transit by the international community long back, developing a secure, efficient and reliable transit transport system continues to challenge the countries involved. The digital revolution unleashed by information and communication technologies has a potential to fundamentally alter international transit transport processes. As transit transport involves sharing of information among many stakeholders an automated customs transit transport system can enhance the efficiency of transit transport enormously. Therefore, there is a growing recognition of the importance of paperless transit transport systems in facilitating transit and reducing related costs.

The Vienna Programme of Action for Landlocked developing countries adopted by international community in 2014 urges use of modern information communication technologies including electronic exchange of information among border agencies of transit and landlocked developing countries to increase the efficiency of transit transport. Further, article 11 of WTO Agreement on Trade Facilitation on freedom of transit provides, among others, for pre-arrival filing and processing of transit declaration, prompt termination of transit operation if the transit requirements are met, and prompt discharge of guarantees. An automated transit transport system can make it easier for countries involved to comply with these provisions.

In addition, the entry into force of the Intergovernmental Agreement on Dry Ports of International Importance in April 2016 affirms the commitment of the countries in the region for coordinated development of the dry ports. An automated customs transit transport system including a goods and vehicle electronic tracking system can play a significant role in ensuring seamless movement of goods and vehicles between and among the dry ports.

ESCAP member countries are committed to a vision of an integrated intermodal transport system as a key driver of sustainable development. By enhancing the efficiency of cross-border and transit transport an automated customs transit transport system can support the development of such a transport system at subregional/regional level and support regional cooperation and integration initiatives.

The New Computerized Transit System, that facilitates transit transport in European countries, is the only fully operational paperless transit transport system. The success of
this system has been inspiration for the ASEAN Customs Transit System being developed by the countries in Southeast Asia.

In this background, this guide attempts to provide a comprehensive understanding of the main components of an automated customs transit transport system and its working. It goes into details of the components architecture of the system and there interaction. It also elaborates on the key feature of an automated system that is the electronic exchange of messages among various stakeholders at the office of departure, transit and destination.

The guide also explains the functioning of the guarantee system and highlights the use of flexible and comprehensive guarantees and their prompt discharge on completion of transit as its key features.

Legal and regulatory framework requirements for an automated customs transit transport system are also discussed. It is reiterated that meeting the customs related requirements of transit is only one of the many challenges facing the transit transport. As a fundamental premise no transit transport is possible without grant of traffic rights by the transit countries and in this regard need for framework agreement covering all aspects of transit transport is emphasized.

The guide concludes by providing with a roadmap for countries interested in developing such a transit system suggesting a need for a feasibility study. The proposed feasibility study would capture the current state of customs automation and procedures in each participating country and come out with a high level specification for the hardware and software requirements for operationalizing such a system.

This guide complements two earlier studies on the subject developed by ESCAP namely, the study on paperless transit\(^1\) and the guide on paperless transit\(^2\). It is hoped that this guide coupled with earlier studies on paperless transit would deepen the knowledge of the stakeholders about operational aspect of the automated customs transit transport system and also make them aware of the potentialities that exist to leverage information communication technologies to effectively and efficiently complete the regulatory requirements while facilitating transit transport.

\(^2\) http://unnext.unescap.org/tools/GuidePaperlessTransitTM.pdf
II. BACKGROUND

An efficient customs transit transport system is a cornerstone of regional economic cooperation and integration. Freedom of transit is a generally accepted principle in most of legal instruments going back to the General Agreement on Tariffs and Trade (GATT), 1947 (now part of the World Trade Organisation (WTO)). Under the transit regime, goods are transported under customs duty suspension from one customs office to another. Generally, the customs transit system facilitates the movement of goods using road transport over land by accelerating the movement of goods in transit and at borders, but it can cover other modes of transport such as railways.

The trader operating under a transit system is permitted to postpone payment of the import duties and taxes due on the goods until they reach the country where they are declared for home consumption and where payment of the duties and taxes is due. Alternatively after the transit movement is complete the goods may be placed into a customs bonded warehouse at the destination, or re-exported.

Under automated customs transit transport system (ACTTS), there is no need for import, export or transit documentation to be re-submitted as the goods pass through each country. A single electronic customs transit declaration is accepted by the Customs authorities at departure, transit and destination.

Lately, there is a renewed emphasis on digital systems with use of new technologies to deal with challenges in transit transport. New technologies such as satellite positioning systems, cellular communication systems, and radio identification technology enabled electronic seals along with internet makes real time tracking of vehicles a reality. Such systems gives control authorities more confidence about movement of foreign vehicles in their territories and encourage them to open more routes for international transport. Keeping this in view ESCAP developed a Secure Cross Border Transport Model in 2011 to demonstrate potential of new technologies in addressing emerging transit transport facilitation challenges.

The electronic vehicle tracking systems are increasingly becoming important means to facilitate transit transport. Some bilateral and multilateral transport facilitation agreements have provisions to this effect. The recently signed Bangladesh, Bhutan, India and Nepal Motor Vehicle Agreement is a good example of an agreement that contains provision for
tracking of vehicles. A number of such systems are in operation in African countries to facilitate movement of goods in transit.

The goods and vehicle electronic tracking system coupled with electronic transit transport system have a potential to provide secure transit and reduce guarantee associated costs as these costs can be more easily related to the potential risks. Such systems will help in establishing flexible guarantees as compared with some of the existing transit systems that have flat guarantees.

Transit transport facilitation is critical for landlocked developing countries, which depend on transit corridors passing through adjacent countries in order to access sea ports. Such systems will enormously benefit the landlocked developing countries in reducing their overall transit transport costs and accessing regional and global markets.

This is the overarching objectives of the Vienna Programme of Action (VPoA) that was adopted by the second United National Conference on Landlocked Developing Countries in 2014. The VPoA reiterates that a secure, reliable and efficient transit transport system is critical for landlocked developing countries to integrate them into regional and global markets. The VPoA contains numerous provisions urging the landlocked developing countries and the transit countries to modernize transport and transit facilities with full use of information and communication technologies. Some of them are:

- Para 37 (c) LLDCs and transit developing countries to modernize transit and transport facilities including customs and border facilities by fully utilizing the ICT
- Para 51 (c) implement integrated border management systems
- Para 52 (b) promote use of modern customs practices including electronic transactions and exchange of information
- Para 53 (c) implementation of multi-country customs transit guarantee regimes

The VPoA also urges development partners and relevant international organisations to support the countries in setting up such systems.

In addition, the entry into force of the Intergovernmental Agreement on Dry Ports of International Importance in April 2016 affirms the commitment of the countries in the region for coordinated development of the dry ports. The experience of many countries such as China, India, Republic of Korea and Thailand indicates that appropriately located and efficient dry ports can reduce transport costs and boost economic activity. Furthermore, an automated transit transport system along with a goods and vehicle electronic tracking system
can play a significant role in ensuring seamless movement of goods and vehicles between and among the dry ports.

ESCAP member countries are committed to a vision of an integrated intermodal transport system as a key driver of sustainable development. Well-functioning ACTTS can support the development of such a transport system at subregional/regional level by enhancing the efficiency of cross-border and transit transport operations.

In this background, this guide attempts to provide better understanding of and steps to implement an ACTTS, so as to fill the existing gap on the lack of knowledge among the stakeholders on ways to develop paperless transit transport system.

If properly designed and implemented an effective ACTTS would:

- Enable goods to move by land more freely between participating countries;
- Enhance regional competitiveness by lowering transit transport costs especially by reducing guarantee costs;
- Promote co-ordination among national and regional regulatory agencies; and
- Facilitate the expansion of regional trade and transport.

The private sector requires an enabling trading environment in order to maximize the opportunities for commercial activity and facilitate them. This requirement must be balanced by the needs of border authorities to protect societies from the ill effects such as: smuggling of drugs, arms and ammunition, diversion of goods in transit including evasion of customs duties and taxes. An ACTTS would provide a potent tool to achieve this objective.
III. REVIEW OF OPERATIONAL AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEMS

This chapter discusses briefly the fully automated operational customs transit transport systems in order to understand the key elements and requirements of such a system. A fully computerized transit transport system is in operation in the European Union (EU); a similar system is being planned in member countries of Association of South East Asian Nations (ASEAN).

A. New Computerized Transit System

1. Main features of NCTS

In Europe there are three transit systems in operation:

- Community Transit for EU Member States;
- Common Transit for transit between the EU and other countries in the region, notably Iceland, Norway, Switzerland and Turkey; and
- Transports Internationaux Routiers (TIR) system.

Community Transit and Common Transit utilize fully harmonized electronic messages, procedures and processes. Both systems are automated and managed under the New Computerized Transit System (NCTS), which provides a paperless transit system to Customs authorities and the trading community.

The TIR system is the oldest transit system that covers a wide geographical area encompassing Europe, North Africa, Caucasus, Central Asia and Middle East. It was developed as a paper-based system utilizing books of vouchers (the TIR carnet) under which declarants make a series of national transit declarations to Customs authorities at entry and exit of the goods to the different customs territories transited. Goods under TIR must be declared to NCTS if they enter the Common or Community Transit areas. There are plans to automate the issue and return of the TIR carnet under a system called e-TIR.
The duties and taxes at risk under the TIR system are guaranteed by an international insurance pool operated by the International Road Transport Union (IRU) in Geneva.  

There are currently 69 contracting parties worldwide to the TIR Convention, and the TIR system is operational in 58 countries.

The Community Transit System is used for the movement of:

- Non-Community goods between the EU Member States (i.e. goods on which the import duties and taxes have not been paid); and
- Community goods between two points in EU through the territory of a third country. Community goods are home produced goods, or goods on which the import duties and taxes have been paid.

The Common Transit System is used for the movement of: Goods between the EU Member States, the European Free Trade Area (EFTA) countries and Turkey.

NCTS provides a management and control environment for goods under Community Transit, Common Transit and TIR transit, supporting a harmonized operating environment for the trade. One of the main requirements of the system is to support a secure environment for the electronic exchange of standardized data between the trade and Customs authorities, and between the different Customs authorities involved.

The main features of NCTS are:

- Electronic connection of economic operators to national customs offices;
- A single electronic customs transit declaration for the entire journey and electronic processing of the declaration;
- Exchange of electronic messages, between Customs authorities of contracting parties, at each stage of the customs transit procedure, including pre-arrival information automatically distributed from the customs office of departure to the customs offices of transit and the customs office of destination;

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3 https://www.iru.org/en_iru_tir_help#  IRU contracts insurance company (-ies) that provide insurance up to certain amount for each TIR Carnet, latest update around 100 000 EUR per Carnet, backed by single insurance company AXA, managed by IRU. Insurance company (-ies) change over time, but it is always contracted by IRU. (https://www.iru.org/resources/newsroom/tir-guarantee-chain).

4 http://www.unece.org/tir/welcome.html
The possibility to print a customs Transit Accompanying Document (TAD) with bar code included, which provides easily readable information at customs offices of transit and destination;

Simplifications and reduced guarantee for reliable traders;

Integrated customs information systems and guarantee management systems; and

Automated termination and discharge of the customs transit procedure, and quick release of the guarantee.

The rules for the electronic messages, common data sets and format of the data messages, including electronic transit declaration are defined in various technical specifications.

The security of electronic communications and the storage of electronic data are addressed with appropriate measures and arrangements. The Common Communications Network / Common Systems Interface (CCN/CSI)\(^5\) is used for all information exchanges in NCTS and other trans-European systems. It is a value added network operated by the Directorate-General for Taxation and Customs Union (DG TAXUD).

The CCN provides common services to exchange taxation, excise and customs information at reasonable cost, with high rapidity, high security and continuity. CCN was designed between 1993 and 1995 and is operational since 1999. Today, the CCN/CSI relies on:

- The Common Communications Network (CCN), which is composed of a series of physical gateways located either in the national customs administration or on the Commission premises. These gateways are interconnected in a secure way through communications services and locally connected to the application platforms provided by the local site.

- The Common Systems Interface (CSI), which is a set of protocols and application programming interfaces allowing the above-described application platforms to exchange information through the CCN backbone. It ensures the interoperability between the relevant heterogeneous systems in the national customs administration.

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Electronic messages are exchanged between traders and the national customs administration, for the electronic submission of transit declarations and customs responses to these submissions. There is also an exchange of electronic messages between the customs offices of the different Contracting Parties involved, notably between the customs office of departure and the customs offices of transit at borders, and the customs office of destination.

2. **Guarantees under NCTS**

Guarantee is an important part of the NCTS. A guarantee is required to cover potential payment of suspended duties and taxes, which may be incurred in respect of goods placed under the transit regime when the goods are lost en-route or other type irregularities occur. There are different types of guarantee under NCTS, as follows:

- Vouchers\(^6\) issued by transport associations and other institutions, which are paper documents with a fixed amount of €10,000;
- Guarantee undertakings from recognized financial institutions; and
- Cash deposits.

NCTS guarantees may be taken out for individual transit operations (i.e. a single journey guarantee), or may cover multiple journeys (the so-called comprehensive guarantee).

3. **Legal Framework for NCTS**

The legal framework of the Community Transit System is set out in the Community Customs Code, which applies directly to members of the European Union. For the institutional framework, the Community Transit System is managed by the European Commission’s Directorate General of Taxation and Customs Union in Brussels, DG TAXUD. This Directorate General is responsible for managing the standard electronic reference data for NCTS, and ensuring that the common secure data network is available at regional level.

Each participating country is responsible for ensuring that the national electronic environment is in place for the submission of NCTS declarations to Customs authority.

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The declaration is processed by a standard national transit declaration application. The system manages the transmission of standard electronic messages to countries of transit and destination. These national administrations are also responsible for handling queries, and supplying helpdesk functions. DG TAXUD also manages functional enhancements to NCTS, along with committees representing EU Member States. The European Parliament and Council also have an overseeing role in monitoring the results of the automation of transit procedures under NCTS.

The Common Transit System is based on the Convention on a Common Transit Procedure of 20 May 1987. The system is managed by an EU-EFTA joint committee, now including Turkey as a contracting party to the Convention.

B. ASEAN Customs Transit System

Another fully automated customs transit transport system is the ASEAN Customs Transit System (ACTS), which is being implemented in the ASEAN region.

1. Main characteristics of ACTS

The ACTS is being piloted in Malaysia, Thailand and Singapore in 2016. It contains many of the features of the Community and Common Transit systems, with the following main characteristics:

- Traders will make a single, standard, electronic declaration for each transit movement of goods;
- Each transit movement will be covered by a single guarantee\(^7\) to cover the duties and taxes at risk, valid in all countries. The guarantee is provided by banks and other approved financial institutions;
- Separate declarations and other documents or guarantees at national level are not required. The transactions are managed at regional / international level and the system is enabled by a computerized network that links Customs authorities across the region;

\(^7\) Under ACTS only banks will be permitted to act as guarantors
The network enables the exchange of standardized electronic messages between the customs offices of departure, transit and destination;

An integrated guarantee system is in place for managing the duties and taxes at risk, including rapid write-off of guarantee amounts following successful delivery of goods to the customs office of destination;

Tracking of transit consignments by Customs authorities at departure, transit and destination via electronic message exchange and logging of events in the system;

No separate declarations or guarantees are required for the means of transport or the container;

The means of transport are approved by ASEAN transport officials following the technical standards laid down in Protocols 3 and 4 of ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT);

Simplified procedures will be available to reliable traders with good revenue records and are able to demonstrate their competence in the customs transit environment;

Multiple journey guarantees that cover a number of transactions will be used in the majority of instances and these may be reduced or waived in the context of the approval to use simplified procedures;

Simplifications for reliable traders include loading of goods at departure at the trader’s own premises, including commercial sealing of vehicles;

Similarly reliable traders will be permitted to deliver transit goods to their own premises at destination; and

As part of the risk management strategy, traders may apply to use the ACTS and a number of the simplifications available that will be judged and approved or denied by the national Customs authority in whose national territory the trader is based. This will consist of a rigorous examination of the financial circumstances of the trader, the business in which he is engaged, the goods that will be moved across which routes and to which destinations, the transporters to be used and sub-contracted, his current revenue record and the level of secure IT system that can be provided to link with the customs ACTS network. Based on this analysis the trader will be accorded an appropriate level of approval and simplification.
2. Legal framework for ACTS

The legal framework of the ASEAN Customs Transit System is set out in the AFAFGIT and its protocols, notably protocol 7 (Customs Transit). The system is managed by ASEAN Member States, with the support of the ASEAN Secretariat in Jakarta, Indonesia, through official ASEAN working groups, as follows:

- The Sub-Working Group on ACTS of the Customs Procedures and trade Facilitation Working Group (SWG-ACTS);
- The Customs Procedures and Trade Facilitation Working Group (CPTFWG);
- The Transport Facilitation Working Group;
- The Transit Transport Coordinating Board (TTCB) bringing customs and transport responsibilities together;
- ASEAN Customs Directors General, reporting to ASEAN Ministers of Finance; and
- Senior Transport Officials, reporting to Ministers of Transport.

The AFAFGIT consists of nine separate Protocols, seven of which relate to transport harmonisation relating to the implementation of standards for the movement of trucks. Two Protocols relate to customs harmonisation requirements: Protocol 7 covers the legal, procedural and documentary requirements for the ACTS and Protocol 2 covers the designation of frontier offices.

ASEAN Member States are aware that in addition to building and implementing the application software, there is a need for a central management team (CMT) to support the ACTS on an on-going basis and the intention is to have this in place within three to four months after the start of the ACTS pilot phase. The CMT will manage the central services of the ACTS, the help desk, on-going requirements for training and user documentation.
IV. SYSTEM ARCHITECTURE OF AN AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM

This chapter details the system architecture of ACTTS. It identifies system components and their distribution over the network domains required to ensure overall system security and interoperability. It also outlines the functional map of the system components that implements the indicated workflow of the transit procedure.

System architecture of an ACTTS consists of:

A. Component architecture: defines key elements of the ACTTS in terms of actual IT application
B. Network domains: describes network topology that ensures system security and interoperability
C. Functional map: outlines the functionality to be covered by the system
D. Procedure workflow: describes end-to-end automated customs transit procedure including required message exchanges
E. Design principles: indicates the need for system security, reliability and modularity

A. Component Architecture

The component architecture provides the conceptual view of the ACTTS by identifying the required logical systems for the implementation of functionality outlined in the functional map (figure.3). It also depicts the deployment locations of logical systems within the defined network domains (figure 2).

The component architecture is presented at figure 1.

1. Description of elements in component architecture

i. Trader users

The trader users are located in the external domain and use a standard web-based user interface of the trader portal that can be accessed through a web browser of their choice.
ii. **Trader systems**

The trader systems are also located in the external domain and refer to trader enterprise resource planning systems (ERPs) that they use in their operations. These systems connect to the web services of the trader portal of the ACTTS exposed to the external domain using XML interface. This allows electronic message exchange between traders’ ERPs and trader portal.

![Diagram](image)

*Figure 1. Automated customs transit transport system – component architecture*
### iii. Logical systems

The table below provides the mapping of logical systems and functional components defined in the functional map and further notes on each system.

<table>
<thead>
<tr>
<th>Logical system</th>
<th>Network domain</th>
<th>Functional component</th>
<th>Group</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trader portal</td>
<td>National domain</td>
<td>Declaration submission and follow-up, Queries</td>
<td>Trader</td>
<td>Implements declaration submission by traders, reception of notification messages from National transit application (NTA) and display of these notifications to traders, etc.</td>
</tr>
<tr>
<td>National transit application (NTA)</td>
<td>National domain</td>
<td>Customs transit</td>
<td>Customs</td>
<td>Implements all main and exception process workflows of ACTTS</td>
</tr>
<tr>
<td>Guarantee management system (GMS)</td>
<td>National domain</td>
<td>Guarantee management</td>
<td>Customs</td>
<td>Implements guarantee management and guarantee related message exchanges</td>
</tr>
<tr>
<td>Risk management system (RMS)</td>
<td>National domain</td>
<td>Risk management</td>
<td>Customs</td>
<td>Implements risk management functionality and risk assessment of declaration data</td>
</tr>
<tr>
<td>Trader repository (TR)</td>
<td>National domain</td>
<td>Reference data management</td>
<td>Customs</td>
<td>Implements trader registry functionality, which includes trader information management and management of simplified procedure authorizations of authorized transit traders</td>
</tr>
<tr>
<td>User management system for</td>
<td>National domain</td>
<td>User management</td>
<td>Trader</td>
<td>Implements user and access rights management for trader users. Managed by</td>
</tr>
<tr>
<td>Logical system</td>
<td>Network domain</td>
<td>Functional component</td>
<td>Group</td>
<td>Notes</td>
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<td>---------------------------</td>
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<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>external users (UMS-EXT)</td>
<td></td>
<td></td>
<td></td>
<td>customs only, traders are assigned their user accounts by customs</td>
</tr>
<tr>
<td>User management system for internal users (UMS-INT)</td>
<td>National domain</td>
<td>User management</td>
<td>Customs</td>
<td>Implements user and access rights management for customs officer users</td>
</tr>
<tr>
<td>Reference data system (RDS)</td>
<td>National domain, Central services domain</td>
<td>Reference data management</td>
<td>Trader, Customs, Central authority</td>
<td>Implements reference data management and distribution services</td>
</tr>
<tr>
<td>Goods and vehicle tracking (GVT)</td>
<td>National domain</td>
<td>Goods and vehicle tracking</td>
<td>Customs</td>
<td>Implements real-time tracking of goods and vehicle including message exchange for violations on integrity of goods and transit route and other agreed parameters</td>
</tr>
<tr>
<td>Management information system (MIS)</td>
<td>Central services domain</td>
<td>Statistics management</td>
<td>Central authority</td>
<td>Implements statistics collection, calculation and presentation services</td>
</tr>
<tr>
<td>Information portal</td>
<td>Central services domain</td>
<td>Information portal</td>
<td>Central authority</td>
<td>Provides general information about the system to the public and restricted information to the registered users</td>
</tr>
<tr>
<td>User management</td>
<td>Central services</td>
<td>User management</td>
<td>Central authority</td>
<td>Implements user and access rights management for</td>
</tr>
<tr>
<td>Logical system</td>
<td>Network domain</td>
<td>Functional component</td>
<td>Group</td>
<td>Notes</td>
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<td>---------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>------------------------------------</td>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>system for central services users (UMS-CS)</td>
<td>domain</td>
<td></td>
<td>central authority users</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td>National domain, Central services domain</td>
<td>Administration and monitoring</td>
<td>Trader, Customs, Central authority</td>
<td>Implements logging, audit trail and system monitoring functionalities in each logical system separately</td>
</tr>
<tr>
<td>Communication gateway</td>
<td>National domain, Central services domain</td>
<td>Integration services</td>
<td>Trader, Customs, Central authority</td>
<td>Web services of trader portal (XML interface) are exposed to external domain, National domains of participating countries and Central services domain communicate over communication network (Internet) in a secure manner using the services of a communication gateways</td>
</tr>
</tbody>
</table>

Table 1. Mapping of functional map, network domains and logical system components
B. **Network Domains**

This section describes network domains of the ACTTS. Separation of the system into network domains is necessary to apply appropriate levels of security in different network domains to protect the privacy of data and varying needs of the users that include traders, customs officers and public.

External and national domains in each participating country are established by each country separately. Existing security policies of each participating countries will apply in their respective external and national domains.

Common domain will be established by joint effort of participating countries. Common security policies have to be agreed between participating countries and applied in the Common domain by all participating countries as per the agreement.

Network domain topology is depicted in the following figure overlapping precisely the functional map of the system.

![Network Domains Diagram](image)

*Figure 2. Automated customs transit transport system – network domains*
1. **External domain**

The External domain contains external users and their systems. External users may include traders, customs brokers, freight forwarders, transporters, or other public users that collaborate with Customs administration in the context of customs transit.

External domain users interact with trader portal, which is located in national domain, using web browsers or web services (XML interface). External domain is considered untrusted, since it is the most vulnerable to security attacks.

2. **National domain**

The national domain is trusted and controlled. It hosts the customs transit system components that implement functional components of the system defined in trader and customs groups. It could be further split into network zones to differentiate between security levels depending on hosted components, such as demilitarized zones for communication services with external and common domain and customs transit transport system zone where customs transit transport system components are hosted.

Demilitarized zones (DMZ) are setup on the perimeter of all the domains – national, external and common. DMZs are used to host firewalls, reverse proxies and other security components to implement security policy along the gateways for communication services between different network domains.

Customs transit transport system zone is a network zone in the national domain that hosts ACTTS components.

3. **Common domain**

The Common domain is a trusted and controlled zone that includes the secured communication network over which electronic messages are exchanged among participating countries and central services components of the system. It could be further split into network zones similarly to national domain as it hosts components that can be accessed by public users and communicates with national domains over the secured communication network.
C. Functional Map

To enable the implementation of the complex process workflows of the transit procedure a number of high level functional areas have to be implemented by a synthesis of integrated system components that satisfy both national and regional requirements.

The functional map is depicted in the figure below.

![Automated Customs Transit Transport System - Functional Map](image)

*Figure 3. Automated customs transit transport system – functional map*

The elements in the functional map are elaborated below:

1. Traders
   
   i. Declaration submission and follow-up

   The objective of this functional component is to assist and facilitate traders with their day-to-day business tasks such as submit declarations, receive release notifications from customs, submit arrival notifications, query guarantee balance. It provides services and supports the business processes available to the traders.
ii. Queries

This functional component allows traders to submit various pre-defined queries to customs transit and guarantee management components of customs in relation to their transit movements and guarantees.

2. Customs

i. Customs transit

The customs transit functional component supports the overall processing of transit movement which is driven by the customs transit declaration. It implements both main and exception process workflows at the customs office of departure and destination, which include processes such as for acceptance, amendment, control, release, cancellation of transit declarations. It monitors goods through electronic communication between customs offices of departure and destination for arrival notification and destination control results and customs offices of departure and transit for the registration of frontier crossing.

Finally, this component interfaces with a number of other supporting components of transit process workflows, e.g. risk management, guarantee management, reference data management, and goods and vehicle tracking.

ii. Guarantee management

The guarantee management functional component provides services for the management of various types of guarantees used in transit procedure, e.g. single journey and multiple journey guarantees, cash guarantees, vouchers, insurance-based guarantees. These services are considered as supporting services to the declaration processing. In addition to the management of guarantees it implements the guarantee related message exchange as well.

iii. Risk management

The Risk management functional component offers services in the application of risk management and risk assessment in transit procedures. In particular, it enables the efficient selectivity, profiling and targeting of high risk consignments. This enables Customs authorities to effectively and efficiently manage inspection processes.
iv. Goods and vehicle tracking

The goods and vehicle transit tracking component uses information from electronic seal(s) and tracking unit through satellite positioning system and cellular communication system for real time tracking of goods and vehicles. It sends message(s) if electronic seal is tampered or there is route diversion to designated official(s). This component is however, optional, and may be installed by Customs authorities for real time tracking in their country or may be extended to countries as agreed by them.

ESCAP developed a secure cross border transport model way back in 2012\(^8\) to provide concept and general design for use of these technologies in cross border and transit transport. Effective implementation of such systems based on the model can give confidence to the control authorities on the goods and vehicles moving on their territory and thereby reduce guarantee requirements as well open more routes for international transport. The model shown in figure 3(a) below provides for:

- Provides concept for vehicle tracking system;
- Uses new technologies such as radio frequency enabled electronic seals;
- Physical inspection at origin/destination addresses concerns of security, diversion of goods;
- Balances control requirements and facilitation;
- Facilitates cooperation among border agencies both behind and across the border.

\(^8\)http://www.unescap.org/sites/default/files/SCBM-fulltext_0.pdf
3. **Central Authority**

Central Management Team (CMT) acts as central authority to support the participating countries. Among other responsibilities, which are discussed in section VI, the CMT will manage the central services of the system, namely:

- an information portal;
- a reference data; and
- statistics.

i. **Information portal**

This functional component provides general information about the system to the public and restricted information to the registered users of the portal, such as customs officers of the countries that are using the system.

ii. **Reference data management**

The reference data management functional component provides services related to the management of code lists, e.g. country codes, package codes, language codes, currency codes and rates, commodity codes, trader registry, transport permit registry.
As the reference data must be synchronized between all components of the system for data consistency and interoperability purposes, this component is distributed over all sites of the system and synchronisation services are in place to ensure data consistency.

The reference data can be managed by customs nationally and by a designated central authority regionally depending on the reference data type. There are several reference data types:

- Regional reference data that are used regionally, e.g. country codes, language codes, commodity codes, currency codes. These reference data are managed regionally by designated central authority and are used by all participating countries for data validation purposes.
- National reference data that are used regionally, e.g. customs office codes, duties and taxes, transport permit registry. Each participating country manages its own set of reference data within regionally defined reference data lists which are used by all participating countries for data validation purposes.
- National reference data that are used nationally, e.g. country specific documents types, trader registry information. These reference data are managed nationally by the Customs authority of the participating country that requires the specific reference data lists for data validation purposes nationally.

One of the main challenges of managing reference data is to agree on common commodity code list that is harmonized between participating countries and includes duties and taxes per country and per commodity code. In essence this commodity code list is a simplified version of a harmonized tariff. Other required code lists do not present significant challenges, due to the fact that they are mostly based on existing international standards, such as ISO and UN/CEFACT standards.

**iii. Statistics management**

The statistics management functional component manages the calculation and provision of transit movement and message exchange based statistics. It collects, processes, and distributes technical and operational statistics.
4. **User management**

The user management functional component provides services for user and access rights management. It allows creation of user groups and assignment of access rights to those groups. One user management functional component must be available for each functional group (trader, customs, and central authority) for security reasons. Traders should get their user accounts assigned and managed by Customs authorities to prevent unauthorized registration into the system.

5. **Administration and monitoring**

The administration and monitoring functional component offers services for the administration of the system, such as collection of information to monitor system’s operation such as log files and audit trail. In addition, it provides services for the configuration of the system.

6. **Integration services**

ACTTS consists of a number of system components which have to interact with each other. The technical component provides services of integration between system components, which include messaging services enabling exchange of electronic messages and security services to ensure secure message exchange.

D. **Process workflows**

The process workflows of ACTTS can be grouped into the following workflow groups:

Main workflows:

- Declaration processing at departure
- Declaration processing at the international border crossings (transit)
- Declaration processing at destination

Exception workflows:

- Cancellations
- Amendments
- Diversions
- Processing enquiries
• Processing recoveries

A high level overview of the transit process work flows is presented in Figure 4.

![Figure 4. Automated customs transit transport system – high level overview](image)

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9 Based on ACTS Customs transit within ASEAN Member States – An introduction- Deliverable of ARISE within the ACTS project done by the consultant who has drafted the study
In particular, the main flow of activities and information is depicted in the following subsections and diagrams covering main workflows. Information is exchanged via electronic means using information exchange (IE) messages of predefined structure that can be validated electronically.

The process workflows and structure of IE messages have to be agreed between participating countries and documented in high level functional system specifications document, which would then be used as a basis for the definition of the detailed system architecture and requirements.

The main electronic messages used in the main workflows are the following:

- The electronic transit declaration data (IE015)
- The allocation of movement reference number (MRN), a unique transit movement registration number given by the system to the transit declaration to identify the movement after acceptance of transit declaration (IE028)
- The anticipated arrival record (AAR) message, sent by the office of departure to the declared office of destination (IE001)
- The anticipated transit record (ATR) message, sent by the office of departure to the declared office(s) of transit to notify the anticipated border crossing points of a consignment (IE050)
- The release for transit message, sent by the office of departure after having checked the consignment to confirm that the transit movement can actually start (IE029)
- The notification crossing frontier (NCF) message (IE118) is used to notify office of departure about the passage of the goods over each international border crossing along the transit route
- The arrival notification message, sent to the office of destination to notify customs when the goods arrive at destination (IE007)
- The arrival advice message, sent by the office of destination to the office of departure when the goods arrive (IE006)
- The control results message, sent by the office of destination to the office of departure after the goods have been inspected, where necessary (IE018)
- The guarantee use message, sent by the customs office of departure to customs office of guarantee (IE203)
- The guarantee use result message sent as reply by customs office of guarantee to customs office of departure after automated control and registration of the use of the guarantee (IE205)
- The guarantee use cancellation sent after termination of customs transit procedure, which will enable automated release of guarantee, once the customs procedure is discharged (IE204)

The electronic messages are defined based on best practices proven in operational NCTS\(^{10}\). ACTS which is currently under development in the ASEAN region uses the same set of electronic messages with some differences in their structure.

1. Declaration processing at departure workflow

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The declaration data is submitted (IE015) to the customs office of departure by the transporter/trader at departure.

When the declaration is valid, the customs office of departure accepts the declaration and a new movement reference number (MRN) is automatically generated and uniquely assigned to the particular transit movement. The MRN is then communicated (IE028) to the trader at departure.

If it is deemed necessary, e.g. based on risk analysis results, customs officer at the customs office of departure inspects the documentation and/or the goods and registers the control results in the system.

Guarantee usage is registered in the system and the balance of the multiple journey guarantee, if such is declared in the declaration data by the transporter/trader, is maintained. The guarantee usage is registered in the system by exchanging the guarantee use (IE203) and guarantee use result (IE205) messages between customs office of departure and customs office of guarantee.

On release of the goods, the customs office of departure transmits details of the customs transit declaration to the customs office of destination using the anticipated arrival record (AAR) message (IE001) and to each customs office of transit using the anticipated transit record (ATR) message (IE050).

The release of the goods is communicated to the transporter/trader at departure using the release for transit (IE029) message.
2. Declaration processing at the international border crossings (transit) workflow

At each international border crossing along the transit route, the customs office of transit records the passage of the goods against the anticipated transit record (ATR) message (IE050) received from the customs office of departure. The passage of the goods is notified to the customs office of departure using the notification crossing frontier (NCF) message (IE118). Note that, unless single stop inspection (SSI) is implemented on an international border crossing, there will be two customs offices of transit at each international border crossing.
3. Declaration processing at destination

![Diagram of declaration processing at destination workflow]

Figure 7. Declaration processing at destination- workflow

The arrival notification (IE007) message is sent by the trader at destination to the customs office of destination to notify customs of the arrival of the consignment. The customs office of destination sends the arrival advice message (IE006) to notify the customs office of departure of the arrival of the goods.

The customs office of destination forwards the control results message (IE018) to the customs office of departure. In case the inspection of documentation and/or goods occurred based on risk analysis performed by the system the control results message contains actual inspection results, otherwise it indicates that the inspection was not performed at destination.

At this point, guarantee usage registered earlier at departure is released. Both trader at departure and trader at destination are notified of the write-off of the particular transit movement via write-off notification message (IE045) and release of goods from transit via release notification message (IE025) respectively.
The above described are the main workflows of an ACTTS enabled by electronic message exchange.

A number of additional workflows and related information exchange messages need to be defined to cover for all eventualities, such as declaration cancellation or amendment, diversion of the truck to a customs office other than the one initially declared, enquiry and recovery procedures for the cases of lost goods or fraudulent declarations.

Although such a system may seem overly complicated at a first glance, because of the automation involved most of the actions are performed automatically by the system and all information is recorded and readily available, enabling customs officers to concentrate on the important part of their work and providing them with a comprehensive real time and historic information on the transit activity in the interconnected region.

With addition of simplified procedures along with comprehensive risk management system, the automation is further increased, allowing the system to process transit movements from authorized transit traders autonomously without interference of a customs officer, unless deemed necessary.

E. General view of the system

To better visualize the overall view of the ACTTS the following figure shows National domains of multiple countries connected to the communication network (internet) via their own communication gateway.

Central services domain is also connected to the same network using the communication gateway. It is important to note that all communications between different domains in the network are point-to-point and does not need to go through any central services domain. Central services are there only to provide reference data services and statistics collection services for data consistency and interoperability purposes.
Figure 8. Automated customs transit transport system – general view

F. Design principles

1. General Principles

The system design must respect the following architectural and design principles:

- It must be based on the state-of-art technological standards and proven design patterns to ensure that the system is future proof.
- The system must adhere to the three-layer architecture. To allow easy maintenance and functional extensibility of the system in the future, implementation of the user interface of the system must be separated from the implementation of process workflows. Furthermore, the system must use a data storage layer (database) which is also separated from both the implementation of process workflows and the implementation of the user interface.
- Process logic must be encapsulated as distinct units with well-defined interfaces to ensure modularity. This will allow replacement of distinct system components without changing the programming of the rest of the system.
A pool of common reusable services must exist to ensure consistency of functionality and data. Such services are typically related to user authentication, electronic message validation, and validation against reference data of the system.

The solution should not be bound to specific products and IT platforms as much as it is possible to ensure easy migration of the system from one IT platform to another in the future.

Configurability should be preferred over hard-coding where applicable to minimize future efforts to implement changes.

It must provide security mechanisms for authentication, access control, auditing, confidentiality, and privacy of information.

The system front-end must be user friendly and adhere to modern usability standards.

The system must support the existing communication load and must be easily scalable to ensure support for any future load increases.

2. **Security**

Information within the system modules is considered valuable and must be protected. This information is an important asset of the solution and plays a primary role in achieving the objectives of the system. Nowadays, information can be manipulated from digitally stored data in geographically dispersed locations. In such an environment, risks of unauthorized access to information; erroneous data insertion; information revelation; and information alteration or destruction emerges.

Information system security is a continuous challenge which involves use of technology. Failure to implement the desired level of security policies would adversely affect system’s objective. Therefore, ensuring suitable level of information integrity, confidentiality and availability is a primary step towards the success of the system.

Government organizations worldwide have a set of security requirements that are summarized below:

- **Authentication and access control:** Authentication of the identity of the person performing the transaction. Creation of a powerful authentication mechanism in order to determine the identity of the person on behalf of whom each transaction is performed. Each user is granted access rights based on his/her identity.
• Directory services: The storage area for user IDs and passwords. It offers one place for an organization to view system access across the company.

• Single sign-on and self-service: The ability to sign on to a system once and then move through the organization’s networks without having to repeatedly re-authenticate. Also includes the ability to reset passwords without the assistance of the IT help desk.

• Data integrity: The completeness, accuracy and validity of data must be guaranteed. Mechanisms and processes ensure the protection of information from modification coming from unauthorized users.

• Information confidentiality: Confidential information should be concealed from unauthorized users. The result of unauthorized access to confidential information has negative impact on the organization’s reliability. Also, penal prosecutions against the organization for revealing personal information might be made, especially if the data revealed are personal sensitive data.

• Non repudiation: The operation framework must not allow for disputing the order for execution of a transaction, nor for verifying the execution and the final result distribution. Time-stamping mechanisms and use of digital certificates provide the desired results.

• Availability of systems and services: The information systems and the services they offer must always be available for use. The continuous flow of information as well as the availability and response of information systems must be ensured. Failure of availability can also mean weakness of the organization to perform its business activities.

• Accountability: This capability strengthens the information security infrastructure by offering capabilities of non-repudiation for performing specific actions from the side of user such as: preventing the security violation of an information system; investigating and identifying error cases; detecting and preventing possible intrusions; and keeping proof data.

3. **Reliability**

In the case of distributed systems where a number of parties participate, the IT applications should pass various modes of testing apart from typical application testing activities in order to ensure conformity with the common specifications that govern the
system. Therefore, the ACTTS should also follow such principle in the context of implementation. The various modes of testing that should be applied are listed below:

- Integration testing: tests various components of the system in the context of the system as a whole.
- National compliance testing: tests the complete functionality of each component of the system including security testing.
- Conformance testing: ensures compliance of the system with the agreed protocol for information exchange in the context of interoperability among countries. Semi-automated testing tools should be developed and used to facilitate conformance testing.
- International testing: tests operations of the whole system in the context of simulated live operations with all system sites involved in the testing. This mode of testing requires successful completion of conformance testing to ensure that all interconnected sites are interoperable in advance of international testing. This can also take shape of pilot operations.

4. **Modularity**

When implementing modern IT systems, it is critical to maintain modularity. Instead of implementing all functionality in one big system, it is a good practice to implement logically distinct functional responsibilities in separate system components, for example risk management and guarantee management. To ensure exchange of information between various system components, well-defined interfaces have to be implemented between them.

Good system design and implementation of functionality in separate system components will allow replacement of or changes in distinct system components in the future without changing the programming of the rest of the system. Modularity will also allow for easier integration to other Customs systems in the future, such as post-clearance audit system, import and export systems.
V. GUARANTEE MANAGEMENT SYSTEM– KEY ELEMENTS

This chapter introduces the concept of guarantees for the duties and taxes at risk on transit movements.

Guarantee management system under the automated transit transport system supports broad range of guarantee types and uses decentralized guarantee provision system based on existing guarantee provision systems in private banking and insurance sectors as opposed to guarantees issued by one central guarantor. This allows not only for reduction of guarantee costs, but also ensures stability of the guarantee system as a whole, due to liability distributed over multiple guarantors.

The Principal is required to provide a guarantee to cover payment of the customs debt which may be incurred in respect of goods placed under the transit regime. Under customs transit the duties and taxes are suspended, and will be paid when the goods are brought to home consumption after the transit operations is finished. Alternatively, the goods may be re-exported, in which case no duties and taxes are due.

If under customs transit operations the goods are illegally diverted to home use without the payment of the duties and taxes due, the Principal must pay the duties and taxes due. Whilst the Principal as the declarant to the transit operation is always liable for the duties and taxes due on the goods under customs transit movement, there may be circumstances where the principal cannot pay, for example in cases of bankruptcy. In these cases Customs authorities will make a claim from the guarantor. So for each transit operation, a guarantee must be taken out to cover the duties and taxes at risk.

These guarantees must to be lodged with the customs office in the country of departure, where they will be registered by the ACTTS. At the departure of a new transit movement, the Principal will submit a transit declaration to Customs authorities. The duties and taxes at risk will be calculated electronically by the system and validated against the guarantee to ensure there is a sufficient amount of guarantee coverage.

Once the transit movement has been completed satisfactorily, in the case of single journey guarantees, the system cancels the guarantee electronically. In the case of multiple journey guarantees, by the system will re-instate the amount of duties and taxes calculated at departure, to replenish that proportion of the guarantee for further use.
The main requirements for a guarantee management system include:

- The definition of a simplified guarantee environment under which a single guarantee undertaking from a recognized financial institution is permitted to cover the duties and taxes at risk on a transit consignment throughout all the countries of the whole transit journey. It must be covered in regional legal and national regulatory frameworks.

- These guarantee undertaking documents should cover both single journeys and multiple journeys, to reduce the administrative burden on the trading sector.

- The guarantee is to be invoked only in cases where the goods under transit have been diverted to home consumption without the payment of the duties and taxes due, and the Principal trader (the company under whose authority the transit declaration has been submitted) has not paid the duties and taxes due.

The guarantor is established in the territory of the Contracting Party where the guarantee is furnished and is approved by the Customs authorities of that territory. The guarantor need to indicate an address for service in the territories of each of the Contracting Parties involved in the transit operation for which he is acting as guarantor.

The liability of the guarantor is based on the acceptance of his guarantee by the customs office of guarantee in the country of departure. It becomes effective from the date the customs transit declaration which he guarantees is accepted by the customs office of departure.

In the case of a single or multiple journey guarantee the liability of the guarantor is limited to the maximum amount shown in the guarantee.

A single journey guarantee covers the full amount of the customs debt liable to be incurred on the transit operation concerned, which is estimated by the transit declaration processing application on the basis of the highest rates of duties, taxes and charges applicable to the goods in the territories covered by the transit operation. The most common forms of guarantees are guarantee undertakings issued by recognized financial institutions, usually banks.

Single or multiple journey guarantees may be provided in the following form(s):

(a) a cash deposit lodged with the office of guarantee

(b) guarantee vouchers issued to the Principal by a guarantor or trade association
(c) a customs bond issued by a recognized trade association

(d) an insurance-based guarantee

(e) a guarantee undertaking given by a guarantor such as a bank.

The acceptable form(s) of guarantee will be determined by the customs office of guarantee in the territory of the country in which the customs office of departure is located.

The Principal may use single journey guarantee paper-based vouchers issued by a Guarantor. In this case the Principal must deliver to the customs office of guarantee single journey guarantee vouchers to the value of the total amount of the customs debt which may be incurred. The guarantor shall indicate on the single journey guarantee voucher the territory of the Contracting Parties for which it is valid, the validity period of the said voucher and the last date on which it may be used.

If the guarantee voucher has been accepted by the customs office of departure on or before the final date of validity, the said voucher remains valid until, the transit operation to which, it relates terminates. Single journey guarantee vouchers must be uniquely numbered and conform to a format to be agreed by the Contracting Parties.

A guarantor may provide a single journey guarantee to cover a single transit operation. The single journey guarantee conforms to a format to be agreed by the Contracting Parties and contain the name of the Principal and its value equivalent to the value of the total amount of the customs debt which may be incurred. Each single journey guarantee is lodged with the office of guarantee and a copy of the guarantee is retained by the customs office of departure. Upon the discharge of the transit operation, a single journey guarantee is cancelled and the guarantor is advised accordingly.

The Principal may use a multiple journey guarantee based on a reference amount. The reference amount is equivalent to the value of the total amount of the customs debt which may be incurred in respect of the goods which the Principal places under the transit procedure at any one time.

The amount to be covered by a multiple journey guarantee is equivalent to the reference amount. A Principal that satisfies criteria regarding his experience, reliability and financial standing may be authorized to provide a guarantee for a reduced amount or to
have a guarantee waiver, subject to the agreement of the Contracting Parties involved in the transit operations.

The amount of guarantee required may be reduced where the Principal demonstrates he has sufficient experience of customs procedures and cooperates very closely with the competent authorities. A guarantee waiver may be granted to exceptionally reliable traders, who are able to demonstrate that they possess sufficient financial resources to meet their obligations.

The guarantor undertakes to pay the customs debt, due under the customs laws and other relevant laws and regulations of the Contracting Party in which an irregularity has been identified in connection with a transit operation. The guarantor is liable, jointly and severally with the Principal, for the payment of such sums.

The liability of the guarantor commences when a customs transit declaration which he guarantees is accepted by the customs office of departure and is applicable to the competent authorities of that country. The guarantor is automatically liable to the competent authorities of each succeeding country at the time when the goods enter the territory of each succeeding country.

Guarantee management system operations are described and depicted along with the main transit workflows in section D.
VI. LEGAL AND REGULATORY FRAMEWORK FOR AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM

This chapter indicates some important reforms of current customs transit control procedures to act as a basis for the ACTTS. The changes can be agreed through a multilateral agreement followed by their incorporation at the national level.

A. Legal regulatory framework

In order to offer an integrated, seamless and facilitated end-to-end trading environment to economic transit operators, it is recommended that the legal framework is transposed into national law. The national regulatory framework should address each of the following aspects, and should include the need for all official agencies at the borders to act in a co-ordinated manner to facilitate the movement of goods across borders. In many cases the Customs authorities may provide agency work for other Government departments, for example in verifying permits of licences issued by the Ministry of Trade or the Ministry of Agriculture.

1. Approved transit routes

Each contracting party must designate the routes which international transit movements are permitted to utilize. These routes are most relevant to transit countries. For countries of departure and destination, account must be taken of the needs of reliable traders to load and / or unload goods at their own premises, which may be distant from the approved transit routes. In all cases, the most economically convenient route should be permitted for the trader to be able to travel in order to join the approved transit route.

2. Approved frontier offices

At international borders, contracting parties must identify the office where controls will be carried out. It is recommended that the layout of roads at border posts is specially designed to minimize the risk of congestion. Ideally the road layout should include a red channel for goods that require physical inspection, a green channel for documentary checks and an express lane for the most reliable traders to utilize for speedy clearance through the border. These facilities may be supplemented by RFID-based tags for barrier control, and additional equipment such as x-ray scanners.
3. **The number and type of authorized road vehicles**

It is recommended that there should be no limit on the number of vehicles utilising the ACTTS. However, in the beginning, there may be commercial sensitivities relating to the status of the transport industry on each contracting party. That is, if one country has a large, competitive and well-invested transport industry, the neighbouring countries may propose limits on the number of trucks that are permitted to use the transit system, at least for an initial period.

The framework may include the standard technical specifications of transit goods vehicles, to be agreed by all contacting parties. These specifications can include vehicle weights and dimensions, safety aspects including braking distances and environmental issues such as emission standards.

For transit an essential element is the security of the load compartment in which the goods will be transported. It is essential that the load compartment is capable of being sealed in such a way that goods cannot be extracted or introduced into the load compartment without breaking the seal.

4. **Third party vehicle insurance**

Road vehicles transporting goods under transit transport arrangements must have valid third party vehicle insurance, covering all the countries of departure transit and destination, so that any damage caused by the vehicle to third party property or individuals can be suitably reimbursed. The scope and level of coverage needs to be agreed between contracting parties. Ideally an international insurance group should participate in a regionally-accepted third party insurance scheme, in order to facilitate the provision of such policies, and the settlement of any claims under the insurance policies.

5. **Customs transit**

The framework should cover all aspects of the proposed ACTTS, specifically:

- The guarantee system, under which a single guarantee covers the duties and taxes at risk throughout the entire transit operation from start to finish;

- The validity of electronic transit declarations;
• The customs control procedures at departure, transit and destination;

• The simplifications offered to reliable traders, notably:
  o Permission to load / unload transit goods at commercial premises;
  o Exemption from the requirement to use approved transit routes at departure and destination;
  o Permission to utilize commercial/electronic seals;
  o Use of multiple journey guarantees; and
  o Provision of guarantee reductions and waivers.

• Exemption for the means of transport from the need for a guarantee or a customs declaration;

• Permission for qualifying vehicle to be able to pick up return loads in any contracting party; and

• Clear administrative procedures in cases of irregularity, involving mutual assistance between the Customs authorities of contracting parties for the pursuit of enquiries and the settlement of claims.

6. Other documentary requirements

The documents that are required to be carried with the goods on the vehicle must be clearly specified. These documents should be in English, with authorized translations where necessary, with Latin characters and Arabic numbers must be used for reasons of standardization and legibility in all contacting parties.

There is no requirement for these documents to be standardized among contracting parties in the transit region, but arrangements should be made for their mutual recognition. The documents to be carried on the goods vehicle include:

• Certificates of vehicle inspection and conformity;
• Driving licence;
• Vehicle registration certificate;
• Operator licences;
• Third party vehicle insurance certificate;
• Cross-border goods vehicle permit in cases where there is a limit on the number of trucks permitted to utilize transit operations; and
• Driver passport.

It is recommended that in addition to building and implementing the application software, there is a need for a Central Management Team (CMT) to support the contracting parties to the regional transit agreement on an on-going basis and this should be in place within three to four months after the start of the pilot phase. The CMT will manage the central services of the system, namely:

• an information portal giving details of the ACTTS to all stakeholders in the public and private sector, including information for the private sector on how to arrange to connect and make declarations to the transit system;
• a reference data system for maintaining standard codes such as country, currency and commodity codes;
• a management information system;
• a regional secure communications network;
• a help desk; and
• on-going requirements for training and user documentation.

B. Proposed reform in the national legal and regulatory environments

In order to achieve the full benefits from the automation of customs transit control procedures, it is essential that these procedures are first rationalized, simplified and supported by a reformed regional legal and national regulatory environment. Specifically this entails the definition of:

• Customs procedures for electronic processing of declarations at departure or the normal procedures;
• Simplified procedures for reliable traders at departure, that is, permission to load goods at the trader’s own premises, electronic submission of transit declaration to Customs authorities, permission to seal the means of transport using commercial seals, manual or electronic;
• Structured risk management programmes, including authorized transit transporters (ATTs), designed to facilitate the commercial environment of reliable
traders, allowing Customs authorities to concentrate documentary and physical checks of goods on the less reliable consignments;

- Standard data sets for the electronic submission by traders of transit declarations;
- Standard data messages to be exchanged between the different Customs authorities at departure, en-route under transit and at destination;
- Simplified customs control procedures at international borders; basically if the seal on the truck is intact, and the cross-check that an electronic declaration has been properly transmitted to the customs office of transit from the customs office of departure along with the cross-check against printed transit document available with the consignment, the consignment should be permitted to proceed without physical examination of the goods;
- Standard procedures for handling incidents en-route such as vehicle breakdown, or national and international diversion;
- Normal and simplified customs procedures at destination. Reliable traders, subject to authorization, can be permitted to deliver the transit consignment to their own premises, subject to documentary/physical checks by Customs authorities as deemed necessary; and
- Standard enquiry and duty recovery procedures under which participating Customs authorities provide mutual assistance in cases of irregularity; in such cases the customs duties and taxes evaded will be paid to the Customs authority in whose territory the irregularity occurred, either by the Principal trader or, failing this, the guarantor.

In addition, the legal framework should support submission/acceptance of the electronic transit declaration made by the trader at departure by Customs authorities at departure, at transit and at destination. The single declaration will cover whole transit movement without need for additional transit declarations in each country of departure, transit and destination.
VII. BENEFITS OF AN AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM FOR THE REGION

This chapter summarizes the benefits of an ACTTS.

The modular IT systems described in this guide support ACTTS which in turn is developed on state-of-the-art technological platforms following proven IT best practices and design principles.

These provide an integration and automation umbrella which can incorporate newly-developed and existing systems working in coordination with each other. It allows the possibilities for further integration at national level with the systems of other agencies involved in national and international trade and transport by linking the ACTTS to national single windows of participating countries.

The modular architecture of the system allows for replacement of selected system components such as the risk management system with existing risk management systems already in operational use by Customs authorities. Practically, any system component can be replaced at any point in time, provided the required integration work is performed. Learning from and following the established models of proven regional IT systems such as NCTS provides an effective IT platform for future inter-regional integration.

Along these lines, the benefits of such a system can be summarized as follows:

- Simplifies, facilitates and streamlines international and national transit procedures through ICT and reduces reliance on paper-based procedures. It enables the efficient flow of structured electronic information among stakeholders of the international and national trade community and facilitates automated processing of information;

- Provides advanced user facilitation services through online and fully-automated functionality with goods and vehicle tracking;

- Achieves greater efficiency and transparency in the management of national and foreign trade operations, reduces the existing disparity between the technology platforms, maximizes the use of information technologies, improves the interoperability between the systems and enhances sharing of information, and strengthens interoperability with other countries’ systems;
• Enables security by the use of mechanisms for authentication, access control, auditing, confidentiality, integrity, and privacy of information and provides controlled access to sensitive information relevant to specific stakeholders;

• Ensures backward-compatibility in terms of the business functionality offered, and ensures future compliance in order to integrate new systems and business processes seamlessly; and

• Provides for real time tracking of goods/vehicles using new technologies making real time enforcement possible.

The benefits of the paperless customs transit transport environment can be summarized as follows:

• Simplified, IT-enabled customs declaration and control procedures at departure, transit and destination, particularly at international borders;

• Faster acquittal of customs guarantees for the duties and taxes at risk, leading to enhanced business efficiency;

• Decrease in transport costs, leading to greater commercial competitiveness;

• More effective information sharing between regulatory agencies, and between competent authorities in participating countries;

• On-line tracking of transit movements by Customs authorities, leading to speedier detection of fraudulent activities;

• A more secure, efficient and effective control environment, which benefits both the public and private sector stakeholders;

• Broad range of guarantee options;

• Reduction of guarantee costs and distribution of liability over multiple guarantors;

• Improved safety and security and increased protection of society;

• Balance between safety, security and fraud prevention on the one hand and legitimate trade facilitation on the other hand; and
• Improved performance and coordination of the government agencies that participate in related trade transactions through various controls and inspections.

Statistics of NCTS adoption in Europe clearly demonstrates rapid adoption of the system by transporters and traders, due to its benefits, as may be seen from the Table 2 below. The number of Anticipated Arrival Record (AAR) messages increased exponentially in the initial years the computerized systems was implemented and thereon has been growing rapidly till 2011. Since then the number of messages appears to have flattened apparently due to lack of perceptible growth in trade and transport in Euro Area.

Table 2: Number of AAR messages

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of IE001</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>4,933</td>
</tr>
<tr>
<td>2002</td>
<td>117,939</td>
</tr>
<tr>
<td>2003</td>
<td>1,102,051</td>
</tr>
<tr>
<td>2004</td>
<td>5,507,064</td>
</tr>
<tr>
<td>2005</td>
<td>7,582,264</td>
</tr>
<tr>
<td>2006</td>
<td>8,353,265</td>
</tr>
<tr>
<td>2007</td>
<td>8,657,387</td>
</tr>
<tr>
<td>2008</td>
<td>8,773,105</td>
</tr>
<tr>
<td>2009</td>
<td>8,876,964</td>
</tr>
<tr>
<td>2010</td>
<td>9,810,834</td>
</tr>
<tr>
<td>2011</td>
<td>10,311,870</td>
</tr>
<tr>
<td>2012</td>
<td>10,131,479</td>
</tr>
<tr>
<td>2013</td>
<td>10,215,668</td>
</tr>
<tr>
<td>2014</td>
<td>10,231,086</td>
</tr>
<tr>
<td>2015</td>
<td>10,177,808</td>
</tr>
</tbody>
</table>

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11 NCTS statistics released by DG TAXUD
VIII. IMPLEMENTATION FRAMEWORK FOR DEVELOPMENT OF AN AUTOMATED CUSTOMS TRANSIT TRANSPORT SYSTEM

This chapter sets out the scope and content of the proposed feasibility study that is recommended to be developed to support the plans for implementation of ACTTS.

The feasibility study will underpin the legal and procedural basis for the implementation of the computerized transit system.

It would analyse the current situation of customs transit transport in countries and establish a prima facie case for such a system.

It would also provide a gap analysis to implement paperless transit transport system.

As part of the feasibility study, it would be necessary to develop a set of technical documentation for the customs transit process. The objective is to describe the legal basis, procedures and features of the system, together with a high-level analysis of the transport issues to be resolved.

The design of the business system to be proposed should make use of the experience of the best practices currently in operation or being piloted around the world, such as European Union and the implementation of its Common and Community Transit and New Computerized Transit System, and of ASEAN and its Customs Transit System.

Depending on the current state of automation in the countries’ customs administrations, it is recognized that the transit IT system will necessarily have to be tested in practice by pilot implementations covering the movement of goods between the countries involved.

Technical documentation developed during the feasibility study may define high level requirements for:

- Data capture and monitoring of each and every transit movement electronically from point of departure through intermediate border posts to point of destination;
- Electronic acquittal of each transaction and an enquiry system;
- Electronic tracking of goods and vehicles;
- Application of risk management techniques including the use of the accreditation system for traders and simplified procedures;
- Modalities to monitor levels of the customs guarantee for goods in transit;
Development of a reference data system; and
Development of a management information system.

A. Suggested contents of the feasibility study

The feasibility study should provide the following information:

- An analysis of the current customs ICT systems and transit procedures in the
target countries. Assessment of the possibility of interconnecting existing
systems to implement ACTTS;
- A high-level user requirement and functional specification for computerized
monitoring and acquittal system for each and every transit movement; and
- An implementation strategy and estimate of likely overall costs.

B. Approach and methodology

Review of the existing situation provides assessment of what needs to be done in what
time scales and phases and estimate resources required at both national and regional
level.

The approach to the work needs to be focused as well as flexible since the full
background and technical possibilities still need to be specified.

The approach is to carry out the work of a feasibility study; the analysis of high level
requirements and the high level definition of technical systems with no predication as to
the final result and propose an implementation strategy and work programme.

The activities below are intended to provide for:

- Analysis and definition of the system and user requirements;
- Examination of the possible solutions leading to a recommendation of a preferred
project with an estimate of likely costs; and
- The development of a technical and financial case to enable a decision to be taken
on the implementation of an automated paperless system.
C. Tasks and activities for the development of feasibility study

During the feasibility study, the experts would undertake the tasks and activities described in the following subsections.

1. Inception phase

- Produce a questionnaire that will be sent to the countries in advance to enable them to prepare properly and to provide the basis for discussions during the missions to each country;
- Prepare a draft work plan and an outline of the report and documents to be produced; and
- Meet with agency(-ies) responsible for management of the feasibility study to finalize the work plan, agree appropriate documentation for the missions to the countries and receive information as to the current status of relevant work in region and the countries.

2. Implementation phase

- Examine the current situation of ICT applications in the target countries, related software, communications systems and hardware through fact-finding missions;
- Present a report that will contain the following as a minimum:
  - An analysis of the current technical and business environment for transit movements in selected countries including models of the processes, data structures and communications systems and protocols used;
  - Identify international best practice and available technical solutions for regional transit systems;
  - Prepare model functional specification and high-level user requirement for ACTTS containing the elements of a fully operational, modern transit management system. This will describe what the system should do together with:
    - Data capture and monitoring of each and every transit movement electronically from point of departure through intermediate border posts to point of destination;
- Application of risk management techniques including the use of the accreditation system for traders and simplified procedures;
- Modalities to monitor levels of the customs guarantee for goods in transit;
- Development of a reference data system; and
- Development of a management information system.

- Perform an overall gap analysis between the existing systems and the high level model functional specification for the ACTTS;
- Prepare an implementation strategy and work programme towards the implementation of the ACTTS, including proposals for further research studies and technical reports that may be required;
- Assess any non-functional requirements in terms of performance management crucial to the operation and maintenance of the ACTTS, for example system availability, staff to manage information, help desk, system testing and training etc. on an ongoing basis; and
- Provide conclusions as to whether the existing technical systems, as they are currently implemented:
  - could be linked together logically, enabling transit movements to be monitored from departure to destination;
  - the options to provide computer capability now;
  - an estimate of the cost of any software development, including the purchase of any proprietary software to facilitate communications, and hardware required; and
  - summarize the pros and cons, limitations, constraints of such an approach, compare it with the ideal ACTTS and make recommendations accordingly.

D. Timeline of the implementation of the complete system

Generally the feasibility study involving three and above countries can be completed over a period of 9-12 months. Implementation of the project should follow without significant delay thereafter to ensure stakeholder buy-in and continuous support. A complete ACTTS can be developed, tested, and piloted over a period of 3-4 years,
depending on constrains to be identified in the feasibility study. Potential cost of such implementation project would depend on feasibility study findings and exact scope of the system and services.

E. Estimated effort and cost for developing feasibility study

This section presents estimated effort and potential cost of the feasibility study. The costs are indicative and actual cost shall be determined depending on the number of countries involved and their requirements.

<table>
<thead>
<tr>
<th>Task/activity</th>
<th>Experts—working days per expert</th>
<th>Total effort (working days)</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inception phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Preparation of the questionnaire</td>
<td>Customs transit transport expert - 3 IT expert - 3</td>
<td>6</td>
<td>Home office</td>
</tr>
<tr>
<td></td>
<td>Team manager - 4</td>
<td>4</td>
<td>Home office</td>
</tr>
<tr>
<td>• Inception meeting</td>
<td>Team manager - 2 Customs transit transport expert - 2</td>
<td>4</td>
<td>On site in central location</td>
</tr>
<tr>
<td><strong>Implementation phase</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Examination of the current situation:</td>
<td>Customs transit transport expert - 3 IT expert - 3</td>
<td>6</td>
<td>On-site in the country</td>
</tr>
<tr>
<td>o per country</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Feasibility study report (incl.)</td>
<td>Team manager - 10</td>
<td>70</td>
<td>Home office</td>
</tr>
<tr>
<td>Technical documentation)</td>
<td>Customs transit</td>
<td>Transport expert - 30</td>
<td>IT expert - 30</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------</td>
<td>-----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Presentation of results</td>
<td>Team manager – 4</td>
<td>Customs transit</td>
<td>Transport expert – 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total effort (e.g. 4 countries)</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total budget (4 countries)</strong></td>
<td><strong>100,000 -170,000 USD</strong></td>
</tr>
</tbody>
</table>

Table 3. Estimated effort and potential cost of the feasibility study

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12 Estimation does not include organization and hosting cost of meetings and the administrative cost of managing agency. It only includes potential cost of expert working days and potential cost of travel by experts.
IX. CONCLUSIONS

This guide provides an outline of many of the necessary features and conditions for successful implementation of an ACTTS. The system should be managed and implemented by Customs authorities, with the co-ordination and co-operation of all stakeholders in the public and private sector. Transport facilitation initiatives observed following implementation of similar systems in other parts of the world speak for their success.

The implementation of such a system must be performed in a step-by-step approach:

- Signing and ratification of an agreement among participating countries for establishing transit transport system, in order to establish the legal basis at the regional level
- Workshop for high level Customs and transport officials and representatives from private sector in order to raise awareness and ensure initial buy-in of the stakeholders
- Feasibility study in the target region, including development of technical and financial case for the establishment of paperless customs transit transport system, which will identify gaps and constraints, define high level specifications and user requirements and estimate effort and costs involved in the implementation
- Implementation of a pilot project on selected transit transport route(s) in the target countries which will provide proof-of-concept of the system
- Full roll-out in the target countries.