

# The Time Release Study as a performance measurement tool for a supply chain and an international corridor

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## Abstract

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This paper provides an introduction to the Time Release Study (TRS) Guide Version 2<sup>1</sup> developed by the World Customs Organization (WCO) in 2011. It includes an overview and new aspects of the WCO TRS Guide and examples of TRS results. The paper also covers the main focus of the TRS and explores ways of using the TRS methodology in an international environment to measure the performance of a supply chain and an international corridor which are key to further strengthening regional cooperation and integration.

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## 1. Introduction

Globalisation has brought about a dramatic increase in cross-border trading. As a result there has been an equally important focus on trade and regulatory processes conducted at the border to ensure they are optimised and that the time required for trade-related procedures is reduced, where appropriate. Just-in-time delivery of goods has grown in importance for businesses and brings significant benefits to all parties involved in the supply chain. Customs administrations have endeavoured to harmonise and simplify their procedures through international standards such as the World Customs Organization's (WCO) Revised Kyoto Convention,<sup>2</sup> the WCO Data Model version 3.0,<sup>3</sup> and widespread use of information and communications technology (ICT). More recently, heightened dialogue has been established between the trading community and Customs. Indeed, the trading community is increasingly working in partnership with Customs to deliver common solutions in response to these critically important trade facilitation objectives.

Customs administrations have also been making efforts to streamline interagency procedures at borders. In order to ensure that facilitation measures are being applied effectively, a Time Release Study (TRS) has been used to improve the performance of the function being measured. A TRS is a unique tool and method for measuring the actual performance of border activities, and customs procedures in particular, as they directly relate to trade facilitation at the border. In 2011 the WCO revised its 'Guide to Measure the Time Required for the Release of Goods' (TRS Guide) in order to keep pace with current developments in international trade transactions.

## 2. Background

A TRS is a systematic and standard method to measure the average time taken to release cargoes and for each step or intervention in a border procedure.<sup>4</sup> A TRS thereby measures relevant aspects of the effectiveness of operational procedures that are carried out by Customs and other regulatory actors in the standard processing of imports, exports and in transit movements. It seeks to measure these elements of trade flows with accuracy so that related decisions aimed at improving such performance can be properly conceived and implemented.

The WCO developed the original TRS Guide in 2001 in order to advise its Member customs administrations wishing to undertake a TRS. Increasingly, a TRS is considered as a useful tool for identifying opportunities to improve border-related procedures so as to achieve further efficiency and effectiveness.<sup>5</sup> It has become one of the key performance indicators (KPIs) for measuring the effectiveness of border management.<sup>6</sup> It is also considered as one of the methods of measuring performance in a customs context contributing to successful modernisation.<sup>7</sup>

Reference has also been made to the WCO TRS in the current Trade Facilitation Negotiations taking place within the World Trade Organization (WTO) as part of the Doha Development Round. Some WTO Members have suggested including the provision on ‘Release Time of Goods’<sup>8</sup> in a future Trade Facilitation Agreement. The WTO’s current Draft Consolidated Negotiating Text on Trade Facilitation includes a provision on ‘Establishment and Publication of Average Release Time’ in which specific reference is made to the WCO TRS as a tool for that purpose.<sup>9</sup>

Nevertheless, in March 2010 WCO Members shared the view that there was scope for updating the original TRS Guide and decided to commence work to that effect, in response to the procedures and practices currently in place in many countries. As a result, the TRS Guide was updated and re-launched in October 2011 as the WCO TRS Guide Version 2.<sup>10</sup>

### **3. Recent developments in terms of the implementation of the WCO TRS**

The WCO TRS has also been acknowledged as a useful performance measurement tool in the trade facilitation domain by international institutions and donors such as the World Bank, the Asian Development Bank (ADB), the United States Agency for International Development (USAID), the Swedish International Development Cooperation Agency (SIDA) and Japan International Cooperation Agency (JICA).

According to the World Bank:

A component of the Customs and Trade Facilitation Project is the Time Release Study. The purpose of the study is to measure the time between the arrival and release of goods ... and examine the procedures and agencies involved. ... The baseline data from the study will then be used to determine the efficiency of customs clearance and streamline the process. The expected outcomes include: a reduction in the duplication of forms, reduced time (for goods to clear Customs) and improved system of information sharing amongst agencies.<sup>11</sup>

USAID pointed out that:

A TRS is an effective diagnostic tool for identifying inefficiencies in the customs clearance process and determining necessary infrastructure, policy and process improvements as it assesses the time elapsed at each stop in the cargo release process.<sup>12</sup>

While the ADB stated that:

The TRS is not a solution but a useful tool for (1) diagnostics on validating issues to inform interventions and (2) monitoring on setting baseline and measurable performance improvements.<sup>13</sup>

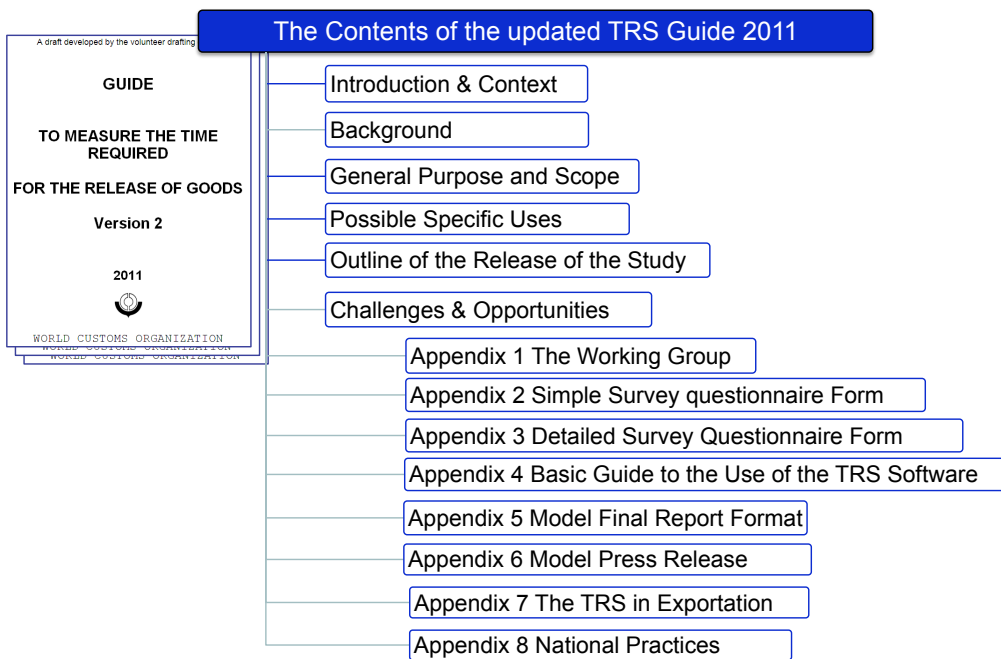
Based on this acknowledgment, international institutions and donors have been helping recipients to conduct a TRS. For example, the World Bank has been supporting many countries including those in the Middle East and in Africa, while the ABD has been supporting numerous Asian countries including those in Central Asia. SIDA has been supporting East and Southern African countries, while JICA has been providing ASEAN countries with support.<sup>14</sup>

## 4. Overview and new aspects of the WCO TRS Guide Version 2

The TRS Guide Version 2 incorporates many new aspects of the TRS, while retaining the same basic methodology as the original version. It highlights the use of a TRS in the context of Customs-Business Partnership, Customs-Customs Cooperation and Coordinated Border Management. It incorporates different TRS methods to address a variety of policy objectives as well as several different TRS approaches, emphasising the importance of the TRS cycle. Challenges and opportunities identified by experienced WCO Members are now included in the Guide together with the national practices of seven countries. Finally, the use of the TRS in international and regional environments and the application of a TRS to exports are additions to Version 2.

The TRS Guide Version 2 consists of six chapters and eight appendices (see Table 1). The first chapter entitled ‘Introduction and Context’ provides the context of the TRS. It stresses the importance of trade facilitation, the role of Customs and the WCO in trade facilitation, the rationale behind carrying out a TRS for trade facilitation as well as the use of a TRS as a performance measurement tool. The second chapter entitled ‘Background’ includes the historical background to the TRS and recent developments relating directly to the TRS, touching on the development sequence of the TRS Guide Version 2.

Table 1: Contents of the TRS Guide Version 2



Source: World Customs Organization 2011.

The third chapter on ‘General Purpose and Scope’ covers different TRS methods in order to address diverse policy objectives. It emphasises the following five key objectives for a TRS: (a) identifying bottlenecks in the international supply chain and/or constraints affecting customs release; (b) assessing newly introduced and modified techniques, procedures, technologies and infrastructure, or administrative changes; (c) establishing baseline trade facilitation performance measurement; (d) identifying opportunities for trade facilitation improvements; and (e) estimating the country’s approximate comparative position as a benchmark tool. The rationale behind a TRS is that it should form part of a continuous improvement

cycle. It is never a standalone exercise.<sup>15</sup> The chapter also stresses that a TRS should not be undertaken as a one-off activity, but should rather form part of a continual exercise.

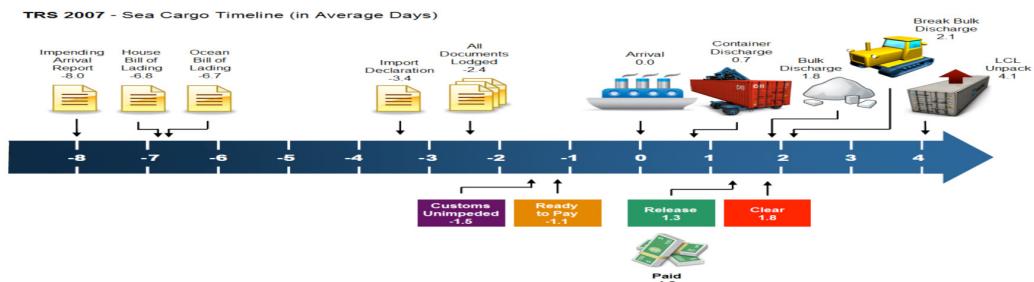
Chapter 4 on ‘Possible Specific Uses for the Study Results’ illustrates several specific uses of a TRS. It highlights the possible utilisation of the TRS results for a number of useful purposes such as (1) structural reform measures within an administration; (2) simplification and harmonisation of customs procedures; (3) automation and modernisation of Customs; (4) diagnosis of the efficiency of specific customs and border procedures such as the Authorised Economic Operator (AEO) Program, AEO Mutual Recognition, Risk Management Technique and/or Single Window; (5) reallocation of resources for optimal utilisation; (6) improving customs transparency; and (7) modernisation programs, capacity building activities and/or Coordinated Border Management programs.

Chapter 5 entitled ‘Outline of the TRS’ addresses a phased approach to undertaking a TRS. It describes the standard application of the WCO TRS methodology and provides guidance to WCO Members so that they can carry it out in a systematic manner. The first phase, known as the preparation phase, covers the decision-making process for implementation of the TRS. The importance of establishing a working group is highlighted in order to determine the scope and design of the study with accuracy. It also covers the planning methodology, including the sampling method, and detailed TRS arrangements such as time and duration, geographical scope, choice of traffic and scope of the goods. The second phase, namely data collection and recording, includes guidance for the working group in order to take account of several key factors including data capture methods, parties engaged and the customs information system. The last phase encompasses data analysis and conclusions. The Guide covers the process of verification and analysis of data and the drafting of a final report, press release and proposals for improvement.

### Examples of the results of a TRS (1)

The Australian Customs and Border Protection Service has conducted an annual TRS since 2007. The data required for a TRS is obtained from customs systems that capture timestamps for key events in the movement of cargoes and in the clearance process. Customs also obtains supplementary data from businesses. Table 2 contains the results of a TRS on sea cargoes carried out in 2007. It shows the average time for each intervention and the average clearance time by type of good.

Table 2: Australian TRS 2007



Source: Time Release Study 2007, Australian Customs Service and the WCO TRS Guide Version 2.

The objective of the TRS was to measure and monitor clearance performance with a view to identifying opportunities for further improvement. It admitted that TRS results and follow-up analysis have helped identify opportunities by providing a more complete view of the operating environment.<sup>16</sup>

Chapter 6, entitled ‘Challenges and Opportunities’, is the last chapter and is new. It provides examples of challenges and opportunities encountered by WCO Members while carrying out their TRS. It

offers practical guidance on how to plan a study, collect data and finalise a report. It also includes useful recommendations for handling issues relating to data integrity, access to business data, and communication and cooperation with stakeholders.

There are eight appendices to the Guide, each providing different practical references for undertaking a TRS. Appendix 1 explains how to set up a working group (WG) and sets out the WG’s general functions and responsibilities. It also describes how the relevant stakeholders can play an effective role to ensure that the TRS provides the best and most comprehensive information which could be used to identify possible improvements in border procedures. In addition to a TRS within a country (domestic TRS), the new Guide now covers implementation of a TRS in an international (regional) environment. Appendix 1 also provides guidance on setting up a joint international WG to undertake a TRS with a neighbouring country. It lists key functions, responsibilities and management matters falling to the joint international WG. It also highlights a joint TRS project between a landlocked country and a neighbouring country with a major sea port, as well as the use of a TRS in a cross-border international corridor and at a one stop border post.<sup>17</sup>

### Examples of the results of a TRS (2)

Japan Customs has used the results of a TRS conducted as one of the customs performance indicators to evaluate the efficiency of new trade facilitation measures. The TRS cycle enables Japan Customs to assess the impact of a number of measures taken in relation to the clearance of goods at import. The latest TRS results (Table 3) clearly show the positive effect on reducing clearance times over a number of years by introducing various measures such as pre-arrival lodgment of the goods declaration, simplified procedures and the Single Window. Another analysis (Table 4) highlights differences in the mean time required for release of goods between Authorised Economic Operators (AEOs) and non-AEOs.

Table 3

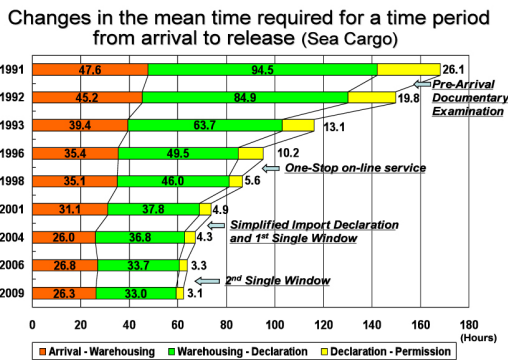
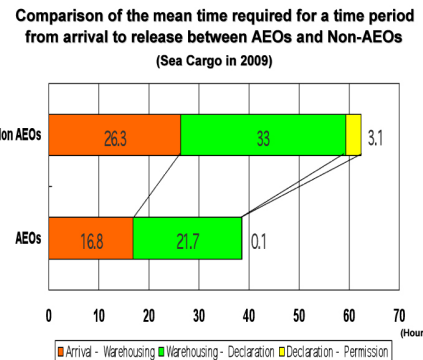


Table 4



Source: Kazunari Igarashi, TRS in Japan, Presentation at the CAREC Workshop by the ADB in 2010 and WCO TRS Guide Version 2.

Appendix 2 contains model simple survey questionnaire forms by mode of transportation for those carrying out a TRS for the first time. It also provides examples of key criteria, key interventions and sample forms for (1) air cargoes, (2) sea cargoes released at an inland customs office, (3) sea cargoes released at a border customs office, (4) land cargoes released at a border customs office, (5) land cargoes released at an inland customs office, and (6) cargoes for a joint international TRS. Appendix 3 includes a comprehensive indicative list of key questions, definitions and a sample form for a detailed TRS.

Appendix 4 has been added to provide basic guidance on the use of the WCO TRS Online Software,<sup>18</sup> while Appendices 5 and 6 contain, respectively, a model final report format and a model press release format.

Appendix 7 describes the application of the WCO TRS to exports. It is stressed that consideration should be given to a TRS in relation to exports in order to respond to the interests and concerns of business stakeholders, especially as the majority of studies undertaken in the past applied only to imports. The export performance in a given international region such as an international corridor could be measured by a TRS relating to exports in combination with a TRS relating to transit.

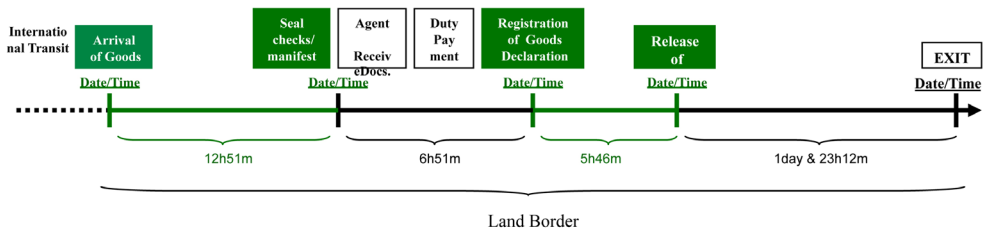
Finally, Appendix 8 includes a list of recent TRS case stories. Experiences in Australia, Cameroon, Japan, Korea, New Zealand, Serbia and Uganda have been compiled as a national practice catalogue of WCO Members.

### Examples of the results of a TRS (3)

The Uganda Revenue Authority (URA) launched a TRS project in order to ascertain where problems existed in the clearance process, and to identify the types of problems, the reasons for the problems and possible solutions to them. With the support of the WCO, the URA completed the project and compiled a TRS report in 2008 which includes various recommendations to enhance the efficiency of Uganda’s border procedures. The study was conducted at selected customs stations and data was collected over a period of seven (7) days using a questionnaire developed for the purpose. Table 5 shows one of the results of the final report, highlighting the difference in average release times at the border customs office and at the inland customs office.

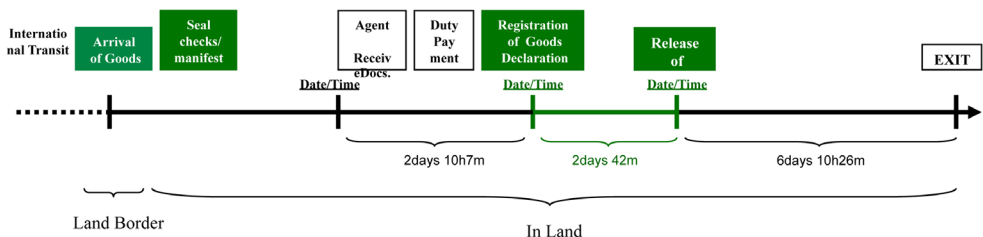
Table 5

Land Cargoes (Border Custom Office)



Land Border

Land Cargoes (Inland Custom Office)



Land Border

In Land

Source: OECD, Aid for Trade Case Story<sup>19</sup> and the WCO TRS Guide Version 2.

Although the URA had put some initiatives in place to improve the system, time measurement had not been carried out to assess the impact of the initiatives implemented, though some estimated times were always reported. It was pointed out that the TRS results showed a completely different processing time from the estimated one. The URA stressed the importance of scientifically derived results.

## 5. Focus of the new WCO TRS Guide

Several approaches have been developed by different organisations to measure the performance of trade facilitation. These include the Doing Business Survey,<sup>20</sup> the Logistics Performance Indicator (LPI)<sup>21</sup> and the Trade and Transport Facilitation in Southeast Europe Program (TTFSE)<sup>22</sup>.

The KPIs included in such performance measurement tools essentially consist of (a) time, (b) cost and/or (c) procedure.

The time component (a) may cover (1) the total time necessary for the entire trade transaction, (2) the time required for processes related to documentation, (3) the clearance time at the border, and (4) the time taken for intervention, such as physical intervention by border agencies including Customs.

The cost component (b) may address (1) the total trade cost for business, (2) the total cost for import, export and/or transit, (3) the total cost of charges in a port, terminal, airport or at a land border crossing, and (4) the total cost of duties and taxes.

Finally, the procedure component (c) may include (1) the total number of documents (steps) to establish or maintain trade business, (2) the total number of documents required for each trade transaction, (3) the total number of documents necessary for each clearance at the border, and (4) the total number of border agencies with which one has to deal (total number of interventions required) for specific transactions.<sup>23</sup>

The main focus of the WCO TRS is the clearance time at the border [(a)(3)], although it is also applicable to the time required for processes related to documentation [(a)(2)] and to the time taken for intervention [(a)(4)] depending on the scope and design of the TRS. The WCO TRS methodology is simple and usually applied to the time from arrival of the means of transportation at the border (airport, seaport or land border crossing) to the time of release of goods to stakeholders, such as a clearing agent or importer.

Another means of sharpening the focus of a TRS is to use a supply chain reference model such as the one developed by UN/CEFACT.<sup>24</sup> Generally speaking, an international trade transaction can be divided into five (5) key basic steps:

- (1) Commercial procedure: establishment of a sales contract, issuance of a purchase order/delivery order, issuance of a delivery note and generation of a payment note/invoice.
- (2) Regulatory procedure for export in the country of origin: a process to obtain an export licence or permission, lodgment of the export declaration to Customs and obtaining release status.
- (3) Transport procedure: establishment of the transport contract, domestic transport of goods, loading of goods, issuance of an airway bill and/or bill of lading, port departure process, international transport and port arrival process.
- (4) Regulatory procedure for import in the county of destination: lodgment of cargo declaration (advanced cargo information), procedure to obtain an import licence or permission, lodgment of the import declaration to Customs and obtaining release status.
- (5) Financial procedure: debit and credit controls, an insurance-related process, payment of duties and taxes, payment of charges and work relating to the financial statement.

These steps are often interlinked but may also be separate. The sequence of the steps can also be altered depending on the business relationship and on special procedures such as the lodgment of a cargo declaration to a destination country prior to the loading of the goods in the country of origin, the lodgment of a customs declaration at import prior to the arrival of the goods and deferred payment.

The TRS methodology is primarily designed to measure the time required for release of goods. Although the principles of the Guide can be applied to other purposes covered by the above five steps, the WCO TRS guide mainly focuses on the regulatory procedures for import, export and transit in the countries of origin and destination.

The regulatory procedure generally comprises four components: (1) port (airport or land border) procedure, (2) customs procedure, (3) procedure governed by border agencies, and (4) business procedures. The trade involves not only Customs but also many other stakeholders such as the port (airport) authority, security authority, quarantine authority, veterinary authority, health agency, standards board as well as concerns including clearing agents, brokers, forwarders, integrators, carriers and financial institutions. The WCO TRS consequently places the spotlight on all four procedures.

During these procedures, the targeted time for a study can be further subdivided into four components: (1) preparation time, (2) waiting time, (3) transmission time, and (4) processing time. Preparation time (1) is the time required to generate or obtain information such as the particulars of a transaction for the customs declaration or import/export certificate and to produce documentation for border procedures. The time taken for standard operations to preserve and maintain the quality of goods for import and export is also included in this time component. The waiting time (2) is the time spent waiting for border procedures or the next stage of procedures to commence as a result of a long queue or transport congestion. Transmission time (3) refers to the time taken to send information or documents to border agencies. The application of ICT to border procedures, such as the use of a Single Window, contributes to facilitating this part of the process. The processing time (4) is the time used by Customs and other border agencies to process goods and includes the time required for the physical inspection of goods, checking the goods against documents and examination of documents.

Business practices may also cause delays. For example, the owner of the goods may decide to keep them at a port facility within a customs controlled area after they have been released because their contact with the port operator enables them to store the goods free of charge for a certain period. An importer may seek out a customer to whom they can sell an imported good after its arrival in order to pay the duties. Goods released by border agencies may also remain in a customs controlled area as a result of the time required to arrange domestic transportation for domestic cargo.<sup>25</sup>

The WCO TRS Guide addresses the four time components mentioned above as well as the time component for business operations related to border procedures, while focusing in greater depth on procedural aspects described in the processing time (4), given that it was initially developed as a customs tool encompassing procedures by border agencies as well as business practices.

## **6. New trend in using the WCO TRS in an international environment**

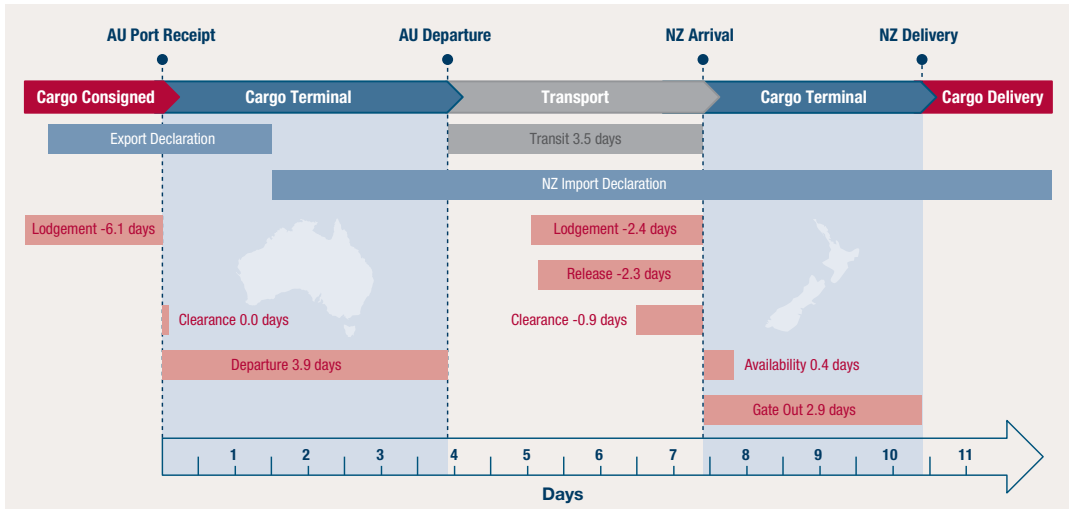
### **6.1 Application of the TRS in order to assess supply chain performance**

Although a number of TRS projects have been undertaken throughout the world, the use of the TRS in an international environment is a relatively new concept. One example is the Trans-Tasman TRS<sup>26</sup> carried out in 2010 as a joint effort by the Australian and New Zealand Customs Services in order to identify opportunities for streamlining trade between the two countries under bilateral arrangements for closer economic relations. Customs officers in both Services worked together to establish the scope of the TRS, including common definitions of subject cargoes and key clearance events, and to analyse the results. Other border agencies were also engaged to verify their clearance times. Supplementary data was also obtained from business.

The study scope encompassed four border procedures covering trade in both directions: (1) Australian export clearance for cargoes to New Zealand, (2) New Zealand import clearance for cargo from Australia, (3) New Zealand export clearance for cargoes to Australia, and (4) Australian import clearance for cargoes from New Zealand.

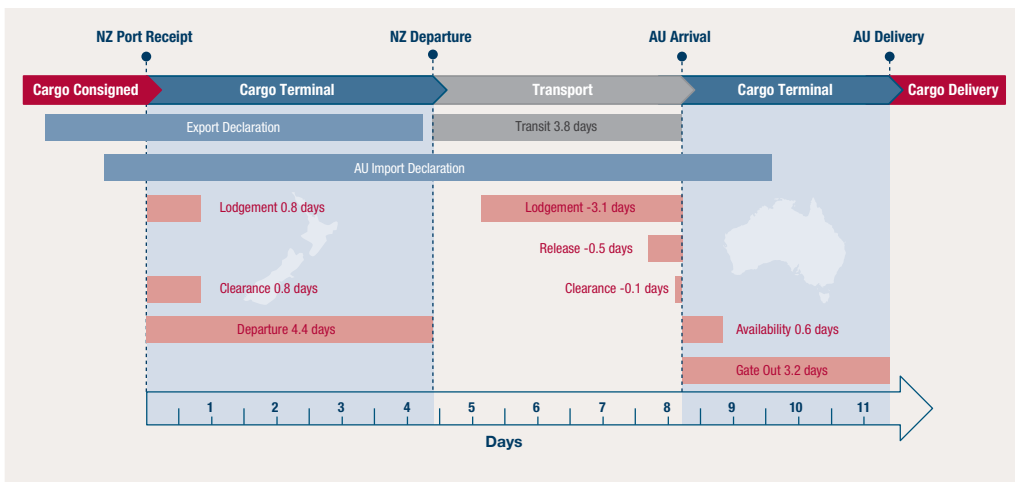


Table 6: Sea cargo timelines – (1) Australia to New Zealand



Source: Trans-Tasman Time Release Study, Australian Customs and Border Protection Service and New Zealand Customs Service 2010, Table 16, p. 20.

Table 7: Sea cargo timelines – (2) New Zealand to Australia



Note: The negative number indicates that cargo has, on average, been released or cleared before it is physically received into customs control based on advanced information provided by traders.

Source: Trans-Tasman Time Release Study, Australian Customs and Border Protection Service and New Zealand Customs Service 2010, Table 17, p. 21.

The TRS produced a wealth of valuable results which were analysed in the final report. One outcome, namely the specific nature of the joint international TRS for sea cargoes, is clearly highlighted in Tables 6 and 7. The Trans-Tasman TRS process began when the cargo was delivered for customs control at export in the country of origin and ended when the goods were available for delivery for domestic use (release) in the country of destination. The final report pointed out that the requisite time periods for the physical movement of cargoes between Australia and New Zealand were very similar in both directions, with the average delivery time for sea cargo from the place of export in the country of origin to the place of unloading in the port of the country of destination being less than nine days. It was also observed

that, on average, import cargo remained in the cargo terminal (customs controlled area) for more than two days after completion of border procedures for the delivery of goods for domestic use prior to being physically removed from the cargo terminal.

The report concluded that the results of the study had helped identify factors contributing to performance levels and the reasons for differences in performance between the two countries. It identified a number of opportunities to further streamline border procedures. Advance cargo reporting, information for small and medium-sized traders, regulatory harmonisation, data harmonisation and risk management were all highlighted as potential areas for improvement.

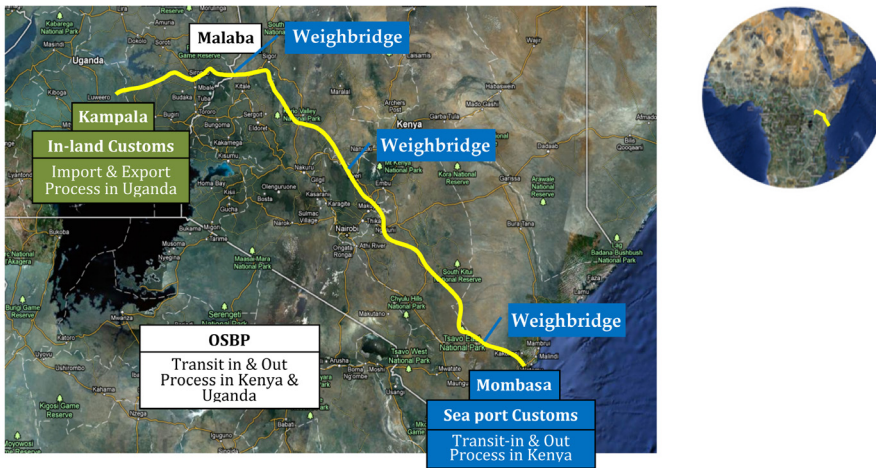
This study effectively explains how the TRS can be used for assessment of performance in terms of supply chain efficiencies and the integration of border procedures between two countries. It provides Customs, other border agencies, businesses and policymakers with baseline data relating to the supply chain and integration of border procedures. It will also serve as a performance measurement tool for these two purposes if undertaken on a regular basis.

### **6.2 Application of the TRS for assessing the performance of an international corridor**

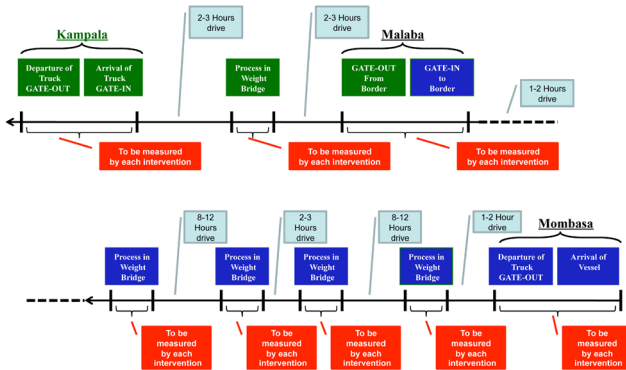
Another example of the application of the WCO TRS in an international environment is a pilot TRS to be carried out in a northern corridor of the East African Community (EAC). It is based on a regional need to measure the performance of an international corridor. In 2011, EAC Members agreed to undertake a pilot TRS in part of a northern corridor from Mombasa sea port in Kenya to an inland customs office in Kampala, Uganda with technical support from the WCO, based on the WCO TRS Guide Version 2. Given that cooperation in trade liberalisation and development is one of the fundamental pillars of the EAC,<sup>27</sup> the study of an international corridor for further trade facilitation is fully in keeping with its priorities. The pilot will cover both inward cargoes from non-EAC Countries to Kampala through Mombasa sea port and outward cargoes from Kampala in Uganda to non-EAC countries through Mombasa sea port. The objective of the pilot project is to identify bottlenecks in the flow of cargoes by measuring the average time of each intervention from/to Mombasa to/from Kampala. The geographical scope and key interventions in terms of the inward flow of cargoes are illustrated in Table 8 below.

After a regional TRS workshop as a kick-off event, the EAC undertook a field study visit to each place of intervention in Mombasa, Malaba and Kampala as well as weighbridges in the northern corridor. The study team drove from Mombasa to Kampala in order to identify the detailed procedures at each point and, based on the findings of the field visit, they began designing a survey questionnaire which is essential for conducting a pilot TRS. The EAC agreed to start data collection in early 2012 and to finalise the pilot TRS. The outcome of the pilot will include not only findings, but also several policy recommendations for trade facilitation in the northern corridor to be presented to high-level government officials for their consideration. Once the pilot has been successfully completed, the EAC will roll out the same TRS methodology to all corridors in the EAC.

Table 8: Map of the pilot EAC TRS project and the process flow on inward cargoes from Mombasa to Kampala



Source: Google maps (satellite image), Mombasa, Coast, Kenya to Kampala, Central Region, Uganda, <http://maps.google.com/>



Source: Report of the ‘Regional Pilot Time Release Study Pre-Survey Tour Mombasa-Kampala (EAC/TF/167/2011)’, September 2011, Directorate of Customs & Trade, EAC Secretariat.

## 7. Conclusions

Time release data represents a powerful performance assessment tool making it possible to measure the effectiveness of customs services and to monitor progress. It leads to the development of a detailed diagnostic of the time required and to the identification of potential corrective actions. Measurement of time release is a worthwhile exercise as it can establish a pre-reform benchmark and thus help in assessing progress made by modernisation initiatives.<sup>28</sup> Beyond the traditional acknowledgment of the use of a TRS within a national environment, it can also be applied to an international environment. The new WCO TRS Guide Version 2 offers clear guidance on how to use it to assess the performance of the international supply chain and international corridors with a view to enhancing regional cooperation, collaboration and integration.

### Notes

- 1 The WCO TRS Guide Version 2 is available at: [www.wcoomd.org/files/1.%20Public%20files/PDFandDocuments/Procedures%20and%20Facilitation\\_2/instruments/Final%20TRS%20Guide%20Version%20II%20EN.pdf](http://www.wcoomd.org/files/1.%20Public%20files/PDFandDocuments/Procedures%20and%20Facilitation_2/instruments/Final%20TRS%20Guide%20Version%20II%20EN.pdf).
- 2 *International Convention on the Simplification and Harmonization of Customs Procedures (as revised)*, [www.wcoomd.org/Kyoto\\_New/Content/content.html](http://www.wcoomd.org/Kyoto_New/Content/content.html).
- 3 The WCO Data Model is a set of carefully combined data requirements that are mutually supportive and which will be updated on a regular basis to meet the procedural and legal needs of cross-border regulatory agencies, such as Customs, controlling export, import and transit transactions, [www.wcoomd.org/home\\_pfoverviewboxes\\_tools\\_and\\_instruments\\_pftoolsdatamodel.htm](http://www.wcoomd.org/home_pfoverviewboxes_tools_and_instruments_pftoolsdatamodel.htm).
- 4 Shujie Zhang 2009, 'TRS as a measurement of trade facilitation: Customs' experience in the Asia-Pacific Region', *World Customs Journal*, vol. 3, no. 2, pp. 125-34, [www.worldcustomsjournal.org/media/wcj/-2009/2/WCJ\\_V3N2\\_Zhang.pdf](http://www.worldcustomsjournal.org/media/wcj/-2009/2/WCJ_V3N2_Zhang.pdf).
- 5 As far as the WCO is aware, the following countries have undertaken a TRS: Australia, Brunei, Cameroon, China, Indonesia, Jamaica, Japan, Jordan, Kenya, Korea (Republic of), Lao People's Democratic Republic, Lesotho, Malawi, Malaysia, Mozambique, New Zealand, Philippines, Rwanda, Serbia, Swaziland, Tanzania, Thailand, Uganda, Vietnam, Zambia.
- 6 Stephen Holloway 2010, 'Measuring the effectiveness of border management: designing KPIs for outcomes', *World Customs Journal*, vol. 4, no. 2, pp. 37-54, [www.worldcustomsjournal.org/media/wcj/-2010/2/Holloway.pdf](http://www.worldcustomsjournal.org/media/wcj/-2010/2/Holloway.pdf).
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- 8 World Trade Organization (WTO) 2006, Communication from the European Communities, Japan, Korea, Mongolia, and the Separate Customs Territory of Taiwan, Penghu, Kinmen and Matsu, TN/TF/W/101, [http://docsonline.wto.org/GEN\\_viewerwindow.asp?http://docsonline.wto.org:80/DDFDocuments/t/tn/TF/W101.doc](http://docsonline.wto.org/GEN_viewerwindow.asp?http://docsonline.wto.org:80/DDFDocuments/t/tn/TF/W101.doc).
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