Technical Report:

Study on Development and Establishment of a Corridor Performance Monitoring System for the Dar es Salaam Corridor

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<td>African Development Bank</td>
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<td>Central Asia Regional Economic Cooperation</td>
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<td>Corridor Performance Monitoring System</td>
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<td>DCC</td>
<td>Dar es Salaam Corridor Committee</td>
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<td>DC</td>
<td>Dar es Salaam Corridor</td>
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<td>DRC</td>
<td>Democratic Republic of Congo</td>
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<td>FESARTA</td>
<td>Federation of East and Southern Africa Road Transport Associations</td>
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<td>ICD</td>
<td>Inland Container Depot</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>MOU</td>
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<td>NC</td>
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<td>NCTA</td>
<td>Northern Corridor Transit Agreement</td>
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<td>NJC</td>
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<td>PMAESA</td>
<td>Ports and Maritime Association of East and Southern Africa</td>
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<td>RSZ</td>
<td>Railway System of Zambia</td>
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<td>SAGC</td>
<td>Southern Africa Global Competitiveness</td>
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<td>SSATP</td>
<td>Sub-Saharan Africa Transport Policy Program</td>
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<td>TAZARA</td>
<td>Tanzania Zambia Railways</td>
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<td>TCC</td>
<td>Trans Caprivi Corridor</td>
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<td>TEU</td>
<td>Twenty Foot Equivalent Units</td>
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<td>TIS</td>
<td>Transit Information System</td>
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<td>TKC</td>
<td>Trans Kalahari Corridor</td>
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<td>TKCMC</td>
<td>Trans Kalahari Corridor Management Committee</td>
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<td>Tanzania Port Authority</td>
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<td>TT</td>
<td>Task Team</td>
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<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
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<td>UNSECAP</td>
<td>United Nations Economic and Social Commission for Asia and the Pacific</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<td>WBCG</td>
<td>Walvis Bay Corridor Group</td>
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<td>WCO</td>
<td>World Customs Organization</td>
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Executive Summary

1. Although the Dar Corridor Constitution (DCC) Secretariat is charged by the Constitution establishing the DCC with the responsibility to monitor the corridor performance, it does not yet have a Corridor Performance Monitoring System (CPMS) in place to enable it to discharge this responsibility. After the Southern Africa Global Competitiveness Hub (Trade Hub) presentation on the need for a CPMS for the DCC and the model the Trade Hub had developed for the Trans Kalahari Corridor (TKC) at the DCC meeting held in July 2009, the DCC members welcomed a proposal to develop a similar CPMS for the DCC. Further the members requested the Trade Hub to assist the DCC Secretariat to secure the commitment of all stakeholders and implement a similar CPMS for the Dar Corridor (DC).

2. In pursuance of this decision, the Trade Hub has worked with the DCC Secretariat to develop this study report and recommend an Action Plan for the implementation of a DCC CPMS. The purpose of this study report is to recommend the development and establishment of cost-effective and sustainable CPMS for DC using existing information collected by the various stakeholders.

3. In addition, the CPMS had to be guided by experience elsewhere on performance initiatives and its primary source of information would be the Port Authorities, Customs Administrations and authorities responsible for weighbridge operations. The primary focus of the CPMS would be time taken to transit the corridor and traffic volumes moved along the corridor.

4. The study was undertaken by the Trade Hub and DCC Secretariat using mainly input from the study on TKC CPMS.

5. The study recommendations are that:
   a. The CPMS for DC shall comprise the submission of information on transit times and delays as well as volumes of traffic to the DCC Secretariat on a monthly basis by all the key stakeholders mentioned above and the analysis on this information and dissemination of the results of the analysis to key stakeholders by the DCC Secretariat shall be done on a quarterly basis.
   b. The main sources of information for the CPMS shall be the Customs Administrations, Tanzania Port Authority (TPA) and authorities responsible for Weighbridges (under Ministries of Transport). Information from other stakeholders, especially Truckers, will be used to check the reliability and validity of the information supplied by these three main sources of information for the DC CPMS.
   c. As part of the CPMS, Time Release Studies (TRS) or choke monitoring will be undertaken as and when necessary at the borders, port or any other node in the transport chain at which the CPMS would be indicating there are inordinate delays.
d. When necessary, periodic surveys on an annual or bi-annual basis will be undertaken to validate information supplied to the CPMS.

6. After DCC adopts the recommendations of the study and Implementation Plan that, inter alia, entails the following shall be implemented:
   a. A Task Team (TT) of Customs Information Technology (CIT) Specialists from the three Customs administrations shall be established as soon as possible to work on the Customs cargo tracking systems and ensure that these systems can generate the information required for the DC CPMS.
   b. This TT would have to ensure, through their administrations that all fields in the Customs cargo tracking systems are correctly filled or completed to facilitate the generation of information required by the CPMS.
   c. The TT shall supply information on transit traffic first for the CPMS to start operating on that basis. For simplicity and as a start, the team could commence with transit traffic only as a proxy for all traffic on DC. Thereafter they will include information on transit times of imports and exports in the information supplied to the Secretariat.
   d. Lastly the TT would include general cargo transit traffic as well as exports and imports.
   e. The DC CPMS could be operational by the end of June 2010.
1. INTRODUCTION

a. Background

From an economic perspective, the function of a corridor is to promote both internal and external trade by providing more efficient transport and logistic services. Corridor focus is not only in improving routes that comprise it but also quality of transport and other logistics services aimed at reducing transit times and cost of shipment of goods and persons along the corridor.  

According to the Constitution of the Dar Corridor Committee (DCC), signed by the public and private sector corridor stakeholders of Malawi and Tanzania in 2003 as well as Zambia in 2008, the Corridor means the transport system described in the First Schedule of the Constitution. And the First Schedule states that “the scope of activities of the committee is cargo and passenger transport utilizing:

- Trunk roads N1, N5 and N35 in The Democratic Republic of Congo (DRC), M1 in Malawi, T2 and T3 in Zambia and A104 and A7 in Tanzania;
- Main roads M1 and M5 in Malawi and M1 and M2 in Zambia;
- The railway system operated by the Société Nationale de Chemin de Fer du Congo in the Katanga Province;
- The railway system operated by Zambia Railways in the Copperbelt and Central Regions;
- The railway system operated by the Tanzania – Zambia Railway Authority between Kapiri Mposhi and Dar es Salaam;
- The railway system service operated by Tanzania Railway Corporation between Kigoma and Dar es Salaam;
- The port of Dar es Salaam;
- The port of Mpulungu;
- The port of Kalemie;
- The port of Kigoma;
- The lake service on Lake Tanganyika;
- Deep sea and coastal shipping services calling at Dar es Salaam.
- The TAZAMA pipeline;
- Malawi Lake Services, Malawi.
- Lake Nyasa Services, Tanzania;
- The port of Chilumba;
- The port of Chipoka;
- The port of Nkhata Bay;
- Kidatu inland transhipment terminal;
- The port Mbamba Bay;
- The port of Itungi; and
- The port of Manda.

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1 SSATP Discussion Paper No. 7 of 2008
The DCC has established a corridor management institution in May 2009 through the appointment of the Executive Director as the nucleus of the DCC Secretariat. DCC is therefore better equipped to monitor corridor performance and address non-tariff barriers along the corridor in a proactive manner, through strategies for continued improvements of corridor performance. However, the DCC Secretariat, as yet does not have a Corridor Performance Monitoring System (CPMS) to monitor the corridor performance.

The DCC Constitution provides for the development and establishment of a CPMS as a tool to quantify successes as well as indicate operational challenges that may exist on the entire corridor. Specifically, Articles 8 (a), 13 (v) and 15 (c), which state respectively:

(i) The functions of the Committee are, inter alia, to develop performance targets for the corridor and to monitor performance;
(ii) The functions of the Secretariat are, inter alia, to develop operational database tracking the corridor’s performance and utilization; and
(iii) The functions of national corridor committees are, inter alia, to develop performance targets for those portions of the corridor falling within the national territory and to monitor performance. Performance indicators to be applied to the DCC are trade and traffic flows, container volumes, adequacy of facilities, processing times at border posts and average point-to-point transit times.

Pursuant to these provisions, the CPMS should therefore be viewed as a tool that assists the DCC Secretariat as the operational arm of the DCC to monitor the performance of the corridor, quantify successes for marketing the corridor’s competitiveness as well as indicate operational challenges that may exist on the entire corridor for remedial actions. The system would also provide a reliable mechanism to the DCC for reporting corridor efficiencies and challenges consistent with its Constitutional mandate and take actions to address the challenges.

At the DCC Plenary meeting held in July 2009 in Dar es Salaam, Tanzania, the meeting was informed that a joint project between the World Bank and Central Corridor was in the process of procuring a consultant to conduct a baseline survey on corridor performance. The TPA negotiated for this project to include the Dar Corridor, and outcomes of the baseline survey would be used to input considerations for the setting up of observatories.

Noting that observatories were quite costly to operate and could present several difficulties to be implemented on the corridor, the Trade Hub was requested to assist with developing a monitoring system that would be easier to implement and less costly to operate.

The Trade Hub made a presentation on a model that was being developed for the TKC, and proposed that the DCC adopts the model for implementation within the next 12 months. The model determines what type of data needs to be collected, based on the objectives of the DCC, and stresses the need that such data should already be normally collected by players (authorities or
operators) on the Corridor. Commitment would be required from those collecting the data that they would provide the Secretariat with such data at agreed intervals, so that the Secretariat processes the data and reports to stakeholders.

Members welcomed the proposal and requested the Trade Hub to assist the Secretariat with the processes required to get commitment from stakeholders, development of the system, as well as processes required towards actual implementation of the system. The meeting noted that output of the performance monitoring system would need to be communicated to members regularly to assist with de-bottlenecking where delays are observed, or to assist with detailed investigation into causes of delays at particular points in the chain.

The purpose of this report is to respond to the DCC request for the development and establishment of a DCC CPMS similar to the one developed for the TKC.

The approach to the development and establishment of a DCC CPMS emphasizes the need to start with a simple sustainable CPMS that could also be developed with time to meet additional needs of the stakeholders. The purpose of this study is to make a proposal on the establishment of such a CPMS for the DC. The study was conducted with technical assistance from the Trade Hub and input from the DCC Executive Director.

The study team reviewed different approaches to CPMS as reflected in the Sub-Saharan Africa Transport Policy Program (SSATP) Discussion Paper No. 7 on Lessons of Corridor Performance Measurement of May 2008. On the three methodologies discussed in the paper i.e. corridor-wide monitoring based on driver’s trip diaries filled by truck drivers; the bottleneck monitoring based on independent surveys; and corridor-wide monitoring based on cooperation and partnership with Port Authorities, Customs and Ministries of Transport, the study team decided to pursue the last one because of its cost-effectiveness and sustainability. However, this would be complemented by the second one as and when necessary. The team further decided that a fully fledged DCC CPMS would entail:

a) Monitoring times, tonnages (volumes), commodities, containers, abnormal loads, etc along the full corridor. Monitoring in both directions, by country source and destination including transport by both road and rail.

b) Monitoring the times from the time the ship arrives at the port outer anchorage, to the time the goods arrive at destination or bonded warehouse in the destination country and/or vice versa i.e. from origin to when cargo is loaded on ship.

c) Bottleneck/Choke monitoring on borders, the port or other important points along the corridor as and when necessary or before and after a major change to infrastructure or systems (e.g. one-stop border post) along the corridor.

d) Key stakeholders, in particular, the Customs, Port Authorities and weighbridge authorities submitting the agreed information to the DCC
Secretariat on a monthly basis and the Secretariat would analyze this information on DC performance and disseminate the results of the analysis to key stakeholders with recommended actions to address challenges identified on a quarterly basis.

b. Study Objectives

In pursuant of the said articles of the Constitution, the overall objective of this study was, therefore, to recommend the development and establishment of a CPMS that is cost-effective and sustainable, largely based on existing information already available within the DC stakeholders that could provide a basis for the corridor performance. The specific objectives of this study were therefore to make a proposal for:

• The design of a CPMS that was cost effective, sustainable and provides stakeholders with good information on the performance of the corridor;
• A CPMS that used as much as possible existing information/data already collected by DC stakeholders in their normal course of business, perhaps with a little tweaking, as the basis of information for the CPMS for cost-effectiveness and sustainability;
• A CPMS whose core source of data was the information already collected by Customs Administrations along the DC through their cargo tracking systems, the Port Authority on cargo movement at the port and the Ministries of Transport on weighbridge times. This information would be augmented by information from other stakeholders as and when necessary for improving the reliability of the information on indicators; and
• A CPMS that was based on lessons learnt from other corridors such as the Northern Corridor and TKC that could start as a simple system that could be developed over time to capture additional indicators as and when this became necessary.

c. Study Team and Approach

The study was undertaken by the Trade Hub Transport Advisor, Godwin Pununwe, who led the study team, the Trade Hub Senior Customs Advisor, Ranga Munyaradzi, and DCC Executive Director, Peter Masi.

The study entailed desktop research, consultation with all key stakeholders through meetings and adaptation of the TKC CPMS study to the DC situation. The stakeholders consulted through meetings include TPA responsible for the Dar es Salaam Port, Customs Administrations of the three countries, Truckers, Clearing and Forwarding Agents, Ministry of Transport/Weighbridge staff, and TAZARA (Tanzania Zambia Railways). The consultation with key stakeholders involved explaining the purpose of the CPMS and need for Customs and other stakeholders to provide a selected set of corridor performance indicators on a monthly basis to the DC Secretariat. Other institutions with experience in corridor performance initiatives were also consulted as their contribution to an effective CPMS for the DC.
d. Structure of the Report

After this introductory chapter the report will proceed with lessons learnt from other institutions on CPMS and/or observatories and corridor monitoring; corridor performance monitoring indicators and the criteria for selecting performance indicators; and the proposed initial performance indicators for DC. Finally it discusses the proposed design of a DC CPMS and way forward or implementation action plan for the DC CPMS. References and annexes will be at the end of the report.

2. LESSONS LEARNT ON CPMS FROM OTHER INSTITUTIONS

Performance of a corridor can be evaluated from two perspectives:

a) *An infrastructure perspective*, which considers the physical capacity of links and nodes in the corridor as well as their use. This approach is often used when deciding on requirements for additional capacity but provides little insight into the effect of corridor performance on trade.

b) *Quality of service perspective*, which examines the quality of service provided for goods moving on the corridor. Performance is measured in terms of average times and/or cost for transport units moving through the corridor. In terms of trade facilitation, the second perspective is the most appropriate. The second perspective will be the primary focus of the DC CPMS in its initial phase.

• SSATP Lessons of Corridor Performance Measurement

With respect to the quality of service perspective, the SSATP hosted by the World Bank identified three approaches or methodologies to corridor performance monitoring initiatives:

• Corridor-wide monitoring based on drivers’ trip diaries filled by truck drivers. In this case selected drivers fill trip sheets in which they are expected to report all stops as well as official payments and bribes;

• Bottleneck monitoring based on independent surveys; the focus is usually on border-crossing time. This entails detailed monitoring of specific locations or choke points within a corridor; and

• Corridor-wide monitoring based on questionnaires to or inputs from port authorities and customs. Ports and Customs have their own cargo tracking systems for their own purposes and also to tucking companies and Ministries of Transport, which can be the basis for a CPMS.

The first two approaches mainly consist of producing data while the third approach mainly consists of gathering data. Cost-wise, data production is obviously much more expensive than data gathering from existing sources. Existing computerized data source, already maintained by ports and customs authorities and Ministries of Transport, complemented by data gathered by

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2 SSATP Discussion Paper No. 7 of 2008
truckers, should be the first data source target of any performance initiative, as these are the most likely to provide sustainability for data supply.

In conclusion on lessons learnt, the SSATP says that while drivers’ trip diaries may be useful, the core of monitoring activities should mostly rely on existing consolidated data from customs and ports authorities and limited surveys (freight forwarders, major trucking companies, truckers and transport unions) to especially benchmark corridor performance.\(^3\)

After reviewing these options discussed by the SSATP, the study team decided to recommend the third approach above for its cost-effectiveness and sustainability. However, it also recommends that this approach be complemented by the second approach as and when necessary i.e. bottleneck monitoring of TRS when bottlenecks are identified at any node in the corridor transport chain.

- Northern Corridor Observatory/Performance Initiatives

The Northern Corridor (NC) comprises the port of Mombasa in Kenya and the transport infrastructure, facilities and services connecting the port and Uganda, Rwanda, Eastern DRC, Northern Tanzania and Southern Sudan. It was established through a Northern Corridor Transit Agreement (NCTA) that created the Northern Corridor Transit Transport Coordinating Authority (NCTTCA) with a Secretariat based in Mombasa.

With assistance from SSATP the NC in 2004-2005 undertook a baseline survey on key non-physical barriers aiming to qualify and quantify the reasons for delays through the drivers’ trip diaries, i.e. the first approach above, but this was costly, about $50,000 plus the cost of a dissemination workshop. However, the baseline survey was successful in that the expected result was achieved, with about 140 trips of which only 20% were filled incorrectly.

Again with assistance from the SSATP, the NC launched a second phase of the performance initiative aimed at establishing a full CPMS in 2006 focusing on transit times and traffic volumes. This time round the main focus was on data collection from pre-existing information, such as computerized data from revenue authorities, port authorities and railway operators, and primary data collection complementing computerized data through interviews of a four targeted trucking operators. Pre-existing data were then complemented with data from private operators in order to check for accuracy of official data.\(^4\) The second phase was successful although it was at a cost of about $150,000.00.

The second phase produced reliable performance measurements but it has been difficult to continue effectively with this phase. The NC CPMS was really now set up with staff in place to process data and disseminate corridor

\(^{3}\) SSATP Discussion Paper No.7
\(^{4}\) SSATP Discussion Paper No.7
performance indicators. However, there was still the challenge of collecting data regularly with the necessary frequency as the suppliers of the data were not complying with the agreement with the NC to supply the data regularly. This is mainly because the port and customs authorities do not always give priority to supplying data to the CPMS and in addition, some of the fields in their cargo monitoring systems are incorrectly filled.  

The bottom-line is that for a CPMS to be functional in a cost-effective and sustainable way, the Customs, Port Authorities and other key stakeholders such as the Ministries of Transport have to commit to supplying reliable information on a regular basis to the CPMS. This commitment could be in the form of a MoU between the DCC Secretariat and these authorities.

It is pertinent to note that the NC CPMS focuses only on imports and on containers only and does not monitor the movement of exports or general cargo. However, data received from stakeholders has both imports and exports.

• CAREC Corridors: Performance Measurement and Monitoring

The Central Asia Regional Economic Cooperation (CAREC) Transport and Trade Facilitation Transport and Facilitation Strategy and its Action Plans focus on the development of six CAREC corridors which facilitate transport and trade within and through the CAREC region.

The same strategy and action plan also mandated that performance be measured and monitored periodically to ascertain the current situation along the links and nodes of each CAREC corridor, identify bottlenecks and determine courses of action to take to address such bottlenecks. Three methods that measure and monitor performance has been considered for CAREC, each focused on a particular corridor component. The Time/Cost Distance Methodology gathers time and cost data associated with transit transport processes to identify constraints along a particular route by looking at detailed breakdown of cost and time involved along every section of such route. Based on the data gathered, further work may be sanctioned using the TRS to assess legal and regulatory component and/or the Logistics Performance Index to assess logistics services efficiency.

a) Time/Cost –Distance methodology

The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) Time/Cost – Distance Methodology is a graphical representation of cost and time data associated with transport processes. The purpose of the model is to identify inefficiencies and isolate bottlenecks along a particular route by looking at the cost and time characteristics of every section along a route. The methodology allows policy makers to:

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5 Development and Implementation of a Transport Observatory on the Northern Corridor, April 2009; Mombassa Workshop funded by SSSATP.
• Analyze the factors that affect the cost and time required to transport goods using certain routes;
• Compare over a period of time the changes in cost and/or time required to transport goods on a certain route;
• Compare and evaluate competing modes of transport operating on the same route; and
• Consider alternative transit routes.

The methodology comprises two parts: two detailed questionnaires to be completed by drivers and an analysis which consists of graphs that are automatically generated as the questionnaires are filled in. The entire methodology is in one Excel file.

b) Time Release Method

At border crossing stops, the World Customs Organization (WCO) Time Release Method was to be used. The method measures the average time taken between the arrival of goods at the border post and their release to the importer/broker. The aim is to determine where problems exist in the process, the reasons for these problems, and possible solutions. It recognizes that the international movement of goods involves customs and other national authorities such as port, health, veterinary, agriculture, standards as well as trading community of importers, exporters, brokers, forwarders, carriers, banks, and others.

It is recommended that the Time Release Method or Study is used as and when necessary as part of the TKC CPMS for monitoring border posts or port performance or time each agent takes in the overall time taken at these points on the corridor. This is really a method for choke/bottleneck monitoring that will be part of the TKC CPMS.

c) Logistics Performance Index (LPI)

The World Bank’s Logistics Performance Index uses a comprehensive approach in measuring critical factors of trade logistics performance such as the quality of infrastructure and logistics services, security of property from theft and looting, transparency of government procedures, macroeconomic conditions, and the underlying strength of institutions. The LPI is based on a web-based questionnaire completed by logistics professionals, i.e. operators or agents of the world’s largest logistics services providers. Respondents rate country performance using a 5-point scale on the following seven areas:
• Efficiency of clearance by customs and border agencies;
• Quality of transport and information technology infrastructure for logistics;
• Ease and affordability of arranging international shipments;
• Competence of the local logistics industry;
• Ability to trace and track international shipments;
• Domestic logistics cost; and
• Timeliness of shipments in reaching destination.
Each respondent also provides time and cost data, including the following:

- Rate of physical inspection (%);
- Customs clearance (days);
- Lead time for export and import (days);
- Number of border agencies for exports, for imports;
- Possibility of a review procedure; and
- Typical charge for a 40-foot container (export and import US$).

The data gathered through the surveys are synthesized or aggregated as weighted average on the seven areas in a composite index to allow for comparisons across about 150 countries.

Strong institutional arrangements at both national and regional levels in implementing the CAREC CPMS would be necessary and would require strong financial backing to succeed. National Joint Committees (NJC) would need to be established to collect the data required for the time/cost-distance analysis of sub-corridors on a quarterly basis. Using the collected data required for the time/cost-distance analysis of these sub-corridors on a quarterly basis.

Using the collected data and with Asian Development Bank (ADB) assistance, the NJC would undertake the time/cost-distance analysis, review the results, evaluate the constraints, and take corrective actions. Based on the results of the time/cost-distance analysis, the NJC would periodically authorize time-release assessments and/or logistics performance assessments. ADB was to finance performance monitoring activities and would help strengthen the capacity of the NJC (or a similar organization) in each CAREC country.

In conclusion on this section, critical lessons can be drawn from the above experiences. One of them is that regular and sustainable data collection to feed into the CPMS is crucial for the success of a CPMS. And data generation for the CPMS, especially if it involves production of data rather than collection of existing data, can be very expensive. Even when the CPMS relies on submission of existing data, regular submission of this data is critical and this can only be achieved if a win-win situation is created and written commitment is made by those who agree to supply the data through instruments such as an MOU. A win-win scenario for all stakeholders could be partly created by actions taken to address bottlenecks identified through the CPMS. The positive impact of a CPMS is achieved only when information generated by the system is used by a corridor management institution to improve competitiveness through removal of bottlenecks to corridor operational efficiency.

- **UNCTAD Study on the Transit Information System for TCC**

In 2007, UNCTAD undertook a study on a Transit Information System (TIS) for the Trans Caprivi Corridor (TCC) at the request of the Walvis Bay Corridor Group (WGCG). TCC begins at the port of Walvis Bay in Namibia, and goes through Zambia and ends in Lubumbashi with a link to Harare. The Trans
Caprivi Highway links landlocked Zambia, Zimbabwe and Southern DRC to the port of Walvis Bay.

The study proposed a TIS for the TCC that had the following providers of accurate data that could be utilized as data sources for the TIS: Namport Port System, Namibian and Zambian Customs Computer Systems. Transporters were considered as a possible source of data but were discarded as it was viewed that their input would impair the data integrity of the system. Namibian and Zambian Customs were considered the primary source of data for the TIS. The study acknowledged that TIS would not be able to show where along the corridor transporters were experiencing delays such as at weighbridges.

The TIS entailed the population of the TIS database with data from the three key institutions (Namport, Namibian and Zambian Customs) using automated methods without the need for any intervention. However, TIS has not been implemented yet primarily because of the high system development costs that were estimated then at N$463,450.00 or US$66,207.00. However, recently the WBCG advised that funds were secured from Germany but the issue of direct access to Customs computer systems is still yet to be finalized.

However, the study team thinks there are a lot of useful lessons from this study that can and shall be incorporated in the proposed DC CPMS.

### 3. CORRIDOR PERFORMANCE INDICATORS

#### Development of Indicators

In developing performance indicators and monitoring mechanisms, it is noted that the operation or functioning of a corridor involves: (i) physical infrastructure, (ii) legal framework that governs trade and the provision of trade services as well as inter-government agreements or international treaties, and (iii) logistics services which operationalize policies and programs that manage and control the flow and storage of goods from points of origin to points of consumption.

Performance indicators are quantitative and periodic assessment of a process (in this case the movement of goods) that helps define and measure progress toward a specific goal. They reflect the efficiency or quality of the corridor's components individually or in combination. It is important for indicators to be comparable across routes, modes of transport, and stops or border posts and links or segments between stops.

Performance can be measured through outcome indicators of time and cost. Time is the amount of time taken to complete movement of the goods from the beginning to the end of the route, including the delays due to congestion or checks along the corridor or quality of service. Costs are those payments related to the movement of the goods and transport vehicles.

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7 Study on A Transit Information System for the Trans Caprivi Corridor, UNCTAD.
Two additional parameters are reliability and flexibility. Reliability refers to the variation in transit time for a specific combination of services and origin-destination pair. The greater the variability, the harder it is to predict actual transit time and in turn, to coordinate sequential activities in the supply chain, which affects average order cycle time and leads to bunching of arrivals and departures. Flexibility refers to different combinations of cost, time, and reliability that allow suppliers to meet varying demands of consumers.

Performance measurement and the choice of indicators must be relevant to the requirements of each corridor. To ensure this, objectives must be clearly identified, the strategy for using the results agreed upon, and the entire process understood and accepted by those involved. Comprehensive performance indicators must include information on the quality of service and reliability, efficiency, assets utilization, financing, and regulatory practices.

A more comprehensive performance measure would take into account in addition to the steps under the time/cost distance methodology, time release method, and the logistics performance index those requirements and procedures that are undertaken even before the goods or transport vehicles are en route, e.g. drivers’ visas, import licenses, vehicle registration, technical standards certification, etc.

Performance targets may use either benchmarks or baseline indicators. A benchmark is usually obtained from ideal conditions where the movement of goods is smooth, i.e. the quality of infrastructure is high, there are no regulatory bottlenecks or arbitrary procedures, and logistics services are efficient. The target in this case is to move towards the benchmark. In contrast, baseline indicators reflect current conditions and therefore existing inefficiencies, low capacities, or poor quality of services, in which case the target is to move away from the baseline. Since benchmarks are difficult to set, baseline indicators are used for practical purposes.

- **Indicators and Criteria for Choosing Appropriate Performance Indicators**

a) **Indicators**

There are many indicators that can be used to measure corridor performance and these may cover volume and capacity; rates and cost factors; safety and security; and transit times and delays; and productivity aspects. Transit times and delays indicators usually cover:

- Transit time per route per mode of transport;
- Transit time origin to destination by country;
- Average dwell time at port;
- Time of customs clearance at port;
- Transit time within port;
- Border post crossing time;
- Time for customs procedures at destination;

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• Dwell times within an Inland Container Depot (ICD)/Inland Port; and
• Weighbridge crossing time.

Most of the corridor indicators include measures of time and cost, but which
time and cost vary from one corridor to another. Likewise, cost could be
measured per ton, consignment, truck, container or TEU. There is an
increasing focus on costs and times per TEU, but on many corridors the
measure used by customs administrations, or often by transporters to price
their offers is still per ton per consignment. The unit of cost should be in
Twenty foot Equivalent Unit or truckload, whichever is the most relevant to the
corridor. As a minimum, any package of measure monitoring corridor
performance should also take transport time and reliability into account. 9

b) Criteria to choose appropriate performance indicators10

The selection of indicators depends on the purpose of the corridor
performance measurement exercise: for advocacy and benchmarking
purposes, comprehensive measures such as total transport time, costs and
their variance need to be sought, whereas for donors’ project monitoring,
more detailed indicators to highlight the impact of donors’ investments can be
developed such as border-crossing time or port dwell time. For corridor
management institutions such as the DCC, they can be interested both in the
global corridor monitoring, and on the detailed segments, disaggregating the
supply chain.

For regional trade and transport projects, the selected indicators for data
collection should, for the sake of sustainability:
• Be easy to measure and collect;
• Be based on consistent and defined parameters readily understood;
• Capture excessive transport costs and/or time; and
• Be as much as possible already measured regularly by the main
logistics stakeholders.

The study team believes the selected performance indicators for the DC
CPMS meet the above criteria.

• Initial DC CPMS and Recommended Indicators

The study team recommends that the DC CPMS would entail:
• Monitoring times, tonnages (volumes), commodities, containers,
abnormal loads etc along the full corridor. Monitoring in both directions,
by country source and destination, including transport by both road and
rail;
• Monitoring the times from the time the ship arrives at the port outer
anchorage, to the time the goods arrive at destination or bonded
warehouse in the destination country and/or vice versa i.e. from origin
to when cargo is loaded on ship;

9 SSATP Discussion Paper No. 7 of 2008
10 SSATP Discussion Paper No. 7 of 2008
• Bottleneck/Choke monitoring on borders, the port or other important points along the corridor as and when necessary or before and after a major change to infrastructure or systems (e.g. one-stop border post) along the corridor; and
• Key stakeholders, in particular, the Customs and Port Authorities submitting the agreed information to the DCC Secretariat on a monthly basis and the Secretariat would analyze this information on DC performance and disseminate the results of the analysis to key stakeholders with recommended actions to address challenges identified on a quarterly basis.

However, for simplicity and sustainability the study team has limited the performance indicators for the DC CPMS, to start with transit times and delay indicators mentioned in 2 (a) above and limited volume indicators. Time here is taken as a proxy of costs in that the shorter the transit times the lower the transport costs and the better the quality of service, to some extent. With further development of the CPMS over time, transport cost will need to be monitored separately, among other indicators.

Consequently, the study team recommended the indicators and sources of these indicators discussed below.

a) Dar es Salaam Port

TPA shall provide the following information/indicators on cargo destined to use the DC:
• Ship turn around time i.e. the time from the arrival of the ship at the port to the time it complete discharging cargo at the port;
• Port dwell time i.e. time from the discharge of the cargo to the time the cargo leaves the port by rail or road. The dwell time for containers and bulk cargo should be shown separately;
• Types and volumes/tonnages of cargo moved through the port every month; and
• Cargo transported from and to the port to and from the DC by rail and road in tonnage and types.

However, Customs shall provide information on how long it was taking to clear goods at the port and based on this information, time other agencies are taking to handle the goods could be determined from the port dwell time. Port Management Association of East and Southern Africa (PMAESA) shall be requested to help benchmarking performance of the port relative to other ports in the region and worldwide. If the Dar es Salaam port is not performing to benchmarks set as per information provided by PMAESA then bottleneck/choke monitoring will be undertaken at the port as necessary.

b) Land Transport – Port to Destination

Here, a number of stakeholders are involved that shall provide the necessary information from their current operations monitoring systems:
Truckers:

Based on their vehicle tracking systems and/or driver trip sheets shall provide the following information:

- Time taken by trucks/drivers from port to the first border;
- Time taken by trucks/driver at the border;
- Time taken by driver/driver from the first border to the second border;
- Time taken at the second border;
- Time taken at any other official stop e.g. police checks;
- Time taken from the second border to the destination (if cleared or bonded customer premises) or the bonded warehouse (if not customs cleared at border);
- Time taken at each weighbridge;
- Number of trips per month per tuck plying the DC or truck turnaround times;
- Number of loaded, empty and partly loaded trips;
- Any node in the corridor where working hours are not synchronized e.g. weighbridge, border opening hours, clearing and forwarding agents; and
- Clearing and Forwarding Agents the Truck Operators use.

However, from the TKC CPMS experience it appears most Truckers are unable to provide this information from the driver’s trip sheets or vehicle tracking systems. It is nevertheless imperative that a few Truckers be identified that will be prepared to provide this information for validating the information obtained from the other key sources such as the Customs, TPA and Ministries of Transport-Weighbridges.

• Clearing and Forwarding Agents

These Agents shall provide similar information as provided by Truck Operators above (obviously not all of it) from their cargo monitoring systems. In addition; they will be asked to:

- Rank DC performance to date compared to other corridors; and
- Advise DC Secretariat the criteria they use for choosing corridor to use.

• Weighbridges/Ministry of Transport

Staff operating these bridges shall provide this information through their Ministries:

- Number of trucks overloaded per month;
- Time taken to weigh trucks;
- Time drivers are waiting before they are weighed (currently not captured but could be captured with a little more effort by staff); and
- Report of any linkage of weighbridge certificate with customs clearance i.e. no clearance at border without weighbridge certificate.
• **TAZARA**

Rail operator would be requested to provide the following information:
- Rail tonnage clearance from the port to Kapiri Mposhi;
- Rail tonnage from Kapiri Mposhi to the port;
- Transit times from port to Kapiri Mposhi; and
- Transit times from point on Kapiri Mposhi to port.

• **Railway System of Zambia (RSZ)**

- Rail tonnage clearance from the Kapiri Mposhi to Sakania Border;
- Rail tonnage from Sakania border to Kapiri Mposhi;
- Transit times from Kapiri Mposhi to Sakania border; and
- Transit times from Sakania border to Kapiri Mposhi.

c) **Borders**

**Customs** although not the only players at the border, they are key players and shall provide information on time taken to clear goods at the border. If there are excessive delays at any border then bottleneck/choke monitoring or TRS shall be instituted to identify the main contributors to the delay and corrective action taken.

d) **Customs Computer Information Systems to be the Core of the DC CPMS**

With cooperation among the Customs of the three countries, most of the time corridor performance indicators above could be provided by their cargo tracking systems. The only indicators the Customs Monitoring systems would be unable to provide are:
- Ship dwell time (to be provided by the Port Authorities);
- Weighbridge times (to be provided by the Ministries of Transport); and
- Time taken from the last border to destination if the goods are cleared at the last border or pre-cleared.

Customs shall provide the following information:
- Transit times throughout the DC and for each of the sections of the DC, e.g. Dar Port to Tanzania/Zambia and Tanzania/Malawi borders. Walvis Bay to Trans Kalahari Border Post and from Mamuno to Pioneer Gate Border Posts;
- Clearance time at Trans Kalahari and Mamuno Border Posts;
- Clearance times at Pioneer Gate and Skilpad Shek Border Posts;
- Transit times of from the Skilpad Shek border post to inland destination bonded premise/warehouse if transit traffic;
- Number of trucks through DC every month crossing border/s; and
- Type of commodities conveyed on DC and their volumes/tonnages.
The information provided by the Customs Administration from their cargo tracking systems shall be the Core of the DC CPMS complemented by information from the Port Authority on port activities and Ministries of Transport on weighbridges. This core will also be complemented by choke-monitoring and other surveys as and when necessary. Customs systems are the core of the DC CPMS because they will provide most of the performance indicators for the CPMS.

In essence, most of the indicators mentioned above could be provided by Customs, TPA and Weighbridges, and information from other stakeholders, that shall be submitted periodically, shall be used to verify and improve reliability of information provided by these three sources. Thus information obtained from trucking companies, clearing and forwarding agents and the railways will be mainly for validation of information obtained from these three main sources.

In an ideal world, all the stakeholders mentioned above would submit the requested information to the DCC Secretariat monthly and the Secretariat would on a quarterly basis prepare a DC Performance Report and circulate it to all stakeholders for any necessary action. The DCC and all its stakeholders would then make the necessary interventions to remove bottlenecks to the efficiency operations of the corridor resulting in improved competitiveness of the corridor. Unfortunately, the real world is far from ideal as some stakeholders such as truckers cannot provide this information on a monthly basis from their current cargo monitoring systems on the corridor.

4. RECOMMENDED CPMS FOR DC

These recommendations and the way forward discussed below are based on the study on the Development and Establishment of a CPMS for the TKC and the experience gained in implementing the same on the TKC. As depicted in the background section of this report, the Trade Hub made a presentation to the July 2009 DCC meeting on a CPMS model that was being developed for the TKC, and proposed that the DCC adopts the model for implementation within the next 12 months. Members welcomed the proposal and requested the Trade Hub to assist the Secretariat with the processes required to get commitment from stakeholders, development of the system, as well as processes required towards actual implementation of the system.

It is in this context that the following is recommended as a CPMS for the DC:

a. The CPMS for DC shall comprise the submission of information on transit times and delays as well as volumes of traffic to the DCC Secretariat on a monthly basis by all the key stakeholders mentioned above. The analysis on this information and dissemination of the results of the analysis to key stakeholders by the DCC Secretariat shall be done on a quarterly basis;

b. The main sources of information for the CPMS shall be the Customs Administrations, TPA and Weighbridges (Ministries of Transport). The information from the other stakeholders will be used to check the
reliability and validity of the information supplied by these three main sources of information for the DC CPMS;

c. As part of the CPMS, the Time Release Study or Choke monitoring will be undertaken as and when necessary at the borders, port or any other node in the transport chain at which the CPMS would be indicating inordinate delays; and

d. If necessary, periodic surveys on an annual or bi-annual basis will be undertaken to validate information supplied to the CPMS.

5. WAY FORWARD/ IMPLEMENTATION ACTION PLAN

The following actions are recommended as a way forward and part of an Implementation Action Plan for the development and establishment of a CPMS for the DC as outlined above:

a. The DCC adopts the recommended CPMS for the DCC as well as its Implementation Action Plan and commits itself to the implementation of the same in the next three to six months on November 19, 2009.

b. The Executive Director writes to the Customs Heads, Director General of TPA, and Ministries responsible for Transport in Tanzania, Malawi and Zambia to have formal and written commitment by these institutions to provide the necessary information for the CPMS by December 20.

c. The Executive Director also writes to TATOA, FEDHAUL and NRTA of Malawi to identify three to four Truckers who have vehicle tracking system who are prepared to validate information obtained from the CPMS on a quarterly basis. The Truckers commitment in writing would also be useful. This is also to be done by December 20.

d. DCC members representing institutions mentioned in (a) and (b) above undertake assist in securing written commitment to supply information to the DCC Secretariat from the heads or their respective institutions.

e. The Customs Working Group sets a TT of Customs Information Technology (IT) Specialists the from the three Customs Administrations that shall meet no later than January 2010 to discuss the modalities and format for uniformly submit to the DCC Secretariat the information required for the CPMS. The TPA IT Specialist should participate in these meeting that will be facilitated by the Executive Director and the Trade Hub. To minimize cost this meeting will be held in Dar es Salaam.

f. The purpose of the TT meeting in January shall be to discuss the capabilities of their cargo tracking systems and ensure that these systems can generate the information required for the DC CPMS. He current Customs IT Committee would consist of this TT. The names of the individual members of the TT would be advised to the DCC Secretariat by Customs Administrations and TPA December 20, 2009.

g. The TT would have to ensure, through their administrations that all fields in the Customs cargo tracking systems are correctly filled or completed to facilitate the generation of information required by the CPMS.

h. This task team would have to get further guidance from the Executive Director with support from the Hub with respect to their work. The TT
shall complete its work within a month and supply the information required to the DCC Secretariat thereafter.

i. The TT shall supply information on transit traffic first for the CPMS to start operating on that basis. For simplicity and as a start, the TT could commence with transit traffic only as a proxy for all traffic on DC. Thereafter the TT will include information on transit times of imports and exports information in the information supplied to the Secretariat.

j. Lastly, the TT would include general cargo transit traffic as well as exports and imports. It was agreed that once the system has been set up the TT will meet as and when necessary to resolve any problems experienced.

k. Customs Administrations, TPA and Ministries of Transport/Weighbridges shall agree to supply the information required for the CPMS starting from March 1, 2010.

l. The Customs Administrations, TPA, Ministries of Transport as well as other stakeholders shall appoint the contact person for information requested for the CPMS by February 28, 2010.

m. The CPMS should be operational from June 1, 2010, i.e. all key stakeholders, in particular Customs, Port and Weighbridges, shall provide information to it on monthly basis starting from the end of March 2010.

n. The FEDHAUL, TATOA and Malawi NRTA shall ensure identified Truckers submit to the DCC Secretariat the information necessary to validate CPMS on a monthly basis. However, the CPMS should be operational on the basis of information from TPA, the Customs Administrations and Ministries of Transport/Weighbridges.

o. The DCC Secretariat shall analyze all information submitted in March, April, and May 2010 and prepare a quarterly review of the DC performance by the end of June 2010.

p. The DC CPMS would start with a simple that will be developed over time to meet additional needs.

q. The DCC Secretariat, assisted by the CPMS IT TT, shall be responsible for operationalizing the DC CPMS. It may be necessary for the TKCMC or the TKC Secretariat to sign a MoU or other instrument with the main suppliers of information i.e. the three Customs Administrations, TPA and the three Ministries of Transport to ensure regular supply of information to the CPMS.
ANNEX 1 – LIST OF CONTACTS

1. Godfrey Onyango, NCTTCA
2. Jean Kizito Kabanguka, NCTTCA
3. Athman Mohamed, NCTTCA
4. Lisumbu Eliombo, NCTTCA
5. Johny Smith, WBCG
6. Gaone Arieff, BURS
7. O. G. Phuthego, BURS
10. Conrad Lutombi, Namibia Road Authority
11. Moses Mwetako, Namibia Customs
12. Aletta Lephala, CBRTA
13. Ronald Stuurman, CBRTA
14. Cliff Naude, SARS
ANNEX 2 – REFERENCES

4. Development and Implementation of a Transport Observatory on the Northern Corridor, April 2009; Mombassa Workshop funded by SSATP.