United Nations
Economic Commission for Africa

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Smart rail and road connectivity

Application of Smart Technology for Seamless Cross-borders in Africa

ideas for a prosperous Africa

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[Virtual]

Application of Smart Technology for Seamless Cross-borders

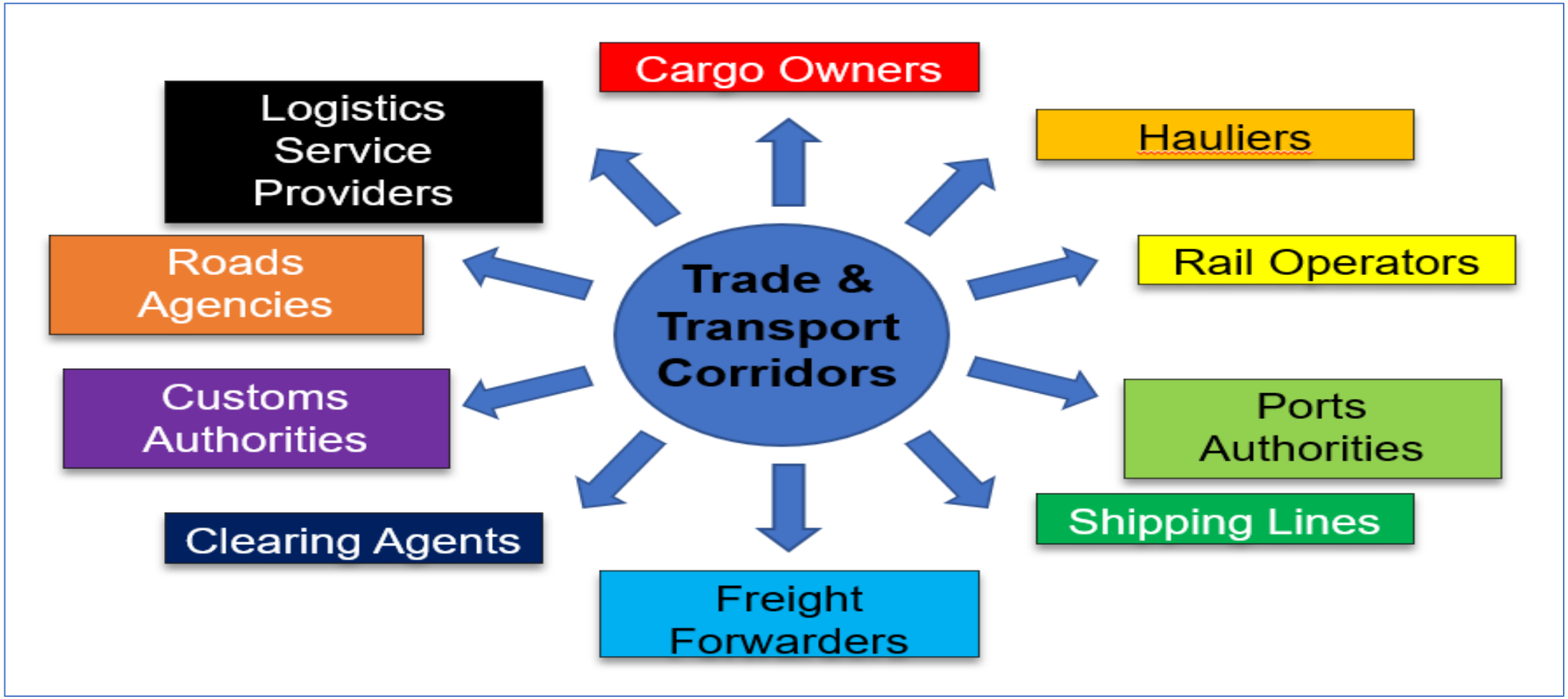
The Challenge in Africa: While seamless cross-border transport and trade requires a regulatory framework and management structures, it still requires technology support to make it a reality

The technology support for SMART and Seamless Transport and Trade requires capabilities at three levels:

- Smart collection of trade and transport information across the entire trade value chain
- Smart processing of this information to convert it into trade and transport intelligence
- Smart decision support at operational, tactical and strategic level

Application of Smart Technology for Seamless Cross-border

Transport and Trade Stakeholders



Application of Smart Technology for Seamless Cross-borders

Recommended SMART Systems:

- **Seamless Connectivity must include the following elements:**
  - ❖ **ASYCUDA compatible conversion programs** and integration between ASYCUDA, other customs systems
  - ❖ AEO (**Authorised Economic Operator) recognition and integration** with trade systems operated by AEO accredited corridor users
  - ❖ **Accredited registered transporter programs** that offer tangible benefits to compliant corridor users in terms of faster transit times.
  - ❖ **Total electronic data capture**, not only for customs declaration but for all verification processes and for any cargo vehicle that uses a corridor.
  - ❖ **Inter-agency international data transmissions** to enable all agencies to utilize information captured in the systems of other agencies.

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Recommended SMART Systems:

- **Smart Connectivity**
  - ❖ **Driver Monitoring** to enable transport companies, cargo owners and government agencies to verify if instructions are accurately implemented and if rules are complied with.
  - ❖ **OBC (on-board computers)** to analyse data collected en-route and to advise drivers about appropriate actions in case of unforeseen incidents.
  - ❖ **Real-time mapping** of all in-transit cargo vehicles to detect incidents and verify if rules are complied with.
  - ❖ **Hazard warning / security alarm system** to enable appropriate corrective action in case of efforts towards theft or non-compliance with rules.

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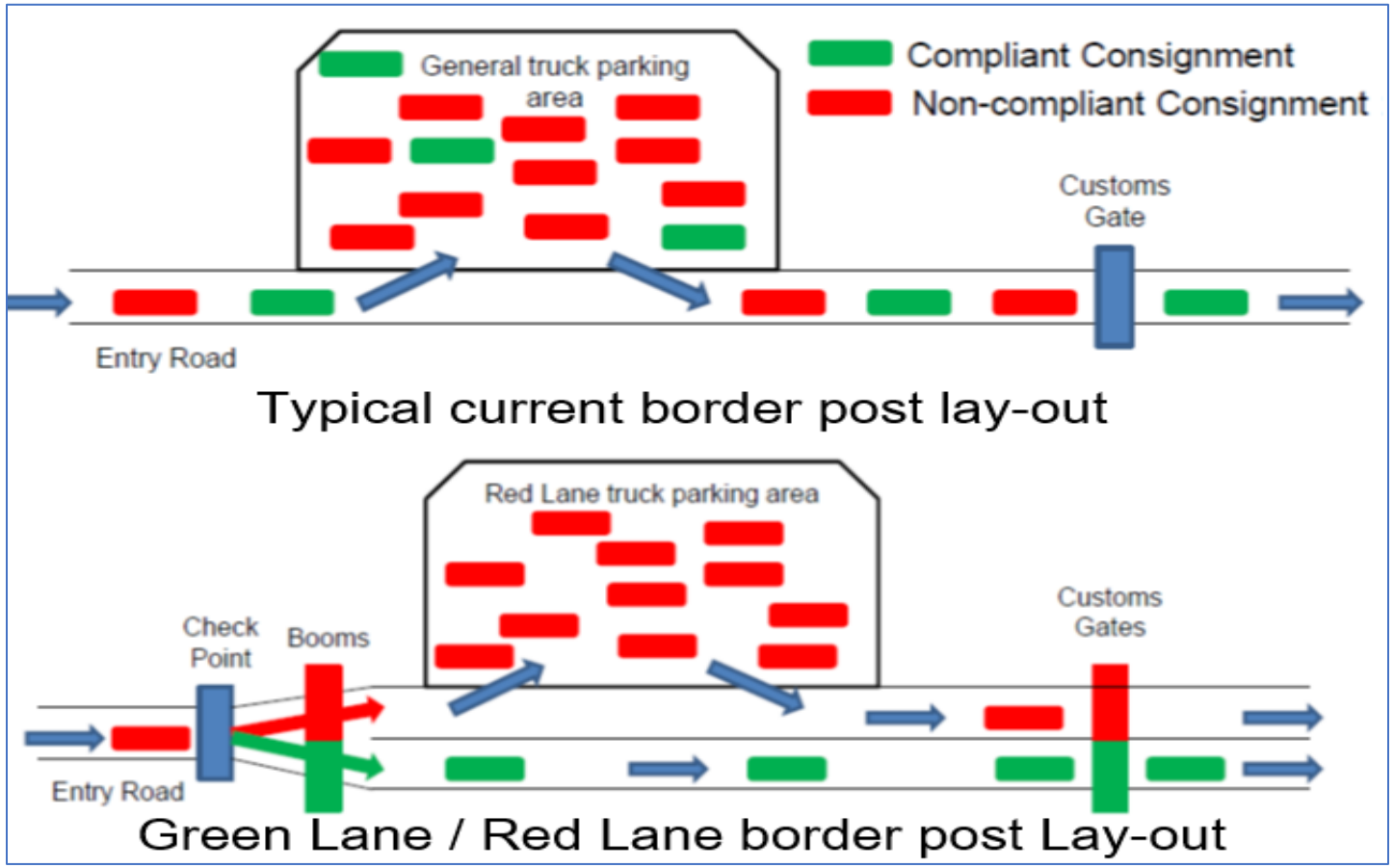
Recommended SMART Systems:

- **Corridor and Border Monitoring:** **GPS tracking; Corridor & Border Performance; Delay problem reporting**

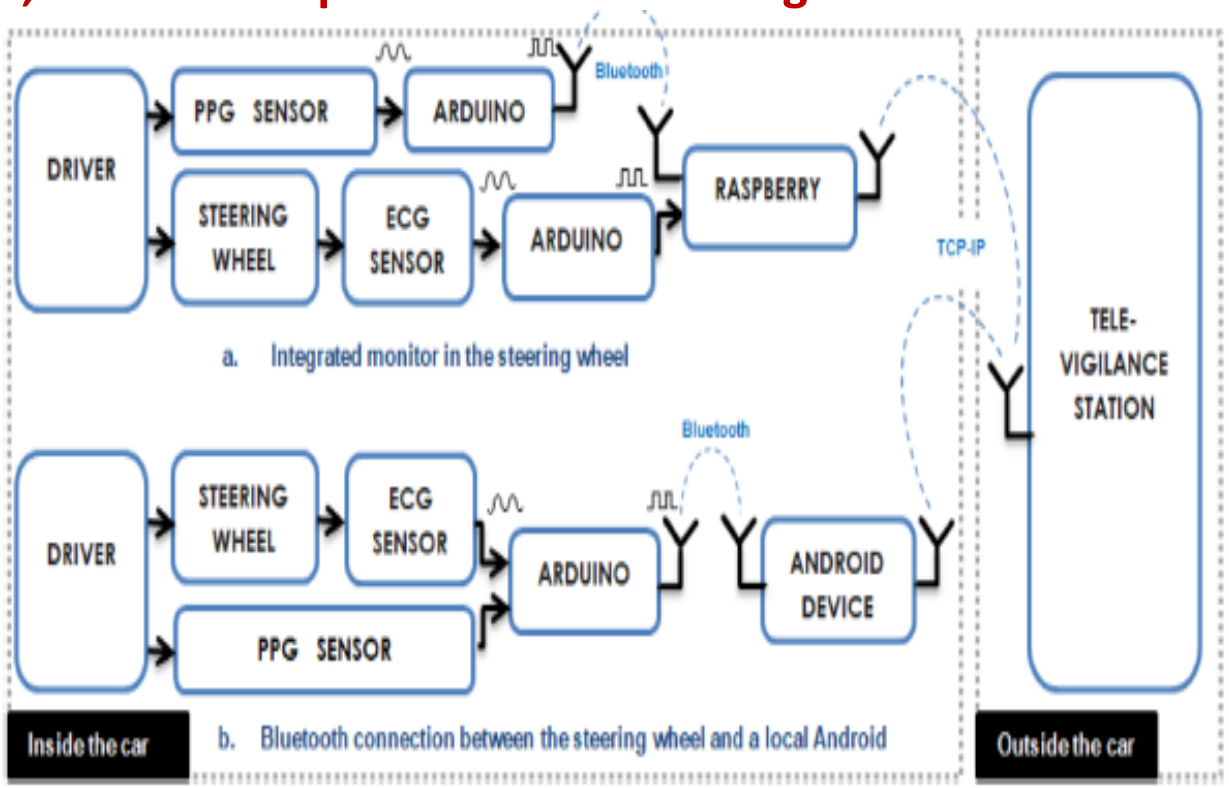


• Intelligent Customs Risk Systems

- Effective risk management is a prerequisite to find an **acceptable balance between the objectives of a customs operation and the streamlined flow of goods**
- The customs operations in many developing countries are **characterised by high levels of physical inspections, with resulting disruption of trade flows,** but with little positive impact for the regional economy
- Most developed economies have moved towards customs risk management models based on the analysis of rich datasets **that can be used to accurately determine the risk represented by a cargo consignment without physically stopping it**
- The use of such models can **result in reduced physical inspections without increasing the risk to Customs of either losing income or allowing the influx of illegal contraband**
- It, therefore, represents a **more optimal compromise between the interests of customs and those of trade,** reducing the economic cost to the region and making the region more attractive to global economic partners

• Medical monitoring of drivers' condition and data exchange for sanitary controls

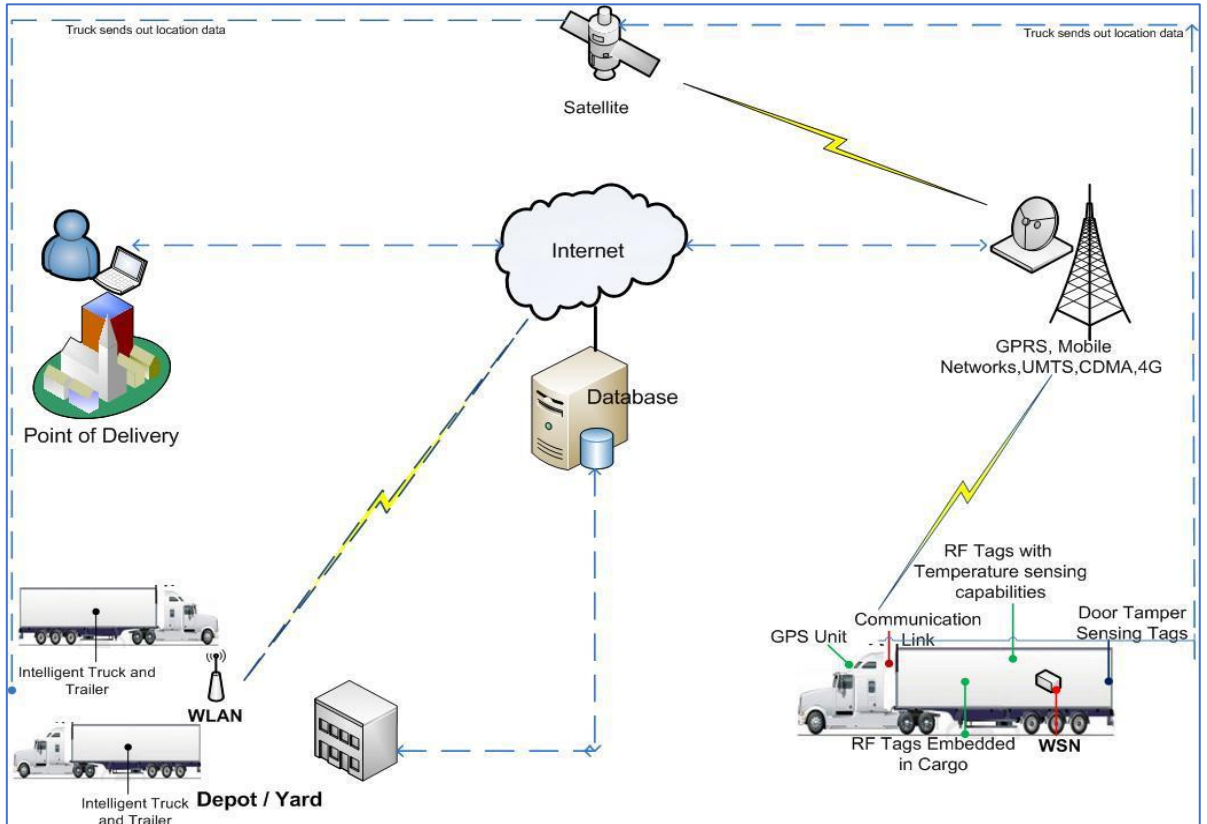
- Trucks and trains are already equipped with modern communication technology used for GPS tracking and other monitoring purposes. **By linking medical monitoring devices, like electronic thermometers, to these systems, it is possible to remotely diagnose drivers that may have contracted a disease** and that may pose a danger to personnel at a goods receive location
- The measurement using new hardware and software devices is **made possible through the contact between the driver contact and an intelligent steering wheel, which is coupled either to an integrated monitor or to a blue-tooth link with a local Android smartphone**



• Corridor and Border Monitoring

a) Satellite monitoring systems for traffic progress and route compliance:

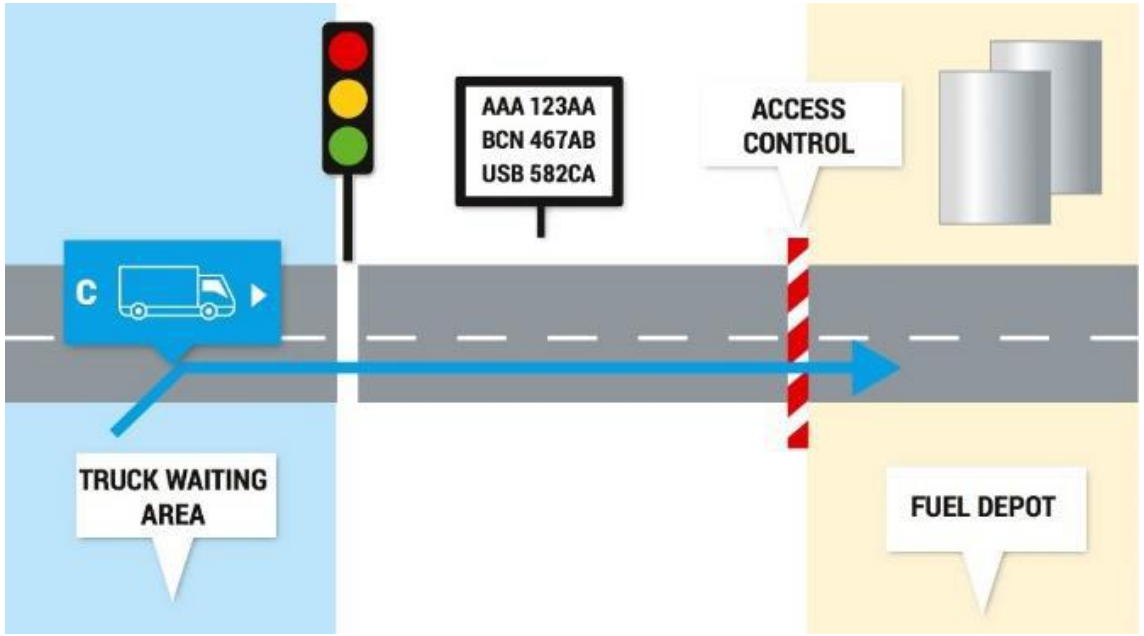
- There is widespread use of **on-board computers (OBCs) in the trucking industry** and most long-distance trucks carry radio communications equipment as a basic precaution in case of breakdowns and to permit GPS tracking, as well providing security against the endemic hijacking of vehicles on corridors
- These existing technical capabilities can be l**everaged through a system where trucks communicate their current status to infrastructure service providers located along transport corridors**



• Corridor and Border Monitoring

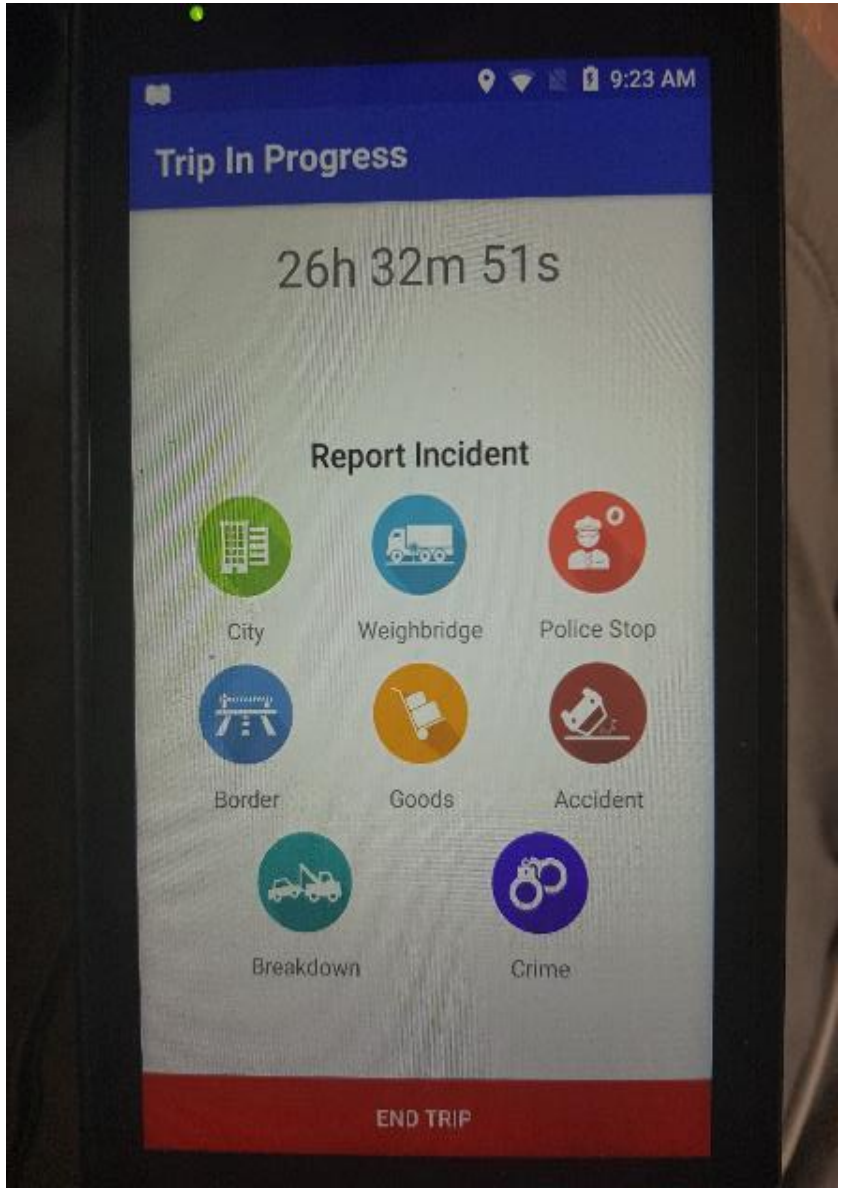
b) "Electronic queue" systems at international checkpoints and accelerated lanes for trucks

- If all cargo vehicles are required to declare their voyages before departure, it is **possible to plan the scheduling of freight to ensure that processing capacity will never be exceeded, thus avoiding long queues and chaotic conditions**
- **A truck must book a time slot to be processed at a border or port** - number of available slots that can be booked corresponds to the processing capacity that is available to handle trucks at that location
- The availability of an online booking system that covers all processing points along a corridor **will allow transport operators to plan the departure of vehicles to arrive on a just-in-time basis**
- As the **possible face-to-face time between truck drivers and customs officials is minimized, the opportunities for corruption and transmitting of diseases are also reduced**



Web and Mobile Monitoring

- **Web and mobile applications to monitor the operational situation on routes** can be used to provide status information to users of the corridor about all important aspects that may cause delays or unsafe situations
- Such information can be **communicated to drivers through Smartphone applications** that will provide prior warnings about unforeseen situations
- If the information that is collected in this way by all corridor users is made available to a central system, **it will allow valuable information to be extracted for decision support purposes**
- **The aggregate reasons for delays can be used to identify the most important underlying causes for inefficiencies** that are experienced by corridor users and traders
- This will **enable continuous improvement of the system** by addressing those issues that are cited most often



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More recommended SMART Systems:

- **Electronic Document Management:** Preloading relevant documentation; Declaration of Origin, Destination &Designated routes
- **Route Planning and Monitoring:** Use of Transport route planning software; Establish standard sector times and routes
- **Automating the Monitoring of Vehicle Weights:** Automated Plate Number Recognition; Automated detection for truck overloads changes and lanes change
- **Online Support Systems for Transporters:** Online Registration and Permit Applications; Online Performance Reports
- **Green Corridor Systems:** Vehicle Emission Monitoring; Fuel Usage Monitoring
- **Electronic Navigation Seals and Smart Containers:** e-Seals and TIR approved containers; Automatic scanning on routes and borders

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Recommended SMART Systems:

- **Smart Tachographs:** Automated verification of driving times; Automated distance measurements based on tolling charges
- **Information systems for Intermodal interaction and Transport Nodes:** Transport hubs for cargo transfers; Electronic Marketplace linking cargo owners, freight agents and Transport Service providers
- **Automated Driverless Vehicles:** Assist drivers in risky situations; Control of vehicles over long stretches of road
- **Creating an ecosystem of Digital Corridors:** Integrated Corridors systems; Integrated Corridor Infrastructure Masterplans
- **Peripheral system support requirements:** Training for stakeholders to exploit digital support capabilities; Systems Maintenance to avoid disruptions
- **Compliance Systems:** Agents, Operators accreditation; Use of TIR , TIRe; Integrated Driver Clearing System

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In Conclusion:

- ICTs **have proved to be a keystone to more efficient and productive trade and transport systems. This provides the motivation for the use of technology systems to provide Seamless and Smart Connectivity to trade and transport systems on the African continent.**

- **In the short term the proposed systems will assist efforts towards the Covid-19 pandemic mitigation by reducing physical contact between human operators in trade and transport value chains**
- **It will furthermore automate procedures that currently lead to long queues and waiting times at border posts and ports.**

- **In the long term the proposed systems will enable more effective coordination between trading partners, increase asset utilization levels, improve the management and protection of infrastructure, reduce turnaround and waiting times and lead to higher levels of service delivery.**

THANK YOU!

Ideas to Action