# Federal Road Safety Corps

**FEDERAL REPUBLIC OF NIGERIA**

"Creating a safe motoring environment in Nigeria"

ENABLING TECHNOLOGY

# eReform @ the Speed of Data



Investments in technology have improved FRSC's ability to make high quality management decisions. Here, President Goodluck Jonathan listens as Osita Chidoka, FRSC Corps Marshal and Chief Executive, demonstrates the capabilities of FRSC Data Dashboard.

The transformation of the Federal Road Safety Corps (FRSC) can be attributed, in part, to the deployment of technology-enabled processes to achieve data-driven decision-making. Aided by a network of technologies, FRSC has improved responses to traffic-related emergencies and achieved a 76 percent decrease in reported road traffic crashes from 1988 to 2012. Over the same period, there has been a 25 percent drop in the number of casualties from road traffic crashes. FRSC's system-wide technology is at the core of this significant decline in crash related death. These achievements have earned the Corps a number of national and international awards as well as recognition as a world-class public sector agency.

## Preamble

Road traffic injuries are a major public health problem and a leading cause of death and injury around the world and in Nigeria. According to the World Health Organisation, about 1.3 million people die and millions more are injured every year as a result of road traffic crashes, especially in developing countries. In 2012, about 6,269 road traffic crashes occurred in Nigeria resulting in 4,260 deaths and 20,757 persons injured. Not diminishing the enormous

pain and cost to the individuals and their families, road traffic crashes can cost a country, such as Nigeria, as much as 1-2 percent of its gross national product. The core mandate of the Federal Road Safety Corps (FRSC) is to eradicate these road traffic crashes and create a safe motoring environment in Nigeria.

At the time of his appointment in 2007, as the Corps Marshal and Chief Executive (COMACE) of FRSC, Osita Chidoka realised that FRSC needed to be transformed from a lethargic public sector agency in to a nimble organisation with private sector affectations. This would require appropriate and targeted action that would be largely impossible to sequence without operational data intelligence. The leadership of the Corps decided to make data collation, analysis, and data-driven decision making one of the core tenets driving reform in the organisation.

Timely, reliable and accurate data are required to determine the real causes of road safety crashes, identify priority areas, formulate strategy, set realistic targets, and monitor performance. This is imperative given that there are never enough resources (financial or otherwise) to apply to all the areas that need attention. For instance, by 2008, FRSC used traffic data to identify eighteen (18) high-risk road corridors and their "Black Spots"; that is the specific points on the roads that are most prone to road traffic crashes. This enabled the Corps to prioritise patrols and interventions on these spots resulting in a 4.29 percent drop in road traffic crashes on these road corridors between 2007 and 2012. Furthermore, analysis of road traffic data led to the establishment of the FRSC Safety Engineering Department that is focused on addressing road traffic crashes resulting from sub-standard road engineering.

## Setting the Strategic Context

Sustainable organisational transformation cannot be achieved without an overarching strategy. Therefore, it was imperative to situate the benefits of data-aided decision-making within a broader strategic context for the FRSC. Guided by this principle, FRSC management created a comprehensive strategy with the following strategic themes:

1. Develop an institutional framework that positions FRSC as the lead agency for road safety management in Nigeria;
2. Create a high performance organisation to drive the implementation of the FRSC mandate;
3. Deploy enabling technologies to improve the Corps' data-driven decision making;
4. Achieve operational excellence through a commitment to quality service and continuous improvement; and

5. Promote multi-sectoral stakeholder cooperation towards creating a safe motoring environment in Nigeria.

Taken together, these strategic themes (and the resultant programmes and initiatives) led to the outstanding performance of the Corps based on institutional, operational, and tactical reform measures that were championed by the leadership team. By 2011, at the end of Osita Chidoka's first term as COMACE, Nigeria recorded 4,765 road traffic crashes (RTC) that resulted in 21,836 casualties of which 4,372 deaths occurred. This is a 47.7 percent drop in RTC incidents from 2006, the year prior to Osita Chidoka becoming the COMACE, when there were 9,114 incidents resulting in 22,334 casualties of which 4,944 deaths occurred.

The transformation at the FRSC and the significant drop in RTC has been internationally recognised with the 2008 Prince Michael of Kent International Road Safety Award, the 2009 National Productivity
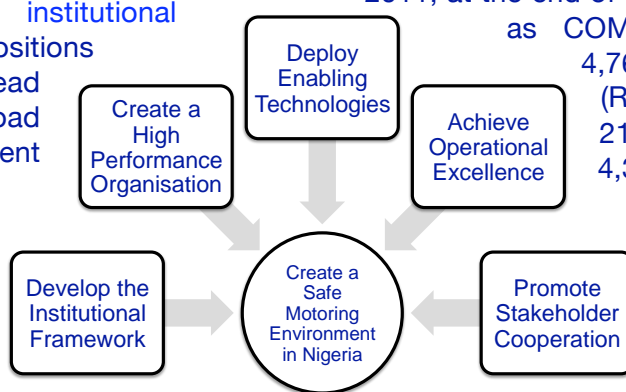


FRSC's Five Strategic Themes

Award, the 2012 World Bank recognition as the "Lead Agency in Road Traffic Management in Africa", and routine invitation by other African governments to provide technical assistance with the establishment of their road safety agencies. Under the Chidoka leadership, FRSC has become the national and international model for public sector agencies thanks, in part, to its focus on using data to improve the quality of its decisions.

Improved decision-making ability is a critical variable in the success of the FRSC. However, this achievement required, first, creating a culture of technology use across FRSC, and then, making significant investments in technology infrastructure to improve data connectivity between FRSC offices, and implementation of tools for data analysis and reporting.

## A Culture Called Technology

FRSC management desired an organisation where the staff understood the primal importance of data and possessed the requisite skills for data collation and analysis. This level of proficiency could not be achieved back in 2007 when the FRSC had a ratio of 1 computer to 200 staff. It was imperative that every staff of the Corps had access to a computer and possessed the ability to use such technology tools to conduct their daily activities.

As a result, FRSC invested significant financial resources to acquire computers to increase the ratio to the current 1 computer to every 20 staff. For instance, FRSC management has fully computerised all the Corps' Duty Rooms - the facilities from where patrol teams depart for their daily operations. The Patrol teams use the computers to file the reports from their daily patrols and operations: booked offenders, fines issued, impounded vehicles, RTC data etc. The data is submitted real-time to the FRSC Data Centre in Abuja.

Unfortunately increased investment in computers does not necessarily correlate to increased use of computers. Process changes are usually required to ensure compliance. To achieve the goal of full compliance to computer use, FRSC management instituted electronic mail as the primary medium for internal communication. In fact, management instructed that an FRSC email account was a prerequisite to a staff receiving their monthly salary. This was a bold move given that when it was introduced in 2008, internet penetration rate in Nigeria was still at about 28 percent. By the end of the first month, only 5,000 of the over 15,000 staff had activated their email accounts. This



To create a technology culture at FRSC, it was imperative to ensure that every staff had ready access to a computer. In 2007, there was 1 computer to 200 staff. Today, the ratio has been improved to 1 computer to 20 staff. All FRSC offices are fully networked.

seemingly minor (yet strategic measure) set off severe backlash that resulted in petitions to the then President Umaru Yar'adua calling for the termination of Chidoka's appointment. Luckily for the Corps, President Yar'adua supported the reform efforts.

Having won the battle, it meant that all staff had to use computers at least once a month to receive their salary notices. Once they logged into their email accounts, they saw other corporate correspondences and soon realised that non-usage of the email system could be career limiting. This success increased computer use by FRSC staff to about 30 percent by the end of the first year.

Other process changes included the introduction of FRSC Intranet as another primary channel for internal communication. This meant that staff had to log on to the Intranet to obtain institutional knowledge on the Corps activities. Furthermore, management instructed that all patrol reports must be completed and submitted electronically every day. As a result, all staff had to get conversant with computer usage. Today, over 95 percent of all patrol reports are submitted online and on time.

Buoyed by these early victories, FRSC management pushed the envelope by introducing the use of computers for all promotion examinations. This was revolutionary, as it had never been done in any other public sector organisation in Nigeria. This decision meant that computer proficiency was a prerequisite for career advancement in the Corps. To be promoted, one had to be proficient in both the examinable content and in the use of computers. By December 2012, over 103 Corps staff had taken the online promotion examinations.

These simple, yet avant-garde, measures have increased technology use in FRSC to 100 percent. Today, it is almost impossible to start and complete any administrative or operational function within the FRSC without employing technology in one form or the other.

## Communication Technologies

With increased use of computers in the Corps, management shifted its focus to other forms of technology and tools to improve connectivity between its offices. These included satellite-based connectivity, phones within a closed user network, and a toll free number to connect to the 24-hour emergency call centre.

As at 2007, none of the FRSC offices were interconnected. Communication was mostly
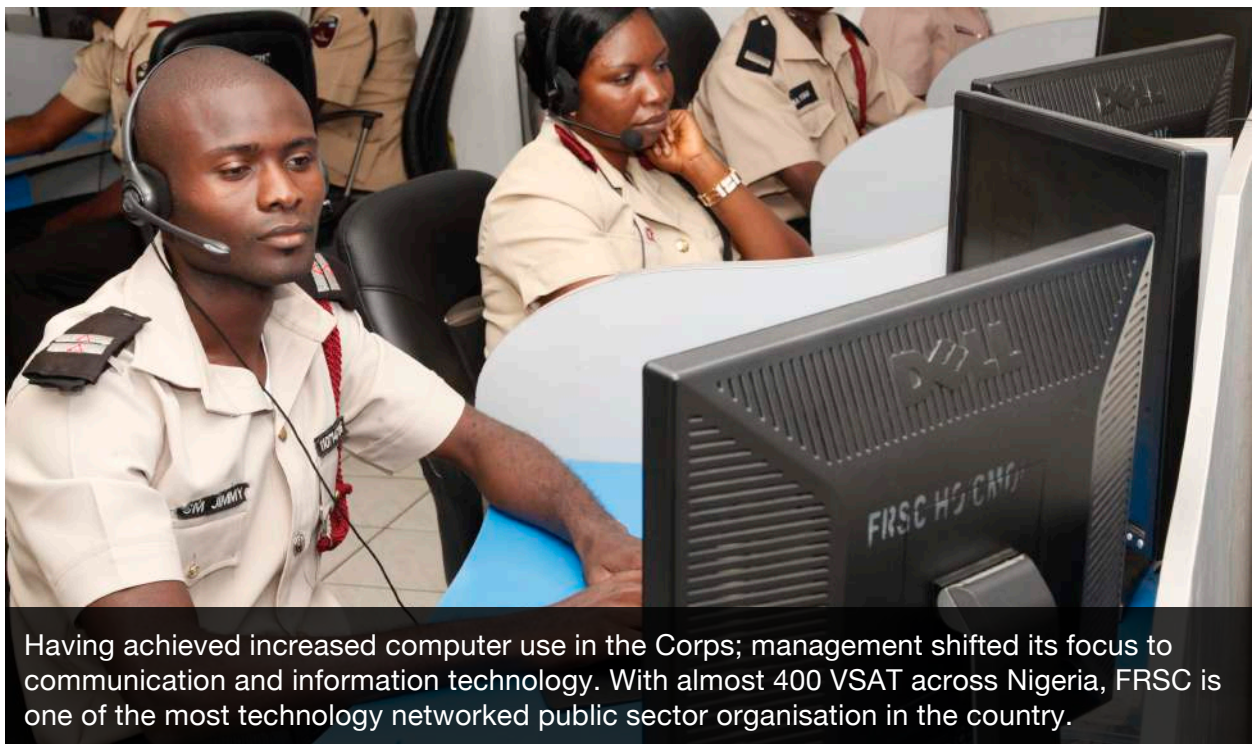


Having achieved increased computer use in the Corps; management shifted its focus to communication and information technology. With almost 400 VSAT across Nigeria, FRSC is one of the most technology networked public sector organisation in the country.

by phone and surface mail. Official memos took over 10 days to travel back and forth from the field offices to FRSC headquarters. By December 2012, FRSC management had deployed almost 400 very small aperture terminals (VSAT) across Nigeria and achieved real-time connectivity of most of the offices. Official memos are now sent at the speed of a click.

Building on the improved connectivity, FRSC implemented a cost-efficient interconnected network of telephone lines for real-time communication among its key officers. A Closed User Group of telephone lines meant that information could be pushed out to all members of the group at the click of a button. This system helped the Corps achieve a 95 percent reduction in the cost of phone calls between telephone lines within the emergency response sub-unit of the Closed User Group (CUG).

The CUG phones also increased the Corps' ability for real time data collection. By December 2012, FRSC had 5,958 telephone lines within the closed user group that were used primarily for communication but also enabled on-the-spot data collection and reporting.
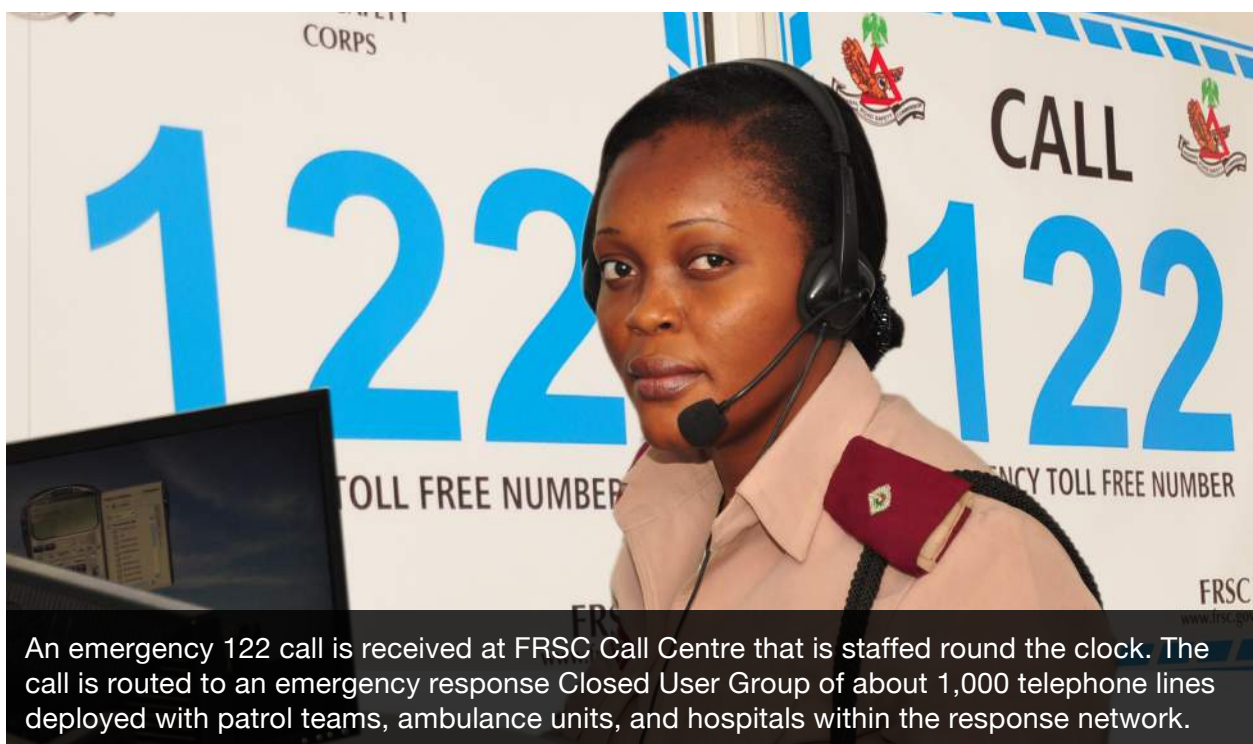
With the improved connectivity between FRSC offices (using VSAT), and among the key staff (using CUG phones), FRSC established an emergency toll free number, "122", for Nigerians to report road traffic crashes and other emergencies.

A call to the 122 emergency phone number is received by an FRSC staff and routed to the emergency response CUG consisting of 1,043 telephone lines. These emergency lines are deployed to FRSC Commanding Officers (233 lines), Operations (233 lines), Patrol Team Leaders (400 lines), Emergency Response Ambulances (25 lines), FRSC Roadside Traffic Clinics (25 lines), Rescue Officers (49 lines) and Federal Hospitals within Emergency Response Network (78 lines).

The emergency toll free number is still not synonymous with emergency response in Nigeria. As evidenced by the data, when emergency calls reduced from 2,764 in 2010 to 2,487 in 2012, crashes increased by 3.85 percent. Nevertheless, FRSC is continuing to push to make the toll free number ubiquitous and first-to-mind in the case of emergencies. FRSC inscribes the number on all its patrol vehicles, tow trucks, billboards, and disseminated through print, electronic and social media.

With the various communication tools in place, FRSC was ready to launch its 24-hour Call Centre to provide coordination and prompt response to emergency situations.



An emergency 122 call is received at FRSC Call Centre that is staffed round the clock. The call is routed to an emergency response Closed User Group of about 1,000 telephone lines deployed with patrol teams, ambulance units, and hospitals within the response network.

The Call Centre has efficient processes for receiving and routing emergency calls to the appropriate response teams. Equipped with other technology tools such as an online vehicle tracker, FRSC Call Centre is able to dispatch patrol and emergency vehicles closest to a road traffic crash site or an area of traffic congestion. By 2012, a combination of these technology tools improved FRSC's average emergency response time to 20 minutes (from the time a call is received at the Call Centre).

## Data and Information Technologies

According to Peter Drucker (a management guru), what can't be measured can't be managed. FRSC management appreciated that to achieve its mandate; it needed to improve its ability to measure its operations and processes and to apply the intelligence gathered from the analysis of the data in improving its decisions.

Although FRSC had a "Data Dashboard" prior to the start of Osita Chidoka's tenure, it had difficulties using the data. In addition to the difficulties of collating road traffic data using manual processes, the key challenge was the need for classification, processing and analysis of the data in a computerised database system for easy retrieval to aid decision-making. FRSC departments were expected to upload data to Dashboard but at

best, the tool was used mainly for end-of-year reporting. FRSC management could not use the information from the data in its management decisions because the data were not received in a timely manner.

By 2009, FRSC Data Centre was created as a warehouse for various management information systems used to track, capture and manage a wide range of data. To ensure continuous update of the Dashboard, data reporting was assigned the highest score of the six criteria used in evaluating individual and departmental performance. This evaluation determines one's career progression within the organisation and has some immediate financial rewards attached. Data reporting constitutes 20 percent of the overall performance score.

FRSC management introduced the Dashboard Analytics to analyse the data and present information for management decisions. The Dashboard Analytics tracks Corps' operations, identifies prevailing and emerging trends, boosts policy formulation and alignment, and enables specific and general decisions or directives. To ensure continued usage of the tool, FRSC management requested a presentation of the data analysis at the start of the weekly management meeting. This requirement ensures timely update of data by all FRSC departments for analysis and presentation at



Every key management decision at FRSC is guided by data derived from the Corps' investments in data and information technologies. Here, Osita Chidoka, COMACE (first on the right) is in a meeting with senior officers of the FRSC.

the management meeting.

The Dashboard has become a critical instrument for management decision making with far reaching beneficial consequences both for FRSC and for general road traffic administration and safety management in Nigeria

In addition, FRSC has developed more efficient processes to generate accurate data and information for FRSC management, other government agencies, private institutions and the public. FRSC can produce more accurate forecasts of road related events and provide reliable and accurate data to assist in national security. For instance, the National Vehicle Identification Scheme (NVIS) which relies on a database linking license plates to the vehicle owner's international passport number, auto insurance policy number and proof of vehicle ownership; has been used by the State Security Service to identify vehicles used in crimes.

## Half the Crashes by 2020

The significant improvement in Nigeria's Road Traffic Crashes (RTC) profile can be attributed, in part, to improved decision making as a result of better data analysis. An analysis of 2008 RTC data showed the

contributors to road traffic crashes are cars (35 percent), buses (17 percent), tankers (9 percent), and motorcycles (23 percent). This ratio appears to be consistent as there are more cars per capita than any other type of vehicles. Further analysis of the data showed the leading causes of road traffic crashes to be lack of proper driver training, overloading, and poor maintenance of the vehicles.

Further disaggregation of the data showed that over 80 percent of the commercial drivers could not provide proof of having attended a driving school. As a consequence, FRSC created the National Drivers School Standardisation Programme that has accredited 395 training providers. Between 2008 and 2012, over 81,484 commercial drivers have attended these programmes.

FRSC created an initiative, Total War on Overloading (TOWOL), to reduce the number of casualties as a result of overloading. Consultations and presentations were made in motor parks across Nigeria and to owners of commercial transport vehicles. In these sessions, FRSC provided data to show that the owners of the vehicles lost a lot more money on the wear-and-tear on their vehicles than they made from the extra passenger or cargo they loaded on their vehicles. As a result, there has been a 21 percent reduction in overloading from 2009 to 2012. In fact,



Investments in data analysis have improved decision-making at FRSC. Data shows that the leading causes of RTCs are lack of proper driver training, overloading, and poor vehicle maintenance. This analysis informed the creation of interventions to address the challenges.

most of the mid-sized commercial buses now carry only three passengers per row as against the four passengers that was the norm until 2009.

Despite these changes, FRSC data showed that although there was a 47.7 percent reduction in RTC by commercial buses, there was a 92.1 percent increase in the number of casualties. Further disaggregation of the data showed that mid-sized commercial buses contributed to this spike in the number of casualties. Analysis indicated that these casualties were from a particular brand of mid-sized buses that were imported from Asia. FRSC has continued to work with the government to ensure that only vehicles that meet a minimum safety standard can be imported into Nigeria.

By January 1, 2009, FRSC introduced a law banning the operation of a motorcycle without a safety helmet. This law was informed by FRSC road traffic crash data that showed the immense pressure on Nigeria's healthcare delivery infrastructure as a result of motorcycle crashes. Thirty-three states in Nigeria (including the Federal Capital Territory) adopted this law to varying levels of acceptance by the Nigerian public.

The role of data in FRSC decision-making can also be emphasized by its introduction of a law mandating the use of seatbelts in a moving vehicle. Although mandatory seatbelt use was introduced in 2003, it met with limited success. By 2007, FRSC stepped up enforcement of the law. With improved data collection and analysis, FRSC was able to secure endorsement and support from other stakeholders in its push for full compliance.

Average compliance across the country has improved from 4.5 percent (2007) to 61 percent (2012). 29 states out of the 36 states plus the Federal Capital Territory have achieved over 50 percent compliance. The best performing states are Rivers (88 percent), FCT (82 percent), Osun (81 percent) and Cross River (81 percent). The least performing states are Bauchi (13 percent), Yobe (10 percent) and Borno (9 percent).

FRSC has leveraged technology to improve its capabilities for data collation and analysis, and this has enhanced its decision-making process. The results are beginning to justify the effort. As a signatory to the Accra Declaration to reduce by 50 percent the number of RTCs in Africa, Nigeria is expected to reduce registered deaths per 10,000 vehicles from 41 as at December



FRSC and its stakeholders are committed to creating a safe motoring environment in Nigeria. Here, President Goodluck Jonathan (L), Col. Lawan Gwadabe, rtd., former FRSC Board Chairman (M) and Osita Chidoka, FRSC COMACE (R) reaffirm their commitment.

2012 to 3.2 by 2020. At the inception of the Federal Road Safety Corp in 1988, there were 156 deaths per 10,000 registered vehicles.

## Innovating to the Next Frontier

Continued success at FRSC will demand progress on all the levers of the corporate strategy. Intelligence obtained from data analysis will continue to be a focal part of this strategy. This will require the mechanism (tools and processes) for comprehensive monitoring of road safety performance. These mechanisms for data collection and analysis will cover not only lagging indicators such as road traffic deaths and injuries but also, and more importantly, leading indicators such as traffic volume, number of licensed drivers, seat-belt use, number of offenders cited for various traffic violations,

safety engineering during road construction, etc.

FRSC will continue to promote technology use within the Corps while investing in new age technologies to enhance its data collation and analysis and that provides the information or intelligence at the point of need or use. For instance, FRSC is exploring ways to enable Nigerians to use the ubiquitous mobile phones to provide real time data on traffic situations. This will aid more efficient patrol and rescue operations.

FRSC is committed to achieving its mandate to eradicate road traffic crashes and create a safe motoring environment in Nigeria. The faster it is able to collate the data and make sense of it, the better.



FRSC data indicated that most of the road traffic crashes involving children occurred on their way to or from school. FRSC worked closely with their strategic partner, Innoson Motors – Nigeria's first indigenous motor manufacturer – to create a specially designed school bus that offers special safety features for children. Data continues to drive FRSC's commitment to innovation to create a safe motoring environment in Nigeria.

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