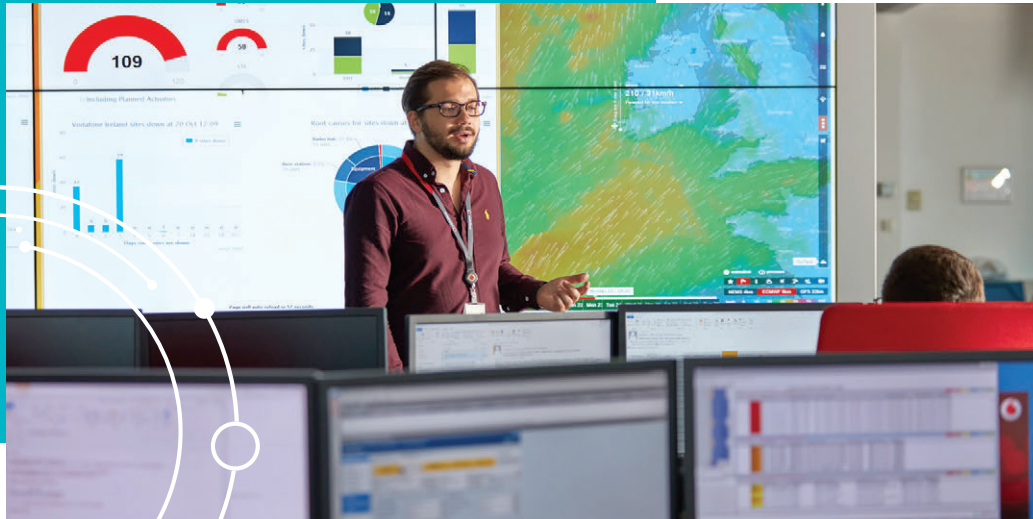


# 05

## Best technology

We have embarked on a transformational journey from a traditional telco to a technology communications company. We are investing in the latest gigabit network technologies and modern digital IT systems as we connect our customers for a better future.

- ✓ Achieved
- ✗ Not achieved
- ⇌ Unchanged



This year, we have invested R13.2 billion in infrastructure across the Group, reinvesting more than 14.6% of revenue back into our network and IT systems. Major network investment programmes include expanding our coverage and increasing network capacity across all our markets, as well as continuing to modernise our networks to prepare for the launch of 5G. We have also adopted the latest digital technologies to help reduce costs and increase productivity through smart network planning, deployment and operations. We have continued to increase investment in IT, focusing on enabling faster time to market our products and services, ensuring the availability of our IT systems and improving our digital channels and capabilities.

### South Africa

#### Further extending our best gigabit network with voice and high-speed data coverage

- ✓ While 2G coverage remains at 99.9% of the population, 3G was extended to 99.7% of the population, and 4G to more than 95%. We have made significant progress in increasing 4G outdoor coverage, despite still not having access to dedicated sub 1GHz 4G spectrum (700/800 MHz).
- ✓ We added 137 new deep rural network sites, connecting rural communities that were previously without any coverage at all.
- ⇌ We remain optimistic that the regulator will soon announce the auction of additional 4G and 5G spectrum during this year, however in the interim we are using innovative software features supported where our radio network has already been modernised, such as dynamic spectrum sharing. This has enabled us to better manage the sharing of our limited spectrum resources across 2G, 3G and 4G on a

dynamic basis, without having to use traditional 'hard' re-farming where spectrum was dedicated to a particular technology.

- ✓ We renegotiated our existing 4G national roaming and facilities agreements with Rain. This allows for rollout across the entire Vodacom network where required. Traffic offloaded to the Rain network has significantly improved the data experience for our 4G customers.
- ✓ We have invested in ensuring that our mobile core network is now 5G ready and we are continuing the ongoing modernisation of our radio and transport networks to also support 5G. Following the allocation of temporary spectrum during the COVID-19 crisis, we selectively launched mobile and fixed 5G services. We have however secured spectrum for 5G through our agreement with Liquid Telecom.
- ✓ We have seen growth in our VoLTE (Voice over LTE) service, which now carries over 2.5 million voice calls during peak traffic periods daily and uses spectrum more efficiently than 2G and 3G technology to increase capacity for the limited spectrum being used. We enabled enhanced voice services (EVS) on our network to improve voice quality for our customers.
- ✓ To cater for the growth in data traffic, we increased the percentage of base stations with self-provided transmission to 96% of all base stations, while 47% of sites have self-provided fibre and 49% have self-provided high-capacity microwave transmission.
- ✓ Mobile network performance improved overall, considering the results of our internal network drive test benchmarking. This has been achieved by continuing the investment in modernising our network to support the latest features and capabilities and expanding our 4G+ footprint where possible.

✔ We significantly grew our fibre to the home and business footprint with 109 536 endpoints passed, and have built new capabilities into our digital channels to place an order, schedule installations and manage services.

✔ National load-shedding, instability of the power grid, increased vandalism and theft at cell towers all negatively impacted network availability, unfortunately affecting both consumer and enterprise customers. We mitigated some of the impact by investing in new back-up batteries and standby power solutions, including deploying 'intelligent lithium-ion batteries' with an integrated battery management system (BMS) as alternate back-up power, and implementing high-security shelters to reduce battery theft and damage. During extended stages of load-shedding, batteries do not have sufficient time to recharge and this remains an operational concern during extended stages of load-shedding.

## Reducing our environmental impact and delivering technology efficiencies

✔ Over the past five years we have realised more than R6 billion in operational expenditure savings through our technology efficiency programme, which focuses on reducing energy consumption, sourcing alternative renewable energy solutions, optimising site lease/rental renegotiations, increasing network infrastructure sharing and ensuring competitive procurement.

✔ Further capital expenditure savings were also achieved by increased network infrastructure sharing and the standardisation of equipment specifications, and reuse of equipment after refurbishing.

✔ We have built an in-house smart capital expenditure tool, using technologies such as Big Data and AI to automate complex network planning tasks. This ensures that all metrics ranging from the best customer experience to ensuring an optimal return on investment are considered and optimised for capital allocation.

✔ We are also using smart IoT technology to remotely monitor and automatically manage energy consumption across our network, contributing to a 25% runtime reduction in air-conditioning in our base station containers.

## Extending our capabilities in modern digital IT

✔ We have adopted and scaled Agile and DevOps delivery practices to ensure tighter collaboration across the business which has resulted in faster time to market for our products and services.

✔ Over the past three years we have employed 200 employees in South Africa with valuable digital skills, including cloud, software engineering and data analytics skills.

✔ We have accelerated cloud adoption and begun moving workloads to the public cloud as part of a wider three-year migration plan in partnership with both AWS and Microsoft Azure. Cloud migration will result in cost savings going forward and provides greater flexibility in delivering new capabilities even faster.

✔ Our existing Big Data capabilities have been enhanced to detect fraudulent activities, increase the resolution of first-time support calls and decrease the average time to handle a call in our contact centre.

✔ TOBi, a leading AI chatbot providing customers with a conversational experience that can solve queries without human interaction, handled over 5.8 million chats during the year and is being expanded to channels that include SMS, WhatsApp and MyVodacom App.

✔ We have used RPA to automate over 140 business processes, resulting in radical simplification of the way we work.

✔ For the second year in a row, Vodacom ranked first in the independent IT for customers (IT4C) benchmark conducted by Gartner, with major improvements in the performance of the MyVodacom self-service app versus competitors.

## Addressing cyber threats to maintain customer security and privacy

➡ Globally and locally we have observed an increase in cyber attacks and data breaches, with evidence of more sophisticated attacks emanating from state-funded hackers significantly raising the risk and potential impact. In response to this challenge, we have established a group-wide cybersecurity and privacy programme and prioritised effective execution of our comprehensive cybersecurity strategy.

✔ We have implemented data leak prevention and detection mechanisms, as well as a dedicated privacy office, to address the persistent threat of data breaches and exposure of our customer and employees' personal information. These activities are constantly monitored in our 24/7 Cyber Intelligence Centre and cybersecurity operations centres.

✔ We have implemented stringent cybersecurity baseline controls which are used to secure and harden our environment against internal and external cyber threats. Vodacom Tanzania has achieved the highest compliance level across the Vodafone Group for the mandated cybersecurity controls.

## Growing our Enterprise technology and services

✔ We have increased our network reach, with more Enterprise customers securely connected through both fixed and mobile technologies such as fibre (broadband connect fibre), microwave (broadband connect wireless premium) and mobile 3G/4G (broadband connect wireless lite).

✔ Our SME business internet portfolio comprising internet connectivity, voice, email, data and productivity software grew 78% year-on-year. To better support our SME partners and customers, we successfully introduced self-service web and mobile applications, and implemented a digital tool which uses geographic information to help customers better understand Vodacom's network coverage and technology footprint, i.e. fibre, 3G and 4G, with improved accuracy and efficiency.

## Best technology continued



- ✓ We further improved access delivery timelines and services for business customers.
- ✓ We have expanded our connectivity product portfolio with software defined wide area network (SD-WAN) technology. SD-WAN enables Vodacom to leverage multiple connectivity technologies at the same time, such as MPLS, fixed line internet and 4G/LTE, to offer technology agnostic wide area network (WAN) solutions to our Enterprise customers. As a cloud based solution, SD-WAN augments Enterprise customers' cloud strategies by ensuring seamless integration into cloud provider services.
- ✓ The number of customers making use of cloud infrastructure and hosting services, for example Office 365, domain services and managed software services on Vodacom's Enterprise Cloud grew by 17%.

### Maintaining technology resilience

- ✓ We successfully completed a focused operational resilience programme across all local markets, the scope of which includes the resilience of critical IT, video and M-Pesa services and recovery plans in the event of failure. There are also improved resiliency measures in place to safeguard our networks against interruptions caused by natural disasters, technology failures or human error.
- ✓ We routinely undertake independent audits to assess our network resilience, reviewing the operational readiness and status of fire detection and prevention systems, evaluating the standards of power installations and auditing building management systems across our facilities.
- ✓ In the event of a disaster at a regional mobile network exchange facility, we have recovery solutions in place. These solutions are regularly tested, to ensure we meet our internal resilience policy targets.
- ✓ The Vodacom core network is fully geo-resilient and in an event of a major incident we would be able to switch over to another core network in a different geographical area.

### International

#### Expanded our best gigabit networks

- ✓ We have expanded network coverage across our international operations. We now have a total of 8 032 2G sites, 6 175 3G sites and over 2 672 4G sites across all our International markets, and accelerated 4G rollout by 67.7% alone.
- ✓ We have also optimised our investment through infrastructure sharing and co-builds. We completed the first fibre co-build with Facebook and Airtel from Moanda to Inga in the DRC.
- ✓ We continue with network virtualisation of our core networks to increase capacity and to improve availability, and now have a virtualised voice core network in Lesotho, Mozambique and Tanzania.

- ✓ We have activated significant additional submarine cable capacity with diverse geographical routes to meet growing demand for data and internet across all of our markets. We have partnered with various other global players in the 2Africa project, one of the world's largest subsea cable projects that will interconnect Europe, the Middle East and 21 landing points in 16 countries across Africa, going live in 2023/24.
- ✗ We experienced particular challenges in Mozambique due to two consecutive cyclones that damaged major roads and infrastructure. We also experienced theft and vandalism to our fibre infrastructure, which was resolved by installing high-speed microwave transmission links as back-up routes to the fibre network.
- ✗ The DRC experienced service availability challenges through a leased fibre route from a third party. To mitigate the issue an additional redundant route using a fibre co-build initiative with Facebook and Airtel was implemented for additional stability and capacity.

#### Strengthening our digital IT capabilities

- ✓ Our International markets have also embraced the adoption of Agile delivery methodologies, with new ways of working launched in Lesotho, Mozambique and Tanzania yielding faster time to market and improved productivity.
- ✓ We have introduced a shared services model across our markets to provide efficiencies and benefit from economies of scale. This has enabled us to accelerate the rollout of new technologies such as Big Data, Robotic Process Automation and chatbots, and also launch new services such as Video Play.
- ✓ Lesotho and Tanzania successfully upgraded their M-Pesa platforms to the latest release, which provided an improvement in performance and included new capabilities such as group savings, debit orders and real-time third-party notifications.
- ✓ We have introduced M-Pesa Group Savings in Lesotho, designed to make group savings reliable and improve financial inclusion in Lesotho.
- ✓ We have introduced new anti-money-laundering capabilities on the central M-Pesa platform. The M-Pesa platform hub enables the detection and screening of payments in real time that are deemed fraudulent. The M-Pesa platform hub also permits faster time to market of new products, eases integration and reduces costs.
- ✓ Lesotho successfully migrated to the converged charging system (single system for both postpay and prepaid billing), hosted in South Africa as a shared service.

## OUR RESPONSE TO THE COVID-19 SITUATION



Our priority during the pandemic is to protect the health and safety of our employees, customers and the general public, while continuing to deliver services to our customers. During the pandemic, connectivity and communication services have been more important than ever. In South Africa, we took various measures during this period.

- We deployed more than 4 100 essential field technical resources to maintain the network, providing 200 000 medical masks, 15 000 litres of hand sanitiser and 440 000 latex gloves.
- We ensured effective network access for the 7 500 Vodacom staff and contractors working from home, via VPN with access to tools, video and audio conferencing and emails. Vodacom staff participated in over 4 370 video conferences a day with more than 20 000 participants in total.
- We monitored changing traffic patterns to bring forward important network capacity upgrades to both our mobile and fixed networks: an increase of up to 46% was seen in data traffic across our mobile networks, with fixed network traffic up 250%.
- We undertook advance ordering of spare parts for maintenance and accelerated installation of back-up batteries and smart IoT energy management solutions to help keep base stations running.

## Network NPS across our markets

We have seen an increase in mobile network competitiveness from our competitors in South Africa and Lesotho impacting our network NPS leadership in these markets. We are continuously investing in our networks by expanding 3G and 4G coverage and ensuring improved performance, quality and capacity through our modernisation programmes to ensure we improve the overall network customer experience. We are executing plans to regain our co-best network leadership in these markets.

Vodacom has however retained the South African Customer Satisfaction Index (SA-csi) leader position in overall customer satisfaction with a 76.1 index score for cellular network. The SA-csi is an independent national benchmark of overall customer satisfaction of the quality of products and services available to consumers in South Africa.

### Overall network NPS

Country	2020	2019
South Africa	#2	#1
Tanzania	#2	#2
DRC	#1	#1
Mozambique	#2	#2
Lesotho	#2	#1



## Vision 2025

### Technology strategy

We have successfully delivered on and concluded the execution of the Technology 2020 strategy, which was originally developed in 2015. Execution of the Technology 2020 strategy has resulted in modernised network infrastructure and digital IT systems across the Group.

Vodacom has been very successful as a traditional telco company providing network connectivity, and has now started a transformational journey from being a traditional telco to becoming a technology communications company. Vodacom's new Technology 2025 strategy is focused on looking beyond pure connectivity by also leveraging scaled platforms to drive new revenue growth. In order to deliver on this ambition, new capabilities are being built and new skills developed.

### The Technology 2025 strategy will drive:

- The evolution of mobile and fixed network access, transport network simplification and telco cloud, with a specific focus on making the network 'smarter' through automation and artificial intelligence.
- A future-proof, flexible modern digital IT architecture for a superior customer experience, enabling exponential growth through scalable platform ecosystems.
- New capabilities across our network and IT platforms for internal and external use, through open interfaces, with the aim of reducing the time to create new products, and reducing the cost of integration.
- Access to Big Data to drive intelligent data-driven decision-making, solutions and operations, enabled via a scalable and secure data platform.
- Security and privacy embedded by design in all our projects, products and services throughout their life cycle.
- The way we think, behave and operate by growing and developing the right skills, core values and behaviours of a technology communications company.