ESWATINI COMMUNICATIONS COMMISSION

General Notice 12/2024

PROPOSED DECISION IN TERMS OF SECTION 38 OF THE ESWATINI COMMUNICATIONS COMMISSION ACT, 2013:

PROPOSED DECISION TO RETIRE LEGACY MOBILE NETWORK TECHNOLOGIES IN THE KINGDOM OF ESWATINI

ESWATINI DATA PROTECTION AUTHORITY

SZ CIRT ESWATINI COMPUTER INCIDENT RESPONSE TEAM

Eswatini Communications Commission UNIVERSAL ACCESS SERVICE FUND

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Definitions

For the purpose of this proposed decision;

2G: Second Generation of mobile networks (also called GSM)

3G: Third generation of mobile networks

4G: Fourth generation of mobile networks (also called LTE)

5G: Fifth generation of mobile networks

Broadband: High-speed internet service that can be used for browsing, streaming, and more

Carrier Aggregation: is a technique in wireless communications that involves using multiple carriers simultaneously to create a wider channel for data transmission.

FDD Frequency Division Duplex refers to duplex communication links where uplink is separated from downlink by the allocation of different time slots in the same frequency band

IMT Internation Mobile Telecommunications is the generic term used by the ITU community to designate broadband mobile systems

IoT: Internet of things, referring to a network of physical objects or "things" that are embedded with sensors, software, and other technologies to connect and exchange data with other devices and systems over the internet.

Legacy Networks: Older communication networks that were designed for earlier types of communication, such as voice calls and low-speed data transfer,

MIMO Multiple-Input-Multiple-Output is an antenna technology for wireless communications in which multiple antennas are used at both the transmitter and the receiver to enable the optimization of data speed and capacity of radio transmission.

NFAP National Frequency Allocation Plan is a comprehensive framework established to designate, control and manage the allocation and use of radio frequencies within a country.

Retire: Officially discontinue the use or support of legacy networks

Smartphone: A mobile phone that combines traditional phone features like calling and texting, with advanced computing capabilities

Spectrum: A range of electromagnetic frequencies used to transmit data, including voice, video, and internet.

Sunset: Indicates a gradual phase-out or planned discontinuation of the legacy networks.

1. Introduction

Over the years, the telecommunications industry has undergone significant advancements in network technologies. These advancements have led to the emergence of newer generations of mobile networks that have gained widespread adoption, such as 3G, 4G, 5G, and ongoing developments around 6G, offering faster data speeds, enhanced coverage and a multitude of innovative services. At the same time, consumer demands, requirements and usage patterns have significantly evolved from the early days of mobile telecommunications services. The modern-day consumer demands ubiquitous, high-speed broadband connections that enables them to effectively participate in the digital economy.

As consumers demand high-speed broadband services, the latest technologies and networks (4G and 5G) have become the more preferred technologies, while legacy networks (2G and 3G) are slowly becoming less relevant. These legacy networks (2G over 32 years and 3G over 22 years), were designed for basic data and voice usage. In today's fast-paced world, consumers demand quick, reliable connections with minimum latency. Legacy networks that do not support the needs of high-speed applications and emerging technologies like Internet of things (IoT) and video streaming are making way for new, faster and more efficient networks. 4G, 5G and soon 6G are the next evolution of cellular networks and offer optimised options including faster speeds, greater capacity and operational efficiencies. Developed nations, where advanced networks are well-established, have been at the forefront of this evolution. As more countries move towards 4G and 5G, this limits the ability of devices and services on 2G/3G to operate seamlessly across borders. Closer to Eswatini, the Republic of South Africa is considering taking a similar course of action, with concrete proposals to retire 2G and 3G networks as early as mid-next year (June 2025). While legacy technologies and networks have served consumers well in the past, it is essential to acknowledge that technology evolves at a rapid pace.

Considering these developments, and as we look towards the future, it has become increasingly apparent that the country considers taking similar a similar course of action with respect to legacy networks as a necessary step to ensure optimal resource allocation, improved quality of service, reduction of operational costs and efficient utilization of spectrum

resources. Analysts agree that retiring these legacy networks would free up spectrum resources being used and refarming them for more advanced technologies like 4G and 5G.

In the foregoing, the Commission has developed this draft decision for the retirement of 2G and 3G technologies within the country's mobile networks. The detailed context and rationale behind this decision is elaborated upon in the next section of this document.

2. Context and Rationale

The telecommunications sector serves as the backbone of most modern economies and underpins various other sectors that are essential for economic activities, from efficient delivery of public services, e-commerce, access to education, health services, etc. The sector has become a critical part of everyday life, allowing citizens and businesses to connect and communicate efficiently across the globe and driving global economic growth. The Government of the Kingdom of Eswatini's Policy Statement 2024 articulates the many challenges and issues that the country faces, including deliberate programmes and initiatives that must be undertaken to address them. These range from poor delivery of public services, low economic growth, unemployment, deteriorating health and education services to diminishing national identity. These are big challenges and the ICT/Telecoms services can play a significant role in addressing them. The ambitious strategy and programme to improve access to and delivery of government services being implemented by the Ministry of Information, Communications and Technology is testament of the critical role that ICT services need to play to improve the lives of EmaSwati. This desire is highly dependent on the availability of reliable and relevant connectivity infrastructure and services.

The government and relevant authorities are therefore required to put in place the relevant frameworks and initiatives that supports the deployment and operationalisation of connectivity infrastructure in a resource-efficient manner. These initiatives can include determinations, based on the obtaining environment at a particular point in time, on what technologies are fit to best serve the aspirations of the country at large. It is in this context that the proposal on the retirement of legacy mobile telecommunications networks is being proposed.

Specifically, the proposal is made against the following considerations:

2.1 Ensuring Efficient use of Radio Frequency Spectrum Resources

Radio frequency spectrum is a finite and limited resource and as such it must be used efficiently and used in applications and services that yield the best social and economic benefits. Accordingly, there is a finite amount of spectrum that is available for mobile network operators to provide all required services and emerging technologies require more of this finite resource. The National Frequency Allocation Plan (NFAP) identifies the following bands (Table 1 below) for use by mobile telecommunications services.

Band (MHz) - FDD	Channelling Arrangement	Amount of Bandwidth	Current Utilisation
700 MHz	703–733 MHz / 758–788 MHz	2X30 MHz	4G/LTE, partly assigned
800 MHz	791–821 MHz / 832–862 MHz	2X30 MHz	4G/LTE, Fully assigned
900 MHz	880–915 MHz / 925–960 MHz	2X35 MHz	2G/3G, Fully assigned
1800 MHz	1710–1785 MHz / 1805–1880 MHz	2X75 MHz	3G/4G/LTE, 70% assigned
2100 MHz	1920–1980 MHz / 2110–2170 MHz	2X60 MHz	3G, 75% assigned
2600 MHz	2500-2570 MHz / 2620-2690 MHz	2X70 MHz	None
3300 MHz	3300-3400 MHz	100 MHz	5G, partially assigned
3500 MHz	3400-3600 MHz	200 MHz	5G, assigned on trial basis
4900 MHz	4800-4990 MHz	190 MHz	None

Table 1: Summary of IMT Allocations in the NFAP and usage scenarios

These different radio frequency spectrum bands have different characteristics, suited for use and application in certain scenarios. As an example, spectrum bands below 1GHz (700, 800 and 900 MHz) have good propagation characteristics, suitable for providing wider and good network coverage at a lesser cost. They are also suited for providing sufficient coverage in uneven / mountainous terrains. Combining such bands

into a contiguous block of spectrum present an excellent combination for coverage and capacity for improved end-user experiences.

In order to have sufficient spectrum resource to match the requirement by new technologies such as 5G and 6G (in the future), spectrum refarming is essential where currently assigned spectrum is used by Mobile Network Operators to deploy networks with new technologies. As can be seen in Table 1 above, mid-band spectrum i.e. 700, 800, 900, 1800 and 2100MHz is currently used for 2G, 3G and 4G networks. By retiring off 2G and 3G networks, operators are able to re-farm this spectrum for use with more important and in-demand networks. This means that they can reuse the spectrum to strengthen their 4G and 5G experiences by employing carrier aggregation to achieve both coverage as well as the high capacity and make sure more communities have access to a fast, reliable and sustainable mobile network. As spectrum below 2 GHz is particularly scarce, reuse of these frequency bands for new and more efficient technologies is essential to maximise the benefits from available spectrum. For example, the spectral efficiency of 4G coupled with Multiple-Input-Multiple-Output (MIMO) techniques is such that refarming 900 MHz spectrum from 2G to 4G with 2×2 MIMO delivers a 12-fold increase in mobile data capacity. For 1800 MHz spectrum, where higher orders of MIMO can be deployed, moving from 2G to 4G delivers a bits/Hz improvement of up to 26 times. This will result in a more efficient usage of spectrum where the different propagation properties of the different bands are utilized to provide a good experience for consumers.

In Eswatini, MNOs utilize 55MHz paired spectrum for 2G and 3G in the bands 900, 1800 and 2100MHz, which is about 32% of the available spectrum and 42% of the assigned spectrum in in these bands as illustrated in the table below. This capacity can be made available for 4G, 5G and later 6G deployment which presents much improved user experience in terms of broadband connectivity.

Frequency Band	Total available Spectrum	Total assigned Spectrum	Spectrum Used for 2G/3G
900 MHz	35MHz	35MHz	35MHz
1800 MHz	75MHz	50MHz	5MHz

2100 MHz	60MHz	45MHz	15MHz
TOTAL	**170MHz**	**130MHz**	**55MHz**

Table 2: Current Spectrum Assignments for 2G and 3G in all Spectrum Bands

2.2 Improving Network Coverage and Quality of Service

Universal service and access to communications services is a pre-requisite for a modernday economy. This implies that communications services should be available and accessible to all, at the same level of quality and experience, including in remote and rural areas of the country.

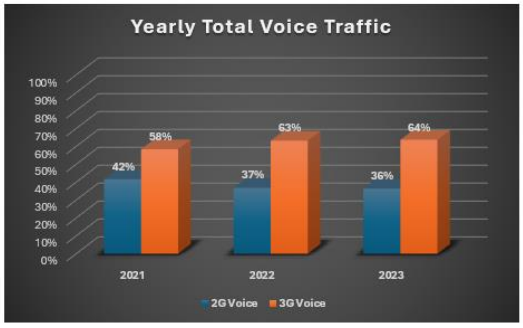
As already indicated, the radio frequency spectrum bands currently used for providing 2G and 3G services (particularly 900 and 1800 MHZ bands) have excellent propagation characteristics suited for providing good network coverage at a lesser cost. This includes providing coverage in hard to reach (due to the mountainous nature) of the country. Retiring the legacy networks (2G/3G) will free up radio frequency resources that can be used by advanced technologies such as 4G and 5G. These advanced networks will be able to provide broader coverage and better signal penetration, enabling more people in remote and underserved areas to access reliable, high-speed connectivity.

2.3 Traffic on 2G/3G Networks:

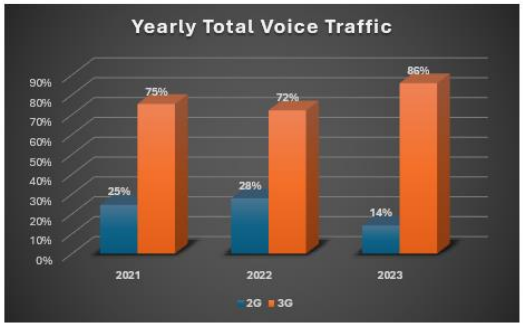
All mobile network sites in the country are 2G, 3G and 4G enabled, with operational and cost elements required to keep the technologies working and available to customers. The important question and consideration on the issue of retiring some of the technologies is what traffic, how much of it and what trends have been observed over the recent past for each type of traffic and technology. A comprehensive analysis of mobile network traffic in Eswatini for the past 3 years indicates a significant shift in usage patterns. The analysis reflects that during this period, the demand and usage for 2G services have been steadily declining.

Voice Traffic:

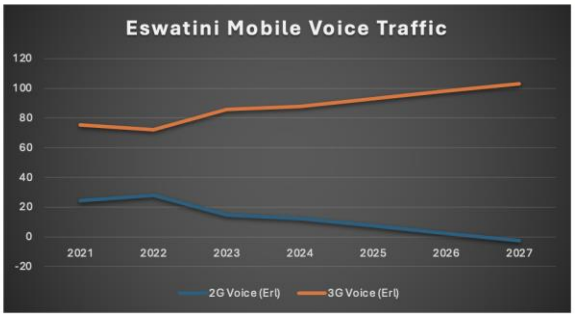
MTN Yearly Voice



ESM Yearly Voice



Currently, the 2G network accounts for only 27% of total voice network traffic while 3G voice network traffic is at 73%. There is currently no voice traffic on the 4G/LTE network due to the fact the that Voice over LTE (VoLTE) is currently not enabled by mobile network operators. Projects (as shown in figure 1 below) indicate that the amount of traffic will continue to decline for the next few years. The implication is that a fully-fledged network, with all the associated running costs, only carries 27% of the total voice traffic, and with one operator having a utilisation of less than 15%. This is in addition to the fact that this network(s) makes use of the high demand spectrum (sub 1GHz band). However, it must be noted though that in addition to voice traffic, the network still carry some low-bandwidth data traffic, used largely in telemetry and IoT applications.



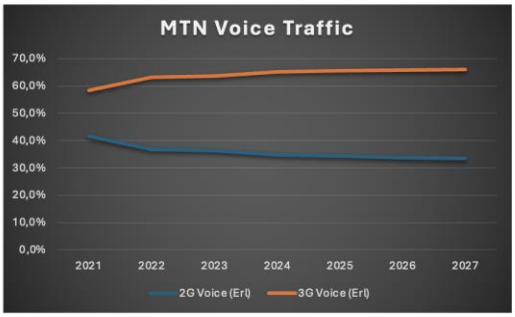


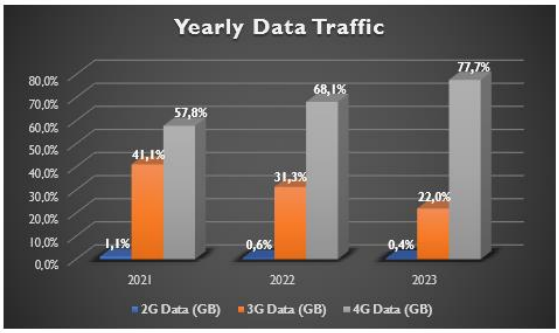
Figure 1: Voice traffic projections on existing technologies upto 2027.

It must be noted that these figures are achieved in the absence of Voice over LTE (VoLTE). The expectation is that the usage pattern will change significantly with the widespread adoption of 4G as the de-facto technology in the country, to include voice services as well. This is project to result in a significant reduction of voice traffic on the 3G network as well within the next couple of years. This implies that the 3G network, similar to 2G, is expected to become less relevant to consumers.

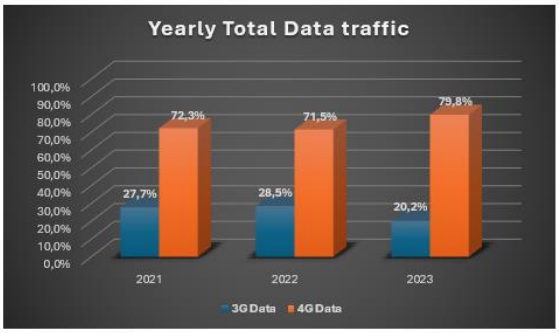
Data Traffic:

In contrast, the 4G/LTE network has experienced substantial growth in usage and traffic, with most of consumers now utilizing this advanced network for data, and multimedia services. While almost 80% of data traffic is on 4G LTE network, about 20% on 3G network, and 0.2% on 2G network. With recent developments, where all the network sites in the country are now 4G enabled, the expectation is that almost all the data traffic will be running on the 4G network within the next two (2) to three (3) years.

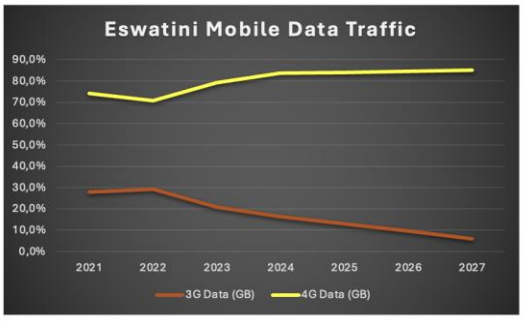
MTN Yearly Data



ESM Yearly Data



From this analysis, it can be clearly noted that 2G traffic on the networks is on the decline. In fact, 2G traffic is almost non-existent for Eswatini Mobile. 3G data traffic is projected to be non existed (as shown in Figure 2 below) on the networks within the next few years. This is a clear indication that there is need for regulatory intervention to ensure efficient use of scarce resources amongst, other considerations.



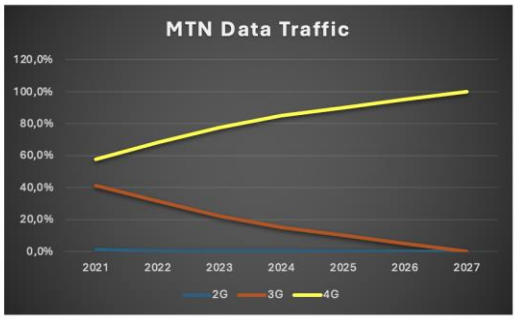


Figure 2: Data traffic projections on existing technologies up to 2027

Commercial 5G Deployments:

At the present moment, there are only a handful of active sites (3 in total) on 5G, with very little traffic on them. The 5G ecosystem is expected to mature within the next few years, contributing significantly to the provision of high throughput, low-latency and massive communications services. To achieve this, a number of interventions by all stakeholders would need to be undertaken, including ensuring access to radio frequency spectrum bands that supports acceptable network coverage at minimum costs, development of sound business cases and usage scenarios as well as engaging in other programmes that supports 5G infrastructure deployments.

2.4 Smartphone Penetration: 2G-Only, 3G-Only Devices

Another significant consideration for the proposal is the proliferation of appropriate devices to enable end users to access network services. Based on device inventory and customer surveys, it has been determined that a diminishing percentage of local customer base relies solely on 2G-only and 3G-only devices. The table below, from one of the mobile service providers in the Kingdom of Eswatini provides a high-level summary of the devices used on the network.

User Type	Number of Users
4G only	207,444
4G-3G Inter-working User	32,661
4G-2G inter-working User	1,147
4G-3G-2G Inter-working User	50,114
3G Only User with 4G Terminal	95,81
3G-2G Inter-working User with 4G Terminal	3,133
3G Only User with 3G Terminal	179,447
3G-2G Inter-working User with 3G Terminal	7,727
2G Only User with 4G Terminal	13,196
2G Only User with 3G Terminal	25,242
2G Only User with 2G Terminal	176,555

Table 3: Network Devices

The majority of customers have already migrated to 4G or newer devices capable of utilizing advanced network technologies, such as VoLTE (Voice over LTE) and faster data speeds. However, it must be noted that there is a large number of 2G-only and 3G-only mobile devices. Appropriate measures will have to be taken to accommodate the current situation. One option that has been adopted in most markets is to ban the importation of 2G only devices from a specified period of time. This action allows the legacy and feature phones to naturally fall of the network (as they stop working/functioning).

2.5 Global Trends and the Associated Risks to Legacy Technology Dumping

Most countries around the world have been actively engaged in similar initiatives of retiring their legacy (2G and 3G) networks. A study of global telecommunications trends and industry best practices reveals that many countries have successfully retired their 2G networks. The first country to complete a full 2G shutdown was Japan in September 2012. Since then, other notable markets have finalized their 2G switch-offs, including Macau (June 2015), Singapore (April 2017), Taiwan (December 2017), and Australia (June 2018). Switzerland completed its shutdown in December 2020 and April 2021, respectively. On the other hand, 3G networks were completely shut down in Taiwan (2018) then Czech Republic (November 2021), Germany (December 2021), Singapore (December 2021), and Malaysia (March 2022). TeleGeography's GlobalComms database notes that there are 89 countries where 2G accounts for less than 10% of overall subscriptions, and by 2028, 172 countries will see at least 90% of mobile subscriptions using 3G, 4G, or 5G networks.

Operators in China and Japan opted to decommission 2G networks while in Europe, operators typically retire (or plan to retire) 3G before 2G due to the latter's widespread use in Internet of Things (IoT) applications in the utility and automotive industries. In the U.S.A., the three main operators, AT&T, T-Mobile, and Verizon completed their 3G sunsetting in 2022.

These global benchmarks demonstrate that retiring the 2G network is a necessary step in the evolution of mobile network infrastructure. According to Ookla, operators

across the globe are prioritizing the retirement of 2G and 3G networks to refarm spectrum for the more efficient 4G and 5G technologies. This shift aims to lower their operating costs and direct investments from maintaining outdated systems to deploying more efficient networks that support faster speeds and greater capacity.

Ookla's speed test intelligence data shows that operators that deactivated 2G or 3G networks improved their median download and upload speeds. For example:

- Zain Bahrain began 3G sunsetting in February 2022, refarmed the 2100 MHz spectrum, and gained access to 20 MHz bandwidth of contiguous spectrum. This move improved 4G capacity and spectral efficiency compared to using carrier aggregation.
- Switching off the 3G network at the end of 2022 (the first in the Middle East) combined with more 4G sites deployed resulted in increasing the operator's median download speed from 58.43 Mbps in Q2 2022 to 88.52 Mbps in Q2 2023 while customer satisfaction ratings climbed steadily throughout 2023.
- 3G share of samples in Oman dropped to 4.7% by the close of 2023 in anticipation of the scheduled shutdown of 3G services by Q3 2024.
- In Saudi Arabia, Saudi Telecoms saw its 3G share of samples fall sharply in 2023, suggesting that the phase-out process is nearing completion.

As indicated earlier on, and closer to home, The South African government recently published a draft policy document proposing the shutdown of 2G and 3G networks by June 2025 and 2027, respectively. From media reports, the mobile industry ecosystem, including network operators, is already engaged in processes towards implementing certain elements of the proposed policy direction. This development, together with the global trends, has certain implications to 'smaller' markets like Eswatini. As an example, one of proposed actions from the South African policy direction in this regard, is to ban the importation and equipment type approval into South Africa for 2G-only and 3G only mobile devices. If such a market is closed off for devices already manufactured, it is highly likely that equipment distributors will look for alternative markets to 'dump' this devices.

3. Proposed Decision

After careful consideration and based on the foregoing, and in accordance with section 38 of the Eswatini Communications Commission Act, 2013, the Commission has determined as follows:

3.1 That 2G (second generation) mobile telecommunications technology be retired in the Kingdom of Eswatini by **31 December 2026**.

3.2 Concomitantly, the importation of 2G and 3G-only devices into the Kingdom of Eswatini is hereby prohibited with immediate effect.

3.3 That 3G (third generation) mobile telecommunications technology be retired in the kingdom of Eswatini by **31 December 2028**.

In the pursuance of this decision, the Commission hereunder directs operators as follows:

1. **Sunset Timeline:** Operators are required to phase out 2G services within the following timelines:
   Start Date: 01-12-2025
   Completion Date: 31-12-2026
2. Following the sunset of 2G, operators are further required to phase out 3G services within the following times:
   Start Date: 01-12-2027
   Completion Date: 31-12-2028
3. **Customer Communication:** Operators must inform their customers about the planned sunset of 2G and 3G services, providing adequate notice and guidance for transitioning to alternative networks. Operators should develop comprehensive communication plans to minimize customer impact and ensure a smooth migration process.
4. **Infrastructure Decommissioning:** Operators remain responsible for decommissioning 2G and 3G network infrastructure, including base stations, switching equipment, and related facilities. The decommissioning process should adhere to relevant environmental regulations and ensure proper disposal of equipment.
5. **Coordination and Reporting:** Operators must actively coordinate with the Commission and provide regular progress reports regarding the sunset process. This includes updates on network migration, customer migration statistics, and any challenges encountered during the transition.

4. Public Consultation and Request for Written Submissions

As part of the public consultation process contemplated by section 32 of the ESCCOM Act, the Commission hereby invites written comments from interested stakeholders and the general public on the proposed decision. The deadline for submission of comments is **17h00 on the 9th of December 2024**. The submissions should be addressed to:

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