NATIONAL COMMUNICATIONS AUTHORITY

COMMUNICATIONS INDUSTRY REPORT 2022

Communication For Development

ABOUT THE REPORT

The Communications Industry Report (CIR) highlights key developments in the communications industry of Ghana for the year 2021 and further gives information on a five-year trend analysis from 2018 to 2022.

The scope of this report focuses on Mobile Network Operators (MNOs), Fixed Network Operators, Broadband Wireless Access (BWA) Providers, Tower Infrastructure Companies, Television, Radio Broadcasting and other services regulated by the National Communications Authority (NCA).

The report provides critical statistical data for policy makers, telecom analysts, consumers, academia, investors and other stakeholders to support decision-making. It combines concise year-on-year analysis of the trends in the industry with substantial use of tables, graphs and figures for easy understanding. The report is the product of data received from the various authorisation and license holders and other relevant stakeholders in the communications industry including ITU.

The publication of the Communications Industry Report (CIR) is consistent with the National Communications Authority's mandate under Section 26 (2)(a) of the 2008, Electronic Communications Act 775.

About NCA

The National Communications Authority, (NCA), was established by an Act of Parliament, Act 524 in December 1996, which was repealed and replaced by the National Communications Authority Act, 2008 (Act 769). The Authority is the statutory body mandated to license and regulate electronic communication activities and services in the country.

Vision

A world-class communications Regulator that facilitates innovative, reliable and sustainable communication solutions to meet stakeholders' expectations.

Mission

Regulate the communications industry in a forward-looking and transparent manner that promotes fair and sustainable competition, stimulates innovation, encourages investment, protects stakeholders' interests and facilitates universal access to quality communications services for national development.

Tag Line/Slogan – Communications for Development

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Executive Summary

This is the 2022 Annual Communications Industry Report produced by the National Communications Authority of Ghana (“NCA/the Authority”). The Authority recognizes that access to a comprehensive and timely set of ICT/Telecom indicators is vital for the proper regulation of the communications sector. The intention is to use these indicators to benchmark values and inform sector policy decision-making. The data used to compile this report was collected over 12 months ending 31st December 2022. The data was collected from secondary sources (such as Mobile Network Operators, Broadcasting Authorization Holders, Submarine Cable Companies, Tower companies, Internet Service Providers, Broadband Wireless Access Service Providers, etc.) as well as through existing administrative data gathered by the Authority from relevant stakeholders. All the major operators have responded to the 2022 request apart from Glo.

The report also includes data on employment in the mobile network sector. According to the 2022 statistics, mobile voice subscriptions stood at 40.05 million in 2022, a reduction from 40.45 million subscriptions in 2021. The penetration rate decreased from 131.38% in 2021 to 126.05% in 2022. Prepaid accounted for 39.62 million, representing 98.93% of the total subscriptions while postpaid subscriptions amounted to 0.43 million representing 1.07% of the total mobile subscriptions. Ultimately, Outgoing International Voice traffic reduced from 451.99 million minutes in 2021 to 319.14 million minutes in 2022.

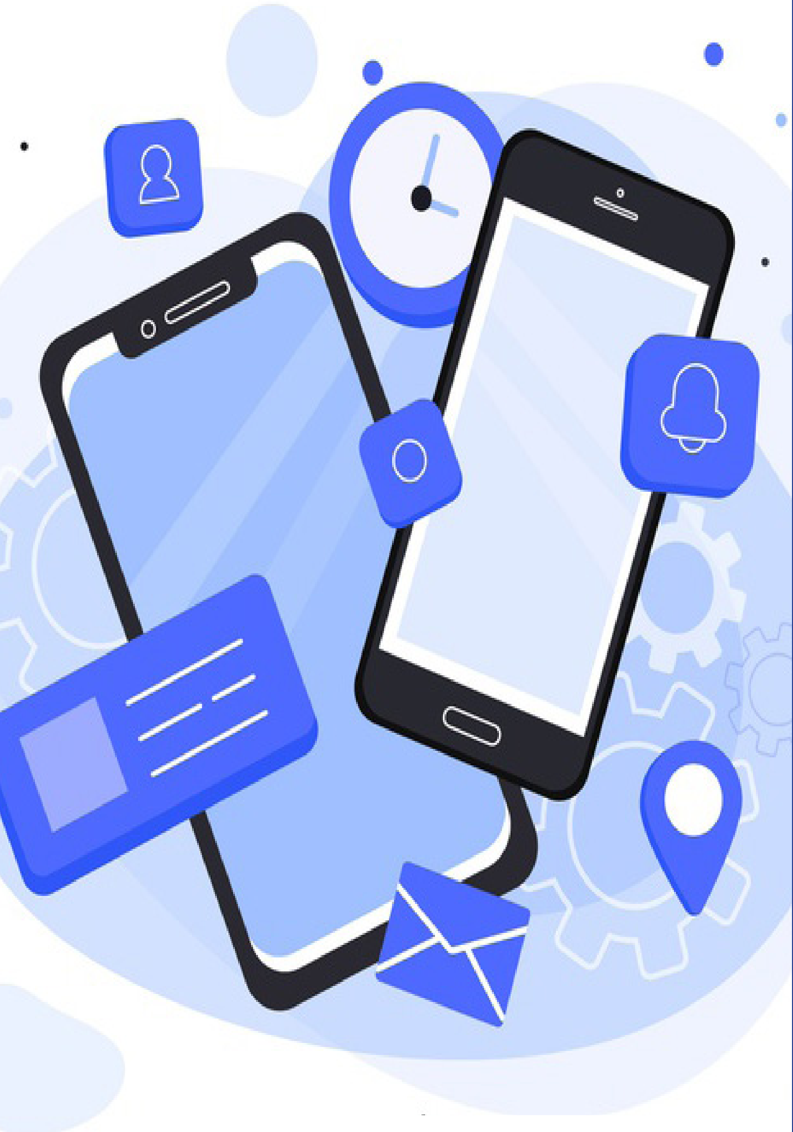
At the end of 2022, MTN subscriptions represented 66.46% of total Mobile Voice Subscriptions. Vodafone ended the year with 18.82% of the market share. AirtelTigo’s market share was 13.95% while GLO ended the year with a 0.77% market share of the total Mobile Data Traffic at the end of 2022 was 1,378.76 million gigabytes while Short Messaging Service (SMS) counts increased by 30.43% from 2.07 billion counts in 2021 to 2.72 billion counts in the year 2022. The average industry tariff for both on-net and off-net voice tariffs was GH 0.13 at the end of 2022.

Fixed voice subscriptions recorded 330,016 subscriptions in 2022 from 315,271 in 2021 which indicates a 4.68% growth. Vodafone subscriptions constituted 98.96% of total fixed voice subscriptions. AirtelTigo subscriptions represented 0.68% of the market share and MTN subscriptions represented 0.36% of the total market. Fixed data subscriptions decreased from 113,722 in 2021 to 102,952 in 2022 representing a negative growth of 9.47%. Vodafone subscriptions constituted 79.89% of total fixed broadband traffic of the market with MTN subscriptions covering 20.11% of the total market.

In relation to BWAs, Surfline’s market share decreased from 81.09% in 2021 to 80.90% in 2022. Busy Internet ended the year with 4.49% of the total BWA market as compared to 6.12% in 2021. Telesol’s market share increased from 10.82% in 2021 to 13.95% in 2022. BBH had a market share of 0.66% in 2022 as compared to 1.96% in 2021.

There were 707 authorised FM stations in Ghana as of the end of 2022. A total of 513 FM stations were in operation whilst 194 stations were not in operation. Out of the total authorized FM stations, 526(74.40%) were Commercial FM stations. There were also 156 authorised television stations in the country, out of which 117 were operational and 39 were not operational

The total number of towers owned and managed by the Tower Companies is 5,310 towers, a 3.45% increase from 5133 towers in 2021. Over the five years, the compound average growth rate is 3.86% from 4,564 towers in 2018 to 5,310 towers in 2022. The total capacity of submarine cable landing operators in Ghana as of the end of 2022 was 3,478 Gbps an increase from 2,905 Gbps in 2021, representing a 19.72% increase in available capacity.



Chapter One

MOBILE CELLULAR SERVICES

1.0 Introduction

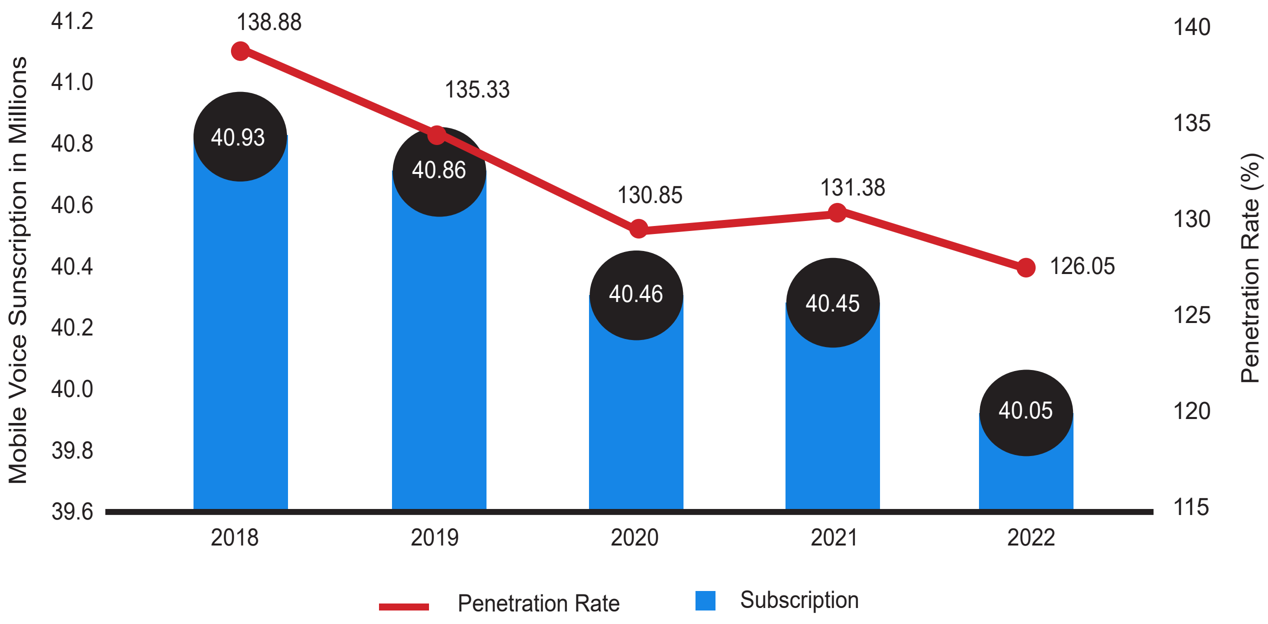
This chapter presents an analysis of services provided by the Mobile Network Operators. At the end of 2022, there were four (4) network service providers namely; AirtelTigo, Glo, MTN, and Vodafone. The Chapter further presents a five-year trend analysis on the subscriptions for mobile voice and data, volumes of traffic, and short messaging service (SMS).

1.1 Mobile Voice Subscriptions and Penetration[1]

Mobile voice subscriptions stood at 40.05 million[2] in 2022, a reduction from 40.45 million subscriptions in 2021. This represents a 1.01% decline in subscriptions. Penetration rate decreased from 131.38% in 2021 to 126.05% in 2022.

Over the five years, the Compound Annual Growth Rate (CAGR) for mobile subscriptions was negative 0.55%**.**

Figure 1: Mobile Voice Subscriptions and Penetration Rate



Source: NCA, Mobile Network Operators, 2022

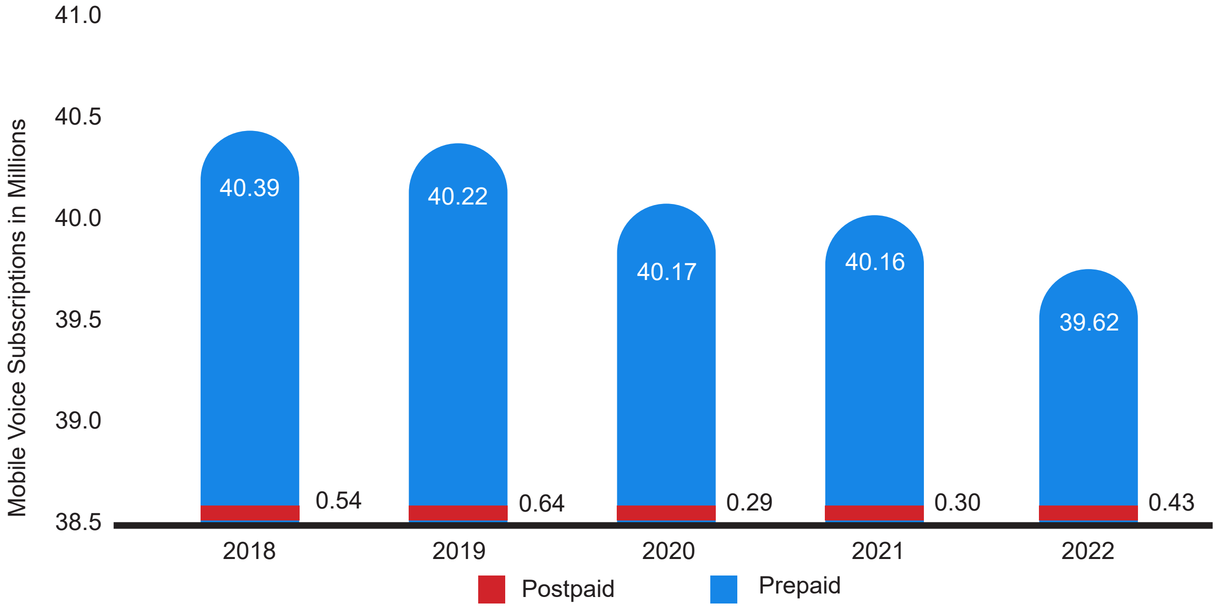
1.2 Prepaid and Postpaid Voice Subscriptions

Mobile Voice subscription was dominated by prepaid subscriptions as against postpaid subscriptions. In 2022, prepaid accounted for 39.62 million, representing 98.93% of the total subscriptions while postpaid subscriptions amounted to 0.43 million representing 1.07% of the total mobile subscriptions.

1. Population of Ghana was based on the 2021 Population and Housing Census conducted by Ghana Statistical Service (GSS). The Population was 30,792,608. This was used for the calculation of the penetration rate. The increase in penetration rate, even though there was a decline in subscriptions, is due to the estimated population of 2020 (30,922,666) being higher than the population for 2021 as reported by the Ghana Statistical Service in the 2021 Population and Housing Census (30,792,608).

2. The total subscriptions as at the end of 2022 includes estimation of Glo's subscriptions. This estimation was based on their last submission as at October 2022.

Figure 2: Distribution of Prepaid and Postpaid Subscriptions

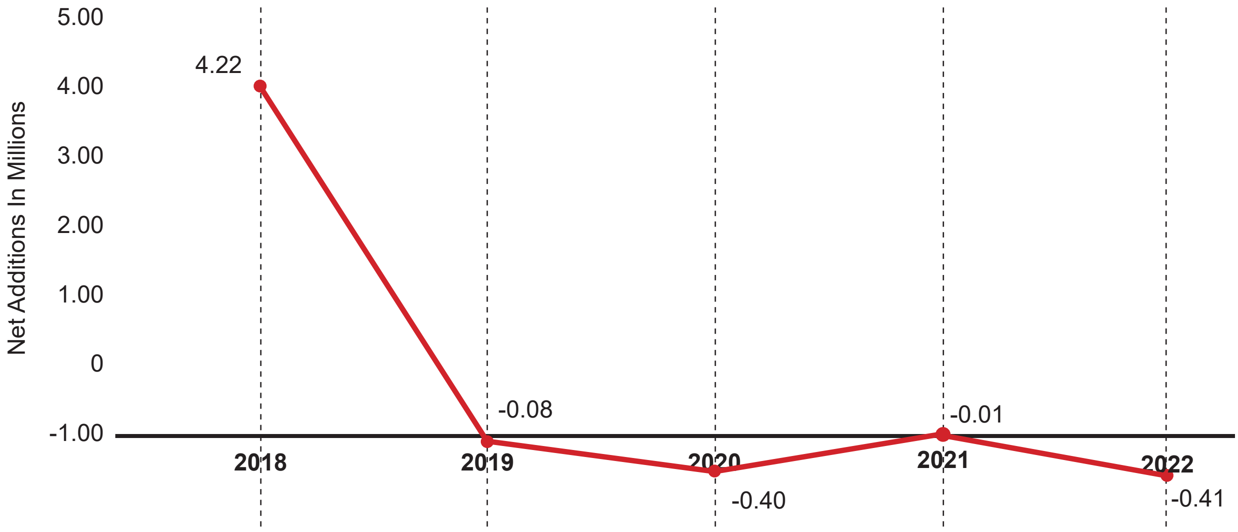


Source: NCA, Mobile Network Operators, 2022

1.3 Net Additions

Mobile voice subscriptions recorded a net loss of 408,765 from 40,454,073 in 2021 to 40,045,308 in 2022.

Figure 3: Net Additions on Mobile Voice Subscriptions

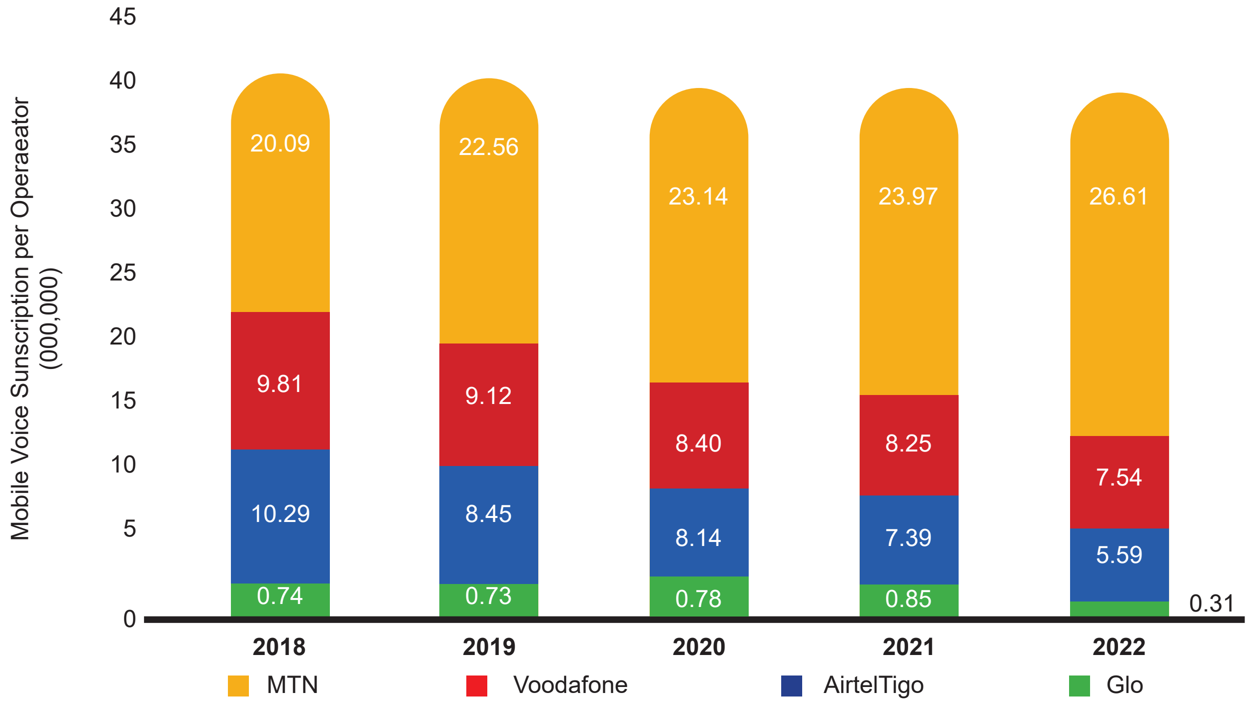


Source: NCA, Mobile Network Operators, 2022

1.4 Mobile Voice Subscriptions per Operator

MTN recorded 26.61 million subscriptions at the end of 2022 representing an increase of 2,647,543 in the previous year's subscriptions. Vodafone had 7.54 million subscriptions representing a decline in subscriptions by 713,036 compared to 8.25 million subscriptions recorded in 2021. AirtelTigo, at the end of 2022 had 5.59 million subscriptions representing a decrease of 1,804,768 subscriptions. Glo recorded a decrease in subscriptions by 538,504 subscriptions ending the year with 0.31 million subscriptions.

Figure 4: Mobile Voice Subscriptions per Operator

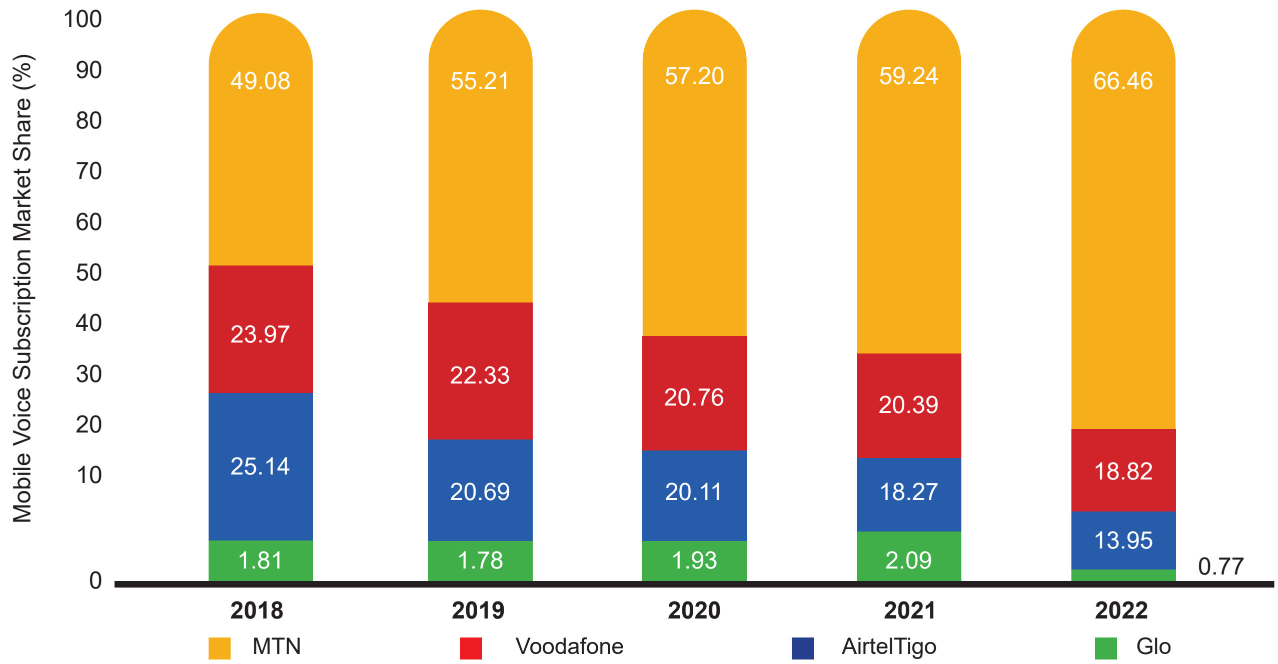


Source: NCA, Mobile Network Operators, 2022

1.5 Market Share (%) per Operator for Mobile Voice Subscriptions

At the end of 2022, MTN subscriptions represented 66.46% of total Mobile Voice Subscriptions. Vodafone ended the year with 18.82% of the market share. AirtelTigo's market share was 13.95% while GLO ended the year with a 0.77% market share of the total Mobile Voice Subscriptions.

Figure 5: Share of Mobile Voice Subscriptions per Operator (%)

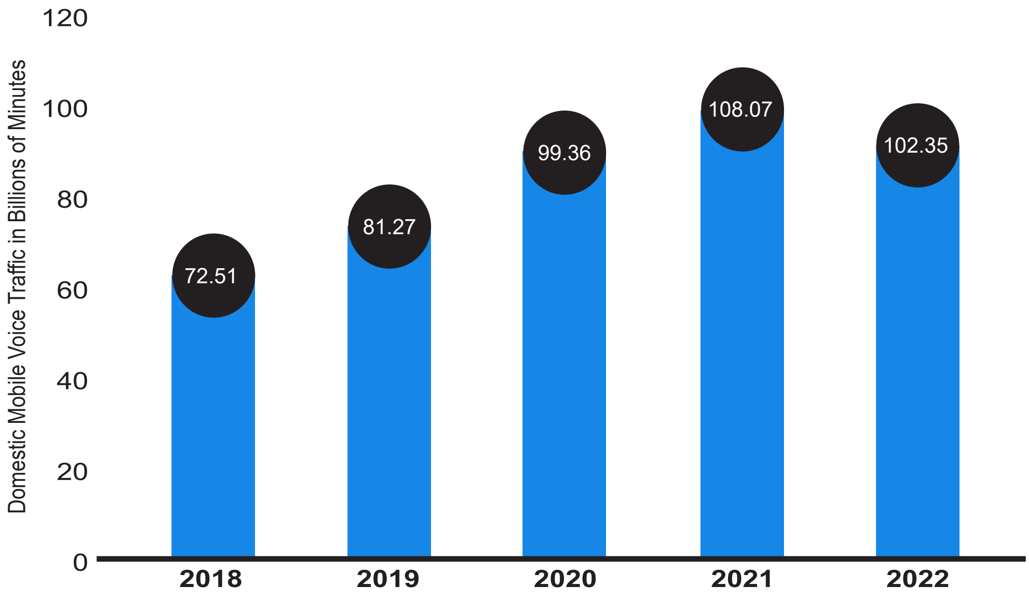


Source: NCA, Mobile Network Operators, 2022

1.6 Total Domestic Mobile Voice Traffic

Total Domestic Mobile Voice Traffic at the end of 2022 was 102.35 billion minutes, this was a 5.72 million deduction from 108.07 billion minutes in the previous year 2021. The traffic experienced a year-on-year increase in volume from 2018 to 2021 until 2022 where it dropped by 5.59%. The CAGR for the five years was 9.00%.

Figure 6: Total Volume of Domestic Voice Traffic in minutes

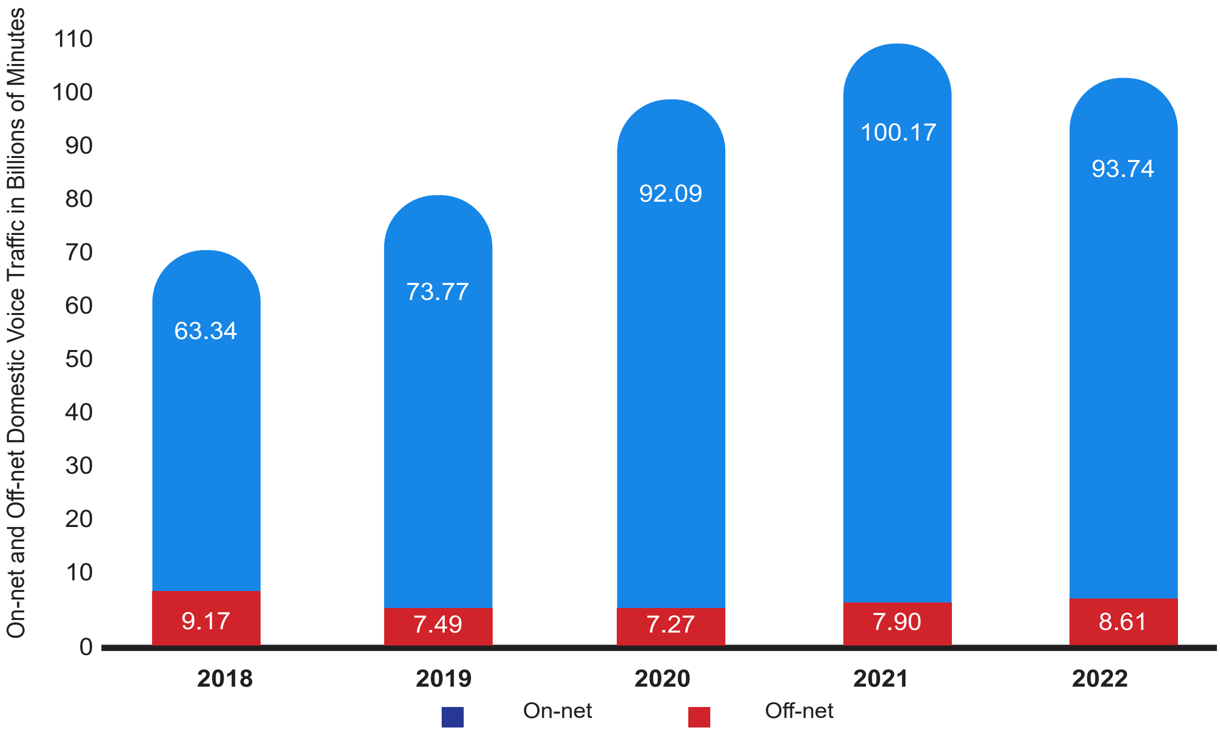


Source: NCA, Mobile Network Operators, 2022

1.7 Domestic Off-net and On-net Voice Traffic

During the period under review, off-net calls increased by 9.01% from 7.90 billion minutes to 8.61 billion minutes. This represents 8.41% of the total volume of domestic voice traffic in 2022. On-net traffic decreased from 100.17 billion minutes in the previous year to 93.74 billion minutes in 2022, representing a decline in growth of 6.42%.

Figure 7: On-net and Off-net Domestic Traffic

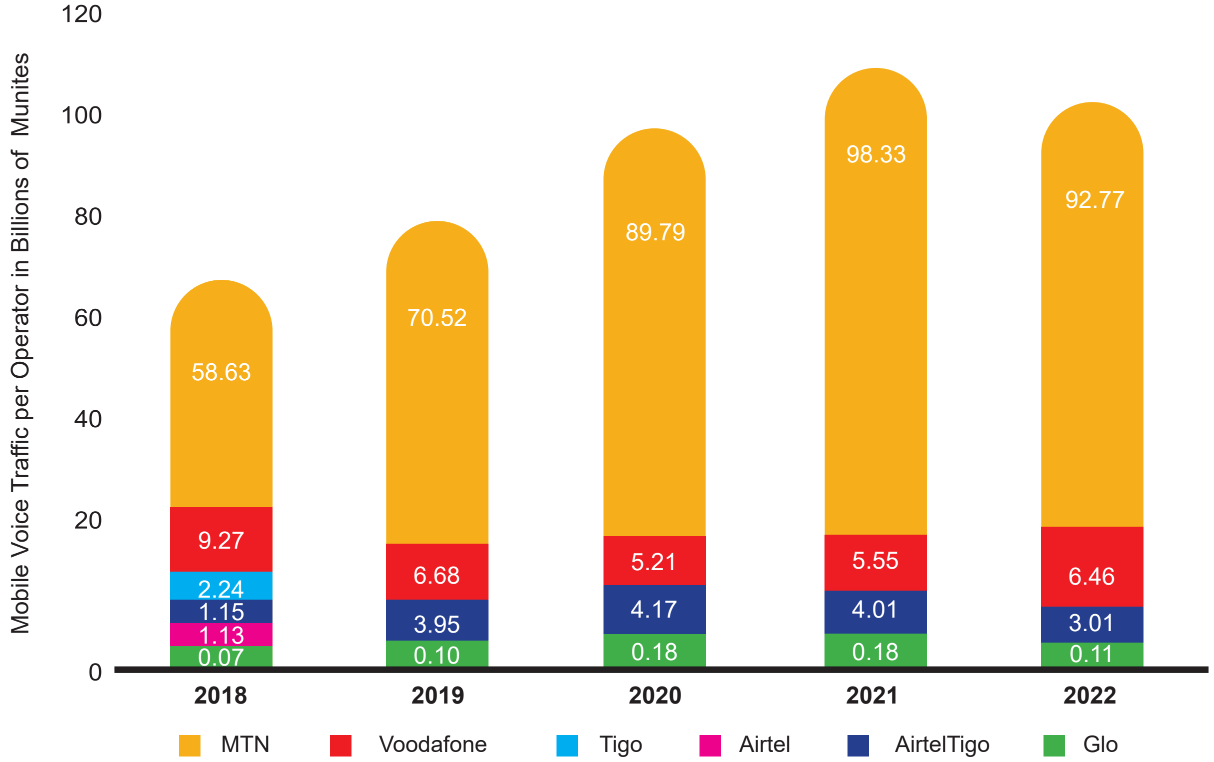


Source: NCA, Mobile Network Operators, 2022

1.8 Mobile Voice Traffic per Operator (Domestic)

MTN subscriptions generated 90.64% of total voice traffic with 92.77 billion minutes. This represents a decrease of 5.56 billion minutes as compared to 98.33 billion minutes in 2021. Vodafone generated 6.46 billion minutes which is also an increase from 5.55 billion minutes recorded in 2021, representing 6.31% of the total voice traffic. AirtelTigo also generated 3.01 billion minutes of voice traffic representing 2.94% of total voice traffic as compared to 4.01 billion minutes in 2021. The remaining 0.11% of total voice traffic was generated by Glo subscriptions recording 0.11 billion minutes of traffic representing a decline from 0.18 billion minutes.

Figure 8: Mobile Voice Traffic per Operator



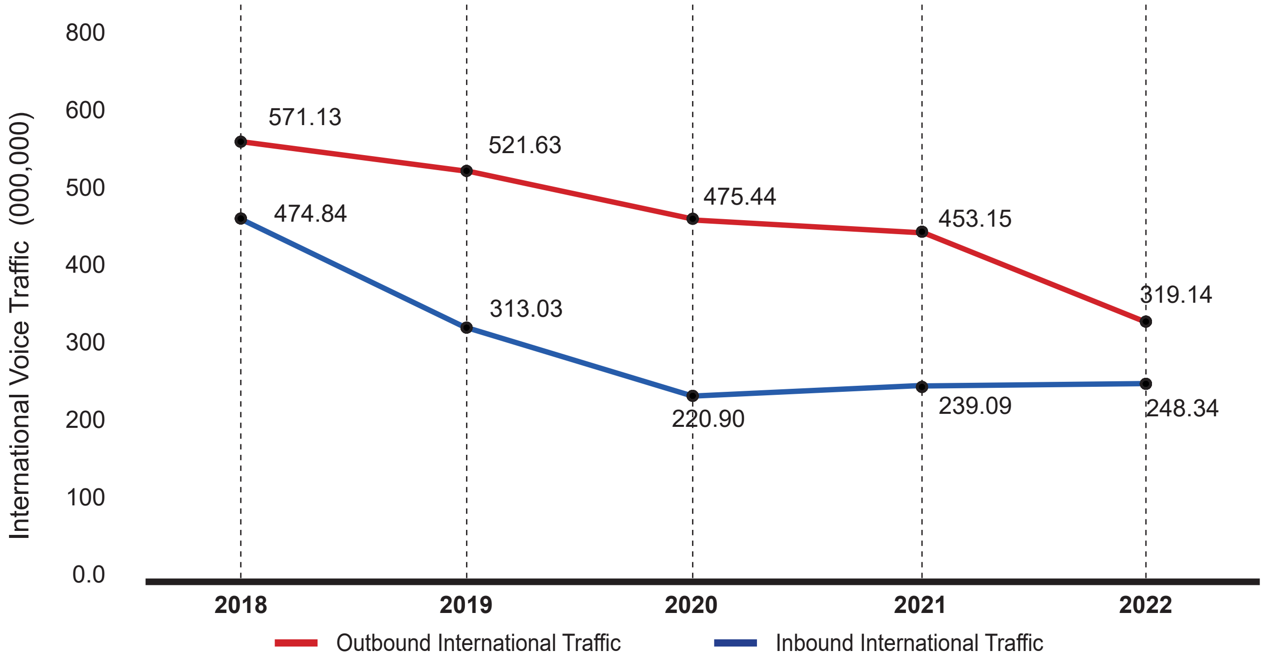
Source: NCA, Mobile Network Operators, 2022

1.9 Mobile Voice Traffic (International)

Outgoing International Voice traffic for the year 2022 was 319.14 million minutes. This is consistent with the continuous decrease in outgoing international voice traffic over the past five years. It declined from 453.15 million minutes in 2021 to 319.14 million minutes in 2022. Outgoing International Voice traffic continually declined from 571.13 million minutes at a steady rate to 319.14 million minutes in 2022.

Incoming International traffic experienced a decline from 474.84 million minutes in 2018 to 248.34 million minutes in 2022. However, there was a steady growth from 220.90 million minutes in 2020 to 248.34 million minutes in 2022 representing an 12.42% growth.

Figure 9: Distribution of International Voice Traffic

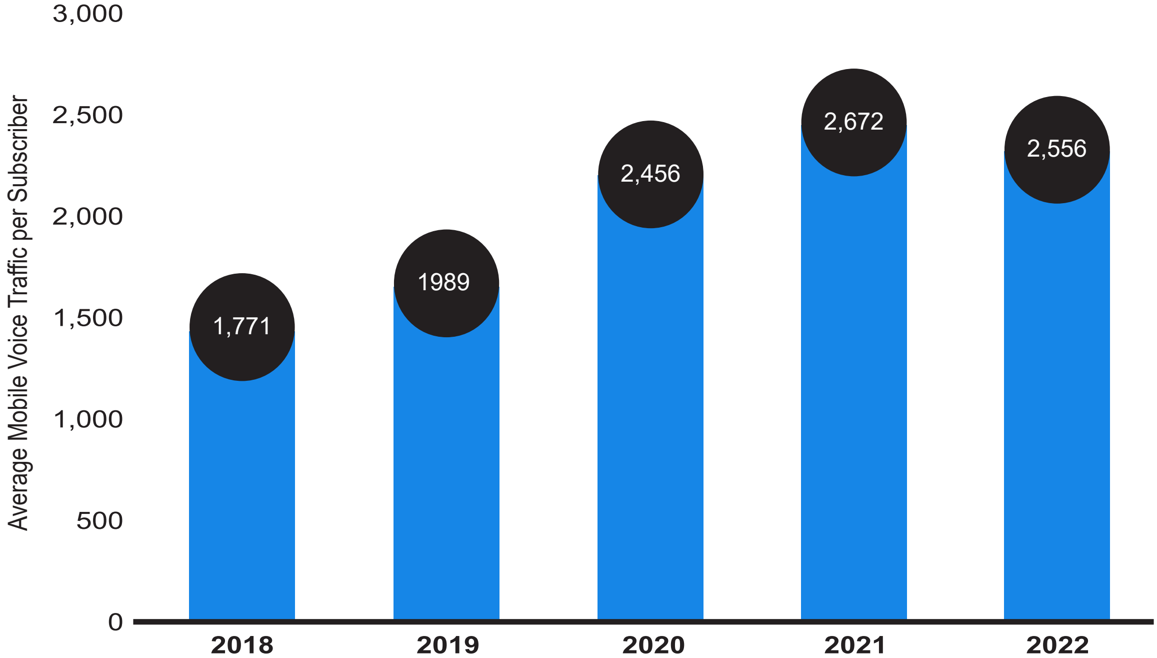


Source: NCA, Mobile Network Operators, 2022

1.10 Average Voice Traffic per Subscription

The average volume of voice traffic generated per subscription increased from 1,771 minutes in 2018 to 2,556 minutes in 2022 recording a compound annual growth rate of 9.60% across the five years. The average voice traffic per subscription experienced steady growth from 2018 to 2021 and a decline in 2022.

Figure 10: Average Voice Traffic per Subscription

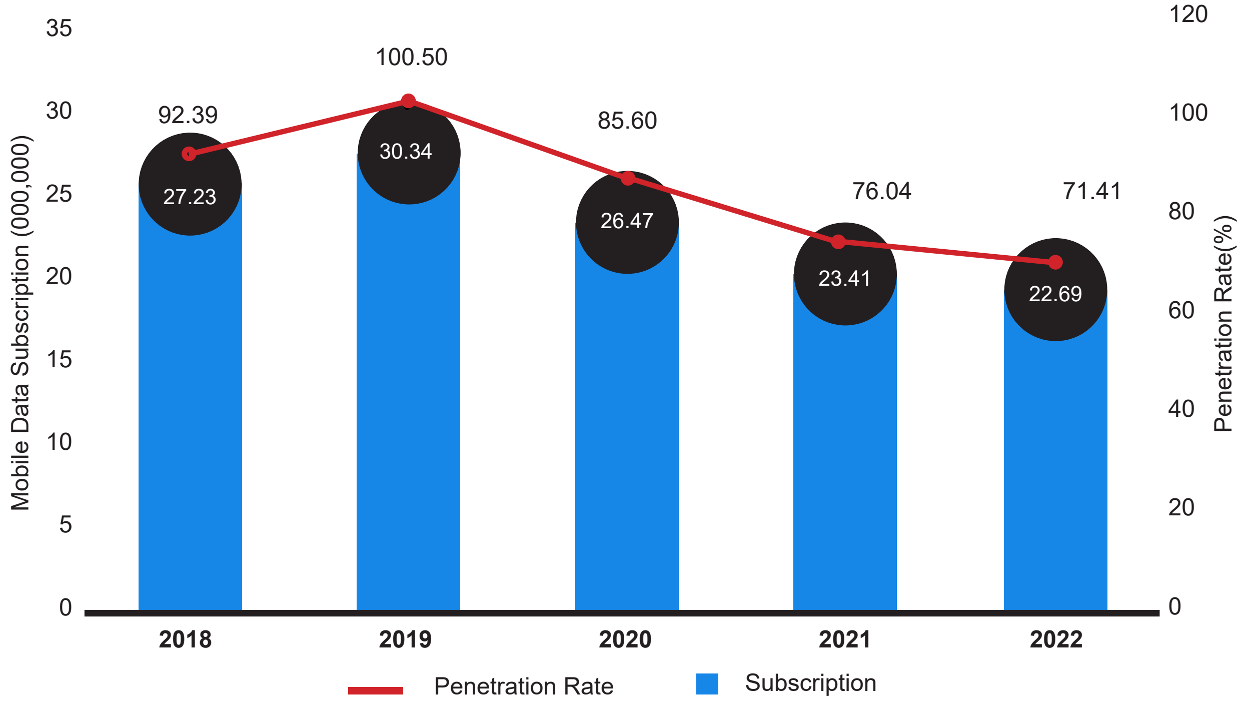


Source: NCA, Mobile Network Operators, 2022

1.11 Mobile Data Subscriptions[3] and Penetration Rate (%)

Mobile data subscriptions have recorded a continuous decline for the past three (3) years from 2019 to 2022. Subscriptions fell by 3.11% from 23.41 million in 2021 to 22.69 million in 2022. CAGR for the five years was negative 4.46%, from 27.23 million in 2018 to 22.69 million in 2022. The penetration rate also fell from 76.04% in 2021 to 71.41% in 2022 as a result of the decline in subscriptions.

Figure 11: Mobile Data Subscriptions and Penetration Rate



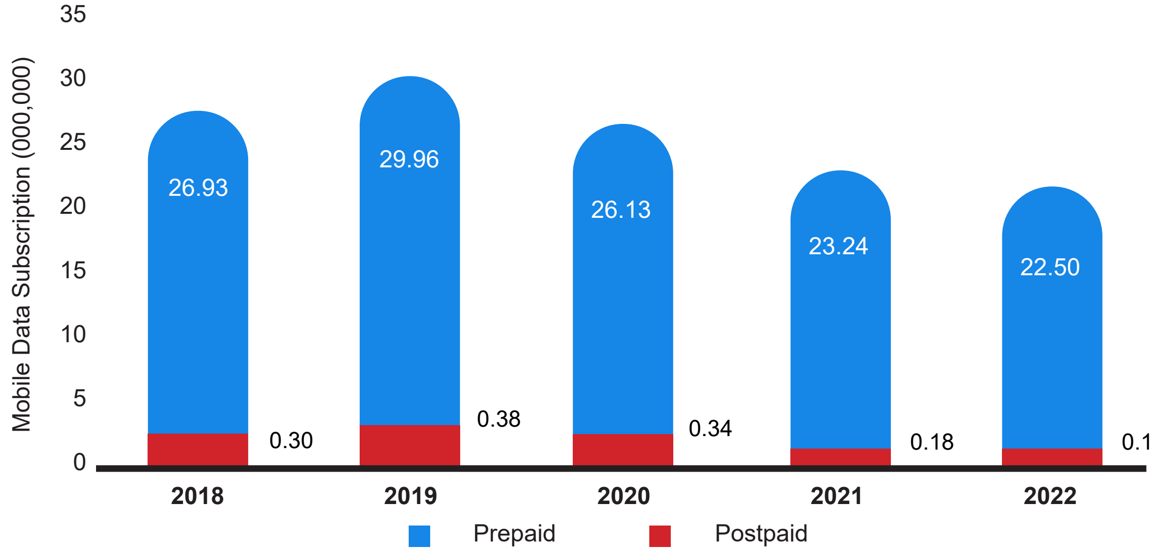
Source: NCA, Mobile Network Operators, 2022

1.12 Postpaid and Prepaid Data Subscriptions

Prepaid subscriptions of 22,498,227 made up 99.17% of total data subscriptions at the end of 2022. Postpaid subscriptions also stood at 188,331 representing 0.83% of the total data subscriptions. This indicates that the data market is predominantly prepaid subscribers.

3. The total mobile data subscriptions as at the end of 2022 includes estimation of Glo's subscriptions. This estimation was based on their last submission as at October 2022.

Figure 12: Distribution of Postpaid and Prepaid Subscriptions



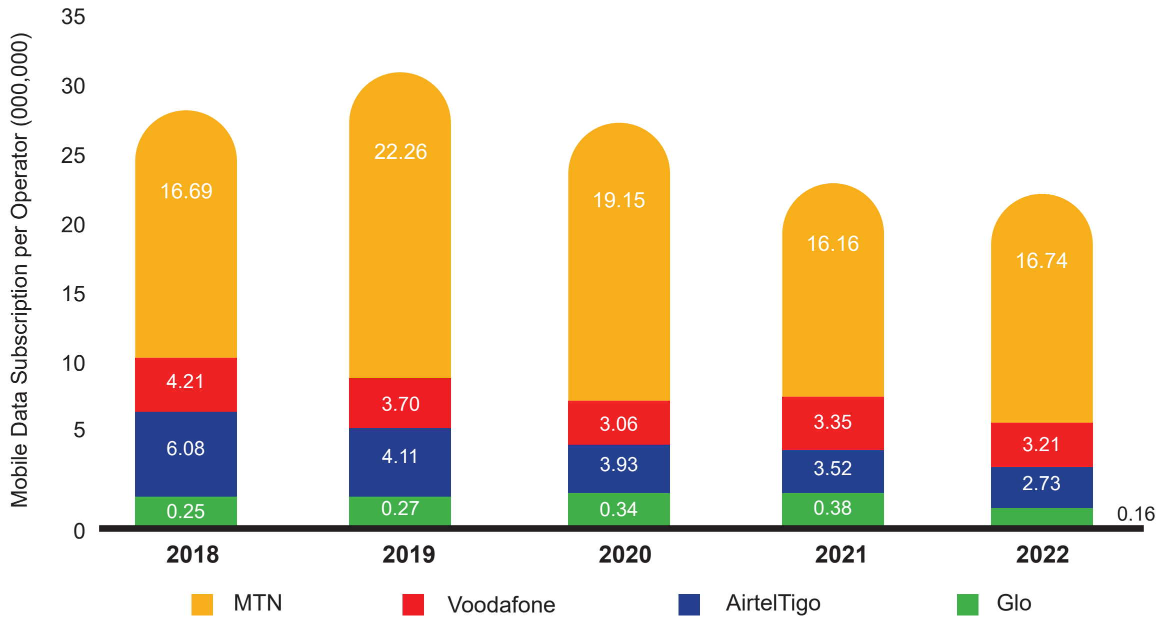
Source: NCA, Mobile Network Operators, 2022

1.13 Mobile Data Subscriptions per Operator

MTN recorded 16.74 million subscriptions at the end of 2022 indicating a 0.58 million increase in subscriptions compared to 16.16 million in 2021, resulting in a 3.59% annual growth. Vodafone ended 2022 with 3.21 million subscriptions, a decrease of 135,351 compared to 3.35 million in 2021 representing a negative 4.18% growth.

AirtelTigo at the end of 2022 recorded 2.73 million subscriptions, a 793,568 decline (-22.44%) from 3.52 million subscriptions in 2021. Glo recorded 0.16 million subscriptions in 2022, a 57.89% decline compared to 0.38 million in 2021.

Figure 13: Mobile Data Subscriptions per Operator

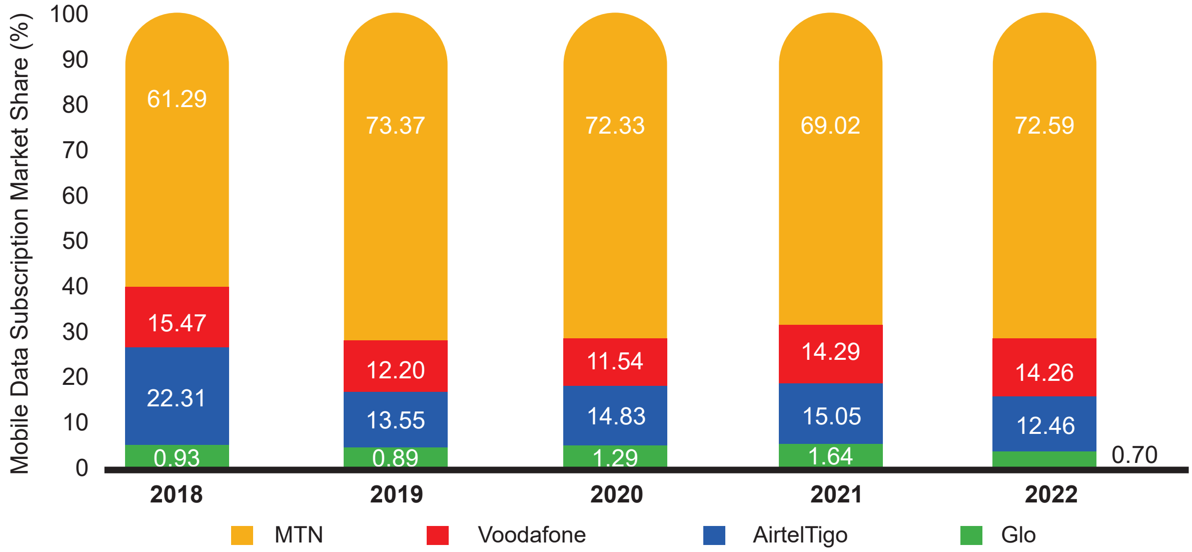


Source: NCA, Mobile Network Operators, 2022

1.14 Market Share (%) per Operator for Mobile Data Subscriptions

MTN subscriptions represented 72.59% of total mobile data subscriptions as compared to 69.02% in the previous year. Vodafone subscriptions recorded 14.26% of the total data subscriptions representing a decline from 14.29% in 2021. AirtelTigo's market share declined from 15.05% in 2021 to 12.46% in 2022. Glo ended the year with 0.70% of the total Mobile Data Subscriptions which indicates a decline from 1.64% of the market share in 2021.

Figure 14: Market Share per Operator

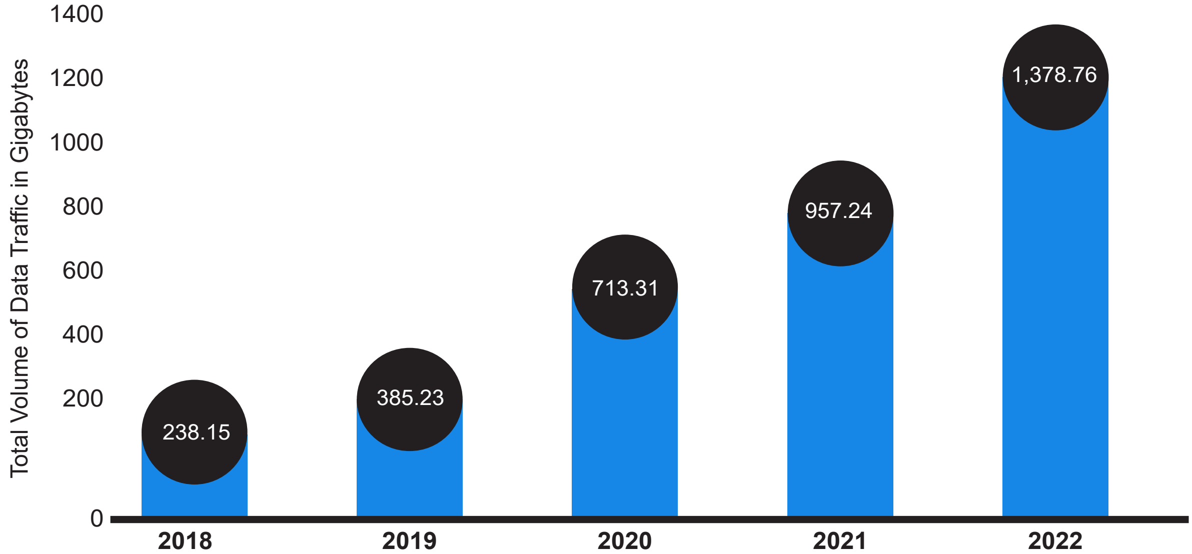


Source: NCA, Mobile Network Operators, 2022

1.15 Mobile Data Traffic

Total Mobile Data Traffic at the end of 2022 was 1,378.76 million gigabytes. This represents a 44.03% increase from 957.24 million gigabytes in the previous year. The volume of data traffic grew at a Compound Annual Growth Rate of 55.12% from 2018 to 2022.

Figure 15: Volume of Mobile Data Traffic



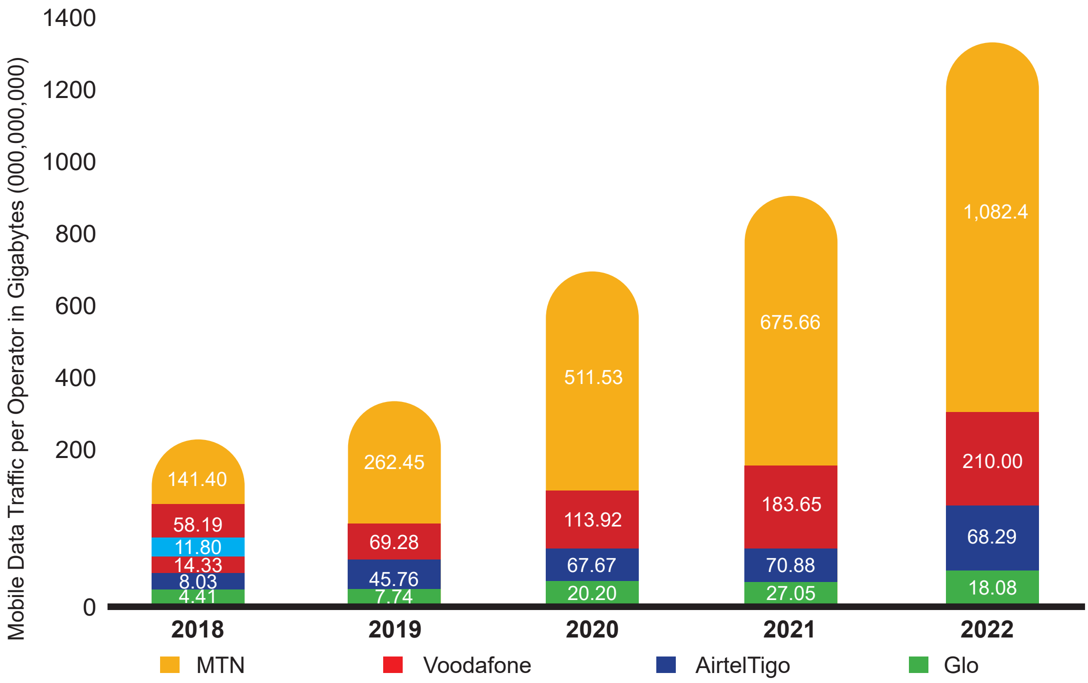
Source: NCA, Mobile Network Operators, 2022

1.16 Mobile Data Traffic per Operator

MTN subscriptions generated 1,082.40 million gigabytes, representing a growth rate of 60.20% as compared to 675.66 million gigabytes in 2021. Vodafone mobile data traffic grew by 14.35%, from 183.65 million gigabytes in 2021 to 210.00 million gigabytes of traffic in 2022. AirtelTigo data traffic experienced a negative growth rate of 3.65%, from 70.88 million gigabytes in 2021 to 68.29 million gigabytes in 2022. Mobile data traffic generated by Glo declined by negative 33.16% from 27.05 million gigabytes in 2021 to 18.08 million gigabytes at the end of the year.

In terms of market share, MTN's data traffic represents 78.51% of the total data traffic. Vodafone's data traffic represents 15.23% of the total data traffic while AirtelTigo contributed 4.95% to total data traffic. Glo accounted for 1.31% of the data traffic market share.

Figure 16: Mobile Data Traffic per Operator

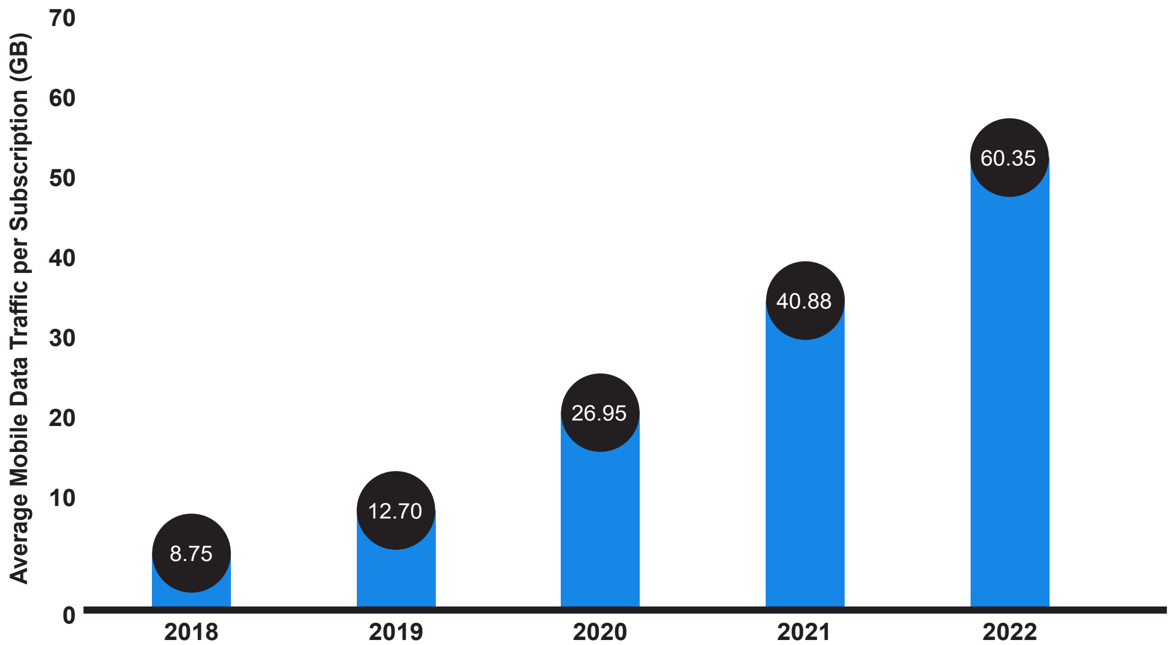


Source: NCA, Mobile Network Operators, 2022

1.17 Average Data Traffic per Subscription

Average data traffic per subscription experienced a consistent rise over the five-years. In the year 2018, the average data traffic per subscription was 8.75 gigabytes, which grew at a CAGR rate of 62.08% to 60.35 gigabytes in 2022.

Figure 17: Average Data Traffic per Subscription

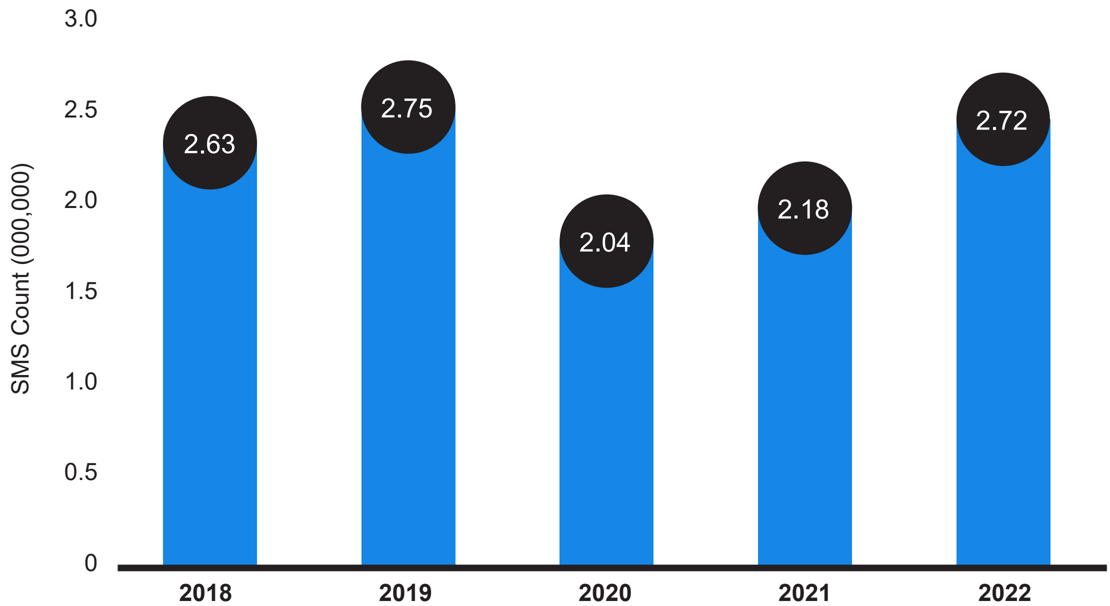


Source: NCA, Mobile Network Operators, 2022

1.18 Total Short Messaging Service (SMS)

Total Short Messaging Service (SMS) counts increased by 30.43% from 2.18 billion counts in 2021 to 2.72 billion counts in the year 2022. Over the five years, the total SMS counts have been fluctuating with an annual compound growth rate of 0.79% from 2.63 billion counts in 2018 to 2.72 billion counts in 2022.

Figure 18: Total SMS Count in Billions

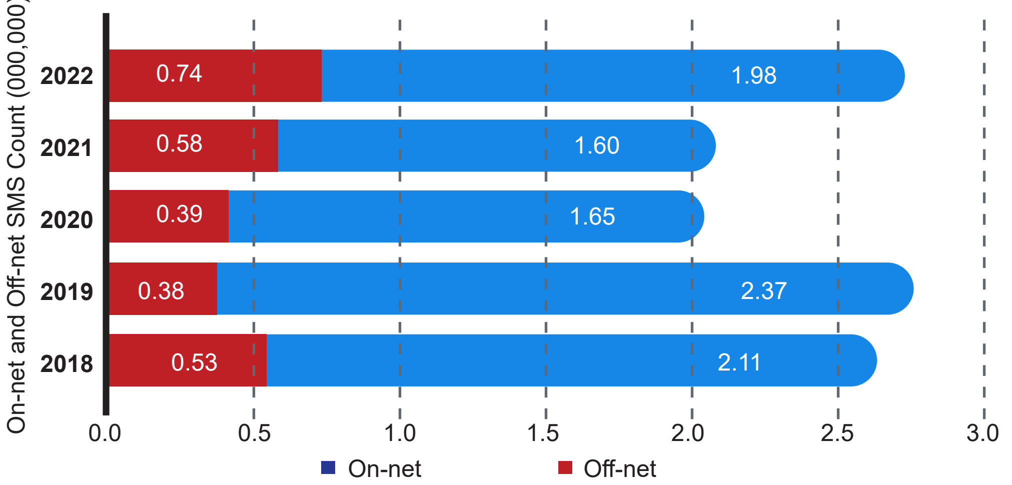


Source: NCA, Mobile Network Operators, 2022

1.19 On-net and Off-net SMS Counts

On-net SMS counts recorded a 23.75% increase from 1.60 billion in 2021 to 1.98 billion in the year under review. Off-net SMS counts also recorded a 27.59% growth from 0.58 billion in 2021 to 0.74 billion in 2022. On-net SMS accounted for 72.69% of the total SMS generated while Off-net SMS counts accounted for the remaining 27.31%.

Figure 19: On-net and Off-net SMS Counts

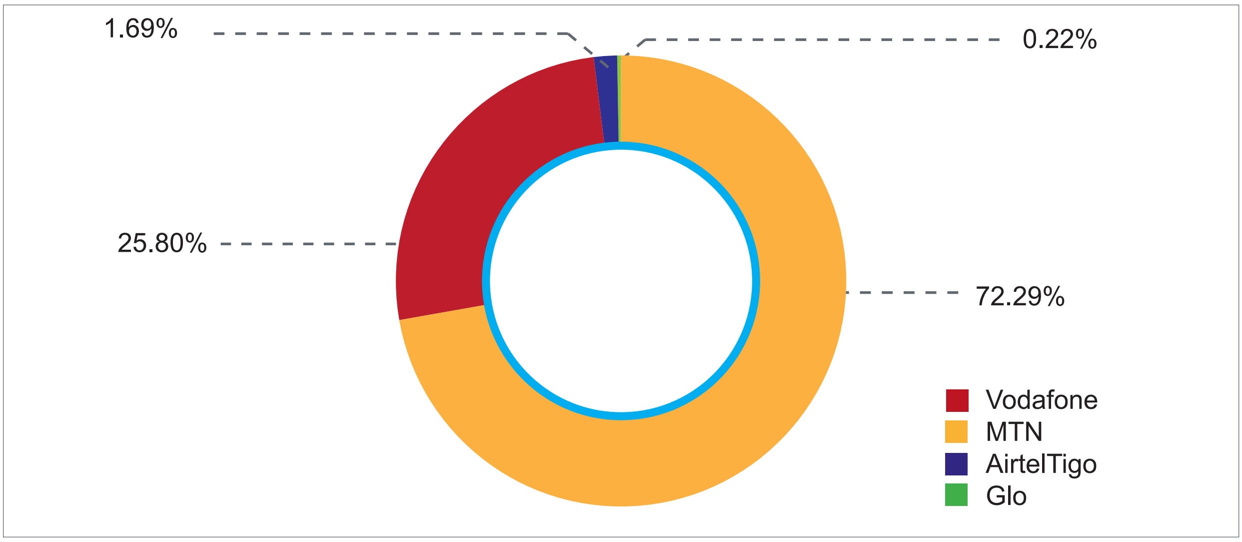


Source: NCA, Mobile Network Operators, 2022

1. 20 Total SMS Count per Operator

MTN generated 1.97 billion SMS counts in 2022 compared to 1.16 billion in 2021 representing 72.29% of the total SMS count. Vodafone had 0.70 billion SMS counts from 0.88 billion in 2021, accounting for 25.80% of the total SMS counts. AirtelTigo subscriptions generated 0.05 million SMS counts, an increase from 0.02 billion in the previous year representing 1.69% of the market share. Glo's SMS counts in 2022 was 0.006 billion representing 0.22%

Figure 20: Market Share of SMS Counts per operator

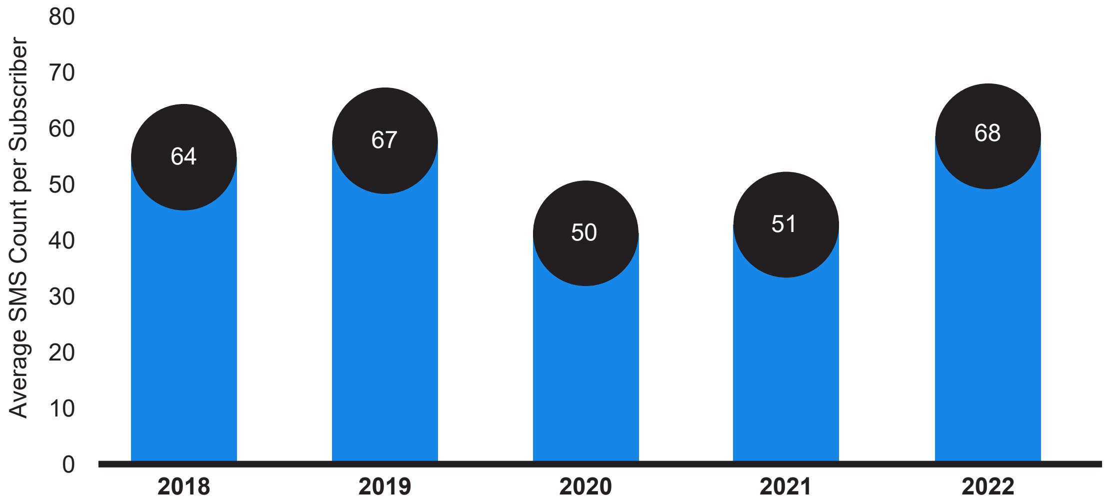


Source: NCA, Mobile Network Operators, 2022

1.21 Average SMS Count per Subscription

The Average SMS Count per Subscription rose from 64 SMS count in 2018 to 67 SMS count in 2019 but fell to 50 SMS count in 2020. In 2022, the average SMS count was 68 from 51 SMS count in 2021, representing a 33.33% growth rate.

Figure 21: Average SMS Count per Subscription

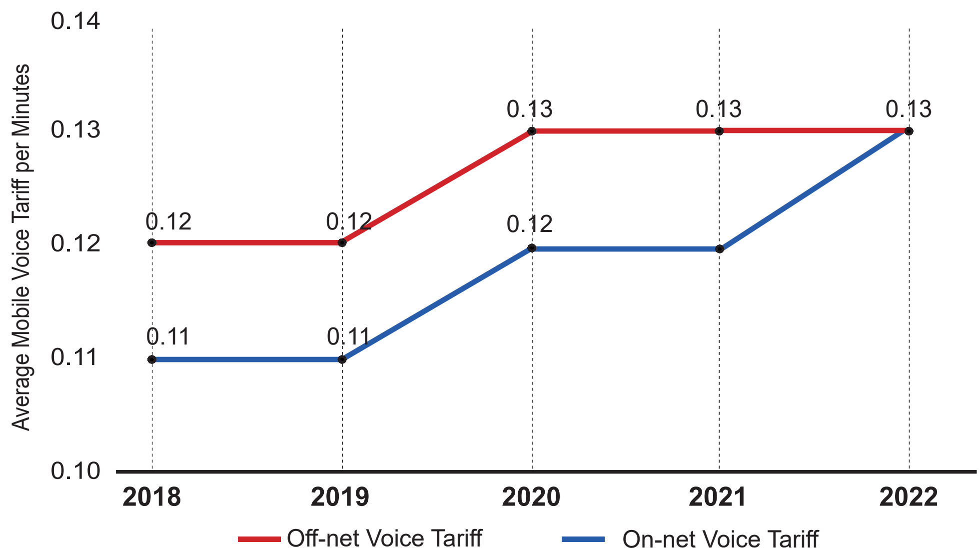


Source: NCA, Mobile Network Operators, 2022

1.22 Default Tariffs on Mobile Services

The average industry tariff for both on-net and off-net voice tariffs was GH 0.13 at the end of 2022. Between 2018 to 2019, On-net and off-net traffic were stable at GH 0.11p and 0.12p respectively. It increased in 2020 to 0.12p and 0.13p for both on-net and off-net respectively and again withnessed an increase in on-net tariffs to 0.13p in 2023 to be at par with off-net tariffs.

Figure 22: Mobile Voice Service Tariffs

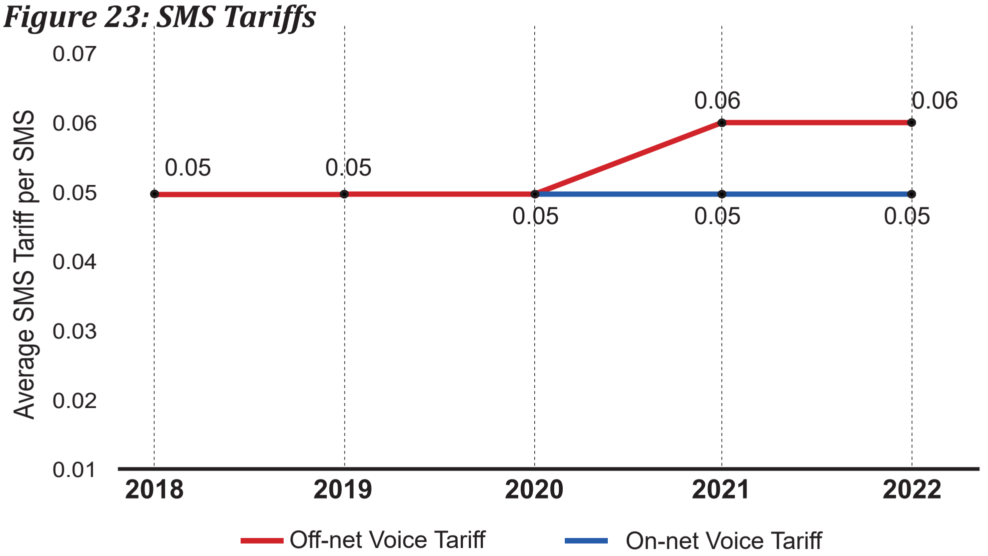


Source: NCA; Mobile Network Operators, 2022

Average SMS Tariffs

The average SMS tariff has been stable over the past four years until 2021 where off net tariffs increased from GH 0.05p to GH 0.06p. On net tariffs however remained unchanged at GH 0.50p over the five past year period.

Figure 23: SMS Tariffs

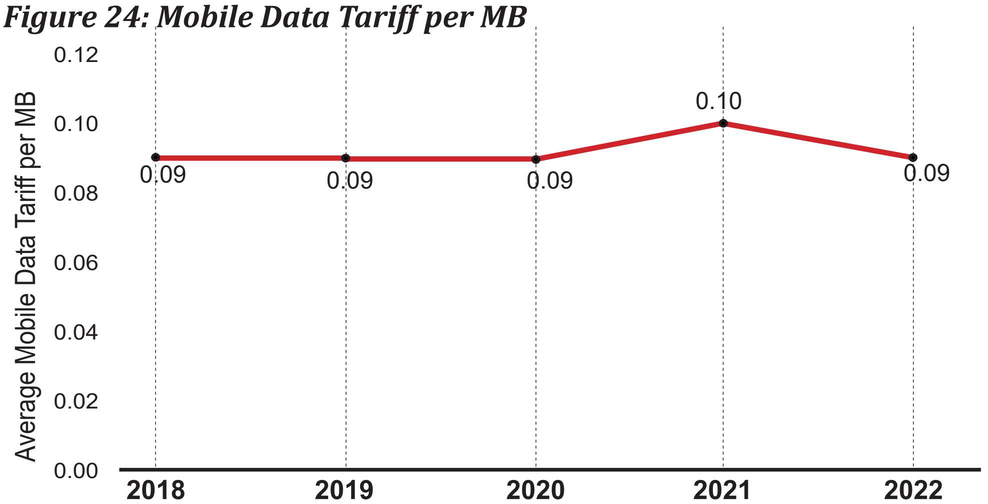


Source: NCA, Mobile Network Operators, 2022

Average Mobile Data Tariffs

Average mobile data tariff increased from GH 0.09p/MB in 2020 to GH 0.10p/MB in 2021 The figure below represents the average industry price of data over the five-year period.

Figure 24: Mobile Data Tariff per MB



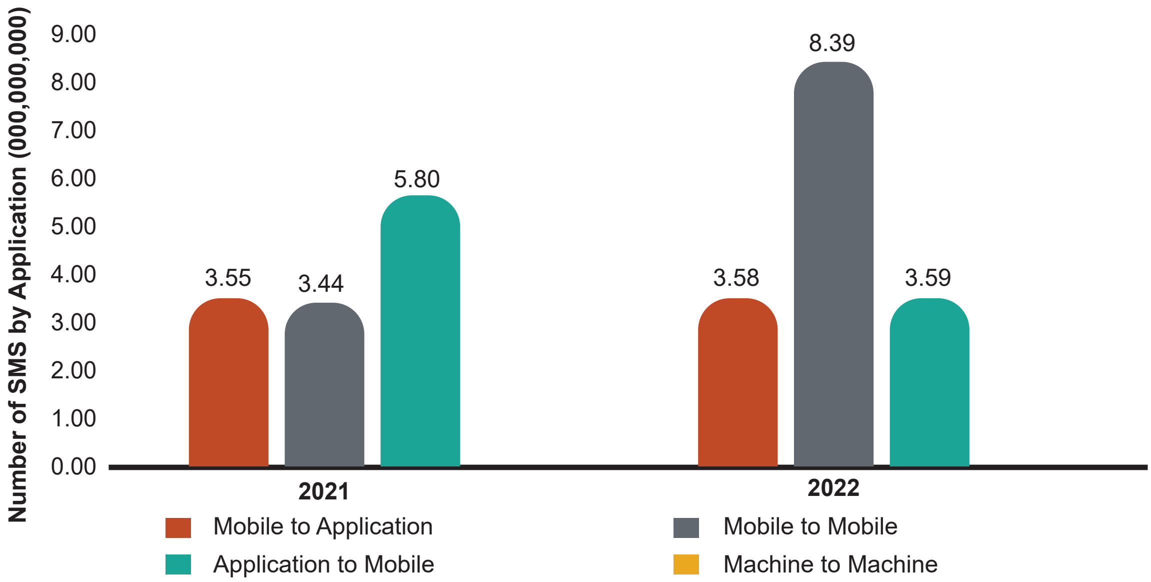
Source: NCA, Mobile Network Operators, 2022

1.23 SMS per Application

The total SMS per application for the period under review is 15.57 billion. In the year 2021, Mobile Application increased from 3.55 billion SMS per application to 3.58 billion in 2022. Mobile to Mobile SMS per application surged from 3.44 billion in the preceding year to 8.39 billion in 2022. However, Application to Mobile SMS declined in the year 2021, from 5.79 billion to 3.59 billion in 2022.

Total SMS per application, Machine to Machine decreased from 6.58 million in the year 2021 to 4.07 million SMS Applications, representing (0.05% of total SMS count).

Figure 25: SMS per Application



Source: NCA, Mobile Network Operators, 2022

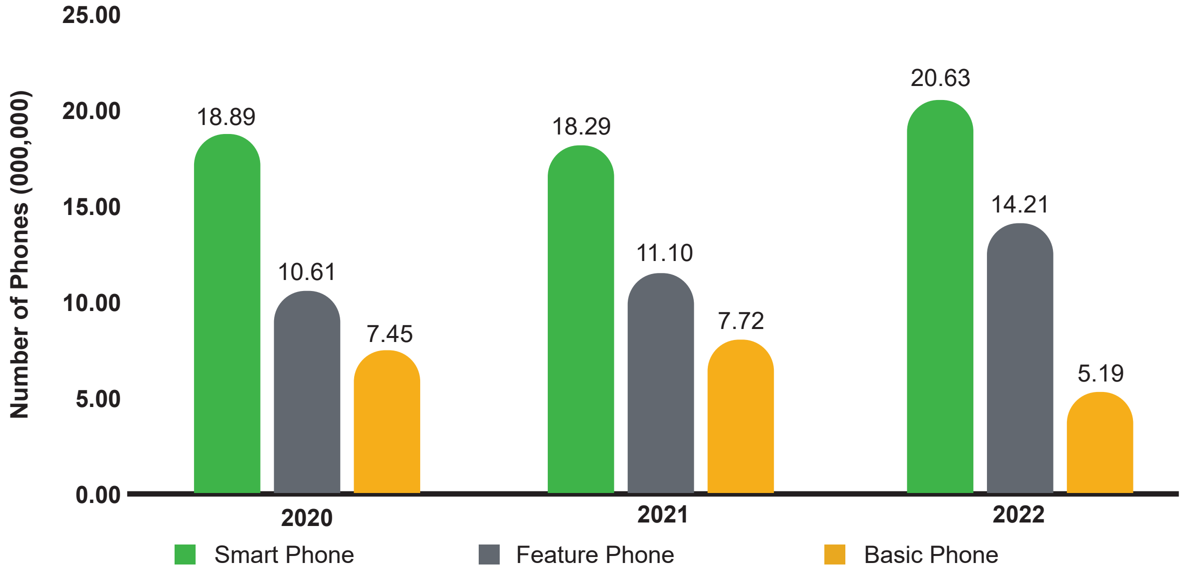
1.24 Type of Mobile Phones on Mobile Network

The total number of mobile phones connected to mobile network was 40,023,224 in 2022, an increase from 36,951,351 phone in 2020. The penetration rate of mobile phone increased from 119.50% in 2020 to 125.98% in 2022. Smartphones users increased from 18.29 million in 2021 to 20.63 million in 2022. The penetration rate for the smart phones increased from 59.39% in 2021 to 64.93% in 2022.

Feature phones users increased from 11.10 million in 2021 to 14.21 million in 2022 representing 28.02% increased. The penetration rate for feature phones increased from 36.04% in 2021 to 44.72% in 2022.

Basic phone users on the network grew fell from 7.72 million in 2021 to 5.19 million in 2022 representing a 32.77% decline in growth. The penetration rate for mobile phones declined from 25.08% in 2021to 16.34% in 2022.

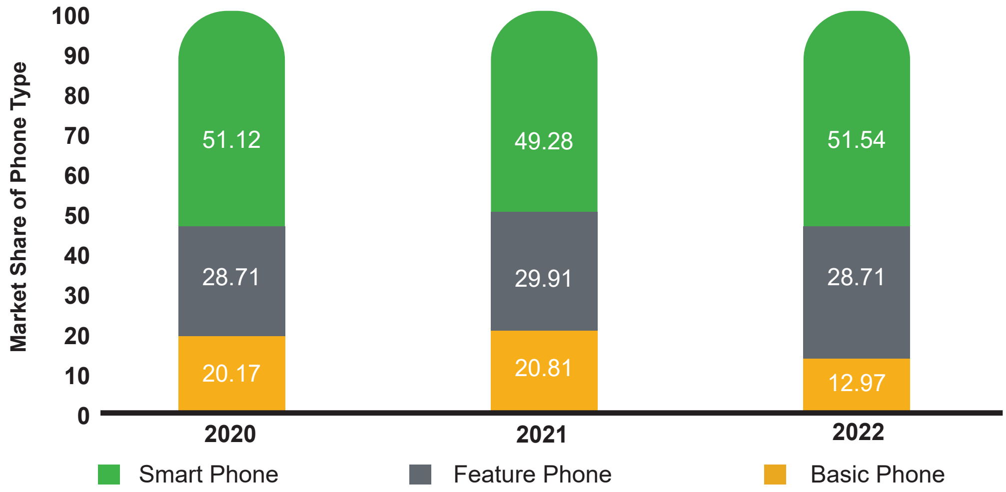
Figure 26: Types of Mobile Phones on Mobile Network



Source: NCA, Mobile Network Operators, 2022

During the period under review, the market share for smart phone users increased from 49.28% in the year 2021 to 51.54% in 2022. The feature phone market share also increased from 29.91% in 2021 to 35.49% in the year 2022. Basic phone market share, however, dropped from 20.81% in the year 2021 to 12.97% in 2022.

Figure 27: Share of type of Mobile Phones on Mobile Network



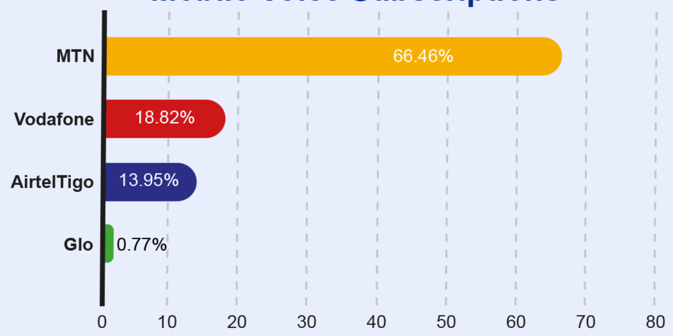
Source: NCA, Mobile Network Operators, 2022

SUMMARY - CHAPTER ONE

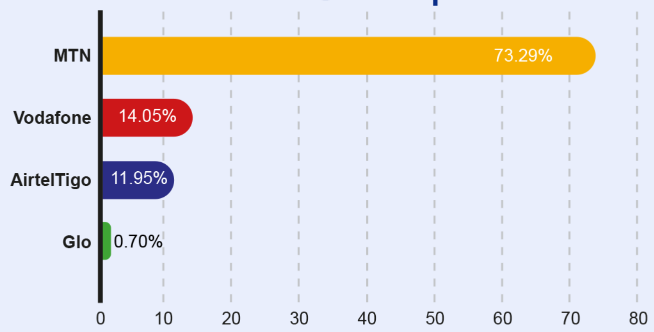
Mobile Voice	Mobile Voice	Mobile Data	Mobile Data
40.05 Million Subscriptions	**98.93%** Prepaid Subscriptions	**22.69** Million Subscriptions	**99.17%** Prepaid Subscriptions
126.05% Penetration Rate	**1.07%** Postpaid Subscribers	**71.41%** Penetration Rate	**0.83%** Postpaid Subscriptions

Market Share

Mobile Voice Subscriptions



Mobile DataSubscriptions



Types of Mobile Phones on Networks

51.54% Smart Phones

35.49% Feature Phones

12.97% Basic Phones

Traffic

Voice Traffic

102.35
Billion Minutes representing a year-on-year growth rate of -5.59%

Average Voice Traffic per Subscription

2,556
Munites

Data Traffic

1,378.76
million gigabytes representing a year-on-year growth rate of 60.20%

Average Data Traffic per Subscription

60.35
GB

SMS Counts

2.72
Billion Counts representing a year-on-year growth rate of 24.84%

Average SMS Count per Subscription

68
Counts

CHAPTER TWO

FIXED NETWORK SERVICES

2.0 Introduction

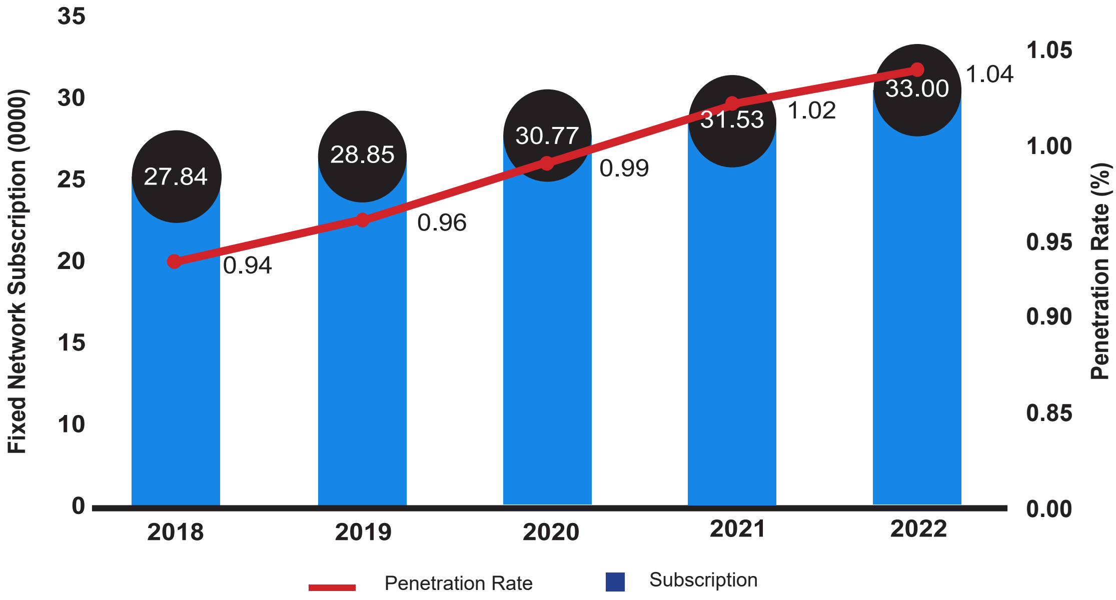
This chapter covers subscriptions, the volume of traffic generated, and fixed data and broadband services over the five years from 2018 to 2022. The telecommunications industry in Ghana currently has three (3) fixed network service providers namely; AirtelTigo, MTN, and Vodafone.

2.1 Fixed Voice Subscriptions and Penetration Rate

Fixed Voice Subscriptions continues to experience steady growth for the fourth year running (2019 – 2022). Fixed voice subscriptions recorded 330,016 subscriptions in 2022 from 315,271 in 2021 which indicates a 4.68% growth. Over the five years, fixed voice subscriptions have grown from 278,379 in 2018 to 330,016 in 2022 representing a compound annual growth rate of 4.35%.

Subsequently, the penetration rate increased from 1.02% in 2021 to 1.04% in 2022. It steadily increased from 0.94% in 2018 to 1.04% in 2022 indicating the steady growth in fixed line subscriptions over the five-year period.

Figure 28: Fixed Voice Subscriptions and Penetration Rate (%)

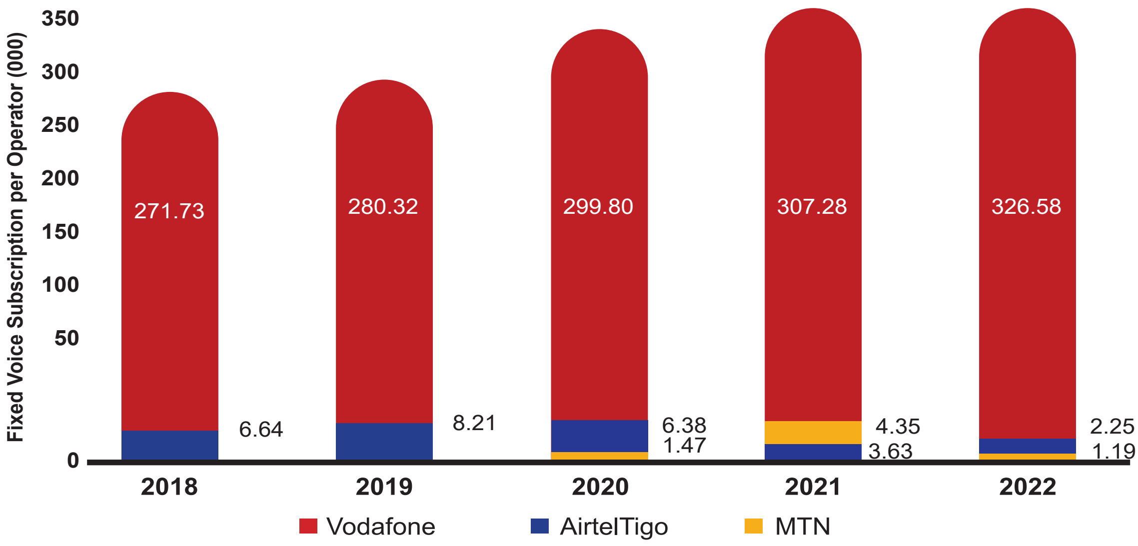


Source: NCA, Fixed Network Operators, 2022

2.2 Fixed Voice Subscription per Operator

Vodafone recorded 326,579 subscriptions in 2022 representing a growth of 6.28% from 307,728 in 2021. AirtelTigo ended the year with 2,247 subscriptions, a decrease from 3,634 subscriptions representing a negative growth of 38.17%. MTN recorded 1,190 subscriptions in 2022a decrease from 4,359 subscriptions in the previous year representing a negative 72.70% growth.

Figure 29: Fixed Voice Subscriptions per Operator

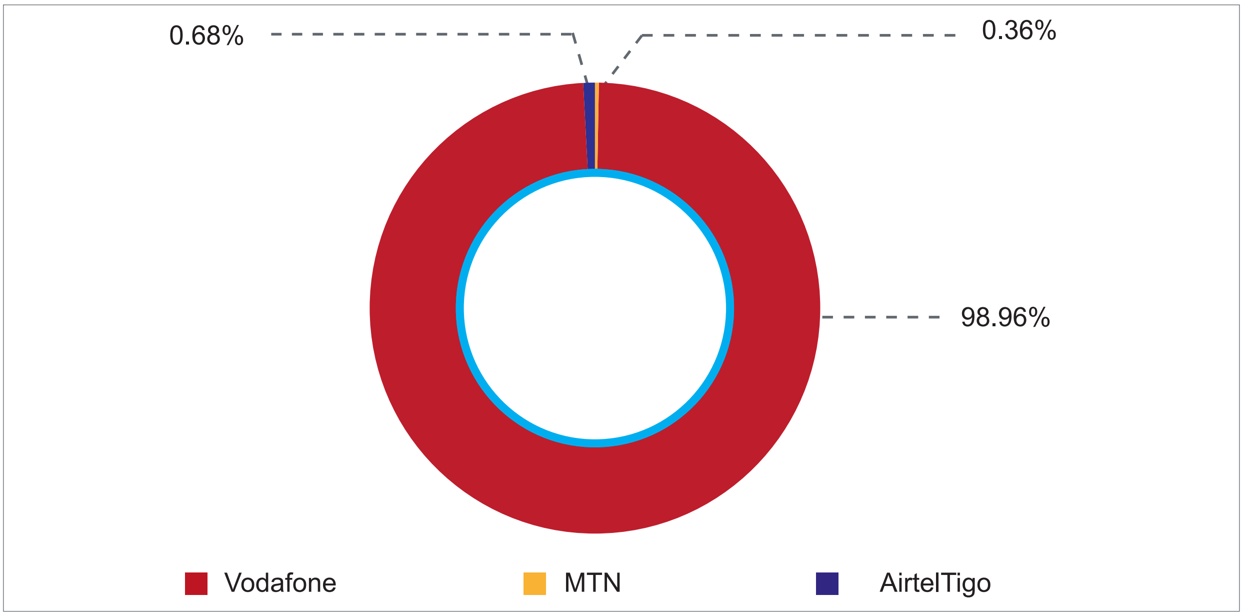


Source: NCA, Fixed Network Operators, 2022

2.3 Fixed Voice Subscription Market Share

Vodafone subscriptions constituted 98.96% of total fixed voice subscriptions. AirtelTigo subscriptions represented 0.68% of the market share and MTN subscriptions represented 0.36% of the total market.

Figure 30: Market Share of Fixed Voice Operators

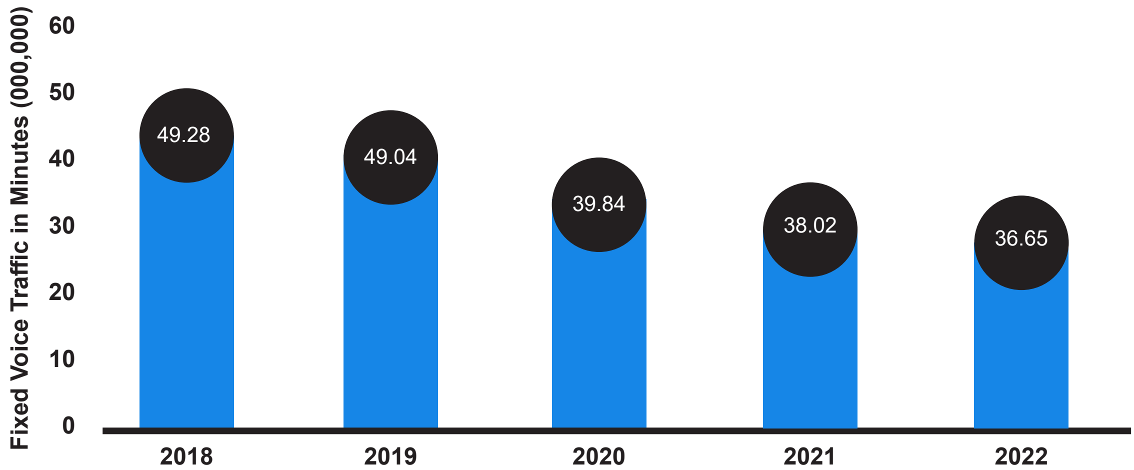


Source: NCA; Fixed Network Operators, 2022

2.4 Fixed Voice Traffic in Minutes

In 2022, the traffic generated from fixed voice subscriptions was 36.65 million minutes compared to 38.02 million minutes in 2021, representing a decline of 3.67%. Over the five years, fixed voice traffic continued to decline from 49.28 million minutes in 2018 to 36.65 million minutes in 2022 resulting in a negative compound annual growth rate of 7.13%.

Figure 31: Fixed Voice Traffic in minutes



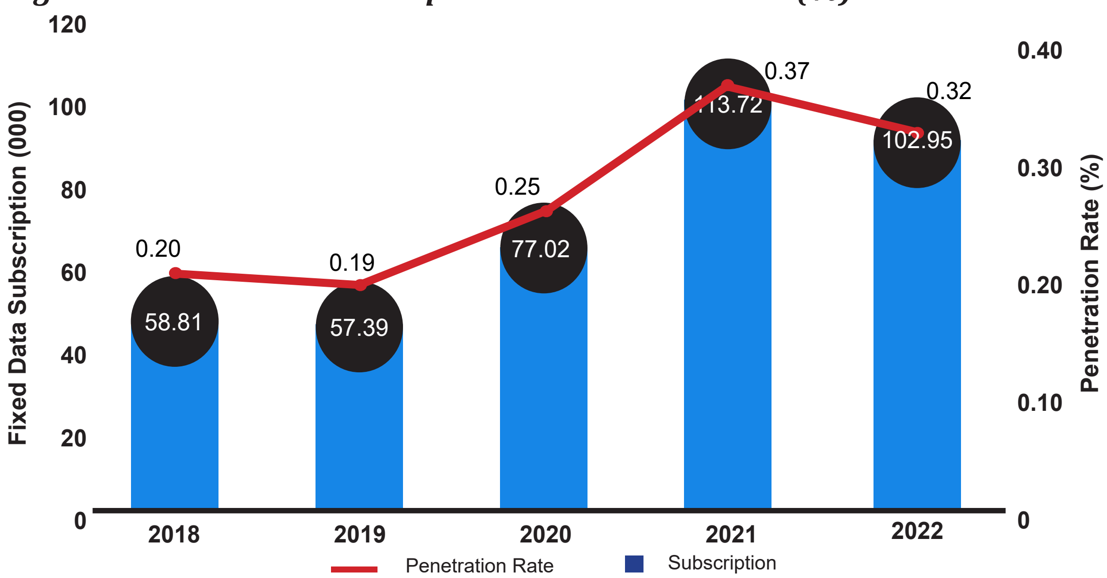
Source: NCA, Fixed Network Operators, 2022

2.5 Fixed Data Subscriptions & Penetration Rate (%)

Fixed data subscriptions declined by 9.47%, from 113,722 in 2021 to 102,952 in 2022. This is the first decline in the last five years. Compound Annual Growth Rate for the period 2018 to 2022 was 15.03%.

The decrease in subscriptions also resulted in a decline in penetration rate from 0.37% in the previous year to 0.32% in the year under review. This was after a two (2) year consistent growth from 0.25% in 2020 and 0.37% in 2021.

Figure 32: Fixed Data Subscriptions &Penetration Rate (%)

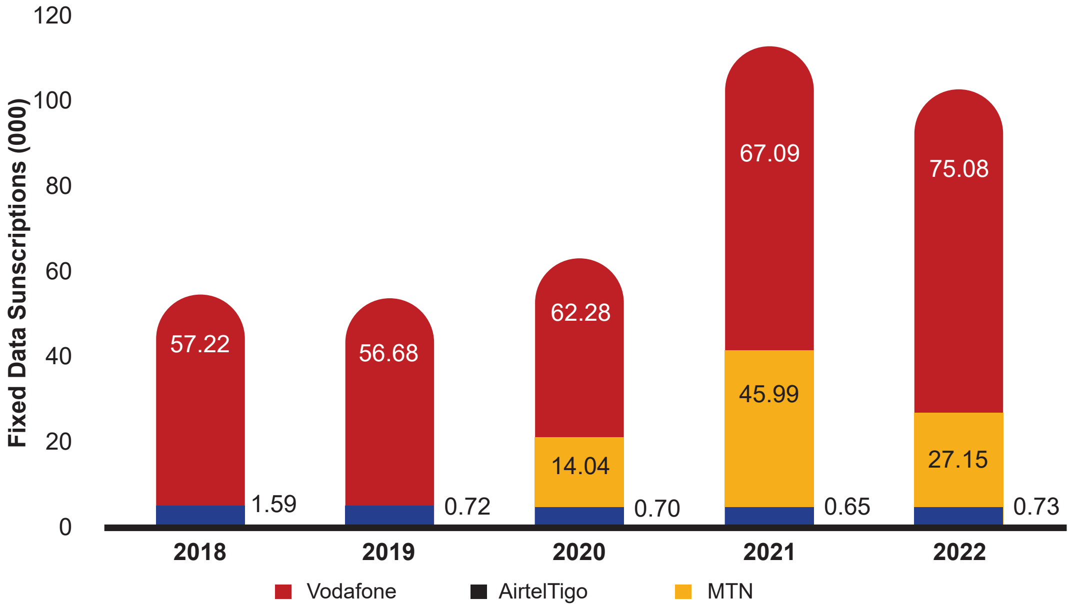


Source: NCA, Fixed Network Operators, 2022

2.6 Fixed Data Subscriptions per Operator

Vodafone subscriptions increased from 67,086 in 2021 to 75,078 in 2022 representing an 11.91% growth rate, MTN's data subscriptions however declined from 45,987 in 2021 to 27,148 in 2022 recording a negative 40.97%. AirtelTigo recorded 649 subscriptions in 2021 and increased slightly to 726 subscriptions in 2022 indicating an 11.86% increase in growth.

Figure 33: Fixed Data Subscriptions per Operator

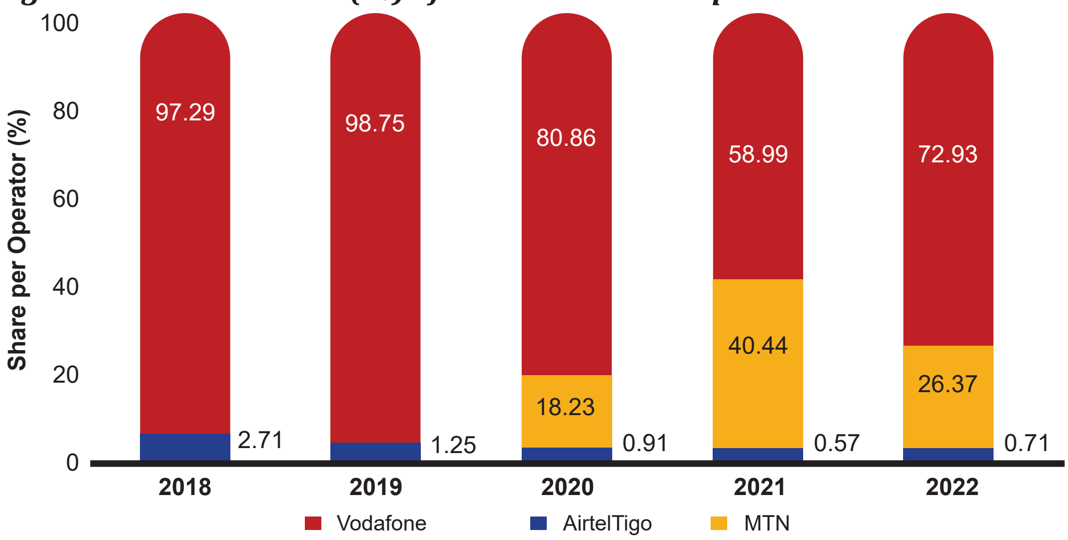


Source: NCA, Fixed Network Operators, 2022

2.7 Fixed Data Subscriptions Market Share

Vodafone's market share of fixed data subscriptions increased from 58.99% in 2021 to 72.93% in 2022, whereas MTN had a market share of 26.37% in 2022 which is a decline from the 40.44% recorded in 2021. AirtelTigo subscriptions accounted for 0.71% of the market share as compared to 0.57% recorded in 2021.

Figure 34: Market Share (%) of Fixed Data Subscription



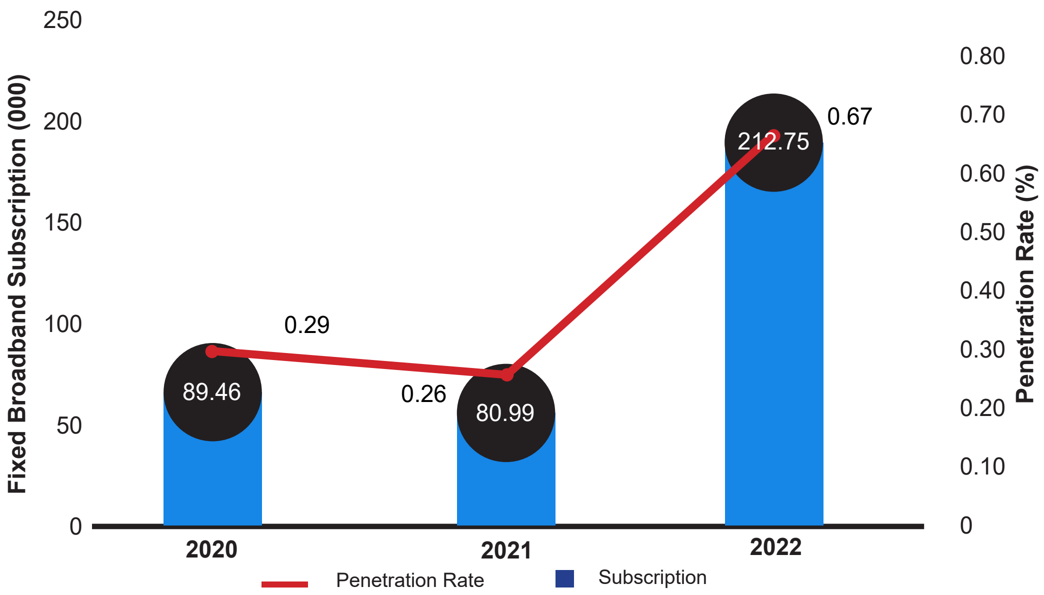
Source: NCA, Fixed Network Operators, 2022

2.8 Fixed Broadband[4] Subscriptions

Fixed Broadband subscriptions at the end of 2022 stood at 212.75 thousand representing a 162.69% increase in subscriptions from 80.99 thousand in 2021. Fixed broadband subscriptions fell from 89.46 thousand in 2020 to 80.99 thousand in 2021 and rose in 2022.

The penetration rate for fixed broadband fell from 0.29% in 2020 to 0.26% in 2021 and increased to 0.67% in 2022.

Figure 35: Fixed Broadband Subscriptions & Penetration Rate (%)

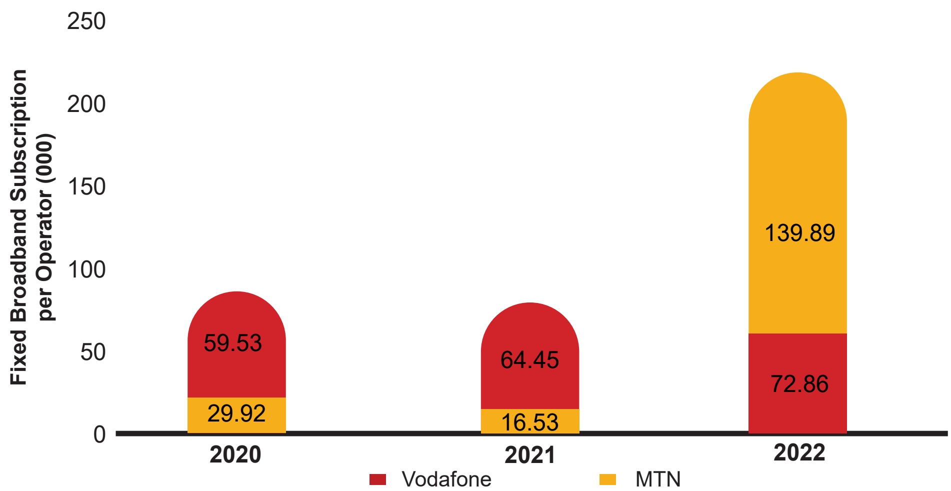


Source: NCA, Fixed Network Operators, 2022

2.9 Fixed Broadband Subscriptions per Operator

At the end of 2022, MTN had 139,894 subscriptions representing 65.76% of the total subscriptions. Vodafone subscriptions made up the remaining 34.24% market shares with 72,078 subscriptions.

Figure 36: Fixed Broadband Subscriptions per Operator



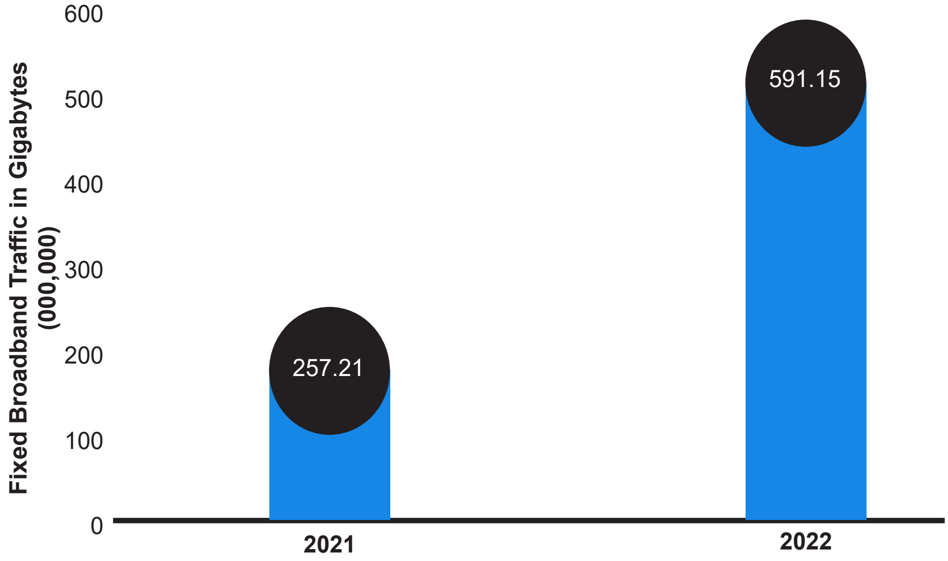
Source: NCA, Fixed Network Operators, 2022

4. This refers to fixed subscriptions to high-speed access to the public Internet (a TCP/IP connection), at downstream speeds equal to, or greater than, 256 kbit/s. This includes Digital Subscriber line (DSL), fibre-to-the-home/building, other fixed (wired)-broadband subscriptions and terrestrial fixed wireless broadband. The NCA started collecting data on this indicator in October 2020.

2.10 Fixed Broadband Traffic

Fixed Broadband Traffic at the end of 2022 was 591.15 million gigabytes. This is an increase of 130% from 257.21 million gigabytes in the previous year

Figure 37: Fixed Broadband Traffic in Gigabytes

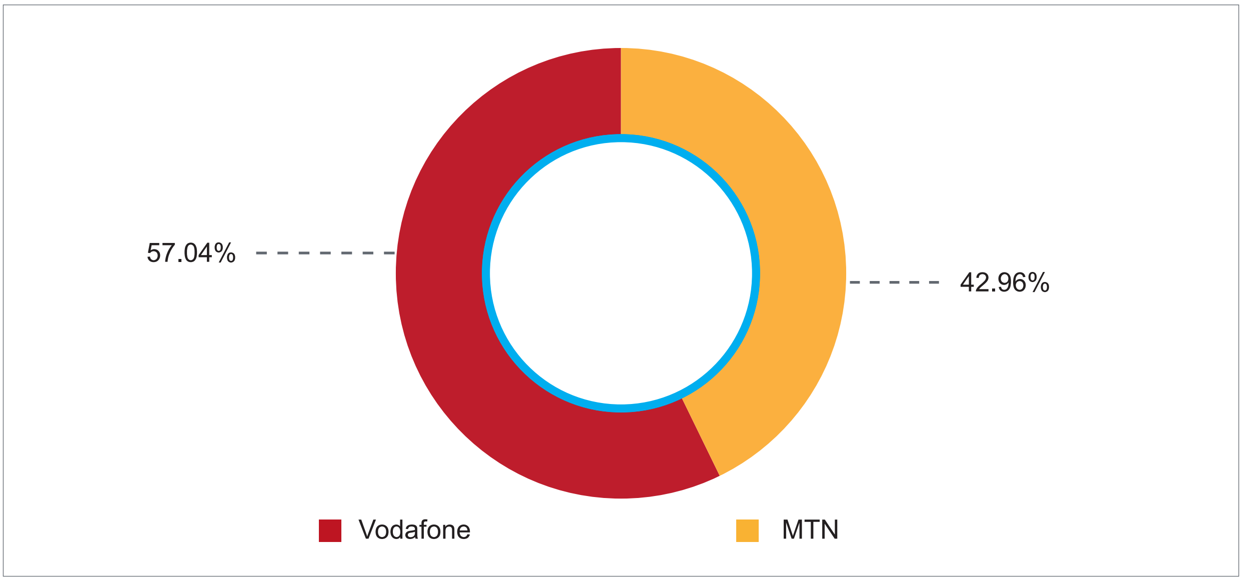


Source: NCA, Fixed Network Operators, 2022

2.11 Fixed Broadband Traffic Market Share

Vodafone subscriptions constituted 79.89% of total fixed broadband traffic of the market with MTN subscriptions covering 20.11% of the total market.

Figure 38: Fixed Broadband Traffic Market Share



Source: NCA, Fixed Network Operators, 2022

Fixed Voice Subscription and Market Share

Fixed Voice Subscriptions

330,016

representing a 4.68% annual growth rate

Operator	Subscriptions	Market Share
vodafone	326,579 Subscriptions	98.96% Market Share
airteltigo	2,247 Subscriptions	0.68% Market Share
MTN	1,190 Subscriptions	0.36% Market Share

Fixed Data Subscription and Market Share

Fixed Data Subscriptions

102,952

representing a -9.47% annual growth rate

Operator	Subscriptions	Market Share
vodafone	75,078 Subscriptions	72.93% Market Share
MTN	27,148 Subscriptions	26.37% Market Share
airteltigo	726 Subscriptions	0.71% Market Share

ed
Subscription

Fixed Broadband Subscription

Operator	Subscriptions	Market Share
MTN	139,894 Subscriptions	65.76% Market Share
Vodafone	72,856 Subscriptions	34.24% Market Share

Fixed Voice Traffic and Market Share

Fixed Voice Traffic

36.65 M

minutes representing a decline of 3.67%

Operator	Traffic	Market Share
vodafone	36.64 million minutes	99.96% Market Share
airteltigo	0.87 million minutes	0.04% Market Share
MTN	0.02 million minutes	0.00% Market Share

Fixed Broadband Traffic

Operator	Traffic	Market Share
MTN	118.82 Million (GB)	42.96% Market Share
Vodafone	157.79 Million (GB)	57.04% Market Share

Chapter Three

BROADBAND WIRELESS ACCESS

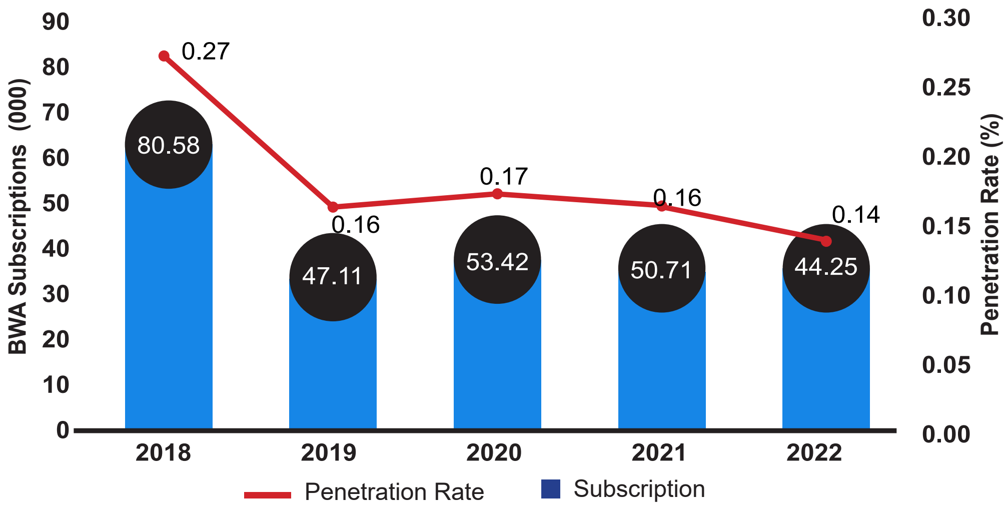
3.0 Introduction

There are five (5) licensed Broadband Wireless Access (BWA) service providers as at the end of year 2022 , namely, Broadband Home, Blu Communications, Busy Internet, Surfline, and Telesol. This chapter highlights an analysis of subscriptions, penetration, and volume of traffic.

3.1 Broadband Wireless Access Subscriptions[5] and Penetration Rate (%)

Broadband Wireless Access (BWA) subscriptions declined from 50,714 in 2021 to 44,247 in 2022 recording a (12.75%) decline in growth. From 2018 to 2021, Broadband Wireless subscriptions have been fluctuating from 80,581 in 2018 to 47,108 subscriptions in 2019 and rose to 53,415 subscriptions representing a negative compound average growth rate of 13.92% over the five-year period. The penetration rate declined from 0.16% in 2021 to 0.14% in 2022.

Figure 39: Broadband Wireless Subscriptions and Penetration Rate (%)



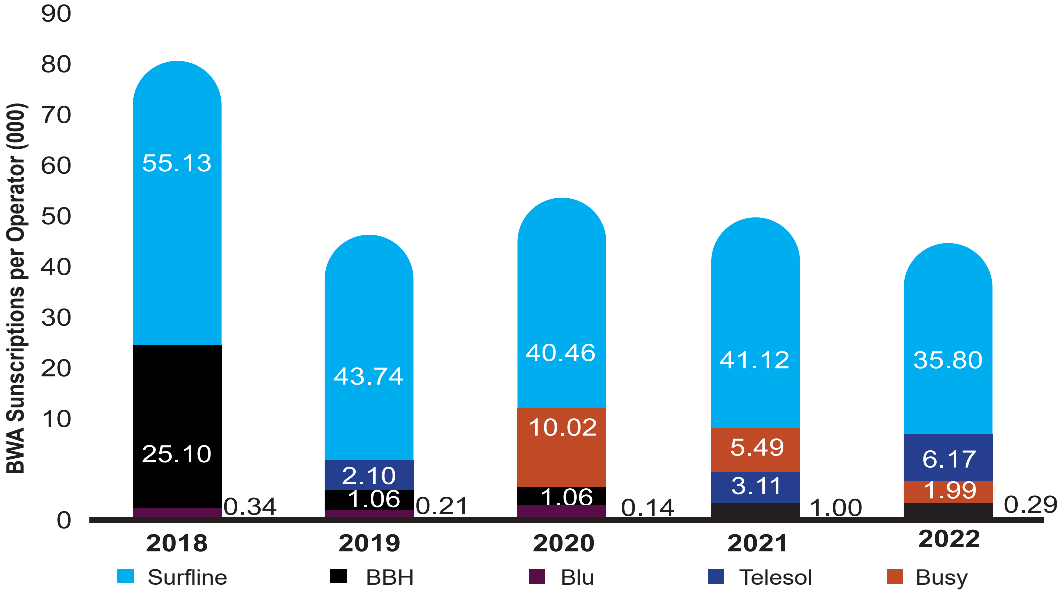
Source: NCA, BWA Operators, 2022

3.2 Broadband Wireless Subscriptions per Operator

Surfline recorded 35,796 subscriptions at the end of 2022 which represents a (12.95%) declined in subscriptions compared to the previous year. Busy had 6,174 subscriptions representing an increase in subscriptions from 5,489 subscriptions. Telesol at the end of 2022 had 1,985 subscriptions recording a decline from 3,106 subscriptions in the previous year. BBH had 292 subscriptions, a decline of 70.68% as compared to 996 subscriptions in the previous year.

5. The total BWA subscriptions as at the end of 2022 includes estimation of Busy's subscriptions. This estimation was based on their last submission as at September 2022.

Figure 40: BWA Subscriptions per Operator

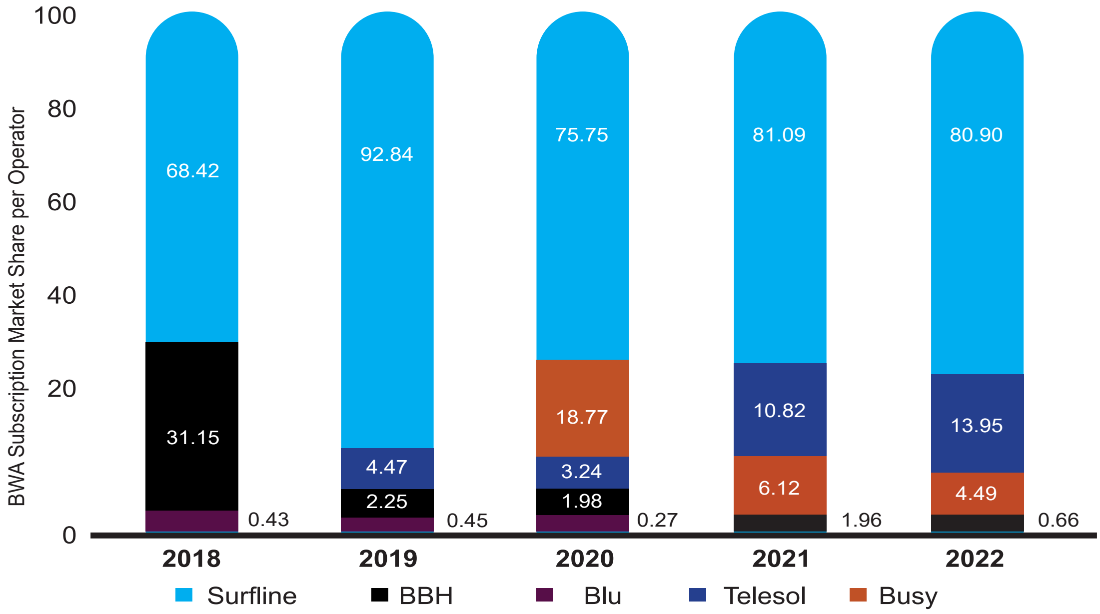


Source: NCA, BWA Operators, 2022

3.3 BWA Subscription Market Share

Surfline's market share declined from 81.09% in 2021 to 80.90% in 2022. Busy Internet ended the year with 4.49% of the total BWA market as compared to 6.12% in 2021. Telesol's market share increased from 10.82% in 2021 to 13.95% in 2022. BBH had a market share of 0.66% in 2022 as compared to 1.96% in 2021.

Figure 41: Market Share for BWA subscription

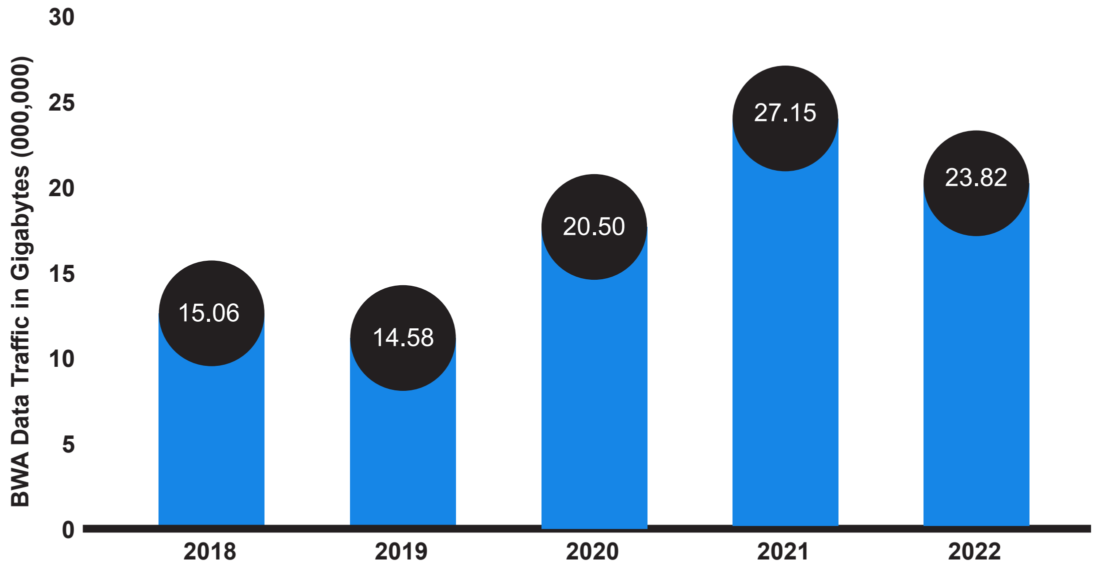


Source: NCA, BWA Operators, 2022

3.4 BWA Traffic in Gigabytes

Total data traffic generated by BWAs at the end of 2022 was 23.82 million gigabytes indicating a decline of 12.28% from 27.15 million gigabytes in the previous year. BWA data traffic generated in the past five years increased from 15.06 million gigabytes in 2018 to 23.82 million gigabytes in the year under review resulting in a Compound Annual Growth Rate of 12.13%

Figure 42: BWA Traffic in Gigabytes

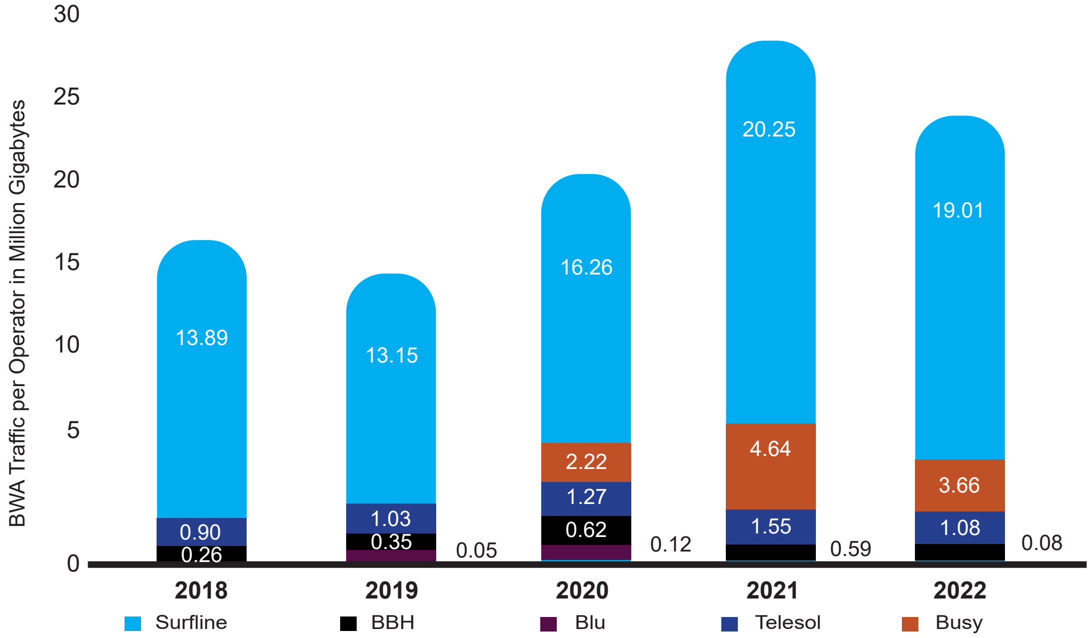


Source: NCA, BWA Operators, 2022

3.5 BWA Traffic per Operator

Surfline generated 19.01 million gigabytes in 2022 from 20.25 million gigabytes in 2021 representing a negative growth of 6.12%. BBH traffic declined from 0.59 million gigabytes to 0.08 million gigabytes in 2022 recording an 86.44% decline in growth. Busy generated 3.66 million gigabyte traffic in 2022 from 4.64 million gigabytes in the previous year, resulting in a 21.12% decline in growth. Telesol generated 1.08 million gigabytes of data traffic for the year under review, a decrease from 1.55 million gigabytes in 2021 which translates into a 30.32% decline in growth.

Figure 43: BWA Traffic per Operator

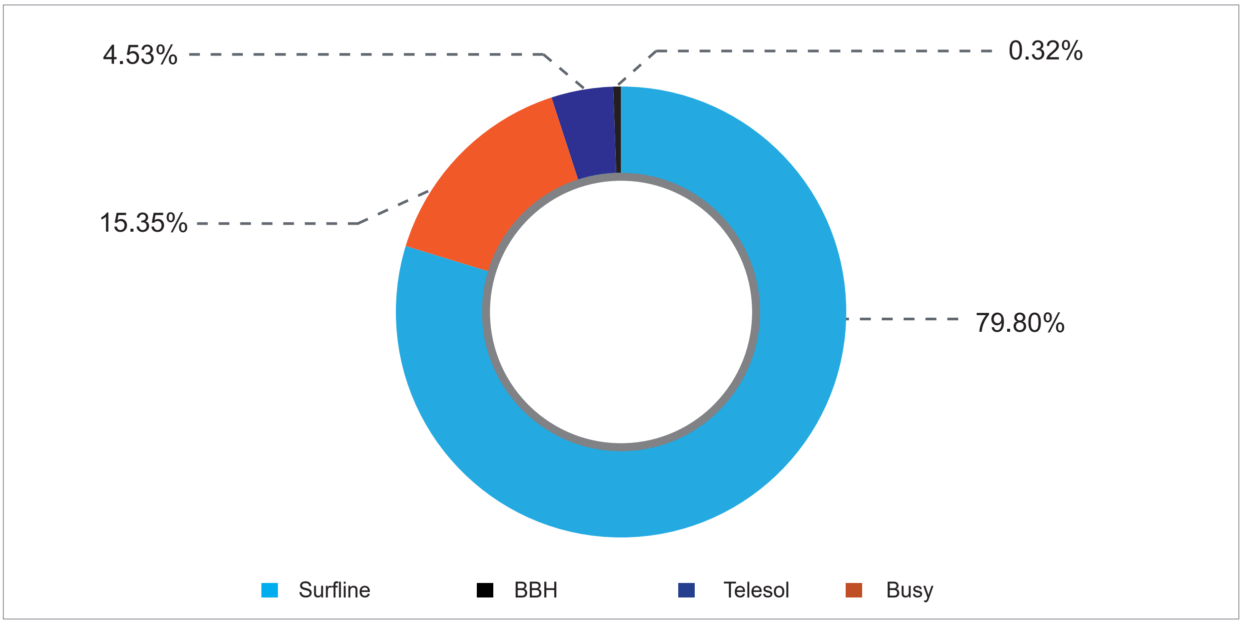


Source: NCA, BWA Operators, 2022

3.6 BWA Traffic Market Share

Surfline subscriptions generated 79.80% ot total traffic. Busy subscriptions generated 15.35%, while Telesol subscriptions generated 4.53% of total traffic. The remaining 0.32% of traffic was generated by BBH subscriptions.

Figure 44: BWA Traffic Market Share



Source: NCA, BWA Operators, 2022

BWA Subscriptions and Market Share

BWA

44,247
a -12.75% decline from the previous year's figure

Subscriptions

0.14%

Penetration

Operator	Subscriptions	Market Share
Surfline	35,796	80.90%
Telesol	6,174	13.95%
Busy	1,985	4.49%
BBH	292	0.66%

BWA Traffic and Market Share

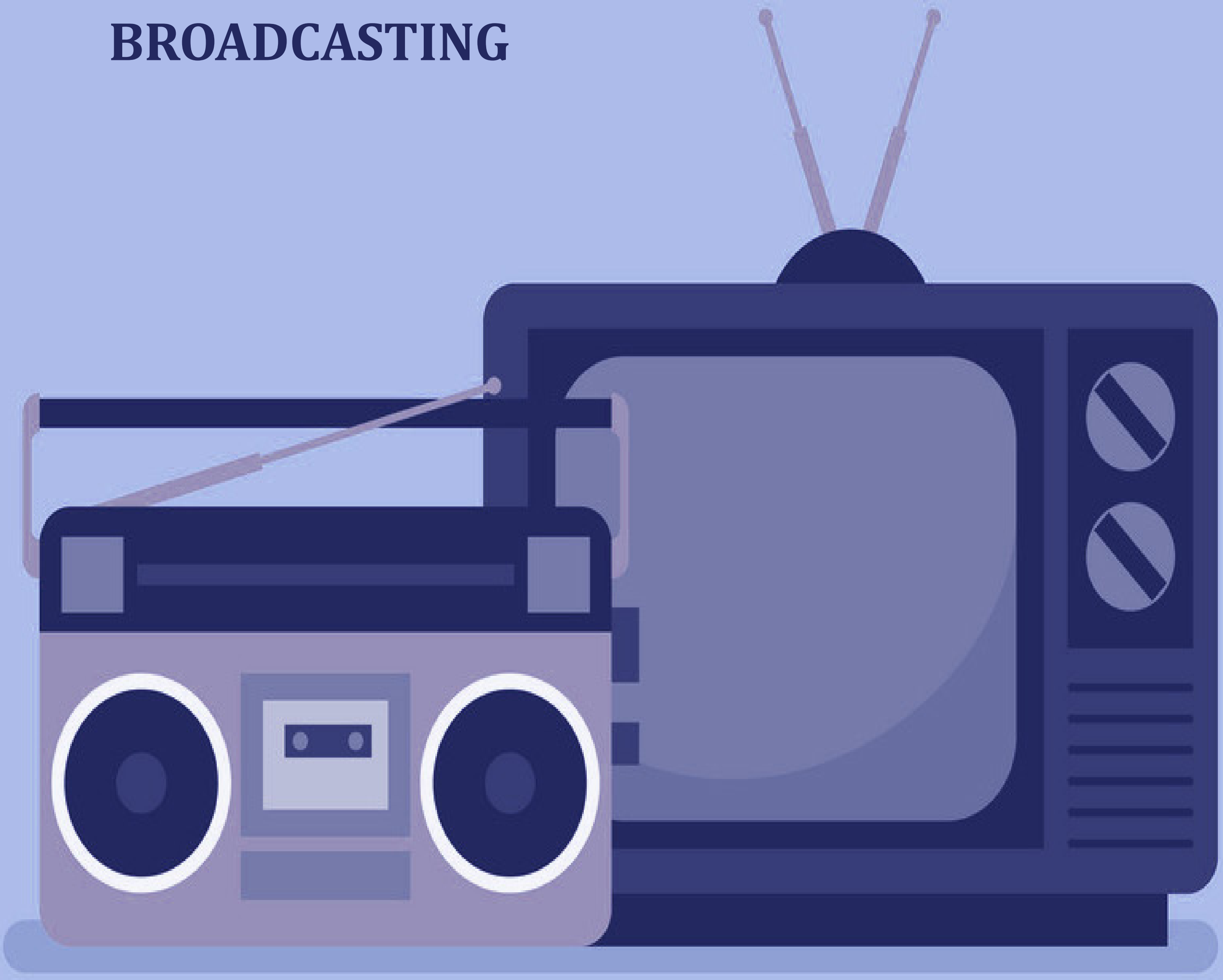
BWA Traffic

23.82 M
Gigabyte representing a 34.70% annual growth rate

Operator	Traffic	Market Share
surfline	19.01 million GB	79.80%
busy	3.66 million GB	15.35%
telesol	1.55 million GB	4.53%
BBH Broadband Home	0.07 million GB	0.32%

Chapter Four

BROADCASTING



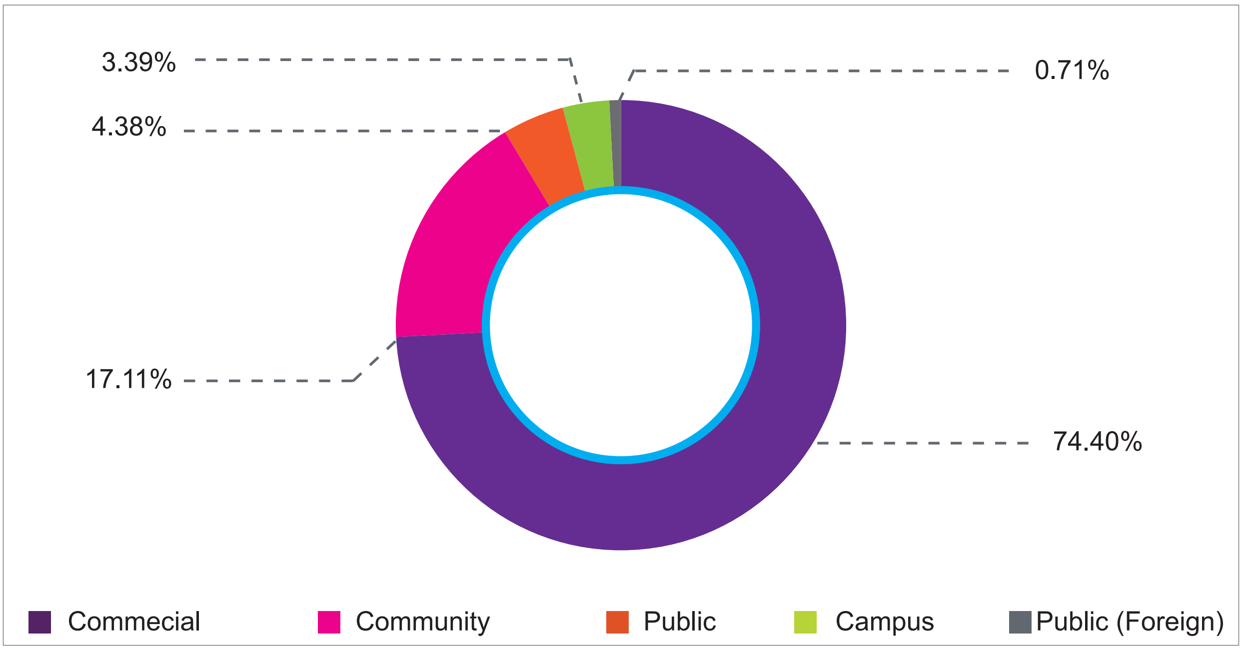
4.0 Introduction

This chapter provides information on Frequency Modulation (FM) and Television (TV) Broadcasting. This analysis includes regional distribution of FM stations, mode of transmission of television signals, and total authorised FM and TV stations. This chapter also provides data on licensed Amateur Radio services in the country.

4.1 Total Number and Types of Authorised Frequency Modulation (FM) Stations

There were 707 authorised FM stations in Ghana as of the end of 2022. A total of 513 (72.56%) FM stations were in operation whilst 194 (27.44%) stations were not in operation. Out of the total authorized FM stations, 526(74.40%) were Commercial FM stations, 121 (17.11%) were Community FM stations, 31(4.38%) were Public FM stations, 24(3.39%) were ampus FM stations and 5 (0.71%) were Public (Foreign) FM stations.

Figure 45: Types of Authorised FM Stations as at 2022

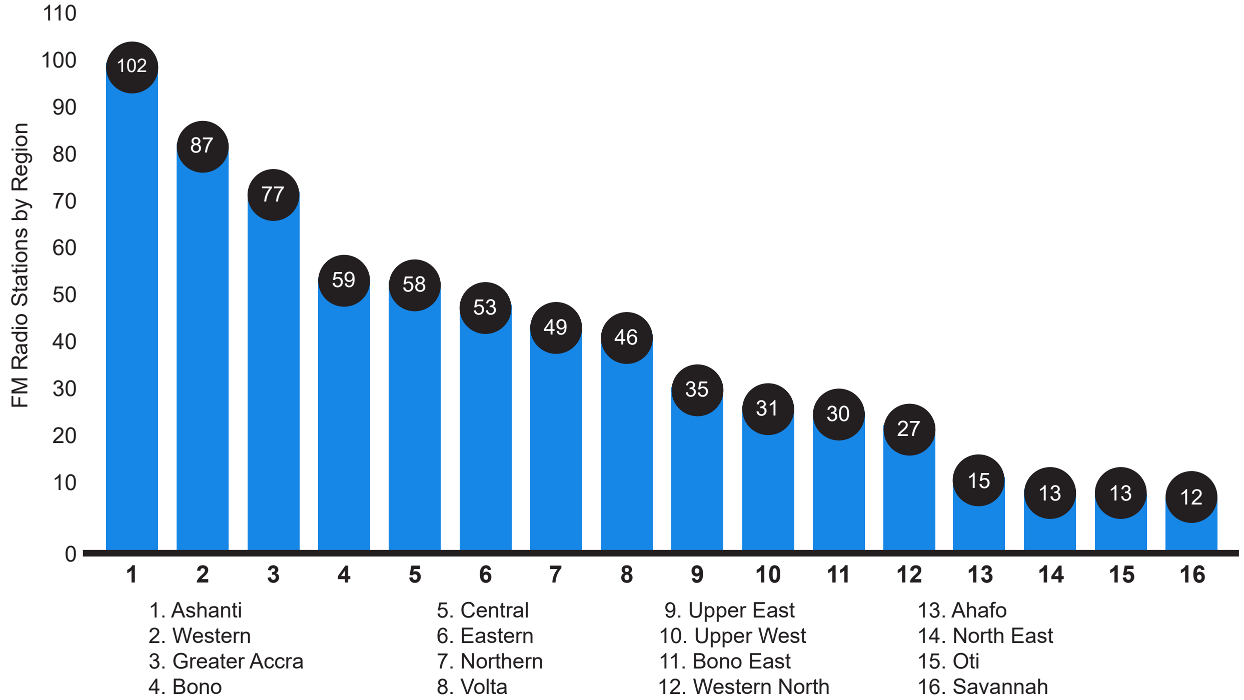


Source: National Communications Authority, 2022

4.2 Regional Distribution of Authorised FM Stations

The Ashanti Region has the highest authorised FM stations with 102 FM stations while Savannah recorded the least number with 12 authorised FM stations at the end of the year under review.

Figure 46: Regional Distribution of Authorised FM Stations

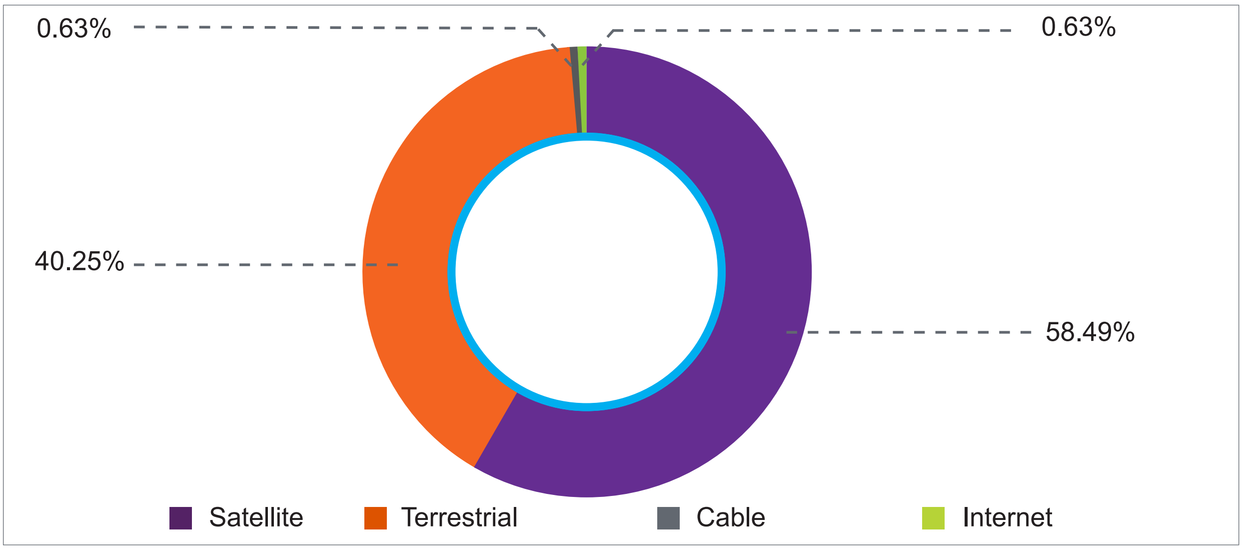


Source: National Communications Authority, 2022

4.3 Total Number and Types of Television (TV) Broadcasting Station by Platforms

At the end of 2022, there were 156 authorised television stations in the country, out of which 117 were operational. There are four (4) platforms used to transmit television signals in Ghana namely; satellite, terrestrial, cable, and internet. Satellite television stations accounted for 58.49% of the authorised TV stations with 93 stations and Terrestrial was 40.25% of the total authorised television stations with 61 stations. One television station has been authorised each for cable and internet respectively with 0.63% of the market.

Figure 47: Number of Authorised TV Stations by Platform for Transmission



Source: National Communications Authority, 2022

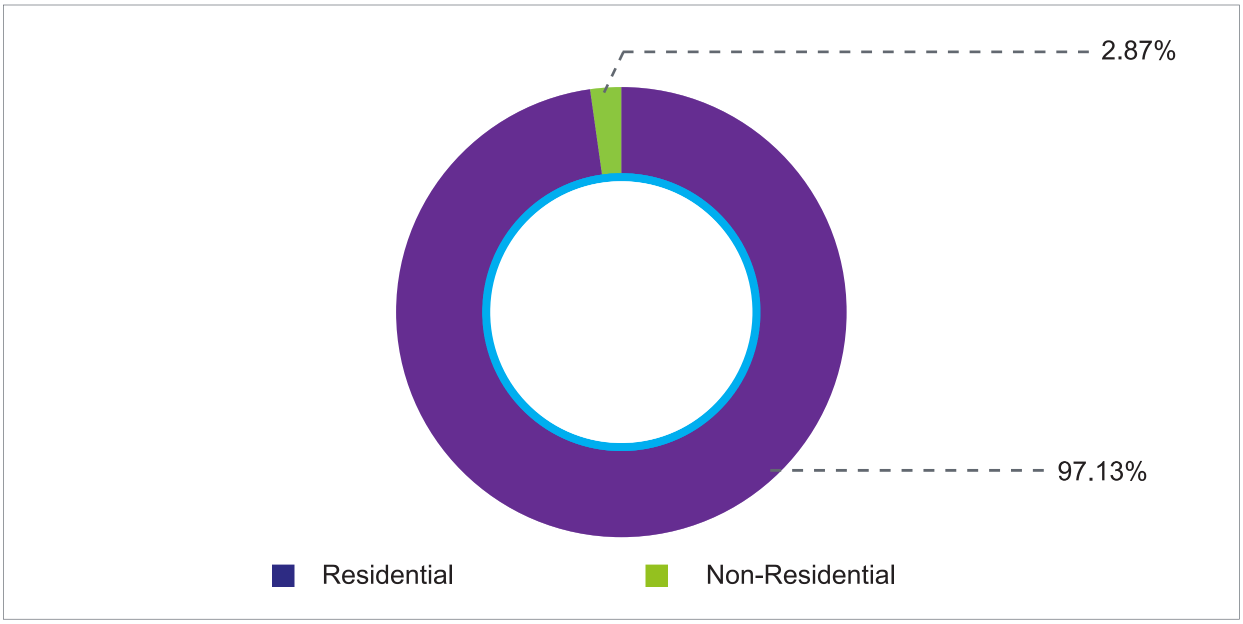
4.4 Categories of Television Services

Fifteen (15) categories of Television Services are authorised by the Authority. The most authorised TV Category is Satellite Television Broadcasting (Free-to-home direct-to-home bouquet).

4.5 Pay TV Services

The subscriber base for the Pay TV for 2022 covers subscribers from DSTv, and GOTv . At the end of 2022, there were 435,473 subscribers. Out of the total subscriptions, 422,967 (97.13%) are residential subscribers while the remaining 12,506 (2.87%) are business subscribers.

Figure 48: Distribution of Pay Tv Subscription



Source: NCA, PayTV Operators 2022

4.6 Amateur Radio Services[6]

Per the Electronic Communications Acts, 2008, Acts 775 Section 7, the class licence is grouped into the following:

a) Amateur Radio Class A:

Refers to Advanced stations: that is stations that have an output power of not more than 1,000 watts

b) Amateur Radio Class B:

Refers to Beginner stations: that is, stations which have an output power of not more than 250 watts; and.

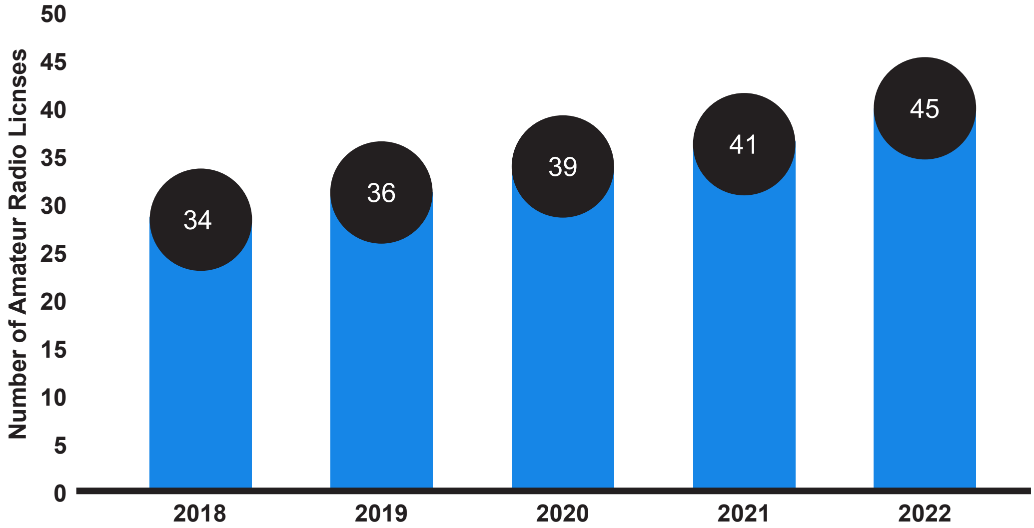
c) Amateur Radio Class C:

Refers to Intermediate stations: that is, stations that have an output power of not more than 100 watts.

6. Amateur Radio Service is a radio communication service for the purpose of self-training, interconnection and technical investigations carried out by amateurs.

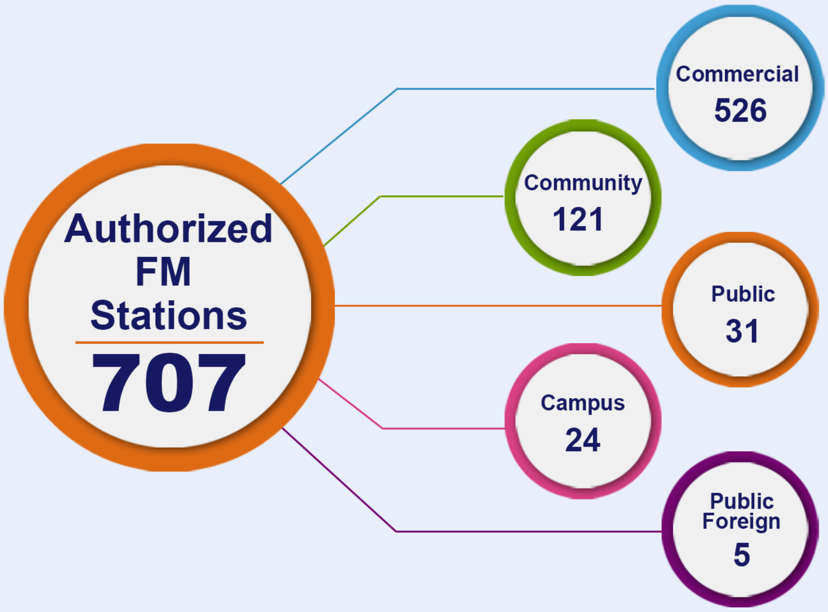
At the end of 2022, 45 Amateur radio licences had been issued representing a 9.96% increase from 41 licences in 2021. Over the five years, licences issued increased by 32.35% from 34 licences in 2018 to 45 licences in 2022.

Figure 49: Amateur Radio Licences



Source: National Communication Authority, 2022

Authorized Radio/FM Stations



FM Stations

513

FM Stations are **operational** representing 72.56% of authorized FM Sations

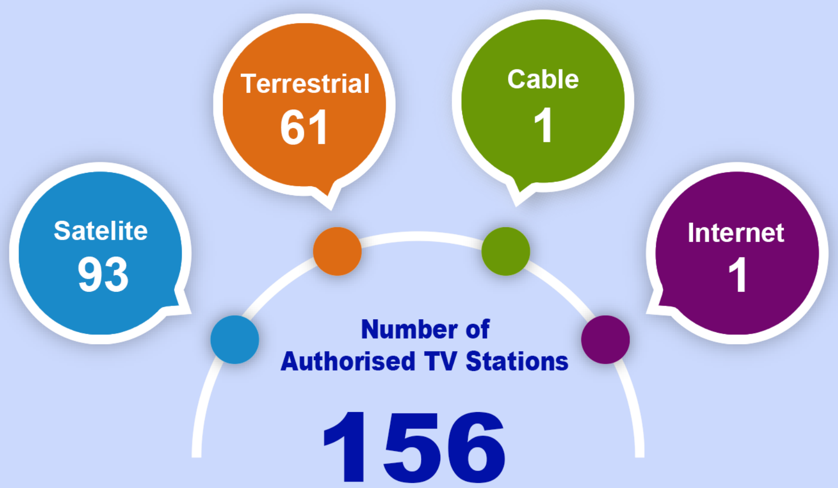
194

FM Stations are **not operational** representing 27.44% of authorized FM Sations

Regional Distribution of Authorized FM Stations

Ashanti Region	Western Region	Oti/North East Regions	Savannah Region
102	**87**	**13**	**12**
Highest Authorized FM Stations	Second Highest Authorized FM Stations	Second Least Authorized FM Stattions	Least Authorized FM Stattions

Authorized TV Stations by Platform



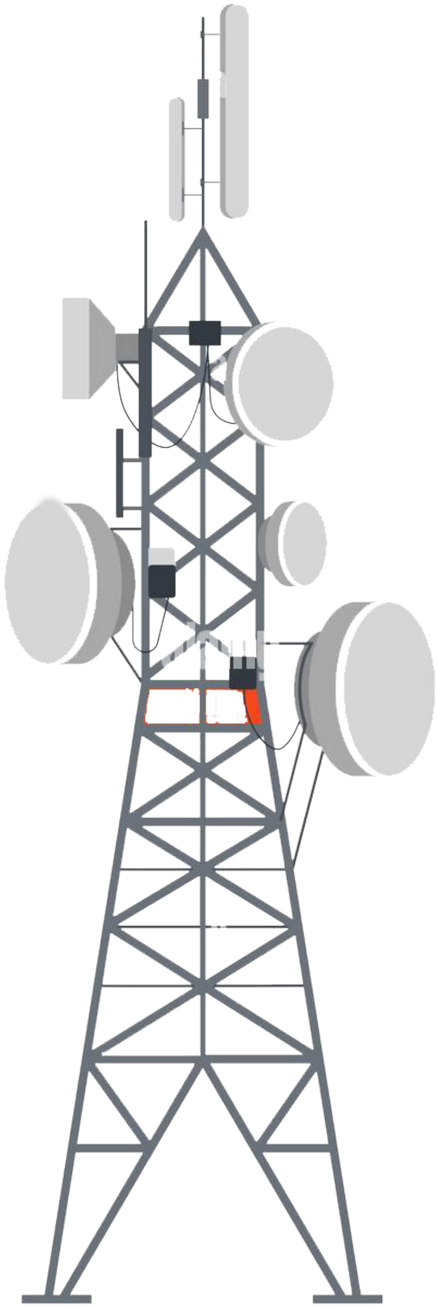
TV Stations

117

TV Stations are **operational** representing 75.00% of authorized FM Sations

39

TV Stations are **not operational** representing 25.00% of authorized FM Sations



Chapter Five

INFRASTRUCTURE SERVICES

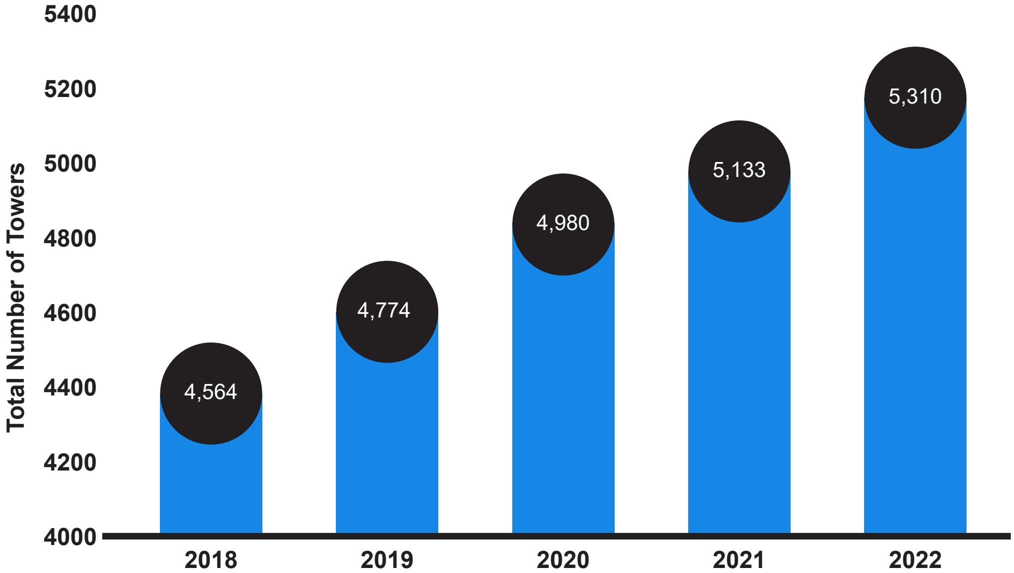
5.0 Introduction

This chapter gives an overview of infrastructure services provided by Towers Companies and International Submarine Operators. It expands to cover the total number of towers, tenancy ratio, and regional distribution of towers, potential capacity lit and used by submarine operators.

5.1 Total Number of Towers

The total number of towers owned and managed by the Tower Companies is 5,310 towers, a 3.45% increase from 5133 towers in 2021. Over the five years, the compound average growth rate is 3.86% from 4,564 towers in 2018 to 5,310 towers in 2022.

Figure 50: Year -on- Year number of Towers

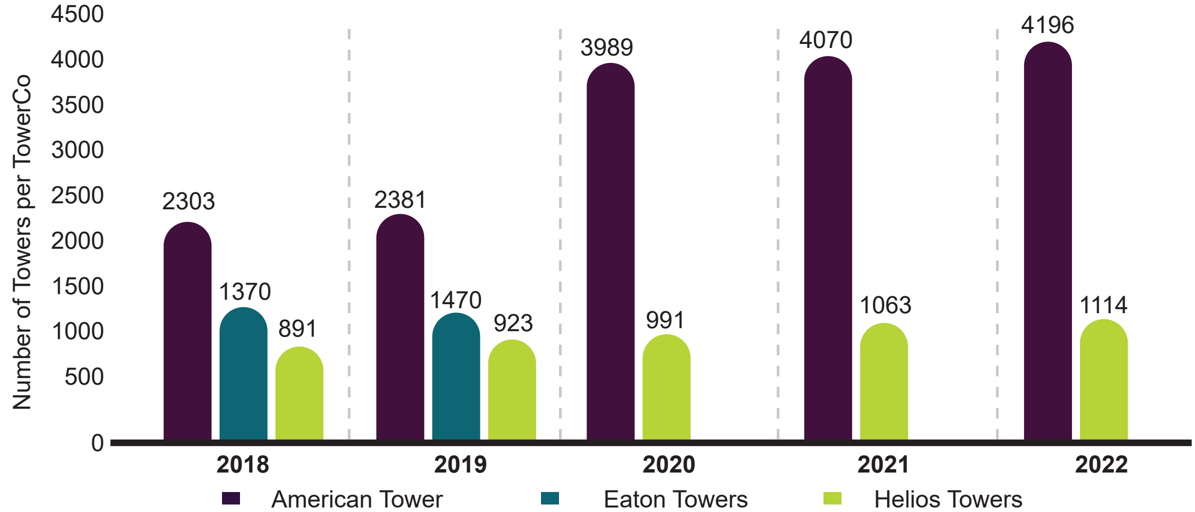


Source: NCA, Tower Companies, 2022

5.2 Number of Towers by Operator

The number of towers owned and managed by American Towers at the end of 2022 are 4,196 representing 79.02% of total towers while Helios Towers reported 1,114 towers represent 20.98% of the total towers.

Figure 51: Total Number of Towers per Operator

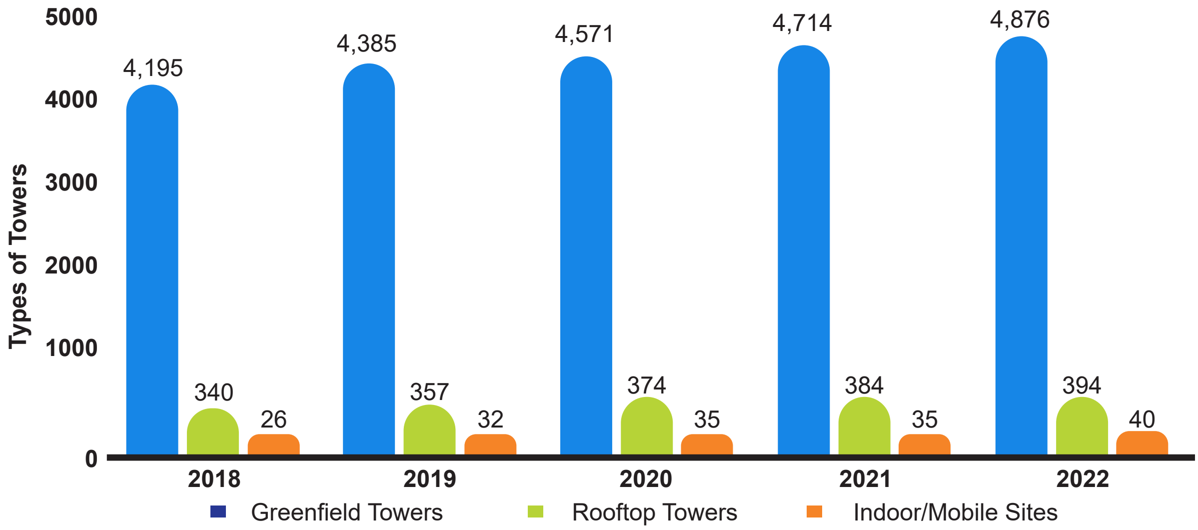


Source: NCA, Tower Companies, 2022

5.3 Types of Towers

There are 3 types of towers used to provide telecommunications in Ghana. These are the Greenfield, Rooftop, and Indoor network/mobile sites towers. At the end of 2022, 91.83% of the total towers were Greenfield towers, 7.42% were Rooftop towers and 0.75% were Indoor network/mobile sites.

Figure 52: Types of Towers

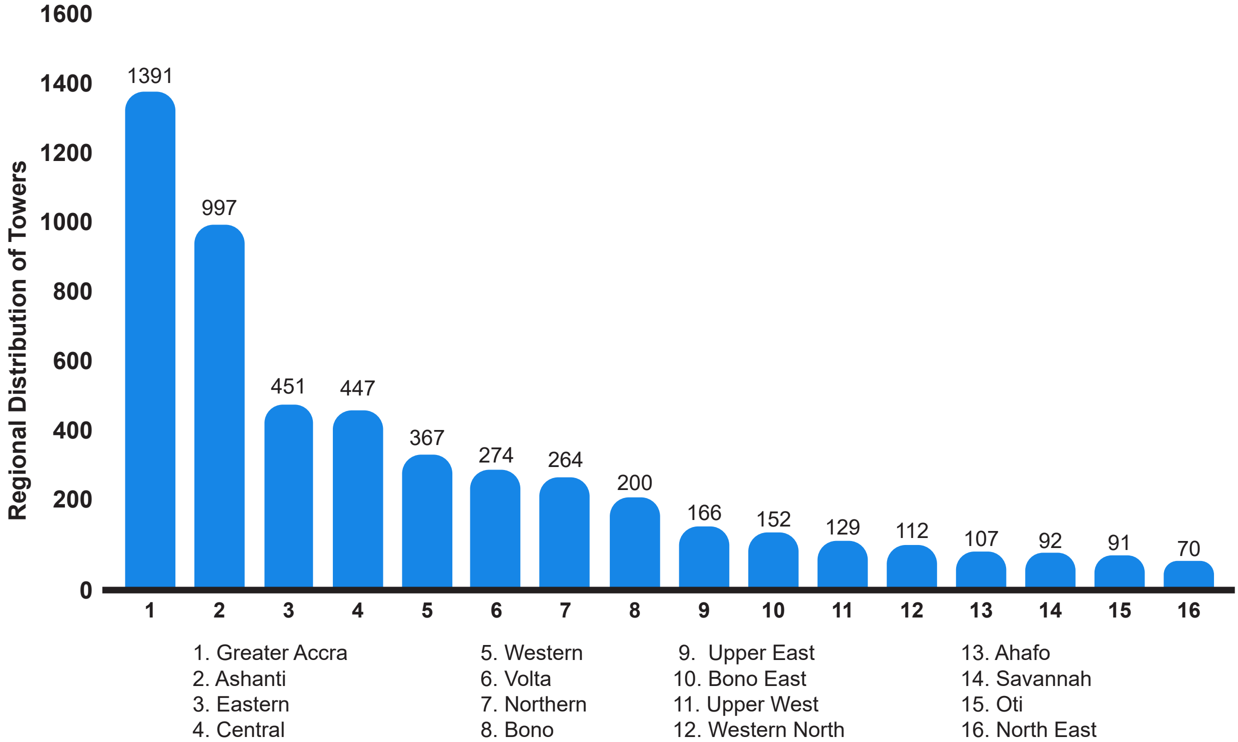


Source: NCA, Tower Companies, 2022

5.4 Regional Distribution of Towers in Ghana

Most Towers are in the Greater Accra region with 1,391 towers and the North East Region with 70 towers.

Figure 53: Regional Distribution of Towers

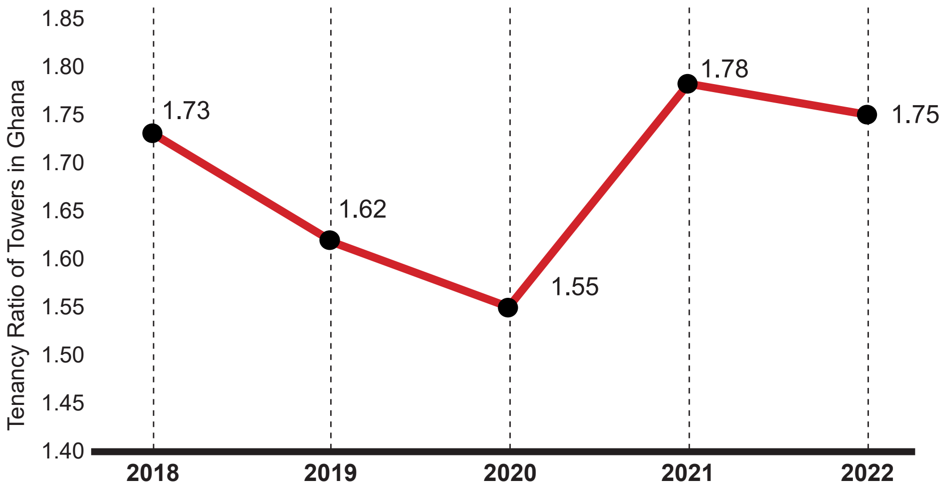


Source: NCA, Tower Companies, 2022

5.5 Tenancy Ratio

Tenancy Ratio decreased from 1.78 in 2021 to 1.75 in 2022, recording a 2.04% decrease. Over the five-years, the tenancy ratio was lowest in 2020 with a ratio of 1.55. .

Figure 54: Tenancy Ratio

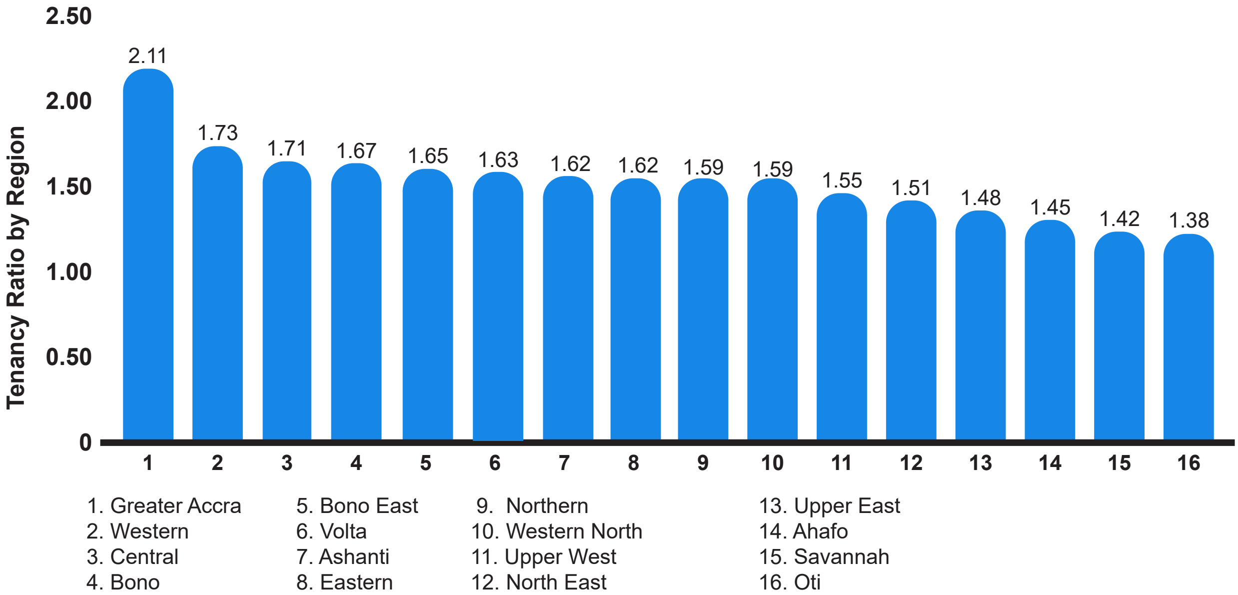


Source: NCA, Tower Companies 2022

5.6 Regional Distribution of Tenancy Ratio

The regional distribution of tenancy ratio in 2021 was between 2.23 and 1.30 with a nationwide average of 1.78. Greater Accra region recorded the highest with 2.23 while Oti region had a tenancy ratio of 1.30.

Figure 55: Regional Distribution of Tenancy Ratio



Source: NCA, Tower Companies, 2022

5.7 Submarine Cable Service

As at the end of 2022, there were 5 Authorised Submarine Cable Landing operators in the country, namely:

a) West Africa Cable Systems (WACS)

b) MainOne Cable Company Ltd.

c) ETG Integrated Services Ltd.

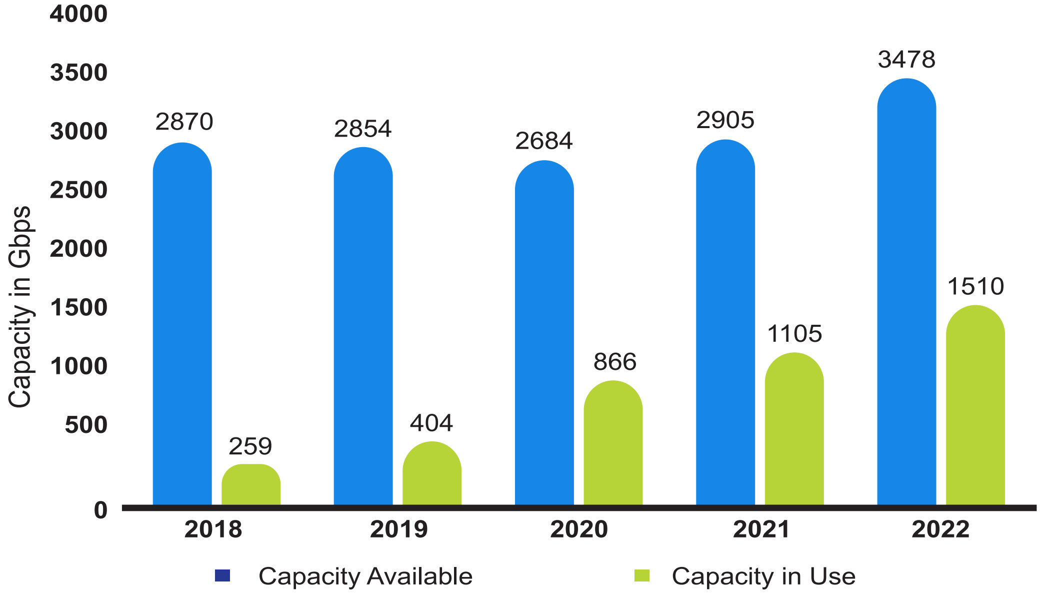
d) SAT-3 Limited.

e) Glo1 Ghana Ltd.

5.8 Submarine Cable Capacity Available and Capacity in Use

The total capacity available as of the end of 2022 was 3,478 Gbps a 19.72% increase from 2,905 Gbps in 2021. The total capacity in use also increased from 1,105.29 Gbps to 1,509.91 Gbps in 2022, representing a 36.61% increase in the usage capacity. Less than half of the capacity available has been in use over the last 5 years.

Figure 56: Total Capacity Available and Capacity in Use

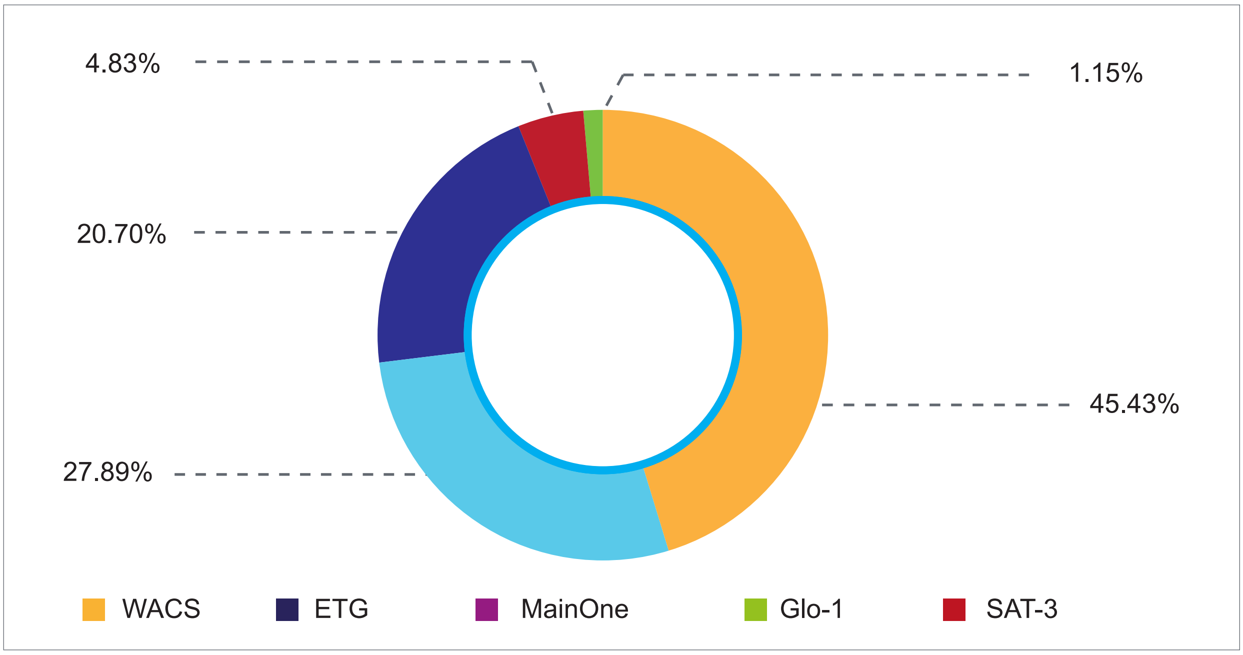


Source: NCA, Submarine Cable Providers 2022

5.9 Market Share of Submarine Cable Capacity

At the end of the year 2022, 45.43% of the total Submarine Cable capacity available was in the care of WACS and MainOne provided 27.89% of the total capacity available. 20.70% of the available capacity was owned by ETG (Dolphine), 4.83% by SAT-3, and 1.15% provided by Glo-1.

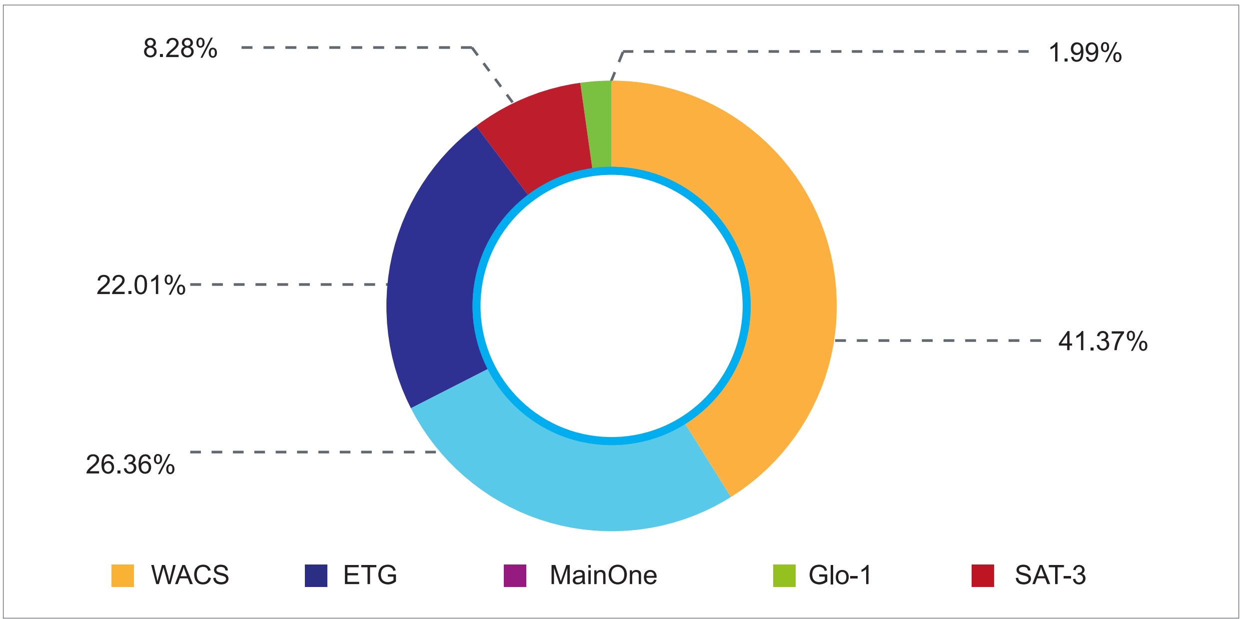
Figure 57: Market Share of Submarine Cable Providers per Capacity Available



Source: NCA, Submarine Cable Providers 2022

In the year of review, 41.37% of the total capacity used was from WACS, MainOne also used 26.36%, ETG (Dolphine) used 22.01%, SAT-3 used 8.28% of the total capacity used and Glo-1 used 1.99%.

Figure 58: Market Share of Submarine Cable Providers per Capacity in Use



Source: NCA, Submarine Cable Providers 2022

Total Number of Towers and Market Share

Total Number of Towers

5,310

representing a **3.45%** annual growth rate

		Market Share
Green Feild Towers	4,876	91.83%
Roof-Top Towers	394	7.42%
Mobile/Indoor Towers	40	0.75%

Number of Towers per Operator and Tenancy Ratio

		Towers
American Tower	79.02%	4,196
Helios Towers	20.98%	1,114

Regional Distribution of Tenancy Ratio

Region with the lowest tenancy ratio		Region with the highest tenancy ratio
1.38	1.75	2.11
Oti	National Average	Greater Accra

Submarine Cable Services

Submarine Cable Capacity Available = **3,478** (Gbps)

	SAT-3	WACS	Glo-1	MainOne	ETG
Capacity Available	168	1,580	40	970	720
Capacity in Use	125	625	30	398	332

Submarine Cable Capacity in Use = **1,510** (Gbps)

Chapter Six

OTHER SERVICES

6.0 Introduction

This Chapter provides information on other major services regulated by the National Communications Authority.

6.1 Numbering Resources

Telephony Numbering Resources are a string of numbers and or alphanumeric used to address electronic communication terminals, networks, protocols, or applications. The Authority regulates and authorizes the use of two main types of numbering resources:

Normal Numbering Resource: Ghana uses the closed numbering plan that follows the ITU.T E164 recommended format to assign numbers. The numbers available for use in connection with network and application services in Ghana and are categorized to include the following

- Network destination codes (NDC)
- Mobile Station International Subscriber Directory Number (MSISDN)
- Mobile Network Codes (MNC)
- Machine-to-Machine Numbering Resources (M2MNR)
- Geographic Numbering Resource

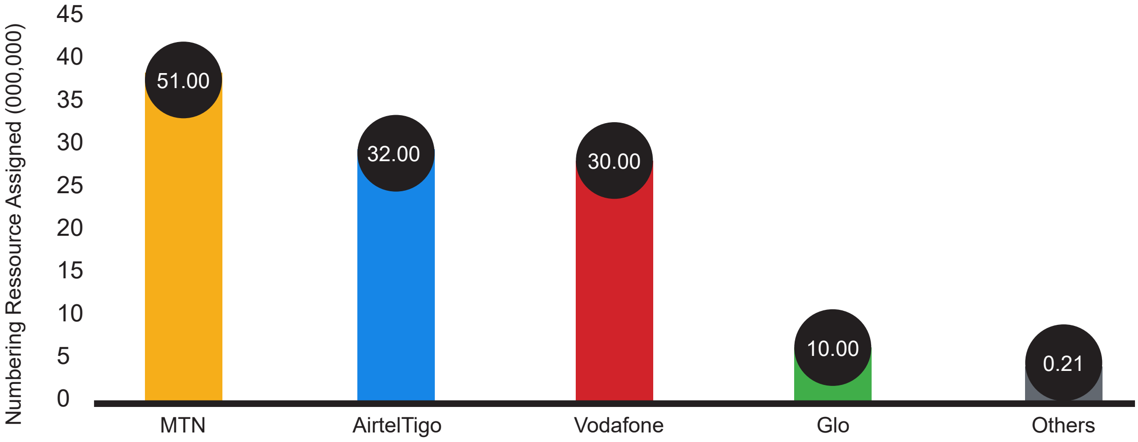
Special Numbering Resource:

The Authority also provides Special Numbering Resources (SNR), which are non-geographic and non-network dependent codes used in sending data and voice. These encompass the following:

- Toll-Free Numbering Resources
- Shared Cost Numbering Resources (SCNR)
- Premium Rate Numbering Resources:
- Short Codes

As at the end of 2022, a total of 123,215,000 Normal Numbering Resources had been assigned to the various service providers. The following are the number of Numbering resources assigned to the various service providers.

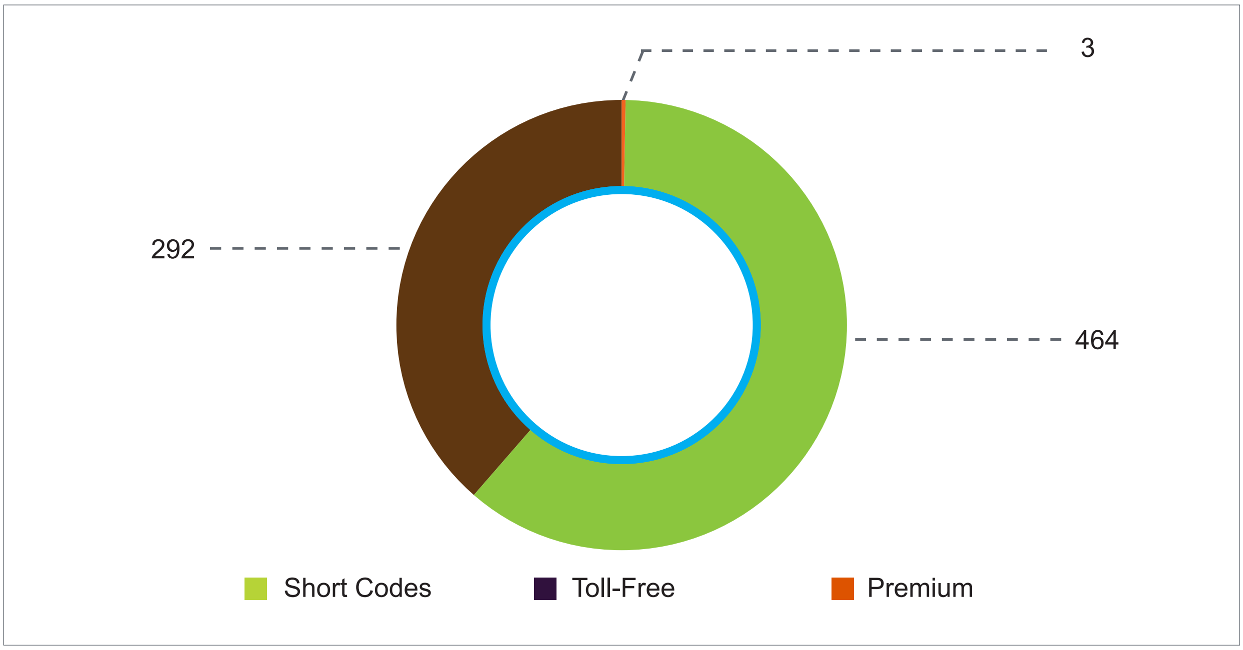
Figure 59: Normal Numbers assigned per operator



Source: National Communication Authority, 2022

Special Numbering Resources assigned to individuals and corporate entities as at the end of the year under review was 759.

Figure 60: Special Numbering Resources Assigned



Source: National Communication Authority, 2022

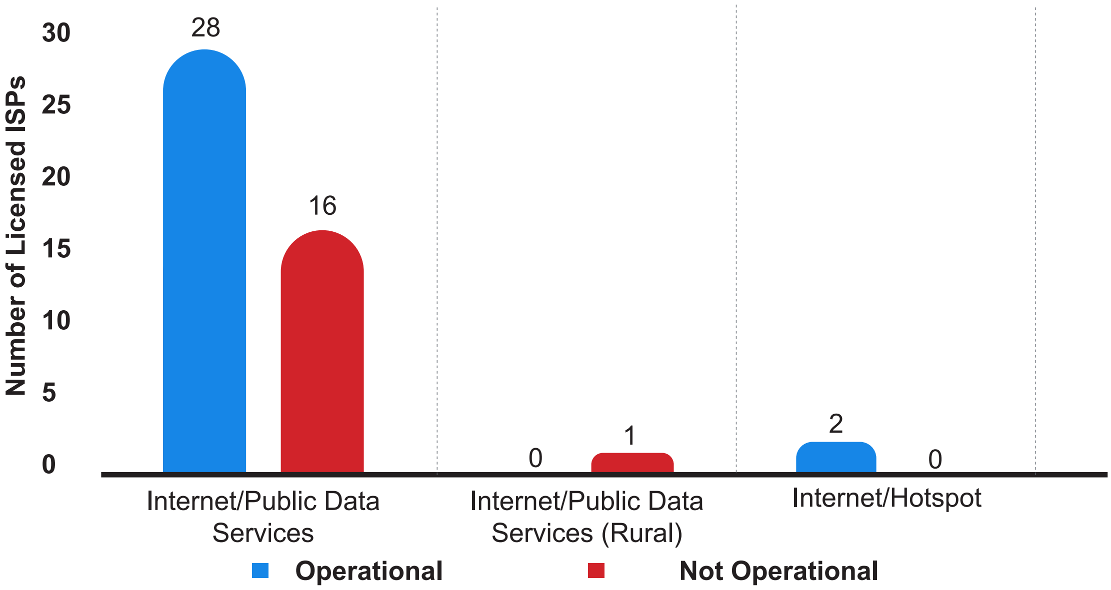
6.2 Internet Service Providers (ISPs)

Internet Service Provider (ISP) refers to an entity that provides access and connectivity to the Internet using both licenced and unlicenced frequency bands for its deployments. The following are the service classifications under ISP:

- Internet / Public Data Service
- Internet / Public Data Service (Rural)
- Internet Hotspot[7]

7. An Internet Hotspot is a physical location where people may obtain Internet access using Wi-Fi technology, via a Wireless Local Area Network (WLAN) connected to an Internet Service Provider's network (or MNO, BWA). The said entity can only use the unlicensed frequency bands for its deployments. The coverage area of an Internet Hotspot Provider should not exceed three (3) Administrative Districts. An Internet Hotspot Provider may qualify to apply for an ISP Authorisation if the Provider seeks to cover more than three (3) administrative districts.

Figure 61: Number of Licenced ISPs



Source: National Communication Authority, 2022

6.3 VSAT Network Services[8]

A Very Small Aperture Terminal (VSAT) is a two-way satellite ground station with a dish antenna that is usually smaller than 3.8 meters.

There are three (3) classes of VSAT Network Licences as follows;

a. VSAT NETWORK CLASS 1:

Refers to the establishment, operation, and provision of a VSAT Network in Ghana, with a minimum of 101 terminals (i.e. (unlimited Terminals 101+).

b. VSAT NETWORK CLASS 2:

Refers to the establishment, operation, and provision of a VSAT Network in Ghana, with a minimum of 51 terminals and a maximum of 100 terminals (i.e. (51-100 Terminals)).

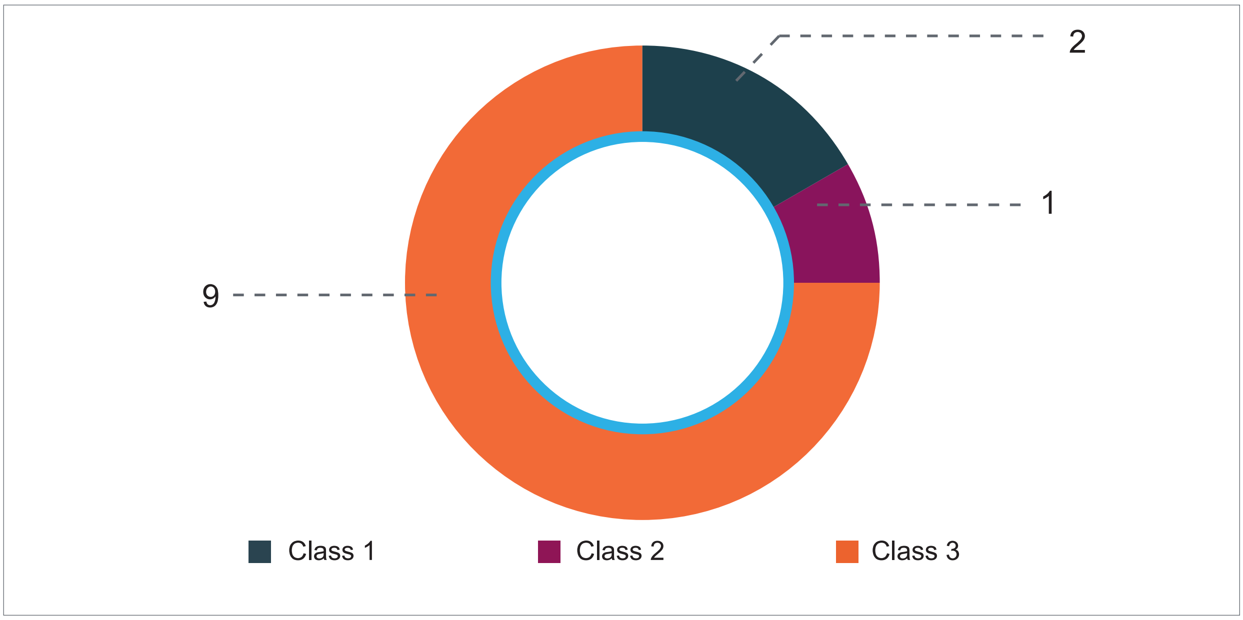
c. VSAT NETWORK CLASS 3:

Refers to the establishment, operation, and provision of a VSAT Network in Ghana, with a maximum of 50 terminals (i.e. (Less/= 50 Terminals)

As of the end of 2022, the Authority had issued 27 authorisations for the operation of VSAT with 2,634 VSAT Terminals. Out of the 27 entities, 1 had Class 1 authorisation, 2 had Class 2 authorisations, and 11 had Class 3 authorisations and 13 authorisations which were single terminals were issued for Corporate and Educational use.

8. VSAT Network Service refers to the deployment of VSATs using a hub to enable the provision of telecommunications services to the public.

Figure 62: Number of Licenced VSAT Operators

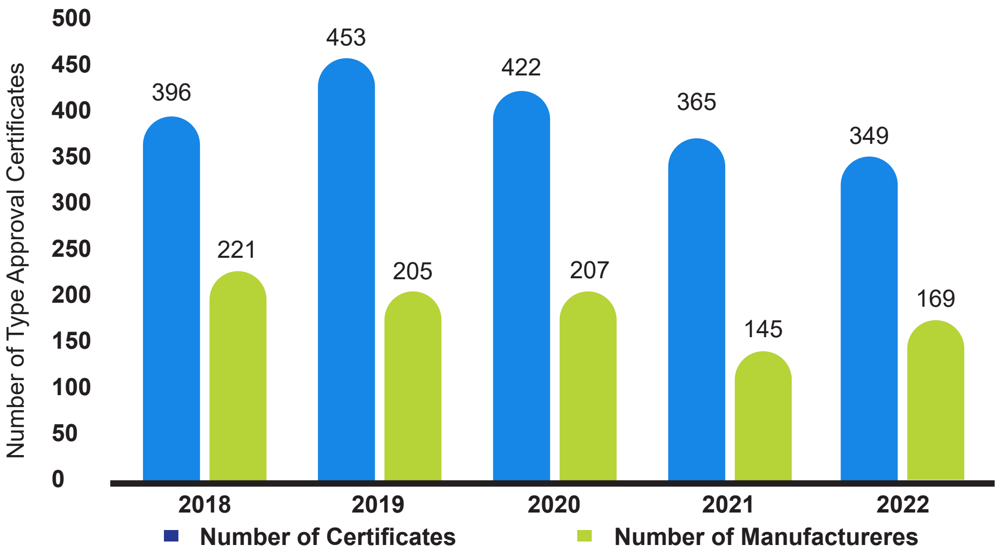


Source: National Communication Authority, 2022

6.4 Type Approval

At the end of 2022, 349 certificates were issued under type approval. This represents a 4.38% decline from the previous year's 365 certificates issued. A total of 169 certificates were given to manufacturers, an increase of 16.55% when compared to 145 certificates issued in the previous year.

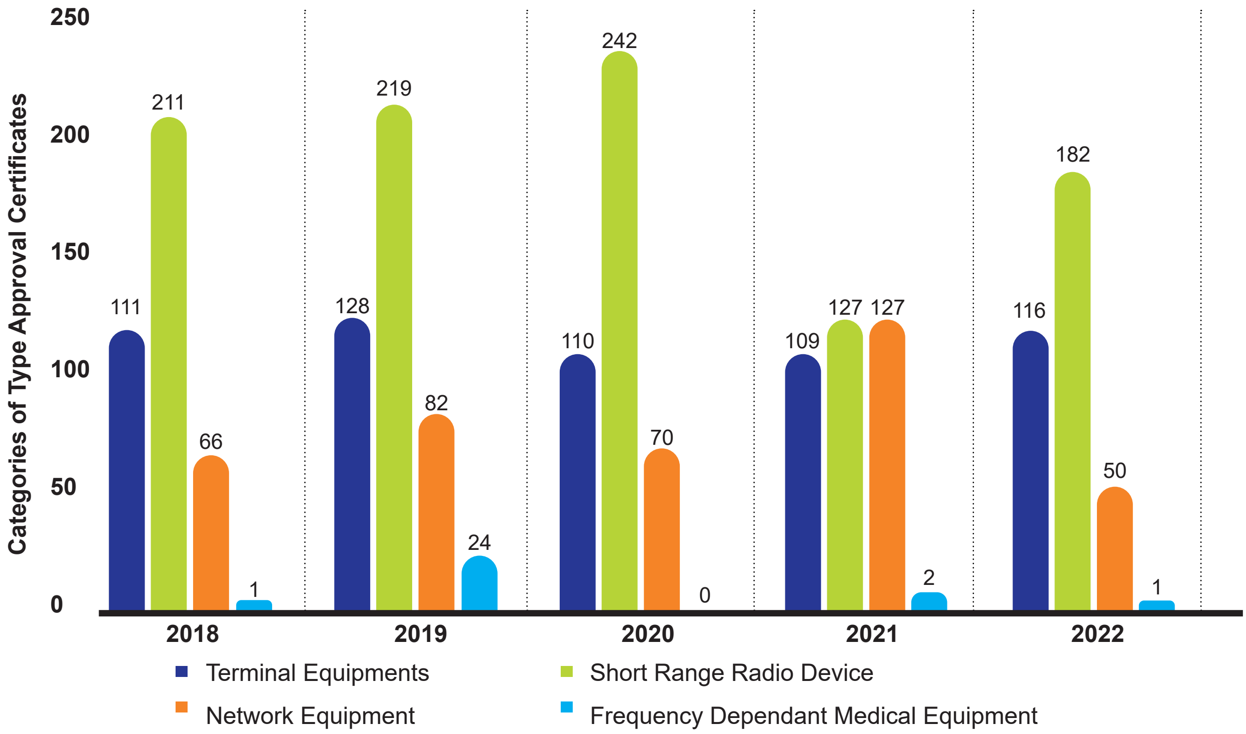
Figure 63: Number of Type Approval Certificates Issued



Source: National Communication Authority, 2022

Over the five-year period, short range radio devices were the most type approved, followed by terminal equipment and then Network equipment. In 2022, 182 short range radio devices, 50 Network Equipment, 116 Terminal Equipment and 1 Frequency Dependent Medical Equipment were type approved.

Figure 64: Categories of Type Approval Certificates Issued

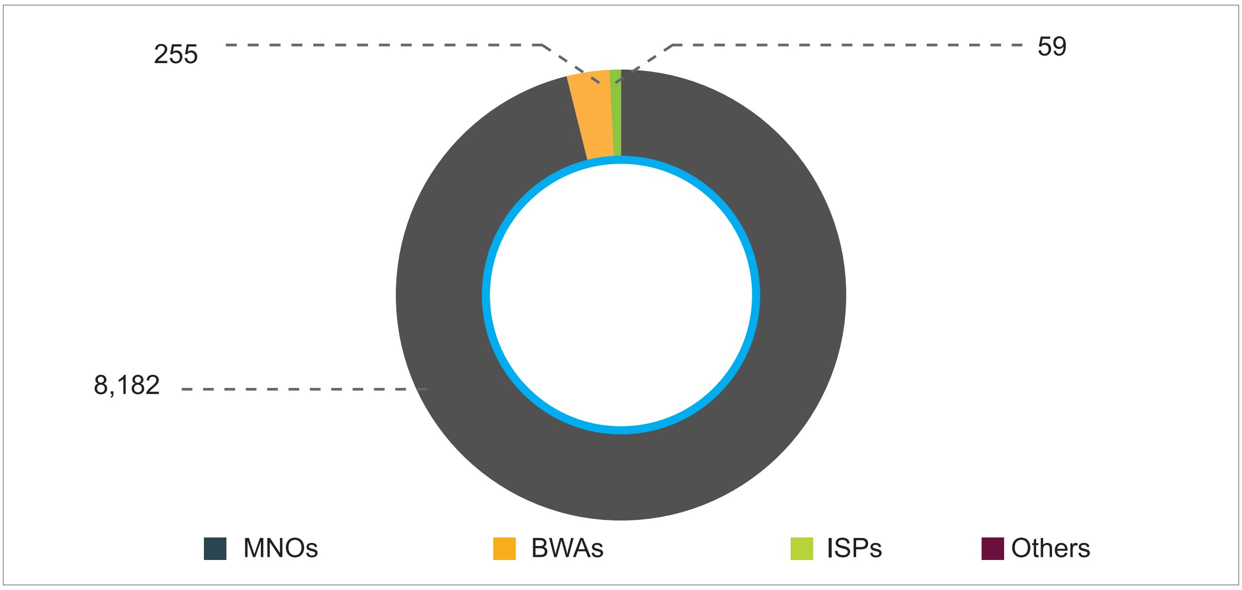


Source: National Communication Authority, 2022

6.5 Microwave Links

In order to facilitate communications between two-sites, the microwave link is used. As at the end of 2022, the Authority had assigned 8,498 microwave links with 96.28% being assigned to MNOs, 3.00% were assigned to BWAs and the remaining 0.72% assigned to ISPs.

Figure 65: Number of Microwave Links Assigned

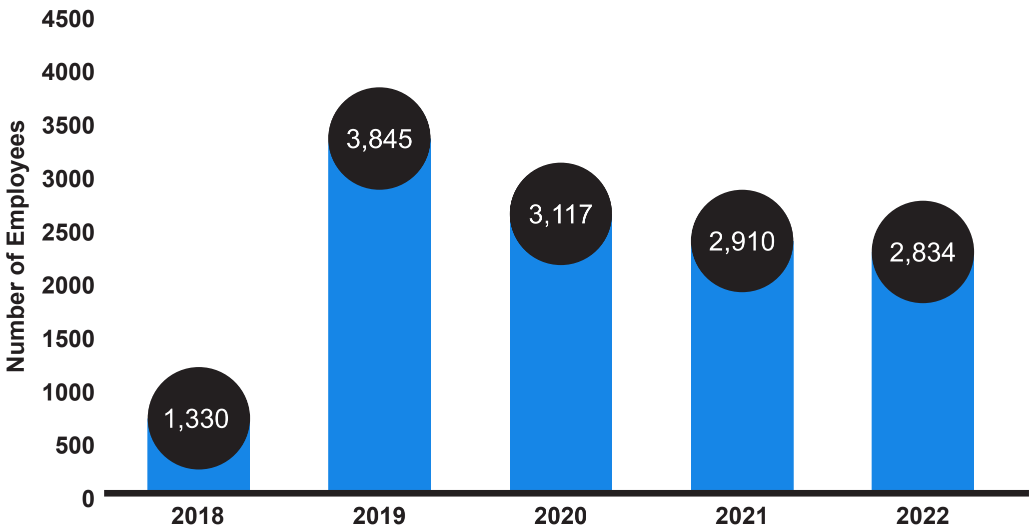


Source: National Communication Authority, 2022

6.6 Employment in the Telecommunications Space

Total employment among the Mobile Network Operators declined from 2,910 personnel in 2021 to 2,834 personnel in 2022 representing a negative growth of 2.61% surged. Over the five-year period, total number of employees increase from 1,330 in 2018 to 2,834 in 2022 with a CAGR of 20.82%.

Figure 66: Number of Employees by MNOs

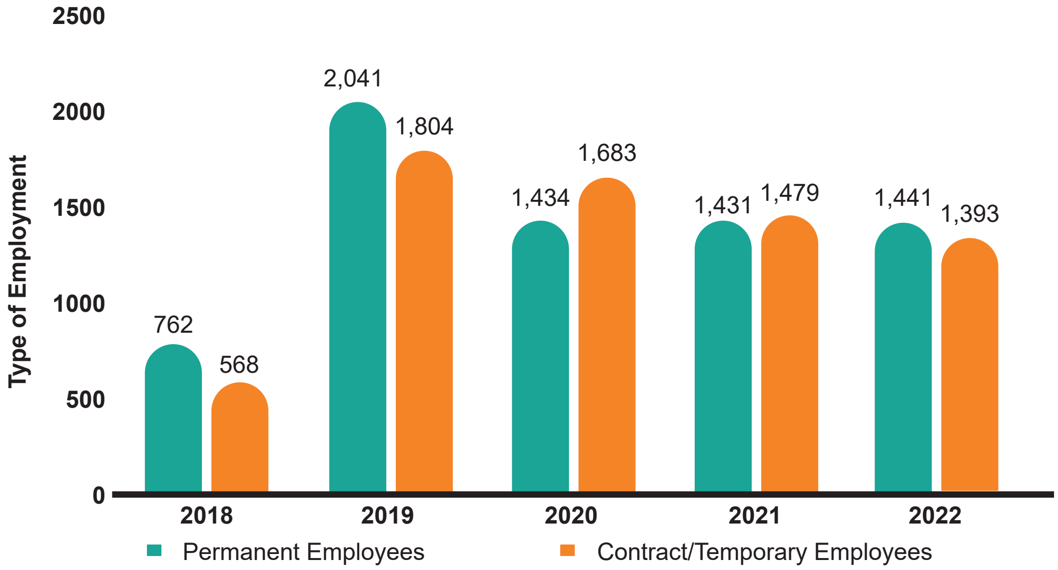


Source: NCA, Mobile Network Operators, 2022

The number of permanent employees for the year 2022 was 1,441 from 1,431 in 2021, a 0.70% growth in permanent employees. Contract/Temporary Employees decreased from 1,479 in 2021 to 1,393 in 2022 recording a 5.81% decline in temporary employees.

Over the five-year period, permanent employees increased from 762 in 2018 to 1,441 in 2022 with a compound average growth rate of 17.26%. The temporary employees over the last five years increased from 568 in 2018 to 1,393 in 2022 with an average growth rate of 25.14%.

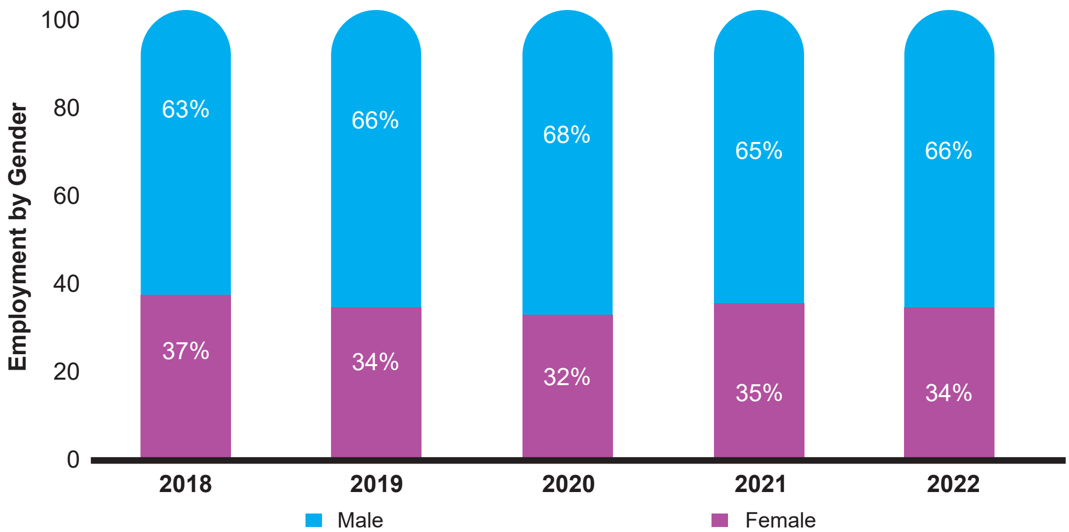
Figure 67: Types of Employment



Source: NCA, Mobile Network Operators, 2022

The Mobile Network Operators have more than 50% male employees as compared to female employees. Male employee's percentage increased from 65% in 2021 to 66% in 2022 whilst the ratio of the female employees fell from 35% to 34% in 2022.

Figure 68: Number of Employees by Gender



Source: NCA, Mobile Network Operators, 2022

Numbering Resources

Mobile Numbering

123.22 Million

Operator	Million Numbers	Market Share
MTN	51.00	41.39%
airteltigo	32.00	25.97%
vodafone	30.00	24.35%
glo	10.00	8.12%
Others	0.22	0.17%

Special Numbering

759

Short Codes	292
Toll-Free	464
Premium	3

Internet Service Providers (ISPs)

Number of Authorised ISPs

57

Out of which 40 are operational representing 70.18%

Public Data Services	53
Public Data Services (Rural)	1
Hotspot	3

VSAT Operators

Number of Licensed VSAT Operators

12

Class 1	2
Class 2	1
Class 3	9

Type Approval

Type Approval Certificates

349 Certificates

169 Manufacturers

Terminal Equipment	116 Certificates
Short Range Radio Devices	182 Certificates
Network Equipment	50 Certificates
Frequency Dependant Medical Equipment	1 Certificates

Microwave Links

Number of Microwave Links Assigned

8,498

MNOs

8,182 representing 96.28% of total Microwave Links Assigned within the Years

BWAs

255 representing 3.00% of total Microwave Links Assigned within the Years

ISPs

61 representing 0.72% of total Microwave Links Assigned within the Years

APPENDIX

Table 1: Mobile Voice Subscriptions and Penetration rate

Subscriptions	2018	2019	2020	2021	2022
Mobile Voice	40,934,875	40,857,077	40,461,609	40,454,073	40,045,308
Growth rate (%)	*11.49*	*-0.19*	*-0.97*	*-0.02*	-1.01
Net Additions	4,219,114	-77,798	-395,468	-7,536	-408,765
Population	29,474,851	30,190,081	30,922,666	30,792,608	31,769,363
Penetration rate (%)	*138.88*	*135.33*	*130.85*	*131.38*	126.05

Source: National Communication Authority, 2022

Table 2: Distribution of Postpaid and Prepaid Subscriptions

	2018	2019	2020	2021	2022
Prepaid	40,391,558	40,216,604	40,173,414	40,158,443	39,310,372
Postpaid	543,317	640,473	288,195	295,630	426,383
Mobile Voice Subscriptions	**40,934,875**	**40,857,077**	**40,461,609**	**40,454,073**	**40,045,308**
Growth rate (%)	*11.49*	*-0.19*	*-0.97*	*-0.02*	-1.01
Net Additions	888,285	-77,798	-395,468	-14,971	-408,765
Population	29,474,851	30,190,081	30,922,666	30,792,608	31,769,363
Penetration rate (%)	*138.88*	*135.33*	*131.84*	*131.38*	126.05

Source: National Communication Authority, 2022

Table 3: Mobile Voice Subscriptions per Operator

Mobile Network Operator		2018	2019	2020	2021	2022
MTN	Subscriptions	20,092,798	22,555,848	23,144,302	23,966,302	26,613,845
	Market Share (%)	*49.08*	*55.21*	*57.20*	*59.24*	*66.46*
Vodafone	Subscriptions	9,813,234	9,122,403	8,400,565	8,250,436	7,537,400
	Market Share (%)	*23.97*	*22.33*	*20.76*	*20.39*	*18.82*
AirtelTigo	Subscriptions	10,289,491	8,453,053	8,135,618	7,390,278	5,585,510
	Market Share (%)	*25.14*	*20.69*	*20.11*	*18.27*	*13.95*
Glo	Subscriptions	739,352	725,773	781,124	847,057	308,553
	Market Share (%)	*1.81*	*1.78*	*1.93*	*2.09*	*0.77*
Total		**40,934,875**	**40,857,077**	**40,461,609**	**40,454,073**	**40,045,308**

Source: National Communication Authority, 2022

Table 4: Mobile Voice Traffic per Operator

Mobile Operator		2018	2019	2020	2021	2022
MTN	Traffic	58,625,073,109	70,521,752,504	89,786,199,833	98,334,998,826	92,774,464,908
	Share (%)	*80.86*	*86.78*	*90.36*	*90.99*	*90.64*
Vodafone	Traffic	9,268,358,493	6,682,666,929	5,215,491,661	5,547,932,163	6,463,007,442
	Share (%)	*12.78*	*8.22*	*5.25*	*5.13*	*6.31*
AirtelTigo	Traffic	1,156,888,791	3,953,752,066	4,174,073,901	4,010,269,647	3,006,884,218
	Share (%)	*1.60*	*4.87*	*4.20*	*3.71*	*2.94*
Glo	Traffic	79,037,480	108,413,410	188,390,005	179,977,127	110,523,331
	Share (%)	*0.11*	*0.13*	*0.19*	*0.17*	*0.11*
Total Voice Traffic		**72,505,092,893**	**81,266,584,909**	**99,364,155,400**	**108,073,177,763**	**102,354,879,899**

Source: National Communication Authority, 2022

Table 5: Distribution of Off net and On net Traffic (Domestic)

	2018	2019	2020	2021	2022
On-Net					
Traffic	63,337,163,519	73,774,794,534	92,094,192,477	100,174,180,889	93,743,975,726
Share (%)	*87.36*	*90.78*	*92.68*	*92.69*	*91.59*
Growth (%)	*24.06*	*16.48*	*24.83*	*8.77*	*-6.42*
Off-Net					
Traffic	9,167,929,374	7,491,790,375	7,269,962,924	7,898,996,874	8,610,904,173
Share (%)	*12.64*	*9.22*	*7.32*	*7.31*	*8.41*
Growth (%)	*-9.50*	*-18.28*	*-2.96*	*8.65*	*9.01*
Total	**72,505,092,893**	**81,266,584,909**	**99,364,155,400**	**108,073,177,763**	**102,354,879,899**

Source: National Communication Authority, 2022

Table 6: Distribution of Inbound and Outbound International Traffic

	2018	2019	2020	2021	2022
Inbound International					
Traffic	474,844,085	313,030,354	220,895,472	239,092,078	248,344,559
Share(%)	*45.40*	*37.50*	*31.72*	*34.53*	*43.76*
Growth(%)	*-3.93*	*-34.08*	*-29.43*	*7.91*	*3.87*
Outbound International					
Traffic	571,134,846	521,630,329	475,444,765	453,152,114	319,144,643
Share(%)	*54.60*	*62.50*	*68.28*	*65.47*	*56.24*
Growth(%)	*-1.56*	*-8.67*	*-8.85*	*-4.93*	*-29.57*
Total	**1,074,483,054**	**1,045,978,931**	**834,660,683**	**696,340,237**	**567,489,202**

Source: National Communication Authority, 2022

Table 7: Average Mobile Voice Traffic per Subscription

Subscriptions	2018	2019	2020	2021	2022
Mobile Voice Subscription	40,934,875	40,857,077	40,461,609	40,454,073	40,045,308
Mobile Voice Traffic	72,505,092,893	81,266,584,909	99,364,155,400	108,073,177,763	102,354,879,899
Average traffic per subscription	1,771	1,989	2,456	2,672	2,556

Source: National Communication Authority, 2022

Table 8: Mobile Data Subscriptions and Penetration Rate (%)

Subscriptions	2018	2019	2020	2021	2022
Prepaid	26,930,768	29,960,572	26,130,249	23,237,338	22,498,227
Postpaid	301,384	380,721	339,714	177,189	188,331
Mobile Data	27,232,152	30,341,293	26,469,963	23,414,527	22,686,558
Growth rate (%)	*16.06*	*11.42*	*-12.76*	*-11.54*	*-3.11*
Net Additions	3,768,002	3,109,141	-3,871,330	-2,892,911	-739,111
Population	29,474,851	30,190,081	30,922,666	30,792,608	31,769,363
Penetration rate (%)	*92.39*	*100.50*	*85.60*	*76.04*	*71.41*

Source: National Communication Authority, 2022

Table 9: Mobile Data Subscription per Operator

Mobile Network Operator		2018	2019	2020	2021	2022
MTN	Subscriptions	16,689,717	22,260,198	19,146,862	16,159,901	16,744,370
	Market Share (%)	61.29	73.37	72.33	69.02	73.29
Vodafone	Subscriptions	4,213,054	3,700,970	3,055,454	3,346,148	3,210,797
	Market Share (%)	15.47	12.20	11.54	14.29	14.05
AirtelTigo	Subscriptions	6,076,649	4,110,972	3,926,130	3,524,022	2,730,454
	Market Share (%)	22.31	13.55	14.83	15.05	11.95
Glo	Subscriptions	252,732	269,153	341,517	384,456	160,627
	Market Share (%)	0.93	0.89	1.29	1.64	0.70
Total		**27,232,152**	**30,341,293**	**26,469,963**	**23,414,527**	**22,846,248**

Source: National Communication Authority, 2022

Table 10: Mobile Data Traffic per Operator

Mobile Network Operator		2018	2019	2020	2021	2022
MTN	Data Traffic (GB)	141,396,759	262,451,963	511,530,510	675,662,190	1,082,401,526
	Market Share (%)	*59.37*	*68.13*	*71.71*	*70.58*	*78.51*
Vodafone	Data Traffic (GB)	58,192,034	69,276,035	113,916,081	183,653,560	210,000,989
	Market Share (%)	*24.44*	*17.98*	*15.97*	*19.19*	*15.23*
AirtelTigo	*Data Traffic (GB)*	34,153,564	45,759,166	67,669,723	70,881,825	68,286,450
	Market Share (%)	*14.34*	*11.88*	*9.49*	*7.40*	*4.95*
Glo	Data Traffic (GB)	4,407,590	7,738,808	20,196,277	27,047,252	18,075,656
	Market Share (%)	*1.85*	*2.01*	*2.83*	*2.83*	*1.31*
Total		**238,149,946**	**385,225,972**	**713,312,591**	**957,244,828**	**1,378,764,621**

Source: National Communication Authority, 2022

Table 11: Average Mobile Data Usage per Subscription

Subscriptions	2018	2019	2020	2021	2022
Mobile Voice Subscription	27,232,152	30,341,293	26,469,963	23,414,527	22,846,248
Mobile Data Traffic (GB)	238,149,946	385,225,972	713,312,591	957,244,828	1,378,764,621
Average Data Usage per subscription	**8.75**	**12.70**	**26.95**	**40.88**	**60.35**

Source: National Communication Authority, 2022

Table 12: Distribution of Off-net and On-net SMS Count

	2018	2019	2020	2021	2022
On-Net SMS					
Traffic	2,106,301,048	2,367,716,985	1,648,715,441	1,600,711,943	1,976,546,289
Growth (%)	*59.28*	*12.41*	*(30.37)*	*(2.91)*	*23.48*
Off-Net SMS					
Traffic	528,189,581	381,146,115	392,946,906	577,412,213	742,702,003
Growth (%)	(0.48)	(27.84)	3.10	46.94	28.63
Total	**2,634,490,629**	**2,748,863,100**	**2,041,662,347**	**2,178,124,156**	**2,719,248,292**

Source: National Communication Authority, 2022

Table 13: SMS Counts per Operator

Mobile Network Operator	2018	2019	2020	2021	2022
MTN	1,182,942,766	1,400,664,864	1,184,006,344	1,268,498,378	1,965,836,108
Vodafone	1,124,902,232	1,286,085,070	832,384,480	884,774,319	701,508,358
AirtelTigo	318,626,777	58,597,086	21,124,918	17,255,704	45,871,731
Glo	8,018,854	3,516,080	4,146,605	7,595,756	6,032,095
Total	**2,634,490,629**	**2,748,863,100**	**2,041,662,347**	**2,178,124,157**	**2,719,248,292**

Source: National Communication Authority, 2022

Table 14: Average SMS Count per Subscription

Subscriptions	2018	2019	2020	2021	2022
Mobile Voice Subscription	40,934,875	40,857,077	40,461,609	40,454,073	40,045,308
Total SMS Count	2,634,490,629	2,748,863,100	2,041,662,347	2,178,124,157	2,719,248,292
Average SMS per subscription	64	67	50	54	68

Source: National Communication Authority, 2022

Table 15: Types of Mobile Phone of on Mobile Networks

Types of Phones	2020	2021	2022
Number of Smartphone Users	18,889,922	18,288,346	20,626,277
Market Share (%)	51.12%	49.28%	51.54%
Number of Feature Phone Users	10,607,310	11,098,344	14,206,200
Market Share (%)	28.71%	29.91%	35.49%
Number of Basic Phone Users	7,454,119	7,723,395	5,190,747
Market Share (%)	20.17%	20.81%	12.97%

Table 16: Default Tariffs for Mobile Services

Average Industry Tariffs	2018	2019	2020	2021	2022
On-net Voice	0.11	0.11	0.12	0.12	0.13
Off-net Voice	0.12	0.12	0.13	0.12	0.13
On-net SMS	0.05	0.05	0.05	0.05	0.05
Off-net SMS	0.05	0.05	0.05	0.06	0.06
Data/MB	0.09	0.09	0.09	0.08	0.09

Source: National Communication Authority, 2022

Table 17: Fixed Voice Subscription and Penetration Rate (%)

Subscriptions	2018	2019	2020	2021	2022
Fixed Network Subscriptions	278,379	288,531	307,668	315,271	330,016
Growth Rate (%) in Subscription	*-7.68*	*3.65*	*6.63*	*2.47*	*4.68*
Net Additions	-23,172	10,152	19,137	7,603	14,745
Country Population	29,474,851	30,190,081	30,922,666	30,792,608	31,769,363
Penetration Rate (%)	*0.94*	*0.96*	*0.99*	*1.02*	*1.04*

Source: National Communication Authority, 2022

Table 18: Fixed Voice Subscriptions per Operator

Fixed Network Operators		2018	2019	2020	2021	2022
Vodafone	Subscriptions	271,732	280,321	299,802	307,278	326,579
	Share (%)	*97.61*	*97.15*	*97.44*	*97.46*	*98.96*
AirtelTigo	Subscriptions	6,647	8,210	6,389	3,634	2,247
	Share (%)	*2.39*	*2.85*	*2.08*	*1.15*	*0.68*
MTN	*Subscriptions*	-	-	*1477*	*4,359*	1,190
	Share (%)	-	-	*0.48*	*1.38*	*0.36*
Total Industry Subscriptions		**278,379**	**288,531**	**307,668**	**315,271**	**330,016**

Source: National Communication Authority, 2022

Table 19: Fixed Voice Traffic in Minutes

Fixed Network Operator		2018	2019	2020	2021	2022
Vodafone	Traffic (Minutes)	45,226,383	49,042,238	35,907,849	37,144,772	36,635,138
	Shares (%)	*91.8*	*100*	*90.14*	*97.70*	*99.96*
AirtelTigo	Traffic (Minutes)	4,052,821	27	3,926,459	873,298	15,032
	Shares (%)	*8.2*	*0*	*9.9*	*2.3*	*0.04*
MTN	*Traffic (Minutes)*	-	-	*1,294*	*28,265*	739
	Shares (%)	-	-	*0.00*		0.00
Total Traffic (Minutes)		**49,279,204**	**49,042,265**	**39,835,602**	**38,018,070**	**36,650,909**

Source: National Communication Authority, 2022

Table 20: Fixed Data Subscriptions and Penetration Rate (%)

Subscriptions	2018	2019	2020	2021	2022
Fixed Network Subscriptions	58,808	57,393	77,022	113,722	102952
Growth Rate (%)	*0.04*	*-0.02*	*0.34*	*0.48*	*-9.47%*
Net Additions	1,998	-1,415	19,629	36,700	-10,770
Country Population	29,474,851	30,190,081	30,922,666	30,792,608	31,769,363
Penetration Rate (%)	*0.20*	*0.19*	*0.25*	*0.37*	*0.32*

Source: National Communication Authority, 2022

Table 21: Fixed Data Subscriptions per Operator

Fixed Network Operator		2018	2019	2020	2021	2022
Vodafone	Subscriptions	57,216	56,677	62,284	67,086	75,078
	Shares (%)	*97.29*	*98.75*	*80.87*	*58.99*	*72.93*
AirtelTigo	Subscriptions	1,592	716	700	649	726
	Shares (%)	*2.71*	*1.25*	*0.91*	*0.57*	*0.71*
MTN	Subscriptions			14,038	45,987	27,148
	Shares (%)			18.23	*40.44*	*26.37*
Total Subscriptions		**58,808**	**57,393**	**77,022**	**113,722**	**102,952**

Source: National Communication Authority, 2022

Table 22: Fixed Broadband Subscriptions

Fixed Network Operator		2020	2021	2022
Vodafone	Subscriptions	59,532	64,457	72,856
	Shares (%)	*66.55*	*79.59*	*34.24*
MTN	Subscriptions	29,924	16,533	139,894
	Shares (%)	33.45	*20.41*	*65.76*
Total Subscriptions		**89,456**	**80,990**	**212,750**

Source: National Communication Authority, 2022

Table 23: Fixed Broadband Traffic

Fixed Network Operator		2020	2021	2022
Vodafone	Traffic	30,360,312	126,533,459	157,793,466
	Shares (%)		*54.41*	*57.04*
MTN	Traffic	16,750,138	106,031,417	118,824,426
	Shares (%)		*45.59*	*42.96*
Total Traffic		**47,110,450**	**232,564,876**	**276,617,892**

Source: National Communication Authority, 2022

Table 24: BWA Subscriptions and Penetration Rate (%)

Subscriptions	2018	2019	2020	2021	2022
BWA	80,581	46,050	53,415	50,714	44,247
Growth rate (%)	-8.05	-42.85	-6.08	-5.06	-12.75%
Net Additions	-7,058	-34,531	7,365	-2,701	-6,467
Population	29,474,851	30,190,081	30,922,666	30,792,608	31,769,363
Penetration rate (%)	0.27	0.15	0.17	0.16	0.14%

Source: National Communication Authority, 2022

Table 25: BWA Subscriptions per Operator

Broadband Wireless Access Operator		2018	2019	2020	2021	2022
Surfline	Subscriptions	55,134	43,735	40,462	41,123	35,796
	Growth rate (%)	-10.24	-20.68	-7.48	1.63	-12.95
	Market Share (%)	68.42	92.84	93.56	81.18	80.90
BBH	Subscriptions	25,100	1,058	1,056	996	292
	Growth rate (%)	-1.8	-95.78	-0.19	-5.68	-70.68
	Market Share (%)	31.15	2.25	2.44	1.97	0.66
Blu	Subscriptions	347	211	143	-	
	Growth rate (%)	-46.86	-39.19	-32.23	-	
	Market Share (%)	0.43	0.45	0.27	-	
Busy	Subscriptions			*10,024*	5,489	1,985
	Growth rate (%)			-	-45.24	-36.09
	Market Share (%)			*18.77*	10.84	4.49
Telesol	Subscriptions	-	2,104	1,730	3,106	6,174
	Growth rate (%)	-	-	-17.78	76.30	12.48
	Market Share (%)	-	4.47	3.81	3.81	13.95
Total		**80,581**	**47,108**	**53,415**	**50,658**	**44,247**

Source: National Communication Authority, 2022

Table 26: BWA Traffic in Gigabytes per Operator

		2018	2019	2020	2021	2022
Surfline	Traffic	13,894,836	13,153,292	16,263,920	20,247,645	19,005,586
	Market Share(%)	92.24	90.18	80.70	74.58	79.80
BBH	Traffic	903,401	1,034,714	318,972	593,566	75,478
	Market Share(%)	6.00	7.09	1.58	2.19	0.32
Blu	Traffic	264,963	345,440	80,267	118,983	-
	Market Share(%)	1.76	2.37	0.40	0.44	-
Busy	Traffic	-	-	2,223,327	4,635,201	3,655,594
	Market Share(%)			11.03	17.07	15.35
Telesol	Traffic	-	51,449	1,268,272	1,553,628	1,079,396
	Market Share(%)		0.35	6.29	5.72	4.53
Total Traffic		**15,063,200**	**14,584,895**	**20,154,758**	**27,149,023**	**23,816,054**

Source: National Communication Authority, 2022

Table 27: Regional Distribution of Authorised FM in Ghana as at the end of 2022

NO.	NAME OF REGIONS	TOTAL NO. AUTHO-RISED	PUBLIC	PUBLIC (FOR-EIGN)	COMMU-NITY	CAMPUS	COM-MER-CIAL	TOTAL NO. IN OPERA-TION	TOTAL NO. NOT IN OPERA-TION
1	ASHANTI	**102**	2	1	16	4	79	78	24
2	WESTERN	**87**	1	0	6	2	50	42	17
3	GREATER ACCRA	**77**	2	0	4	0	24	26	4
4	BONO	**59**	0	0	1	0	14	9	6
5	CENTRAL	**58**	2	0	13	3	40	39	19
6	EASTERN	**53**	2	0	15	1	35	47	6
7	NORTHERN	**49**	2	3	10	4	58	63	14
8	VOLTA	**46**	3	0	10	2	34	31	18
9	UPPER EAST	**35**	3	0	4	0	5	8	4
10	UPPER WEST	**31**	1	0	5	0	7	3	10
11	BONO EAST	**30**	2	0	10	3	20	23	12
12	WESTERN NORTH	**27**	2	0	11	2	16	20	11
13	AHAFO	**15**	3	0	5	1	37	37	9
14	NORTH EAST	**13**	1	0	3	0	9	9	4
15	OTI	**13**	2	1	8	2	74	59	28
16	SAVANNAH	**12**	3	0	0	0	24	19	8
TOTAL		**707**	**31**	**5**	**121**	**24**	**526**	**513**	**194**

Source: National Communication Authority, 2022

Table 28: Authorized TV Stations as at the end of 2022

NO.	TYPE OF TELEVISION SERVICE	TOTAL NO. OF AUTHORISED STATIONS	TOTAL NO. OF STATIONS ON AIR	TOTAL NO. OF STATIONS NOT ON AIR
1	Analogue Terrestrial Television	2	2	0
2	Digital Terrestrial Free-To-Air Television Programme Channel (Nationwide Coverage)	40	40	0
3	Digital Terrestrial Free-To-Air Television Programme Channel (Regional Coverage)	6	6	0
4	Digital Terrestrial Pay Television (Service only)	0	0	0
5	Digital Terrestrial Pay Television (Service and Frequency)	5	5	0
6	Digital Terrestrial Television (Network only)	0	0	0
7	Digital Terrestrial Radio Service on TV Multiplex	8	2	6
8	Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)	3	3	0
9	Satellite Television Broadcasting (Free-To-Air Direct-To-Home Bouquet)	8	6	2
10	Satellite Television Broadcasting (Free-To-Air Direct-To-Home Single Channel)	81	52	29
11	Digital Terrestrial Television additional Services (e.g. Teletext, etc.)	0	0	0
12	Digital Terrestrial Mobile Television Service (Stand-alone Authorization)	0	0	0
13	Digital Cable Television	1	1	0
14	Television over Internet Protocol (Pay TV)	1	0	1
15	Subscription Management Service for a Satellite Television Broadcasting (Pay TV Direct-To-Home Bouquet)	1	0	1
TOTAL		**156**	**117**	**39**

Source: National Communication Authority, 2022

Table 29: Number of Towers and Market Share per Tower Company

Tower Company		2018	2019	2020	2021	2022
Eaton Towers	Number of Towers	1,370	1470			
	Market Share (%)	*30*	*30.79*			
American Towers	Number of Towers	2,303	2,381	3,989	4,070	4,196
	Market Share (%)	*50.5*	*49.9*	*80.1*	*79.3*	*79.0*
Helios Towers	Number of Towers	891	923	991	1,063	1,114
	Market Share (%)	*19.5*	*19.3*	*19.9*	*20.7*	*21.0*
Total		**4,564**	**4,564**	**4,980**	**5,133**	**5,310**

Source: National Communication Authority, 2022

Table 30: Types of Towers

TOWER	2018	2019	2020	2021	2022
Greenfield	4,195	4,385	4,571	4,714	4,876
Rooftop	340	357	374	384	394
Indoor Network/Mobile Sites	26	32	35	35	40
Total number of towers	**4,561**	**4,774**	**4,980**	**5,133**	**5,310**

Source: National Communication Authority, 2022

Table 31: Tenancy Ratio of Towers

	2018	2019	2020	2021	2022
Total Number of Towers	4,564	4,774	4,980	5,133	5,310
Total Number of Tenants	7,837	7,753	7,729	9,148	9,270
Tenancy Ratio	**1.73**	**1.62**	**1.55**	**1.78**	**1.75**

Source: National Communication Authority, 2022

Table 32: Regional Distribution of Towers and Tenancy Ratio

Region	Number of Towers	Number of Tenants	Tenancy Ratio
Ahafo	107	155	1.45
Ashanti	997	1619	1.62
Bono	200	333	1.67
Bono East	152	251	1.65
Central	447	765	1.71
Eastern	451	731	1.62
Greater Accra	1391	2929	2.11
North East	70	106	1.51
Northern	264	420	1.59
Oti	91	126	1.38
Savannah	92	131	1.42
Upper East	166	246	1.48
Upper West	129	200	1.55
Volta	274	446	1.63
Western	367	634	1.73
Western North	112	178	1.59

Source: National Communication Authority, 2022

Table 33: Total Submarine Cable Capacity Available (Gbps)

Total Capacity Available (Gbps)	2018	2019	2020	2021	2022
SAT-3	60	64	74	95	168
WACS	1770	1770	1,580	1,580	1580
MainOne	270	270	270	470	970
ETG (Dolphine)	740	720	720	720	720
GLO-1	30	30	40	40	40
Total	**2,870**	**2,854**	**2,684**	**2,905**	**3,478**

Source: National Communication Authority, 2022

Table 34: Total Submarine Cable Capacity in Use (Gbps)

Total Capacity in Use (Gbps)	2018	2019	2020	2021	2022
SAT-3	59	50	42	55	125
WACS	150	280	616.8	561.3	625
MainOne	17.5	37.29	124.053	360	398
ETG (Dolphine)	25.62	30	43.12	98.99	332
GLO-1	7	7	40	30	30
Total	**259**	**404**	**866**	**1105**	**1510**

Source: National Communication Authority, 2022

Table 35: Authorized VSAT Network Operators as at the end of 2022

S/N	VSAT NETWORK	NUMBER OF COMPANIES
1	Class 1	2
2	Class 2	1
3	Class 3	9
Total		**12**

Source: National Communication Authority, 2022

Table 36: Numbering Resources

Types of Numbering	2018	2019	2020	2021	2022
Short codes	370	467	605	437	464
Premium numbers	0	0	8	5	3
Toll Free	70	75	1159	1033	292
Mobile numbers (SIM cards)	99,610,000	105,610,000	105,610,000	116,410,00	123,215,000

Source: National Communication Authority, 2022

Table 37: Type Approval Certificates

	2018	2019	2020	2021	2022
Number of certificates	396	453	422	365	349
Number of Manufacturers	221	205	207	145	169
Terminal Equipment	111	128	110	109	116
Short Range Radio Devices	211	219	242	127	182
Network Equipment	66	82	70	127	50
Frequency Dependent Medical Equipment	1	24	0	2	1

Source: National Communication Authority, 2022

Table 38: ISP Service Classifications.

No.	ISP Service Classification	Operational	Not Operational	Number of Companies
1	Internet / Public Data Service	37	16	53
2	Internet / Public Data Service (Rural)	0	1	1
3	Internet Hotspot	3	0	3
Total		**40**	**17**	**57**

Source: National Communication Authority, 2022

Table 39: Microwave Links Authorization

S/N	MICROWAVE LINKS	2021	2022
1	MNOs	8,125	8,182
2	BWAs	263	255
3	ISPs	104	59
4	Others		2
TOTAL		**8,492**	**8,498**

Source: National Communication Authority, 2022

NCA CONTACTS AND PRESENCE NATIONWIDE

The following are the locations and addresses of the Authority's offices across the country:

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Tel: +233 (0) 302 776621 / 302 771701
Email: info@nca.org.gh
Website: https://www.nca.org.gh

2. Bolgatanga
H/No ZB 70, Zorbisi Estates
Digital Address: UB-0034-8536
PMB-Bolgatanga
Upper East Region, Ghana
Tel: +233 (0) 382 021141
Email: complaints.bolgatanga@nca.org.gh

3. Koforidua
Residency Street,
Behind New Juaben Municipal Library
Digital Address: EN-001-4621
PMB – Koforidua
Eastern Region, Ghana
Tel: +233 (0) 342 28380/ 342 28382
Email: complaints.koforidua@nca.org.gh

4. Tamale
Watherson Residential Area
Digital Address: NT-0027-8191
P. O. Box TL 1590, Tamale
Northern Region, Ghana
Tel: +233 (0) 3720 28105/ 3720 20104
Email: complaints.tamale@nca.org.gh

5. Sunyani
House No. 83/D, Penkwase
Digital Address: BS-0012-4632
P. O. Box SY125, Sunyani
Brong Ahafo Region, Ghana
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Email: complaints.sunyani@nca.org.gh

6. Kumasi
Fuller Road, Danyame, Kumasi
Digital Address: AK-063-2250
P. O. Box KS 10768, Kumasi
Ashanti Region, Ghana
Tel: +233 (0) 322 020014/ (0) 322 020018
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7. Ho
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Digital Address: VH-0006-0554
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8. Takoradi
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