



AMERICAN TOWER®
CORPORATION

American Tower Corporation: International Market Overview

Fourth Quarter 2017



American Tower International Market Overview

Introduction

International Portfolio Overview • International Markets Poised for Smartphone Growth

Advanced Wireless Markets

Germany • France


















Evolving Wireless Markets

Argentina • Mexico • Brazil • South Africa • Chile • Peru

Developing Wireless Markets

Colombia • Paraguay • India • Ghana • Uganda • Costa Rica • Nigeria

International Portfolio Overview⁽¹⁾

	India	France	Germany	Ghana	Nigeria	South Africa ⁽²⁾	Uganda	EMEA	Argentina ⁽³⁾	Brazil	Chile	Colombia	Costa Rica	Mexico ⁽⁴⁾	Paraguay	Peru	Latin America
																	
# of Sites ⁽⁵⁾	58,034	2,484	2,208	2,201	4,757	2,530	1,431	15,611	8	18,889	1,304	4,484	494	9,139	836	764	35,918
% of 4Q17 Property Revenue	17.7%	1.0%	1.0%	1.8%	3.2%	1.6%	0.9%	9.6%	0.2%	9.4%	0.6%	1.4%	0.3%	6.1%	0.1%	0.3%	18.4%
% of 4Q17 Property Gross Margin	11.2%	1.0%	1.3%	1.5%	2.8%	1.5%	0.7%	8.8%	0.2%	9.0%	0.5%	1.2%	0.3%	6.7%	0.1%	0.3%	18.3%
International Tenants ⁽⁶⁾	% of Total Property Revenue																
Airtel	~5%	✓		✓	✓		✓	✓									
Telefónica	~5%		✓					✓	✓	✓	✓	✓	✓	✓		✓	✓
Tata	~5%	✓															
AT&T	~4%									✓		✓		✓		✓	✓
Vodafone	~3%	✓	✓	✓		✓		✓									
MTN	~3%			✓	✓	✓	✓	✓									
Idea Cellular	~3%	✓															
Telecom Italia	~2%									✓							✓
Reliance-Jio	~2%	✓															
Nextel Intl.	~2%									✓							✓

(1) Reflects the Company's Asia, EMEA and Latin America segments.

(2) Portfolio also includes fiber and fiber-related assets, which are excluded from the site count.

(3) Portfolio primarily consists of urban telecommunications assets, fiber and the rights to utilize certain existing utility infrastructure for future telecommunications equipment installation, all of which are excluded from the site count.

(4) Portfolio also includes urban telecommunications assets, including fiber, concrete poles and other infrastructure, which are excluded from the site count.

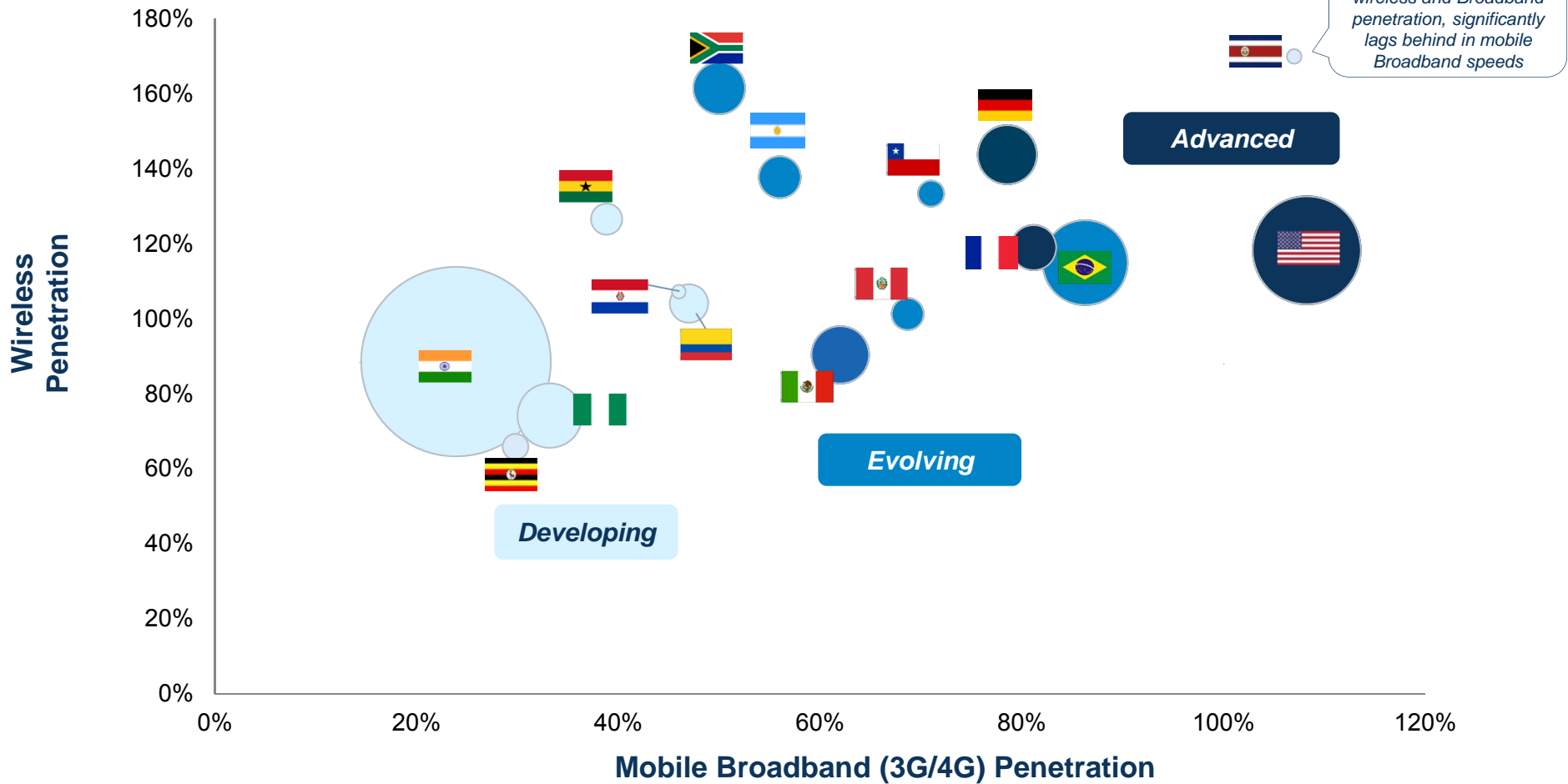
(5) Includes in-building and outdoor DAS networks.

(6) Represents top 10 international tenants for the quarter ended December 31, 2017.

International Markets Poised for Smartphone Growth

Wireless Penetration vs. Mobile Broadband (3G/4G) Penetration⁽¹⁾

(Size of bubbles = Number of mobile subscribers; Wireless and Broadband penetration calculated by dividing subscriber numbers by total population)



AMT's International Exposure Provides Access to Significantly Less Mature Wireless Markets

Notes: ⁽¹⁾ Data for Peru, Ghana, & Nigeria calculated using CAGR's from 2Q2015; Data for USA calculated using Cisco VNI 3G/4G penetration
Sources: Altman Vilandrie & Co. research, Bank of America Merrill Lynch Wireless Matrix, GSMA Intelligence, BuddeComm, Statista, OECD, Cisco VNI Report

Advanced Wireless Markets

Germany • France



WIRELESS MARKET OVERVIEW:

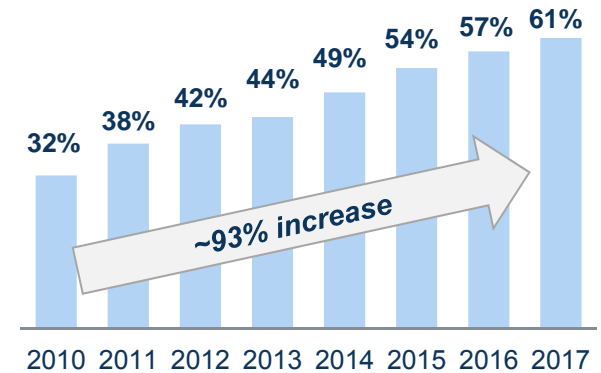
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	118M	1%
Wireless Penetration	143%	1%
Average Monthly Voice MOU	161 ⁽¹⁾	3%
ARPU	\$16	0%

Key Catalysts

- **2018 auction** for 5G transition in the **2 GHz (2x60 MHz) & 3.6 GHz (300 MHz) bands**
- **~80% LTE Coverage (66.3 million customers)** as of end of 2017
- **LTE rollout by all major operators** in 800 and 2600 MHz bands
- **T-Mobile rolled out LTE in 900 MHz** in Mar'17 to increase coverage
- **LTE-A launched by all major carriers**

Data as a % of Wireless Revenue ⁽²⁾

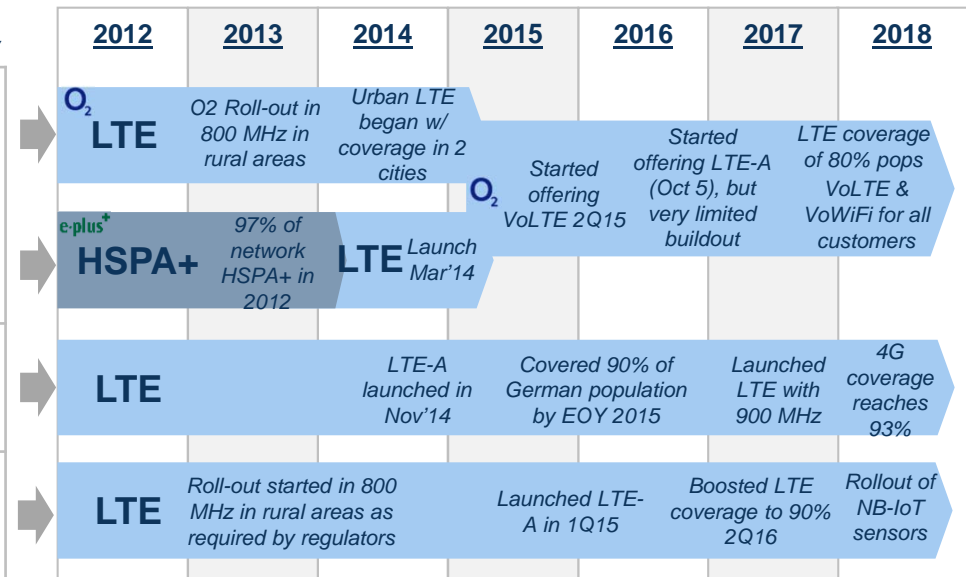


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

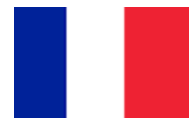
	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u>	<u>Current Technology</u>
 Telefonica Europe	✓	38%	~360 MHz Holdings in 700, 800, 900, 1800, 1900, 2100, 2600, and 3500 MHz bands	2G/3G /4G
 Deutsche Telekom	✓	36%	~220 MHz Holdings in 700, 800, 900, 1500, 1800, 2100, and 2600 MHz bands	3G/4G
 Vodafone	✓	26%	~230 MHz Holdings in 700, 800, 900, 1500, 1800, 2100, and 2600 MHz bands	3G/4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15 ⁽²⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 3Q15

Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018, carrier annual reports, press releases and news articles



WIRELESS MARKET OVERVIEW:

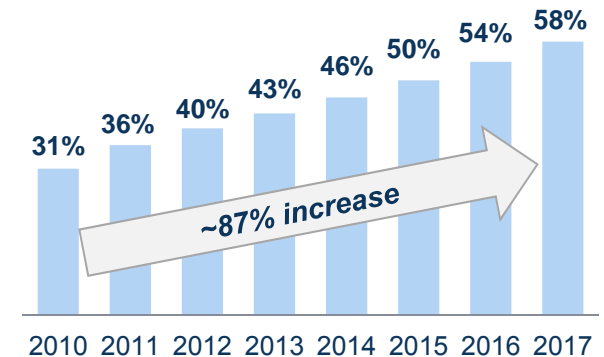
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	70M	1%
Wireless Penetration	119%	3%
Average Monthly Voice MOU	88 ⁽¹⁾	1%
ARPU	\$24	-6%

Key Catalysts

- **Temporary spectrum in the 3400 MHz-3800 MHz and 26 GHz bands** for 5G trials awarded by ARCEP
- **Bouygues and SFR will end 4G roaming deal by 2018** due to pressure from ARCEP, accelerates LTE network buildout (Jun'16)
- **ARCEP fines Orange and SFR** for not meeting rural coverage agreement (Sep'16)
- **LTE-A launched by all major carriers**
 - **Providers to invest ~\$4B** to roll out 4G w/ no coverage gaps by 2020
- **Orange announces rollout of LTE based broadband service** (Mar'17)

Data as a % of Wireless Revenue ⁽²⁾



WIRELESS CARRIER OVERVIEW:

Top 4 Carrier Characteristics

	AMT Customer?	Sub Mkt. Share	Spectrum Holdings ⁽²⁾	Current Technology
Orange	✓	32%	~90 MHz Holdings in 700, 800, 900, 1800, 2100, 2600 MHz bands	2G/3G/4G
SFR Numericable	✓	29%	~80 MHz Holdings in 700, 800, 900, 1800, 2100, and 2600 MHz bands	2G3G/4G
Bouygues	✓	20%	~75 MHz Holdings in 700, 800, 900, 1800, 2100, and 2600 MHz bands	2G/3G/4G
Free Mobile	✓	19%	~55 MHz Holdings in 700,900,1800,2100, and 2600 MHz bands	2G/3G/4G

Carrier-Announced Network Deployment Timelines

	2012	2013	2014	2015	2016	2017	2018
LTE	Launch Jun'12 in Marseille						5G trials scheduled for late 2018/ early 2019
HSPA+	Launch Dec'12 in Lyon		LTE-A launched in Jun'14				81% LTE coverage; 18 municipalities covered with LTE-A
HSPA+			Launch in Oct'13	Ultra LTE-A with 300Mb/s speed rollout in November	First to launch VoLTE Nov'15		95% LTE coverage
HSPA+			4G available at no additional cost Dec'13		700 & 1800 MHz bands added		84% of population covered with 4G

Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15 ⁽²⁾ AV&Co. projection based on data as % of revenue for Orange 09-'12' and 12-'16' CAGR for Germany as similar market
Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018, carrier annual reports, press releases and news articles, ARCEP

Evolving Wireless Markets

Argentina • Mexico • Brazil • South Africa • Chile • Peru



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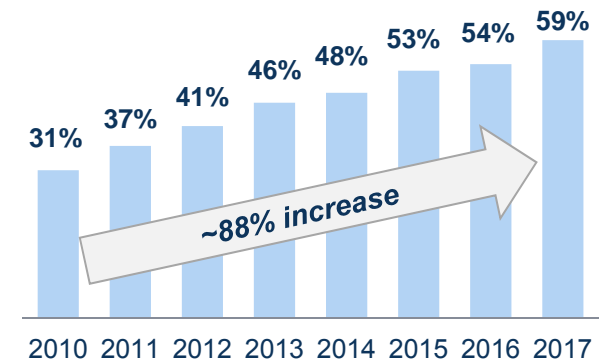
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	61M	2%
Wireless Penetration	138%	1%
Average Monthly Voice MOU	109 ⁽¹⁾	0%
ARPU	\$7	13%

Key Catalysts

- **Telecom Argentina to invest \$5B by 2020** (announced 2018)
- **ENACOM auctions 2.5 GHz (2500 MHz – 2690 MHz) bands** with Movistar and Claro winning 30MHz and Personal winning 40 MHz (Jul'17)
- **By 2016 Argentina surpassed 60% 4G coverage** across the country
- **ENACOM publishes guidelines** to encourage telecom competition (Jan'17)

Data as a % of Wireless Revenue ⁽²⁾

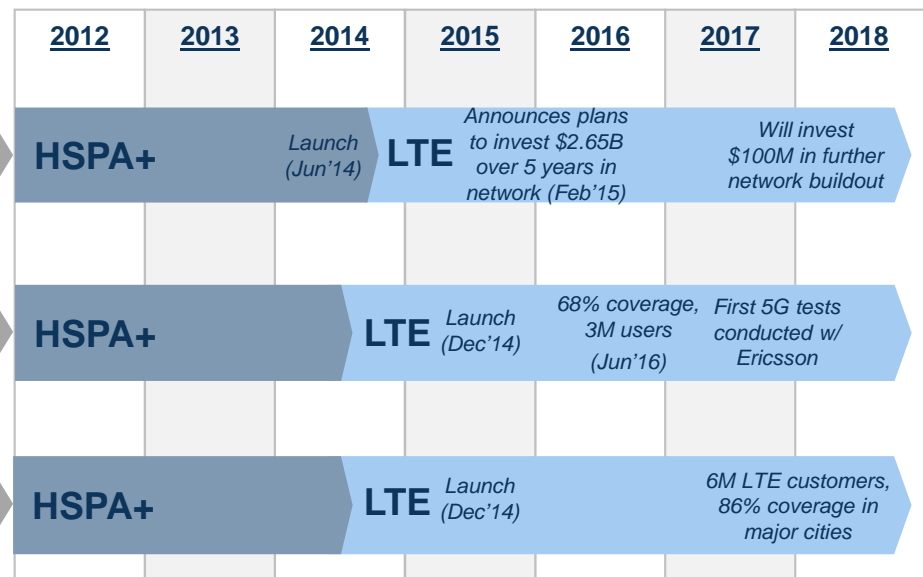


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings⁽³⁾</u>	<u>Current Technology</u>
 América Móvil	✓	37%	~135 MHz Holdings in 700, 850, 1700, 1850, 1900, 2000 MHz	2G/3G /4G
 Telefónica	✓	32%	~125 MHz Holdings in 700, 850, 1700, 1850, 1900, 2000 MHz	2G/3G /4G
 Telecom Argentina	✓	31%	~100 MHz Holdings in 700, 850, 1700, 1900, 2100 MHz	2G/3G /4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15 ⁽²⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 3Q15 ⁽³⁾ Holdings vary by region.
Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018



WIRELESS MARKET OVERVIEW:

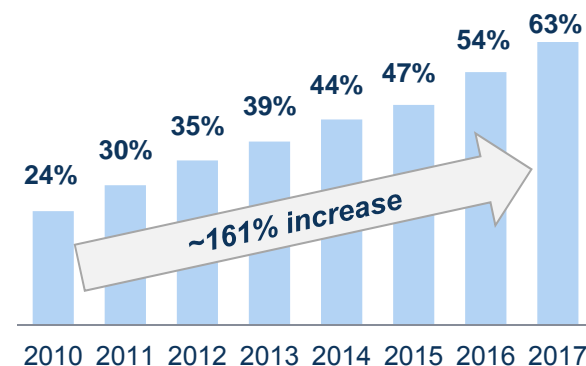
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	112M	3%
Wireless Penetration	90%	2%
Average Monthly Voice MOU	232 ⁽¹⁾	3%
ARPU	\$7	-5%

Key Catalysts

- **Ifetel to approve or reject separation of Telmex** proposed by AMX in Q1 2018
- **March 2018 auction of 2.5 GHz (2500-2690 MHz)**, all operators allowed to participate
 - **Conditions published** and the minimum reference value for each 20 MHz is set at \$18.7mm
- **Red Compartida, 20-year wholesale wireless broadband procurement, was awarded to Altan Consortium** ⁽²⁾: gives access to 90 MHz of 700 MHz band (Nov'16)
- **National roaming agreement** signed by America Mobil and Telefonica (Dec'16)

Data as a % of Wireless Revenue ⁽¹⁾

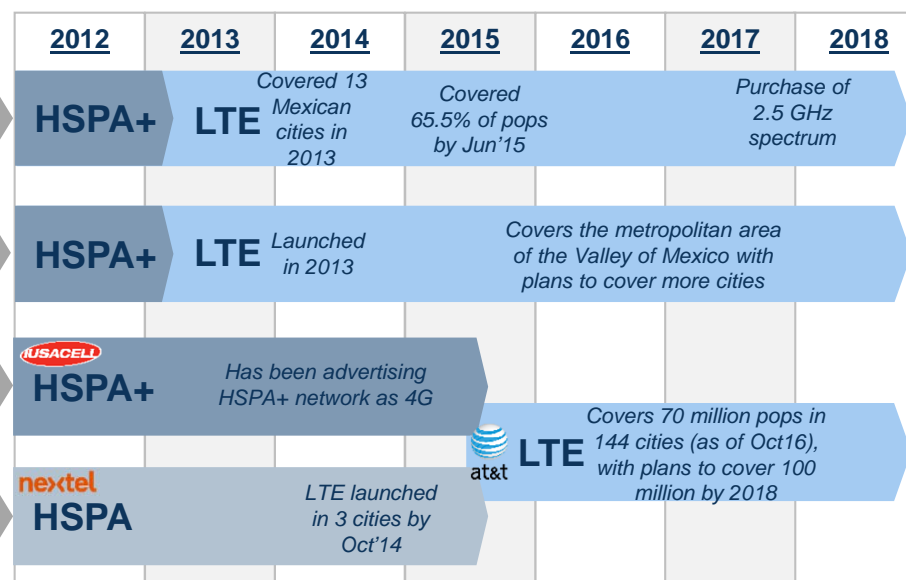


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u> ⁽³⁾	<u>Current Technology</u>
 América Móvil	✓	66%	~200 MHz Holdings in AWS-1, AWS-3, 850, 1900 MHz, 2500 GHz	2G/3G /4G
 Telefónica	✓	21%	~61 MHz Holdings in 850 and 1900 MHz	2G/3G /4G
 AT&T ⁽⁴⁾	✓	13%	~130 MHz Holdings in AWS-1, SMR, 850, 1900 MHz	2G/3G /4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15/3Q15 ⁽²⁾ Altan consortium consists of Morgan Stanley, IFC, Axtel, Megacable, Multitel ⁽³⁾ Holdings vary by region ⁽⁴⁾ AT&T completed acquisitions of Iusacell and Nextel; Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018



WIRELESS MARKET OVERVIEW:

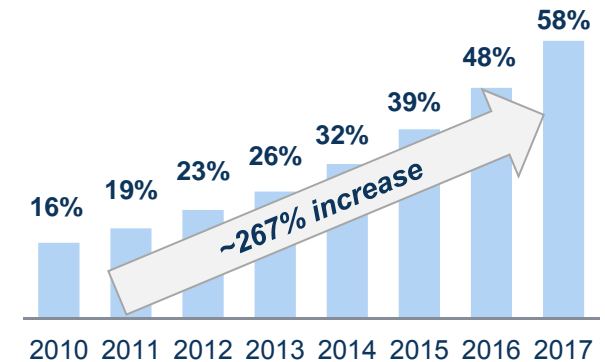
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	240M	2%
Wireless Penetration	115%	1%
Average Monthly Voice MOU ⁽¹⁾	129	2%
ARPU	\$7	1%

Key Catalysts

- **Anatel set to allocate 2300 MHz – 2400 MHz band** for mobile use
- **Nokia and TIM sign contract to buildout LTE network** in 700 MHz band (Mar'17)
- Vivo and Claro move forward with their site sharing partnership, will add **180 joint base stations in rural areas** (May'16)
- **Oi's Creditors approve plan to exit bankruptcy protection** that depends on a \$1.2 billion capital increase and monthly fines to Anatel (Dec'17)
 - **Oi filed for bankruptcy protection** in June'16

Data as a % of Wireless Revenue ⁽¹⁾



WIRELESS CARRIER OVERVIEW:

Top 4 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Sub Mkt. Share</u>	<u>Spectrum Holdings⁽²⁾</u>	<u>Current Technology</u>
 Telefónica	✓	31%	~107 MHz Holdings in 450, 700, 800, 1800, 1900, 2100, and 2500 MHz bands	2G/3G/4G
 Telecom Italia	✓	25%	~73 MHz Holdings in 450, 700, 800, 1700-1860, 1920-2165, and 2500 MHz bands	2G/3G/4G
 América Móvil	✓	25%	~106 MHz Holdings in 450, 700, 800, 1700-1860, 1900-2165, and 2500 MHz bands	2G/3G/4G
 Tele Norte Leste	✓	17%	~47 MHz Holdings in 450, 800, 1700-1860, 1900-2165, and 2500 MHz bands	2G/3G/4G

Carrier-Announced Network Deployment Timelines

2012	2013	2014	2015	2016	2017	2018
UMTS/HSPA+	LTE	Launched Apr'13	Reached 47% of pops covered and coverage of 183 cities by EOY 2015			57% 4G availability reached
UMTS/HSPA+	LTE	Reached 76M subs by EOY 2014		\$3.6B in planned capex 2015-2017 411 cities covered; LTE-A launched in Jun'16		90% Coverage of urban pop by 4Q17
HSPA+	LTE	93 markets by Oct14, 71M LTE subs by EOY 2014		Planned \$3.6B to expand 3G and 4G networks LTE-A launched in Jun'16		LTE-A coverage in 140 cities
HSPA+	LTE	Launched in 5 World Cup cities in Apr'13	Did not bid on 700 MHz	Expected to invest ~\$500M through 2015		Moving forward with bankruptcy proceedings

Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15/3Q15 ⁽²⁾ Holdings vary by region, calculated using mean holdings, weighting each region equally
Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018, press releases, RCR



WIRELESS MARKET OVERVIEW:

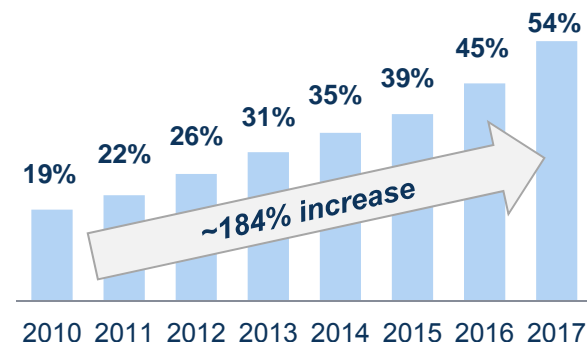
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	91M	9%
Wireless Penetration	162%	7%
Average Monthly Voice MOU ⁽¹⁾	150	6%
ARPU	\$8	-4%

Key Catalysts

- **Additional spectrum auctions** over the next few years (700 MHz, 800 MHz, and 2.6 GHz) will aid carriers' 4G expansion
 - Originally Jan'17, **postponed twice to unconfirmed date**
- **LTE-A launched or testing** in progress by major carriers; buildout constrained by lack of spectrum
- **Increased emphasis on rural coverage** by regulatory authorities likely to lead to demand for tower space

Data as a % of Wireless Revenue ⁽²⁾



WIRELESS CARRIER OVERVIEW:

Top 4 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u>	<u>Current Technology</u>
 Vodafone	✓	44%	~81 MHz Holdings in 900, 1800, and 2100 MHz bands	3G/4G
 MTN Group	✓	34%	~81 MHz Holdings in 900, 1800, and 2100 MHz bands	2G/3G/4G
 Saudi Oger Ltd.	✓	17%	~81 MHz Holdings in 900, 1800, and 2100 MHz bands	3G/4G
 Telkom SA	✓	5%	~160 MHz Holdings in 1800, 2100, 2300, and 3500 MHz bands	3G/4G

Carrier-Announced Network Deployment Timelines

	2012	2013	2014	2015	2016	2017	2018
Vodafone	HSPA+	LTE Launched in Jo'burg in 2012	VoLTE trials launched in Sep'14	2,600 LTE sites by EOY 2015	55% LTE coverage Feb'16	8 LTE-A sites by Apr'16	
MTN Group	HSPA+	LTE Launched in 3 cities in Dec'12	1,000 LTE sites by Nov'14	Added 3,148 LTE sites in 2015	LTE-A launched in 3 suburbs in Mar'16		South Africa's first 5G trial Jan'18
Cellco	HSPA+	LTE Trials since 2012	Upgraded infrastructure in 4Q14	LTE launched in Sep'15	Plans for 4,000 base stations	LTE-A launched in 3 cities Apr'16	
Telkom SA	HSPA+	LTE Reached 6 cities		LTE-A trials since Nov'14; rolled out to 27 suburbs by May'15			

Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15 ⁽²⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 3Q15
 Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018, annual reports



WIRELESS MARKET OVERVIEW:

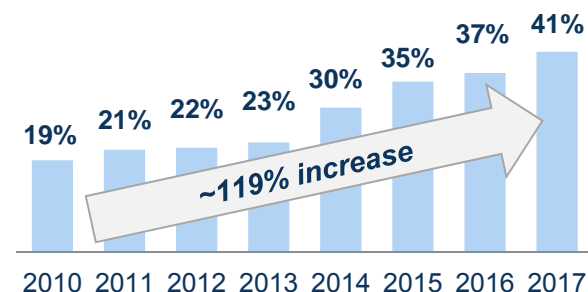
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	25M	2%
Wireless Penetration	134%	1%
Average Monthly Voice MOU ⁽¹⁾	132	-3%
ARPU	\$12	1%

Key Catalysts

- **Claro conducted a 5G lab trial** using the 27 GHz band, the first in Latin America
- **Entel finished national LTE-A rollout in Mar'17**, both Movistar and Claro are investing in further buildout
- **Rural 4G rollouts** should further drive coverage tower growth
- **Minimum connection speed rules** to be introduced will drive investment
 - Minimum speed will be a % of average speed available on each plan; providers required to provide app for speed tests

Data as a % of Wireless Revenue⁽²⁾

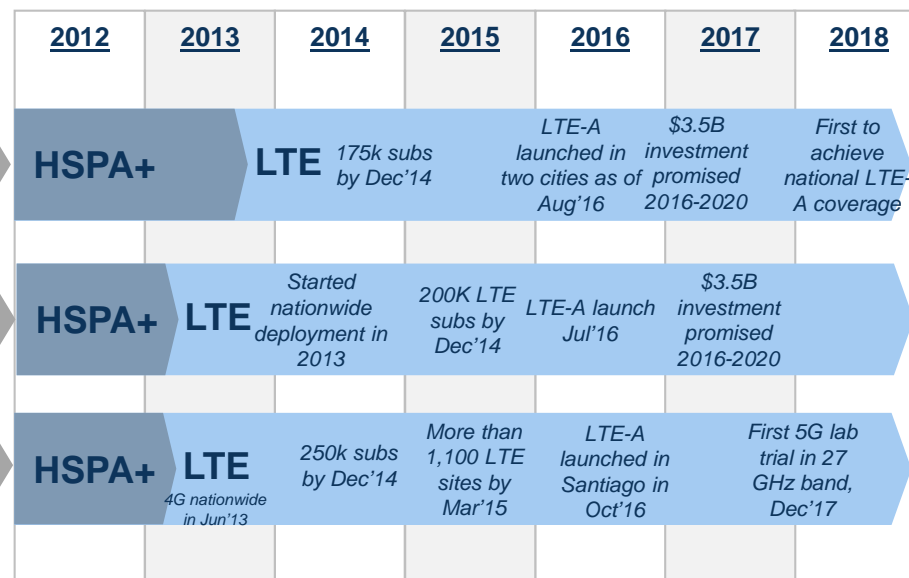


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u>	<u>Current Technology</u>
 Entel	✓	37%	~110 MHz Holdings in 700, 1900, and 2600 MHz bands	3G/4G
 Telefónica	✓	35%	~95 MHz Holdings in 700, 850, 1900, and 2600 MHz bands	3G/4G
 América Móvil	✓	28%	~95 MHz Holdings in 700, 850, 1900, and 2600 MHz bands	3G/4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15 ⁽²⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 3Q15
Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, SUBTEL, Bank of America Merrill Lynch Global Wireless Matrix January 2018



WIRELESS MARKET OVERVIEW:

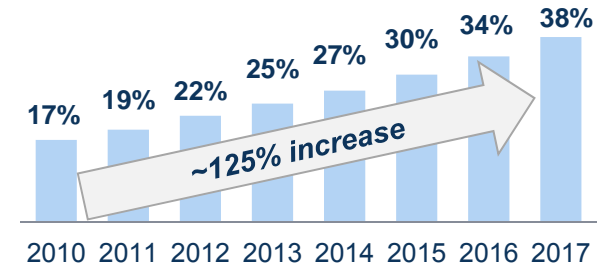
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	36M ⁽¹⁾	6%
Wireless Penetration	101%	4%
Average Monthly Voice MOU ⁽²⁾	168	10%
ARPU	\$8	0%

Key Catalysts

- **Telefónica** to spend \$108m for 4G
- **New entrants such as Dolphin Telecom⁽³⁾ and Bitel** stimulate demand for towers
 - Dolphin signed MVNO agreement in early 2017
- **2Q16 700 MHz auction results** – Entel: 2x15 MHz (\$290M USD); Claro: 2x15 MHz (\$306M USD); Movistar: 2x15 MHz (\$315M USD)
 - As a result, Claro doubled its 4G footprint in 4Q16
- Government encourages expansion to sparsely populated areas driving **coverage tower demand**

Data as a % of Wireless Revenue ⁽²⁾

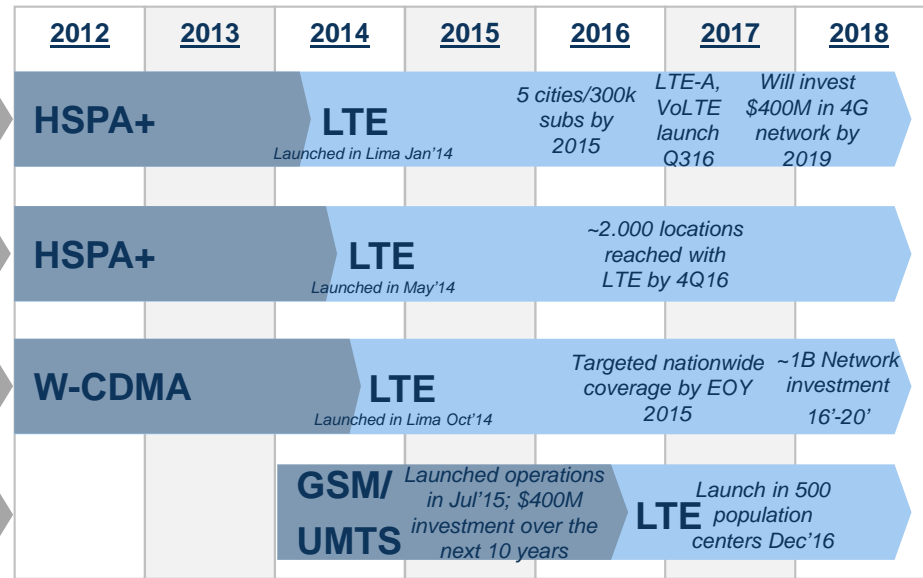


WIRELESS CARRIER OVERVIEW:

Top 4 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u>	<u>Current Technology</u>
 Telefónica	✓	41%	~145 MHz Holdings in 700, 850, 900, 1700/2100, 1900, and 3500 MHz bands	2G/3G /4G
 América Móvil	✓	33%	~110 MHz Holdings in 700, 1900 and 2600 MHz bands	2G/3G /4G
 Entel	✓	14%	~145 MHz Holdings in 700, 850, 1900, 2600 MHz, and AWS bands	2G/3G /4G
 Viettel	✓	11%	~85 MHz Holdings in 900 and 1900 MHz bands	2G/3G /4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ Adjusted BAML data to account for Bitel subscribers. ⁽²⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15/3Q15 ⁽³⁾ Dolphin Telecom announced plans to become a mobile operator in Peru in February 2017; Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018; Gartner Mobile Services Forecast 1Q15

Developing Wireless Markets

Colombia • Paraguay • India • Ghana • Uganda • Costa Rica • Nigeria



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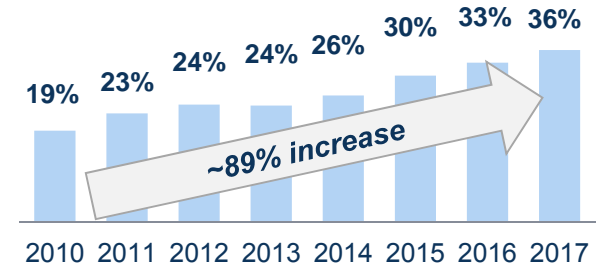
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	51M	2%
Wireless Penetration	104%	1%
Average Monthly Voice MOU ⁽¹⁾	211	4%
ARPU	\$6	1%

Key Catalysts

- MinTIC asks for parties interested in the **700, 1900 MHz spectrum auction** to come forward (Mar'17); date of auction **delayed until 2018**
- **LTE networks launched** by all major players, outnumber 3G connections for the first time in Apr'17
- **CRC reviewing barriers to infrastructure deployment**, paving the way for future tower deployments
- **Tigo-Une merger** provides stronger third carrier; \$250M network investment announced at time of merger

Data as a % of Wireless Revenue ⁽²⁾

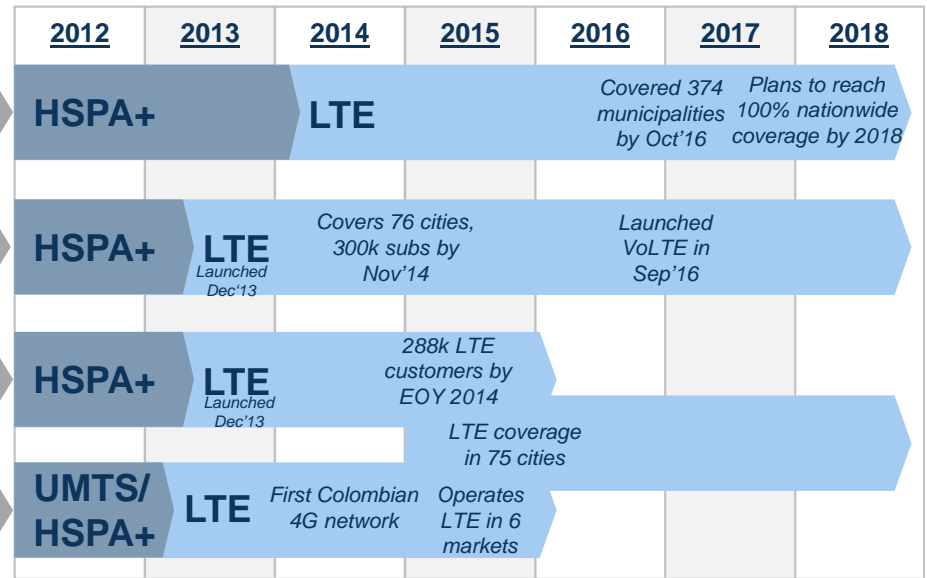


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u>	<u>Current Technology</u>
 América Móvil	✓	57%	~80 MHz Holdings in 850, 1900, and 2500 MHz bands	3G/4G
 Telefonía	✓	28%	~75 MHz Holdings in 850, 1900, and AWS bands	3G/4G
 Millicom (50%) EPM Group (50%) 	✓	15%	~140 MHz Holdings in 1900, 2500 MHz, and AWS bands	3G/4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15 ⁽²⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 3Q15
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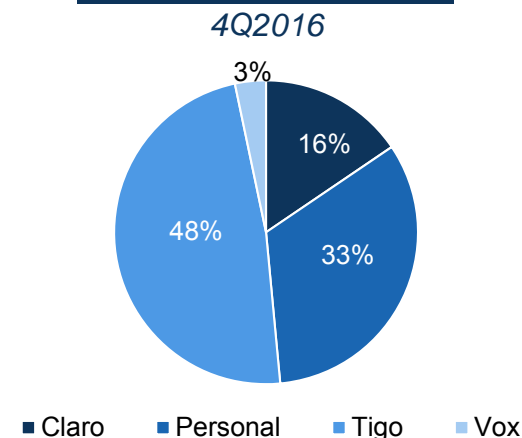
Snapshot

Indicator	As of 4Q16	2010 – 4Q16 CAGR
Wireless Subscribers	7.5M	4%
Wireless Penetration	107%	2%
Data as % of Revenue ⁽¹⁾	50%	40%
ARPU ⁽¹⁾	\$7	11%

Key Catalysts

- **700 MHz auction Jan '18**, generated \$85 million
 - Auction saw **7, 2x5 MHz paired bands sold**
 - **Tigo Paraguay won auction** with ~30 MHz, followed by **Claro and Personal** with ~20 MHz each
 - **Vox** did not participate
- **Tigo to invest \$100mm to provide 66% coverage** with LTE by 2020
- **Personal reaches 250k LTE subscribers** in Oct'16

Subscriber Market Share

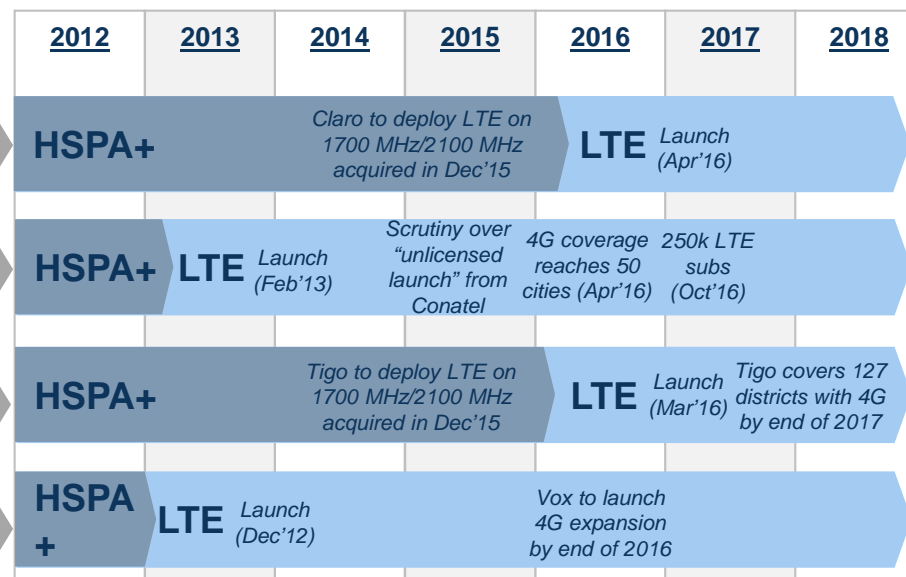


WIRELESS CARRIER OVERVIEW:

Top 4 Carrier Characteristics

	AMT Customer?	Subscriber Market Share ⁽²⁾	Spectrum Holdings ⁽³⁾	Current Technology
 América Móvil		16%	~80 MHz Holdings in 750, 1700, 1900, 2100 MHz	2G/3G /4G
 Telecom Argentina		33%	~70 MHz Holdings in 750, 850, 1900 MHz	2G/3G /4G
 Millicom	✓	48%	~165 MHz Holdings in 750, 850, 1700, 2100, 1900, 2600 MHz	2G/3G /4G
 Hola		3%	~100 MHz Holdings in 900, 1700, 2100, 2600 MHz	2G/3G /4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ Claro and Millicom 2017 annual reports used as benchmark for Data as a % of revenue and ARPU, growth represents YoY growth ⁽²⁾ Calculated from Dec'16 numbers

⁽³⁾ Spectrum holdings from 2018 750 MHz auction not released, calculated based on amount paid and price per band. Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, RCR Wireless, Conatel



WIRELESS MARKET OVERVIEW:

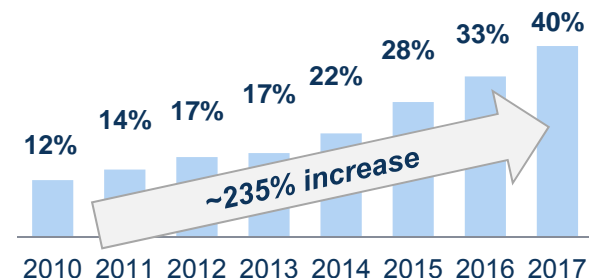
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	1.1B	11%
Wireless Penetration	89%	5%
Average Monthly Voice MOU ⁽¹⁾	374	0%
ARPU	\$2	-4%

Key Catalysts

- **India planning mass spectrum sale of more than 3,000 MHz of frequencies** across numerous bands
- **3Q16 spectrum auction:** 700, 800, 900, 1800, 2100, 2300, 2500 MHz; Winners: Vodafone, Airtel, Reliance Jio, and Idea Cellular
 - **60% unsold**, no bids for 700 MHz;
- **New entrant Jio** to acquire RCom
- **Vodafone and Idea merger set to close in 1H18**, creating India's largest mobile operator
- **Aircel** filed for bankruptcy in late February 2018 (~7% market share)

Data as a % of Wireless Revenue ⁽¹⁾

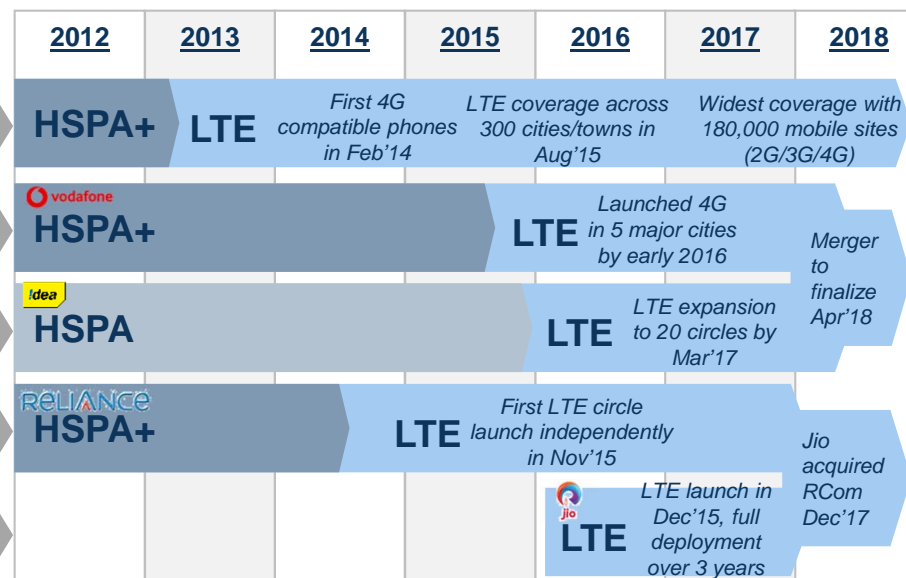


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

	AMT Customer?	Sub Mkt. Share ⁽²⁾	Spectrum Holdings ⁽³⁾	Current Technology
 Bharti, Singtel	✓	32%	~49 MHz Holdings in 900, 1800, 2100, and 2300 MHz bands	2G/3G /4G
 Vodafone/Idea	✓	35%	~60MHz Holdings in 900, 1800, 2100, 2300 and 2500 MHz bands	2G/3G /4G
 Reliance Jio/RCom	✓	17%	~60MHz Holdings in 850, 900, 1800, 2100 and 2300 MHz bands	2G/3G /4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15/3Q15. ⁽²⁾Market shares exclude MTNL and BSNL which account for ~10% of wireless market and Airtel which accounts for ~7% ⁽³⁾Spectrum holdings vary by region; calculated using mean holdings, weighting each region equally. Sources: American Tower research & analysis, AV&Co. research & analysis, BAML Global Wireless Matrix January 2018, TRAI



WIRELESS MARKET OVERVIEW:

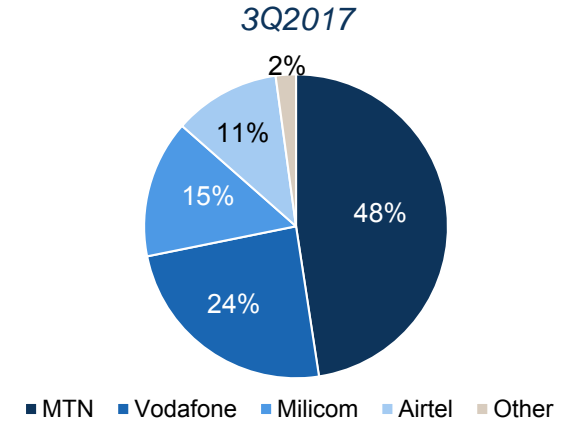
Snapshot

Indicator	As of 2Q17	2010 – 3Q17 CAGR
Wireless Subscribers	36M	11%
Wireless Penetration	131%	8%
Average Monthly Voice MOU	119	0%
Yearly ARPU	\$3 ⁽¹⁾	-14%

Key Catalysts

- **Data demand expected to grow at ~83% CAGR** through 2020
- **Changing competitive landscape** due to Millicom and Bharti merger
- **Rapidly growing subscriber base** and solid macroeconomic conditions expected to drive growth in wireless
- **MTN launched 4G in all regions** in Jun'16, the first nationwide 4G network, w/ smaller entrants launching regional 4G networks
- **4Q15 800 MHz auction results** – MTN Ghana won 2x10 MHz (only MTN result announced)

Subscriber Market Share

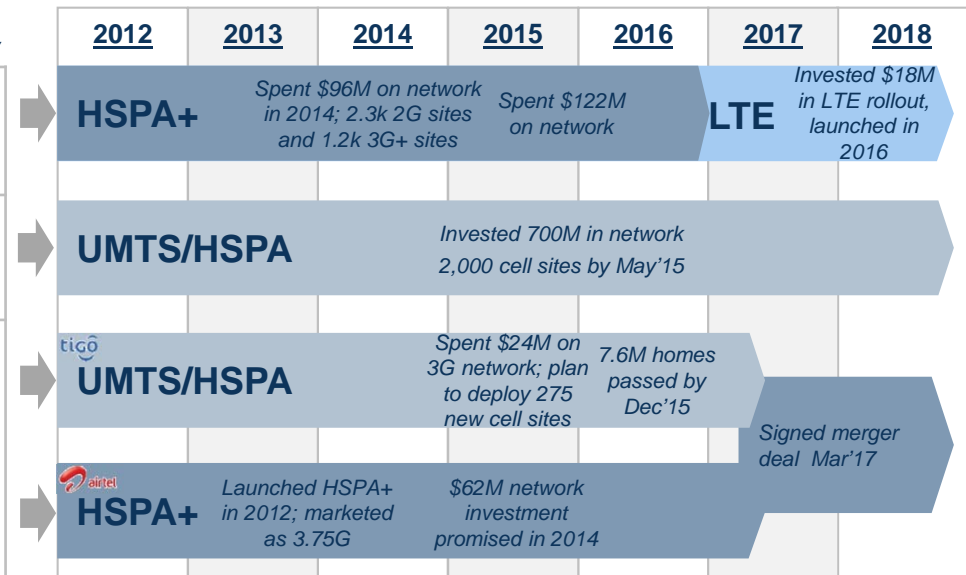


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u>	<u>Current Technology</u>
 MTN Group	✓	48%	~20 MHz Holdings in 800, 900, 1800, and 2100 MHz bands	2G/3G /4G
 Vodafone	✓	24%	~65 MHz Holdings in 900, 1800, and 2100 MHz bands	2G/3G
 Airtel Tigo	✓	26%	~20 MHz Holdings in 900 and 1800 and 2100 MHz bands	2G/3G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ Data from 2Q17; AV&Co. projection based on 2008-4Q14 CAGR

Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, BuddeCom, National Communications Authority of Ghana Statistics Report January 2018, BuddeCom Ghana Mobile Report 3Q16, NCA



WIRELESS MARKET OVERVIEW:

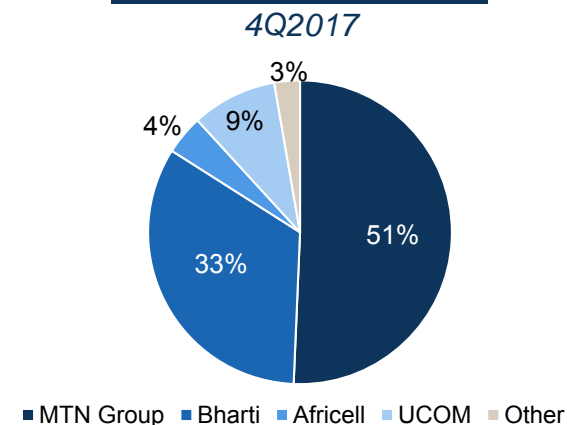
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	24M	20%
Wireless Penetration	66%	16%
Data as % of Revenue	30% ⁽¹⁾	7%
Yearly ARPU	\$2.06 ⁽²⁾	-16%

Key Catalysts

- **Major MNOs to outsource tower builds**
- Airtel, MTN Uganda and Smile ⁽³⁾ to **expand 4G networks and services**, however buildout restricted by lack of spectrum
- **Rural coverage** improvement initiatives underway, including 770km fiber ring to towns in western Uganda
- New market entrant Vodafone launched 4G LTE network in Feb'15 in 2 cities using 2.6 GHz band

Subscriber Market Share

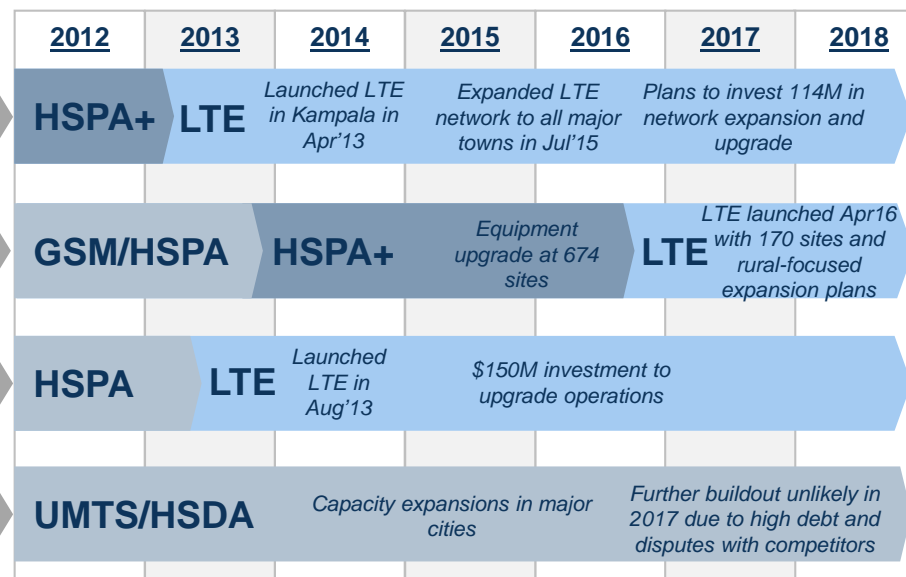


WIRELESS CARRIER OVERVIEW:

Top 4 Carrier Characteristics

	<u>AMT Customer?</u>	<u>Subscriber Market Share</u>	<u>Spectrum Holdings</u>	<u>Current Technology</u>
 MTN Group	✓	51%	up to 44 MHz Holdings in 2300, 2500, 2600, 3500 and 900, 1800 MHz bands	2G/3G /4G
 Bharti	✓	33%	up to 14MHz Holdings in 900, 1800, 2100 MHz band	2G/3G /4G
 UCOM	✓	9%	up to 44 MHz Holdings in 900, 1800, 2100, 2300, 2500, 3500 MHz bands	2G/3G
 Africell	✓	4%	Holdings in 800, 1800 and 2100 MHz bands	2G/3G /4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ CAGR based on '07-1Q15 period ⁽²⁾ Based on 2017 MTN ⁽³⁾ Smile announced \$46M network investment in Apr17.

Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, BuddeCom, MTN 2016 Annual Report, MTN 2017, BuddeCom Uganda Mobile Report 3Q17



WIRELESS MARKET OVERVIEW:

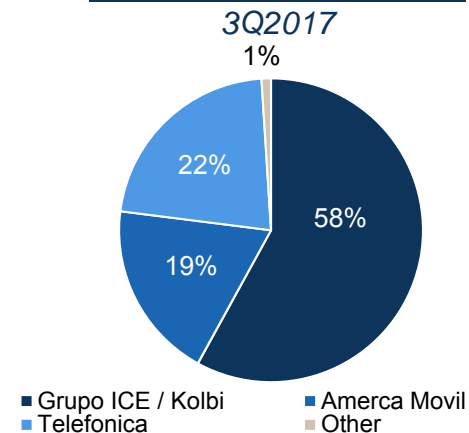
Snapshot

Indicator	As of 4Q16	2010 – 4Q16 CAGR
Wireless Subscribers	8.3M	18%
Wireless Penetration	170%	17%
Data as % of Revenue	50%	31%
ARPU	\$9.3	-4%

Key Catalysts

- **70 MHz** of spectrum (2x20MHz in 1800MHz and 2x15MHz in 1900MHz/2100MHz) left over from 2011 auction **auctioned Jul'17**
 - **Movistar and Claro** each win 35 MHz
- Auction of **100 MHz of 700 MHz** band likely to occur late 2018 / early 2019
- **Sutel lifts tariff regulations** from 4 out of eleven markets analyzed (Dec'16)⁽¹⁾
- **ICE market share has declined** rapidly since monopoly ended in 2011
- **Fonatel funds network expansion projects** to underserved communities

Subscriber Market Share

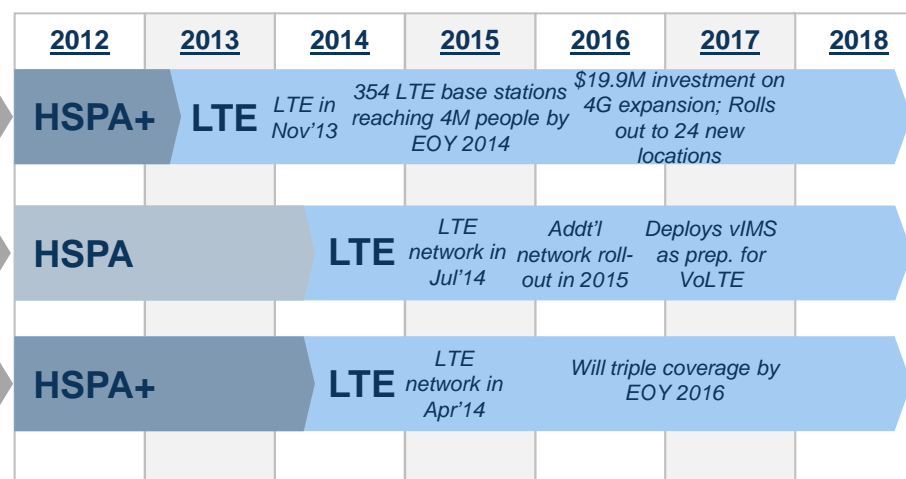


WIRELESS CARRIER OVERVIEW:

Top 3 Carrier Characteristics

	AMT Customer?	Subscriber Market Share	Spectrum Holdings	Current Technology
Grupo ICE / Kolbi	✓	58%	~550 MHz Holdings in 850, 1800, and 2600 MHz bands	2G/3G /4G
Telefonica	✓	22%	~60 MHz Holdings in 850, 1800, and 2100 MHz bands	2G/3G /4G
América Móvil	✓	19%	~70 MHz Holdings in 1800 and 2100 MHz bands	2G/3G /4G

Carrier-Announced Network Deployment Timelines



Notes: ⁽¹⁾ The four deregulated markets are international telephony, fixed internet, international roaming and transit telecommunications
Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, BuddeComm Costa Rica Mobile Report 3Q2017, Sutel

WIRELESS MARKET OVERVIEW:

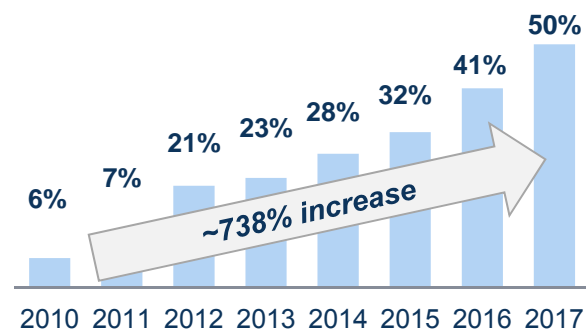
Snapshot

Indicator	As of 3Q17	2010 – 3Q17 CAGR
Wireless Subscribers	140M	8%
Wireless Penetration	74%	4%
Average Monthly Voice MOU ⁽¹⁾	164	11%
ARPU	\$3	-11%

Key Catalysts

- All carriers currently expanding LTE
- National Broadband Plan seeks to cover **80% of population with 3G by 2018**
- **Ntel deploys LTE-A** in three cities (1Q17)
- **Low penetration** vs. other African nations presents growth opportunities
- MTN was **only bidder** in May'16 2.6GHz auction due to high prices (won 2x30 MHz)

Data as a % of Wireless Revenue⁽²⁾



WIRELESS CARRIER OVERVIEW:

Top 4 Carrier Characteristics

	AMT Customer?	Subscriber Market Share	Spectrum Holdings	Current Technology
 MTN Group	✓	36%	110 MHz Holdings in 700, 800, 900, 1800, 2100, 2600 MHz	2G/3G /4G
 Globacom		25%	60 MHz Holdings in 900, 1800, and 2100 MHz bands	2G/3G /4G
 Bharti	✓	27%	60 MHz Holdings in 900, 1800, and 2100 MHz bands	2G/3G /4G
 Emirates Telecom Corp.	✓	12%	60 MHz Holdings in 900, 1800, and 2100 MHz bands	2G/3G /4G

Carrier-Announced Network Deployment Timelines

2012	2013	2014	2015	2016	2017	2018
HSPA	2G coverage was 87% of population; 3G was 49% of population		\$1.2B network upgrade Bought spectrum in 700 MHz in 2015		LTE	Rolled out 4G on 800MHz acquired from Visafone 3Q16
HSPA		2014 expansion resulted in 90% 3G coverage of its network			LTE	Launched in 6 cities 3Q16
HSPA+		3G across 36 states			LTE	Coverage of 60 locations by Nov'16
HSPA			Spent \$1.2B to improve network		LTE	Launched parts of Lagos 3Q16

Notes: ⁽¹⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 2Q15 ⁽²⁾ AV&Co. projection based on Bank of America Merrill Lynch Wireless Matrix 3Q15

Sources: American Tower research & analysis, Altman Vilandrie & Co. research & analysis, Bank of America Merrill Lynch Global Wireless Matrix January 2018, Nigerian Communications Commission, GSMA

Appendix: Spectrum Auction Summary and Definitions

Spectrum Auction Summary – Advanced & Evolving Wireless Markets

**Highlighted
Carriers are new
or recent entrants**

Completed Major Auctions: 2012-2017

Expected: 2018-19

	Year	Bands Auctioned	Winners	Tech.	Build-out Requirements	
 U.S.A.	2014	AWS-3	AT&T, Verizon, Dish, T-Mobile	4G	Licensees must cover 40% of their licensed population within six years and 75% of their licensed population within 12 years	mmWave spectrum (28, 37, 39, 64-71 GHz and other bands) auction likely, date not announced CBRS 3.5 GHz (3550 MHz – 3700 MHz) bands gaining momentum, backed by major wireless providers
	2016	600MHz	T-Mobile, Dish, Comcast, AT&T	4G	Licensees must cover 40% of their licensed population within six years and 75% of their licensed population within 12 years	
 Germany	2015	700, 900, 1500, and 1800 MHz	Deutsche Telekom, Vodafone, Telefonica O2	4G	N/A	1800MHz spectrum renewal process and new fiber regulatory framework in 2018
 France	2015	700 MHz	SFR, Orange, Bouygues, Free Mobile	4G	Licensees are required to cover 50% of rural areas by Jan22 and increase coverage on mobile transport including underground trains	3.5 GHz (3410 MHz – 3460 MHz) allocation for fixed wireless set for 2018-2019
 Argentina	2014	700, 850, 1700, 1900 MHz	Personal, Claro, Telefonica	3G/4G	N/A	No known plans
	2017	2500 MHz	Movistar, Claro, Personal	4G	Successful bidders must roll out service on 2.5 GHz (2500 MHz – 2690 MHz) bands in 24-48 months	
 Mexico	2016	1710-1780 (AWS-1), 2110-2180 (AWS-3)	AT&T, America Movil	4G	N/A	2.5 GHz (2500-2690 MHz) auction set to take place March 2018, all carriers allowed to participate
	2016	700 MHz	Altan Consortium	4G	Awardee of “Red Compartida” government contract is required to build out a nationwide LTE wholesale network	
 Brazil	2012	450MHz, 2.5GHz	Claro, TNL, Vivo, Telecom Italia Mobile, Sunrise, Sky Brasil	4G	Coverage in major cities and rural areas required before soccer world cup and Olympic games (2016)	Auction of “Lot C” of spectrum auction from 2015 will include additional 1.9 and 2.5 MHz spectrum; also potential re-auction of 700 MHz; Anatel to allocate 2300 MHz – 2400 MHz band for mobile use
	2014	700MHz	Claro, TIM, Vivo, Algar	4G	Responsible for clearing 700 MHz of legacy interference	
	2015	1.8, 1.9, 2.5-2.69 GHz	Telefonica Brasil, Claro, TIM Brasil	4G	N/A	
 South Africa	<i>no major auctions</i>					Plans to auction spectrum in 800MHz, 2.6GHz, 3.5 GHz
 Chile	2012	2.6 GHz	Claro, Entel, Movistar (20 MHz each)	4G	12 months to deploy their networks across most of Chile; must also connect ~583 isolated areas within 24 months	No known plans
	2014	700 MHz	Claro, Entel, Movistar	4G	Requires coverage of 854 km of roads, 503 schools, 98% of population	
 Peru	2013	AWS	Movistar, Nextel (Entel)	4G	\$400mn of investment required in the first 10 years for each block of spectrum	No known plans
	2016	700MHz	Entel, Claro, Movistar	4G	Each licensee required to roll out LTE to 195 underserved towns (15 in y1, 129 in y2, 51 in y3)	








Sources: Regulatory authorities, Press releases, Fierce Wireless, AV&Co. Research & Analysis; Note: N/A indicates no major build-out requirements or no data available

Spectrum Auction Summary – Developing Wireless Markets

Highlighted
Carriers are new
or recent entrants

Completed Major Auctions: 2012-2017

Expected: 2018-19

	Year	Bands Auctioned	Winners	Tech.	Build-out Requirements	
 Colombia	2013	1.7, 2.5 GHz	Movistar, Claro, Tigo, DirectTV , Avantel	4G	Purchase ~550K tablets for poor students and improve wireless internet quality in rural areas	Auctions in 700, 900, 1900 and 2500 MHz bands delayed into 2018 (no date announced)
 Paraguay	2015	1.7, 2.1 GHz	Tigo, Claro	4G		January 2018 Auction of 700 MHz bands (2x5 MHz paired blocks in 713-803 MHz bands), Tigo wins ~30 MHz, with Claro and Peronal winning ~20 MHz (unofficially)
	2012	800, 1800 MHz	Vodafone, Airtel, Uninor, Idea, Videocon	2G		
	2014	900, 1800 MHz	Vodafone, Airtel, Idea, Uninor, RCOM, Aircel, Jio	2G		
 India	2013	800, 900, 1800 MHz	MTS India	2G		Planning mass spectrum sale of more than 3,000 MHz of frequencies in the 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz, 2500 MHz, 3300 MHz-3400 MHz and 3400 MHz – 3600 MHz bands
	2015	800, 900, 1800 and 2100 MHz	Airtel, Vodafone, Idea, RCOM, Jio , Aircel, Tata	2G/3G		
	2016	800, 1800, 2100, 2300, and 2500 MHz	Reliance Jio, Bharti Airtel, Idea, Vodafone	2G/3G/4G		
 Uganda	<i>no major auctions</i>					No known plans
 Ghana	2015	800 MHz	MTN Ghana	4G		No known plans
 Costa Rica	2017	1800, 1900, 2100 MHz	Movistar, Claro	3G/4G		Auction of 700 MHz likely to occur late 2018 / early 2019
	2014	2.3GHz	Bitflux (consortium of VDT, BitCom, and Superflex)	3G/4G		
 Nigeria	2016	2.6GHz	MTN	3G/4G		No known plans

Sources: Regulatory authorities, Press releases, Fierce Wireless, AV&Co. Research & Analysis; Note: N/A indicates no major build-out requirements or no data available

Definitions and Data Sources

Definitions

- **ARPU:** The monthly average revenue per user is calculated by dividing service revenues by the average subscriber base during the quarter.
- **Data as % of ARPU:** Data revenue including messaging revenues, as reported by carriers as percentage of ARPU
- **Subscribers:** Data based on reported subscribers by carriers. This may include more than one SIM card per user, which may be counted as multiple subscribers.
- **Voice Minutes of Use:** The minutes of use per month per average user is calculated by dividing total minutes of use as reported by carriers, using estimates where available, by the average subscriber base during the quarter.
- **Wireless Penetration:** Mobile subscribers as a percentage of country population.

Data Sources

-  - Global Wireless Matrix 05 January 2018
-  - Research and Analysis
-  - Research and Analysis