



TELECOMMUNICATIONS

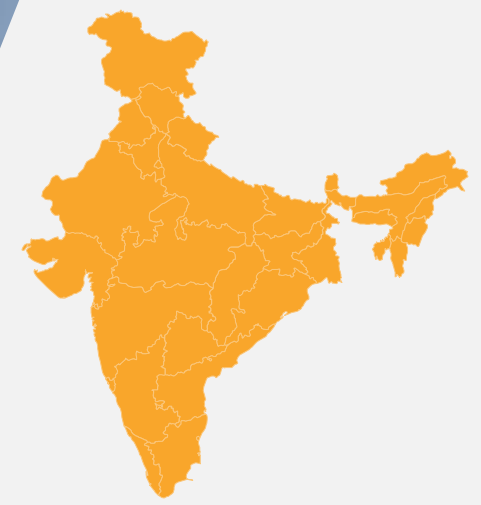


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Second-largest subscriber base

- India has the second largest telecom network in the world.
- Total subscriber base in the country stood at 1,189.28 million at the end of July 2019.

Rising penetration rate

- Telecom penetration, also known as tele-density, has grown rapidly over the course of the past few years.
- Tele-density grew from 18.23 per cent in FY07 to 90.23 per cent in FY20 (till July).

Second-highest number of internet users

- India has the second highest number of internet subscribers globally.
- India's active internet subscription has reached 530 million in 2018 at a run rate of 65 million users per year in the last two years.

Affordability and lower rates

- As per report by Ericsson, India has the world's highest data usage per smartphone at an average of 9.8GB per month.
- Availability of affordable smartphones and lower rates of data are expected to drive growth in the Indian telecom industry.

Source: Telecom Regulatory Authority of India, TechSci Research

ADVANTAGE INDIA



- India ranks second in terms of number of telecommunication subscriptions, internet subscribers and app downloads* globally.
- Moreover, India is also one of the largest data consumers globally. It has highest data usage per smartphone at an average of 9.8GB per month.
- India's internet users is expected to reach 627 million in 2019.

Robust demand

- In the era of 5G, telecom will earn 70 per cent of its revenue from core beneficiaries of 5G. Currently it is earning 30 per cent from enterprises.
 - The government of India has introduced Digital India programme under which all the sectors such as healthcare, retail, etc. will be connected through internet.
 - For domestic consumption and exports, Ericsson will start manufacturing of 5G radio products in India.

Attractive opportunities

ADVANTAGE INDIA

- Telecommunication ratings in the country are expected to start rising within the next two quarters (Q3 and Q4 2018-19), providing higher pricing power to incumbent players.

Increasing ratings

- The government has been proactive in its efforts to transform India into a global telecommunication hub.
- The Government of India unveiled the National Digital Communications Policy, 2018 in September 2018. The policy aims to attract US\$ 100 billion worth of investments and generate 4 million jobs in the sector by 2022.
- As of January 2019, expenditure on telecom infrastructure and services by Government of India grew six-fold to Rs 60,000 crore (US\$ 8.31 billion) between 2014-19.

Policy support

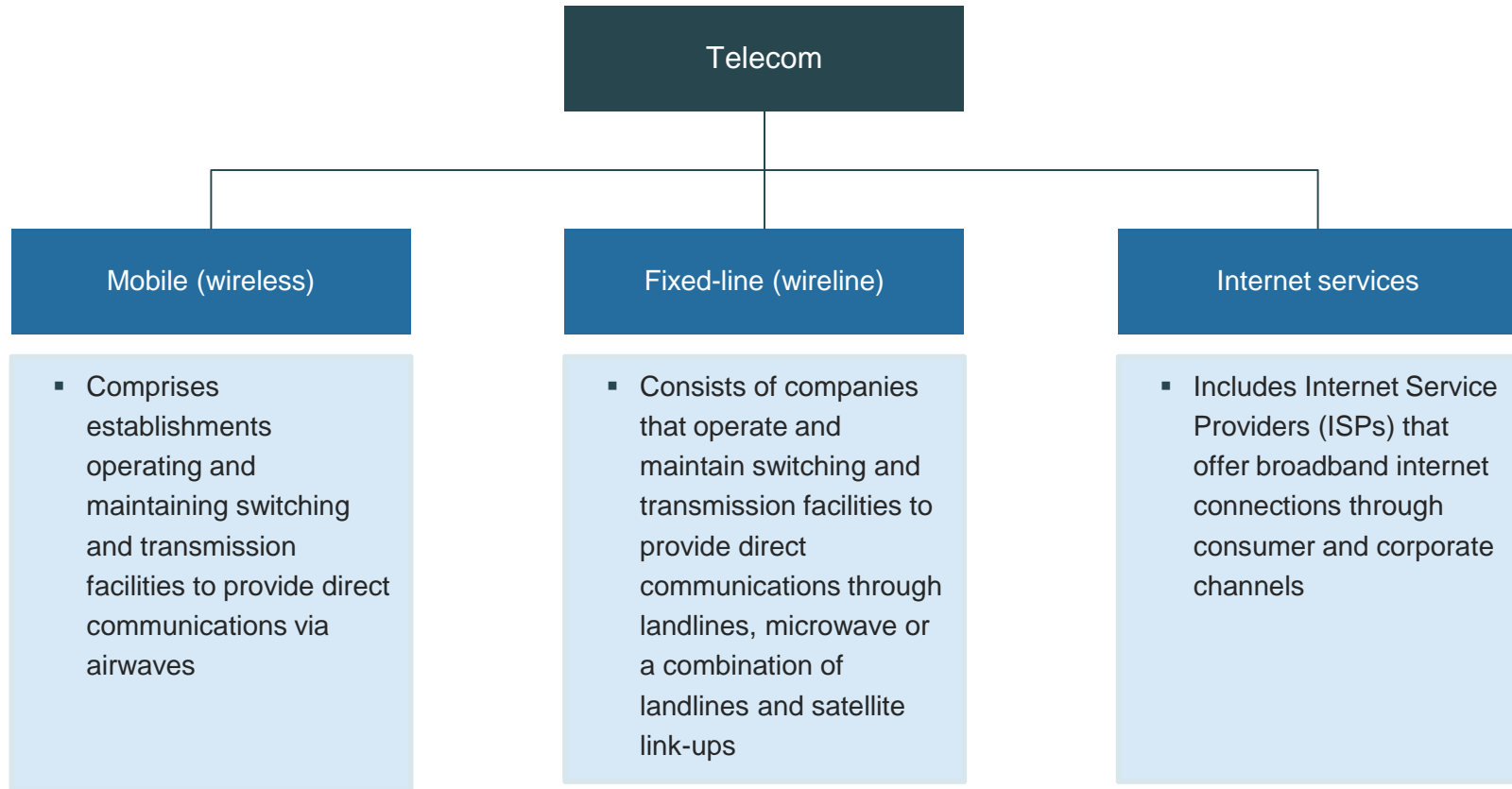
*Notes: *Combined iOS App Store, Google Play and third-party android, ^Nokia MBit Index 2018, PB- Petabytes*

Source: Economic Times, TRAI, App Annie, Department of Telecommunications

MARKET OVERVIEW



THE TELECOM MARKET SPLIT INTO THREE SEGMENTS

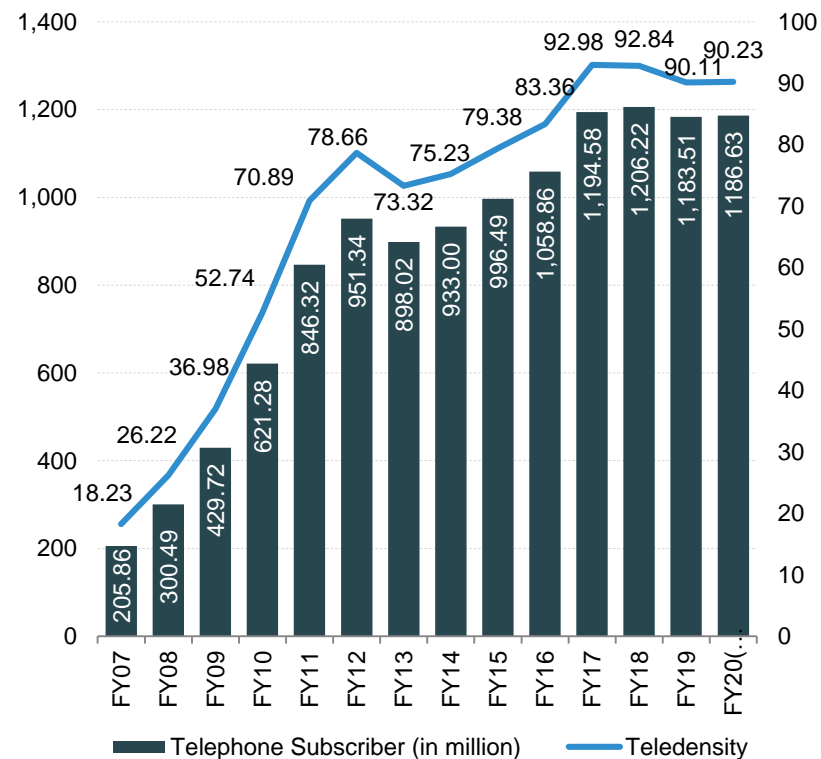


Source: TechSci Research

TELECOM SUBSCRIBER BASE EXPANDS SUBSTANTIALLY

- India is currently the second largest telecommunication market and has the second highest number of internet users in the world.
- India's telephone subscriber base expanded at a CAGR of 15.69 per cent, reaching 1,183.51 million during FY07–19.
- Tele-density (defined as the number of telephone connections for every 100 individuals) in India, increased from 18.3 per cent in FY07 to 90.11 per cent in FY19.
- Total telephone subscriber base and tele-density reached 1189.28 million and 90.23 per cent, respectively, at the end of July 2019.

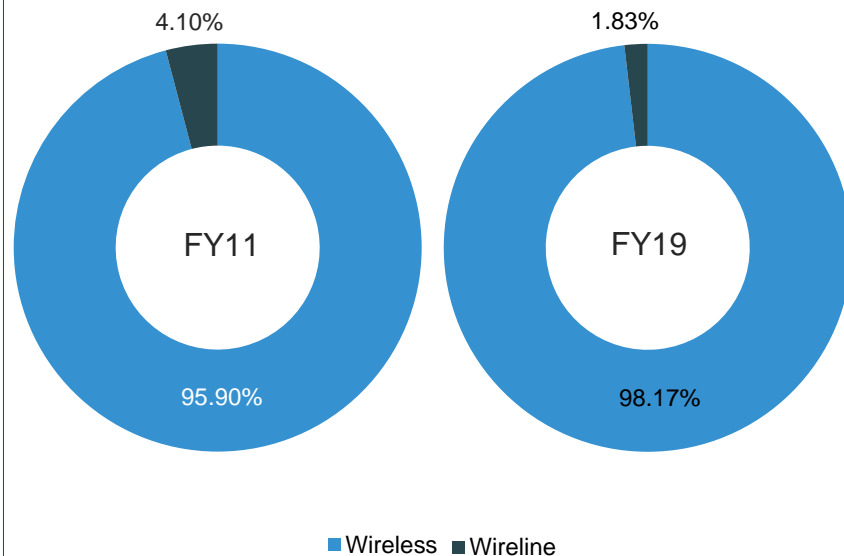
Growth in total subscribers and tele-density



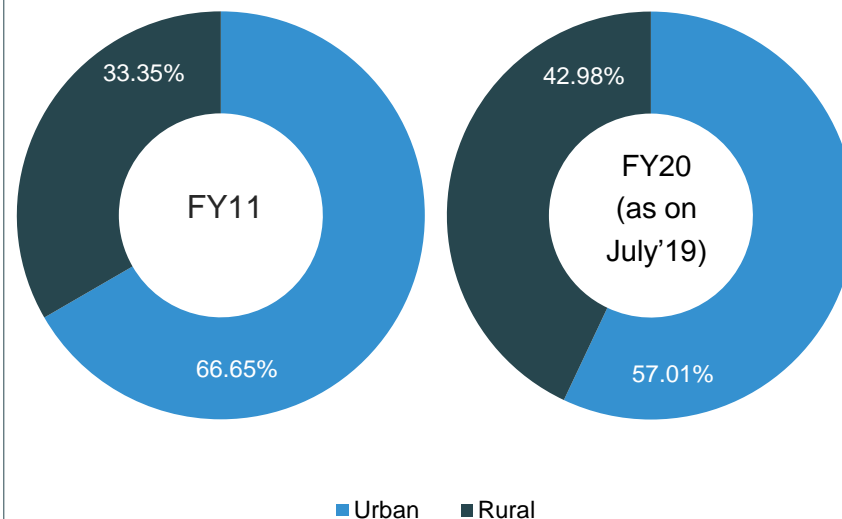
Note: CAGR - Compound Annual Growth Rate
Source: Telecom Regulatory Authority of India

WIRELESS AND RURAL SEGMENTS GAINING SHARE

Wireless and Wireline share in telephone subscriptions



Urban and Rural share in telephone subscriptions

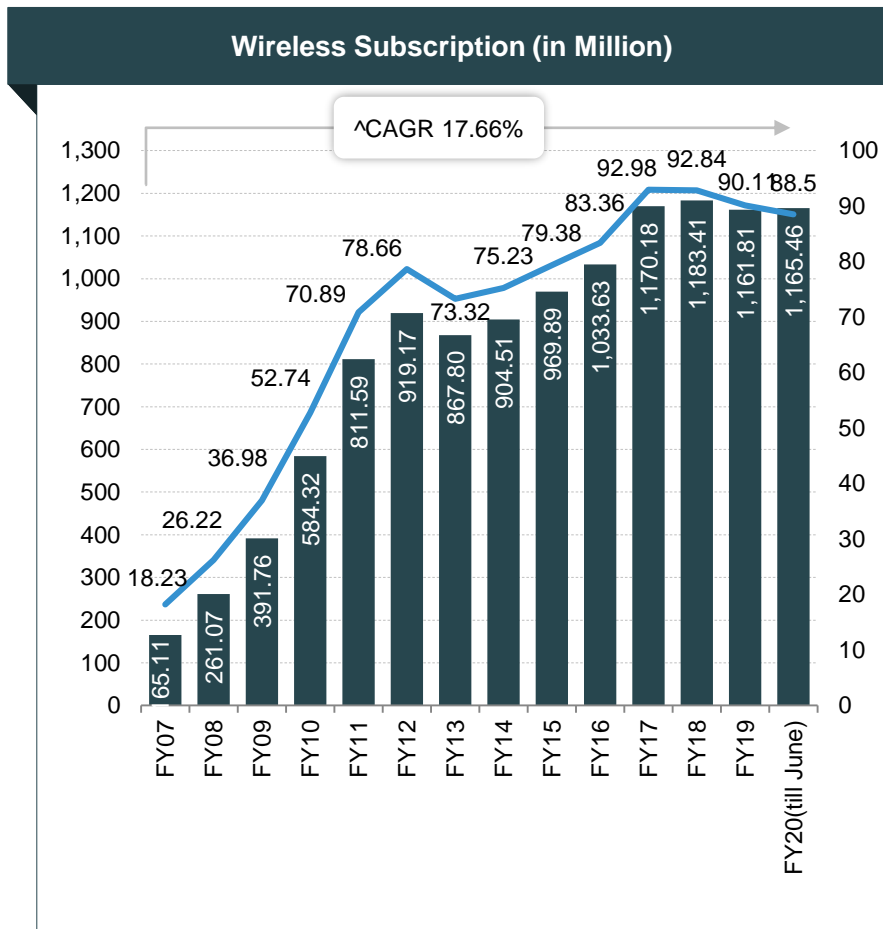


- The share of the wireless segment in India's telecommunications market has increased steadily.
- As of March 2019, the wireless segment comprises 98.17 per cent and in June 2019 it reached 98.2 per cent of telephone subscriptions, compared to 95.90 per cent in FY11.
- Similarly, share of rural subscribers in total telephone subscribers has surged as telecommunications penetration has increased.
- As of June 2019, rural subscribers form 56.68 per cent of total telephone subscribers, compared to 33.35 per cent in FY11.

Source: Telecom Regulatory Authority of India

WIRELESS SUBSCRIPTIONS WITNESS ROBUST GROWTH OVER THE YEARS

- Wireless subscriptions have grown robustly over the past few years.
- Between FY07-19, wireless subscriptions in the country increased at a CAGR of 17.66 per cent to 1,165.46 million.
- The growth in wireless subscriptions has led to a significant rise in wireless tele-density.
- Wireless tele-density of India has increased more than five-fold from 18.23 per cent in FY07 to 88.50 per cent as on June 2019.
- At the end of June 2019, wireless subscriptions stood at 1165.46 million while wireless tele-density reached 88.50 per cent.

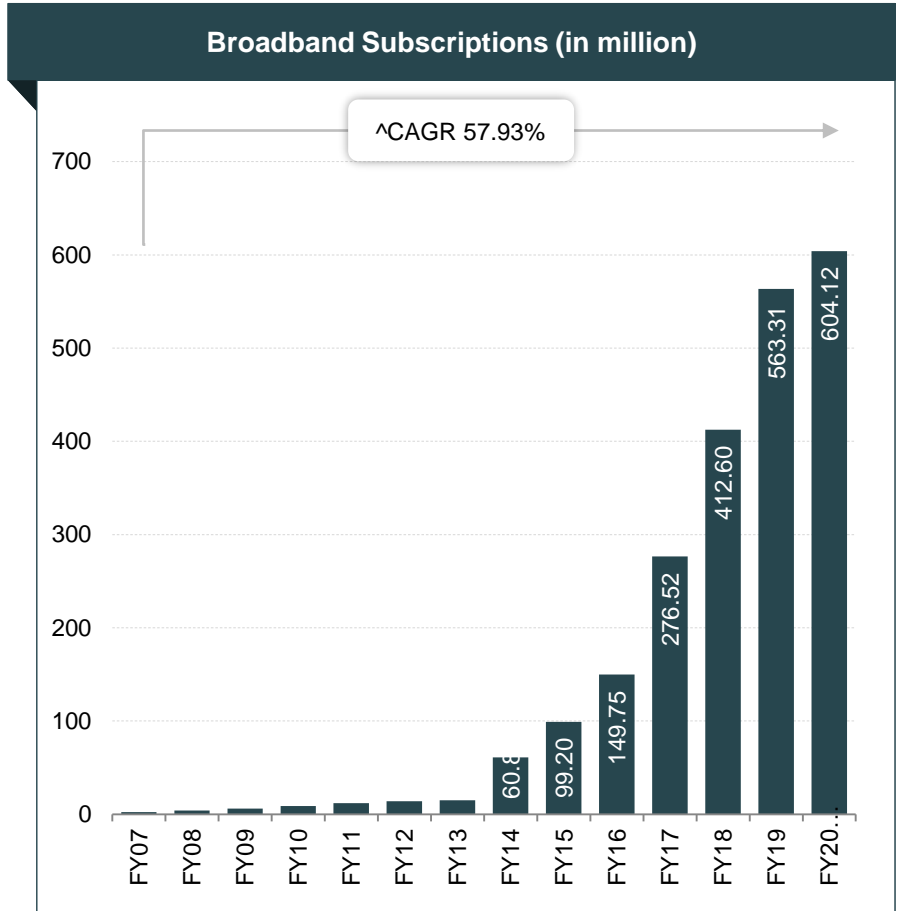


Note: CAGR - Compound Annual Growth Rate, ^CAGR is up to FY18

Source: Telecom Regulatory Authority of India

STRONG GROWTH IN BROADBAND DRIVES INTERNET ACCESS REVENUES

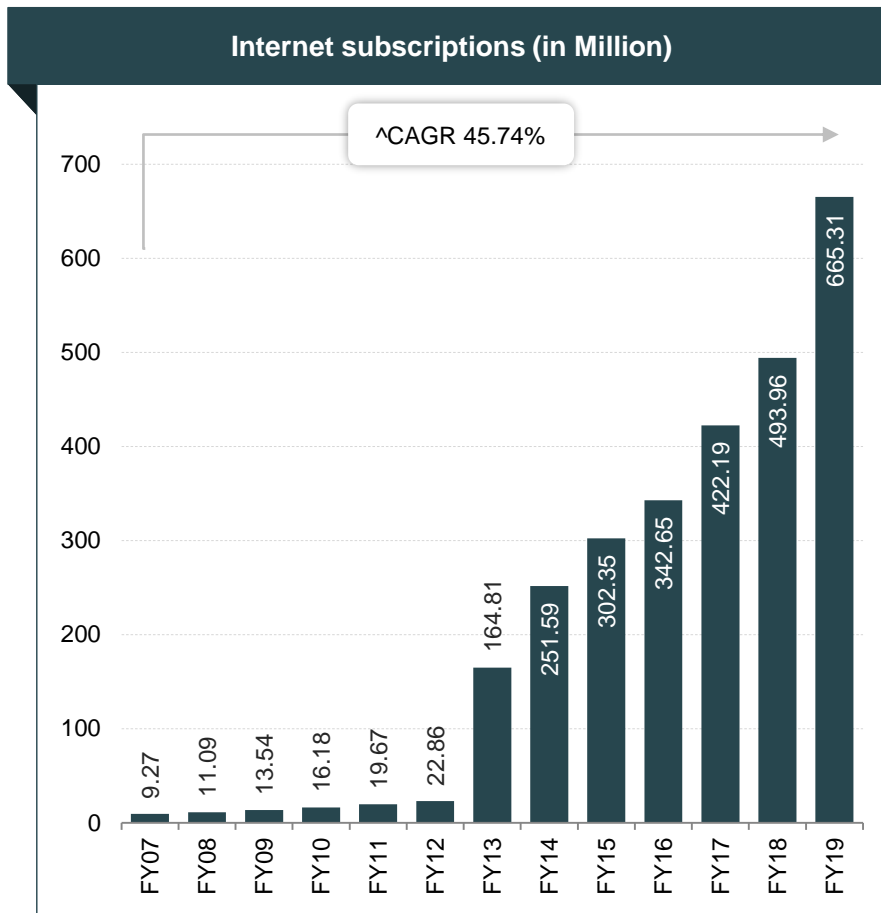
- Total broadband subscriptions in the country increased at a CAGR of 57.93 per cent during FY07–19 to reach 503.31 million. Subscriptions stood at 594.59 million, as of June 2019.
- The number of wired broadband subscriptions stood at 18.42 million, at the end of June 2019.
- Wireless broadband subscribers# stood at 576.17 million, at the end of June 2019.



Note: CAGR - Compound Annual Growth Rate, ^CAGR is up to FY18, #Includes Mobile devices users and Fixed wireless subscribers
Source: Telecom Regulatory Authority of India;

NUMBER OF INTERNET SUBSCRIBERS INCREASING AT A FAST PACE

- The number of internet subscribers in the country increased at a CAGR of 45.74 per cent during FY06-19 to reach 665.31 million in 2018-19.
- Internet subscriptions in India surpassed the 500-million mark by the end of June 2018.
- The number of internet subscribers in the country is expected to double by 2021 to 829 million#. Overall IP traffic is expected to grow 4-fold at a CAGR of 30 per cent by 2021.
- As of 2019, India holds the world's highest data usage per smartphone at an average of 9.8GB per month. It is expected to double to 18GB by 2024

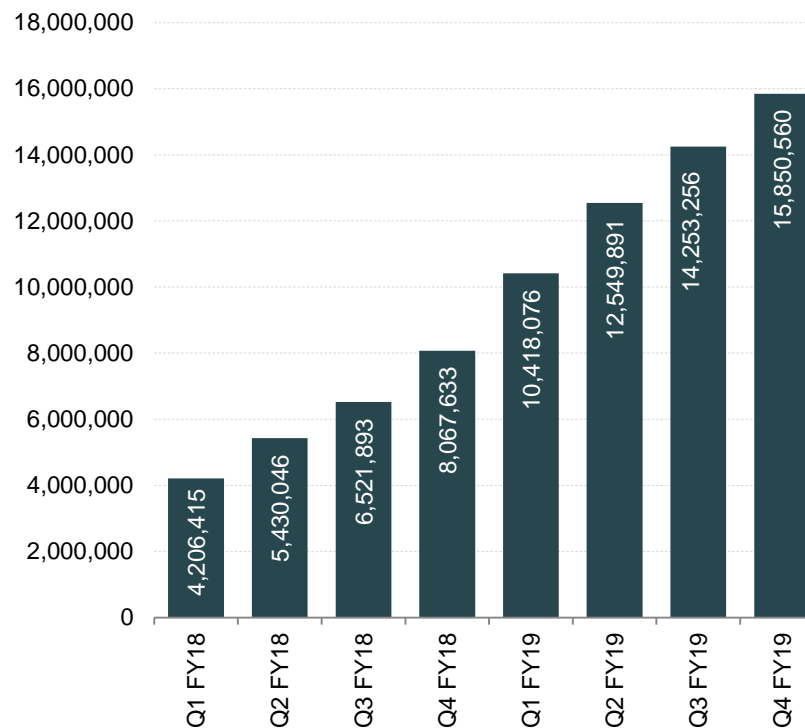


Note: CAGR - Compound Annual Growth Rate; BSNL - Bharat Sanchar Nigam Ltd, IP – Internet Protocol, ^CAGR is up to FY18, #as per CISCO,
Source: Telecom Regulatory Authority of India, Business Monitor International

EXPONENTIAL GROWTH IN DATA CONSUMPTION

- India holds the distinction of being the largest consumer of mobile data globally.
- Data consumption in the country has witnessed exponential growth over the course of the past few years.
- Total wireless data usage in India grew 119.00 per cent year-on-year to 1,58,50,560 terabytes between January-March 2019.

Total Wireless Data Usage (in Terabytes)



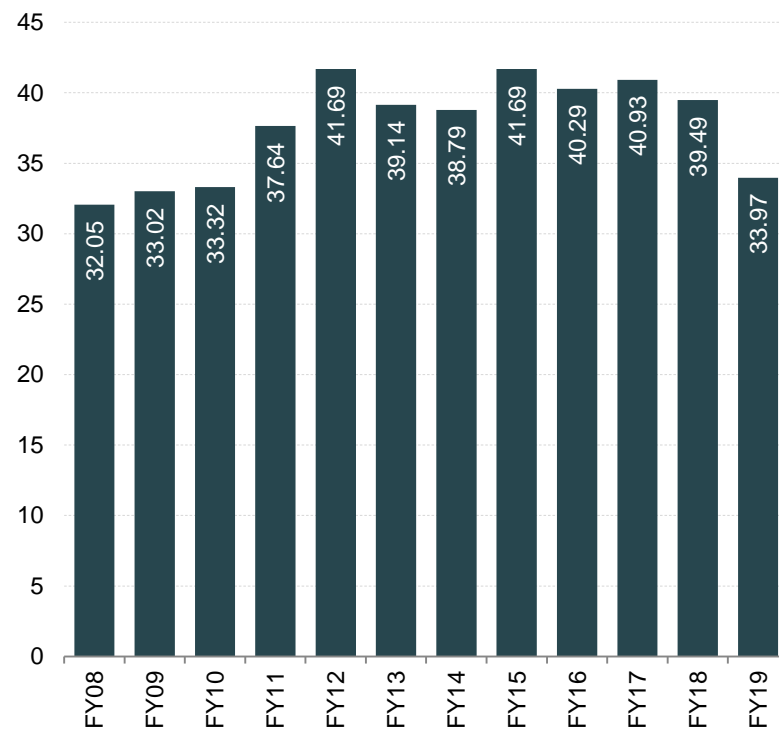
Note: CAGR - Compound Annual Growth Rate

Source: Telecom Regulatory Authority of India, Lok Sabha

SURGING TELECOM REVENUES

- Indian telecom sector's gross revenue grew from US\$ 32.05 billion in FY08 to US\$ 33.97 billion in FY19.
- Gross revenue of the telecom sector stood at Rs 237,416.6 crore (US\$ 33.97 billion) in 2018-19.
- Indian telecom sector's revenue is expected to grow by 7 per cent in FY20 backed by stabilizing tariff wars and increased spending by subscribers due to minimum recharge plans.

Telecom Sector Gross Revenue (US\$ billion)(as of Dec 2018)



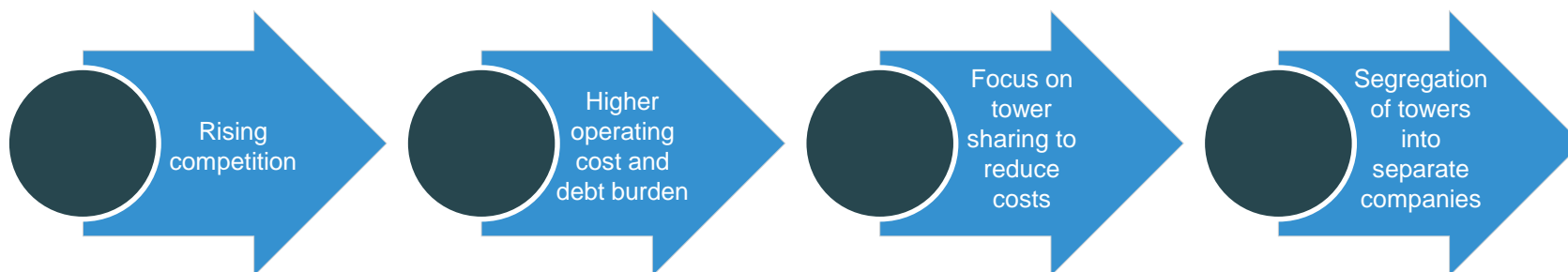
Note: CAGR - Compound Annual Growth Rate, FY – Indian Financial Year (April – March)

Source: Telecom Regulatory Authority of India's Performance Indicator Report, TechSci Research , Crisil

EMERGENCE OF TOWER INDUSTRY

- A surge in the subscriber base has necessitated network expansion covering a wider area, thereby creating a need for significant investment in telecom infrastructure
- To curb costs and focus on core operations, telecom companies have been segregating their tower assets into separate companies. For example: Reliance Communications has decided to finalise a deal to sell its stake in Reliance Infratel. The value of the deal is around US\$3.68 billion
- Creating separate tower companies has helped telecom companies lower operating cost and improve capital structure; this has also provided an additional revenue stream
- Inspired by the success seen by Indian players in towers business, most of the operators around the world are replicating the model

Emergence of Tower Industry



Source: TechSci Research

RECENT TRENDS AND STRATEGIES



NOTABLE TRENDS IN THE INDIAN TELECOM SECTOR

... (1/2)

Green Telecom

- The green telecom concept is aimed at reducing carbon footprint of the telecom industry through lower energy consumption
- The Government of India's National Digital Communication Policy, released in September 2018, envisages strengthening of mobile tower industry by promoting and incentivising deployment of solar and green energy for telecom towers.
- The Government of India proposed a joint task force between Ministry of New and Renewable Energy (MNRE) and Department of Telecommunication to promote green technology in the sector.

Expansion to Rural Markets

- There are over 62,443 uncovered villages in India; these would be provided with village telephone facility with subsidy support from the government's Universal Service Obligation Fund (thereby increasing rural tele-density)
- As of July 2019, the rural subscriber base accounted for 42 per cent of the total subscriber base, thereby fuelling growth across the sector

Emergence of BWA Technologies

- The most significant recent developments in wireless communication include BWA technologies such as WiMAX and LTE
- In March 2018, Bharti Airtel its VoLTE services in Kolkata while Vodafone launched VoLTE services in Jaipur and Jodhpur.
- As of June 2018, BSNL is expected to launch its 5G services by 2020.
- India is expected to be the second largest market in 5G services followed by China in the next 10 years.

Internet Of Things (IoT)

- IoT is the concept of electronically interconnected and integrated machines, which can help in gathering and sharing data. The Indian Government is planning to develop 100 smart city projects, where IoT would play a vital role in development of those cities.
- Reliance Jio has partnered with Samsung Electronics to set up a nationwide Internet of Things (IoT) network
- As of August 2019, Jio's IoT platform is ready to be commercially available from January 2020

Notes: BWA - Broadband Wireless Access, TRAI - Telecom Regulatory Authority of India

Source: TechSci Research

NOTABLE TRENDS IN THE INDIAN TELECOM SECTOR

... (2/2)

Consolidation

- Vodafone India and Idea have merged into Vodafone idea. Vodafone Idea is unifying assets and aims to complete network integration by June 2020.
- Airtel's acquisition of Tata Teleservices' mobile business was given approval by Competition Commission of India (CCI) in November 2017. As of December 2018, the deal was cleared by the National Company Law Tribunal (NCLT).

Rising investments

- In 2017, Vodafone disclosed its plans to invest US\$1,310 million to upgrade and expand Vodafone India network coverage and US\$ 655 million to upgrade its technology centre
- The new National Digital Communications Policy 2018 has envisaged attracting investments worth US\$ 100 billion in the telecommunications sector by 2022.

Outsourcing non-core activities

- As part of the recent outsourcing trend, operators have outsourced functions such as network maintenance, IT operations and customer service

Mobile banking

- Department of Posts launched mobile banking for its saving account customers.
- The number of mobile wallet transaction increased 5 per cent month-on-month to 325.28 million in July 2018.
- In March 2017, the government set a target of achieving 25 billion digital transactions for banks with the help of PoS machines, transactions enabled and merchants, which have been added in firms
- As of August 2019, more than 503 banks have been permitted to provide mobile banking services in India.

Investments in optical fibre network

- Reliance Jio Infocomm is going to expand its optical fibre network to over 1,100 cities under its JioGigaFiber brand. In August 2019, commercially launched Jio GigaFiber as wired broadband service.
- In January 2019, Himachal Futuristic Communications Ltd (HFCL) decided to expand its optical fibre cable (OFC) manufacturing capacity to 10.5 million fkm from 7 million fkm.

Notes: FKM – Fibre Kilometre

Source: 'Searching for New Frontiers of growth: Indian Banks'- PwC, TechSci Research , Reserve Bank of India

Marketing strategy

- Players are using innovative marketing strategies to succeed in this sector. For example,
 - Vodafone Idea launched #StrongerEveryHour with aim to highlight the improved network of Vodafone SuperNet 4G - India's Data Strong Network.
 - Airtel launched new ad campaign 'Sab Kuch Try Karo, Fir Sahi Chuno'

Differentiation

- Players differentiate themselves by providing different services to customers.
- Bharti Airtel has already partnered with Amazon Prime and Hotstar and is expected to tie up with Netflix to offer free subscription to Netflix's content on its mobile customers.

Reduced number of plans

- Players have reduced the number of plans on offer and now offer a limited number of simple tariff plans along with marquee plans.
- This has simplified choosing plans for customers and customers can choose the best deals for themselves.






Pricing strategy

- Players price their products very carefully due to the price sensitive nature of customers and high competition in the sector.

Notes: CDMA – Code Division Multiple Access, GSM - Global System for Mobile Communication

Source: Company websites, TechSci Research

KEY COMPANIES IN THE MARKET

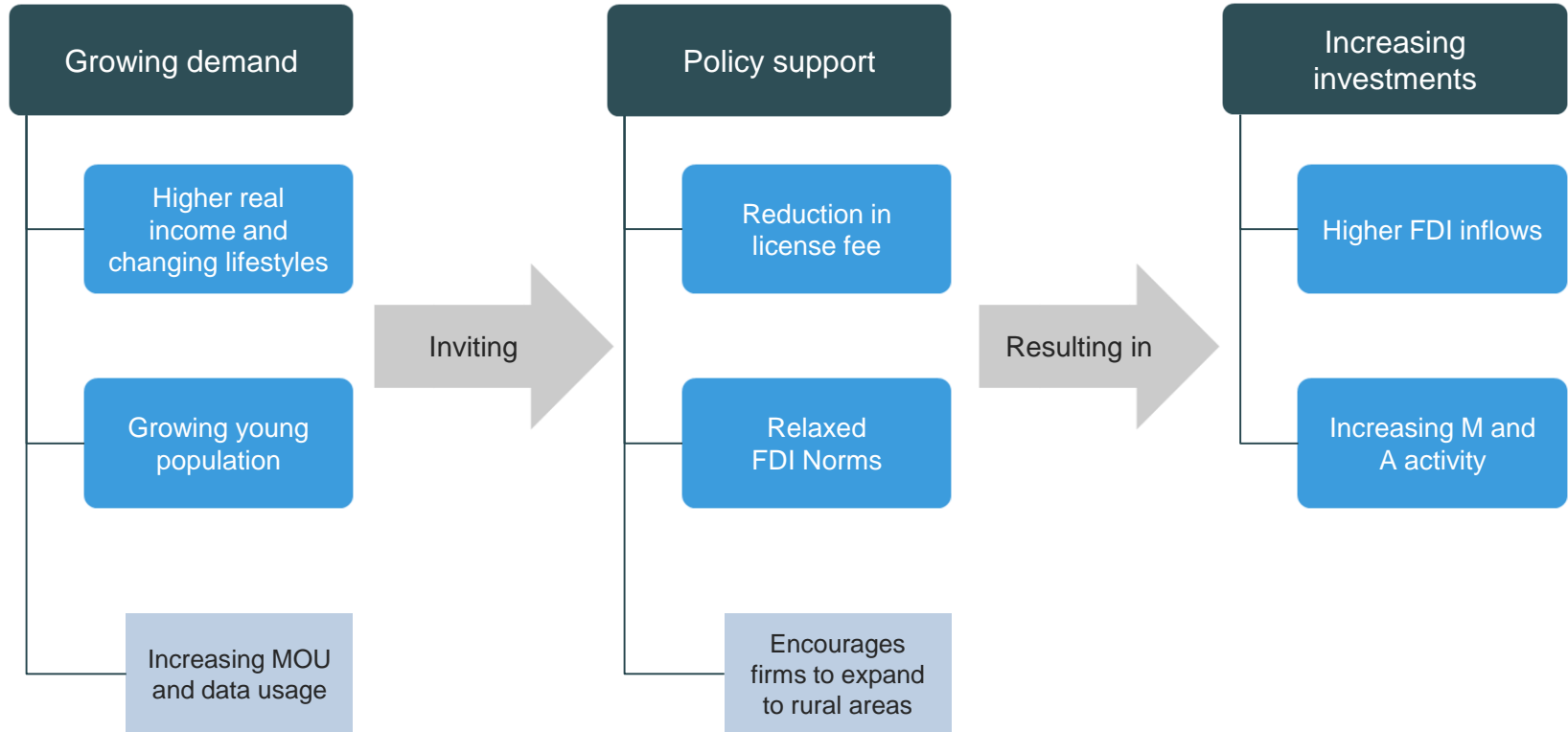
Company	Ownership	Presence
 <p>Mahanagar Telephone Nigam Ltd (MTNL)</p>	Government (56.3 per cent), Life Insurance Corporation (18.8 per cent)	Fixed-line and mobile telephony (in Delhi and Mumbai), data and Internet
 <p>Bharat Sanchar Nigam Ltd (BSNL)</p>	Government (100 per cent)	Fixed-line and mobile telephony (GSM – outside Delhi and Mumbai), data and Internet in 22 circles
 <p>Bharti Airtel</p>	Bharti Group (45.48 per cent), Pastel Ltd (14.79 per cent), Indian Continent Investment (6.65 per cent),	Broadband and mobile (GSM) in 22 circles
 <p>Vodafone Idea Limited</p>	Aditya Birla Group and Vodafone Group partnership	Broadband and mobile (GSM) in 22 circles
 <p>Reliance Jio Infocomm</p>	Reliance Industries Limited.	Broadband and mobile

Source: Companies' websites, Moneycontrol

GROWTH DRIVERS



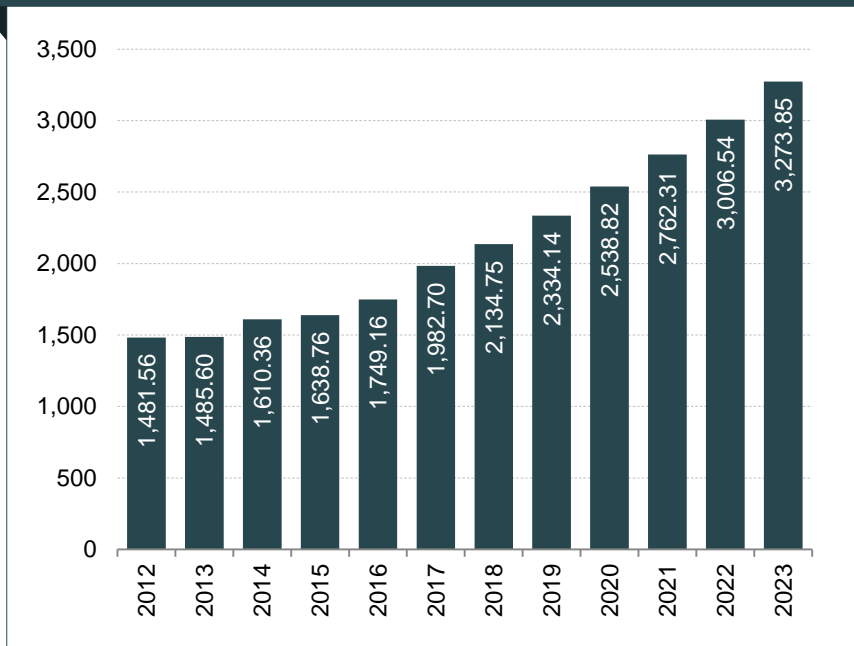
SECTOR BENEFITS FROM RISING INCOME, GROWING YOUNG POPULATION



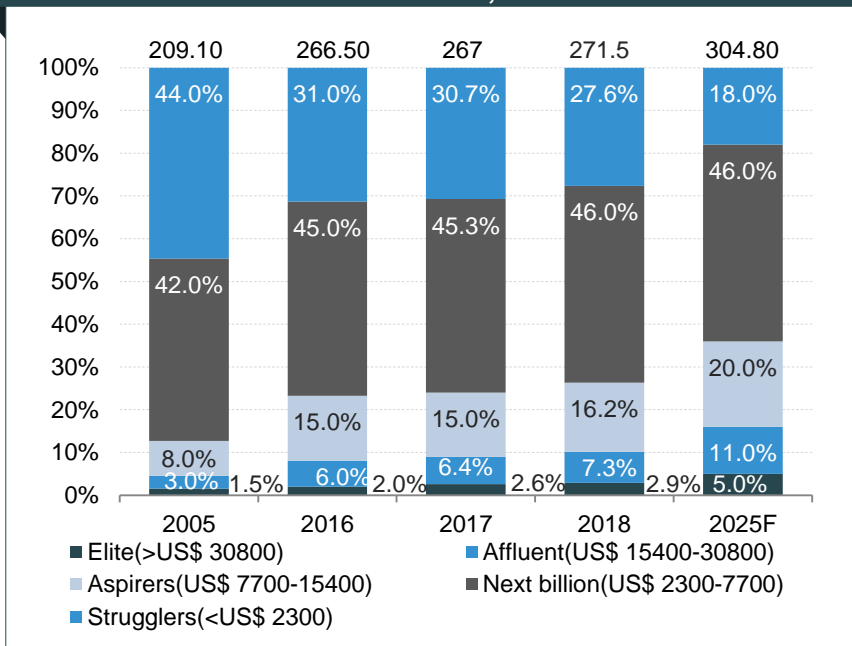
Note: FDI - Foreign Direct Investment, MOU - Minutes of Use per month and per subscriber, M&A - Mergers and Acquisitions

RISING INCOME AND GROWING RURAL MARKET FUELS DEMAND FOR TELECOM SERVICES

GDP per capita at current prices* (US\$)



**Indian residents shifting from low to high income groups (%)
Million Household, 100%^**



- Incomes have risen at a brisk pace in India and will continue rising given the country's strong economic growth prospects.
- GDP per capita of India is expected to grow at a CAGR of 7.47 per cent from US\$ 1,481.56 in 2012 to US\$ 3,273.85 in 2023.
- Increasing income has been a key determinant of demand growth in the telecommunication sector in India
- The emergence of an affluent middle class is triggering demand for the mobile and internet segments
- A young, growing population is aiding this trend (especially demand for smart phones).

Notes: CAGR - Compound Annual Growth Rate, *Estimates after 2013, ^Data for 2005, 2006 and 2025 is from BCG's *The New Indian: The Many Facets of a Changing Consumer*, for 2017 from IBM-Kalaari Capital's *Imagining a Trillion Dollar Digital India* and for 2018 from Redseer Consulting's *Indian Habit of Being Healthy* **Source:** IMF World Economic Outlook Database April 2018

STRONG POLICY SUPPORT CRUCIAL TO THE SECTOR'S DEVELOPMENT ... (1/3)

To compensate the consumers in case of call drop

- In August 2017, TRAI directed operators to have a call-drop rate of not greater than 2 per cent.
- The policy measures of TRAI have had positive impact. Call-drops in the country have decreased from 0.94 per cent in 2016 to 0.52 per cent in March 2018.

Standards of quality wireline and wireless services

- In 2015, Telecom Regulatory Authority of India made regulations to amend the Standards of quality of wireline (telephone service) and cellular mobile telephone services. These regulations has been laid down to ensure better and effective compliance with the quality of service regulations and to protect the interest of the customers

Relaxed FDI norms

- FDI cap in the telecom sector has been increased to 100 per cent from 74 per cent; out of 100 per cent, 49 per cent will be done through automatic route and the rest will be done through the FIPB approval route
- FDI of up to 100 per cent is permitted for infrastructure providers offering dark fibre, electronic mail and voice mail

Skill Development

- In May 2017, Microsoft India signed a Memorandum of Understanding with the Telecom Sector Skill Council (TSSC) to encourage skill development through "Project Sangam".
- In a major push for Prime Minister Narendra Modi's 'Skill India' mission, Microsoft's Indian-born CEO Satya Nadella launched a Cloud hosted platform named as "Project Sangam" to help the government not only train but also assist people get jobs via professional networking website LinkedIn, which was acquired by the company last year.

Notes: FDI - Foreign Direct Investment, FIPB - Foreign Investment Promotion Board

Source: TRAI, TechSci Research

STRONG POLICY SUPPORT CRUCIAL TO THE SECTOR'S DEVELOPMENT ... (2/3)

Telecommunication Tariff Order

- In February 2018, TRAI passed the Telecommunication Tariff (63rd amendment) order, according to which, telecom firms are free to give promotional offers to customers if the offers are transparent, non-predatory and non-discriminatory.

Set up internet connections

- The Department of Information Technology intends to set up over 1 million internet-enabled common service centres across India as per the National e-Governance Plan
- On 8th August 2016, the Telecom Regulatory Authority of India (TRAI) made the 10th amendment to the TCPR (Telecom Consumers Protection Regulations) permitting telecom companies to offer data packs having maximum validity of 365 days

Reduction in license fees

- In January 2015, the Government of India recommended reduction in license fees of telecom operators by 6 per cent, telecom operators currently pay 8 per cent of adjusted gross revenue as licence fee
- The issuance of several international and national long-distance licenses has created opportunities and attracted new companies into the market

Make in India

- The Government of India has announced the Phased Manufacturing Programme (PMP) to promote domestic production of mobile handsets. This initiative will help in building a robust indigenous mobile manufacturing ecosystem in India and incentivise large scale manufacturing.

Notes: USOF - Universal Service Obligation Fund; OFC - Optical Fibre Cable, WiMAX - Worldwide Interoperability for Microwave Access Telecommunications

Source: TRAI, TechSci Research

STRONG POLICY SUPPORT CRUCIAL TO THE SECTOR'S DEVELOPMENT ... (3/3)

Financial support

- The USOF is expected to extend financial support to operators providing services in rural areas and encourage active infrastructure sharing among operators

Enhanced spectrum limit

- The prescribed limit on spectrum would be increased from 6.2MHz to 2x8 MHz (paired spectrum) for GSM technology in all areas other than Delhi and Mumbai, where it will be 2x10MHz (paired spectrum)
- Telecom players can, however, obtain additional frequency; there will be an auction of spectrum subject to the limits prescribed for the merger of licenses
- In January 2018, the government revised cap on spectrum holding from 25 per cent to 35 per cent.

Telecommunication amendment order for broadcasting and cable services

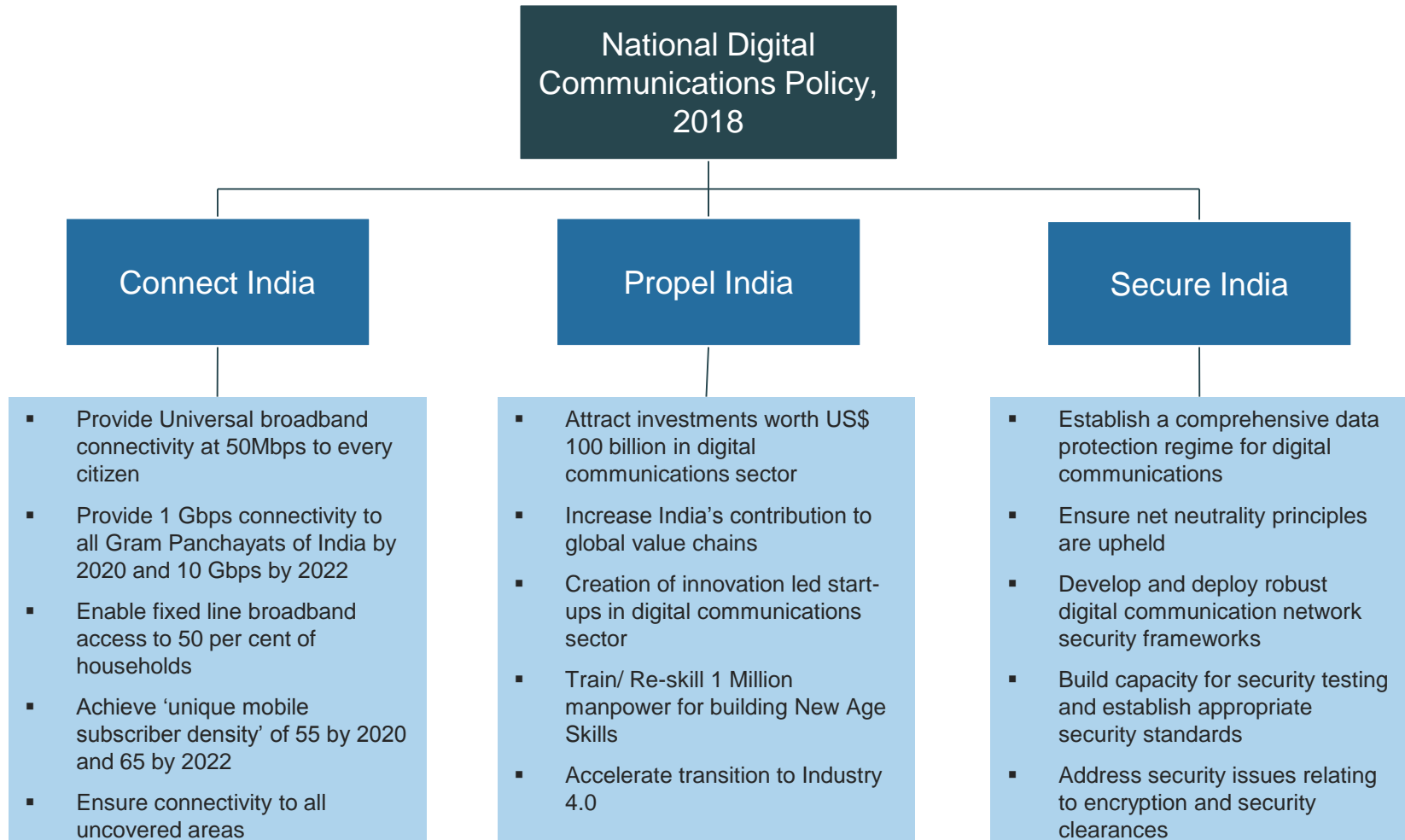
- In 2015, telecom authority issued this order mandating every DTH operator to specify the tariff for supply and installation of the customer premises equipment. DTH operator should specify the refundable security deposit, installation charges, monthly rental charge and activation.
- As of July 2019, India achieved 100 per cent digitisation of cable TV network.

Indian Mobile Congress

- In October 2018, India held the second edition of the Indian Mobile Congress. The conference brought together more than 5,000 delegates and 50,000 visitors.
- Global and local industry leaders such as Samsung, Intel, Ericsson, Nokia, Airtel, Reliance Jio and Vodafone participated in the event, apart from others.

Notes: USOF - Universal Service Obligation Fund; OFC - Optical Fibre Cable

Source: TRAI, TechSci Research



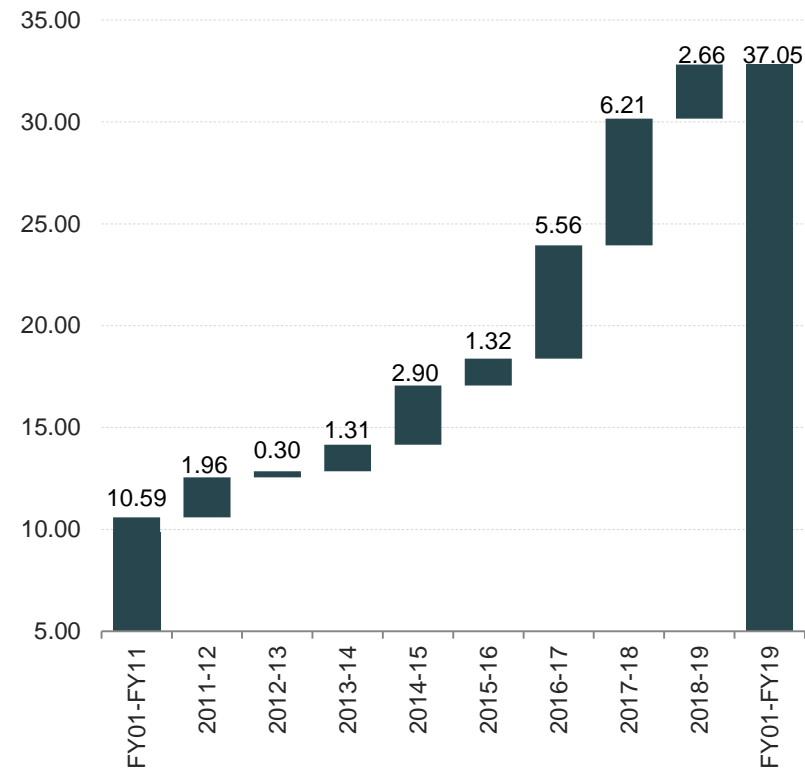
Note: Mbps – Mega bits per second, Gbps – Giga bits per second

Source: National Digital Communications Policy, 2018

FOREIGN INVESTMENTS FLOWING IN ... (1/2)

- FDI inflows into the telecom sector during April 2000-July 2019 totalled to US\$ 37.05 billion.
- During this period, FDI into the sector accounted for a share of nearly 7.93 per cent of total FDI inflows into the country.

FDI inflows in telecommunication in April 2000-July 2019 (US\$ billion)



Source: Department for Promotion of Industry and Internal Trade (DPIIT)

FOREIGN INVESTMENTS FLOWING IN ... (2/2)

- Vodafone India and Idea Cellular have merged into 'Vodafone Idea' to become India's largest telecom company, as of September 2018.

Foreign investment in India

Target	Acquirer	Acquisition price (US\$ million)	Division acquired
Bharti Airtel	Singtel (as of February 2019)	367.15	Increase in stake to 48.90 per cent
Bharti Airtel	Singtel (2018)	411.02	Increase in stake to 48.90 per cent
Ascend Telecom Infrastructure Pvt. Ltd.	IDFC Alternatives (2017)	54.29	33 per cent stake
Telenor	Bharti Airtel (2017)	N/A	Infrastructure and Contracts
Bharti Airtel's operations in Burkina Faso and Sierra Leone	Orange SA (2016)	900	100 per cent stake
MTS	Reliance Communication (2015)	736.98	8 – 10 per cent stake
Augere Wireless	Bharti Airtel (2015)	21.3	100 per cent stake
Bharti Airtel	SingTel(2013)	302	Increases stakes to 32.34 per cent
Bharti Airtel	Qatar Foundation Endowment(2014)	1,260	PE deal – 5 per cent stake
Vodafone India Ltd	Vodafone International Holdings (2014)	1,641	Increases stakes to 100 per cent
Ascend Telecom	Ascend Telecom Infrastructure Pvt Ltd	54.29	33 per cent stake

Notes: M&A - Merger and Acquisition, PE - Private Equity

Source: Thomson Banker, Deal Tracker, Grant Thornton, TechSci Research

OPPORTUNITIES



OPPORTUNITIES ACROSS SEGMENTS IN THE INDUSTRY ... (1/2)

Increasing mobile subscribers

- India's mobile subscriber base is expected to reach 1,420 million by 2024 from 1,200 million in 2018, with 80 per cent users having 4G connections.^
- As of January 2019, Airtel becomes the first operator to launch high speed data service, i.e 4G in group of islands like Andaman and Nicobar.

Untapped rural markets

- By July 2019, rural tele-density reached 56.98 per cent, growing from 43.05 per cent as of March 2016
- Rural wireless tele-density in the country increased to 56.98 per cent by July 2019 from 50.88 per cent as of March 2016.

Rising internet penetration

- Internet penetration is expected to grow steadily and is likely to be bolstered by government policy
- Number of broadband subscribers reached 604.12 million at the end of July 2019.
- To encourage cash economy, Indian government announced to provide free Wi-fi to more than 1,000 gram panchayats.

Note: ^Ericsson Mobility Report November 2018

Source: KPMG, TRAI, TechSci Research

OPPORTUNITIES ACROSS SEGMENTS IN THE INDUSTRY ... (2/2)

Development of telecom infrastructure

- TRAI has made several recommendations for the development of telecom infrastructure, including tax benefits and recognising telecom infrastructure as essential infrastructure

Growth in MVAS and cloud computing

- The Indian Mobile Value-Added Services (MVAS) industry is expected to grow at a CAGR of 18.3 per cent during the forecast period 2015–2020 and reach US\$ 23.8 billion by 2020.

Telecom equipment market

- Telecom equipment market is expected to reach US\$ 30 billion by 2020.
- In October 2018, telecom equipment producers committed over Rs 4,000 crore (US\$ 554 million) worth of investments at the Indian Mobile Congress.
- Further, in October 2018, Swedish communications major Ericsson commenced exports of 5G-ready telecom equipment from the country.

Growing Cashless Transactions

- In order to overcome the cash related problems being faced by people, due to demonetisation, Paytm launched a service through which consumers and merchants can pay and receive money instantly, without an internet connection
- This has enabled non-smartphone users to go cashless.
- Value of Unified Payments Interface (UPI) transactions grew to more than Rs 161,456.56 crore (US\$ 955 million) in September 2019.

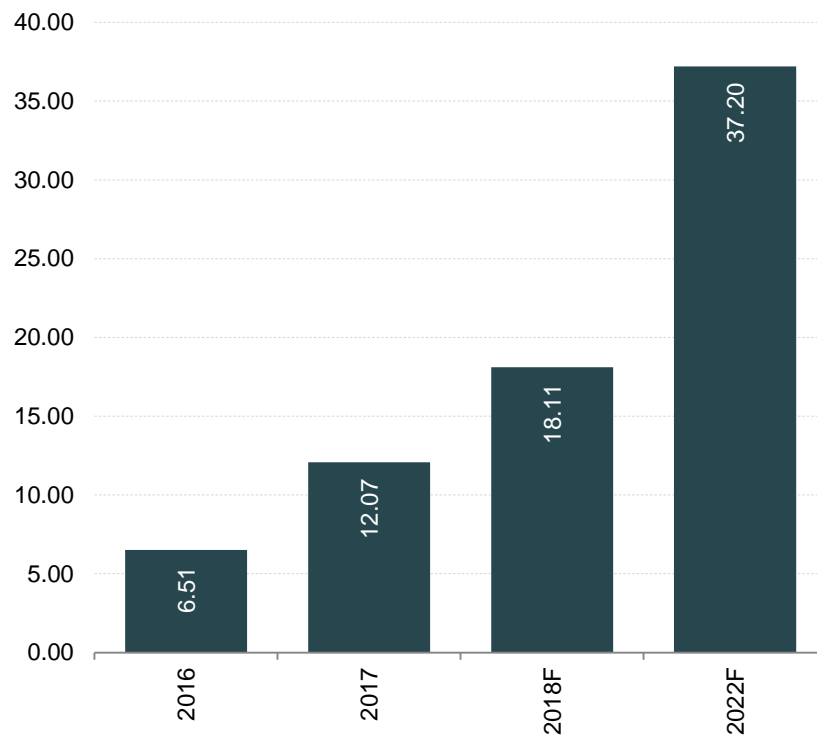
*Notes: VAS - Value-Added Services, NTP - National Telecom Policy, * - as per IDC, ^ - as per Electronics Industry Associations*

Source: Press Information Bureau, Government of India, TechSci Research

MOBILE APPLICATION MARKET: FAST GROWING SEGMENT

- In 2017, India surpassed USA to become the second largest market in terms of number of app downloads.
- App downloads in the country increased from 6.51 billion in 2016 to 12.07 billion in 2017.
- Moreover, during the first quarter of 2018, India became the world's fastest-growing market for mobile applications. The country remained as the world's fastest growing market for Google Play downloads in the second and third quarter of 2018.
- App downloads in India are expected to increase to 18.11 billion in 2018F and 37.21 billion in 2022F.
- The segment's growth is expected to be driven by increasing mobile connections and availability of low-range smartphones
- Over 100 million apps are downloaded every month across different platforms such as iOS, Blackberry, Nokia and Android
- As of January 2019, India has witnessed a 165 per cent growth in app downloads in the past two years.
- 4.8 billion downloads of mobile applications was registered in India in three months of 2019 at the end of March 2019.

App downloads^ in India (in billions)



Notes: F – Forecast, *As per latest data available, ^Combined iOS App Store, Google Play and third-party android

Source: Gartner, Deloitte, Assorted News Articles, App Annie, TechSci Research

KEY INDUSTRY ORGANISATIONS



Association of Unified Telecom Service Providers of India (AUSPI)

Address: B-601, Gauri Sadan 5, Hailey Road, New Delhi – 110 001, India
Tel: 91 11 23358585
Fax: 91 11 23327397
Website: <http://www.auspi.in/>

Association of Competitive Telecom Operators (ACTO)

Address: 601, Nirmal Tower, 26, Barakhamba Road, Connaught Place, New Delhi – 110 001, India
Tel.: 91 11 43565353 / 43575353
Fax: 91 11 43515353
E-mail: info@acto.in
Website: www.acto.in

Internet and Mobile Association of India (IAMAI)

Address: F-36, Basement, East of Kailash, New Delhi – 110 065, India
Tel: 91 11 46570328
E-mail: kalyan@iamai.in
Website: www.iamai.in

Cellular Operators Association of India

Address: 14, Bhai Vir Singh Marg, Sector 4, Gole Market, New Delhi – 110001, India
Tel: 91 11 2334 9275
E-mail: contact@coai.in
Website: www.coai.com

USEFUL INFORMATION



- BWA: Broadband Wireless Access
- CAGR: Compound Annual growth rate
- DoT: Department of Telecommunication
- FDI: Foreign Direct Investment
- FTTH: Fibre To The Home
- FY: Indian Financial Year (April to March)
- IMF: International Monetary Fund
- INR: Indian Rupee
- IPTV: Internet Protocol Television
- M&A: Mergers and Acquisitions
- MoU: Minutes of Use per month and per subscriber
- MPEG: Moving Picture Experts Group
- OFC: Optical Fibre Cable
- TRAI: Telecom Regulatory Authority of India
- USOF: Universal Service Obligation Fund
- US\$: US Dollar
- VAS: Value-Added Services
- WiMAX: Worldwide Interoperability for Microwave access telecommunications

Wherever applicable, numbers have been rounded off to the nearest whole number

EXCHANGE RATES

Exchange Rates (Fiscal Year)

Year INR	INR Equivalent of one US\$
2004-05	44.95
2005-06	44.28
2006-07	45.29
2007-08	40.24
2008-09	45.91
2009-10	47.42
2010-11	45.58
2011-12	47.95
2012-13	54.45
2013-14	60.50
2014-15	61.15
2015-16	65.46
2016-17	67.09
2017-18	64.45
2018-19	69.89

Exchange Rates (Calendar Year)

Year	INR Equivalent of one US\$
2005	44.11
2006	45.33
2007	41.29
2008	43.42
2009	48.35
2010	45.74
2011	46.67
2012	53.49
2013	58.63
2014	61.03
2015	64.15
2016	67.21
2017	65.12
2018	68.36

Source: Reserve Bank of India, Average for the year

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