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INDUSTRY REPORT

Market Landscape and Competitive Analysis of the Telecommunications Infrastructure Services, Infrastructure digitalization solution Services and Surveillance Solutions Industries in the PRC and Jiangxi Province

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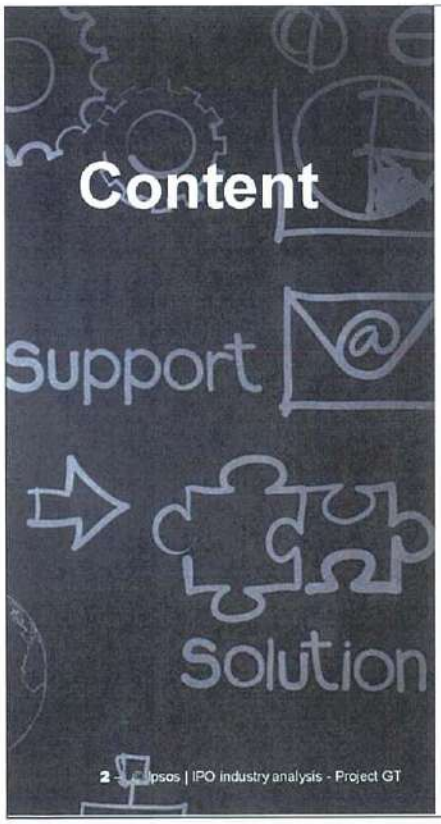

Content

Objective and Scope Coverage

Analysis timeframe

- Reference Year: 2023
- Prior Year: 2019-2023
- Future: 2024-2028

Geographical coverage

- The PRC and Jiangxi Province

  Eastern Regions include Beijing, Tianjin, Hebei Province, Shanghai, Jiangsu Province, Zhejiang Province, Fujian Province, Shandong Province, Guangdong Province and Hainan Province.
  Central Regions include Shanxi Province, Anhui Province, Jiangxi Province, Henan Province, Hubei Province and Hunan Province.
  Western Regions include Inner Mongolia, Guangxi, Chongqing, Sichuan Province, Guizhou Province, Yunnan Province, Tibet, Shaanxi Province, Gansu Province, Qinghai Province, Ningxia and Xinjiang.
  North-eastern Regions include Liaoning Province, Jilin Province and Heilongjiang Province

Objective

To assess the industry development, trends and competitive landscape of the telecommunications infrastructure services industry, digitalization solution services Industry, and surveillance solutions industry in the PRC and Jiangxi Province

Market Segments

- Telecommunications Infrastructure Services industry
- digitalization solution services Industry
- Surveillance Solutions Industry

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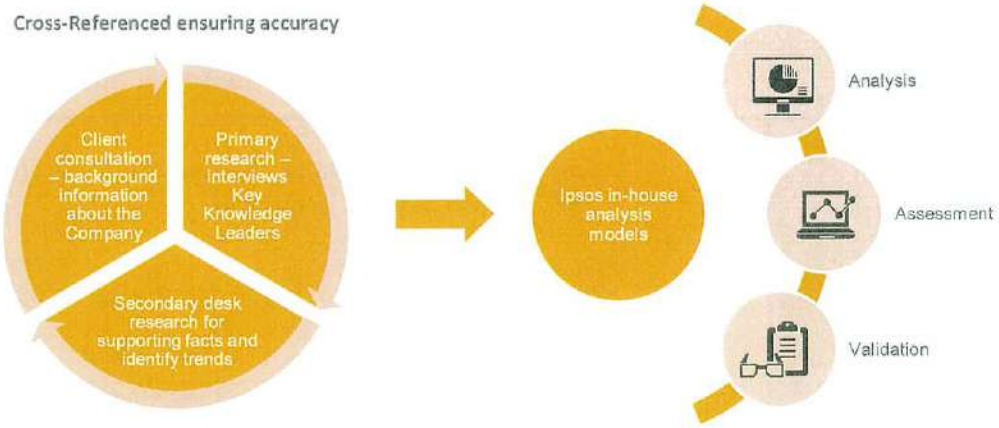
Methodology

The report utilized a full circle and multi-level information sourcing process to ensure accuracy, and Ipsos' in-house analysis models and techniques to provide industry related insights.



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Research Outcome (1/6)

Part 1: Overview of the macro-economic environment in the PRC and Jiangxi Province

- Overview of the macro-economic environment:
  - China and Jiangxi Province GDP, GDP per capita and GDP growth rate (2019-2028F)
  - China and Jiangxi Province population and growth rate (2019-2028F)
  - China and Jiangxi Province urbanization rate (2019-2023)
  - China and Jiangxi Province fixed asset investment and growth rate (2019-2023)
  - China and Jiangxi Province mobile and internet user data (2019-2028F)
    i. Number of broadband internet subscribers
    ii. Number of mobile telephone subscribers
    iii. Average data flow per one month per one user (DOU)
    iv. Number of 4G/5G services subscribers

Research Outcome (2/6)

Part 2: Overview of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

- Qualitative research on telecommunication infrastructure services industry:
  - Definition of telecommunication infrastructure services industry
  - Value chain analysis
  - Government policy regulations
  - Industry standard, qualification, license and registration
  - Competitive bidding process
  - Future demand and trends of the industry
- Completed investment in the telecommunications network construction in the PRC and Jiangxi Province (2019-2028F)
- Overall telecommunications network base station quantity and prediction in the PRC and Jiangxi Province (2019-2028F)
- Overall telecommunications network optical cable quantity and prediction in the PRC and Jiangxi Province (2019-2028F)
- Telecommunications infrastructure services industry labour cost and prediction in the PRC (2019-2028F)
- Telecommunications infrastructure services industry cement cost in the PRC (2019-2023)

Research Outcome (3/6)

Part 3: Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

- Industry competitive landscape analysis:
  - Industry structure
  - Factors of competition
- Telecommunication infrastructure services market size and prediction in the PRC and Jiangxi Province(2019-2028F)
- Top 5 service providers of the industry in the PRC (ranking is based on revenue) in 2023, market share and background
- Top 5 service providers of the industry in Jiangxi Province(ranking is based on revenue) in 2023, market share and background*
- Market drivers
- Entry barriers
- Opportunities
- Threats and Challenges
- Company's competitive advantages over its competitors in the industry

Research Outcome (4/6)

Part 4: Overview of the digitalization solution services industry in the PRC and Jiangxi province

- Qualitative research on smart-city development:
  - Definition of the industry
  - Smart city applications
  - Recent development
  - Recent trends and development
  - Industry value chain
- Market value of the digitalization solution services industry in the PRC
- Market value of the digitalization solution services industry in the Guangdong, Anhui and Jiangxi
- Competitive analysis of the digitalization solution services industry in the PRC and Jiangxi Province
  - Industry structure
  - Market Drivers
  - Entry Barriers
  - Factors of competition
  - Opportunities
  - Threats and Challenges
  - Competitive Advantages of the Company

Research Outcome (5/6)

Part 5: Overview of the surveillance solutions industry in the PRC and Jiangxi Province

- Qualitative research on surveillance solutions' industry development:
  - Recent development
  - Recent trends in surveillance solutions
  - Government policy and regulation
  - Industry value chain
- Number of surveillance cameras in the PRC and Jiangxi Province (2019-2028F)
- Project cost breakdown of the surveillance solutions industry in the PRC
- surveillance solutions industry's market size in the PRC and Jiangxi Province (2019-2028F)

Research Outcome (6/6)

Part 6: Competitive analysis of the surveillance solutions industry in Jiangxi Province

- Industry competitive landscape analysis:
  - Factors of competition
- Market drivers
- Entry barriers
- Opportunities
- Threats and Challenges
- Company's competitive advantages over its competitors in the industry

Assumptions in the Study

Assumptions

- It is assumed that the China economy will remain in steady growth across the period from 2023 to 2027, in the expectation that COVID-19 will continue to be under control in the foreseeable future.
- It is assumed that the supply of and demand for products and services of the telecommunications infrastructure services industry and digitalization solution services industry in the PRC and Jiangxi Province are stable over the forecast period
- Besides COVID-19, it is assumed that there is no external shock such as a financial crisis or natural disaster to affect the supply of and demand for services in the telecommunication infrastructure services industry, digitalization solution services industry and surveillance solutions industry in the PRC and Jiangxi Province during the forecast period
- It is assumed that no industry regulation will have a dramatic or fundamental impact on the telecommunications infrastructure services industry and digitalization solution services industry in the PRC and Jiangxi Province during the forecast period

Abbreviations

4G	Fourth Generation Wireless Network Technology
5G	Fifth Generation Wireless Network Technology
AI	Artificial Intelligence
AIoT	Artificial Intelligence of Things
BTS	Base Transceiver Station
CAGR	Compound Annual Growth Rate
CCC	China Compulsory Certificate
CDMA	Code-Division Multiple Access
COB	Chip on Board Packaging
COF	Chip on film Packaging
COVID-19	Corona Virus Disease 2019
CSP	Chip-scale Packaging
DAS	Distributed Antenna System
DOU	Average data flow per one month per one user (DOU)
FTTH	Fiber-to-the-home
FDD LTE	Frequency Division Duplex-Long Term Evolution
G7 CIDB	Construction Industry Development Board of Malaysia (CIDB) G7 License
GDP	Gross Domestic Product

GIS	Geographic Information System
GSM	Global System for Mobiles
HDD Machine	Horizontal Directional Drilling Machine
ICT	Information and Communications Technology
IIOT	Industrial Internet of Things
IoT	Internet of Things
IoV	Internet of Vehicles
IP	Internet Protocol
LAN	Local Area Network
LoRa	Long Range Radio
MIIT	Ministry of Industry and Information Technology
MSTP	Multiple Spanning Tree Protocol
OpenRAN	Open Radio Access Network
PON	Passive Optical Network
PPP	Public-Private-Partnership
PRC	People's Republic of China
PTN	public telephone network
R&D	Research and development
RAN	Radio Access Network

RMB	Renminbi, Official Currency of People's Republic of China
SoCs	System on a chip
TD LTE	Time Division Duplexing-Long Term Evolution
TD SCDMA	Time Division Synchronous Code Division Multiple Access
Three-Network Convergence	State Project on Merging telecommunications, Television and Internet Services in One Network
TSP	telecommunications Service Provider
Ups	Uninterruptible Power Supply
WCDMA	Wideband Code Division Multiple Access
WLAN	Wireless Local Area Network

OVERVIEW OF THE MACRO-ECONOMIC ENVIRONMENT IN THE PRC AND JIANGXI PROVINCE

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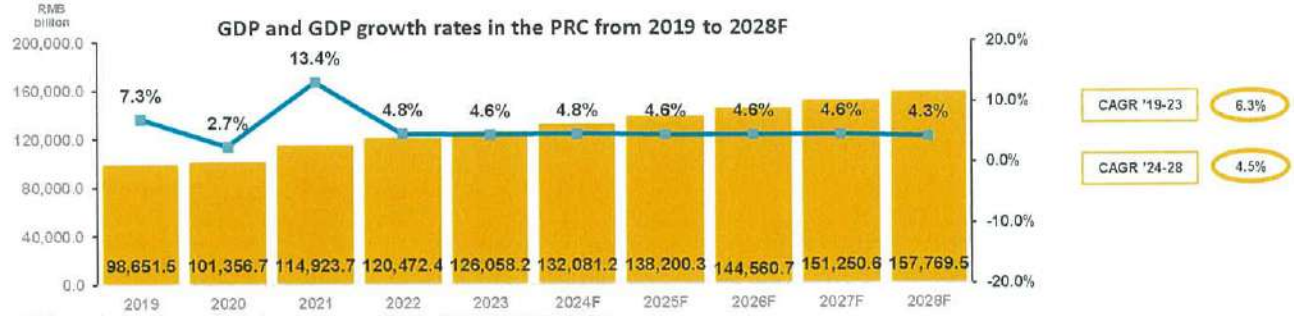
GDP in the PRC

The GDP in the PRC increased in the historical period due to the steady performance in primary and secondary sectors as well as robust growth of services industries. It is estimated to grow stably due to the positive implementation of infrastructure policies and emerging industries

The GDP in the PRC grew from approximately RMB 98,651.5 billion in 2019 to approximately RMB 126,058.2 billion in 2023, at a CAGR of approximately 6.3%. Apart from the economic growth in the primary and the secondary sectors, which mainly include manufacturing, raw material extraction and agricultural activities, the steady increase of GDP in the historical period can be explained by the robust growth of tertiary sectors in the PRC. Despite telecommunications industries generating the second-highest industrial value-added in 2020, the economic downturn caused by COVID-19 affected international trading negatively which led to the dropping growth rate in 2020. **During the forecast period, the GDP in the PRC is estimated to grow from approximately RMB 132,081.2 billion in 2024 to approximately RMB 157,769.5 billion in 2028, at a CAGR of approximately 4.5%.** China will continue to implement its blueprint "Made in China 2025" (中國製造2025) and the 14th Five-Year Plan to develop the digital economy. The development of the digital economy places a mandatory focus on building digital infrastructures such as 5G networks and related applications, in order to enhance the efficiency of corporate management and city governance. Advanced technology development in the telecommunications industry is projected to be one of the main drivers of GDP growth in the forecasting period.

GDP and GDP growth rates in the PRC from 2019 to 2028F



Notes: GDP refers to Gross Domestic Product in current prices; GDP growth rates are at current prices
Sources: National Bureau of Statistics of China, International Monetary Fund, Ipsos research and analysis

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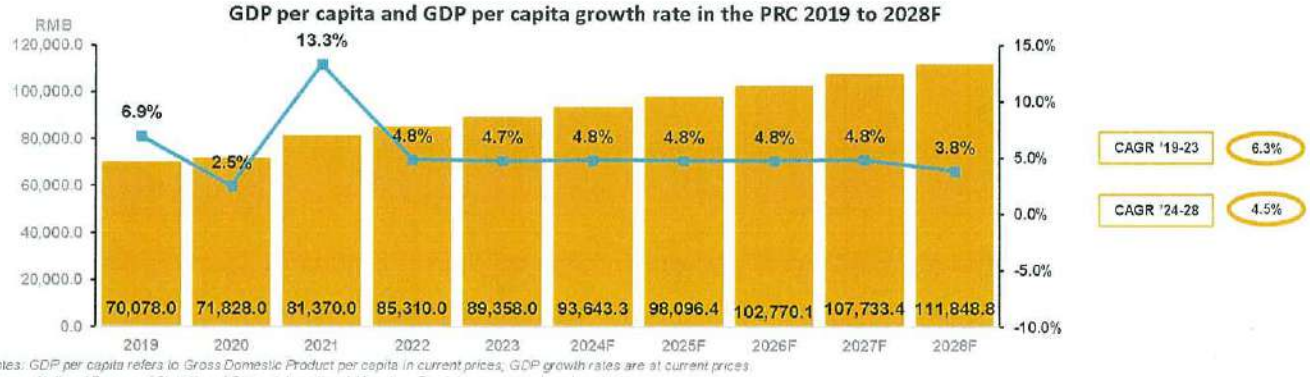
GDP per Capita in the PRC

The GDP per capita growth rate in the PRC experienced a drop between 2018 to 2020 but recovered significantly in 2021 and are anticipated to grow steadily at a similar level from 2023 to 2027

The GDP per capita in the PRC increased from approximately RMB 70,078.0 in 2019 to approximately RMB 89,358.0 in 2023, growing at a CAGR of 6.3%. The GDP per capita growth rate decreased to 2.5% in 2020 due to the outbreak of COVID-19, highlighted by the rise of the unemployment rate from approximately 4.9% in 2018 to 5.2% in 2020. According to the 14th Five-Year Plan (2021-2025), China implemented strategies to invest in cultivating a quality workforce, especially in the technological industry. The aim is to intensify innovative engineers and scientists and strengthen the national technological governance system. The above policy led to the significant growth of the GDP per capita in 2021 to 13.3%. **For the forecast period, the GDP per capita is anticipated to grow from approximately RMB 93,643.3 in 2024 to approximately RMB 111,848.8 in 2028, increasing at a CAGR of 4.5%.**

GDP per capita and GDP per capita growth rate in the PRC 2019 to 2028F



Notes: GDP per capita refers to Gross Domestic Product per capita in current prices; GDP growth rates are at current prices
Source: National Bureau of Statistics of China; International Monetary Fund; Ipsos research and analysis

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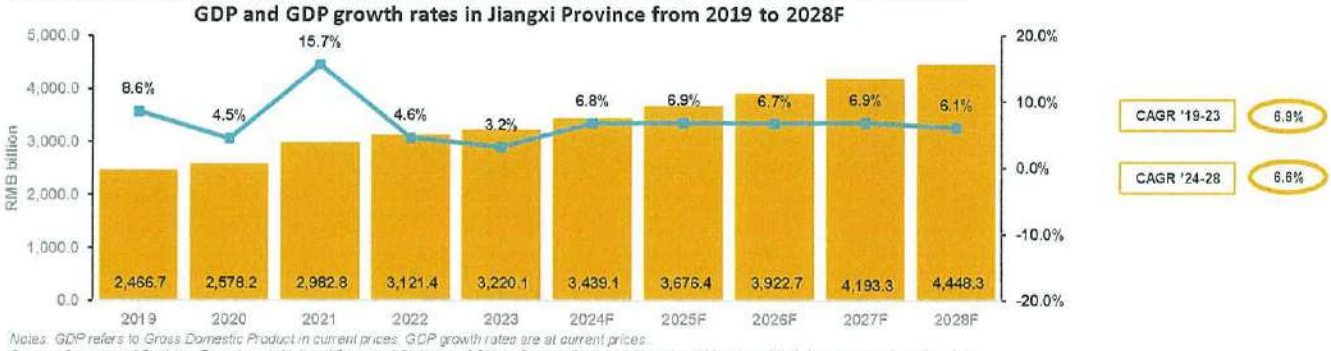
GDP in Jiangxi Province

The GDP in Jiangxi Province increased in the historical period due to the enhanced performance in various industry sectors, in particular, the telecommunications and electronic equipment industries. It is estimated to grow stably due to the positive implementation of infrastructure policies

The GDP in Jiangxi Province grew from approximately RMB 2,466.7 billion in 2019 to approximately RMB 3,220.1 billion in 2023, at a CAGR of approximately 6.9%. The steady increase of GDP in the historical period can be explained by the robust growth of secondary and tertiary sectors, particularly the services industry. Double-digit growth of 15.4% and 16.1% were also recorded in industrial investment and private investment respectively in 2021. Nevertheless, the economic downturn from 2019 to 2020 was caused by the outbreak of COVID-19, which has negatively affected retail sales. **During the forecast period, the GDP in Jiangxi Province is estimated to grow from approximately RMB 3,439.1 billion in 2024 to approximately RMB 4,448.0 billion in 2028, at a CAGR of approximately 6.6%.** As China lays out its blueprint "Made in China 2025" to develop smart cities, Jiangxi Province has put a focus on urban-rural development and better living standards with policies including "14th Five-Year Plan for Jiangxi Province Urban-Rural development"(江西省"十四五"住房城鄉建設發展規劃). Advanced technology development in the telecommunications industry is projected to be one of the main drivers of GDP in the forecasting period.

GDP and GDP growth rates in Jiangxi Province from 2019 to 2028F



Notes: GDP refers to Gross Domestic Product in current prices; GDP growth rates are at current prices
Source: Census and Statistics Department; National Bureau of Statistics of China; Census Bureau; International Monetary Fund; Ipsos research and analysis

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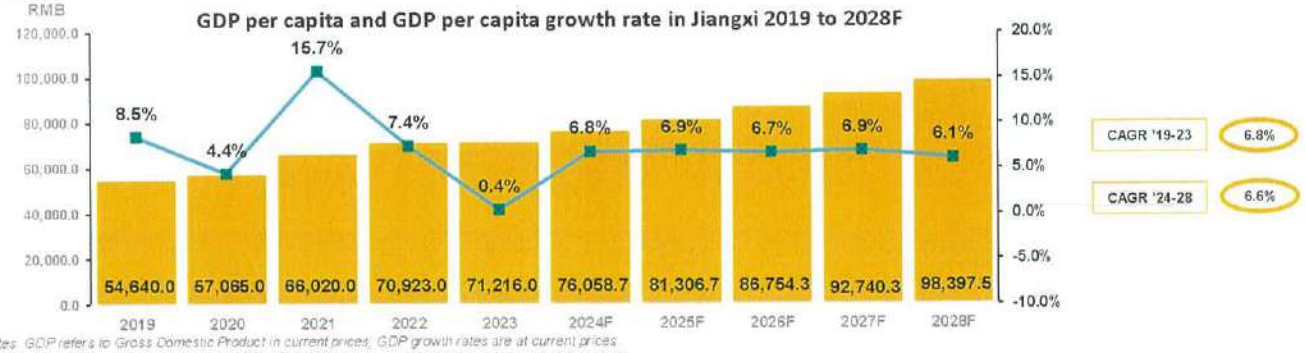
GDP per Capita in Jiangxi Province

The GDP per capita growth rate in Jiangxi Province experienced a drop between 2019 to 2020 but recovered significantly in 2021 and are anticipated to grow steadily at a similar level from 2023 to 2027

The GDP per capita in Jiangxi Province increased from approximately RMB 54,640.0 in 2019 to approximately RMB 71,216.0 in 2023, growing at a CAGR of approximately 6.8%. The GDP per capita growth rate decreased to approximately 4.4% in 2020 due to the outbreak of COVID-19, highlighted by the rise of the unemployment rate in urban areas from approximately 2.9% in 2019 to 3.2% in 2020. In addition, there was a significant decline in overseas tourism of approximately 93.4%. With the implementation of policies such as "14th Five-Year Plan for Jiangxi Province manufacturing industry development"(江西省 "十四五" 製造業高質量發展規劃) and "Three-year Plan for the Interconnected Jiangxi (2021-2023)" (智聯江西" 建設三年行動方案(2021-2023年)), the GDP per capita growth rate in 2021 has increased to approximately 15.7%. **For the forecast period, the GDP per capita is anticipated to grow from approximately RMB 76,058.7 in 2024 to approximately RMB 98,397.5 in 2028, increasing at a CAGR of approximately 6.6%.** Along with ambitious planning in urban development and advancing the existing industry with digital technology, it is forecasted that the growth rate of GDP per capita in Jiangxi Province will exceed the average growth of other provinces.



Notes: GDP refers to Gross Domestic Product in current prices; GDP growth rates are at current prices
Source: National Bureau of Statistics of China, International Monetary Fund, Ipsos research and analysis

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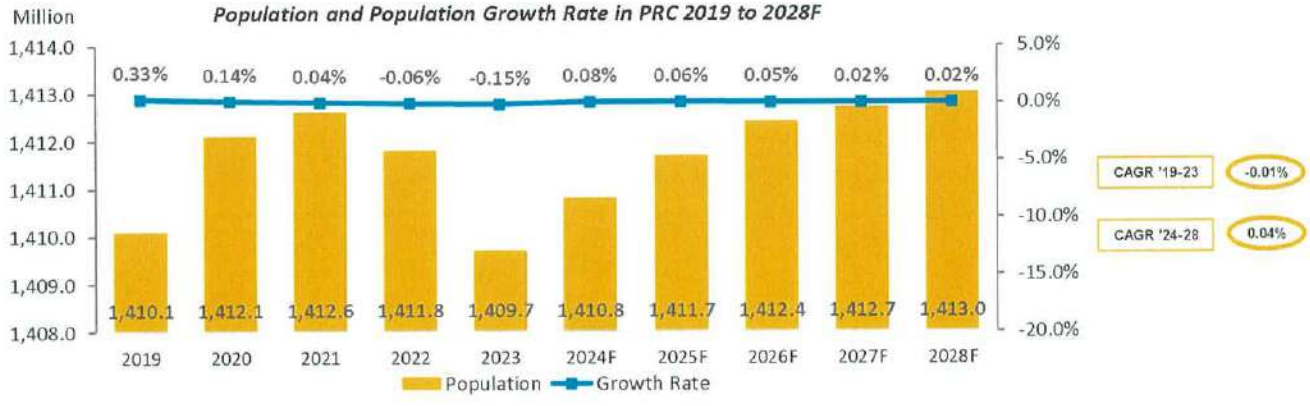
Population and Population Growth Rate in the PRC

The population reach the point of growth stagnation and will remain at more than 1.4 billion in the near future.

The population in Mainland China grew from approximately 1,410.1 million in 2019 to approximately 1,409.7 million in 2023, at a CAGR of approximately -0.01%. With the growing population moving from rural to urban areas, the population growth rate decelerated partly due to financial constraints attributed to the relatively higher cost of child-bearing in urban areas.

The population of China is estimated to grow continuously from approximately 1,410.8 million in 2024 to approximately 1,413.0 million in 2028, expanding at a CAGR of approximately 0.04%. It is estimated that the "Three-Child Policy" rolled out in 2021 will spark a slight increase in birth, compensating for the rising mortality rate from the ageing population and the declined birth rate in urban areas.



Source(s): National Bureau of Statistics of China, World Bank, Ipsos research and analysis

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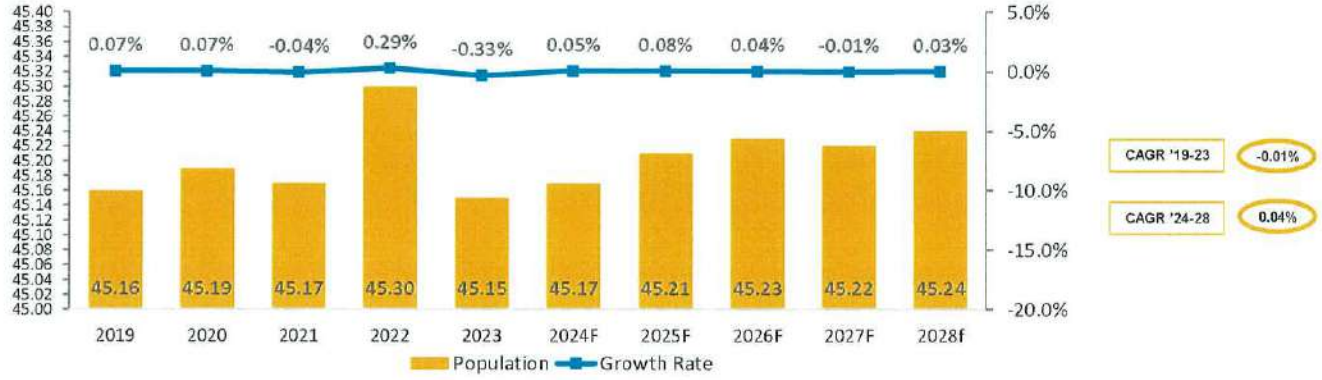
Population and Population Growth Rate in Jiangxi Province

The population reaches the point of growth stagnation with insensible increments in the upcoming 5 years.

The population in Jiangxi Province grew from approximately 45.16 million in 2019 to approximately 45.15 million in 2023, at a CAGR of approximately -0.01%. The birth rate of Jiangxi Province has been decreasing whilst the death rate has remained stable in the past few years. This resulted in a slowdown in the natural increase of population in Jiangxi Province. Despite the decline in a natural increase in population, the birth rate of Jiangxi Province still ranks top among all provinces in China with a birth rate of approximately 12.6% in 2019.

The population of Jiangxi Province is estimated to grow from approximately 45.17 million in 2024 to approximately 45.24 million in 2028, at a CAGR of approximately 0.04%. With the relatively low proportion of the population over 65 years old lowering the mortality rate, it is estimated that an insensible increment will continue to be recorded in the coming years.

Population and Population Growth Rate in Jiangxi Province 2019 to 2028F



Source(s): National Bureau of Statistics of China; World Bank, Ipsos research and analysis

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Urbanization Rate in the PRC and Jiangxi Province

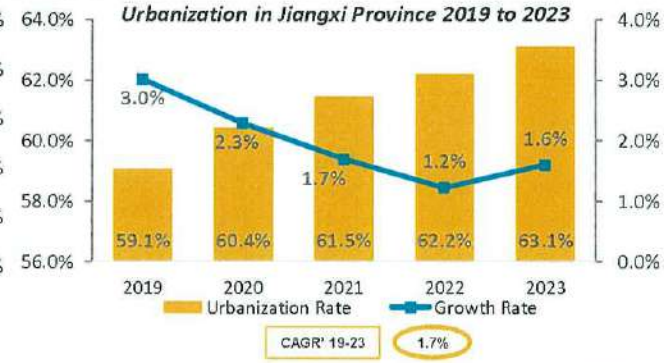
Significant growth of the urbanization rate in the PRC was recorded in 2020 while steady growth was recorded in Jiangxi Province yet the growth has slowed down in recent year.

The urbanization of China reached approximately 66.2% in 2023, at a CAGR of approximately 1.3% from 2019 to 2023. Apart from the ambitious target to reach the urbanization rate up to 70% in 2030, "The new urbanization and integrated urban-rural development in 2021" (2021年新型城鎮化和城鄉融合發展重點任務)issued by National Development and Reform Commission in April 2021 further indicates the importance of effective urbanization of migrant with upgraded infrastructure in the urban area. Smart cities will be developed with a centralized digital platform integrating data of all kinds in order to increase the management efficiency in public facilities, transportation, public security and medical services.

The urbanization of Jiangxi Province reached approximately 63.1% in 2023, at a CAGR of approximately 1.7% from 2019 to 2023. While the government further push for development in the central region of China, Jiangxi Province is envisioned to develop the Nanchang metropolitan as the hub among cities along the Yangtze River. With the roadmap in the "14th Five-Year Plan for Jiangxi Province Urban-Rural development"(江西省"十四五"住房城鄉建設事業發展規劃), the urbanization rate is estimated to grow together with the increment in the urban area. The growth in urbanization slowed down in 2020 due to the outflow arising from the COVID-19 outbreak.

Urbanization in the PRC 2019 to 2023

Urbanization in Jiangxi Province 2019 to 2023



Source(s): National Bureau of Statistics of China; Ipsos research and analysis

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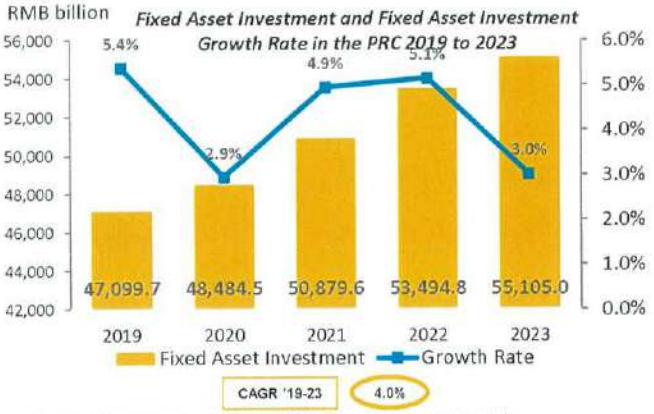
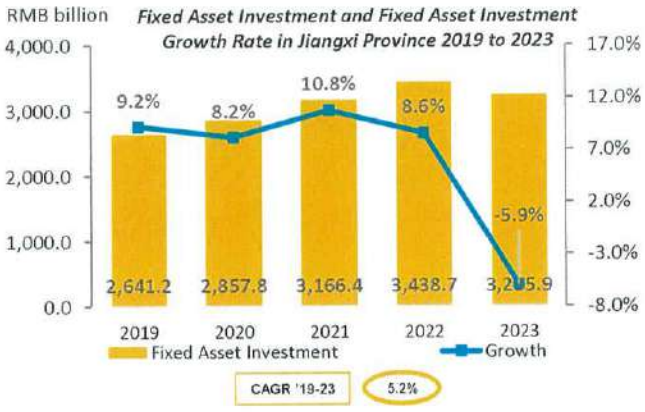
Fixed Asset Investment(without Agriculture) and Growth Rate in the PRC and Jiangxi Province

Fixed asset investment in the PRC and Jiangxi Province increased by 5.1% and 8.6% respectively. The country is gaining momentum in fixed asset investment after COVID-19.

Despite the impact of COVID-19, the PRC still showed a year-on-year increase in fixed asset investment at approximately 4.0%. The Chinese government put forward an RMB four trillion stimulus package to stimulate the economy and it invested in infrastructure including telecommunications infrastructure. The year-on-year increase in fixed asset investment in construction industry and telecommunications ,software and information technology is 2.0% and 21.8%.

The fixed-asset investment in Jiangxi Province experienced an overall increase from approximately RMB 2,641.2 billion in 2019 to approximately RMB 3,235.9 billion in 2023, with CAGR of 5.2%. While Jiangxi Province invested heavily in emerging and high potential industries, investments in telecommunications, software and information technology decrease year-on-year by 7.8% as the business activity were slowed during outbreak of COVID-19 pandemic in 2022.





Source(s): National Bureau of Statistics of China; Ipsos research and analysis

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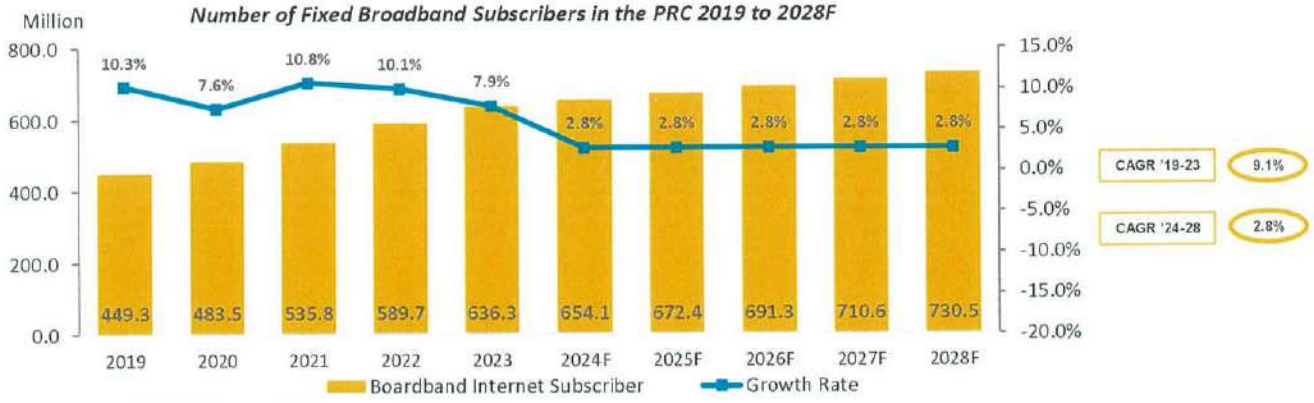
Number of Fixed Broadband Subscribers in the PRC

The number of fixed broadband subscribers in the PRC increased rapidly from 2019 to 2023 and is estimated to grow steadily at a similar level from 2024 to 2028.

The number of fixed broadband subscribers grew from approximately 449.3 million in 2019 to approximately 636.3 million in 2023, at a CAGR of approximately 9.1%. Among the approximately 636.6 million broadband internet subscribers in the PRC in 2023, around 94.5% of the subscribers experienced an internet speed of over 100Mbps and approximately 25.7% of the subscribers experienced an internet speed of over 1000Mbps. The telecommunications network system is well developed under the plan of "Broadband Strategy China"(寬帶中國).

The number of fixed broadband internet subscribers is estimated to grow from approximately 654.1 million in 2024 to approximately 730.5 million in 2028, at a CAGR of approximately 2.8%. With the low population growth and the increasing penetration of 5G mobile services, the number of subscribers is estimated to grow steadily from approximately 2.8% to 2.9% from 2024 to 2028.



Source(s): National Bureau of Statistics of China; MIIT; Ipsos research and analysis

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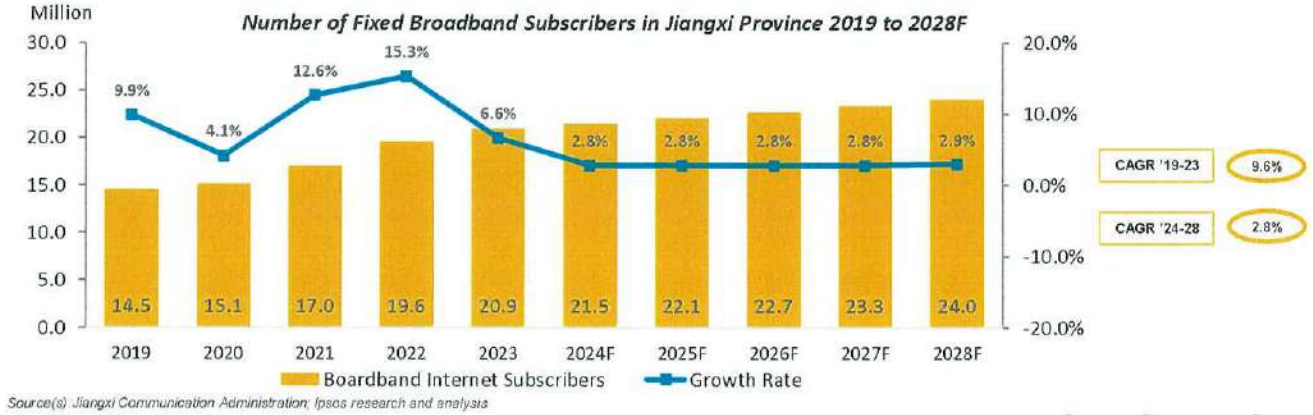
Number of Fixed Broadband Subscribers in Jiangxi Province

The number of fixed broadband subscribers in Jiangxi Province maintained a steady growth from 2019 to 2028 and is estimated to remain at a similar level afterward.

The number of fixed broadband subscribers in Jiangxi Province grew from approximately 14.5 million in 2019 to approximately 20.9 million in 2023, at a CAGR of approximately 9.6%. The high growth in 2018 mainly was attributed to the increasing total lengths of telecommunications network optical cable, as Jiangxi Province accelerated the construction of telecommunications infrastructures from 2016 to 2017. The penetration of Fibre to the home (FTTH) reached approximately 91.5% in 2021. "Notice on Promoting the Coordinated Development of 'Dual Gigabit' Networks in 2021 "(關於2021年推進「雙千兆」網路協同發展的通知) issued by Jiangxi Province Communication Administration further accelerate the development of FTTH, the last mile of the network that delivers telecommunication signal to the end-users premises. **The number of broadband internet subscribers in Jiangxi Province is estimated to grow from approximately 21.5 million in 2024 to 24.0 million in 2028, at a CAGR of approximately 2.8%.** Continuing the policy in developing FTTH, with the emersion of broadband advancement in the future, the number of broadband internet subscribers is predicted to experience steady yearly growth.



Source(s): Jiangxi Communication Administration; Ipsos research and analysis

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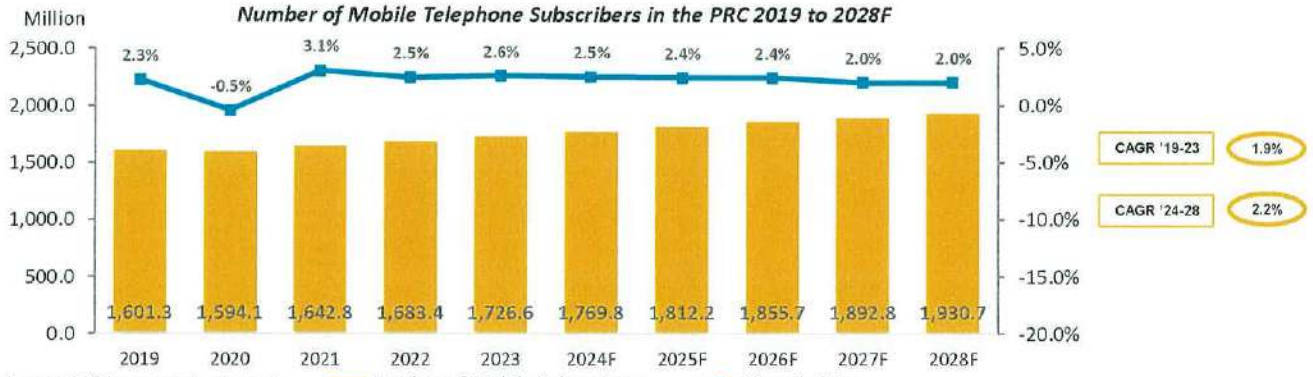
Number of Mobile Telephone Subscribers in the PRC

The number of mobile telephone subscribers in the PRC increased steadily from 2019 to 2023 and is estimated to maintain at a steady level in 2024 to 2028.

The number of mobile telephone subscribers in the PRC grew from approximately 1,601.3 million in 2018 to approximately 1,726.6 million in 2023, at a CAGR of approximately 1.9%. With the national telecommunications infrastructure contribution in the PRC, the network services have been expanded from the 4G generation to the 5G. The penetration rate of mobile telephone networks has reached approximately 116.3 devices per hundred people in 2021. A slight drop was recorded in 2020 as users ceased their second mobile phone subscription when business activities were slowed during the COVID-19 pandemic.

The size of mobile telephone subscribers in the PRC is estimated to grow from approximately 1,769.8 million in 2024 to approximately 1,930.7 million in 2028, at a CAGR of approximately 2.2%. With the promising national 5G network infrastructure in the PRC, the domestic network services are estimated to reach out to the minority of new users whilst the 5G network service expands promisingly.



Source(s): MIIT; Ipsos research and analysis

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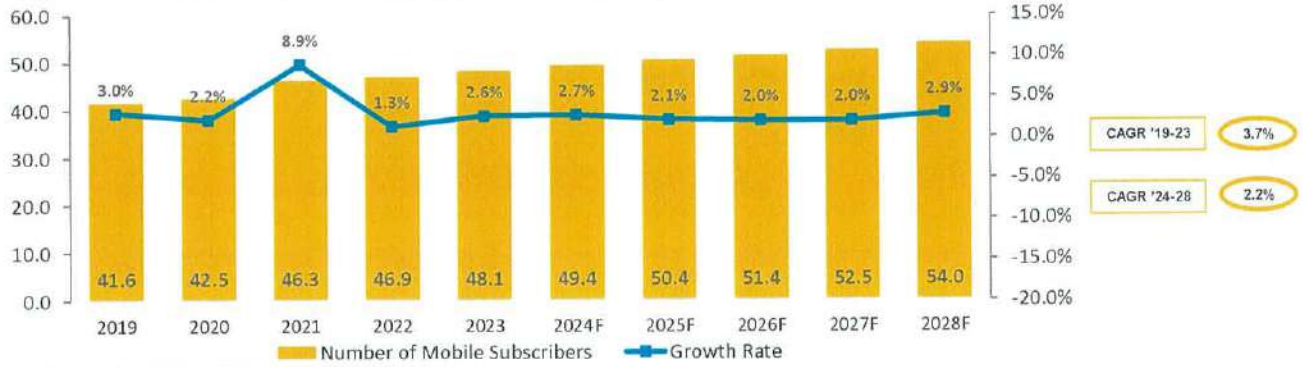
Number of Mobile Telephone Subscribers in Jiangxi Province

The number of mobile telephone subscribers in Jiangxi Province increased from 2019 to 2023 and is estimated to continue to rise from 2024 to 2028.

The overall number of mobile telephone subscribers in Jiangxi Province grew from approximately 41.6 million in 2019 to approximately 48.1 million in 2023, at a CAGR of approximately 3.7%. The penetration rate of mobile telephone networks has reached approximately 103.9 devices per hundred people in 2022. The mobile telephone subscription penetration in Jiangxi Province started to catch up with the national average since the expansion of 4G services at a lower service fee.

The number of mobile telephone subscribers in Jiangxi Province is estimated to grow from approximately 49.4 million in 2024 to approximately 54.0 million in 2028, at a CAGR of approximately 2.2%. With the active promotion of 5G by the telecommunications network operators offering high-quality mobile services at accessible pricing, it is estimated the growth rate will continue to exceed the national average. It is estimated that the penetration rate of mobile telephone networks will reach approximately 116.4 devices per hundred people in 2027.

Number of Mobile Telephone Subscribers in Jiangxi Province 2019 to 2028F



Source(s): Jiangxi Communication Administration; Ipsos research and analysis

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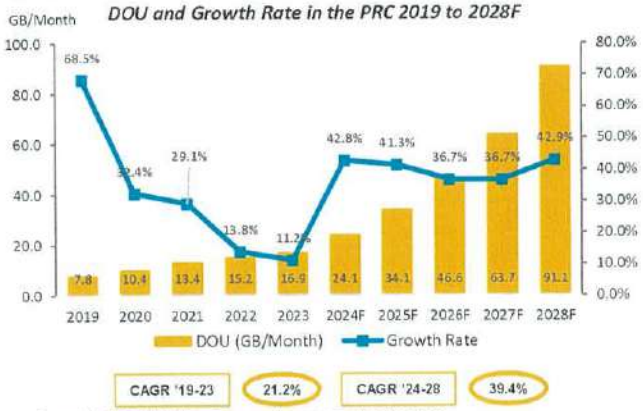
Average data flow per one month per one user (DOU) in the PRC and Jiangxi Province

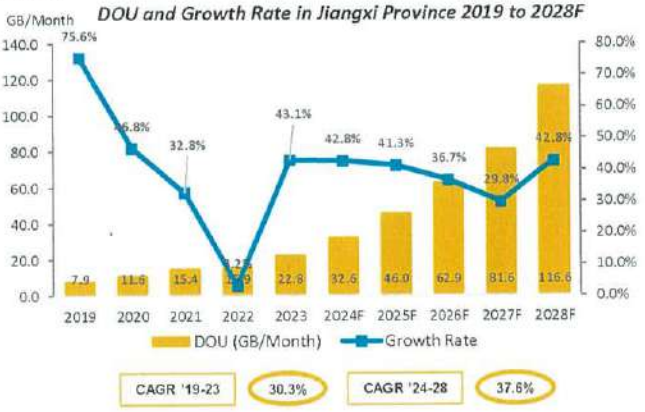
The average data flow per one month per one user (DOU) in the PRC, including Jiangxi Province, has been growing from 2019 to 2023 and is estimated to increase exponentially in the future due to comprehensive telecommunications network coverage development.

The DOU in the PRC grew from approximately 7.8GB per month in 2019 to approximately 16.9GB per month in 2023, whilst reaching its growth rate peak of approximately 68.5% in 2018, at a CAGR of approximately 21.2%. The country has been developing a comprehensive network to boost the growth of internet use in the domestic market at full-service capacity with the increasing penetration of 4G and 5G. The DOU is estimated to reach approximately 82.1GB/month in 2027. **The DOU of Jiangxi Province reached approximately 22.8GB per month in 2023 at a CAGR of approximately 30.3% from 2019 to 2023.** The average DOU in Jiangxi Province exceeded the average national figure from 2019 to 2026. The DOU is estimated to grow at the same pace as the national average and reach approximately 116GB per month in 2028, as people are estimated to use more data on daily life and commercial application.

DOU and Growth Rate in the PRC 2019 to 2028F



DOU and Growth Rate in Jiangxi Province 2019 to 2028F



Source(s): MIIT, ITU, China Telecom; Ipsos research and analysis

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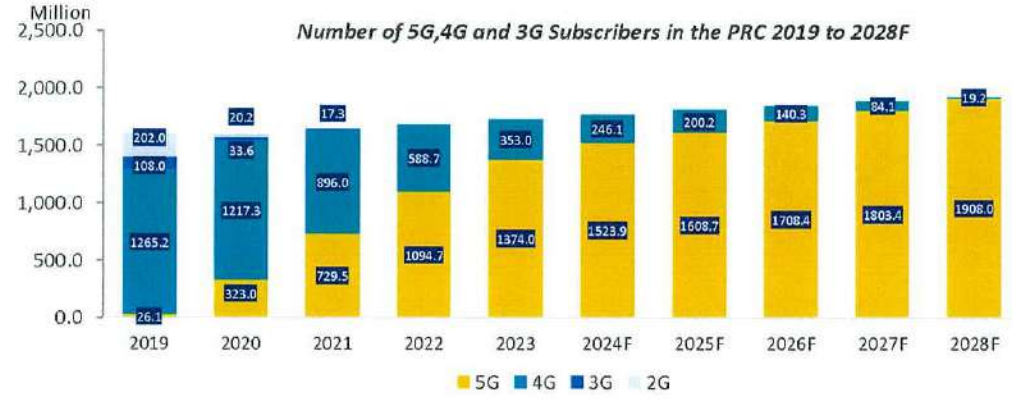
Number of 5G, 4G and 3G subscribers in the PRC

5G will gradually replace 4G and 3G to become the dominant mobile access technology by subscription in 2026.

The number of 5G subscribers increased from approximately 26.1 million in 2019 to approximately 1374.0 million in 2023, at a CAGR of approximately 169.3%. With the 5G network coverage covered 100% of prefecture-level cities, approximately 95% of counties and 35% of towns and villages in 2021, the telecommunications network operators aggressively promoted 5G data plan to their customers. By the end of 2023, approximately 90% of the mobile network subscription adopted for 5G services.

The number of 5G subscribers is estimated to grow from approximately 1523.9 million in 2024 to approximately 1908.0 million in 2028, at a CAGR of approximately 5.8%. With 5G subscriptions gradually replaced 4G subscriptions since 2020, the 5G penetration will continue to grow substantially as the telecommunications network operators continue to promote and reduce the price of 5G services. It is estimated that approximately 99% of mobile subscribers will choose the 5G mobile services in 2028.



Overall	
CAGR '19-23	1.9%
CAGR '24-28	2.1%
3G Subscriber	
CAGR '18-21	-50.7%
-	
4G Subscriber	
CAGR '19-23	-27.3%
CAGR '24-28	-47.2%
5G Subscriber	
CAGR '19-23	169.3%
CAGR '24-28	5.8%

Source(s): China Telecom, China Mobile, China Unicom, MIIT, Ericsson Ipsos research and analysis

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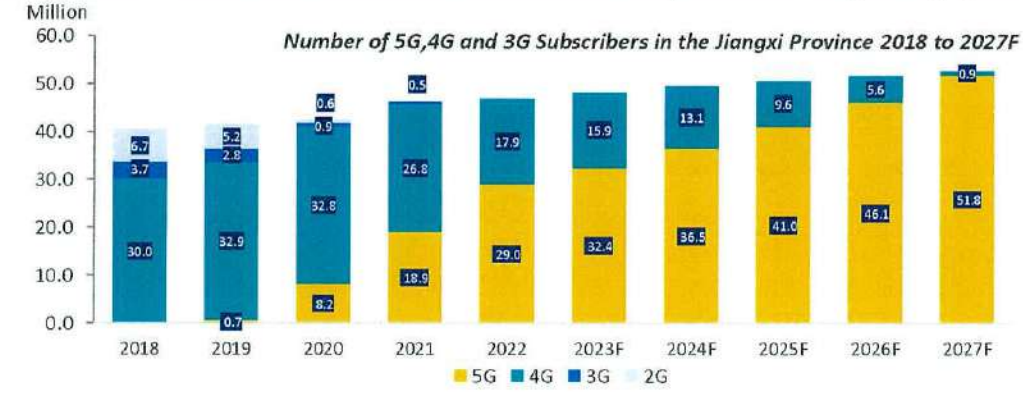
Number of 5G, 4G and 3G subscribers in Jiangxi Province

The provincial government is ambitious to proliferate the use of 5G together with the digitalization of publics services.

The number of 5G subscribers in Jiangxi Province increased from approximately 0.7 million in 2019 to approximately 29.0 million in 2022, at a CAGR of approximately 254.1%. The plans for 5G infrastructure such as "The 5G Implementation Action Plan (2021-2023)"(5G 應用"揚帆"行動計劃(2021-2023 年)), "Jiangxi Province 5G Network Development Plan"(江西省 5G 發展規劃 (2019 –2023 年)), which emphasized to accelerate the construction of new generation of 5G telecommunications infrastructures in 2020 and 2021 for future commercial application.

The number of 5G subscribers in Jiangxi Province is estimated to grow from approximately 32.4 million in 2023 to approximately 51.8 million in 2027, at a CAGR of approximately 12.5%. The plan such as "Three-year Plan for the Interconnected Jiangxi (2021-2023)"("智聯江西" 建設三年行動方案（2021-2023年）) set to develop full coverage of 5G in all counties and major areas in towns and village and meanwhile digitalized all public services. It is forecasted that the demand for 5G will rise at a faster pace than the average country's growth rate.



Overall	
CAGR '18-22	3.8%
CAGR '23-27	2.2%
3G Subscriber	
CAGR '18-21	-48.7%
CAGR '22-27	-
4G Subscriber	
CAGR '18-22	-12.1%
CAGR '23-27	-51.1%
5G Subscriber	
CAGR '18-22	254.1%
CAGR '23-27	12.5%

Source(s): MIIT, Jiangxi Communications Administrations, Ericsson Ipsos research and analysis

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OVERVIEW OF THE TELECOMMUNICATIONS INFRASTRUCTURE SERVICES INDUSTRY IN THE PRC AND JIANGXI PROVINCE

2

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Overview of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

The telecommunications network is an important infrastructure for human beings to realize long-distance communication, and usually has a three-layer structure of access network, transmission network and core network.

Definition and introduction of the industry (1/4)

- The telecommunications industry in the PRC is dominated by the three telecommunications network operators including China Unicom, China Telecom, and China Mobile (collectively the "Big Three"). They are state-owned enterprises, essentially forming a triopoly in the industry. The Big Three as well as the telecommunications tower infrastructure service provider, China Tower, account for over 90% of the completed investments in telecommunications infrastructure in the PRC.

Telecommunications network

- A telecommunications network is a group of nodes interconnected by telecommunications links that are used to exchange messages between the nodes. A telecommunications network is a communication system that constitutes the interconnection of multiple telecommunications systems for end-users to communicate with each other. It is an important infrastructure for human beings to realize long-distance communication. Telecommunications network uses optical (electrical) cables, wireless, optical fiber or other electromagnetic systems to transmit and receive identifications, sounds, texts, images or other signals through corresponding control, processing, switching equipment and application platforms. Mobile phones, telephones, computers and other terminal equipment are connected to the telecommunications network through wireless base stations and wired optical (electric) cables and transmitted to the core layer switching system, signaling system and control system in the core layer network, to realize the function of long-distance communication and information exchange. The telecommunications network usually has a three-layer structure of the core network, transmission network and access network.

Source(s): Ipsos Research and Analysis

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Overview of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

The telecommunications network is an important infrastructure for human beings to realize long-distance communication, and usually has a three-layer structure of access network, transmission network and core network.

Definition and introduction of the industry (2/4)

Core network

- A core or a backbone network provides paths for the exchange of information between various sub-networks. Typically, in telecommunications networks, the term 'core' is used by operators and refers to the high-capacity communication facilities that connect primary nodes. Core networks cover a large area, often connecting systems in different cities.
- The core network is the network responsible for service control and call processing. The uplink process is that the access network receives various user information and then transmits it to the core network through the transmission network and the IP bearer network, and the core network analyzes and processes various user information. The downlink process means that the core network passes the processing results through the transmission network and IP bearer network to the access network, and the access network is responsible for feeding back the relevant information to the user, in order to meet the various needs of the user.

Transmission Network

- Transmission network transmits electrical or optical signals, consisting of various nodes and links that transmit, transfer, and receive information, and provide protected signal transmission connection channels to other networks through transmission equipment, optical cables (or microwaves, satellites). The transmission network and the IP bearer network are the infrastructures of the network. Transmission network includes inter-provincial trunk transmission network, intra-provincial trunk transmission network and metropolitan area transmission network. At present, the transmission network has all realized optical fiber transmission. The metropolitan area transmission network system equipment is generally a 2.5G or 10G optical network. The intra-provincial trunk transmission network is basically dominated by 10G to 100G optical networks, and the inter-provincial trunk transmission network generally adopts a single wave 40G or 100G capacity and can achieve an 80*100G transmission rate through wavelength division technology.

Source(s): Ipsos Research and Analysis

Overview of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

The telecommunications network is an important infrastructure for human beings to realize long-distance communication, and usually has a three-layer structure of access network, transmission network and core network.

Definition and introduction of the industry (3/4)

Access network

- An access network mainly serves to receive and transmit signals between end-user devices and the telecommunications network via the transmission network which would utilize base stations as well as electrical and optical cables as the conduit.
- The access network is mainly implemented in two ways: wireless access and wired access. As the wireless networks of all telecommunications network operators in the PRC have generally adopted 2G, 3G, 4G, and 5G converged networking methods, 5G users will gradually occupy a dominant position. At present, most wired access networks have realized optical fibre access, and their access rates have been significantly improved.
- Access network is a general term of various access methods for user terminals or user networks to access communication networks, including mobile access networks (as known as the wireless network) such as GSM, CDMA, TD SCDMA, WCDMA, TD LTE, FDD LTE, etc.; wireless access network such as WLAN, etc.; wired access network such as PON, PTN, MSTP, Ethernet switches, etc.

Source(s): Ipsos Research and Analysis

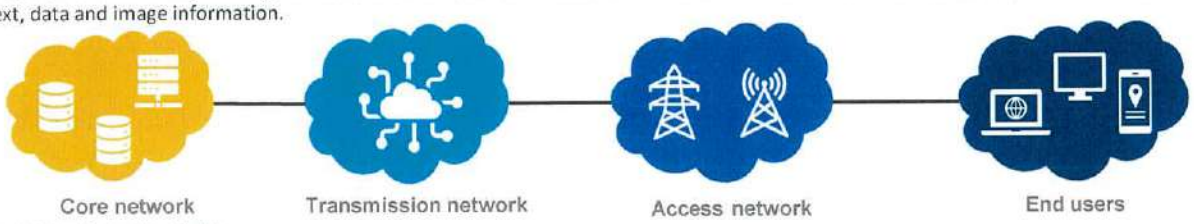
Overview of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

The telecommunications network is an important infrastructure for human beings to realize long-distance communication, and usually has a three-layer structure of access network, transmission network and core network.

Definition and introduction of the industry

End users

- End users of the telecommunications network are users of terminal equipment such as mobile phone subscribers and broadband internet subscribers.
- Typical terminal equipment include telephones, telegraphs, mobile phones, wireless pagers, data terminals, microcomputers, facsimiles, televisions, etc. Some terminals themselves can also be a local or small telecommunications system, and they are connected as terminal devices to the public telecommunications network, such as subscriber switches, ISDN terminals, local area networks, office automation systems, computer systems, etc.
- Terminal equipment is generally installed at the user's place and provides the equipment (telecom endpoint) that is necessary for the user to implement the functions of the access protocol. Its function is to convert voice, text, data and image (static or active) information into electrical or electromagnetic signals and send them out and restore the received electrical or electromagnetic signals to the original voice, text, data and image information.



Source(s): Ipsos Research and Analysis

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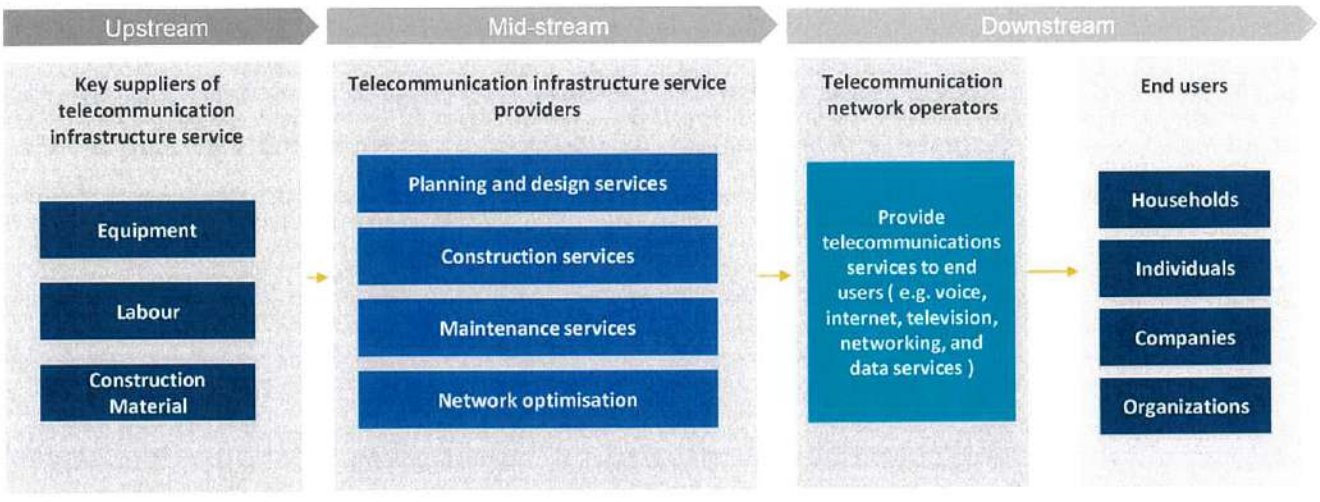
Value chain of the telecommunication infrastructure services industry

Ipsos remark: we have checked the participants in "plan and design services", which some projects are assigned subsidiary of 中国移动通信集团设计有限公司, the rest are assigned to 中通服 and other private corporations following a similar structure as "construction services", so we suggest maintaining a services module of "planning and design."

Key players in the telecommunications infrastructure services industry in the PRC consist of key suppliers of telecommunication infrastructure services, telecommunication infrastructure services providers, telecommunications network operators, and end-users.

Value Chain (1/5)



Source(s): Ipsos Research and Analysis

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Value chain of the telecommunication infrastructure services industry

Key players of the telecommunications infrastructure services industry in the PRC consist of key suppliers of telecommunication infrastructure services, telecommunication infrastructure services companies, telecommunications network operators, and end-users.

Value Chain (2/5)

Key suppliers of telecommunication infrastructure services

- Key suppliers of the telecommunications infrastructure services industry provide materials, equipment, and labours to telecommunication infrastructure services projects.
- The equipment for telecommunication infrastructure services projects, is procured by the telecommunication network operators mainly through centralized bidding at both group and provincial level, and independent procurement at the prefecture level. The equipment can further be categorized into four categories including wireless equipment, transmission equipment, base station equipment and optical equipment.
- Labour services are mainly procured from labour suppliers by telecommunication infrastructure services companies. The telecommunication infrastructure services company entrusts labour service suppliers and outsources the workload to them according to the needs of each project. The procurement from labour suppliers is mainly for the processes with low technical content but requiring a lot of labour in the project, such as pipeline excavation and optical (electric) cable laying, which does not involve the core technical process in equipment installation as telecommunication infrastructure services companies allocate their own human resources.
- Some other construction materials are sourced locally by the telecommunication infrastructure services company such as cement or screws, which account for a relatively small proportion of the project cost.
- As in the telecommunication infrastructure services projects, the main equipment are provided by telecommunications network operators, and the telecommunication infrastructure services company only purchases some construction auxiliary materials. In addition, there are labour service procedures in the telecommunication infrastructure services projects, and telecommunication infrastructure services companies negotiate with the labour service company to purchase labour services from it to meet the needs of the project.

Source(s): Ipsos Research and Analysis

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Value chain of the telecommunication infrastructure services industry

Key players of the telecommunications infrastructure services industry in the PRC consist of key suppliers of telecommunication infrastructure services, telecommunication infrastructure services companies, telecommunications network operators, and end-users.

Value Chain (3/5)

Telecommunication infrastructure services companies

- Telecommunication infrastructure services projects are usually awarded from the Big Three telecommunications network operators including China Unicom, China Telecom, and China Mobile and the telecommunications tower infrastructure service provider, China Tower.
- The telecommunication infrastructure services providers can further be categorised into three tiers. First-tier providers can offer a full range of telecommunication infrastructure services across the nation. These first-tier companies are generally the subsidiary companies of the telecommunications network operators. Second-tier is the private enterprises that can provide complete services across all regions. Depending on their business strategy, these players offer a full range of telecommunication infrastructure services, yet most players usually specialise in only one type of service. Third-tier providers generally are the leaders in certain provinces. While their strength relies on the close partnership with local telecommunications network operators and their project experience in the local market, they are also capable of taking on national projects. Fourth-tier providers are services providers with operations limited to one province.
- Telecommunication infrastructure services companies mainly provide four types of services along the entire telecommunications services cycle 1) telecommunications network planning and design services, 2) telecommunications network infrastructure construction service, 3) telecommunications maintenance services, and 4) telecommunications and information integration services.
- Companies in this industry may be either (i) companies focusing on only one or two telecommunication infrastructure services or (ii) diversified companies providing a full range of services in relation to the telecommunications infrastructure services industry or other related businesses.

Source(s): Ipsos Research and Analysis

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Value chain of the telecommunication infrastructure services industry

Key players of the telecommunications infrastructure services industry in the PRC consist of key suppliers of telecommunication infrastructure services, telecommunication infrastructure services companies, telecommunications network operators, and end-users.

Value Chain (4/5)

Telecommunications network operators

- The telecommunication industry in the PRC is dominated by the Big Three telecommunications network operators in the PRC including China Mobile, China Telecom, and China Unicom. They are state-owned enterprises, essentially forming a triopoly in the industry. The market share of China Mobile, China Telecom, China Unicom in 2022 (as of Dec 31 2023) was 53.4%, 26.9% and 19.7% respectively in terms of mobile subscriptions. The Big Three as well as the telecommunications tower infrastructure service provider, China Tower, account for over 90% of the completed investments in telecommunication infrastructure in the PRC.
- These telecommunications network operators offer voice, internet, television, networking, and data services which can either be wired or wireless, over a large area, such as Fixed Broadband, Fibre to the Home (FTTH), Mobile Telecom Services, and high-speed broadband to end-users for homes or businesses.
- The telecommunications network operators invest in and develop the entire telecommunications network in the PRC. China Mobile and China Telecom both many their own subsidiary to manage part of their own telecommunication infrastructure services. Yet due to the high labour cost and the high number of labour required in infrastructure construction, telecommunications network operators outsource part of the telecommunication infrastructure services projects to the telecommunication infrastructure services companies.
- As state-owned enterprises, the telecommunications network operators are actively involved in the implementation of national policies in telecommunications. Besides the active building of telecommunications infrastructure including 5G and fixed networks, the operators take part in different digital infrastructure building, for example, IIoT of manufacturing, smart public security, remote learning, and smart elderly caring.

Source(s): Ipsos Research and Analysis

Value chain of the telecommunication infrastructure services industry

Key players of the telecommunications infrastructure services industry in the PRC consist of key suppliers of telecommunication infrastructure services, telecommunication infrastructure services companies, telecommunications network operators, and end-users.

Value Chain (5/5)

Telecommunications network operators (cont.)

- The telecommunications industry is considered a strategic sector that is closely tied to national security and stability, as it plays a critical role in the flow of information and communication within the country. Telecommunications network operators in the PRC are responsible for providing the infrastructure and services that enable communication and information exchange, including voice and data transmission, internet access, and mobile services. As such, they are in a position to collect, store, and transmit large amounts of sensitive information, including personal data, financial information, and government communications. The PRC government has implemented tight control over the telecommunications industry to ensure that national security concerns are addressed, including the allocation of licenses and spectrum. This control has led to a limited number of players in the market, as the government allocates licenses and spectrum only to a select few players including, China Mobile, China Union and China Telecom. The limited competition in the industry gives these players greater bargaining power in their partnerships with telecommunications infrastructure services providers.
- Due to the extremely high entry barriers attributable to the significant investment in infrastructure, technology, and expertise, the current duopoly of the big 3 telecommunications network operators in the PRC is estimated to remain in the foreseeable future.

End-users

- End-users purchase and enjoy the end products of the telecommunications infrastructure services industry through telecommunications network operators to deliver the telecommunications services such as 4G or 5G wireless network services and broadband services. These end-users include households or individuals who are owners of computers, smartphones, and other mobile and smart gadgets.
- Other end-users include organizations and companies that require a reliable, secure and fast connection that can enable their day-to-day business operations to run smoothly, especially when transmitting multiple information via the internet simultaneously or needing larger storage space to store softcopy documents and files online.

Source(s): Ipsos Research and Analysis

Type of services provided by the telecommunication infrastructure services companies

Telecommunication infrastructure services companies usually provide telecommunications network planning and design, infrastructure construction, optimisation and maintenance, and [telecommunications and information integration] services.

Types of services provided (1/5)

1) Telecommunications network planning and design services

- Telecommunications network planning and design services involve telecommunications network scheme planning services, feasibility study and project design services on wireless networks, transmission networks, optical/cable lines, communication pipelines, access networks, and computer networks.

2) telecommunications infrastructure construction services

- telecommunications infrastructure construction services cover various network construction services of the core network, wireless network, transmission network, access network and supporting infrastructure. Aside from constructing the network infrastructure, testing and commissioning would also be conducted to ensure its efficacy and to ensure that it is capable of fulfilling the specifications as determined by the customer and other industry or governmental standards. The main tasks include telecommunications equipment installation, wired transmission engineering and access engineering, indoor distribution system technical service and telecommunications infrastructure construction etc.
- Construction works implementation duration varies from several months to one and a half years. For example, transmission network implementation might take one to two years to complete, supporting network (支撑网) implementation takes at most one year to complete, and construction of base stations takes a month to a year. While modification or upgrading of current infrastructure is also considered a construction project, the implementation period is relatively shorter, ranging from several days to several months.

2.1) Telecommunications equipment installation

- Telecommunications equipment installation can be divided into wired telecommunications equipment installation, wireless telecommunications equipment installation, and power supply equipment installation
- Wired telecommunications equipment installation includes the installation of the rack, cable and auxiliary equipment, the installation and commissioning of optical fiber digital transmission equipment, and the installation and commissioning of data communication equipment.
- Wireless telecommunications equipment installation includes the installation of equipment racks, cables and auxiliary equipment for mobile telecommunications, microwave telecommunications and satellite telecommunications.
- Power supply equipment installation includes the installation of high and low voltage distribution equipment, transformers, AC and DC power supply equipment, UPS equipment, etc.
- The profit margin of this kind is project is relatively higher as skilled labour and certain licenses are required for telecommunication infrastructure services companies. Fewer companies can join the tender and the discount rate during the tender is relatively lower.

Type of services provided by the telecommunication infrastructure services companies

Telecommunication infrastructure services companies usually provide telecommunications network planning and design, construction, optimisation and maintenance, and [telecommunications and information integration] services.

Types of services provided (2/5)

2) telecommunications infrastructure construction services

2.2) Wired transmission engineering and access engineering

- Wired transmission engineering can be divided into telecommunications pipeline engineering and telecommunications line engineering.
- Telecommunications pipeline project mainly includes the new construction, reconstruction and expansion of the telecommunications pipeline. Telecommunication infrastructure services company carries out construction according to the design drawings approved by the telecommunications network operators to meet the requirements of optical/ cable layout and use. According to the pipeline level, it can be divided into trunk pipeline, branch pipeline and local network pipeline.
- The main construction contents of telecommunications line engineering include equipment inspection, line routing, earthwork, overhead pole road, optical / cable laying, line protection and protection, installation of optical / cable junction box and branching equipment, optical / cable connection, optical / cable entry and completion, optical / cable test, etc. According to the form of line medium, it can be divided into optical cable line engineering and cable line engineering. According to different laying methods, it can be divided into overhead, directly buried, wall, pipeline, underwater, etc.
- The access engineering is mainly to provide telecommunications network operators with unified access services for resident networks of multi-services such as wired network voice, data and video. The resident network is the "last kilometer or last mile" of the access network from telecommunications network operators to end users. According to customer types, it can be divided into group customers and family customers. For group customers, it usually includes Internet group special line, voice group special line, point-to-point group special line, optical fiber group leasing, etc. For family customers, it mainly includes home broadband access services and home wireless network services superimposed on this basis.

Type of services provided by the telecommunication infrastructure services companies

Telecommunication infrastructure services companies usually provide telecommunications network planning and design, construction, optimisation and maintenance, and [telecommunications and information integration] services.

Types of services provided (3/5)

2) telecommunications infrastructure construction services

2.3)Indoor distribution system engineering

- Indoor distribution system engineering mainly refers to the use of an indoor antenna distribution system to evenly distribute the signals of mobile base stations in every corner of the room. This can ensure that the indoor area has ideal signal coverage. The distribution can be divided into the indoor distribution of buildings, indoor distribution of large venues, indoor distribution of tunnels, etc.
- With the rapid development of 5G, the demand for data use in mobile and application terminals will grow exponentially. At the same time, indoor distribution system engineering can strengthen the coverage of indoor signals for the characteristics of high frequency and weak wall penetration ability of 5G. Therefore, 5G would bring a huge business opportunity for indoor distribution system engineering.

2.4) Telecommunications infrastructure construction

- The construction of telecommunications infrastructures mainly includes base station site selection, machine room decoration, civil engineering foundation, lightning protection and grounding, the introduction of external power supply, antenna elevation project and other ancillary projects. It is the foundation of network construction and plays an important role in ensuring the security of the entire network and the stability of data transmission.
- The profit margin of this kind is project is relatively lower as telecommunication infrastructure services companies need to hire third-party labour to finish the project.

2.5) Construction projects duration

- Construction works implementation duration varies from several months to one and a half year . For example, transmission network implementation might take one to two years to complete, supporting network(支撑网) implementation takes at most 1 year to complete, and construction of base stations takes a month to a year. While modification or upgrading of current infrastructure is also considered a construction project, the implementation period is relatively shorter, ranging from several days to several months.

Source(s): Ipsos Research and Analysis

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Type of services provided by the telecommunication infrastructure services companies

Telecommunication infrastructure services companies usually provide telecommunications network planning and design, construction, optimisation and maintenance, and [telecommunications and information integration] services.

Types of services provided (4/5)

3) Telecommunications network optimisation services

- Telecommunications network optimisation services refer to formulate network parameter adjustment and system optimisation plans, and to adjust the implementation after testing, analyzing and evaluating existing operating equipment and various network business indicators. It collects multidimensional network data through flow data analysis, field test data collection, parameter analysis, hardware inspection and other means for the existing network to conduct comprehensive data analysis. According to the investigation results, the methods to optimize and adjust telecommunications network include parameter modification, network structure adjustment, equipment configuration adjustment and some other technical means. The telecommunications network optimisation services continuously enhance the stability, reliability, efficiency, and applicability of telecommunications networks, improve the service quality of telecommunications network operators and enhances the perception of telecommunications network for end users. Also, optimisation services ensure the high-quality operation of the system, make the existing network resources obtain the best benefit, and obtain the maximum benefit with the most economical input.

4) Telecommunications network maintenance services

- Telecommunications network maintenance services can be divided into routine basic maintenance and emergency troubleshooting according to the nature of work. Routine basic maintenance refers to the routine maintenance and patrol inspection of the main equipment and its supporting equipment in the current network operation of wireless network, wired network and transmission network according to the telecommunications network maintenance procedures. The main contents include the supervision and maintenance of telecommunications equipment, telecommunications base station tower and mast, machine room, power environment equipment, lightning protection and grounding system, maintaining the environmental sanitation of machine room and emergency repair of equipment. Emergency fault handling is to make rapid response to major network faults and solve them in the shortest time. It includes the formulation of technical support, the problem upgrading approaches and action plans, and the provision of emergency telecommunications support services for important social activities.

Source(s): Ipsos Research and Analysis

IpsosStrategy3

Type of services provided by the telecommunication infrastructure services companies

Telecommunication infrastructure services companies usually provide telecommunications network planning and design, construction, optimisation and maintenance, and smart cities integration services.

Types of services provided (5/5)

5) Digitalization solution services

- Due to the existing capability in telecommunications infrastructure building and the close working relationship with telecommunications network operators, many of the key players take part in the emerging development of digital infrastructure, IoT, smart cities related facilities that require 5G and other advanced ICT technology. [Information and communications technology infrastructure services] mainly aim to serve the special needs of telecommunications network operators, government and enterprise customers, and to provide comprehensive services including system scheme design, equipment and material procurement, installation and implementation, and system commissioning etc.
- The business cycle of smart cities solution services project is generally long. In the early stage of the project, corresponding technical schemes are formed by configuring different system equipment and software platforms according to the target needs of customers. In the project implementation stage, the procurements of equipment, materials and systems are organized in batches based on the project cycle, and carry out software research and development, hardware system installation, etc. Finally, the equipment are tested and debugged. After there implementation of hardware and software, there is still a long cycle of maintenance.
- Many of the telecommunication infrastructure services companies also engage in the provision of digitalization solution services also possess research and development departments. Many of the companies have developed and owned an extensive portfolio of intellectual property rights in hardware and software to increase their competitiveness during the bidding process.

Source(s): Ipsos Research and Analysis

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Major policies in telecommunications infrastructure services industry - the PRC

While the policies placed strong emphasis on telecommunications infrastructure development in the earlier years, the recent policies set to accelerate the development of digital infrastructure including the deployment of 5G technology, smart cities, and Internet of Things(IoT) for manufacturing

Major Policies (1/6)

Time of Issue	Policy	Issuing Department	Policy Highlight
2024.04	Implementation Plan for Promoting Equipment Upgrading in Industrial Sectors (推動工業領域設備更新實施方案)	Ministry of Industry and Information Technology (MIIT) and Six Other Departments	The Plan revolves around implementing an advanced equipment upgrading initiative, implementing a digital transformation initiative, implementing a green equipment promotion initiative, implementing an inherent safety enhancement initiative, etc., and deploys 12 key tasks. The Plan requires strengthening fiscal support for equipment upgrading and technological transformation in industrial sectors, incorporating qualified key projects into the scope of central budgetary investment and other funding support. It calls for intensifying tax incentive support for specialized equipment for energy conservation, water conservation, environmental protection, and production safety, incorporating digital and intelligent transformation into the scope of preferential policies.
2024.01	Action Plan for the "Interconnected" Industrial Internet Identification Resolution System (2024-2026) (工業互聯網標識解析體系"貫通"行動計畫(2024-2026年))	Ministry of Industry and Information Technology (MIIT) and 11 Other Departments	This Plan delineates seven key tasks, including: interconnecting industrial and supply chains; comprehensively empowering the "Three Products" strategy for consumer goods; facilitating digital healthcare integration; optimizing green and low-carbon management; enhancing safety management levels; improving urban digitalization levels; and propelling the upgrading of industrial clusters. Furthermore, the Plan proposes supporting measures across five aspects: infrastructure, technological innovation, products and services, data circulation, and security assurance.
2023.12	Notice on Accelerating the Construction of "Broadband Frontiers" (關於加快"寬帶邊疆"建設的通知)	Ministry of Industry and Information Technology (MIIT) and 12 Other Departments	This policy clearly delineates seven key tasks: accelerating the upgrading of broadband networks in county towns, strengthening the construction of broadband networks in rural areas, promoting road mobile network coverage, enhancing network security capabilities for border administration agencies and border trade zones, strengthening broadband network coverage in islands and maritime areas, improving network maintenance service levels, and enabling digital development in frontier regions. Specifically, this includes "proactively guiding basic telecommunications enterprises to appropriately advance the layout of 'Double Gigabit' network infrastructure in frontier county towns" and "flexibly adopting mid-band and low-band 5G base stations to gradually extend 5G network coverage to rural areas."
2023.11	Trial Work Rules for Pilot "5G + Industrial Internet" Integrated Application Pioneer Zones (Interim) ("5G+工業互聯網"融合應用先導區試點工作規則(暫行)) & Construction Guidelines for Pilot "5G + Industrial Internet" Integrated Application Pioneer Zones ("5G+工業互聯網"融合應用先導區試點建設指南)	Ministry of Industry and Information Technology (MIIT)	The "Trial Work Rules" comprise seven chapters and 20 articles, including General Provisions, Pilot Requirements, Application Procedures, Review Procedures, Approval Procedures, Tracking and Evaluation Procedures, and Supplementary Provisions. They aim to thoroughly implement the innovation and development strategy for the industrial internet, strengthen the management of pilot "5G + Industrial Internet" Integrated Application Pioneer Zones, leverage the leading and driving effect of the pioneer zones, and promote the large-scale development of "5G + Industrial Internet" integration. The "Construction Guidelines" encourage localities to undertake pilot construction of pioneer zones at the city level (prefectural-level cities and above). They provide 16 reference items across five aspects for pioneer zone pilot construction: pioneering development policies, pioneering infrastructure, pioneering industry applications, pioneering industrial ecosystems, and pioneering public services.

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Major policies in telecommunications infrastructure services industry - the PRC

While the policies placed strong emphasis on telecommunications infrastructure development in the earlier years, the recent policies set to accelerate the development of digital infrastructure including the deployment of 5G technology, smart cities, and Internet of Things(IoT) for manufacturing

Major Policies (2/6)

Time of Issue	Policy	Issuing Department	Policy Highlight
2023.05	Implementation Opinions on Further Deepening Co-construction and Sharing of Telecommunications Infrastructure to Promote High-quality Development of "Double Gigabit" Networks (關於進一步深化電信基礎設施共建共用 促進 "雙千兆" 網絡高品質發展的實施意見)	Ministry of Industry and Information Technology (MIIT) and 13 Other Departments	This policy deploys key tasks in six areas, and proposes four specialized initiatives: Promoting coordinated and intensive construction of "Double Gigabit" networks; Deepening common access to "Double Gigabit" networks, and launching the "Double Gigabit" Network Joint Breakthrough Initiative; Strengthening maintenance and rectification of rural telecommunications pole lines and cables, and launching the Rural Pole Line Joint Governance and Maintenance Initiative; Encouraging cross-industry opening and sharing, and launching the Cross-industry Sharing Pilot Initiative; Enhancing digital technology support, and launching the Digital Safeguard Improvement Initiative; Optimizing the environment for "Double Gigabit" network construction.
2023.02	Overall Plan for Digital China Construction (數字中國建設整體佈局規劃)	Central Committee of the Communist Party of China & The State Council	The plan is set to advance Chinese-style modernization and support for constructing a new national competitive advantage. The plan states that the foundation of digital China construction should be consolidated, which is to open the digital infrastructure arteries, aiming to accelerate the construction of 5G network and gigabit optical network, deepen the scale deployment and application of IPv6, promote the comprehensive development of mobile Internet of things, and promote the scale application of Beidou. Also, the plan is to systematically optimize the layout of computing infrastructure, promote the efficient complementarity and synergy of computing power in the east and west, and guide the reasonable echelon layout of general-purpose data centers, supercomputing centers, intelligent computing centers and edge data centers.
2022.10	Plan for Development of IIoT in Industrial Parks (工業和信息化部辦公廳關於組織開展工業互聯網一體化進園區 "百城千園行" 活動的通知)	Ministry of Industry and Information Technology(MIIT)	The plan is set to take advantages of industrial clustering in industrial parks, promote the spread of industrial Internet to local cities and counties, empower the digital transformation of enterprises, especially small and medium-sized enterprises, and facilitate high-quality economic development.
2022.09	Guideline for development of Full 5G Connection in Factories (工業和信息化部辦公廳關於印發5G全連接工廠建設指南的通知)	Ministry of Industry and Information Technology(MIIT)	The plan is set to guide all regions and industries to actively carry out the construction of 5G fully connected factories, drive the development and growth of the 5G technology industry, further accelerate the "5G + IIoT (Industrial Internet of things)" new technology and new scenarios and new models to the depth of industrial production in various fields and links, and promote the traditional industry to improve quality, reduce costs, increase efficiency, green and safe development.

Source(s): Ipsos Research and Analysis

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Major policies in telecommunications infrastructure services industry - the PRC

While the policies placed strong emphasis on telecommunications infrastructure development in the earlier years, the recent policies set to accelerate the development of digital infrastructure including the deployment of 5G technology, smart cities, and Internet of Things(IoT) for manufacturing

Major Policies (3/6)

Time of Issue	Policy	Issuing Department	Policy Highlight
2022.01	Plan for Integration of Cloud and Network to Accelerate the Information Technology Infrastructure Development in Small and Medium-sized Cities (兩部門關於促進雲網融合 加快中小城市信息基礎設施建設的通知)	Ministry of Industry and Information Technology (MIIT) & National Development and Reform Commission	The plan is set to be in line with the current development trend of cloud-network integration, to accelerate the upgrading of network infrastructure and to deploy the application infrastructure on demand in small and medium-sized cities, aiming to develop the digital economy, improve the functions of livability and livability, promote people's well-being, and accelerate the urbanization construction with the county as an important carrier.
2021.12	14th Five-Year Plan Information and Communication Industry Development Plan ("十四五" 信息通信行業發展規劃)	The State Council	The plan is set to develop strategic technologies and digital infrastructure, aiming to advance the digital infrastructure in the PRC and share the technology with the world. Efforts were also be made to deepen comprehensive digital transformation in key industries, including the full digital transformation for social governance, traditional industries and a highly digitalized agricultural industry. The plan highlighted the innovation of key technologies such as quantum computing, network communications, big data, artificial intelligence, blockchain, and new materials. The plan was also set to construct smart cities and digital villages, such as smart parking lots, smart charging centres, and smart dustbins in newly built residential areas to enhance public security.
2021.03	The "'Dual Gigabit' Networks Development Action Plan 2021-2013 ("雙千兆"網絡協同發展行動計劃（2021-2023年）)	Ministry of Industry and Information Technology(MIIT)	The plan is set to accelerate the development of both Fiber-to-the-home(FTTP) and 5G networks and enable the two types of technology to complement the best network efficiency. The plan is also set to upgrade the telecommunications infrastructure of public facilities in rural areas.

Source(s): Ipsos Research and Analysis

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Major policies in telecommunications infrastructure services industry - the PRC

While the policies placed a strong emphasis on telecommunications infrastructure development in the earlier years, the recent policies set to accelerate the development of digital infrastructure including the deployment of 5G technology, smart cities, and Internet of Things(IoT) for manufacturing

Major Policies (4/6)

Time of Issue	Policy	Issuing Department	Policy Highlight
2020.03	Plan for Advancing the development of 5G (工業和資訊化部關於推動5G加快發展的通知)	Ministry of Industry and Information Technology(MIIT)	The plan is set to accelerate the construction of digital infrastructure and industrial digitalization by developing at least 20 best cases from enterprises. The plan also encouraged the upgrade of digitalized industrial intranet with 10 benchmarking networks, led by 100 leading enterprises in key industries and 1,000 local leading enterprises in the PRC. The plan also suggested the provincial government to lead the industrial enterprises working with leading telecommunications network operators to develop and innovate in 5G plus Industrial Internet of Things (IIoT).
2019.11	Plan for Advancing the 512 Program on "5G Plus Industrial Internet of Things (IIoT)" (工業和資訊化部辦公廳關於印發 "5G+工業互聯網" 512 工程推進方案的通知)	Ministry of Industry and Information Technology(MIIT)	The plan is set of goal of making breakthroughs in a number of key 5G-related technologies and enhancing the capacity of "5G plus IIoT" in order to create public services platforms for five industries by the year 2022. Ten key sectors were also selected to pioneer "5G plus IIoT" for the development of databases.
2019.06	Implementation Plan for Promoting the Upgrading of Key Consumer Goods and the Recycling of Resources (2019-2020)(推動重點消費品更新升級暢通資源迴圈利用實施方案(2019-2020年))	National Development and Reform Commission (NDRC)	The plan is set to accelerate the commercial application of the 5G in mobile phones, such as the Internet of Things(IoT), artificial intelligence (AI), bioinformatics, virtual reality and augmented reality (VR/AR).
2018.08	(擴大和升級資訊消費三年行動計劃（2018-2020年）)	Ministry of Industry and Information Technology(MIIT)/ National Development and Reform Commission (NDRC)	The plan is set to accelerate the research on 5G technology with pilot projects to ensure the commercial application of 5G in 2020. The plan is further set to leverage the technology to create consumer demand by technology-enabled product and services including wearable devices, connected cars, smart elderly care.

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Major policies in telecommunications infrastructure services industry - the PRC

The plans were set to accelerate the development of telecommunications infrastructure to increase the penetration and quality of telecommunications services.

Major Policies (5/6)

Time of Issue	Policy	Issuing Department	Policy Highlight
2018.05	(關於深入推進網路提速降費加快培育經濟發展新動能2018專項行動的實施意見)	Ministry of Industry and Information Technology(MIIT)/ State-owned Assets Supervision and Administration Commission of the State Council (SASAC)	The document suggested accelerating the development of 5G economy, including the 5G technology standard, research, development of supply chain and security standards. The document also suggested the nation lead the standardization of 5G standard in the world and the new generation of mobile broadband telecommunications networks. The document also called for the collection of use cases to promote the deployment of 5G in vertical industries.
2017.08	Circular to promote and upgrade information consumption to further unleashing the potential of domestic demand (關於進一步擴大和升級資訊消費持續釋放內需潛力的指導意見)	The State Council	The plan is set to accelerate the research on 5G technology with pilot projects to ensure the commercial application of 5G in 2020. The plan also set to trigger consumer demand by enhancing the traditional private and services with use of technology for example smart home, smart TV, digital payment, remote medical consultation, media cotent etc.
2017.01	Plan for information technology and communication industry (2016-2020) (信息通信行業發展規劃（2016-2020年）)	Ministry of Industry and Information Technology(MIIT)	The plan is set to develop information technology as a core of future technology by accelerating the construction of related infrastructure. The plan is set to increase the network speed and decrease of fee of broadband networks in order to increase the pentration. Together with the "Broadband China Strategy" (寬帶中國), a comprehensive ecosystem will be developed to support the emerging industries and deport of Internet of Things(IoT). The plan also set to boost the development of information communication technology in the rural area.
2017.01	Plan for software and information technology services industry (2016-2020) (軟體和資訊技術服務業發展規劃（2016-2020 年）)	Ministry of Industry and Information Technology(MIIT)	The plan is set to develop a comprehensive ecosystem in information technology and support the development of leading enterprises in order to be influential in the global telecommunications industry. The plan further highlighted the deployment of 4G/5G technologies, cloud computing and big data to develop social services and social governance.

Source(s): Ipsos Research and Analysis

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Major policies in telecommunications infrastructure services industry - the PRC

The plans were set to accelerate the development of telecommunications infrastructure to increase the penetration and quality of telecommunications services.

Major Policies (6/6)

Time of Issue	Policy	Issuing Department	Policy Highlight
2016.03	13th Five-Year Plan Information and Communication Industry Development Plan ("十三五" 國家資訊化規劃)	The State Council	The plan is set information technology as inseparable of the sustainable development of society and economy. World-class information technology infrastructure will be developed, and the "Broadband China Strategy" (寬帶中國) will be full articulated. 5G technology and research will continue to be the core focus and commercial deployment of 5G will be achieved.
2015.09	Plan for telecommunications infrastructure development in urban area (關於加強城市通信基礎設施規劃的通知)	Ministry of Housing and Urban-Rural Development & Ministry of Industry and Information Technology(MIIT)	The plan is set the construction of telecommunications infrastructure (Cable, base station, base station controller, pipeline) to be part of the urban planning policy. The objective of the plan is to coordinate, align and speed up the development of telecommunicaton structure in order to maximize the network coverage and services quality.

Source(s): Ipsos Research and Analysis

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Major policies in telecommunications infrastructure services industry – Jiangxi Province

Besides policies to set the development of infrastructure, policies were also launched to accelerate the development of new infrastructure and related application.

Major Policies – Jiangxi Province (1/5)

Time of Issue	Policy	Issuing Department	Policy Highlight
2024.04	Notice on Advancing the Systematic Development of New Information Infrastructure in Jiangxi Province (關於推進新型信息基礎設施體系化發展的通知)	Jiangxi Communications Administration	The plan proposes to comprehensively promote the "construction, utilization, and research" of our province's new information infrastructure, fostering the deep integration of the digital economy with the real economy. This year, Jiangxi Province aims to build 14,000 new 5G base stations, achieving a 5G network access rate of 96% in administrative villages; ensuring that all prefecture-level cities become "gigabit cities"; establishing over 100 new 5G virtual private networks; and exceeding 9 billion yuan in fixed asset investment and research and development spending in the industry. Jiangxi Province will optimize the deployment of new information infrastructure this year, carry out a special "signal upgrade" action to continuously expand the breadth and depth of mobile communication network coverage; promote the optimized layout of cloud network infrastructure in small and medium-sized cities; continuously improve the level of industry integration and application services, accelerate the improvement and innovation of "double gigabit" applications, promote the "intelligent connection of all things" through mobile internet of things, deepen the scaled deployment and application innovation of IPv6, drive the innovative development of industrial internet, and enhance the application level of computing power empowerment; accelerate the green and low-carbon development of the industry, deepen the co-construction and sharing of telecommunication infrastructure, and improve the level of green and low-carbon development in the industry.
2023.06	Implementation Plan for the Digital Transformation of Manufacturing Industry in Jiangxi Province (江西省製造業數字化轉型實施方案)	People's Government of Jiangxi Province	This plan promotes the construction of information infrastructure. It comprehensively advances the "double gigabit" network construction, continuously optimizes the 5G network construction in industrial parks and supporting service carriers, and aims to reach 100,000 5G base stations across the province. Efforts will be made to accelerate the deep deployment of IPv6 (Internet Protocol version 6) in the manufacturing industry. Additionally, the construction of infrastructure such as the Internet of Things, satellite internet, and vehicle networking will be promoted, along with the deployment of artificial intelligence infrastructure, the establishment of data sets and open-source toolkits. The deployment of blockchain infrastructure will also be encouraged to form a trusted blockchain service support platform. Leveraging the role of Nanchang's national-level internet backbone direct connection point, the plan aims to advance the computing network layout across the province and promote the deployment of dedicated international internet data channels in Jiangxi.
2023.05	Action Plan for Digital Transformation of the New Energy Industry in Jiangxi Province (2023-2025) (江西省新能源产业数字化转型行动计划(2023-2025年))	Department of Industry and Information Technology of Jiangxi Province	This Plan vigorously promotes the digital construction of industrial clusters. It advances the development of digital economy featured industrial clusters, supporting the growth of digital economy featured clusters like Intelligent Photovoltaics in Yingtan and Intelligent New Energy in Yichun, to create a distinctive and coordinated digital industrial landscape. It supports enterprises within the clusters to upgrade internal and external networks, encouraging enterprises to cooperate with telecommunications operators, internet companies and others to upgrade enterprise networks. It propels IP-based, flattened and flexible technological transformation and construction of enterprise intranets, enabling mobile IoT, 5G, and Next Generation Wireless Intelligent Networks (NGB-W) applications in enterprises. It supports the construction of Industrial Internet platforms, identification resolution secondary nodes and other platforms in featured industrial clusters, providing a series of digital transformation solutions for cluster enterprises leveraging these platforms.

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Major policies in telecommunications infrastructure services industry – Jiangxi Province

Besides policies to set the development of infrastructure, policies were also launched to accelerate the development of new infrastructure and related application.

Major Policies – Jiangxi Province (2/5)

Time of Issue	Policy	Issuing Department	Policy Highlight
2022.12	Three-Year Action Plan for Promoting the Development of Big Data Industry in Jiangxi Province (2023-2025) (江西省推進大數據產業發展三年行動計畫(2023-2025年))	Department of Industry and Information Technology of Jiangxi Province	This plan emphasizes the improvement of communication infrastructure. It aims to fully promote the comprehensive deployment of gigabit optical networks, expedite the large-scale construction of 10G-PON Optical Line Terminal (OLT) equipment, ensuring that household users generally possess gigabit access capabilities, while large enterprises and institutions enjoy 10G access capabilities. The plan also strives to continuously optimize the IPv6 network quality of backbone networks, metropolitan area networks, and access networks. It promotes the upgrading and reconstruction of facilities such as big data centers, cloud platforms, and user terminals, expanding the IPV6 export bandwidth of big data centers based on demand, ensuring that newly-built big data centers fully support IPV6. Additionally, it calls for the establishment and effective utilization of the national-level internet backbone direct connection point in Nanchang, as well as the dedicated international internet data channels in Shangrao and Jiujiang. Efforts will be made to construct dedicated links directly connecting to the international gateway bureau in cities such as Nanchang, Ganzhou, and Ji'an, enhancing the performance of international internet access. Furthermore, the plan accelerates the construction of a high-speed, mobile, secure, and ubiquitous "one network with multiple planes" new government external network, laying a solid foundation for government services, office administration, urban governance, and other network needs.
2022.05	Implementation Plan for Accelerating the Construction of New Internet of Things Infrastructure in Jiangxi Province (江西省加快推進物聯網新型基礎設施建設實施方案)	Department of Industry and Information Technology of Jiangxi Province	This Plan fully leverages the Internet of Things in driving digital economic development and enabling traditional industry transformation. First, it improves information infrastructure through IoT facility coverage, high-quality 5G networks, and gigabit optical network construction. Second, it consolidates industrial support by driving core technology breakthroughs, promoting technological convergence, and fostering IoT industry growth. Third, it deepens cross-industry applications in smart cities, digital villages, upgraded infrastructure across sectors like transportation and healthcare, and smart home/community deployments. Fourth, it optimizes supporting systems for IPv6 adoption in IoT, public services, talent and security assurance. By end-2023, county-level regions will have gigabit access, 5G coverage in urban/rural areas, and an integrated 4G/5G/NB-IoT/eMTC mobile IoT ecosystem. The IoT industrial ecosystem will be enhanced, exceeding RMB 200 billion in scale, establishing it as a national IoT application demonstration zone across sectors.

Source(s): People's Government of Jiangxi Province; Jiangxi Communications Administration; Ipsos Research and Analysis

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Major policies in telecommunications infrastructure services industry – Jiangxi Province

Besides policies to set the development of infrastructure, policies were also launched to accelerate the development of new infrastructure and related application.

Major Policies – Jiangxi Province (3/5)

Time of Issue	Policy	Issuing Department	Policy Highlight
2022.05	"14th five-year" Digital Economy Development Plan in Jiangxi Province (關於印發江西省"十四五"數字經濟發展規劃的通知)	People's Government of Jiangxi Province	The plan is set to actively promote the digital economy to do better and stronger "No. 1 Development Project" and strive to create a new situation of high-quality leap-forward development. The plan proposes to continuously upgrade the digital infrastructure to accelerate the digital transformation of industries.
2022.05	Three-year Action Plan for Digital Governance in Jiangxi Province 江西省數字政府建设三年行动计划 (2022-2024年)	People's Government of Jiangxi Province	The plan is set to actively digitalise public services, city governance, personal and corporate credit system, and digital payment leveraging on data science, virtual reality and artificial intelligence
2022.04	Plan for IIoT Identification and Resolution System Construction (2022-2025) (江西省工業互聯網標識解析體系建設行動方案（2022-2025年）)	Jiangxi Province Department of Industry and Information Technology	The plan is set to further promote the digital economy to do better and stronger "No. 1 development project", accelerate the construction of industrial Internet identification resolution system, and promote the development of industrial Internet. The industrial Internet identification and resolution system is the public network infrastructure of the IIoT, which is the key hub for realizing the integration of all industrial elements and information in all aspects.
2022.04	Plan for IIoT Capabilities Enhancement in Jiangxi Province (江西省工業互聯網強鏈提能行動計劃)	Jiangxi Provincial Development and Reform Commission	The plan is set to further implement the industrial Internet innovation and development strategy, promote the industrial Internet to empower Jiangxi as strong industrial province, and help the digital technology and the real economy to achieve integration and development in a wider scope, deeper degree and higher level.

Source(s): People's Government of Jiangxi Province; Jiangxi Communications Administration; Ipsos Research and Analysis

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Major policies in telecommunication infrastructure services industry– Jiangxi Province

Besides policies to set the development of infrastructure, policies were also launched to accelerate the development of new infrastructure and related application.

Major Policies – Jiangxi Province (4/5)

Time of Issue	Policy	Issuing Department	Policy Highlight
2021.12	Three-year Plan for the Interconnected Jiangxi (2021-2023) (“智聯江西” 建設三年行動方案（2021-2023年）)	People's Government of Jiangxi Province	The action plan is formulated to focus on the construction of new infrastructure, coordinate the provincial information network and data resources, and strengthen the in-depth application of new-generation information technology, to promote the high-quality and leapfrog development of the economy and social governance of the whole province.
2021.10	The 14th five-year plan of new infrastructure construction in Jiangxi Province (江西省 “十四五” 新型基礎設施建設規劃)	People's Government of Jiangxi Province	The plan is to build a high-speed, intelligent, comprehensive integrated, secured and credible new infrastructure system by 2025 and stated to speed up the construction of 5G network and optical fibre broadband network, and to promote the development of mobile Internet of things and IIoT, etc. The plan indicated that efforts will be made to promote the construction of new infrastructure in the fields of industry, agriculture, e-commerce, energy, education and urban management, and support the digital transformation and intelligent upgrading of traditional industries.
2021.10	The "14th Five-Year" Information and Communication Industry Development Plan of Jiangxi Province (江西省 “十四五” 信息通信行業發展規劃)	Jiangxi Communications Administration	The plan is to propose that, by 2025, all cities in Jiangxi Province will be built as Gigabit cities, with more than 100 thousands 5G base stations, and Jiangxi Province will achieve comprehensive coverage of 5G networks in both urban and rural areas with in-depth 5G coverage in key application scenarios. In addition, the plan indicated that the total amount of telecommunications related business in Jiangxi Province will increase by 20% annually by 2025, the scale of information and communication industry in Jiangxi Province will be further expanded, with upgrading the comprehensive development level in the national ranking.
2021.05	Notice on Promoting the Coordinated Development of 'Dual Gigabit' Networks in 2021 (關於2021年推進「雙千兆」網路協同發展的通知)	Jiangxi Communications Administration	The plan emphasized on 18 measures such as accelerating the deployment of 5G independent networking scale and continuously expanding the coverage of gigabit optical networks, in order to accelerate the development of "Double Gigabit" network construction and application in Jiangxi Province. The notice specifies that by the end of 2021, the comprehensive level of "Double Gigabit" network development in Jiangxi Province will be higher than the national average. By the end of 2023, a "dual gigabit" network system that meets the needs of high-quality leap-forward development of the economy and society will be fully established.

Source(s): People's Government of Jiangxi Province, Jiangxi Communications Administration, Ipsos Research and Analysis

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Major policies in telecommunication infrastructure services industry- Jiangxi Province

The plans were set to accelerate the development of telecommunications infrastructure to increase the penetration and quality of telecommunications services.

Major Policies – Jiangxi Province (5/5)

Time of Issue	Policy	Issuing Department	Policy Highlight
2019.02	Jiangxi Province 5G Network Development Plan (2019-2023) (江西省 5G 發展規劃 (2019－2023 年))	People's Government of Jiangxi Province	The plan sets goals to build a model of 5G integrated application in Jiangxi Province and develop Jiangxi Province as one of the core areas of 5G industrial development in the PRC by 2023. The plan emphasized accelerating the construction of a new generation of information and telecommunications infrastructures to improve the supply capacity of the 5G network, and to excavate the demand for 5G applications in various vertical fields such as to accelerate the innovative application of "5G + IIoT" and to promote the transformation and upgrading of traditional industries.
2019.02	Action plan for high quality leap forward development of "2+6+N" industry in Jiangxi province (2019-around 2023) (江西省 “2+6+N”產業高品質跨越式發展行動計劃（2019-2023 年左右）)	People's Government of Jiangxi Province	The action plan is to promote the construction of major projects, the extension and expansion of industrial chain, and the transformation and industrialization of major achievements, in order to build 2 trillion level, 6 five-hundred-billion level and N one-hundred-billion level industries. In addition, the plan emphasized to develop and expand high-quality enterprises, and to push forward the pilot demonstration of the transfer and transformation of major national science and technology projects of the new generation broadband wireless mobile telecommunications network.
2019.01	Three-year Action Plan for the Development of Telecommunications Infrastructures in Jiangxi Province (2018-2020) (江西省信息通信基礎設施建設三年攻堅行動計劃（2018-2020）)	People's Government of Jiangxi Province	The action plan sets the goal to invest over 30 billion RMB in telecommunications infrastructure in Jiangxi province including core network, transmission network, access network, FTTP, 4G/5G bases station, IoT network and cloud computing centers. Over 50 projects were committed by the three major telecommunications network operators and the government.

Source(s): People's Government of Jiangxi Province, Jiangxi Communications Administration, Ipsos Research and Analysis

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Major regulations in telecommunication infrastructure services industry

Major Regulations (1/2)

Currently applicable laws and regulations in this industry are as follows:

Time of Issue	Regulations	Issuing Department	Summary
2022	Measures for telecommunications General service project completion and acceptance (電信普遍服務項目竣工驗收管理辦法)	Ministry of Industry and Information Technology	The measures propose to standardize the completion and acceptance of telecommunications general service projects, and to ensure the smooth implementation of general service projects.
2018	Regulations on quality supervision and management of communication construction projects (通信建設工程品質監督管理規定)	Ministry of Industry and Information Technology	The regulation points out that it is necessary to strengthen the quality supervision and management of communication construction projects to ensure the quality of communication construction projects. The regulations are applicable to the construction units, survey units, design units, construction units and supervision units of communication construction projects.
2017	Measures for the administration of telecom business license (Revised) (電信業務經營許可管理辦法)（修訂）	Ministry of industry and information technology	The measures propose to strengthen the management of telecom business license, and make relevant provisions on the application, examination and approval, use, standardization of business behavior, change and cancellation of business license, supervision and inspection of business license, etc.

Source(s): The Ministry of industry and information technology; The State Council; Ipsos Research and Analysis

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Major regulations in telecommunication infrastructure services industry

Major Regulations (2/2)

Currently applicable laws and regulations in this industry are as follows:

Time of Issue	Regulations	Issuing Department	Summary
2016	Telecommunications regulations of the people's Republic of China (revised in 2016) (中華人民共和國電信條例)（2016修訂）	The State Council	The regulation proposes to standardize the order of the telecommunications market, safeguard the legitimate rights and interests of telecommunications users and telecommunications business operators, ensure the safety of telecommunications networks and information, and promote the healthy development of the telecommunications industry.
2016	Network security law of the people's Republic of China (中華人民共和國網路安全法)	The State Council	The law points out that to build, operate or provide services through the network, technical measures and other necessary measures shall be taken in accordance with the provisions of laws, administrative regulations and the mandatory requirements of national standards to ensure the safe and stable operation of the network, effectively respond to network security incidents, prevent network illegal and criminal activities, and maintain the integrity, confidentiality and availability of network data.

Source(s): The Ministry of industry and information technology; The State Council; Ipsos Research and Analysis

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Major licenses in telecommunication infrastructure services industry

Major Licenses

Licenses	Issuing Department	Summary
Telecommunications Network planning and design Professional Qualification 有線通信規劃設計專業資質	Ministry of Housing and Urban-Rural Development (MOHURD)	The qualification determines if network planning and design project can be undertaken by the company. The qualification is a sub-regulation under the Professional Qualification of Construction Design in Electronic Communication, Broadcasting and Television Industry (電子通信廣電行業工程設計專業資質)
Communications Project Implementation General Contracting Enterprises Qualification 通信工程施工總承包資質	Ministry of Housing and Urban-Rural Development (MOHURD)	The qualification determines the scale of telecommunications engineering and construction that can be undertaken by a company as a contractor. It classifies the contractors in three classes by capital scale, the quantity of staff and previous project performance. The level of classification is also used to determine the project scale that can be undertaken by contractors. First tier contracting enterprises can undertake projects with all scale, Class 2 with a restriction of $20 million RMB or below investment and third tier contracting enterprises with a restriction of $5 million RMB or below.
Electronic system engineering general contractor qualification 電子與智慧化工程專業承包資質	Ministry of Housing and Urban-Rural Development (MOHURD)	The qualification determines the scale of electronic system engineering project can be undertaken by a company as a contractor. It classifies contractors in two levels by capital scale, the quantity of staff and previous project performance. Level 1 contractors can undertake all types of projects while level 2 corporate can only undertake equipment installation project with $25 million RMB or less contract volume and electronic system engineering building project in buildings with $15 million RMB or less contract volume
telecommunications engineering supervisor qualification 通信工程監理資質	Ministry of Industry and Information Technology (MIIT)	The qualification determines the telecommunications and communication tower construction scale and types that can be undertaken by a company as the implementation supervisor. Class A contractors can undertake all scales and types of projects under the regulation.
telecommunications network maintenance qualification 通信網路代維企業資質	China Association of Communication Enterprises (CACE)	The qualification determines the scale and types of communication network maintenance project can be undertaken by communication network maintenance company. The qualification assess on service standards in optical cable, base station, installation and maintenance, comprehensive maintenance, tower maintenance.
Labour services subcontractor qualification 施工劳务資質	Ministry of Housing and Urban-Rural Development (MOHURD)	An enterprise that has obtained the qualification for undertaking a labor service by subcontract may undertake the labor service subcontracted by an enterprise that has obtained main contractor in communication Construction "通信工程施工總承包资质" and main contractor"施工总承包资质" As of Aug 31 2022, there are approximately 308,969 awarded the Labour services subcontractor qualification

Source(s): MOHURD; MIIT; CACE; Ipsos Research and Analysis

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Tendering process in the telecommunication infrastructure services industry

Telecommunication infrastructure services projects tendering process involves telecommunication infrastructure services companies participating for open tender from telecommunications network operators

Tendering process

Open tender

- telecommunications network operators publish the bidding demand information on official platforms either independently or through third-party bidding agencies
- telecommunications network infrastructure construction companies participate in the tender for a potential telecommunication infrastructure services project
- telecommunications network operators usually announce the key tender bidding in every two years or three years, depending on the telecommunication providers. For example, China Mobile announce the key project tender in Jiangxi province on a bi-annual basis. Each of the provincial offices of the telecommunications network operators will also invite and decide tenders for projects within their region.

Tender document preparation and evaluation of the bidder

- telecommunications network infrastructure construction companies select the project registration within the company's business scope through the review of project information on the bidding platform and prepare bidding documents in strict accordance with the requirements of the bidding documents.
- After the receipt of bidding documents, telecommunications network operators organize an expert evaluation committee for the comprehensive comparison and selection of bidders.
- The evaluation team will select the participating units in strict accordance with the scoring requirements in terms of qualification level, technical level, performance scale, comprehensive strength of the enterprise, business quotation, etc.

Shortlisting and signing contract

- telecommunications network operators determine the shortlisted bidders through the evaluation of the bidders and publicize them on the official platform. After the publicity period expires and the final successful bidder is determined, a notification of award will be issued.
- telecommunications network operators shall sign a sales contract with the telecommunication infrastructure services company in accordance with the requirements of the bidding documents and the response of the bidding documents to establish a sales relationship. In the whole bidding process, the supplier's quotation present as discount rate and bidding process are all open and transparent.

Tender Awarded And Implementation

- The telecommunication infrastructure services company awarded for the contract will commence accordingly with the project.
- After a certain part of the project is completed and infrastructure is built, telecommunication network providers or their outsourced agents would inspect the quality of deliverables and issue the certifications before they settle the payment to the telecommunication infrastructure services providers.
- After the commission of a framework agreements, customers have the flexibility to determine the work scope based on their own requirement by issuing work orders to supplier and the actual value vary based on the actual issued work orders. Typically a minimum of 60% of the contract value will be actualized. Telecommunication network operators will typically plan for a higher contract value in ensuring sufficient resources will be secured for the project.
- After the customer issue an work order, the timeframe generally required for the project implementation up to and including the practical completion in respect of a work order is approximately one to two months.
- It take a substantial period of time to finish the inspection and settlement audit as the telecommunication network providers and designated inspection agents require a long period of time to inspect infrastructure in different regions in the provinces.
- After the inspection and settlement audit, it might also take substantial time to raise the payment procedure, it is not uncommon for telecommunication network providers to defer the payment to infrastructure services providers.
- Among some of the leading infrastructure services providers, the days sales outstanding range from approximately 100 days to approximately 450 days.

Source(s): Ipsos Research and Analysis

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Tendering process in the telecommunication infrastructure services industry

Telecommunication infrastructure services projects tendering process involves telecommunication infrastructure services companies participating for open tender from telecommunications network operators

Tendering process

Bidding policies and business pricing methods of major customers

- In recent years, telecommunications network operators have gradually adopted "centralized procurement" tendering instead of the traditional city-level companies bidding. For example, China Mobile's centralized procurement at the group level includes telecommunications equipment installation, wired transmission engineering and access engineering (transmission pipeline engineering), and comprehensive maintenance projects. The projects of Indoor distribution system engineering, wired transmission engineering and access engineering (wired broadband project), and the construction of telecommunications infrastructures are procured by the company at the provincial level or prefecture level. The other telecommunications network operators remain in procurement at the provincial or prefecture level.
- The basis of project price is mainly based on "The notice on printing and distributing the budget quota, engineering cost quota and engineering budget preparation procedures of information and communication construction projects"(關於印發信息通信建設工程預算定額、工程費用定額及工程概預算編制規程的通知)issued by the Ministry of industry and information technology and the quota of construction projects in various provinces. The estimated project price by province and district are all listed in the tending document for the bidders as a reference.
- The tender success rate of telecommunications infrastructure construction and maintenance services companies varies from approximately 15% to approximately 35% for telecommunication infrastructure construction projects and approximately 30% to approximately 45% for telecommunication maintenance projects depending on companies' price competitiveness and past experience in a certain province.

Source(s): Ipsos Research and Analysis

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Overview of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

Future demand and trends of the industry

Continuous development of the "New Infrastructure"

- With the continuous improvement of China's traditional infrastructure system, the traditional infrastructure construction represented by transportation, energy and water conservancy will gradually reduce investment during the "14th Five-Year" period. The new infrastructure represented by 5G infrastructure, extra-high voltage (EHV) and Industrial Internet of Things (IIoT) will gradually start to exert strength. At the executive meeting of the State Council held on September 22, 2021, "The 14th Five-Year Plan for the Construction of New Infrastructure" ("十四五" 新型基礎設施建設規劃)was released, which emphasized that during the 14th Five-Year Plan period, it is necessary to promote the construction of new infrastructure based on information network and driven by technological innovation. According to the estimation of the China Academy of Information and Communications Technology (CAICT), the total investment related to new infrastructure during the 14th Five-Year Plan period will reach 10.6 trillion RMB, accounting for more than 10% of the PRC's total infrastructure investment in the same period.
- In October 2020, 14 departments including the Ministry of Industry and Information Technology jointly issued a notice on the "Recent Work Plan for Expanding Domestic Demand and Promoting Consumption"(近期擴內需促消費的工作方案). The work plan clearly proposed to accelerate the construction of 5G network base stations, and support local governments to increase their support for 5G network construction in terms of site resource acquisition and financial subsidies. With the formation of the 'Dual Circulation' development model in the PRC, 5G network construction will play an increasingly important role in promoting digital transformation and cultivating new momentum for economic development. Relevant policies will further help the sustainable development of the telecommunication infrastructure services industry.

Source(s): The State Council; The China Academy of Information and Communications Technology; ipsos research and analysis

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Overview of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

Future demand and trends of the industry

New urbanisation and integrated urban-rural development

- The National Development and Reform Commission issued the "Key Tasks for New Urbanization and Urban-Rural Integration Development in 2021"(2021年新型城鎮化和城鄉融合發展重點任務), which emphasized to implement the new urbanization strategy to accelerate the integrated development of urban and rural areas. The tasks indicated to build new smart cities to promote the intelligent upgrading of municipal public facilities in key areas such as transportation, public security, water, electricity and heat. In addition, the PRC will further promote data integration and sharing to improve urban operation management and emergency response capacity.
- As stated in "The 14th Five-Year Plan for Information and communication Industry" (十四五" 信息通信行業發展規劃) issued by the Ministry of Industry and Information Technology, one of the development focus is to continue to improve the level of rural telecommunications network facilities to achieve 5G accessibility in villages by 2025 rate reached 80%. There will also be promotion of the 5G applications in precision agricultural production, remote medical consultation, online education and other fields.
- In January 2022, the Ministry of Industry and Information Technology (MIIT) and National Development and Reform Commission jointly issued the "Notice of Promoting the Integration of Cloud and Network to Accelerate the Construction of Information Infrastructure in Small and Medium-sized Cities" (兩部門關於促進雲網融合加快中小城市信息基礎設施建設的通知), aiming to basically build a cloud network infrastructure covering small and medium-sized cities in the eastern region, and most of the central, western and northeastern regions by 2025.

Deployment of 5G in smart cities and application in vertical industries

- The Chinese government and relevant departments have successively issued industrial policies such as the "14th Five-Year Plan Information and Communication Industry Development Plan" ("十四五" 資訊通信行業發展規劃), "The Industrial Internet of Things (IIoT) Development Action Plan (2018-2020)" (工業互聯網發展行動計劃（2018-2020年）), and "The "'Dual Gigabit' Networks Development Action Plan 2021-2023 (「雙千兆」網路協同發展行動計劃（2021-2023年）) and reaffirm the development of the telecommunications industry as a strategic industry in the PRC. The PRC's proactive efforts in new infrastructure and the smart city will lead to a new round of social investment boom. The new infrastructure includes not only information infrastructure such as 5G, IIoT, and data centers, but also the digital transformation and upgrading of traditional facilities such as transportation, energy, manufacturing, municipal pipeline networks, and public governance.
- Telecom operators were estimated to further optimize equipment procurement, survey design, and engineering construction to comply with the construction period and mitigate the impact of the COVID-19 pandemic. According to the MIIT, the PRC was also estimated to encourage new consumption models and promote the development of 5G plus medical health, 5G plus IIoT, and 5G plus the internet of vehicles.

Source(s): The National Development and Reform Commission; The Ministry of Industry and Information Technology; Ipsos research and analysis

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Overview of the telecommunications infrastructure services industry in Jiangxi Province

Future demand and trends of the industry in Jiangxi Province

- Jiangxi Communications Administration issued "The "14th Five-Year" Information and Communication Industry Development Plan of Jiangxi Province (江西省 "十四五" 信息通信行業發展規劃) which proposed that, by 2025, all cities in Jiangxi Province will be built as Gigabit cities, with more than 100,000 5G base stations, and Jiangxi Province will achieve comprehensive coverage of 5G networks in both urban and rural areas with in-depth 5G coverage in key application scenarios. In addition, the plan indicated that the total amount of telecommunications-related business in Jiangxi Province will increase by 20% annually by 2025.
- The Jiangxi Provincial Communications Administration issued the "Notice on Promoting the Coordinated Development of 'Dual Gigabit' Networks in 2021" (關於2021年推進「雙千兆」網路協同發展的通知), which emphasized that Jiangxi Province will implement 5 key tasks and 18 specific measures, to further consolidate the foundation of "Double Gigabit" network, continuously expand the coverage of gigabit optical network and accelerate the deployment of 5G independent network scale, and there will be 19,000 new 5G base stations and more than 10 million 5g Users by the end of 2021. By the end of 2023, a "dual gigabit" network system that meets the needs of the development of the economy and society will be fully established in Jiangxi Province.
- After the peak period in basic infrastructure building, it is expected that policy will stimulate the investment in 5G related application projects in different industries. It is also estimated that large stated owned enterprise(SOE) will lead the investment in order to create paragon cases for local and small medium size enterprises to follow.
- Policy such as "14th five-year" Digital Economy Development Plan in Jiangxi Province (江西省 "十四五" 數字經濟發展規劃的通知) and Plan for IIoT Capabilities Enhancement in Jiangxi Province (江西省工業互聯網強體提能行動計劃) launched in 2022 urge to accelerate the development of 5G+ Industrial Internet of Things(IIoT) development in different industries, particularly smart manufacturing. It is estimated that the telecommunications network operators will continue to work closely with the private and public sectors to develop the telecommunication infrastructure as well as relevant 5G applications.

Source(s): The State Council, The Ministry of Industry and Information Technology; Ipsos research and analysis

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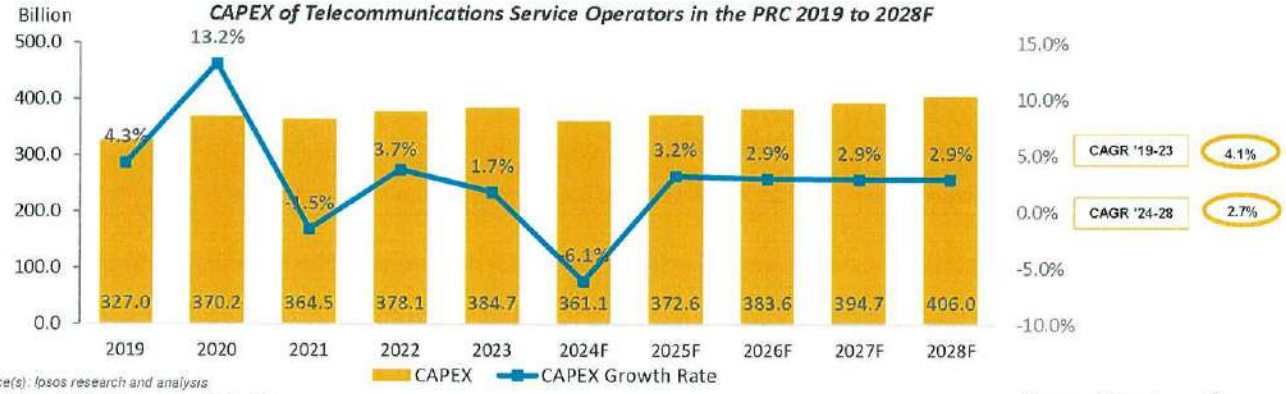
CAPEX of telecommunications network operators

The capital expenditure (CAPEX) of major telecommunications network operators increased due to the development of 5G network and is estimated to increase at a CAGR of approximately 2.7% from 2024 to 2028 while shifting more to industrial digitalization.

The capital expenditure (CAPEX) of major telecommunications network operators in the PRC grew from about RMB 327.0 billion in 2019 to about RMB 384.7 billion in 2023, at a CAGR of approximately 4.1%. The CAPEX of major telecommunications network operators in the PRC, including the Big Three telecommunications network operators (China Mobile, China Unicom, and China Telecom) and the China Tower, increased from 2018 to 2022 mainly driven by the development of 5G network, including 5G network infrastructure constructions, in order to continually improve the 5G network coverage.

The capital expenditure (CAPEX) of major telecommunications network operators is estimated to grow from about RMB 361.1 billion in 2024 to about RMB 400.9 billion in 2028, at a CAGR of approximately 2.7%. It is expected that the growth of CAPEX of major telecommunications service will slow down in coming years due to the completion of basic telecommunication infrastructure. For instance, the CAPEX of China Mobile is estimated to be about RMB 180.3 billion, of which 5G related CAPEX is about to be RMB 69 billion in 2023. In addition, it is expected that major telecommunications network operators will shift more CAPEX to industrial digitalization. For instance, China Telecom plans to allocate about 38.5% of the capital investment in digitalization in different industries in 2024.

CAPEX of Telecommunications Service Operators in the PRC 2019 to 2028F



Source(s): Ipsos research and analysis

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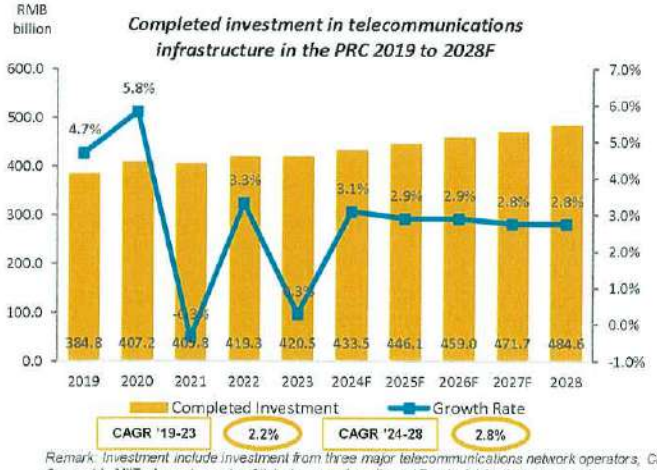
Overall completed investments in telecommunications infrastructure in the PRC and Jiangxi Province

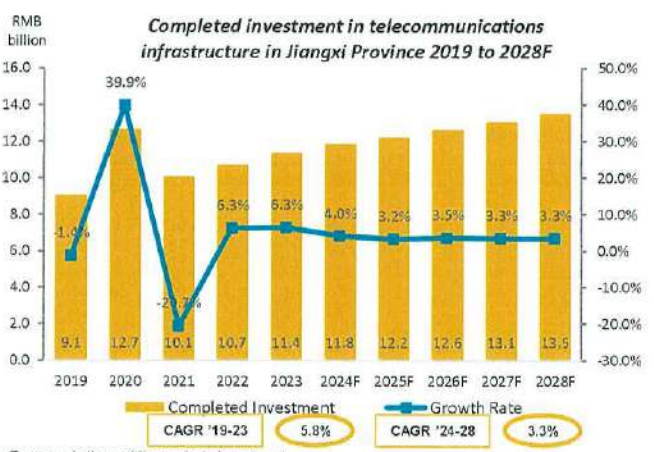
Completed investments in telecommunications infrastructure in the PRC and Jiangxi Province increased at a CAGR of approximately 2.2% and 5.8% respectively from 2019 to 2023, and estimated to keep increasing at a CAGR of approximately 2.8% and 3.3% respectively from 2024 to 2028

The investments in Jiangxi province peaked in 2020, the last year of the "Three-year Action Plan for the Development of Telecommunication Infrastructures in Jiangxi Province (2018-2020)"(江西省信息通信基礎設施建設三年攻堅行動計劃(2018-2020)). With the investments led by the three telecommunications network operators, the estimated investments for high-speed optical cable networks and mobile networks in 2020 were high at approximately RMB 33.0 billion and RMB 82.1 billion respectively.

Completed investment in telecommunications infrastructure in the PRC 2019 to 2028F



Completed investment in telecommunications infrastructure in Jiangxi Province 2019 to 2028F



Remark: Investment include investment from three major telecommunications network operators, China Tower and other public or private investment.
Source(s): MIIT, Annual reports of listed companies; Jiangxi Provincial Statistic Bureau; Ipsos research and analysis

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Overall completed investments in telecommunication infrastructure services in the PRC and Jiangxi Province

The PRC

- The competed investment in telecommunication infrastructure refers to the capital expenditures of the Big Three and the capital investment of government –led telecommunication infrastructure projects. The capital investments include both the purchases of equipment as well as services including network planning and design, and construction.
- According to the financial report from the Big Three and the China Tower, "Statistical Bulletin of the Communication Industry" (通信業統計公告) published by the Ministry of Industry and Information Technology of China(MIIT), the overall completed investments in telecommunication infrastructure services in the PRC fluctuated from about RMB 384.8 billion in 2019 to about RMB 420.5 billion in 2023, at a CAGR of approximately 2.2%. The increment was mainly attributed to massive 4G and 5G networks development and the government-led investment projects on 5G infrastructure.
- The overall completed investments in telecommunication infrastructure services in the PRC are estimated to increase from about RMB 433.5 billion in 2024 to about RMB 484.6 billion in 2028, at a CAGR of approximately 2.8%. The growth is estimated to be driven by the commercial application of telecommunication technology and the development of digital economy including smart cities.

Source(s): MIIT; Jiangxi Provincial Statistic Bureau; Ipsos research and analysis

Overall completed investments in telecommunication infrastructure services in the PRC and Jiangxi Province (1/2)

Jiangxi Province

- The overall completed investments in telecommunication infrastructure services in Jiangxi Province grew from about RMB 9.1 billion in 2019 to about RMB 11.4 billion in 2023, at a CAGR of approximately 5.8%. In 2020, the province's completed investments in telecommunication infrastructure services surged by about 39.9% compared to 2019. The growth in completed investments in telecommunications network construction in 2020 was primarily attributed to the investments by the Big Three and the provincial government in the Three-year Action Plan for the Development of Telecommunications Infrastructure in Jiangxi Province (2018-2020)（江西省信息通信基礎設施建設三年攻堅行動計劃（2018-2020））set the goal to invest over RMB30 billion in telecommunications infrastructure in Jiangxi province including core network, transmission network, access network, FTTP, 4G/5G base station IoT network and cloud computing centers. The overall completed investments in telecommunications infrastructure in Jiangxi Province is estimated to continue the growth at a CAGR of approximately 3.3% from 2024 to 2028. Policy including the Notice on Advancing the Systematic Development of New Information Infrastructure in Jiangxi Province (關於推進新型信息基礎設施體系化發展的通知) will continue to drive the development of 5G infrastructure and the related application of industrial internet of things (IIoT). The People's Government of Jiangxi Province issued the Three-year Action Plan for Digital Governance in Jiangxi Province (2022-2024) （江西省数字政府建設三年行動計劃（2022-2024年））, which is set to actively digitalise public services, city governance, personal and corporate credit system, and digital payment leveraging on data science, virtual reality and artificial intelligence.
- On the other hand, as the urbanization rate of Jiangxi is approximately 63.1% in 2022 and it is lower than the national average of approximately 66.2%, it is expected that the provincial government will accelerate the urbanization rate and result a increased investment in infrastructure construction.
- According to the national tender released by China Mobile in November 2021, 中国移动2022年至2023年通信工程施工服务集中采购(传输管线-各省)项目, Jiangxi ranked number three among the thirty one provinces in terms of budget level, with the budget level of over RMB 3.4 billion. The share of the budget is approximately 5.8% and it is high than the share of Jiangxi's GDP which is approximately 2.7% of the national GDP.

Source(s): MIIT; Jiangxi Provincial Statistic Bureau; Ipsos research and analysis

Overall completed investments in telecommunication infrastructure services in the PRC and Jiangxi Province (2/2)

Jiangxi Province – Rationale for higher CAGR for 1st submission

The growth is mainly supported by the favourable policies implemented to promote digital transformation by the Jiangxi government. These policies aim to serve to kick-start the development trajectory during the period, and beyond. As such, some of these policies would extend into 2035, while some of the policies may cover the period from 2022 to 2025. For policies with an initial end date before 2027, it is expected that these policies will continue to have positive lingering effects on the demand for telecommunication services, and hence, the demand for telecommunication infrastructure on an on-going basis. Some of the policies include,

- The People's Government of Jiangxi Province issued the Three-year Action Plan for Digital Governance in Jiangxi Province (2022-2024) (江西省數字政府建設三年行動計劃(2022-2024年)) which is set to actively digitalise public services, city governance, personal and corporate credit system, and digital payment leveraging on data science, virtual reality and artificial intelligence.
- The Jiangxi provincial government issued the "Notice on the Medium- and Long-term planning for Industry Development (2023-2035) (「關於江西省未來產業發展中長期規劃（2023-2035年）的通知」) which is set the goal to accelerate the digitalization of existing industries as well as the commercialization of future technology. While nine cities in have achieved the status of 'dual gigabit cities (雙千兆城市)' and over 50,000 units of manufacturing equipment have been upgraded to smart control, the provincial government set the goal to develop over 50 IIoT platform and 10 IIoT demonstration districts by 2035.
- The Three-year Action Plan to Promote the Development of Big Data Industry in Jiangxi Province (2023-2025) (江西省促進大數據產業發展三年行動計劃(2023-2025年)) announce to "Enhance communication infrastructure. Efforts are being made to fully deploy gigabit optical networks and accelerate the construction of 10G-PON optical line terminal (OLT) equipment, enabling widespread access to gigabit capability for household users and ten-gigabit capability for large enterprises and organisations. Continual optimisation of the core networks, transmission networks, and access networks is taking place. Upgrades and renovations are being carried out for facilities such as data centres, cloud platforms, and user terminals. Establishing and utilising the Nanchang national-level backbone direct connection point and the dedicated international internet data channels for Shangrao and Jiujiang are being prioritised."
- As the urbanisation rate of Jiangxi is approximately 63.1% in 2023 and is lower than the national average of approximately 66.2%, it is expected that the provincial government will continue to accelerate urbanization policies in Jiangxi Province and result in a higher growth in investment in infrastructure construction, fixed broadband subscribers and mobile phone subscribers in comparison to the national average.

It is anticipated that the CAGR of completed investments in telecommunication infrastructure in Jiangxi Province, amounting to approximately 5.6%, will exceed the national CAGR of approximately 3.1%. The notable outperformance of Jiangxi Province's telecommunications sector, surpassing the national growth rate of the PRC, can be attributed to several factors. Primarily, supportive policies mentioned earlier have played a pivotal role in driving the demand for telecommunication infrastructure in Jiangxi Province from 2022 to 2025. These policies have contributed to a robust CAGR of 8% from 2023 to 2027, accelerating the sector's development. Furthermore, when critically analysing growth at national and provincial levels, it becomes evident that a province's growth can significantly distinguish it from others. While every province has different capacities for digital transformation, a few, like Jiangxi Province, have efficiently capitalised on their potential, thus surpassing the national average. This strategic growth management has achieved a laudable telecommunication status for Jiangxi Province, demonstrating the efficacy of its approach in contrast to other less digitally transformed provinces. Moreover, Jiangxi Province's progressive approach, positioning it ahead of other regions, was reflected in adjustments made for future sustainability. The Jiangxi Province has proactively adapted to ensure long-term viability. The combination of supportive policies and forward-thinking strategies will contribute to the Jiangxi Province's success in the telecommunication sector.

Source(s): MIIT; Jiangxi Provincial Statistic Bureau; Ipsos research and analysis

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Ranking of the telecommunication network providers in China

		Ranking in China			
		Revenue (billion RMB)	Number of mobile services subscription (million)	By number of 5G services subscription (million)	By number of fixed network (million)
Dec 2021	China Mobile 中国移动	848.3	957.0	387.0	218.0
	China Telecom 中国电信	434.2	372.0	188.0	170.0
	China Unicom 中国联通	327.9	317.1	154.9	95.1
Dec 2022	China Mobile 中国移动	937.3	975.5	622.5	272.2
	China Telecom 中国电信	475.0	391.2	268.0	180.1
	China Unicom 中国联通	354.9	309.0	215.8	103.0
	China Tower 中国铁塔	92.2			
Dec 2023	China Mobile 中国移动	1,009.3	991.0	795.0	298.0
	China Telecom 中国电信	513.6	409.05	321.7	191.4
	China Unicom 中国联通	372.6	328.3	263.8	Not disclosed (last updated Apr 9,2024)
	China Tower 中国铁塔	94.0			

Source(s): Annual reports of listed companies

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Ranking of the world's top telecommunication network providers (Rank by 2023 revenue)

Rank by Revenue	Name	Country of origin	2021 FY Revenue (USD Billion) Exchange rate 31 May 2023	2022 FY Revenue (USD Billion) Exchange rate 31 Mar 2023	2023 FY Revenue (USD Billion) Exchange rate 31 Mar 2023
1	China Mobile	China	133.5	136.2	140.3
2	Verizon	USA	133.6	136.8	134.0
3	AT&T 美国电话电报	USA	135.4	120.7	122.4
4	Comcast	USA	116.4	121.4	121.6
5	Deutsche Telekom AG	Germany	116.5	123.7	121.5
6	Reliance Industries	India	86.6	109.6	118.6
7	NTT Corporation	Japan	108.4	108.2	97.2
8	T-mobile US	USA	80.1	79.6	78.6
9	China Telecom 中国电信	China	68.0	71.3	72.4
10	Charter Communications	USA	51.7	54.0	54.6
11	China Unicom 中国联通	China	51.6	51.6	51.3
12	Vodafone Group PLC	USA	51.2	53.0	49.6
13	Orange SA	France	50.3	45.8	47.9
14	Telefonica SA (TEF)	Spain	46.5	42.1	44.0
15	KDDI Corp. (KDDIY)	JAPAN	49.9	43.0	N/A

Source(s): Annual reports of listed companies; J

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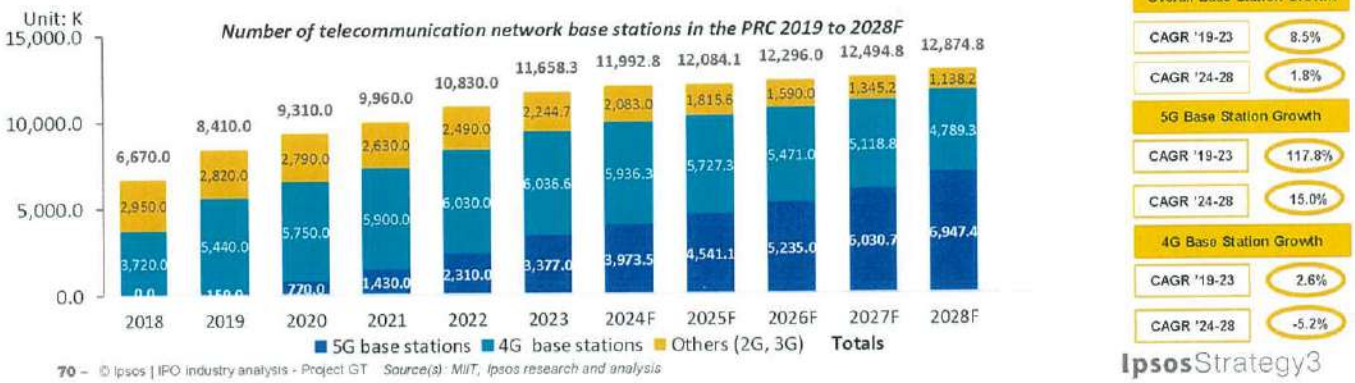
Number of telecommunications network base stations in the PRC

The number of telecommunications network base stations in the PRC increased at a CAGR of approximately 8.5% from 2019 to 2023, and it's estimated to stagnate from 2023 to 2027 when 2G/3G/4G stations retire.

The base station is a fixed transceiver station serving as a central connection point for a wireless device to communicate in a telecommunications network and is a critical component of a public mobile network that allows telecommunications network providers to deliver continuous telecommunications services to the public. With the deployment of 5G technology, the variety and amount of mobile traffic will increase substantially, and the number of base stations is estimated to expand to meet the increased demand. The number of telecommunications network base stations typically reflects the level of investment in mobile telecommunications infrastructure. **The number of telecommunications network base stations in the PRC grew from about 8,410.0K in 2019 to about 11,658.3K in 2023, at a CAGR of approximately 8.5%.** The growth of the number of telecommunications network base stations in the PRC is mainly attributed to the transformation and expansion of both 4G and 5G network services. With the 5G network replacing 4G, 3G and 2G in the future, the number of base stations will remind an insensible growth trend. **The number of 5G base stations in the PRC increased from approximately 150K in 2019 to about 3,377K in 2023, at a CAGR of approximately 117.8%. It is expected that the 5G base stations will replace the 2G, 3G, and 4G stations gradually and the total number of base stations is estimated to stagnate along with the retirement of older technologies. The number of 5G base stations is estimated to reach about 6,947.4.2K in 2027, at a CAGR of approximately 15.0%.** The growth of 5G base stations is mainly driven by government support in the 5G network development. For example, the "14th Five-Year Plan Information and Communication Industry Development Plan" ("十四五" 信息通信行業發展規劃), is set to accelerate the development of the 5G network by setting the penetration target to be 26 5G base stations for every ten thousands of people in 2025.



Overall Base Station Growth	
CAGR '19-23	8.5%
CAGR '24-28	1.8%
5G Base Station Growth	
CAGR '19-23	117.8%
CAGR '24-28	15.0%
4G Base Station Growth	
CAGR '19-23	2.6%
CAGR '24-28	-5.2%

 Source(s): MIIT, Ipsos research and analysis

IpsosStrategy3

Number of telecommunications network base stations in Jiangxi Province

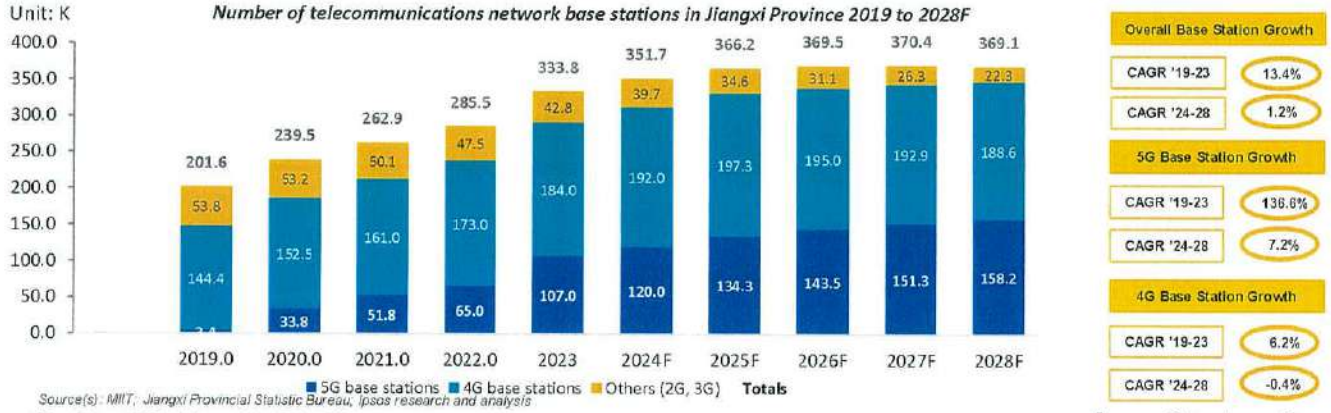
The number of telecommunications network base station in Jiangxi Province increased at a CAGR of approximately 13.4% from 2019 to 2023, and it's estimated to increase at a CAGR of approximately 0.9% from 2024 to 2028

The number of telecommunications network base stations in Jiangxi Province increased from about 201.6K in 2019 to about 333.8K in 2023, at a CAGR of approximately 13.4%, representing sustained growth in Jiangxi Province. The increment in telecommunications network base stations in Jiangxi is mainly attributed to the 5G telecommunications network development, as new base stations are needed for 5G to continue to deepen into rural areas.

The number of telecommunications network base stations in Jiangxi Province is estimated to increase from approximately 351.7K in 2024 to about 369.1K in 2028, at a CAGR of approximately 1.2%, representing sustained growth in Jiangxi Province. The growth in the number of 5G base stations is offset by the retirement of the 2G and 3G base stations.

The number of 5G stations is estimated to increase from approximately 121.1 thousand in 2024 to approximately 154.2 thousand in 2028, at a CAGR of approximately 6.2%. The steady growth is mainly driven by the local government support in the 5G network infrastructure investment in Jiangxi Province. The 14th Five-year Information and Communication Industry Development Plan of Jiangxi Province (江西省"十四五"信息通信行業發展規劃) sets to build more than 100 thousand 5G base stations in Jiangxi Province by 2025, achieving 80% coverage of 5G networks in both urban and rural areas.

Number of telecommunications network base stations in Jiangxi Province 2019 to 2028F



Source(s): MIIT; Jiangxi Provincial Statistic Bureau; Ipsos research and analysis

IpsosStrategy3

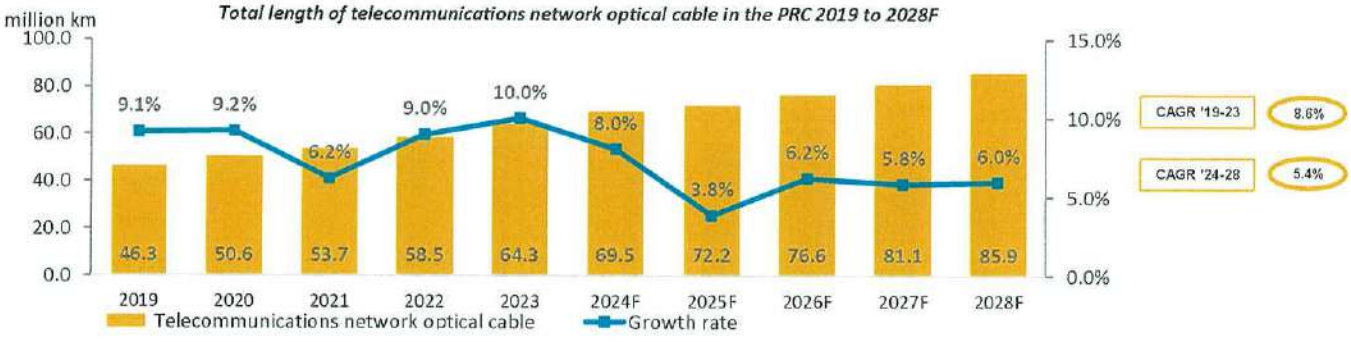
The total length of telecommunications network optical cable in the PRC

The total length of telecommunications network optical cable in the PRC increased at a CAGR of approximately 8.6% from 2019 to 2023, and it's estimated to increase at a CAGR of approximately 5.5% from 2024 to 2028

The optical cable is the core transmission media of the [fixed line] telecommunications network. The number of telecommunications network optical cables typically reflects the level of investment in fixed-line telecommunications infrastructure. **The length of the overall telecommunications network optical cable in the PRC grew from about 46.3 million km in 2019 to about 64.3 million km in 2023, at a CAGR of approximately 8.6%.** The constant growth of the telecommunications network optical cable is mainly credited to the Broadband China Strategy and Implementation Plan (「寬帶中國」戰略及實施方案) that set to accelerate the penetration of the high-speed broadband services at internet speed of over 100Mbps and 1000Mbps.

The length of the overall telecommunications network optical cable in the PRC is estimated to steadily increase from about 69.5 million km in 2024 to about 85.9 million km in 2028, at a CAGR of approximately 5.4%. The expected steady growth is mainly attributed to the prospective development of domestic telecommunications networks with the support from the national policy Notice on Accelerating the Construction of Broadband Frontiers (關於加快"寬帶邊疆"建設的通知), which is set to accelerate the development of both Fiber-to-the-home (FTTP) and 5G networks to enable the best network efficiency and to upgrade the telecommunications infrastructure of public facilities in rural areas.

Total length of telecommunications network optical cable in the PRC 2019 to 2028F



Source(s): MIIT; Ipsos research and analysis

IpsosStrategy3

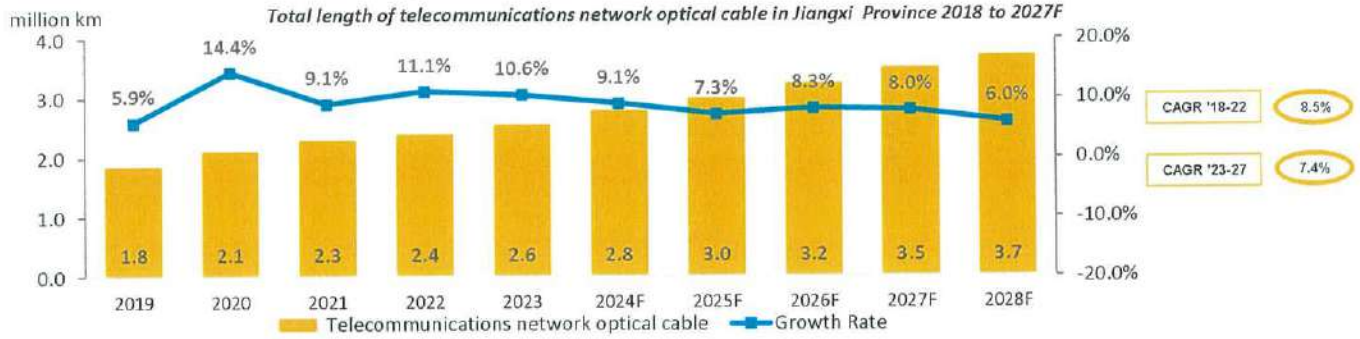
The total length of telecommunications network optical cable in Jiangxi

The total length of telecommunications network optical cable in Jiangxi Province increased at a CAGR of approximately 8.5% from 2019 to 2023, and it's estimated to increase at a CAGR of approximately 7.4% from 2024 to 2028

The length of the overall telecommunications network optical cable in Jiangxi Province surged from about 1.8 million km in 2019 to about 2.6 million km in 2023, at a CAGR of approximately 8.5%. The increase in the telecommunications network optical cable in Jiangxi Province is mainly due to the investment in telecommunications infrastructure, following the local government's action plan for the development of telecommunications infrastructures.

The length of the overall telecommunications network optical cable in Jiangxi Province is estimated to increase from about 2.8 million km in 2024 to about 3.7 million km in 2028, at a CAGR of approximately 7.4%. The expected growth is mainly attributed to the local government's support of the 5G network development plan in Jiangxi Province in line with national policy to achieve comprehensive coverage of 5G networks in both urban and rural areas. The People's Government of Jiangxi Province issued the 14th Five-year Digital Economy Development Plan in Jiangxi Province（關於印發江西省"十四五"數字經濟發展規劃的通知）, which proposes to continuously upgrade the digital infrastructure to accelerate the digital transformation of industries.

Total length of telecommunications network optical cable in Jiangxi Province 2018 to 2027F



Source(s): MIIT; Jiangxi Provincial Statistic Bureau, Ipsos research and analysis

IpsosStrategy3

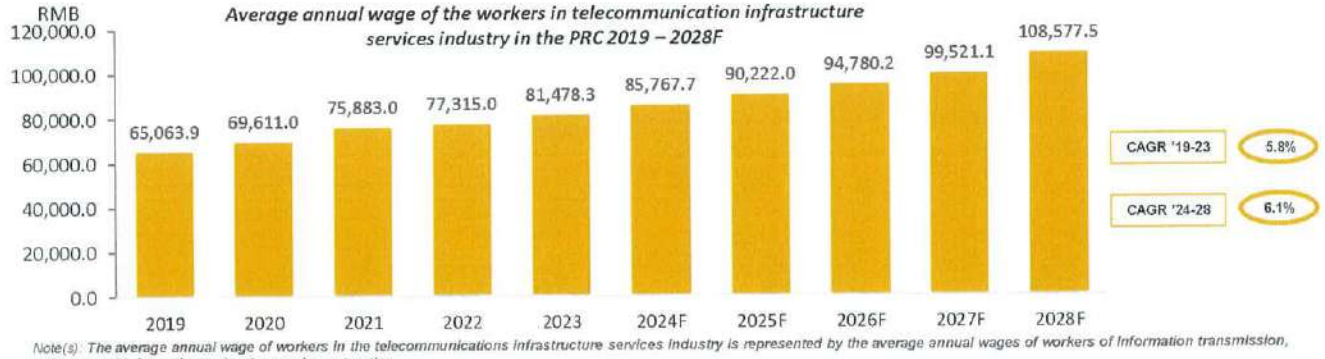
The average annual wage of the workers in the telecommunications infrastructure services industry in the PRC

The average annual wage of the workers in telecommunications infrastructure services industry in the PRC grew at a CAGR of approximately 5.8% from 2019 to 2023 due to the increasing demand for high technology workers for telecommunication infrastructure services.

Telecommunications infrastructure services generally involve labor-intensive work; therefore, the wage of workers is the major cost for providing such services.

The average annual wage of the workers in the telecommunications infrastructure services industry grew at a CAGR of approximately 5.8% from 2019 to 2023. The growth is mainly attributed to the rapid transformation of the telecommunications network from 3G to 4G or from 4G to 5G, resulting in the surging demand for skilled telecommunications labor. It is forecasted that the average annual wage of workers is estimated to grow at a CAGR of approximately 6.1% from 2024 to 2028 owing to the continuous demand for experienced workers for the construction of telecommunications infrastructure. Labour and construction materials including cement and steel are the major cost to the telecommunications infrastructure services providers. Cost of labour on average account for 75% of the total cost of the company.

Average annual wage of the workers in telecommunication infrastructure services industry in the PRC 2019 – 2028F



Note(s): The average annual wage of workers in the telecommunications infrastructure services industry is represented by the average annual wages of workers of information transmission, software and information technology and construction.
Source(s): IMF; China yearbooks; Ipsos research and analysis

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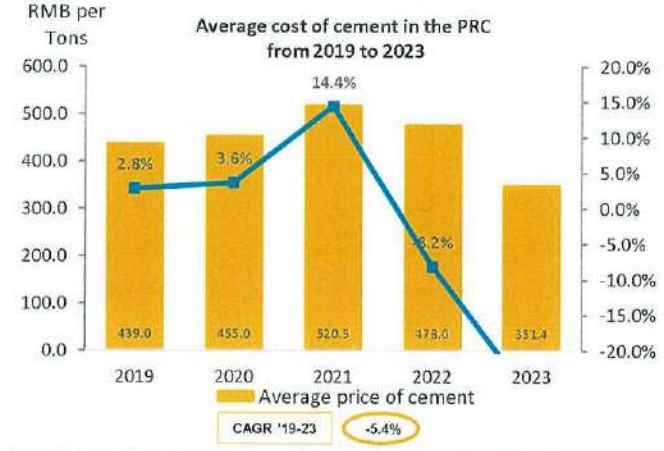
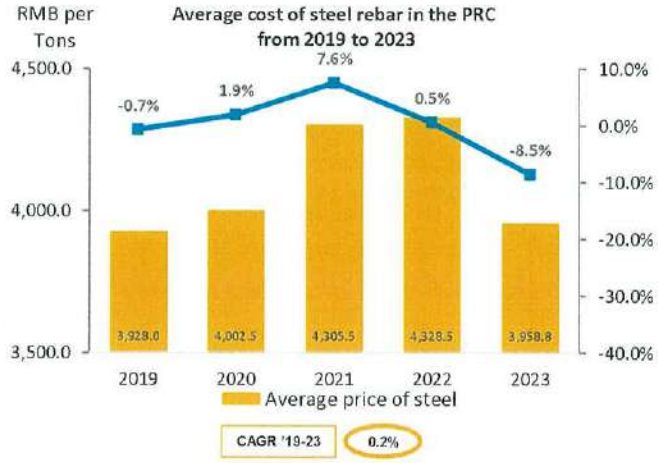
The average cost of cement for construction in the PRC

The average cost of cement in the PRC increased at a CAGR of approximately -5.4% from 2018 to 2022

The average cost of cement in the PRC decreased from about RMB 439.0 per ton in 2019 to about RMB 351.4 per ton in 2023, at a CAGR of approximately -5.4%. The decline in the average cost of cement in the PRC is a consequence of the bleak conditions of the Chinese real estate market. Currently, the cement sector is facing production overcapacity, weak demand, high inventory, low prices, and declining profits. Between 2022-2023, the average cost of cement decreased by 26.5%. **The average cost of steel in the PRC stayed constant from about RMB 3,928.0 per tons in 2019 to about RMB 3,958 per tons in 2023, at a CAGR of approximately 0.2%.** Following the weakened demand for raw materials within the construction industry, the production cost of steel will decrease and will result in a downwards increment in trading price.

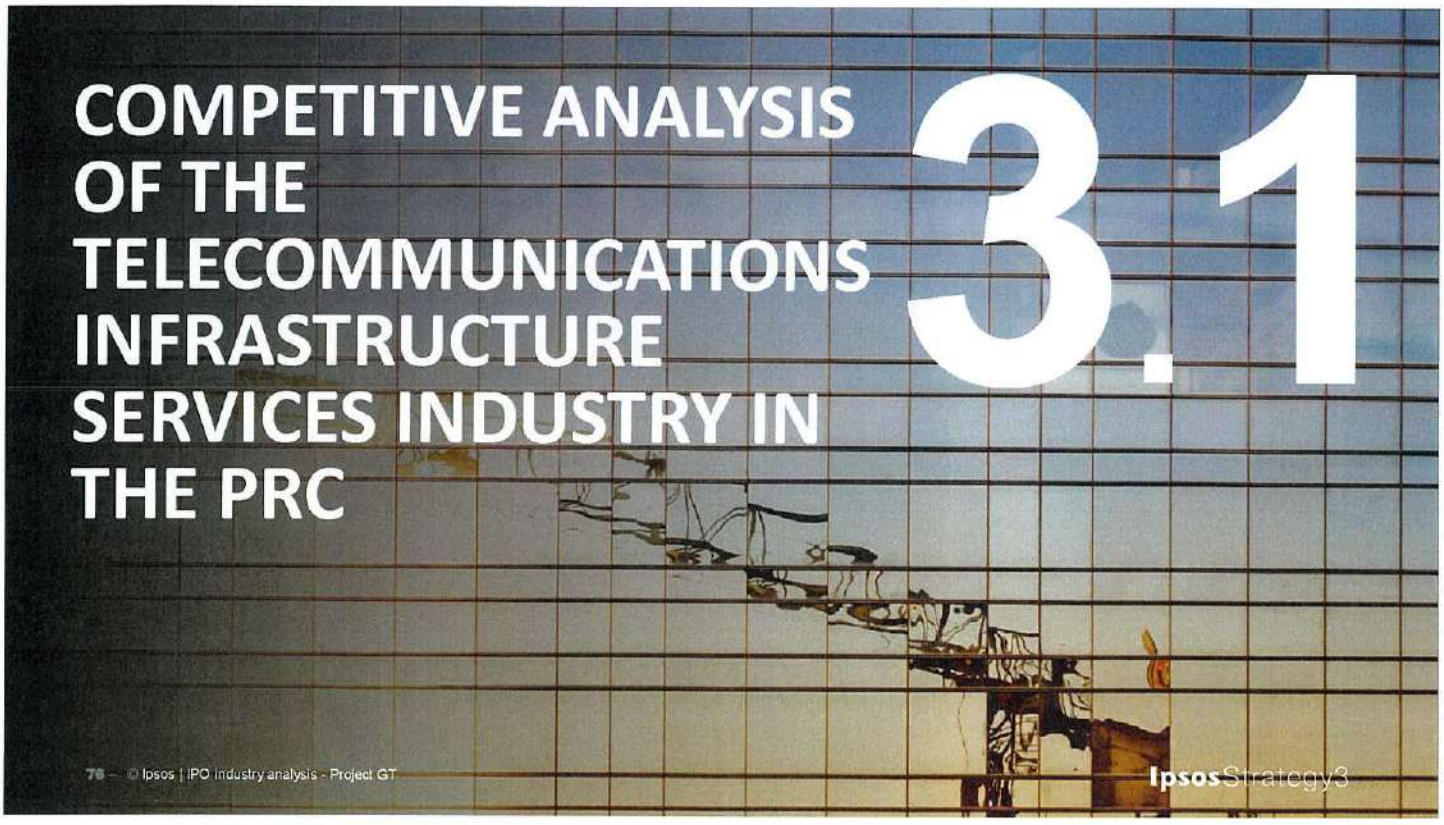




Source(s): Shanghai Futures Exchange; Digital Cement; CEMPI; Ipsos research and analysis

Remark: Product PO 42.5

Source(s): Shanghai Futures Exchange



3.1 COMPETITIVE ANALYSIS OF THE TELECOMMUNICATIONS INFRASTRUCTURE SERVICES INDUSTRY IN THE PRC

Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

The industry is fragmented and mature with a vast number of services providers serving three major telecommunications network operators. The market concentration level will increase along with a more sophisticated tendering mechanism implemented by telecommunications network operators eliminating some weaker players.

Industry structure

Customer concentration

- The key customers of the telecommunications infrastructure services industry in the PRC are the Big Three telecommunications network operators including China Unicom, China Telecom, and China Mobile and the telecommunications tower infrastructure service provider, China Tower. Their investment account for over 90% of the completed investment in telecommunication infrastructure services in the PRC.
- the key customers of the telecommunications infrastructure services industry in the PRC are the Big Three and the world's largest telecommunications tower infrastructure service provider. Their investment account for over 90% of the completed investment in telecommunication infrastructure services in the PRC. It is common for players within the telecommunications infrastructure services industry to have high customer concentration. For some of the players in the market, the top five customers accounted for over 90% of the total revenue

Competitor concentration

- 2022: There are many telecommunication infrastructure services providers in the country, and the industry in the PRC is highly fragmented with low concentration. As of 2022, there are 353 companies that are certified with the first tier Communications Project Implementation General Contracting Enterprises Qualification (Class 1), 1,066 companies that are certified with second-tier Communications Project Implementation General Contracting Enterprises Qualification (Class 2) and 4,351 companies that are certified with second-tier Communications Project Implementation General Contracting Enterprises Qualification (Class 3).There are 5,770 companies in the PRC in total and 6.1% of the industry players were awarded with Class 1 certificate.
- 2023: There are many telecommunication infrastructure services providers in the country, and the industry in the PRC is highly fragmented with low concentration. As of 2023, there are 366 companies that are certified with the first tier Communications Project Implementation General Contracting Enterprises Qualification (Class 1), 2,389 companies that are certified with second-tier Communications Project Implementation General Contracting Enterprises Qualification (Class 2) and 3,249 companies that are certified with second-tier Communications Project Implementation General Contracting Enterprises Qualification (Class 3).There are approximately 6,004 companies in the PRC in total and 6.1% of the industry players were awarded with Class 1 certificate.
- These service providers can further be categorised into four tiers. First-tier providers can offer a full range of telecommunication infrastructure services across all provinces. These first-tier companies are generally the subsidiary companies of the telecommunications network operators. Second-tier is the private enterprises that can offer a full range of services across all provinces. Depending on their business strategy, most players usually focus on one type of service, either construction or maintenance services. Third-tier providers generally are the leaders in certain provinces. While their strength relies on the close partnership with local telecommunications network operators and their project experience in the local market, they are also capable of taking on national projects. Fourth-tier providers are services providers with operations limited to one province.
- In recent years, major telecommunications network operators started to centralize the tendering process to headquarters or provincial subsidiary companies rather than city level subsidiary companies. The tendering process became more systematic and transparent nowadays when the services providers evaluated according to past performance, project experience, local service experience, technical capability and team roster instead of merely price. While telecommunications network operators are more demanding on services quality and technological capability, it is estimated that more small-scale services providers will be eliminated from the market. New entrants will also be more difficult to enter the market.

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Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

While the next phase of development in the industry will be the application of the 5G technology, industry players are seeking to expand their services offering and customer bases to diversify their business risk.

Industry structure

Types of service offerings

- First-tier and second-tier industry leaders can provide the full services offering along with the telecommunication infrastructure services from planning and design, construction, optimisation and maintenance. Third-tier companies in the industry are usually specialized in specific scope of services. For example, GCI Science & Technology focuses on network planning and design; Zhongtong GuoMai Telecommunications and Hangzhou Freely Telecommunications focus on infrastructure construction; Super Telecom and Eastone focus on telecommunications network maintenance and optimisation.
- Due to the high concentration of customers, some key players in the market diversified their revenue stream and customer base by offering services beyond telecommunications infrastructure . Due to the existing capability in telecommunications infrastructure building, many key players participate in the development of digital infrastructure, IoT, smart cities related facilities that require 5G and other advanced ICT technology. The players typically position themselves as system integrator that provides installation of related equipment, design of software and integration of hardware, network and software.

Source(s): Ipsos Research and Analysis

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Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

Past project experience becomes one of the crucial criteria for companies to stand out in a tender evaluation.

Factors of competition

Proven track record of projects

- During the tendering process, companies are required to demonstrate their technical capability through past project experience. Past project experience becomes solid evidence and proof to explain how a company can manage and execute the product under different scenarios for example in different geographical locations.
- Companies are also required to list their project experience in the designated provinces in the tender document to demonstrate the capability to manage projects in specific provinces.
- According to the bidding document from some of the major telecommunications network operators(中國移動2019至2020年傳輸管線工程施工服務集中採購江西項目), companies are required to participate in a similar project in the provinces that are listed in the tender document in the past three years.
- During the bid evaluation process for major telecom infrastructure construction projects offered by the Big Three, the past performance of telecommunications infrastructure services providers plays a crucial role. It accounts for 20% of the score used to evaluate the bids. This assessment is based on the telecommunications infrastructure services providers' track record and performance in previous projects, underscoring the importance of a strong and proven history in successfully securing contracts.

Company scale

- The company can manage large scale projects even under uncertainty. The company scale is commonly evaluated by the number of staff, number and background of the core management team, the scale and number of completed, types of customers, number of licenses and financial performance such as yearly sales revenue.

Source(s): Industry Expert Interview; Ipsos Research and Analysis

Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

Past project experience becomes one of the crucial criteria for companies to stand out in a tender evaluation.

Factors of competition

License awards

- While licenses do not create a competitive advantage for a company in the industry, licenses and certificates are the prerequisites for a company to participate in the bidding of projects. The number of licenses of different kinds secures companies to participate in large scale and integrated projects when a comprehensive range of services are listed in the project.

Competitive R&D capability with constant innovation

- The market players with advanced technology and R&D capability can provide more value-adding products and services to their customers, creating a distinct advantage over competitors.
- While key players started to expand their services covering a wider scope of digital infrastructure beyond the building of telecommunications infrastructure, investment in research will help the company in developing distinctive advantages for example proprietary software or system in certain specific areas in smart cities for example a software platform for surveillance .

A good relationship with the customer

- Customers might invite companies to submit a proposal for projects. A good relationship with customers allows companies to understand the requirement of the customers to provide a more customized solution that fit with customers' need and want.

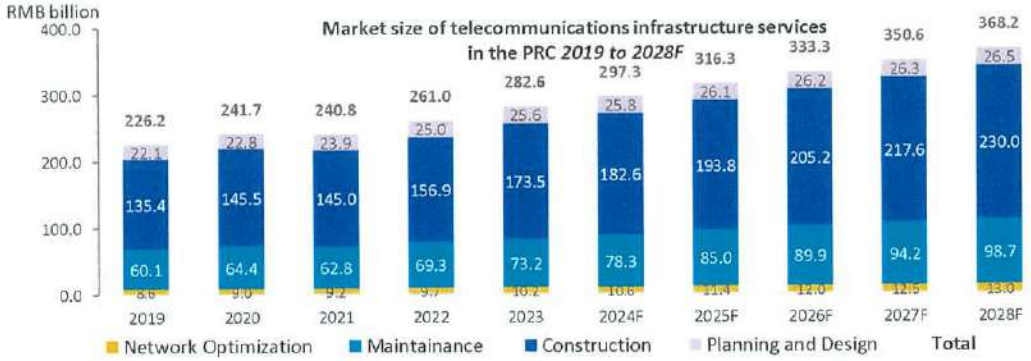
Source(s): Industry Expert Interview; Ipsos Research and Analysis

Market size of telecommunications infrastructure services industry in the PRC

The market value of the telecommunications infrastructure services industry increased steadily due to continued investment in 5G and related digital infrastructure, yet the growth is reducing construction and maintenance fee discount part of the growth.

The overall market value of the telecommunications infrastructure services industry in the PRC grew from about RMB 226.2 billion in 2019 to about RMB 282.6 billion in 2023, at a CAGR of approximately 5.7%. The market value increased continuously, led by the massive demand for 4G and 5G infrastructure construction services. Due to the short transmission distance 5G, a high number of base stations was built resulting in a high increment in construction services.

The overall market value of the telecommunications infrastructure services industry in the PRC is estimated to grow from about RMB 297.3 billion in 2024 to about RMB 368.2 billion in 2028, at a CAGR of approximately 5.5%. Infrastructure construction services will continue to be the key driver of the market in the foreseeable future. In addition, the growth will be driven by investments in 5G commercial applications and advanced technology like IoT, IDC etc. The growth in operational cost of telecommunications operation (OPEX) will drive the demand for maintenance services yet the growth will be offset by technological advancement in lowering the maintenance cost. It is also estimated that telecommunications network operators will minimize the expense of maintenance.



Overall Market Value	
CAGR '19-23	5.7%
CAGR '24-28	5.5%
Planning and Design	
CAGR '19-23	3.7%
CAGR '24-28	0.6%
Construction	
CAGR '19-23	6.4%
CAGR '24-28	5.9%
Maintenance	
CAGR '19-23	5.0%
CAGR '24-28	6.0%
Network optimisation	
CAGR '19-23	4.4%
CAGR '24-28	5.3%

Notes: The market size refer to the telecommunications infrastructure services provided to the Big Three and China Tower
Source(s): MIIT; Three telecommunications network operators; Ipsos research and analysis

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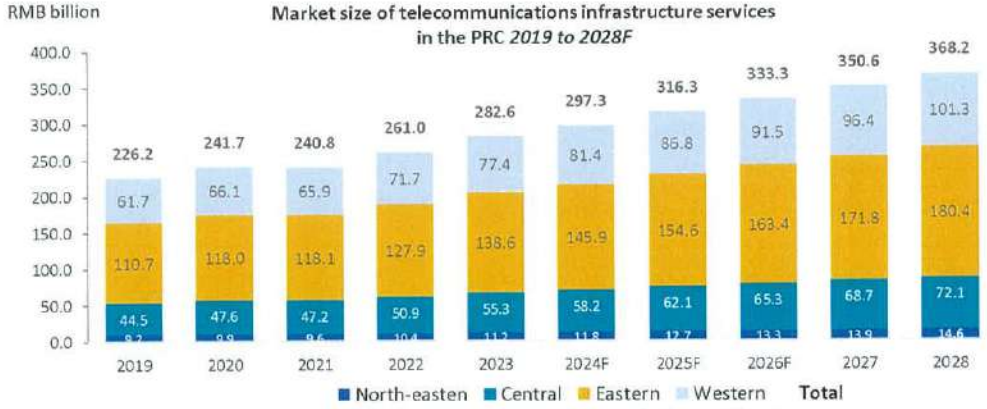
Market size of telecommunications infrastructure services industry break down by regions

The market value of telecommunications infrastructure services industry increased steadily due to continued investment in 5G and related digital infrastructure, yet the growth is reducing construction and maintenance fee discount part of the growth.

The overall market value of telecommunications infrastructure services industry in the PRC grew from about RMB 226.2 billion in 2019 to about RMB 282.6 billion in 2023, at a CAGR of approximately 5.7%. The market value increased continuously lead by construction services due to the massive 4G and 5G basic infrastructure. Due to the short transmission distance 5G, a high number of base station was built resulting in a high increment in construction services.

The overall market value of telecommunications infrastructure services industry in the PRC is estimated to grow from about RMB 297.3 billion in 2024 to about RMB 368.2 billion in 2028, at a CAGR of approximately 5.5%. As western region and central were less well developed, a higher growth is estimated to catch up the infrastructure development with the rest of other provinces in China.



Overall Market Value	
CAGR '18-22	5.7%
CAGR '23-27	5.5%
North-eastern	
CAGR '18-22	5.0%
CAGR '23-27	5.4%
Central	
CAGR '18-22	5.6%
CAGR '23-27	5.5%
Eastern	
CAGR '18-22	5.8%
CAGR '23-27	5.4%
Western	
CAGR '18-22	5.8%
CAGR '23-27	5.6%

Notes: The market size refer to the telecommunications infrastructure services provided to the Big Three and China Tower
Notes: Telecommunications network infrastructure services include network planning and design, construction and maintenance
Source(s): MIIT; Three telecommunications network operators; Ipsos research and analysis

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Market size of telecommunications infrastructure services industry in the PRC

The market value of the telecommunications infrastructure construction services industry increased driven by the increasing demand of 5G base station constructions and is estimated to grow due to the continued investment in 5G infrastructures.

Construction

The market value of the telecommunications infrastructure construction services industry grew from about RMB 135.4 billion in 2019 to about RMB 173.5 billion in 2023, at a CAGR of approximately 6.4 %. The market value of the telecommunications infrastructure construction services industry increased mainly attributed to the transformation and expansion of 4G and 5G network, and a high number of 5G base stations was built because of the short transmission distance of 5G requiring a higher density of base stations. The increased basic infrastructure construction services was contributed by the growing 4G and 5G base stations and increasing length of optical cables in the PRC. **The overall market value is estimated to grow from about RMB 182.6 billion in 2024 to about RMB 230.0 billion in 2028, at a CAGR of approximately 5.9%.** Along with the adoption of the 5G network in the future, 5G related telecommunications network infrastructure including 5G base stations will continue to be developed. The growth will be driven by the investment in commercial applications of telecommunications technology such as the Internet of Things (IoT), Internet Data Center (IDC), etc.

Maintenance

The market value of the telecommunications infrastructure maintenance services is estimated to grow from about RMB 78.3 billion in 2024 to about RMB 98.7 billion in 2028, at a CAGR of approximately 6.0%. The demand for maintenance services is estimated to increase due to the expansion of the network of telecommunications infrastructures including both 4G and 5G base stations. As telecommunication network operators are applying different optimisation measures as well as more advanced equipment, it is estimated that a lower degree of maintenance will be required and therefore the growth rate in maintenance services is close to growth rate of construction services even there are increasing number of base stations.

Source(s): Ipsos Research and Analysis

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Top five players in the telecommunications infrastructure construction services industry in the PRC (By 2021 Revenue)

By 2021, 316 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification* (通信工程施工總承包（一級）（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction Services (RMB billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	31.5	20.3%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	12.8	8.8%
3	潤建通信股份有限公司 Runjian Communication Co. ,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	2.4	1.7%
4	中貝通信集團股份有限公司 China Bester Group Telecom Co., Ltd.	Established in 1992, the company mainly engages in telecommunications infrastructure construction and maintenance services.	Yes	1.6	1.1%
5	南京嘉環科技股份有限公司 Nanjing Bestlink Technology Co., Ltd.	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	1.3	0.9%
Others				95.4	65.8%
Total				**145.0**	**100%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report
3) Percentage/figure may not add up to 100%/amount due to rounding

Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top five players in the telecommunications infrastructure construction and maintenance services industry in the PRC (By 2021 Revenue)

By 2021, 316 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification* (通信工程施工總承包（一級）（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction and Maintenance Services (RMB billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	48.1	23.2%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	13.2	6.4%
3	潤建通信股份有限公司 Runjian Communication Co. ,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	3.7	1.8%
4	中貝通信集團股份有限公司 China Bester Group Telecom Co., Ltd	Established in 1992, the company mainly engages in telecommunications infrastructure construction and maintenance services.	Yes	2.2	1.1%
5	南京嘉環科技股份有限公司 Nanjing Bestlink Technology Co., Ltd.	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	1.8	0.9%
Others				138.7	66.8%
Total				**207.7**	**100%**

Notes:
The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
1. The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
2. Percentage/figure may not add up to 100%/amount due to rounding.
Source(s): Annual reports of listed companies; Ipsos research and analysis

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Top five players in the telecommunications infrastructure construction and maintenance services and network optimisation industry in the PRC (By 2021 Revenue)

By 2021, 316 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification* (通信工程施工總承包（一級）（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure construction and maintenance services and network optimisation Services (RMB billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	48.1	22.2%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	13.2	6.1%
3	潤建通信股份有限公司 Runjian Communication Co. ,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	3.8	1.7%
4	南京嘉環科技股份有限公司 Nanjing Bestlink Technology Co., Ltd.	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	2.2	1.0%
5	中貝通信集團股份有限公司 China Bester Group Telecom Co., Ltd	Established in 1992, the company mainly engages in telecommunications infrastructure construction and maintenance services.	Yes	2.2	1.0%
Others				147.4	67.9%
Total				**216.9**	**100%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.
Source(s): Annual reports of listed companies; Ipsos research and analysis

IpsosStrategy3

Top five players in the telecommunications infrastructure construction services industry in the PRC (By 2022 Revenue)

By 2022, 353 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction Services (RMB Billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	32.5	20.6%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	18.3	11.6%
3	中信科移動通信技術股份有限公司 CICT Mobile Communication Technology Co., Ltd	Established in 1998, the company mainly manufacture telecommunication equipment and engages in telecommunications infrastructure construction and maintenance services.	Yes	2.8	1.7%
4	潤建通信股份有限公司 Runjian Communication Co. ,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	2.4	1.5%
5	中貝通信集團股份有限公司 China Bester Group Telecom Co., Ltd.	Established in 1992, the company mainly engages in telecommunications infrastructure construction and maintenance services.	Yes	1.6	1.0%
	Others			99.8	63.4%
	Total			**157.3**	**100%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunication network infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis.

IpsosStrategy3

Top five players in the telecommunications infrastructure construction and maintenance services industry in the PRC (By 2022 Revenue)

By 2022, 353 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction Services (RMB Billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	50.6	22.3%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	18.8	8.3%
3	潤建通信股份有限公司 Runjian Communication Co. ,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	3.6	1.6%
4	中信科移動通信技術股份有限公司 CICT Mobile Communication Technology Co., Ltd	Established in 1998, the company mainly manufacture telecommunication equipment and engages in telecommunications infrastructure construction and maintenance services.	Yes	3.1	1.4%
5	中貝通信集團股份有限公司 China Bester Group Telecom Co., Ltd.	Established in 1992, the company mainly engages in telecommunications infrastructure construction and maintenance services.	Yes	2.0	0.9%
	Others			148.4	65.5%
	Total			**226.6**	**100%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunication network infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis.

IpsosStrategy3

Top five players in the telecommunications infrastructure construction and maintenance services and network optimisation industry in the PRC (By 2022 Revenue)

By 2022, 353 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction Services (RMB Billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	50.6	21.4%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	18.9	8.0%
3	潤建通信股份有限公司 Runjian Communication Co. ,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	3.7	1.6%
4	中信科移動通信技術股份有限公司 CICT Mobile Communication Technology Co., Ltd	Established in 1998, the company mainly manufacture telecommunication equipment and engages in telecommunications infrastructure construction and maintenance services.	Yes	3.1	1.3%
5	南京嘉環科技股份有限公司 Nanjing Bestlink Technology Co., Ltd.	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	2.2	0.9%
		Others		157.7	66.7%
		Total		**236.3**	**100%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunication network infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top five players in the telecommunications infrastructure construction services industry in the PRC (By 2023 Revenue)

By 2023, 366 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction Services (RMB Billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	32.9	18.9%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	17.0	9.8%
3	中信科移動通信技術股份有限公司 CICT Mobile Communication Technology Co., Ltd	Established in 1998, the company mainly manufacture telecommunication equipment and engages in telecommunications infrastructure construction and maintenance services.	Yes	2.8	1.6%
4	潤建通信股份有限公司 Runjian Communication Co. ,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	2.5	1.4%
5	中貝通信集團股份有限公司 China Bester Group Telecom Co., Ltd.	Established in 1992, the company mainly engages in telecommunications infrastructure construction and maintenance services.	Yes	1.7	1.0%
		Others		116.7	67.2%
		Total		**173.5**	**100.0%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunication network infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top five players in the telecommunications infrastructure construction and maintenance services industry in the PRC (By 2023 Revenue)

By 2023, 366 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction Services (RMB Billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	51.4	20.8%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	17.6	7.1%
3	潤建通信股份有限公司 Runjian Communication Co.,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	3.9	1.6%
4	中信科移動通信技術股份有限公司 CICT Mobile Communication Technology Co., Ltd	Established in 1998, the company mainly manufacture telecommunication equipment and engages in telecommunications infrastructure construction and maintenance services.	Yes	3.3	1.3%
5	中貝通信集團股份有限公司 China Bester Group Telecom Co., Ltd.	Established in 1992, the company mainly engages in telecommunications infrastructure construction and maintenance services.	Yes	2.1	0.9%
	Others			168.4	68.3%
	Total			**246.7**	**100.0%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunication network infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top five players in the telecommunications infrastructure construction and maintenance services and network optimisation industry in the PRC (By 2023 Revenue)

By 2023, 366 companies had acquired the First Tier Communications Project Implementation General Contracting Enterprises Qualification（通信工程施工總承包）(Class 1)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction Services (RMB Billion)	Percentage
1	中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	51.4	20.0%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	17.6	6.9%
3	潤建通信股份有限公司 Runjian Communication Co.,Ltd.	Established in 2003, the company mainly focuses on providing telecommunications infrastructure construction and maintenance services.	Yes	3.9	1.5%
4	中信科移動通信技術股份有限公司 CICT Mobile Communication Technology Co., Ltd	Established in 1998, the company mainly manufacture telecommunication equipment and engages in telecommunications infrastructure construction and maintenance services.	Yes	3.3	1.3%
5	南京嘉環科技股份有限公司 Nanjing Bestlink Technology Co., Ltd.	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	2.3	0.9%
	Others			178.4	69.4%
	Total			**256.9**	**100.0%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunication network infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis

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3.2 COMPETITIVE ANALYSIS OF THE TELECOMMUNICATIONS INFRASTRUCTURE SERVICES INDUSTRY IN JIANGXI PROVINCE

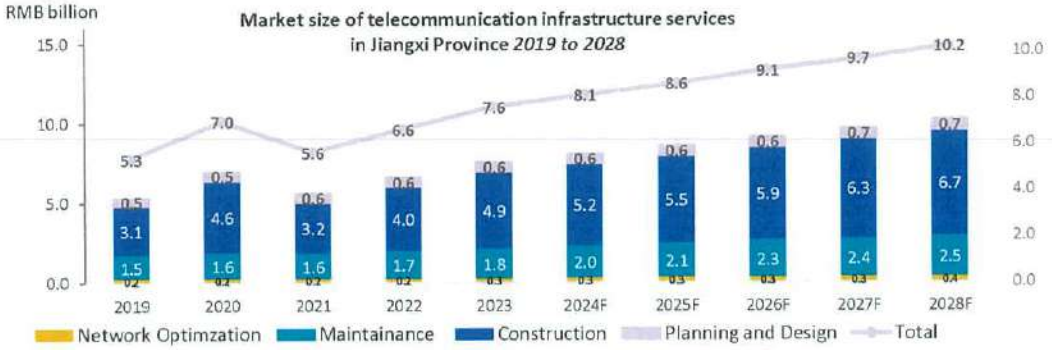
IpsosStrategy3

Market size of the telecommunications infrastructure services industry in Jiangxi Province

The overall market value of telecommunications infrastructure services industry in Jiangxi Province increased steadily due to continued investment in 5G and related digital infrastructures.

The overall market value of the telecommunications infrastructure services industry in Jiangxi Province grew from about RMB 5.3 billion in 2019 to about RMB 7.6 billion in 2023, at a CAGR of approximately 9.2%. The market value increased continuously driven by the massive construction of 4G and 5G basic infrastructures, such as base stations, telecommunications pipeline engineering, and other ancillary works that make the base stations work, following a similar developing trend to the PRC.

The overall market value is estimated to grow from about RMB 8.1 billion in 2024 to about RMB 10.2 billion in 2028, at a CAGR of approximately 5.9%. The steady growth is estimated to be driven by continuous investment in the construction of telecommunications infrastructure for commercial and governmental applications.



Overall Market Value	
CAGR '19-23	9.2%
CAGR '24-28	5.9%
Planning and Design	
CAGR '19-23	3.6%
CAGR '24-28	1.6%
Construction	
CAGR '19-23	12.1%
CAGR '24-28	6.3%
Maintenance	
CAGR '19-23	5.2%
CAGR '24-28	6.3%
Network optimisation	
CAGR '19-23	4.4%
CAGR '24-28	6.0%

Notes: The market size refer to the telecommunication infrastructure services provided to the Big Three and China Tower
Source(s): MIIT, Three telecommunications network operators; Ipsos research and analysis

 Source(s): MIIT, National Bureau of Statistics of China, Ipsos research and analysis

IpsosStrategy3

Market size of telecommunications infrastructure construction services industry in Jiangxi Province

Construction

The market value of telecommunications infrastructure construction services in Jiangxi Province increased driven by the growing demand of 5G base station constructions and is estimated to grow due to the continued investment in 5G infrastructures.

The market value of the telecommunications infrastructure construction services industry in Jiangxi Province grew from about RMB 3.1 billion in 2019 to about RMB 4.9 billion in 2023, at a CAGR of approximately 12.1%. The investments in Jiangxi Province peaked in 2020, the last year of the "Three-year Action Plan for the Development of Telecommunication Infrastructures in Jiangxi Province (2018-2020)" (江西省信息通信基礎設施建設三年攻堅行動計劃 (2018-2020)). The increased market value is mainly attributed to the transformation and expansion of 4G and 5G networks, with increased construction of base stations and surged length of optical cables in Jiangxi province, driven by the local government's telecommunications network construction plan as well as the 5G network development plan in Jiangxi. The construction of 5G infrastructure and FTTH is estimated to continually drive the market. "Notice on Promoting the Coordinated Development of 'Dual Gigabit' Networks in 2021 (關於2021年推進「雙千兆」網路協同發展的通知) issued by Jiangxi Province Communication Administration further accelerate the development of FTTH.

The overall market value of the telecommunications infrastructure construction services industry in Jiangxi Province is estimated to grow from about RMB 5.2 billion in 2024 to about RMB 6.7 billion in 2028, at a CAGR of approximately 6.3%. Policies launched since 2022 set the development of the digital economy in 5G and IIoT, including the "14th five-year" Digital Economy Development Plan in Jiangxi Province (關於印發江西省"十四五"數字經濟發展規劃的通知), which proposes to upgrade the digital infrastructure to accelerate the digital transformation of industries, and the "Plan for IIoT Capabilities Enhancement in Jiangxi Province (江西省工業互聯網強體提能行動計劃)", which is set to further implement the industrial Internet innovation and development strategy in Jiangxi Province.

Maintenance

The market value of the telecommunications infrastructure maintenance services is estimated to grow from approximately RMB 2.0 billion in 2024 to approximately RMB 2.5 billion in 2028, at a CAGR of approximately 6.3%. The steady growth is estimated to be driven by the expansion of the network of telecommunications infrastructures including both 4G and 5G base stations.

Company's Mkt Share in Construction & Maintenance

- **Based on these figures, and the companies 2022 relevant revenue of RMB 117,810,499.8, representing a market share of 2.0%**
- **Based on these figures, and the companies 2023 relevant revenue of RMB 209,128,941.1 , representing a market share of 3.1%**

IpsosStrategy3

Top players in telecommunications network infrastructure construction services industry in Jiangxi Province (By 2021 Revenue)

Rank	Company Name	Company Description	Company Listed	Revenues in telecommunications Infrastructure Construction Services (RMB million)	Percentage
1	江西省通信產業服務有限公司 Jiangxi Province Communications Industry Service Co., Ltd.	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	470.6	14.6%
2	江西省郵電建設工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd.	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	212.4	6.6%
3	中贛通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd.	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services	No	154.6	4.8%
4	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	141.9	4.4%
5	江西綠鴻通信有限責任公司 Jiangxi Lvhong Communication Co., Ltd	Established in 1997, the company mainly engages in providing telecommunications network planning and design services and telecommunications infrastructure construction services	No	123.2	3.8%
	Other			2,128.3	65.9%
	Total			3231.1	100.0%

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report
3) Percentage/figure may not add up to 100%/amount due to rounding

Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top players in telecommunication network infrastructure construction and maintenance services industry in Jiangxi Province (By 2021 Revenue)

By 2021, approximately 35 active players in the Jiangxi market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance project with total amount of over RMB 20 million in 2020 and 2021. There are approximately 20 active players in the Jiangxi market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with total amount of over RMB 50 million in 2020 and 2021.

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction and Maintenance Services (RMB million)	Percentage
1	江西省通信產業服務有限公司 Jiangxi Province Communications Industry Service Co., Ltd.	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	982.3	20.4%
2	江西省郵電建設工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd.	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	228.3	4.8%
3	中贛通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd.	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services	No	179.3	3.7%
4	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	144.9	3.0%
5	江西綠鴻通信有限責任公司 Jiangxi Lvhong Communication Co., Ltd	Established in 1997, the company mainly engages in providing telecommunications network planning and design services and telecommunications infrastructure construction services	No	123.2	2.6%
				3,147.5	65.5%
	Total			4,805.5	100.0%

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report
3) Percentage/figure may not add up to 100%/amount due to rounding.
Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top players in telecommunication network infrastructure construction and maintenance services and network optimisation industry in Jiangxi Province (By 2021 Revenue)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure construction and maintenance services and network optimisation Services (RMB million)	Percentage
1	江西省通信產業服務有限公司 Jiangxi Province Communications Industry Service Co., Ltd.	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	982.3	19.5%
2	江西省郵電建設工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd.	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	228.3	4.5%
3	中贛通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd.	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services	No	179.3	3.6%
4	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	144.9	2.9%
5	江西綠鴻通信有限責任公司 Jiangxi Lvhong Communication Co., Ltd	Established in 1997, the company mainly engages in providing telecommunications network planning and design services and telecommunications infrastructure construction services	No	123.2	2.4%
	Other			3,372.4	67.0%
	Total			5030.4	100.0%

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top players in telecommunications network infrastructure construction services industry in Jiangxi Province (By 2022 Revenue)

Rank	Company Name	Company Description	Company Listed	Revenues in telecommunications Infrastructure Construction Services (RMB million)	Percentage
1	中移建设有限公司 China Mobile Construction Co., Ltd.	Established in 2008, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	502.0	12.5%
2	江西省通信建设服务有限公司 Jiangxi Province Communications Industry Service Co., Ltd.	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	341.6	8.5%
3	南京嘉环科技股份有限公司 Nanjing Bestlink Technology Co., Ltd.	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	135.7	3.4%
4	江西省邮电建设工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd.	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	135.5	3.4%
5	武汉恒信技术服务有限责任公司 Wuhan Hengxi Technology Services Co., Ltd.	Established in 2013, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of CICT Mobile Communication Technology Co., Ltd.	Yes	126.8	3.1%
6	上海电信工程有限公司 Shanghai Telecommunications Engineering Co., Ltd.	Established in 1952, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	106.2	2.6%
7	中赣通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd.	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services	No	91.8	2.3%
		Other		2,590.3	64.3%
		Total		**4029.9**	**100.0%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage figure may not add up to 100% amount due to rounding.
Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top players in telecommunication network infrastructure construction and maintenance services industry in Jiangxi Province (By 2022 Revenue)

- During Jan 2021 – Dec 2022, there are approximately 456 companies awarded Class 1, Class 2 or Class 3 qualification which were active in the Jiangxi Market(company that take part in any project tendering), and approximately 12.1% of the industry players were awarded with first tier Communications Project Implementation General Contracting Enterprises Qualification (Class 1).
- During Jan 2021 – Dec 2022, 55 players with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) won at least one project in infrastructure construction and maintenance services industry in Jiangxi By 2022, approximately 35 active players in the Jiangxi market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with an aggregate amount of approximately over RMB 20 million in 2021 and 2022. There are approximately 20 active players in the Jiangxi market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with an aggregate amount of approximately over RMB 50 million in 2021 and 2022.

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction and Maintenance Services (RMB Million)	Percentage
1	江西省通信建设服务有限公司 Jiangxi Province Communications Industry Service Co., Ltd.	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	1,095.4	19.0%
2	中移建设有限公司 China Mobile Construction Co., Ltd.	Established in 2008, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	612.7	10.6%
3	南京嘉环科技股份有限公司 Nanjing Bestlink Technology Co., Ltd.	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services.	Yes	143.2	2.5%
4	江西省邮电建设工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd.	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	141.0	2.4%
5	武汉恒信技术服务有限责任公司 Wuhan Hengxi Technology Services Co., Ltd.	Established in 2013, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of CICT Mobile Communication Technology Co., Ltd.	Yes	126.9	2.2%
6	中赣通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd.	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services	No	118.0	2.0%
7	上海电信工程有限公司 Shanghai Telecommunications Engineering Co., Ltd.	Established in 1952, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	106.2	1.8%
		Other (Top 7)		3,419.4	59.3%
		Other (Top 5)		3,643.7	63.3%
		Total		**5762.9**	**100.0%**

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage figure may not add up to 100% amount due to rounding.
Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top players in telecommunication network infrastructure construction and maintenance services and network optimisation industry in Jiangxi Province (By 2022 Revenue)

- China Mobile Construction Co., Ltd. (中移建設有限公司), Nanjing Bestlink Technology Co., Ltd (南京嘉環科技股份有限公司) and Wuhan Hongxi Technology Services Co., Ltd. (武汉虹信技术服务有限责任公司) emerged as the top players in 2022 as they won some of the key construction projects in equipment installation and transmission line construction in late 2021 and the construction work would be done between 2022 and 2023.

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure construction and maintenance services and network optimisation Services (RMB Million)	Percentage
1	江西省通信產業服務有限公司 Jiangxi Province Communications Industry Service Co., Ltd	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	1,095.4	18.2%
2	中移建設有限公司 China Mobile Construction Co., Ltd	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited	Yes	612.7	10.2%
3	南京嘉環科技股份有限公司 Nanjing Bestlink Technology Co., Ltd	Established in 1998, the company mainly engages in providing telecommunications infrastructure construction and maintenance services	Yes	142.1	2.4%
4	江西省郵電建設工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	141.0	2.3%
5	武汉虹信技术服务有限责任公司 Wuhan Hongxi Technology Services Co., Ltd	Established in 2013, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of CICT Mobile Communication Technology Co., Ltd.	Yes	126.9	2.1%
6	中贛通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services	No	118.0	2.0%
7	上海电信工程有限公司 Shanghai Telecommunications Engineering Co., Ltd	Established in 1952, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	106.2	1.8%
		Other		3,863.3	61.0%
		Total		**6,005.7**	**100.0%**

Notes
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report
3) Percentage/figure may not add up to 100%/amount due to rounding

Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top players in telecommunications network infrastructure construction services industry in Jiangxi Province (By 2023 Revenue)

Rank	Company Name	Company Description	Company Listed	Revenues in telecommunications Infrastructure Construction Services (RMB million)	Percentage
1	中移建設有限公司 China Mobile Construction Co., Ltd	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	692.4	14.2%
2	武汉虹信技术服务有限责任公司 Wuhan Hongxi Technology Services Co., Ltd	Established in 2013, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of CICT Mobile Communication Technology Co., Ltd.	Yes	199.4	4.1%
3	中贛通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services	No	178.1	3.7%
4	江西省郵電建設工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	162.4	3.3%
5	江西省通信產業服務有限公司 Jiangxi Province Communications Industry Service Co., Ltd	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	97.7	2.0%
		Other		3,535.7	72.7%
		Total		4,865.7	100.0%

Notes
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report
3) Percentage/figure may not add up to 100%/amount due to rounding
Source(s): Annual report of listed companies; Ipsos research and analysis

IpsosStrategy3

Top players in telecommunication network infrastructure construction and maintenance services industry in Jiangxi Province (By 2023 Revenue)

- During Jan 2022 – Dec 2023, there are approximately 246 companies awarded Class 1, Class 2 or Class 3 qualification which were active in the Jiangxi Market(company that has won at least one project, and approximately 15.8%(39 company) of the industry players were awarded with first tier Communications Project Implementation General Contracting Enterprises Qualification (Class 1).
- During Jan 2022 – Dec 2023, 42 players with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) won at least one project in infrastructure construction and maintenance services industry in Jiangxi
- There are approximately 12 active players in the Jiangxi market with First Tier Communications Project Implementation General Contracting Enterprises Qualification(通信工程施工總承包) (Class 1) who has won construction and maintenance projects with an aggregate amount of approximately over RMB 20 million from 2022 to 2023.
- There are approximately 5 active players in the Jiangxi market with First Tier Communications Project Implementation General Contracting Enterprises Qualification(通信工程施工總承包) (Class 1) who has won construction and maintenance projects with an aggregate amount of approximately over RMB 50 million from 2022 and 2023.
- The number of active players signification reduced comparing year 2022 has major telecommunication infrastructure tender was accounted during 2021 including China mobile 2022-2023 telecommunications construction agreement (cable installation services) in Jiangxi **Province**"中国移动2022年至2023年通信工程施工服务集中采购（传输管线-江西）"**, China Telecom** 2021-**2022 telecommunications construction agreement in Jiangxi Province(cable installation services)**"中国电信江西公司2021-2022年线缆工程集中招标项目", China Mobile 2022-2023 telecommunications construction agreement in Jiangxi Province(Equipment installation services)中国移动2022年至2023年通信工程施工服务集中采购（设备安装-江西） Project in 2022 including China mobile(Jiangxi) 2022-2023 telecommunications construction agreement (base station construction and upgrading services) in Jiangxi Province江西移动2022-2023年室分及网优小基站相关工程施工服务采购项目 and China Tower 2022-2023 tower body integrated construction services centralized bidding project framework aggrement in Jiangxi Province中国铁塔江西省分公司2022-2023年通信基站一体化施工项目
- The company rose to be the number three in Jiangxi province for two reasons. First, the company has awarded more telecommunication network infrastructure maintenance framework tenders during 2022 which result a higher revenue recognized in 2023. Second, as company has consistently be active in Jiangxi Province, there are consistently revenue actualized from past projects in comparison to Nanjing Bestlink Technology Co., Ltd (南京嘉骏科技股份有限公司) and Wuhan Hongxi Technology Services Co., Ltd (武汉虹信技术服务有限责任公司) which was awarded key projects in during 2021 and 2022 only.

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure Construction and Maintenance Services (RMB million)	Percentage
1	江西省通信產業服務有限公司 Jiangxi Province Communications Industry Service Co., Ltd.	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	862.2	12.9%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	801.6	11.9%
3	中贛通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd.	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services.	No	209.1	3.1%
4	武汉虹信技术服务有限责任公司 Wuhan Hongxi Technology Services Co., Ltd.	Established in 2013, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of CICT Mobile Communication Technology Co., Ltd.	Yes	199.4	3.0%
5	江西省郵電建設工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd.	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	170.3	2.5%
		Other (Top 5)		4,466.6	66.6%
		Total		6,709.2	100.0%

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.
Source(s): Annual report of listed companies; Ipsos research and analysis.

IpsosStrategy3

Top players in telecommunication network infrastructure construction and maintenance services and network optimisation industry in Jiangxi Province (By 2023 Revenue)

Rank	Company Name	Company Description	Company Listed	Revenue in telecommunications Infrastructure construction and maintenance services and network optimisation Services (RMB million)	Percentage
1	江西省通信產業服務有限公司 Jiangxi Province Communications Industry Service Co., Ltd.	Established in 2007, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	862.2	12.4%
2	中移建設有限公司 China Mobile Construction Co., Ltd.	Established in 2003, the company mainly engages in telecommunications infrastructure construction services. The company is now a wholly-owned subsidiary of China Mobile Limited.	Yes	801.6	11.5%
3	中贛通信（集团）有限公司 Zhonggan Communication (Group) Co., Ltd.	Established in 2002, the company focuses on providing telecommunications infrastructure construction and maintenance services.	No	209.1	3.0%
4	武汉虹信技术服务有限责任公司 Wuhan Hongxi Technology Services Co., Ltd.	Established in 2013, the company engages in providing telecommunications infrastructure construction and maintenance services. The company is now a wholly-owned subsidiary of CICT Mobile Communication Technology Co., Ltd.	Yes	199.4	2.9%
5	江西省郵電建設工程有限公司 Jiangxi Post And Telecommunication Construction Engineering Co., Ltd.	Established in 1981, the company mainly engages in providing telecommunication network infrastructure construction services. The company is now a wholly-owned subsidiary of Chinese Communications Services Co., Ltd.	Yes	170.3	2.4%
		Other		4,721.8	67.8%
		Total		6,964.4	100.0%

Notes:
1) The revenue refer to the telecommunications infrastructure services provided to the Big Three and the world's largest telecommunications tower infrastructure service provider.
2) The revenue figures refer to revenue generated by offering telecommunications infrastructure construction and maintenance services. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report.
3) Percentage/figure may not add up to 100%/amount due to rounding.

Source(s): Annual report of listed companies; Ipsos research and analysis.

IpsosStrategy3

Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

National policy will continue to spur demand in infrastructure development (i.e., telecommunications and power supply), which in turn will provide continuous momentum for the telecommunication infrastructure services industry

Market Drivers

Urbanisation and rural development

- Urbanisation helps to spur growth and demand for telecommunications infrastructure, as the number of potential users would increase over time. The national policy such as the "14th Five-Year Plan Information and Communication Industry Development Plan ("十四五" 信息通信行業發展規劃)" and provincial policies such as "Jiangxi Province 5G Network Development Plan (江西省 5G 發展規劃 (2019 –2023 年))" set a roadmap for the penetration of 5G network as well as 1000M FTTH in urban and rural areas in the PRC and Jiangxi Province.

5G application and 5G industrial internet of things (IIoT)

- The national policy such as Plan for Development of IIoT in Industrial Parks (關於組織開展工業互聯網一體化進園區 "百城千園行" 活動的通知), Guideline for development of Full 5G Connection in Factories (關於印發5G全連接工廠建設指南的通知) and provincial policy such as "14th five-year" Digital Economy Development Plan in Jiangxi Province (關於印發江西省 "十四五" 數字經濟發展規劃的通知) and Plan for IIoT Capabilities Enhancement in Jiangxi Province (江西省工業互聯網強體提能行動計劃) launched in 2021 emphasized the development of 5G+ Industrial Internet of Things(IIoT) development in different industries, particularly smart manufacturing. It is estimated that the telecommunications network operators will continue to work closely with the private and public sectors to develop the telecommunication infrastructure as well as relevant 5G applications in the different vertical industries including city management, healthcare, education, transportation, agriculture, infrastructure management etc.

End consumer need for mobile services and technology

- Subscription of 5G data plan rose exponentially since 2021 and is estimated to grow continuously. With the increased penetration of 5G mobile phones and the increasing demand for high-quality entertainment like gaming, video with the use of mobile phones, telecommunications network operators will continue to proliferate the telecommunications infrastructure and technology to meet up the market expectation.

Surging demand for smart cities and the application of emerging technologies

- With the well-developed 5G network and digital infrastructure in the future, how to create value out of the digital infrastructure is the next topic on the agenda. National policies are set to encourage the development of smart cities and the integration of emerging technology, including 5G, IoT, AIoT, and cloud computing for application in vertical industries. Telecommunications technology, particularly 5G is indispensable because of the high speed of transmission and lower latency, there is a huge opportunity for telecommunications infrastructure construction service providers to take an essential part in the game.

Source(s): National data, Ipsos Research and Analysis

Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

High capital requirements and fierce talent competition are the entry barriers for new entrants in the telecommunications infrastructure services industry

Entry Barriers

High capital requirements

- The execution of an infrastructure construction project typically involves significant amounts of resources and costs, including the machinery, tools, equipment, and workforce necessary for the successful completion of a project. Existing players already have the existing equipment and financial capabilities to carry out large-scale projects which serves as a deterrent to new entrants into the industry due to the high amount of capital required to match the capabilities of these existing players.
- In addition, customers will typically only pay after the project is completed and the work has been verified for quality. Industry players must maintain a strong cash flow and financing capacity to maintain liquidity of business operations because the customer payment process could be long. Besides operating cash flow, new entrants must also meet the minimum net assets pre-requisite to qualify for the licenses. For example, the net asset capital requirement for the first tier Communications Project Implementation General Contracting Enterprises Qualification （通信工程總承包一級資質） is RMB80 million.
- During the construction phase, telecommunication infrastructure services providers need to pay the salary to the labour suppliers before the completion of the project before covering the project payment from customers. This creates additional cash flow requirements for companies in the industry to operate the business and ensure completion of the project.

- Telecommunications infrastructure services provider needs to remain a strong cash flow to ensure the operation of the business, as customers settle the payment after a relatively substantial period of time for the following reasons.
  - As the customers demand to ensure the quality of construction deliverables, the inspection period is relatively lengthy before the acceptance.
  - As there might be some different construction companies involved in the same construction project, the customer may wait until all the different aspects of works under the same construction project are completed before carrying out the inspection, acceptance, and settlement audit processes altogether or perform settlement audit or work order, and issuance of VAT invoice.
  - As state-owned enterprises often have relatively lengthy internal approval processes which need to be performed before they can proceed to settlement audit or approve the final accounts
  - Customer will typically retain a portion of the project payment as retention money to secure warranty services provided by telecommunication infrastructure services providers.

Source(s): Ipsos Research and Analysis

Competitive analysis of the telecommunications infrastructure services industry in the PRC and Jiangxi Province

Proven project records and experience from existing players will hinder the newcomers to join the market

Entry Barriers

Talent Competition

- Companies require a professional team consisting of technical and management talents in performing the services. With the vast scope of work from network design equipment installation to maintenance services, senior staff with sophisticated project experience is needed to manage the implementation of projects of different kinds.
- A full team of senior and junior staff are also required to get the relevant licenses. For example, for a company to acquire the first tier Communications Project Implementation General Contracting Enterprises Qualification （通信工程總承包一級資質）, 60 mid-level telecommunications engineers and 120 people certificated intermediate technicians should be hired as full-time staffs. Ten years of experience in managing the implementation of telecommunications engineering projects is also required for the company's technical lead.
- With the emerging need for the integration of telecommunications technology with other technology like big data, IoT and AI for smart cities and other commercial applications, leading companies in the industries are desperate for experienced talent with relevant project experience and skills. It becomes even more challenging for new entrants to build a sizable and stable professional team to join the market.

Track record of past project experience

- The lack of sufficient past project experience is a barrier to new entrants since past project experience is one of the key bidding evaluation criteria to demonstrate a company's capability to complete a project of a similar type. Existing players in the industry have accumulated a high number of successful projects with excellent proven records.
- Stated-owned enterprise are subject to a set of stringent procedure and conditions as well as robust selection criteria in choosing suitable supplier for their various projects, including past project experience, scale and nature of projects undertaken, possession of required technical qualification and permis, financial and operational capabilities, resources allocation and cost effectiveness

Local expertise

- Different province including Jiangxi Province presents unique geographical complexities, characterised by diverse terrains environment. Located in the Central Region, Jiangxi Province is mainly hilly and mountainous with extensive basins and valleys. These geographical characteristics impose greater challenges for certain types of infrastructure-related projects to be carried out in Jiangxi Province when compared with other provinces and regions as it requires high level of skills and expertise plus effective project planning.

License

- Licenses are the prerequisites for a company to participate in the project bidding from the Big Three. It is challenging for new entrants to meet all licensing requirements, as licensing is strictly controlled by responding departments under the evaluation of the business operation, technology standard, net asset, and past project experience.

Source(s): Ipsos Research and Analysis

Competitive analysis of the telecommunication infrastructure services in the PRC and Jiangxi Province

Beyond the growth in 5G infrastructure, the development of 5G related commercial applications will be a new opportunity with no dominating players in the market.

Opportunities

5G application and 5G IIoT

- The national policy has planned to develop new digital infrastructures with the integration of 5G, AI, IoT, cloud computing, and big data, turning the traditional industry into an entire digitalised economy. With the lower cost of technology, more industries can adapt and enjoy the benefit of emerging technologies and applications. For example, the Internet of Things (IoT), which will connect every object, appliance, sensor, device, and application to the Internet, is a broad area for development using a supercharged 5G wireless network. There is a large business opportunity in hardware and integrating hardware with different advanced technology and management solutions, including solution platforms and data analysis.
- Telecommunications network operators are leading in 5G+ Industrial Internet of Things(IIoT) development. The telecommunications network operators work closely with large and small enterprises to launch pilot IIoT cases in different industries, particularly smart manufacturing. The telecommunications network operators are releasing white papers to showcase the business cases to create the demand for 5G applications, including city management, healthcare, education, transportation, agriculture, and infrastructure management etc. As the close partnership working with telecommunications network operators, telecommunication infrastructure services providers can take part in IIoT projects, including projects that request the infrastructures construction.

Carbon reduction practices

- To cater for the concern in carbon emission, some players in the market have started to offer sustainable solutions. For example, Super Telecom Co., Ltd. is offering a photovoltaic base station to achieve the effect of energy saving and emission reduction for the base station. Given the government and the public will be putting more pressure on traditional industries to reduce carbon emissions for the country to reach carbon zero by 2060, it is believed the demand for sustainable telecommunications products will increase.

Source(s): Ipsos Research and Analysis

Competitive analysis of the telecommunication infrastructure services in the PRC and Jiangxi Province

The highly competitive environment, increasing labour cost, and the potential reduction of 5G-related capital expenditure could pose potential threats and challenges to telecommunication infrastructure services industry

Threats and Challenges

Highly competitive environment

- The current environment of the telecommunications infrastructure services industry in the PRC is competitive, the fierce competition together with the sheer number of players in the industry may make it difficult for companies to stand out and end up with a price war in some of the bidding projects.

Increasing labour cost

- Telecommunication infrastructure services generally involve labour-intensive work. Therefore, the wage of workers is the major cost for providing such services. The average annual wage of the workers in the telecommunications infrastructure services industry in the PRC grew from about RMB 65,063.9 in 2019 to approximately RMB 81,478.3 in 2023, at a CAGR of approximately 6.8%. The upward trend reflects the continuous demand for a skilled and experienced labour force, especially in some provinces that are short of labour. As a result, the increasing labour cost in the industry could potentially reduce the profitability of telecommunication infrastructure services.

The potential reduction of expenditure on 5G infrastructure

- Large telecommunications network operators may slow down investments in 5G base stations and shift the investment to 5G application and development of digital economy. The shift of investment focus could pose potential threats to telecommunication infrastructure services companies. In the past two years, the PRC has been moderately ahead of the construction of 5G network, and capital expenditure may steadily decline in the future. . It could potentially reduce the revenue for the telecommunications infrastructure construction industry and pose challenges to the telecommunication infrastructure services companies.
- The revenue of the telecommunication infrastructure services companies could be affected by the periodicity of capital expenditure of the telecommunications network operators. As the capital expenditure of telecommunications network operators in 5G network infrastructure construction may decline, it could potentially reduce the revenue of the telecommunications infrastructure construction companies. As a result, the potential reduction of 5 G-related capital expenditure may potentially pose challenges to telecommunication infrastructure services companies.

Source(s): Ipsos Research and Analysis

Competitive advantages of the Company

The strong exposure in Jiangxi set the foundation for the company to capture future opportunities in the telecommunications infrastructure sector as well as the booming development of new infrastructures in the PRC

Competitive Advantages of the Company

Leading telecommunication infrastructure services provider in Jiangxi Province with a good track record

- As one of the leading telecommunication infrastructure services providers in terms of market share in Jiangxi, the company is well-known for its knowledge as well as project experience in the field of telecommunication infrastructure services. Given the future business opportunities in and smart cities development, the reputation of the company in Jiangxi Province will be beneficial to expanding its clients beyond the major telecommunications network operators. These clients might include the Jiangxi government and other private corporations that are planning for smart city-related infrastructures or IIoT that require advanced telecommunications technology.

Diversified project experience

- Besides the construction of conventional telecommunications infrastructures such as telecommunications equipment installation, wired transmission engineering, access engineering of the transmission network and access network, the company also participated in projects such as smart healthcare, smart urban management, and smart education that require telecommunications related technology. The strong portfolio allows the company to stay ahead of its competitors in the booming development of new infrastructure.
- With local expertise in Jiangxi, there would be a huge potential for the company to take part in smart village development given the increasing urbanization rate as well as the rapidly growing development of the modernized urban and rural areas.

Source(s): Ipsos Research and Analysis

3.3 INDUSTRY OVERVIEW AND COMPETITIVE ANALYSIS OF THE TELECOMMUNICATIONS INFRASTRUCTURE SERVICES INDUSTRY IN XINGJIANG AND YUNNAN PROVINCE

Industry overview and competitive analysis of the telecommunication infrastructure services in Xinjiang

5G network expansion in Xinjiang to facilitate the applications of advanced technology and promote the cooperation between economic corridors

Xinjiang Uygur Autonomous Region

Industry Overview

- During the period of Covid from 2020 to 2022, some of the projects were deferred because of lockdown of the province. Haven't said that, the overall investment has been remained at a substantial level, following the overall investment strategy on telecommunication infrastructure decided by the Big Three and the China Tower.
- Until December 2023, there are over 54,000 5G bases station completed in Xinjiang Uygur Autonomous Region , covered 100% of the urban areas in Prefectural-Level city and county town, and 99.16% of town areas. The penetration rate is to be 19.5 5G base stations for every ten thousands of people in 2025. Urumqi city and Qaramay Shehiri city are two of "Double Gigabit" cities among the 88 "Double Gigabit" cities in China.
- The investment on 5G infrastructure is approximately approximately RMB 1.7billion in 2021, approximately RMB 1.7 billion in 2022, estimated to be RMB 1.8 billion in 2023.

Competitive Landscape

- The competitive landscape in Xinjiang is very similar to other provinces. While national leaders such as China Communications Services Co., Ltd., China Mobile Construction Co., Ltd., CICT Mobile Communication Technology Co., Ltd and Nanjing Bestlink Technology Co., Ltd., local players such as 博信通信股份有限公司, 立昂技術股份有限公司 are also active in the market.
- Due to the expansive geographical area of Xinjiang Uygur Autonomous Regions that is 10times the area of Jiangxi Province, a higher number of telecommunication infrastructure service providers are needed to accommodate the development need within the region
- During Jan 2021 – Dec 2022, approximately 77 players with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) won at least one project in Xinjiang Uygur Autonomous Region . During the period, approximately 34 active players in the Xinjiang market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance project with total amount over RMB 20 million in 2021 and 2022. There are approximately 20 active players in the Xinjiang market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with total amount of over RMB 50 million in 2021 and 2022.
- During Jan 2022 – Dec 2023, approximately 70 players with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) won at least one project in Xinjiang Uygur Autonomous Region . During the period, There are approximately 22 active players in the Xinjiang market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with total amount over RMB 20 million in 2022 and 2023. There are approximately 6 active players in the Xinjiang market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with total amount of over RMB 50 million in 2022 and 2023.
- In comparison to telecommunications infrastructure constructions, fewer companies are taking part in telecommunications infrastructure maintenance. China's largest province is a landscape of deserts, mountains, and oases, making the labour-intensive infrastructure maintenance jobs more difficult to manage. Some of the infrastructure maintenance companies are less inclined to take part in the maintenance project in Xinjiang Uygur Autonomous Region.

Investment on 5G infrastructure

RMB Billion	2020	2021	2022	2023	2024	2025
Actual(2020-2022 Oct) and Estimate (2022-2025)	2.0	1.7	1.7	(Estimated) 1.8	(Forecast) 1.4	(Forecast) 1.0
Planned Investment 新疆维吾尔自治区5G通信基础设施专项规划（2021-2025年）	-	5.7	4.6	5.6	4.1	2.9

Industry overview and competitive analysis of the telecommunication infrastructure services in Xinjiang

Xinjiang Uygur Autonomous Region

Opportunity

Belt and Road Initiative

Xinjiang has a crucial geographical position for the development of the digital economy and the telecommunications industry under the Belt and Road Initiative（一帶一路）, sharing the borders with eight countries including Kazakhstan, Kyrgyzstan, Tajikistan, Afghanistan, Pakistan, India, Russia, and Mongolia. In light of this, the rollout of thousands of 5G base stations in Xinjiang is expected to drive greater demand for telecommunications infrastructure in the region as a dependable and robust infrastructure network is paramount for achieving advancement in the telecommunications industry, thereby build connectivity and cooperation across economic corridors. As the demand for high-speed and reliable telecommunications services continues to increase in the region, there is also a growing demand for advanced technology applications, such as cloud computing, big data, and IoT. The development of these advanced technology applications can support the further growth of the digital economy in Xinjiang Uygur Autonomous Region .

Smart city application

- Policy such as Five-Year Planning for the Development of 5G Infrastructure in Xinjiang Uygur Autonomous Region 《新疆维吾尔自治区5G通信基础设施专项规划（2021-2025年）》 which sets the goal to accelerate the development of smart cities, smart communities, smart industrial parks as well as 5G commercial application. The areas of 5G commercial applications include smart urban management, smart industrial, smart agriculture, smart education, smart travel healthcare, smart transportation hub with over 70 pilot projects

Source(s): Ipsos Research and Analysis

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Industry overview and competitive analysis of the telecommunication infrastructure services in Xinjiang and Yunnan

Yunnan accelerates 5G development in a wide range of fields with the aim to supporting the growth of "Digital Yunnan"

Yunnan Province

Industry Overview

- According to the "14th Five-Year" Information and Communication Industry Development Plan of Yunnan Province 《"十四五"云南信息通信行业发展规划》, the province set a target to reach 150,000 5G base stations, 3,250,000 kilometer of network optical cable by 2025 with over 2million gigabit broadband household subscribers.
- The Big Three is also expanding their services to Southeast Asian country via Yunnan Province. Until 2023, 13 optical cables are built in Laos and Myanmar to offer boardband services to foreign countries.

Competitive Landscape

- The competitive landscape in Yunnan is very similar to other provinces. National leaders such as China Communications Services Co., Ltd., China Mobile Construction Co., Ltd., CICT Mobile Communication Technology Co., Ltd and Nanjing Bestlink Technology Co., Ltd., Runjian Communication Co. ,Ltd.
- **During Jan to 2021 – Dec 2022**, approximately 65 players with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) won at least one project in Yunnan. There are approximately 37 active players in the Yunnan market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance project with total amount over RMB 20 million in 2021 and 2022. There are approximately 29 active players in the Yunnan market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with total amount of over RMB 50 million in 2021 and 2022.
- **During Jan to 2022 – Dec 2023**, approximately 70 players with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) won at least one project in Yunnan. There are approximately 15 active players in the Yunnan market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance project with total amount over RMB 20 million in 2022 and 2023. There are approximately 7 active players in the Yunnan market with First Tier Communications Project Implementation General Contracting Enterprises Qualification (通信工程施工總承包) (Class 1) who has won construction and maintenance projects with total amount of over RMB 50 million in 2022 and 2023.

Source(s): Ipsos Research and Analysis

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Industry overview and competitive analysis of the telecommunication infrastructure services in Yunnan

Yunnan accelerates 5G development in a wide range of fields with the aim to supporting the growth of "Digital Yunnan"

Yunnan Province

Opportunity

Digital Yunnan

- Yunnan Province is actively developing its digital economy, with initiatives such as the "Digital Yunnan" plan（十四五" 数字云南规划）to build a comprehensive digital infrastructure network across the province. In 2023, the Office of the Leading Group for the Construction of Digital Yunnan announced "Key Points of Digital Yunnan 2023（ 2023年数字云南工作要點）, which emphasizes that Yunnan Province will accelerate the construction of Digital Yunnan in six aspects, including consolidating new infrastructure, building a collaborative and efficient digital government, vigorously developing a digital economy, building a shared digital society, and vigorously attracting and training digital talents. Yunnan Province plans to invest in constructing high-speed broadband networks, 5G networks, and other advanced telecommunications infrastructure to support the development of e-commerce, digital services, and other innovative industries.
- There are over 200 5G relevant commercial application projects implemented in Yunnan Province. This includes smart agriculture, smart industrial, smart grain depot, smart tourism, smart healthcare, and smart education. The provincial government also set to develop 3to 5 5 G-enabled factory.
- To accelerate rural vitalization, China Telecom launched the digital application "村村享" that offers rural governance with the use of 5G and other advanced technology in the country. Yunnan province actively participated in this digitalized rural vitalization initiative with over 42 counties taking part in it, providing digital governance to over 2,300 villages and 300,000 rural families.

Source(s): Ipsos Research and Analysis

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OVERVIEW OF THE digitalization solution services INDUSTRY IN THE PRC AND JIANGXI PROVINCE

4

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Overview of the digitalization solution services industry in the PRC

Definition of smart city (Policy)

- The term "smart planet" was initiated in 2008 by IBM and generally refers to the use of technology to interconnect the world and improve it. The term later evolved to become the term "smart city" which refers to the application of advanced technology to make the city living "smarter".
- The Chinese government has been actively promoting the development of smart cities since 2012. In November 2012, The Ministry of Housing and Urban-Rural Development issued an "Interim Management Measures Management Guideline for National Smart City Pilots" 《国家智慧城市试点暂行管理办法》 to encourage the development of the smart city. The interim measures emphasised that "Smart cities establishment is an important initiative to implement the directives and policies of the Central Committee of the Chinese Communist Party and the State Council regarding innovation-driven development, promoting new-type urbanisation, and building moderately prosperous societies in an all-round way". Since then smart city has been well recognized as the application of advanced technology(e.g. AI. Cloud Computing) and interconnected technology(e.g. 5G, IoT) and digitalization in infrastructure, public facilities, community, city governance, grain depots, transportation, public services, public facilities, public healthcare, smart manufacturing etc.
- Together with some later policies such as "Guideline for Healthy Development of Smart Cities" 《关于促进智慧城市健康发展的指导意见》 issued by National Development and Reform Commission (NDRC) together with seven other governmental departments, smart city is well recognized by the general audience as well as the industry as the use of data and technology to enhance urban planning, construction, management and services that brings more efficient life to people in general.

Definition of smart city (Corporation)

- Top companies in the industry who provide turnkey solutions in smart city-related areas typically describe the service as "Smart City services" or "Smart services"
- **China Communications Services Co., Ltd.** (中國通信服務股份有限公司) (stock code: 00552.HK) focused on strategic emerging industries such as digital infrastructure, smart city, green and low-carbon, and defined itself as an "integrated smart service provider". In the field of smart city, the company mainly put efforts into the development of key areas of digital government, enterprise digital transformation and smart transportation.
- **Taiji Computer Corporation Limited** (太極計算機股份有限公司) (stock code: 002368.HK) positioned itself as "a leading enterprise in smart cities" and mainly engages in smart government and smart health.
- **China Bester Group Telecom Corporation Limited** (中貝通信集團股份有限公司) (stock code: 603220.CH) positioned itself as a telecommunication technology services provider with an ambition to be a leader in smart cities construction. The core services include 5G infrastructure construction services, smart city construction services and 5G industry application solution services.

Source(s): Ipsos Research and Analysis

Overview of the digitalization solution services industry in the PRC

Latest smart city (Policy)

Time of Issue	Policy	Issuing Department	Policy Highlight
2024.04	Guidance on Deepening Smart City Development and Promoting Comprehensive Digital Transformation of Cities (Draft for Soliciting Opinions) (深化智慧城市发展推进城市全域数字化转型的指导意见(徵求意見稿))	National Data Administration	The policy proposes that by 2027, significant progress will be made in the comprehensive digital transformation of cities nationwide, resulting in a group of livable, resilient, and smart cities characterized by horizontal connectivity, vertical integration, and distinct features. Urban digital economy innovation will thrive, digital governance will be efficient and precise, digital services will be convenient, digital emergency resilience will be secure, and the ecological environment will be intelligent and green. The major arteries of digital infrastructure will be optimized, releasing the vitality of data resources, and the benefits of urban development will reach all citizens. By 2030, comprehensive breakthroughs in nationwide urban digital transformation will lead to the emergence of a group of globally competitive Chinese-style modern cities in the era of digital civilization.
2023.12	Implementation Plan for Promoting Common Prosperity through the Digital Economy (數字經濟促進共同富裕實施方案)	National Development and Reform Commission	Through the development of the digital economy and the construction of smart cities, data elements have achieved rapid cross-regional and cross-departmental flow, enhancing resource sharing and collaborative capabilities. This has improved efficiency in cross-regional administrative processes, laying the foundation for the inclusive development of high-quality public services. On the other hand, the continuous innovation in artificial intelligence (AI) and big data applications is expanding the coverage and precision of key services in areas related to people's livelihoods, such as healthcare, education, elderly care, social security, and employment. These digital innovations can provide personalized and diversified customized services for different regions, demographics, and industries, effectively meeting the increasingly diverse life demands of the population. This transformation shifts from a model of 'people seeking policies' to 'policies finding people,' and from 'massive searches' to 'one-click access'
2023.02	Overall Layout Plan for Building a Digital China (數字中國建設整體佈局規劃)	The State Council	The policy clearly outlines the overall framework for building Digital China, which follows the '2522' approach. This approach involves two fundamental aspects: solidifying digital infrastructure and data resource systems as the 'two foundations,' and promoting the deep integration of digital technology with economic, political, cultural, social, and ecological development as the 'Five-in-One.' Additionally, it emphasizes strengthening the innovation system for digital technology and establishing robust security measures as the 'two capabilities,' while optimizing the domestic and international environments for digital development.
2022.07	Overall Layout Plan for Building Urban Infrastructure during the 14th Five-Year Plan Period (十四五全國城市基礎設施建設規劃)	Ministry of Housing and Urban-Rural Development & National Development and Reform Commission	In order to build a comprehensive, efficient, practical, intelligent, green, safe, and reliable modern infrastructure system, this policy proposes four key tasks. First, it aims to promote the systematic construction of urban infrastructure, enhancing the resilience and safety of cities. Second, the policy encourages shared construction and utilization of urban infrastructure, fostering a new pattern of coordinated development between regions and urban-rural areas. Third, it emphasizes the need to improve urban ecological infrastructure, thereby promoting green and low-carbon development. Finally, the policy accelerates the construction of new urban infrastructure, driving the transformation and development of smart cities.
2022.03	Key Tasks for the Development of New Urbanization and Urban-Rural Integration in 2022 (2022年新型城鎮化和城鄉融合發展重點任務)	National Development and Reform Commission	This policy emphasizes the enhancement of smart capabilities. It includes measures such as improving the national spatial information platform, creating a comprehensive national land spatial planning 'one-map,' exploring the construction of 'urban data brains,' accelerating the development of city-level integrated big data platforms to facilitate data perception, analysis, decision-making, and execution in urban contexts. Additionally, the policy promotes the application of the Internet of Things (IoT) and intelligent transformation in municipal public facilities and buildings, digitizing resources in schools, hospitals, nursing homes, and libraries. Furthermore, it aims to enhance smart government services by providing convenient online services for business registration, tax payment, certificate verification, and administrative licensing. Lastly, the policy calls for the improvement of basic networks in small and medium-sized cities in the central and western regions.

Overview of the digitalization solution services industry in the PRC

Smart city application enhances the efficiency and quality of our everyday life in areas such as transportation, healthcare, utilities, personal safety, living environment, business environment and public services.

Definition of smart city and infrastructure digitalisation solution

- The development of smart city requires digitalisation and integration of urban infrastructure, social infrastructure, and commercial infrastructure, encompassing an area's population, transportation assets, energy resources, commercial activity, and communications with the use of digital technologies to enable rapid incident response and coordinated operation of infrastructure, resulting a more efficient life to people.
- Smart cities collect large amounts of data and use them to improve city operations via technology-enabled acquisition, integration, analysis, and application from a city's core management systems. Developers can create technological applications based on a city's critical infrastructure, converting data into insightful tools. These applications in turn serve as a form of public-private partnerships, creating opportunities for government, companies, and the public.
- More specifically, infrastructure digitalization solution services refer to the turnkey solution from planning, developing, installing and optimizing the hardware and software of different infrastructures. This involves the application of traditional technologies including digitalization, information and communication technology (ICT) to design system that connects different infrastructures for collection of data and operation of infrastructure, as well as the use of advanced technologies such as the Internet of Things (IoT), cloud computing, and Artificial Intelligence (AI) for real-time data collection, real-time incident response, rapid analytics and automated decision making.
- With the breakthrough in technology in the last decade, the concept of "smart cities" has also gained significant attention among governments and businesses worldwide. The idea focuses on enhancing the efficiency and quality of our everyday life in areas such as mobility, communication, energy, water, waste, security and integrated platforms for governments.

Source(s): Ipsos Research and Analysis

Overview of the digitalization solution services industry in the PRC

Smart city application enhances the efficiency and quality of our everyday life in areas such as transportation, healthcare, utilities, personal safety, living environment, business environment and public services.

Definition

Technology	Definition	Smart city applications examples
Blockchain	Blockchain refers to a shared, immutable ledger that facilitates the process of recording transactions and tracking assets across a network. Due to the decentralized nature in which blockchain digitizes and distributes data, blockchain technology can be implemented across a multitude of industries with particular applications in cyber security.	Banking, payment and transfer, law enforcement, database management, IoT data transfer
IoT	The Internet of things (IoT) describes physical objects that are embedded with sensors, processing ability, software, and other technologies that connect and exchange data with other devices and systems over the internet or other networks.The devices do not need to be connected to the public internet, they only need to be connected to a network and be individually addressable. Smart cities use IoT devices such as connected sensors, lights, and meters to collect and analyze data.	Smart streetlight automation, smart waste management, energy infrastructure monitoring, environmental quality monitoring, networked video cameras, smart electrical metering
Big data	Big data is a field that treats ways to analyze, systematically extract information from, or deal with data sets that are large or complex. Big data refers to the use of predictive analytics, user behaviour analytics, or certain other advanced data analytics methods that extract value from big data. Big data offer the potential for smart cities to obtain valuable insights from a large amount of data collected through various sources.	Traffic signal optimisation, incident analysis and social credit information platforms
AI	AI refers to various methods for using a non-human system to learn from experience and imitate human intelligent behaviour. AI systems can efficiently sift through large quantities of Big data to generate data predictions and provide cost-effective solutions to fuel smart city technologies. AI systems can be supervised or unsupervised. In supervised learning, datasets and target values are created to train AI systems to find specific solutions in the collected raw data. The AI will then carry out programmed tasks and actions, whilst exploring new opportunities and possibilities that may provide better outcomes than current solutions. In unsupervised learning, non-labelled and non-classified datasets are used to train and ask questions of AI. AI technology can be broadly categorised into "discriminative AI" and "generative AI". Discriminative AI is a type of AI model which mainly focuses on data classification and statistical analysis based on given parameters or examples. As opposed to the advanced forms of AI (such as generative AI) which involve content reconstruction or generation by themselves, discriminative AI is a more basic form of AI which simply analyses the patterns or features in the input data to assign labels to new data. Discriminative AI model is commonly used in tasks such as image recognition, language processing, fraud detection, and recommendation systems. On the other hand, generative AI is a more advanced form of AI model which is to create new data and content that the model has been trained on. Generative AI models provide a window into the intricate structures within the data, allowing for creative data generation and synthesis. xx Some of the Group's services or products may have incorporated its core technologies such as real-time video surveillance analysis technology, city panorama display systems, big data intelligent analysis technology and distant medical consultation analysis technology pertaining to discriminative AI, which involves data classification and statistical analysis. However, they do not involve content reconstruction or generation by themselves and do not meet the standards of generative artificial intelligence technology.	surveillance , smart parking, smart public transportation
Cloud computing	Cloud computing enables convenient, on-demand network access to a shared pool of configurable computing resources, such as networks, servers, storage, applications, and services, which the cloud system can rapidly provision and release automatically. Cloud technology will provide the digital infrastructure for smart cities as a storage and analysis system for data.	Surveillance data storage, IoT sensor data processing, government data storage and public cloud centers

Source(s): Ipsos Research and Analysis

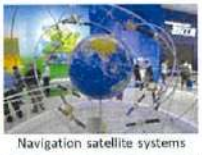
Overview of the digitalization solution services industry in the PRC

Smart city applications enhance the efficiency and quality of our everyday life in different areas such as smart transportation, smart healthcare, smart utilities, personal safety, living environment, business environment, and public services.

Digitalization applications (1/2)

Smart transportation


Self-driving bus


Navigation satellite systems


Vehicle sharing

Smart logistics

Smart urban management


Smart streetlights


Smart parking meters


surveillance


Energy metering

Smart building


Utility metering, security system, occupancy sensor, environmental controls

Smart Manufacturing


Automated factories

Smart Education


Machine learning power personalized learning

Smart healthcare


AI diagnosis


Remote diagnosis

Smart governance


Digital appointment of public services

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Overview of the digitalization solution services industry in the PRC

Smart city applications enhance the efficiency and quality of our everyday life in different areas such as smart transportation, smart healthcare, smart utilities, personal safety, living environment, business environment, and public services.

Digitalization applications (2/2)

Smart city applications can generally be categorized into the following scenarios:

Digitalization Applications	Examples
Digital urban management	Smart city governance, smart public facilities management, automated energy control, traffic management, etc.
Digital industrial	Automated manufacturing, predictive maintenance and AI robotics, etc.
Digital healthcare	Digital appointment, electronic health record, digitalisation in hospitals, AI diagnosis and remote diagnosis, etc.
Digital government	Digital appointments of public services, digital payment, etc.
Digital grain depots	Unattended monitoring of warehouse including energy management, environmental controls and security systems etc.
Digital management	Digital staff management, digital and automated supply chain management, automated operation analytics and management
Digital surveillance	Surveillance system with advanced analytics for crime prevention and traffic management, etc
Digital finance	Smart cloud-based audit, digital banking, fraud detection with big data analytics, customer services with AI chatbot, insurance underwriting with machine learning, etc
Digital telecommunications constructions	Digital procurement supply chain management, smart project and budget management, equipment damage detection, etc
Digital education	Remote learning, machine learning-powered personalized learning, classroom management, school safety management

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Overview of the digitalization solution services industry in the PRC

Smart city applications enhance the efficiency and quality of our everyday life in different areas such as smart transportation, smart urban management, smart healthcare, smart utilities, personal safety, living environment, business environment, and smart governance.

Recent development

- With the established infrastructure on the internet, mobile communication and broadband connection in the PRC developed in the past decade, the PRC has emphasized smart city development in the recent five-year plans. The development of Chinese smart city technology is primarily top-down, driven by government investment, and generally aligns with regional development patterns. Significant resources have been directed towards furthering the technological innovation and public-private partnerships behind smart cities, including the development of 5G, Artificial Intelligence (AI), electric vehicles, cloud computing, machine learning, blockchain technology, and the Internet of Things(IoT).
- The development of 5G networks also accelerates the development of smart cities. Previous generations of wireless network technologies primarily dealt with human communications in the form of voice, data and Internet, whereas 5G networks aim to satisfy industrial communications and drive the digitalisation of the global economy. With 5G networks gaining prominence and replacing older networks, there will be an increasing demand for smart technologies which can take advantage of faster network speeds, lower latency, increased capacity and improved reliability to access information. 5G-based ubiquitous sensor networks can connect everything in a smart city and promote the integrated development of humans, machines, and things. AI, big data analysis, edge computing, IoT and 5G will also empower city management, businesses and people's livelihood. With the increasing availability of advanced technologies, video surveillance has gradually expanded to fields including traffic management, emergency command, disaster prevention, passenger flow analysis, environmental pollution monitoring and insurance loss verification.
- Besides managing the cities and public spaces through surveillance, smart transportation, smart lighting, smart building, and smart energy are also some of the smart city technologies. These smart city technologies will benefit the country with a healthier population and a growing economy. The Chinese citizens' awareness of smart city technology solutions reflects a positive trend with more people availing themselves of online and digital services to pay bills, manage taxes and use other public utilities.
- Due to the recent concern about carbon emissions and environmental protection, there is also increasing public awareness about the sustainability of the environment and the sustainability practices of private corporations.

Source(s): Ipsos Research and Analysis

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Overview of the digitalization solution services industry in the PRC

5G and AI milestones have been made in the PRC recently

Recent Trend and Development (1/2)

5G plays a critical role in allowing information gathered through sensors to be transmitted in real-time to central monitoring locations. The ubiquitous network derived from its integration with AI empower smart city applications across China as below:

Time	5G Projects	Key highlights of the projects
2022	5G Smart Factory in Ningde	With the support of technology giants including China Mobile, Huawei and other partners, the leader in lithium-ion battery development, CATL built the largest 5G enterprise network across 6 provinces and 7 bases in Fujian, Jiangsu and Sichuan. CATL has been integrating 5G into the production line of CATL Hudong factory by applying a central intelligent process-aware control system, AI quality inspection of ultra-high-speed motion full-volume video stream, real-time inspection of full-volume big data, augmented reality expert system, and intelligent logistics.
2022	Hengyang 5G Smart Transportation Project	The leading autonomous driving technology company, Mushroom Chelian Information Technology and the Hengyang government promoted large-scale commercialization of city-level autonomous driving. The project has been designed to improve the digitalization of the public sector by applying autonomous driving innovations to public transportation, cabs, sanitation patrols and other urban public service scenarios.

Source: Ipsos Research and Analysis

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Overview of the digitalization solution services industry in the PRC

5G and AI milestones have been made in the PRC recently

Recent Trend and Development (2/2)

5G plays a critical role in allowing information gathered through sensors to be transmitted in real-time to central monitoring locations. The ubiquitous network derived from its integration with AI empower smart city applications across China as below:

Time	AI Projects	Key highlights of the projects
2020	The City Brain System in Hangzhou	Hangzhou adopted the City Brain system developed by Alibaba to improve city governance by using AI, big data and 5G technologies. The system connects an average of 120 million pieces of data every day to enhance operational efficiency. The system monitors real-time traffic conditions in the city and the system can calculate the number of vehicles on the road automatically. Also, cameras are used to acquire real-time traffic information and command traffic lights to turn green or red based on real-time road conditions to improve transportation efficiency. Statistics show that drivers now spend 4.6 minutes less time on the 22-kilometer-long Shangtang Elevated Road as a result of the system.
2020	"Safe and Smart Community" in Wuhan	Wuhan was one of the first cities to pilot the smart city program. Wuhan is the largest water and transport hub in the PRC, and it is a populous city. Considering its dense population, a "Safe and Smart Community" was built and IoT was leveraged to automate and actively control security in the community. surveillance cameras, access control systems, household electricity meters, water pressure, smoke detectors on each floor and other equipment have all been connected to the Internet of Things. These real-time data are collected by the public security information system. Police officers are able to receive signals if abnormal situations happen. The program has successfully reduced the crime rate and increased the sense of security of citizens.

Source: Ipsos Research and Analysis

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Overview of the digitalization solution services industry in Jiangxi Province

Jiangxi Province has been promoting the applications of 5G and Industrial Internet of Things(IIoT) that enhance social and economic values

Recent Trend and Development (1/3)

Jiangxi Province has been accelerating the development of 5G applications in recent years . There have been more than 500 5G application cases in Jiangxi Province since 2021, covering education, healthcare, mining, transport and many more other industries.

Time	Projects	Key highlights of the projects
2021.03 to 2025.12	Xunwu County 5G + Smart City	The project aims to establish a county data sharing platform and improve the "sharp eyes" program (雪亮工程), with plans to build smart medical treatment, smart community, and smart education, etc.
2021.08 to 2027.12	Ganzhou Rongjiang New Area Smart City Construction	This project plans to build urban operation center, public information platform, and public information foundation.
2020.05 to 2024 12	Huichang County Smart City Transformation	The project mainly plans to build big data command centre, big data centre system, big data information exchange system, smart whole system, smart city management system, sensor acquisition subsystem, 5G network base station construction, smart signal control system, smart cloud eye system, smart tourism, smart park innovation demonstration project, and digital village integrated management platform, etc.

Source: Ipsos Research and Analysis

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Overview of the digitalization solution services industry in Jiangxi Province

Jiangxi Province has been promoting the applications of 5G and Industrial Internet of Things(IIoT) that enhance social and economic values

Recent Trend and Development (2/3)

Jiangxi Province has been accelerating the development of 5G applications in recent years. There have been more than 500 5G application cases in Jiangxi Province since 2021, covering education, healthcare, mining, transport and many more other industries.

Time	Projects	Key highlights of the projects
2023	Digital and smart infrastructure construction	A new generation of high-speed, mobile, secure, and ubiquitous information infrastructure will be completed by 2023. 50,000 5G base stations will be built, achieving full coverage of 5G networks and gigabit optical networks at urban homes, industrial parks, schools, hospitals, public culture, and tourist venues. 3 to 5 new smart city benchmarks will be built and the coverage of smart campus construction will reach 100%. Also, the coverage of smart hospital construction will reach 70%, and the deployment of infrastructure such as smart transportation and smart energy will be accelerated.
2021.12 to 2023.12	Longnan 5G + Digital City	The project aims to build 5G + application platforms for smart education, smart medicine, smart urban management, and smart tourism, etc.
2022.01 to 2023.12	Yuantong Express (Gannan) Smart Innovation Park	The project mainly intents to construct Yuantong Express operation headquarters in Gannan, business management center, smart logistics center, and cloud warehouse center, etc.

Source: Ipsos Research and Analysis

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Overview of the digitalization solution services industry in Jiangxi Province

Jiangxi Province has been promoting the applications of 5G and Industrial Internet of Things(IIoT) that enhance social and economic values

Recent Trend and Development (3/3)

Jiangxi Province has been accelerating the development of 5G applications in recent years . There have been more than 500 5G application cases in Jiangxi Province since 2021, covering education, healthcare, mining, transport and many more other industries.

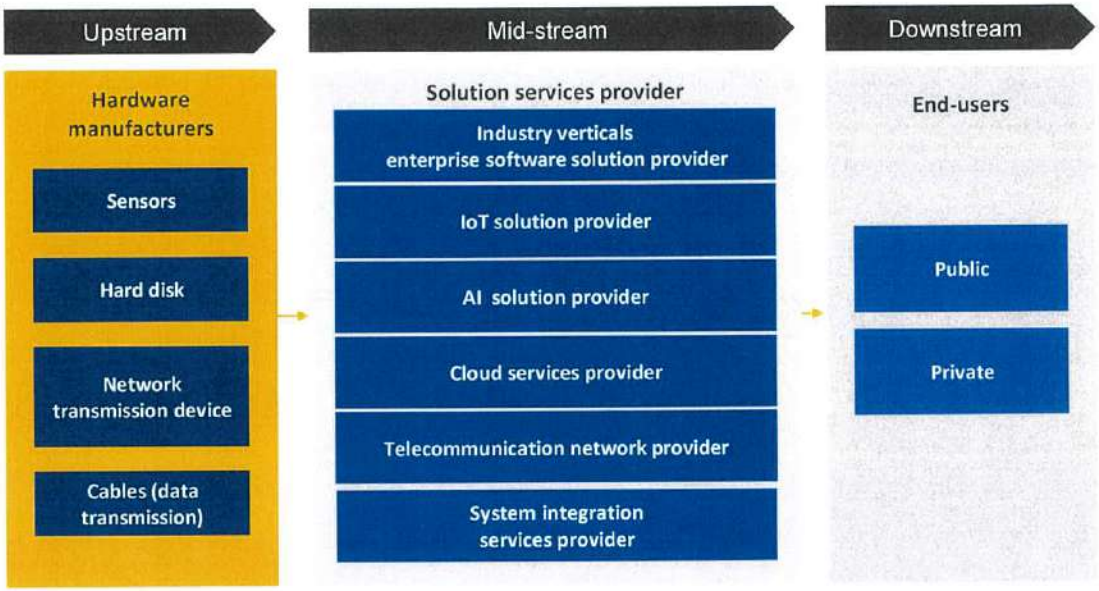
Time	Projects	Key highlights of the projects
2021	China Unicom 5G and industrial Internet of Things (IIoT) transformation on Jiangxi's Textile factory	With the advocacy of the 14th five-year plan, China Unicom implemented 5G and IIoT technologies on the Jiangxi Mingheng Textile industry. The textile factory gained benefit from the low delay and large bandwidth of 5G. The big data analysis allows the factory to undergo automation on data-based production management, provide fault early warning and maintenance management to reduce labour costs and enhance production efficiency. Mingheng Textile increased its efficiency by 25% and gross profit by 60%.
2021	5G + IIoT Smart Manufacturing Demonstration Base	China Unicom and Ganzhou Pharmapack Intelligent Equipment Co,. Ltd jointly built the first pharmaceutical packaging factory in Jiangxi which gave full play to its cloud-network integration capability of "calculation, capability and ecology". This strategic cooperation strengthens their belief in the far-reaching impact brought by 5G and they build a 5G+ IIoT Smart Manufacturing Demonstration Base to demonstrate how the application of 5G technology improve the quality of package.
2021	China Mobile's Smart Village Project in Anyi	The village is fully covered by 5G bandwidth. This project integrated IoT, AI platforms and drones to transform from traditional farming, planting, management, and harvesting, to digital management of agricultural production. The planting environment is managed and monitored in real-time through sensors to achieve efficient harvesting, visualization of plants and automate the pesticide spraying process.

Source: Ipsos Research and Analysis

IpsosStrategy3

Overview of the digitalization solution services industry in the PRC

The key players of the digitalization solution services industry in the PRC consist of hardware manufacturers, solution services providers and end-users.



 Source(s): Ipsos Research and Analysis

Overview of the digitalization solution services industry in the PRC

The key players of the digitalization solution services industry in the PRC consist of hardware suppliers, solution services companies and end-users.

Value Chain (1/2)

Hardware manufacturers

- Sensing hardware manufacturers
  - Digitization and advancements in technologies are driving the large-scale adoption of sensor technologies in smart cities. These technologies have to be integrated with sensor networks to create connected city ecosystems to ease decision-making by government bodies as well as enable the optimal use of public resources. There are four types of sensors in general: 1) electronic sensors are deployed in environmental surveillance sensors and speedometer sensors to monitor power and detect faults. 2) infrared sensors generate unbiased data in dynamic and unstable environments, for example, crucial archaeological site information. 3) Thermal sensors are used to track energy distribution and improve energy efficiency. 4) proximity sensors are used in automated vehicle systems.
- Hard Disk
  - The big data collected from different devices are saved in hard disks.
- Network transmission device providers and cables
  - Network transmission devices connect individual workstations and servers. Types of network transmission devices include media connectors, network interface cards, repeaters and hubs.

Source(s): Ipsos Research and Analysis

Overview of the digitalization solution services industry in the PRC

The key players of the digitalization solution services industry in the PRC consist of hardware suppliers, solution services companies and end-users.

Value Chain (2/2)

Solution services companies

- Digitalization solution services providers provide turnkey solutions for clients by integrating hardware and digital solution. The process involves site planning, customized software system design, hardware and software installation, solution system testing and maintenance.
- Solution services companies are further categorized according to the core capability of the services providers:
  - Industry verticals enterprise software solution providers: solution providers who provide industry-specific digital solutions to assist end users in managing different management issues such as information management, data analysis and customer services.
  - AI solution providers: AI solution providers adopt deep learning frameworks to simulate human thought and decision-making. These solution providers typically develop a solution for different industries such as surveillance, education, and transportation, to assist and optimize decision-making. Solution providers leverage the learning framework to improve the quality of AI algorithms.
  - IoT solution providers: IoT solution providers develop the solution platform that connects the devices with other devices and systems for the exchange of data and remote control. Similar to AI solution providers, IoT solution providers develop solutions for different industry verticals or specific smart city applications.
  - Cloud services providers provide the digital storage and analysis system for data. Cloud technology enables convenient, on-demand network access to a shared pool of configurable computing resources, such as networks, servers, storage, applications, and services.
  - Telecommunication network provider refers to the Big Three that provides telecommunication network services to support data transmission.
  - System integration services providers provide smart city turnkey solutions without owning any proprietary solutions, cloud services and telecommunication. Often, they are commissioned or subcontracted by other solution providers to implement solutions. Their main solutions include site planning, designing a customized software architecture or application, installing of hardware and software, and testing and optimizing the systems.
- Digitalization solution services projects were generally obtained by way of single-source procurement. It is not uncommon for digitalization solution services projects to be obtained in such a way. For single-source procurement, the customer would directly invite digitalization solution services providers to offer its services as opposed to the service provider seeking a tender via the online platform of the customer. As such, the local market reputation, track record, and technical capabilities of digitalization solution services providers are of considerable importance.
- In a typical contract, customers will pay the digitalization solution services providers and the solution providers will pay to their upstream supplier accordingly in order to mitigate their business risk.

End-users

- Citizens, government and private companies are the main end-users of smart city infrastructures.

Source(s): Ipsos Research and Analysis

IpsosStrategy3

Market value of the digitalization solution services industry in the PRC

The overall market value of the infrastructure digitalization solution services industry in the PRC increased steadily due to continued investments in technological innovations related applications and infrastructures.

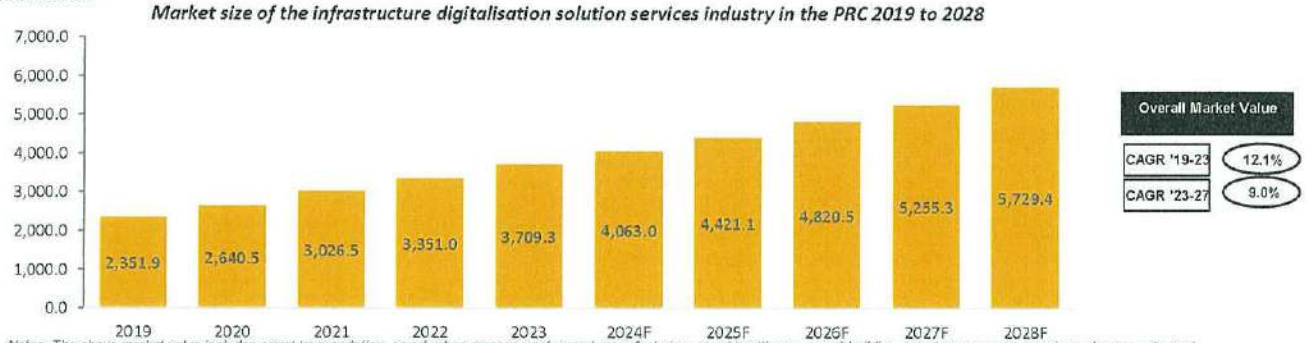
The overall market value of the infrastructure digitalization solution services industry in the PRC grew from about RMB 2,351.9 billion in 2019 to about RMB 3,709.3 billion in 2023, at a CAGR of approximately 12.1%. With more sophisticating technology, various infrastructure digitalization projects have been launched for city governance in the PRC. For example, the "Safe and Smart Community" project in Wuhan, leveraged IoT through collecting real-time data from surveillance cameras, access control systems, and water pressure, etc., to automate and actively control security in the community.

The overall market value of the infrastructure digitalization solution services industry in the PRC is estimated to grow from about RMB 4,063.0 billion in 2024 to about RMB 5,729.4 billion in 2028, at a CAGR of approximately 9.0%. The 14th Five-Year Plan for National Informatization("十四五"國家信息化規劃) aimed to accelerate the development of infrastructure digitalisation applications such as public transport, express logistics, healthcare, and education by the year of 2025.

- **Based on these figures, and the companies 2022 relevant revenue of RMB 70,590,600, it is estimated that the Group's market share in the infrastructure digitalization solution services industry in China is approximately 0.0021%.**
- **Based on these figures, and the companies 2023 relevant revenue of RMB 107,943,620 , it is estimated that the Group's market share in the infrastructure digitalization solution services industry in China is approximately 0.0029%.**

RMB Billion

Market size of the infrastructure digitalisation solution services industry in the PRC 2019 to 2028



Notes: The above market value includes smart transportation, smart urban management, smart manufacturing, smart healthcare, smart building, smart governance, smart warehouse and smart education

Source(s): MIIT; Three telecommunications network operators; Ipsos research and analysis

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Market value of the digitalization solution services industry in the Guangdong, Anhui and Jiangxi

Anhui

Guangdong

- The overall market value of the infrastructure digitalization solution services industry in Guangdong grew from about RMB 260.4 billion in 2019 to about RMB 405.4 billion in 2023, at a CAGR of approximately 11.7%. Guangzhou was active in the development of 5G pilot city. For example, China Mobile and ZTE launched "Guangzhou 5G Pilot City" which mainly applies 5G technologies in 5 transportation scenarios, including high-speed railway, subway, bus, road administration and the Internet of Vehicles(IoV). The overall market value of the infrastructure digitalization solution services industry in Guangdong grew from about RMB 445.6 billion in 2024 to about RMB 634.7 billion in 2028, at a CAGR of approximately 9.2%. Guangzhou, Shenzhen, and Foshan are classified as the pilot smart cities by MOHURD, MIIT and NDRC.
- Digital Economy Promotion Regulations in Guangdong Province（廣東省數字經濟促進條例）and the "Guangdong Province Action Plan for the Development of New Generation Artificial Intelligence Innovation (2022-2025)（廣東省新一代人工智能創新發展行動計劃），a strong focus has been placed on the development and adoption of AI technologies and IoT equipment in the field of security which fosters the ecosystem of smart surveillance equipment within the province.

Anhui

- The overall market value of the infrastructure digitalization solution services industry in Anhui grew from about RMB 89.3 billion in 2019 to about RMB 138.5 billion in 2023, at a CAGR of approximately 11.6%. The overall market value of the infrastructure digitalization solution services industry in Anhui grew from about RMB 152.4 billion in 2024 to about RMB 219.3 billion in 2028, at a CAGR of approximately 9.5%. According to the 14th Five-Year Plan, the province will accelerate the development of "New infrastructure +", which includes the development of 5G infrastructure, IIoT, big data center and "city brain".
- In 2022, the Anhui Provincial Economics and Information Department released the 14th Five-Year Plan for Development of Software and Information technology services industry《安徽省"十四五"软件和信息服务业发展规划》, the plan set to accelerate the development of software and information technology services industries in Anhui. The plan further set to accelerate the development of software with the integration of advanced technology, including cloud computing, big data, 5G, blockchain, IIoT, in order to develop an integrated software ecosystem
  - The 14th Five-Year Plan for Development of Software and Information Technology Services Industry《安徽省"十四五"软件和信息服务业发展规划》set different milestone to achieve by 2025. For example, the market revenue of software and information technology services will reach 300 billion RMB with 20% annual growth. With an annual increment of 300 new enterprises, the number of software and information technology services with reach 3,000, including 50 enterprises with annual revenue of 1 billion RMB. Approximately 100 proprietary software will also be developed each year for different vertical industries applications and approximately 30 of them will be selected as outstanding cases 1 billion

Jiangxi

- The infrastructure digitalization solution services industry in Jiangxi Province has experienced significant growth, with its market value increasing from approximately RMB 61.8 billion in 2019 to approximately RMB 96.1 billion in 2023, representing a CAGR of approximately 11.7%. It is expected that the market will continue to expand from approximately RMB 104.0 billion in 2024 to approximately RMB 150.8 billion in 2028, at a CAGR of approximately 9.7%. To drive the development of the digital economy, Jiangxi Province has issued the Three-Year Digital Economy Development Plan (2020-2022) ("數字經濟發展三年行動計畫 (2020－2022年)"). This policy emphasizes the enhancement of Jiangxi Province's position as a digital economy hub. The provincial government has actively sought to attract technology talents who can contribute to the advancement of advanced infrastructure digitalization solution in Jiangxi Province. Furthermore, the integration of government and company surveillance data is encouraged, with the aim of establishing a comprehensive data platform in the province. IoT plays a crucial role in infrastructure digitalization solution, and the development plan set to accelerate the IoT application on smart urban management, smart industrial, smart healthcare and smart tourism. These factors collectively contribute to the growth of the infrastructure digitalization solution services industry in Jiangxi Province.
- Based on these figures, and the companies 2022 relevant revenue of RMB 70,590,600, it is estimated that the Group's market share in the infrastructure digitalization solution services industry in Jiangxi Province in 2022 is approximately 0.08%.
- Based on these figures, and the companies 2023 relevant revenue of RMB 102,845,230, it is estimated that the Group's market share in the infrastructure digitalization solution services industry in Jiangxi Province in 2022 is approximately 0.11%.

RMB Billion	2019	2020	2021	2022	2023	2024F	2025F	2026F	2027F	2028F	CAGR '19-23	CAGR '24-28
East	1,151.1	1,294.4	1,484.6	1,647.2	1,827.6	1,992.7	2,167.8	2,364.6	2,588.6	2,833.8	12.3%	9.2%
Central	462.5	518.3	593.0	653.9	725.2	795.8	866.8	943.9	1,032.8	1,130.1	11.9%	9.2%
Western	641.8	721.5	827.8	916.7	1,009.1	1,109.6	1,206.5	1,317.0	1,426.0	1,544.0	12.0%	8.6%
Northeast	96.5	106.3	121.1	133.2	147.4	164.9	180.0	195.0	208.0	221.9	11.2%	7.7%
Country	2,351.9	2,640.5	3,026.5	3,351.0	3,709.3	4,063.0	4,421.1	4,820.5	5,255.3	5,729.3	12.1%	9.0%
Guangdong	260.4	290.6	331.4	366.8	405.4	445.6	490.3	583.3	581.8	634.7	11.7%	9.2%
Anhui	89.3	99.5	113.5	125.5	138.5	152.4	167.0	181.7	199.6	219.3	11.6%	9.5%
Jiangxi	61.8	68.6	78.7	86.4	96.1	104.0	114.0	123.9	136.7	150.8	11.7%	9.7%

Source(s): MIIT, Three telecommunications network operators, Ipsos research and analysis
Notes: The above market value includes smart transportation, smart manufacturing, smart health, smart building, smart public services, smart warehouse, smart education and smart security

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Market value of the smart city solution services industry in the PRC

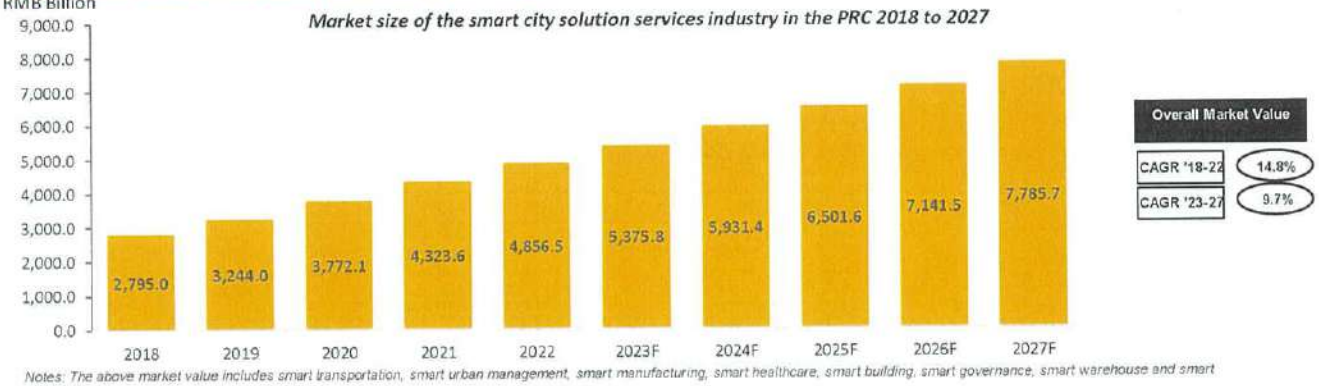
The overall market value of the digitalization solution services industry in the PRC increased steadily due to continued investments in technological innovations related applications and infrastructures.

The overall market value of the smart city solution services industry in the PRC grew from about RMB 2,795.0 billion in 2018 to about RMB 4,856.5 billion in 2022, at a CAGR of approximately 14.8%. With more sophisticating technology, various smart city projects have been launched for city governance in the PRC. For example, the "Safe and Smart Community" project in Wuhan, leveraged IoT through collecting real-time data from surveillance cameras, access control systems, and water pressure, etc., to automate and actively control security in the community.

The overall market value of the smart city solution services industry in the PRC is estimated to grow from about RMB 5,375.8 billion in 2023 to about RMB 7,785.7 billion in 2027, at a CAGR of approximately 9.7%. The 14th Five-Year Plan for National Informatization("十四五"國家信息化規劃) aimed to accelerate the development of smart city applications such as public transport, express logistics, healthcare, and education by the year of 2025.

Based on these figures, and the companies 2022 relevant revenue of RMB 70,590,600, it is estimated that the Group's market share in the infrastructure digitalisation solution services industry in China is approximately 0.0015%.

Market size of the smart city solution services industry in the PRC 2018 to 2027



Notes: The above market value includes smart transportation, smart urban management, smart manufacturing, smart healthcare, smart building, smart governance, smart warehouse and smart education
Source(s): MIIT, Three telecommunications network operators, Ipsos research and analysis

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Market value of the smart city solution services industry in the PRC

The overall market value of the smart city solution services industry in the PRC increased steadily due to continued investments in technological innovations related applications and infrastructures.

RMB Billion	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Smart finance	224.0	250.9	276.8	309.5	345.3	395.6	450.9	514.1	585.1	672.4
Smart industrial	1727.6	2052.9	2429.0	2821.9	3190.4	3544.9	3922.8	4313.0	4757.6	5183.9
Smart healthcare	40.8	51.0	66.3	80.8	99.3	115.5	134.0	153.5	174.6	197.8
smart management	213.9	226.5	241.3	253.7	267.1	279.9	294.4	308.0	322.1	335.6
Smart government	143.1	159.0	175.8	190.3	206.2	222.1	237.9	254.2	270.9	288.3
Smart grain depot	23.8	26.9	29.0	33.7	38.7	43.3	48.5	54.3	60.8	66.6
Smart education	416.3	463.5	524.4	588.8	658.7	716.0	777.8	835.6	897.3	955.0
Smart Urban Management	4.6	11.4	25.2	38.0	43.3	49.7	54.7	58.0	61.4	72.2
Smart surveillance	0.8	2.0	4.4	6.7	7.6	8.8	10.3	11.0	11.6	13.8
Total	2795.0	3244.0	3772.1	4323.6	4856.5	5375.8	5931.4	6501.6	7141.5	7785.7

Overall Market Value		Smart government	
CAGR '18-22	14.8%	CAGR '18-22	9.6%
CAGR '23-27	9.7%	CAGR '23-27	6.7%
Smart Finance		**Smart Grain Depot**	
CAGR '18-22	11.4%	CAGR '18-22	12.9%
CAGR '23-27	14.2%	CAGR '23-27	11.3%
Smart Industrial		**Smart Education**	
CAGR '18-22	16.6%	CAGR '18-22	12.2%
CAGR '23-27	10.0%	CAGR '23-27	7.5%
Smart Healthcare		**Smart Urban Management**	
CAGR '18-22	24.4%	CAGR '18-22	74.7%
CAGR '23-27	14.4%	CAGR '23-27	9.8%
Smart Management		**Smart surveillance**	
CAGR '18-22	5.7%	CAGR '18-22	75.6%
CAGR '23-27	4.6%	CAGR '23-27	11.9%

Source(s): MIIT; Three telecommunications network operators; Ipsos research and analysis

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Market value of the smart city solution services industry in the Guangdong, Anhui and Jiangxi

National

- it is estimated that the **Group's** market share in the smart city solution services industry in China is approximately 0.0015%.

Anhui

Guangdong

- The overall market value of the smart city solution services industry in Guangdong grew from about RMB 311.4 billion in 2018 to about RMB 531.6 billion in 2022, at a CAGR of approximately 14.8%. Guangzhou was active in the development of 5G pilot city. For example, China Mobile and ZTE launched **"Guangzhou** 5G Pilot **City"** which mainly applies 5G technologies in 5 transportation scenarios, including high-speed railway, subway, bus, road administration and the Internet of Vehicles(IoV). The overall market value of the smart city solution services industry in Guangdong grew from about RMB 587.6 billion in 2023 to about RMB 862.0 billion in 2027, at a CAGR of approximately 10.1%. Guangzhou, Shenzhen, and Foshan are classified as the pilot smart cities by MOHURD, MIIT and NDRC.
- Digital Economy Promotion Regulations in Guangdong Province （廣東省數字經濟促進條例） and the **"Guangdong** Province Action Plan for the Development of New Generation Artificial Intelligence Innovation (2022~2025)（廣東省新一代人工智能創新發展行動計劃）, a strong focus has been placed on the development and adoption of AI technologies and IoT equipment in the field of security which fosters the ecosystem of smart surveillance equipment within the province.

Anhui

- The overall market value of the smart city solution services industry in Anhui grew from about RMB 107.0 billion in 2018 to about RMB 181.8 billion in 2022, at a CAGR of approximately 14.2%. The overall market value of the smart city solution services industry in Anhui grew from about RMB 200.7 billion in 2023 to about RMB 295.7 billion in 2027, at a CAGR of approximately 10.2%. According to the 14th Five-Year Plan, the province will accelerate the development of **"New** infrastructure **+"**, which includes the development of 5G infrastructure, IIoT, big data center and **"city brain"**.
- In 2022, the Anhui Provincial Economics and Information Department released the 14th Five-Year Plan for Development of Software and Information technology services industry《安徽省"十四五"软件和信息服务业发展规划》, the plan set to accelerate the development of software and information technology services industries in Anhui. The plan further set to accelerate the development of software with the integration of advanced technology, including cloud computing, big data, 5G, blockchain, IIoT, in order to develop an integrated software ecosystem
  - The 14th Five-Year Plan for Development of Software and Information Technology Services Industry《安徽省"十四五"软件和信息服务业发展规划》set different milestone to achieve by 2025. For example, the market revenue of software and information technology services will reach 300 billion RMB with 20% annual growth. With an annual increment of 300 new enterprises, the number of software and information technology services with reach 3,000, including 50 enterprises with annual revenue of 1 billion RMB. Approximately 100 proprietary software will also be developed each year for different vertical industries applications and approximately 30 of them will be selected as outstanding cases 1 billion

Jiangxi

- The smart city solution services industry in Jiangxi Province has experienced significant growth, with its market value increasing from approximately RMB 74.1 billion in 2018 to approximately RMB 125.2 billion in 2022, representing a CAGR of approximately 14.0%. It is expected that the market will continue to expand from approximately RMB 139.3 billion in 2023 to approximately RMB 202.5 billion in 2027, at a CAGR of approximately 10.0%. To drive the development of the digital economy, Jiangxi Province has issued the Three-Year Digital Economy Development Plan (2020-2022) **("**数字經濟發展三年行動計畫 (2020 – 2022年)**")**. This policy emphasizes the enhancement of Jiangxi Province's position as a digital economy hub. The provincial government has actively sought to attract technology talents who can contribute to the advancement of advanced smart city solutions in Jiangxi Province. Furthermore, the integration of government and company surveillance data is encouraged, with the aim of establishing a comprehensive data platform in the province. IoT plays a crucial role in smart city solutions, and the development plan set to accecelerate the IoT application on smart urban management, smart industrial,smart healthcare and smart tourism. These factors collectively contribute to the growth of the smart city solution services industry in Jiangxi Province.
- Based on these figures, and the companies 2022 relevant revenue of RMB 70,590,600, it is estimated that the **Group's** market share in the infrastructure digitalisation solution services industry in Jiangxi Province in 2022 is approximately 0.06%.

RMB Billion	2018	2019	2020	2021	2022	2023F	2024F	2025F	2026F	2027F	CAGR '18-22	CAGR '23-27
East	1,368.2	1,587.7	1,849.2	2,120.9	2,387.2	2,648.7	2,909.0	3,188.0	3,503.2	3,835.0	14.8%	9.7%
Central	550.0	637.9	740.4	847.2	947.7	1,051.1	1,161.7	1,274.6	1,398.3	1,530.0	14.8%	9.8%
Western	762.6	885.3	1,030.7	1,182.5	1,328.5	1,462.4	1,619.9	1,774.3	1,951.1	2,112.6	14.9%	9.6%
Northeast	114.2	133.1	151.9	172.9	193.0	213.7	240.8	264.7	288.9	308.1	14.0%	9.6%
Country	2,795.0	3,244.0	3,772.1	4,323.6	4,856.5	5,375.8	5,931.4	6,501.6	7,141.5	7,785.7	14.8%	9.7%
Guangdong	311.4	359.2	415.2	473.4	531.6	587.6	650.5	721.1	790.0	862.0	14.3%	10.1%
Anhui	107.0	123.2	142.1	162.1	181.8	200.7	222.4	245.6	269.2	295.7	14.2%	10.2%
Jiangxi	74.1	85.2	98.0	112.4	125.2	139.3	151.8	167.7	183.5	202.5	14.0%	10.0%

Source(s): MIIT; Three telecommunications network operators; Ipsos research and analysis

Notes: The above market value includes smart transportation, smart manufacturing, smart health, smart building, smart public services, smart warehouse, smart education and smart security

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INDUSTRY OVERVIEW AND COMPETITIVE ANALYSIS OF digitalization solution services INDUSTRY IN GUANGDONG AND ANHUI PROVINCE

4.1

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Industry overview and competitive analysis of the digitalization solution services industry

Jiangxi Province – Industry overview

- China's 14th Five-Year Plan (2021-2025) ("十四五" 規劃 (2021-2025)) placed its focus on building China into a self-reliant technological powerhouse that bolstered the development of the digitalization solution services industry. Two of the main goals of the 14th Five-Year Plan focus on supporting the R&D of midstream manufacturers and enhancing the digitalisation of smart cities, smart communities and smart homes. The plan has also put forward higher standards for smart city solutions. China continued its existing 75% R&D expense deduction policy for enterprise income tax. The policy has been beneficial for IT industries and offered a 100% expense deduction for R&D manufacturing companies. The policies drove smart city solutions companies such as AI, IoT and big data companies to increase their R&D expenses and thus innovate smart city solutions.
- In 2021, Jiangxi issued the Three-year Plan for the Interconnected Jiangxi (2021-2023) (智聯江西建設三年行動方案 (2021-2023年)). The policy prioritized enhancing Jiangxi into a digital economy by strengthening the construction of 5G, IoT, big data, and Industrial Internet. Investments have been put into building a comprehensive ecosystem of NB-IoT,4g and 5G. The Jiangxi government is supporting Nanchang to be the main city of the 5G, IoT, VR and AI industry and recruiting technology talents who would contribute to inventing advanced smart city solutions. The scale of the digital economy in Jiangxi Province is striving to contribute 45% of the regional GDP in 2023.
- In 2022, Jiangxi issued the 14th five-year Digital Economy Development Plan in Jiangxi Province (關於印發江西省 "十四五" 數字經濟發展規劃的通知). The plan is set to continuously upgrade the digital infrastructure to accelerate the digital transformation of different industries and enhance the digital economy in Jiangxi Province.
- Given the current development of smart hospital in Jiangxi is underdeveloped expect the Grade 3A hospital (三甲医院), there will be opportunity for the development of smart hospitals in Jiangxi Province in the future. And comparatively the development of smart finance is stagnant as some of the leading banks has ceased the investment in digitalization in retail branches after realizing a relatively low return of investment since the investment during the period of 2013 to 2016.
- The provincial government started developing the urban mastermind (城市大腦) since 2017 to centralize and digitalize urban management, it is forecasted that the provincial will continue to invest in smart city applications in smart urban management, smart government and smart healthcare.

Source(s): Ipsos Research and Analysis

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Industry overview and competitive analysis of the digitalization solution services industry in Guangdong Province

Leading the way in smart city development in the PRC with a strong focus on advanced technologies, supported by government policies and collaboration with Hong Kong.

Guangdong Province Mkt Overview

- Guangdong Province has its advantages in developing smart cities. The province possesses an expansive tertiary industry and serves as a prominent technology hub with a fast-growing high-tech manufacturing presence, a high urbanization rate and the highest GDP among all provinces in the PRC. Guangdong is taking the lead to accelerate its smart city development, with the funds (RMB 6.9 billion) allocated by the PRC government. Guangdong Province has a compelling stake in remaining at the forefront of technological advancement and innovation.

- In 2022, the Guangdong Provincial Department of Science and Technology, in collaboration with the Department of Industry and Information Technology, proclaimed its commitment to expedite the transformation from a conventional "e-government" model to an advanced "smart government" framework. This transition entailed integrating systems and knowledge while leveraging data analytics to enhance governmental efficiency.

- Furthermore, Guangdong cooperates with Hong Kong to promote the development and adoption of cloud computing, big data, Internet of Things, smart city and other technologies. The cooperation between Guangdong and Hong Kong leverage the edge of technological skills and R&D talents which will create stronger impetus for smart city development.

- In Guangdong Province, policies such as "Digital Government Reform and Construction in Guangdong Province 2022"（廣東省數字政府改革建設2022年工作要點的通知）, "Digital Economy Promotion Regulations in Guangdong Province"（廣東省數字經濟促進條例） and the "Guangdong Province Action Plan for the Development of New Generation Artificial Intelligence Innovation (2022-2025)（廣東省新一代人工智能創新發展行動計劃（2022-2025）placed a strong focus on the adoption of AI and IoT technologies in modernising governance capabilities which enhance the management efficiency of the government and strengthen the smarty city ecosystem in Guangdong. In April 2023, the Guangdong government issued a "3-Year Action Plan on Standardized Development of Smart Home Appliances in Guangdong Province (2023-2025)"（广东省推动智能家电标准化发展三年行动方案（2023—2025年）The Action Plan encompasses 23 measures across 5 key areas, aiming to achieve standardized development of smart home appliances in Guangdong.

Source(s): Ipsos Research and Analysis

IpsosStrategy3

Industry overview and competitive analysis of the digitalization solution services industry in Anhui Province

Empowering Anhui Province's smart city development by encouraging the application of advanced technologies in various smart city scenarios.

Anhui Province

- Anhui Province is home to multiple economic and technological development zones (i.e. Hefei High-tech Zone) as well as serving as a prominent hub for nearly 2000 leading high-tech enterprises. Specifically, Hefei City in China was regarded as one of the "Smart Community International Standard Pilot Cities" which has been playing a crucial role in smart city development. In 2022, Smart City (Hefei) Standardization Research Institute made an international standard "Smart community infrastructures – Data exchange and sharing for community infrastructures based on geographic information" which commits to the research, application and promotion of smart city standardization. Enterprises in the high-tech zone have participated in the formulation of 17 ISO and IEC international standards, accounting for 27% of the province's total and 64% of the city's total, and the formulation and revision of 680 national standards and 694 industry standards, accounting for about one-seventh of the province's total and one-fourth of the city's total.
- In 2017, the Anhui's provincial government published "The 13th Five-Year Plan for Informatization Development Planning Notice for Anhui Province 安徽省“十三五” 信息化发展规划 Under the objective of "smart Anhui", the aim was to become one of the national leaders in the level of informatization by promoting the wide application of information technology in economic, social, cultural and other areas. In particular, a series of key actions were identified including:
  - the "Internet + Government Service" initiative: implementation of a unified digital government affairs platform which serves to enhance public service efficiency, improve service quality and increase public users' satisfaction as part of the government's action plans to transform from the traditional governance mode to an integrated intelligent and collaborative governance in the new era;
  - the "Internet + Education Inclusion" initiative: the upgrading of the education information infrastructure construction and the acceleration of the full implementation of smart schools construction and application; and
  - the application of new generation information technology for the medical and healthcare sectors initiative: the construction of a distanced medical service platform and related application systems whereby patients and medical increase
- In 2020, the provincial government of Anhui Province further published the "Anhui Province Digital Government Construction Plan (2020-2025) Notice 安徽省“数字政府” 建设规划 (2020—2025年) which introduced additional policies incentivizing the technological advancement in various sectors, including the smart governance, school schools and smart hospitals sectors. For example, for smart governance, the "Wanshitong 皖事通' mobile application operated by the government has allowed the Anhui residents and corporations access to over 1500 types of public services conveniently. The adoption of cloud-based technology at municipalities-vis-province levels further facilitates the collection and analysis of big data relating to government affairs in Anhui. For smart schools, Anhui's provincial government has encouraged the use of AI and IoT technologies across the classrooms with the purpose of creating a digitalised and creative learning environment for students. For smart hospitals, the focus would be on the continuous improvement of the national health information online platform which aims to optimize the provision of hospital and doctor consultation services for patients and elderly with chronic diseases and to strengthen the home-based intelligent services for emergency assistance.

- In 2022, the Anhui Provincial Economics and Information Department released the 14th Five-Year Plan for Development of Software and Information technology services industry《安徽省“十四五”软件和信息服务业发展规划》, the plan set to accelerate the development of software and information technology services industries in Anhui. The plan further aimed to accelerate the development of software with the integration of advanced technology including cloud computing, big data, 5G, blockchain, IIoT, in order to develop an integrated software ecosystem. The Anhui government focuses on cultivating talents in enhancing the development of smart government, smart education, smart healthcare etc.
  - The 14th Five-Year Plan for Development of Software and Information Technology Services Industry《安徽省“十四五”软件和信息服务业发展规划》set different milestone to be achieved by 2025. For example, the market revenue of software and information technology services is expected to reach 300 billion RMB with 20% annual growth. With an annual increment of 300 new enterprises, the annual revenue of software and information technology enterprises will reach RMB 1 billion. Also, approximately 100 proprietary software will also be developed for different vertical industries applications each year.

Source(s): Ipsos Research and Analysis

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Competitive analysis of the digitalization solution services industry in the PRC

Competitions among digitalization solution services providers in the PRC are intense.

Industry structure

Competitors' concentration(PRC)

- Competitions among digitalization solution services providers in the PRC are intense. It is estimated that there are more than 21,500 digitalization solution services providers in the PRC.
- Considering the emerging demand for smart cities and related infrastructures in the PRC, a growing number of upstream companies tend to diversify their revenue by offering turnkey services on top of the provision of hardware, competing with the existing digitalization solution services providers. A digitalization solution services company does not only compete with other counterparts which mainly offer digitalization solution services but also competes with upstream companies that are starting to extend their business vertically.
- The industry is also highly fragmented, with top players dominating different provinces. Companies have their geographical focus, which they diversify their business in various provinces to provide localised aftersales services

Industry Structure

The digitalization solution services can be categorized into four tiers

- 1st tier player. The Big three and the China Tower. As major network operator that provide network services to provincial government as well as state owned enterprises, they also participate in the tendering of the smart cities projects including some of the provincial level project invited by the provincial government. It is not uncommon for them to outsources the project do different telecommunication services providers.
- The Big Three
- 2nd tier player. Private companies who are specialized in in development of hardware, software or development of vertical solution. These company start and a supplier of only hardware or software, and then scale up their business by providing turnkey solutions to their client. These players are typically active and specialized in several vertical industries. They are also active in different geographical regions and oftenly set up subsidiary in different province in order to provide more thoughtful aftersales services.
- 3rd tier player. Third-tier providers generally are the leaders in one province. While their strength relies on the close partnership with local telecommunications network operators and their project experience in the local market, they are also capable of taking on national projects. Private companies typically start with focusing and specializing in one or two sub-segments with limited capital resources.
- Fourth-tier providers are services providers with operations limited to one province. They are typically acquire business through the sub-contraction from the 1-3rd tier players
- Emerging companies such as Tencent, Alibaba start to provide turnkey solutions after their well established cloud services

Competitive analysis of the digitalization solution services industry in the PRC Province(1/2)

Competitions among digitalization solution services providers in the PRC are intense.

Companies related to smart cities	1	2	3
Geographic Location	Anhui Province	Guangdong Province	Guangdong Province
Business Focus	Smart Healthcare; Smart Education; Smart Public Services	Smart Taxation, Smart Customs	Smart Security
Business Scale (annual)	RMB 120 million	RMB 100 million	RMB 150 million
Operation Qualification	High-tech enterprise; Double Soft Certification	High-tech enterprise; Double Soft Certification	High-tech enterprise; Double Soft Certification
Gross Profit Margin	30%	30%	30%
Net Profit Margin	10%	10%	10%
Numbers of Projects	15-20	10	10
Size of Projects	RMB 1-30 million	RMB 2-30 million	RMB 3-30 million
Company Customers	Municipal Health Commission, Municipal Education Commission, Political and Legal Organizations	Tax Authorities, Customs, National Development and Reform Commission	Industrial Park, Real Estate Companies
Number of Companies	74	111	290
Description	• The policy The 14th Five-Year Plan for Development of Software and Information Technology Services Industry《安徽省"十四五"软件和信息服务业发展规划》introduced in 2022 will incentivize more software enterprises to setup in Anhui province. • Enterprises are encouraged and incentivized to develop proprietary software particularly in AI and intelligent speech system.	• According to the Guangdong Province Action Plan for the Development of New Generation Artificial Intelligence Innovation (2022~2025) 广东省新一代人工智能创新发展行动计划, AI technology will be one of the core developing technology in Guangdong province. • 11 provincial AI industrial parks have been developed as agglomeration to accelerate and incubate development of both national wide technology but also small and medium startups. • AI enterprises will also focus applying AI technology on applications including smart manufacturing, smart public services, smart healthcare, smart education, smart finance, smart security and surveillance to enhance operational efficiency. • By 2025, it is estimated that there will be over 3000 outstanding enterprises in AI.	

Competitive analysis of the digitalization solution services industry in the PRC Province(2/2)

Competitions among digitalization solution services providers in the PRC are intense.

Companies related to smart cities	1	2	3
Geographic Location	Anhui Province	Guangdong Province	Guangdong Province
Business Focus	Smart Healthcare; Smart Education; Smart government	Smart Taxation, Smart Customs	Smart Security
Operation Qualification	High-tech enterprise; Double Soft Certification	High-tech enterprise; Double Soft Certification	High-tech enterprise; Double Soft Certification
Annual Net Profit	RMB 10 million	RMB 10million	RMB 10million
Numbers of Projects	At least 3-5 smart city projects signed with the Big Three per year	At least 3-5 smart city projects signed with the Big Three per year	3-5 smart city projects signed with the Big Three per year
Company Customers	Municipal Health Commission, Municipal Education Commission, Political and Legal Organizations	Tax Authorities, Customs, National Development and Reform Commission	Industrial Park, Real Estate Companies
Number of Companies	92	120	213
Description	• The policy The 14th Five-Year Plan for Development of Software and Information Technology Services Industry 《安徽省"十四五"软件和信息服务业发展规划》 introduced in 2022 will incentivize more software enterprises to setup in Anhui province. • Enterprises are encouraged and incentivized to develop proprietary software particularly in AI and intelligent speech system.	• According to the Guangdong Province Action Plan for the Development of New Generation Artificial Intelligence Innovation (2022~2025) 广东省新一代人工智能创新发展行动计划, AI technology will be one of the core developing technology in Guangdong province. • 11 provincial AI industrial parks have been developed as agglomeration to accelerate and incubate development of both national wide technology but also small and medium startups. • AI enterprises will also focus applying AI technology on applications including smart manufacturing, smart public services, smart healthcare, smart education, smart finance, smart security and surveillance to enhance operational efficiency. • By 2025, it is estimated that there will be over 3000 outstanding enterprises in AI.	

Top digitalization solution services provider in the PRC (By 2022 Estimated Revenue)

Rank	Company Name	Company Description	Company Listed	Estimated Revenues in digitalization solution services providers (RMB) By 2022 revenue
1	中國聯合網絡通信集團有限公司(中國聯通) China United Network Communications Group Co., Ltd. (China Unicom)	Established in 1994, the company is a Chinese state-owned telecommunications operator and engages in smart city solution services in smart industrial, smart urban management, and smart education.	Yes	Unable to identify from public available information
2	中國電信集團有限公司(中國電信) China Telecommunications Corporation (China Telecom)	Established in 1995, the company, as a Chinese state-owned telecommunication company, mainly engages in smart city solution services in smart government, smart management, and smart surveillance.	Yes	Unable to identify from public available information
3	中國移動通信集團有限公司(中國移動) China Mobile Communications Group Co., Ltd. (China Mobile)	Established in 2000, the company, as a Chinese state-owned company, mainly focuses in providing smart city solution services in smart government, smart urban management, and smart healthcare.	Yes	Unable to identify from public available information
4	中國鐵塔股份有限公司(中國鐵塔) China Tower Corporation Limited (China Tower)	Established in 2014, as a Chinese state-owned telecommunication company, the company mainly engages in providing smart city solution services in smart surveillance, smart telecommunications construction and smart urban management	Yes	Unable to identify from public available information
5	杭州海康威視數字技術股份有限公司(海康威視) Hangzhou Hikvision Digital Technology Co., Ltd. (Hikvision)	Established in 2001, the company is a Chinese state-owned manufacturer and mainly engages in providing smart city solution services in smart surveillance and smart urban management	Yes	68,096,447,020
6	中通服中國通信服務股份有限公司 China Communications Services Co., Ltd.	Established in 2006, the company mainly engages in smart city solution services in smart industrial, smart urban management, and smart government.	Yes	24,766,792,000
7	清华同方股份有限公司 Tsinghua Tongfang Co., Ltd	Established in 1997, the company is a Chinese state-owned software company and mainly engages in smart city solution services in smart industrial and smart urban management.	Yes	16,732,348,300
8	中兴通讯 Zhongxing Telecommunication Equipment Corporation (ZTE Corporation)	Established in 1985, the company is a Chinese partially state-owned technology company and mainly focuses on providing smart city solution services in smart government, smart finance, smart education, and smart urban management.	Yes	14,627,700,000
9	北京千方科技股份有限公司 China Transinfo Technology Co., Ltd	Established in 2000, the company develops industry-specific software and provides information system integration services and mainly engages in smart city solution services in smart surveillance and smart urban management.	Yes	6,989,687,385
10	太極計算機股份有限公司 Taiji Computer Corporation Limited	Established in 1987, as an information technology and services company, the company mainly engages in smart city solution services in smart government, smart surveillance, smart healthcare, and smart education.	Yes	5,968,480,018
11	中國電子信息產業集團有限公司 China Electronics Corporation	Established in 1989, the company is a Chinese state-owned company and mainly engages in smart city solution services in smart healthcare, smart government, and smart urban management.	Yes	5,790,903,099
12	浙江大华技术股份有限公司 Zhejiang Dahua Technology Co., Ltd.	Established in 2001, the company is a Chinese partly state-owned publicly traded company that mainly focuses on providing smart city solution services in smart surveillance and smart urban management.	Yes	5,594,273,436
13	中电科普天科技股份有限公司 Cetc Potevio Science&Technology Co Ltd	Established in 1994, the company provides electronic information, and communications services and mainly engages in providing smart city solution services in smart surveillance and smart urban management	Yes	5,565,012,158
14	東軟集團股份有限公司 Neusoft Corporation Co Limited	Established in 1991, the company provides information technology product and solution that mainly focuses on smart city, healthcare and intelligent vehicle connectivity.	-	Unable to identify from public available information
15	科大訊飛股份有限公司 IFLYTEK Co., Ltd.	Established in 1999, the company is a partially state-owned Chinese information technology company and mainly focuses on providing smart city solution services in smart industrial, smart education, smart healthcare, and smart urban management	Yes	4,913,075,220
16	航天信息股份有限公司 Aisino Co Ltd	Established in 2000, the company engages in the provision of information security solutions and services and mainly engages in providing smart city solution services in smart government and smart finance.	Yes	4,332,018,200
17	国泰新点软件股份有限公司 Guo Tai Epoint Software Co.,Ltd	Established in 1998, the company provides software-centric intelligent overall solutions and mainly focuses on providing smart city solution services in smart government, smart management, and smart urban management	Yes	2,824,267,468
18	卫宁健康科技集团股份有限公司 Winning Health Technology Group Co.,Ltd	Established in 1994, the company specializes in developing and selling medical software, providing technology support services and information technology solutions to the healthcare industry, and mainly engages in smart city solution services in smart healthcare.	Yes	2,632,276,238
19	佳都科技集团股份有限公司 PCI Technology Group Co Ltd	Established in 1986, the company is a professional provider of artificial intelligence technology and products and mainly engages in smart city solution services in smart urban management and smart surveillance.	Yes	2,273,814,131
20	富士康工业互联网股份有限公司 Foxconn Industrial Internet Co., Ltd.	Established in 2015, the company is at the forefront of intelligent manufacturing integration solutions and industrial internet service, and mainly engages in smart city solution services in smart industrial.	Yes	1,911,788,000

Notes:
1) The smart city solution services [illegible]
2) The revenue figures refer to revenue generated by offering smart city solution services providers. Thus, the revenue figures shown above are different from the figures disclosed in the respective companies' annual report
3) Percentage/figure may not add up to 100%/amount due to rounding

Competitive analysis of the digitalization solution services industry in the PRC & Jiangxi Province

Difficulties in achieving economies of scales, high cost of investment, and talent competition are the entry barriers for new entrants in the digitalization solution services industry

Entry Barriers

Technology barriers

- The core competitiveness of the digitalization solution services industry is in technology and R&D. It would be difficult for new entrants to break through the technology barrier in the short term. Smart city solutions require technical talents to integrate technologies, and these technologies require long-term research experience accumulated by professionals, from research and product development teams who have worked in the industry for years. For example, the development of AIoT requires a large amount of data and years of experience in order to develop high-level algorithms with better recognition efficiency and accuracy.

High cost of investment

- Since technology is constantly evolving, high capital investment is required for enhancing technologies, developing innovative solutions, training IT talents and obtaining intellectual property. New entrants or start-ups need to invest a large amount of capital to invent leading solutions so that they can compete with competitors who have gained a certain market share in the digitalization solution services industry.
- In some digitalization solution services projects, system integration services providers are also required to source and purchase the hardware equipment without advance payment from the customer before the completion of the project. Cash flow requirement is high for companies in the industry to operate the business and ensure project completion.
- For smart city solution projects, it is also a market practice that customers settle the payments with the solution supplier only after a substantial period of time after project delivery or acceptance. The end customers particulary the dominate plyers being the Big Three with significant bargaining power in negotiatin of contracts terms, these end customers generally refers credi terms that involved staggered payments throughout different stages of the project, from commissioning stage, completion stage and post completion stage, for flexibility and liquidity reasons.
- For example, in a typical smart surveillance project, the customer pays about 30% of the project fee upon commission of the project, about 30% of the project fee upon completion of the inspection of the project, about 20% of the project fee the second year after completion of the project, about 10% of the project fee the third year after completion of the project and about 10% of the project fee the fourth year after completion of the project. This payment term can ensure that the solution supplier will provide substantial follow-up services after the completion of the project.

Difficulties in achieving economies of scales

- Large-scale industry players who have built close relationships with upstream manufacturers can equipment in bulk order to lower the procurement cost. New entrants with unestablished relationships with upstream manufacturers may find it difficult to achieve economies of scale. It poses challenges for new entrants to maintain a competitive price with high-profit margins with comparatively higher costs of material and equipment.
- Customers also more inclined to procure services from local service providers due to their familiarity with the local business environment and connections with different industry stakeholders within the market.

Talent Competition:

- The success of innovative smart city solutions highly relies on the technical talents to conduct research and develop new solutions that meet end-users' needs. It is important for these IT professionals to develop innovative solutions to meet the three to five years product lifecycle. Not only do they need to equip with theoretical knowledge of technologies like AI, IoT and 5G, but they also need to have gained rich work experience in the industry. Due to the competitive remuneration and reputation of scalable industry players, most of the top professionals devote their efforts to these existing industry players. It is challenging for new entrants to acquire top talents and form their R&D teams in the short term.

Source(s): Ipsos Research and Analysis

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Competitive analysis of the digitalization solution services industry in the PRC and Jiangxi Province

Innovations, positive feedback from end-users and partners, value-added services and good track record of projects and relationships with upstream manufacturers are key factors of competition

Factors of competition (1/2)

R&D capability with constant innovation: The market demand for smart city solutions has been rising. Companies in the digitalization solution services industry differentiate themselves from competitors in the following two ways. Industry players must recruit and retain technical talents capable of innovating and developing new smart city solutions that meet evolving needs of end-users. In addition, as technology in the smart city solution industry is constantly evolving, industry players need to keep track of the latest trends and developments of advanced technologies and adopt them quickly to stand out from competitors.

Value-added services: On top of providing innovative solutions, value-added services such as maintenance and technical support services, and 24/7 after-sales support services can be decisive factors for end-users in the selection of smart city solutions providers. For instance, companies that can offer immediate support to fix malfunctioning solutions or software bugs would prevent the loss of important end-users' information. Such value-added services would increase customers' loyalty to the company.

Positive feedback from end-users and partners: As feedback from previous or existing end-users and partners such as testimonials, customer reviews and appreciation letters are proof of the quality and credibility of solutions, positive feedback is one of the evaluation factors for potential end-users and partners to review the trustworthiness of digitalization solution services companies.

Good track record of projects and relationships with upstream manufacturers and customers: Close relationships of digitalization solution services companies with upstream manufacturers can ensure stable supplies of hardware and software with less fluctuating costs in large-scale projects. Also, close relationships with major telecommunications network operators would generate potential business opportunities as they might either introduce the business opportunity to solution integrator or outsource the projects to them.

It is not uncommon in the industry that projects are obtained by way of single-source procurement and customers seek would directly invite service providers to offer the services instead of issuing an open tender

Source: National Public Service Platform for Standards Information, Ipsos Research and Analysis

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Competitive analysis of the digitalization solution services industry in the PRC

Supportive initiatives from the PRC government and rising demand for building smart homes are beneficial to the digitalization solution services industry

Market Drivers & Opportunities

Strategic blueprint of the PRC government

- "The 14th Five Year Plan for Economic and Social Development and Long-Range Objectives ("十四五"時期經濟社會發展的目標和指標)" allocated significant resources towards furthering technological innovation and integration behind smart cities, including the development of 5G, AI, cloud computing and IoT, all of which play critical roles in the digitalization solution services industry. The government has been supporting industry players to develop higher-quality smart city solutions. Also, smart city solutions were planned to be implemented in a wide range of areas such as smart homes, smart communities, and transportation. Apart from the 14th Five-Year Plan, the growing development of smart cities in the PRC provides initiatives for industry players to engage in the digitalization solution services industry.

Growing urbanisation rate

- The PRC government implemented urbanisation policies which created a great initiative for smart city solution providers to expand their businesses and fostered the growth of the digitalization solution services industry. In 2022, The National Development and Reform Commission (NDRC) issued the Key Tasks in New Style Urbanisation and Integrated Urban-Rural Development (新型城鎮化和城鄉融合發展重點任務) to drive the expansion of urban infrastructure including smart city development into rural areas.

Investment on smart city relevant application from Big Three

- While the Big Three slow down the investment in telecommunications infrastructure, the investment is shifted to different 5G+ Industrial Internet of Things(IIoT) development and commercial applications. The telecommunications network operators are releasing white papers to showcase the business cases to create the demand for 5G applications, including urban management, healthcare, education, transportation, agriculture, and infrastructure management etc.

Application in healthcare after COVID-19

- While COVID has enhanced the penetration of digital governance practices, the government is also setting the goal to accelerate the application of smart healthcare particularly in hospital digitalization, electronic health record, as well as remote diagnosis. For example according to "Strategic Planning for Development of digital China" 数字中国建设整体布局规划 and "The 14th Five-Year Plan for Development of the Traditional Chinese Medicine Industry " 关于印发十四五中医药发展规划的通知 released by the State Council, both policies set the objective to develop smart hospital and remote diagnosis.

Source(s): Ipsos Research and Analysis

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Competitive analysis of the digitalization solution services industry in the PRC and Jiangxi Province

Uncertain AI accuracy and the entry of upstream manufacturers into providing system integration services pose threats to the digitalization solution services industry

Threats and Challenges

Uncertain AI accuracy

- Despite recent investments put into AI development and its applications in smart city solutions, industry players raise concerns about the accuracy fallacy of AI technology. Although the accuracy rate of AI is normally 80%, AI algorithms might not be sophisticated to the extent of ensuring 100% accuracy in identifying critical transportation accidents or criminals. There might be underreporting risks in delivering promises to the end-users such as the government and police. Some end-users tend to seek an optimised accuracy of AI and currently might not have confidence in implementing AI-driven smart city solutions on a full scale.

Competitions from upstream manufacturers

- Given that the demand for turnkey smart city solutions has been surging recently, upstream manufacturers such as Huawei extend their operations by not only manufacturing basic hardware components such as sensors and hard disks but also providing system integration and maintenance services. They aim to achieve economies of scale and diversify their revenue stream. However, it is considered a potential threat to existing solutions services providers because the upstream manufacturers might shrink the available customer base and hence decrease the market share of existing solutions services providers.

Source(s): Ipsos Research and Analysis

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Competitive analysis of the digitalization solution services industry in the PRC and Jiangxi Province

Uncertain AI accuracy and the entry of upstream manufacturers into providing system integration services pose threats to the digitalization solution services industry

Threats and Challenges

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Source(s): Ipsos Research and Analysis

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Competitive analysis of the digitalization solution services industry in the PRC and Jiangxi Province

The company distinguishes itself from its competitors in Jiangxi Province by building up well-established relationships with telecommunications network operators, providing timely and localised after-sales support and investing in technological innovation

Competitive Advantages of the Company

Well-established relationships with telecommunications network operators

- The Company has a solid track record of business collaborations with the Big Three telecommunications network operators in major smart city projects. For instance, the collaboration with China Mobile on the Sharp Eyes Project in 2018. With the advocacy of smart cities and enhancement of the social security paradigm, it is anticipated that there will be more implementation of surveillance solutions projects. Stable business relationships are likely to bring more business opportunities through the referrals of an increasing number of end-users from telecommunications network operators.

Timely and localised after-sales support

- After-sales service plays an important role in end-user retention and satisfaction. It is beneficial to generate loyal end-users and enhance company value. One of the Company's competitive advantages is its localised and timely 24/7 after-sales and maintenance services. Since the Company is mainly based in Jiangxi Province, agile management enables the Company to provide more timely support compared to large-scale competitors whose support centres are relatively fragmented geographically. Also, some project contractors may outsource maintenance services to subcontractors who might not have holistic technical knowledge. In this case, the promising and one-stop support provided by the Company outstands due to its robust technical maintenance experience gained throughout 20 years.

Technological innovation

- The Company is investing in developing proprietary solutions for surveillance and other smart cities-related applications. These investments will help the Company secure its business revenue through differentiating solutions.
- Also, the Company is investing in blockchain technology, a decentralized and publicly distributed electronic ledge built on the model of offering absolute security and trust. It is perceived that blockchain will be extensively applied in the surveillance solitons industry given its advantage of improving data confidentially, enabling more secured IoT devices and advanced auditing.

Source(s): Ipsos Research and Analysis

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OVERVIEW OF THE SURVEILLANCE SOLUTIONS INDUSTRY IN THE PRC AND JIANGXI PROVINCE

5

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Overview of the surveillance solutions industry in the PRC and Jiangxi Province

The advancement of the surveillance solutions is important to improve the social security in the PRC

Recent Development

- The surveillance solution is a network of cameras, monitors and recorders that are applied to interior and exterior areas of buildings and infrastructures. A video surveillance system protects the property from criminal activity as well as accidents in the first place. The latest surveillance technology applies automated video analysis technologies, mainly artificial intelligence technologies in video surveillance applications. surveillance solutions are in widespread use across China, such as face and vehicle recognition systems and target tracking detection solutions to facilitate the stability of social security. The Chinese government had installed approximately 540 million surveillance cameras across China as of 2021.
- The advanced surveillance solutions transformed national security practice from passive monitoring to preventive measures. Since many of the smart city command centers can share national-level big data from the national-level public security intranet, police officers can integrate information from face recognition and movement tracking cameras and criminal records to foresee suspicious behaviours such as loitering in a specific area. Facial recognition cameras can match every face with an ID card and trace movements in time which enhances the arresting efficiency. Also, installing traffic surveillance cameras on highways or crowded areas can keep track of illegal dumping and traffic accidents. It acts as a reminder to drivers to follow the traffic safety rules and discourage violations. Furthermore, surveillance solutions reduce the burden on public security as the tracking technology is leveraged to surveil 1.4 billion people with less manpower.
- Moreover, facial recognition checks were implemented to check visitors' appearance through the national database and alert customs if there are any suspects of parallel traders. Surveillance solutions go beyond surveillance cameras, police officers wear AI-powered smart glasses which link to facial recognition software. Fugitives were caught at the Zhengzhou East high-speed rail station. In 2020, the Police Cloud System was implemented to integrate data from social media and internet browsing activities to public security bureaus and predict crime.

Source(s): Ipsos Research and Analysis

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Overview of the surveillance solutions industry in the PRC and Jiangxi Province

The advancement of the surveillance solutions is important to improve the social security in the PRC

Recent Development and trends

- With successive reinforcement of China's security paradigm during the 14th Fiver-Year Plan, the surveillance industry has been developing rapidly. Advanced technologies such as 5G, artificial intelligence and cloud computing improved at a fast pace, and the functions of surveillance products are becoming more and more diversified due to the integration of artificial intelligence and the Internet of Things (AIoT). Traditional security is mainly limited to maintaining social safety and reducing crime which surveillance solutions are implemented by public security departments. However, China has gradually shifted to a pan-security era in which the implementation of surveillance solutions extends to transportation, construction, property and other fields to build up a comprehensive security paradigm and grid management.
- The promotion of smart cities in the second-tier and third-tier cities and the new infrastructure plan encourage communities to implement surveillance solutions. Communities go beyond relying on video surveillance cameras but also implement intrusion alert systems, perimeter defence systems, electronic patrol systems and access control systems. The above surveillance solutions are implemented in areas that have a high density of population such as schools and residential properties.
- Some grain depots have been using surveillance cameras in monitoring the state of stored grain. Information could then be passed onto a single control room where custodians can get real-time information about grain such as the quantity and temperature remotely. Also, surveillance cameras allow vehicle access control management in which alarm signals are sent automatically to custodians which can prevent accidents effectively. Blockchain technology allows manufacturers to track products in real-time and store the related data on a tamper-proof ledger which increases stocking efficiencies due to the digitisation of recordkeeping.
- On the other hand, safety accidents are a concern in the construction industry due to its large construction area, complex site layout and potentially low safe awareness of workers. To strengthen the safety protection of the construction site, a visual surveillance management system is implemented for managers to get real-time data and monitor the safety of workers closely. Also, a facial recognition system is implemented to undergo security inspections to prohibit unauthorized personnel from crossing the border of construction sites.

Source(s): Ipsos Research and Analysis

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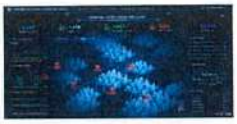
Overview of the surveillance solutions industry in the PRC

Surveillance solutions are deployed in areas such as judicial, education, energy, healthcare, tourism and urban management.

Surveillance applications

Judicial



Smart Judicial Visualization Decision-Making System

Information Command Center

surveillance is used to collect evidence for judicial cases and provide suggestions and information to judges during trial or interrogation.

Education

Classroom safety Surveillance

Student Performance Surveillance

surveillance is used to monitor the safety within the campus. In-classroom surveillance is used to measure and evaluate students' performance and participation during lessons.

Energy

Energy Usage Surveillance System on Buildings

surveillance is used to monitor the energy consumption of architectures and maximize energy efficiency and sustainability

Health Care

Hospital Surveillance system

Remote Infusion Surveillance System

surveillance is used to monitor the status of patients, operations and the latest capacity of the hospital. surveillance is also used to monitor patients' infusion statuses and other needs.

Urban Management

Surveillance on Village Security

Surveillance on Transportation

surveillance is used in supervising the security of villages, streets and public areas, providing data to the big data system and preventing the occurrence of accidents and enhancing the social security level

Tourism

Surveillance on Tourist Attraction

surveillance is used to supervisee the security of tourist attractions, ensuring the tourists are safe and heritages are protected.

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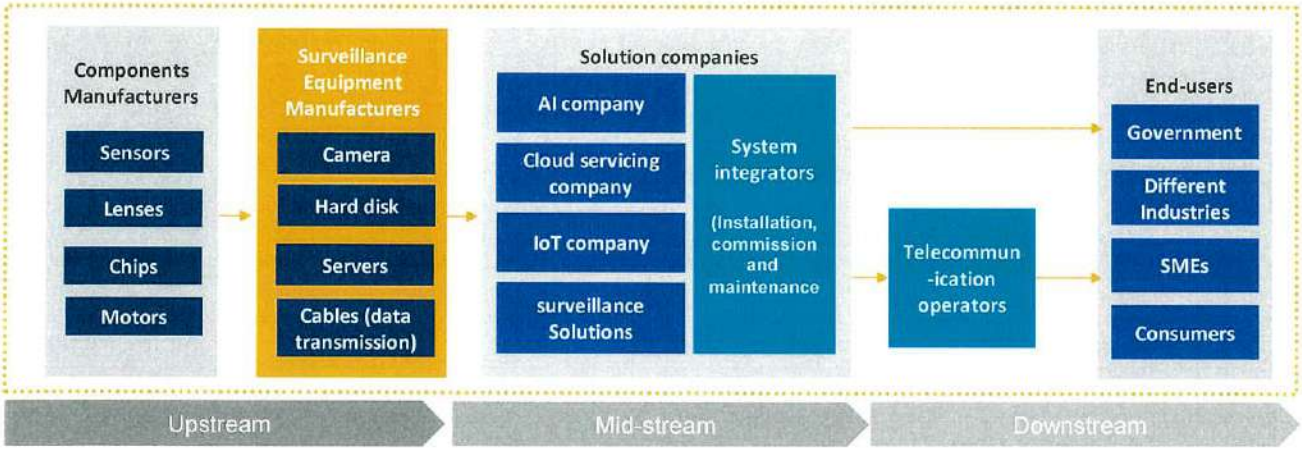
Value chain of the surveillance solutions industry in the PRC and Jiangxi Province

The key players of the surveillance industry consist of basic components manufacturers, surveillance equipment manufacturers, system integrators, telecommunications network operators and end-users

Value chain (1/3)

- The industry is generally defined by 5 main stakeholders in the industry and below illustrates the value chain in the surveillance industry:



Source(s): Ipsos Research and Analysis

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Value chain of the surveillance solutions industry in the PRC and Jiangxi Province

The key players of the surveillance industry consist of basic components manufacturers, surveillance equipment manufacturers, system integrators, telecommunications network operators and end-users

Value Chain (2/3)

Components Manufacturers

- The upstream of the value chain consists of basic components suppliers including sensors, lenses, chips and motors. These suppliers provide fundamental hardware support for the midstream camera compact module manufacturers. The lens is the core component of the smart camera. Lens suppliers produce different types of lenses for various shooting ranges and qualities. Major lens suppliers in the PRC are Yutong Optical Technology, Union Optech Ltd., Tamron and Sigma. Chips comprise the processing and memory units while motors serve the automatic focusing function. Also, sensors improve camera sensitivity and reduce noise. These basic components will be provided to the camera compact module manufacturers.

Surveillance Equipment Manufacturers

- Camera compact module manufacturers purchase components such as lenses, chips, motors and sensors from the aforementioned upstream suppliers and assemble them into camera modules and manufacture smart cameras. The core technology of the camera module is the glass encapsulation technology which refers to using a glass layer to protect the active area of the image sensor. Also, packaging technology needs to be used to package integrated circuits with insulating plastic or ceramic materials. The world's mainstream packaging technologies include Chip-scale packaging (CSP), Chip onboard packaging (COB), Chip on film packaging (COF). The type of packaging technology used to assemble the camera compact module is generally selected by the software suppliers in terms of the (i) cost and (ii) camera thickness. COB and COF packaging are frequently chosen due to their high cost-effectiveness. Main manufacturers include Hikvision, Uniview and Dahua Technology.
- Other hardware is required to build surveillance systems which include hard disks and servers for data storage, cable and wires for data transmission. Some camera manufacturers develop the above hardware to maximize revenue.

Source(s): Ipsos Research and Analysis

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Value chain of the surveillance solutions industry in the PRC and Jiangxi Province

The key players of the surveillance industry consist of basic components manufacturers, surveillance equipment manufacturers, system integrators, telecommunications network operators and end-users

Value Chain (3/3)

System Integrators and telecommunications network operators

- After the camera compact modules are finished by camera compact module manufacturers, system integrators add algorithms to the smart camera and embody informatization through AI and IoT technologies. For example, the functions of facial recognition and action analysis are added to smart cameras which turn them into surveillance cameras and video systems. These companies provide services such as system solution design, equipment and material procurement, system commissioning, installation and maintenance. Top AIoT companies include Megvii, Aiwinn and CloudWalk. As surveillance video data needs to be processed and transmitted via a 5G network, telecommunications network operators might form partnerships with system integrators and share profits generated from the collaborated projects.

End-users

- Surveillance solutions are implemented by a wide range of end-users ranging from governments to individual consumers. They use surveillance products on different scales. The implementations by end-users can be categorized into the city-level, industry level and consumption level. In terms of city-level implementation, the promotion of a "social credit system" and " smart city" reinforce the installation of the video surveillance system. "Safe city" believes in three defense mechanisms which are defenses by people, facilities and technologies. Defense by technologies has been encouraged positively. Therefore, AI face recognition and fingerprint recognition systems are widely implemented across China. More than 40% of the surveillance solutions are implemented at the city-level. Surveillance solutions such as property owner identification systems, access control systems and automatic fire alarm systems are also implemented in schools, construction sites and retail industries to predict accidents and provide advanced warnings. With increasing supplies of surveillance products and their lower costs, the implementations of surveillance solutions extend to communities and families.

Source(s): Ipsos Research and Analysis

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Policies and regulations of the surveillance solutions industry

The PRC government rolled out intersecting surveillance solutions projects to improve social security in recent decades

Policies and Regulations (1/2)

Below table sets forth a series of policies to promote social security in the PRC:

Time of issuance	Policies	Authorities	Key highlights of the policies
2021.05	"Three-year Plan for the Interconnected Jiangxi (2021-2023) (智聯江西建設三年行動方案 2021-2023年)"	People's Government of Jiangxi Province	It aimed to build 3 to 5 new smart city benchmarks in Jiangxi Province which applied surveillance solutions and big data on the government, industry, enterprise and consumption levels.
2020.03	"Plan for advancing the development of Industrial Internet of Things (IoT) (工信部辦公廳發佈推動工業互聯網加快發展的通知)"	Ministry of Industry and Information Technology	It expanded the scope of national data monitoring and has been carrying out on-site and remote inspections on enterprises, ensuring products reached the standard.
2020	Implementation of "smart helmets" for temperature screening	Police and epidemic control units	Chinese Police wore "smart helmets" equipped with AI infrared cameras to detect pedestrians' temperature from up to 5 meters away. The helmets are equipped with 5G connectivity, capabilities to scan QR codes and facial recognition to screen out potential Covid-19 carriers.
2020	The Social Credit System (社會信用體系)	State Council of the People's Republic of China	It set up databases that evaluate the trustworthiness of individuals and authorities. It has been collecting data of nationals via video surveillance. The main aim was to provide a moral guarantee to prohibit fraud, counterfeiting and other misconduct.

Source(s): State Council of the People's Republic of China, China Security Industry Association, Ipsos Research and Analysis

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Policies and regulations of the surveillance solutions industry

The PRC government and Jiangxi Province issued regulations to protect the privacies of the Chinese and improve the level of digital infrastructure respectively

Policies and Regulations (2/2)

Below table sets forth a series of regulations to promote social security in the PRC:

Time of issuance	Regulations	Authorities	Key highlights of the regulations
2021.09	"Data Security Law of the People's Republic of China (中华人民共和国数据安全法)"	Standing Committee of the National People's Congress	This Law aims to regulate data processing activities, safeguard data security, protect the rights and interests of the Chinese.
2020.03	"Technical requirement for household security management system (居家安防智慧管理系統技術要求)"	State Administration for Market Regulation	It unifies the standards of home surveillance products such as surveillance cameras, smart door locks and fire alarms as the connectivity between surveillance products is important.
2020. 01	"Regulations on video and image collection in the public areas for security (公共安全重點區域視頻圖像資訊採集規範)"	The Ministry of National Security	It sets standards on the video surveillance data security control to ensure the privacies of the Chinese would not be exposed. It was stated that the party who keeps the video must not tamper with the content and always encrypt the data. A password is required to access the data if a video is being "accidentally downloaded".

Source(s): State Council of the People's Republic of China, China Security Industry Association, Ipsos Research and Analysis

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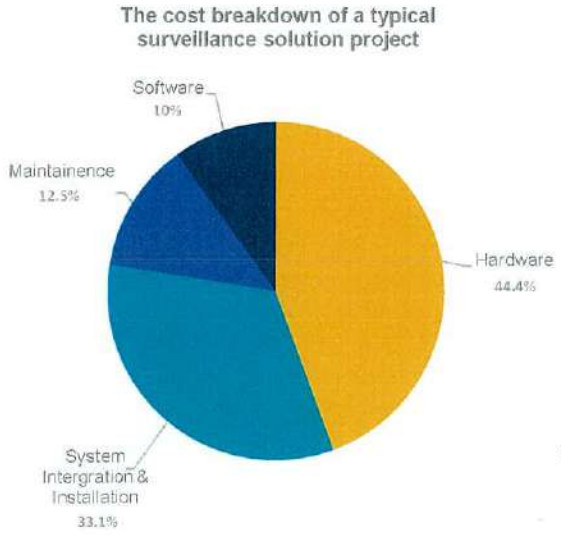
Project cost breakdown of the surveillance solutions industry in the PRC



- In a typical project of delivering surveillance solutions, four main components that add up to the total cost are hardware, software, system integration and installation, and maintenance. Hardware constitutes the largest part of a project which is approximately on average 44.4% of the total cost. The hardware included cameras, LCDs, and components for data transmission and storage. Also, system integration and installation constitute on average 33.1% of the total cost. Advanced analytical technologies such as AI, IoT, and cloud computing are integrated by system integrators. System integration is a crucial part of offering surveillance solutions. The services of system integration include tailor-made system solution design, equipment and material procurement, system commissioning, installation, and maintenance. Maintenance cost refers to the aftersales services provided at the clients' sites or remotely after the installation of surveillance solution. Moreover, maintenance accounts for 12.5% of the total cost to ensure equipment and systems operate efficiently during their usual life cycle. The usual life cycle of surveillance solutions is on average 3-5 years. Maintenance services can be provided at the clients' sites or remotely. In general, remote maintenance services such as offering advice on chatbots and telephones would be provided if the problem is easy to be tackled. On the contrary, technicians would visit clients' sites to repair complicated problems. Furthermore, software refers to the software managing the surveillance data or other AI analytical software. Software constitutes 10% of the total cost. AI analytical software analyzes audio and images from surveillance solutions to recognize humans, vehicles, objects, attributes, and events.
- The breakdown of cost varies depending on the scale of projects and the types of hardware, software and system integrators that end-users prefer. The preferences of end-users are generally based on their specifications and standards. Large-scale projects include applying surveillance solutions to enable access control in public areas and national grain depots across cities. On the other hand, medium-scale or small-scale projects are completed at a district level such as deploying surveillance solutions in residential areas.

Source(s): Ipsos Research and Analysis

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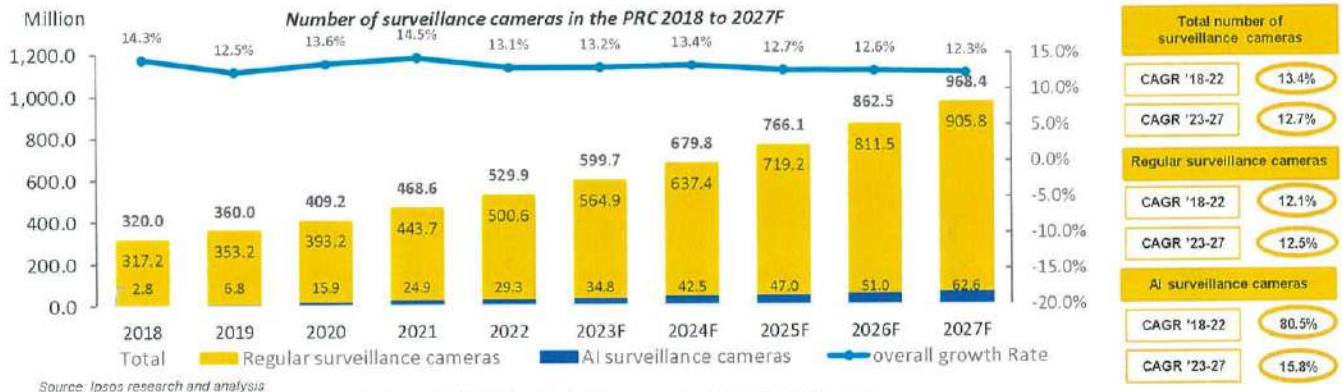
Number of surveillance cameras in the PRC

Significant growth in the number of AI surveillance cameras was recorded from 2018 to 2022 while steady double-digit growth is anticipated in the total number of surveillance cameras in the PRC from 2023 to 2027

The number of surveillance cameras in the PRC increased from 320.0 million units in 2018 to 529.9 million units in 2022, at a CAGR of approximately 13.4%. Mass security management system schemes such as the Sharp eyes project (雪亮工程) aim for full surveillance coverage and total unification of its existing databases across China. The project triggers the demand for surveillance cameras. Demand has not been surging from the government only but also from property owners and SMEs. **It is worth noting that AI cameras grew significantly at a CAGR of approximately 80.5% from 2018 to 2022** as there was a demand shift from traditional security cameras to advanced AI cameras. Chinese customers demand active and timely analytical functions that analyze the audio and images from video surveillance cameras to improve security while regular cameras do not perform advanced analytical functions.

During the forecast period, the number of surveillance cameras in the PRC is estimated to grow from 599.7 million in 2023 to 968.4 million in 2027, at a CAGR of approximately 12.7%. The steady growth is mainly driven by continuous investments in social security management systems as well as the regular replacements of surveillance equipment. The growth of AI surveillance cameras is estimated to increase due to the lower costs of AI cameras.



Source: Ipsos research and analysis
Notes: surveillance cameras can be used in a variety of fields including public safety, home access control, car security and other fields

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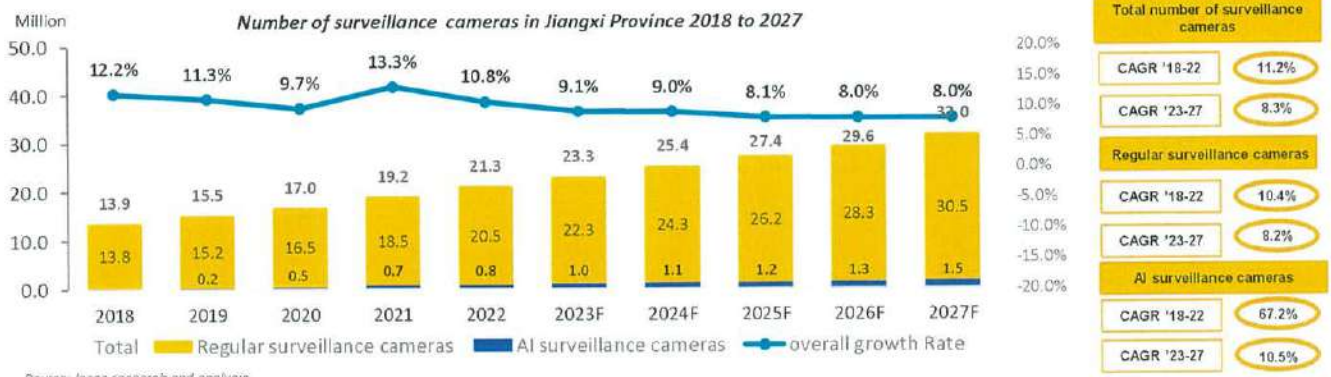
Number of surveillance cameras in Jiangxi Province

Significant growth in the number of AI surveillance cameras was recorded from 2018 to 2022 while steady growth is anticipated in the total number of surveillance cameras in Jiangxi Province from 2023 to 2027

The number of surveillance cameras in Jiangxi Province increased from 13.9 million units in 2018 to 21.3 million units in 2022, at a CAGR of approximately 11.2%. Since the implementation of the Sharp Eyes project, China mandated increasing coverage of surveillance cameras in public areas. In response, Nanchang, the capital of Jiangxi Province has increased installations of surveillance cameras which include functions of advanced AI analysis and facial recognition in public areas.

For the forecast period, steady growth is anticipated from 2023 to 2027, increasing at a CAGR of approximately 8.3%. The surveillance network is estimated to achieve a serviceability rate of over 95% in major public areas in Jiangxi Province. **It is noticeable that AI cameras grew markedly, at a CAGR of approximately 67.2% from 2018 to 2022.** It was driven by the implementation of the "Three-year Plan for the Interconnected Jiangxi (2021-2023) (智聯江西建設三年行動方案 2021-2023年)" in Jiangxi Province to accelerate the growth of advanced technologies such as AI and IoT. **The number of surveillance cameras in Jiangxi Province is estimated to grow from 23.3 million in 2023 to 32.0 million in 2027, at a CAGR of 8.3%.** The stable growth is estimated to cause by the elimination of less competitive provincial start-ups or companies that might not be able to develop their business sustainably in terms of enhancing AI technology or applying AI in diversified fields.



Source: Ipsos research and analysis
Notes: surveillance cameras can be used in a variety of fields including public safety, home access control, car security and other fields

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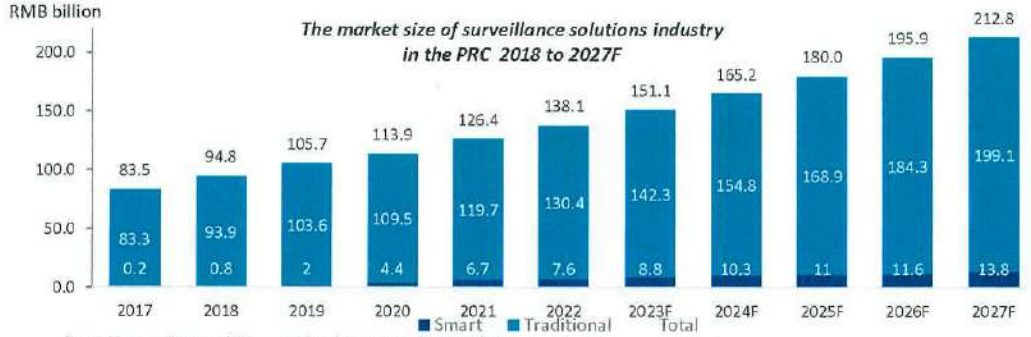
The market value of the surveillance solutions industry in the PRC

The steady growth of the market value of the surveillance solutions industry in the PRC over both historical and forecast periods is driven by the government support to enhance social security and the technological advancement of surveillance cameras

The overall market value in the PRC grew from RMB 94.8 billion in 2018 to RMB 138.1 billion in 2022, at a CAGR of approximately 9.9%. The market value increased mainly because of the deployment of government policies including the Sharp Eyes project, Skynet and Safe Cities projects to defend the civilians from threats of crime, terror and natural disasters. The Chinese government advocated having an omnipresent national surveillance network since 2015. Demand for surveillance solutions has been increasing from end-users such as political parties, property owners, hospitals and schools. An increasing number of companies with technical advantages of AI, big data and IoT have been entering the profitable surveillance solutions industry. In 2017, more than 530 patents linked to surveillance cameras and video surveillance were published in the PRC.

The overall market value is anticipated to grow from RMB 151.1 billion in 2023 to RMB 212.8 billion in 2027, at a CAGR of approximately 8.9%. The steady growth of surveillance solutions is estimated to be driven by the continuous government support in enhancing social security in the PRC and the technological advancement of surveillance cameras. In addition, the amount of fixed assets investment in the tertiary industry is estimated to grow at a CAGR of 5.9% from 2022 to 2026 in the PRC.



The market value of the surveillance solutions industry	
CAGR '18-22	9.9%
CAGR '23-27	8.9%
Overall Market Value (Traditional)	
CAGR '18-22	8.6%
CAGR '23-27	8.8%
Overall Market Value (Smart)	
CAGR '18-22	74.8%
CAGR '23-27	11.9%

Source(s): surveillance solutions providers; Ipsos research and analysis
Notes: surveillance solutions include equipment (hardware and software), system integrations and maintenance services

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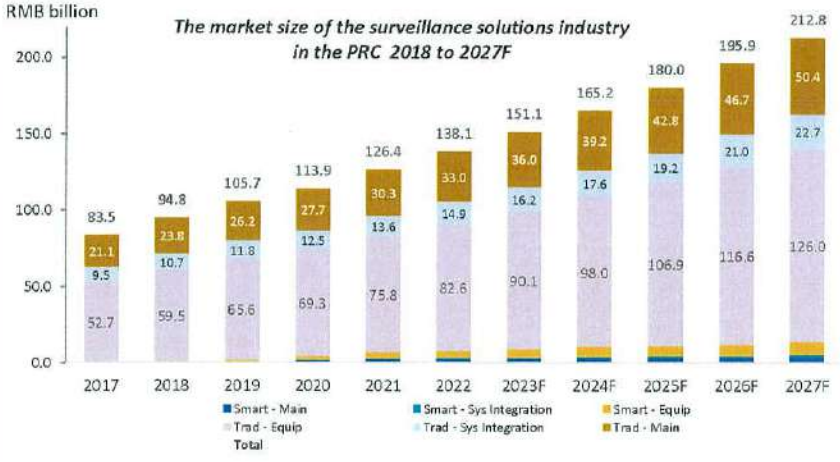
The market value of the surveillance solutions industry in the PRC (with breakdown)

The steady growth of the market value of the surveillance solutions industry in the PRC over both historical and forecast periods is driven by the government support to enhance social security and the technological advancement of surveillance cameras

The overall market value in the PRC grew from RMB 94.8 billion in 2018 to RMB 138.3 billion in 2022, at a CAGR of approximately 9.9%. The market value increased mainly because of the deployment of government policies including the Sharp Eyes project, Skynet and Safe Cities projects to defend civilians from threats of crime, terror and natural disasters. The Chinese government advocated having an omnipresent national surveillance network since 2015. Demand for surveillance solutions has been increasing from end-users such as political parties, property owners, hospitals and schools. An increasing number of companies with technical advantages of AI, big data and IoT have been entering the profitable surveillance solutions industry. In 2017, more than 530 patents linked to surveillance cameras and video surveillance were published in the PRC.

The overall market value is anticipated to grow from RMB 160.0 billion in 2023 to RMB 212.8 billion in 2027, at a CAGR of approximately 8.9%. The steady growth of surveillance solutions is estimated to be driven by continuous government support in enhancing social security in the PRC and the technological advancement of surveillance cameras. In addition, the amount of fixed assets investment in the tertiary industry is estimated to grow at a CAGR of 5.9% from 2022 to 2026 in the PRC.



Overall Market Value		Overall Market Value (Traditional)		Overall Market Value (Smart)	
CAGR '18-22	9.9%	CAGR '18-22	8.6%	CAGR '18-22	74.8%
CAGR '23-27	8.9%	CAGR '23-27	8.8%	CAGR '23-27	11.9%
Equipment		**Equipment**		**Equipment**	
CAGR '18-22	9.9%	CAGR '18-22	8.6%	CAGR '18-22	74.8%
CAGR '23-27	8.9%	CAGR '23-27	8.8%	CAGR '23-27	11.9%
System Integration		**System Integration**		**System Integration**	
CAGR '18-22	9.9%	CAGR '18-22	8.6%	CAGR '18-22	74.8%
CAGR '23-27	8.9%	CAGR '23-27	8.8%	CAGR '23-27	11.9%
Maintenance		**Maintenance**		**Maintenance**	
CAGR '18-22	9.9%	CAGR '18-22	8.6%	CAGR '18-22	74.8%
CAGR '23-27	8.9%	CAGR '23-27	8.8%	CAGR '23-27	11.9%

Source(s): surveillance solutions providers; Ipsos research and analysis
Notes: surveillance solutions include equipment, system integrations and maintenance services

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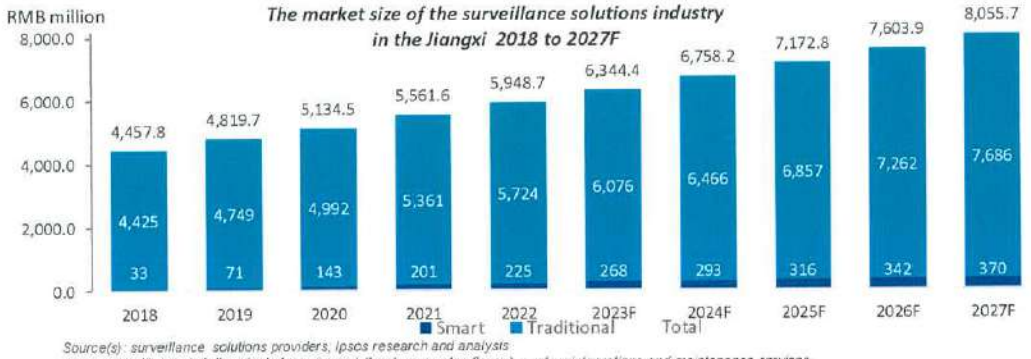
The market value of the surveillance solutions industry in Jiangxi Province

The steady growth of the market value of the surveillance solutions industry over the historic and forecast periods is driven by the ongoing and upcoming support in terms of investments and projects deployment from the Jiangxi government

The overall market value of the surveillance solutions industry in Jiangxi Province grew from about RMB 4,075 million in 2018 to about RMB 5,948.7 million in 2022, at a CAGR of approximately 7.5%. Jiangxi Province's focus on the digital economy led to the increase of surveillance solutions projects. The "Three-year Plan for the Interconnected Jiangxi (2021-2023) (智聯江西建設三年行動方案 2021-2023年)" was one of the key drivers in the growth of the surveillance solutions industry. The plan is set to build 3 to 5 new smart city benchmarks in Jiangxi Province which applied smart surveillance solutions and big data at the government, industry, enterprise and consumption levels. **The overall market value of the surveillance solutions industry is estimated to grow from RMB 6,344.4 million in 2023 to RMB 8,055.7 million in 2027, at a CAGR of about 6.2%.** The Jiangxi government sets the plan to develop 20 smart communities by 2025. The above initiative is estimated to drive the growth of the surveillance solutions industry in Jiangxi Province.



Overall Market Value	
CAGR '18-22	7.5%
CAGR '23-27	6.2%

Overall Market Value (Traditional)	
CAGR '18-22	6.6%
CAGR '23-27	6.1%

Overall Market Value (Smart)	
CAGR '18-22	61.5%
CAGR '23-27	8.3%

Source(s): surveillance solutions providers, Ipsos research and analysis
Notes: surveillance solutions include equipment (hardware and software), system integrations and maintenance services

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The market value of the surveillance solutions industry in Jiangxi Province

The steady growth of the market value of the surveillance solutions industry over the historic and forecast periods is driven by the ongoing and upcoming support in terms of investments and projects deployment from the Jiangxi government

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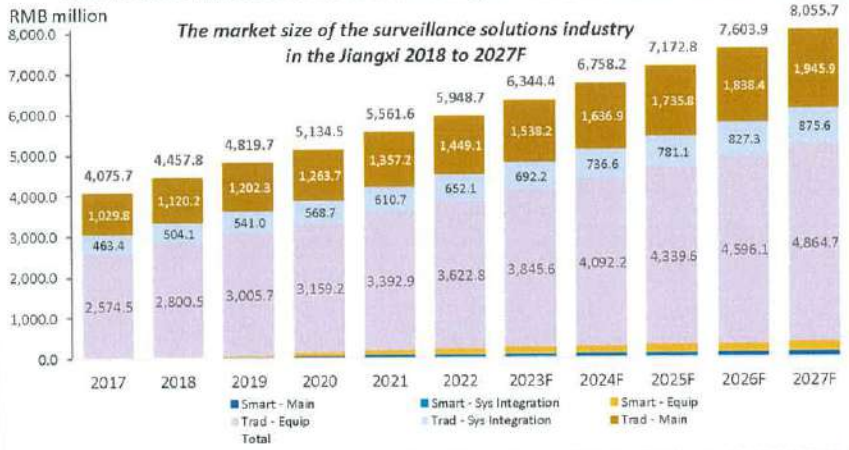

Overall Market Value	
CAGR '18-22	7.5%
CAGR '23-27	6.2%
Equipment	
CAGR '18-22	7.5%
CAGR '23-27	6.2%
System Integration	
CAGR '18-22	7.5%
CAGR '23-27	6.2%
Maintenance	
CAGR '18-22	7.5%
CAGR '23-27	6.2%

Overall Market Value (Traditional)	
CAGR '18-22	6.6%
CAGR '23-27	6.1%
Equipment	
CAGR '18-22	6.6%
CAGR '23-27	6.1%
System Integration	
CAGR '18-22	6.6%
CAGR '23-27	6.1%
Maintenance	
CAGR '18-22	6.6%
CAGR '23-27	6.1%

Overall Market Value (Smart)	
CAGR '18-22	61.5%
CAGR '23-27	8.3%
Equipment	
CAGR '18-22	61.5%
CAGR '23-27	8.3%
System Integration	
CAGR '18-22	61.5%
CAGR '23-27	8.3%
Maintenance	
CAGR '18-22	61.5%
CAGR '23-27	8.3%

Source(s): surveillance solutions providers, Ipsos research and analysis
Notes: surveillance solutions include equipment, system integrations and maintenance services

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COMPETITIVE LANDSCAPE OF THE SURVEILLANCE SOLUTIONS INDUSTRY IN JIANGXI PROVINCE

6

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Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

Growing urbanisation rate and government policies are the main market drivers for surveillance solutions industry in the PRC and Jiangxi Province

Market Drivers (1/2)

Growing urbanisation rate

- The PRC government implemented urbanisation policies which created a great initiative for surveillance solutions companies to expand their businesses and fostered the growth of the surveillance solutions industry. In 2019, the urbanization rate of China's resident population was 60.6% and the rapid urbanization is estimated to continue with the urbanization rate reaching 80% by 2050. The PRC government has been optimizing urban constructions in a wide range of areas such as smart medical systems, smart transportation, smart warehouses etc.

The government of the PRC and Jiangxi Province issued policies on fostering the growth of the surveillance solutions industry

- China's 14th Five-Year Plan (2021-2025) placed its focus on building China into a self-reliant technological powerhouse that bolstered the development of the surveillance solutions industry. China continued its existing 75% R&D expense deduction policy for corporate income tax. The policy has been beneficial for IT industries since 2018 and offered a 100% expense deduction for R&D manufacturing companies. The policies drove surveillance solutions companies such as AI, IoT and big data companies to increase their R&D expenses and thus innovate surveillance solutions. In addition, two of the main goals of the 14th Five-Year Plan focus on supporting the R&D of midstream manufacturers and enhancing the digitalisation of smart cities, smart communities and smart homes. The plan has also put forward higher standards for surveillance solutions deployed in smart cities.

Source(s): National data, China Security Industry Association, Ipsos Research and Analysis

IpsosStrategy3

Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi

The PRC government has been continuously investing in supporting surveillance solutions companies while enhanced safety awareness of the Chinese increases the demand for surveillance solutions

Market Drivers (2/2)

The government of the PRC and Jiangxi Province issued policies on fostering the growth of the surveillance solutions industry (con't)

- In 2021, Jiangxi issued "Three-year Plan for the Interconnected Jiangxi (2021-2023) (智聯江西建設三年行動方案 2021-2023年)" The policy prioritized enhancing Jiangxi into a digital economy Government and companies' surveillance data are encouraged to be integrated and build a comprehensive data platform in Jiangxi. Besides, IoT is one of the key technologies applied in surveillance solutions. The IoT industry has grown rapidly with the acceleration of 5G and wide application of the industrial IoT, the number of IoT connected devices in China will reach 15.6 US billion in 2025. Investments have been also put into promoting AI products, supporting Nan Chang to be the main city of the IoT industry and recruiting technology talents who would contribute to inventing advanced surveillance solutions.

Enhanced safety awareness of the Chinese

- The government has been promoting the "Holistic Approach to National Security (總體國家安全觀)" for almost ten years. The policy have been aiming to enhance the safety awareness of the Chinese on physical security. The rising safety awareness is likely to increase the willingness of the Chinese to invest in purchasing surveillance solutions and drive the growing demand for surveillance solutions. It is because surveillance solutions can provide better security protection on a personal and family level.

Source(s): National data, Ipsos Research and Analysis

Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

Strict production control and technology barriers are the entry barriers for new entrants in the surveillance solutions industry

Entry Barriers (1/2)

Strict production and sales control

- Since surveillance solutions involve the privacy data of the Chinese, the PRC government has relatively strict supervision on the production and sales of surveillance solutions to maintain a high standard of data security. There are certain numbers of licenses or approval required for entering the surveillance solutions industry. According to "Regulations on safety precaution products (安全技術防範產品管理辦法)", all the surveillance solutions must pass the inspection of the "Testing Center For Quality of Security and Police Electronic Product" and obtain the production registration approval issued by the provincial security department. Also, industry players need to obtain the PRC Compulsory Certification before surveillance solutions are sold in the PRC. To enter the international market, companies need to obtain various certifications such as Conformitè Europëenne (CE) and Federal Communications Commission (FCC).

Technology barriers

- The core competitiveness of the surveillance solutions industry is in technology and R&D. It would be difficult for new entrants to break through the technology barrier in the short term. surveillance solutions require technical talents to integrate technologies such as digital video processing technology, audio, and video codec technology comprehensively. These technologies require long-term research experience accumulated by professionals, from research and product development teams who have worked in the industry for years. For example, the development of AIoT requires a large amount of data and years of experience in order to develop high level algorithms with better recognition efficiency and accuracy.

Source(s): Ipsos Research and Analysis

Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

Difficulties in achieving economies of scales, high cost of investment, and talent competition are the entry barriers for new entrants in the surveillance solutions industry

Entry Barriers (2/2)

High Cost of Investment

- Since technology is constantly evolving, high capital investment is required for enhancing technologies, developing innovative solutions, training IT talents and obtaining intellectual property. New entrants or start-ups need to invest a large amount of capital to invent leading solutions so that they can compete with competitors who have gained a certain market share in the surveillance solutions industry.

Difficulties in achieving economies of scales

- Large-scale industry players who have built close relationships with upstream manufacturers can purchase basic components, camera modules and other equipment in bulk in order to lower the procurement cost. New entrants with unestablished relationships with upstream manufacturers may find it difficult to achieve economies of scale. It poses challenges for new entrants to maintain a competitive price with high-profit margins with comparatively higher costs of material and equipment.

Talent Competition

- The success of innovative surveillance solutions highly relies on the technical talents to conduct research and develop new solutions that meet users' needs. It is important for these IT professionals to develop innovative solutions to meet the 3 to 5 years product lifecycle. Not only do they need to equip with theoretical knowledge of technologies like AI, IoT and 5G, but they also need to have gained rich work experience in the industry. Due to the competitive remuneration and reputation of scalable industry players, most of the top professionals devote their efforts to these existing industry players. It is hard for new entrants to acquire top talents and form their R&D team in the short term.

Source(s): Ipsos Research and Analysis

Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

Innovations, positive feedback from end-users and partners, value-added services and good track record of projects and relationships with upstream manufacturers are key factors of competition

Factors of competition (1/2)

R&D capability with constant innovation

- The market demand for advanced surveillance solutions has been rising. Companies in the surveillance solutions industry differentiate themselves from competitors in the following two ways. Industry players must recruit and retain technical talents capable of innovating and developing new surveillance solutions that meet evolving needs of end-users. In addition, as technology in the surveillance market is constantly evolving, industry players need to keep track of the latest trends and developments of surveillance technologies and adopt them quickly to stand out from the competitors.

Value-added services

- On top of providing innovative solutions, value-added services such as maintenance and technical support services, and 24/7 after-sales support services can be decisive factors for end-users in the selection of surveillance solutions providers. For instance, companies that can offer immediate support to fix malfunctioning solutions or software bugs would prevent the loss of important surveillance data. Such value-added services would increase customers' loyalty to the company.

Positive feedback from end-users and partners

- As feedback from previous or existing end-users and partners such as testimonials, customer reviews and appreciation letters are proof of the quality and credibility of solutions, positive feedback is one of the evaluation factors for potential end-users and partners to review the trustworthiness of surveillance solutions companies.

Source: National Public Service Platform for Standards Information, Ipsos Research and Analysis

Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

Innovations, positive feedback from end-users and partners, value-added services and good track record of projects and relationships with upstream manufacturers are key factors of competition

Factors of competition (2/2)

Good track record of projects and relationships with upstream manufacturers and customers

- Close relationships of surveillance solutions companies with upstream manufacturers can ensure stable supplies of camera compact modules and software with less fluctuating costs in large-scale projects. Also, close relationships with major telecommunications network operators would generate potential business opportunities as they might either introduce the business opportunity to solution integrator or outsource the projects to them.

Source: Ipsos Research and Analysis

Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

Supportive initiatives from the PRC government and rising demand for building smart homes are beneficial to the surveillance solutions industry

Opportunities

Strategic blueprint of the PRC government

- "The 14th Five Year Plan for Economic and Social Development and Long-Range Objectives ("十四五"時期經濟社會發展的目標和指標)" allocated significant resources towards furthering technological innovation and integration behind smart cities, including the development of 5G, AI, cloud computing and IoT, all of which play critical roles in the surveillance solutions industry. The government has been supporting industry players to develop higher-quality surveillance solutions such as access control systems, surveillance cameras and traffic flow detection systems. Also, surveillance solutions were planned to be implemented in a wide range of areas such as smart homes, smart communities, and transportation. Apart from the 14th Five Year Plan, the growing development of smart cities in the PRC provides initiatives for industry players to engage in the surveillance solutions industry.

Rising demand for smart homes

- Personal and family households are becoming emerging target end-users in the surveillance solutions industry in the PRC. The rising urbanisation rate and the growth of the middle class are opportunistic to the surveillance solutions industry. More and more Chinese are moving to live in the urban areas in the PRC and their income level is increasing. Moreover, according to the Ministry of Public Security, the annual loss of households due to burglary is up to RMB 1.13 trillion RMB. This can be explained by the policy of building open communities. The Chinese are unsecured and more aware of home safety. Thus, they are more willing to purchase home surveillance solutions which improve home security and enhance the safety of family members effectively. The popularity of smart homes is on the rise. On the other hand, the smart lock has the second-highest frequency of usage. Under the empowerment of AIoT, smart locks can integrate face recognition and connect to the community property office and its security system, which provides users with a safer home environment.

Source(s): Ipsos Research and Analysis

Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

Uncertain AI accuracy and the entry of upstream manufacturers into providing system integration services pose threats to the surveillance solutions industry

Threats and Challenges

Uncertain AI accuracy

- Despite recent investments put into AI development and its applications in various sectors, industry players raise concerns about the accuracy fallacy of AI technology. Although the accuracy rate of AI is normally 80%, AI algorithms might not be sophisticated to the extent of ensuring 100% accuracy in identifying critical transportation accidents or criminals. There might be underreporting risks in delivering promises to the end-users such as the government and police. Some end-users tend to seek an optimised accuracy of AI and currently might not have confidence in implementing AI surveillance solutions on a full scale.

Competitions from upstream manufacturers

- Given that the demand for turnkey surveillance solutions has been surging recently, upstream manufacturers such as Huawei extend their operations by not only manufacturing basic hardware components such as cameras and hard disks but also providing system integration and maintenance services. They aim to achieve economies of scale and diversify their revenue stream. However, it is considered a potential threat for existing system integrators because the upstream manufacturers might shrink the available customer base and hence decrease the market share of existing integrators.

Source(s): Ipsos Research and Analysis

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Competitive analysis of the surveillance solutions industry in the PRC and Jiangxi Province

The company distinguishes itself from its competitors in Jiangxi Province by building up well-established relationships with telecommunications network operators, providing timely and localised after-sales support and investing in technological innovation

Competitive Advantages of the Company

Well-established relationships with telecommunications network operators

- The Company has a solid track record of business collaborations with the Big Three telecommunications network operators in major smart city projects. For instance, the collaboration with China Mobile on the Sharp Eyes Project in 2018. With the advocacy of smart cities and enhancement of the social security paradigm, it is anticipated that there will be more implementation of surveillance solutions projects. Stable business relationships are likely to bring more business opportunities through the referrals of an increasing number of end-users from telecommunications network operators.

Timely and localised after-sales support

- After-sales service plays an important role in end-user retention and satisfaction. It is beneficial to generate loyal end-users and enhance company value. One of the Company's competitive advantages is its localised and timely 24/7 after-sales and maintenance services. Since the Company is mainly based in Jiangxi Province, agile management enables the Company to provide more timely support compared to large-scale competitors whose support centres are relatively fragmented geographically. Also, some project contractors may outsource maintenance services to subcontractors who might not have holistic technical knowledge. In this case, the promising and one-stop support provided by the Company outstands due to its robust technical maintenance experience gained throughout 20 years.

Technological innovation

- The Company is investing in developing proprietary solutions for surveillance and other smart cities related applications. These investments will help the Company secure its business revenue through differentiating solutions.
- Also, the Company is investing in blockchain technology, a decentralized and publicly distributed electronic ledge build on the model of offering absolute security and trust. It is perceived that blockchain will be extensively applied in the surveillance solitons industry given its advantage of improving data confidentially, enabling more secured IoT devices and advanced auditing.

Source(s): Ipsos Research and Analysis

IpsosStrategy3

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