

**GSMA 5G TRANSFORMATION HUB**

The world's most innovative 5G solutions



# 5G Makes Sea Fishing Safer and More Lucrative

China Unicom Guangdong's new network delivers downlink speeds of 60 Mbps up to 61 km from the coast

China Unicom Guangdong Branch and Huawei have built a 5G network in Yangjiang to support a digital fishing vessel management system. The system uses the 5G connectivity, together with cloud computing and GPS and Beidou positioning, to enable dynamic monitoring of fishing vessels, improving safety, especially during typhoons. The 5G high speed link also supports digital commerce and communications between the boats and the shore enhancing the lives of fisherman and their families.





# 5G Makes Sea Fishing Safer and More Lucrative

## CASE STUDY LEAD: CHINA UNICOM GUANGDONG BRANCH AND HUAWEI

### + CHALLENGE



The 6,000 fishing vessels that operate along the 459 km coastline around Yangjiang City didn't have access to affordable and reliable connectivity. That made fishery administration difficult and prevented the use of digital channels to sell a fresh catch, thereby compromising the safety and prosperity of the fisherman and their families.

### + SOLUTION



Using Huawei's 5G MetaAAU technology, China Unicom Guangdong is now providing 5G coverage (in the 2.1 GHz and 3.5 GHz spectrum bands) along the coastline around Yangjiang. With a 5G high-speed, low latency connection, fishermen can receive the news, weather warning messages and videos on demand, while also making use of live webcast platforms, such as Taobao, TikTok, and An-Acre-Field,

through which they can sell fish. China Unicom Guangdong is also using the 5G network along the coast to support a digital fishing vessel system. Equipped with GPS and BeiDou positioning, the system uses a big data analysis platform to monitor the grid location of large numbers of fishing boats. To help them remain safe, the system delivers automated messages to the fishermen flagging weather forecasts.

### + IMPACT & STATISTICS



China Unicom Guangdong says the 5G MetaAAU technology can provide stable and continuous downlink speeds of 400 Mbps up to 30 km offshore, and 60 Mbps up to 61 km from the coast. More than 4,000 boats now use the digital fishing vessel system, which has been running stably for nearly two years. Once the 5G MetaAAU solution is deployed in a specific location, the average number of

users increases by 19%, the uplink traffic increases by 43%, and the downlink traffic increases by almost 25%, according to China Unicom Guangdong's analysis.

### + WIDER IMPLICATIONS



China Unicom Guangdong has plans to roll out the digital fishing vessel system to the whole of Guangdong province, with a view to serving between 40,000 to 50,000 vessels. In future, the mobile operator intends to also use 5G connectivity to support offshore wind power, fish farms, island tourism, rural revitalisation, manufacturing plants, firefighting and QR code scanning.

### + STAKEHOLDERS

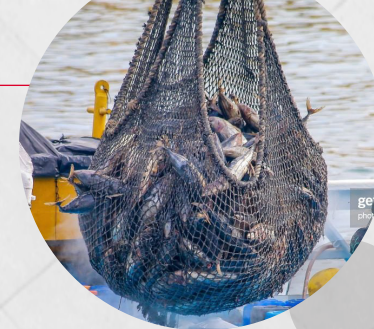
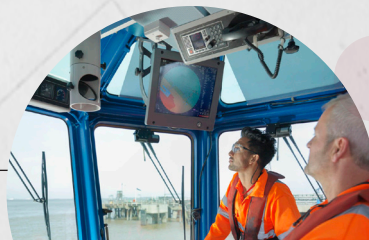


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# 5G Makes Sea Fishing Safer and More Lucrative

**China Unicom Guangdong's new network delivers downlink speeds of 60 Mbps up to 61 km from the coast**

Poor mobile coverage at sea often means small fishing boats go unconnected. Their crew then lack vital information about the weather, they can't sell their catch until they return to shore and are unable to contact their families.

To better serve this market, China Unicom Guangdong has built comprehensive 5G coverage (using the 2.1 GHz and 3.5 GHz spectrum bands) along the 459 km coastline around Yangjiang, an area that is rich in marine life. With a 5G high-speed, low latency connection, fishermen can receive the news, weather warning messages and videos

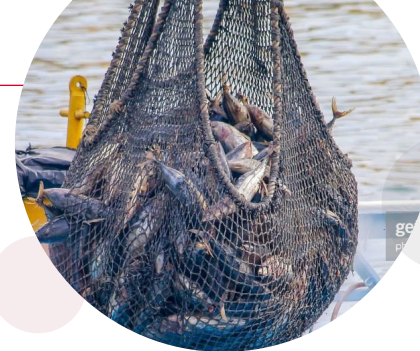
on demand, while also making use of live webcast platforms, such as Taobao, TikTok, and An-Acre-Field, through which they can sell fish. In the first half of 2022, Yangjiang's fishing industry sold about 350 million yuan (about US\$50 million) of seafood through e-commerce.

China Unicom Guangdong says the 5G system has the capacity to efficiently serve large number of vessels, enabling fishermen to use their smartphones at sea. That allows crews to connect with family members through high-speed data links and HD video calls, making their lives more enjoyable than before. "I can chat with my family at any time in the open sea to let them know my status at sea, so that my family can rest assured that I can go out to fishing," says Chen Bo, a fisherman in Xitou Town, Yangjiang City.

The 5G connectivity is also improving safety. China Unicom Guangdong has developed a digital fishing vessel system, which employs the 5G network along the coast, GPS and BeiDou positioning, and a cloud-based big data analysis platform. Through the "one-ship-one-file" database, the fishery administration department can dynamically supervise the real-time location and operating status of large numbers of fishing boats on a grid-based digital map, automatically notifying users when an abnormal situation is detected. At the same time, fishermen and their families can use the app on their smartphones to check the location of fishing boats, and can call for rescue with a single click in the case of an emergency.

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**Chen Bo** - fisherman in Xitou Town, Yangjiang City



“In the past, on typhoon days, my biggest concern was that fishing boats from towns and villages did not return to harbour safely in time,” says Kaichao Li, Chief of the Business Unit of Yangxi Brigade of Guangdong Fishery Administration Corps. “Since the digital fishing vessel system was in place, I just had to sit in front of the big screen and monitor the fishing vessel’s position. For the fishing vessels that have not returned, I can directly call the fishermen to urge them. With the digital fishing system, the safety of fishing vessels is no longer a problem,” he adds.

Since the beginning of 2022, 5G traffic in the region has increased by 27.5%, as more and more fishing vessels have been registered into the digital fishing vessel system, according to China Unicom Guangdong. More than 4,000 boats now use the system,

which has been running stably for nearly two years. In 2022, China Unicom Guangdong hopes to add a further 2,000 boats.

To date, the system has enabled the authorities to capture more than 40 vessels operating in violation of regulations, clear more than 10,000 meters of illegal netting equipment and avoid typhoon-related losses of 4.6 million yuan, according to Huawei.

With the digital fishing system, the safety of fishing vessels is no longer a problem

**Kaichao Li** - Chief of the Business Unit of Yangxi Brigade of Guangdong Fishery Administration Corps



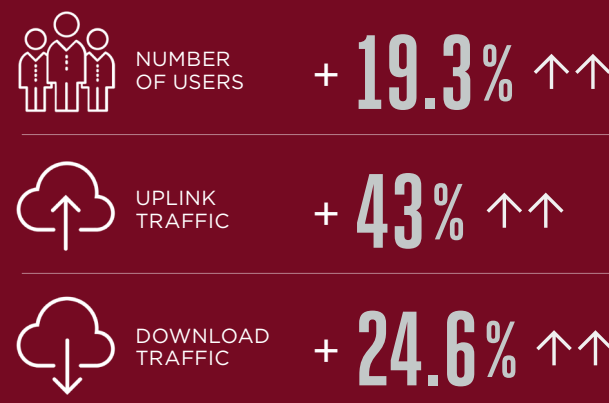


# Harnessing advanced antenna technology

To provide high quality coverage along the coastline of Yangjiang, China Unicom Guangdong has deployed Huawei's 5G MetaAAU (32T32R) system, which incorporates an ELAA (extreme large antenna array) and an ultra-high-resolution beam management. In extensive field tests, this approach delivered a stable and continuous downlink of more than 400 Mbps within 30 km of the shore, and 60 Mbps up to 61 km from the coast, according to the mobile operator. Even at the longer distance, the network also delivered 2 Mbps in the uplink.

"Overall, the 5G MetaAAU has outstanding performance in improving coverage, increasing the number of users, and stimulating traffic in coastal areas," says Guixin Pan, Deputy General Manager of Network Product Innovation Centre of China Unicom Guangdong. "Test results show that after 5G MetaAAU is deployed, the average number of users increases by 19.3%, the uplink traffic increases by 43%, and the downlink traffic increases by 24.6%."

Huawei says the new network has sufficient capacity to allow for the development of a novel wireless access proposition for a mothership and a set of boats surrounding it. It envisions special antennas will be mounted on the mothership to pick up the 5G signal and share it with nearby boats. "Design for this kind of high gain antenna is an interesting area for further research, as it implies wide application prospects in terms of offshore wind power construction etc.," says Daozhou Xu, Vice President of the 5G and LTE TDD Product Line of Huawei.



Such a service should appeal to the maritime sector as 5G is far more cost-effective than the satellite links generally used to provide connectivity at sea. China Unicom Guangdong says these satellite links are very expensive, ranging from US\$500 to US\$1,000 per month, which is about 60 times that of its cellular proposition. Furthermore, satellite terminals are large and require a diesel engine for power supply, which isn't suitable for small fishing vessels and increases the risk of pollution.

An alternative approach would be to set up repeaters without

permission. However, China Unicom Guangdong notes that such repeaters are illegal and the signals of the repeaters are unstable due to serious interference. "By comparison, a 5G connection has a much stronger anti-interference capability as China Unicom Guangdong has a large bandwidth of 200 MHz frequency spectrum at 3.5 GHz band," says Daozhou Xu of Huawei.



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## China Unicom Guangdong's U-Joy Cities programme

In June 2022, China Unicom Guangdong launched the Lighting up Yangjiang campaign to build a 5G ecosystem and fuel the digital development of hundreds of industries in the region, while enabling citizens to enjoy the digital dividends brought by 5G.

The campaign is part of the U-Joy Cities programme, which China Unicom Guangdong and Huawei launched in May 2022. That programme is designed to adapt 5G to the characteristics of the Greater Bay Area and cities in Guangdong. It also aims to develop innovative 5G products, build a 5G operations ecosystem with industry partners, and drive industry digitalization.

China Unicom Guangdong plans to build a further 1,500 5G base stations in Yangjiang over the next two years. The goal is to provide full coverage of Yangjiang city, high-speed railways, highways, scenic spots, industrial parks, ports, fishing grounds and administrative villages.

Located on the south west coast of Guangdong Province, Yangjiang City is surrounded by beautiful scenery and unique natural resources. There are many large and small ports in the area, which hosts the largest national marine pasture demonstration area in China.

China Unicom Guangdong also has plans to promote the digital fishing vessel system to the whole of Guangdong province, with a view to serving between 40,000 to 50,000 vessels. At the same time, the mobile operator intends to develop related value-added services to enable more people to enjoy 5G and digitalization.

In future, China Unicom Guangdong intends to work on ten major U-Joy Cities scenarios, encompassing offshore wind power, marine fisheries, island tourism, rural revitalisation, multiple manufacturing sectors, fire-fighting and QR code scanning.



## About the GSMA

The GSMA is a global organisation unifying the mobile ecosystem to discover, develop and deliver innovation foundational to positive business environments and societal change. Our vision is to unlock the full power of connectivity so that people, industry, and society thrive. Representing mobile operators and organisations across the mobile ecosystem and adjacent industries, the GSMA delivers for its members across three broad pillars: Connectivity for Good, Industry Services and Solutions, and Outreach. This activity includes advancing policy, tackling today's biggest societal challenges, underpinning the technology and interoperability that make mobile work, and providing the world's largest platform to convene the mobile ecosystem at the MWC and M360 series of events.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com).

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## GSMA 5G Transformation Hub

The GSMA 5G Transformation Hub is a source of information on some of the most innovative 5G solutions in the world. This portal contains case studies detailing design, benefits, key players, measured value and the future impact of scaling up these 5G solutions worldwide. The 5G Era is now firmly established and this family of standardised GSM technologies, including mmWave, are being rolled out successfully across the globe. The GSMA 5G Transformation Hub, launched at MWC Barcelona in 2022, provides details of how 5G is best placed to deliver real value for a range of key sectors including manufacturing, energy, transportation, media and live entertainment, smart cities and construction.. Many more case studies will be added, in the coming months, covering even more industries and the GSMA is asking Members to nominate innovative 5G case studies to add to this global digital showcase. The 5G Transformation Hub is sponsored by Qualcomm.

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