Industry Spotlight

Mining and Resources

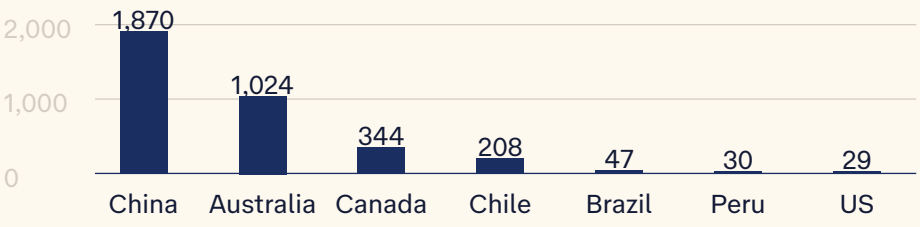
How can digital infrastructure help WA's mining and resources industry operate more productively?



WA's mining industry is a leader globally in incorporating advanced technology into the mining process. The State's development of the first autonomous heavy rail network and the scale of its autonomous haulage fleets place it at the forefront of mining technology, illustrating that the industry is willing to use its large financial base to adopt new digitally enabled practices.[1] Its continuous development and deployment of cutting-edge technology depends heavily on the scale, speed and reliability of the supporting digital infrastructure growing alongside it.

$13.1bn
Contribution to WA's Digital Economy in FY40 from Mining and Resources

Number of autonomous haul trucks by country



Source: Mining Technology, 2025

1. Rio Tinto (2018) *World-first autonomous trains deployed at Rio Tinto's iron ore operations.* Available here.

WA's advantages

WA's mineral and petroleum industry recorded $220 billion in sales in FY2025, while investment of $33 billion accounted for 62% of the national total.[2] That scale of output and capital expenditure allows operators to fund automation, remote operations and advanced analytics at an industry leading scale, placing the State at the forefront of global mining innovation. WA's comparative advantage also lies in the combination of large, remote and technically demanding operations; deep mining and engineering expertise; established remote operations capability; and a strong mining equipment, technology and services ecosystem, providing an ideal environment in which to develop, test and commercialise industrial digital and AI solutions.

Key barriers

Mine sites sit long distances from metropolitan networks, and the terrestrial fibre serving the Pilbara, Goldfields and Mid West is limited in both capacity and route diversity, leaving many operations dependent on microwave and satellite links for part of their traffic. Continued deployment of autonomous and AI-enabled systems depends on the scale, speed and reliability of that supporting infrastructure. As these technologies become more sophisticated, operations will need to move larger volumes of data off site for model training, digital twin synchronisation and access to hyperscale compute. This will require complementary investment in private wireless networks and on-site mobile infrastructure, which allow remote operations to generate and act on data, and resilient long-haul connectivity, which moves that data to Perth or interstate computing capacity.

Benefits to WA

Seizing mining's digital opportunity could lift WA's productivity, safety and resource efficiency. Automation, predictive maintenance and AI-enabled optimisation could reduce downtime, improve asset utilisation and help unlock new deposits, while reducing workers' exposure to hazardous environments. Developing exportable industrial AI, autonomous systems and mining software would also create high-skilled jobs, attract investment and diversify WA's economy by capturing more value from its mining expertise.

Key use cases

1. **Operate increasingly integrated, autonomous and data-driven production systems** through remote operations centres which coordinate autonomous haulage, drilling and drone surveys across multiple sites, while connected sensors, computer vision and live video analytics improve equipment monitoring and worker safety.

2. **Digital twins, orebody models and AI-enabled optimisation** could connect decisions across extraction, processing and logistics, helping operators increase recovery rates, improve fleet utilisation and respond more quickly to changing operating conditions.

3. **Predictive maintenance** enabled by larger and richer flows of equipment diagnostics, imagery and sensor data would allow AI systems to identify emerging faults before they lead to failures, reducing unplanned downtime and extending asset lives.

4. **Industrial AI software, digital twins, autonomous systems and operational optimisation platforms** for export to resource markets globally.

2. Government of WA (2026) *WA Mineral and Petroleum Statistics Digest FY2025.* Available here.

Use Case: Rio Tinto AutoHaul

Rio Tinto's AutoHaul programme is the world's first long-distance, heavy-haul autonomous rail network, moving iron ore from Pilbara mines to port across a 2,000-kilometre network connecting 18 mines with the ports of Dampier and Cape Lambert. Up to 53 driverless trains operate simultaneously, each hauling around 28,000 tonnes, with the network handling more than 320 million tonnes of iron ore in 2025.[3] The $940M programme, developed with Hitachi Rail over more than a decade, represented one of the most ambitious heavy-haul automation projects undertaken globally.[4]

The network depends on continuous, reliable data exchange between trains, trackside systems and a control centre. Locomotives are fitted with onboard cameras and sensors that feed condition, location and safety data back to controllers in real time, while an automated train protection system manages speed restrictions, crossings and collision alerts across the full length of track. None of this is possible without long-haul connectivity capable of carrying high volumes of operational data across the distance separating the Pilbara from the coordination centre.

That coordination centre sits in Perth, more than 1,500 kilometres from the rail corridor it manages.[5] A train controller in Perth sets each train's route, after which onboard computers and control-centre systems take over, monitoring position, speed and track conditions and making live operating decisions. Rio Tinto, BHP and Fortescue have each built similar Perth-based remote operations centres for their Pilbara mine, rail and port assets, reflecting an industry-wide shift toward centralising specialist monitoring and control functions in the capital rather than on site.[6]

This model illustrates the wider opportunity for WA's mining industry. Centralising operations in Perth reduces the number of specialist staff required on remote sites, widens the labour pool available to fill technical roles and allows operators to apply data science, engineering and analytics capability that would be difficult to sustain at a remote mine gate. Higher-capacity, more resilient long-haul connectivity between the Pilbara and Perth would support the continued expansion of this model, including richer sensor data, more sophisticated automation and faster response to operational and safety events across WA's mining regions.

3. International Railway Journal (2026) *AutoHaul drives efficiencies at Rio Tinto.* Available here.
4. Rio Tinto (2018) *World-first autonomous trains deployed at Rio Tinto's iron ore operations.* Available here.
5. Rio Tinto (2019) *How did one of the world's largest robots end up here?* Available here.
6. iTnews (2013) *BHP Billiton opens Perth remote control centre.* Available here. Mining Technology (2020) *Mapping out autonomous and remote mine projects in WA.* Available here.

About this Industry Spotlight

This Industry Spotlight draws on independent analysis by Oxford Economics Australia for *Australia's Western Gateway*. The report examines the size and potential growth of Western Australia's digital economy to FY2040, including digital activity embedded across established industries. It also assesses how additional network capacity and resilience could support technology adoption, productivity and economic activity. Read the full report for the complete analysis and methodology.

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