
GLOSSARY OF TECHNICAL TERMS

This glossary of technical terms contains explanations of certain technical terms used in this document. As such, these terms and their meanings may not correspond to standard industry meanings or usage of these terms.

“4G/5G”	Fourth-generation and fifth-generation mobile communication technologies used to support wireless data transmission between mining vehicles, ground-based systems and cloud platforms, including for positioning, dispatching and remote monitoring
“ADE” or “Average Displacement Error”	the average spatial deviation between predicted and actual vehicle trajectories over a specified time horizon, serving as a key metric for assessing the accuracy and stability of trajectory prediction in autonomous driving systems.
“AI”	Artificial intelligence, a field of research in computer science focused on creating systems capable of performing tasks that typically require human intelligence
“Autonomous driving transportation”	transportation activities carried out by vehicles capable of sensing their environment and navigating or operating with reduced or no human intervention.
“chassis”	The structural part of an engineering machinery designed to mount the body of the machinery that provide load-bearing and transportation capabilities
“Coordinated speed guidance”	a cloud-based control mechanism that dynamically provides speed adjustment instructions to multiple vehicles within an autonomous fleet, based on real-time traffic conditions, task priorities and right-of-way allocation, with the aim of optimizing traffic flow efficiency, avoiding conflicts and ensuring safe and coordinated operations.
“deep learning”	A class of machine learning algorithms based on artificial neural networks that enable autonomous systems to extract features and patterns from complex, high-dimensional data for perception and decision-making
“digital twin”	A virtual replica of a physical asset, such as a vehicle or infrastructure, that mirrors its real-time state and performance for simulation, monitoring, and predictive maintenance applications
“domain controller”	High-performance computational units that manage specific functional domains within a vehicle — such as powertrain, chassis, or infotainment

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“drive-by-wire”	A design where vehicle functions such as steering, braking and acceleration are electronically controlled via commands sent through electronic interfaces, replacing the traditional manual controls such as pedals or levers operated by the hand and foot
“dual carbon”	A policy concept commonly used in the PRC referring to the objectives of carbon peaking and carbon neutrality, namely achieving a peak in carbon emissions by a specified target year and subsequently realizing net-zero carbon emissions through emissions reduction and offset measures
“ESG”	Environmental, social and governance
“extended-range”	A vehicle configuration that includes an auxiliary generator or larger battery pack to extend driving distance beyond the standard range of a pure electric powertrain
“full-stack”	An end-to-end development capability encompassing hardware design, software engineering, system integration, and data infrastructure, typically owned in-house to ensure tight coordination and performance optimization
“GHG” or “greenhouse gas”	Atmospheric gasses such as carbon dioxide and methane that contribute to global warming, often tracked and reported by companies to align with climate-related regulatory or ESG frameworks
“GNSS” or “Global Navigation Satellite System”	A constellation of satellites that provide global geolocation and timing services
“ISO”	The International Organization for Standardization, an independent, non-governmental organization that develops and publishes international standards
“ISO 14001”	An internationally recognized standard for Environmental Management System published by the ISO
“ISO 45001”	An internationally recognized standard for Occupational Health and Safety Management Systems published by the ISO
“ISO 9001”	An internationally recognized standard for Quality Management Systems published by the ISO
“km/h”	Kilometer per hour
“L4 autonomous driving”	A level of autonomous driving defined under the SAE classification framework, under which a vehicle is capable of performing all dynamic driving tasks without human intervention within specified and constrained operating environments, such as designated mining areas

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“large language model”	a type of artificial intelligence model trained on large volumes of text data using deep learning techniques to understand, generate and process natural language.
“large model”	an artificial intelligence model with a large number of parameters trained on extensive datasets, capable of performing complex tasks such as perception, prediction and decision-making.
“latency”	The delay between the transmission of data and its reception or processing
“LiDAR”	A remote sensing device that uses light from a laser to measure the relative spatial positions of objects
“loading, hauling and dumping”	a sequence of mining operations involving the loading of material, transportation of such material, and its subsequent unloading at a designated location as part of the mine production cycle.
“mass production”	A large-scale production phase that adopts automated intelligent manufacturing and engineering facilities to ensure product consistency, reduce labor costs, enhance utilization, and achieve cost-efficiency
“multi-agent”	a system comprising multiple autonomous agents that interact, cooperate or coordinate with one another to accomplish tasks or achieve common objectives.
“OBU” or “on-board unit”	A device installed on vehicles enabling V2X communication and supporting V2X applications
“OEM”	The original equipment manufacturer, which assembles and installs automotive parts during the construction of a new vehicle
“operating expenses”	the sum of distribution and selling expenses, administrative expenses and research and development expenses
“OTA” or “over-the-air”	Remote software updating through cloud networks
“overburden removal”	The mining operation of removing soil, rock or other material that overlies a mineral deposit, in order to expose the underlying ore body for extraction, which is commonly performed in open-pit mining operations
“payload”	The maximum permissible weight that an engineering machinery can safely transport in addition to its own unloaded weight
“perception”	In autonomous vehicles, refers to the ability of vehicles to perceive and understand its environment, process and interpret data from sensors and base decisions on this knowledge

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“redundancy”	Referring to employing two or more parallel systems, sensors or components that perform the same or similar functions to ensure that vehicle can continue to operate safely in the event of partial failure
“rigid mining truck”	A rigid-frame mining haul truck designed for large-payload and long-distance transportation in mining operations, typically featuring a non-articulated chassis and used in large-scale open-pit mines
“RTK system”	Real-Time Kinematic Position system, referring to a high-precision GNSS technology that collects and process signals from GNSS satellites to provide real-time accurate
“sensor”	A device, module, machine, or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, frequently a computer processor
“V2V”	Vehicle-to-vehicle, referring to wireless information exchange and communication technologies between OBUs, enabling real-time sharing of driving data such as speed, position and direction to enhance road safety and traffic efficiency Definition
“V2X”	Vehicle-to-everything, referring to the communication between a vehicle and any entity that may affect, or may be affected by, the vehicle
“VCU”	Vehicle control unit, a central domain controller located within a machine, which receives signals from various sensors dispersed throughout the machine, including those linked to the brakes, accelerator pedal, battery system, and charging connections
“wide-body mining truck”	A type of heavy-duty vehicles used for transporting large volumes of loose materials, which are characterized by their wide width, enabling easy maneuverability in off-highway operations and facilitating navigation through narrow spaces