AUTONOMOUS SOLUTIONS, INC.

AUTONOMOUS HAULAGE SYSTEM

Retrofit Your Existing Fleet To Autonomous Operation
WHY AUTONOMOUS MINING?

Volatility in global commodity markets and pressure from communities and regulations to improve sustainability, social responsibility, and safety, are placing strain on mining revenue and costs from multiple fronts. As pressure mounts, mining companies are searching for innovations that can help reduce costs and meet the new demands of today’s mining landscape while simultaneously maintaining profitability. With automation’s ability to combat cost drivers like fuel inefficiency, safety violations, labor costs, vehicle utilization, and unscheduled maintenance, autonomous mining is the answer the mining industry is looking for.

Productivity
Increase productivity by improving the flow of traffic, optimizing energy and fuel consumption, reducing unscheduled maintenance, and leveraging economies of scale. Mining vehicle automation has been seen reducing load and haul costs by 13%.

Safety
ASI is dedicated to strengthening safety in the mining industry. From collision avoidance to obstacle detection, each automation kit delivers multiple layers of hardware, software, and sensor safety features, safeguarding both personnel and vehicles.

Sustainability
Automation can improve the quality of work for employees by reducing exposure to unhealthy or unsafe environments, supplying technical and analytical jobs, and mitigating and managing risks.

Utilization
Published studies report autonomous fleets outperforming manned fleets by an average of 12%. This improvement is primarily due to the elimination of shift changes, required breaks, and unplanned operator absences.

AUTOMATION LEVELS

Driver Assist
Even though driver assist technologies still require an operator to be in the vehicle, they can greatly improve overall mine safety and productivity. For example, with collision avoidance systems and auto spotting solutions you can avoid costly downtime due to accidents, as well as improved productivity with dual spotting.

Remote Control
Remote control is the first step in the automation pathway. Using line-of-sight and a handheld remote control, operators control unmanned vehicles from a safe distance, avoiding unstable terrain, falling debris, and other hazards. R/C is a safe, low-cost entry point into vehicle automation.

Teleoperation
Add cameras and command & control software to upgrade from remote control to teleoperation. Enjoy improved flexibility, richer feedback, increased safety, and cost savings as an operator can control multiple vehicles from a remote location.

Full Autonomy
An operator can monitor multiple vehicles as Mobius™—ASI’s server based command & control software—handles tasking, path tracking, and critical vehicle functions. Reduce unscheduled maintenance, increase yield, and achieve economies of scale with full automation.
OBSTACLE DETECTION AND AVOIDANCE

VANTAGE
Vantage improves safety for robotic vehicles, initiating see-and-stop, or see-and-avoid behavior to react safely to potential hazards in the environment. Vantage equipped vehicles use an advanced suite of software and sensors to create a 3 dimensional model of the world around it, scanning 100s of times a second for obstacles.

Sensor Fusion
Convert native data streams from nearly any sensor type (e.g. LIDAR, laser, radar, etc.) into usable information within the command and control system.

See-and-Stop
As its most basic obstacle handling functionality, vantage slows vehicles to a safe stopping point when an obstacle is detected and awaits operator intervention.

See-And-Avoid
Vantage dynamically plans the safest and most efficient pathway around an obstacle identified through sensor data. No operator approval is necessary.
Automate with Our VCU

Kit Sensors
An array of sensors collect environment information and relay it to the on-board VCU to give awareness of the vehicle’s surroundings to the automation system.

Control Unit
ASI’s patented VCU computer is the brain in the vehicle. It also relays information between the vehicle, server, and Mobius.

Operation
In by-wire vehicles no actuators are needed, as the VCU integrates with vehicle controls directly through our vehicle interface module.

Automate Any Vehicle Type In Your Existing Fleet

- BLAST TRUCKS
- ADTS
- HAUL TRUCKS
- LIGHT VEHICLES
- EXCAVATORS
- DOZERS
COMMAND & CONTROL WITH MOBIUS

SIMPLE SITE SETUP
Quickly generate custom maps, designate lanes, and roadways, set safety perimeters, create field areas. Experience the simple, clean Mobius™ interface that leverages advance design and development techniques and incorporates user testing results from industry professionals.

MULTI-VEHICLE OPERATIONS
Enjoy greater productivity and efficiency as a single operator controls multiple unmanned vehicles interacting in the same area or at dispersed locations. Improve productivity with embedded artificial intelligence modules that automatically task vehicles, generate paths, develop area coverage patterns, and more.

Haulage A.I.
MULTI-VEHICLE CONTROL
The Haulage A.I. leverages advanced multi-vehicle command and control software to set up and manage a coordinated system of OEM-agnostic haul trucks and excavators. The Haulage A.I. keeps all trucks consistently tasking, queues waiting vehicles, and regulates the haul cycle in the most efficient way possible.

Traffic Management
PROXIMITY MONITOR
The proximity monitor protects your equipment by ensuring any vehicle will come to a halt if it’s put on a collision course with another vehicle, building, unknown obstacle, or the map’s edge.

CHOREOGRAPHER
The choreographer manages traffic throughout the site by using advanced algorithms that assign priority to the appropriate vehicle at intersections and adjusts the speed of each vehicle in the cycle to eliminate queuing.

Safety
SAFE AREA LOCKOUT
Unmanned vehicles will stop if they approach any designated safe area around each vehicle on the map.

CAMERA MONITORING
Remotely monitor any vehicle’s surroundings with live camera feeds.

E-STOP
If unmanned vehicles leave the safety area or lose signal, the e-stop override immediately brings the vehicle to a halt.

Load & Dumping
SUPPORTED DUMPING
Paddock dumping
Edge dumping (limited)
Crusher dumping

SUPPORTED LOADING
Excavator loading on the bench
Side-loading with an excavator
Side-loading with a shovel
Two-sided loading with a shovel
Two-sided loading with an excavator
Anglo American’s Automation Partner

The goal of the multi-year relationship is to deliver enhanced productivity, sustainability, and safety through OEM agnostic mining vehicle automation systems for the company’s haulage operations.

“[The mining industry] needs to leap forward 20 years in five”

Tony O’Neill
ANGLO AMERICAN

Our Clients

Contact our sales staff for quotes or any additional information.

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