



ADVANCED AUTONOMY FOR THE MINING INDUSTRY

THE INDUSTRY CHALLENGE

Mining companies are facing increasing pressure to improve safety, efficiency, and cost-effectiveness while operating in some of the world's most demanding environments. Traditional methods rely on human-operated vehicles and equipment, which can lead to delays, increased operational costs, and safety hazards. According to the Bureau of Labor Statistics, the mining industry consistently exhibits higher rates of occupational fatalities when compared to other industry sectors. Specifically in open-pit mines, personnel are exposed to a variety of hazards, including slope failures, rockfalls, flooding, heavy machinery accidents, and air pollution from dust and gasses. And while improved regulations and enforcement, combined with improved equipment controls and designs, have led to a decrease in the number and rate of fatalities, the fact remains that mining remains one of the most hazardous industries, accounting for approximately 8% of all fatal workplace industries.

Beyond safety concerns, rising labor costs and fuel expenses are driving mining companies to implement innovative cost-reduction strategies. Cost and scheduling changes, schedule delays, and downtime all contribute to cost overruns and high labor expenses. On average, research indicates that each downtime incident at a mining site costs approximately \$180,000, with mining companies allocating between 35 and 50% of their annual budgets to maintenance. Mine owners are also seeking to reduce costs and environmental waste by decreasing the amount of time and fuel that it takes to complete load-haul-dump (LHD) cycles, which involve significant expenses across multiple areas of a mining operation.



THE NEYA SOLUTION

In response to the industry's complex needs, Neya Systems has designed a fused-sensor system integrating multiple sensors and tracking management processes to ensure vehicle operation in challenging environments, including nighttime, heavy dust, precipitation, shocks, vibrations, and extreme temperatures. By integrating Neya's advanced perception technologies within current operational frameworks, haul trucks can autonomously respond to obstacles encountered during specific tasks, reducing downtime.

This system also lessens the amount of stopping time required at mining intersections or to change human drivers. Every stop at an intersection adds minutes to each haul cycle, and with hundreds of trips per day, these stops accumulate into lost operational hours and increased fuel consumption. When quantified on an annual basis per vehicle, reducing the time spent at these stops can save mining companies millions of dollars per year, significantly reduce energy costs, and improve worker safety.

Neya's robust perception system is currently deployed at an open-pit mine in Western Australia, where it has been actively working on numerous mining haul trucks and effectively automating the company's mining haul truck operations.