



PRODUCTIVITY & EFFICIENCY

The cost of surface mining is largely dependent on the output of the mining team. To lower the mining cost, the mining team should be optimised in terms of

- Loader output,
- Truck fleet and,
- Ancillary mining cost.

To assist mining supervisors to achieve this, the following key performance indicators should be analysed and managed in real time:

- **Loader loading time** - This is the time it takes for a loader to load a truck, including truck exchange time. This is dependent on material fragmentation, and loading face geometry, and operator skill.
- **Truck cycle time** - This is the time it takes for a mining truck to drive from the loader to the dump, tip the load, and return to the loader for the next load. This is dependant on the haul profile characteristics, such as rolling resistance, incline and decline gradients and distances of the various haul segments.
- **Required truck fleet** - This is the optimal number of trucks in a mining team to allow continuous mining, with minimal loader waiting time while eliminating truck queuing at the loader. The aim is to create a virtual conveyer of trucks running between a loader and the dump.

Mining haul profiles change constantly due to the following reasons:

- Selective mining practices require the destination of material to change within a mining block.
- Increasing haul distance with the extension of dumps.
- Changing to in-pit haul routes.



Sens Mining monitors the loading and cycle time of each truck. Using these two parameters, Sens Mining determines the optimal truck fleet, and reports on the actual number of trucks vs the optimal truck fleet. This will assist mining supervisors to add or remove mining trucks, ensuring an optimal mining fleet at all times.

The combined data of these KPI's, enables the mining supervisors and management to:

- measure productivity and profitability of the loading, hauling and ancillary costs for specific haul profiles,
- analyse each aspect of the mining activity , to ensure the mining operation is performing to target and to budget driving the margin band for profitability.

