

PAYLOAD INCREASE OF 5.9% WITH LIGHTWEIGHT TRAY UPGRADE

Payload capacity is a critical factor in the mining industry. Maximising capacity allows companies to transport larger loads per cycle, leading to improved efficiency and profitability.

Our client is a mining operator with a fleet of 54 Caterpillar 793 haul trucks, producing over 60 million tonnes of iron ore annually. They engaged COSOL to assess the potential of adopting lightweight trays to improve the payload capacity of their fleet.

CHALLENGE

Our client faced several challenges impacting their production and cost per tonne:

Truck Availability & Reliability

Truck Utilisation

Operating hours versus maintenance downtime

Productive Efficiency

Productive activities versus wasteful activities like queueing

Cycle Time

Time required for truck to complete one cycle

Payload

Amount of material truck can carry per cycle

Small increases in payload can lead to significant reductions in cost per tonne. But increasing payload is challenging due to truck limitations. The chassis, drive train, braking, and steering systems are designed for a specific gross vehicle mass, while the trays are designed to hold a specific volume and density of material.

Lightweight trays offer a solution, enabling payload to be increased by an amount equivalent to the reduction in tray weight. But changing trays without increasing production simply increases costs, so this approach requires careful consideration of the following factors:

- Cost to purchase new trays
- Downtime for the upgrade
- Lifetime maintenance requirements
- Increase in truck payload
- Loading bucket compatibility (new buckets may be needed to properly fill the new trays)

Financial and productive time investment

Making the decision to implement lightweight trays is a significant financial consideration. There are also hidden costs in the form of lost production across the fleet as each truck requires downtime to replace the tray.



SOLUTION

Our client had been approached by a vendor offering a potential lightweight tray candidate. They engaged COSOL to analyse their options and determine the best solution.

Here's how we approached the problem:

01

Understand

Gain deep insights into your asset management challenges. We go beneath the surface to understand your company's unique needs

- Analysed the current tray specifications and their impact on fleet productivity
- Researched and identified potential tray options that could improve capacity
- Calculated the cost to upgrade trays, including downtime and maintenance
- Evaluated the performance and productivity benefits of the lightweight trays

02

Decide

Cut through complexity and get clear recommendations. We facilitate decision-making with fact-based data analysis.

03

Act

Set plans in motion with a practical and coordinated approach. We take ownership from the start to finish to deliver value in our solution.

- Engaged with multiple stakeholders, each with their own opinions and concerns
- Worked closely with the client to align on the project's direction and deliverables
- Completed the project, including analysis and recommendations, **within six weeks**

OUTCOMES

COSOL delivered a comprehensive solution that provides our client with the following results:

- An accurate, fact-based recommendation to proceed with the lightweight tray change, along with a compelling business case. The increased production capacity outweighed the implementation costs, including revenue and profit gains from the existing fleet.
- A detailed plan outlining the actions needed to implement the tray change and unlock this value. This included considerations for production change management to sustainably achieve the additional payload capacity on each load.
- The solution achieves a **payload increase of 5.9% above current levels**. This translates to an additional fleet capacity of **71 million tonnes over ten years**.
- The increased capacity allows our client the option to instead deliver the same production volume with **5.6% fewer trucks**, equivalent to removing three trucks.
- By eliminating existing tray rebuilds, the solution results in a reduction of approximately **31,000 hours in maintenance labour** over five years.
- Circumstances were identified in which sticking with the current trays may have been a better outcome. Through consultation with site leadership, we included actions in the plan to unlock the full potential of the lightweight trays while mitigating these risks.

INSIGHTS

- Transitioning to lightweight trays is only viable providing production teams can increase the average payload without increasing loading time (from an additional loading asset pass).
- Value from lightweight trays is achieved through lowering cost per tonne. This reduction can be achieved in two ways:
 1. Increasing fleet total production; or
 2. Reducing costs by parking up excess trucks to achieve the same total production.
- Conducting tray liner rebuilds for lightweight trays onsite was shown to negate the business value.
- Successful transitioning to lightweight trays requires integrated change management, including verification of payload and production gains compared to plan.



COSOL: When Reliability Matters

COSOL is built on one belief: in asset-intensive industries, reliability is everything. We are a trusted, Intelligent Asset Operations partner - known for our deep expertise, dependable delivery, and ability to keep critical assets performing at their best.

