



# OPMOS - Open Pit Mine Optimization System

Advanced Robotic Solution for Future Mining



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# About Israel Aerospace Industry

- **Largest** Defense and Aerospace company in Israel
- Active in both the **defense and commercial** markets
- Employees: **15,000** (Engineers: 6,000)
- Cutting edge technologies and solutions for:  
**Space, Air, Land, Sea and Cyber**
  
- Revenues: 4 B\$
- Backlog: 9 B\$
- 80% export, worldwide in over **90 countries**
- Tel Aviv Stock Exchange





# IAI's Robotic Group Profile

- **Over 15 years experience** in developing and manufacturing State of the art Autonomous Vehicle Systems (AVS)
- **Operational deployments** and thousands of operation hours
- Providing a **wide range of Autonomous robotic solutions** for Defense, HLS and Commercial markets
- **Proven past experience**



# Robotic System advantages



## Robotic 3D's (Dangerous, Dull, Dirty)



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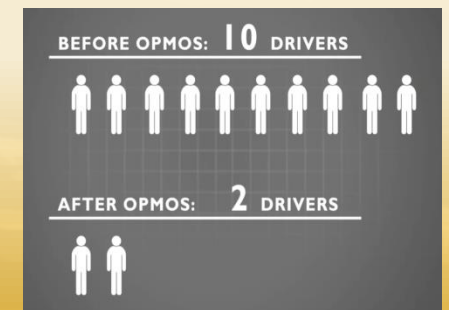
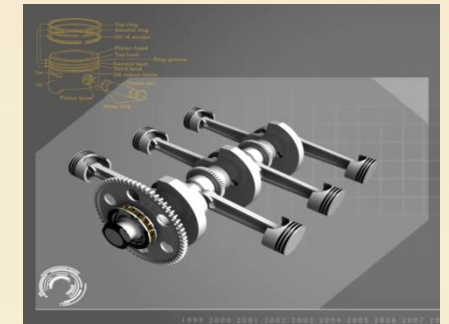
# OPMOS overview

- Advanced **Robotic solution** for Future Mining
- Easily adapted to a wide variety of **mining machinery and haul trucks**
- **Accurate navigation solution**
- **Obstacle detection and avoidance**
- **Command & control center** for planning, execution and real-time fleet management
- Supports **full mining life-cycle**, from loading to dumping
- System components are designed for durability in **harsh mine environments**



# OPMOS Benefits

- Improves **production performance** (+15%), reduces waiting time (-20%)
- Enables continuous, unmanned activity in all-weather conditions for **24/7 operation**
- **Reduces operational costs**, such as: human resources (-5%), fuel consumption (-10%), tire wear (-12%), and platform maintenance (-14%)
- **Improves monitoring** and control of planned vs. actual mine performances **Increases safety**
- Optimizes driving for **cleaner environment**



\* Parreira, J and Meech, J. 2010. Autonomous vs manual haulage trucks - how mine simulation contributes to future haulage system developments. CIM Meeting 2010, Vancouver-BC, Canada.

\*\* J. Parreira and J.A. Meech, 2011. "An interactive simulation model of human drivers to study autonomous haulage trucks", Procedia Computer Science, 6

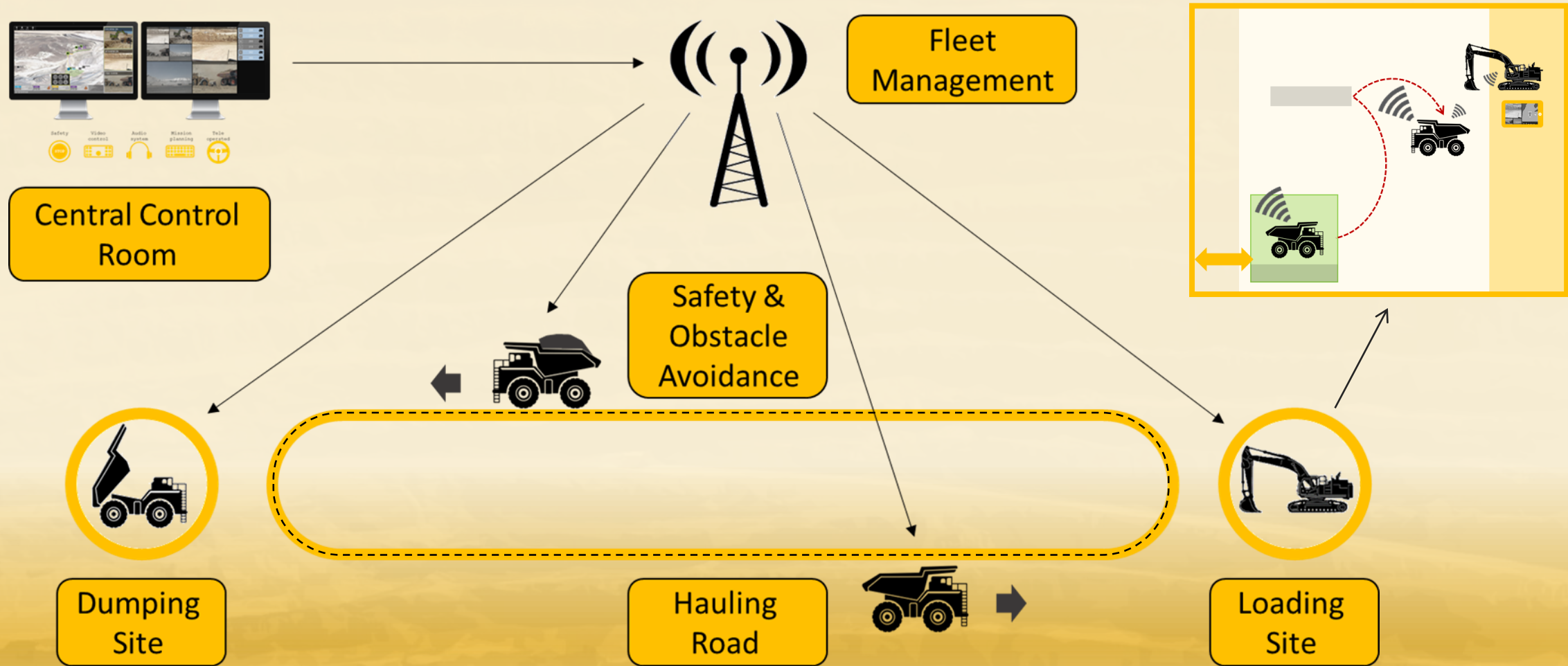
\*\*\* S. Brundrett, P.Eng, 2014. Industry analysis of autonomous mine haul truck commercialization", University of British Columbia

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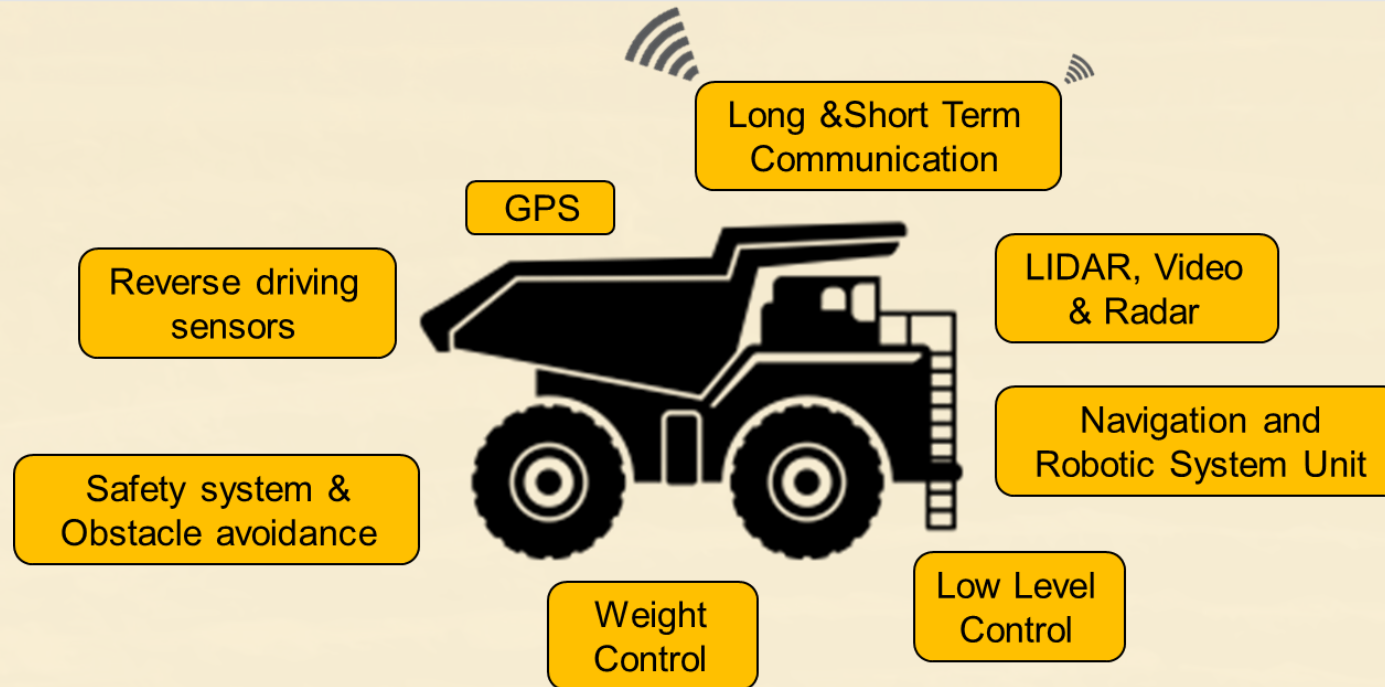
# OPMOS – Robotic haulage process



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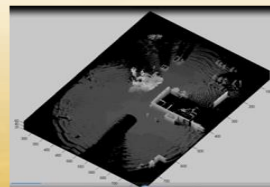
# OPMOS – Platform Robotization



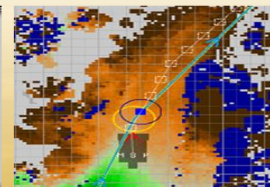
Medium & low Level Control



Navigation & localization



Perception



Path Planning



Operation center

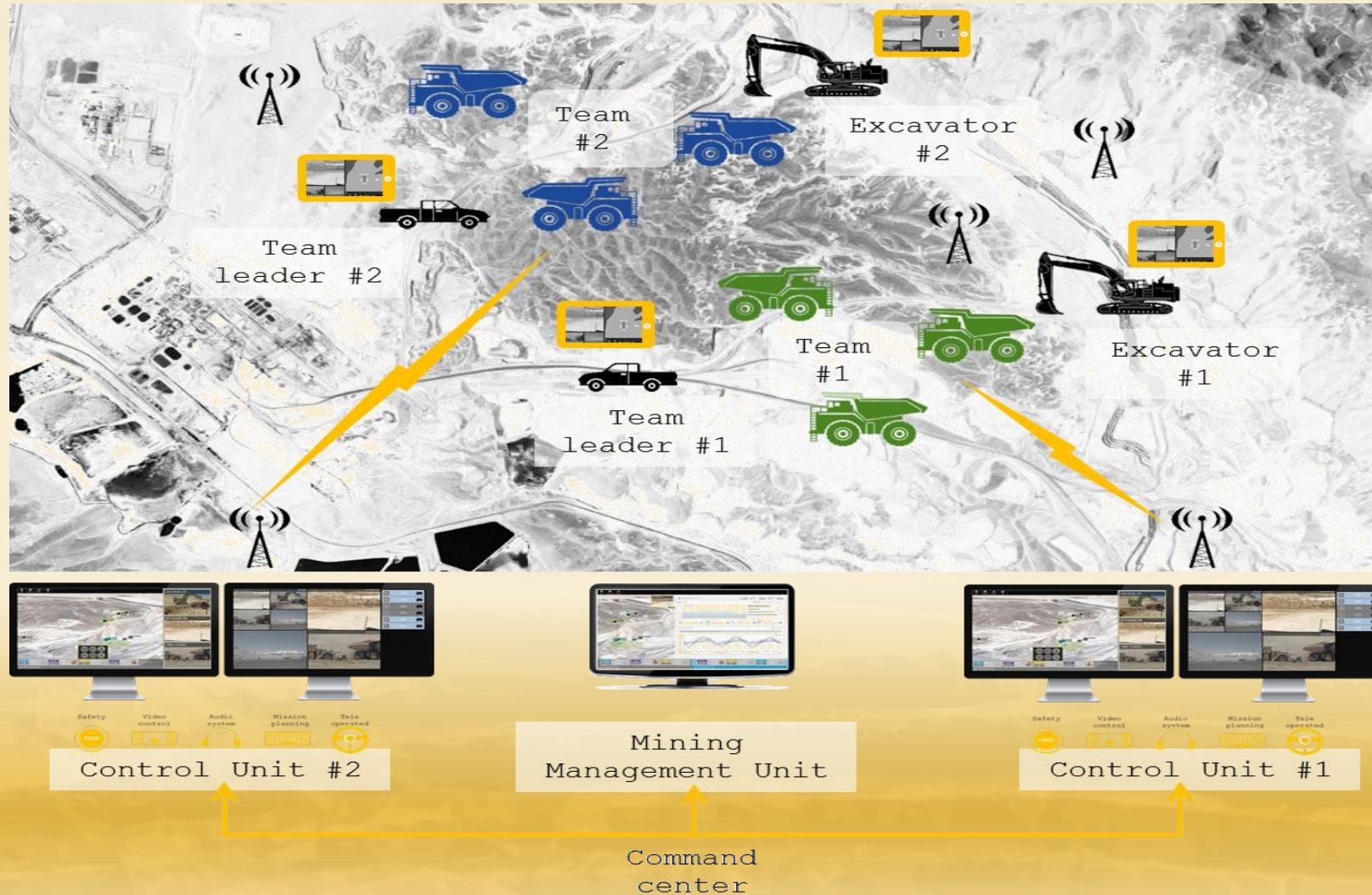
OPMOS solution is based on IAI's proven ROBOTIC KIT capabilities

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# OPMOS - Fleet management



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# OPMOS Fleet Management & Optimization

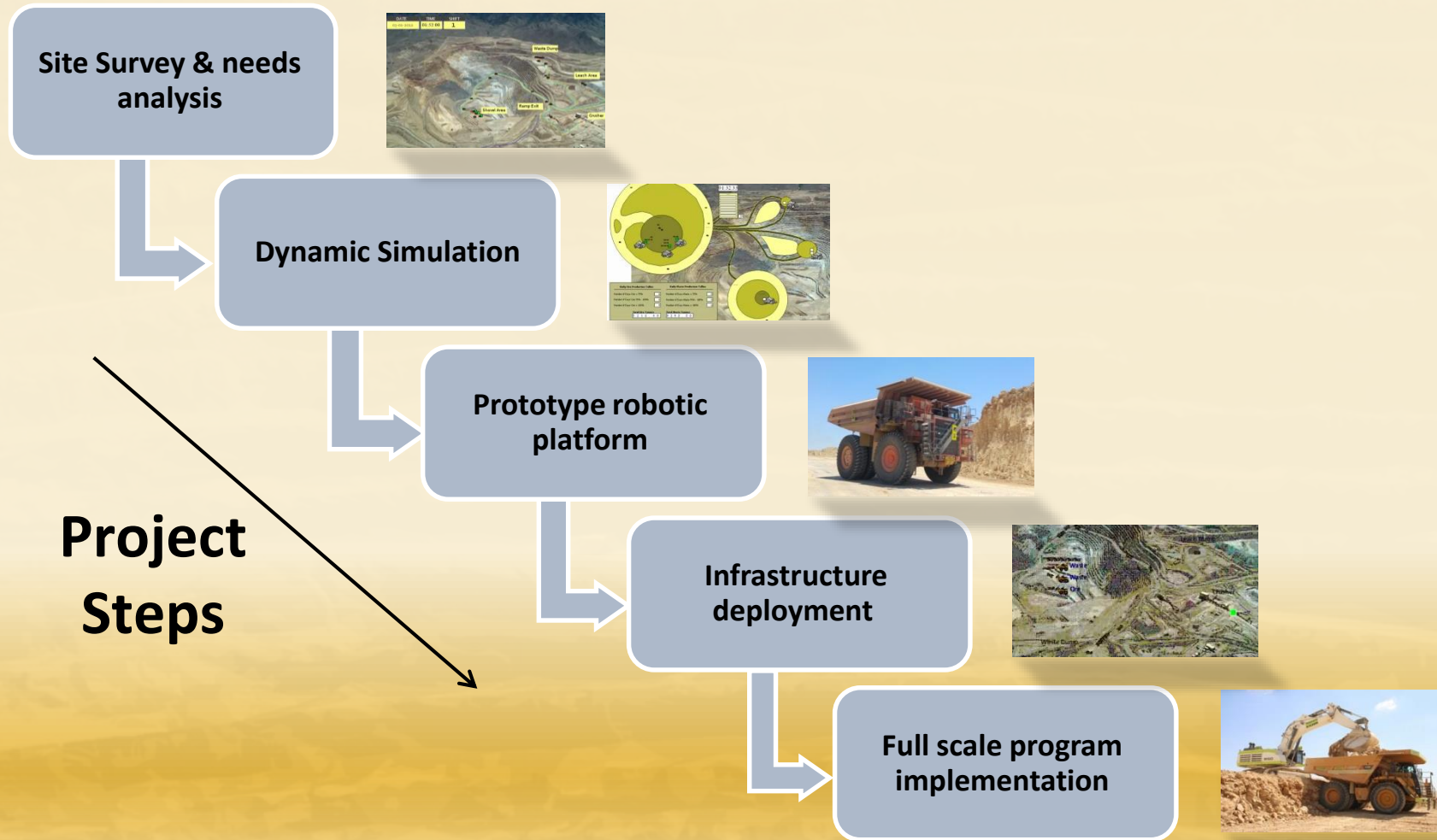


Real time information & Data analytics to Increase operation productivity and efficiency





# OPMOS Implementation



# OPMOS – Optimize your mine

Thank you.

