Earthworks Fleet Planning Course: Haul Cycles, Productivity and Unit Cost

4 – 8 January 2027
London - Premier Inn Victorya

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Programme Summary

Earthworks fleet planning is the subject of this one-week training course for construction managers, plant leaders and earthworks planners, ending in a fleet plan pack for one earthmoving package. Fleets are often chosen by habit or by what is available, so trucks queue at the loader, machines stand idle and unit cost drifts from the estimate. The programme works from quantities and haul routes to cycle times, machine matching and cost control, using the participant's own package as test material. Mars Training Centre UK delivers this programme on earthworks fleet planning to mixed-organisation cohorts.

The Business Case

The fleet decides both pace and cost on civil, quarry and infrastructure packages. A fleet that is too small misses the programme; one that is too large wastes plant hire and fuel. Leaders who build the plan from haul cycles, test the machine match and track output against target can adjust early instead of explaining overruns later.

- Earthworks Unit Cost: Falls as machine numbers match the haul cycle instead of habit.
- Plant Utilisation: Rises as queueing and idle time are found and removed.
- Schedule Reliability: Improves as output is tracked against a stated production target.

Principles and Evidence Base

- Cycle time and productivity estimation: The programme applies it to build hourly output for loading and hauling machines in Session 2.
- Truck and excavator combination selection: The programme uses it to balance loading and hauling capacity in Session 3.
- Simulation-based fleet optimisation: The programme uses simple simulation logic to test fleet combinations and queueing in Session 3.
- ISO 19014-1 and ISO 15817: The programme refers to these earthmoving machinery safety standards when discussing safety-related control and remote operator control systems in Session 4.

Intended Participants

- Construction managers who commit plant and haul fleets to earthmoving packages.
- Plant leaders who assign machines, operators and maintenance cover.
- Earthworks planners who estimate production and cost for tenders and baselines.
- Owner-side engineers who review contractor fleet proposals.

Typical functions include road contractors, quarry operators, industrial site developers and infrastructure authorities.

Learning Outcomes

1. Participants will be able to construct an earthworks volume schedule and haul route plan for a work package.
2. Participants will be able to evaluate haul cycle times and hourly output for loading and hauling machines.
3. Participants will be able to diagnose queueing and idle time in a truck and excavator fleet.
4. Participants will be able to design a fleet combination that meets a production target.
5. Participants will be able to prioritise cost and safety controls for the fleet in operation.
6. Participants will be able to justify a fleet plan to project sponsors and plant suppliers.

Programme Structure

Day 1: Earthworks Fleet Planning Scope and Quantities

What must be moved, over which routes, and by when?

- Earthworks Volume Schedule
- Haul Route Map
- Swell and Load Factor Sheet
- Production Target Statement
- Fleet Planning Assumptions Log

Day 2: Haul Cycles and Machine Productivity

How long does one cycle take, and what does a machine move in an hour?

- Haul Cycle Time Build-Up
- Loader Pass Count Sheet
- Haul Distance and Grade Table
- Hourly Output Calculation
- Job Efficiency Adjustment

Day 3: Truck and Excavator Matching

How many trucks keep a loader working without a queue?

- Fleet Combination Table
- Truck Count Balance
- Queueing and Idle Time Review
- Simulation Run Summary
- Fleet Sensitivity Check

Day 4: Unit Cost and Fleet Control

What does each tonne cost to move, and how is output kept on target?

- Owning and Operating Cost Sheet
- Cost per Tonne Moved Table
- Production Tracking Board
- Machine Safety and Remote Control Review
- Variance Response Log

Day 5: Applying the Tools to One Fleet Plan Pack

Do the quantity, cycle, matching and cost tools form one working fleet plan?

- Applying the Session 1 Earthworks Volume Schedule
- Using the Session 2 Haul Cycle Time Build-Up
- Testing the Session 3 Fleet Combination Table
- Checking the Session 4 Cost per Tonne Moved Table
- Completing the Fleet Plan Pack

Methodology

The programme uses a data workshop method built on anonymised haul logs, cycle time studies, cost sheets and production reports from road, quarry and site development packages. Participants work in small groups on a shared earthworks package and receive written facilitator feedback on every exercise set.

- Suggested activity: Timing a haul cycle on paper and finding the longest delay.
- Suggested activity: Adding one truck to a fleet and recalculating output and queueing.
- Suggested activity: Comparing a planned cost per tonne with a month of site actuals.

Capstone Output

Each participant completes a fleet plan pack for one earthmoving package. It holds an earthworks volume schedule, a haul cycle time build-up, a fleet combination table, a cost per tonne moved table and a production tracking board. The pack is used at work to brief the project team, challenge a contractor's fleet proposal and respond when output falls behind target.

Frequently Asked Questions

Is earthworks fleet planning suitable for managers who are not plant specialists?

Yes. Earthworks fleet planning assumes construction or contract experience and teaches the cycle, matching and cost calculations step by step with worked examples.

Which methods does earthworks fleet planning rest on?

Earthworks fleet planning here rests on cycle time and productivity estimation, truck and excavator combination selection and simulation-based fleet optimisation, with ISO 19014-1 and ISO 15817 for machine safety.

How is the fleet plan pack from earthworks fleet planning used at work?

You use the fleet plan pack to brief the project team, test contractor proposals, set production targets and respond quickly when output falls behind.

How does earthworks fleet planning differ from general construction project management training?

Earthworks fleet planning centres on machine cycles, matching and unit cost for earthmoving. General construction project management training covers wider scope, programme and contract topics.