Haul & Load

Where's the Money For Tomorrow?
Simple ways to affect cost improvement
Volvo Construction Equipment

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Course Agenda

- Purpose and Goal
- A Test
- Where's the money??
- Practical cost improvement "today"
- Practical cost improvement for "tomorrow"
- Conclusion

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Haul & Load – What can you affect “tomorrow”

Course Purpose

- Offer quick hitting ideas to improve productivity or lower costs of your current mobile fleet
- Important - This is an open dialogue not a lecture.

Goal

- Take home at least one idea for basic but significant cost/process improvement in your operations.

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Haul & Load - What can you affect “tomorrow”

Observations

- Cost control
  = **business viability** in this market
  = **competitive advantage** in a recovering market (?)
- Operationally
  - What can you control
  - What is beyond your control

Focus for Today

- Actions to improve cost/ton?
  - Change **what** you do ?
  - Change **how** you work ? → **Optimize operations**
  - Change what you **use** to do work ?

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Example #4 – Truck Loading

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Example #4 – Truck Loading

As shown on video

Max Production (approx) *

- 20 trucks/hour
- 708 tons/hour (642 tph)

* 30 second spot time.

If spot time = 15 seconds?

Max Production (approx)

- 23 trucks/hour
- 814 tons/hour (738 tph)

→ **15% improvement**

+106 ton/hr x 8 hr/day = +850 ton/day (771 tpd) = $ _____ ?

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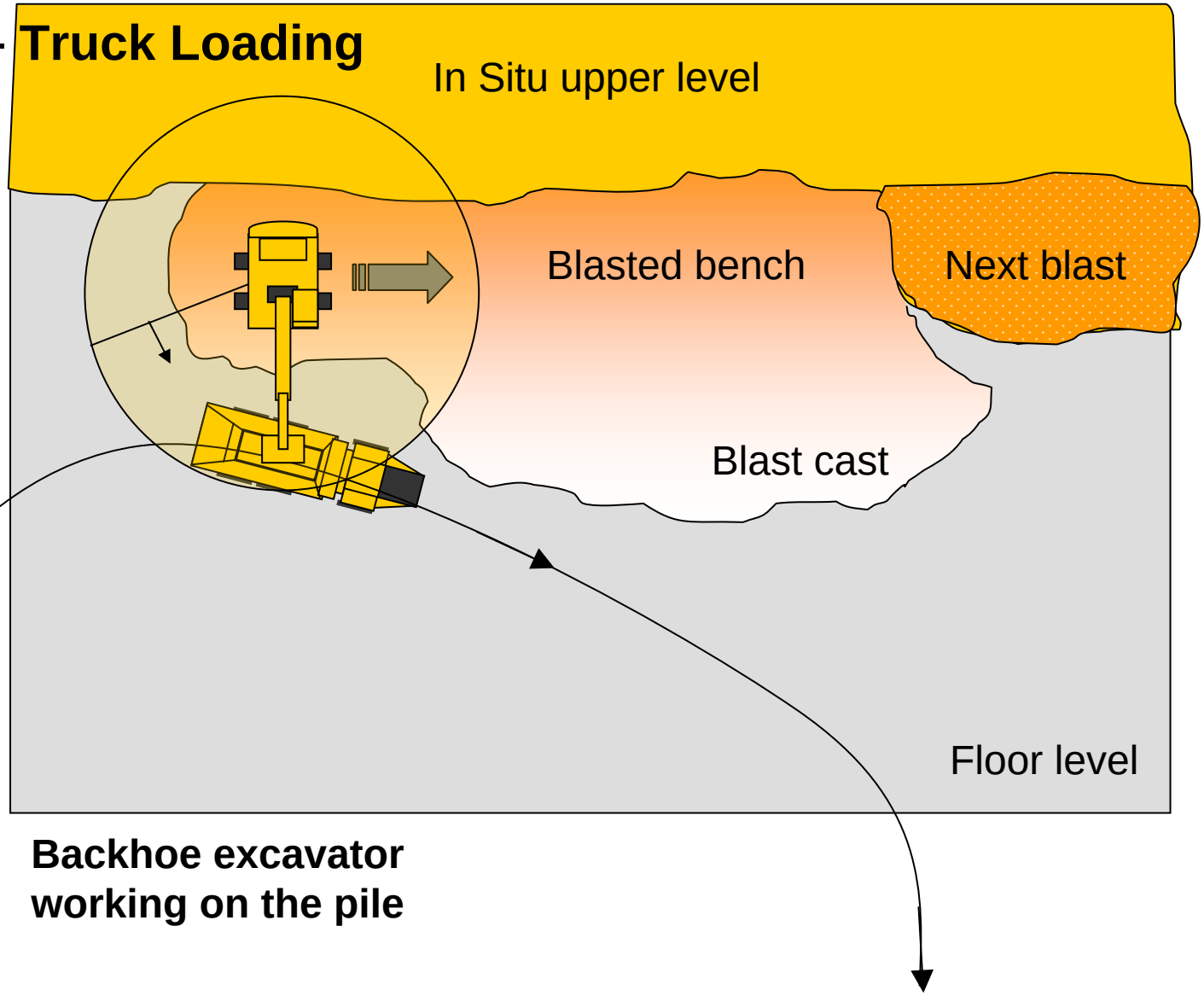
Example #4 – Truck Loading

+ productivity
+ safety



Backhoe excavator working on the pile

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Example #4 – Truck Loading

15 second spot time
<20 second cycles

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Example #5 – Hauler Drive Mode

- Is 6x6 mode always needed?

  → in quarries 6x4 is often sufficient

+ fuel efficiency
+ tire life
+ drive train life

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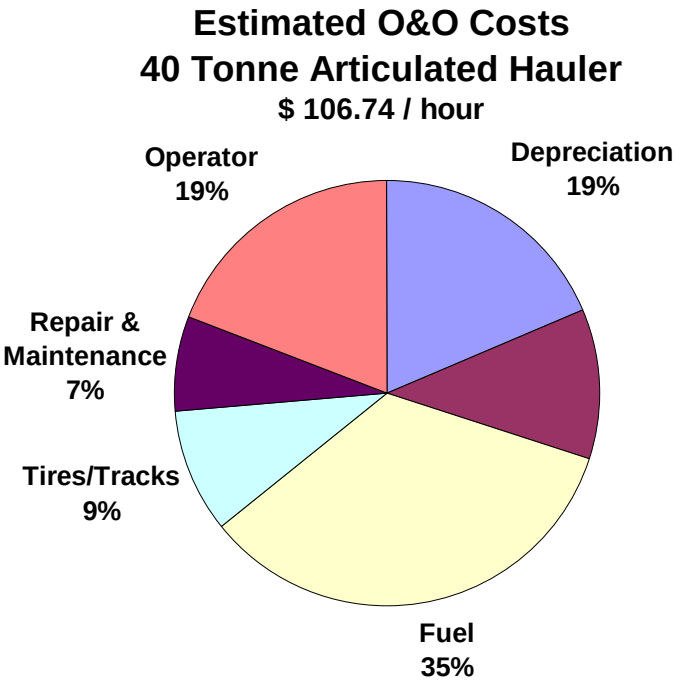
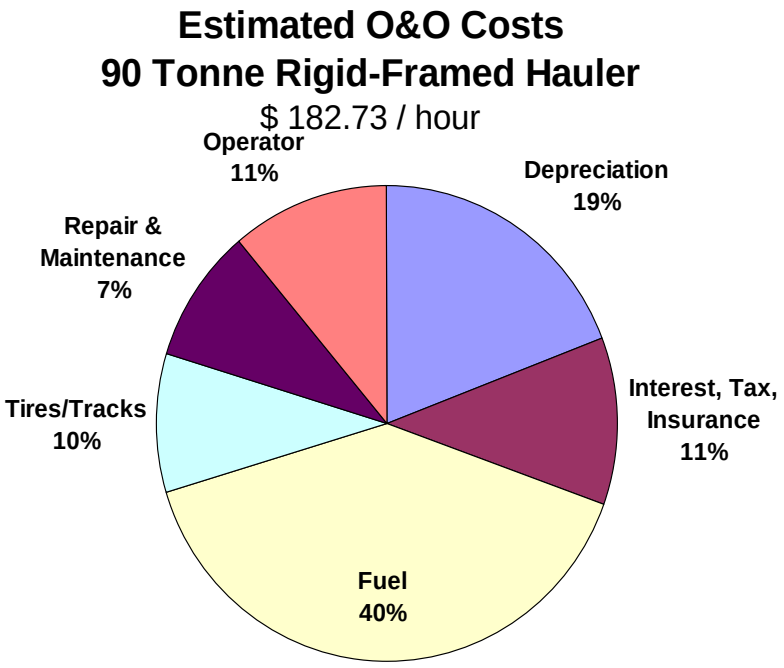
Example #5 – Hauler Drive Mode





= $ 3,750 / year

= $ 7,500 / year

5%+ + fuel efficiency
+ tire life
+ drive train life

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Example #6 – HOW MANY PASSES?

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Example #6 – Truck Payload

- Coal mine, poor weather conditions
  - Fleet of 90t rigid dump trucks
  - 15.5 yd^3 face shovel, poor digging/fill factor
    - 5 pass loading, slight overload situation
  - 1.2 mile main ramp out of pit
    - 10% grade + 5-7% rolling resistance
- Truck Issues
  - Operating costs
  - Unscheduled downtime

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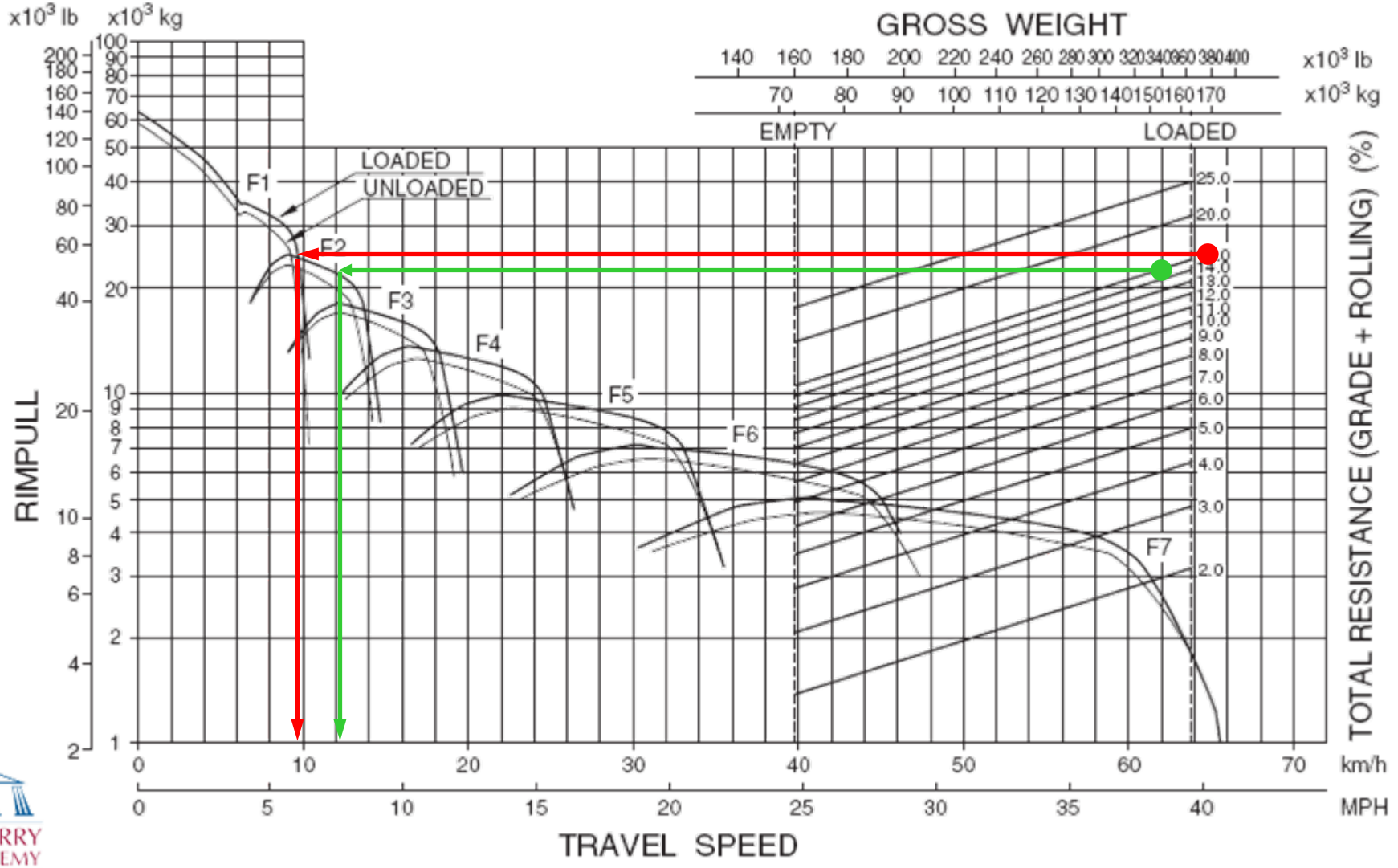
Example #6 – Truck Payload



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Haul & Load - Optimize Operations

Example #6 – Truck Payload

- Proposed solution:
  - 4 full pass to 88t payload (vs. 5 lite pass to 101t)
- Results:
  - Faster cycle time by 12%
  - Dramatically less time on grade, utilizing 2 gears instead of 1.
  - Despite lower payload, unit truck production the same (99%)
- Potential upside:
  - Higher shovel production → more fleet production.

	Case A	Case B
	5 pass	4 pass
Payload T	**101**	**88**

Truck Cycle Time		min	min
Load Time		**2.7**	**2.2**
Haul	pit floor	1.0	1.0
	main ramp	**13.3**	**10.0**
	top road	2.0	2.0
Turn/Dump		1.5	1.5
Return	top road	2.0	2.0
	main ramp	7.0	7.0
	pit floor	1.0	1.0
Spot Time		0.5	0.5
Total		**31.0**	**27.2**

88%

Unit Truck Production		
Cycles/50 min hour	1.61	1.84
Unit Production (Tph)	**162.9**	**161.9**

99%

Theoretical Shovel Production		
Trucks/Hour Capacity	15	19
Hourly Production (Tph)	**1,239.0**	**1,340.0**

108%

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Example #7 - Existing Equipment

- **Re-Handling or Yard/Load-Out: a unique application**

  Switch to a re-handling bucket: 7%+ efficiency measured

- **Tire** type/upkeep – Review with your tire dealer:
  - Do you run L4's or even L5's on your re-handling loader? L3's probably save $!
  - Tire pressures, specs and compounds?

  → 5% fuel efficiency gain is realistic . . . Annual savings in the thousands $ . .

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Example #8 - Load & Carry

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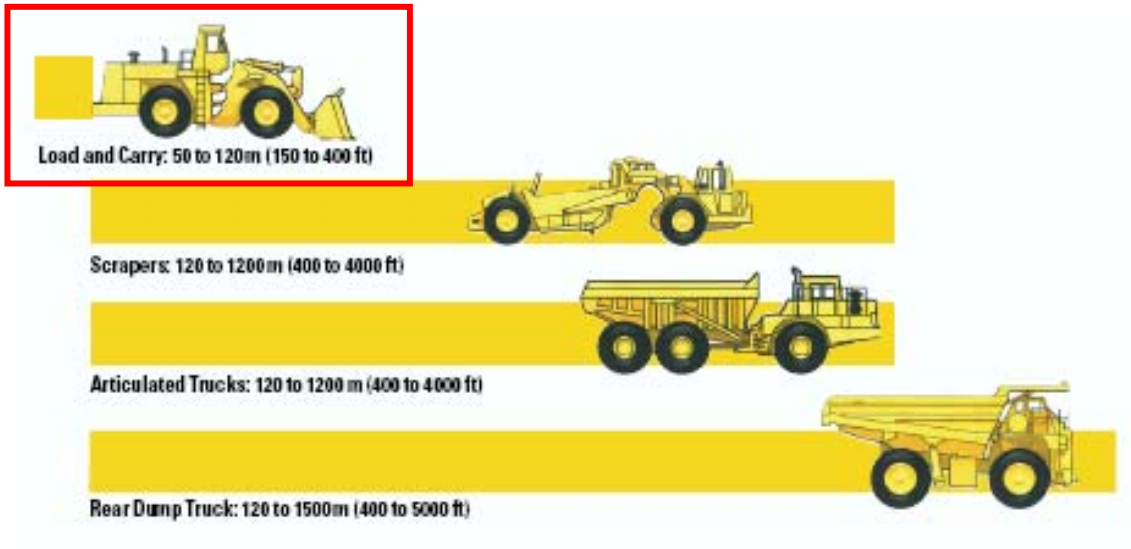
Example #8 - Load & Carry

- Do you need trucks?
- Here's the traditional view.
- The goalposts are moving:
  - Breakeven closer to 600' (185m) due to technology advances.



Benefits

- Fewer mobile machines: less operators, less traffic
- Lower investments
- More flexibility on ramp/hopper design.

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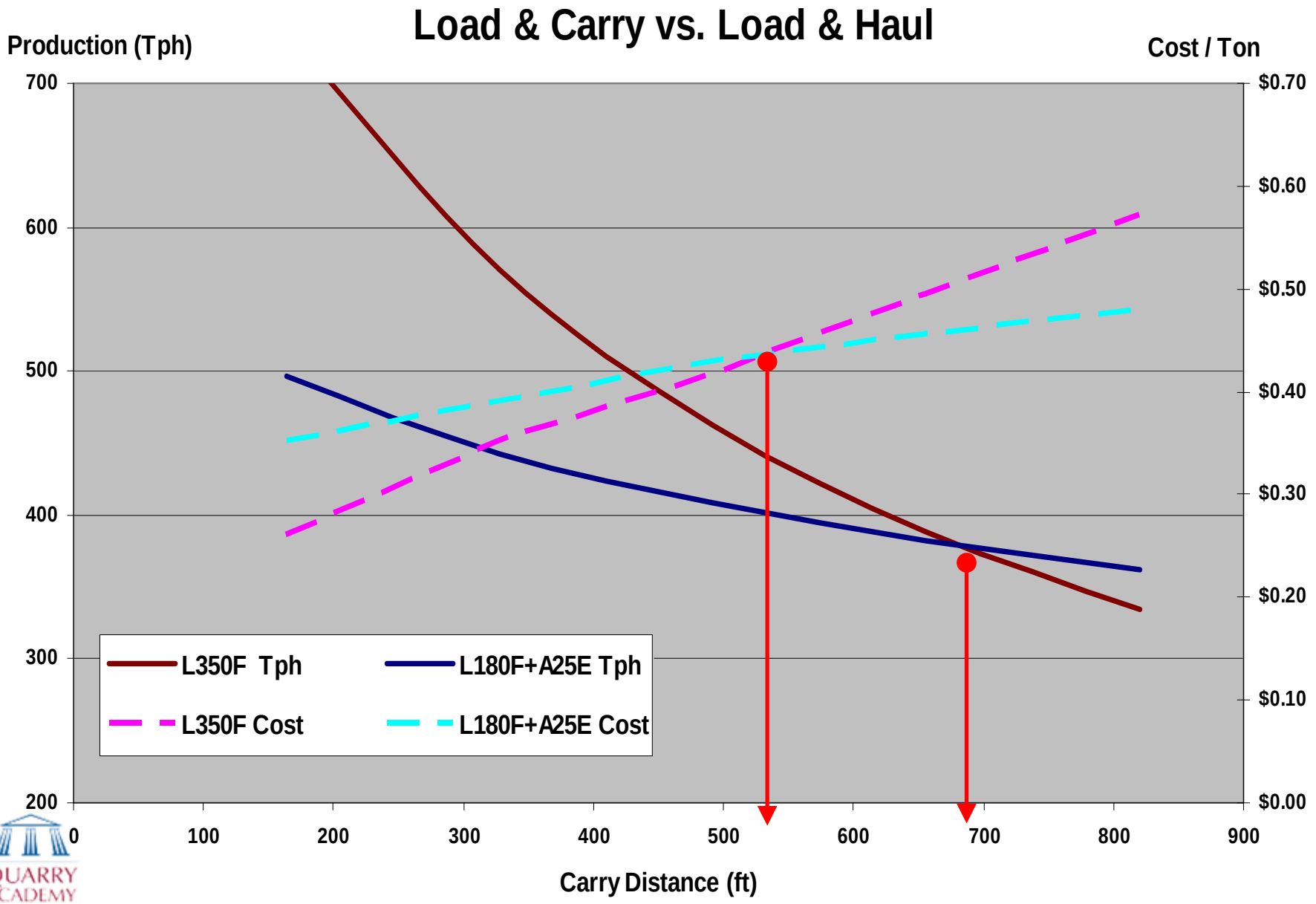

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Decisions Decisions???

- So many alternatives
  - Best site layout – which routes, grades, turns, etc …
  - Load & Carry vs. Load and haul
  - How many trucks, what size trucks
  - Excavator vs. Loader vs. Load and Carry
- What if you want/need to change something?

Look for a site simulation study!

- Most equipment manufacturers have software to do this for you.

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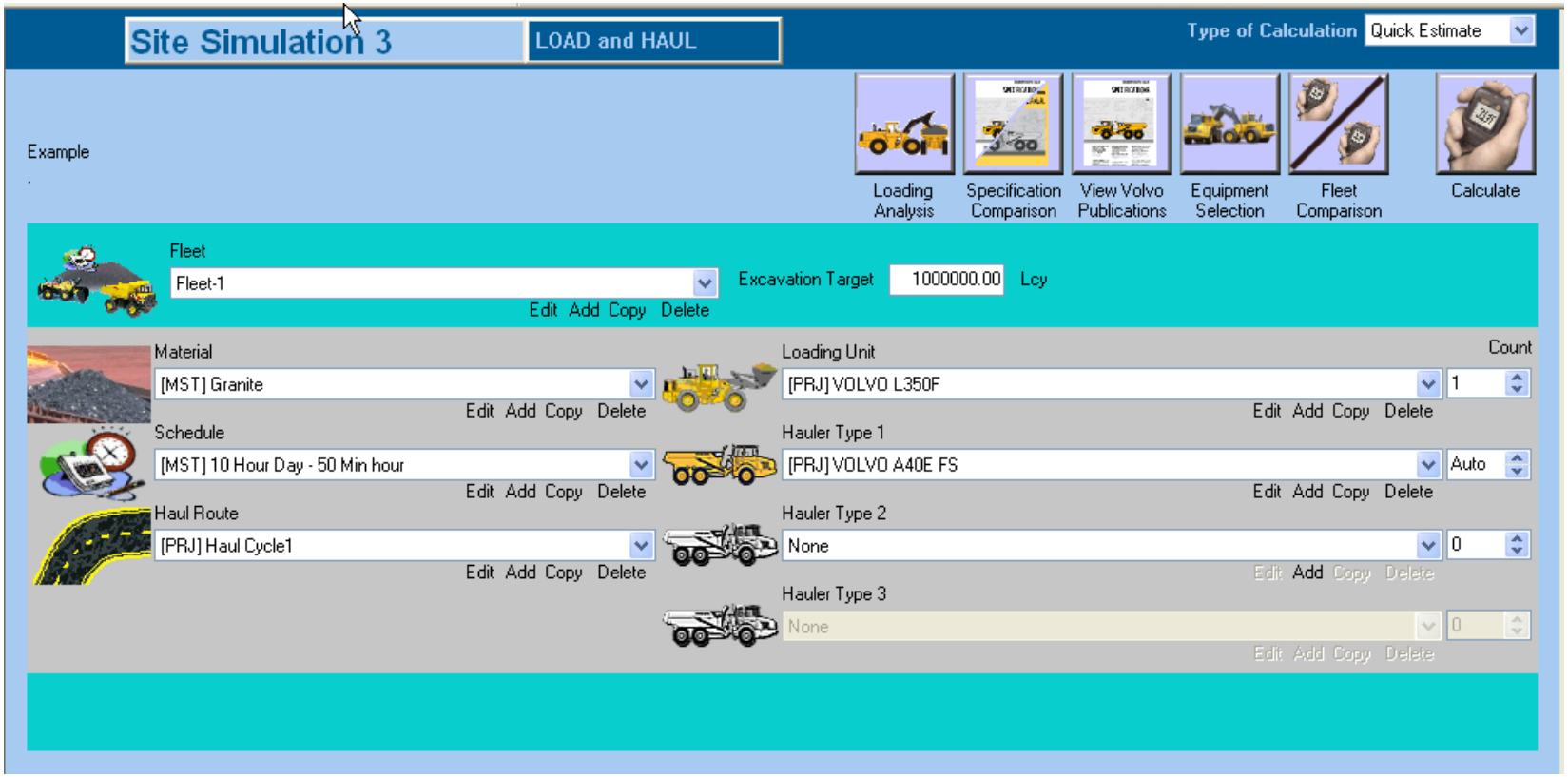
- Create just about any scenario and mix that you want
- Adjust details in every aspect until it is tuned to your liking



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Haul & Load – What you can affect “tomorrow”

Conclusions

- Don’t presume yesterday’s solution:
  - Performance, cost/value, and market demand ALL change.
  - Technology
  - Application
- Make informed decisions for your future mobile needs.
- Study different solutions.
- **Challenge the status quo!**

Thank You!
Questions?

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