



Inventory Systems in Practice

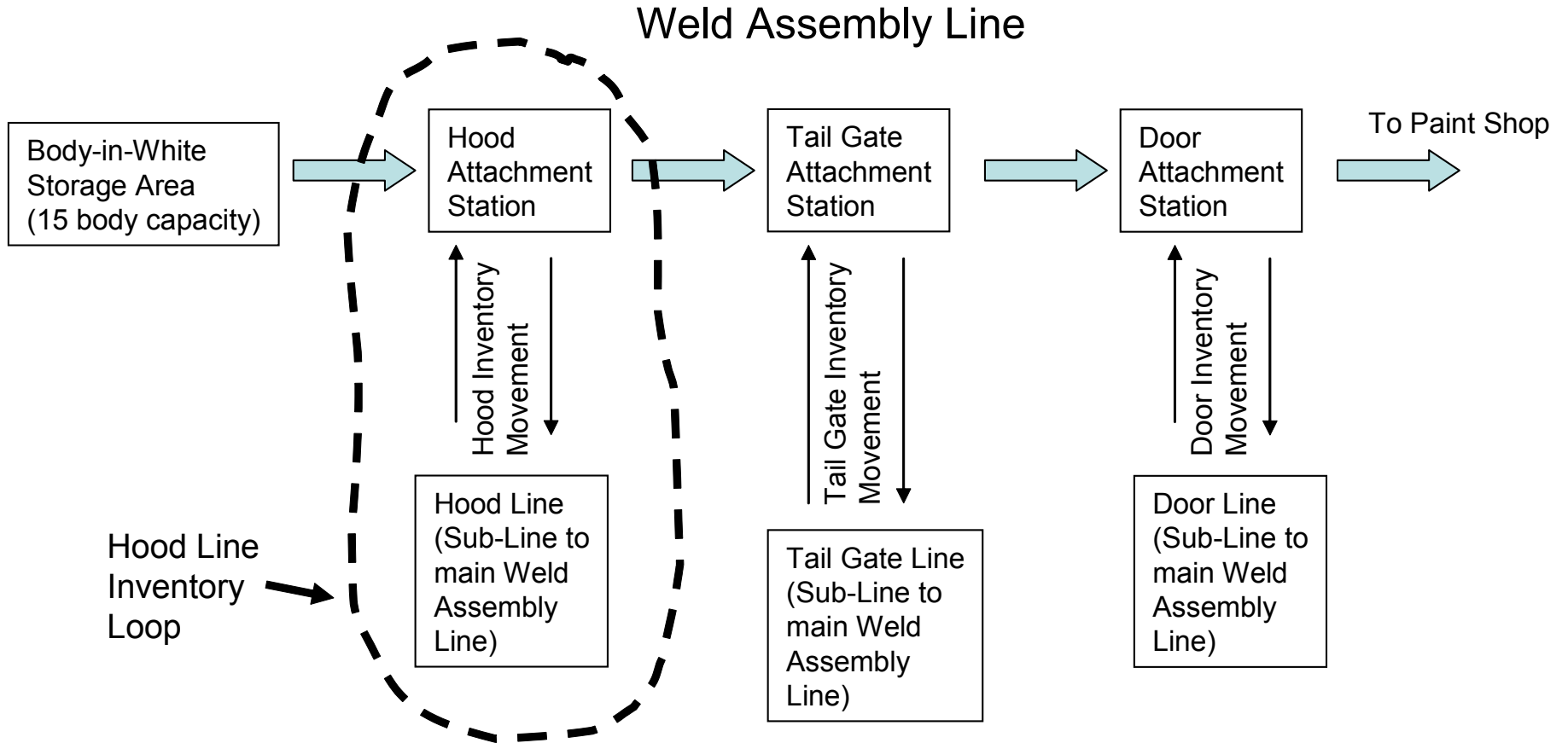
Or “How I got out of doing the last
two questions on the final exam”



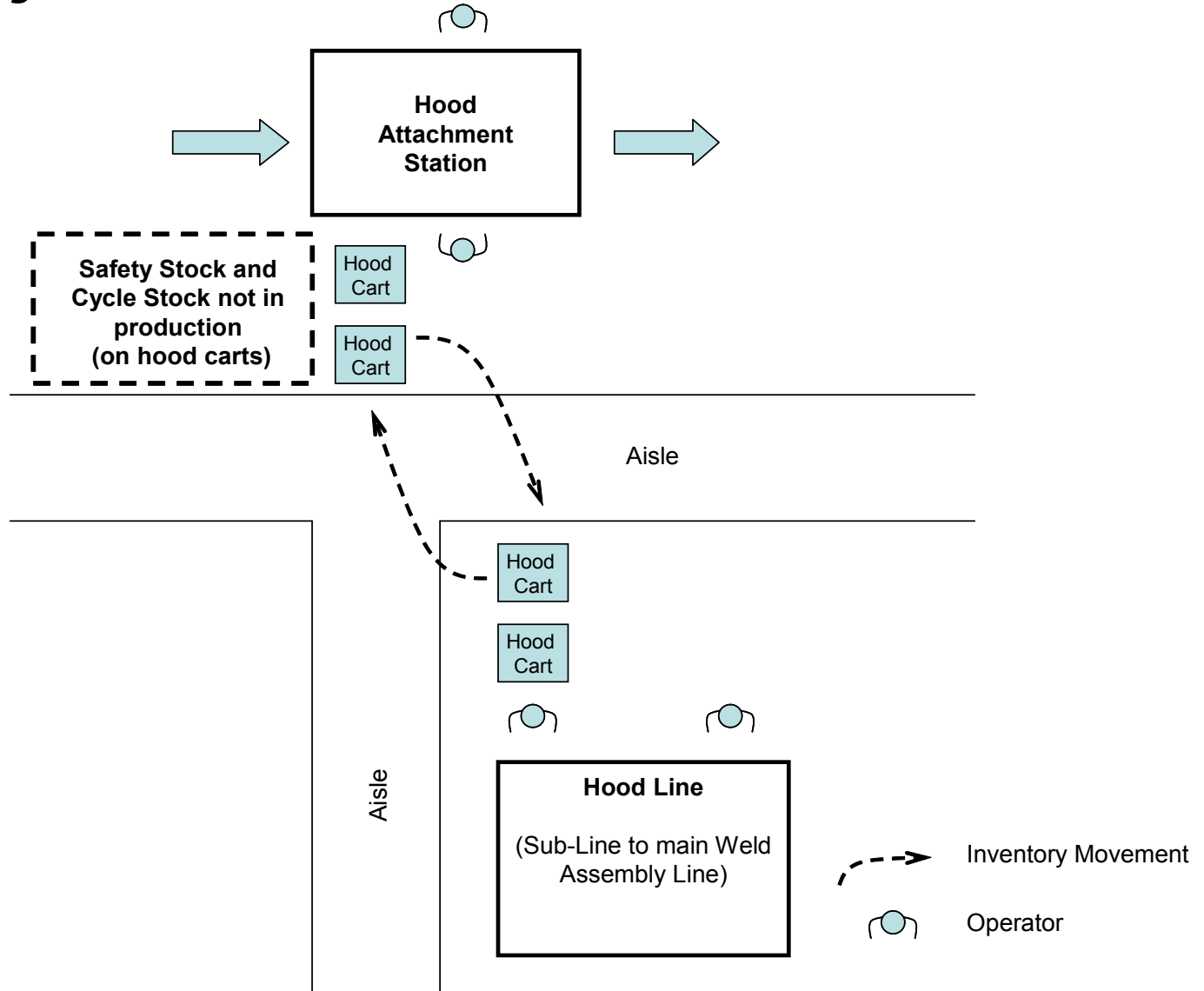
The Project

- Upgrade the Hood Line to enable the production of another vehicle model and increase output from 800 units per day to 825 units per day
- Responsibility: Design, Manufacturing, Commissioning, Hood Design Interface, and “connections”

System View



Project View





Inventory Control

- The number of carts is fixed at four (4) per model. Each cart hold ten (10) hoods: **40 units of inventory maximum per model (+ safety stock)**
- Carts are designed to be as large as ergonomically possible and are to number as few as possible.
- Do the class models give the same answers?



Estimating the parameters

μ : Both the Weld Line and the Hood Line had the same production goal 825 units per day.

Line speed set to 840 units per day → 60.0 seconds per unit cycle time.

MTTR, MTTF:....



MTTF, MTTR

- **From design data:** 15 minutes per day of downtime.
- **From discussion:** There is 2-6 failures per day. This information needed some verification.
- **From operating policy:** There is 840 minutes per day of production time.

$$MTTF = \frac{840 - 15}{"2 - 6"}$$

(in min)

$$MTTR = \frac{15}{"2 - 6"}$$

(in min)



The Answer

The deterministic processing time model says that we need **40 units of inventory space**.

Why?

- The production rate (μ) is defined
- Demand rate is defined
- Inventory space is defined
- Only MTTR and MTTF can vary
But: These quantities are highly correlated and controlled by the same person.

System is a tradeoff between maintenance and inventory space.