

Customer Challenges

- Funding Constraints
- Undersized Facility
- Tight Delivery Schedules
- Underutilization of available resources

PROJECT SUMMARY

A major defense contractor retained PMC to perform a capacity analysis study of a vehicle processing facility. The goal of the project was to allow for evaluation of the vehicle throughput and processing bay utilization under different operating scenarios. PMC utilized a discrete event simulation model to meet the project requirements.

SYSTEM DESCRIPTION

The vehicle was first produced then transported through a variety of stations and two processing bay areas, before reaching the final process and exiting the facility.

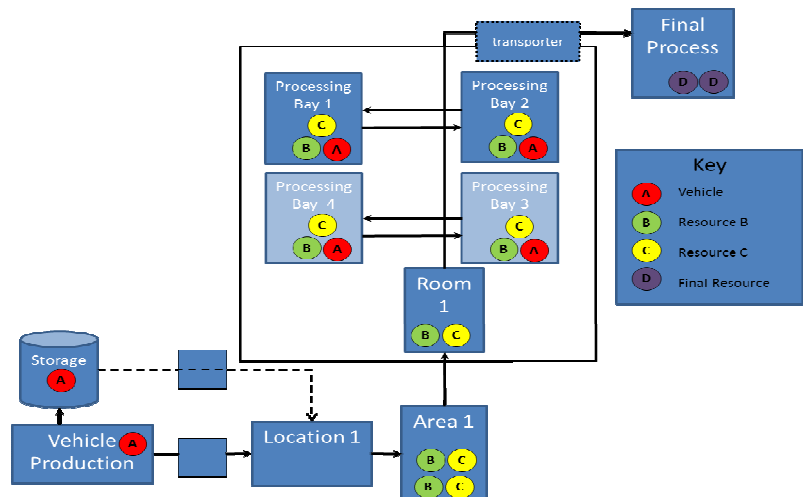
OPPORTUNITY

Throughput at the facility was lower than required for meeting demand. The capacity allotment and utilization rate of the processing bays was suspected to be the constraining factors.

APPROACH

PMC's plan consisted of four main steps:

1. Identify and collect information relating to facility, vehicle, processes, and other resources
2. Develop discrete event simulation model using SIMUL8 software
3. Simulate production under four demand scenarios
4. Perform output analysis and system evaluation



Modeled Facility Layout and Vehicle Flow

Case Study: Capacity Analysis Aids A Vehicle Processing Facility

SOLUTION

The SIMUL8 model created by PMC's simulation team allowed the facility to improve the layout and design of the facility. Simulation was performed on the four scenarios:

- fixed sequence + fixed inter-arrival times (FSFI)
- random sequence + fixed inter-arrival times (RSFI)
- fixed sequence + random inter-arrival times (FSRI)
- random sequence + random inter-arrival times (RSRI)

The model illustrated that the 2-bay configuration did not have sufficient capacity to meet with demand, which prompted the recommendation of increasing to 3 or 4 bays, depending on the processing modification plan chosen.

BENEFIT

This simulated model granted the manufacturer the flexibility to study the effect of demand fluctuations on throughput, and also to quantify costs due to storage delays and waiting times. The model provided the ability to plan ahead for future demand, and design the facility in a manner that would permit the desired throughput.

