

OPTIMIZING DISTRIBUTIONS NETWORKS FOR OPTICOFFEE

SOLVING LOGISTICAL CHALLENGES WITH OPTIMIZATION AND SIMULATION

PROBLEM DESCRIPTION

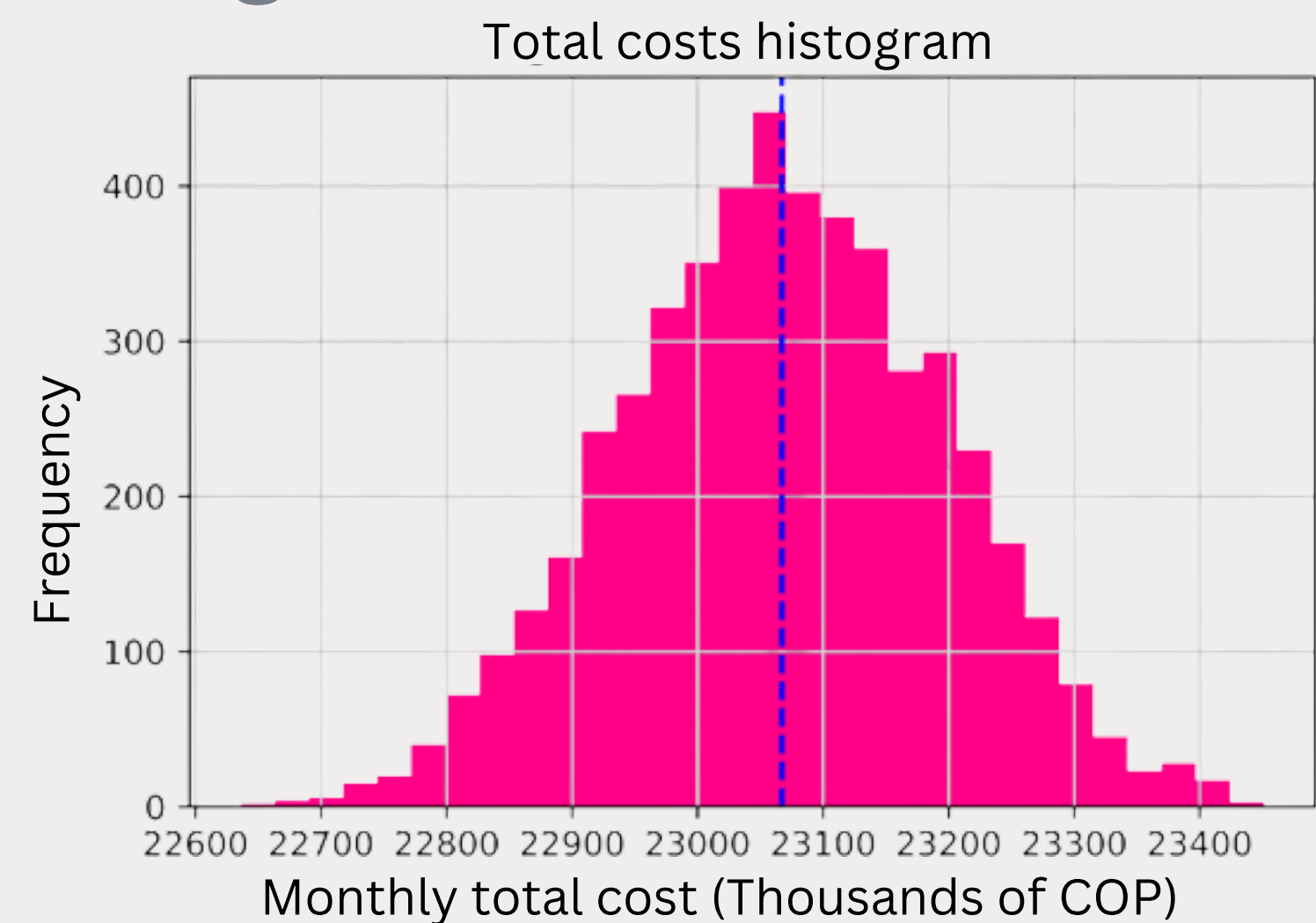
OptiCoffee is looking to expand its operations in Bogotá and needs to choose the right warehouses for storing and transporting coffee. The goal is to achieve a profitable expansion that meets customer demand and ensures warehouse capacity.

PROBLEM STATEMENT

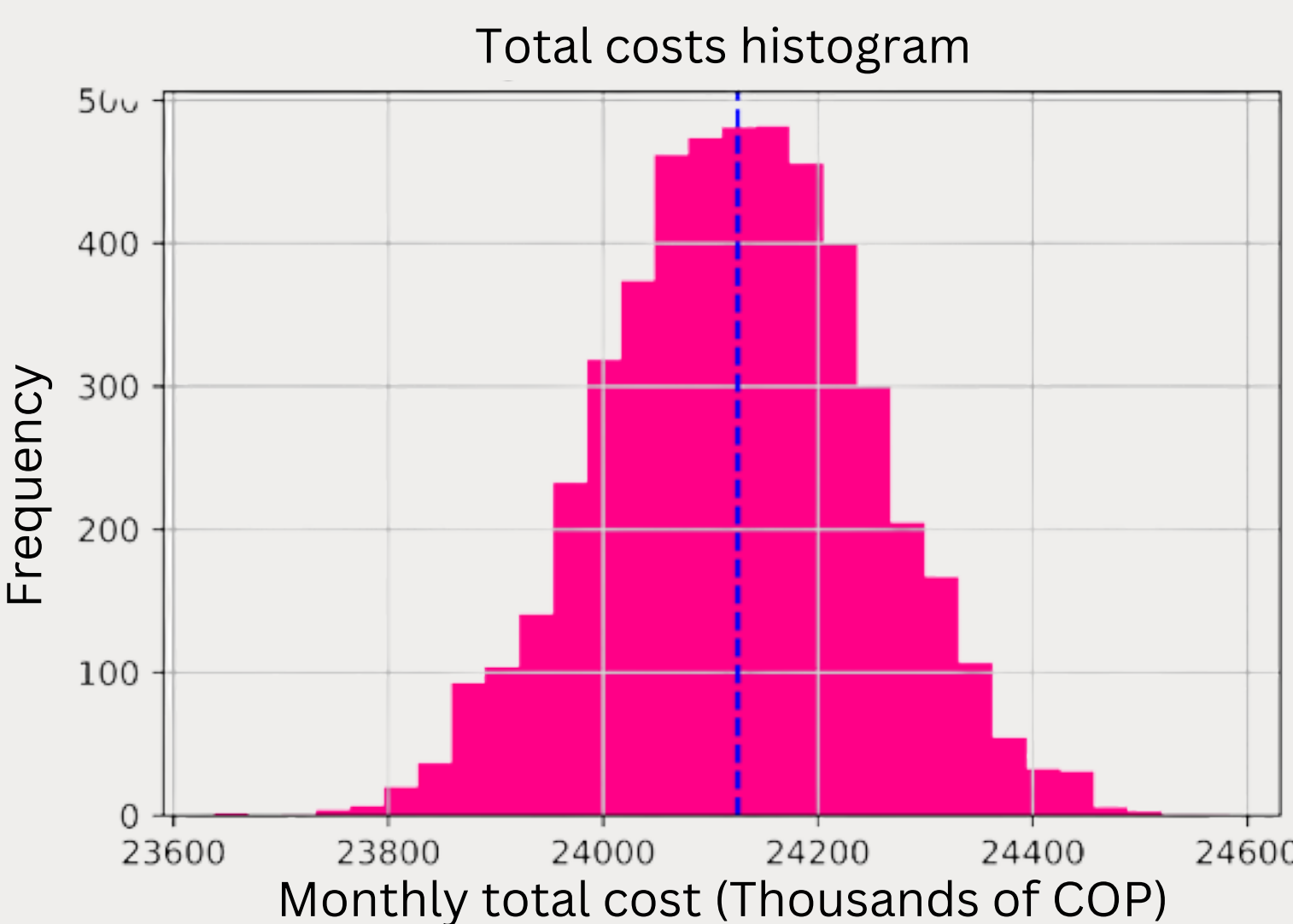
$$\begin{aligned} \min \quad & \sum_{i \in B} F_i Y_i + \sum_{i \in B} \sum_{j \in C} C_{ij} X_{ij} \quad (1) \\ \text{s. a:} \quad & \sum_{i \in B} X_{ij} = 1, \forall j \in C \quad (2) \\ & \sum_{j \in C} d_j X_{ij} \leq K_i, \forall i \in B \\ & X_{ij} \leq Y_i \forall i \in B, j \in C \\ & X_{ij} \in \{0,1\} \forall i \in B, j \in C \\ & Y_i \in \{0,1\} \forall i \in B \end{aligned}$$

RESULTS

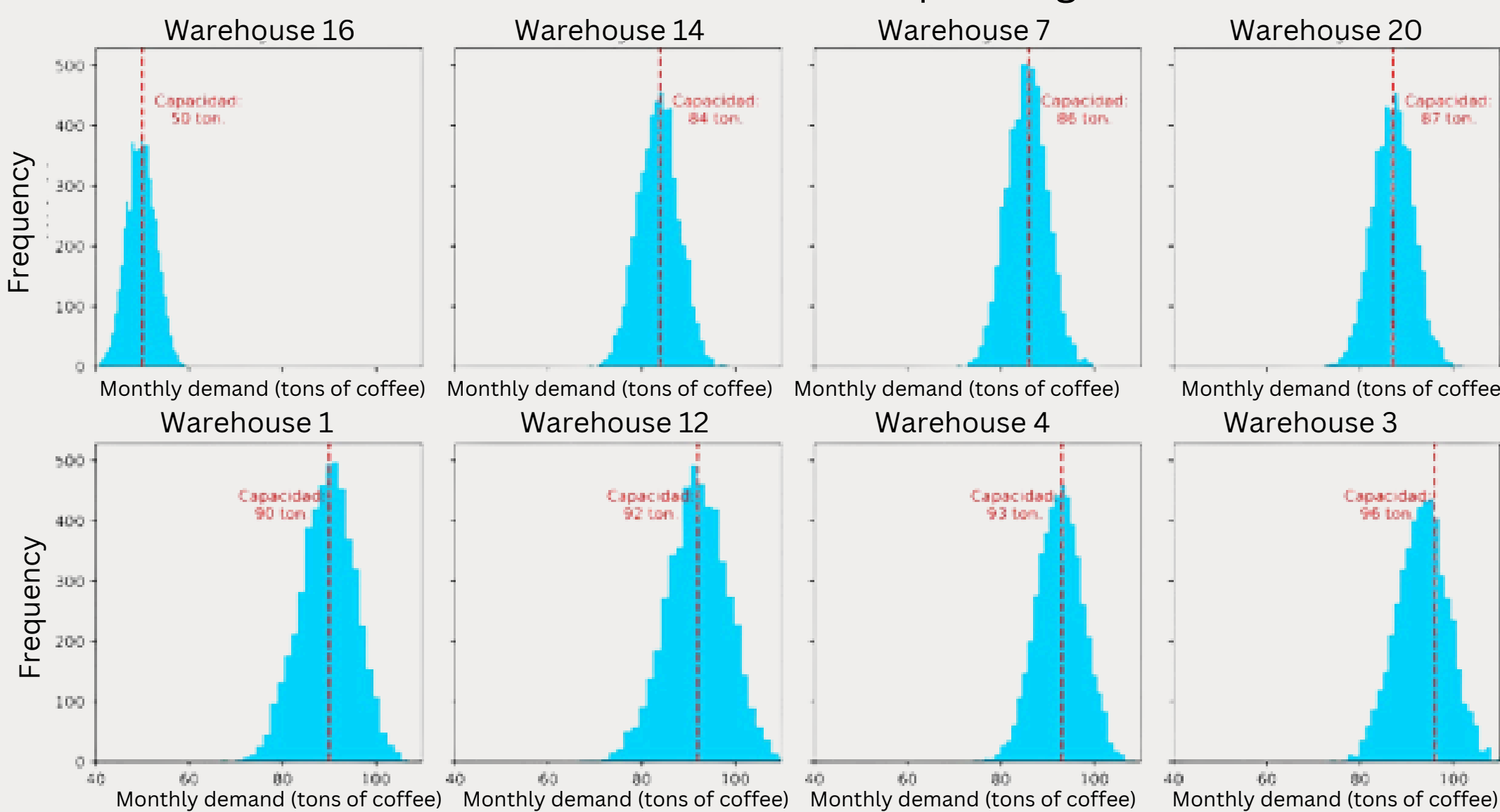
Triangular distribution scenario



Mode scenario



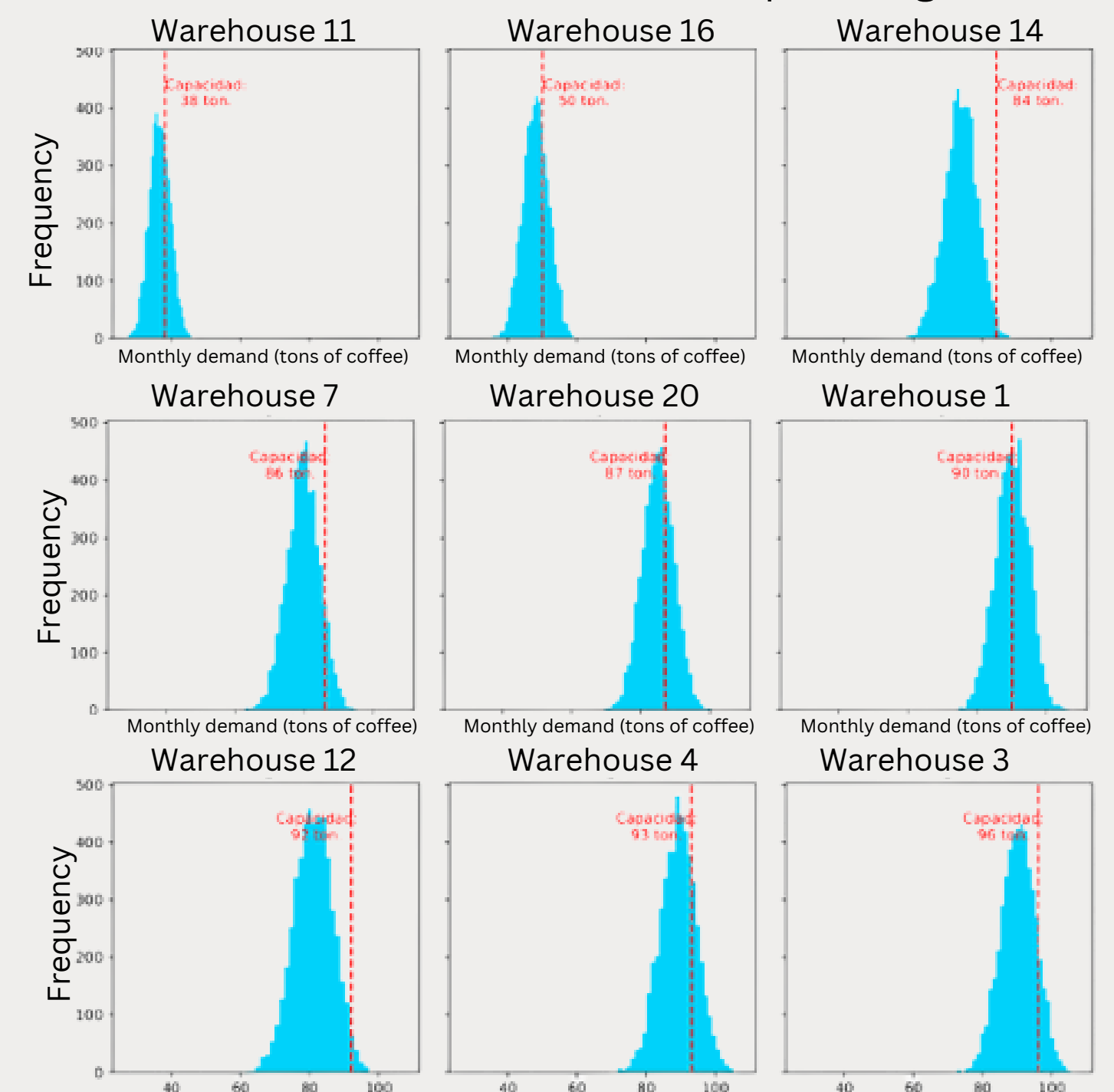
Total demand distribution for each operating warehouse



avg. prob: demand > capacity

46.16%

Total demand distribution for each operating warehouse



avg. prob: demand > capacity

21.97%

CONCLUSION

When estimating demand using the expected value, the cost and probability of meeting demand are low. However, when estimating demand using the mode (the most frequently requested value), the cost is higher, but the probability of meeting demand increases.