# Can an Automated Warehouse Handle Future Production Growth?

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**Modern factories rely on a steady flow of materials to keep production running smoothly. At the studied factory, thousands of pallets containing parts and components pass through an automated warehouse known as the Highbay before reaching production. While the system has supported operations for many years, increasing production volumes have raised concerns about whether it can handle future demand without causing delays.**

To answer this question, a discrete-event simulation model of the factory's inbound material flow was developed. The model recreated the journey of pallets from arriving trucks, through storage locations and conveyor systems, to the point where materials are delivered to production. By testing different scenarios in a virtual environment, it was possible to evaluate the performance of the system without interrupting real operations.

The simulation painted a clear picture of the current situation. When a pallet is requested from the Highbay, it takes on average almost two hours before it reaches production. While this already affects material availability, the future scenario proved even more concerning. As production demand increases, the Highbay struggles to keep pace with incoming requests. Queues begin to form, pallets accumulate in the system, and average lead times increase to more than three and a half hours. The results suggest that the current setup may become a significant bottleneck if no improvements are made.

The good news came from testing a relatively simple improvement. The study investigated what would happen if the two automated cranes responsible for storing and retrieving pallets operated at a higher speed. The results were striking. Under current operating conditions, average lead times decreased from 112 minutes to only 40 minutes. Even under future demand levels, the improved system, maintained lead times of approximately 56 minutes and prevented the formation of large backlogs. This suggests that increasing crane performance could significantly improve the responsiveness of the warehouse and support future production growth.

While the study was conducted at a specific manufacturing facility, the approach can be applied to many other warehouses and production systems facing similar challenges. As industries continue to automate and production demands increase, digital simulation offers a powerful tool for understanding complex systems and ensuring that future growth does not come at the expense of operational efficiency.

This popular scientific article is derived from the master's thesis: *Discrete-Event Simulation as Decision Support for AS/RS Performance in an Inbound Material Flow: A Case Study at Company X,* written by Axel Samuelsson and Zahra Adgi (2026).