



SUCCESS STORY: MANUFACTURING LAYOUT ASSESSMENT AND OPTIMISATION FOR NEW PRODUCT INTRODUCTION

INTRODUCTION

The London Electric Vehicle Company (LEVC) is the leading global manufacturer and retailer of purpose-built commercial electric vehicles. Their iconic black cabs are famous across the world. As part of their commitment to deliver zero-emissions capable technology across a range of electric commercial vehicles, they introduced a new product: the VN5. It is a zero emissions-capable light electric van with a battery range extender.

The HSSMI team used its expertise in productivity improvement and scale-up, to support the introduction of the new product. The focus was on the critical workstations that would have the most impact.

THE CHALLENGE

The overall goal was to introduce the new product to the existing workstation. One key challenge was the limited footprint available on the production floor which would be further stretched by the addition of the new VN5 vehicle. It was important to maximise use of space while ensuring that takt times and operator safety were not compromised.

Other challenges included limited access to the workstation and constraints imposed by other production activities or facility elements which restricted potential expansion. Lineside inventory levels were high and were not possible to expand without looking into the safety stock and reorganising the storage space.

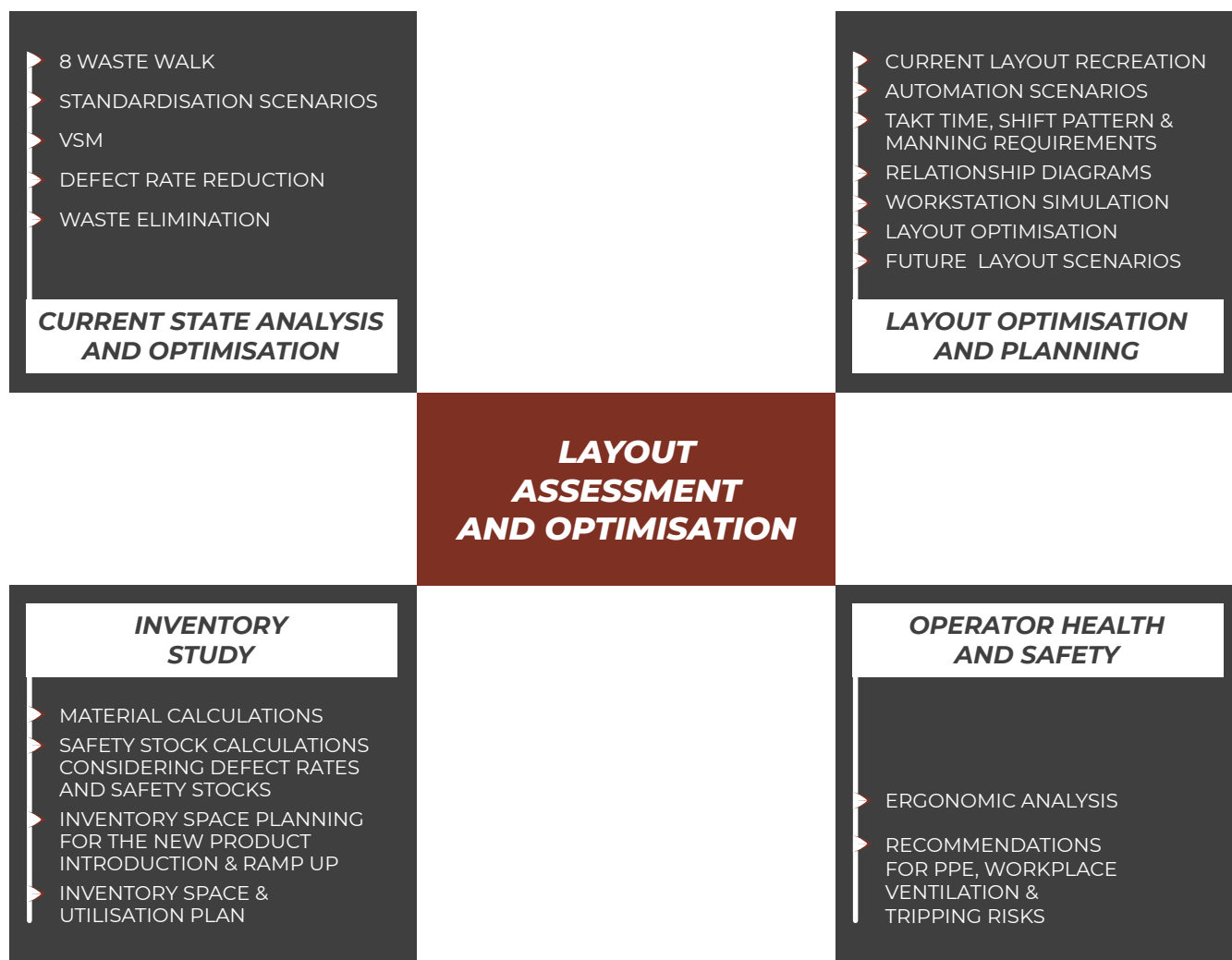
THE APPROACH

Starting with Value Stream Mapping and an 8-waste walk, the team identified the pain points / waste and categorised into high and medium and low waste levels, enabling the team to identify the opportunities that would have the highest impact. The initial assessments also included health, safety, and ergonomics.

To further understand the layout requirements, HSSMI assessed the planned volumes, product mix and sequencing requirements, shift patterns, manning requirements, process plans, and cycle times. The team analysed the documentation provided by the LEVC team and validated it through operator observations over a period of time. This allowed the team to understand the standard processes and the reasons for any operator deviations from the process.

Using relationship diagrams, spaghetti diagrams, process standardisation, and other lean manufacturing techniques, the team redesigned and proposed alternative layouts.

The layouts were further validated and optimised using manufacturing simulation that modelled layouts, manufacturing operations, and operator movement. Using the simulation, the team was able to understand the impact of volume scale-up and product mix changes on the layouts and predict and mitigate any potential issues.



An additional step was the storage and logistics assessment. HSSMI calculated the inventory space needed based on the minimum parts needed by production and safety stock, considering the defects rate and delivery time. This plan helped HSSMI to calculate the correct footprint for the current volumes and to see the future impact of the ramp-up and new product introduction.

THE RESULTS

The team proposed a process standardisation plan and multiple layouts for current processes and the introduction of the VN5. The results of the proposal indicated potentially improved cycle times of up to 40% and the potential to increase throughput by about 8.3%. The proposals focussed on minimizing the investment required, efficient use of space, and minimal distances for material handling. The most utilised scenario increased the throughput by 37.5% with machine OEE at 92%.

The team also proposed two automation scenarios with manual time reduction opportunities (by 54%), a list of equipment, and a detailed footprint.

The results, however, showed that whilst the improvement for short to medium term was great, the footprint available would be insufficient for volume scale-up in the long term.

The work done gave the LEVC team sufficient information to make high-level decisions on the future of the production facility.

LAYOUT SCENARIO SUMMARY

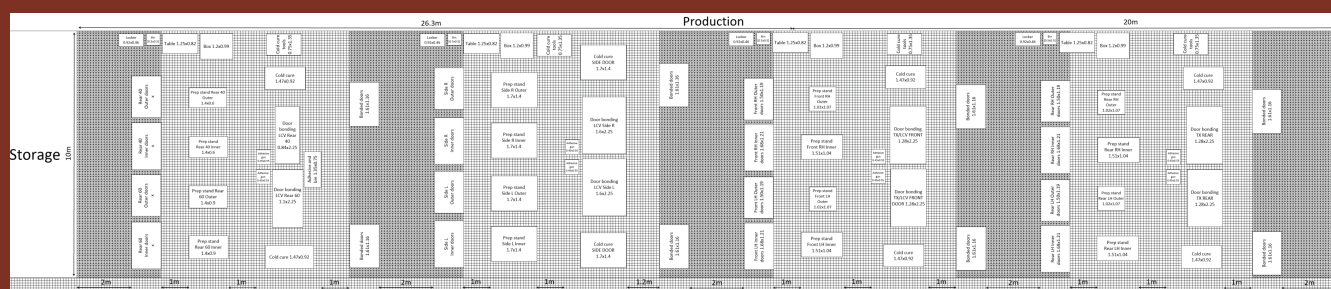
GOALS

- ▶ Minimal material movement/handling
- ▶ Minimal investment
- ▶ Cell strategy

CONSTRAINTS

- ▶ Limited space available
- ▶ Access to workstation from 2 sides: storage and walking lane

SPACE REQUIRED - 263 m²



“The analysis undertaken by HSSMI has further augmented the understanding of the changes required for the introduction of the VN5. The analysis of product content by process station has enabled LEVC to understand where product mix conditions allow for process optimisation throughout the plant. The analysis has also significantly contributed to the strategic shift of changing material feed principles to point of fit consumption. The approach has been altered to introduce multi layered delivery to point of fit principles, inclusive of Kanban, JIT kit delivery and late config sequencing trollies. The new approach will see material density at point of fit reduced by circa 75% of current state, leading to more accurate and faster perpetual inventory activity at relevant stations.”

Lee Boyce, LEVC Manufacturing Engineering Manager