

Improving Bergstrom Zone 12 Layout Efficiency and Part Accessibility

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Introduction

Bergstrom Inc. is located in Rockford, IL and is a world leader in making heating, ventilation, and air conditioning units for vehicles. The company is over 65 years old and their success can be attributed to devoting themselves to lean manufacturing methods and continuous improvement solutions. For our project we were assigned the task of redesigning and optimizing Zone 12 in their factory.

Problem Description

Due to product variation and poor zone orientation, the product assembly process lacks efficiency and consistency, leading to low productivity and unnecessary motion. The scope of our project includes layout design and identifying areas of automation and the ergonomics analysis. Some things that are out of scope are the shipping process, and the handling of any external rejects. In the end we will deliver an improved layout, a recommended labor resource to station ratio, the revenue per square feet, and the revenue per employee.

Method

Time studies, motion studies (shown in Figure 1), layout redesign and capacity analysis were applied to analyze the current state and investigate solutions for a significantly better proposed model. Zone 12 currently has 5 operators and 12 stations (5:12). A capacity analysis was conducted using 2019 demand data and time studies data to find the ideal number of operators for the zone. Also, stations that have the same tools and make the same products were combined, reducing the number of needed stations from 12 to 8.

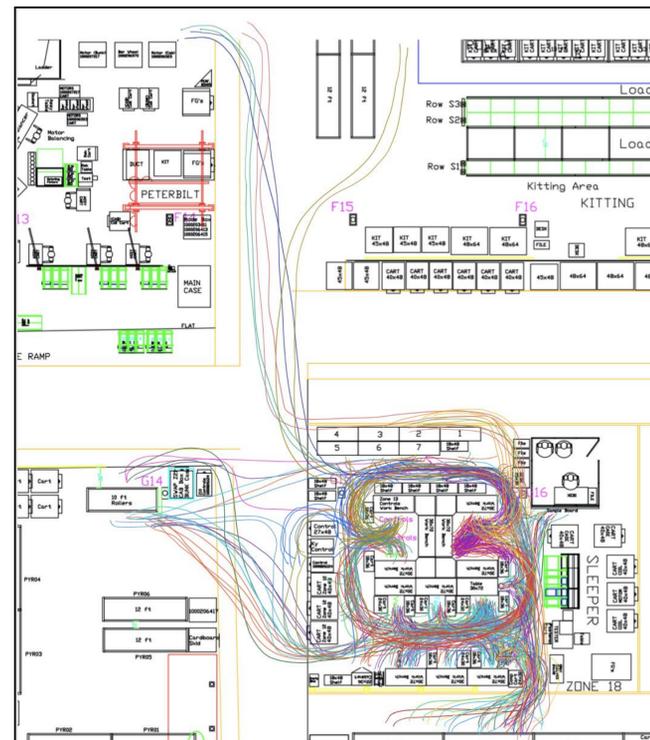


Figure 1 – Current Layout Spaghetti Diagram (Each color represent a different motion study)

Results

Figure 2 shows the time studies results. On average 47.21% of the time is value-added time. The issues that these studies highlighted are:

- Excess motion in the zone, frequent motion outside of the zone to retrieve and move parts, the average travel distance is 552 feet
- Non-value-added time spent on filling up forms and traveling to other stations

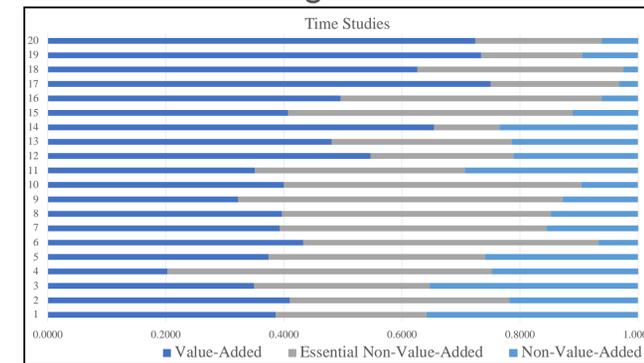


Figure 2 – Time Studies

Automating the forms and redesigning the layout will improve the value-added time. The capacity analysis concluded that Zone 12 needs 4 operators, improving the new



Figure 3 – Proposed Layout

operator to station ratio from 5:12 to 4:8, which was used to create the proposed layout, shown in Figure 3. The proposed layout will decrease excess motion on average by 52.71%

Recommendations

Combining stations created room in Zone 12 for frequently visited areas outside of the zone. This frees up space outside of the zone that can be used as storage area for zones that are in need.

Since the number of operators in Zone 12 will reduce from 5 to 4; the operator can be reallocated to another zone in the plant where demand is higher. The capacity analysis tool can be used for future planning.

Acknowledgements

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