

CASE STUDY

Lean Warehouse

Grand Rock Exhaust Systems

PROBLEM / CHALLENGE

Grand Rock sells a wide selection of aftermarket exhaust products. They produce to order, have a product-line they produce and stock for inventory and distribute for other manufacturers. The production facility and warehouse are in one facility. The business has experienced significant growth and with increased raw material inventory due in large part to supply chain uncertainties. The warehouse had become overwhelmed resulting in inefficient warehouse operations.

LEAN ASSESSMENT

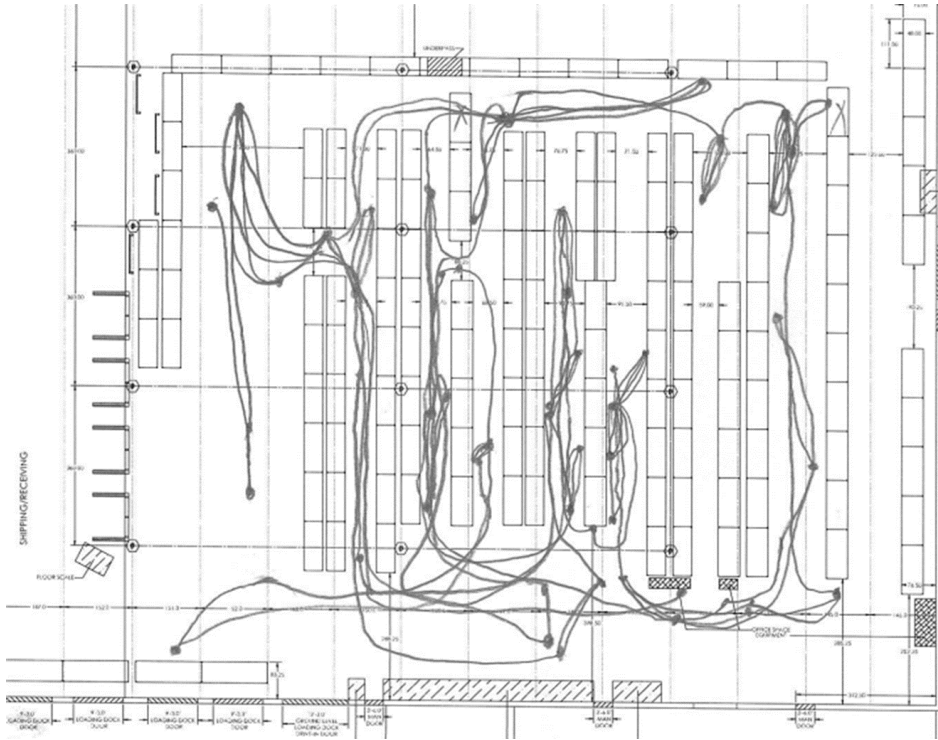
A 2-day Lean Assessment was conducted. We recommended to apply Lean techniques to improve the warehouse layout, analyze and rationalize the raw material and finished goods inventory, and implement 5S best practices in the warehouse.

IMPLEMENTATION DETAILS: Warehouse Layout

- Provided training for warehouse personnel to capture “current state” warehouse operations
 - conduct time studies
 - spaghetti diagrams
- Analyzed the data and generated alternative layout configurations that reduced movement and time for both put-a-way and picking operations
- Process Flow Mapped (PFM) core warehouse processes to identify non-Lean process steps and recommend improvement ideas
- Developed implementation plan to re-layout the warehouse during the slow winter post-holiday period
- Provided 5S Training
- Eliminated low-performing SKUs

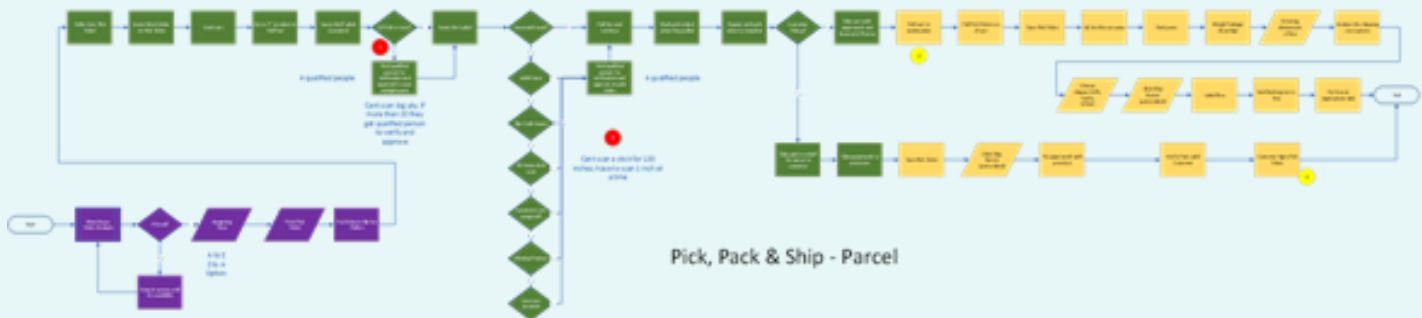


SPAGHETTI DIAGRAM WAREHOUSE OPERATIONS

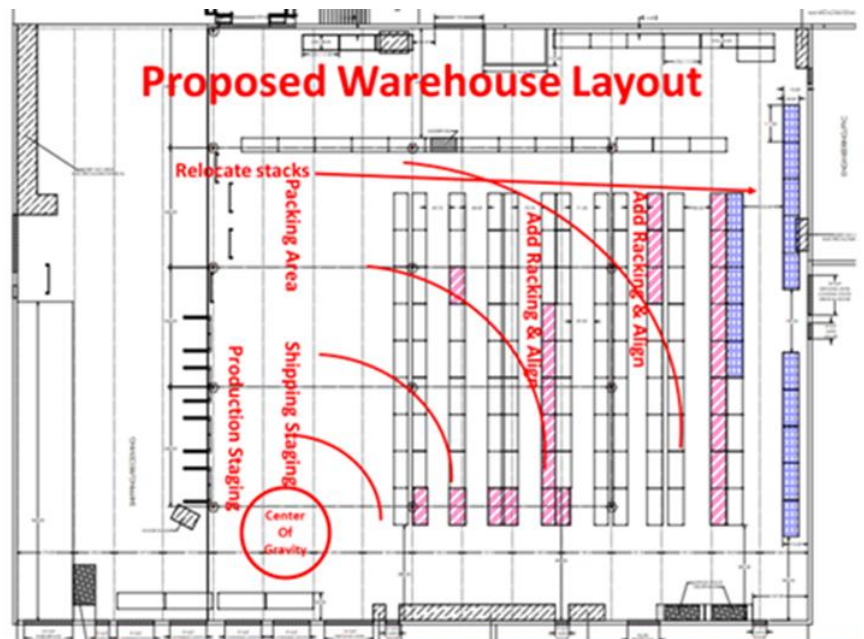


Example: “pick operation” spaghetti diagram

PROCESS FLOW MAP EACH WAREHOUSE PROCESS



- Identify “center of gravity” (COG) from spaghetti diagrams
- Design new warehouse layout to improve operational flow and leverage COG concept



■ COMPARE BEFORE AND AFTER TIME STUDIES

Time Study & Process Flow Analysis

Row Labels	Sum of Total Minutes	Sum of Total Minutes2
Pickers	141.38	100.00%
Admin	9.83	6.96%
NVA	22.55	15.95%
Packing	60.83	43.03%
Pick	48.17	34.07%
Grand Total	141.38	100.00%

Current State

Row Labels	Sum of Proposed New Time	Sum of Proposed New Time 2
Outbound Planning	1.13	1.80%
Admin	1.13	1.80%
packers	15.46	24.74%
Admin	0.25	0.40%
Packing	15.21	24.34%
pickers	45.89	73.46%
Admin	3.33	5.34%
NVA	9.53	15.25%
Pick	33.03	52.87%
put away	0.00	0.00%
NVA	0.00	0.00%
Grand Total	62.48	100.00%

Proposed Future State

■ OTHER IMPLEMENTATION DETAILS: 5S TRAINING

- Provided 5S training to all management and warehouse personnel
- Red tagged (removed) all F classification SKUs from warehouse per inventory rationalization
- Used the 1st, 2nd and 3rd S's to help with the transition to the new Lean layout

■ DIFFICULTIES ENCOUNTERED

- Co-locating of the warehouse and the production facility caused some challenges due to the tight space
- The moves necessary to create the Lean Warehouse had to wait for winter shutdown and the time frame left no room for unplanned issues

RESULTS

- Increased pick speed by 20% in current warehouse layout
- Increased overall warehouse labor productivity by 55%
- Eliminated \$450,000 in obsolete inventory

Reference: Haris Tocalic, President
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