Options to Improve Productivity at a Parts Distribution Center

Marc Wulfraat
President
(514) 482-3572 x 100
Marc.wulfraat@MWPVL.com

All Rights Reserved to MWPVL International Inc. January, 2013
Company Overview

Supply Chain and Logistics Consulting Firm

Headquartered in Montreal Since 2006; 2nd Office in Caribbean

26 Years Consulting Experience, 200+ Mandates Completed

Markets Served: 75% USA; 15% Canada; 10% Rest of World

Markets Served: Retail 40%; Distribution 35%; Manufacturing 25%

Specialization: Strategy, Operations, DC Design, Technology
MWPVL International Services Overview

Planning

 Suppliers
 Raw Materials Processing
 Production
 Distribution, Wholesale, Retail
 Transportation
 Store
 Consumer

Execution

Supply Chain Experience

1. Global and Domestic Supply Chain Strategy
2. Distribution Network Optimization
3. Distribution Flow Path Optimization
4. Product Sourcing and Procurement Strategy
5. Distribution Channel Strategy
6. Supply Chain Demand Planning and Forecasting
7. Transportation Management & Optimization
8. Supply Chain Execution Technology
9. Operations Assessments
10. Distribution Center Design
11. Material Handling Systems
12. Purchasing, Forecasting and Inventory Management
13. Outsourcing to 3PL Service Providers
14. Logistics Excellence
Why Hire MWPVL International?

- **MWPVL International** provides clients with:
  - Unbiased experience in supply chain and logistics operations
  - Strong experience in helping distribution companies in the following critical areas:
    - Invaluable insight to improve efficiency, accuracy, service level and quality of your distribution operations
    - Optimized supply chain network strategies to support the business strategy and growth objectives of your company
    - The design and implementation of distribution facilities to maximize asset utilization, labor efficiency and quality of service
    - The selection and deployment of supply chain and logistics technology applications
  - A trusted advisor in supply chain, logistics and distribution best practices.
Goal: To improve labor productivity within the same four walls of your distribution center by deploying cost justifiable solutions suitable to the specifics of the warehouse operation.
Unique Characteristics of a Parts Distribution Operation

- Parts distribution centers are typically characterized by:
  - Parts distribution centers often have more than 100,000 SKUs in stock
  - 5% – 10% of the inventoried parts constitute 80+% of the order line activity
  - The need to pick at all vertical levels of the distribution center because of insufficient real estate at ground-level to provide pick facings due to the high variety of parts being stocked
  - Low pick density and high travel time per order
  - A ratio of putaway lines to pick lines that is in the range of 1 : 2 thus stocking labor is very labor intensive
  - Wide variation in shape, size and weight of parts which requires multiple storage zones and picking strategies to optimize the operation
  - Parts distributors must often ship orders within a very tight time window (e.g. 30 minutes), particularly in the automotive aftermarket industry where service centers are ordering parts
Measuring Labor Productivity

- In the absence of defined labor standards, the measurement of current labor productivity rates is a critical first step to better understand opportunities for productivity improvements within the operation
  - Measure each discrete job function by capturing the worked man-hours and the throughput volumes (e.g. order lines, units, cases, cube)
  - Develop a simple table as shown in the next slide
  - Isolate the job functions that are relatively inefficient
- Typically, in parts distribution centers, productivity gains can be achieved through techniques designed to increase pick density and reduce travel time
### E.g. Measure Productivity by Function

- Identify current productivity levels by job function and whenever possible benchmark against other similar parts distribution operations – see example below

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach Truck Receiving + Putaway</td>
<td>10</td>
<td>8 - 9</td>
<td>10 - 15</td>
</tr>
<tr>
<td>Putaway</td>
<td>31</td>
<td>25</td>
<td>25 - 35</td>
</tr>
<tr>
<td>Picking - Bins</td>
<td>75</td>
<td>70</td>
<td>60 - 100</td>
</tr>
<tr>
<td>Picking - Lower Racks</td>
<td>53</td>
<td>45-50</td>
<td>50 - 75</td>
</tr>
<tr>
<td>Picking - Man-up Order Selector</td>
<td>23</td>
<td>20</td>
<td>20 - 35</td>
</tr>
<tr>
<td>Picking - Reach Truck</td>
<td>17</td>
<td>10 - 15</td>
<td>10 - 15</td>
</tr>
<tr>
<td>Packing</td>
<td>88</td>
<td>80</td>
<td>75 - 100</td>
</tr>
<tr>
<td>Shipment Processing</td>
<td>250 ctns/5.0 Hours</td>
<td>250 ctns/Shift</td>
<td>200 - 300</td>
</tr>
<tr>
<td>Kitting</td>
<td>114</td>
<td>105</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Discrete Pick Locations

- Many parts distribution centers lack the notion of a discrete pick location per part
  - A discrete pick location by definition is a unique bin location address that is assigned to one part only such that the location is not shared with any other part (i.e. each pick location can only be assigned to one item only)
  - When a shelf level contains multiple SKUs co-mingled to a single shelf level, the operator must search through the parts to find the right one to be picked
  - The time penalty per pick transaction is approximately 5.75 seconds in bin shelving and 3.45 seconds in racking slots
  - This is due to the extra time required to search for the matching part number
  - Another way of saying this is that a pick rate of 67 lines per hour can increase to 75 lines per hour if each SKU has a discrete pick location
  - Establishing a discrete pick slot with a properly-sized pill box / bin container will have the dual benefit of speeding up the picking process and increasing picking accuracy
E.g. Vertical Parts Picking With Pill Boxes for Discrete Locations
Defining Picking Strategy Around Part Velocity

- Typically the top 5% parts generate 50% of order lines (A items)
  - Hot zones
  - Pick to Light
  - Reverse pick concept
- Next 5% of parts generate 25% of the order lines (B items)
  - Slotting strategies
  - Right size/location of pick slots
- All other parts are very slow moving
  - Dead zones
  - Mezzanines and takeaway conveyors
  - Vertical picking with man-up trucks
  - Stockchaser trucks
  - Cluster picking
  - Less attention needed for these SKUs
High Velocity “A” Parts - Picking Strategy : Hot Zones

➢ For “A” items, set up a high density picking zone with the goal to increase pick density and reduce travel time for both picking and putaway operations.

➢ An ergonomically designed “hot pick” area combined with pick to light or similar technology can enable rapid order turnaround time combined with high levels of efficiency.
Pick to Light

- Typically applied for less than case pick in flow racks (or shelf bins) where faster velocity parts are being picked.
- Highest levels for picking accuracy – typically in the 99.95% range.
- Pick productivity typically in the 100 – 250 lines/hour range depending on order density.
- Often combined with a conveyor for picking multiple orders concurrently.
- Cost of pick to light system is a function of the number of pick locations that require lights so it makes most sense to use this technology for say the fastest 2 – 3,000 parts.
Medium Velocity “B” Parts Picking Strategy: Horizontal Carousels

Carousels

- Suitable for small cube parts that are medium to high velocity in terms of “hits”
- Efficient space usage due to elimination of operating aisles
- Downside is that they need to be shutdown during a quiet time to be replenished
- Pick rates can range from 150 – 600 lines per hour (average is 250 - 300) and are a function of:
  - 2 vs. 3 vs. 4 carousel pods per picker
  - Batch pick 12 orders at a time with put to light
  - Riser platform
  - Scanning confirmation requirements
Slow & Medium Velocity “B” & “C” Parts Picking Strategy: Mezzanines & Zone Transfer Conveyors Slow Velocity Parts

- **Conveyors**
  - 2nd Level mezzanine and ground level shelf picking
  - Shelves run perpendicular to takeaway conveyor
  - Small parts are picked into cartons or totes for transfer to another pick zone or to packing
  - Zone picking – more than 1 operator works the order
  - Cluster picking – picker works multiple orders at a time
  - Audit process for 0.5% of orders
  - Mechanized takeaway conveyors to sortation to pallets
Slow Velocity “C” Parts Picking Strategy:
Cluster Picking Strategies for Slow Velocity Parts

- Pick and sort multiple small orders to a cart
  - E.g. 16 – 32 orders are picked and sorted concurrently
  - Can be deployed in slow moving areas of the warehouse where bin shelving is used (e.g. mezzanines)
  - Typical 75 – 110 lines per hour pick rate depending on many factors
  - Lightweight design
  - Totes can be removed and deposited to takeaway conveyor
A stockchaser truck (e.g. Taylor Dunn) is a vehicle that allows a picker or stocker to quickly travel the warehouse:
- Operator can access product at ground level
- Stockchasers can pull a cluster-pick carts (see previous slide)
Slow Velocity “C” Parts Picking Strategy:
Vertical Picking – Man-Up Order Picker Trucks

- VNA aisles can be configured to be as narrow as wide 48” with wire guidance or say 72” without wire guidance
- Product is hand stacked into vertical rack locations with wire mesh / plywood decking
- Strategy for larger SKUs that do not fit into shelf bins
- Slot fastest “C” items at ground level to reduce vertical travel
- Pick rates vary but will often be in the range of 25 – 50 lines per hour
Optimizing the Packing Function

- Packing Table Layout and Design is critical to maximizing the productivity of this function
  - Understanding how to improve the packing function basically requires insight from having been exposed to other distributors that do well at this function.
  - Pack rates typically range from 75 – 100 lines per hour for parts distributors.
Option: Voice Directed Picking (VDP)

Voice Directed Picking

- Flexible because the technology can be used in all areas of the warehouse.

- Most applicable to areas where two hands are needed for the job
  - Heavy Full Case (e.g. oils, fluids)
  - Bulk products
  - Tires / Exhaust pipes, etc.

- Cost of the technology is a function of the number of pickers using voice.

- Accuracy levels are higher than RF picking because of less quantity errors and eyes always on the job.
Slotting

- Software to continually optimize pick slot assignments to parts
- Tends be require a ½ full time inventory person to make this work.
- Reslot every quarter or every major season
- Only useful if it is used – start-up time can be 4 – 6 months
- Keep fastest “hit” items at the end of the shelf runs to minimize travel into pick aisles
- $75 – 100K typical investment
Option: Warehouse Heat Map

- **Warehouse Heat Map**

  - Used to analyze where labor has been most active in the warehouse
  - Can be used to visually analyze where the most "hits" have been taking place so that reslots can be made for the worst offenders
Recap and Conclusions

- Parts distribution centers generally suffer from low productivity rates because they have large SKU populations and most of the parts are ordered at most a few times a year.
- This presentation highlights the importance of developing picking and storage strategies by the notion of velocity class.
- Techniques in this presentation are designed to increase pick density and reduce travel time.
- There are different technologies and material handling equipment solutions that are most suited to each of the strategies identified in this presentation.
Options to Improve Productivity at a Parts Distribution Center

Marc Wulfraat
President
(514) 482-3572 x 100
Marc.wulfraat@MWPVL.com