

CONDUCTED BY:



CONDUCTED FOR:



Introduction and Methodology

- This research was conducted by the Peerless Research Group on behalf of *Logistics Management* and *Modern Materials Handling* magazine, and marks our twelfth annual <u>Evaluation of Warehouse Operations & Trends</u> survey.
- The study was conducted to evaluate current activities and to assess any trends in the evolution of warehouses and distribution-center facilities and operations.
- Specific areas of investigation include:
 - Nature of distribution center's operations
 - Size of distribution center and scope of distribution activities
 - Areas for possible expansion
 - Distribution center systems and technologies in use
 - Means for measuring productivity
 - Actions taken to manage warehouse operating costs
 - Events that cause disruptions in distribution center operations
- The report compares this year's findings to 2016, 2015 and 2014 results. In each wave, the survey was administered via email invitation to subscribers of *Logistics Management* magazine. Respondents were qualified for being involved in decisions as they pertain to their company's distribution center operations.
- As incentive to respond, individuals participating in the survey were offered the chance to enter a raffle for one of two \$100 amazon.com gift certificates.
- A disposition of each study follows:

	Field dates	Usable surveys	+/- @ 95% confidence level
2014	September, 2014	354	5.4%
2015	September, 2015	217	6.8%
2016	September, 2016	187	7.2%
2017	September, 2017	302	5.8%

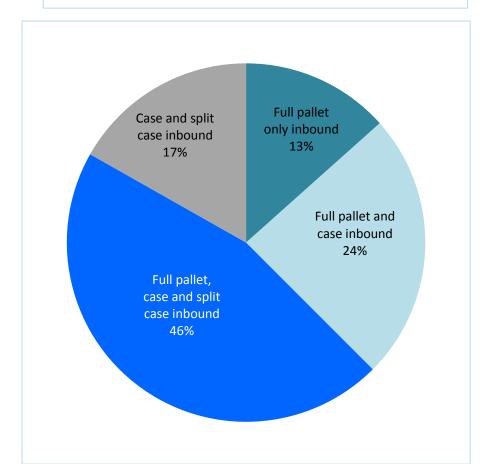


Size and Scope of Distribution Center Network and Operations

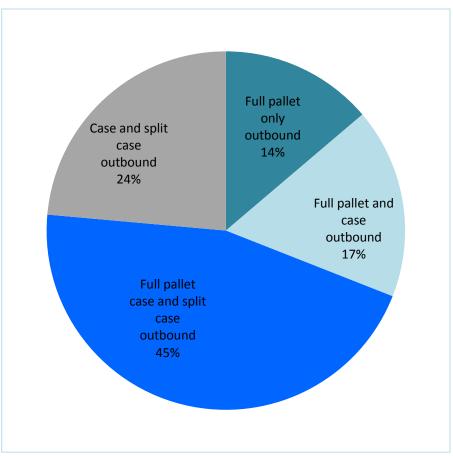


Nature of DC's inbound/outbound operation

Inbound



Outbound

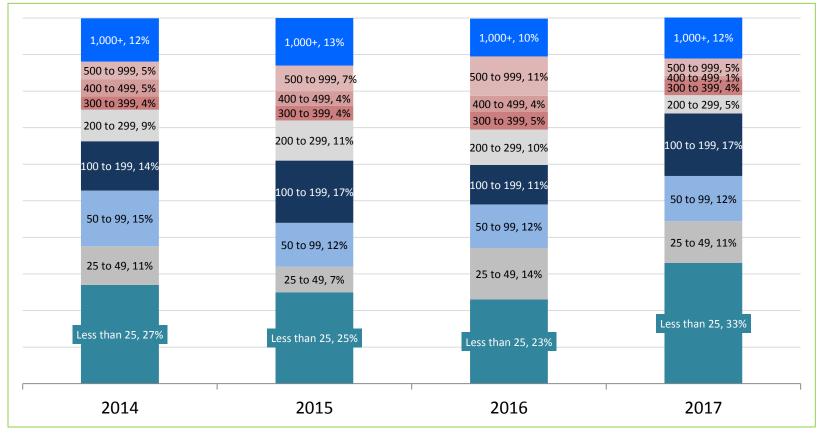


What is the nature of your distribution center's operation?

In what unit load quantities are products shipped outbound?



Number of Employees



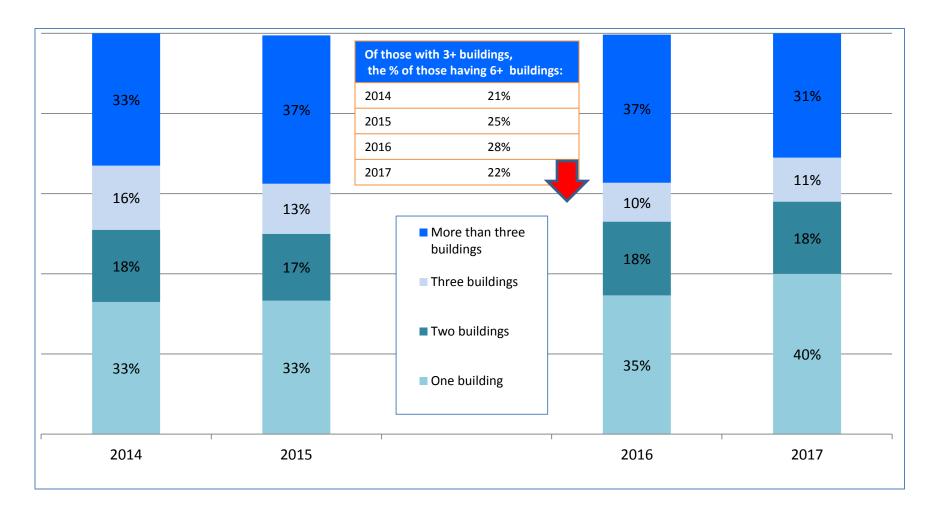
	2014	2015	2016	2017
Average # of employees	249	287	278	228







Size of Distribution Center Network: Number of Buildings





Size of Distribution Center Network: <u>Total</u> Square Footage

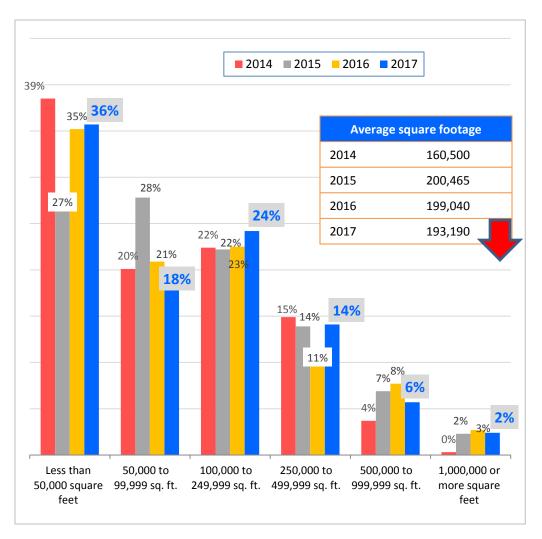
	2014	2015	2016	2017
Less than 25,000 sq. ft.	12%	14%	13%	19%
25,000 – 49,999 sq. ft.	12%	8%	9%	10%
Less than 50,000 sq. ft. (net)	24%	22%	22%	29%
50,000 to 99,999 sq. ft.	16%	9%	12%	12%
100,000 to 249,999 sq. ft.	16%	19%	17%	16%
250,000 to 499,999 sq. ft.	17%	16%	16%	11%
500,000 to 999,999 sq. ft.	10%	14%	15%	13%
1,000,000 to 1,999,999 sq. ft.	6%	7%	9%	8%
2,000,000+ sq. ft.	11%	13%	10%	10%
Average square footage	502,325	570,700	539,000	473,400
Median square footage	195,455	246,341	240,410	176,600







Size of Distribution Center Network: Most Common Square Footage



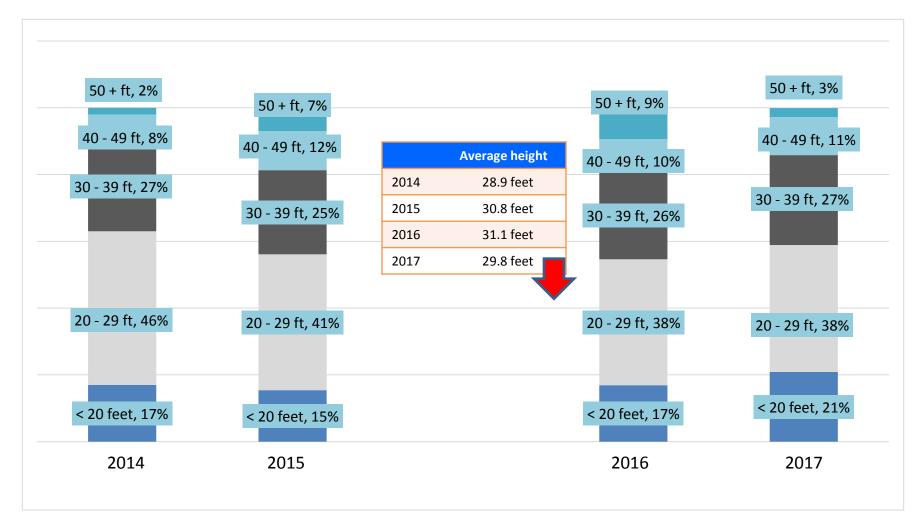
Most common sq. footage if	Network is 3 buildings or less	Network is 4 buildings +
Less than 50,000 sq. ft.	43%	20%
50,000 – 99,999 sq. ft.	20%	14%
100,000 – 249,999 sq. ft.	22%	30%
250,000 – 499,999 sq. ft.	8%	26%
500,000 – 999,999 sq. ft.	6%	5%
1,000,000 + sq. ft.	1%	5%

Average sq. footage	Network is < 3 buildings	Network is 4 buildings +
2017	159,510	264,675
2016	178,090	264,445
2015	158,955	270,680
2014	129,500	224,125

Among the [three or less/four or more] buildings in your network, what is the most common square footage?



Size of Distribution Center Network: Clear Height of Buildings







Scope of Distribution Center Operations: Annual Inventory Turns

	2014	2015	2016	2017
Less than 1.0	5%	6%	7%	3%
1.0 to 2.9	15%	13%	11%	16%
3.0 to 4.9	20%	21%	19%	26%
5.0 to 6.9	17%	15%	17%	14%
7.0 to 8.9	11%	7%	12%	8%
9.0 to 11.9	11%	8%	11%	8%
12.0 to 17.9	8%	15%	7%	10%
18.0 to 23.9	3%	4%	3%	4%
24.0 or greater	11%	11%	14%	10%
Average	8.6	9.1	9.2	8.5







Scope of Distribution Center Operations: Number of SKUs

	2014	2015	2016	2017
Less than 100	12%	12%	11%	19%
100 to 499	12%	16%	12%	11%
500 to 999	12%	10%	13%	11%
1,000 to 2,499	14%	11%	13%	13%
2,500 to 4,999	12%	9%	13%	11%
5,000 to 9,999	11%	12%	9%	9%
10,000 to 19,999	11%	11%	11%	9%
20,000 to 49,999	8%	9%	9%	7%
50,000 – 74,999	1%	3%	4%	4%
75,000 or more	7%	8%	7%	8%
Average	11,840	14,036	13,774	13,130



Roughly what percentage of your SKUs are conveyable and/or could be	
handled robotically?```	

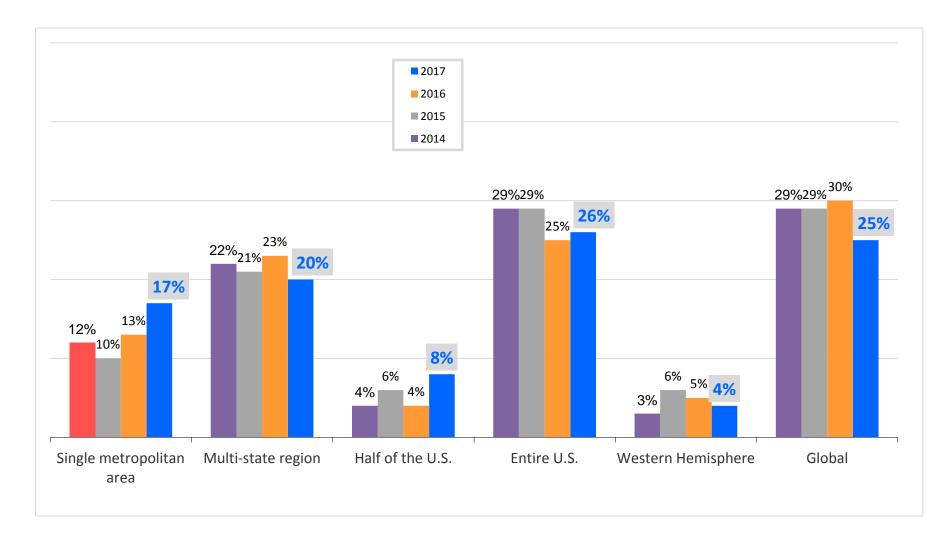
36%

29%





Scope of Distribution Center Operations: Areas of Service





Distribution Center Expansion Plans

Planning to expand over next 12 months:

74% 72% 71% 69% 2015 2017 2014 2016

Areas for expansion:

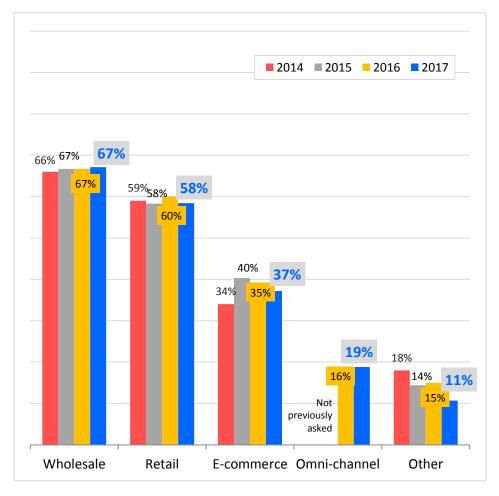
	2014	2015	2016	2017
Number of employees	35%	34%	33%	36%
Number of SKUs	36%	38%	28%	29%
Annual inventory turns	25%	22%	19%	23%
Overall square footage	28%	30%	27%	23%
Area of service	24%	26%	23%	22%
Number of buildings	20%	18%	13%	17%
Height of buildings	5%	5%	3%	5%
Other	4%	5%	2%	3%

Based on those planning expansion

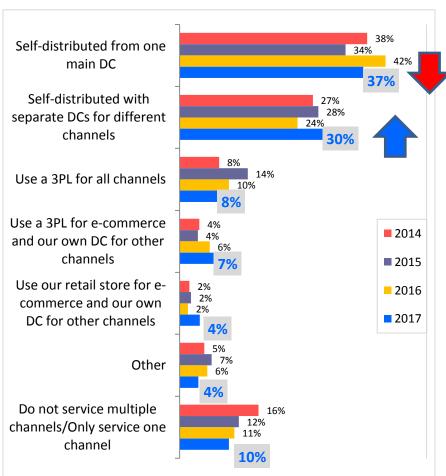
Within the next 12 months, in which area(s) are you considering or planning to expand your distribution center operations?



Market channels serviced by company



How multiple channels are being fulfilled



What market channels does your company service?

If you are servicing multiple channels, how are they fulfilled?

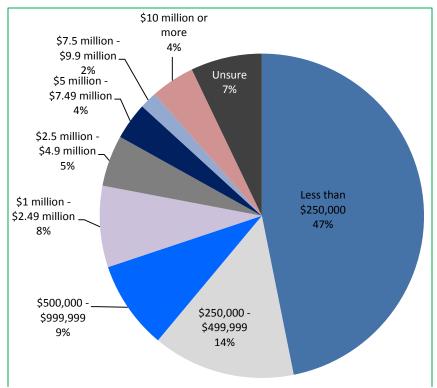


Systems and Technologies in Use



Warehouse Operations & TRENDS

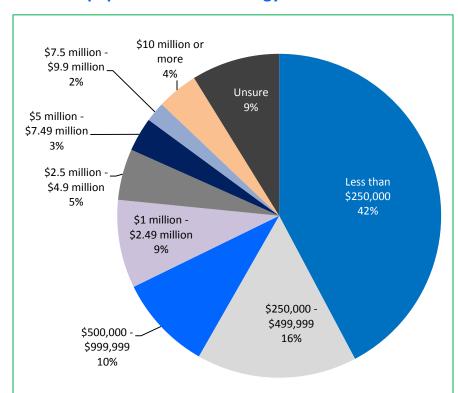
2016 capital expenditures for warehousing equipment and technology



	2013	2014	2015	2016
Average CAPEX	\$1.346M	\$1.213M	\$1.370M	\$1.431M
Median CAPEX	\$252,000	\$266,130	\$242,950	\$250,000

What are your approximate capital expenditures for warehousing equipment and technology in 2016?

Estimated capital expenditures for warehousing equipment and technology in 2017



Projected CAPEX for next year								
	2014 2015 2016 2017							
Average CAPEX	\$1.148M	\$1.354M	\$1.395M	\$1.517M				
Median CAPEX	\$317,000	\$314,815	\$358,696	\$303,190				

And, what do you estimate your capital expenditures for warehousing equipment and technology will be in 2017?





Warehouse Management Systems in use

	2014	2015	2016	2017
Using a Warehouse Management System (NET)	85%	85%	83%	87%
Legacy WMS (basic WMS, homegrown & developed in-house)	35%	35%	35%	42%
ERP with a WMS module	33%	34%	39%	36%
Best-of-breed WMS	18%	16%	11%	13%
Labor management systems (LMS)	10%	10%	10%	12%
Product slotting functionality	7%	6%	8%	9%
On-demand/Cloud/SaaS	4%	3%	3%	5%
None or minimal	15%	15%	17%	13%



What Warehouse Management System (WMS) is currently in use at your distribution center?



Materials Handling Systems in Use

	2014	2015	2016	2017
RECEIVING				
Conventional receiving	81%	86%	84%	84%
Mechanized (conveyor based) receiving	15%	14%	8%	14%
PICKING				
Conventional/cart or lift truck picking	59%	74%	69%	70%
Mechanized (conveyor-based) picking	16%	12%	10%	13%
Automated picking	8%	7%	3%	10%
REPLENISHMENT				
Conventional/cart or lift truck replenishment	62%	62%	65%	62%
Automated replenishment	8%	7%	7%	8%
Mechanized (conveyor-based) replenishment	7%	8%	11%	8%
CONVENTIONAL STORAGE	69%	74%	75%	75%
AUTOMATED STORAGE & RETRIEVAL	10%	7%	9%	10%
AUTOMATIC GUIDED VEHICLES	5%	4%	3%	6%
Other	1%	2%	3%	1%



Picking Technologies in Use

	2014	2015	2016	2017
Paper-based	60%	61%	59%	62%
RF assisted w/Scan verification	49%	50%	49%	48%
Parts to person technology		5%	10%	12%
Light assisted w/Scan verification	8%	8%	12%	10%
Voice assisted with scan verification	7%	7%	8%	7%
RF assisted with no scanning	5%	4%	4%	7%
Voice assisted with no scanning	7%	5%	3%	7%
Automated unit sorter	4%	4%	4%	6%
Robotic or other automated technology		2%	3%	5%
Light assisted with no scanning	3%	4%	1%	4%
Other	2%	2%	1%	1%



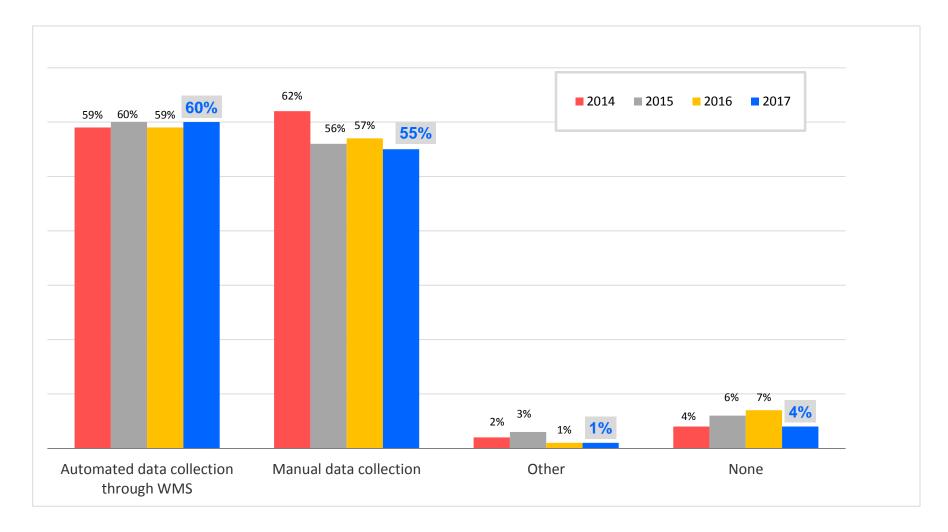
Order Filling Techniques in Use

	2014	2015	2016	2017
Single order picking	80%	75%	71%	79%
Batch picking	42%	44%	42%	43%
Cross docking	32%	33%	35%	30%
Zone picking	26%	34%	33%	27%
"Put" to order	18%	17%	15%	20%
Put-wall system			3%	4%
Other	1%	2%	1%	1%

Which kinds of order filling techniques are currently in use at your distribution center?

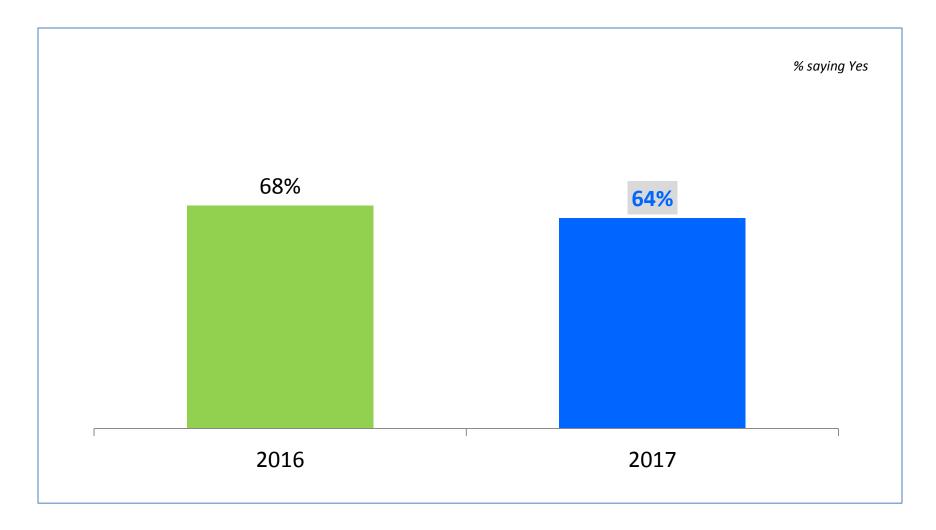


Data Collection Methods Used to Gauge Productivity



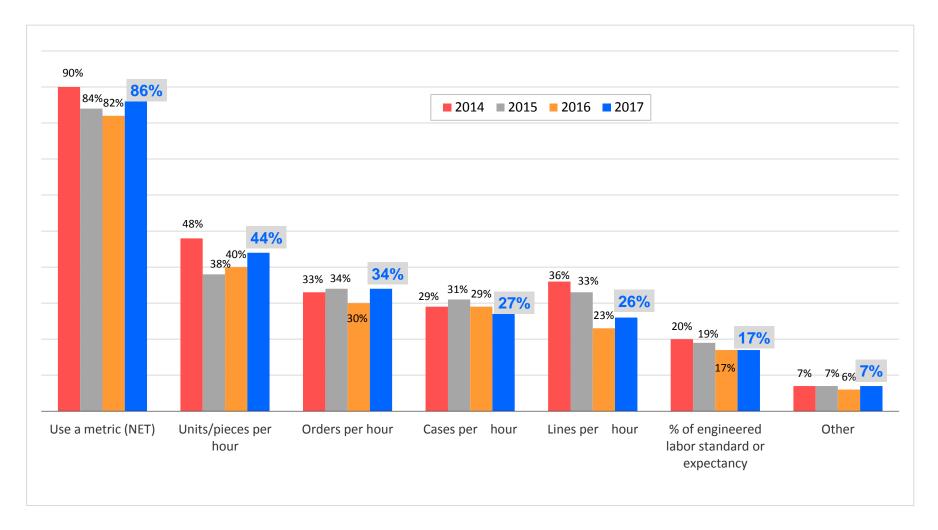


Do you have SKU weight and dims in your Item Master?





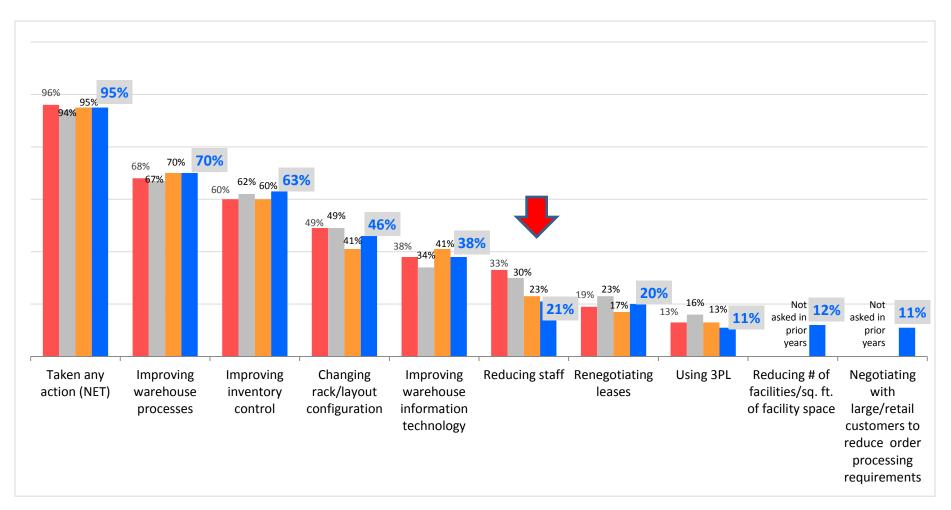
Productivity Metrics in Use







Actions Taken to Lower DC Operating Costs



During the past 12 months of this challenging economy, what actions have you been taking to lower operating costs within your distribution facilities?



Company Policies/Initiatives

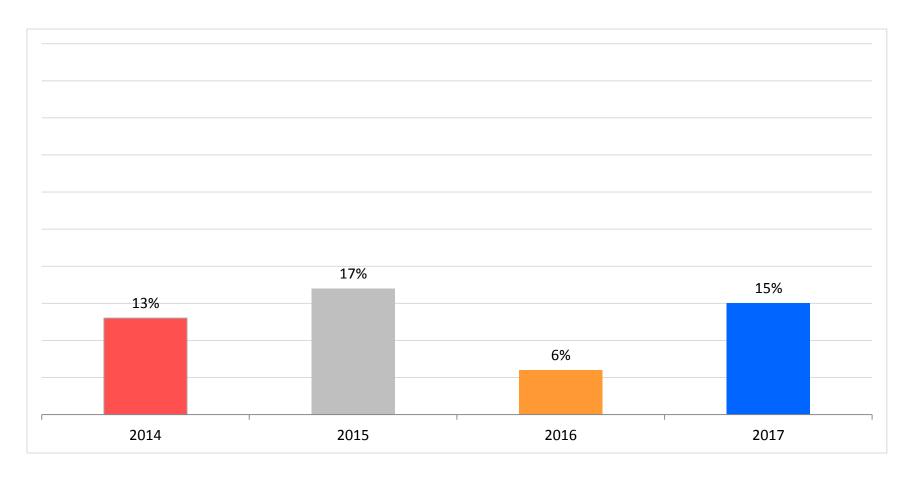


Value-added Services Offered to Customers

	2014	2015	2016	2017
NET any value-added service	87%	87%	89%	90%
Special labeling	56%	54%	54%	54%
Lot number control		40%	37%	34%
Product assembly	30%	24%	27%	31%
Serial number control		30%	33%	30%
Kitting for production	29%	28%	26%	29%
Promotional packs	29%	28%	28%	25%
Grouping/sorting of products prior to shipment	23%	24%	17%	23%
Price marking	15%	13%	19%	18%
Display building and packaging	22%	19%	15%	17%
Deferred customization	17%	15%	11%	15%
RF tagging	10%	11%	13%	13%
Sequencing for production	9%	10%	11%	13%
Other	6%	3%	3%	3%



Organizations That Have Experienced a Catastrophic Event



Has any part of your supply chain experienced any "catastrophic" events in the last 2 years (i.e. earthquakes, hurricanes, other extreme weather, hackers, labor strikes, etc.

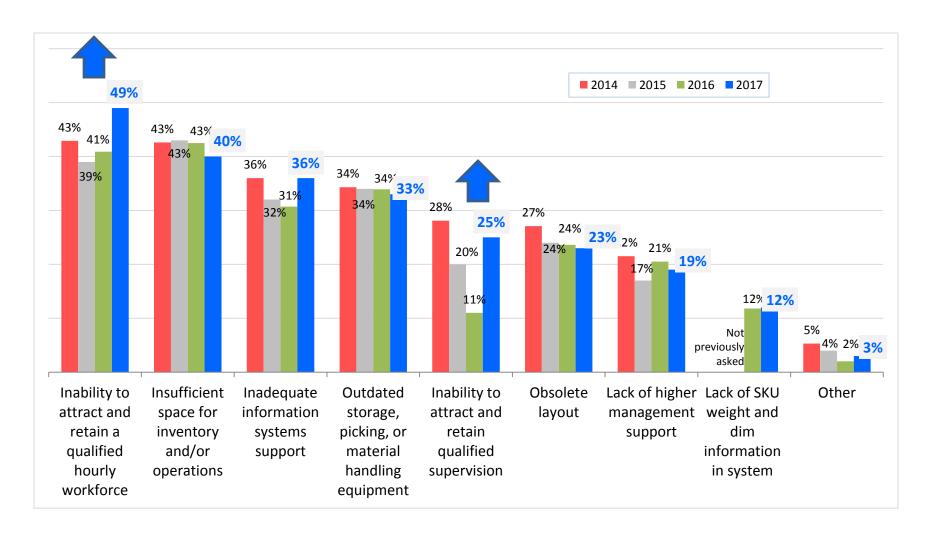


- Adding 3PLs
- Becoming more automated/Automation
- Adding more space/storage/racking systems/Adding DCs
- Expansion/Moving to a new facility/location
- Implementing technologies voice picking/RF scanning
- Improving labor finding talented workers/Improving our LMS/Reducing staff
- Implementing/upgrading our WMS
- Improving warehouse processes/efficiencies
- Improving inventory accuracies/Reducing inventory

See Appendix for complete listing of verbatim comments



Major Issues as it Pertains to Warehouse/DC Operations



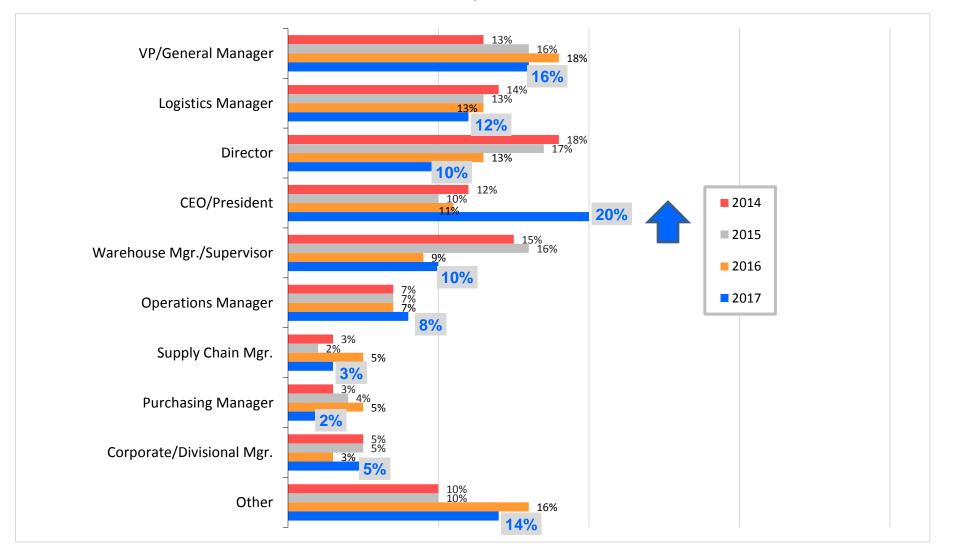


Respondent and Company Profile



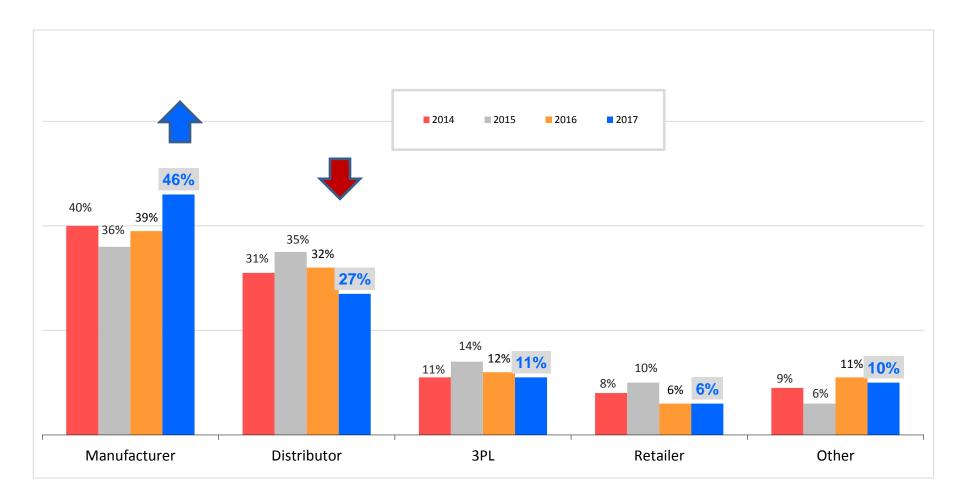


Job Title/Function





Type of Business



Please indicate which of the following best describes your company.

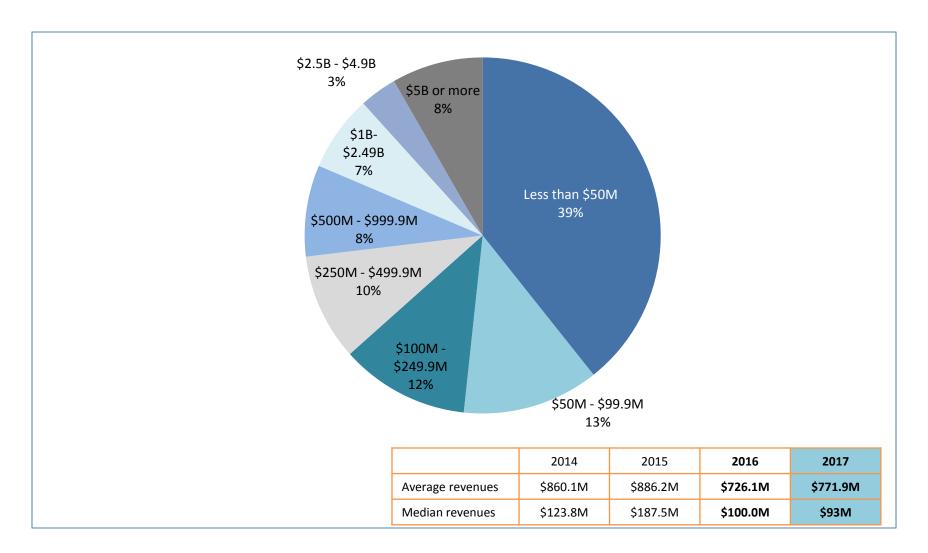


Primary Business at Location

	2014	2015	2016	2017
Food & Grocery	15%	16%	12%	13%
Automotives, Aerospace and Aviation	5%	6%	9%	7%
General Merchandise	7%	6%	6%	7%
Paper, Packaging and Office Supplies	5%	5%	6%	5%
Apparel, Shoes, Accessories	4%	5%	6%	4%
Fabricated metals	5%	4%	6%	6%
Building, Construction & HVAC Materials	6%	7%	5%	5%
Electronics, Computers and Software	4%	7%	4%	7%
Pharmaceutical/Health Care/Medical Devices	7%	6%	4%	3%
Chemicals	5%	4%	4%	3%
Industrial equipment	3%	3%	4%	5%
Furniture and Appliances	2%	1%	4%	3%
Parts and Equipment	1%	1%	3%	3%
Rubber, Plastics, Ceramics, etc.	3%	3%	1%	2%
Cosmetics, Fragrances, Beauty	1%	1%	1%	2%
Other (includes sporting goods, agriculture, energy, etc.)	27%	25%	25%	25%



Annual Revenues



Appendix

Verbatim Comments

3 years, 8 DC Managers.

3PLs

3PLs

Add location

Adding 3PLs, Make to order JIT.

Adding fulfillment in stages

Adding Mechanization

Adding more sku's.

Adding more space

Adding regional DC's

Additional storage racks

Automated shipping lines to scan and sort shippers to correct carrier by service level.

Automation

Automation

Automation

Automation. Improved inventory control systems

Balance the levers and the drivers of every industry, mostly the spectacular ones in the face of politics.

Bar Code / RFID system implementation, integrated with ERP

Batch picking for single-line orders

Better automation

Better flow

Better people management

Better racking

Better training & productivity

Bringing in new products

Buildings.

Cessation of liquid HazMats storage, expansion of SF

Challenge in hiring sharp talent for warehouse roles

Change of WMS to SAP

Changing layout of facility.

Combining two facilities into a single location

Company ownership

Configuration of customer orders continues to evolve towards less full pallets, more mixed SKU case picks

Consolidation of two major centers into one center.

Corporate spinoff

Cost of labor

Cross training

Daily P&L tracking.

Depends on customer's needs. Always changing

Deploying RF receive/put away/pick/pack/ship across company retail/wholesale locations.

Digitalization and automation of processes.

Down sizing

Due to increase in pallet processing buying a palletizer to auto shrink wrap, saved significant time in prep

E-COMMERCE

Expanding to Houston, TX

EXPANSION

Expansion

EXPANSION BY ADDING ANOTHER DC

Finding good employees

Finding good employees.

Full utilization of engineered labor standards

GEMBA WALK BOARD

Growth and the need to adapt and change going forward. Need better automation to improve inventory control.

Having to go out and secure additional warehouse space.

HAZMAT shipping requirement

HIRING FULL TIME EMPLOYEES AND REDUCE THE NUMBER OF TEMPS ON SITE

I would say looking back on our inventory and seeing the lay time it took to move material off the shelf .

Implementation of Best of Breed systems (WMS, TMS, ERP)

Implementation of RF scanning.

Implementation of Voice pick

Implementing a WMS

Implementing automatic cycle counting.

Implementing new ERP system.

Implementing voice

Import and Export

Improve inventory control procedures, metrics, and processes

Improved cost modeling and Network Optimization

Improved efficiency.

Improved flow

Improved labor management systems

Improved organization and reduced inventory.

Improved productivity

Improving inventory control

Improving processes to increase efficiency and decrease staffing

Improving warehouse process

Improving warehouse processes

Improving warehouse processes

Improving warehouse processes

Improving warehouse processes

Increase efficiency

Increase in business

Increase in number of DCs and deployment of best of breed ERP, TMS and WMS

Increase in volume

Increase size

Increased quantity of items handled to support more product lines

Increased special handling, labeling, sequencing, less than full pallet picks Number of SKU's

Increased volumes and inventory have resulted in capacity challenges

Inefficiencies of our customers

Infrastructure

Insourcing

Integration of Direct to Consumer fulfillment into the Wholesale/Retail DC.

Inventory accuracy

Inventory accuracy

Inventory control

Inventory increase.

Inventory reduction and hiring /retention practices.

Is when we first started we had a lot of orders

Keeping inventory low Eliminate low turnover products

Labor shortage

Larger number of SKUs

Layout and slotting

Layout change, leaning of process

Layout of bin locations

LOSS OF PRODUCT STAGING AREA

Management personnel change

Material handling

More automation

More case movement and more SKUs

More customer orders.

More distribution centers

Moved to large facility within the states. Went to conveyor and scanning tech for picking and put away

Moving

Moving into a new facility bringing all aspects of distribution under one roof

Moving locations - large pick and pack accounts

Moving to a larger warehouse

My business has declined significantly due to illness

New facility

New facility added.

New facility, improved technology, equipment and processes

New layout in shipping and receiving.

New scanning equipment

New Software Program

New WMS that is home-grown as not to be tied to a OEM supplier for upgrades and enhancements.

On line buying

Opening of new West Coast DC

Optimizing turn times compared against the deployed capital of the inventory. Objectives were to have fresh and required inventory yet reduce "Stale" capital in the warehouse. So some expensive items are no longer stocked, especially if they can be delivered in 2 days.

Organization

Organization, layout and barcode scanning

Outsource my all or D.C. Facilities

Packaging Improved

Partial Automation

Personnel training

President Donald Trump

Process improvement

Process improvement, Employee retention

Process Management

Process re-alignment and worker productivity

Product mix

Productivity gains of 25 % in the last 12 months through Continuous Improvement

Putting in place exacting processes and procedures that help manage the way we manage our inventory

Quality and quantity of work. Providing additional production offering. Upgrading software and sorting methods.

Racking changes

Reducing facilities

Reducing inventory

Reducing staff

Reducing the number of Staff

Reducing the square footage

Reduction in sales/orders

Reduction of sq. ft of facility space and renegotiated leases

Regulatory requirements for hazardous materials processing

Relocation to new facility with 32' clear

Reorganizing of warehouse area

RF Scanning and expansion to a larger facility

Right sizing facilities

Robotics

SAP implementation and Easy WMS

Scanning of all out-bound bicycles, and plans are in affect to start scanning all inbound bikes that come off containers

Senior management change

Separating different product families.

Shelving locations

SKU location and Picking based upon SKU Velocity versus locations based upon Brand / Style / Color / Size.

Slotting

Smaller and smaller orders.

Staff reduction

Staff reduction

Staff reduction

Standardization of operating procedures

Streamlining to be more lean and efficient

Technology and Training

Technology Improvements.

Tecnologías de la información y capacitación de personal

The addition of voice picking

The amount of SKU's

The evolution and growth of our Ecommerce fulfillment operations

The migration away from warehouse-based stockpiling of inventory to high-velocity operations, pushing more products through the same physical assets while bringing down overall costs.

The most significant change has been reducing the number of facilities in our network from 5 to 3.

The most significant change were voice picking, WMS, tracking and telemetry trucks

The number of clients and number of sku's in house.

The significant increase in internet orders

The use of wireless technology to communicate with employees

Tighter inventory control with reference to the market/sales

Transforming warehouse to an adaptable inbound/ outbound spaces by joining receiving and shipping

Usage of technology: one WMS, slotting software, and LMS

Use of data collection to measure processes

Use of FBA

Utilizing 3PLs

Voice picking

Volume increases

Waste management has been a focus. We reduced the volume going to the landfill and moved to recycling and reuse of waste. Saved dollars and is good for the environment.

Waveguide-based wireless picking system.

We have got bar coded handheld computers.

We have reduced the number sku numbers that had low turn over

We have seen buyers shifting to more JIT Inventory.

Went to a three shift operation

WMS improved processes RFID integration

WMS system