



AN EVALUATION OF
Warehouse Operations
& **TRENDS**

September 2018

CONDUCTED BY:

PRG
PEERLESS RESEARCH GROUP

CONDUCTED FOR:

Logistics
MANAGEMENT. **MODERN**
MATERIALS HANDLING.



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 thirteenth annual *Evaluation of Warehouse Operations & Trends* 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 2017, 2016 and 2015 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
2015	September, 2015	217	6.8%
2016	September, 2016	187	7.2%
2017	September, 2017	302	5.8%
2018	September, 2017	138	8.8%

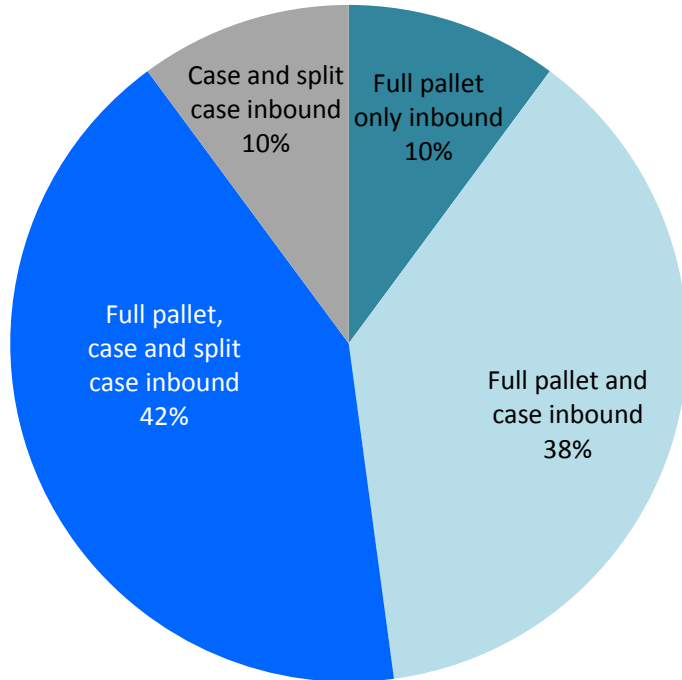


Size and Scope of Distribution Center Network and Operations



Nature of DC's Inbound/Outbound Operation

Inbound

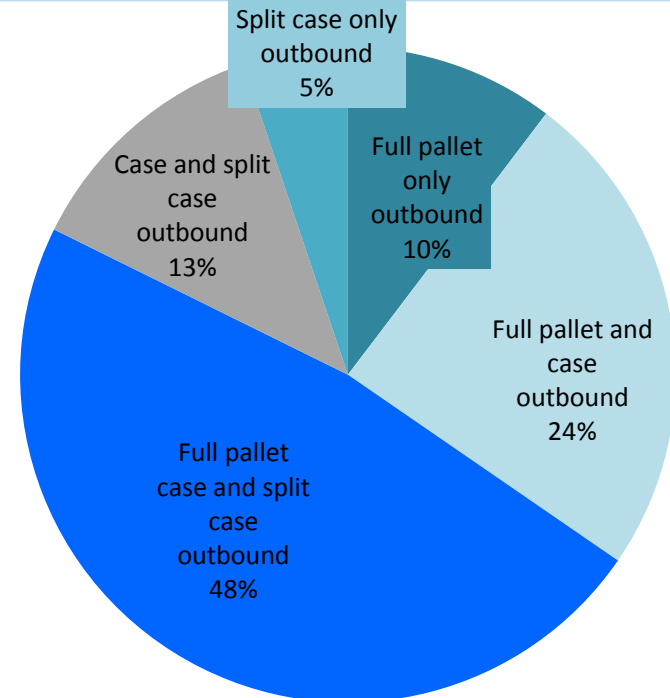


2017 Results

Full pallet only inbound	13%
Full pallet and case inbound	24%
Full pallet, case and split case inbound	46%
Case and split case inbound	17%

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

Outbound



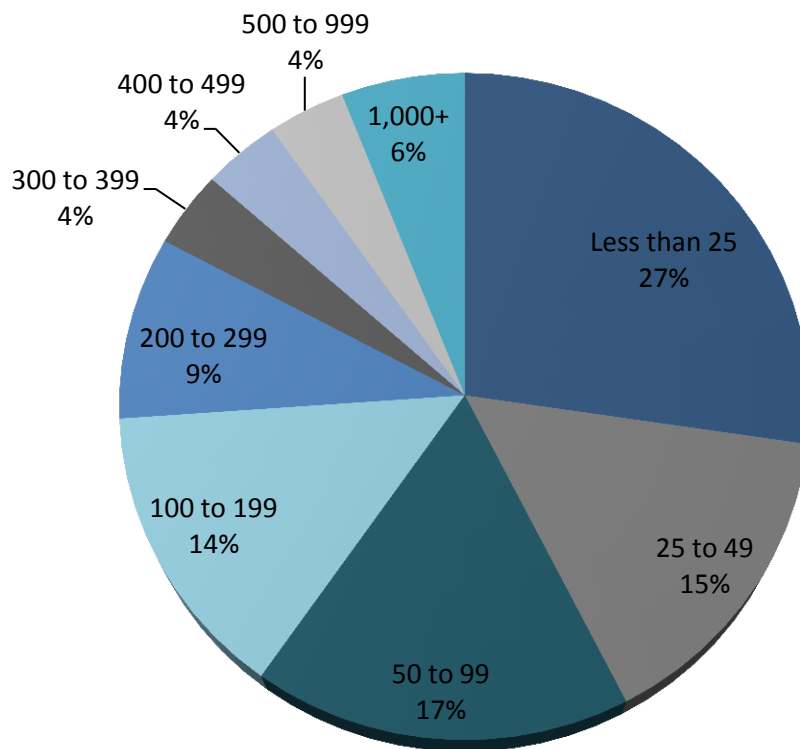
2017 Results

Full pallet only outbound	14%
Full pallet and case outbound	17%
Full pallet case and split case outbound	45%
Case and split case outbound	24%

In what unit load quantities are products shipped outbound?



Number of Employees in Company's Main Warehouse

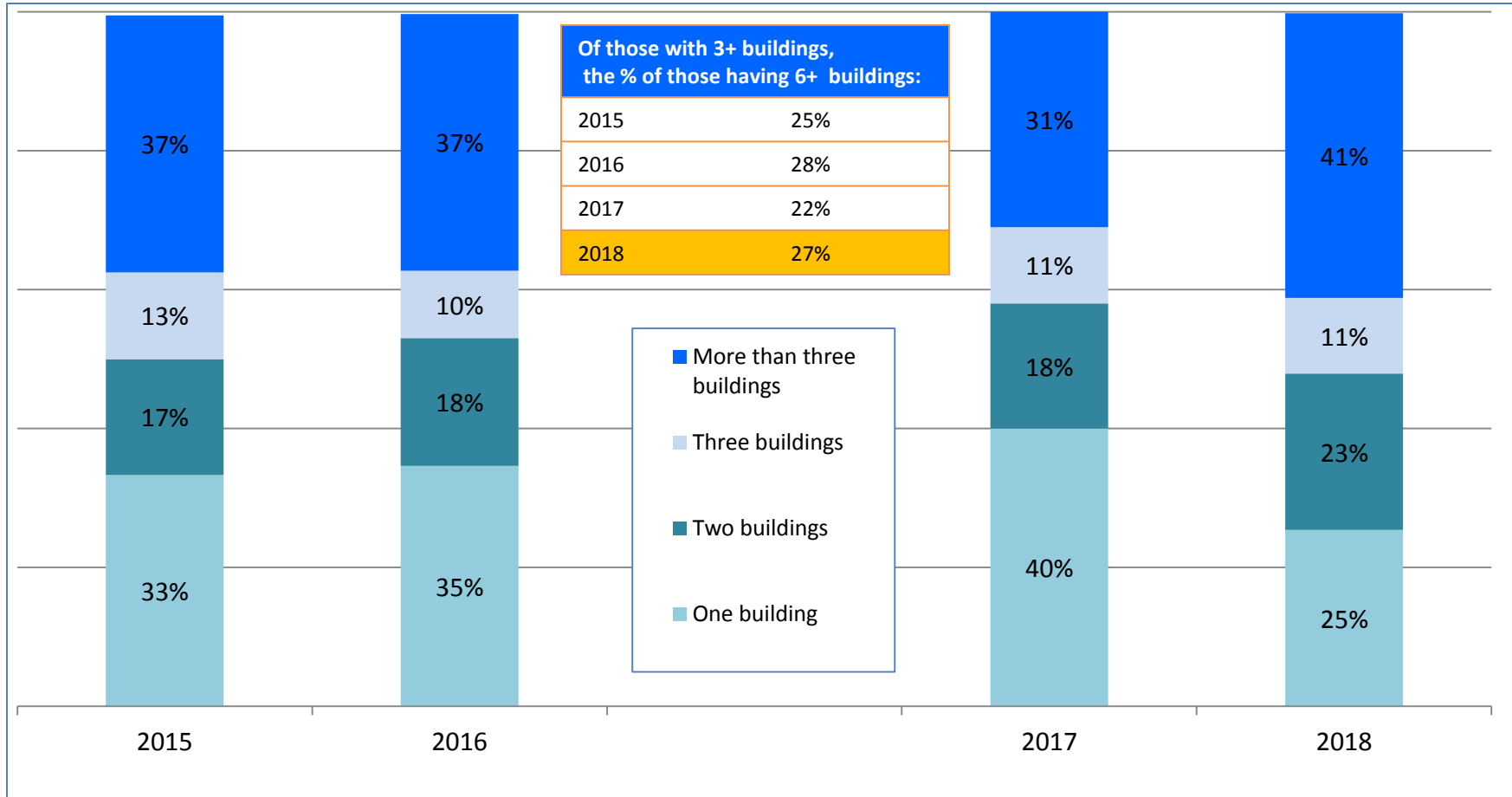


What is the total number of employees in your company's main warehouse?

	2018
Average # of employees	182



Size of Distribution Center Network: **Number of Buildings**



How many buildings are in your distribution network?



Size of Distribution Center Network: Total Square Footage

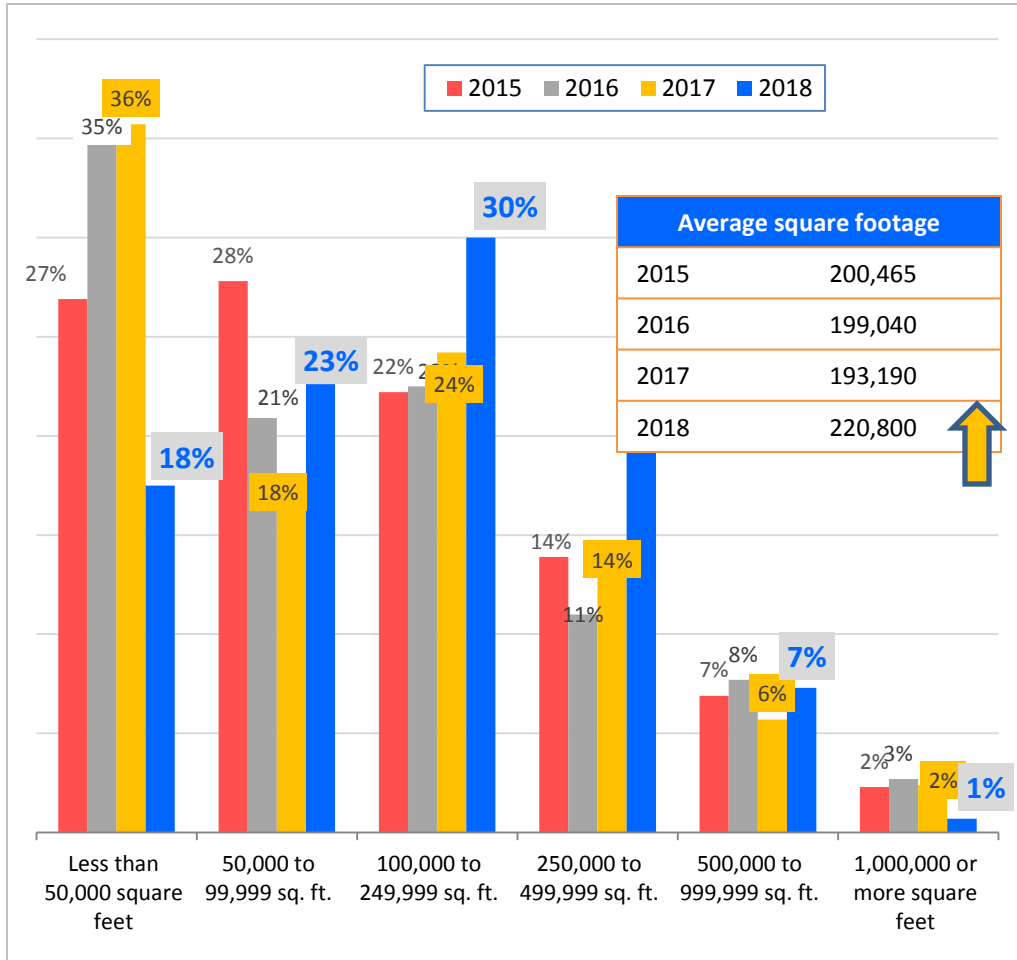
	2015	2016	2017	2018
Less than 25,000 sq. ft.	14%	13%	19%	6%
25,000 – 49,999 sq. ft.	8%	9%	10%	4%
Less than 50,000 sq. ft. (<i>net</i>)	22%	22%	29%	10%
50,000 to 99,999 sq. ft.	9%	12%	12%	6%
100,000 to 249,999 sq. ft.	19%	17%	16%	30%
250,000 to 499,999 sq. ft.	16%	16%	11%	18%
500,000 to 999,999 sq. ft.	14%	15%	13%	10%
1,000,000 to 1,999,999 sq. ft.	7%	9%	8%	9%
2,000,000+ sq. ft.	13%	10%	10%	17%
Average square footage	570,700	539,000	473,400	672,080
Median square footage	246,341	240,410	176,600	305,000



What is the approximate **TOTAL** aggregate square footage of all buildings in your distribution center network?



Size of Distribution Center Network: Most Common Square Footage



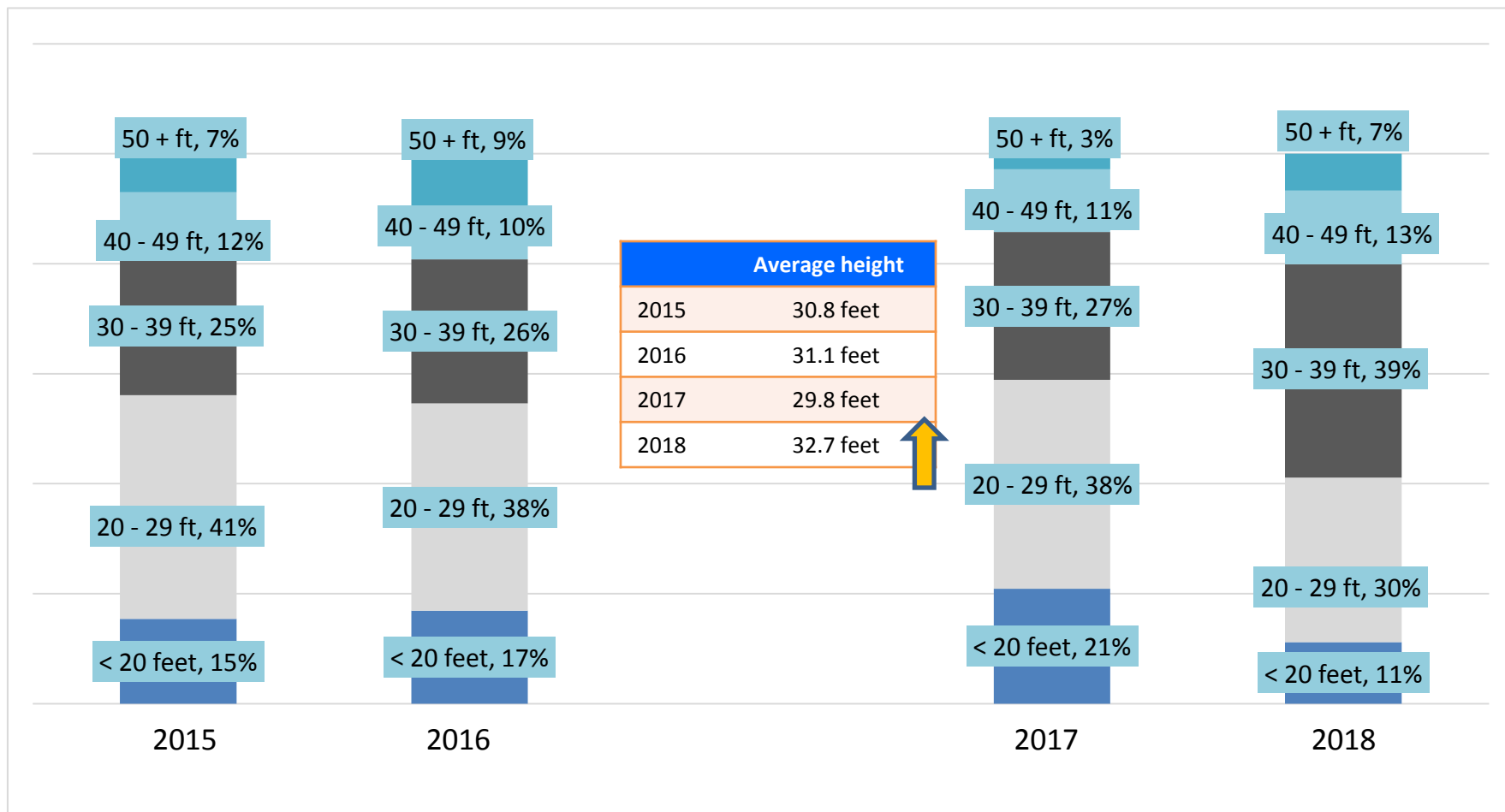
Among the buildings in your network, what is the most common square footage?

Most common sq. footage if . . .	Network is 3 buildings or less	Network is 4 buildings +
Less than 50,000 sq. ft.	16%	2%
50,000 – 99,999 sq. ft.	9%	2%
100,000 – 249,999 sq. ft.	42%	12%
250,000 – 499,999 sq. ft.	20%	16%
500,000 – 999,999 sq. ft.	9%	12%
1,000,000 + sq. ft.	4%	56%

Average sq. footage	Network is < 3 buildings	Network is 4 buildings +
2018	267,190	736,405
2017	159,510	264,675
2016	178,090	264,445
2015	158,955	270,680



Size of Distribution Center Network: Clear Height of Buildings

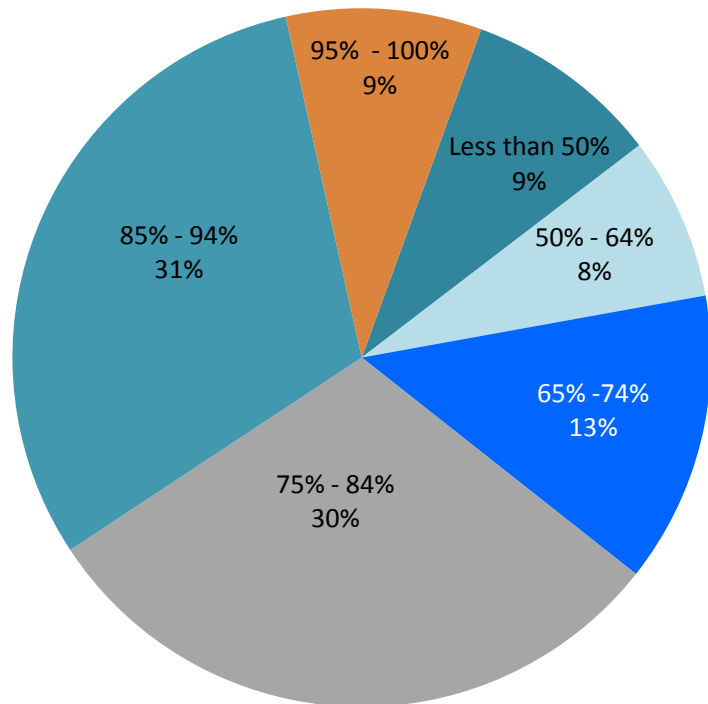


What is the most common clear height?



Space utilization

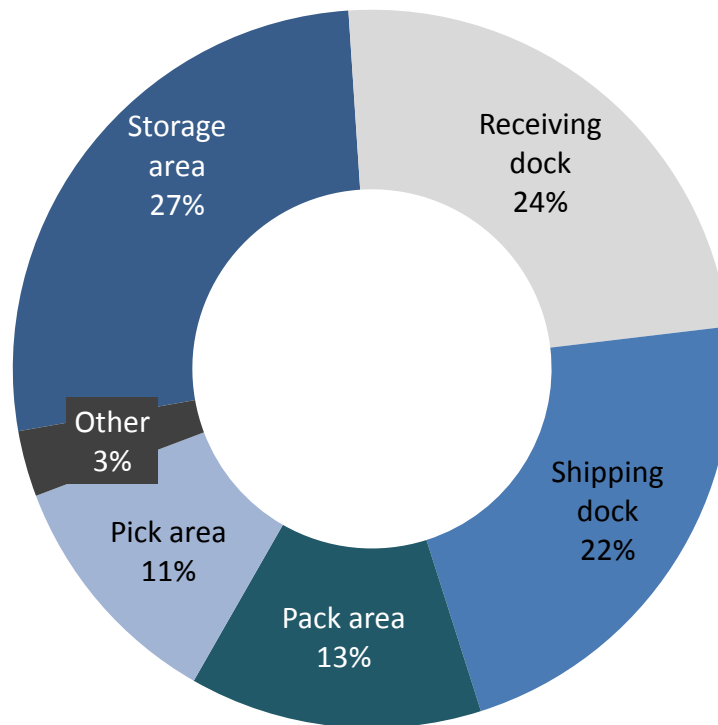
Average warehouse space utilization



Average % of space used: 78.3%

What do you estimate your average warehouse space utilization (pallet storage capacity utilization) will be in 2018?

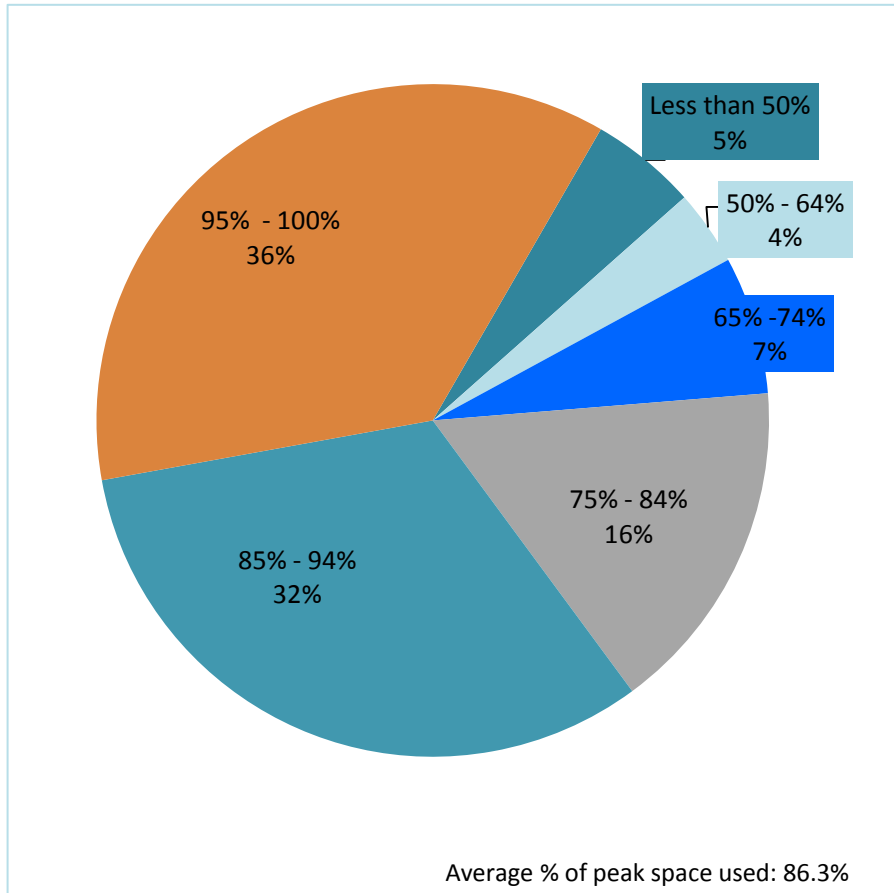
The most congested area in warehouses



Which area in your warehouse is the most congested in terms of square footage (space)?

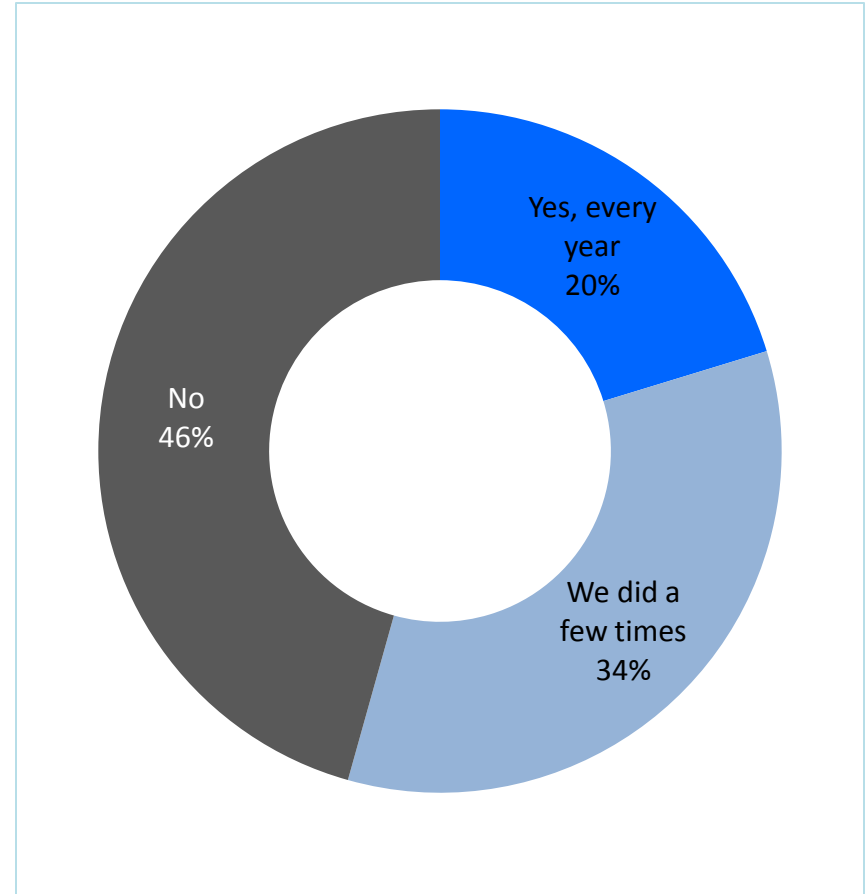


Peak warehouse space utilization



And, what do you estimate your peak warehouse space utilization (pallet storage capacity utilization) will be in 2018?

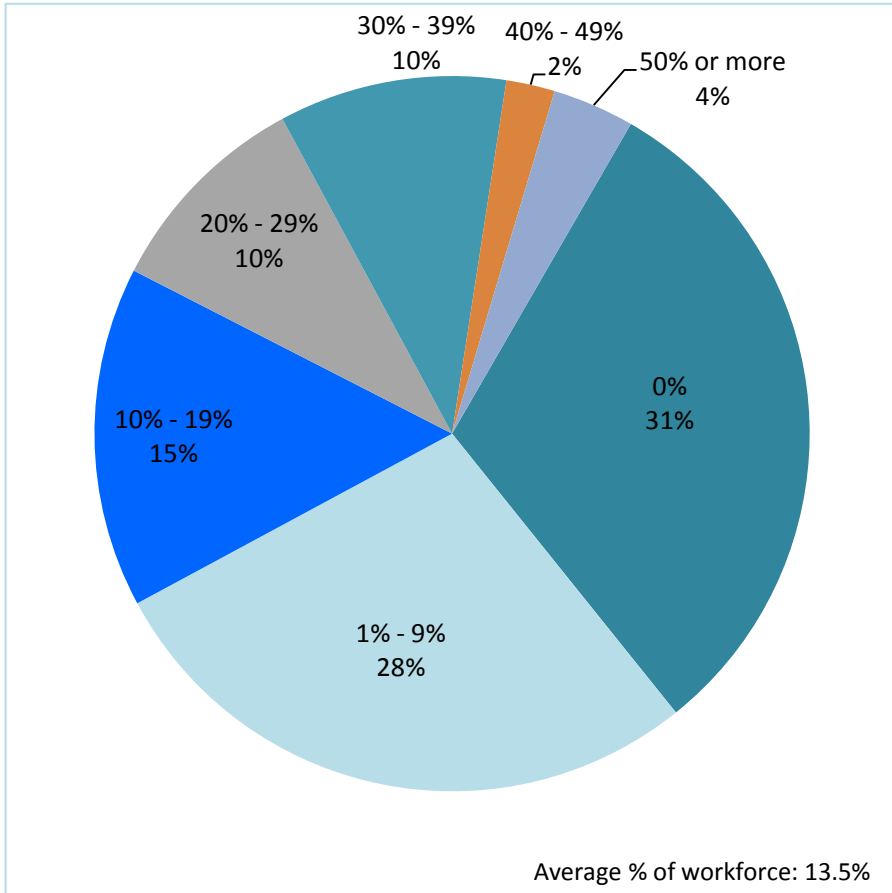
Leasing additional space during peak season



In the past five years, have you leased additional/outside space during peak season?

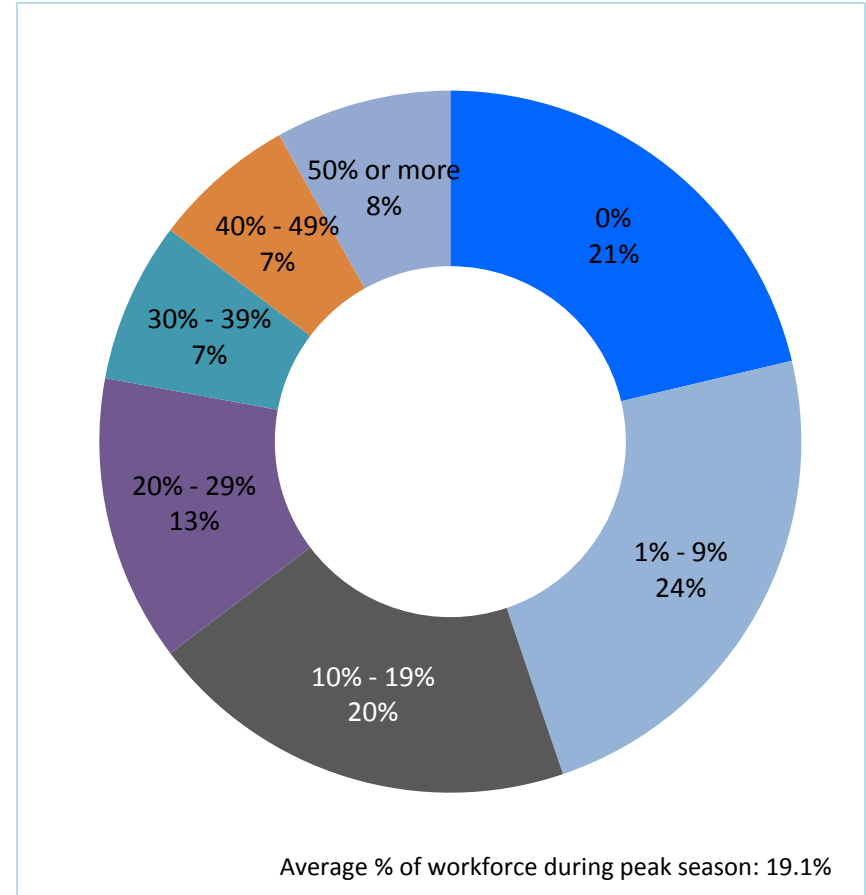


Percent of workforce who are temporary during *average* volume periods



What percentage of your workforce are temporary employees during average volume periods?

Percent of workforce who are temporary during *peak* volume periods



What percentage of your workforce are temporary employees during peak volume periods?



Scope of Distribution Center Operations: Annual Inventory Turns

	2015	2016	2017	2018
Less than 1.0	6%	7%	3%	4%
1.0 to 2.9	13%	11%	16%	11%
3.0 to 4.9	21%	19%	26%	27%
5.0 to 6.9	15%	17%	14%	13%
7.0 to 8.9	7%	12%	8%	9%
9.0 to 11.9	8%	11%	8%	10%
12.0 to 17.9	15%	7%	10%	12%
18.0 to 23.9	4%	3%	4%	3%
24.0 or greater	11%	14%	10%	11%
Average	9.1	9.2	8.5	8.9

Approximately how many inventory turns do you have annually?



Scope of Distribution Center Operations: **Number of SKUs**

	2015	2016	2017	2018
Less than 100	12%	11%	19%	8%
100 to 499	16%	12%	11%	15%
500 to 999	10%	13%	11%	9%
1,000 to 2,499	11%	13%	13%	13%
2,500 to 4,999	9%	13%	11%	9%
5,000 to 9,999	12%	9%	9%	12%
10,000 to 19,999	11%	11%	9%	16%
20,000 to 49,999	9%	9%	7%	8%
50,000 – 74,999	3%	4%	4%	3%
75,000 or more	8%	7%	8%	7%
Average	14,036	13,774	13,130	13,985



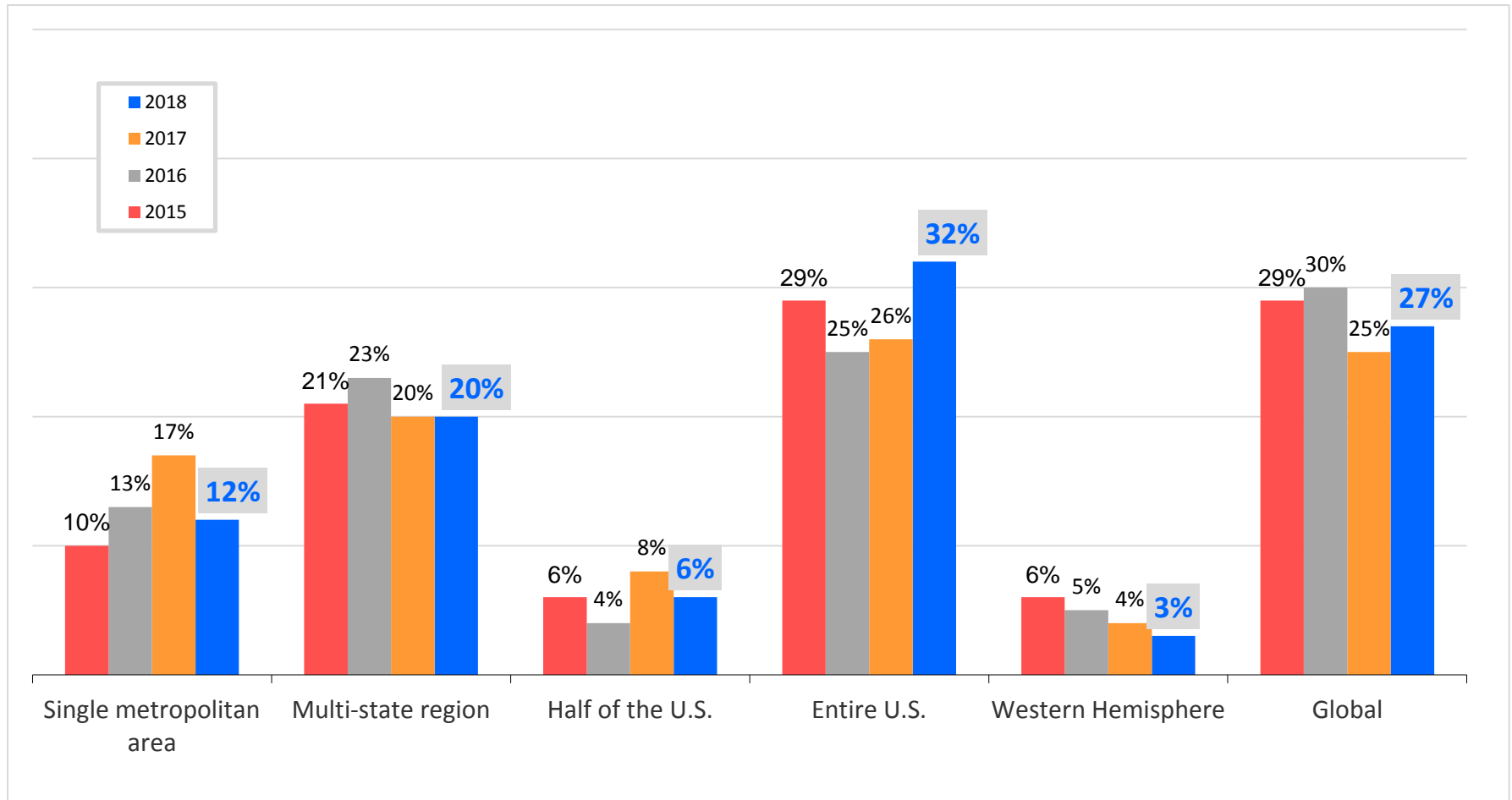
Roughly what percentage of your SKUs are conveyable and/or could be handled robotically?''''	36%	29%	43%
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Approximately how many SKUs do you carry?



Scope of Distribution Center Operations: **Areas of Service**

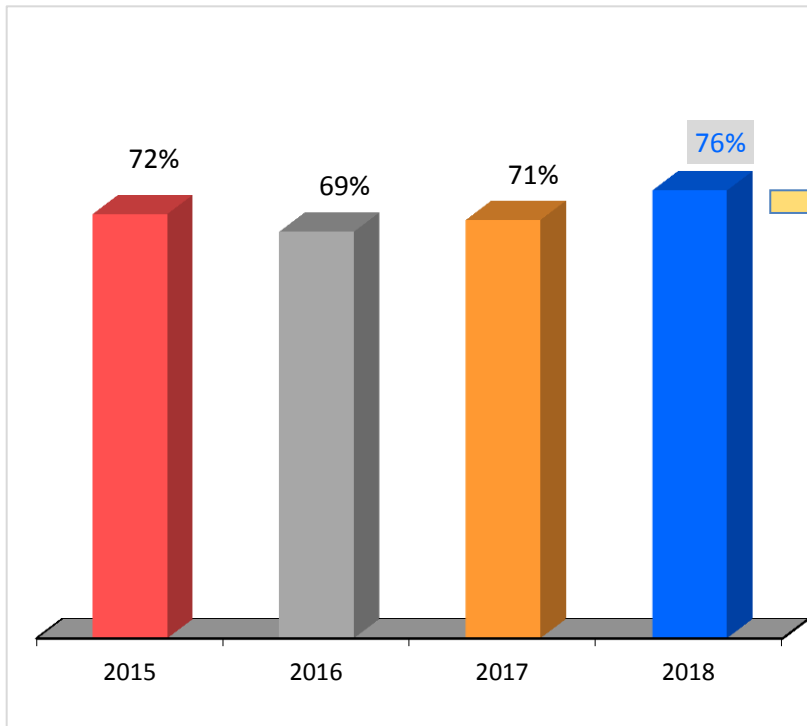


What is the geographic scope of your distribution center operations?



Distribution Center Expansion Plans

Planning to expand over next 12 months:



Areas for expansion:

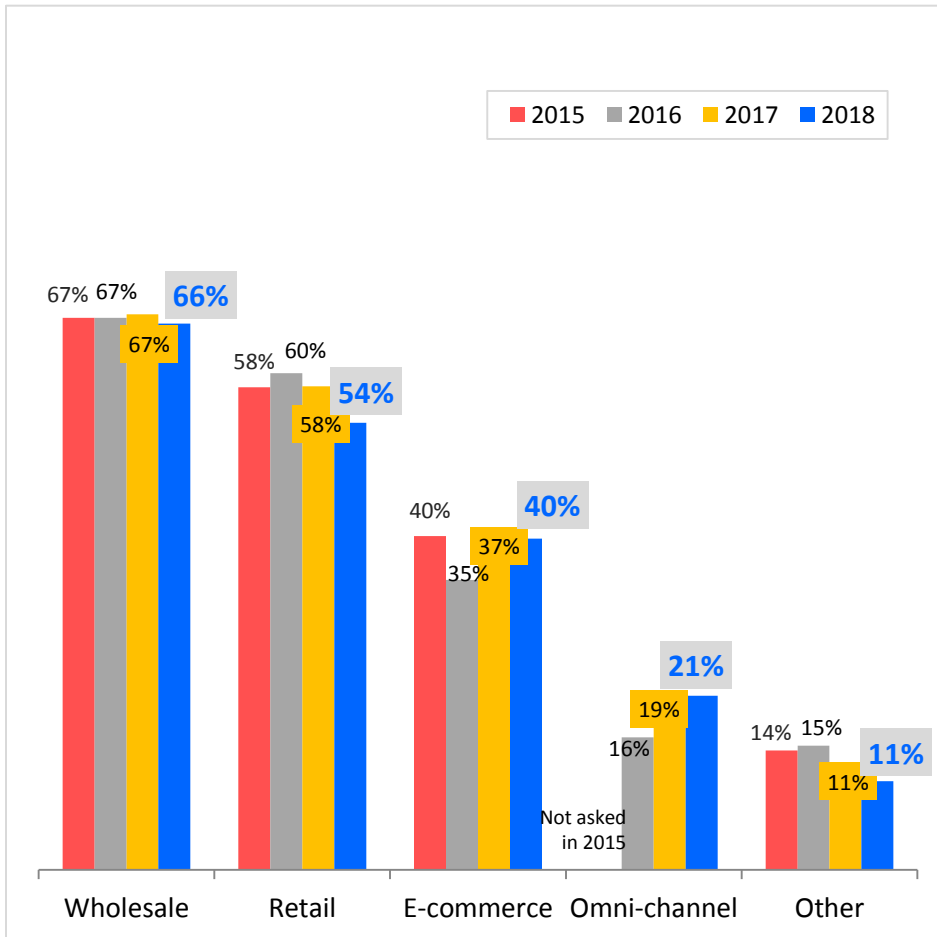
	2015	2016	2017	2018
Number of employees	34%	33%	36%	33%
Number of SKUs	38%	28%	29%	33%
Annual inventory turns	22%	19%	23%	17%
Overall square footage	30%	27%	23%	29%
Area of service	26%	23%	22%	21%
Number of buildings	18%	13%	17%	23%
Height of buildings	5%	3%	5%	5%
Other	5%	2%	3%	3%

Based on those planning expansion

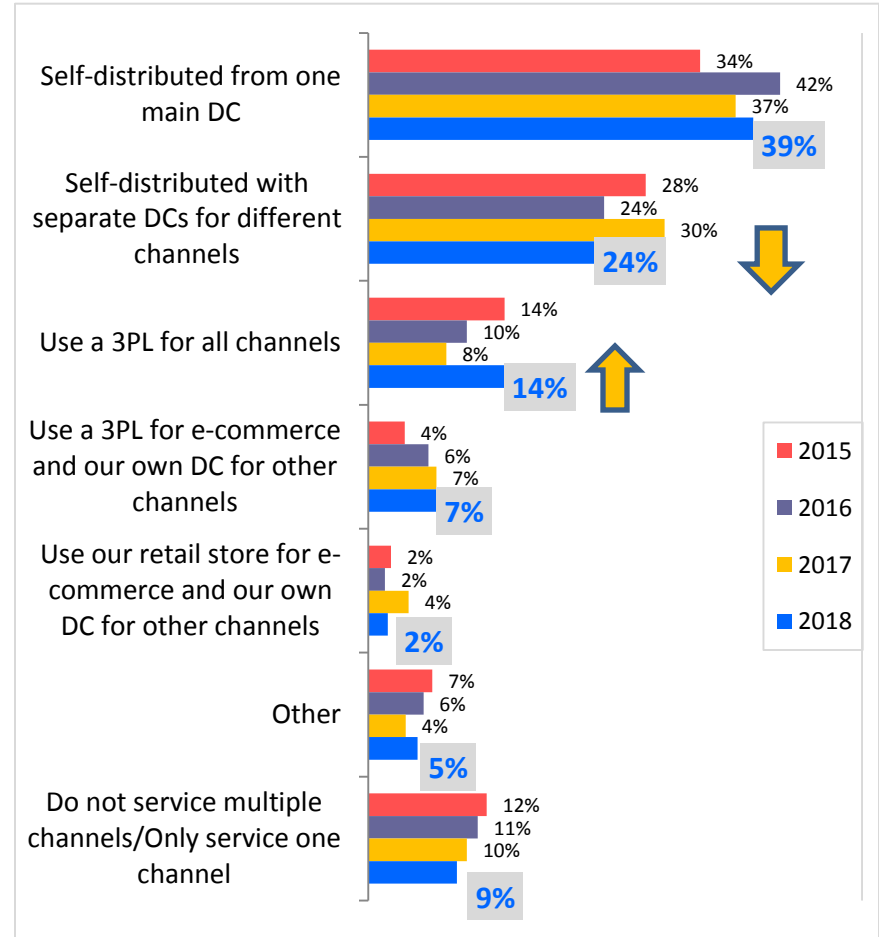
Within the next 12 months, in which area(s) are you considering or planning to expand your distribution center operations?



Market channels serviced by company



How multiple channels are being fulfilled



What market channels does your company service?

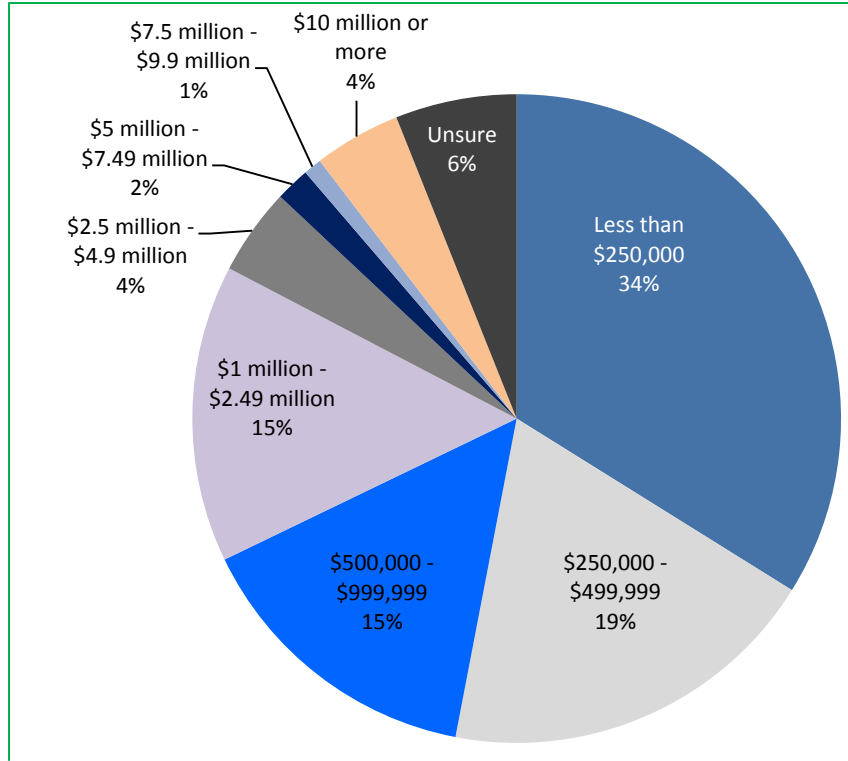
If you are servicing multiple channels, how are they fulfilled?



Systems and Technologies in Use



2018 capital expenditures for warehousing equipment and technology

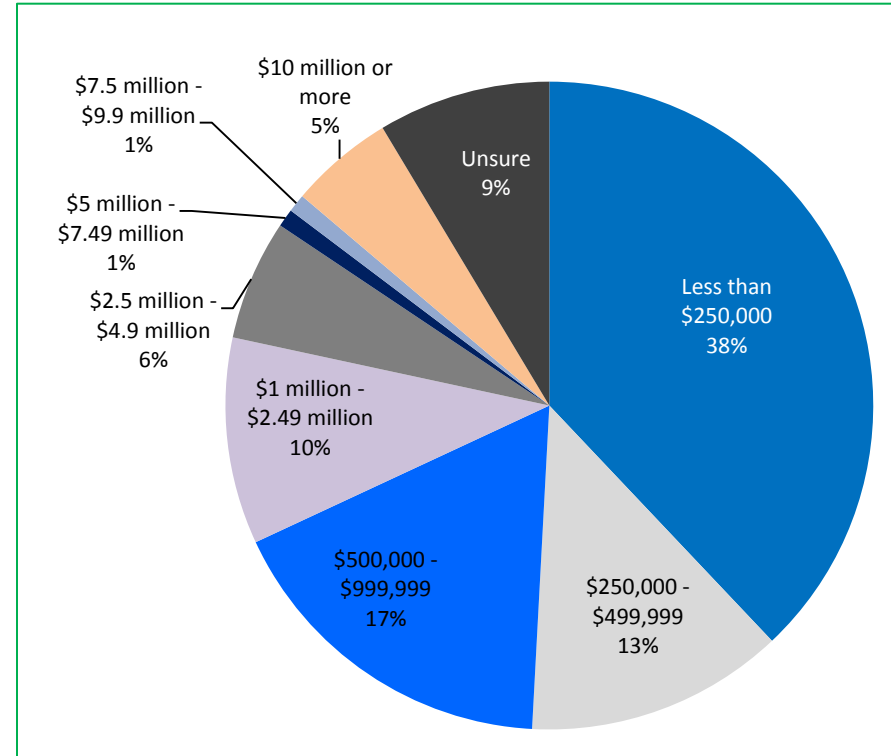


Current CAPEX

	2015	2016	2017	2018
Average CAPEX	\$1.213M	\$1.370M	\$1.431M	\$1.213M
Median CAPEX	\$266,130	\$242,950	\$250,000	\$420,455

What are your approximate capital expenditures for warehousing equipment and technology in 2018?

Estimated capital expenditures for warehousing equipment and technology in 2019



Projected CAPEX for next year

	2016	2017	2018	2019
Average CAPEX	\$1.354M	\$1.395M	\$1.517M	\$1.267M
Median CAPEX	\$314,815	\$358,696	\$303,190	\$450,000

And, what do you estimate your capital expenditures for warehousing equipment and technology will be in 2019?



Warehouse Management Systems in use

	2015	2016	2017	2018
Using a Warehouse Management System (NET)	85%	83%	87%	93%
Legacy WMS (basic WMS, homegrown & developed in-house)	35%	35%	42%	43%
ERP with a WMS module	34%	39%	36%	33%
Best-of-breed WMS	16%	11%	13%	19%
Labor management systems (LMS)	10%	10%	12%	15%
Product slotting functionality	6%	8%	9%	10%
On-demand/Cloud/SaaS	3%	3%	5%	9%
WCS/WES-based system	NA	NA	NA	6%
None or minimal	15%	17%	13%	7%



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



Materials Handling Systems in Use

	2015	2016	2017	2018
RECEIVING				
Manual receiving	86%	84%	84%	87%
Mechanized (conveyor based) receiving	14%	8%	14%	16%
PICKING				
Manual picking	74%	69%	70%	76%
Mechanized (conveyor-based) picking	12%	10%	13%	14%
Automated picking	7%	3%	10%	8%
REPLENISHMENT				
Manual replenishment	62%	65%	62%	74%
Automated replenishment	7%	7%	8%	5%
Mechanized (conveyor-based) replenishment	8%	11%	8%	8%
MANUAL STORAGE	74%	75%	75%	80%
PALLETIZERS	NA	NA	NA	19%
AUTOMATED STORAGE & RETRIEVAL	7%	9%	10%	12%
ROBOTIC/ARTICULATING ARMS	NA	NA	NA	3%
AUTOMATIC GUIDED VEHICLES/ AUTONOMOUS VEHICLES	4%	3%	6%	4%



What types of materials handling systems are in use at your distribution center?



Picking Technologies in Use

	2015	2016	2017	2018
RF assisted w/Scan verification	50%	49%	48%	57%
Paper-based	61%	59%	62%	48%
Voice assisted with scan verification	7%	8%	7%	12%
Light assisted w/Scan verification	8%	12%	10%	11%
Voice assisted with no scanning	5%	3%	7%	10%
Parts to person technology	5%	10%	12%	7%
Automated unit sorter	4%	4%	6%	6%
Light assisted with no scanning	4%	1%	4%	6%
RF assisted with no scanning	4%	4%	7%	5%
Robotic or other automated technology	2%	3%	5%	5%
Other	2%	1%	1%	2%



What kinds of picking technologies are currently in use at your distribution center?



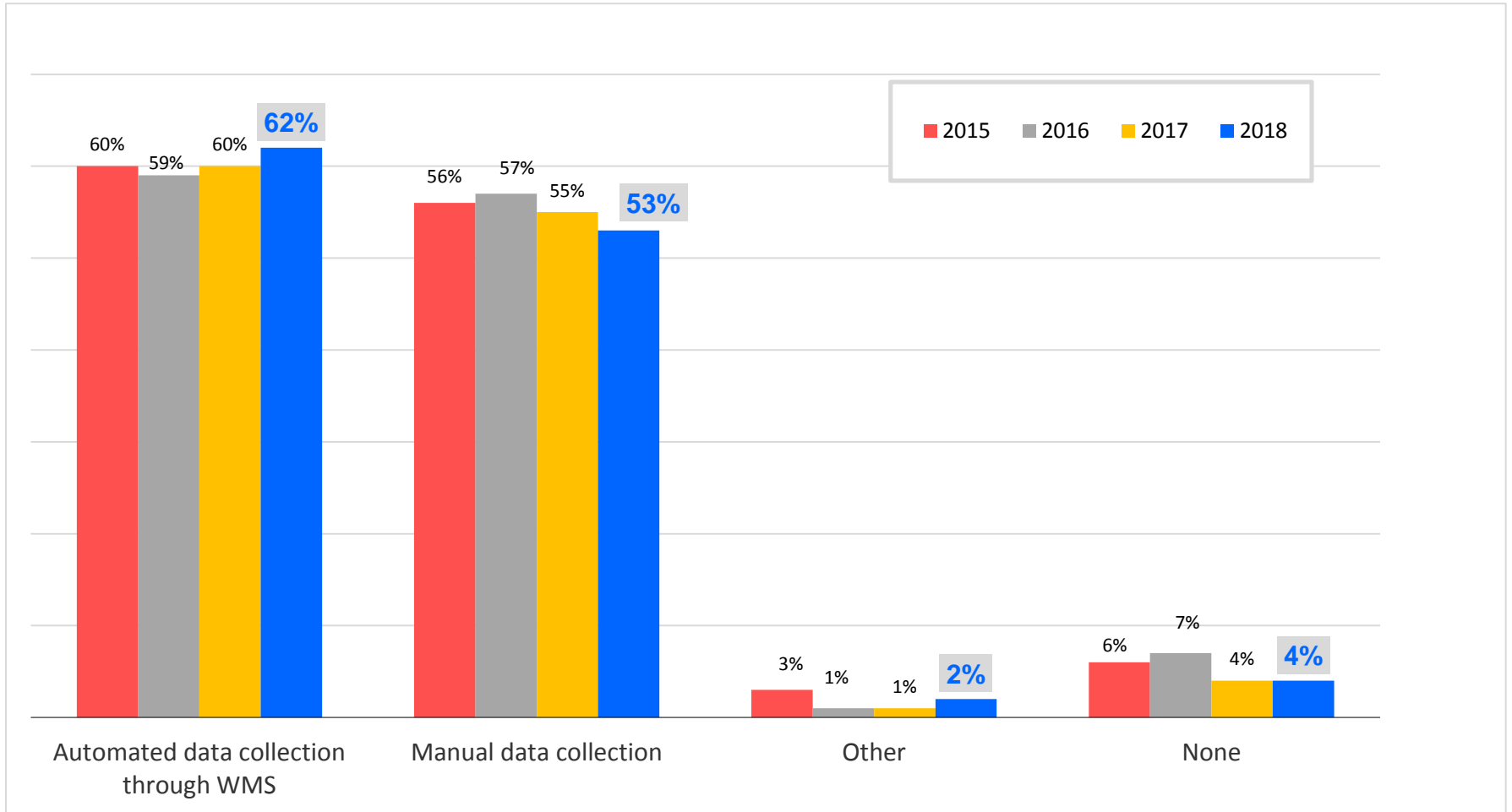
Order Filling Techniques in Use

	2015	2016	2017	2018	
Single order picking	75%	71%	79%	64%	↓
Batch picking	44%	42%	43%	46%	
Zone picking	34%	33%	27%	34%	↑
Cross docking	33%	35%	30%	29%	
Wave picking	NA	NA	NA	29%	
“Put” to order	17%	15%	20%	21%	
Put-wall system	--	3%	4%	9%	↑
Other	2%	1%	1%	1%	

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



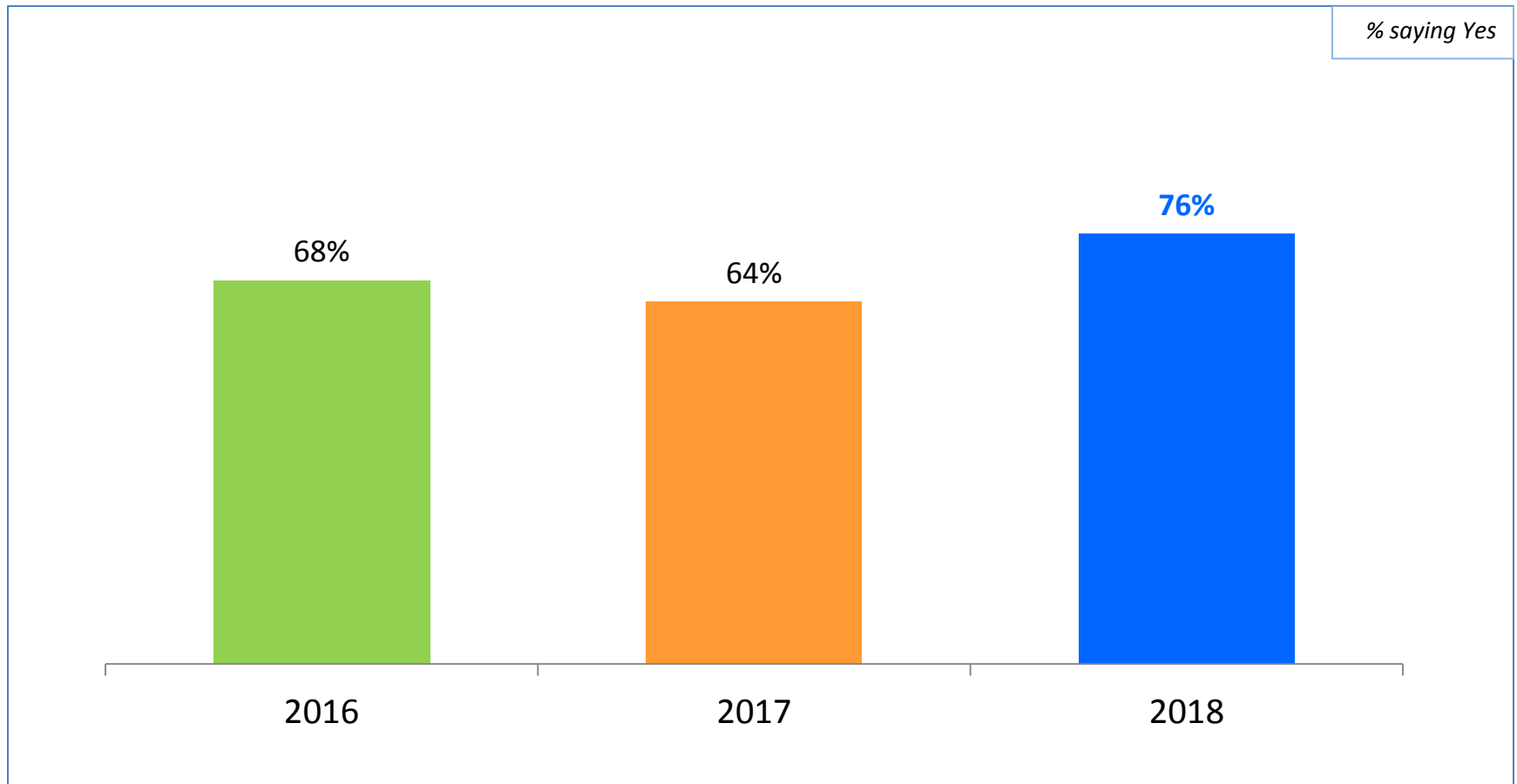
Data Collection Methods Used to Gauge Productivity



What data collection methods does your organization use to gauge productivity?



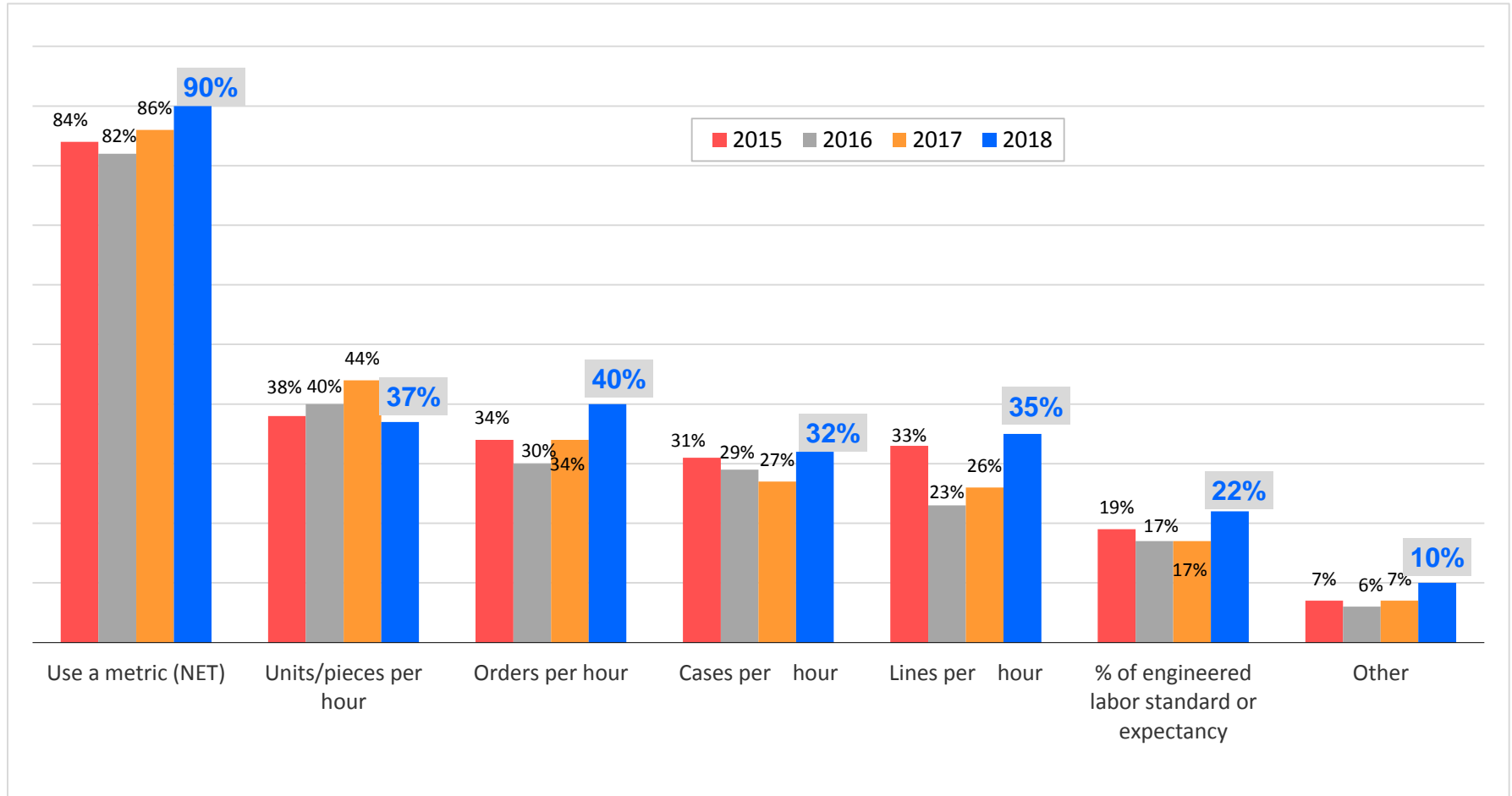
Do you have SKU weight and dims in your Item Master?



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



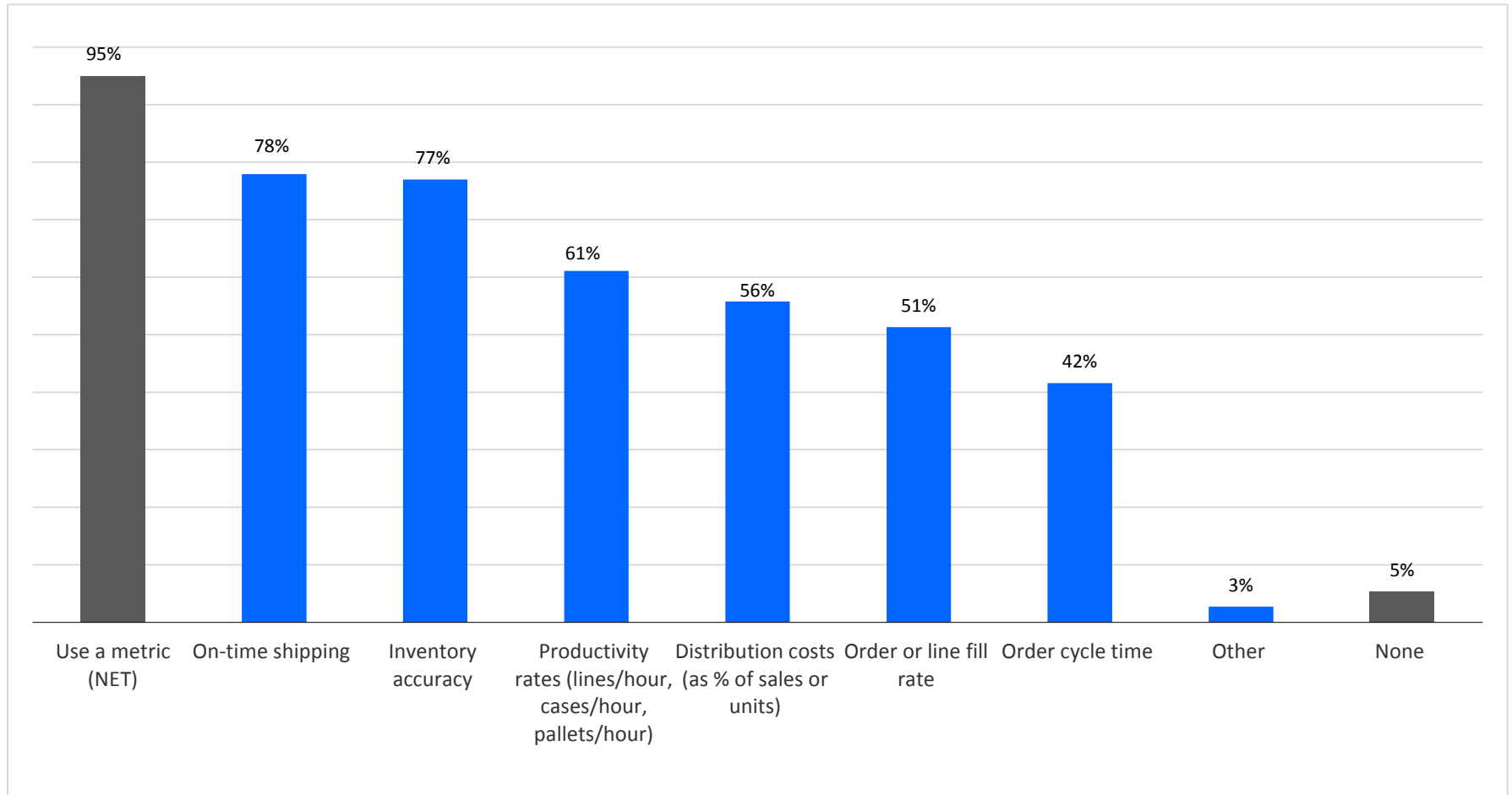
Productivity Metrics in Use



And, which metrics do you use to gauge productivity?



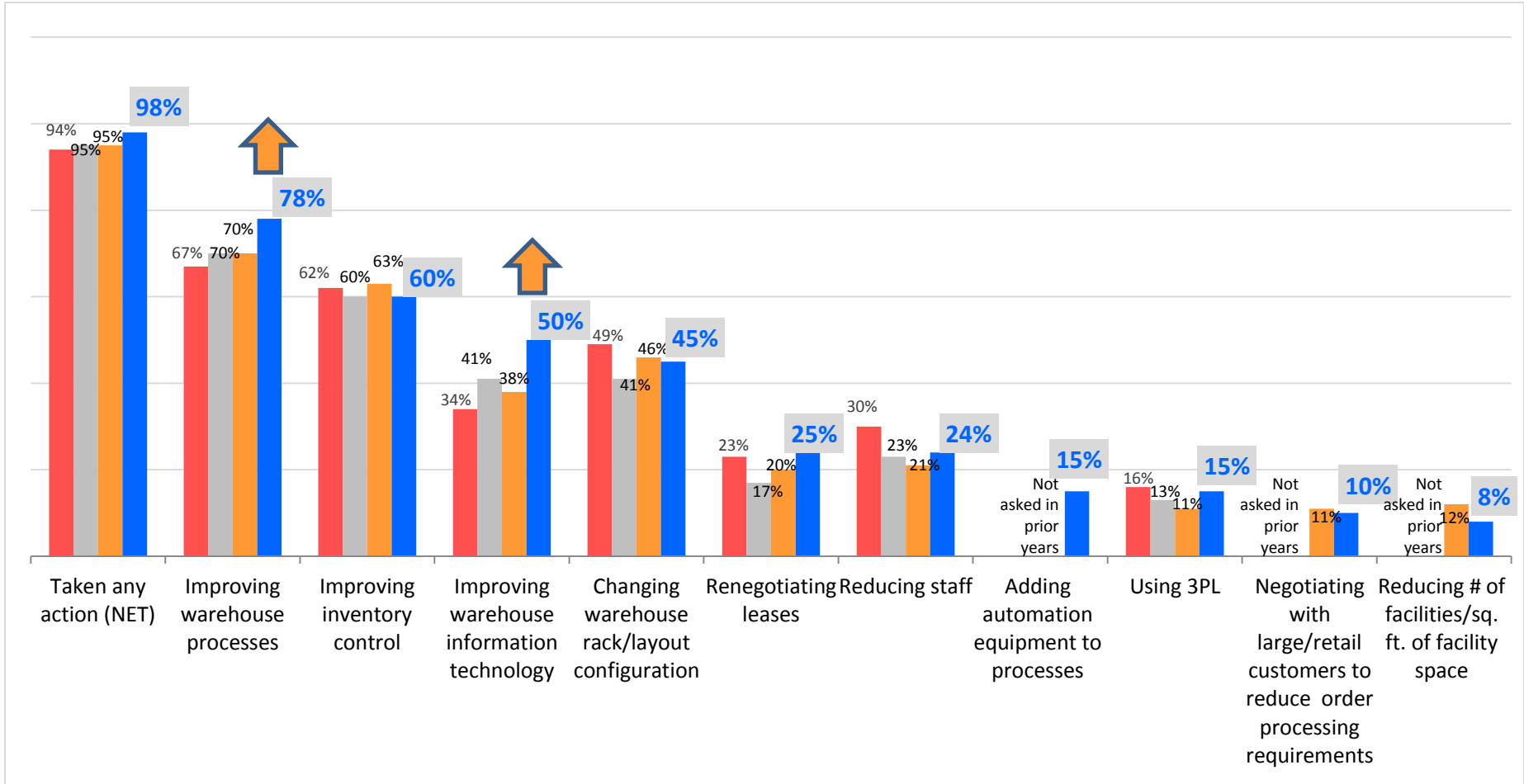
Metrics Use to Collect/Manage Warehouse Operations



What metrics does your company collect/manage within your warehouse operations?



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



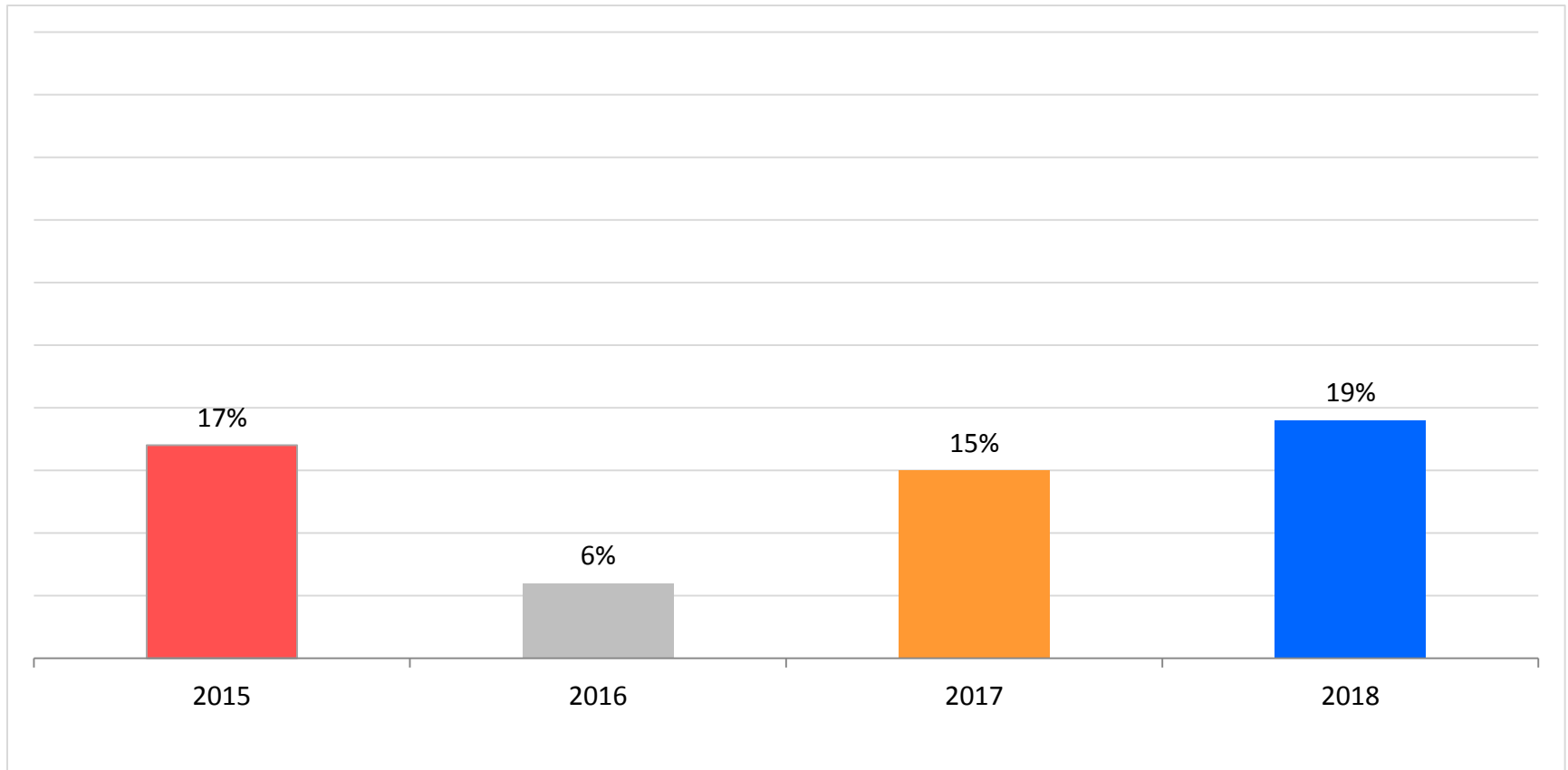
Value-added Services Offered to Customers

	2015	2016	2017	2018	
NET any value-added service	87%	89%	90%	87%	
Special labeling	54%	54%	54%	48%	↓
Special packaging	NA	NA	NA	37%	
Lot number control	40%	37%	34%	33%	
Kitting for production	28%	26%	29%	28%	
Display building and packaging	19%	15%	17%	25%	↑
Grouping/sorting of products prior to shipment	24%	17%	23%	23%	
Serial number control	30%	33%	30%	22%	↓
Promotional packs	28%	28%	25%	21%	
Product assembly	24%	27%	31%	20%	↓
Price marking	13%	19%	18%	15%	
RF tagging	11%	13%	13%	15%	
Deferred customization	15%	11%	15%	9%	
Sequencing for production	10%	11%	13%	5%	
Other	3%	3%	3%	3%	

What additional or value-added services do you offer customers?



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.



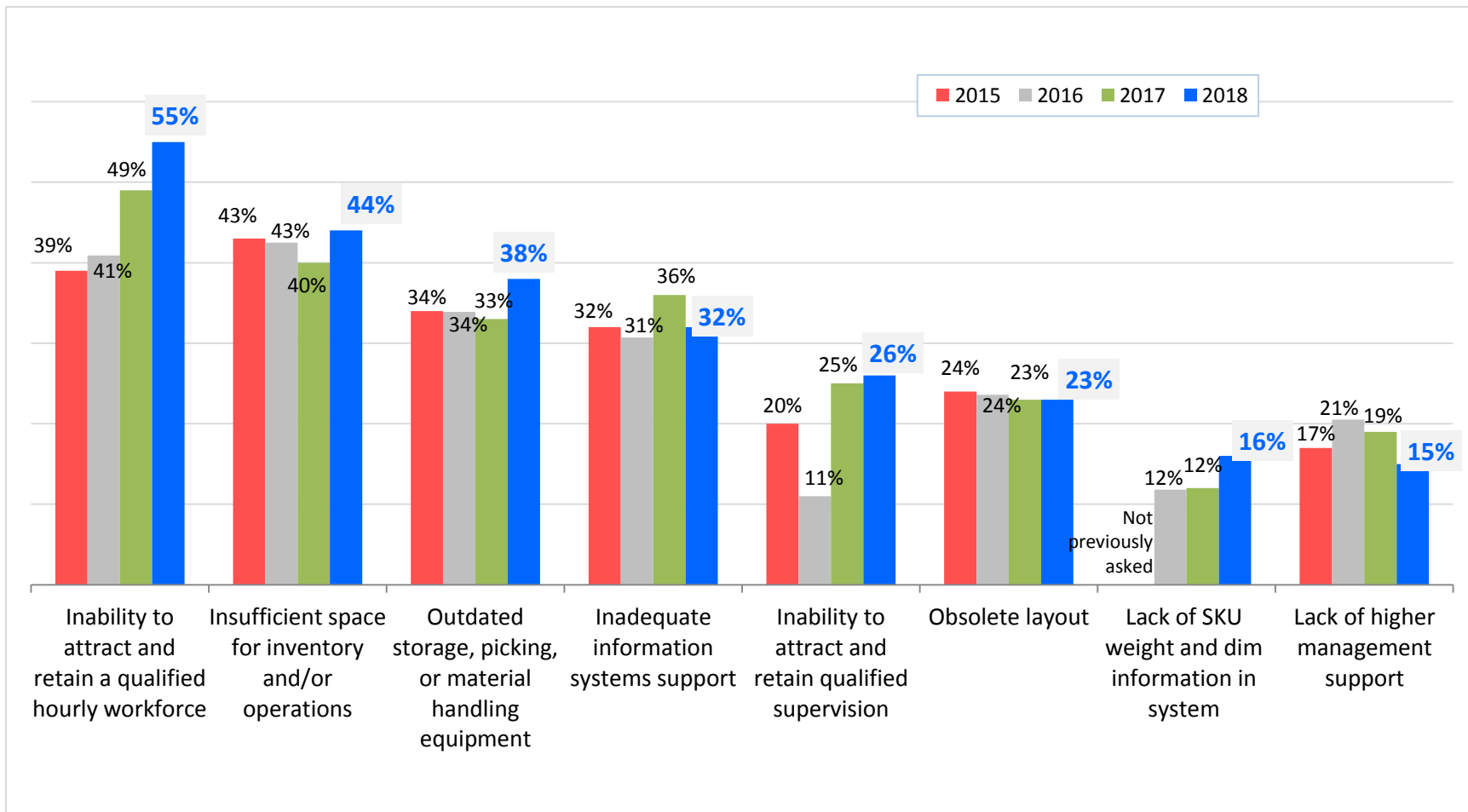
Changes in DC Operations over the Last Three Years

- Implementing/Improving technology (ERP, WMS, etc.)
- Increased volume
- Growth; adding more space; changes to warehouse configuration
- Implementing automated systems (racking systems, scanning, voice picking, etc.)
- Improving operational efficiencies; process improvements; usage of warehouse efficiency metrics
- Change in management
- Replacing personnel
- Customer issues (improving service; adjusting to customer order patterns)
- Warehouse consolidation; combining facilities
- Increased number of SKUs

What would you say has been the most significant change in your distribution center operations over the last three years?



Major Issues as it Pertains to Warehouse/DC Operations



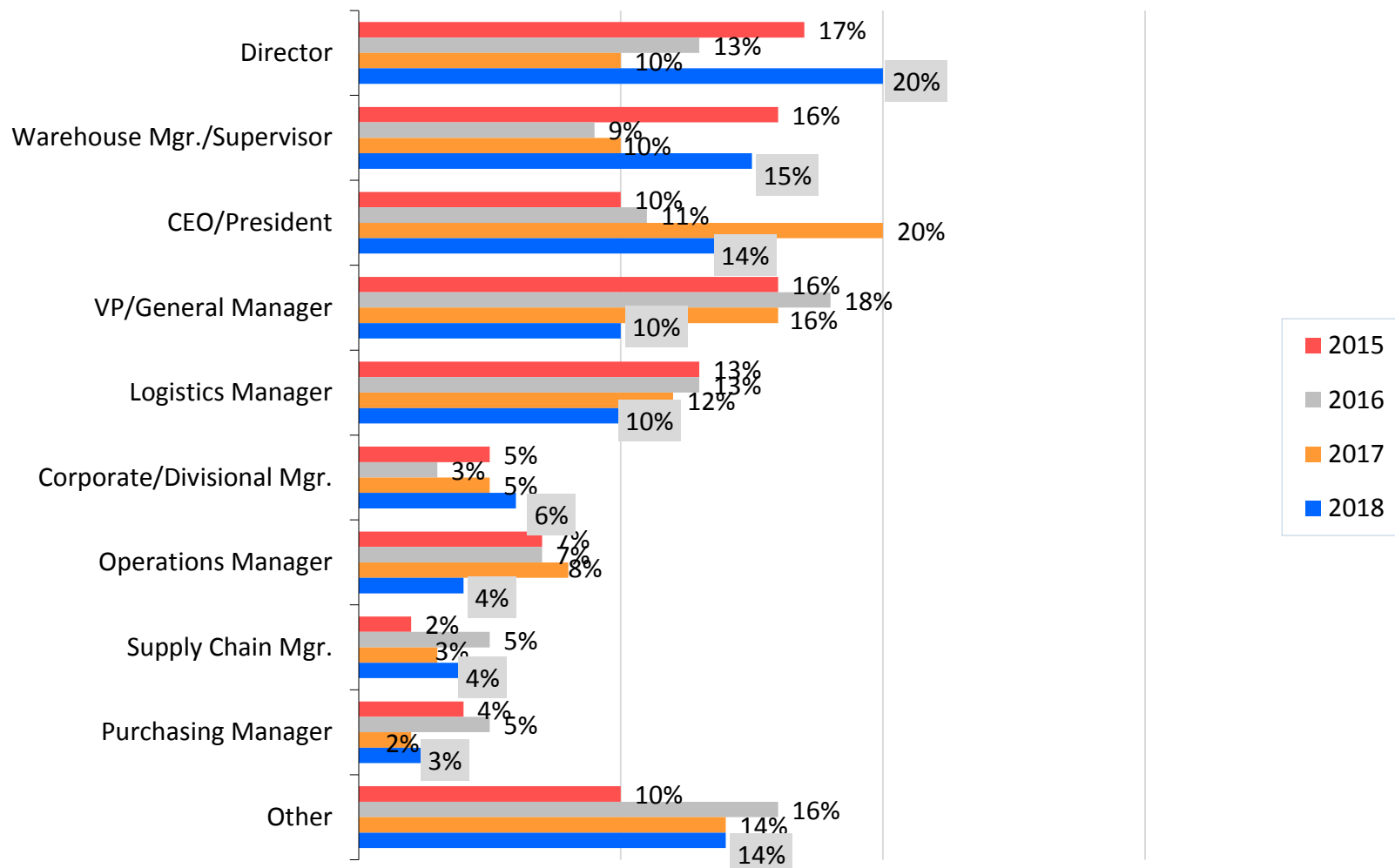
Which of the following would you consider to be major issues?



Respondent and Company Profile



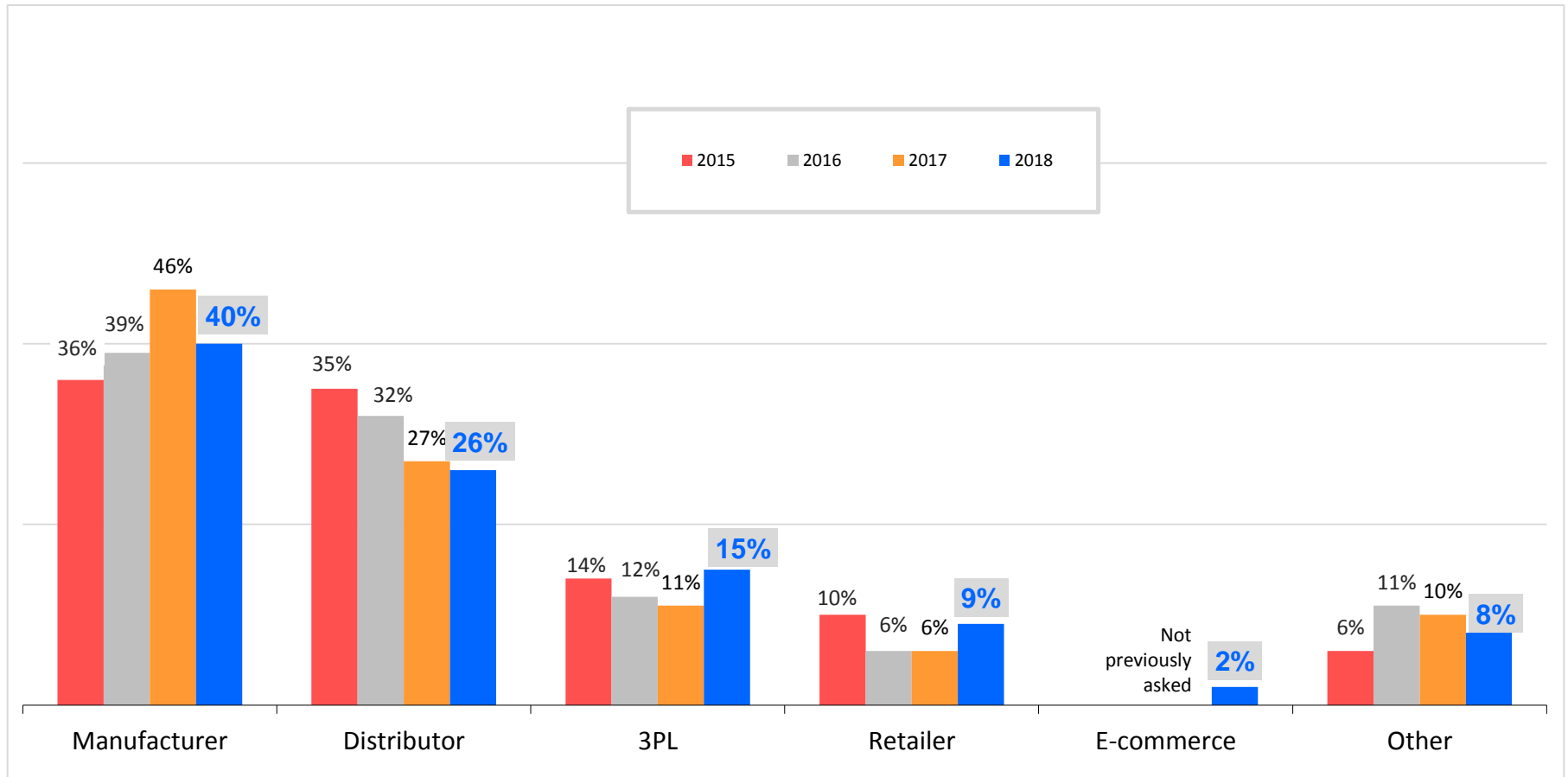
Job Title/Function



Which of the following best describes your job title/function?



Type of Business



Please indicate which of the following best describes your company.



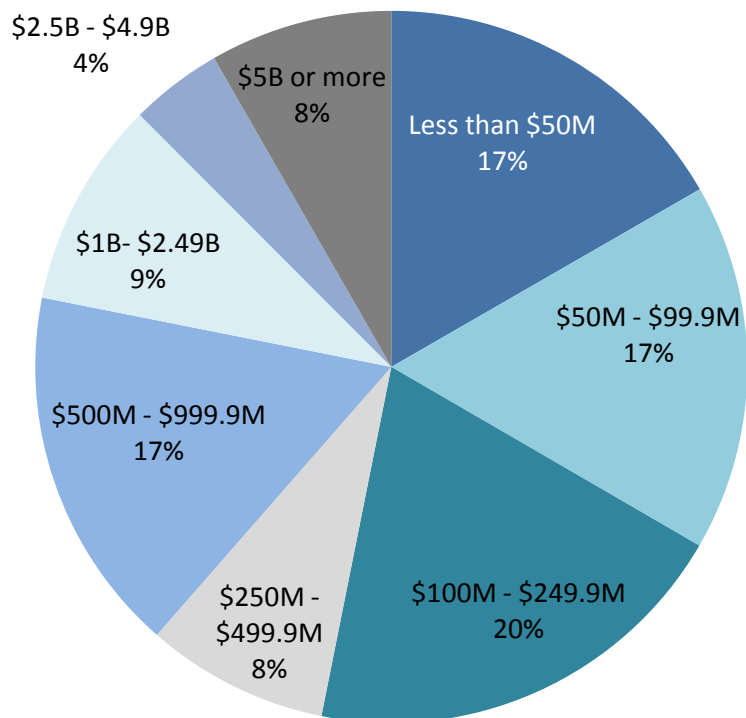
Primary Business at Location

	2015	2016	2017	2018
Food & Grocery	16%	12%	13%	19%
Paper, Packaging and Office Supplies	5%	6%	5%	7%
Apparel, Shoes, Accessories	5%	6%	4%	7%
Building, Construction & HVAC Materials	7%	5%	5%	7%
Automotives, Aerospace and Aviation	6%	9%	7%	6%
General Merchandise	6%	6%	7%	6%
Pharmaceutical/Health Care/Medical Devices	6%	4%	3%	6%
Furniture and Appliances	1%	4%	3%	5%
Fabricated metals	4%	6%	6%	4%
Electronics, Computers and Software	7%	4%	7%	4%
Parts and Equipment	1%	3%	3%	4%
Chemicals	4%	4%	3%	3%
Industrial equipment	3%	4%	5%	3%
Cosmetics, Fragrances, Beauty	1%	1%	2%	3%
Rubber, Plastics, Ceramics, etc.	3%	1%	2%	2%
Other (includes sporting goods, agriculture, energy, etc.)	25%	25%	25%	14%

What is the primary product at your location?



Annual Revenues



	2015	2016	2017	2018
Average revenues	\$886.2M	\$726.1M	\$771.9M	\$1.251B
Median revenues	\$187.5M	\$100.0M	\$93M	\$226M

What do you estimate your company's overall sales or revenues will be in 2018?