

2003 TLI/WERC Warehouse Benchmarking Survey

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Participating Companies

Able Sales Co.
Allstate Insurance
American Honda-Alpharetta
American Italian Pasta Co
American Woodmark
Antioch
AOL
APL Logistics
ARC International
Atlanta Bonded Warehouse
Aventis Pharma
Bear Creek Operations
Ben & Jerry's Homemade
Bose Corporation
Bristol Myers Squibb
Burriss Logistics
Bush Bros.
Cardone
Carolina Biological Supply
Central States Distribution Service
Cequent Corporation
Champion Laboratories Inc.
Colgate Palmolive
Cooper Tire
DHL Danzas Air & Ocean
DLA
Eagle
Eastman Kodak

Electro Source
Electronics Boutique of America
Elekta
Empire Vision Centers
Estee Lauder
EXEL LOGISTICS
Expotran
Faultless Starch/Bon Ami Co.
FFF Enterprises Inc.
Focus on the Family
Ford Motor Co.
Fulton County Schools
General Warehouse
GlaxoSmithKline
Gordon Food Service
GPI
Grainger
Grand and Toy
Graybar
Hartness International
HC Logística Chile Ltda.
Hershey Foods Corporation
Hollister Inc.
Home & Garden Party
Homegoods/TJX
Honeywell Technology
Hub One Logistics
Inprax
InterArt/Sunrise
Interface flooring
Invitrogen

John Deere
Johnsonville Sausage
KELLOGG MARINE INC.
KENYA AIRWAYS
KN Logistics
Kodak Polychrome Graphics
Kohler
Kraft
L.L.Bean Inc.
Land O Lakes
Leatherman Tool Group
Levi Strauss & Company
Logista
Logistic Manager
Louisiana Pacific
Mattel
Menlo Worldwide
Miller Brewing Co.
Moen Inc
Motorola
Nestle Purina
Nestle USA
Nortel Networks
Nova Chemicals
Oak Ridge Associated Universities
Oce Printing Systems
Otto Ficker AG
Owens Corning
Ozburn-Hessey Logistics
Pactiv
Payless ShoeSource

Pendleton
Perrigo Co.
Poly-Trucking
PPL
QWEST
Raytheon
Reckitt Benckiser
Rich SeaPak
Schering-Plough Healthcare Prod.
Schwan Food Company
Snap-on Tools
Standard Corp
SULLIVAN TIRE CO
Tampa Electric Company
Tennant Company
TEXAS GENCO
The Childrens Place
The Container Store
The Holland Group Inc.
Things Remembered
Thomas & Betts
Tiffany & Co
Toyota Forklifts of Atlanta
Trane
USCO Logistics
Vaisala-GAI
Vistakon
Volvo Cars of No. Amer.
Walt Disney World
Weidmuller
Western Wireless



Issues Addressed in 2003 Warehouse Benchmarking Survey

◆ Warehouse Mission

- Primary Unit of Measure
- Primary Ship-To Type
- Merchandise Types

◆ Building Configuration

- Square Footage
- Building Dimensions
- Clear Height
- Dock Doors

◆ Facility Management

- Owned vs. Leased
- In-sourced vs. Outsourced
- Occupancy Levels

◆ Facility Activity

- Number of Total/Active SKUs
- Number of Orders, Lines, Cases

◆ Material Handling Systems

- Pallet Storage/Retrieval Systems; Case Handling Systems; Broken Case Storage Retrieval Systems

◆ Information Handling Systems

- WMS - Yes/No, Package or In-House
- Communication Systems

◆ Workforce

- Union vs. Non-Union
- Payscale, Turnover
- Operator to Supervisor Ratio

◆ Metrics

- Productivity Metrics
- Quality Metrics
- Cycle Time Metrics

◆ Practices

The "Average" Warehouse

- ◆ Size
 - 239,000 sq. feet
- ◆ Length to Width
 - 1.7 to 1
- ◆ Clear Height
 - 31.35 ft.
- ◆ Dock Doors
 - 26
- ◆ Staffing
 - 150 FTEs
- ◆ Outsourcing?
 - Insourced (75%)
- ◆ WMS
 - Yes (77%)
- ◆ Shipping
 - 2,314,713 lines/year
 - 544,345 orders/year
- ◆ SKUs
 - 57,735 total
 - 38,467 active
- ◆ Occupancy
 - 82% normal
 - 96% peak
- ◆ Union?
 - Non-Union (66%)
- ◆ Pay
 - Avg. to Above Avg.

Warehouse Quality Index (WQI)

- ◆ Warehouse Quality Index =
Shipping Accuracy x Inventory Accuracy
- ◆ Shipping Accuracy =
% Order Lines Shipped
without Errors
- ◆ Inventory Accuracy =
% Warehouse Locations
without Discrepancies
- ◆ All warehouses were ranked based their WQI and a
WQI rank % calculated as the ratio of the rank to the
total warehouses. Those warehouses with lower WQI
rank %s have the highest quality performance.

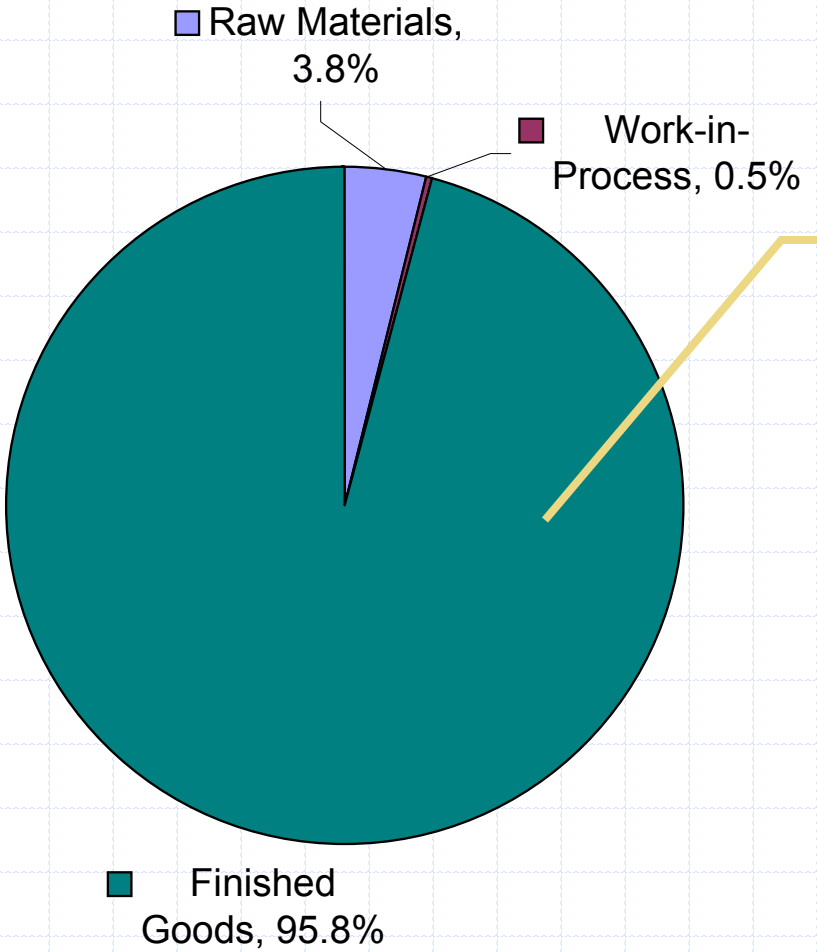
Warehouse Productivity Rank %

- ◆ All warehouses were classified as piece shipping or case shipping warehouses.
- ◆ All piece shipping warehouses were ranked based on their productivity performance calculated as the ratio of the annual number of order lines shipped to the annual total person-hours expended in the warehouse. The warehouse with the highest productivity received the rank of 1; the warehouse with the second highest productivity received the rank of 2; and so on. The warehouse productivity rank % is the ranking divided by the number of warehouses in the classification with legitimate responses in the survey. The LOWER the RANK %, the HIGHER THE PRODUCTIVITY.
- ◆ All case shipping warehouses were ranked based on their productivity performance calculated as the ratio of the annual number of cases shipped to the annual total person-hours expended in the warehouse. The warehouse productivity rank % is the ranking divided by the number of warehouses in the classification with legitimate responses in the survey. The LOWER the RANK %, the HIGHER THE PRODUCTIVITY.

Warehouse Performance Rank %

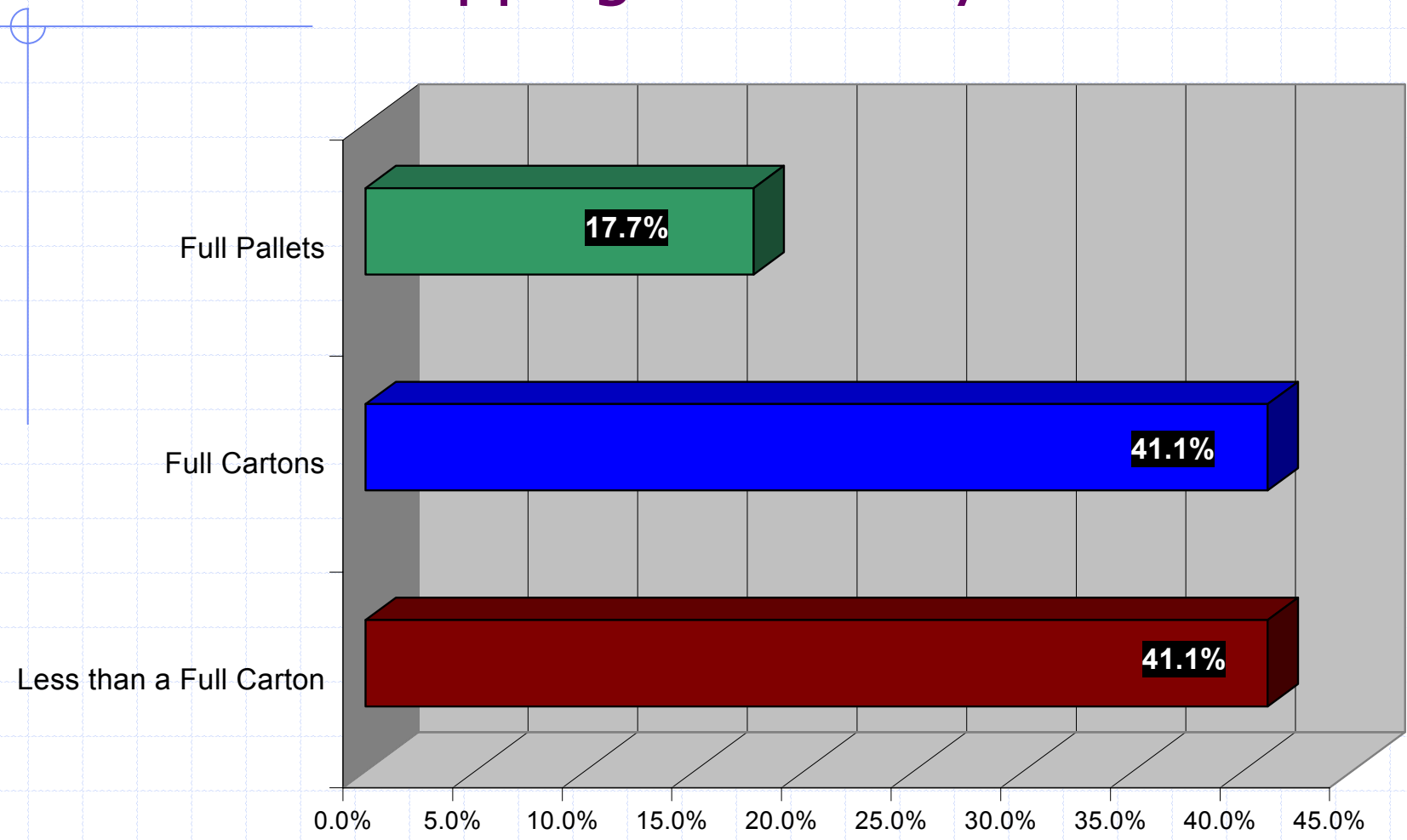
- ◆ The warehouse performance rank % is the sum of the warehouse productivity rank % and the warehouse quality index rank %.

Inventory Status for Survey Warehouses

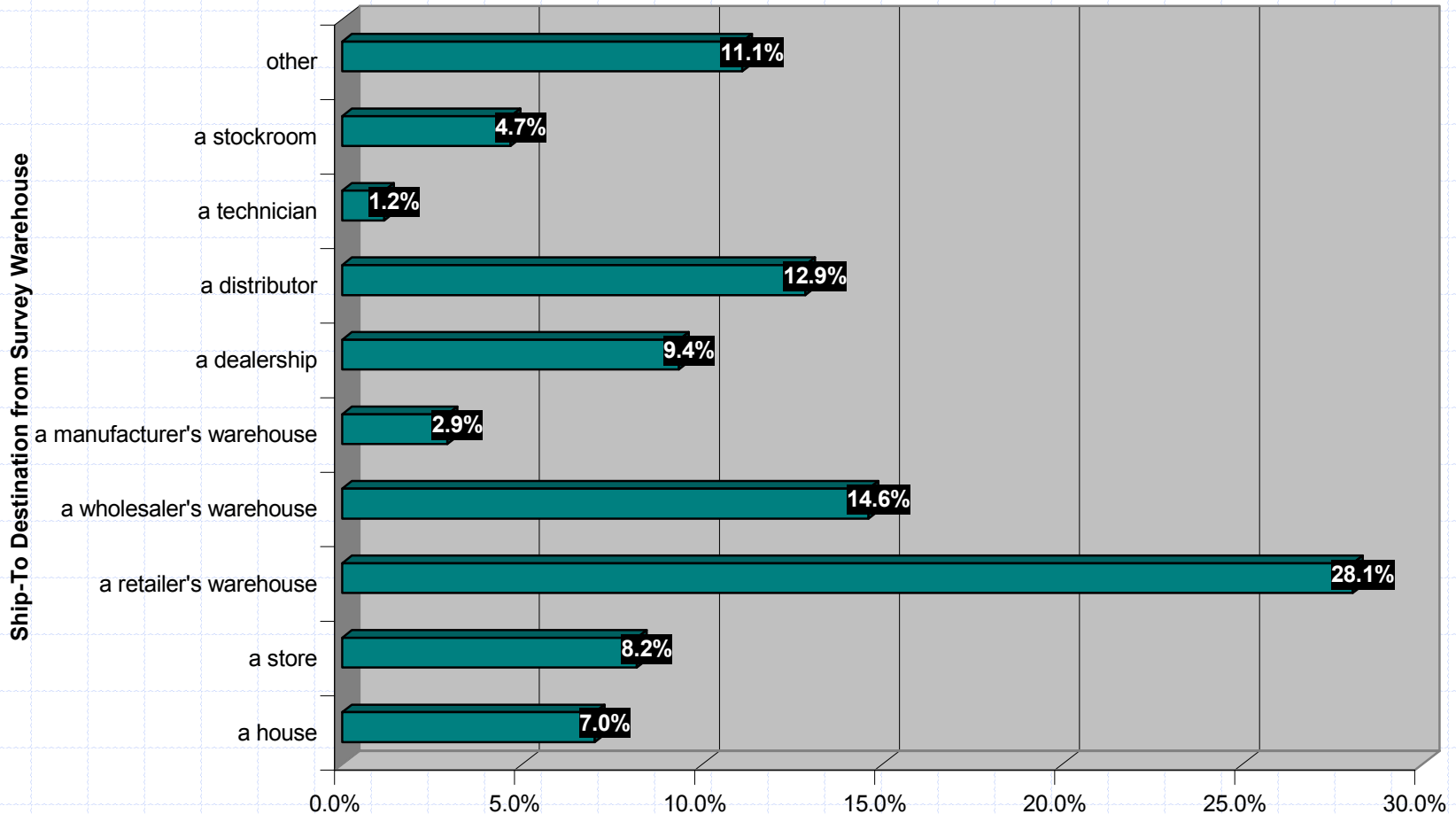


The large majority of warehouses in the survey house finished goods.

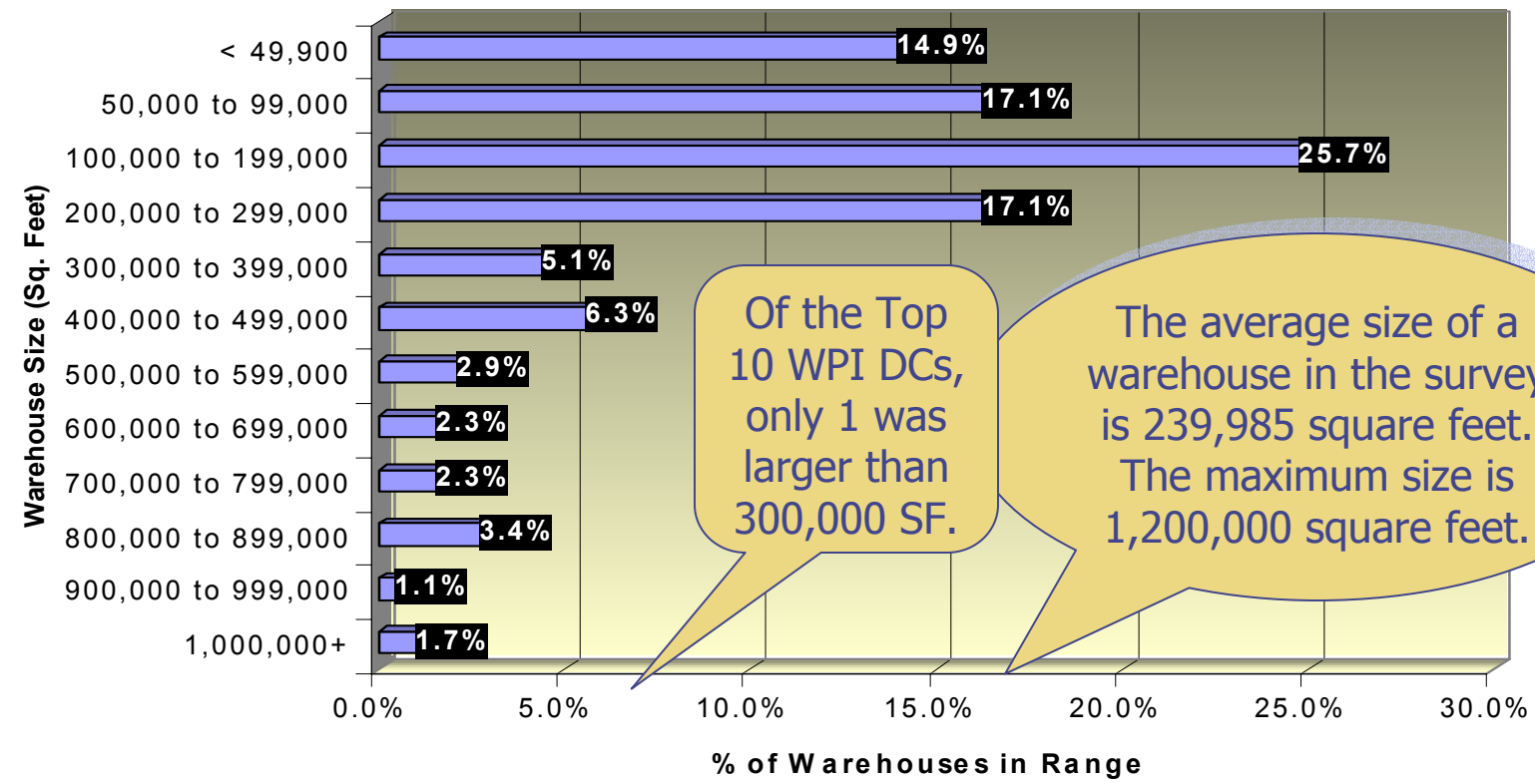
Primary Unit of Measure for Shipping for Survey Warehouses



Ship-To Locations from Survey Warehouses



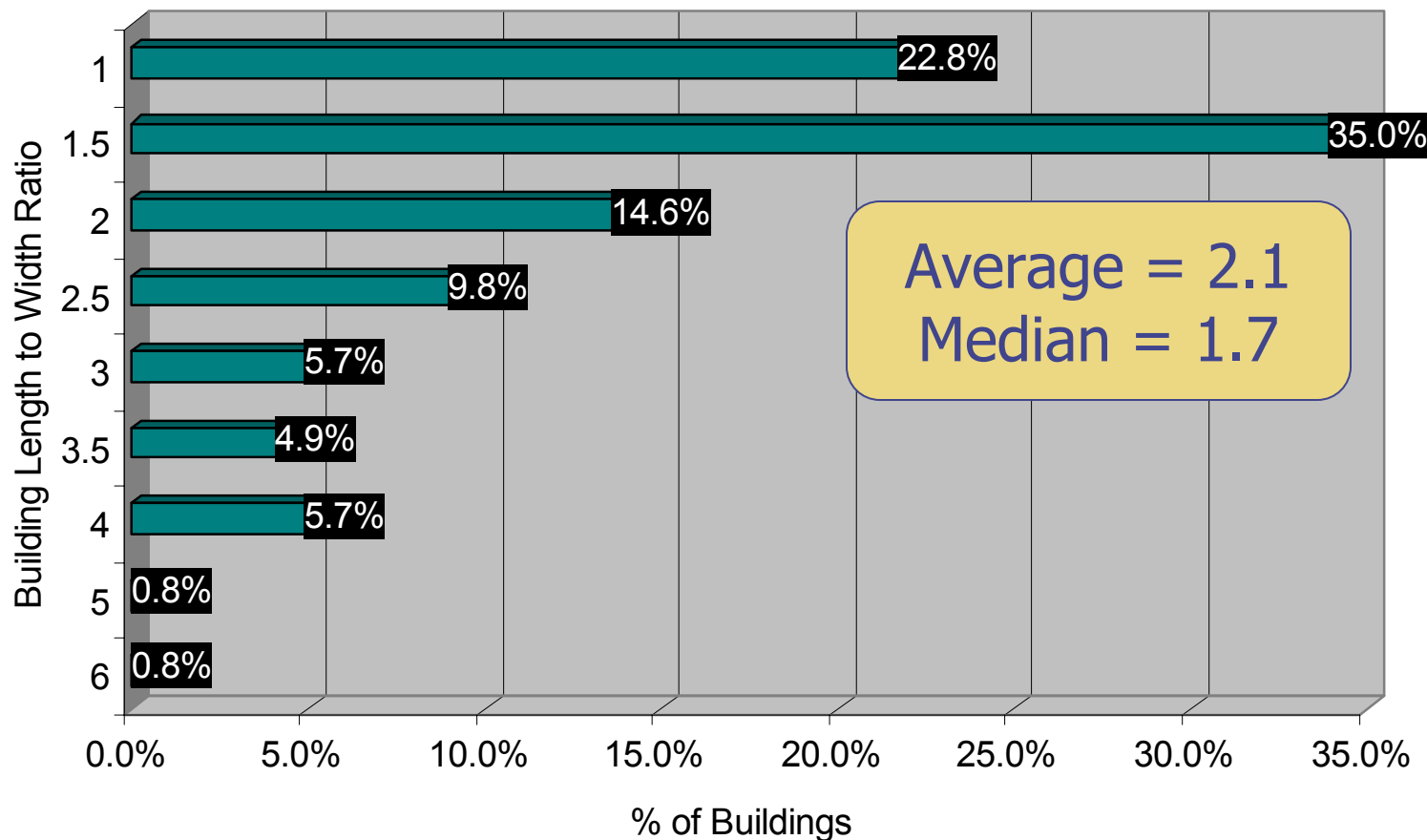
Box Size for Survey Warehouses



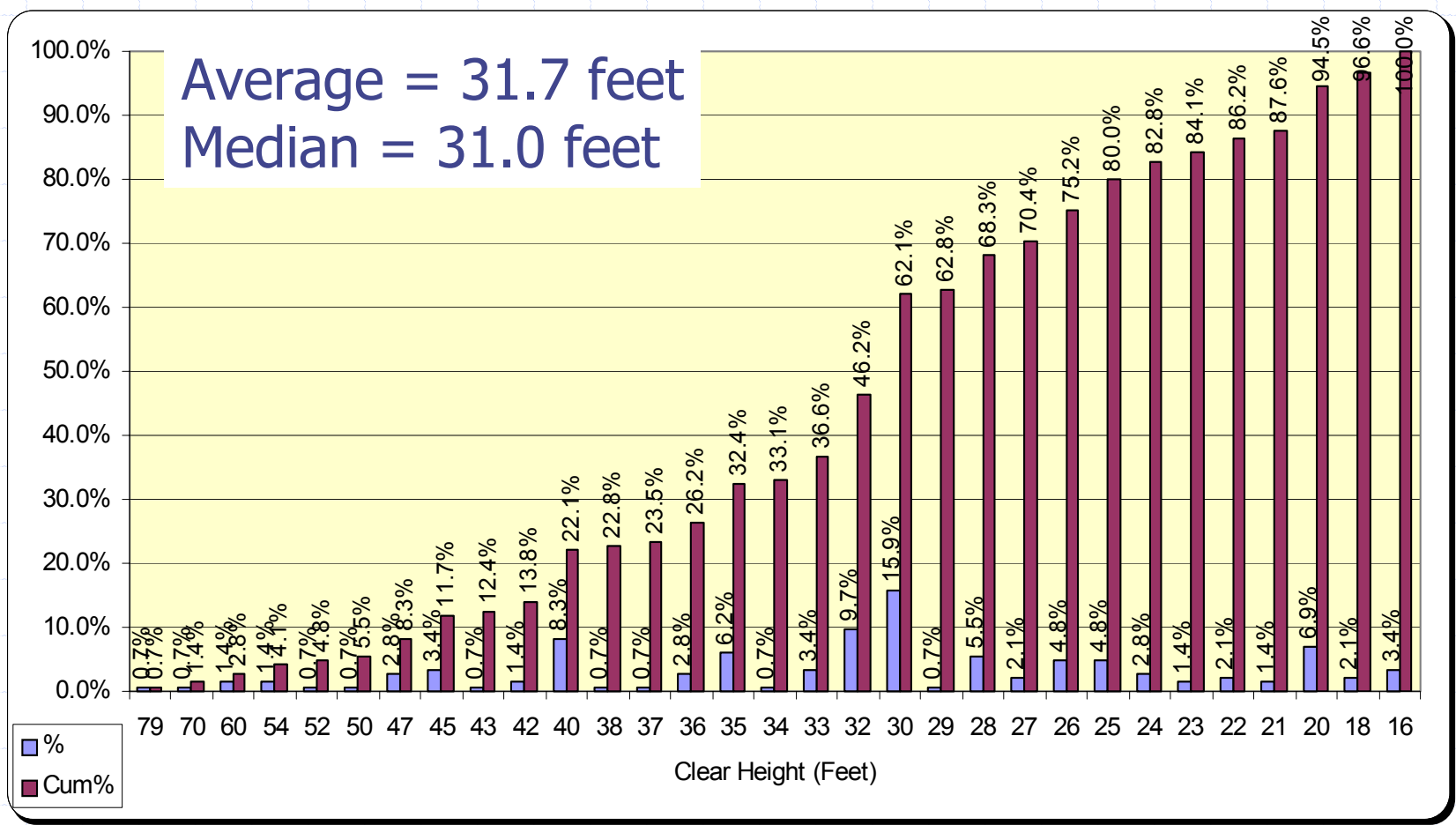
Of the Top 10 WPI DCs, only 1 was larger than 300,000 SF.

The average size of a warehouse in the survey is 239,985 square feet. The maximum size is 1,200,000 square feet.

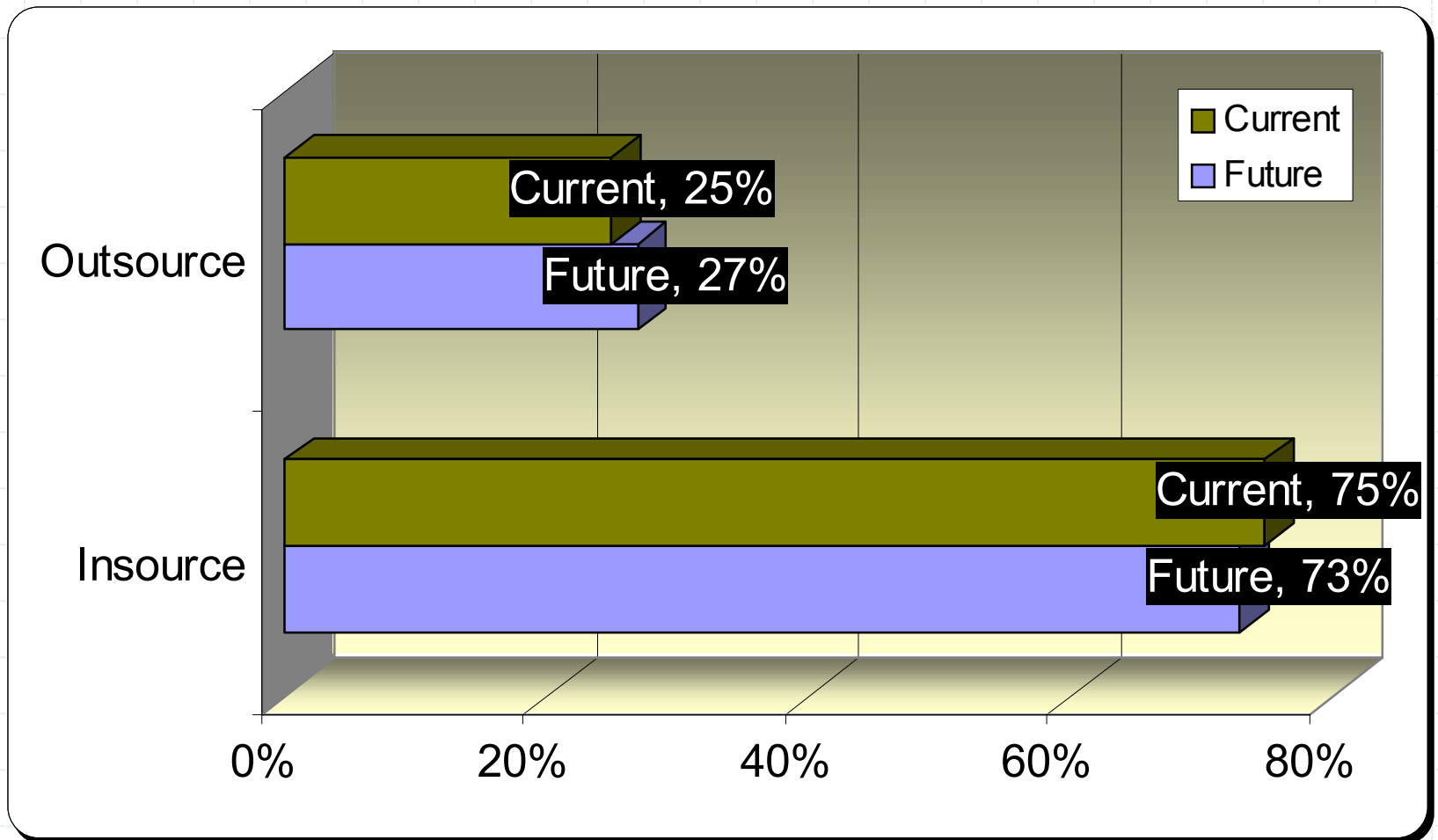
Building Length to Width Ratio



Building Clear Height (Feet)



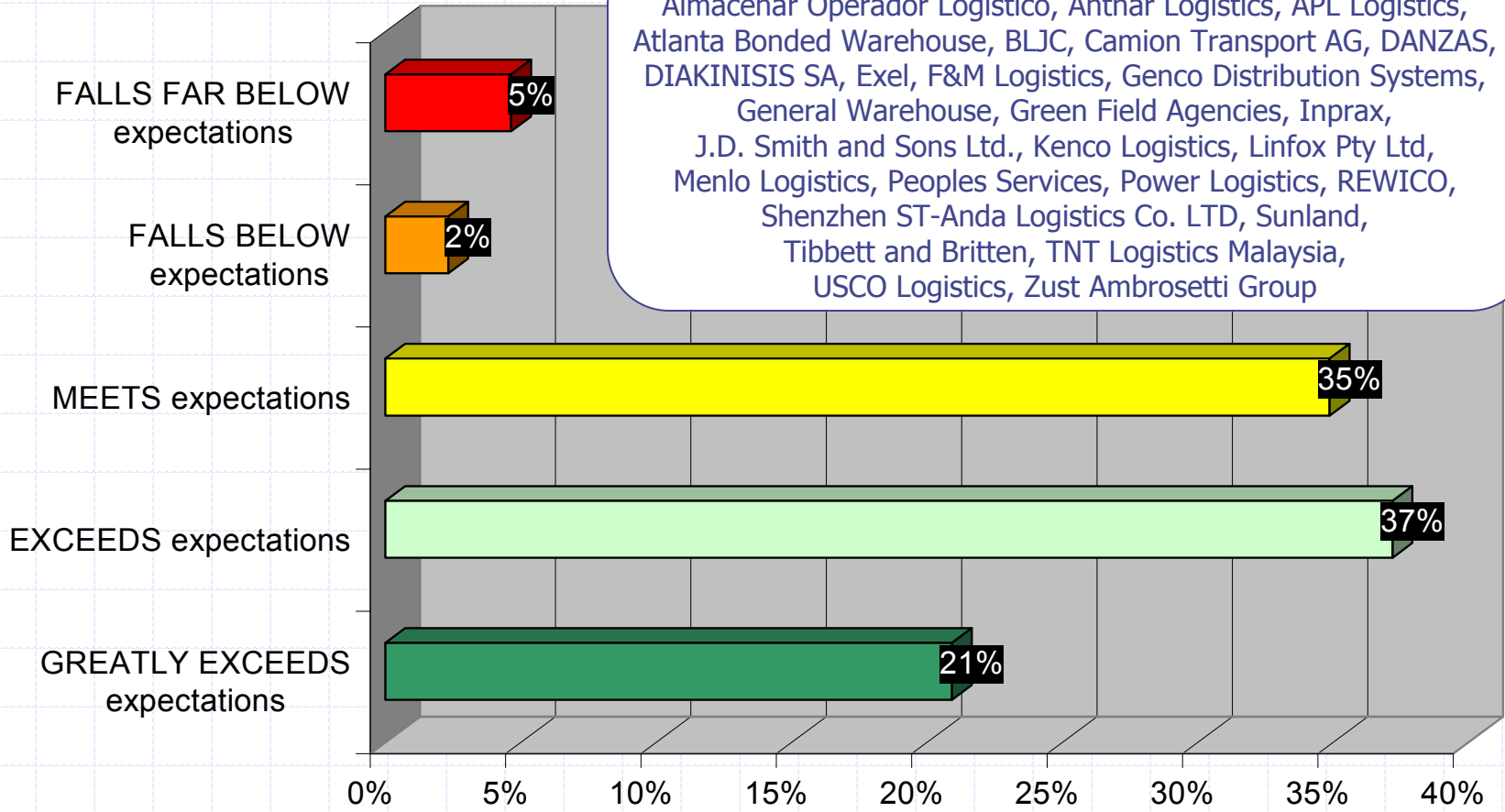
In sourcing vs. Outsourcing



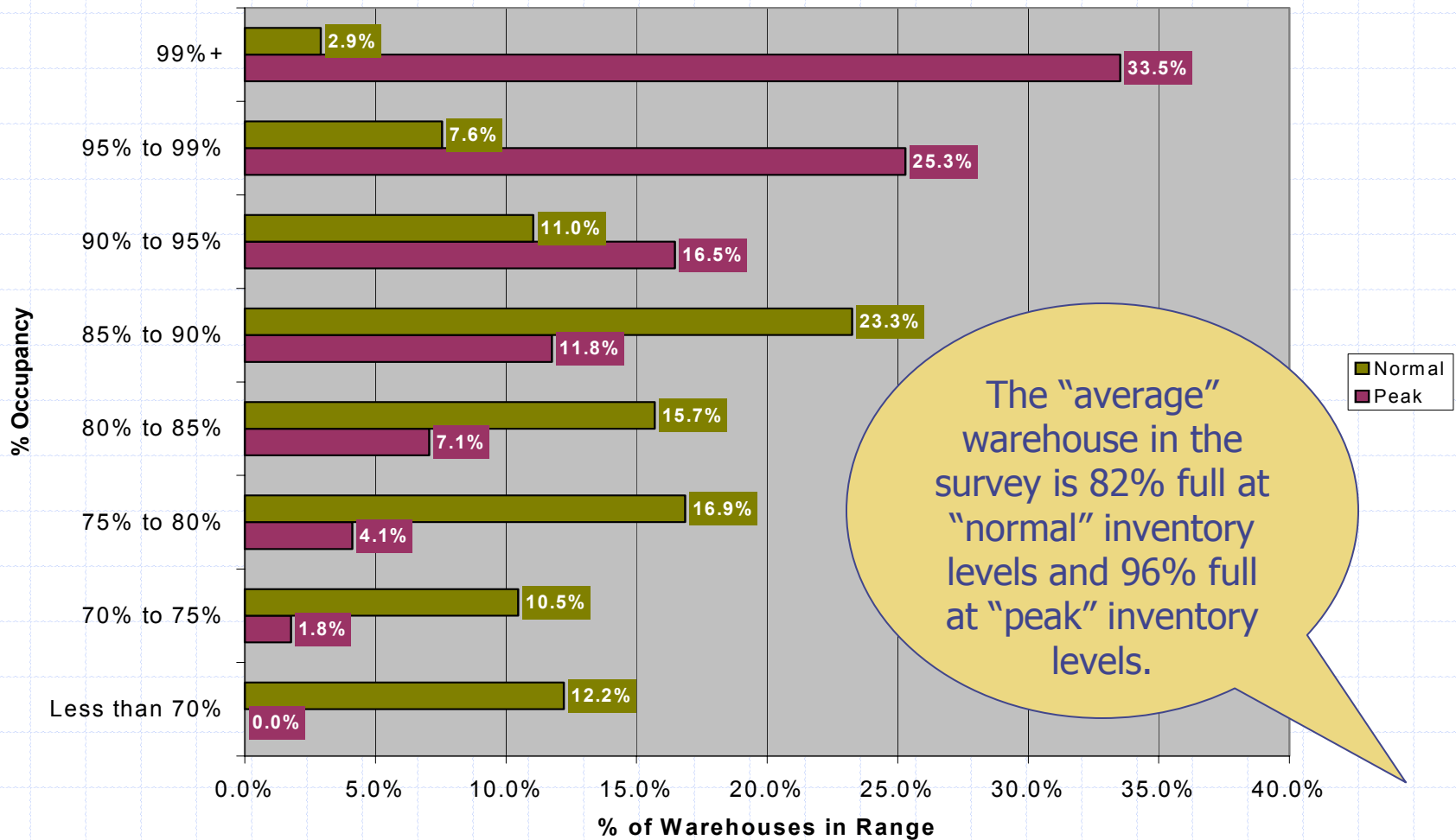
Satisfaction with Third-Party Logistics Services

3PLs in 2003 Warehouse Benchmarking Survey

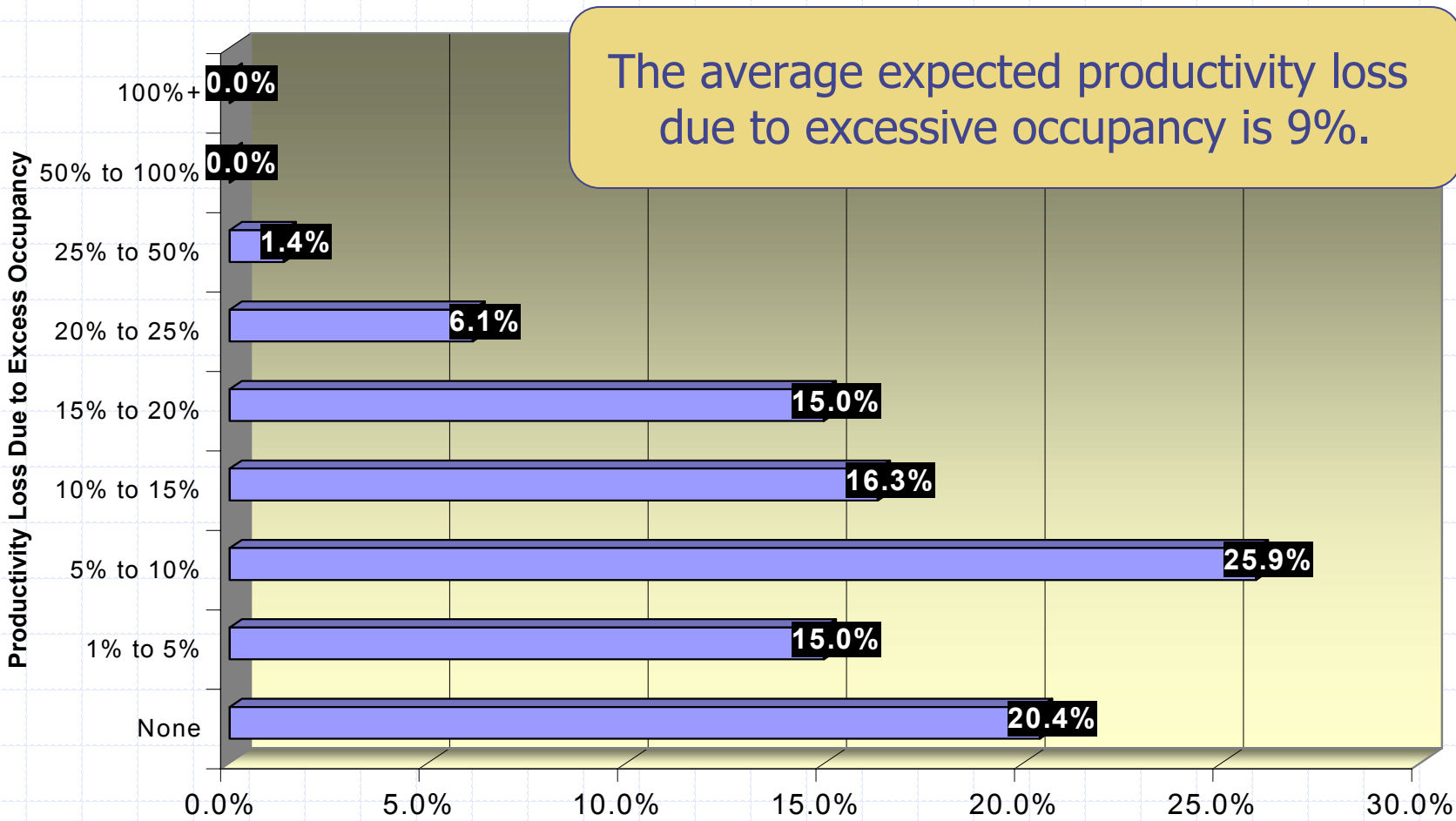
Almacenar Operador Logistico, Anthar Logistics, APL Logistics, Atlanta Bonded Warehouse, BLJC, Camion Transport AG, DANZAS, DIAKINISIS SA, Exel, F&M Logistics, Genco Distribution Systems, General Warehouse, Green Field Agencies, Inprax, J.D. Smith and Sons Ltd., Kenco Logistics, Linfox Pty Ltd, Menlo Logistics, Peoples Services, Power Logistics, REWICO, Shenzhen ST-Anda Logistics Co. LTD, Sunland, Tibbett and Britten, TNT Logistics Malaysia, USCO Logistics, Zust Ambrosetti Group



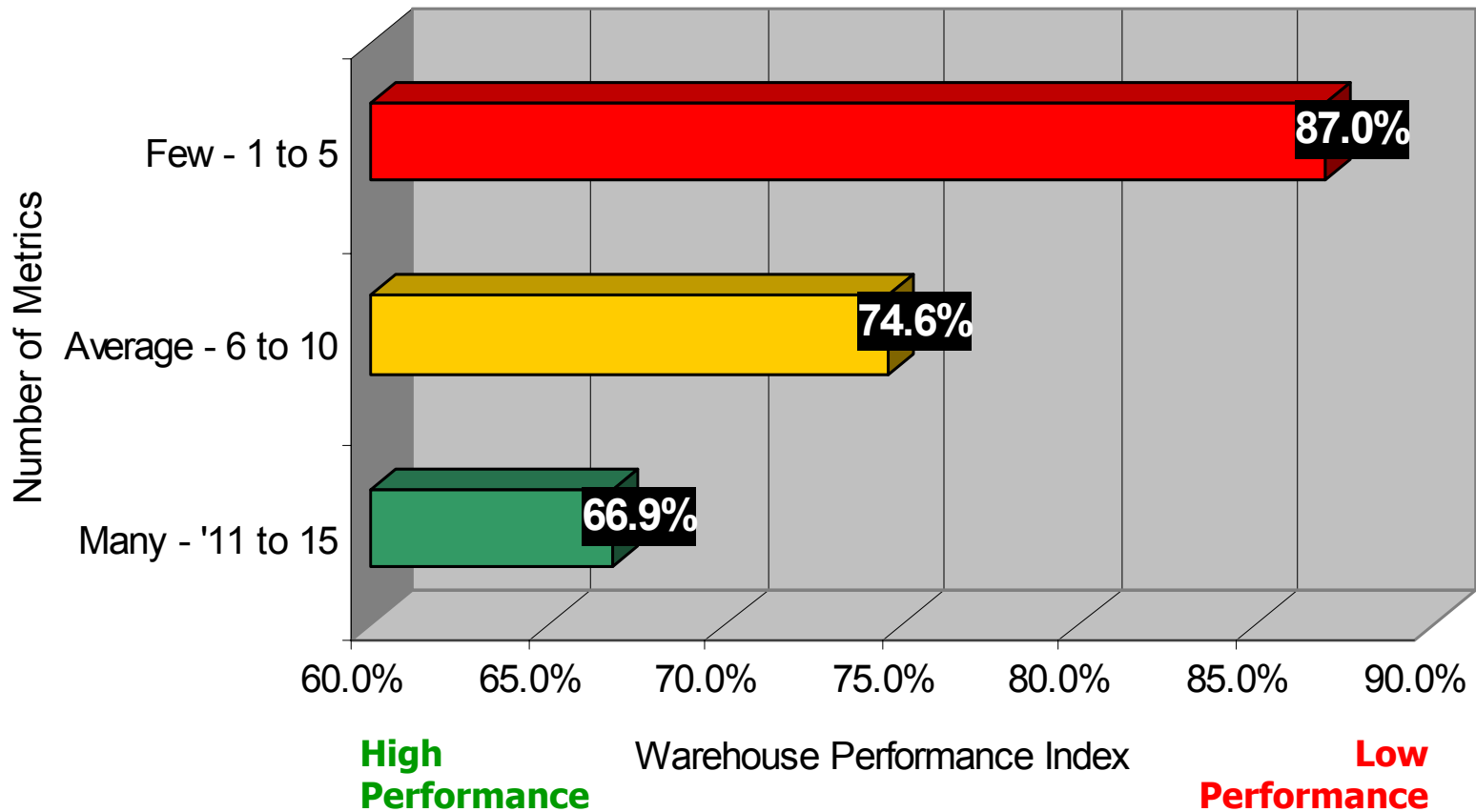
Occupancy Levels at Normal and Peak Inventory



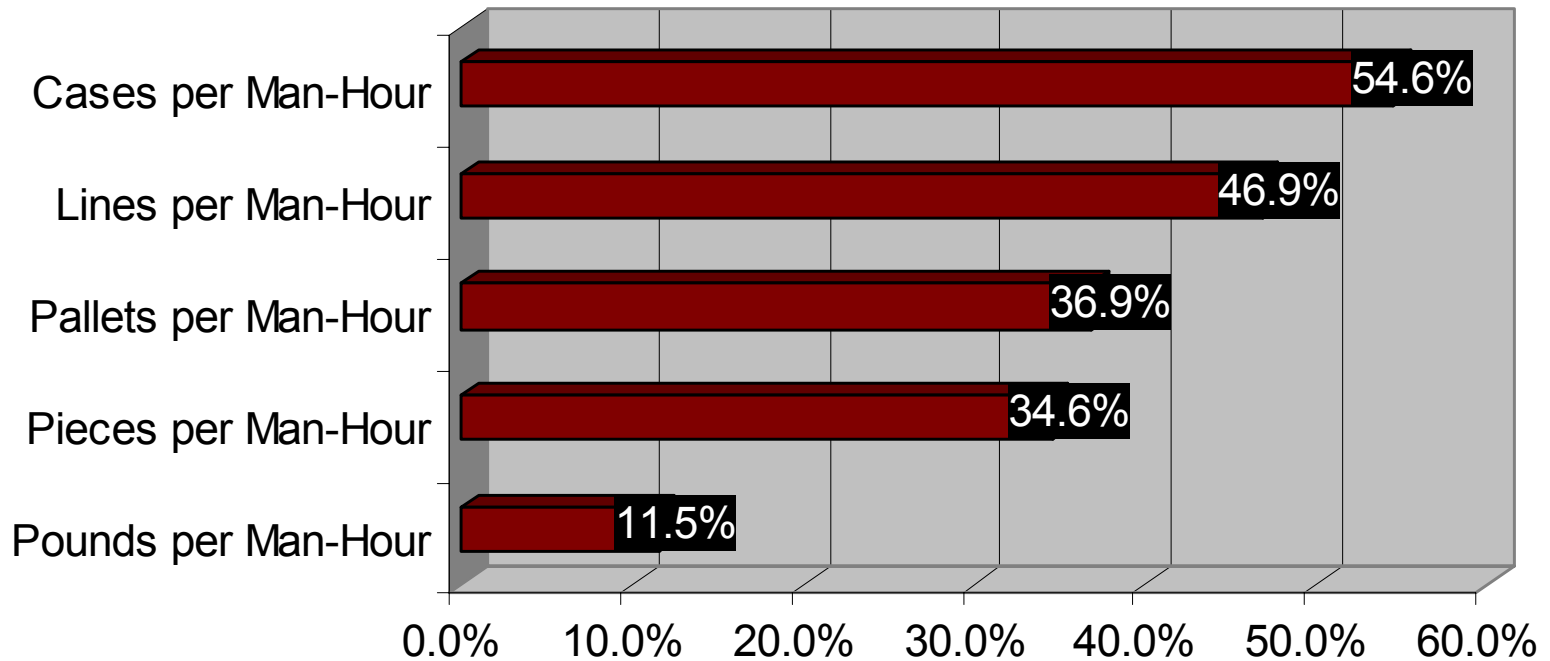
Productivity Loss Due to Excessive Occupancy



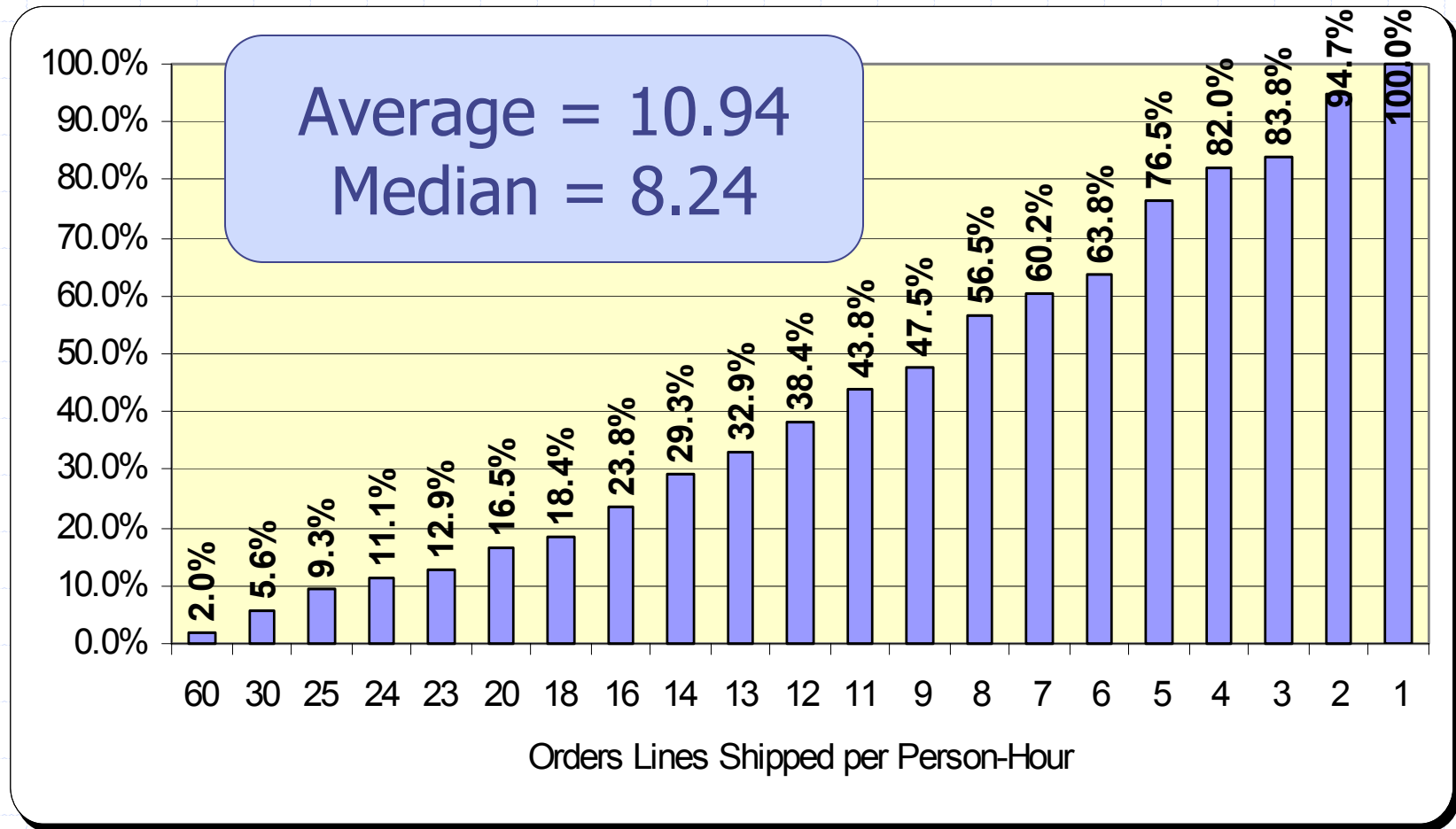
It pays to measure!



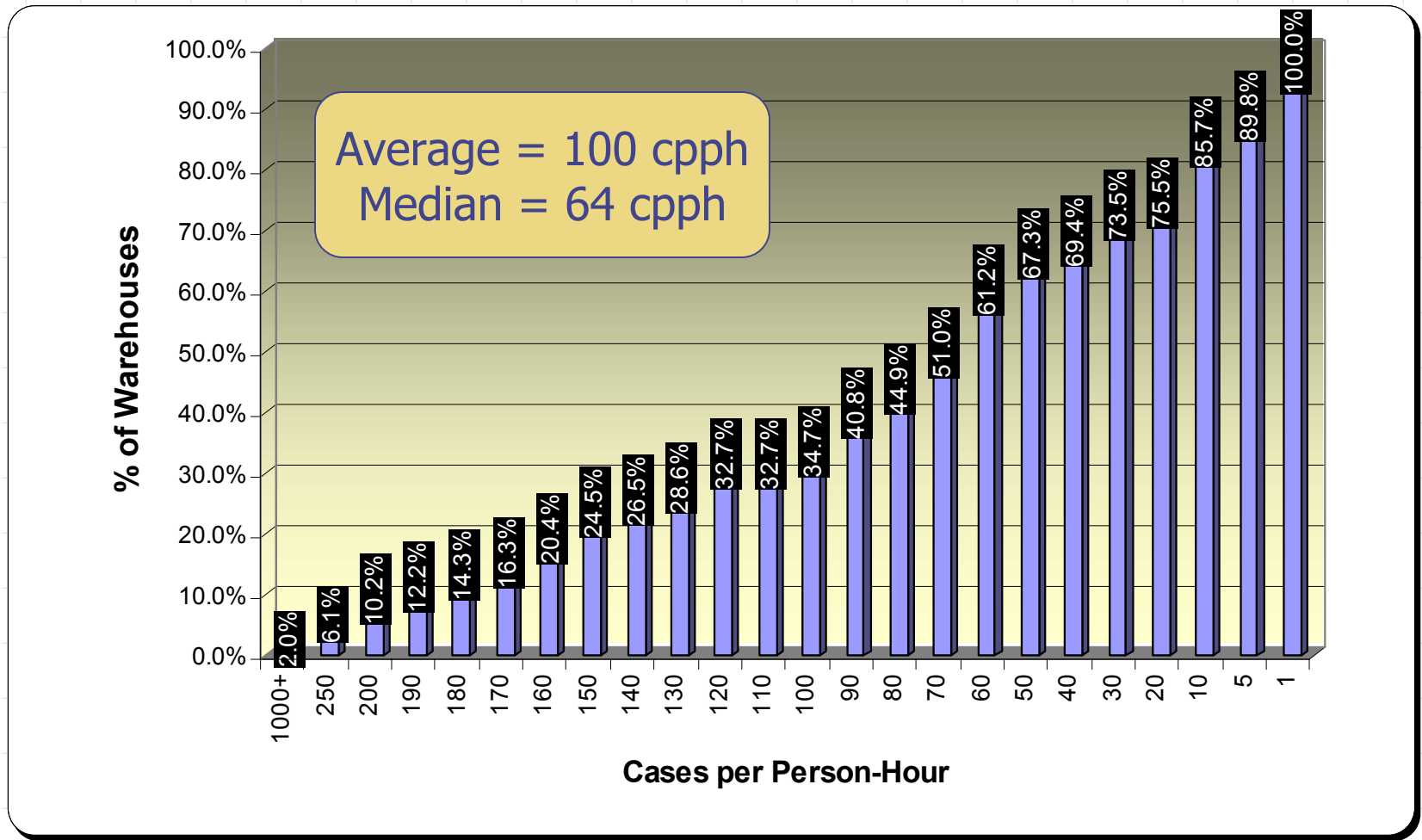
Productivity Metrics in Survey Warehouses



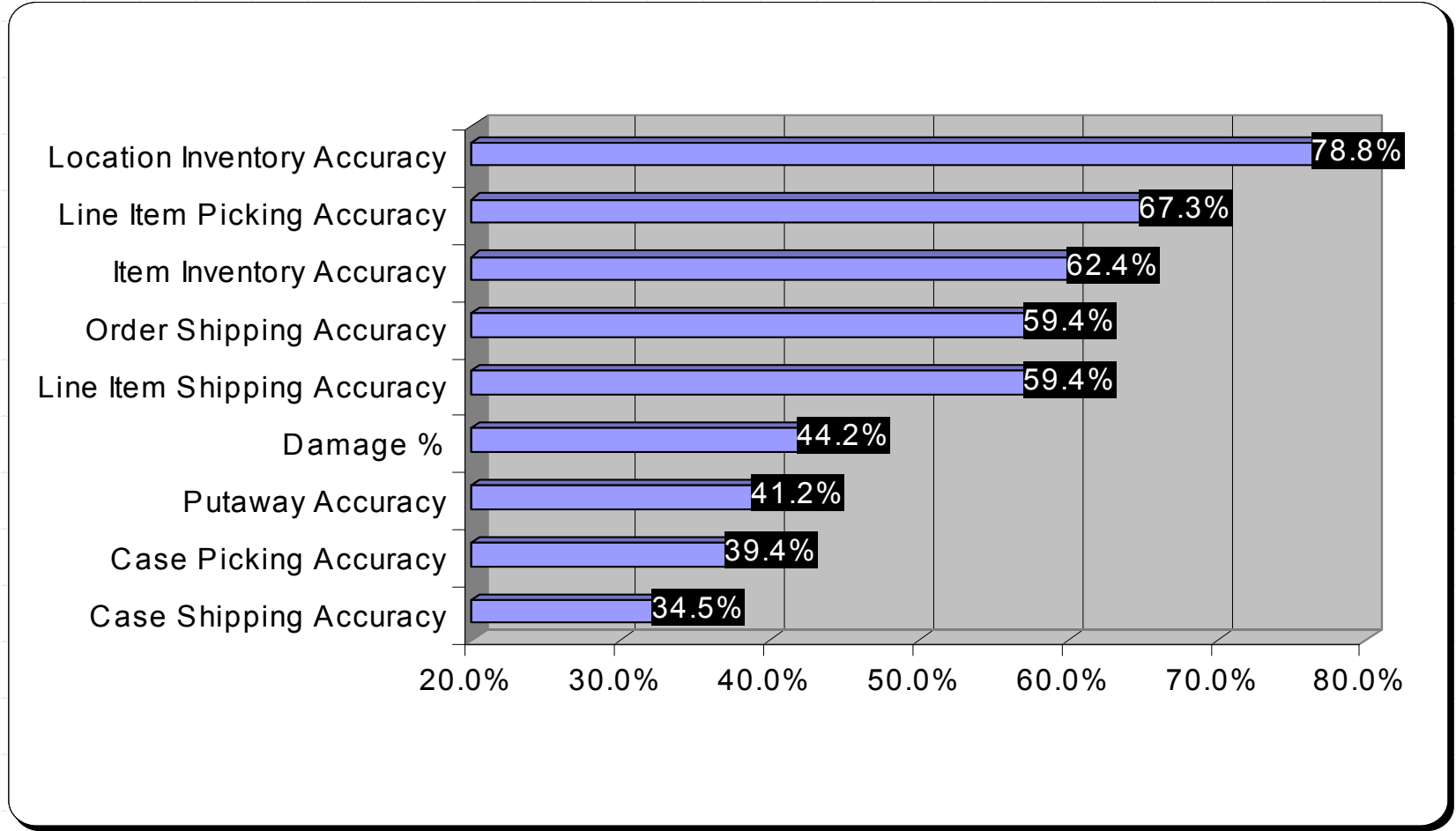
Order Lines per Total Person-Hours for Piece Shipping Warehouses



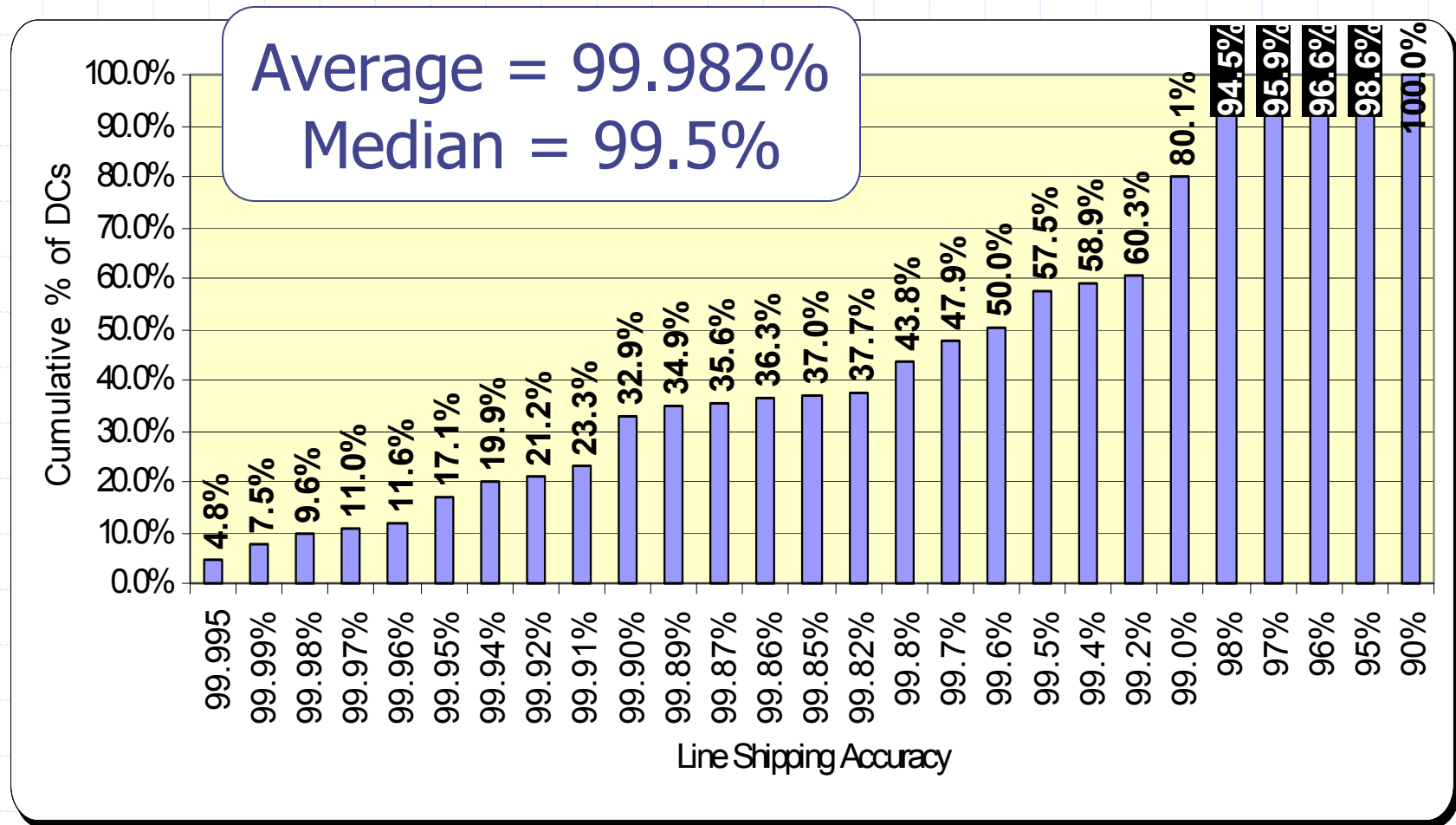
Outbound Cases per Total Person-Hour



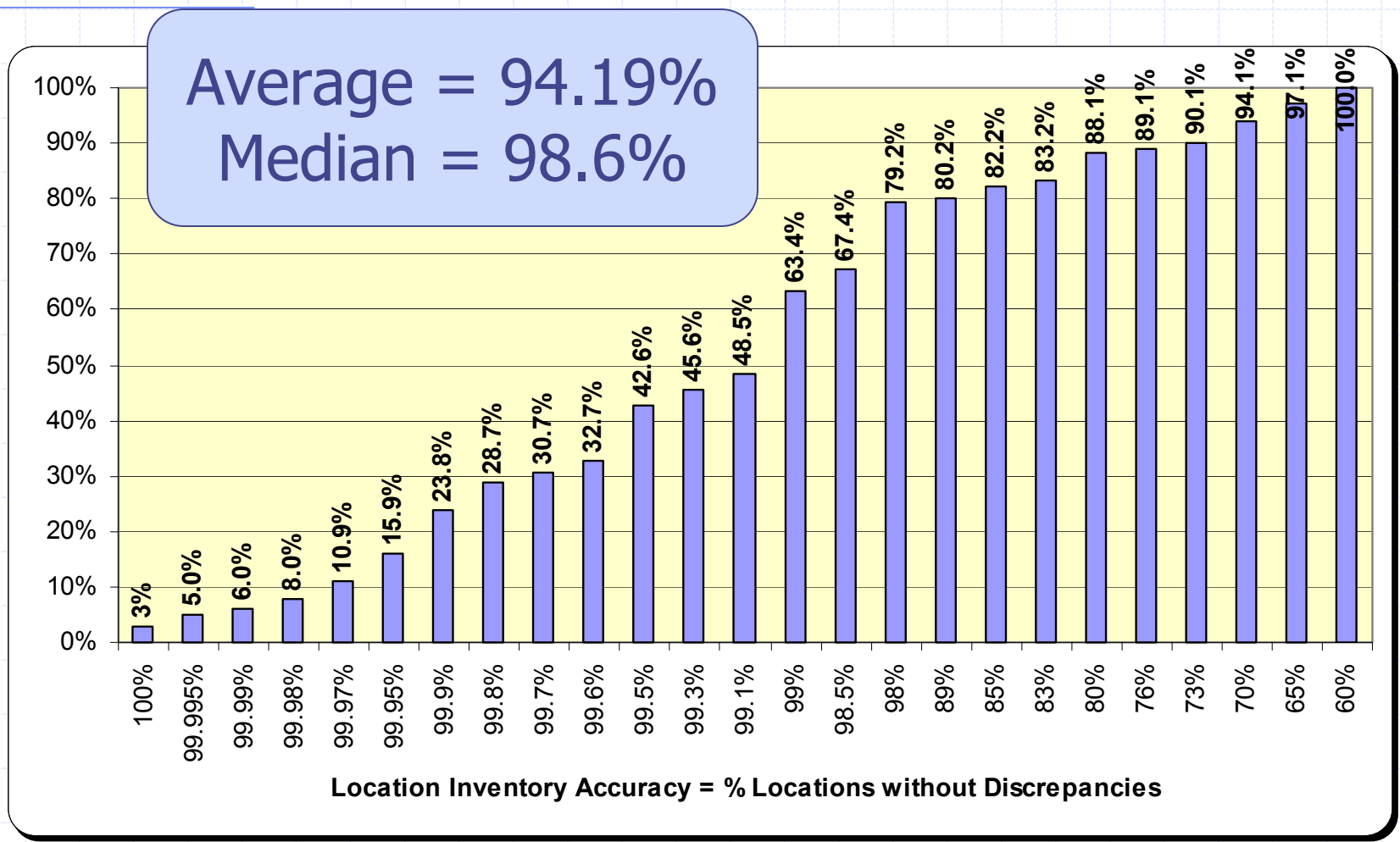
Quality Metrics in Survey Warehouses



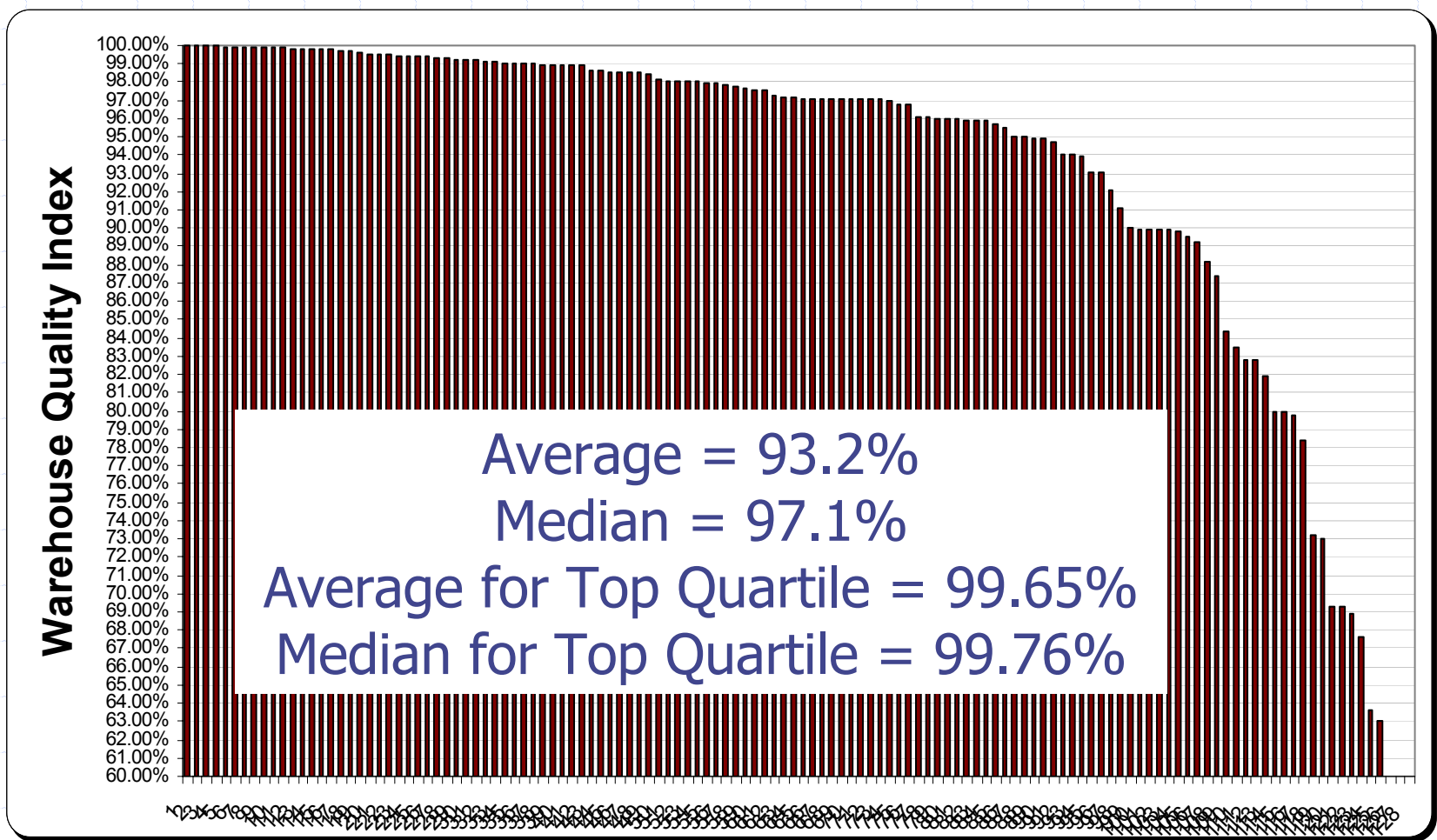
Order Line Shipping Accuracy in Survey Warehouses



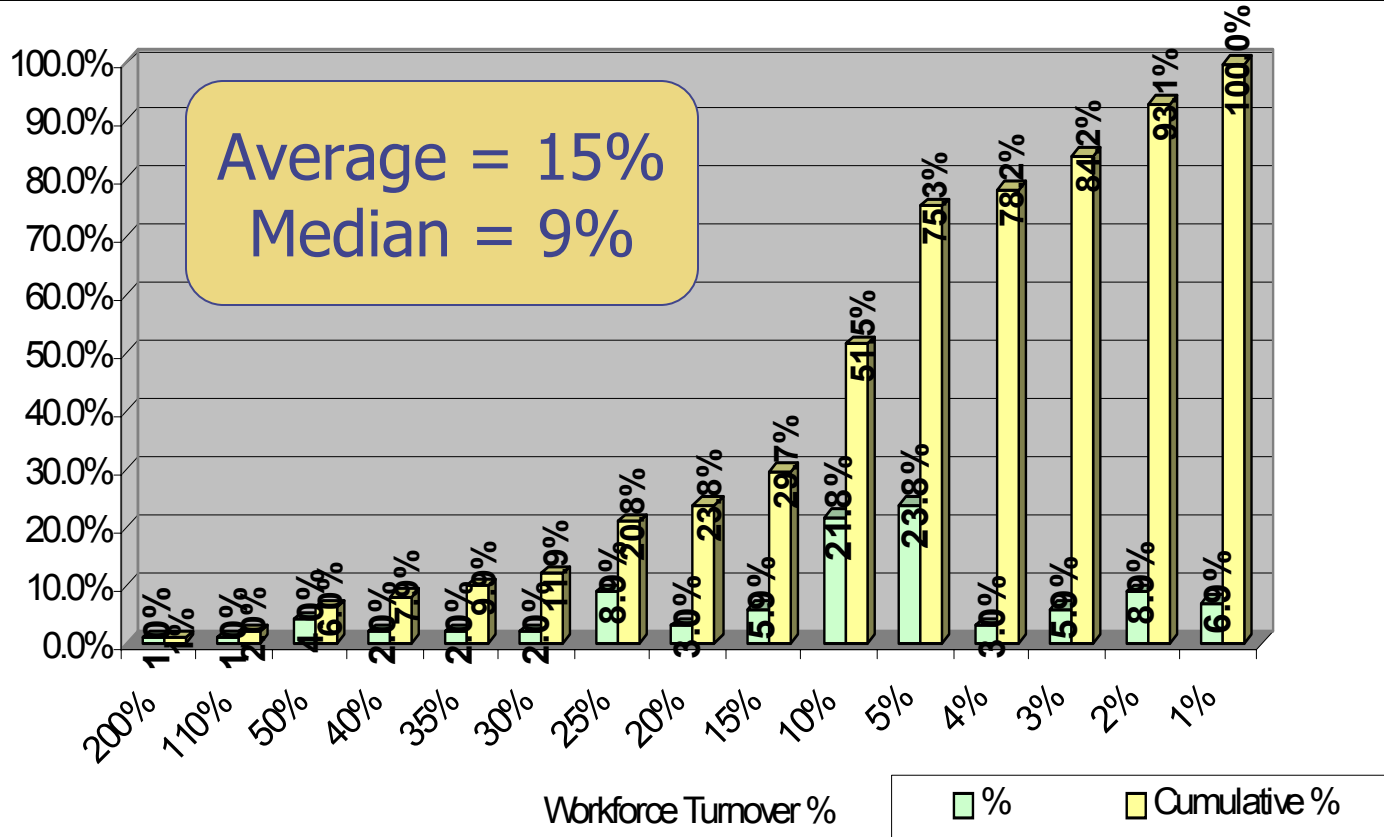
Location Inventory Accuracy in Survey Warehouses



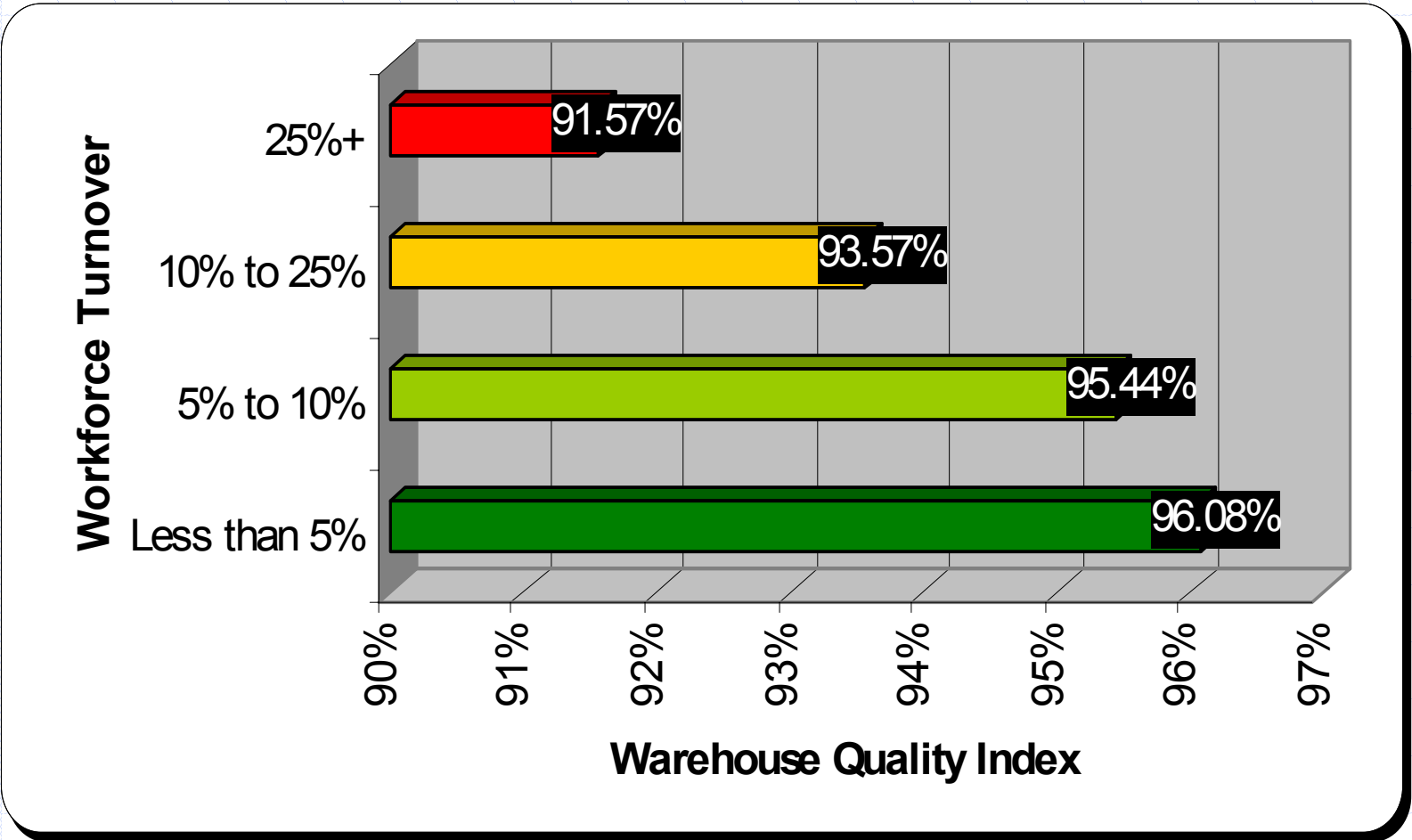
Warehouse Quality Index = Shipping Accuracy x Inventory Accuracy



Workforce Turnover

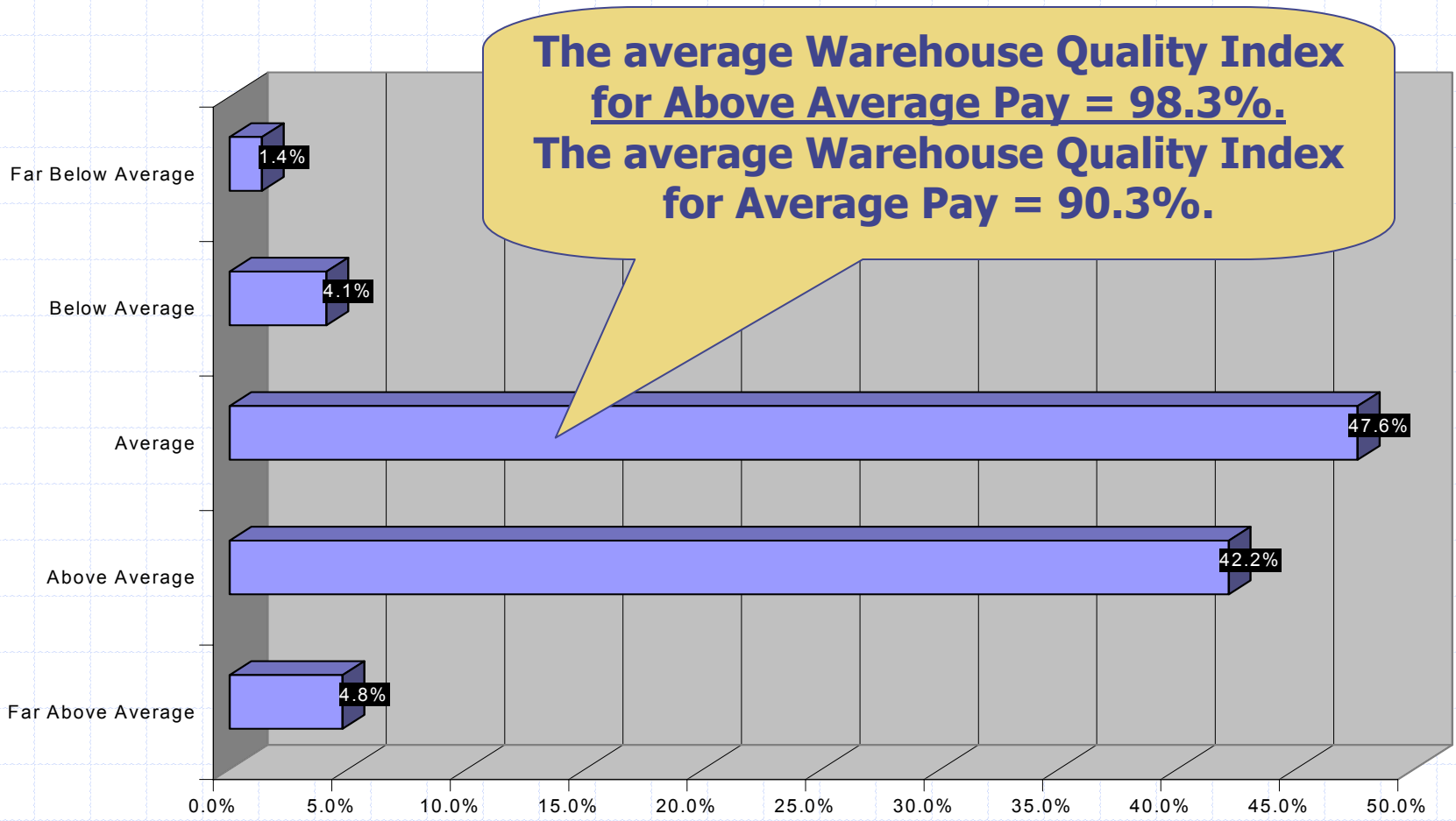


Workforce Turnover vs. Warehouse Quality



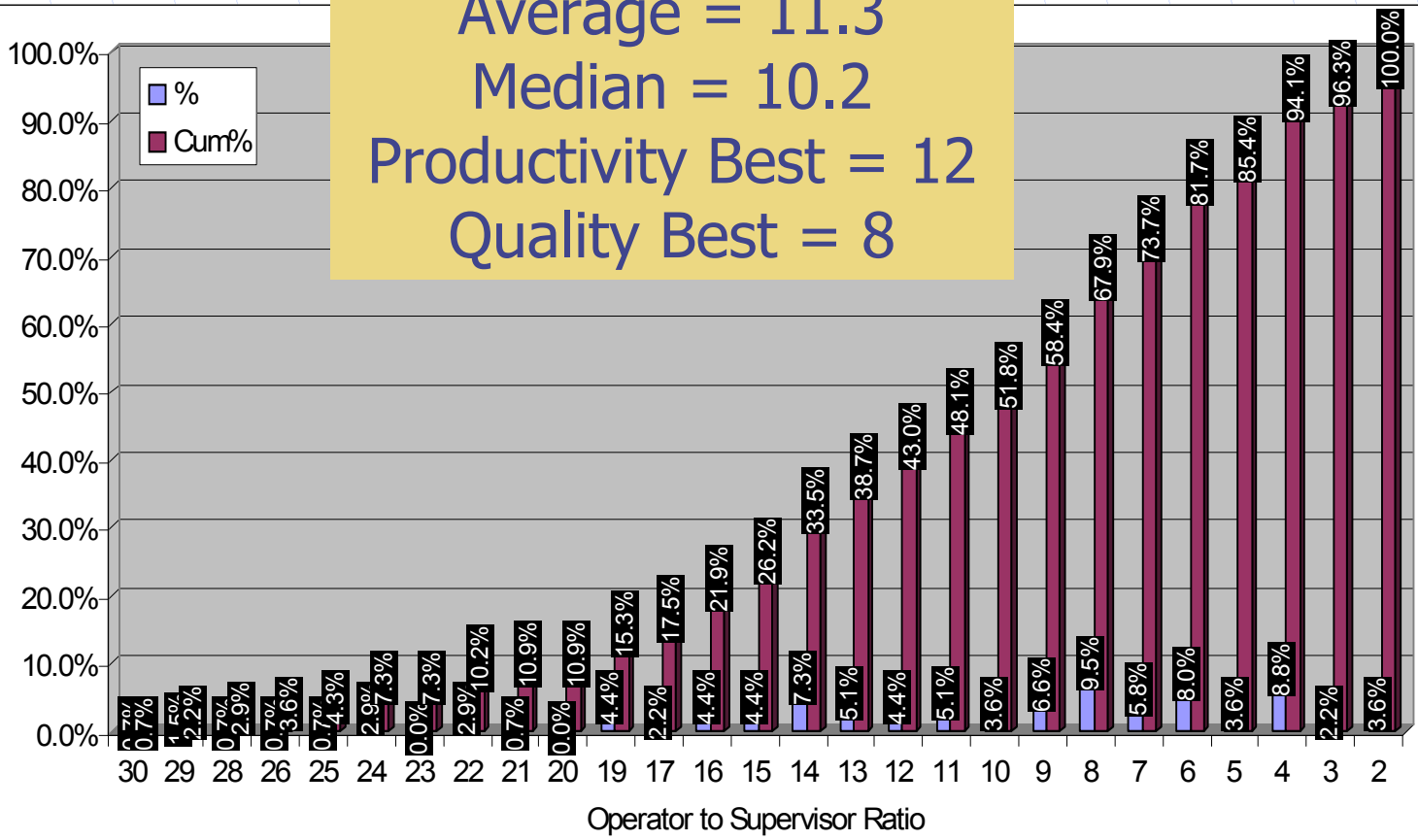
It pays to pay!

Pay Scales for Survey Warehouses

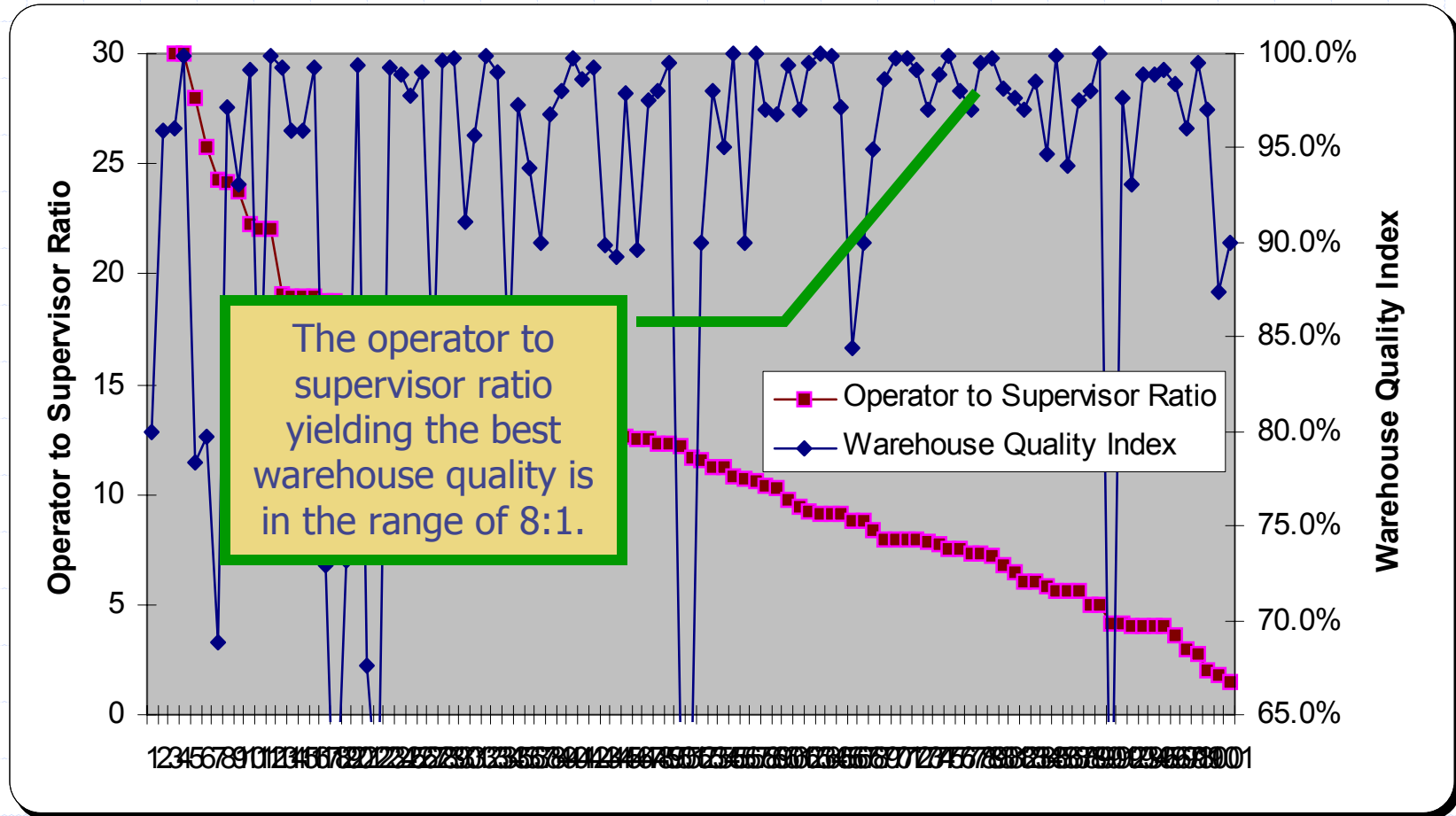


Operator to Supervisor Ratio

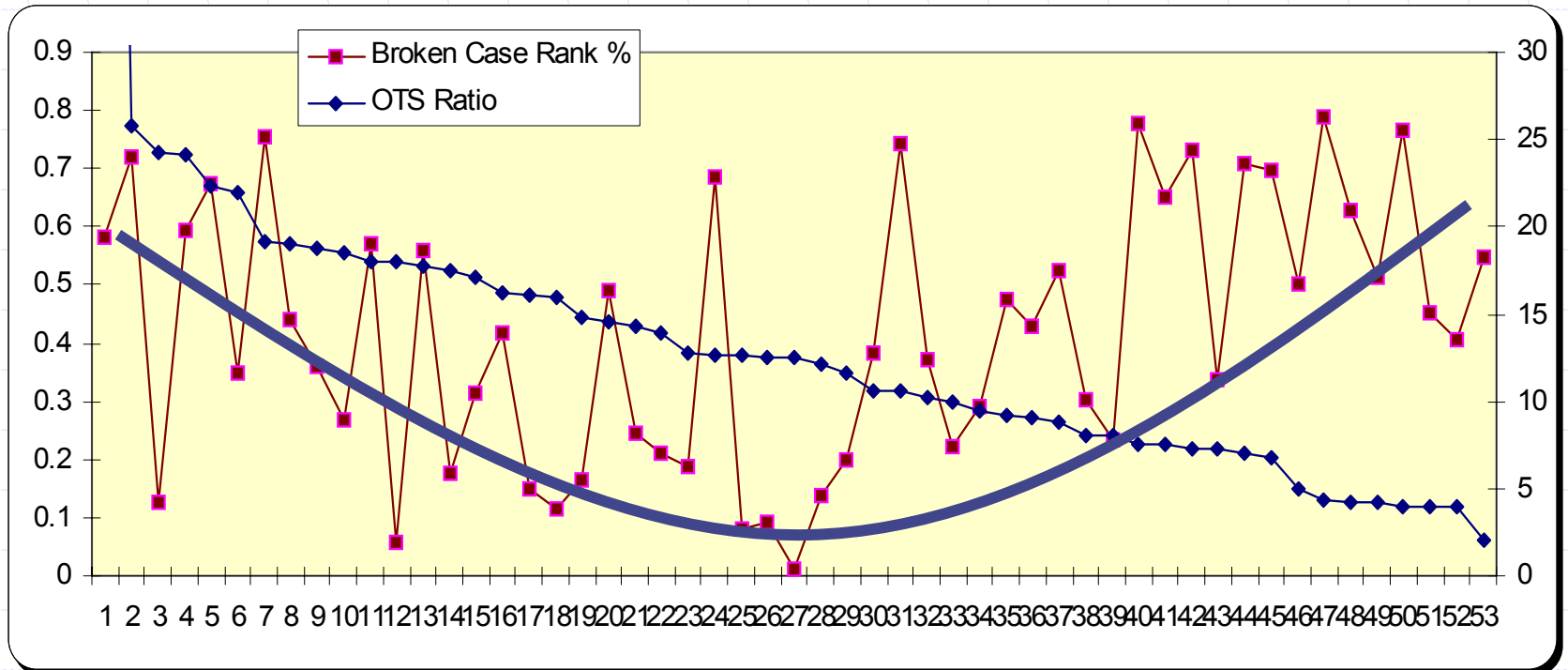
Average = 11.3
 Median = 10.2
 Productivity Best = 12
 Quality Best = 8



Operator to Supervisor Ratio vs. Warehouse Quality Index

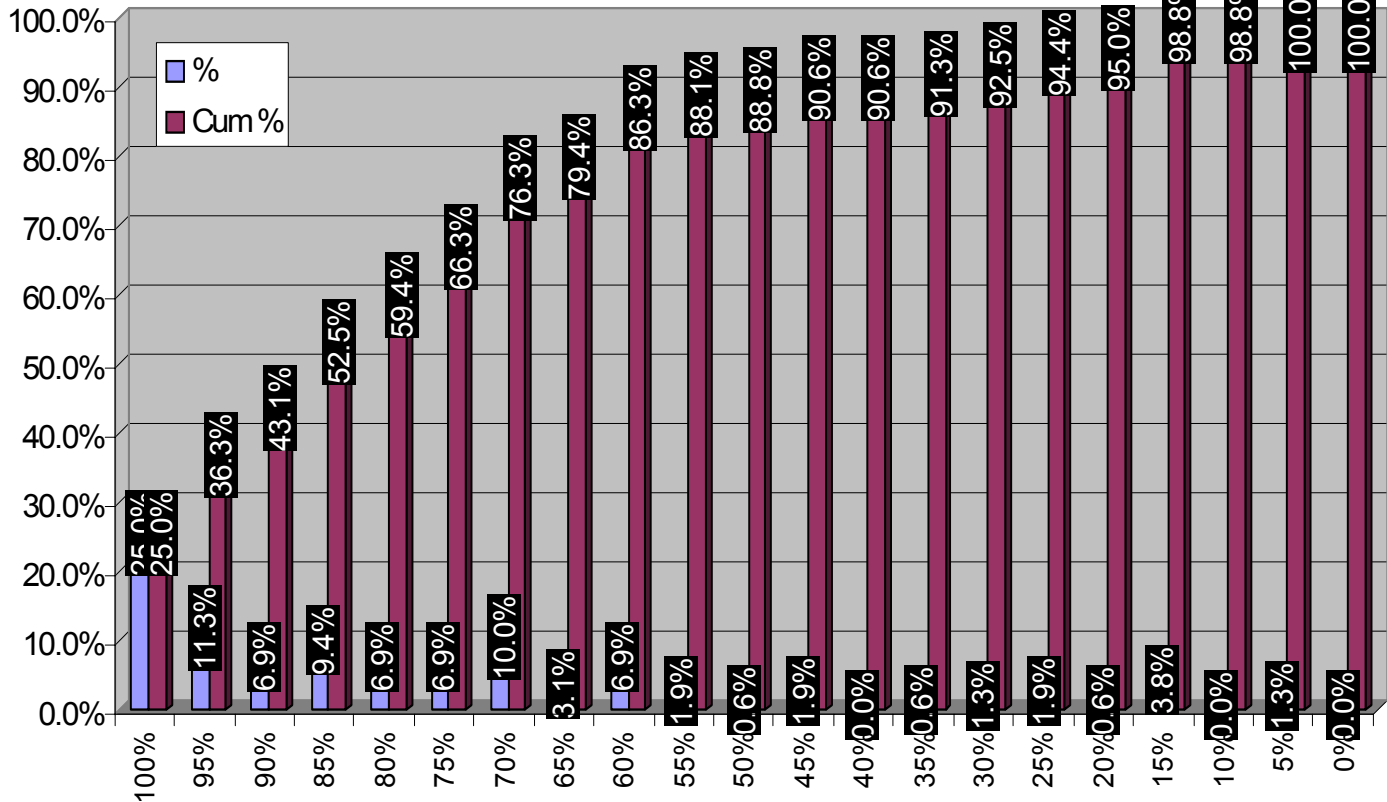


Operator to Supervisor Ratio Impact



The operator to supervisor ratio yielding the highest DC productivity for the survey warehouses is 12.0 in piece shipping warehouses.

% Active SKUs

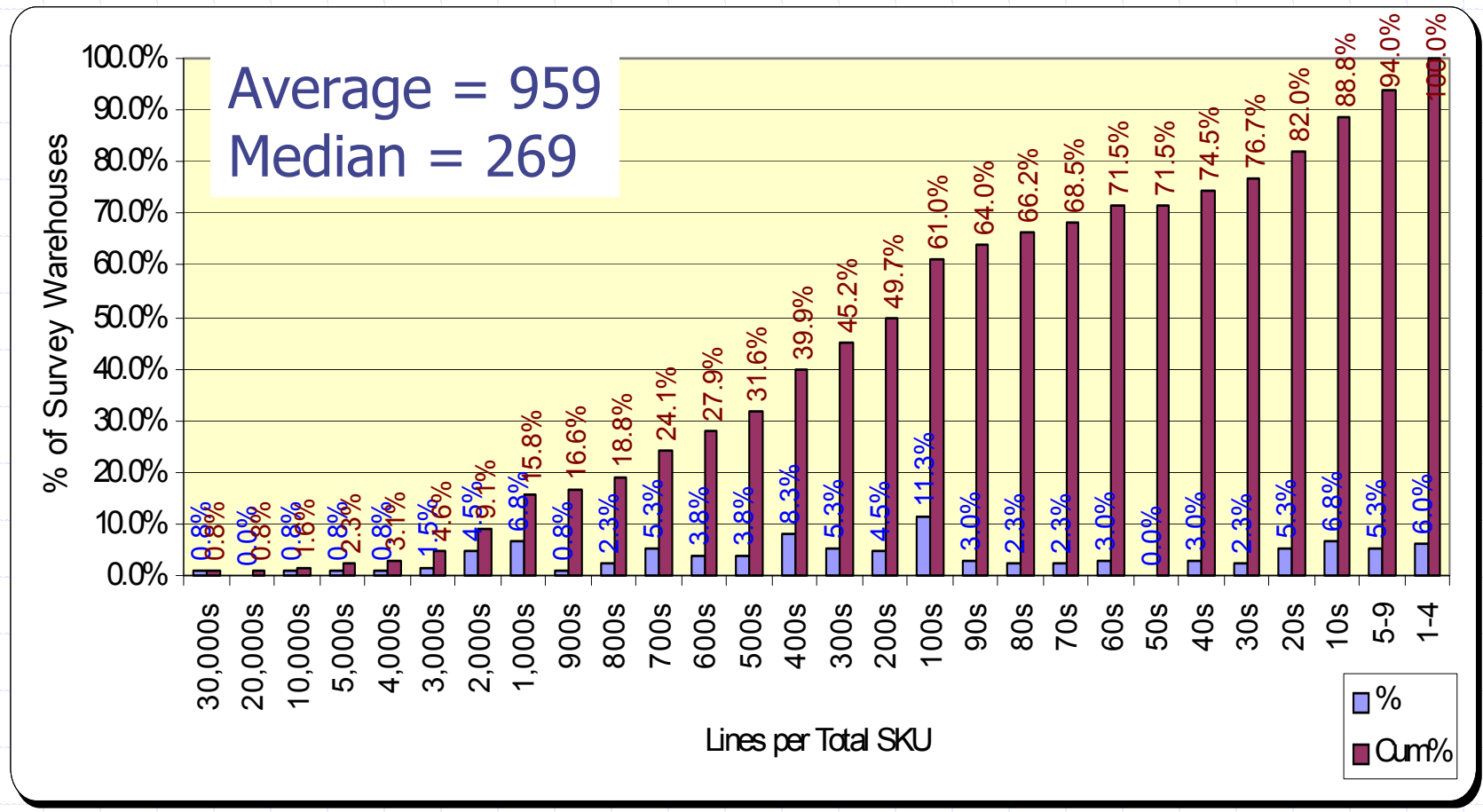


Average = 78.2%

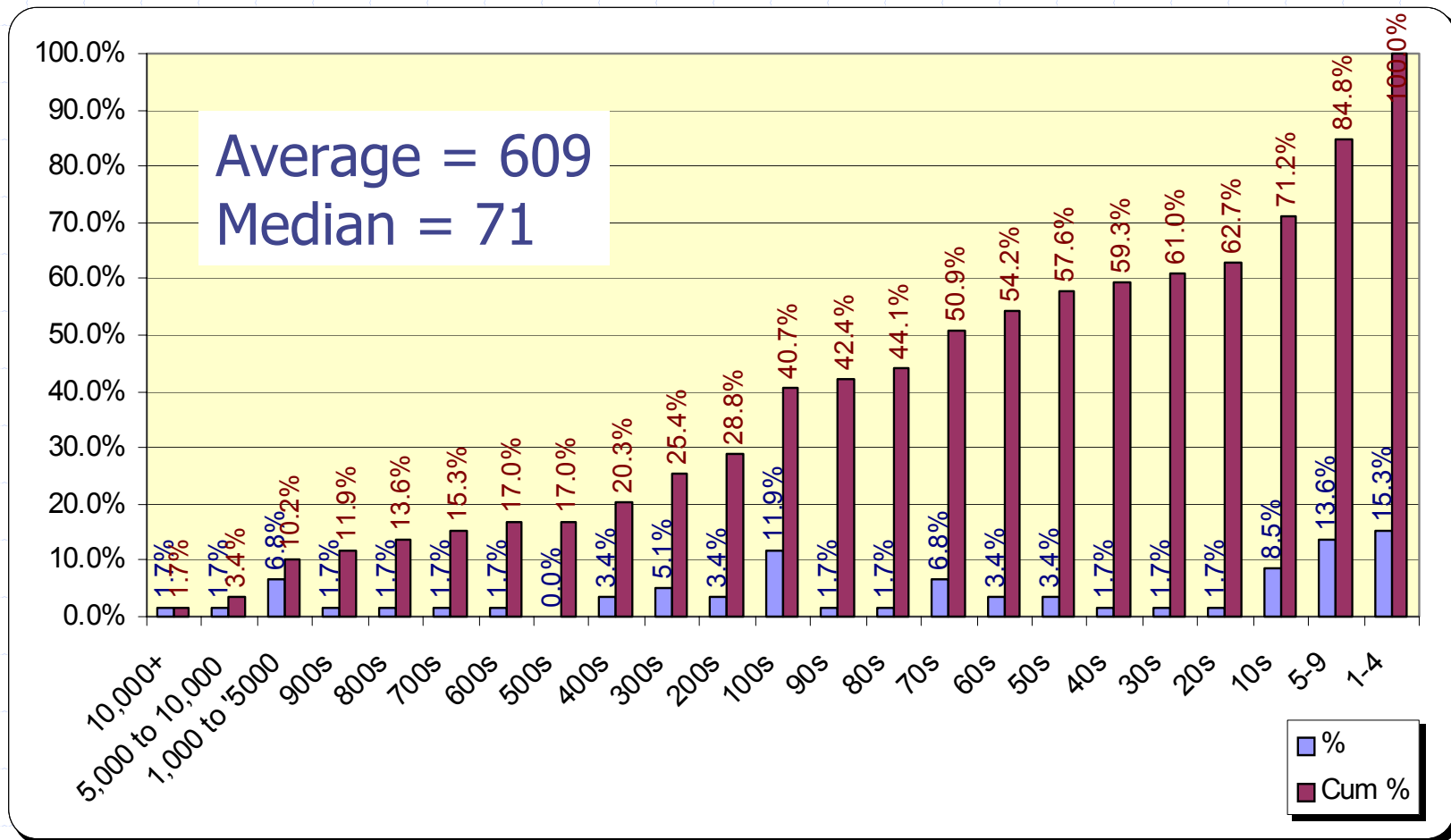
% Active SKUs

Median = 85.1%

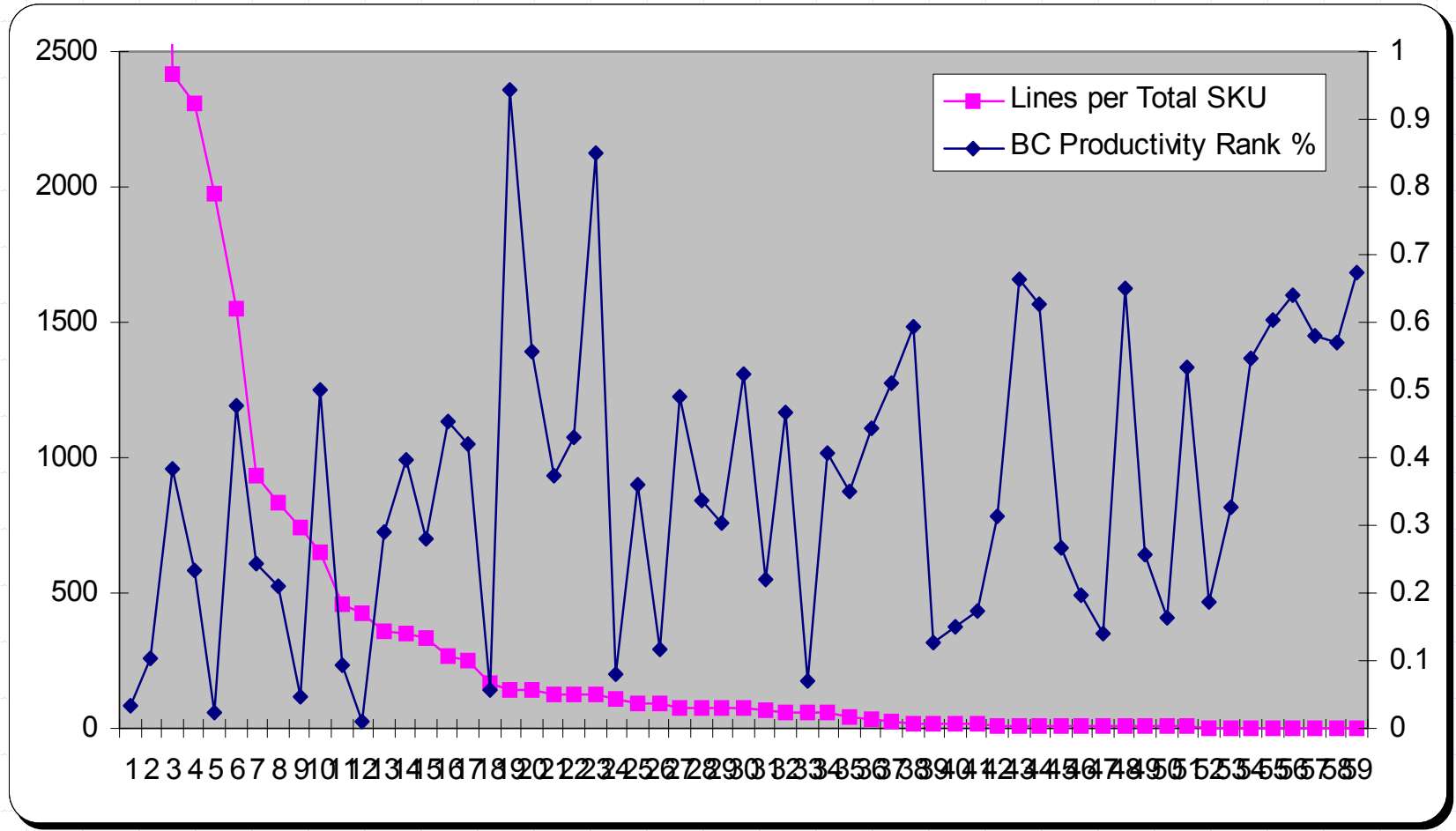
Annual Order Lines per SKU



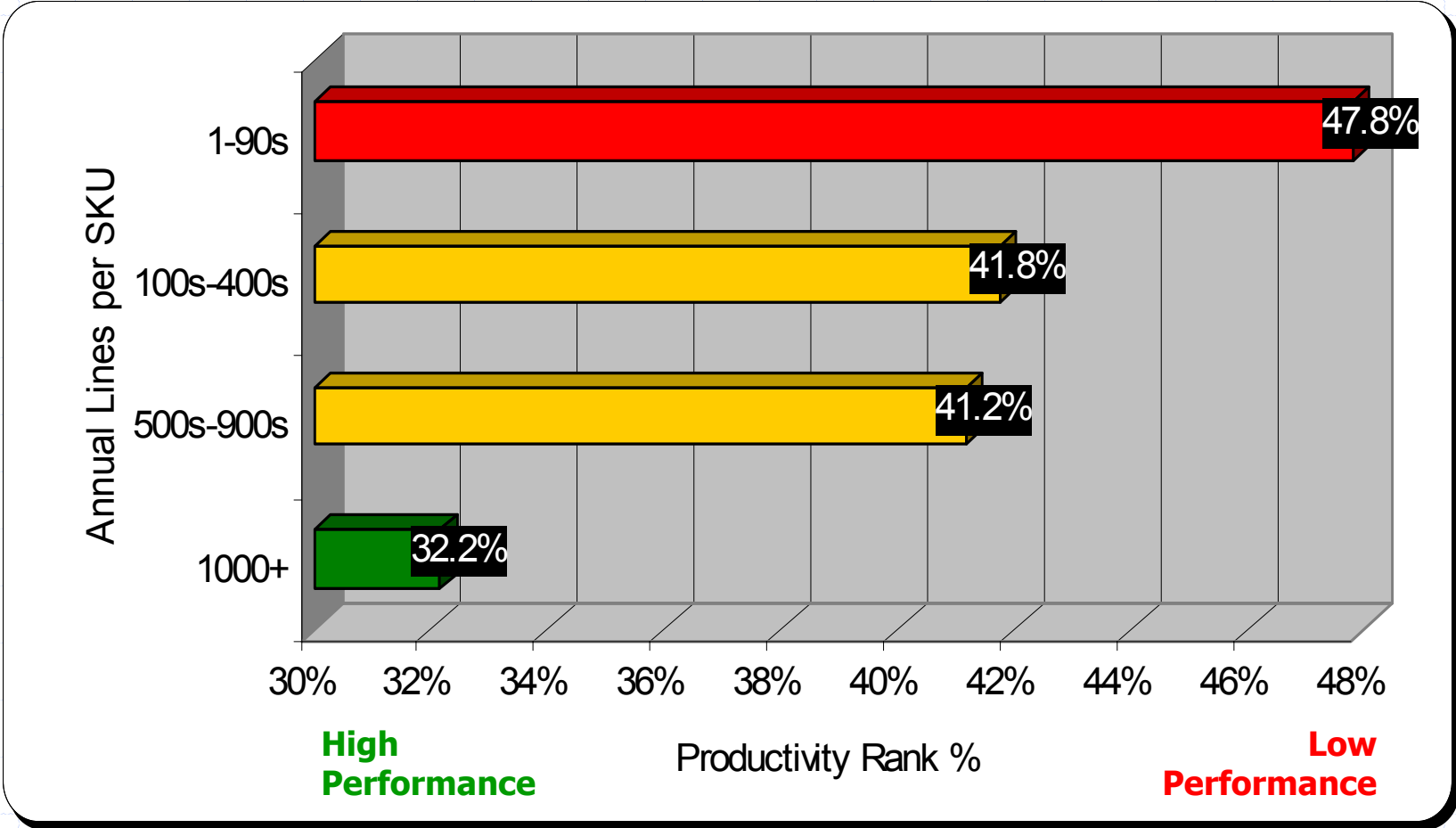
Lines per SKU in Piece Shipping DCs



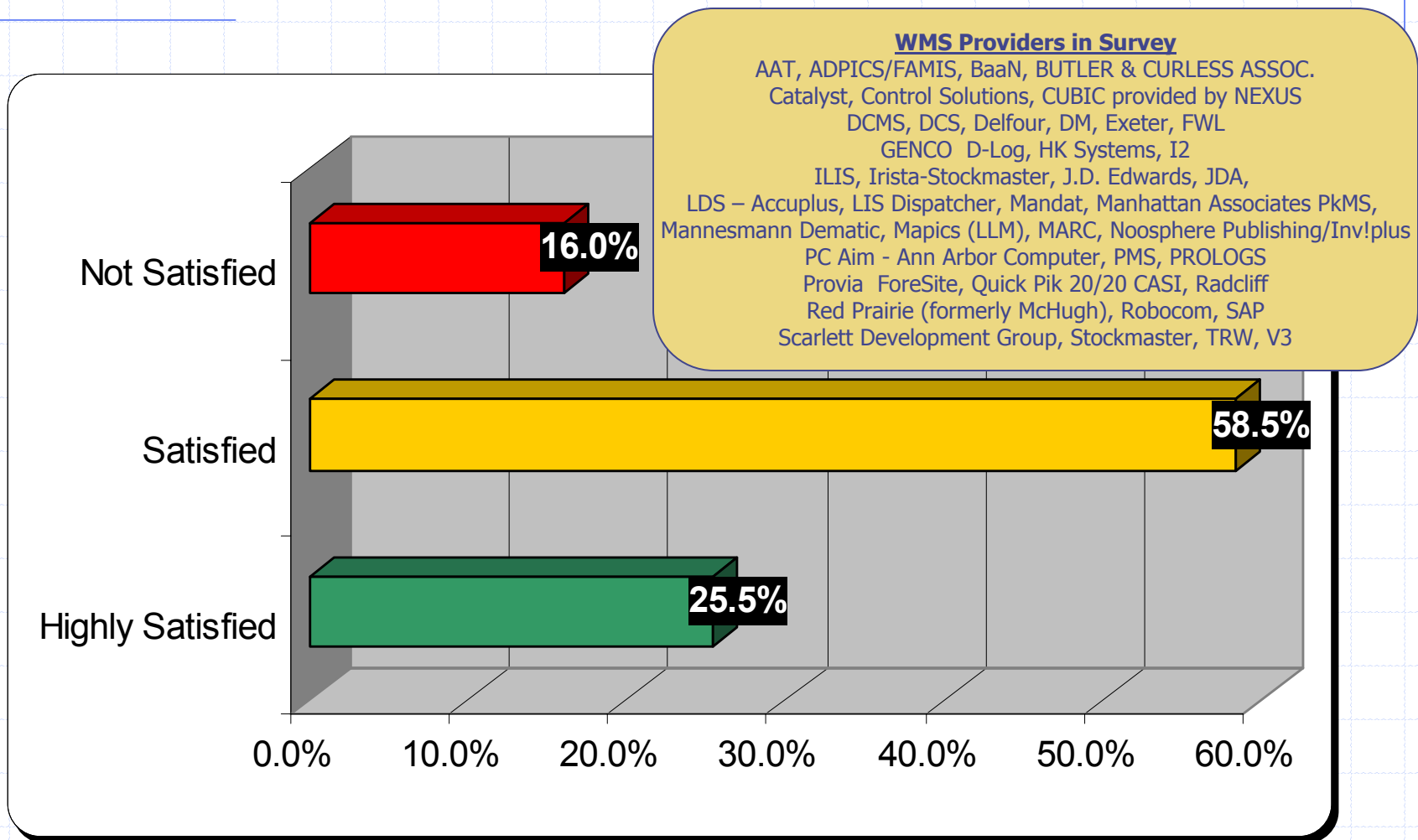
Annual Lines per SKU vs. Productivity Rank % for Piece Shipping Warehouses



Annual Lines per SKU vs. Productivity Rank %

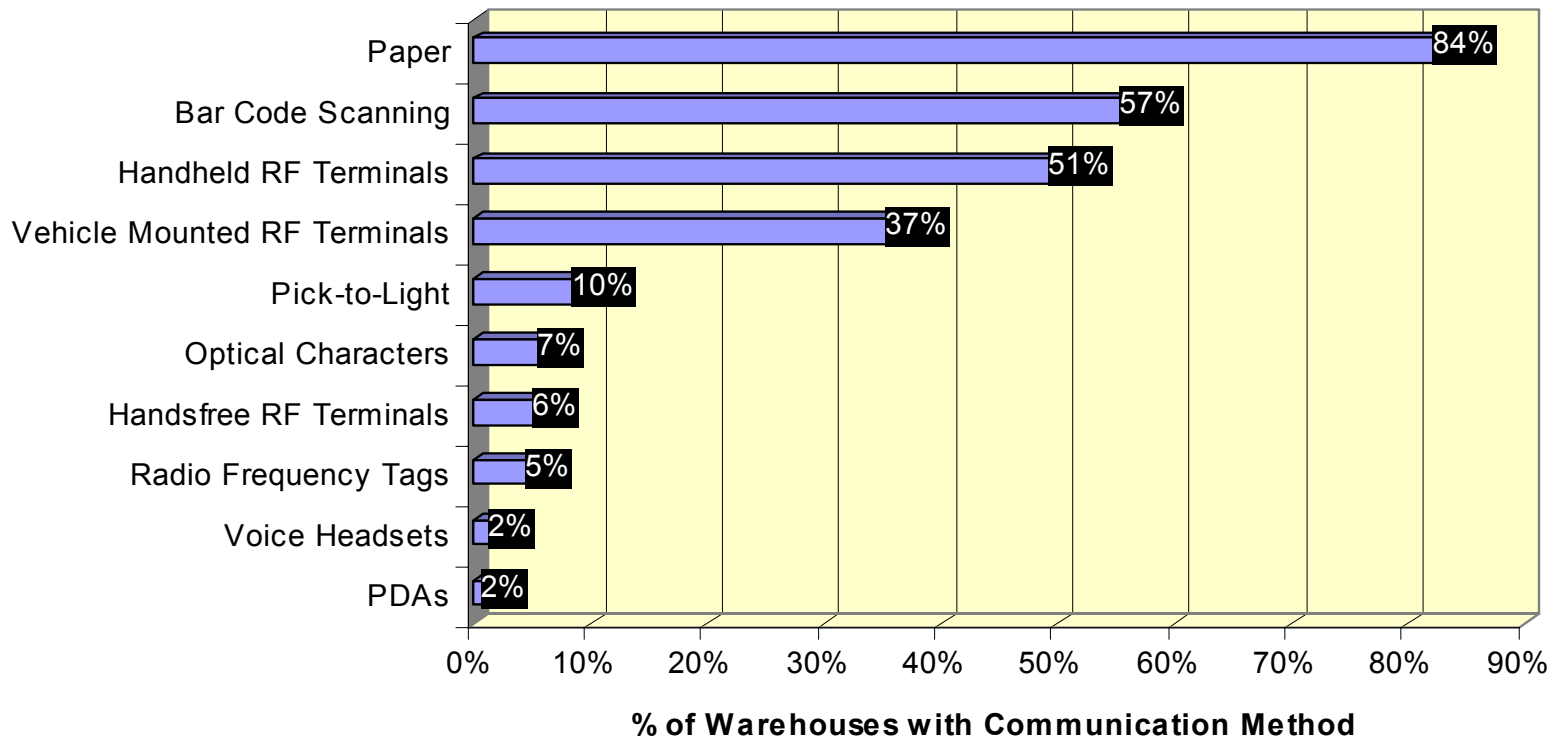


WMS Satisfaction

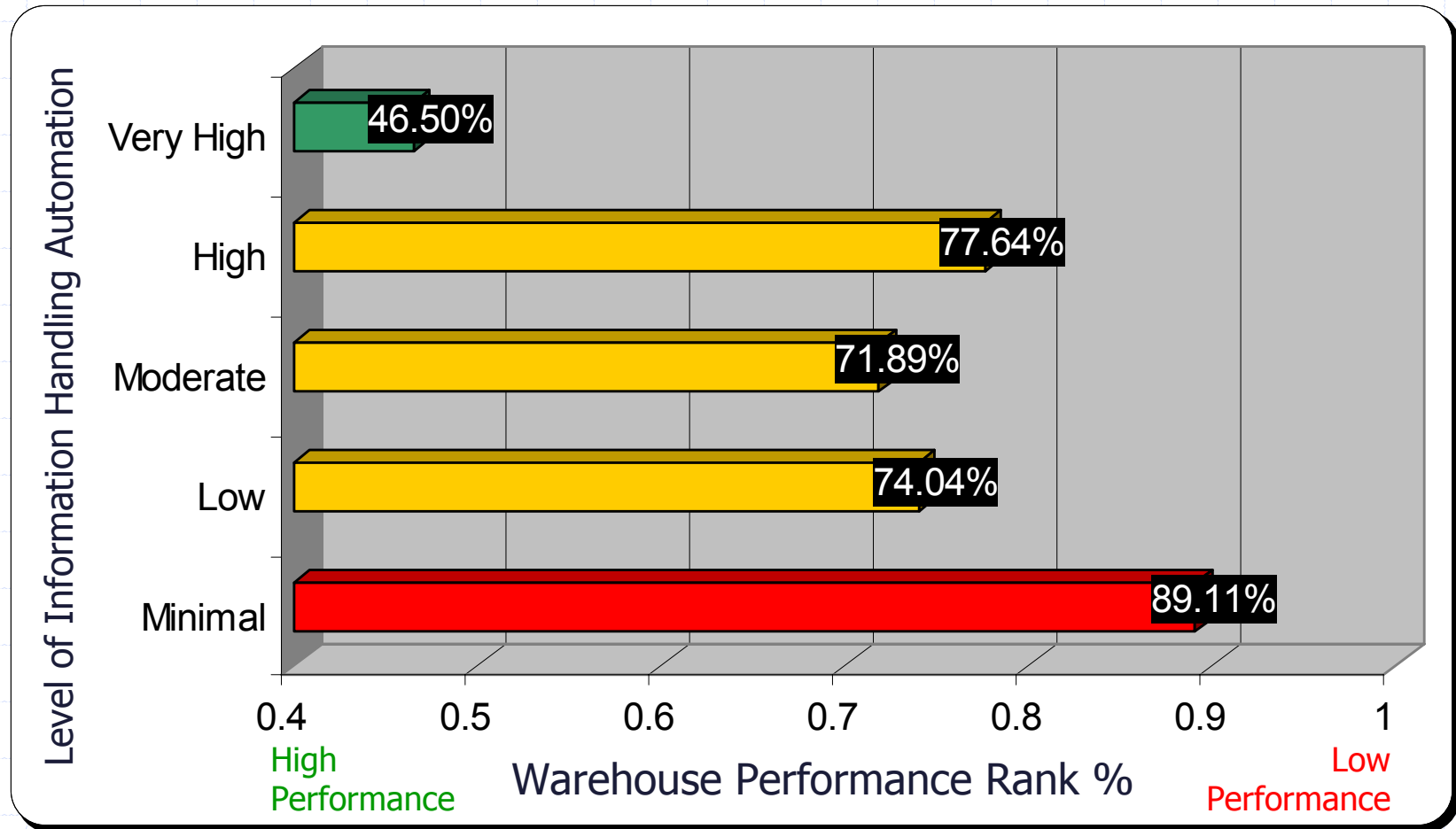


- WMS Providers in Survey**
- AAT, ADPICS/FAMIS, BaaN, BUTLER & CURLESS ASSOC.
 - Catalyst, Control Solutions, CUBIC provided by NEXUS
 - DCMS, DCS, Delfour, DM, Exeter, FWL
 - GENCO D-Log, HK Systems, I2
 - ILIS, Irista-Stockmaster, J.D. Edwards, JDA,
 - LDS – Accuplus, LIS Dispatcher, Mandat, Manhattan Associates PkMS,
 - Mannesmann Dematic, Mapics (LLM), MARC, Noosphere Publishing/Inv!plus
 - PC Aim - Ann Arbor Computer, PMS, PROLOGS
 - Provia ForeSite, Quick Pik 20/20 CASI, Radcliff
 - Red Prairie (formerly McHugh), Robocom, SAP
 - Scarlett Development Group, Stockmaster, TRW, V3

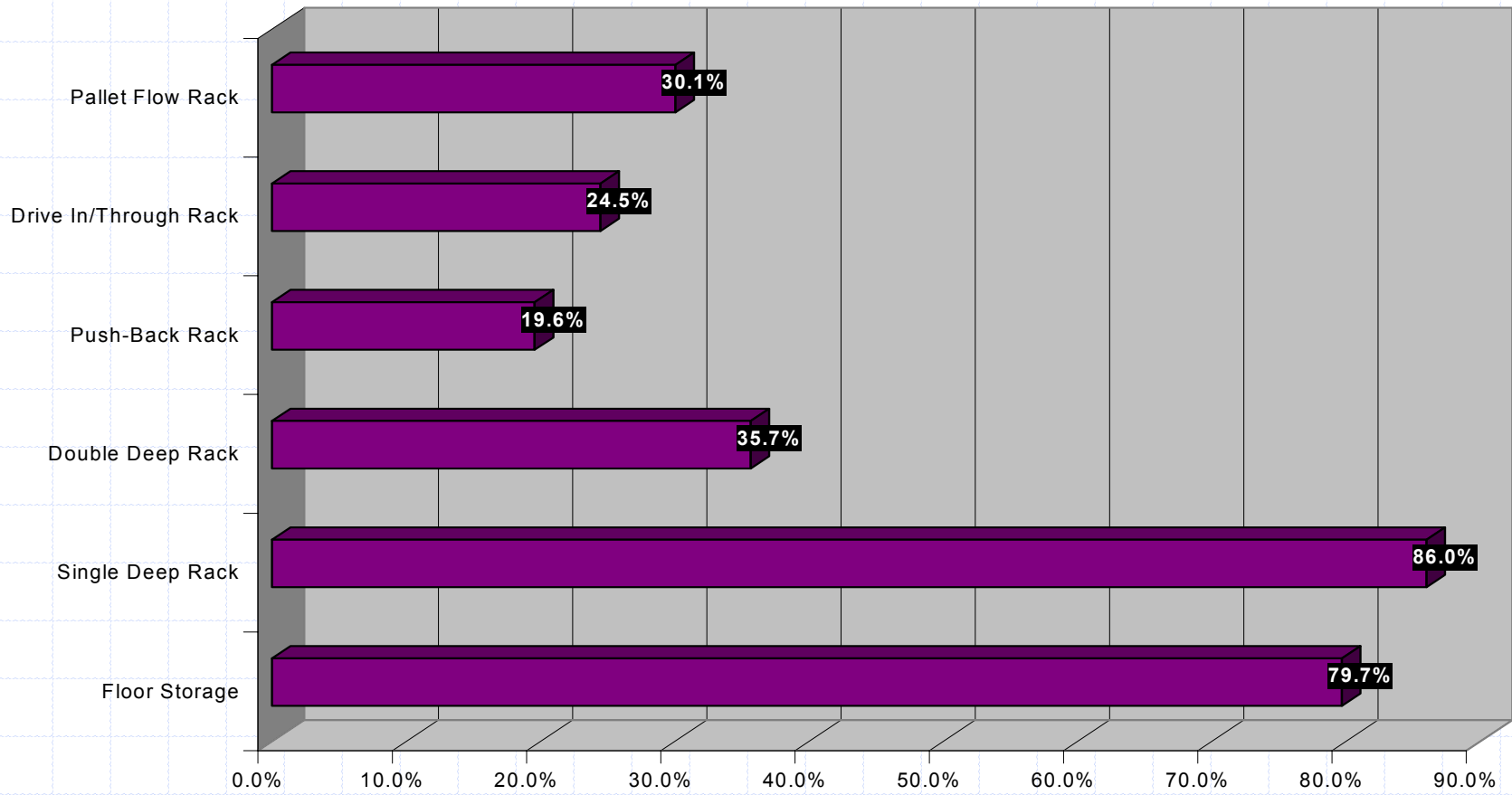
Warehouse Communication Methods



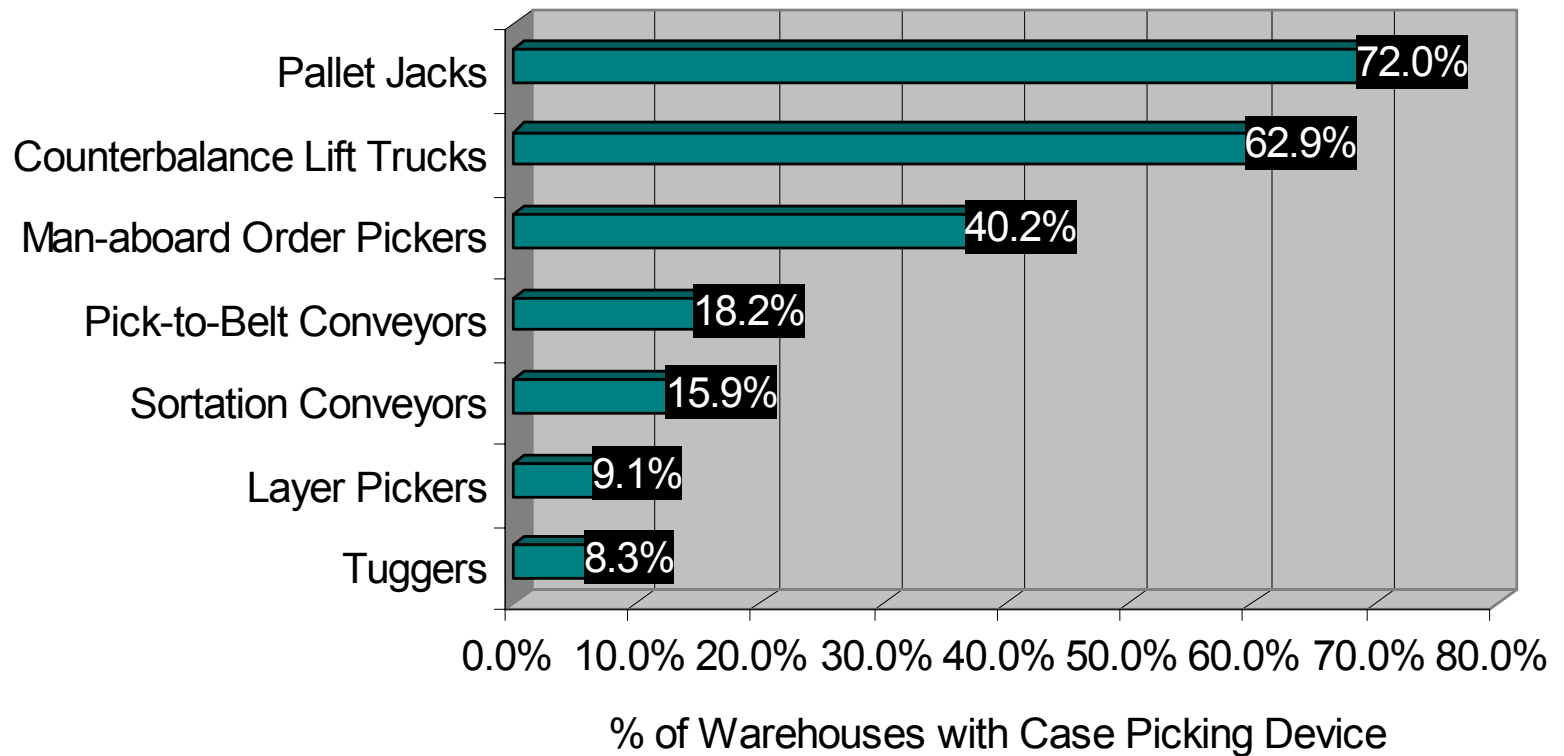
Level of Information Handling Automation vs. Warehouse Performance Rank %



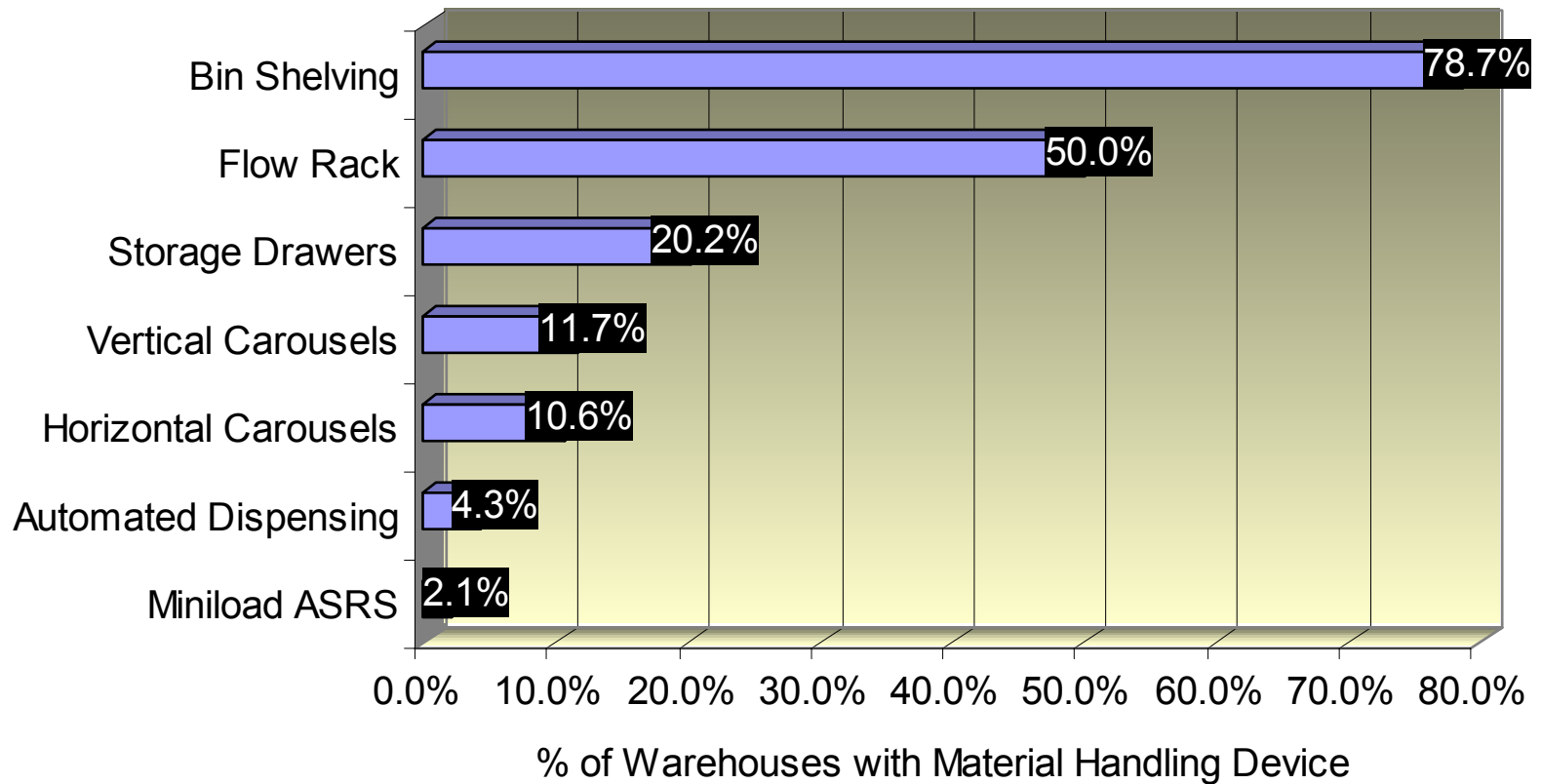
Pallet Storage Modes in Survey Warehouses



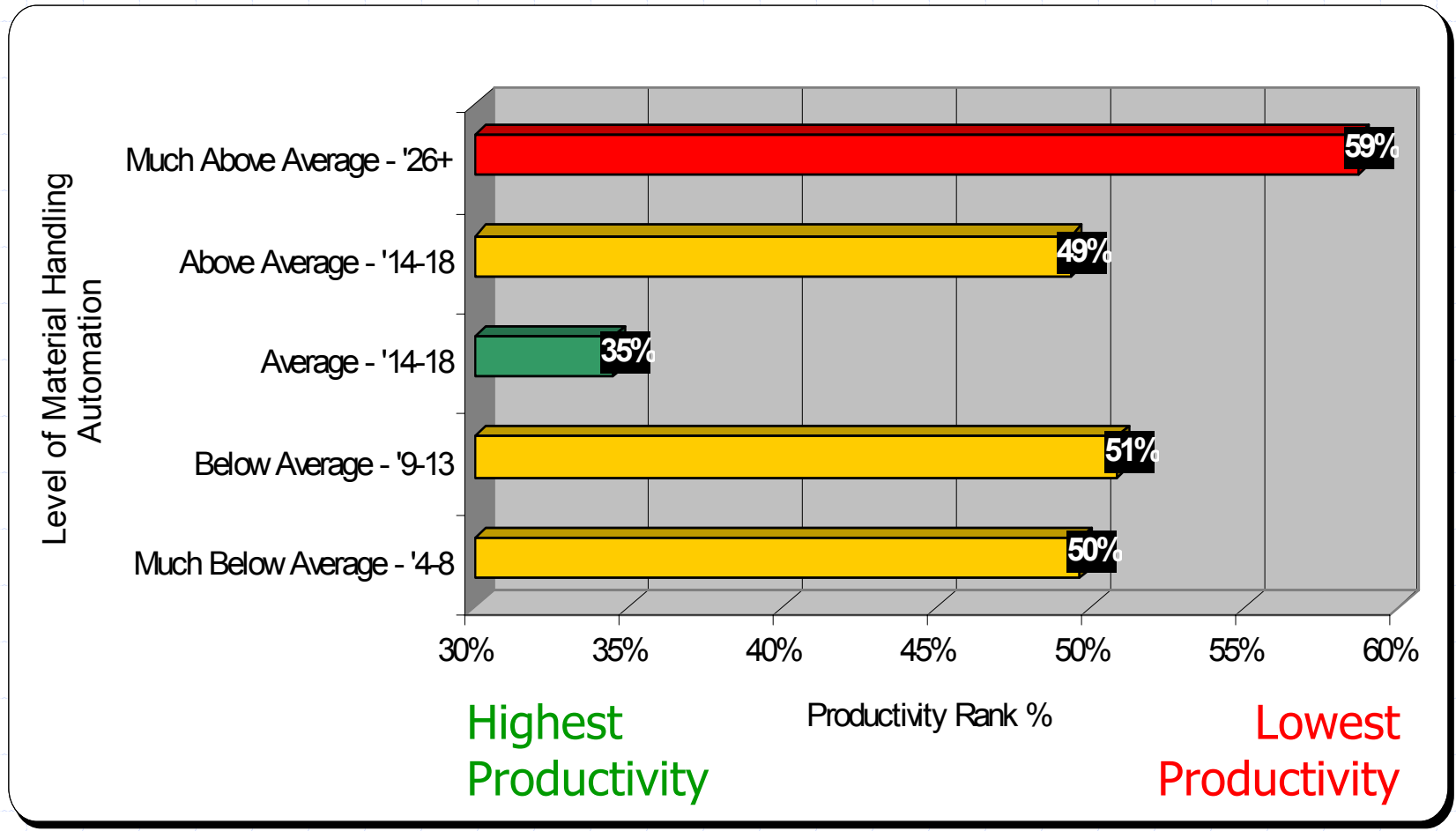
Case Picking Devices



Broken Case Picking Equipment



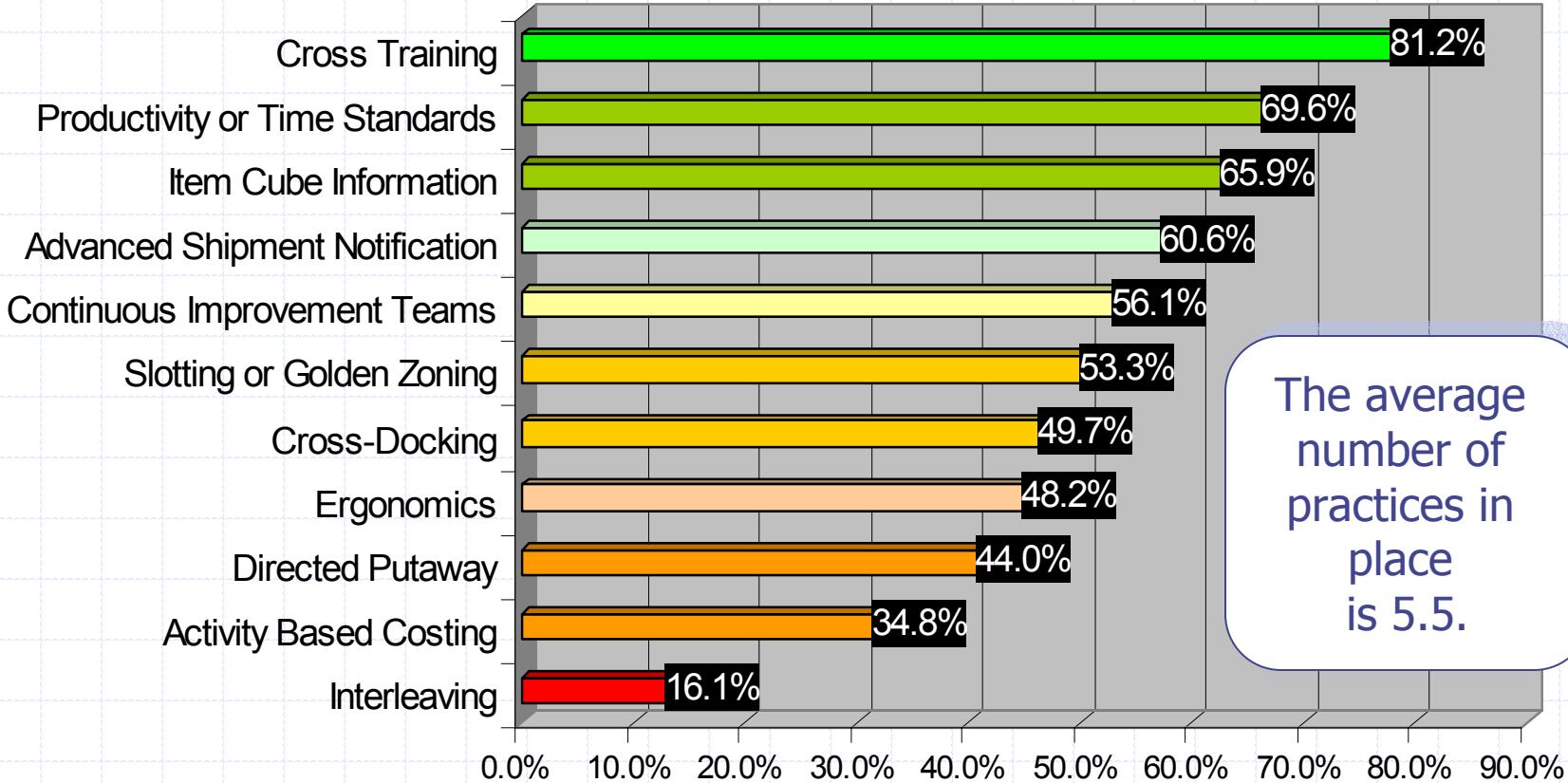
Material Handling Automation vs. Warehouse Productivity



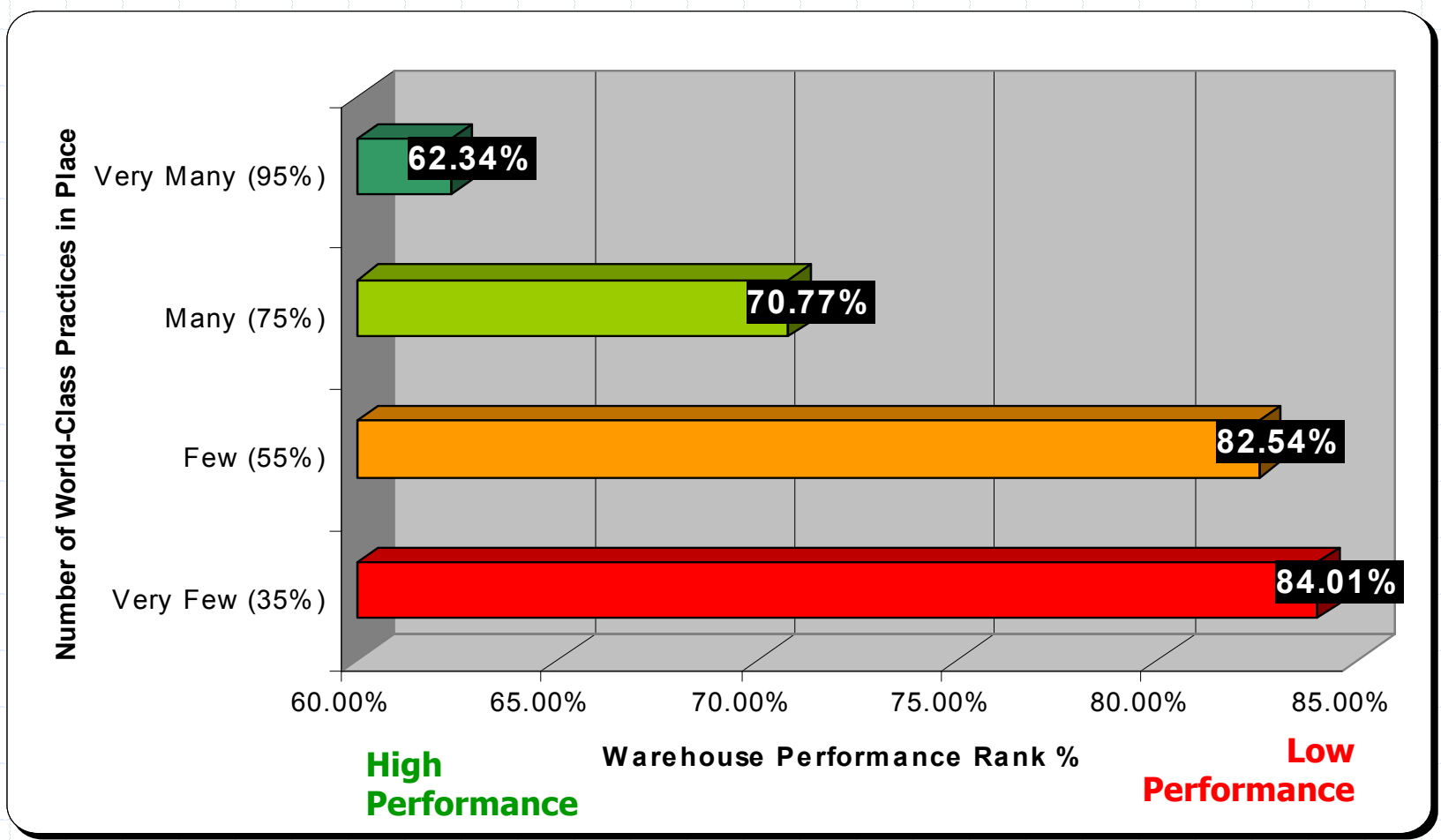
Highest Productivity

Lowest Productivity

Practices in Place in Survey Warehouses



It pays to practice!



The “Perfect” Warehouse

- ◆ A building 671 feet long, 447 feet wide, 30 feet clear with 300,000 square feet in a rapidly appreciating area inside a free trade zone within 24 hour delivery of all U.S. zip codes and in close proximity to a highly skilled and motivated workforce.
- ◆ The building is 80% occupied during “normal” inventory levels and 90% occupied during “peak” inventory levels.
- ◆ The operation is a hybrid insource-outsource model with the perfect outsource provider(s) chosen to perform those activities inside the warehouse that SHOULD BE outsourced.
- ◆ The operation is supported by a WMS provided by an ASP enabling all world-class warehousing practices and integrating with a wide variety of paperless communication devices chosen perfectly to meet the unique needs of each activity within the warehouse.

The “Perfect” Warehouse

- ◆ The workforce is cross-trained with an operator to supervisor ratio of 12 where QUALITY is the key success driver and 8 where PRODUCTIVITY is the key success driver and where operators are delighted with average to above-average pay.
- ◆ The SKUs would be highly active, yielding 1000+ hits per year on average.
- ◆ An APPROPRIATE level of material handling technology is in place, each device chosen to perfectly match the handling requirements of the task.
- ◆ A holistic set of financial, productivity, quality and cycle time metrics work together to motivate and maintain world-class warehouse performance.

Contact Information

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