
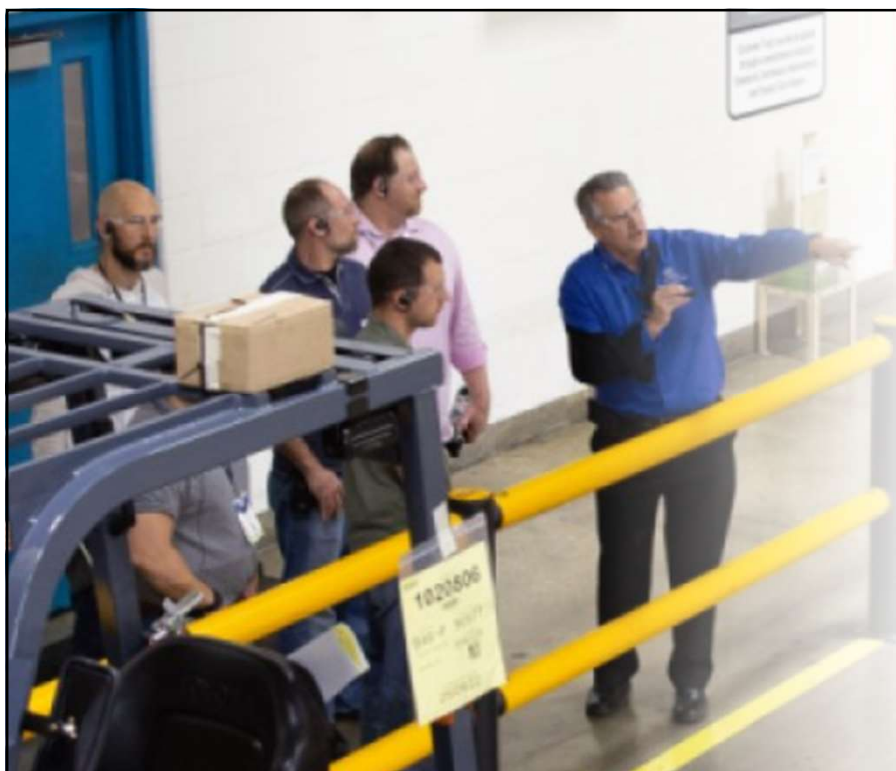


Leveraging Industry Tools to Improve Your Operations

CLRC – Supply Chain Evolution: Shaping the Future
August 24, 2023



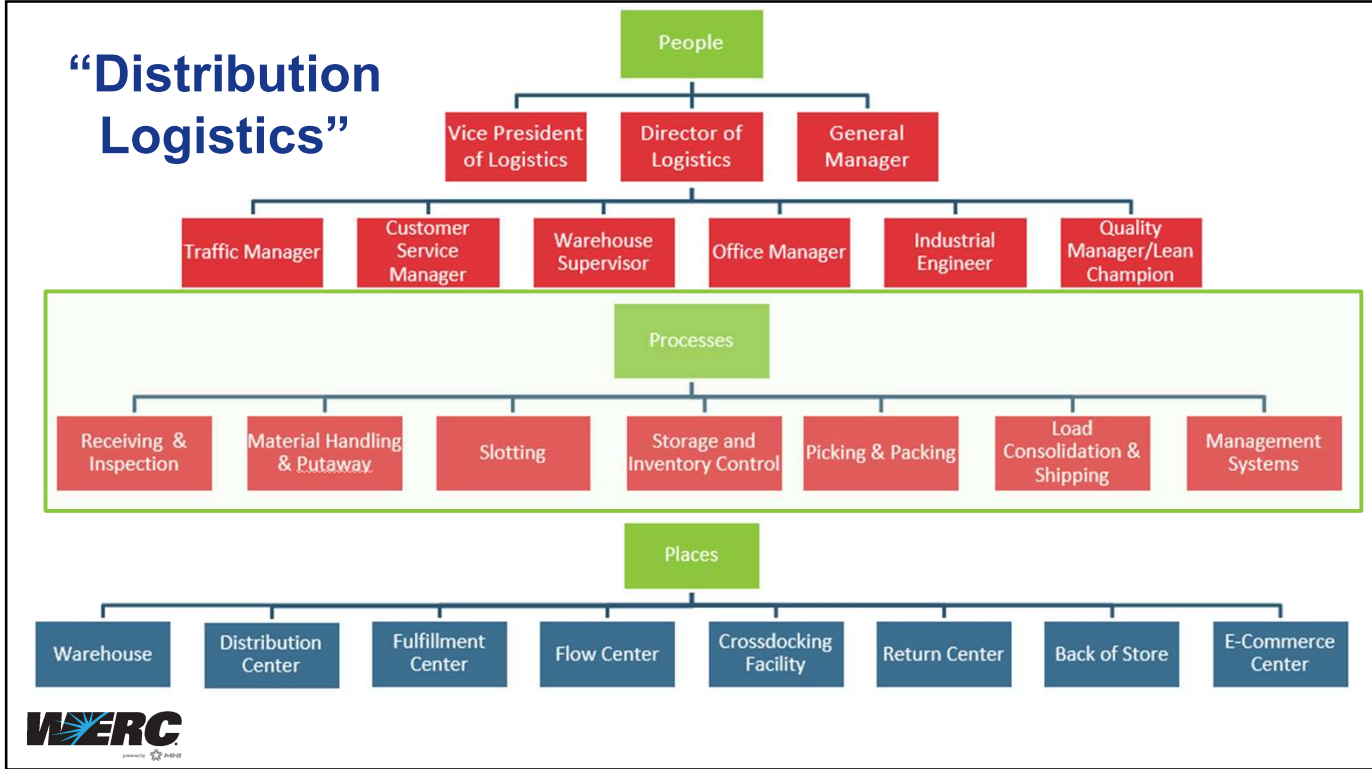
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WERC Mission: WERC helps our members and their companies to succeed by creating unparalleled learning experiences, networking opportunities and access to research-driven industry information.

WERC Vision: WERC exists to lead the warehousing industry, advance warehousing science and develop competitive advantage for both individuals and corporations.

2

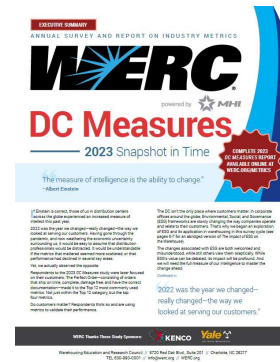


3

Leveraging Industry Tools to Improve Your Operations

Agenda

- Introduction of the WERC Study
- Critical Warehouse Metrics and Insights
- A step-by-step approach to benchmarking
- DC Measures Online Tool & Facility Certification Program
- People, People, People...



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About the Study

WERC Thanks Its Research Partner: **DC VELOCITY**

2023 marks the 20th year of the *DC Measures* study. The purpose of this study is to help operations improve their warehousing practices. Every January, the survey is launched via an email invitation to WERC members and *DC Velocity* readers. Survey participants are asked to report their actual levels of performance for 2022. The study captures 37 key operational metrics that are close to the heart of most distribution center professionals. The measures have been grouped into five balanced sets—Customer, Operations, Financial, Capacity/Quality, and Employee—plus the additional set related to cash-to-cash cycle measurement.

About the Researchers



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WERC Researcher

Manager of Education Programs, SMC³

Certified in Transportation and Logistics (CTL) by AST&L

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Georgia College & State University



DONNIE F. WILLIAMS, JR., Ph.D.

Associate Professor

Department of Supply Chain Management

Executive Director, Supply Chain Management Research Center

Sam M. Walton College of Business

University of Arkansas

5

“If you can’t measure it, you can’t manage it.”

~ Peter Drucker

6

TYPES OF BENCHMARKING

QUANTITATIVE benchmarking demonstrates best RESULTS

QUALITATIVE benchmarking demonstrates best PRACTICE

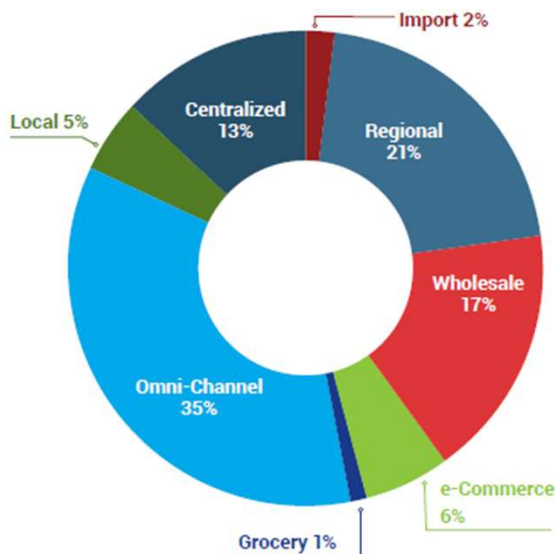
PRACTICE generates results

Improve practices to obtain best results

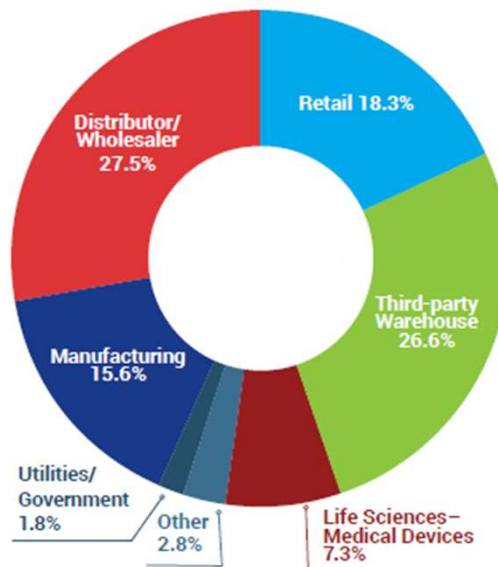


7

Type of DC or Warehouse

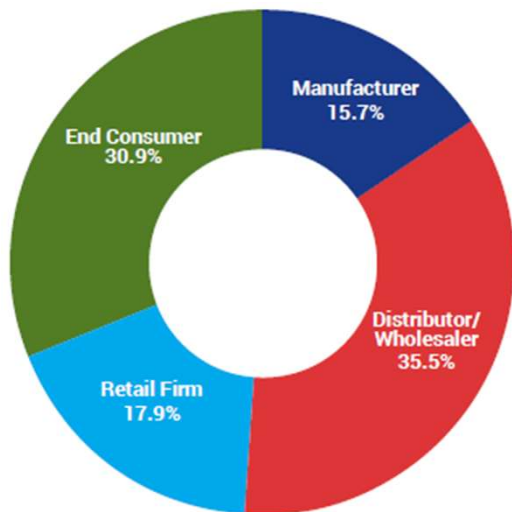


Breakdown by Industry

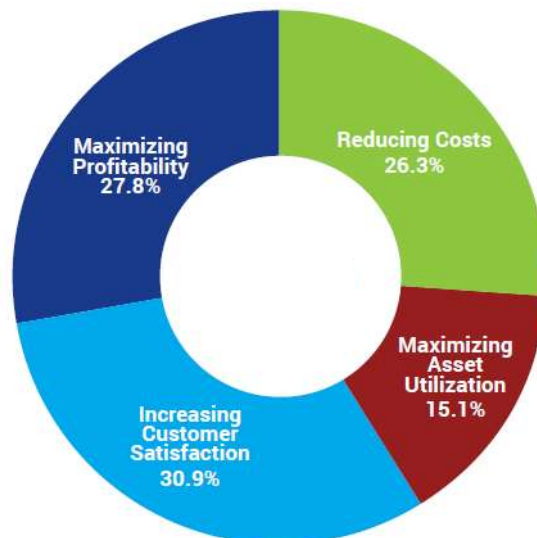


8

Primary Customer Served



Customer Satisfaction Tops the Leaderboard



9

Broken Case Picking on the Rise

Metrics	2023 % of Total	2023 % Cases vs 2023 % Pallet	2022 % Cases vs 2022 % Pallet
Broken Case Picking	48.4%	73.6%	65.1%
Full Case Picking	25.2%		
Partial Pallet Picking	4.9%	26.4%	34.9%
Full Pallet Picking	21.5%		

Broken case picking increased by 13%

Metrics	2022 % of Total	2022 % Cases vs 2022 % Pallet	2021 % Cases vs 2021 % Pallet
Broken Case Picking	35.2%	65.1%	73.0%
Full Case Picking	29.9%		
Partial Pallet Picking	13.6%	34.9%	27.0%
Full Pallet Picking	21.3%		



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Demographics by Company Size

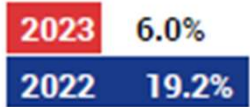
Greater Than \$1 Billion



\$100 Million - \$1 Billion



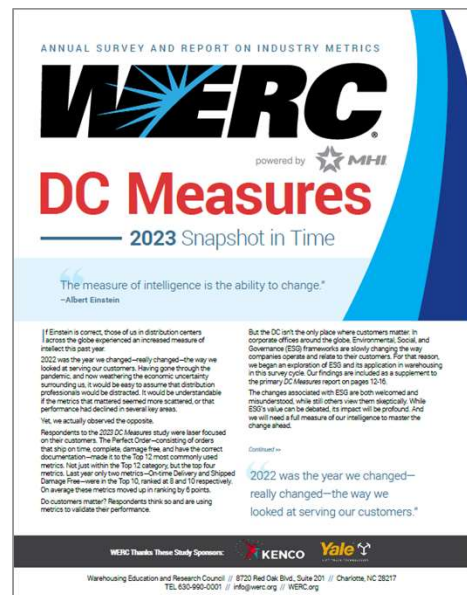
Less Than \$100 Million



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Agenda

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Monitoring the Metrics

QUINTILE PERFORMANCE CLASSIFICATION FOR TOP 5 METRICS

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Top 5 Metrics	Major Opportunity	Disadvantage	Typical	Advantage	Best-in-Class	Median
1. Percent of Orders with On-time Delivery	Less than 87.44%	>= 87.44 and < 94.16%	>= 94.16 and < 96.94%	>= 96.94 and < 99%	>= 99%	95.30%
2. Shipped Complete per Customer Order	Less than 89.14%	>= 89.14 and < 95%	>= 95 and < 97.78%	>= 97.78 and < 99.48%	>= 99.48%	96.00%
3. Shipped Damage Free (Outbound)	Less than 93.88%	>= 93.88 and < 97.5%	>= 97.5 and < 99%	>= 99 and < 99.4%	>= 99.4%	98.40%
4. Correct Documentation	Less than 83.8%	>= 83.8 and < 96.7%	>= 96.7 and < 99%	>= 99 and < 99.6%	>= 99.6%	98.10%
5. Peak Warehouse Capacity Used*	Less than 85%	>= 85 and < 95%	>= 95 and < 97%	>= 97 and < 100%	>= 100%	95.00%

Legend: > greater than; >= greater than or equal to; < less than

Note: Average and Peak Warehouse Capacity does not always reflect best practices. Due to the calculations for quintiles, we have continually reported that Best-in-Class is above 90%. A high average warehouse capacity is not beneficial; studies have shown that an average warehouse capacity between 80 and 85% allows the warehouse to respond to shifts in demand.



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Monitoring the Metrics

Top 12 Metrics for 2023

Metrics	Category	2023	2022	2021
Percent of Orders with On-time Delivery	POI/Customer	1	8	5
Shipped Complete per Customer Order	POI/Customer	2*	12	6
Shipped Damage Free (Outbound)	POI/Customer	2*	10	7
Correct Documentation	POI/Customer	4	16	8
Peak Warehouse Capacity Used	Capacity	5	5	3
Average Warehouse Capacity Used	Capacity	6	1	1
On-time Shipments	Customer	7*	3	4
Order-picking Accuracy (Percent by Order)	Quality	7*	2	2
Part-time Workforce to Total Workforce	Employee	7*	33	23
On-time Ready to Ship	Outbound Operations	10	4	10
Dock-to-Stock Cycle Time, in Hours	Inbound Operations	11	6	9
Overtime Hours to Total Hours	Employee	12	32	28



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What is the Perfect Order Index (POI)?

POI is a compilation score which measures the result of each of the 4 major components of a perfect order:

- Delivered On-time
- Shipped Complete
- Shipped Damage Free
- Correct Documentation

POI is determined by multiplying each component of the perfect order to one another.

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Change Is In The Air

Quintile Ranking	Decline in Performance	Improved Performance	Maintained Performance
Best-in-Class	16	14	6
Median	14	15	7
Major Opportunity	13	18	5

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Best In Class, Best Improvement

Metric	2023	2022	2021	2020	2019
Distribution Costs as a Percentage of COGS	0.5%	0.68%	3.7%	3.48%	3%
Orders Picked and Shipped Per Hour	67	48	35	38.2	34
Annual work force turnover	5%	6.2%	4.8%	4.7%	3%
Overtime Hours to Total Hours	3	3.85	3	3	2.06
Unplanned Absence Percentage	3%	3.7%	2.1%	2%	2%



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Median Metrics, Best Improvement

Metric	2023	2022	2021	2020	2019
Internal Order Cycle Time (hours)	8.65	12	10	8	8
Distribution Costs as a Percentage of COGS	1.44%	2.7%	8.4%	8.5%	6%
Honeycomb %	70%	45%	30.5%	30%	30%
Cross Trained Percentage	60%	50%	70%	75%	70%



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Major Opportunity, Best Improvement

Metric	2023	2022	2021	2020	2019
Backorders as a % of total lines	13.04%	20%	10%	10%	10%
Honeycomb %	28.4%	12%	10%	6.4%	8.08%
Annual work force turnover	33.24%	47%	39.4%	40%	37.2%
Part Time Workforce to Total Workforce	15.4%	20%	10%	10%	16%
Unplanned Absence Percentage	15%	23%	11%	10%	10%



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ANNUAL SURVEY AND REPORT ON INDUSTRY METRICS

WERC
powered by **MH1**

DC Measures
2023 Snapshot in Time

"The measure of intelligence is the ability to change."
—Albert Einstein

If Einstein is correct, those of us in distribution centers across the globe experienced an increased measure of intellect this past year.

2022 was the year we changed—really changed—the way we looked at serving our customers, being gone through the pandemic, and now weathering the economic uncertainty surrounding us. It would be easy to assume the distribution professionals would be distracted. It would be understandable if the metrics that mattered seemed more scattered, or that performance had declined in several key areas.

We actually observed the opposite.

Respondents to the 2022 DC Measures study were laser focused on their customers. The Perfect Order—consisting of orders that are on time, complete, change-free and have the correct documentation—made it to the Top 12 most commonly used metrics. Not just within the Top 12 category, but the top four metrics. Last year only two metrics—On-time Delivery and Shipped Change-Free—were in the Top 10, ranked at 6 and 7 respectively. On average these metrics moved up in ranking by 5 points.

Do customers matter? Respondents think so and are using metrics to validate their performance.

But the DC isn't the only place where customers matter. In corporate offices around the globe, Environmental, Social, and Governance (ESG) frameworks are slowly changing the way companies operate and relate to their customers. For that reason, we began an exploration of ESG and its application in warehousing in this survey cycle. Our findings are included as a supplement to the primary DC Measures report on pages 12-16.

The changes associated with ESG are both welcomed and misunderstood, while still others view them skeptically. While ESG's value can be debated, its impact will be profound. And we will need a full measure of our intelligence to master the change ahead.

Continued ~

"2022 was the year we changed—really changed—the way we looked at serving our customers."

WERC thanks these Study Sponsors: **KENCO** **Yale**

Warehousing Education and Research Council // 8720 Red Oak Blvd., Suite 201 // Charlotte, NC 28217
TEL: 830-990-0001 // info@werc.org // WERC.org



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TYPES OF BENCHMARKING

QUANTITATIVE benchmarking demonstrates best RESULTS

QUALITATIVE benchmarking demonstrates best PRACTICE

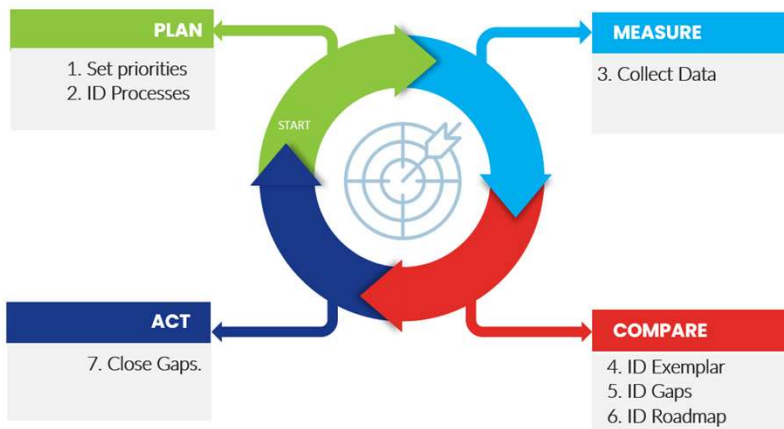
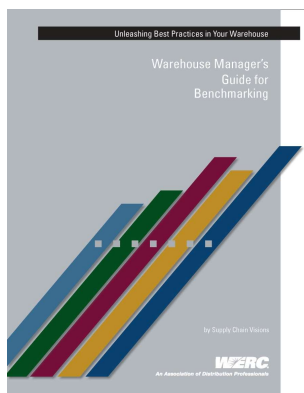
PRACTICE generates results

Improve practices to obtain best results



21

Seven Steps to “Successful Benchmarking” ...



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STEP 1: SET PRIORITIES

The best place to start is with a vision statement and values.

A vision statement is a simple statement that describes the firm's future state

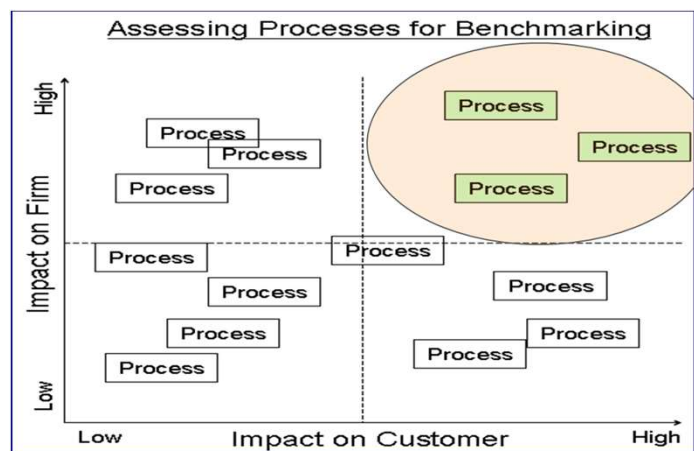
- *Safest workplace in America*
- *Quality is Job 1*
- *Always the lowest price*
- *We will be #1 or #2 in our markets....or get out of the business*



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STEP 2: DETERMINE CRITICAL PROCESSES

Consider narrowing down your list of what you would like to benchmark against

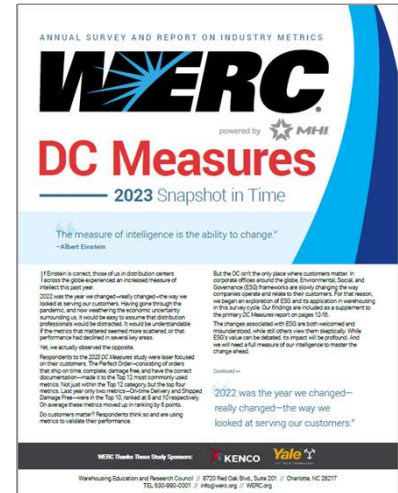


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STEP 3: COLLECT YOUR DATA

- Yourself (other locations)
- Customers
- Industry associations
- Formal benchmarking services

Gartner Research: Market Guide for Benchmarking Services for Transportation Rates and Logistics Performance Metrics



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STEP 3: COLLECT YOUR DATA

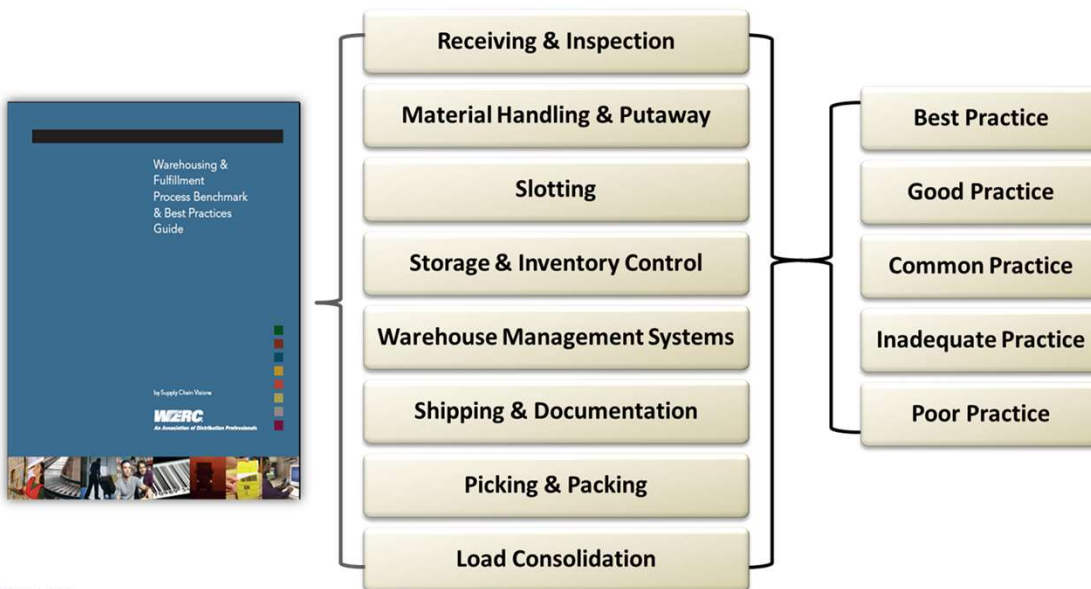
Example Metrics from WERC Benchmarking Study

Customer Metrics*	Major Opportunity	Disadvantage	Typical	Advantage	Best in Class	MEDIAN
On time shipments	Less than 95.7%	>= 95.7 and < 98%	>= 98 and < 99.1%	>= 99.1 and < 99.8%	>= 99.8%	98.5
Total Order Cycle Time	Greater than 72	>= 48 and < 72	>= 15 and < 48	>= 4.5 and < 15	< 4.5	36
Internal Order Cycle Time	Greater than 36	>= 23.4 and < 36	>= 8 and < 23.4	>= 2.2 and < 8	< 2.2	12
Backorders as a Percent of total lines	Greater than 5.3%	>= 2.2 and < 5.3%	>= 1.1 and < 2.2%	>= 0.5 and < 1.1%	< 0.5	1.8
Inbound Metrics						
Dock to Stock Cycle Time, in Hours	Greater than 18.7	>= 8.2 and < 18.7	>= 4 and < 8.2	>= 2 and < 4	< 2	6
Lines Received and Put Away per Hour	Less than 6	>= 6 and < 13.6	>= 13.6 and < 21.4	>= 21.4 and < 50	>= 50	17
Percent of supplier orders rec'd w/ correct docs	Less than 90%	>= 90 and < 95%	>= 95 and < 98%	>= 98 and < 99%	>= 99%	95.9
Percent of supplier orders rec'd damage free	Less than 95%	>= 95 and < 97.5%	>= 97.5 and < 98.6%	>= 98.6 and < 99.1%	>= 99.1%	98
On time receipts from supplier	Less than 85%	>= 85 and < 90%	>= 90 and < 95%	>= 95 and < 98%	>= 98%	94



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STEP 4: RESEARCH BEST PRACTICES



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STEP 4: RESEARCH BEST PRACTICES

Process Group	Practices to be avoided					Process Attribute
	Poor Practice 1	Bad Practice 2	Common Practice 3	Good Practice 4	Best Practice 5	
Dock/Yard Management	Warehouse personnel have little or no access to shipment data before arrival	Shippers and carriers supply inbound shipment information on a limited basis	Warehouse personnel can get information on inbound shipments on demand only	Warehouse personnel receive data on inbound shipment information from shippers and carriers	Warehouse personnel and systems use inbound shipment status for planning operations in hourly segments	Process Attribute
	Little or no effort to get information about inbound deliveries	Shippers and carriers may notify of pending deliveries, but times not scheduled	Receiving appointments manually tendered, shippers given broad delivery window	Manual scheduling of deliveries to maximize utilization of available labor and dock space. Shippers given a delivery time in hours and minutes	Dock appointments are made and systems are used to manage and monitor that appointments are kept	

Practices which are commonly seen and used – while they may provide added value they leave room for improvement

Recognized best practices for the given attribute – note that the best practice may vary across industries, geographies and business units

Practices which are considered to provide little value.

Practices which provide significant added value, and may be fully satisfactory for most businesses



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STEP 4: RESEARCH BEST PRACTICES

With process standards you can rank selected processes against the standard and identify the process changes required to achieve the target

Receiving and Inspection – Process Benchmarks					
Process Group	Poor Practice	Inadequate Practice	Common Practice	Good Practice	Best Practice
Inspection	No inspection process at receipt	Insufficient inspection to identify non-conforming product, essentially checking for damage only.	Sufficient inspection to identify non-conforming product. Failing product is quarantined to prevent use	Sufficient inspection to identify non-conforming product which is then quarantined to prevent use or referred to suppliers within a prescribed timeframe	Inspection process results in quarantine, immediate notification to suppliers & carriers and initiates return process

Receiving and Inspection – Process Benchmarks					
Process Group	Poor Practice	Inadequate Practice	Common Practice	Good Practice	Best Practice
Rank	1	2	3	4	5
Dock Management			X		
Transactions		X			
Product Labeling	X				
Advance Ship Notice & Supplier Communication		X			
Process	X				
Inspection		X			
Cross Docking	X				
Metrics			X		
RFID	X				
<i>Self Assessment Score Tool</i>				16	

- Scoring of the Receiving Inspection Process is Assessed as **Inadequate Practice**
- Review Process Attributes and Score Each Process Group



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STEP 5: IDENTIFY GAPS

Warehouse & Fulfillment: Gap Analysis

Process Rank	Gap	Poor Practice 1	Inadequate Practice 2	Common Practice 3	Good Practice 4	Best Practice 5
Receiving & Inspection	Red		Orange			Star
Material Handling & Putaway	Red		Orange			Star
Slotting	Yellow			Orange		Star
Storage & Inventory Control	Red	Orange				Star
Warehouse Management Systems	Yellow			Orange		Star
Shipping & Documentation	Red		Orange			Star
Picking & Packing	Green				Orange	Star
Load Consolidation & Shipping	Red		Orange			Star

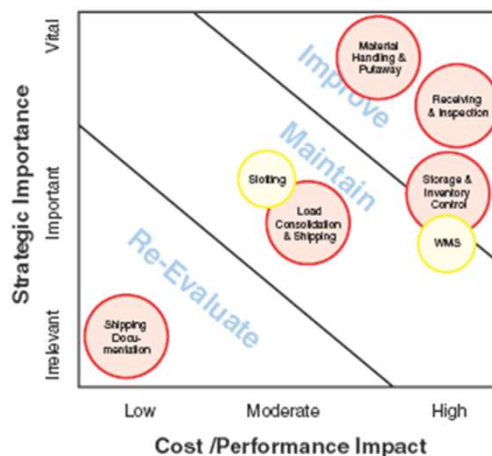


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STEP 5: IDENTIFY GAPS

Once the gap is known, the processes can be classified as needs improvement, maintain, or re-evaluated

- Improve: processes that are most important to strategic goals
- Maintain: performance in those processes in which there is no competitive advantage to be gained
- Re-evaluate: the processes that do not support your goals



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STEP 5: IDENTIFY GAPS

Process	Strategic Impact	Cost/Performance Impact	Total Rating	Gap
Receiving & Inspection	High Impact	High Impact	6	High Gap
Material Handling & Putaway	High Impact	High Impact	6	High Gap
Slotting	Medium Impact	Medium Impact	4	Medium Gap
Storage & Inventory Control	Medium Impact	High Impact	5	High Gap
Warehouse Management Systems	Medium Impact	High Impact	5	Medium Gap
Shipping & Documentation	Low Impact	Low Impact	2	High Gap
Picking & Packing	High Impact	High Impact	6	Low Gap
Load Consolidation & Shipping	Medium Impact	Medium Impact	4	High Gap

High Impact
 High Gap
 Medium Impact
 Medium Gap
 Low Impact
 Low Gap
6 Highest Priorities in Red
 5 Secondary Priorities in Green



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STEP 6: IDENTIFY ROADMAP

Can your target be quantified into a metric?

Warehouse & Fulfillment: Gap Review							
Process Rank	Gap	Poor Practice 1	Inadequate Practice 2	Common Practice 3	Good Practice 4	Best Practice 5	
Receiving & Inspection	Red		Orange	→	→	Target (Red Star)	
Material Handling & Putaway	Red		Orange	→	→	Target (Red Star)	
Slotting	Yellow			Orange	→	Target (Red Star)	
Storage & Inventory Control	Red	Orange	→	→	→	Target (Red Star)	
Warehouse Management Systems	Yellow			Orange	→	Target (Red Star)	
Shipping & Documentation	Red		Orange	→	→	Target (Red Star)	
Picking & Packing	Green				Orange	→	Target (Red Star)
Load Consolidation & Shipping	Red		Orange	→	→	Target (Red Star)	



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STEP 7: CLOSE GAPS AND IMPROVE/REFINE PROCESSES

Highest Priorities in Red
Secondary Priorities in Green

Process Rank	Gap	Poor Practice 1	Inadequate Practice 2	Common Practice 3	Good Practice 4	Best Practice 5	
Receiving & Inspection	Red		Orange	→	→	Target (Red Star)	
Material Handling & Putaway	Red		Orange	→	→	Interim Target (Green Triangle) & Target (Red Star)	
Slotting	Yellow			Orange	→	Target (Red Star)	
Storage & Inventory Control	Red	Orange	→	→	→	Interim Target (Green Triangle) & Target (Red Star)	
Warehouse Management Systems	Yellow			Orange	→	Target (Red Star)	
Shipping & Documentation	Red		Orange	→	→	Target (Red Star)	
Picking & Packing	Green				Orange	→	Target (Red Star)
Load Consolidation & Shipping	Red		Orange	→	→	Target (Red Star)	

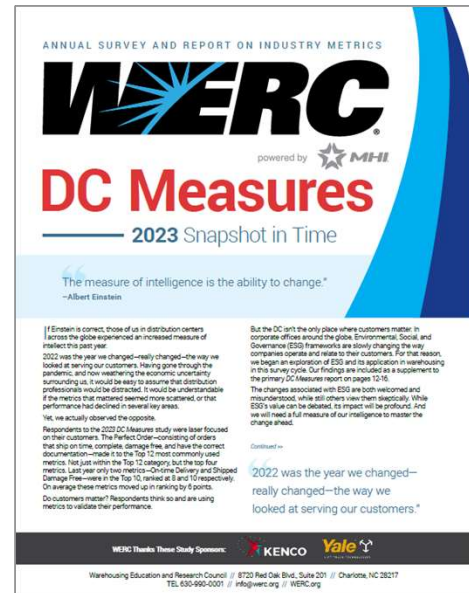
Interim Target



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WERC's Online Benchmarking Tool

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WERC's Facility Assessment & Certification Program



- Present the result of the process assessment and certification audit
- Review the assessment methodology and processes covered
 - Clarify any questions
- Review the detailed results of the qualitative assessment
 - A guide to understanding the detailed report
 - Discuss Auditor's Notes
 - Clarify any questions
- Discuss options for building on the value of the assessment process

Grading Example

Poor Practice	Bad Practice	Common Practice	Good Practice	Best Practice	Audited Score	Minimum Acceptable
Warehouse personnel have little or no access to shipment data before arrival	Shippers and carriers legally inbound shipment information on a limited basis	Warehouse personnel can get information on inbound shipments on demand only	Warehouse personnel receive data on inbound shipment information from shippers and carriers	Warehouse personnel and systems use inbound shipment status for planning operations in hourly segments	3	3

Auditor's Notes Regarding this Functional Attribute: Outlining How Work is Done and Possible Considerations for Process Improvement

Legend: ● Passed ● Failed

Process Assessment Summary

High Level Results

The table below shows SampCo's assessment findings summarized by key process group.

Process Group	Count of Entries by Practice Level					Total Grade	Minimum Allowable
	Poor Practice	Bad Practice	Common Practice	Good Practice	Best Practice		
Receiving and Inspection	0	2	10	2	0	42	41
Material Handling & Putaway	0	0	17	0	0	51	51
Slotting	0	0	9	0	0	27	27
Storage & Inventory Control	0	1	15	0	0	47	46
Picking & Packing	0	0	15	2	0	59	53
Load Consolidation & Shipping	1	0	17	0	0	52	51
Shipping Documentation	0	0	10	0	0	30	30
Warehouse Management System	0	0	18	0	0	54	48
Assessment Summary	1	3	113	2	0	356	377

Note that each of the eight process sections meets Minimum Allowable Aggregate Total grade guidelines, as does the Assessment Summary Total. However the distribution of practices in the "Poor" to "Common" columns indicates that there is likely room for improvement. Further analysis of individual Attributes within each section is presented in Appendix 3.



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WERC Resources... all at werc.org



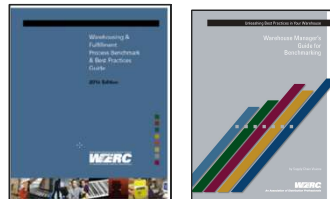
DC Measures Report



Online Benchmarking Tool



WERC's Best Practices Guide & Manager's Guide for Benchmarking



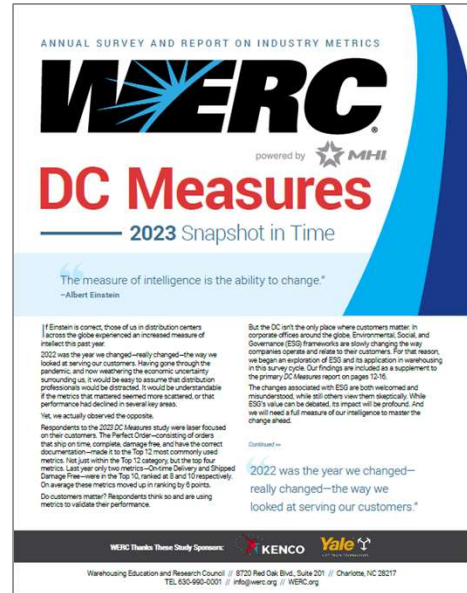
WERC Facility Assessment & Certification Program



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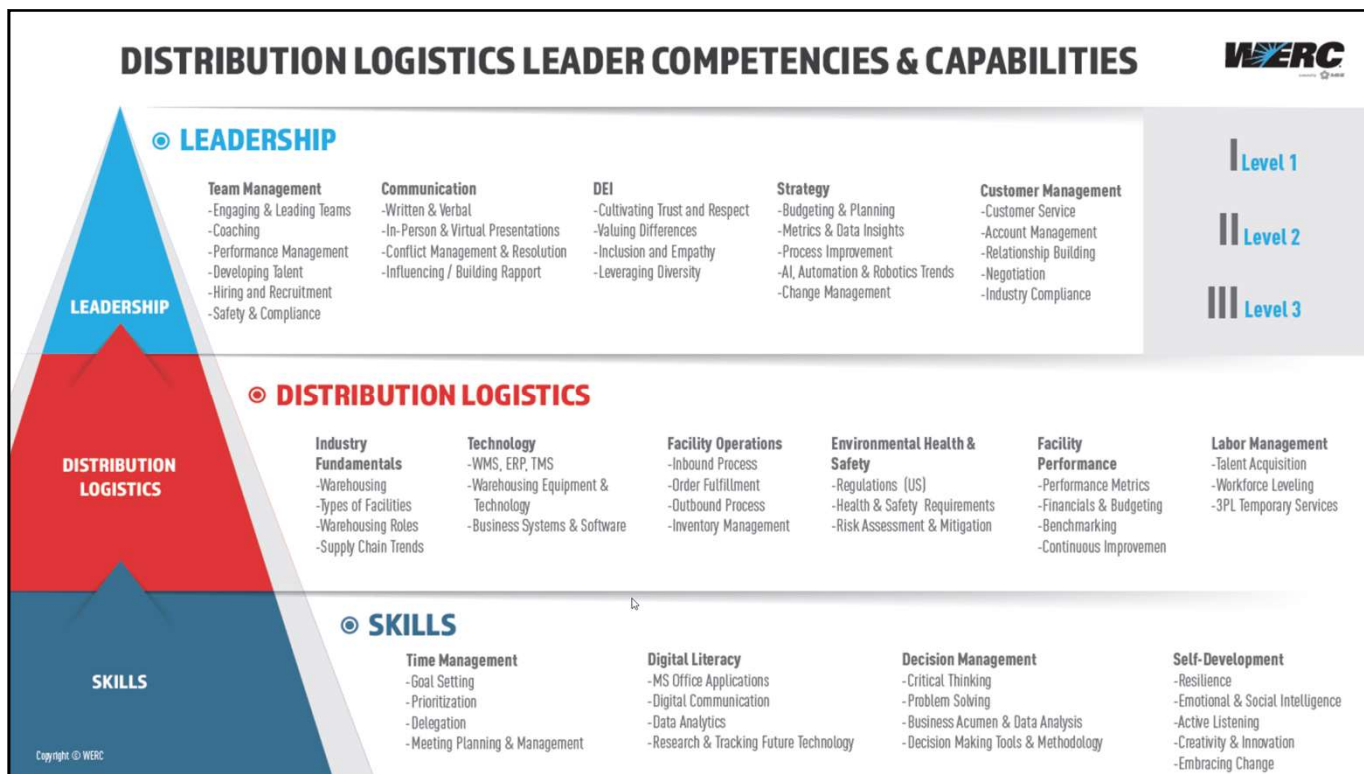


Learning... it never stops!

Industry Associations Offer:

- Conferences
- In-Person & Online Learning
- Certification & Credentialing Programs





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Distribution Logistics Leader Micro-Credential & Certification Program



Available Q3 2023



Available Q4 2023



Available Q2 2024



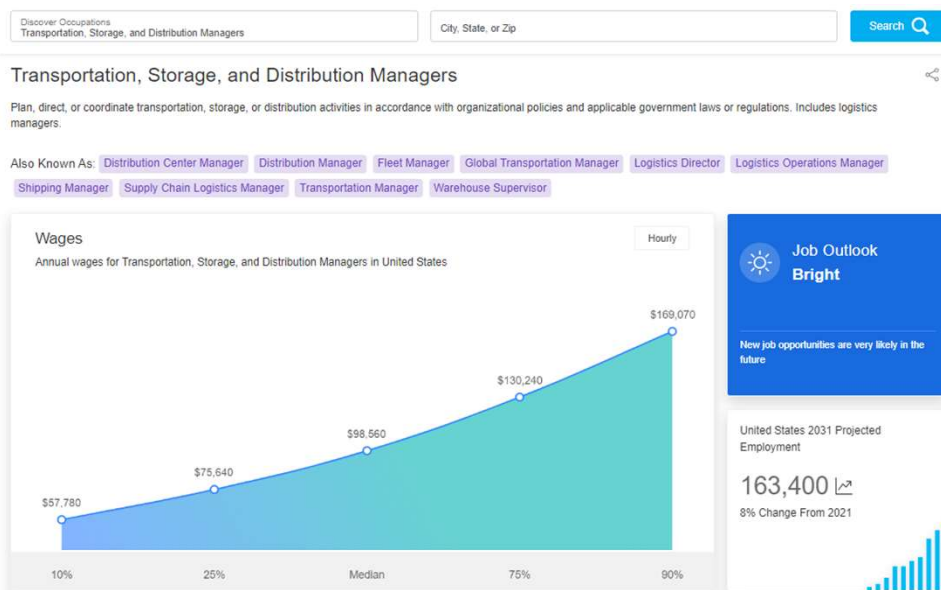
Available Q3 2024



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One more data point... Salary Data & Insights:

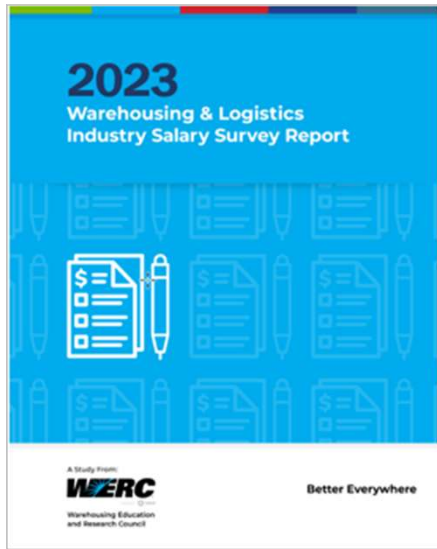
<https://www.werc.org> Select "Careers"



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One more data point... Salary Data & Insights:



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Thank You!

Michael Mikitka, MHI Knowledge Center and WERC

mmikitka@werc.org / 630.320.5801

www.werc.org / www.mhi.org



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