



# PROMAT®

2015

McCormick Place South | Chicago  
March 23-26, 2015  
promatshow.com

# Autowave transitions: The best fit for eCommerce fulfillment

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Presented by:

Art Eldred, Vargo Companies

Dan Perry, Vargo Companies

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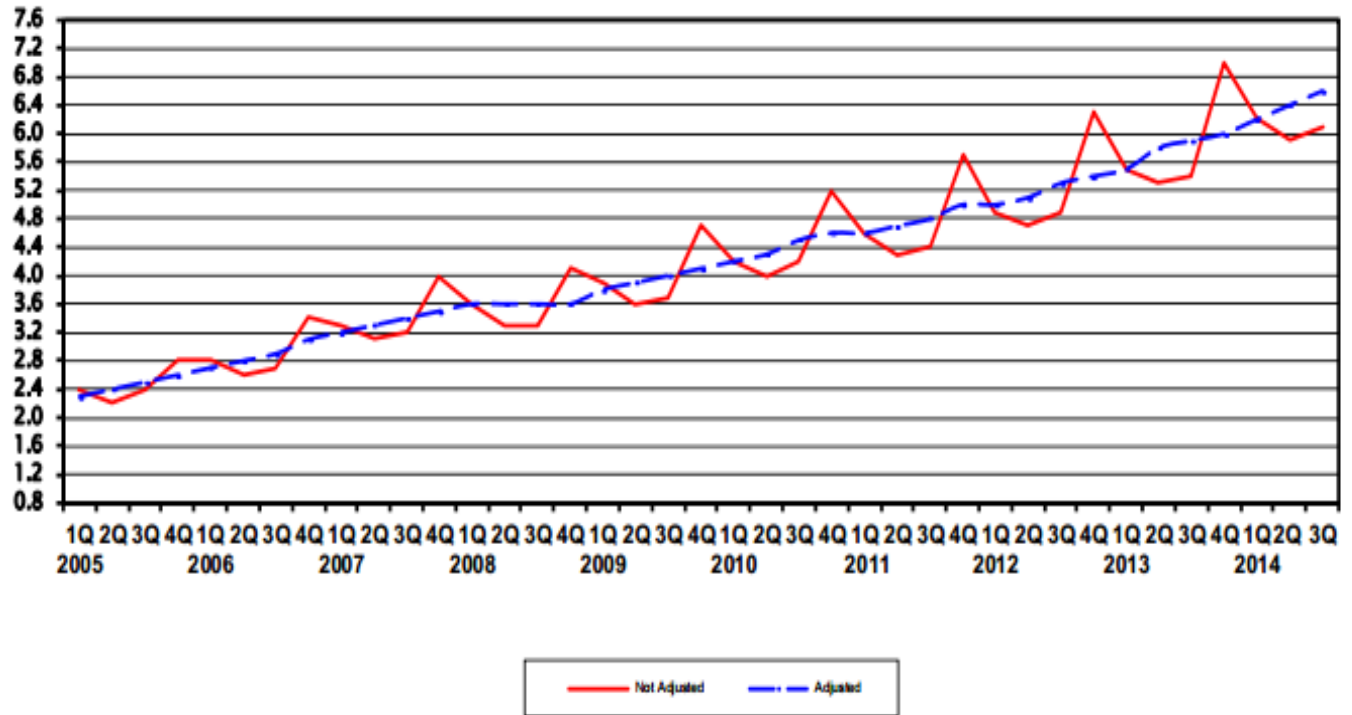
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## No end in site for eCommerce Growth

Estimated Quarterly U.S. Retail E-commerce Sales as a Percent of Total Quarterly Retail Sales:  
 1<sup>st</sup> Quarter 2005 - 3<sup>rd</sup> Quarter 2014

Percent of Total

- 2014 e-commerce Q3 +16.2% over 2013
- 2014 retail sales Q3 +4.3%
- 2014 Q3 e-commerce accounted for 6.1% of sales





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## Where would you rather see your customer's order?



In their hands



Waiting in a buffer in your new "state of the art" DC

## E-commerce Havoc on the “Waveologists”

Plan, Correct, Exception Monitor, Plan, Correct, Exception  
Correction, Plan, Correct, Exception Monitor, Plan, Correct



Source: WV Commerce Department Newsletter



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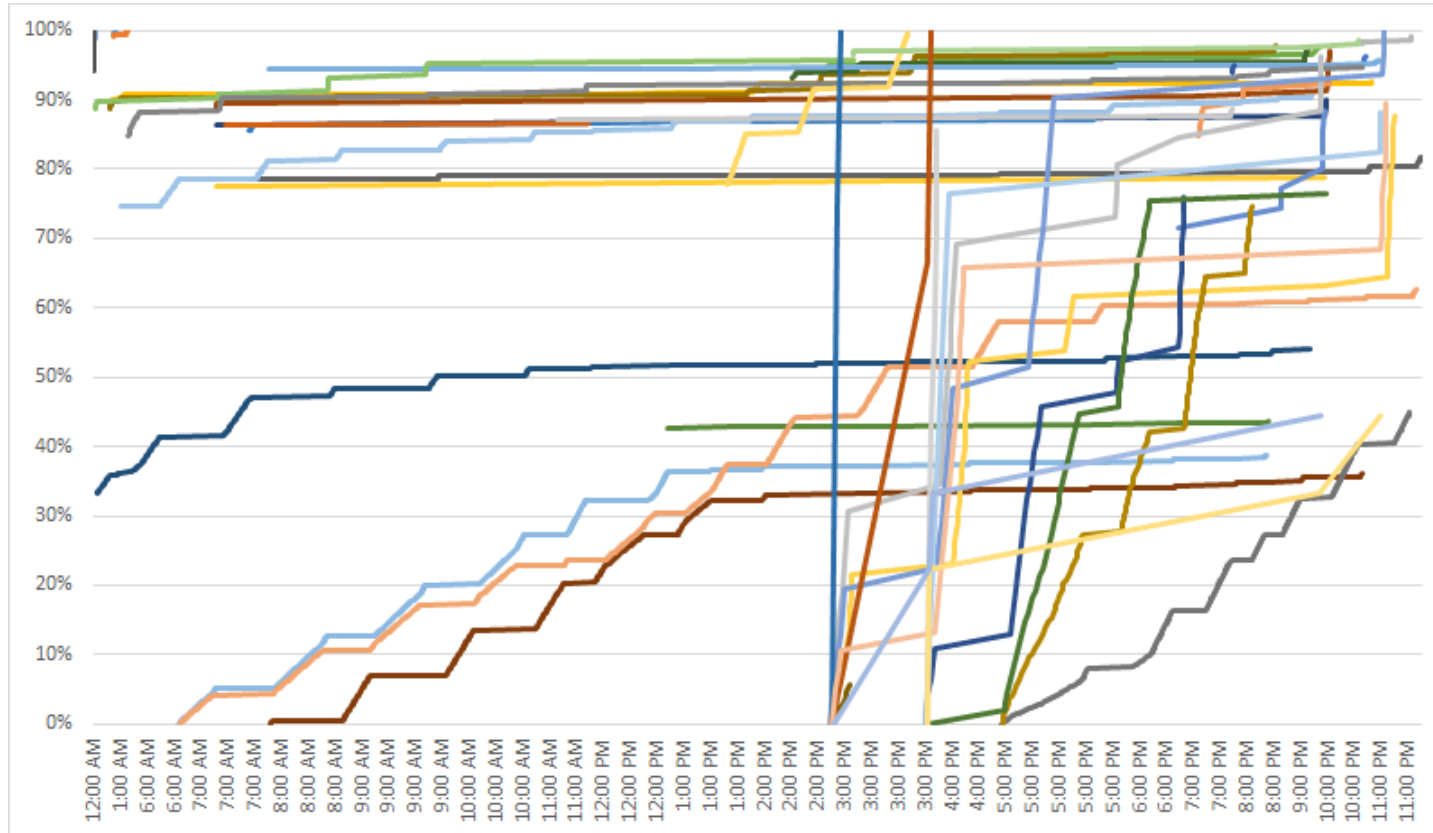
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## Wave Completion Status – 18<sup>th</sup> Oct (actual)



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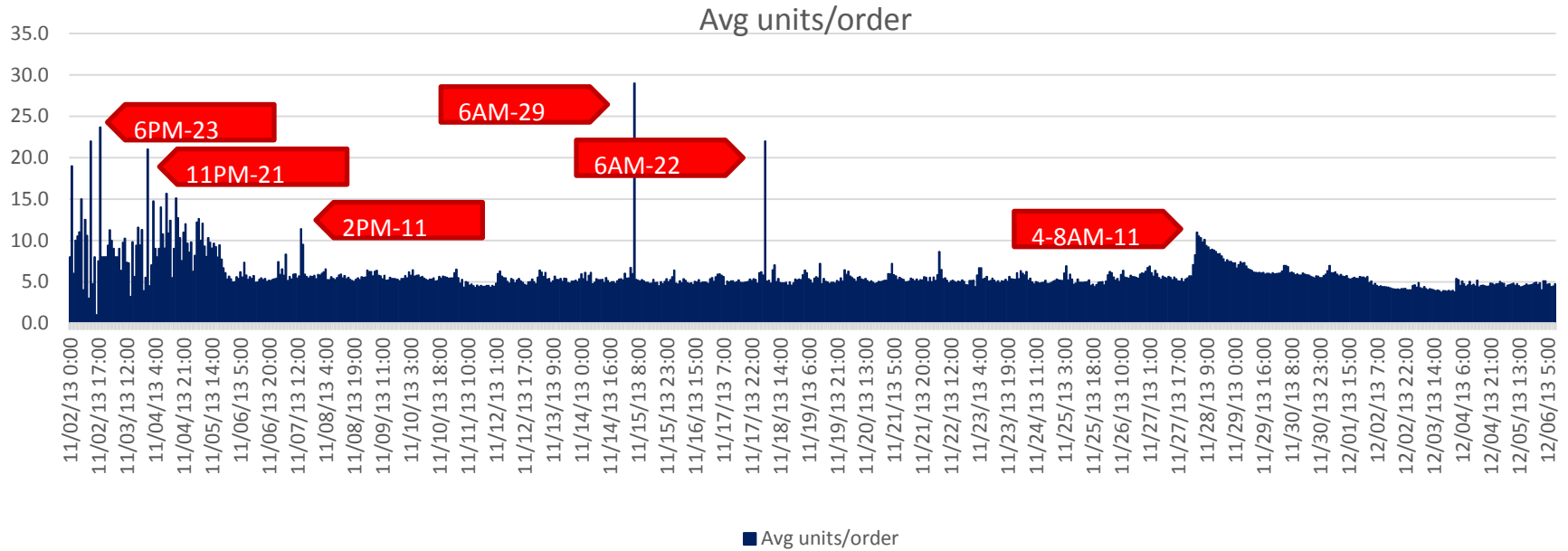


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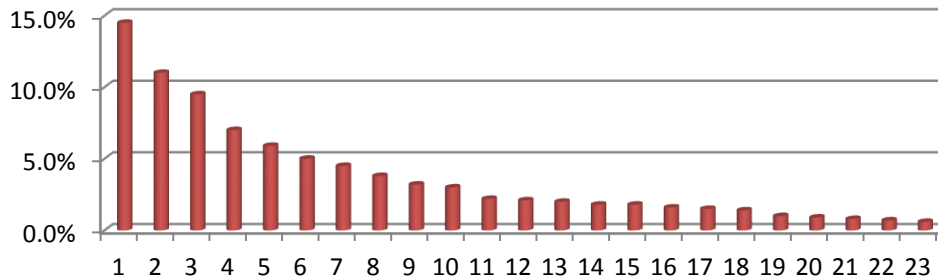
## Order Profile Volatility



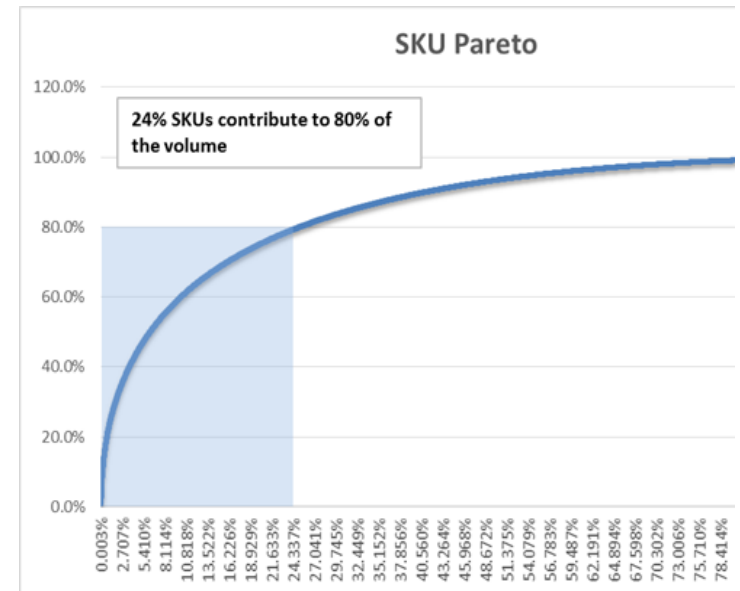
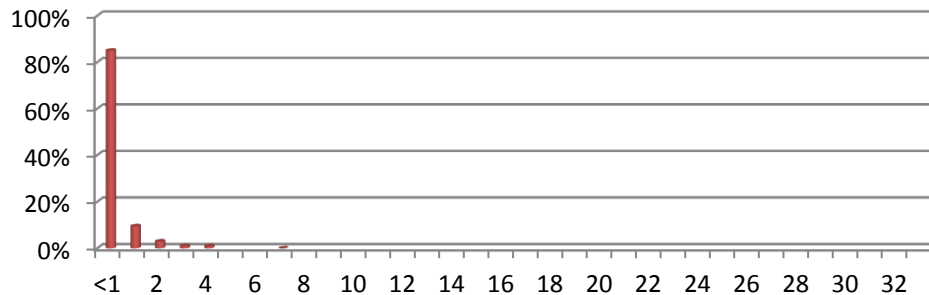


## SKU Consumption

Percent of Active SKUs With <1 Case Units Daily Usage @ 350,000 Daily Units



Overall Percent of Active SKUs By # Cases of Daily Usage @ 350,000 Daily Units



# Lean Distribution – **MINIMIZING** waste

## Ten Mudas - Wastes in Operations

1. **Over production** – Producing more than current need
2. **Over processing** – Doing unnecessary work
3. **Motion** – Worker movement
4. **Transportation** – Movement of goods
5. **Rework** – Not getting it right the first time
6. **Space** – Non-value producing use of space
7. **Inventory** – Inventory supporting process cycle time
8. **Utilities** – Usage of power, water, security resources
9. **Waiting** – Idle goods
10. **Intellectual** – Not taking advantage of intellectual/information resources of workers, supervisors, managers, forecasters, historical data, current conditions in related areas, ...



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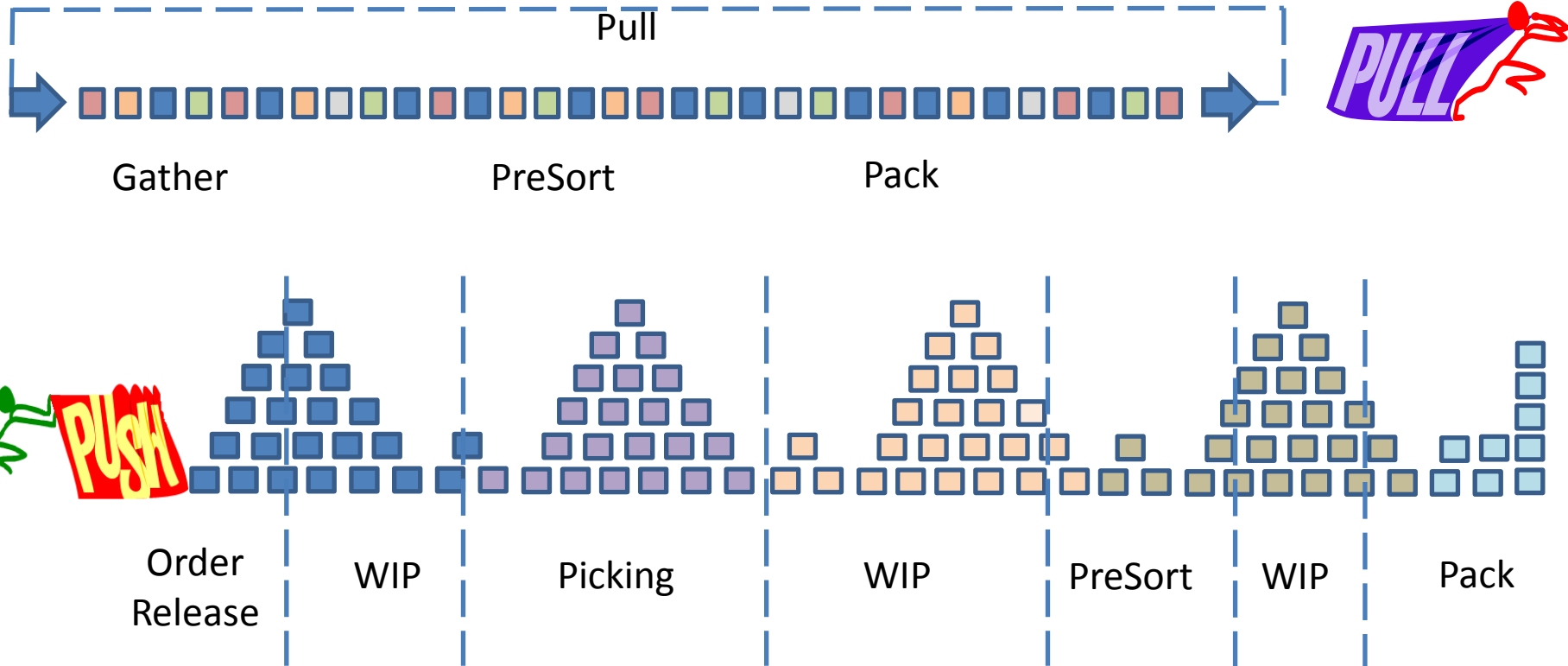
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# ***Lean Dynamic Optimization – The Autowave Answer***

- Lean Distribution
- Demand Driven Fulfillment
- Waveless processing
- Dynamic sortation control
- Automatic labor balancing
- Synchronization of multiple work flows
- Equipment / Process workload management
- Work in process buffer size reduction
- Capacity improvement through constant utilization
- Efficient integrated exception processing

# FIND WHAT'S NEXT.

Continuous  
Pull

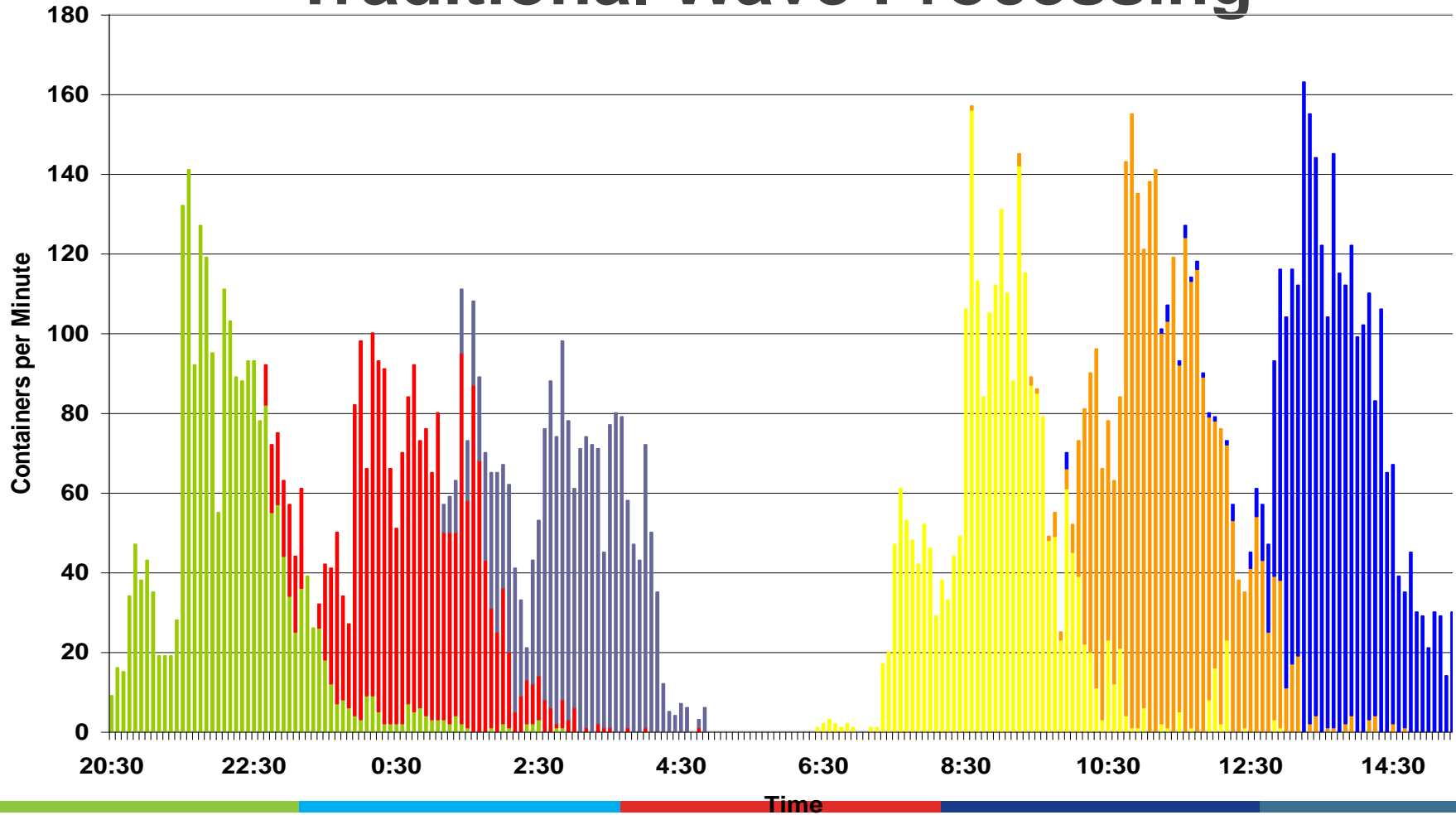


Work In-Progress (WIP) Causes:

Inefficiency, More Touches, More Mechanization, More Management, Footprint++

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# Traditional Wave Processing

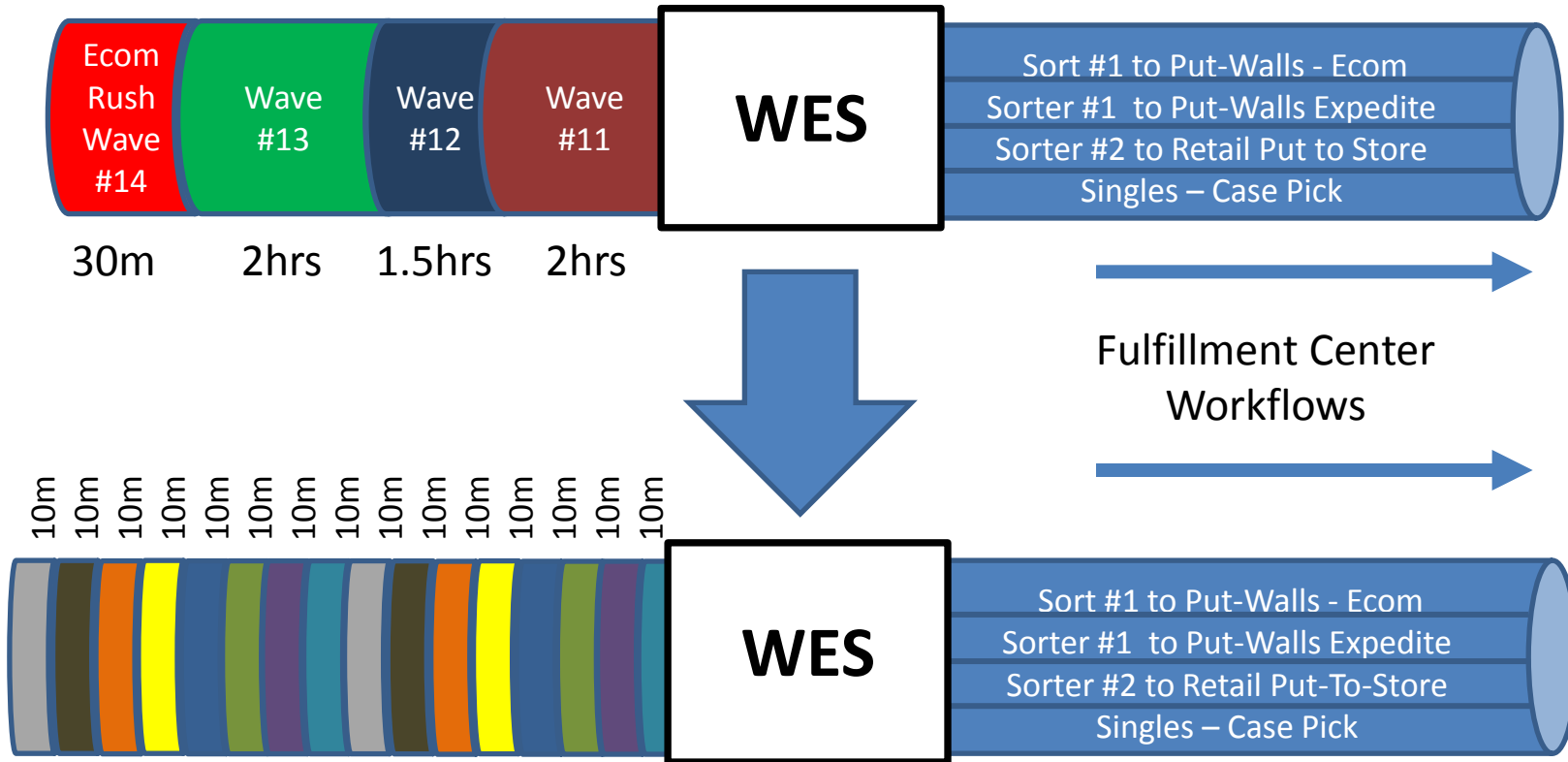


■ Wave 2 ■ Wave 3 ■ Wave 4 ■ Wave 5 ■ Wave 6 ■ Wave 7



W/24/2015 Confidential

## Autowaving Via the WES





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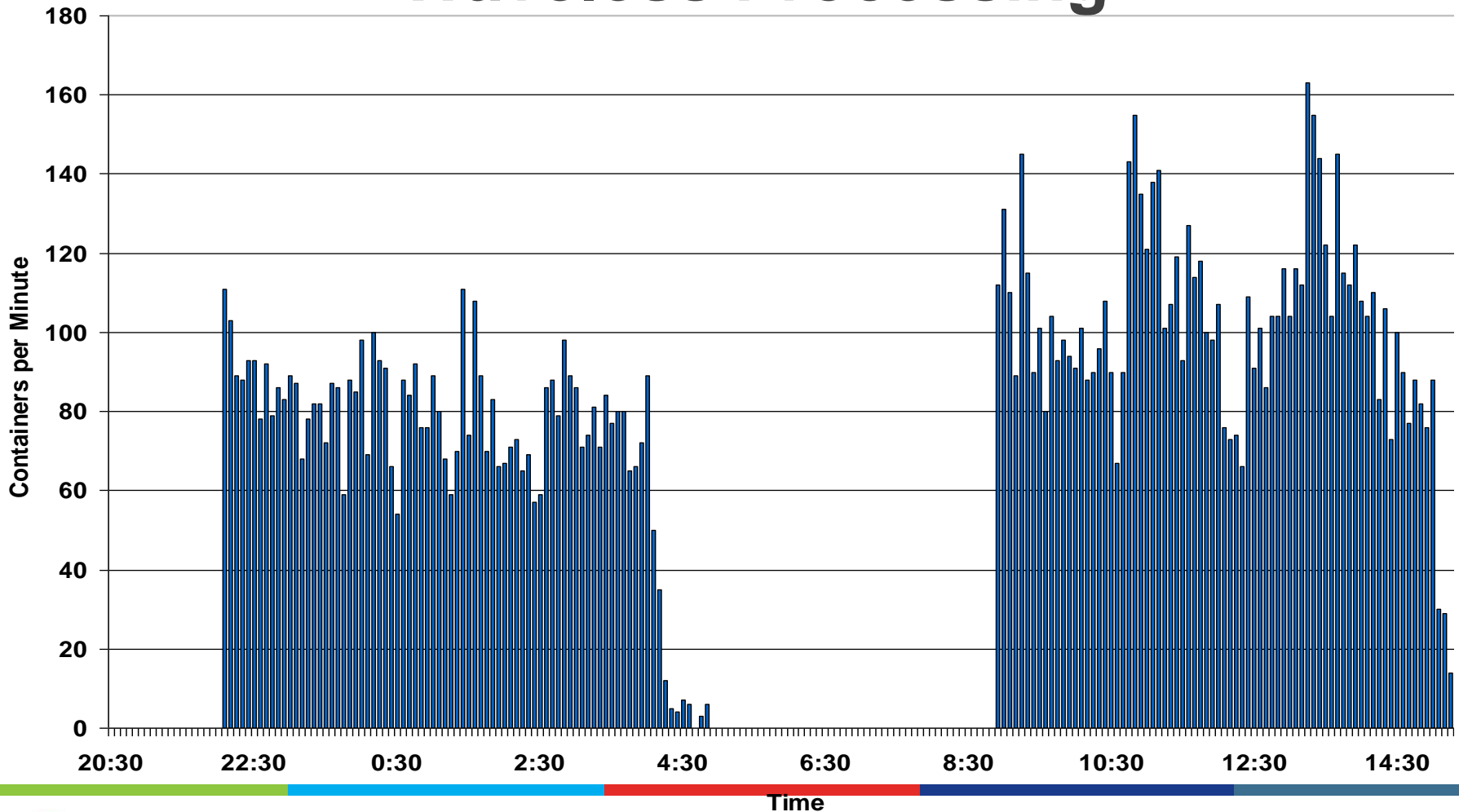


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# Waveless Processing



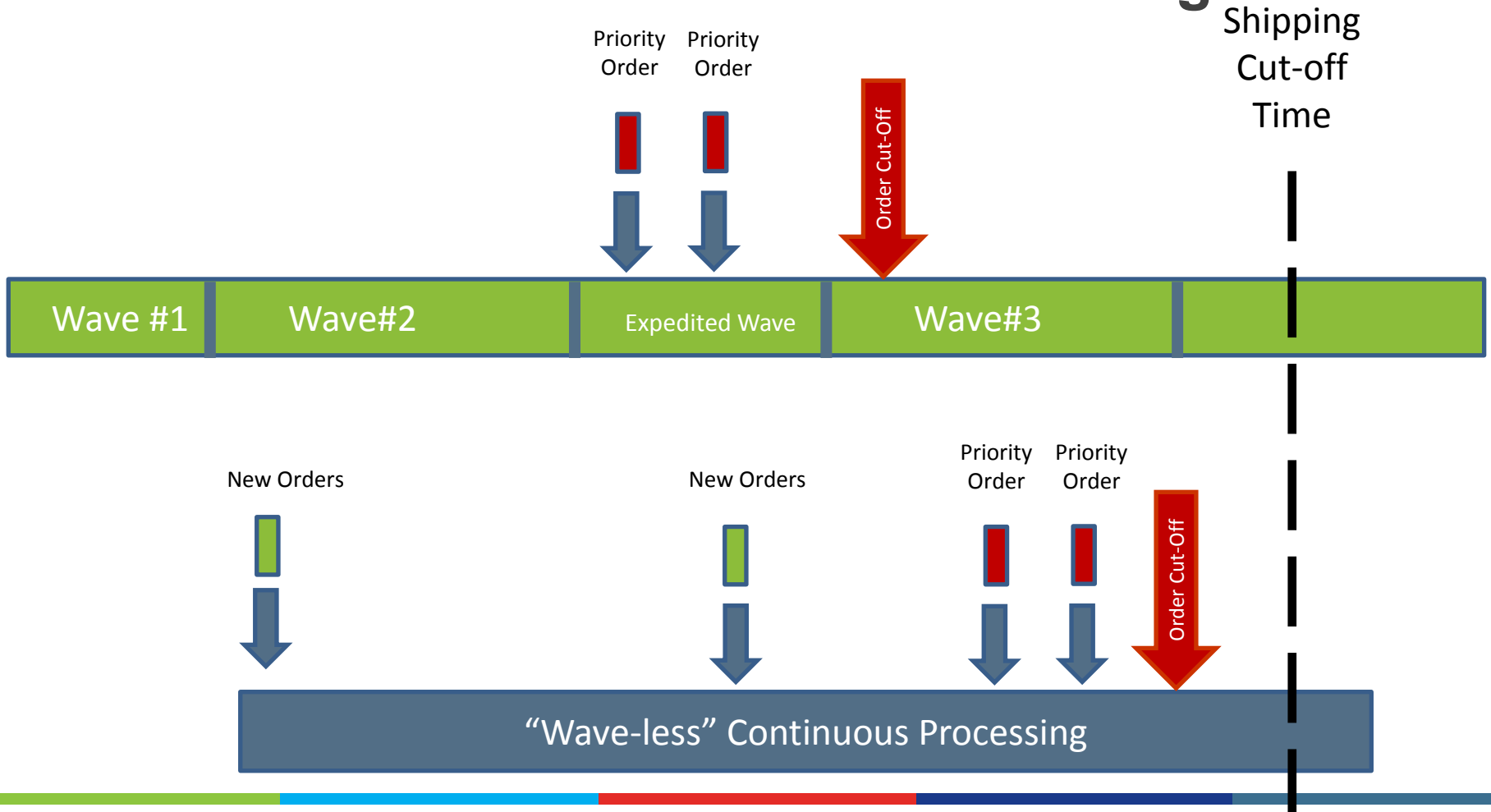
THE INDUSTRY THAT MAKES SUPPLY CHAINS WORK™

■ Waveless



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# Continuous "Lean" Processing



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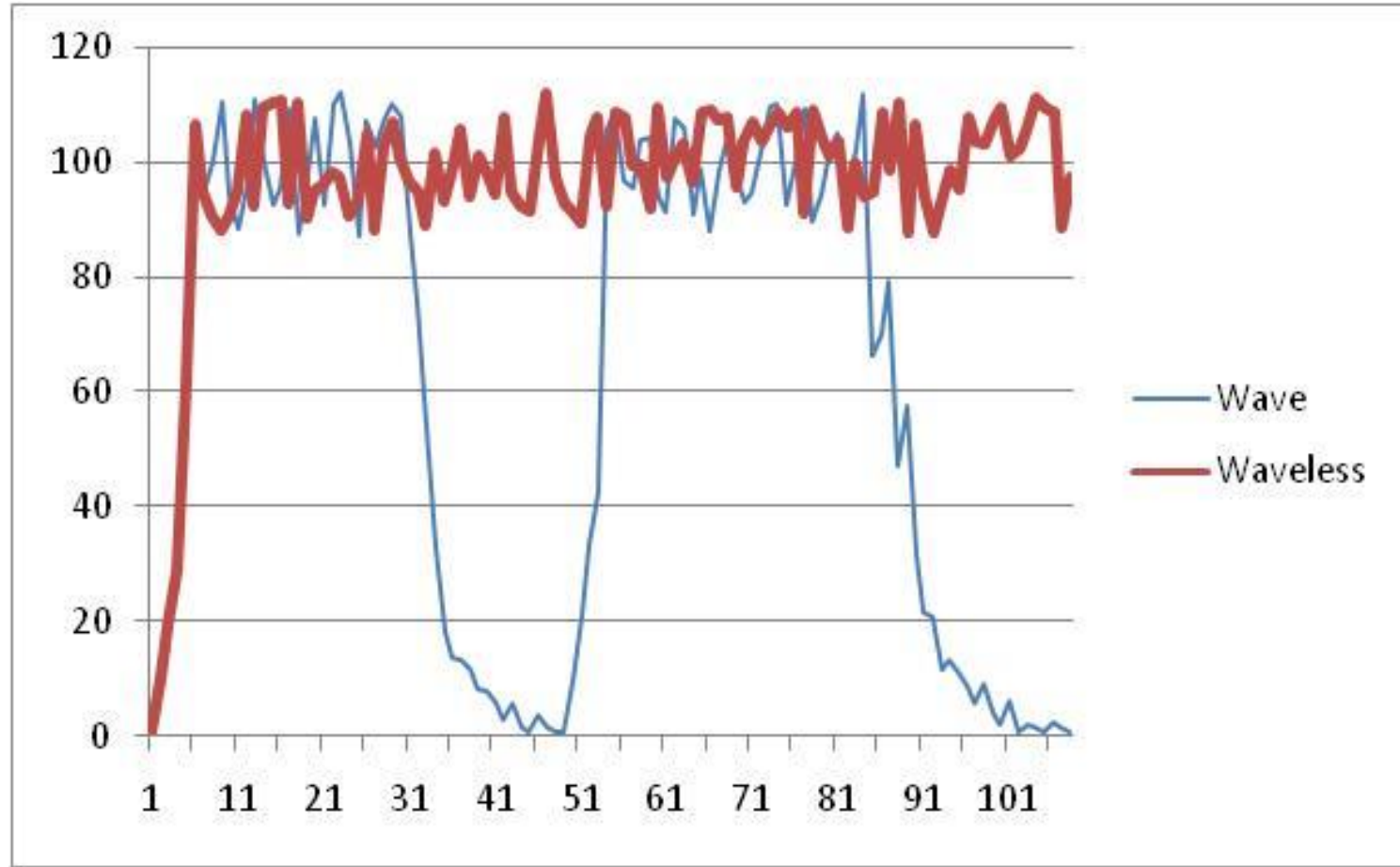
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### Sorter Capacity Utilization – Wave vs. Waveless



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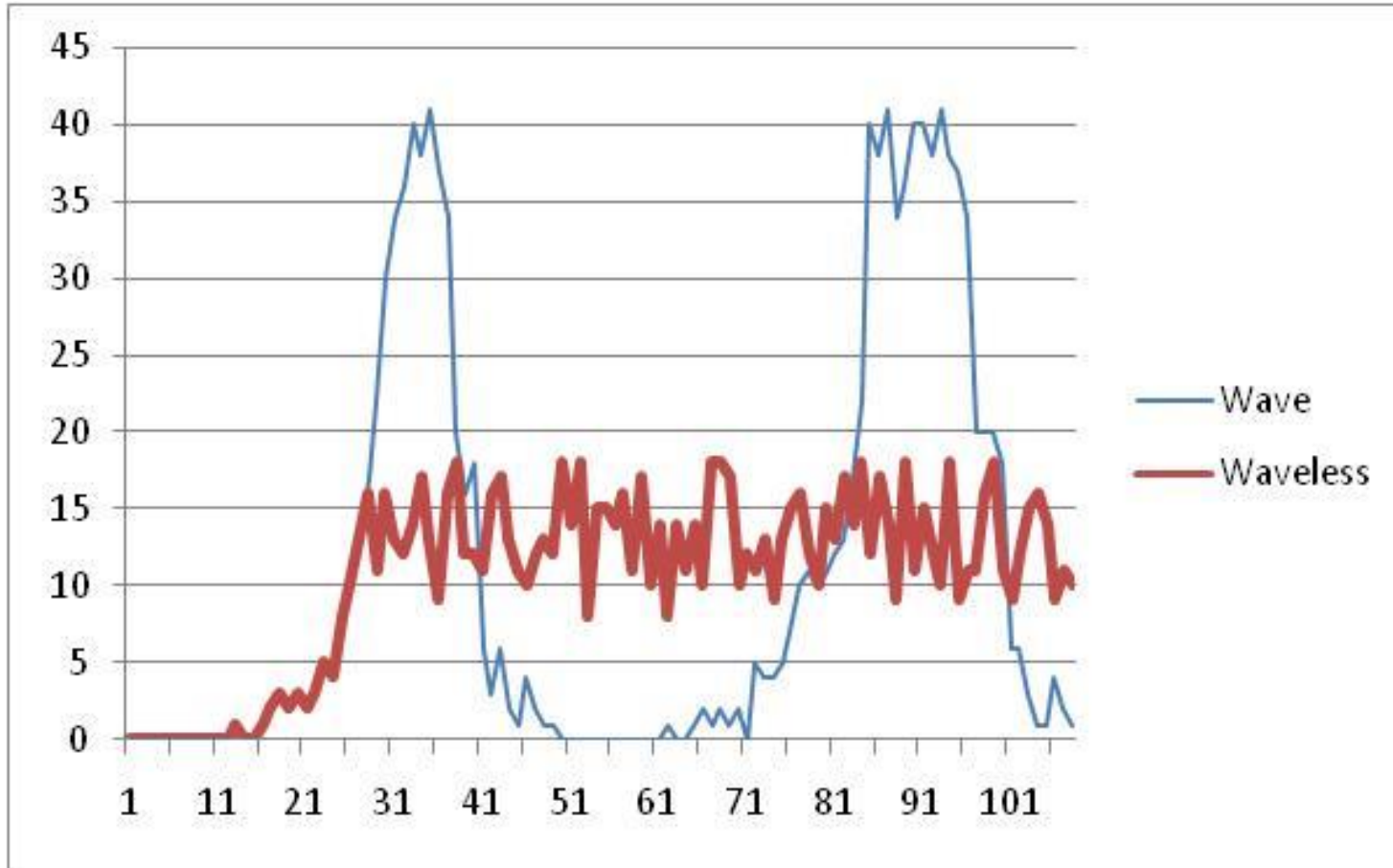
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## Sorter Order Completions – Wave vs. Waveless







## *Waveless Picking Efficiency*

- Waveless does not mean batch-less
- Larger batch size = Greater pick efficiency
  - Larger batch = Greater pick density = Less distance between picks = Less travel time
- In no case will waveless picking be less efficient than wave-based picking

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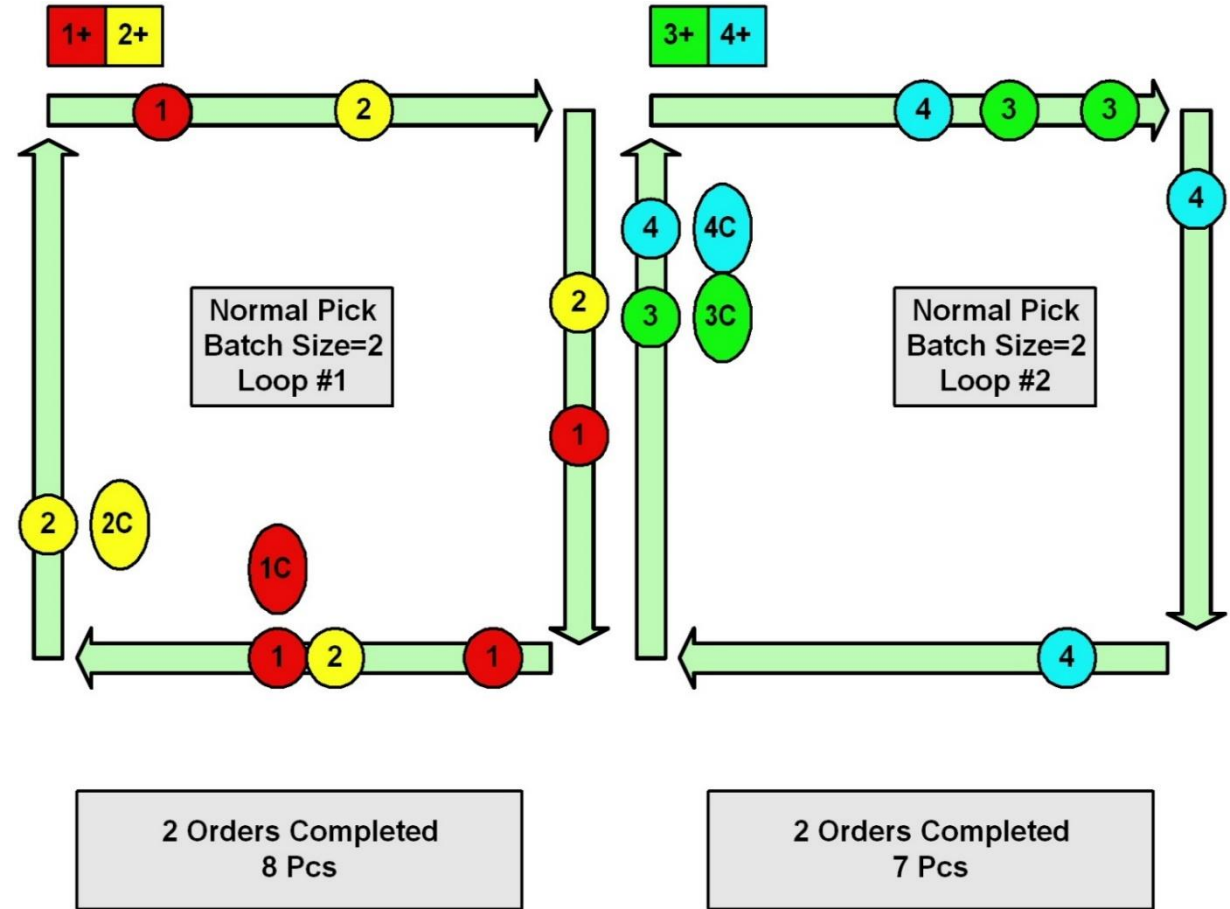


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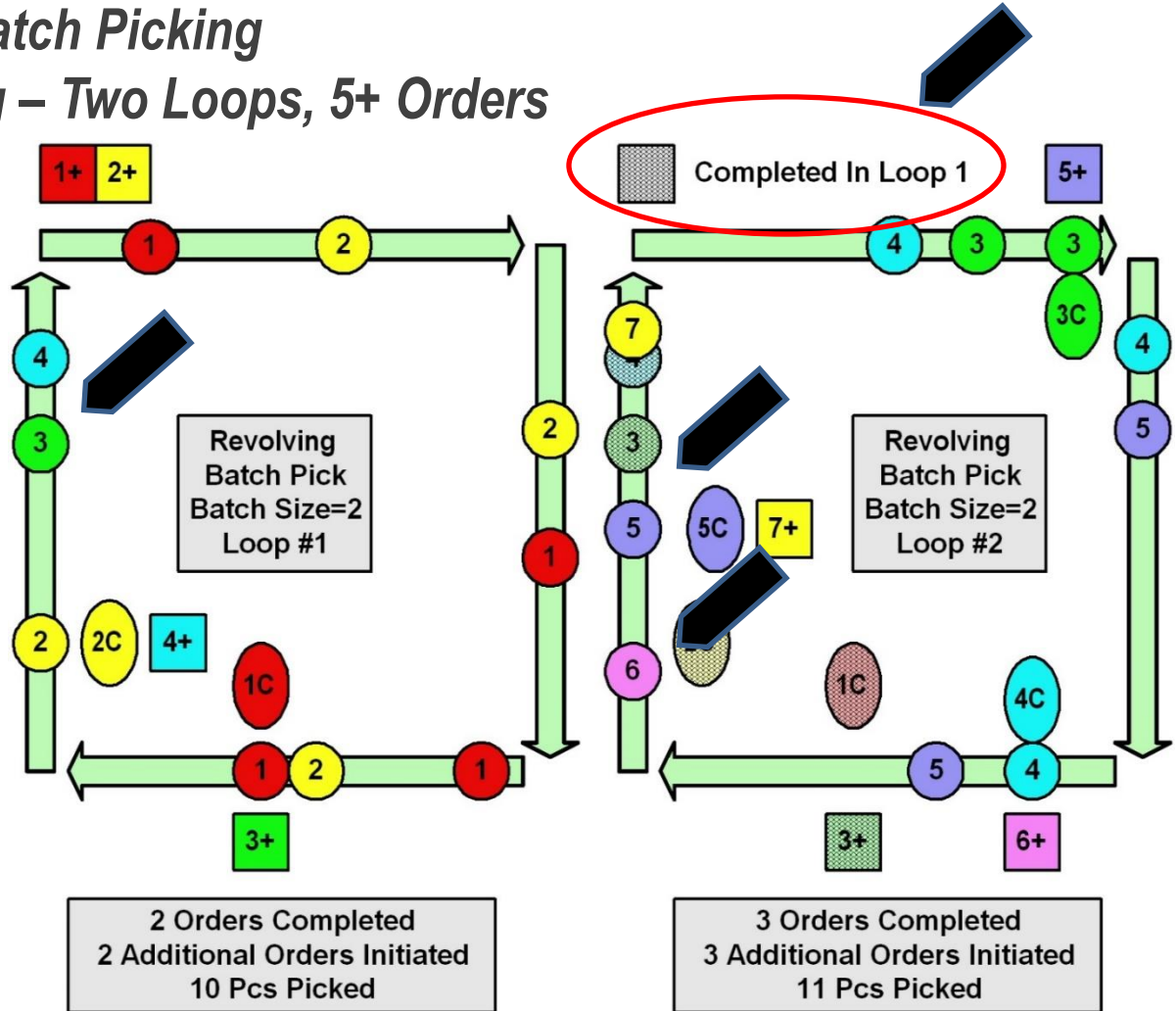
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## Example - Traditional Processing Two Loops, 2 Batches, 4 Orders



## Example - Revolving Batch Picking Continuous Processing – Two Loops, 5+ Orders

1 Additional Order  
 6 Additional Pieces





## *Reduction in Exception Orders – Wave vs Waveless*

- Most exception orders are due to “late” items
- By definition late items do arrive - but in a wave based system they are after the wave is closed
- Waveless systems have NO wave closing
- Chutes remain assigned to an order until either the last item arrives or the chute “times out”
- In waveless systems chute timeouts can be quite long since chutes are dynamically assigned and some chutes complete early and can be re-used. This reduces the immediate need for the late item order chute. This added time allows many late item orders to close without additional problem resolution activity.





## *Benefits Of Dynamic Optimization*

- Automatically compensates for changes in:
  - Work requirements
  - Work priorities
  - Work resources
  - Resource availability exceptions
- Plan is built incrementally as work progresses
- No need to “un-plan” in order to create a new plan
- Recognizes that most tasks are exception free while those that have exceptions just take additional time to resolve
- Takes advantage of exception “opportunities” when possible

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## Efficiency is...

**“The greatest opportunity for increasing personal productivity in distribution operations lies not in expecting people to work faster, harder, or even more accurately. The greatest opportunity for improvement lies in having people work constantly and independently at their own individual work rate.”**

**John Fontanella, Vice President at AMR Research**

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## ***For More Information:***

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