

# TECHNOLOGY ADVANCES IN MATERIAL HANDLING

Sponsored by:



Presented by:

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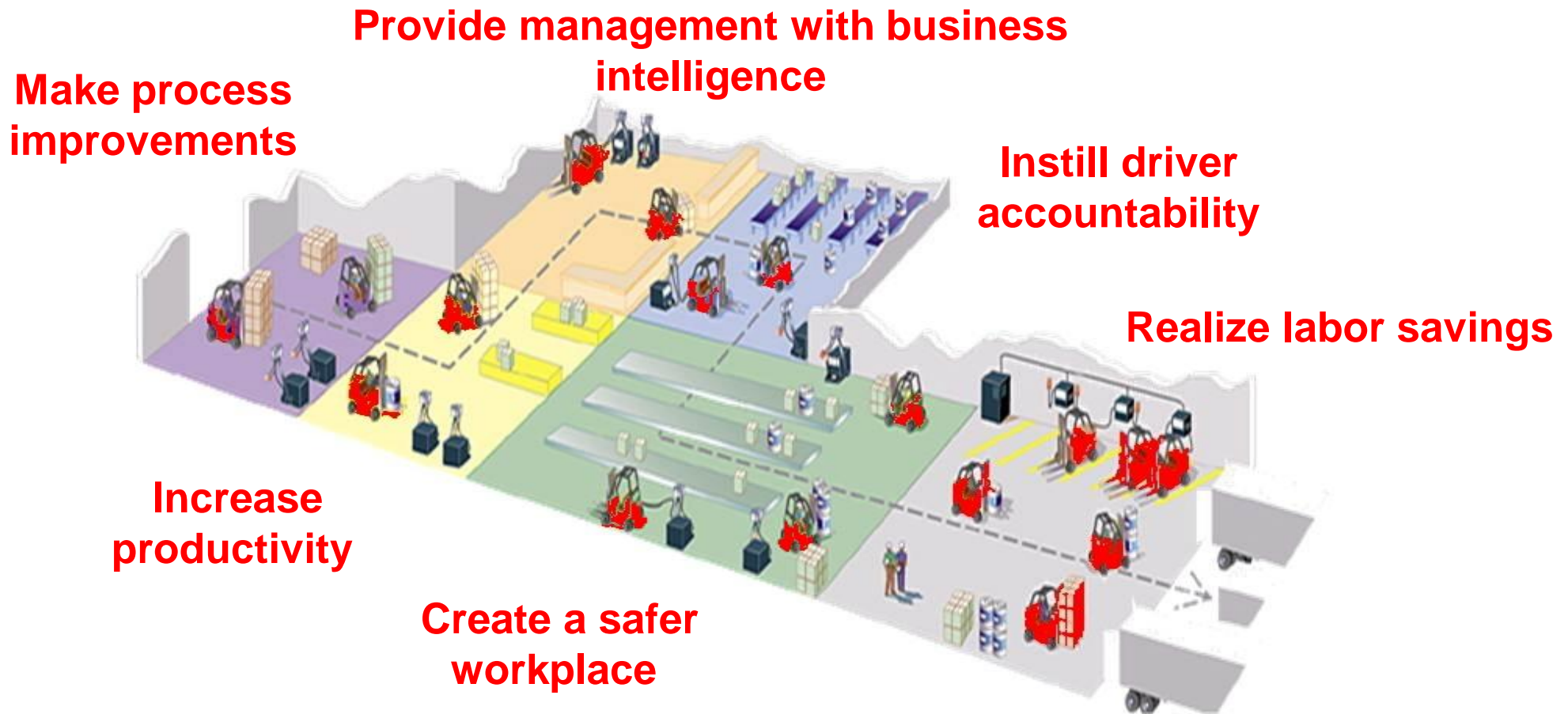
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# WAREHOUSE OPTIMIZATION SYSTEMS

» Data acquisition that drives warehouse efficiency

# WAREHOUSE OPTIMIZATION



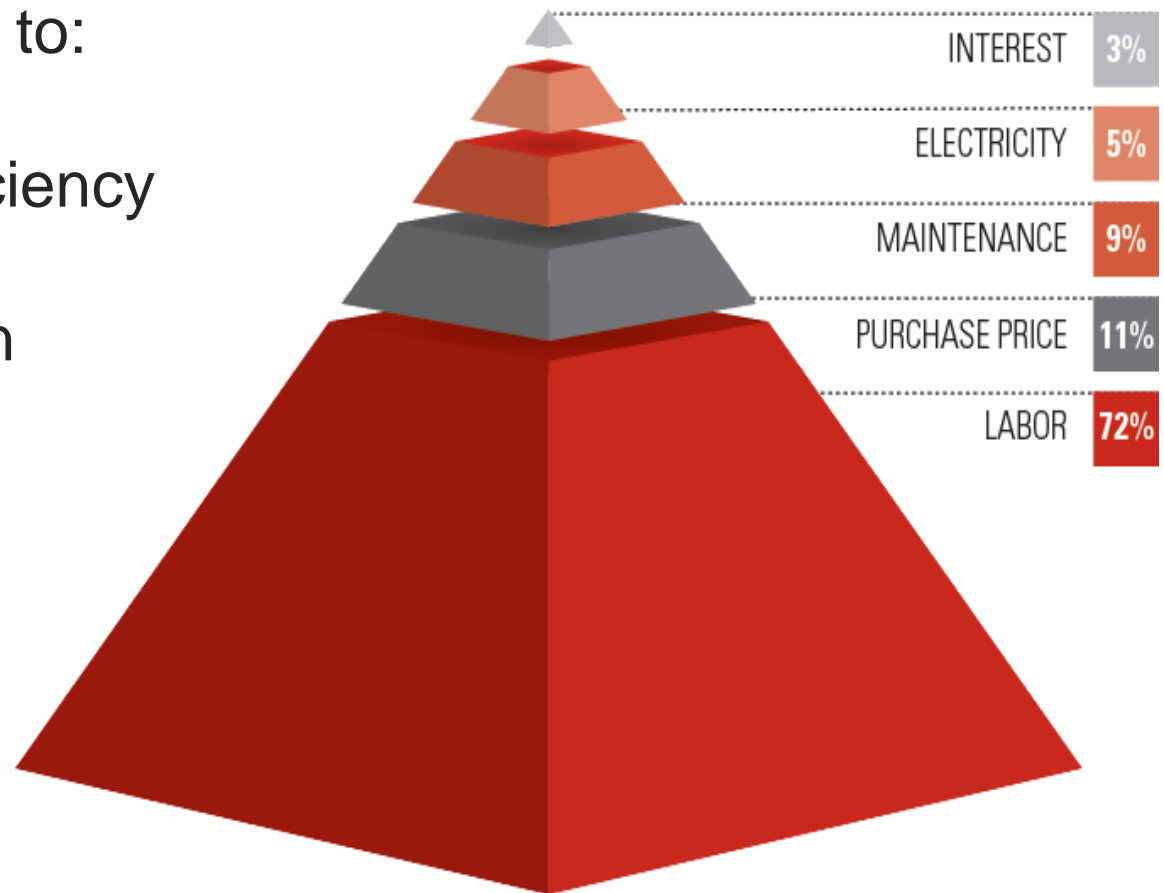
Programs such as fleet management systems address these opportunities, and *more...*

# DID YOU KNOW?

**72% of all forklift operating expenses are NOT related to truck price or general maintenance costs**

Customers demand information to:

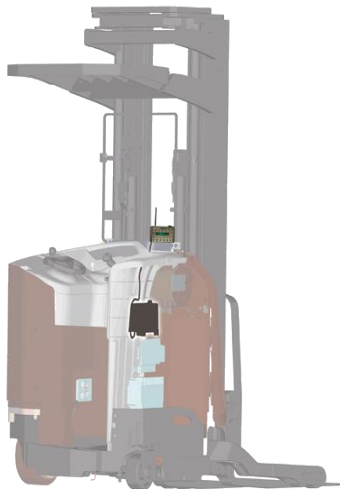
- Improve productivity
- Increase operational efficiency
- Reduce costs
- Maximize asset utilization
- Instill accountability
- Reduce impacts/damage
- Reduce liability and risk



# MOBILE DATA PLATFORMS



Voice-directed Work



Truck Data Capture



Barcode Data Collection



Fixed-mount Computers



Battery Monitoring



Vehicle Management Systems



# TRUCK DATA CAPTURE SYSTEMS



# FLEET OPTIMIZATION – Core Features

## OSHA CHECKLISTS

- Electronic vs. Paper Checklists
- Paperless/Automated Record Management
- Wireless Maintenance Alerts
- Automatic Vehicle Lockout

## IMPACT MONITORING

- Multiple Impact Level Settings
- Wireless Impacts Alerts/Recording by Driver
- Damage Expense Avoidance

## PRODUCTIVITY

- Increase Operator Efficiency
- Optimize Vehicle Utilization & Mix

## ACCESS CONTROL

- Operator Certification & Authorization
- Enforcement & Lockout
- Automated Asset Tracking

# LMS TODAY

» A review of current Labor Management System solutions



# KEY COMPONENTS OF LABOR MANAGEMENT

- » Cost to serve visibility
  - » Where are my labor \$ being spent?
  - » What is my cost per unit by process, customer or category?
  - » How am I tracking compared to my volume adjusted budget?
- » Employee Accountability
  - » Recognize top performers and take action with underperformers daily.
  - » Fair labor standards are critical.
- » Pay-for-Performance
  - » Share part of the savings with employees for hitting stretch goals.
  - » Should be based on individual or small team performance.

# CHALLENGES ASSOCIATED WITH LABOR MANAGEMENT

## » Key Challenges

- » Productivity should be tracked at the individual level
- » Single metric standards (units/hr) vary too much to be effective
- » Timely reporting is needed to make effective management decisions

## » Spreadsheets are flexible but have significant limitations

- » Hard to track performance over a period of time
- » Complex models can break easily

## » Traditional Labor Management Systems

- » Powerful tools but can be expensive to implement and maintain
  - › Software integration
  - › Development and maintenance of Engineered Labor Standards
  - › Mapping warehouse locations to calculate travel distance

# SOLUTION: Fleet Management + Labor Management

- » **Fleet management systems** collect real-time data from the **vehicle**
  - » Travel distances, utilization rates, impact monitoring, checklist automation
- » **Labor management systems** integrate vehicle and **employee** activities
  - » Daily data feed from the fleet management system, WMS, spreadsheets and time clock
- » Two Options
  - » Lite version for facilities without scanned data
  - » Full version combines the data from a fleet management system with WMS data
- » Benefits
  - » Travel metrics without the cost of XYZ modeling
  - » Accountability and rewards based on **fair** and **accurate** metrics

# VEHICLE LABOR COST BY ACTIVITY

Data collected through fleet management systems, combined with labor data, provide the ability to determine cost per case by vehicle type. Management can direct supervisors to place drivers on the most cost effective equipment for the task being performed.

C...	F...	Department ...	Process Name	Category	Metric Number	Metric	Units Proces...	Hours	Unit Cost	Unit Cost (90...	Total Cost	Missing Hours	Missing Hour...
...	...	Picking	Picking		1	Cases	953	14.35	0.30	0.32	276.68		
...	...	Picking	Picking	High Reach ...	1	Cases	83312	2203.33	0.501	0.513	41775.99		
...	...	Picking	Picking	Counter Bala...	1	Cases	19325	396.11	0.412	0.42	7970.8		
...	...	Picking	Picking	Double Pallet...	1	Cases	733	18.43	0.47	0.371	344.82		
...	...	Picking	Picking	Single Pallet ...	1	Cases	15665	558.36	0.654	0.668	10237.51		
...	...	Picking	Picking	Order Picker	1	Cases	81	17.05	3.859	4.72	312.57		

# EMPLOYEE SCORECARD

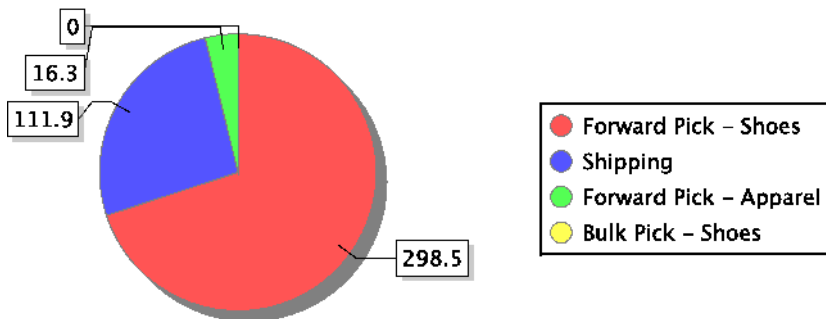
Date: July 30, 2012

Employee: Curlew, Paula (443)

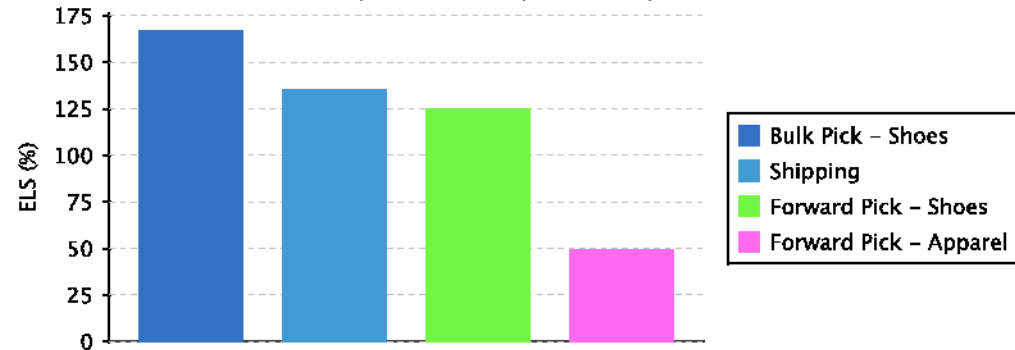
## Performance Summary

Item	Last Period	90 Days	YTD
ELS	123.99 %	124.66 %	120.25 %
ELS Rank	14 of 37	13 of 50	16 of 61
QLS	100.00 %	100.00 %	100.00 %
QLS Rank	1 of 37	1 of 50	1 of 61
Direct Hours	67.74	426.75	1,047.28
Indirect Hours	1.83	12.94	12.94
Indirect %	2.64 %	2.95 %	2.64 %
Indirect Rank	17 of 37	28 of 50	24 of 61
Work Days in Period	9	63	147
Bonus Earned	\$ 191.91	\$ 1,102.65	\$ 2,405.03
Bonus Rank	5 of 37	8 of 50	8 of 61
Evaluation Score	4.25	4.25	4.25
Eval. Score Rank	1 of 37	1 of 50	1 of 61
Missing Time			
Missing Time Rank			

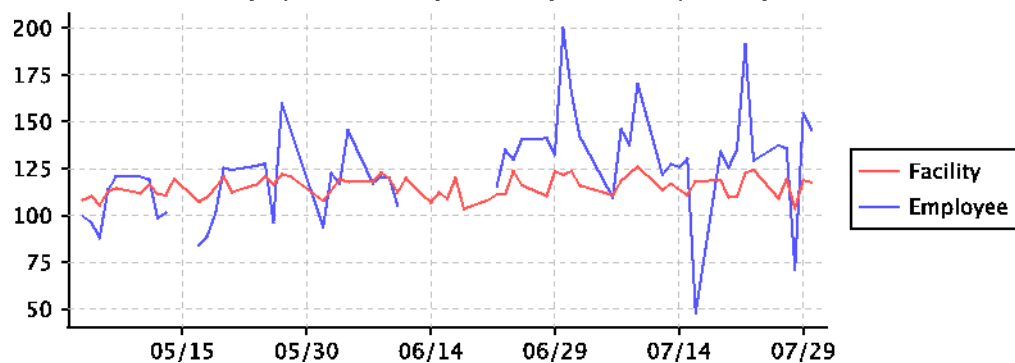
Top 5 Processes by Hours Worked (90 days)



Top 5 Processes by ELS (90 days)



Employee Productivity vs. Facility Productivity (90 days)



Employee Evaluation Scores

	90 day Score	90 day Rank	YTD Score	YTD Rank
Attitude	4.00		4.00	
Teamwork	5.00		5.00	
Safety	4.00		4.00	
Attendance	4.00		4.00	
<b>Average</b>	<b>4.25</b>	<b>1 of 50</b>	<b>4.25</b>	<b>1 of 61</b>

# CASE STUDY – GENCO

- » Second largest third-party logistics in North America, with more than 130 facilities
- » Has an internal labor management consulting group with extensive experience in this area
- » They identified a fleet management system and a labor management system as a powerful combination
- » Fully implemented the combined system at the first facility
- » Combining lift truck data, WMS data, time clock data and manual tracking sheets

**Today...**

**A combination of fleet management and labor management systems are now proposed as the solution for Genco current and new potential 3PL customers.**

# COMPLETE VIEW OF WAREHOUSE OPERATIONS

## » How these systems work together

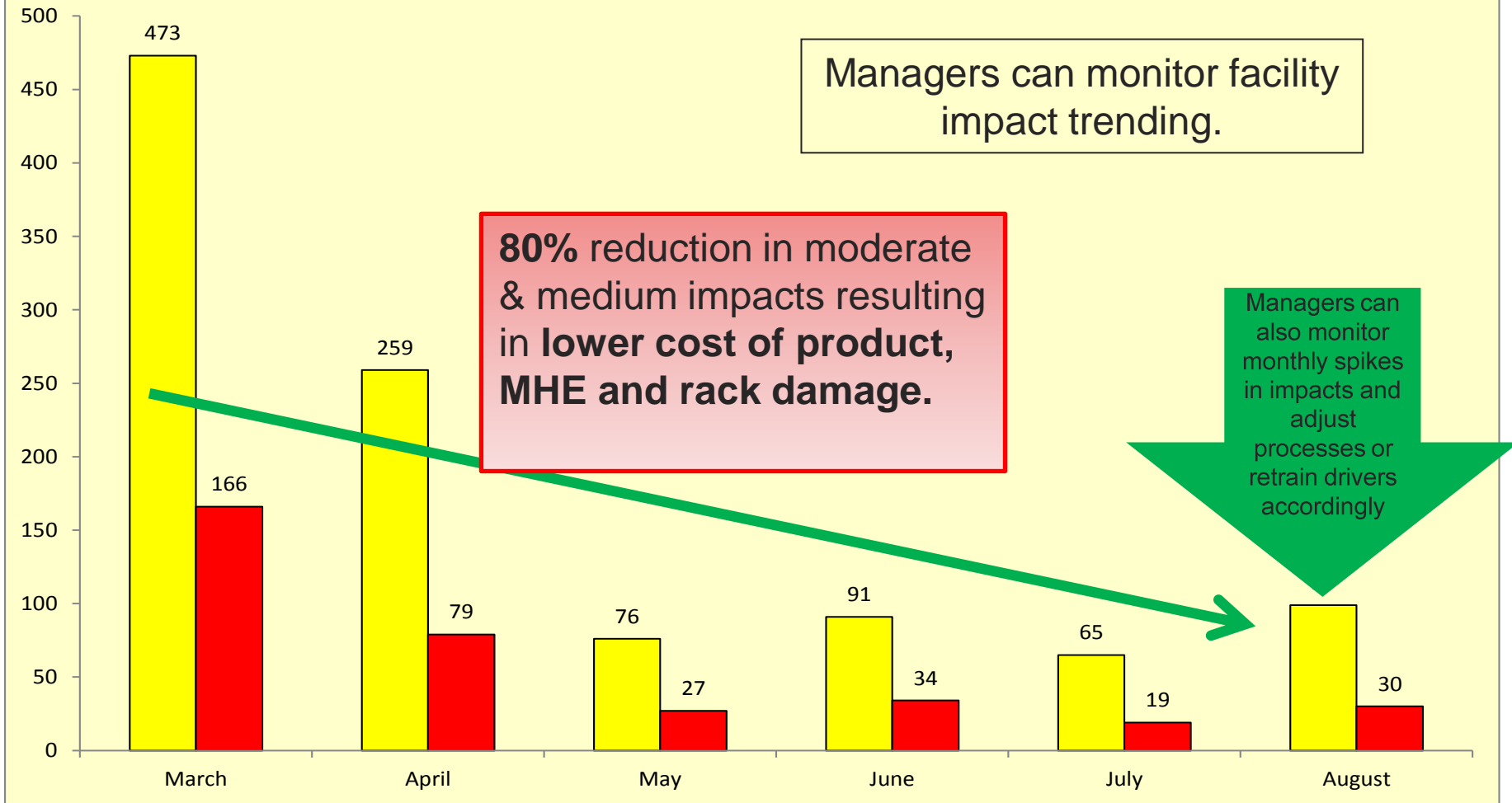
- » Vehicle data is exported from the fleet management system to the labor management system
- » Also can be integrated with **WMS** and **time clock** data
- » Result is a complete picture of **operator** and **vehicle** activity
- » Rewards can be based on **fair** and **accurate** metrics
- » Warehouse productivity **increases** and costs are **reduced**

# RESULT OF IMPACT TRACKING IS AN 80% REDUCTION IN IMPACTS

## Moderate and Medium Level Impact Trend, by Month

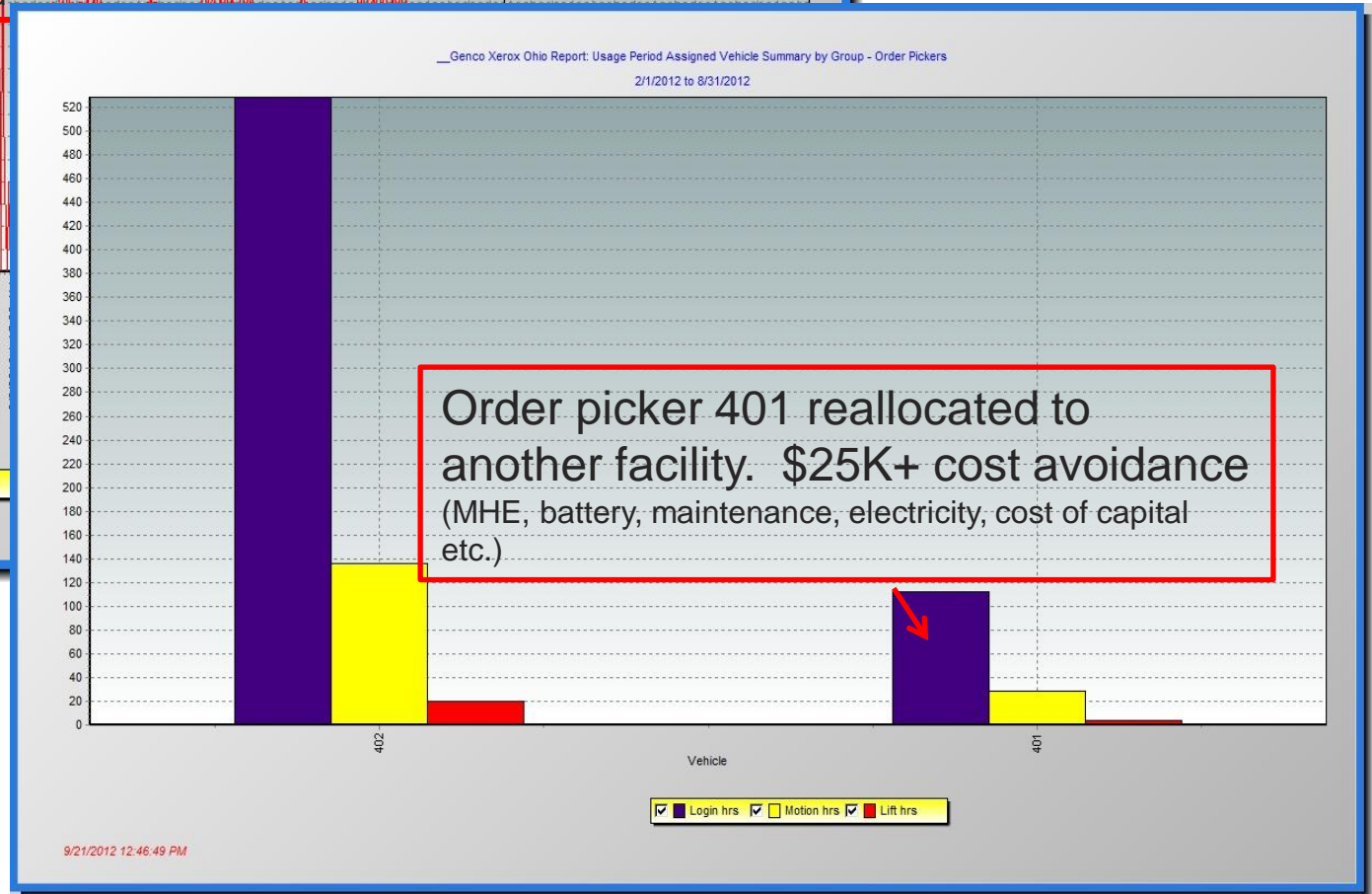
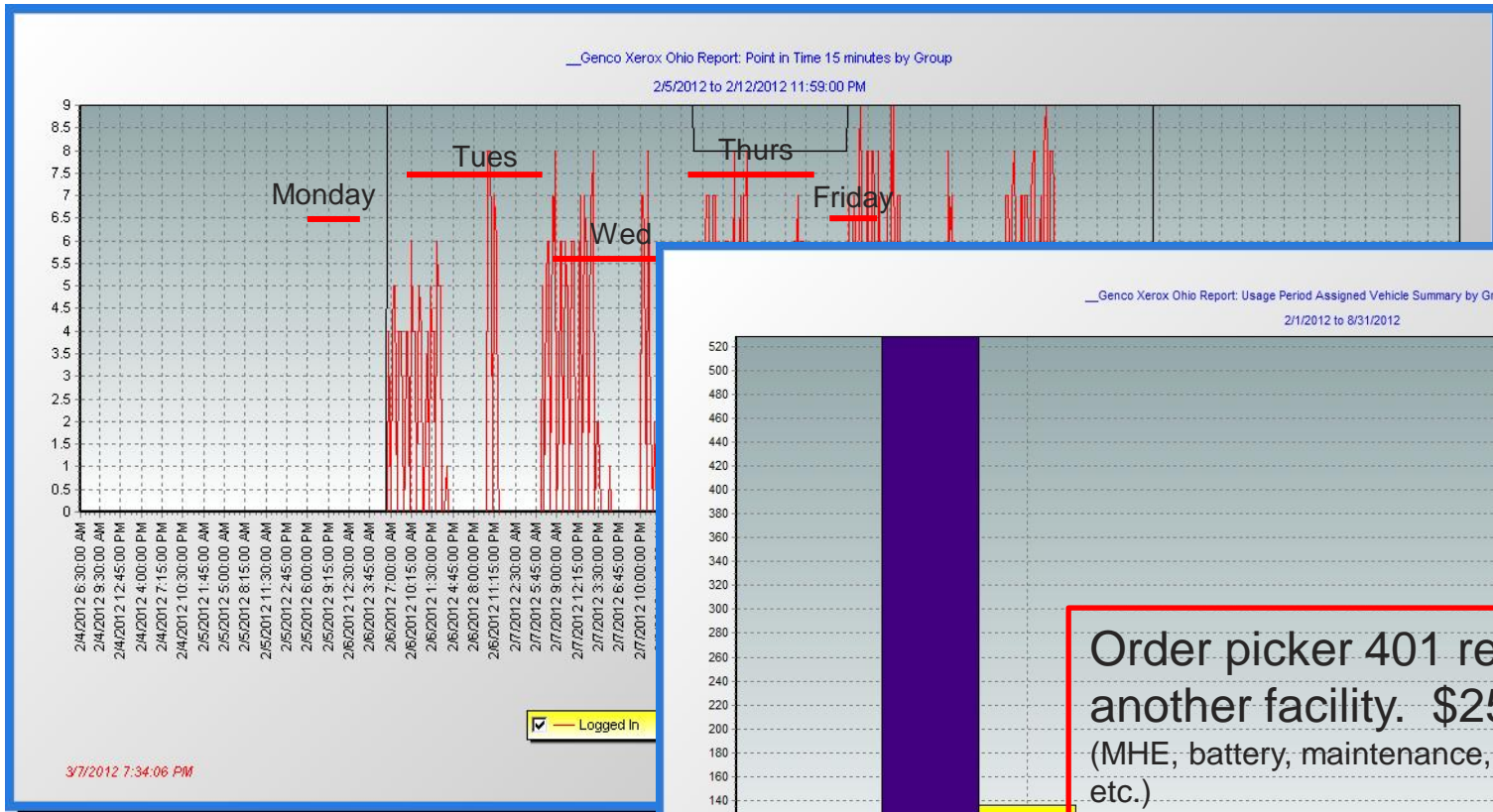
Genco Xerox March 1 - August 31, 2012

■ Moderate ■ Medium





# VEHICLE FLEET SIZE AND UTILIZATION CAN BE ANALYZED

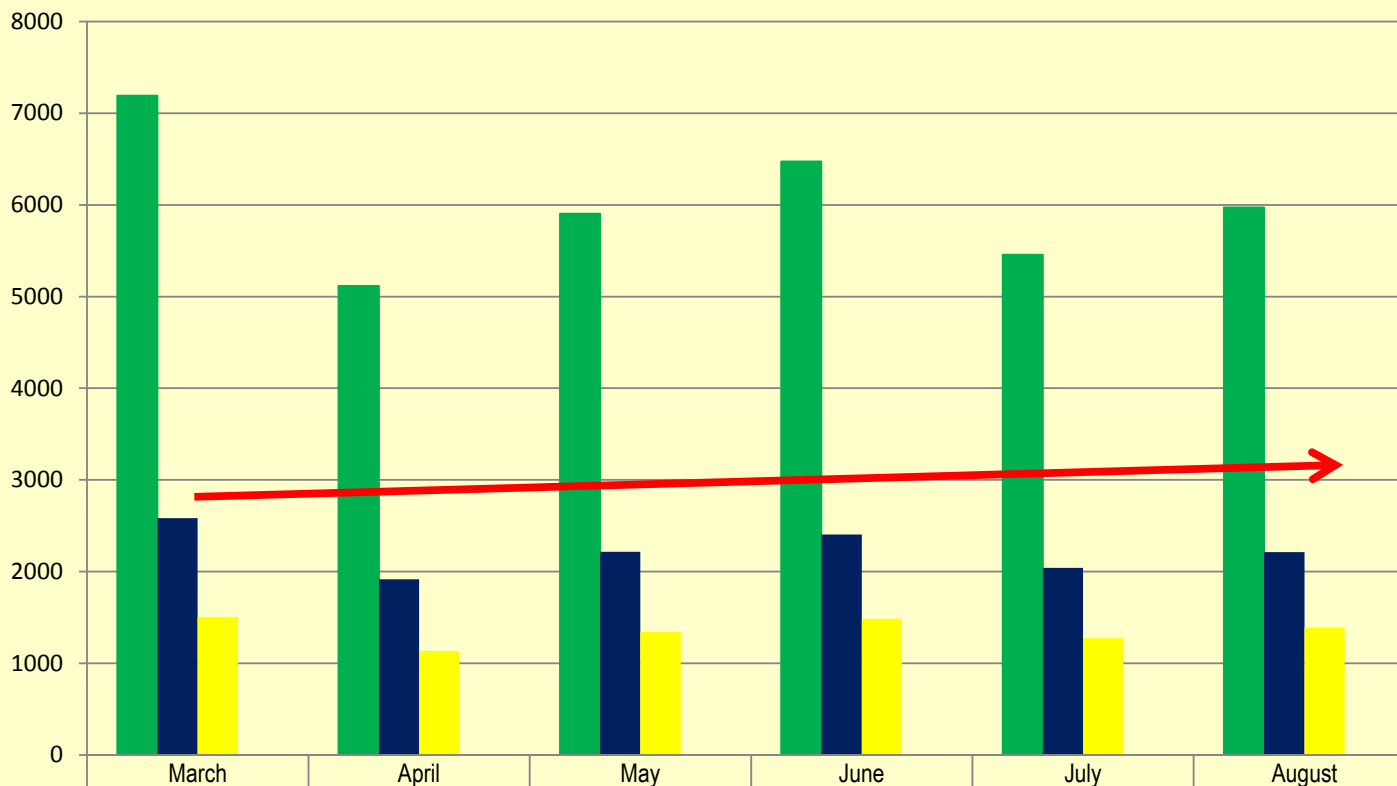


# TRAVEL WITH LOAD UTILIZATION

## Improvement in Travel with Load (TWL) Vehicle Utilization

Genco Xerox March 1 - August 31, 2012 - All vehicles except Order Pickers

■ Login Hours ■ Motion Hours ■ TWL Hours



	March	April	May	June	July	August
Login Hours	7191.42	5116.67	5906.02	6475.57	5456.46	5971.72
Motion Hours	2582.32	1917.33	2215.09	2404.82	2041.38	2212.24
TWL Hours	1505.25	1135.02	1340.66	1483.88	1271.94	1391.38
TWL as a % of Motion Time	58.3%	59.2%	60.5%	61.7%	62.3%	62.9%

The red arrow tracks the month-to-month improvement in travel with load (TWL) as a percentage of motion time (the amount of time the vehicle is traveling or lifting).

This metric measures the amount of time a vehicle is actually moving product.

**7.9%**

increase (from 58.3% to 62.9%) in TWL since the fleet management system was implemented.

# COST BREAKDOWN BY PROCESS

Facility: Sample Customer

Date Range: 07/19/2011 to 07/19/2011

Department	Process	Client	Unit Name	Units / Hr	Units Processed	Total Hours	Unit Cost (unburdened)	Unit Cost (90 Day)	Total Cost	Productivity Score
Assembly	Assembly-Label/Ticket	Williams Sonoma Catalog	Eaches	44.57	156	3.5	\$ 0.272	\$ 0.127	\$ 42	
	Assembly-Rework		Eaches	56.56	207	3.7	\$ 0.165	\$ 0.076	\$ 34	
		Macys Home Store	Eaches	122.93	1,260	10.2	\$ 0.096	\$ 0.096	\$ 121	
	Assembly-w/Poly Bag-Label		Units	244.80	4,896	20.0	\$ 0.031	\$ 0.023	\$ 150	
	Sets/Clip Strips		Sets	117.60	1,176	10.0	\$ 0.064	\$ 0.136	\$ 75	
Forklift	Full Case Pick - NonWalmart		Locations	106.04	5,514	52.0	\$ 0.168	\$ 0.200	\$ 924	141.6 %
	Full Case Replenishment		Full Pallets	20.78	112	5.4	\$ 0.930	\$ 1.051	\$ 104	152.2 %
	Putaway		Pallets	25.65	159	6.2	\$ 0.765	\$ 0.759	\$ 122	132.6 %
Other Areas	Cycle Count		Locations	39.22	60	1.5	\$ 0.512	\$ 0.514	\$ 31	112.2 %
	Indirect- Cardboard					0.5			\$ 7	
	Indirect- Cleaning					5.7			\$ 72	
	Indirect- Inventory					0.6			\$ 8	
	Indirect OA					1.0			\$ 16	
	Misc					2.8			\$ 52	
Pick & Pack	Packing/No Audit		Units	308.27	5,142	16.7	\$ 0.042	\$ 0.082	\$ 216	116.0 %
	Picking - Non-Macys			67.39	1,176	17.4	\$ 0.183	\$ 0.118	\$ 215	58.5 %
Replenishment Split Case	Split Case Replenishment		Lines	17.46	88	5.0	\$ 0.869	\$ 0.626	\$ 76	90.1 %
Unloading	Unload Containers		Cases	550.13	8,252	15.0	\$ 0.034	\$ 0.041	\$ 277	123.2 %
Missing Time						3			\$ 51	
Total Tracked Labor Cost		Regular Hours				177			\$ 2,544	
		Overtime Hours				0			\$ 0	

# DAILY PRODUCTION REPORT

Facility: LPDemo

Date: 11/11/2009

Shift: Day

Process Name	Code	Metric 1 Qty	Metric 2 Qty	Metric 3 Qty	Hours	ELS %	Complete %
<b>Armstrong, Rodney</b>		Day ELS: 95.3%	Direct Hrs: 7.6	Bonus: \$ 0.00	Cumulative Bonus: \$ 23.11		
		Missing Hrs. Adj.: -	Indirect Hrs: 0.0	Lock In ELS: 95.3%			
Consolidation	Rc1-TRODNEYA	Qty 558.0	Locations 4.0	Scans 4.0	0.48	41.8 %	100 %
Forward Pick - Apparel	Pi3-TRODNEYA	Qty 248.0	Locations 32.0	Scans 32.0	0.99	61.4 %	100 %
Replenishment - Apparel	Rp1-TRODNEYA	Qty 1273.0	Locations 17.0	Scans 19.0	0.94	117.9 %	100 %
Replenishment-Footwear	Rp2-TRODNEYA	Qty 1776.0	Locations 106.0	Scans 108.0	5.16	102.7 %	100 %
<b>Bates, Cathle</b>		Day ELS: 129.5%	Direct Hrs: 7.2	Bonus: \$ 21.75	Cumulative Bonus: \$ 69.36		
		Missing Hrs. Adj.: -	Indirect Hrs: 0.0	Lock In ELS: 129.5%			
Forward Pick - Shoes	PI4-CATHIEB	Qty 321.0	Locations 154.0	Scans 174.0	2.31	120.1 %	100 %
Shipping	Sh1-CBSHIP3	Qty 4403.0	Locations 486.0	Scans 3179.0	4.94	134.0 %	100 %
<b>Bolling, Daniel</b>		Day ELS: 77.4%	Direct Hrs: 7.7	Bonus: \$ 0.00	Cumulative Bonus: \$ 28.00		
		Missing Hrs. Adj.: -	Indirect Hrs: 0.0	Lock In ELS: 77.4%			
Data Entry - Returns	Rt1-DANIELB	Qty 80.0	Orders 57.0	Scans 77.0	2.91	157.0 %	100 %
Writing Up - Apparel	rt4-db	Pieces 140.0	Lines 64.0	RA's 1.0	4.75	28.7 %	100 %

# DAILY REPORTS ALLOWS FOR TRACKING TO KPI

Any number of KPI can be tracked using a fleet management system. Supervisors receive a daily report that ranks drivers by their achievement of TWL as a percentage of login time. Those drivers who achieve highest scores are recognized; those who need coaching are encouraged to adopt the best practices of their peers.

First Login	Last Logoff	Login Hrs	Activity Hrs	Deadman Hrs	Travel Hrs	TWL Hrs	TRVL %	TWL %
09/04 07:09	09/04 11:57	4.3	2.5	3.0	2.5	2.5	67.0%	56.7%
09/04 07:00	09/04 14:59	7.1	4.0	0.0	4.0	3.0	57.0%	41.6%
09/04 07:00	09/04 14:59	7.1	3.1	3.7	3.1	1.9	67.0%	40.8%
09/04 08:04	09/04 14:44	4.5	2.6	2.2	2.6	1.6	57.0%	34.9%
09/04 07:24	09/04 15:00	6.2	2.4	3.2	2.9	2.1	57.0%	33.4%
09/04 07:00	09/04 14:59	7.2	4.5	6.3	4.4	2.3	62.0%	32.7%

Annotations:

- 1.9 hours standing on deadman (highlighted in red box, pointing to 3.7 hours in the 4th row)
- 2.1 hours empty travel (highlighted in purple box, pointing to 2.1 hours in the 5th row)
- 4 hours of opportunity (highlighted in green box, spanning from 3.7 hours in the 4th row to 2.3 hours in the 6th row)

# COMPREHENSIVE REPORTING

## Supervisor Productivity Report

Multiple metrics such as quality and performance impact incentive payout

Facility: Demo Client

Start Date: 11/26/2010

Rank	Name	Daily Productivity	Missing Hrs. Adj.	Lifetime Productivity	Personal Goal	Direct Hours	Lock In ELS	Lock In QLS	Bonus Earned	Cumulative Bonus
1	Quichocho, Noemi	174.9		126.4	100.0	7.96	174.9	100.0	\$ 35.82	\$ 95.19
2	Carreno, Amalia	157.5		96.4	100.0	7.99	157.5	100.0	\$ 35.96	\$ 134.95
3	Reykin, Vita	149.6		124.1	100.0	7.32	149.6	100.0	\$ 32.94	\$ 130.67
4	Stolyarchuk, Svetlana	145.2		113.1	100.0	7.93	145.2	100.0	\$ 35.08	\$ 59.95
5	Clarke, Christina	129.4		122.9	100.0	7.68	129.4	100.0	\$ 23.04	\$ 136.23
6	Aguier, Lianne	128.8		105.4	100.0	7.82	128.8	100.0	\$ 23.46	\$ 72.02
7	Lopez, Anthony	124.9		95.3	100.0	7.73	124.9	100.0	\$ 23.19	\$ 59.97
8	Curle, Paula	123.1		119.0	100.0	6.69	123.1	100.0	\$ 20.07	\$ 172.34
9	Garcia Ramirez, Paulina	122.5		123.0	100.0	7.34	122.5	100.0	\$ 22.02	\$ 99.96
10	Chandler, Jasmine	114.9		106.9	100.0	6.72	114.9	100.0	\$ 10.08	\$ 65.90
11	Thygeson, Shirley	114.3		77.4	100.0	7.88	114.3	100.0	\$ 11.82	\$ 11.82
12	Melencon, Brittani	105.2		98.0	100.0	7.82	105.2	100.0	\$ 11.73	\$ 76.64
13	Corrigan, Mark	96.8		99.0	98.6	3.96	96.8	100.0	\$ 0.00	\$ 73.16
14	Bolin, Daniel	95.9		83.3	100.0	5.32	95.9	100.0	\$ 0.00	\$ 27.95
15	Huntley, Mitchell	90.3		123.3	100.0	4.00	90.3	100.0	\$ 0.00	\$ 32.39
16	Miller, Rainbow	87.1		90.9	100.0	7.65	87.1	100.0	\$ 0.00	\$ 0.00
17	Munala, Hilary	73.4		111.9	100.0	7.06	73.4	100.0	\$ 0.00	\$ 43.65
18	Weed, Vance	69.3		96.4	100.0	7.83	69.3	100.0	\$ 0.00	\$ 60.89

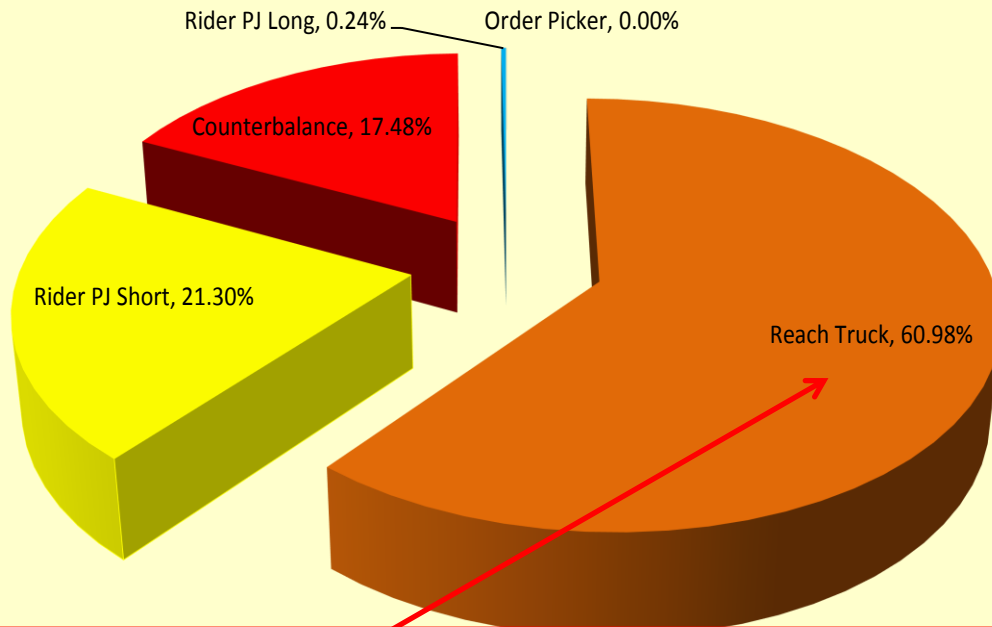
Incentive takes ramp-up period into account

# ANALYSIS OF CASE PICKING VEHICLE USAGE

## Vehicle Utilization for Picking:Case

April 1 through April 26, 2012

Reach Truck   Rider PJ Short   Counterbalance   Rider PJ Long   Order Picker

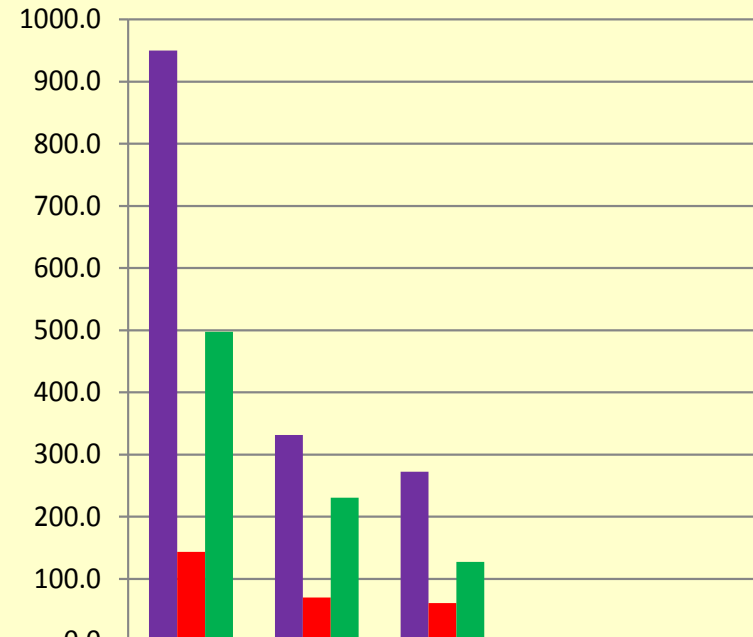


Over 60% of cases picked using most expensive & less productive MHE

Case-picking vehicle activity was 33.39% of all vehicle activity for the period April 1 through April 26, 2012. In-depth view of activity by vehicle type provides insight into best practices to manage labor and vehicle assignments to maximize profitability.

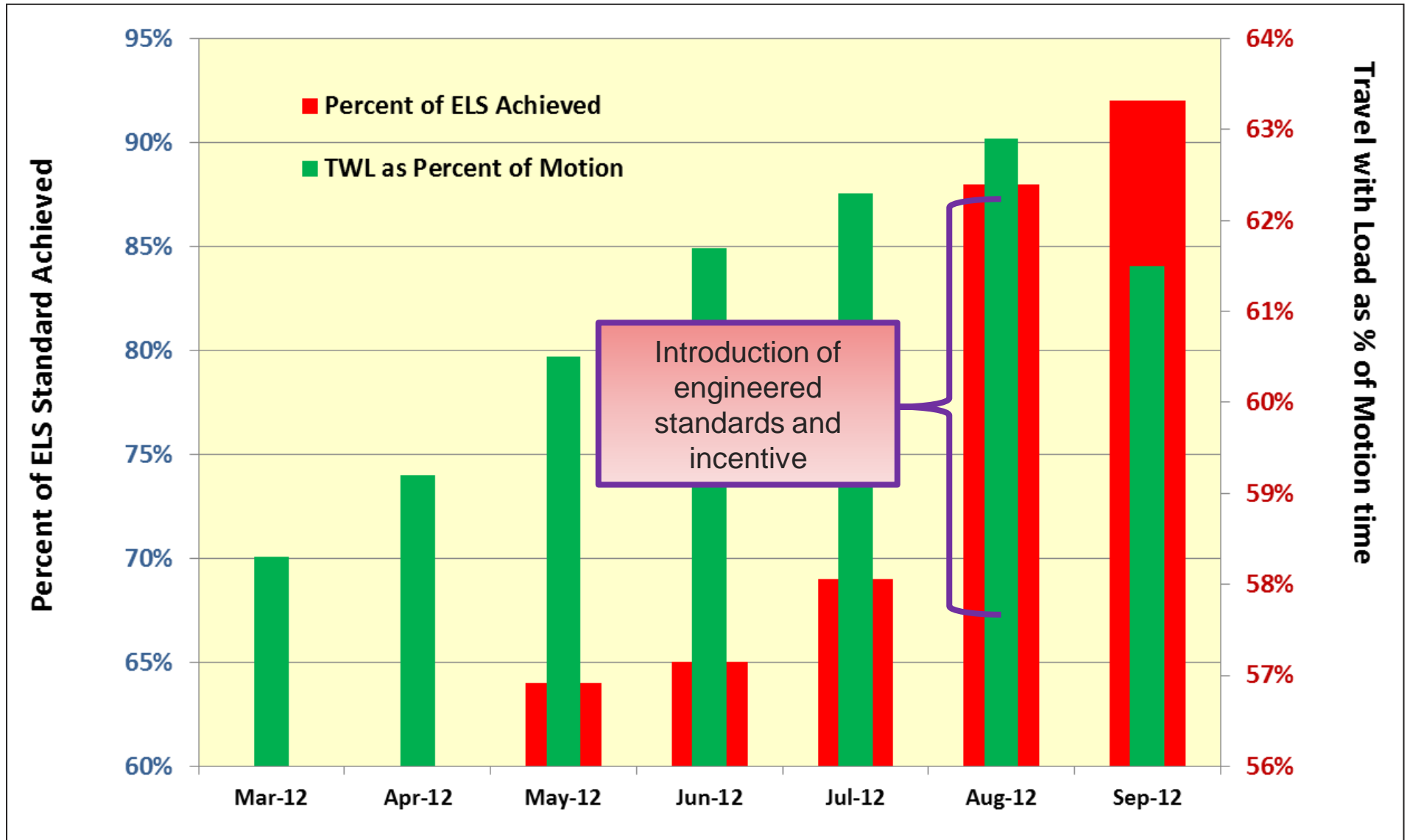
## Case Picking

Login Hrs   TWL Hours   LWL Hours



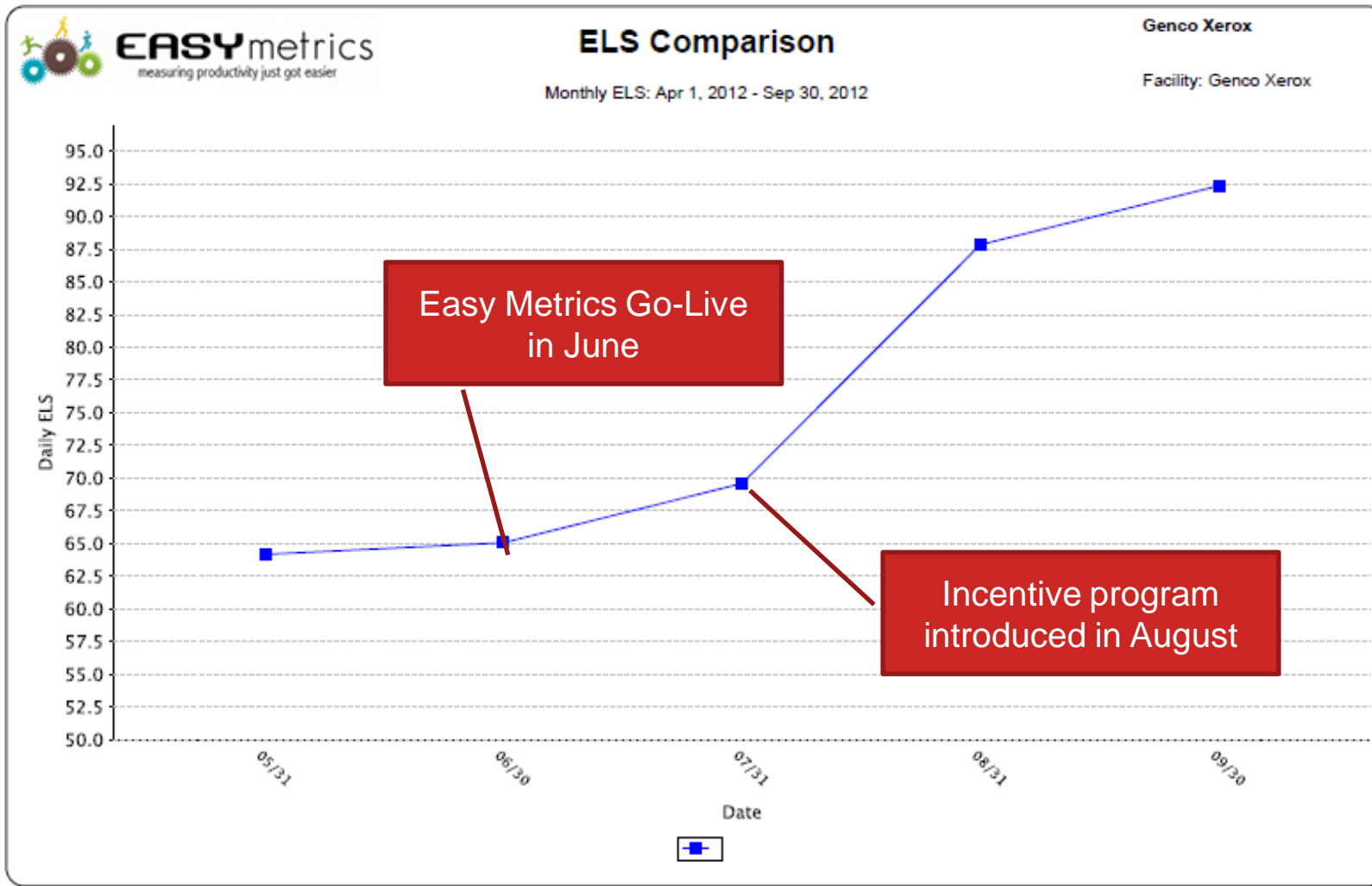
	Reach Truck	Rider PJ Short	Counter balance	Rider PJ Long	Order Picker
Login Hrs	950.1	331.8	272.3	3.7	0.0
TWL Hours	143.4	70.4	61.1	0.8	0.0
LWL Hours	497.9	230.4	127.3	2.4	0.0

# COMBINED PRODUCTIVITY IMPROVEMENT





# PRODUCTIVITY TREND GRAPHS



The ability to graph productivity trends was requested by the Xerox.

Now, this is part of the standard product.

# BENEFITS TO YOUR WAREHOUSE

- » Cutting-edge business intelligence functionality
- » True metrics based on operator and vehicle activity
- » A complete solution to managing equipment usage, plus...
- » An employee reward solution for productivity improvement
- » Can optimize fleet for warehouse task requirements

## Fleet Management + Labor Management

# COMBINED RESULTS

- » Increased productivity
- » Reduced labor costs
- » Reduced impacts
- » Increased net savings
- » Decreased indirect costs

**Thank you for attending. For more information, please contact:**

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