

Economical and Ecological Material Handling

Sponsored by:



Presented by:

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Elevating Green, Lowering Costs

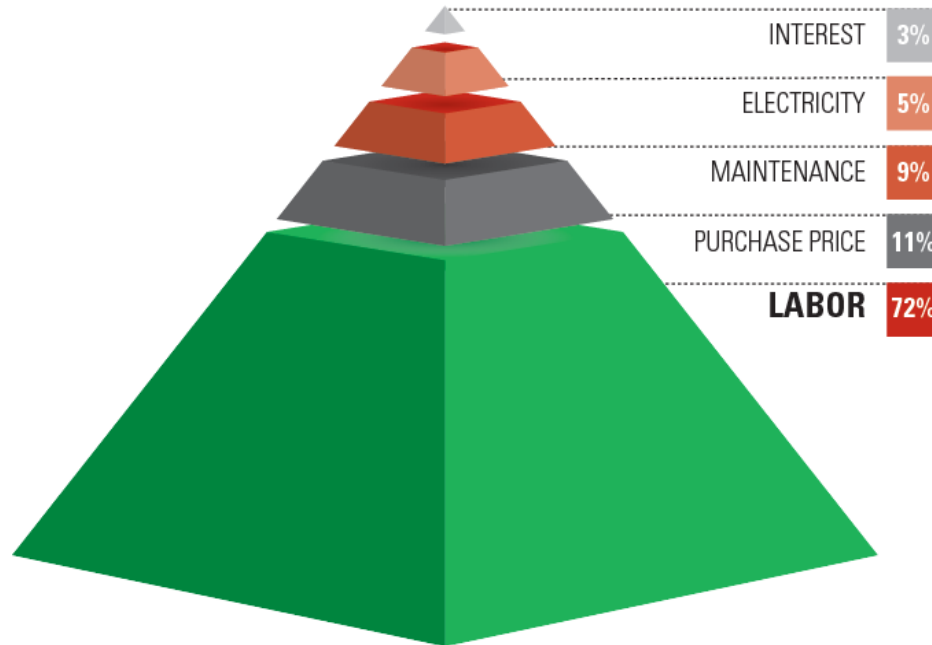
- In the 2011 Energy Efficiency Indicator (EEI) survey from the Institute for Building Efficiency, 66 percent of commercial building executives and managers in the United States and Canada said energy management was extremely or very important to their organizations, up from 52 percent in 2010.
- Closer to the material handling world, energy efficiency is a key component toward greening the supply chain.
 - Choosing trucks designed to use the least energy per pallet moved.
 - Deploying the mix of truck models with features that best fits the application.
 - Creating warehouse layouts that minimize travel.
 - Optimizing battery performance and service life.

Industry Trends to Reduce Costs

- Upgraded lighting for electrical savings.
 - Sensors in aisles, offices, washrooms.
 - Heating and cooling building during off hours.
 - Upgraded WMS and business systems.
 - Battery charging technologies to reduce energy costs.
 - Outsourcing maintenance, loading and unloading and other services.
-
- Fleet maintenance tracking tools.
 - Fleet optimization management tools.
 - Real time battery monitoring tools.
 - Re-evaluating order picking procedures.

Cost of a Lift Truck Over its Life

Only 11% of the total cost of a lift truck is the purchase price.



The operator maintenance and electricity account for remaining 89%.

Cost Drivers – Aging Fleet

- The average lift truck has an estimated economic life of **10,000-14,000** hours.
- This is equivalent to 300,000 over-the-road miles.
- 50% of the trucks in service are beyond their economic life cycle.
- The average lift truck is over ten years old.
- Average time for a lift truck to acquire 10,000 hours is five years.
- Nearly half of all forklifts use/have obsolete technology.

Cost Drivers – Underutilization

- On average, companies have 10%-20% more trucks than needed.
- Short-term rentals often are used to supplement shortages created by excessive downtime.
- Lift truck fleets typically consist of a diverse mixture of brands, requiring an extensive inventory of parts to support them.
- In-house maintenance challenges include keeping up with changing technology.

Cost Drivers – No Strategy

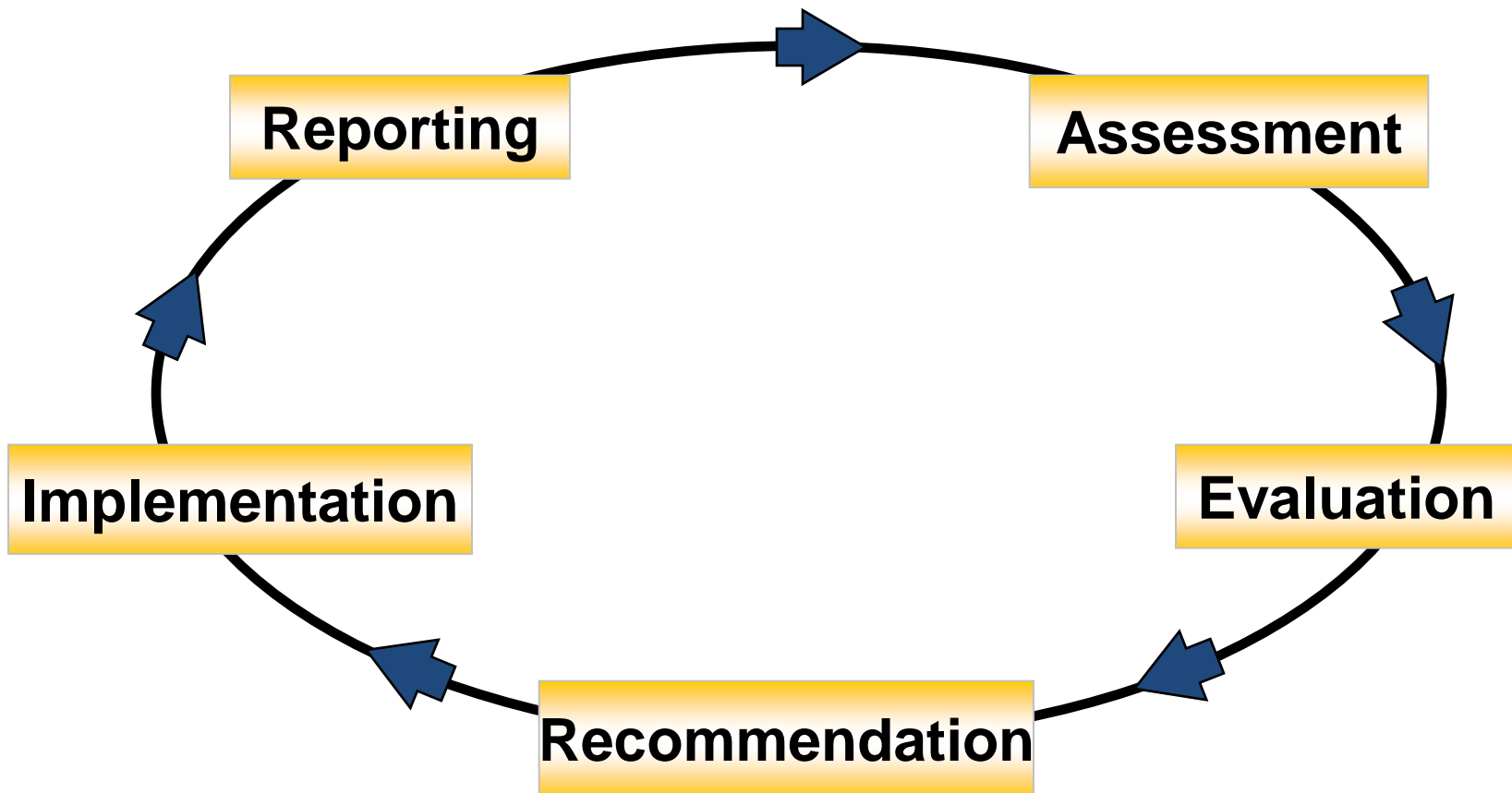
- An independent survey of 500 companies revealed:
 - Only 6% knew the cost per hour of the trucks in their fleet.
 - Only 25% had an information system to track parts and labor
 - Most companies do not have scheduled or preventative maintenance programs for their lift truck fleets.

Cost Drivers – Conclusion

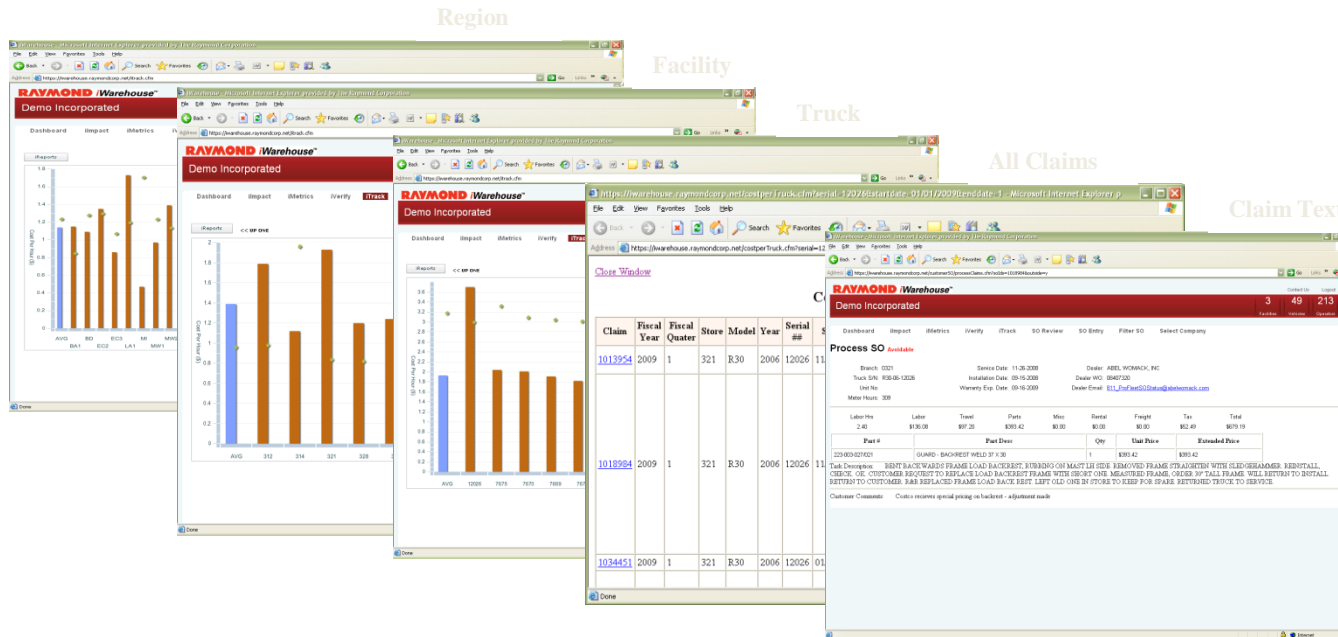
As the assets age, the cost of operation increases:

- Repair expenses increase
- Downtime increases
- Productivity decreases

Fleet Strategy



Reporting Cost Per Hour



Cost Per Hour (CPH) and utilization reports can be run on demand by truck model and by date range. As shown above, the user can drill down into the information by region, facility, truck, claims and claim text.

Cost Reports

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Fleet Cost Reports

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File Edit View Favorites Tools Help

Address bar: http://mtdash.com/asp/summary.asp?zoneid=2&unitid=1&detail=0

12 Month Non Detail Report

Truck Costs

Store	City	May 2010	Apr 2010	Mar 2010	Feb 2010	Jan 2010	Dec 2009	Nov 2009	Oct 2009	Sep 2009	Aug 2009	Jul 09
1	SEATTLE	\$2,319.64	\$2,007.34	\$2,509.89	\$2,742.44	\$2,728.42	\$4,238.20	\$1,130.00	\$5,167.08	\$1,094.72	\$2,109.88	\$5,200
1033	POCATELLO	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$497.41	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
115	LYNNWOOD	\$1,426.60	\$0.00	\$0.00	\$1,256.48	\$783.01	\$889.01	\$0.00	\$701.68	\$164.25	\$492.78	\$1,499
124	VISTA	\$1,185.84	\$1,628.54	\$1,352.20	\$1,113.00	\$2,516.44	\$779.64	\$2,135.91	\$1,495.07	\$930.72	\$1,644.62	\$1,62
13	SILVERDALE	\$560.11	\$0.00	\$0.00	\$1,662.90	\$1,163.48	\$670.28	\$0.00	\$489.59	\$447.31	\$579.48	\$1,551
200	BALTIMORE	\$1,278.36	\$482.76	\$887.08	\$278.41	\$1,537.34	\$1,116.92	\$1,475.53	\$1,714.22	\$204.53	\$204.53	\$200.2
210	TRACY	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
218	STERLING	\$1,028.33	\$2,206.97	\$1,293.29	\$0.00	\$4,914.01	\$1,161.66	\$1,510.97	\$6,646.07	\$613.10	\$2,450.62	\$2,51
225	MANASSAS	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
233	ARLINGTON	\$0.00	\$0.00	\$245.02	\$0.00	\$208.02	\$153.25	\$1,424.29	\$637.55	\$0.00	\$248.21	\$2,24
24	SANTA MARIA	\$1,535.80	\$272.25	\$272.25	\$1,661.81	\$407.39	\$4,105.20	\$472.00	\$2,135.21	\$674.04	\$1,220.20	\$0.00
312	MILFORD	\$1,466.70	\$2,729.84	\$276.50	\$2,001.63	\$1,458.24	\$4,928.22	\$497.08	\$2,458.99	\$781.89	\$1,530.02	\$2,24
324	COLCHESTER	\$1,612.03	\$183.72	\$1,350.18	\$1,582.50	\$1,747.11	\$3,178.72	\$2,735.70	\$2,125.86	\$1,203.77	\$658.29	\$2,76
341	YONKERS	\$254.88	\$3,166.24	\$272.87	\$2,427.48	\$4,494.42	\$3,925.44	\$2,049.73	\$5,909.18	\$398.82	\$2,948.75	\$2,91

12-month Rolling Cost Reports

Cost Reports: Different fleet cost reports can be run on demand by truck model, by location to display costs by truck, hours, CPH, cost by facility, etc. This provides the user with valuable information in regard to individual trucks, usage, trends by facility etc.

Quarterly Customer Reports



Summary by Facility



Truck Type by Facility

Consolidated Invoicing

On a typical 50-truck fleet, in one year you will spend over \$50,000 in creating purchase orders and processing invoices (20 invoices/truck @\$50 each).

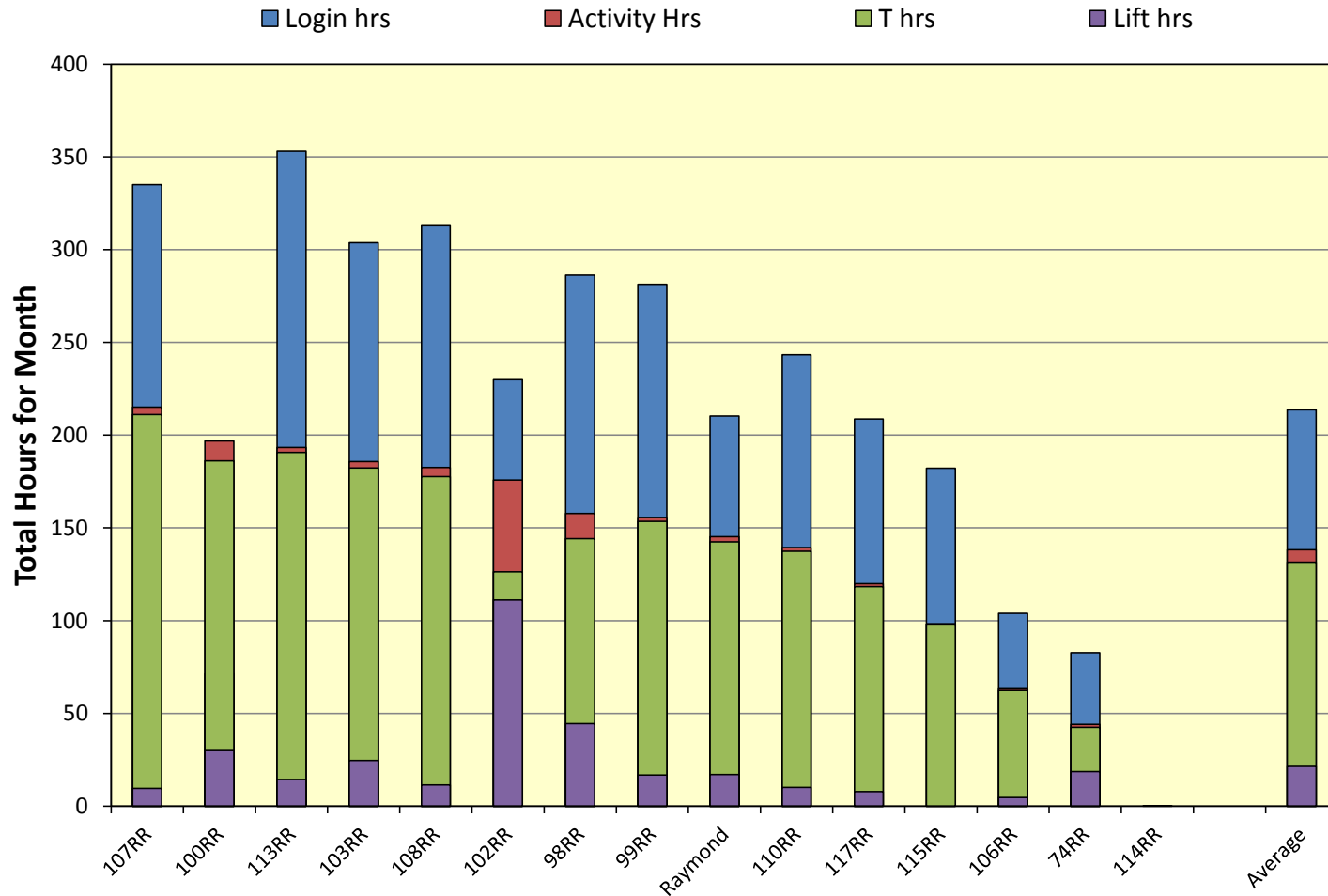
Fleet Tracking

Allows you to:

- ✓ *Redirect resources into your core business*
- ✓ *Reduce fleet size by eliminating unnecessary trucks*
- ✓ *Reduce maintenance expenditures*
- ✓ *Minimize capital investments*
- ✓ *Lower administrative costs*
- ✓ *Increase utilization and productivity*
- ✓ *Redeploy underutilized equipment*
- ✓ *Consolidate invoicing and payment transactions*
- ✓ *Manage fleet costs*

Equipment Usage Summaries

Reach Truck Usage for Month of October 2011



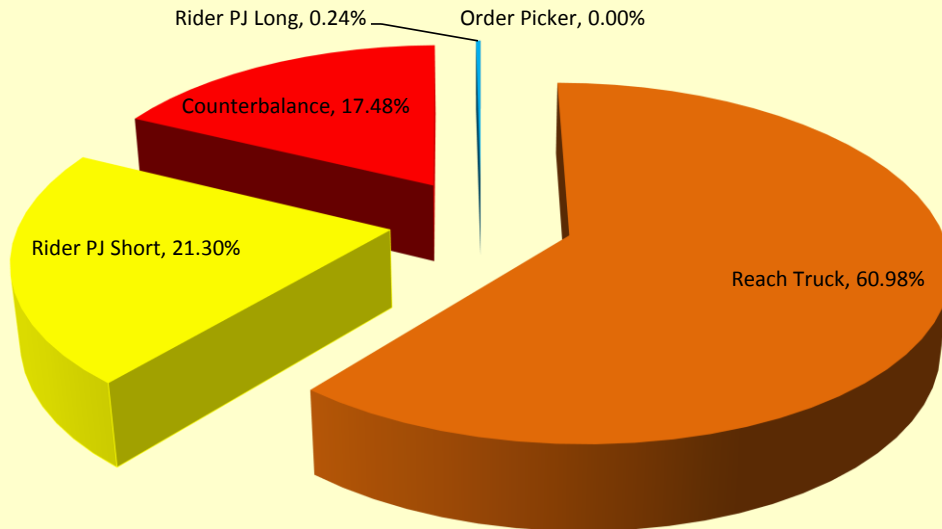
Analysis of Case Picking Vehicle Usage

Example from April: Reach trucks were utilized over 60% of the time while case picking was being performed

Vehicle Utilization for Picking:Case

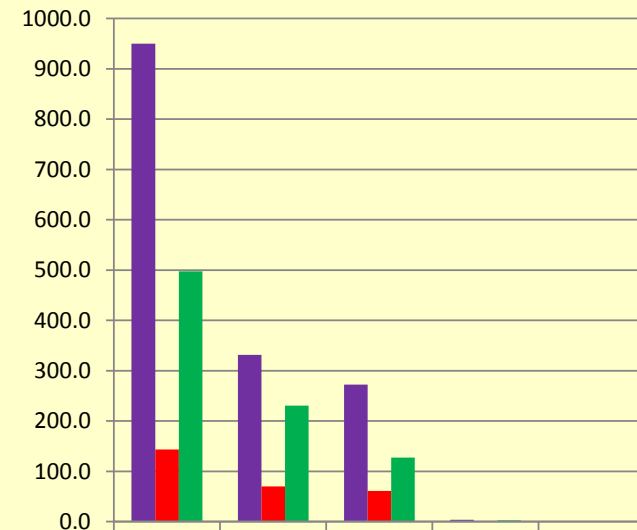
April 1 through April 26, 2012

Reach Truck Rider PJ Short Counterbalance Rider PJ Long Order Picker



Case Picking

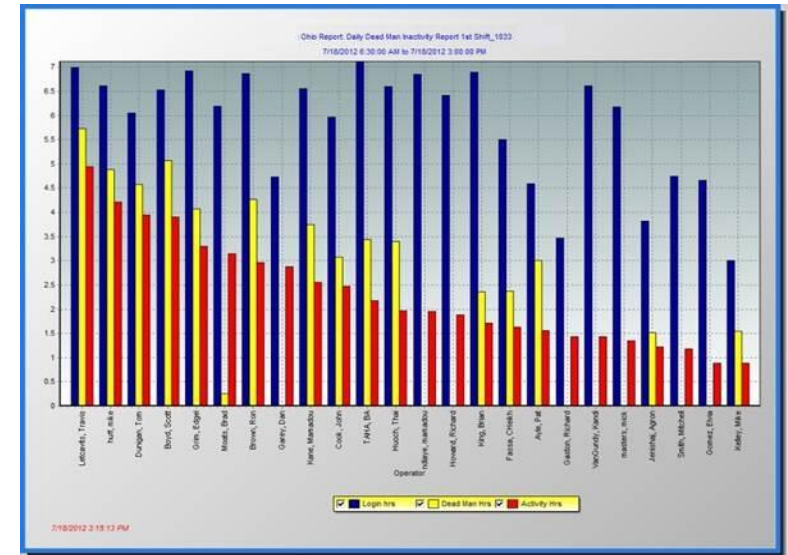
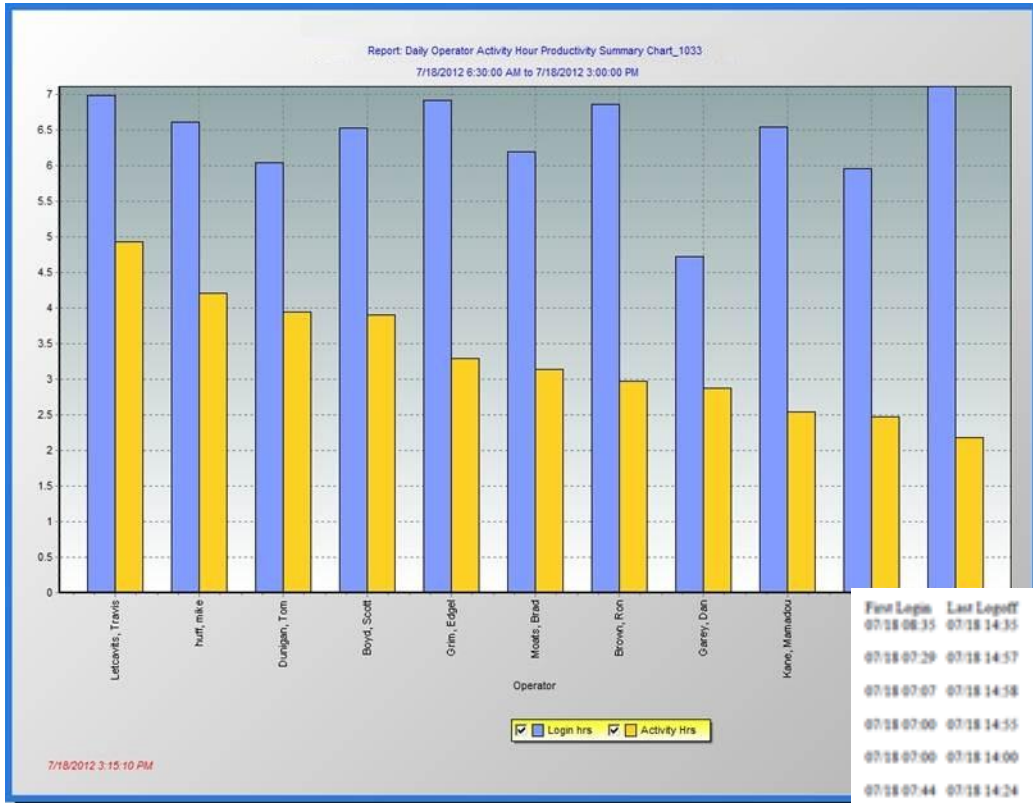
Login Hrs TWL Hours LWL Hours



	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

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/vehicle use.

Daily Reports of Driver Performance



Login	Activity	Dead Man	Travels	TWL	TRVL %	TWL %
4.590	1.556	3.007	1.431	1.402	31%	30.5%
6.529	3.903	5.073	3.850	2.082	59%	31.9%
6.861	2.968	4.269	2.928	1.759	43%	25.0%
5.959	2.469	3.076	2.435	2.064	41%	34.0%
6.047	3.950	4.576	3.891	2.591	64%	42.8%
5.506	1.632	2.368	1.598	1.051	29%	19.1%
4.723	2.871	0.000	2.871	2.233	61%	47.3%
3.469	1.434	0.000	1.434	0.584	41%	16.8%
4.662	0.882	0.000	0.882	0.852	19%	18.3%
6.917	3.292	4.072	3.269	1.438	47%	20.8%
6.434	1.874	0.000	1.874	1.782	29%	27.8%
6.696	4.213	4.884	4.114	3.312	62%	50.1%

Drivers are required to enter correct job codes to receive credit for work performed. This enables management to view the total vehicle activity by job type.

Pareto Chart – Total Vehicle Hours

Pareto Chart - Vehicle Activity, by Job Type						
March 1 - July 15, 2012						
Job Type	Login Hours	Travel with Load Hours	Lift with Load Hours	Number of Lifts	Average Vehicle Speed	Percent of Total Usage
Picking: Case	9397.6	1669.4	5369.3	10515	5.06	30.7%
Picking: Bulk (Full Pallet)	4881.6	848.0	2657.5	1039	5.37	16.0%
Gray Market: Putaway	2538.1	440.3	1406.2	10490	6.44	8.3%
Inbound: Putaway	1718.8	582.6	833.3	16767	5.63	5.6%
Picking: Replenish	1689.2	431.2	744.8	726	5.43	5.5%
Outbound: LTL	1082.7	219.9	490.8	7522	5.76	3.5%
Admin: Inventory	1043.3	257.9	573.0	13876	6.46	3.4%
Inbound: Unload	969.9	466.5	691.7	38418	5.90	3.2%
Picking: Parcel	846.9	141.6	534.3	49415	5.59	2.8%
Admin	837.8	156.4	339.1	25832	5.36	2.7%
Outbound: FTL	719.1	147.6	364.2	6205	5.45	2.3%
Gray Market: Pallet Move	663.8	138.0	302.2	1376	5.60	2.2%
VALO: Putaway	646.8	219.1	343.6	8939	5.81	2.1%
VMI: Picking	590.1	178.8	252.9	14829	5.82	1.9%
Admin: Housekeeping	586.9	138.8	364.4	3354	5.91	1.9%
VALO: Replenish	545.5	201.9	300.1	21448	5.46	1.8%
VMI: Putaway	386.0	133.2	180.3	4814	5.36	1.3%
Admin: Special Projects	343.3	97.1	212.0	552	6.49	1.1%
Outbound: DMO	325.8	80.7	177.5	67639	5.53	1.1%
Inbound: VMI	225.3	66.0	94.1	133893	5.73	0.7%
Outbound: Paperwork	132.7	38.5	52.9	13270	5.63	0.4%
Outbound: Audit	123.1	8.1	25.1	38808	6.19	0.4%
Outbound: Intl/Canada	113.9	28.1	54.8	2181	6.56	0.4%
VALO: Line Retrieval	62.4	19.6	27.6	20052	6.04	0.2%
Admin: Audit	58.0	11.1	20.1	16299	6.09	0.2%
Admin: RF Issue	45.2	8.7	24.8	15660	5.51	0.1%
Outbound: Parcel Ship	27.0	4.7	13.8	9267	5.90	0.1%
Totals	30600.6	6733.5	16450.3	553186		100%

81.7%

A total of 30,600 vehicle hours were utilized between March 1 and July 15 on the four classes of MHE at this location.

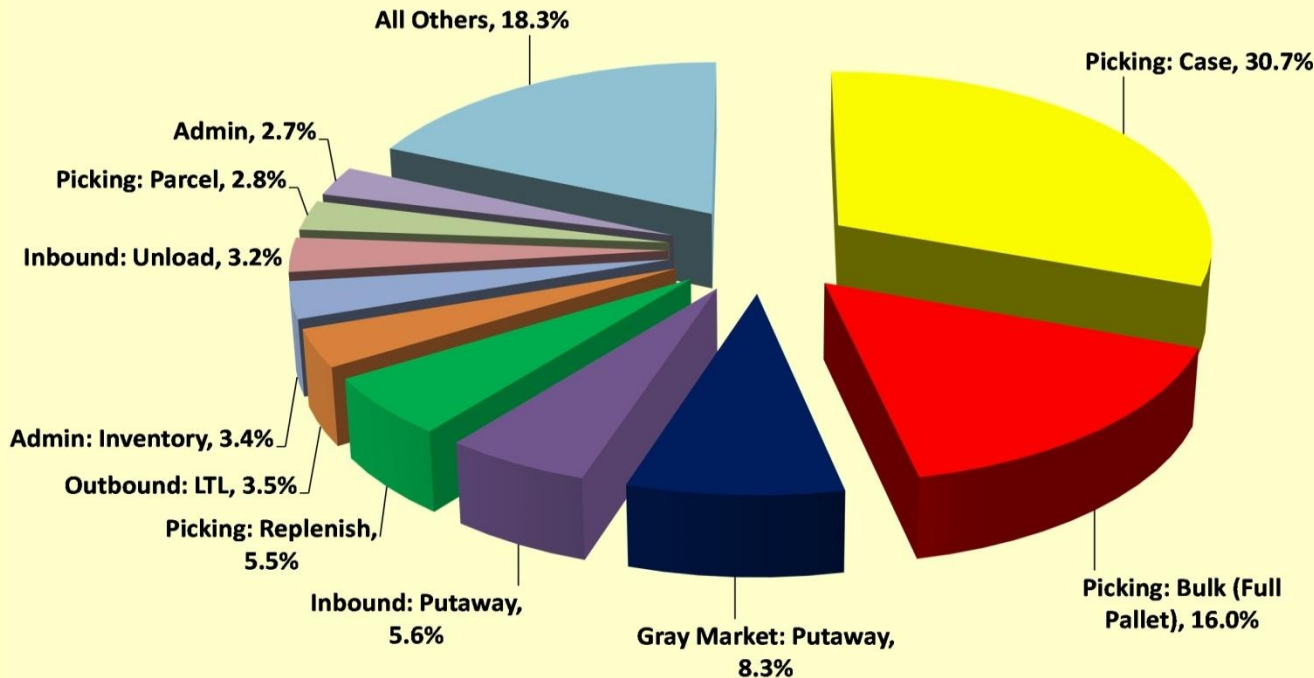
- Reach Trucks
- Counterbalance trucks
- Pallet jack riders
- Orderpickers

This chart shows the detail of usage and average vehicle speed for each job type.

Leveraging Vehicle Hour Information

Percent of Vehicle Login Time by Warehouse Task

March 1 - July 15, 2012

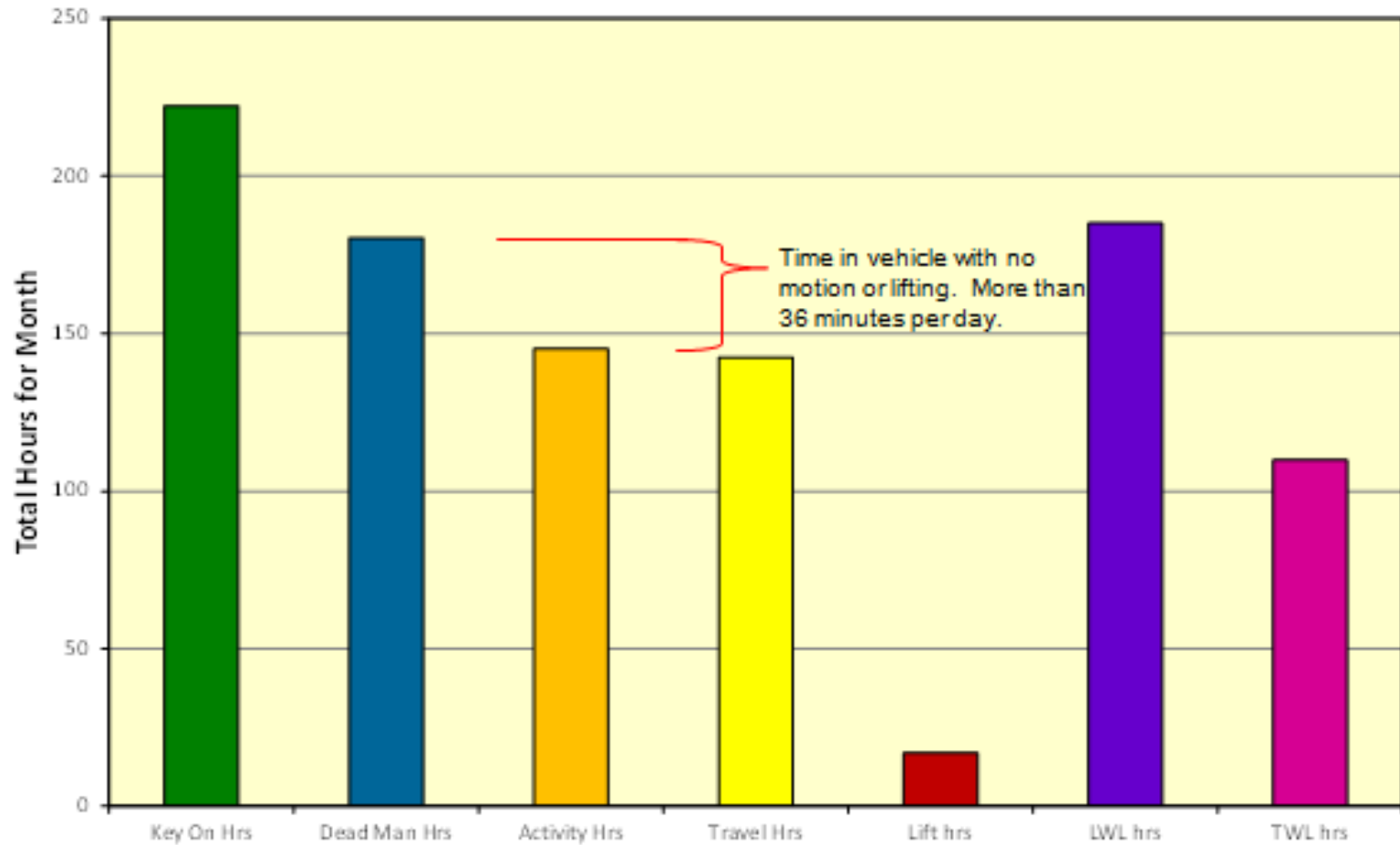


Fleet management systems track actual vehicle speed and distance traveled as each task performs.

Leveraging this information provides more accurate task costs by vehicle type, in order to *maximize the use of the right equipment for the right job*.

As an example, we can use this information in order to determine a better mix of equipment for case picking, which accounts for almost 31% of all vehicle usage.

Daily Unproductive Time/Operation

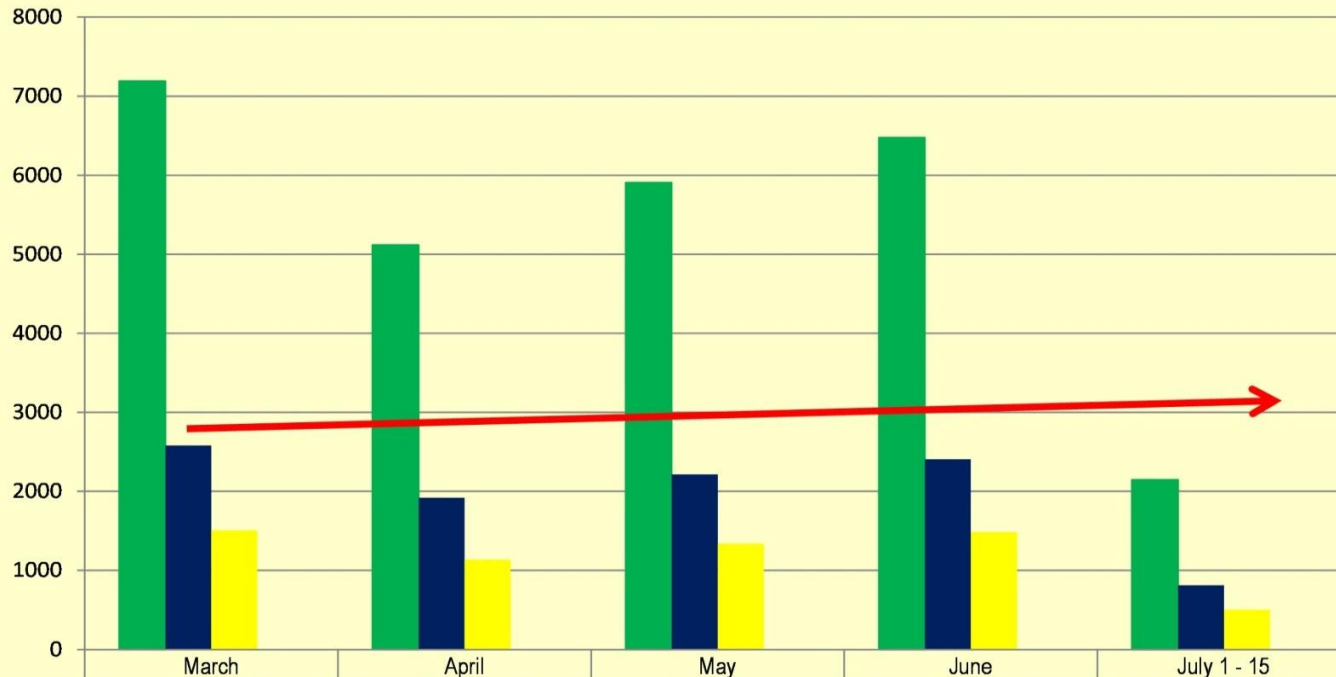


Management View of Utilization

Improvement in Travel with Load (TWL) Vehicle Utilization

March 1 - July 15, 2012 - All vehicles except Order Pickers

■ Login Hours ■ Motion Hours ■ TWL Hours



	March	April	May	June	July 1 - 15
Login Hours	7191.42	5116.67	5906.02	6475.57	2147.76
Motion Hours	2582.32	1917.33	2215.09	2404.82	813.22
TWL Hours	1505.25	1135.02	1340.66	1483.88	501.91
TWL as a % of Motion Time	58.3%	59.2%	60.5%	61.7%	61.7%

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.

There has been a

5.9%

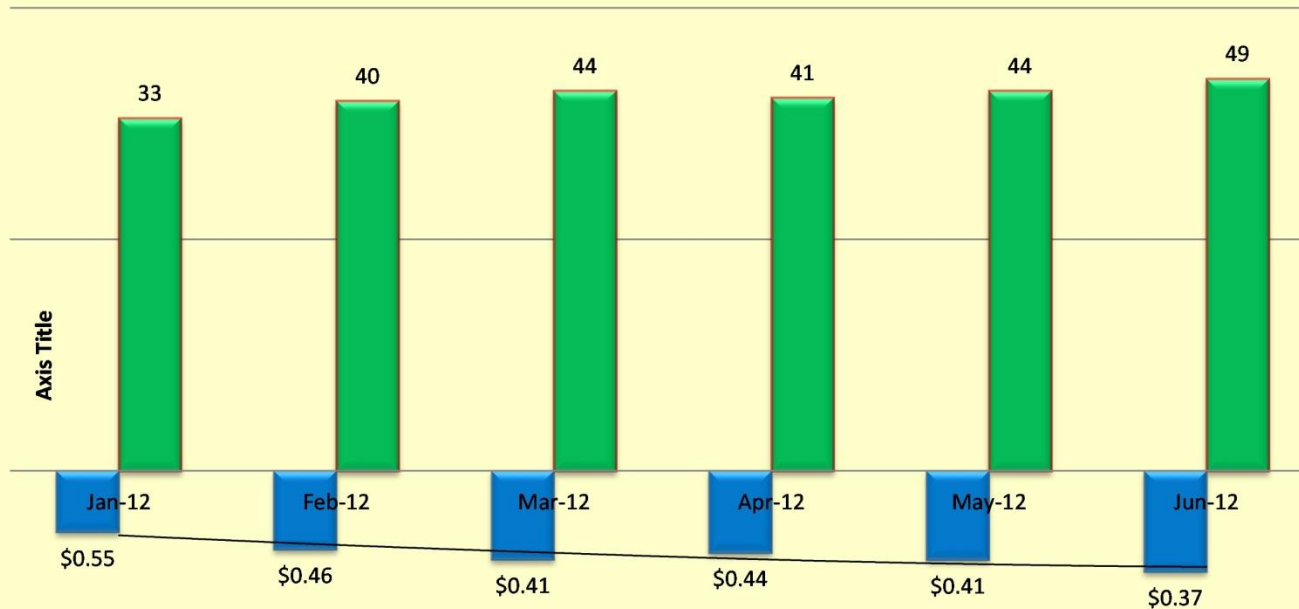
increase (from 58.3% to 61.7%) in TWL since a warehouse optimization system was implemented.

Management View of Cost/Unit

Improvement in Units/Hour and Cost/Unit

January 2012 through June 30, 2012 - iWarehouse went "live" January 9, 2012

■ Cost/Unit Outbound ■ Units/hour



In 2012, the warehouse optimization system has already contributed to a 33% reduction in cost per case.

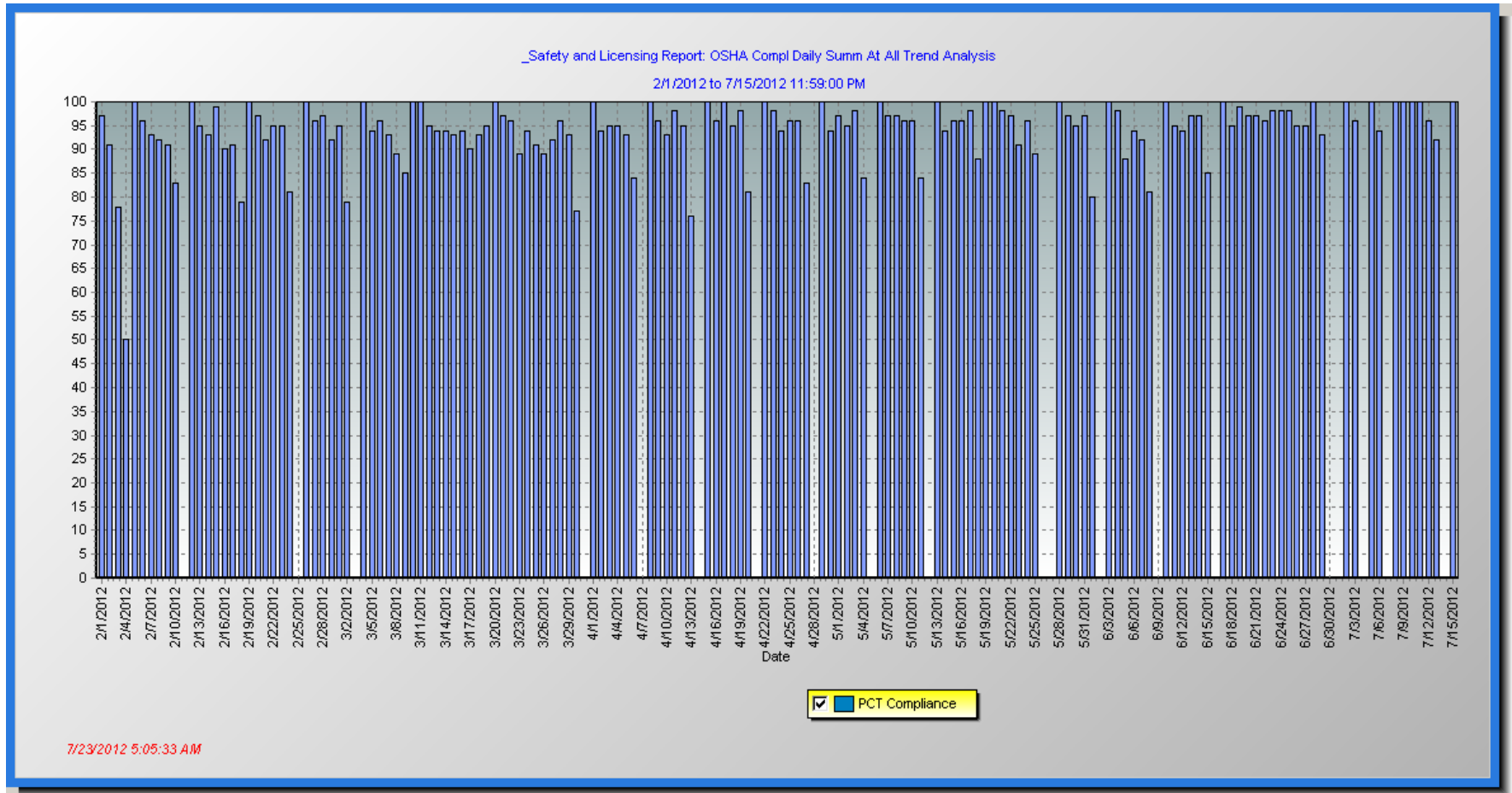
	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12
■ Cost/Unit Outbound	\$0.55	\$0.46	\$0.41	\$0.44	\$0.41	\$0.37
■ Units/hour	33	40	44	41	44	49

Compliance and Operator Inspection Checklists

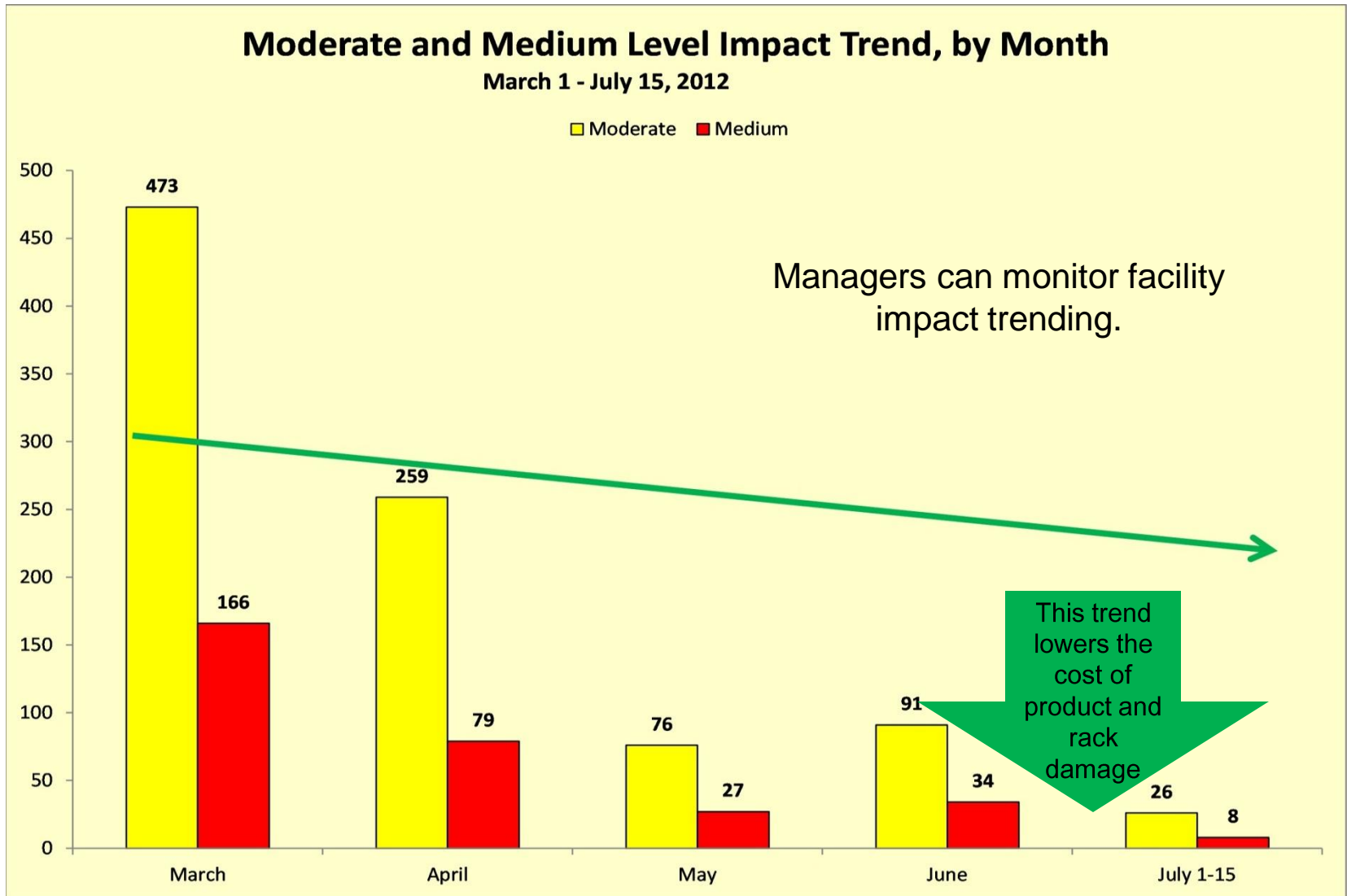
- Only authorized operators with up-to-date certifications (licensing) are allowed to operate equipment.
- Pre-use inspection compliance is enforced with readily available online reporting when needed.
- Lockout/tagout is automated when a critical issue is identified on a vehicle.
- Maintenance personnel are automatically notified of all issues identified on a vehicle.
- Traceability is captured for any lockout/tagout events with respect to who identified an issue and who released the vehicle back into service.

OSHA Compliance is Automated

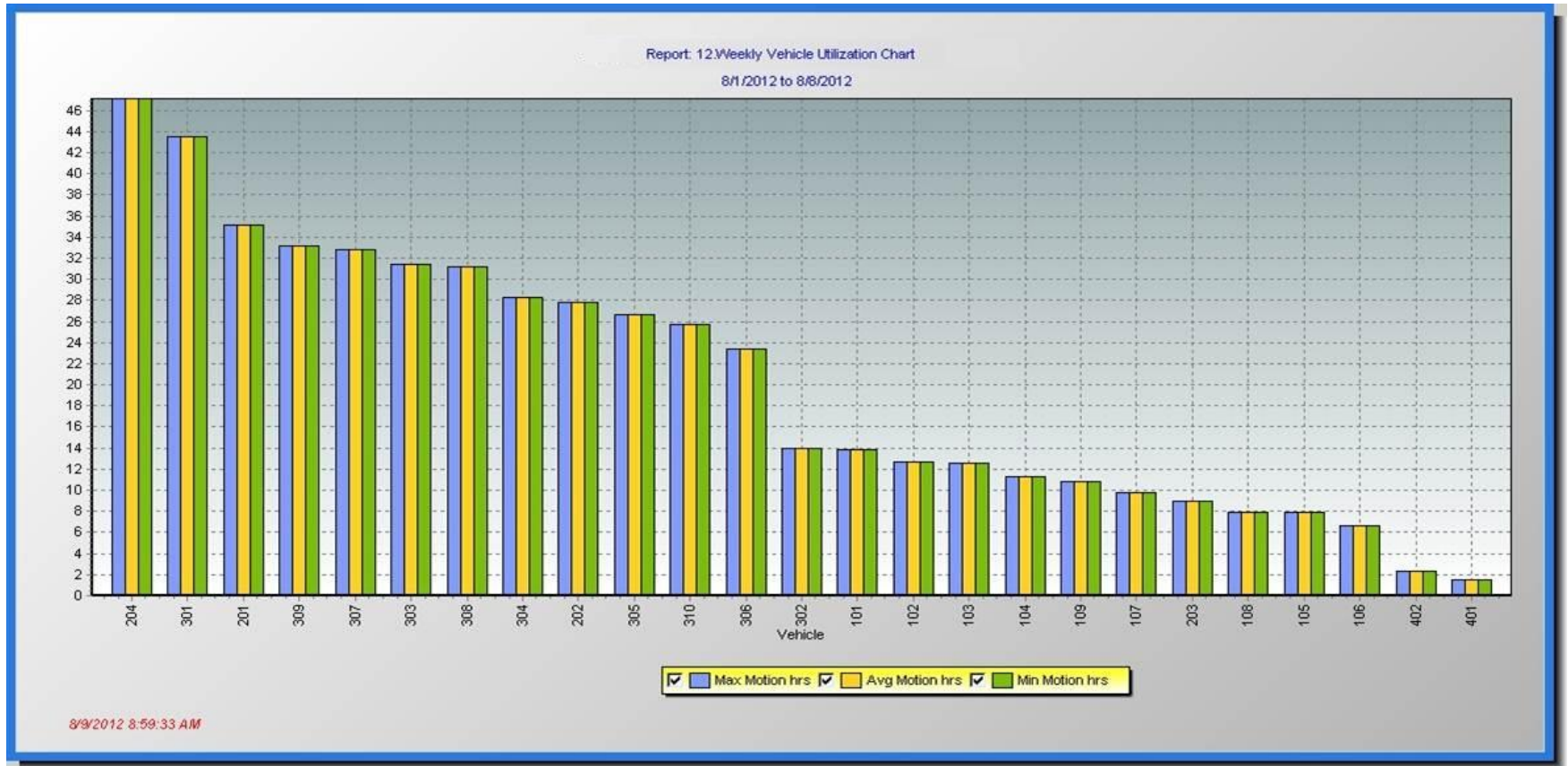
All OSHA paperwork is now 100% automated. Manager's auditing is enhanced, ensuring better compliance with facility protocols.



Result of impact tracking is an 80% reduction in impacts.



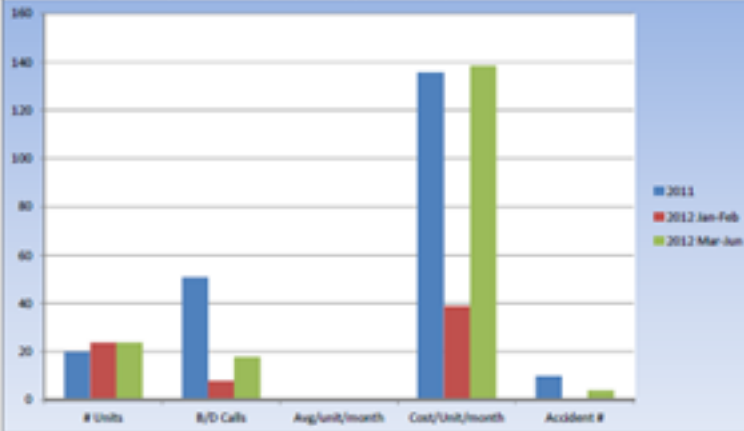
Wireless Capture of Vehicle Usage



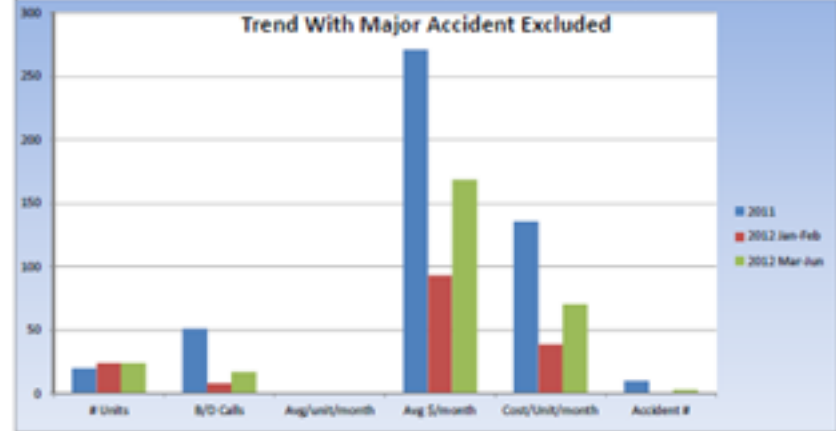
Automatically capturing and reporting actual vehicle usage enables the managers to transition to usage-based scheduled maintenance, as opposed to calendar-based, thereby significantly reducing the actual number of maintenance events required and reducing overall facility maintenance costs.

Maintenance Cost Trending

Period	# Units	B/D Calls	Avg/unit/mo	Total Cost	Avg \$/month	Cost/Unit/month	Accident #
2011	20	51	0.213	\$ 92,579.00	\$ 2,714.92	\$ 135.75	10
2012 Jan-Feb	24	8	0.167	\$ 3,864.00	\$ 932.00	\$ 38.83	0
2012 Mar-Jun	24	18	0.188	\$ 13,299.00	\$ 3,324.75	\$ 138.53	4



Period	# Units	B/D Calls	Avg/unit/month	Total Cost	Avg \$/month	Avg \$/month	Cost/Unit/month	Accident #
2011	20	51	0.213	\$ 92,579.00	\$ 2,714.92	\$ 271.49	\$ 135.75	10
2012 Jan-Feb	24	8	0.167	\$ 3,864.00	\$ 932.00	\$ 93.20	\$ 38.83	0
2012 Mar-Jun	24	17	0.177	\$ 6,749.00	\$ 1,687.25	\$ 168.73	\$ 70.30	3



Comments and Recommendations

- 1) Overall cost trend up over previous year with all Out Of Contract cost considered
- 2) One Accident/Damage occurrence represents 43% of overall cost for 2012. With this incident excluded all trends are down
- 3) Breakdown Average trend down over previous year: Review root-cause of Break-downs between Scheduled Maintenances
- 4) Wheel/Tire cost represents 23% of 2012 cost which is slightly up from 17% in 2011
 - a. reviewing wheel compounds to determine how to reduce cost
 - b. Steer tire on 4250 and Load wheels on the Reach truck

Economic and Ecological Benefits Through Design

- Eco-Performance is a philosophy in design solutions for maximum economic and ecological benefits.
- Eco-Performance allows customers to reduce downtime, energy costs and CO₂ emissions while increasing pallet moves.

Product	Percentage run-time longer per charge	Productivity improvement
Reach	21%	9%
Pallet Trucks	33%	6%
Stand-up Counterbalanced	17%	9%

**The Comparative Data Report by the United States Auto Club Properties Inc. (USAC) test results are based on a 2011 study*

Measuring Lift Truck Efficiencies

ENERGY EFFICIENCY

21.3% INCREASED EFFICIENCY
\$26,042 SAVED

COMPETITOR		RAYMOND		RAYMOND ECO-PERFORMANCE ADVANTAGE	
Batteries Charged / Year	14,800	Batteries Charged / Year	11,412	Fewer Battery Charges	3,388
Battery Charge Labor \$	\$27,300	Battery Charge Labor \$	\$88,460	Less Labor \$ to Charge Batteries	\$18,021
kWh Used Annually	440,800	kWh Used Annually	348,910	Lower Annual kWh Usage	\$3,990
Energy Cost	\$28,384	Energy Cost	\$27,780	Reduced Energy Cost	\$1,611

PRODUCTIVITY

8.5% INCREASED PRODUCTIVITY

COMPETITOR		RAYMOND		RAYMOND ECO-PERFORMANCE ADVANTAGE	
Pallets Moved per Day	7,342	Pallets Moved per Day	8,101	More Pallets Moved per Day	841
Pallets Moved per Year	1,893,000	Pallets Moved per Year	2,545,228	Pallets Moved per Year	180,228

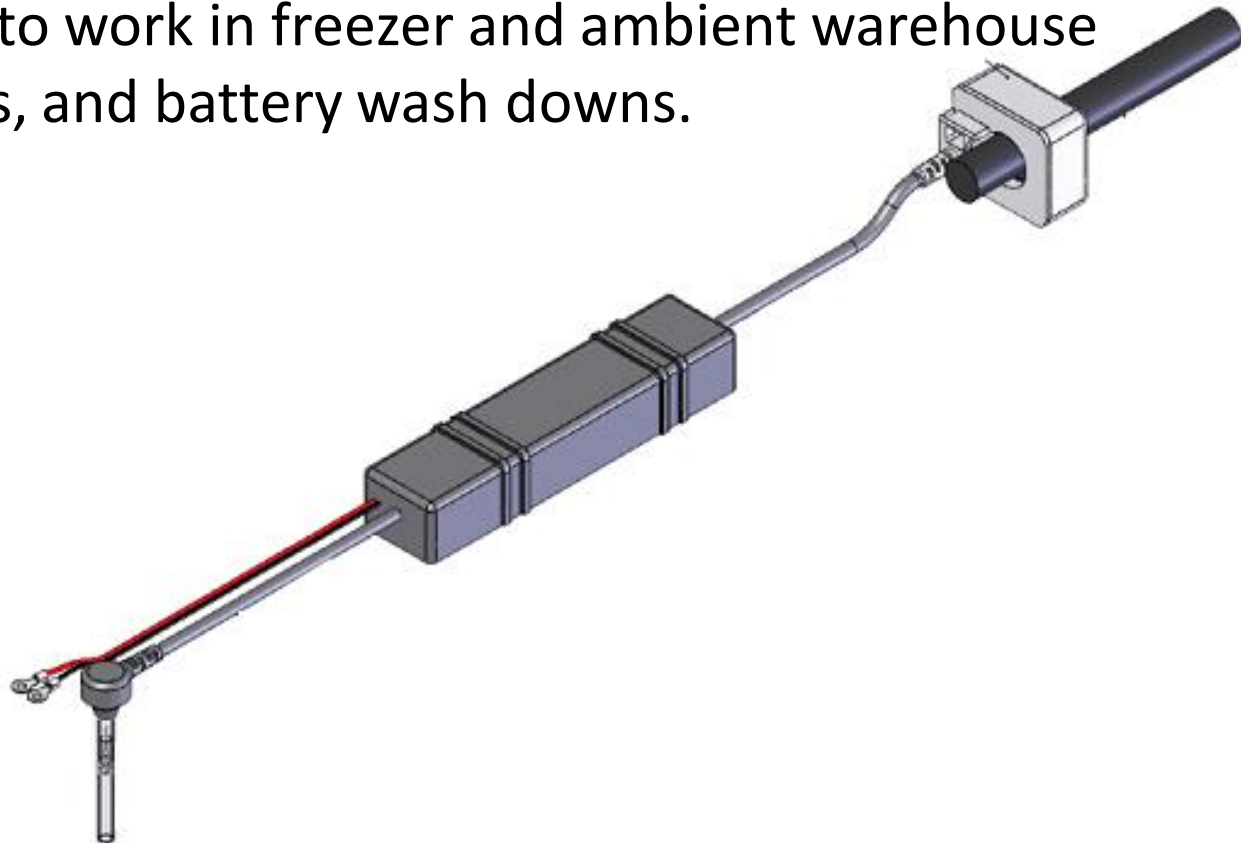
LABOR SAVINGS

8.5% SAVED
\$144,202 SAVED

COMPETITOR		RAYMOND		RAYMOND ECO-PERFORMANCE ADVANTAGE	
Labor Hours / Year to move 1,893,000 pallets	34,200	Labor Hours / Year to move the same number of pallets	35,228	Fewer Hours Saved	6,911
Labor \$ / Day to move 7,342 pallets	\$8,798	Labor \$ / Day to move the same number of pallets	\$8,328	Lower Cost per Day for Standard Work	\$871
Labor \$ / Year to move 1,893,000 pallets	\$1,898,300	Labor \$ / year to move the same number of pallets	\$1,832,300	Annual Labor \$ Savings	\$144,202

Battery Monitoring Systems Overview

- Field-installed option available on 24-, 36- and 48-volt vehicles.
- UL E and EE rating.
- Designed to work in freezer and ambient warehouse conditions, and battery wash downs.



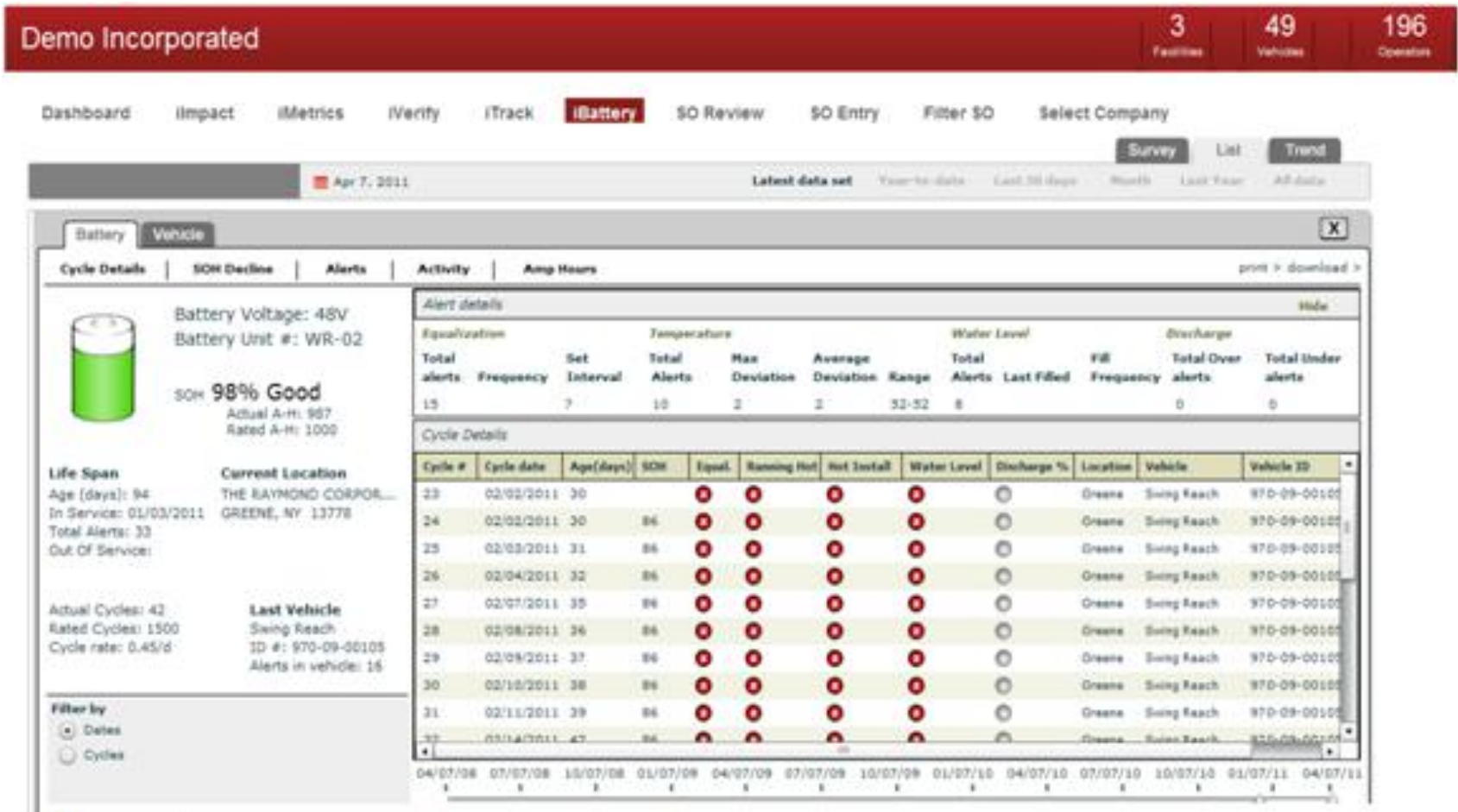
Information Obtained with Battery Monitoring Systems

- Transmit real-time truck/battery information.
 - Battery identification
 - Battery state of charge (BSOC)
 - Ampere-hours consumed by the truck
 - Ampere-hours returned to the battery from regenerative processes
 - Cell temperature (option)
 - Cell water status (option)
- Ampere-hours obtained during the last charge.
- Automated email service alerts to your maintenance staff or a local service provider.
- Captured information is viewable on any computer through a secure portal.

Dashboard Examples



Dashboard Examples



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

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