Fleet Management 101

An Introduction to Key Principles, Concepts, Strategies, and Techniques — Part 2

Indianapolis, IN
March 14, 2017

MERCURY

On the Agenda

Break	10:30 – 10:45
Organizational and Process Improvement	10:45 – 11:00
Preventive Maintenance	11:00 – 11:30
PM Training	11:30 – 12:00
Lunch	12:00 – 1:00
Maintenance and Repair	1:00 – 1:40
Performance Measurement	1:40 – 2:45
Break	2:45 – 3:00

On the Agenda

Break	2:45 – 3:00
Managing Fleet Replacement	3:00 – 3:30
Fleet Data Sources and Processing Tools	3:40 – 3:50
Strategies for Reducing Fleet Costs	3:50 – 4:00
Key Trends in Fleet Management	TBD
Adjournment	4:00

Maintenance and Repair

Key Elements of a Comprehensive Fleet Maintenance and Repair Program

		Justification
1	**Core values and culture**	• Alignment to the organization's core values, vision, mission, goals and objectives are critical to success
2	**Policies and procedures**	• Documented policy and procedure alignment with detailed work instructions standardize processes enhance quality, reduce waste and maximize efficiencies
3	**Employee engagement**	• Effective on-boarding, Individual development planning, personal performance objectives, feedback surveys, and cross-functional team involvement increase commitment • Driver interaction is fundamental to successful maintenance operations and customer satisfaction
4	**Workplace organization**	• Clean and organized shops promote greater employee morale, safety and labor efficiencies
5	**Parts/supply management**	• Effective parts management, orderly parts rooms and kits tied to shop planning & scheduling maximize productivity

MERCURY

Key Elements of a Comprehensive Fleet Maintenance and Repair Program

6 Cost charge-back system

7 Planning and scheduling

8 PM, PdM & Maint. Focus

9 Repair quality control

10 FMIS

Justification

- A charge-back model promotes cost recognition for consumption of services and aids fiscal accountability

- Standardized planning and scheduling maximizes shop capacity reducing outsourcing and downtime

- Preventive, predictive maintenance, warranty and recall program compliance enhances fleet quality, safety, reliability and availability

- "Inspect what you expect" – Quality is the result of consistent supervisor QCIs, coaching and training

- The capture of accurate data is the lifeblood of great fleet management enabling proactive PM, PdM, work order and backlog repair management

- Key performance indicators, metrics and dashboards are the fuel that drive benchmarks toward continuous improvement

THE WORK TRUCK SHOW® · NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Effective Fleet Maintenance and Repair Starts with Alignment to Your Organization's "Core Values"

- Vision, mission, and goals
- Employees first
- Safety focus
- Accountability
- Ethical, honesty, trust
- Customer service excellence
- Accountability

Example: Program Core Values and "Non-negotiables"

Core Values

Guiding maintenance principles employed to drive the behavior and decision-making process to shape you're organization's image…

Non-negotiables

An understanding of operational commitments derived from the core standards that won't be compromised…

Example: Non-negotiables

1. 100% "on-time" PM

2. Repair completion within "X" working days

3. Quality repairs that meet OEM standards

4. 100% DVIR compliance

5. WO data entered by next business day

6. No costs variance between FMIS and Financial systems

Detailed Work Instructions Drive Standardization, Reduce Costs, and Mitigate Liability

Why?

- Standards enforcement

- Establish step-by-step task instructions

- Facilitate technician training

- Enforce quality and safety

- Enable technician performance and work accountability

- Mitigate potential liability

Employee Engagement is a Full-Time Activity from Hire to Termination

- Structured interview guides

- Formal on-boarding processes

- Commitment to training

- Individual development plans

- Personal performance objectives aligned with Org goals

- Formal evaluation process

- Talent review process

- Employee feedback surveys and engagement ratings

A Robust Maintenance and Repair Program Requires Driver Involvement

- Driver safety is critical

- Drivers are org's "eye & ears"

- Driver (i.e., Customer) satisfaction is paramount to success

- Daily driver vehicle operation feedback is essential (and often required by law)

- Drivers perform key daily tasks

DRIVER'S VEHICLE INSPECTION REPORT

Driver Inspection

Driver Inspection Reporting Process

- Sec. 396.11 Driver vehicle inspection report

  (a) Report required. Every motor carrier shall require its drivers to report, and every driver shall prepare a report in writing at the start and completion of each day's work on each vehicle operated and the report shall cover at least the following parts and accessories:

  - Service brakes
  - Trailer brake connections
  - Parking brake
  - Steering mechanisms
  - Lighting devices and reflectors
  - Tires
  - Horn

  - Windshield wipers
  - Rear vision mirrors
  - Coupling devices
  - Wheels and rims
  - Emergency equipment

THE WORK TRUCK SHOW
NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Formalized Pre/Post-trip Inspection (DVIR) Training Strengthens Driver Involvement and M&R Processes

Sample Process

1. Initiate training program to formally walk drivers through the pre/post-trip inspection, the regulatory requirements and checklist review ensuring all steps are completed in sequence

2. Assign person to review driver post-trip inspections daily to ensure drivers are capturing defects

3. Analyze DVIRs – including both the input fields and quality of description on mechanical issues noted – to determine compliance

4. Regularly coach drivers to ensure follow-through

5. Implement a daily review process between Ops and Fleet for repair scheduling, repeat trends and RCPS process with extended team

THE WORK TRUCK SHOW. NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Workplace Organization Using Lean Management Principles Like "5S" Boosts Safety and Productivity

1. Sort
- Less is more - only what is needed is present, and distracting clutter is eliminated
- A streamlined workplace sets a standard for quality work

2. Set in Order
- Organized workplace increases productivity by not searching for misplaced items
- Removes obsolete and unused items from the shop floor to reduce clutter

3. Shine
- A clean environment reduces stress and when something needs to be used, it's readily available and always in good working order

4. Standardize
- Visual management procedures help make 5S elements a part of normal routine

5. Sustain
- Easy to keep the shop tidy going forward
- A place for everything and everything in its place

Before

After

Parts Management is a Critical Component of an Effective In-House Fleet M&R Program

Why?

- Increases productivity

- Enhances safety

- Reduces downtime, waste, and inventory dollar$

How?

- 5S the parts room

- Organize parts loc/bins by VMRS code

- JIT policy & formal supplier contracts

- PM parts kits

- Routine obsolescence reviews

BEFORE

AFTER

Employing a Cost Charge-back System Improves Operator Engagement and Accountability

- Improves customer care and cost recognition

- Allows zero-based budgeting

- Has a positive impact on user operating behavior

- Users motivated to reduce operator misuse/abuse

- Increases involvement in the maintenance repair process

Proactive Scheduling Allows you to Manage Assets Versus Assets Managing You!

- SRT use maximizes productivity

- Monitor direct & indirect labor

- Consider using a COTS for SRTs

- Use SRTs for resource allocation

- Ensure SRTs are assigned to all repairs to set expectations and hold techs accountable

- Assign shop scheduling duties for clear accountability

- Use calendar tools to show "live" job status updates w/SRT compliance

- Utilize overhead LED monitor to increase visibility in shop

Standard Repair Times guide

Quality Control is Essential for the Credibility of a Good Fleet M&R Program

- Inspect what you expect!

- Frontline supervision performing QCIs is essential

- Timely employee feedback promotes understanding

- Robust external supplier QC processes should be detailed in SLA and monitored for compliance

- QCIs should be measured, shared and reviewed

QCIs Should be Measured for Compliance to Promote Continuous Improvement

How?

- Randomly select 5-10 items on PM checklist

- Perform QCI with Tech present to lead, teach, and coach

- Determine how many items are inspected properly

- Tabulate results and share with the Tech

- File and track results compliance (e.g., 4 of 5 = 90%)

Goal = 100%

1. 2. Check engine oil
2. 11. Test interior lights and switches
3. 15. Test operation of all horns
4. 22. Check Steering play
5. 28. Operate and cycle hydraulic systems

Focus On Warranty and Recall Management Reduces Cost and Increases Reliability

- Warranty claims can equal ~8-10% of original acquisition cost

- Shops must leverage warranty and recall compliance to mitigate costs and liability

- Vehicle complexity is impacting costs and reliability, making warranty and recall compliance more critical (e.g., 2015 was a record year for recalls)

- Centralized warranty team can pay for itself in total dollars recovered. (warranty dollars are yours to claim)

- Warranty and recall management is the "right thing to do" and can have downstream impacts upon disposal

THE WORK TRUCK SHOW. | NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Cross-Functional Team Focus Involves Key Stakeholders in Solutions to Improve Operations

Goals/Objectives

- Increase team accountability – reduce finger-pointing
- Hold daily cross-functional team meetings enable RCPS and facilitate identification of ongoing issues
- Regular cross-functional meetings foster a collaborative team environment
- Team holds quick shift meeting at a
- Meetings led by Fleet Manager and the team discusses PM compliance, down trucks, road calls, door traffic, misuse/abuse and other pertinent information
- Problem-solving takes place and employee follow-up is carried out to prevent future problems

Review previous day's issues (e.g., Door traffic/Road Calls) to RCPS

Cross-functional team involvement promotes accountability as key stakeholders become part of the maintenance and repair management process.

A Good FMIS is the Single Most Important Tool in a Fleet M&R Program

- Must ensure data accuracy -"garbage in = garbage out"

- All shop staff must understand importance of accurately recording transactions in the FMIS

- Data serves to:

  o Document repair and serve activities (WO, PM, Fuel, Etc.)

  o Create customer billing/cost allocation

  o Shop and replacement scheduling

  o Plan staffing levels and resource availability

  o Capture trends and benchmark results for continuous improvement

  o Data allows you to measure what you manage

All Successful Fleet Management Organizations Must Keep Score To Win!

- Define metrics

- Set goals and objectives

- Review progress and trends

- Identify issues and improve process and performance

Common Maintenance and PM Metrics:
- On-time compliance %
- Early completion %
- Late (Past due) %
- Asset reliability %
- Asset availability %
- Shop Scheduling %
- Downtime %
- # Door traffic
- # Road calls
- QCI given/pass %
- # Backlog repairs

Preventative Maintenance			
KBI	Act		Goal
Early	3.3%		15.0%
Late	9.9%		0.0%
Compliant	86.9%		85.0%

PM Compliance is Critical for Cost Control
On-time PMs Reduce Unnecessary Costs and Downtime

Compliant PM

What does this mean?
Improved asset reliability, fewer costs and unscheduled breakdowns!

YOY ~12% improvement in PM Compliance!

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	80.8%	83.7%	86.7%	87.6%	87.6%	88.6%	88.9%	89.9%	91.1%	91.8%		
Goal	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%	85.0%
2011	77.5%	78.1%	79.2%	80.7%	81.4%	80.1%	80.2%	79.9%	80.3%	80.1%	77.9%	79.5%
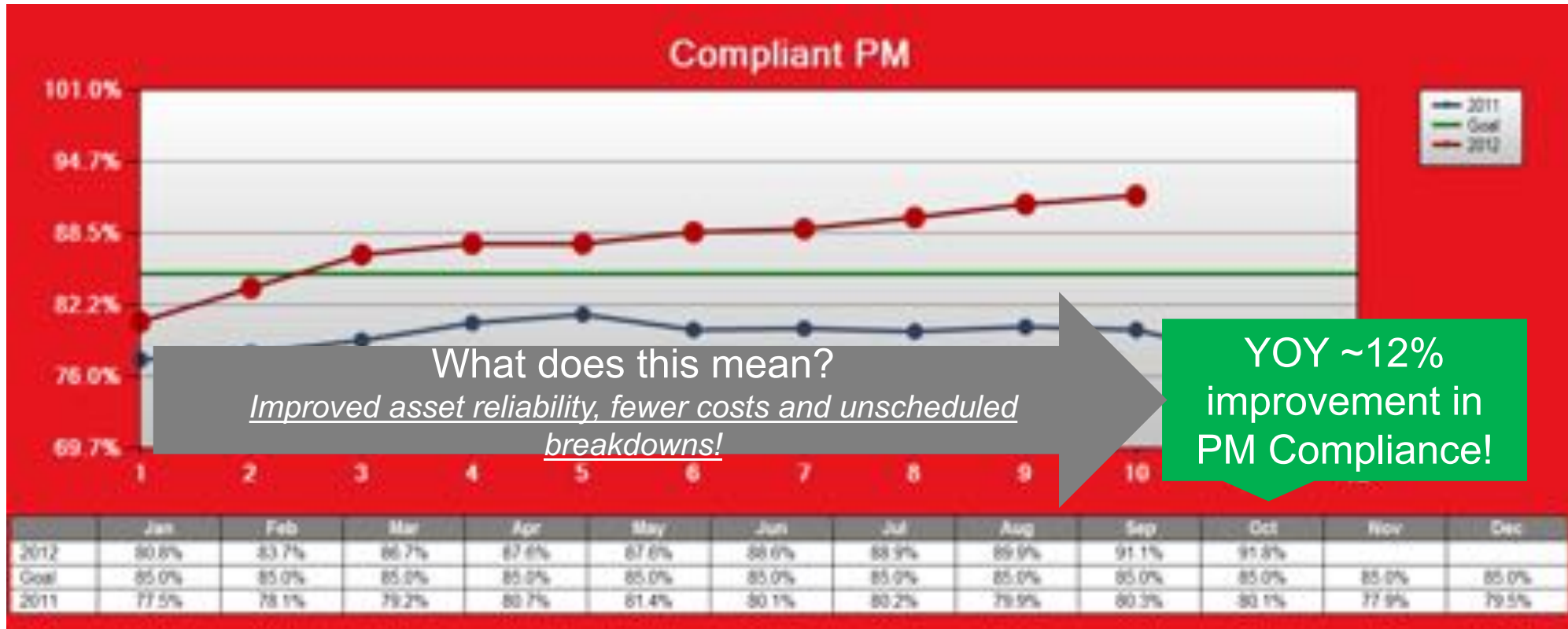
Goal = > 95%

Summary

- Organizational alignment and best practices produce quality results

- A good maintenance and repair program is no accident

- People matter and should be considered as your most important resource

- Successful maintenance and repair programs are proactive and not reactive

- A robust PM/PdM program should be the primary focus

- Measuring what you manage leads to continuous improvement

- Process flow and FMIS data capture are critical to success

Performance Measurement Through Metric Development and Benchmarking

Communication & Collaboration

- Utilize Steering Teams to Drive Initiatives

- Focus on People, Process and Technology

- Foster Collaboration & Engagement e2e

- Link Goals/Objectives throughout the Organization (Use Mnemonics)

  - ✓ Unify Goals for Success

  - ✓ Drive Standards Development

  - ✓ Improve Employee Capability

  - ✓ Review, Return and Report Metrics

  - ✓ Drive "Root Cause" Analysis

  - ✓ Develop Corrective Action Plans

Fleet Steering Team

Business Team

People Team

Process Team

Technology Team

Area Maintenance Councils
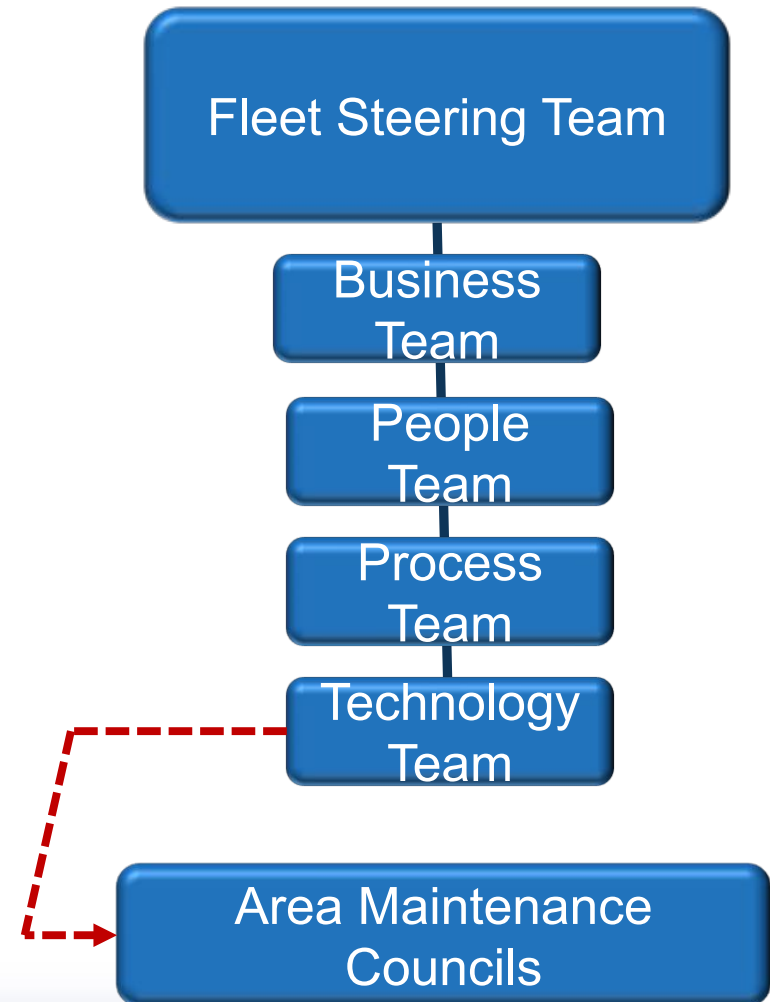
Organizational Focus on "What's Important"

...*"Focus on the critical few versus the trivial many!"*
---Jack Welsh, GE

THE WORK TRUCK SHOW® | NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY
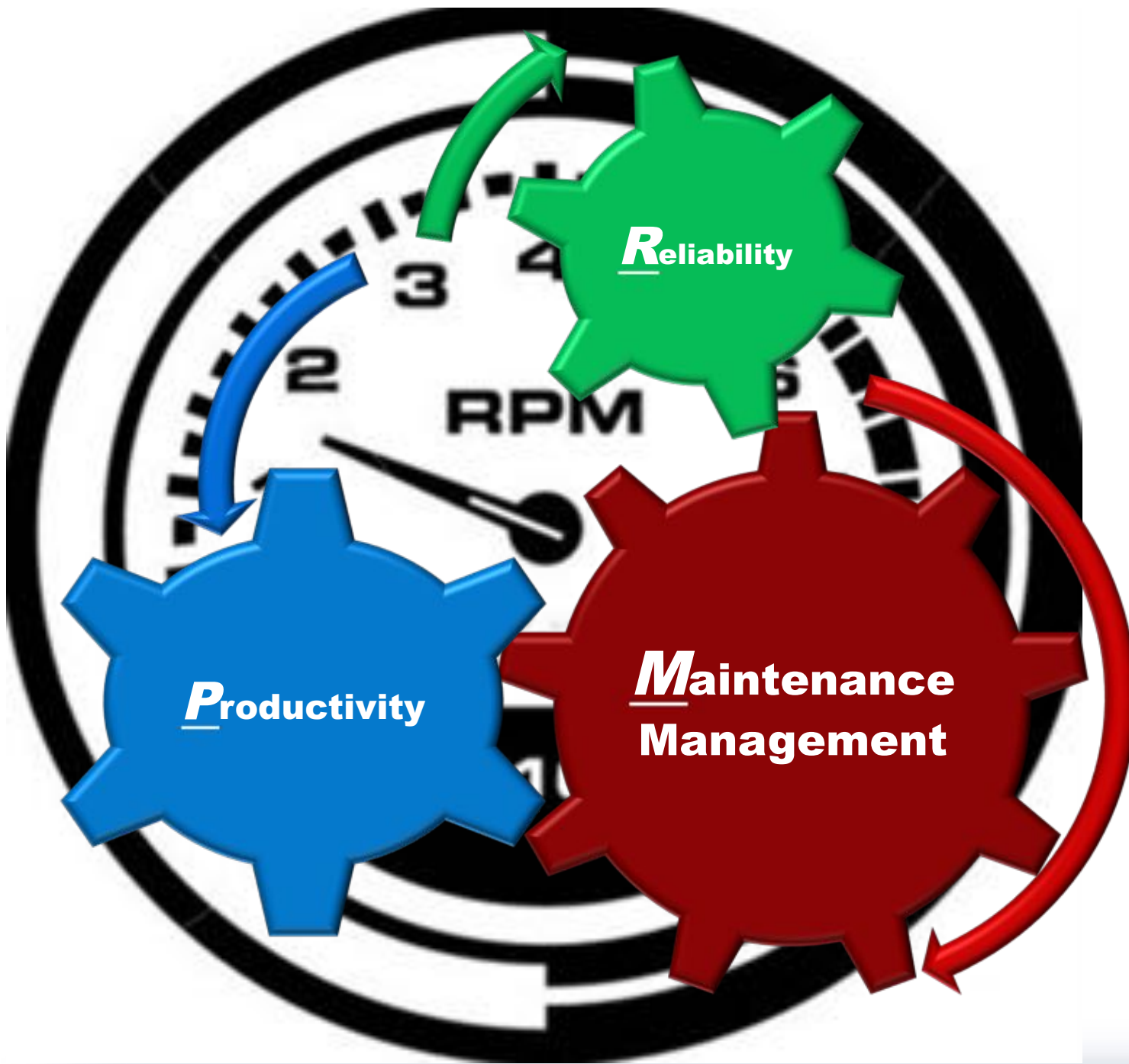
RPM Objectives:

Genius of And
Zero Defects

- **Standard**
- **Metrics**
- **And**
- **Reliable data**
- **Tracking**

Equal improved asset **R**eliability -enhanced Technician **P**roductivity measures *And* improved **M**aintenance management standards resulting in *Zero Defects And* improved customer service!

Focus on the Critical Few Metrics That Drive Your Organization Versus the Trivial Many

Continuous Improvement

R RELIABILITY	Rank	Region	Days Between	**P** PRODUCTIVITY	Rank	Region	Cost	**M** MAINTENANCE	Rank	Region	PM Currency
	1	Region A	83.1		1	Region A	$0.093		1	Region A	93.60%
	2	Region B	80.1		2	Region B	$0.105		2	Region B	92.40%
	3	Region C	73.6		3	Region C	$0.112		3	Region C	90.50%
	4	Region D	66.9		4	Region D	$0.118		4	Region D	88.70%
	5	Region E	61.9		5	Region E	$0.126		5	Region E	84.50%
	6	Region F	55.3		6	Region F	$0.126		6	Region F	84.10%
	7	Region G	54.2		7	Region G	$0.164		7	Region G	83.80%
	8	Region H	42.8		8	Region H	$0.191		8	Region H	82.60%
		Company	**64.7**			Company	**$0.13**			Company	**87.40%**

Asset Utilization - Hours/Day

Jan 5.70, 6.77, 7.25, 7.33, 7.59, 7.77, 7.19, 7.67 (Aug)
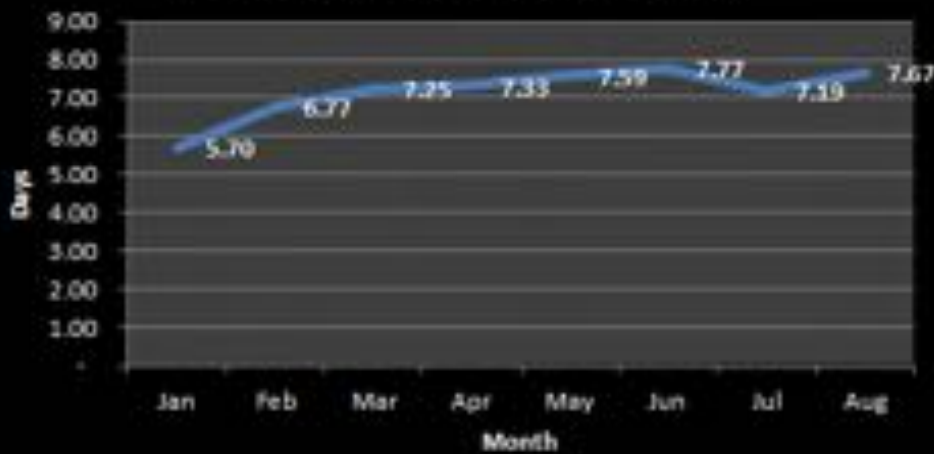
Days Between Service Interuptions

Jan 45.0, 49.7, 51.0, 56.3, 61.0, 71.1, 80.3, 75.3 (Aug)

THE WORK TRUCK SHOW. NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Determining the Critical Few (Fleet)

Where is the money and where should you focus your time and energy?

- Depreciation is most likely the single largest fleet cost.

  o Too many assets, too many spares.

- Fuel is generally the 2nd largest fleet cost.

  o Right type of fuel

- People (productivity) is always among the top fleet costs.

  o Technician productivity – Wrench time, SRTs

- Maintenance, repair costs and parts is among the top fleet costs

  o Tires, Brakes, Electrical

Mnemonics Example 1: R.A.C.E. to Success!

Metric Dashboard

Fleet Health

Metrics (Core 4)

R	*Reliability*	• **Door Traffic (DT)** • **Road Calls (RC)**
A	*Availability*	• **Downtime (DnT)**
C	*Cost*	• **Cost to Budget (C)**
E	*Equipment Utilization*	• **Hours Used (U)**

$\uparrow$ **RC** = $\uparrow$ **Cost**

$\uparrow$ **Down** = $\uparrow$ **Cost**

$\uparrow$ **Down** = $\downarrow$ **Avail**

$\uparrow$ **Use** = $\downarrow$ **Cost**

THE WORK TRUCK SHOW | NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Mnemonics Example 3: 4C – Goal Targets

Improve YOY and Deliver 4C Targets by 12/31:

1. **Corral The Outliers**:
   - Cost favorable by 2.1% to previous budget
   - Improve previous year's 94% reliability to 96.0%
2. **Cull The Herd**:
   - Reduce fleet size YOY by 5%
3. **Capability/Capacity Building**:
   - Design and roll-out "Workshop" - training fleet team on P&L Mgt. and continuous improvement
4. **Comply w/Procurement**:
   - Increase YOY procurement initiative compliance from 78% to 80%.

Mnemonics Example 2: R.P.M.
(Reliability, Productivity & Maintenance Mgt.)
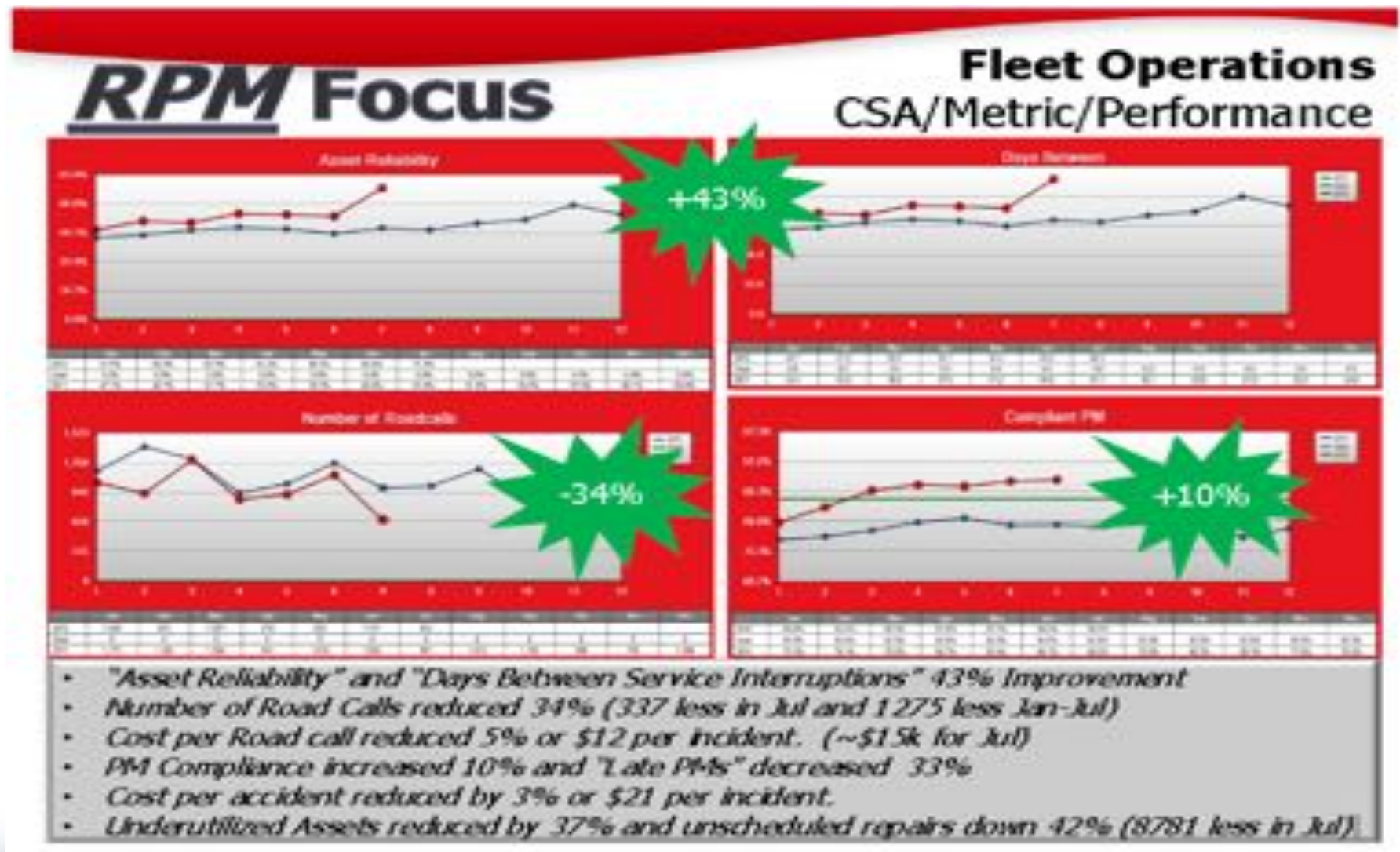
Weekly Reporting Standards

- Standards in Process and Reporting reduce variation

- Consistent reporting improves performance

- Reporting performance elevates accountability

- Accountability le ads to continuous improvement

"*Variation is enemy to execution!*"

Fleet Weekly Reporting Process

1. Celebrate success!
2. Identify opportunities & issues for improvement
3. Create SMART Action Plan

CELEBRATE SUCCESS!

IDENTIFY OPPORTUNITIES & ISSUES

CREATE AN ACTION PLAN

Closed loop process

Conduct *"Root-Cause"* Analysis

- Identify key outputs

- Identify root cause

- Test data

- Identify key deliverables

- Identify key success factors

ANALYZE to Identify Causes

- **Goal**
  - o Analyze potential root causes and confirm them with data

- **Key Outputs**
  - o Root causes that have been tested and confirmed

Analyze: Processes

Identify Potential Root Causes

Collect Data to Verify Root Causes

Quantify Cause-Effect Relationships & Confirm root Causes

To analyze the data and the process map to determine root causes and opportunities for improvement

Brainstorming Potential Root Causes

Purpose

- Brainstorming is a method for generating lots of ideas quickly.

  – Encourage creativity

  – Involve everyone (Huddles)

  – Generate excitement and energy

  – Separate people from the ideas they suggest

Uses in ANALYZE

- Use brainstorming to generate a lot of potential root causes of the focused problem statement defined in MEASURE.

  – Use "5 Whys" to push for root causes.

  – Key question is, "Why does that happen?"

Brainstorming Methods & Guidelines

- **Brainstorming Methods**
  - Rounds: Go around in turn, one idea per turn, until everyone passes
  - Popcorn: Anyone calls out ideas, no order, until all ideas are out

- **Guidelines**
  - Start with silent "think" times
  - Freewheel—don't hold back
  - NO CRITICISM
  - Hitchhike—build upon ideas
  - The more ideas, the better
  - Post ideas

Employing the "5 Whys?" for Problem-solving

- To push for root causes, start with your final problem statement and then ask WHY five times.

- **Example:**
  Final Problem Statement:
  Customers complain about too much vehicle downtime.

Why 1

Why 2

Why 3

Why 4

Why 5
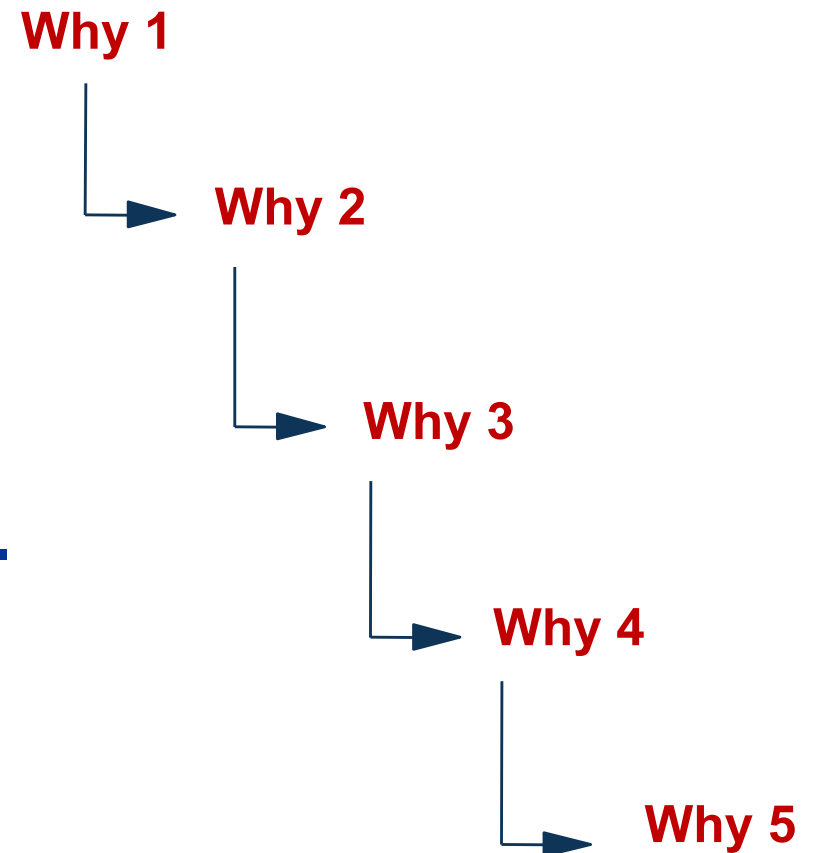
Five Why's Illustration

Problem: Customers complain about too much vehicle downtime

Why <u>does this problem happen?</u>
  Techs take longer to diagnose the issues.

  Why <u>does it take backup operators longer?</u>
    Our Techs don't know their job as well as the outsource Techs do.

    Why <u>don't our Techs know the job as well?</u>
      There is high turnover and lack of training

      Why <u>is there high turnover and lack of training?</u>
        Techs are a competitive job with a shortage.

        Why <u>are we not competing?</u>
          Tech retention and training is not a priority, and the job is not well understood.

Critical Success Factors

Next Steps:

- Perform a Cause and Effect analysis on the problem

- Identify root causes and verified with data

- Select root causes wit probable greatest impact

- Quantified opportunity area

- Set SMART Goals to drive performance toward improvement

Weekly Report S.M.A.R.T. Goal Action Plans

S = Specific

M = Measurable

A = Attainable

R = Relevant

T = Time-Bound

Not SMART:

- Review road-calls
- Reduce operational costs.

SMART:

- Reduce road-calls from 10 to 7 by Mar 15th
- Reduce operational costs by 10% by Jun 30th

Managing Fleet Replacement

Why is The Timely Replacement of Vehicles and Equipment Important?

- Controlling employee and public safety

- Controlling fleet maintenance and repair costs

- Managing total costs of asset ownership

- Promoting employee productivity

- Promoting efficiency of fleet management and maintenance activities

- Projecting a positive image to customers, upper management, taxpayers, elected officials, and/or the general public

Direct Life Cycle Costs of a Vehicle

Capital, Operating and Total Cost Trend Lines
(Single-Axle Dump Truck)

Costs (000) vs. Replacement Cycle (years)
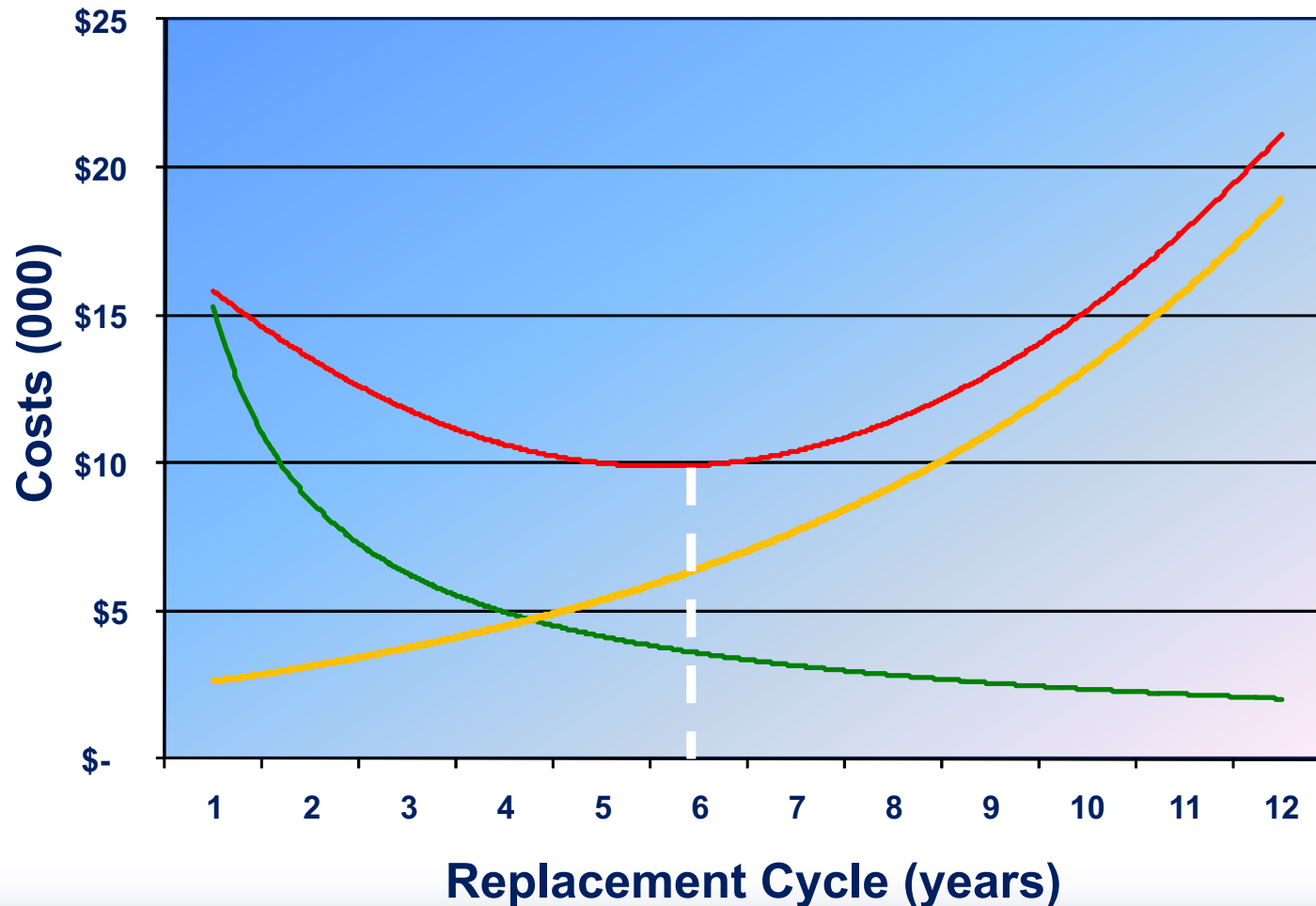
Impact of Vehicle Use on LTD Truck Maintenance and Repair Costs
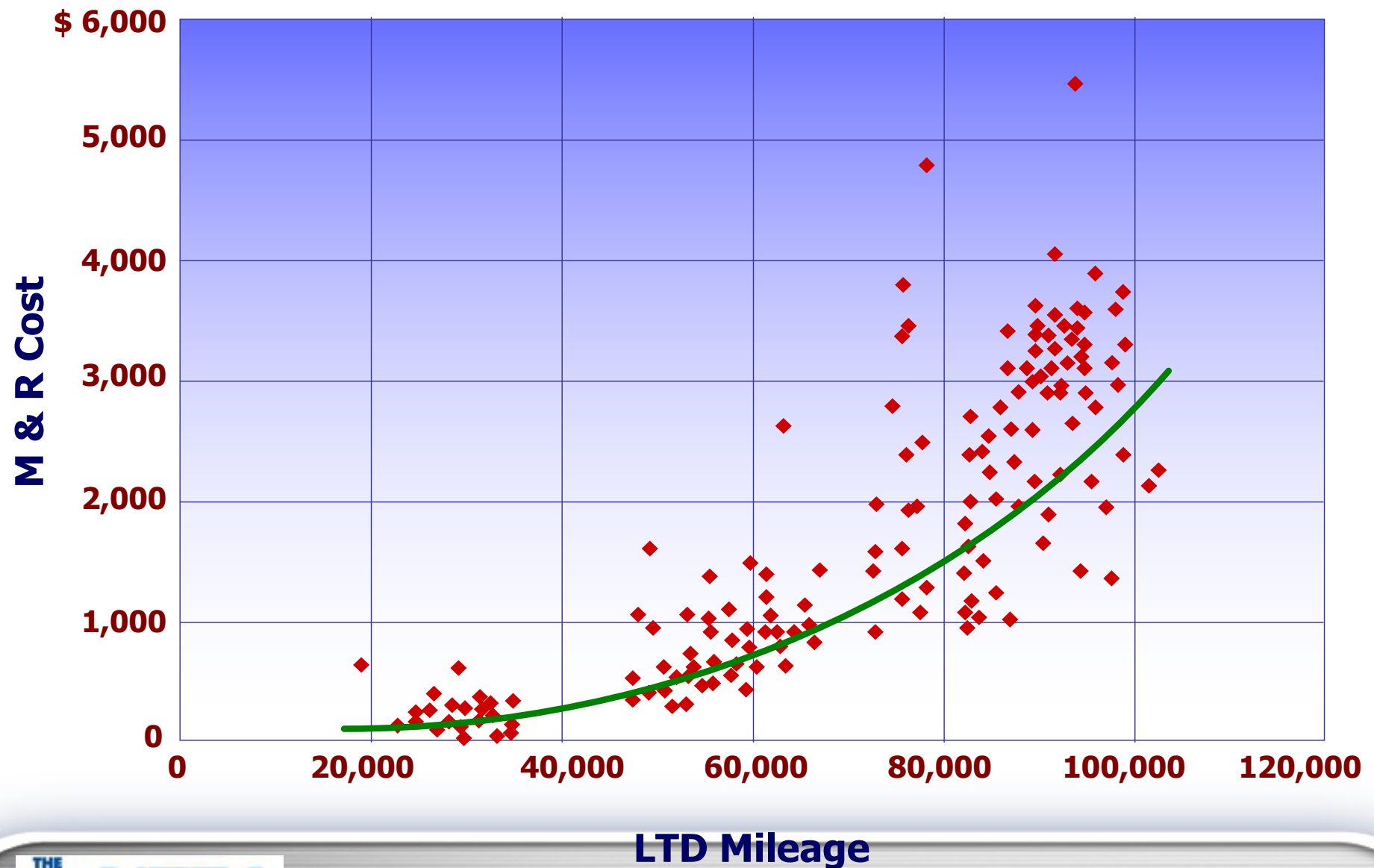
Why do Organizations do A Poor Job of Replacing Vehicles in a Timely Manner?

- Lack of *willingness* to devote sufficient funds to the timely replacement of fleet assets

- Not lack of *ability* to pay for timely replacement of assets

Why is There a Lack of Willingness to Spend Money on Fleet Replacement?

- Choice of capital financing approach colors perceptions:
  - Pay before you go versus pay as you go
  - Sunk cost versus ongoing depreciation
- Focus on marginal M&R cost versus total cost
- Lack of understanding of vehicle life cycle cost principles
- Lack of understanding of the magnitude and volatility of fleet replacement costs
- Lack of understanding of the impact of vehicle age on vehicle performance
- Lack of appreciation of the importance of the fleet to overall organizational success

How Do You Get More Money For Fleet Replacement?

- Empirically identify optimal vehicle replacement cycles

Costs to Include in a Vehicle Life Cycle Cost Analysis

- Capital
  - Purchase price
  - Upfitting cost (labor and parts)
  - Recapitalization
  - Residual value

- Operating
  - Routine maintenance and repair (exclude accident costs)
  - Fuel
  - Insurance
  - Taxes

- What else?

Sample Life Cycle Cost Analysis

GENERAL ANALYSIS PARAMETERS	
Average Annual Utilization	32,434
Average Net Acquisition Cost	$ 166,856
Average MPG	9.0
Fuel Cost per Gallon	$ 3.00
Annual Fuel Economy Deterioration Factor	1%
Inflation Rate	3%
Discount Rate	6%
Acquisition/Remarketing Cost per Vehicle	
In-Servicing and Decommissioning Cost per Vehicle	

Sample Life Cycle Cost Analysis

REPLACEMENT CYCLE (Yrs)	1	2	3	4	5	6	7	8
Meter at replacement	32,434	64,867	97,301	129,734	162,168	194,601	227,035	259,468
CAPITAL COST								
Depreciation Schedule	65.5%	42.9%	28.1%	18.4%	12.0%	7.9%	5.2%	3.4%
Estimated Residual Value (uninflated)	$ 109,259	$ 71,544	$ 46,848	$ 30,677	$ 20,087	$ 13,153	$ 8,613	$ 5,640
Annual Depreciation	$ 57,597	$ 37,715	$ 24,696	$ 16,171	$ 10,589	$ 6,934	$ 4,540	$ 2,973
Annualized Ancillary Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital Costs (nominal$)	$ 57,597	$ 38,846	$ 26,200	$ 17,671	$ 11,918	$ 8,038	$ 5,421	$ 3,657
OPERATING COST								
Annual Maintenance and Repair Cost (2014$)	$ 16,182	$ 19,123	$ 22,599	$ 26,706	$ 31,560	$ 37,297	$ 44,076	$ 52,086
Annual Fuel Cost (2014$)	$ 10,811	$ 10,920	$ 11,031	$ 11,142	$ 11,255	$ 11,368	$ 11,483	$ 11,599
Total Annual Operating Costs (nominal$)	$ 26,993	$ 30,945	$ 35,678	$ 41,358	$ 48,189	$ 56,416	$ 66,340	$ 78,325
ORCA ANALYSIS								
Equivalent Annual Cost	$ 84,590	$ 77,300	$ 72,311	$ 69,136	$ 67,435	$ 66,974	$ 67,599	$ 69,217

THE WORK TRUCK SHOW. NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Sample Life Cycle Cost Analysis

REPLACEMENT CYCLE (Yrs)	1	2	3	4	5	6	7	8
Meter at replacement	32,434	64,867	97,301	129,734	162,168	194,601	227,035	259,468
CAPITAL COST								
Depreciation Schedule	65.5%	42.9%	28.1%	18.4%	12.0%	7.9%	5.2%	3.4%
Estimated Residual Value (uninflated)	$ 109,259	$ 71,544	$ 46,848	$ 30,677	$ 20,087	$ 13,153	$ 8,613	$ 5,640
Annual Depreciation	$ 57,597	$ 37,715	$ 24,696	$ 16,171	$ 10,589	$ 6,934	$ 4,540	$ 2,973
Annualized Ancillary Costs	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Capital Costs (nominal$)	$ 57,597	$ 38,846	$ 26,200	$ 17,671	$ 11,918	$ 8,038	$ 5,421	$ 3,657
OPERATING COST								
Annual Maintenance and Repair Cost (2014$)	$ 16,182	$ 19,123	$ 22,599	$ 26,706	$ 31,560	$ 37,297	$ 44,076	$ 52,086
Annual Fuel Cost (2014$)	$ 10,811	$ 10,920	$ 11,031	$ 11,142	$ 11,255	$ 11,368	$ 11,483	$ 11,599
Total Annual Operating Costs (nominal$)	$ 26,993	$ 30,945	$ 35,678	$ 41,358	$ 48,189	$ 56,416	$ 66,340	$ 78,325
ORCA ANALYSIS								
Equivalent Annual Cost	$ 84,590	$ 77,300	$ 72,311	$ 69,136	$ 67,435	$ 66,974	$ 67,599	$ 69,217

How Do You Get More Money For Fleet Replacement?

- Empirically identify optimal vehicle replacement cycles

- Develop a plan that quantifies long-term fleet replacement costs

Why Develop a Replacement Plan?

- To develop an understanding of the magnitude and annual volatility of future fleet replacement costs

- To determine and quantify the extent to which a backlog of vehicle replacement needs exists

- To provide the foundation for developing a business case justification for increasing fleet replacement spending

- To support the evaluation of alternative capital financing approaches

Baseline Fleet Replacement Plan

Gross Replacement Costs
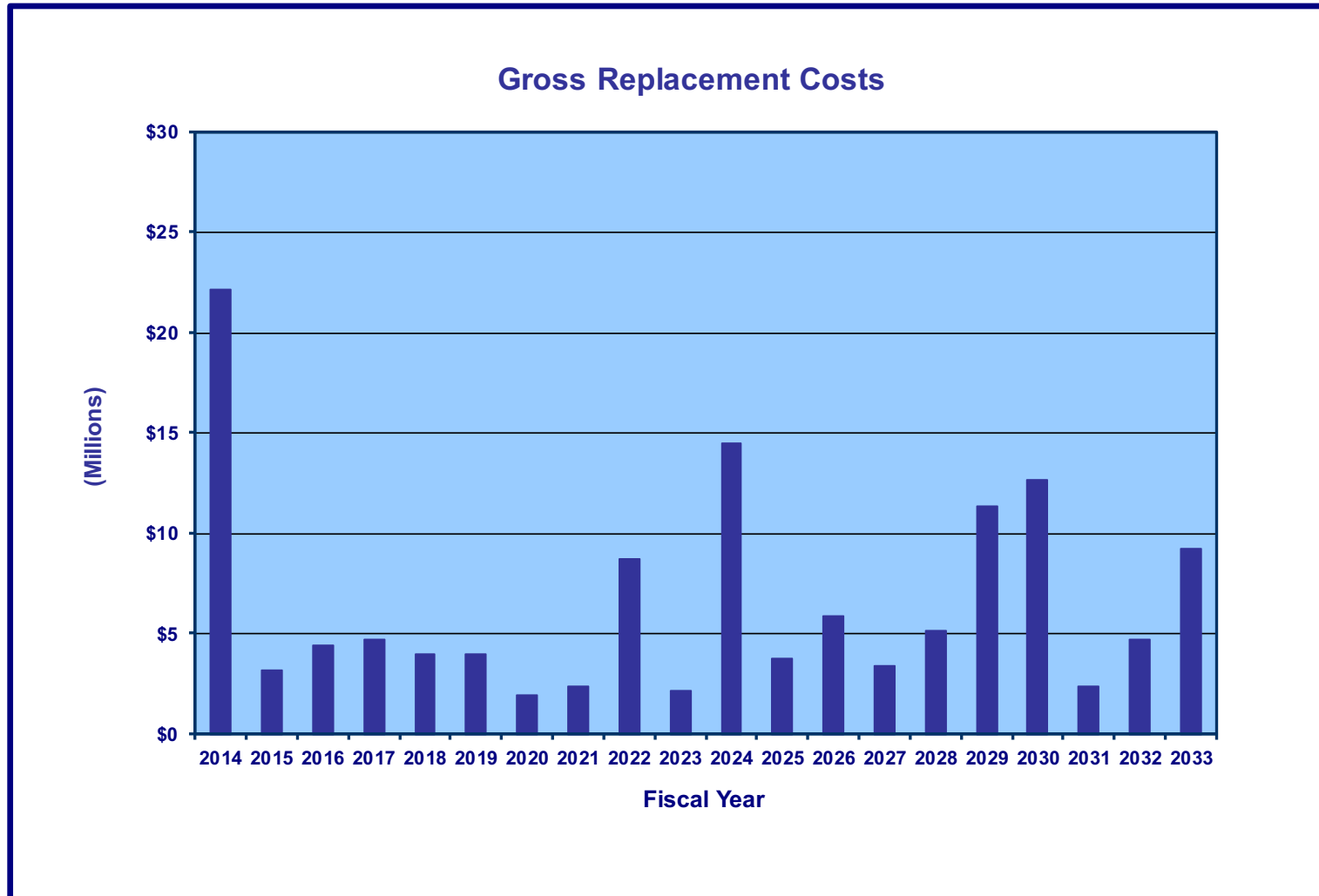
Fleet Replacement Statistics

Total number of units in the fleet	**906**
Number of asset types	180
Average asset age (years)	9.2
Average recommended replacement cycle (years)	**10.0**
Average current asset purchase price	**$ 53,607**
Gross fleet replacement cost (today's dollars)	$ 44.9 M
Average annual fleet replacement cost (today's dollars)	**$ 4.5 M**
Average annual replacement *expenditures* (2008-12)	$ 2.7 M
Current replacement backlog	$ 22.2 M
Number of assets that exceed recommended replacement age	466
Percentage of assets that exceed recommended age	51.4%

Fleet Data Sources and Processing Tools

The Role of a Fleet Management Information System (FMIS)

- To capture, store, and facilitate the analysis of *quantitative* data on all facets of fleet and fleet management performance:
  - Vehicles
  - Drivers
  - Maintenance technicians
  - Parts
  - Fuel
  - Facilities
  - Suppliers
- Computerized data are the *foundation* of cost-effective fleet management

Types of Fleet Management Software

- Integrated FMIS for in-house asset, shop, and parts management

- Fleet leasing/management company management information tools for customers

- Fuel management systems
  - Bulk fuel tank management
  - Bulk fuel dispensing
  - Fuel credit card management

- Motor pool management systems

- Mobile resource management (telematics) systems

Major Integrated FMIS Software Companies in North America

- AssetWorks – www.assetworks.com

- Chevin Fleet Solutions – www.chevinfleet.com

- Faster – www.fasterasset.com

- Collective Data – www.collectivedata.com

- Arsenault – www.arsenault.com

- RTA Fleet – www.rtafleet.com

Other Types of Software Used to Manage Fleets

- Enterprise resource planning (ERP) software – e.g., SAP, Oracle, HTE

- Enterprise asset management (EAM) software – Maximo, Infor

- Infrastructure management software – AgileAssets, iWorQ

Key Features of an FMIS not Available in ERP, EAM, and Other Software

OPERATIONAL AREA	Out of the Box		With Modification / Configuration		
	COUNT OF FEATURES AVAILABLE OUT OF THE BOX	FIT-RATE OF MODULE OUT OF THE BOX	COUNT OF FEATURES AVAILABLE WITH MODIFICATION OR CONFIGURATION	FIT-RATE OF MODULE WITH MODIFICATION OR CONFIGURATION	TOTAL PRIORITY 1 FEATURES REQUIRED
Accident/incident management	0	0.00%	27	100.00%	27
Customer/driver management	0	0.00%	6	100.00%	6
Equipment/asset management	28	9.46%	268	90.54%	296
Fuel and bulk fluids management	2	4.55%	42	95.45%	44
General settings and features	6	9.23%	59	90.77%	65
Location management	5	25.00%	15	75.00%	20
Motor pool management	1	3.33%	29	96.67%	30
Parts management	95	59.38%	65	40.63%	160
Procurement card	1	12.50%	7	87.50%	8
Purchase order management	36	100.00%	0	0.00%	36
Technical requirements	18	54.55%	15	45.45%	33
Technician management	25	71.43%	10	28.57%	35
Telematics	0	N/A	0	N/A	0
Vendor management	9	39.13%	14	60.87%	23
Warranty management	14	66.67%	7	33.33%	21
Work order management	86	48.86%	90	51.14%	176
FIT RATE	**326**	**33.27%**	**654**	**66.73%**	**980**

Key Considerations When Buying Computerized Systems and Tools

- Defining functional requirements

- Understanding product functionality fits and gaps

- Determining willingness of your organization to tailor current business practices to new system functionality

- Determining willingness – and propensity – of product developer to customize – or not customize

- Determining internal technical support capabilities and priorities

- Using new system acquisition as an opportunity to reengineer outdated business practices

Dashboards
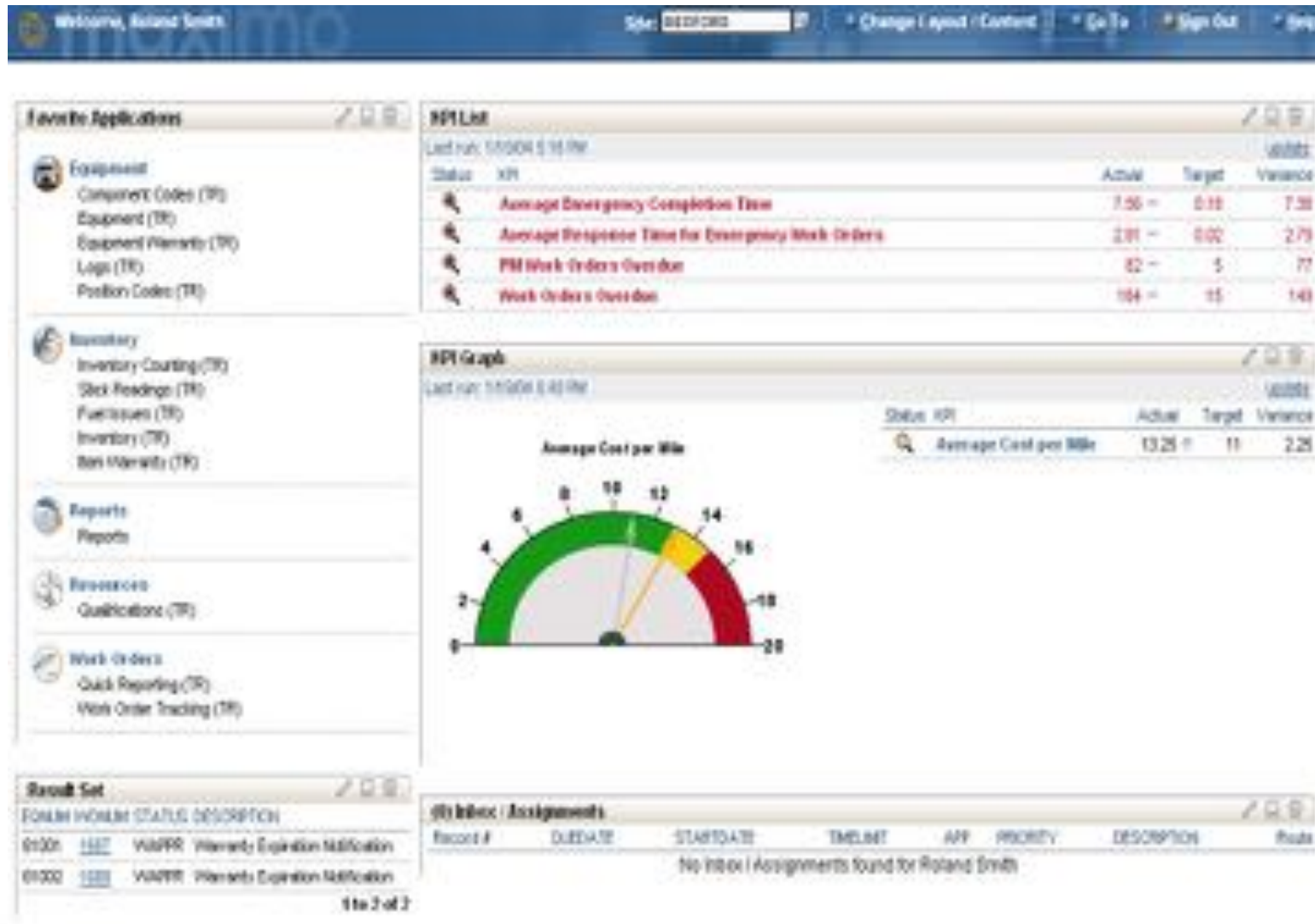
Strategies and Techniques for Reducing Fleet Costs

Reasons that Opportunities Exist to Reduce Fleet Costs

- *Inefficient* fleet management structures and practices

- *Ineffective* fleet management practices

- Fleet user organization focus on core mission

- Lack of information on, and visibility of, costs

- Lack of appreciation of the magnitude of costs

- Insufficient ownership of, and accountability for, costs

- Lack of understanding of vehicle life cycle costs and TCO management principles

- Complexity and interdependence of fleet management and operating activities

Strategies for Reducing Fleet Costs Quickly – the Low-Hanging Fruit

- Pay less for the fleet-related goods and services you buy
  - o Vehicles
  - o Fuel
  - o Parts
  - o Maintenance and repair services
  - o Asset management services
  - o Financing
- Purchase price assurance (i.e., hedge)
- Get paid more / more quickly for the assets you sell

Strategies for Reducing Fleet Costs That Usually Take Time to Bear Fruit

- Increase operational efficiency

  - Fleet-dependent activities

  - Fleet management activities

- Increase visibility of, and accountability for, costs

  - KPI reports

  - Cost charge-back system

- Change asset replacement cycles to minimize total cost of ownership

Increase Efficiency through Business Process Reengineering

- Fleet operation

  o Right types/numbers of vehicles for the job

  o Trip planning (routing and scheduling)

  o Vehicle dispatching

  o Vehicle sharing / pooling

- Fleet management

  o Program and facility consolidation

  o Fleet standardization

  o Shop automation

  o Mechanic training

  o Policies and procedures

Key Trends in Fleet Management

Fleet Industry Trends that are Shaping the Future

- Brain drain

- Chronic underinvestment in human capital

- Shortage of new talent entering the fleet management profession

- Increasing complexity and potential applications of *information* technology

- Increasing complexity of *automotive* technology

- Big data

Implications of Industry Trends for Fleet Owners

- Increasing reliance on third-party service providers (i.e., outsourcing)

- Growing demand for ongoing fleet management support services

- Growing, albeit still largely unfocused, demand for "data analytics"

- Growing demand for professional training and certification services

- Growing demand for technical guidance in the areas of AFVs and telematics

Concerns of Fleet Managers Today

- Asset management

- Information management

- Decision maker management

- Customer (fleet user) management

- Personnel management

- Supplier management

- Financial management

- Sustainability/CSR management

Dealing with growing technological complexity of assets

Weighted Average Cost per Engine Hour (CPEH)

Post-Emission | Pre-Emission Cost Curve
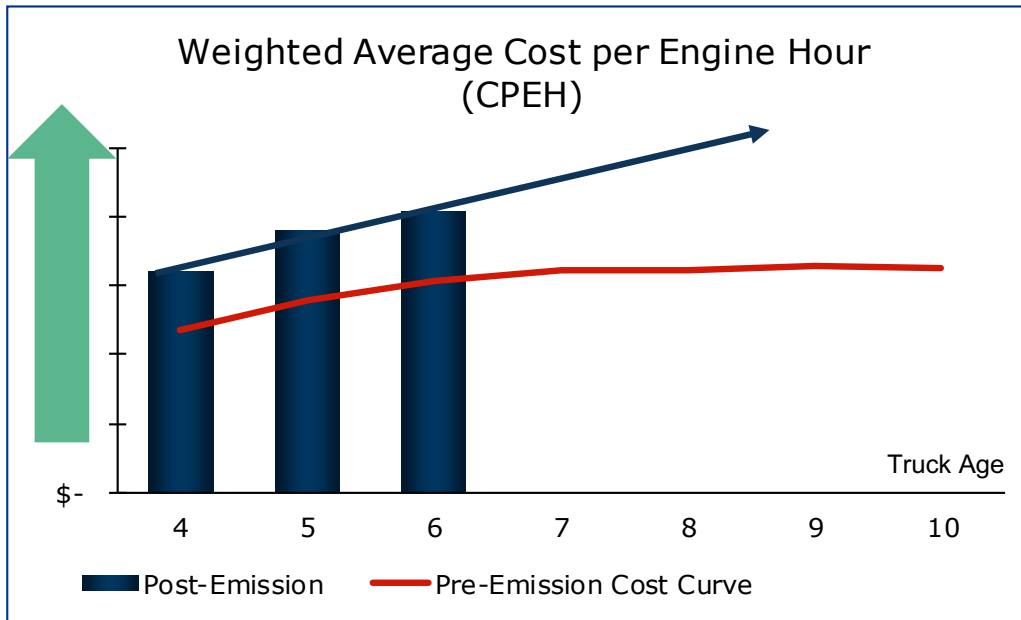
Examples of emissions complexity:

System	Part Description	Pre-Emission	Post-Emission
Emissions/Exhaust After Treatment	Muffler vs. Diesel Particulate Filter Assembly	$ 95	$ 4,719
	Diesel Particulate Filter Only	$ -	$ 2,258
	Turbo vs. Variable Geometry Turbo	$ 967	$ 3,294
	EGR cooler vs. no EGR cooler	$ -	$ 1,096
Engine	Fuel Injector E6 vs. MP7	$ 106	$ 695
	Cylinder Head E6 vs MP7	$ 1,779	$ 3,674

- Government emissions regulations and new engine technologies introduced between 2007 and 2010 continue to increase truck maintenance costs

- On average, a post-2007 emissions truck costs 25% more per engine hour to maintain when a truck comes off warranty (two years after purchase)

- Capital costs are up 30% since 2007

- Parts costs and total number replaced is expanding

- Need to continue working to mitigate cost impact by training technicians on new technologies to lessen reliance on higher cost 3rd party repair vendors and downtime

78

Modern Vehicles

Driver support
- Navigation
- Collision warning/avoidance
- Augmented vision

System automation
- Dynamic EV charging
- Computer control of engine, brakes, etc.

Telematics
- Remote control (locks, start)
- Remote diagnostics
- Remote repair (updates)

Content and communication
- Voice and data
- Information and entertainment

Growing Technological Complexity of Fleet Assets

- In the early 1980s, vehicles with embedded computers had upwards of 50,000 lines of software code; vehicles in 2016 generally have more than 100 million lines of code

- Increasing demand for more and varied features

- Items once considered options only available on luxury models eventually will be incorporated across model lines

- The trend of ever expanding electronic functionality shows no sign of slowing down, continued progress in vehicle automation further accelerates the complexity and dependence on embedded controllers

- For many fleet owner employees, their vehicle is far and away the most sophisticated electronic device they operate to perform their job functions and missions

THE WORK TRUCK SHOW. NTEA THE ASSOCIATION FOR THE WORK TRUCK INDUSTRY

MERCURY

Asset Management Challenges

- Dealing with growing technological complexity of assets

- Justifying vehicle replacement cycles/policies

- Dealing with the effects of aging vehicles and equipment

- Determining which asset management activities to outsource

Information Management Challenges

- Acquiring/dealing with information systems that are suitable (or not) for fleet management

- Avoiding information overload – especially from telematics solutions

- Converting data into usable management information

- Using information

  - To guide policy setting, forecasting, planning, and decision making

  - To delegate responsibility and foster accountability

- Articulating return on employee investment in sound data capture, analysis, and reporting practices

Decision Maker Management Challenges

- Articulating the value of the fleet to the enterprise

- Advocating for the needs of fleet users

- Exerting influence over decision making

- Providing enterprise-wide information

- Dealing with organizational changes (e.g., M&A)

- Minimizing the "politicization" of fleet management

Customer Management Challenges

- Treating fleet users like *customers*

- Minimizing "regulation" of fleet user behavior

- Understanding customers' fleet asset and service needs and how to meet them

- Demonstrating cost competitiveness (internal v. external repair)

- Increasing "downtime" and "reliability" concerns

- Need for increased "Driver training" to counter growing complexity

Financial Management Challenges

- Working through the budgeting process and influencing funding decisions

- Quantifying, justifying, and controlling fleet costs

- Managing vehicle total cost of ownership (TCO)

- Distributing costs to fleet users (i.e., Charge-back)

- Understanding alternative capital financing methods (Lease, loan, cash, sinking or reserve fund, ISF, Enterprise Fund, etc.)

- Understand alternative modes of transportation to owning vehicles (rent, public transportation, POV reimbursement, etc.)

Sustainability/Corporate Social Responsibility Management

- Securing funding for (more costly) lower emission vehicles, alternative fuel vehicles, and fueling/charging infrastructure

- Design criteria for consistent AFV decision-making (ROI, IRR, etc.)

- Determine the best AFV solution for your organization (EV, CNG, etc.)

- Managing safety and efficiency of AFV operation

- Partner with the Department of Energy and Clean Cities

- Design communication programs to articulate AFV program value and benefits

Personnel Management Challenges

- Talent is a business problem, not an HR problem

- People Reflect, Protect and Preserve the Company Brand

- Assessing Capability is Cross-functional Effort

- Increased Diversity Drives Innovation

- Need for Project Management & Productivity Focused Solutions

Personnel Management Process

- Recruiting
- Retaining
- Motivating
- Developing

Recruiting and retaining qualified technicians is very challenging

- Society has negative view of the professional technician career path.

- Guidance counselors and parents discourage youth to consider a career in vehicle maintenance.

- Fewer opportunities for youth to obtain experience working in automotive maintenance.

- Vehicles more complex and youth unable or ill-equipped to work on own vehicles and cultivate interest in automotive technology.

- Internal processes may need streamlining (or > training)

Increasingly difficult to attract adequate Maintenance Talent and capability

- Unable to attract and acquire enough talented and qualified technicians and supervision

- Customer success, execution and durability depend on quantity and quality fleet personnel

- Impacting higher outsource labor costs, increased mistakes, overtime, Internal resource capacity, etc.

- Need to strengthen fleet management skills using traditional education, internal training tools and industry recognized certification programs to better compete in the market. (e.g., University/College, Trade/Voc Schools, ASE, and CAFM)

Develop Technician Marketing Program

- Expand use of Social Media websites to attract candidates

- Defined jobs and level of technical skills needed to maintain equipment.

- Designate regional employees to serve in an advisory capacity in vocational schools.

- Leverage industry tools and venues to broaden outreach (e.g., LinkedIn, CareerBuilder, Monster, TMC, NAFA, Waste Expo, etc.

- Prepare advance communication packet and talking points for Leaders

- Consider establishing Fleet "People Committee" and designate specific managers to be involved with programs that promote technician image and Company programs.

Expand the existing labor pool

- Work closer with Vocational & Tech Colleges to proactively attract candidates prior to graduation (Part-Time work force)

- Increase focus on strengthening candidate pool working with diversity outreach programs

- Get to students at the middle school level is key. Elementary school career day events are excellent opportunities as well.

- Network early to identify High School seniors as potential candidates and develop a part-time worker program to hire students as laborers.

- Target Veteran outreach programs to attract quality candidates from those returning from Military deployment

- Utilize retired (or soon to retire) employees as a "Succession Planning" resource to mentor newly hired associates

- Develop a "Apprenticeship" program (Partner with Labor)

Strengthen Salary Programs

- Consider "Sign-On Bonus" to incent candidates to join

- Establish a "Tool Allowance" program to better compensate Technicians for continued investment

- Strengthen "shift pay" differentials to mitigate threat of Technicians' leaving (or not joining) to work desired dayshifts at higher paying companies (e.g., Government and Dealers)

- Develop an annual incentive (bonus) program to compensate Technicians with a "Claw-back" for greater retention focus

- Implement compensation program to pay for ASE (Automotive Service Excellence) continuous training (i.e., Testing and % salary bump for passing tests)

- Linkage to incentive programs to include performance top to bottom with KPI metric focus e2e on achieving org goals

Sources of Information on Fleet Management

Industry Associations

- NAFA Fleet Management Organization
  - www.nafa.org

- American Public Works Association
  - www.apwa.net

- American Trucking Associations
  - www.trucking.org

- National Truck Equipment Association
  - www.ntea.com

- Association of Equipment Management Professionals
  - www.aemp.org

- American Public Transportation Association
  - www.apta.com

- Rocky Mountain Fleet Management Association (*FleetPros*)
  - www.rmfma.org

Other

- **Bobit Business Media**
  - o www.fleet-central.com
- **Penton**
  - o www.penton.com
- **Mercury Associates, Inc.**
  - o www.mercury-assoc.com

For More Information

Tony Yankovich
Overland Park, KS
913-568-5837
tyankovich@mercury-assoc.com

Steve Saltzgiver
Phoenix, AZ
801-702-7288
ssaltzgiver@mercury-assoc.com

www.mercury-assoc.com