Fleet Management 101
An Introduction to Key Principles, Concepts, Strategies, and Techniques – Part 1
Indianapolis, IN
March 14, 2017
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</table>
About the Instructors

Tony Yankovich

• More than 28 years' experience in the fleet industry
  • 12 years as asset manager for 1,200 unit fleet
  • 17 years as fleet management consultant
• Directed, managed or participated in over 225 fleet studies across North America

Steve Saltzgiver

• More than 40 years’ experience as a fleet maintenance technician, local and state government (Utah and Georgia), and corporate (Coca-Cola and Republic Services) fleet manager and fleet management consultant
• Successfully transitioned from wrench tuner to manager of a $1.5 billion (annual capital and operating budget), 50,000-unit fleet
About Mercury Associates, Inc.

- Largest dedicated fleet management consulting company in North America
- More than 600 clients served, with fleets of <100 to >200,000 vehicles and pieces of equipment
- Company’s mission is to help organizations improve fleet management practices, improve fleet performance, and reduce fleet costs
Key Mercury Associates Services

• Fleet Management Best Practices Studies
• Fleet Management Program Consolidation and Organizational Restructuring Studies
• Fleet Cost Analysis, Reduction, and Containment Studies
• Fleet Utilization, Optimization, and Rightsizing Studies
• Fleet Management Information System Requirements Definition, Acquisition, Implementation, Hosting
• Outsourcing Feasibility Studies
Key Mercury Associates Services

- Development of Requirements, Specifications, and Tenders – Vehicles, Services, Information Systems
- Supplier Selection, Contract Negotiation, and Performance Reviews
- Determination of Optimal Vehicle Replacement Cycles
- Evaluation of Lease versus Buy and other Capital Financing Strategies
- Financial Audits of Fleet Leasing Company and other Supplier Invoices
- Management Training
Sample Mercury Associates, Inc. Clients

Corporate
- 3M
- Air Products
- Aramark
- BP
- Bell Canada
- BNSF Railway
- Danella
- GlaxoSmithKline
- Honeywell
- Intel
- Johnson Controls
- Pacific Gas & Electric
- Pfizer
- Quanta Services
- Rockwell-Collins
- Schindler Elevator
- Toyota

Commercial
- Alyeska Pipeline Service Company
- British Columbia Hydro
- Carolinas HealthCare System
- Coinmach Services
- Flint Hills Resources
- Georgia Power Company
- Goodwill Industries
- Gulf Stream Marine
- Hoosier Energy
- Horizon Utilities
- Hunt Brothers Pizza
- Laidlaw
- Lancaster Foods
- Lighting Maintenance, Inc.
- Terra Renewal
- Whiting Oil & Gas

Government/Other
- US Army, Navy, Air Force, Marine Corps
- US Postal Service
- Smithsonian Institution; NASA
- Canada Post
- United Nations
- LDS Church
- RAND Corporation
- Transportation Research Board
- 33 of 50 largest cities in the US, including 10 largest;
- 3 of 5 largest cities in Canada
- 35+ state and provincial governments
- 40+ colleges and universities
Workshop Objectives

• Learn about key fleet management principles, trends, and best practices – not all of which are equally applicable to every fleet owner

• Learn to think about fleet management as a complex, multidisciplinary, and interdependent set of activities

• Learn to think about fleet management in a structured, proactive, and scientific fashion

• Learn about the importance of using objective, quantitative data to perform fleet management activities efficiently and effectively
Keys to the Success of this Workshop for You

• Think about the relevance of the concepts, strategies, and techniques presented here to the industry and the particular part of the organization in which you work

• Think about who in your organization needs to understand and support the elements of an effective fleet management program
Fleet Management: An Overview
Evolution of Vehicles

1880’s
Karl Benz
Evolution of Vehicles

Ford GT
Evolution of Vehicles
Evolution of Fleet Management

Then

Wrench & Return

and

Analysis

File It

FMIS

Big Data

Telematics

Now
The Science of Fleet Management
What is a “scientific” approach to the management of anything?

**Scientific** (definition)

- Something that is done in an **organized** way that agrees with the methods and principles of science

**Science** (definition)

- The state of knowing; **knowledge** as distinguished from ignorance or misunderstanding
- A department of **systematized** knowledge as an object of study
- Knowledge or a **system** of knowledge covering general truths or the operation of general laws, especially as obtained and tested through scientific method

**Scientific Method** (definition)

- Principles and procedures for the **systematic** pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses
More Definitions

**Strategy**
- Defines your long-term goals and how you are planning to achieve them

**Tactics**
- Identifies the specific steps required to attain your strategy

“Strategy without tactics is the slowest route to victory. Tactics without strategy is the noise before defeat.”

*Sun Tzu in “The Art of War” 5th century BC*
Many organizations do not approach fleet management in a scientific fashion because...

...the **goals** of fleet management activities are not clear or well understood.

The goals of any fleet management program are to furnish assets that are:

1. Suitable
2. Available
3. Reliable
4. Safe
5. Economical
6. Sustainable

Different stakeholders may view the importance of these goals very differently from one another.
Many organizations do not approach fleet management in a scientific fashion because…

… there is insufficient appreciation of the complexity of fleet management activities
Fleet management is complicated because…

• Managing a fleet involves the performance of two distinct, but interdependent, types of activities:
  o Asset management activities
  o Enterprise management activities

• Performing these activities requires different types of knowledge and skills and many individuals who are skilled in one area are not skilled in the other

• Responsibility for performing these activities usually is fragmented, with different employees and/or organizational units responsible for different “pieces of the puzzle”

• Many enterprise management activities are designed and conducted to manage an entire enterprise, not just a fleet; enterprise-wide goals and associated management policies and procedures are not always aligned with the demands of effective fleet management
Asset Management Activities

- Vehicle Allocation
- Vehicle Dispatching
- Routing & Scheduling
- Vehicle Acquisition
- Fuel Card Management
- Accident Repair Management
- Replacement Planning
- Operator/Driver Training
- Vehicle Maintenance & Repair
- Parts Procurement & Supply
- Driver Management
- Mechanic Supervision
- Motor Pool Management
- Outsourced Repair Management
- Bulk Fuel Management
- Roadside Assistance
- Licensing & Titling
- Used Vehicle Remarketing
- Personal Use Management
- Cost-Effective Asset Performance
Key Concepts in Fleet Management
Vehicle Statistical Referencing System

What needs to be done?

Who is going to do it?

Where will the work take place?
Workload
Workforce
Workplace
VSRS

1.0 VEU
- 100 sedans
- 100 VEU
- 1,200 hours
- 0.9 technicians

4.0 VEU
- 100 dumps
- 400 VEU
- 4,800 hours
- 3.6 technicians

5.5 VEU
- 100 sewer trks
- 550 VEU
- 6,600 hours
- 4.9 technicians
Sample

- Fleet = 500 assets
- VEU = 1,100
- Hours per VEU = 12 direct labor hours per year
- Direct labor hours required = 13,200/yr
- Technician productivity target = 1,450 hours/yr
- Technicians required = 9.1
- Maintenance bays required = 14
- Shop supervisors required = 1
- Parts clerks required = 1
- Fleet manager = 1
- Support analyst = 1
Fleet Management Policies and Procedures
Documented policies and procedures are important for...

• Ensuring that all the elements required to perform a particular fleet management activity effectively and efficiently are identified and understood

• Uncovering deficiencies in current practices

• “Institutionalizing” knowledge and maintaining sound practices despite employee turnover

• Demonstrating professionalism and commitment to high-quality performance to management and customers
# Potential Depth and Breadth of Fleet Management Policies and Procedures

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Lifecycle of a Policy & Procedure
Summary: Key Attributes of a Scientific Approach to Fleet Management

• Clear understanding of goals and objectives

• Recognition of fleet management as a complex set of principles, policies, and processes that need to be applied/practiced in a systematic fashion

• Structured, data-driven goal and policy setting, forecasting, planning, and decision making methodologies

• Formally defined (documented) policies and procedures for performing all key asset management activities and for leveraging/influencing pertinent enterprise management practices
Driving Accountability (RACI)
RACI Discussion
Responsibility, Accountability, Consult and Inform

- There was an important job to be done and EVERYBODY was asked to do it ..... 

- EVERYBODY was sure that SOMEBODY would do it .....
**RACI Discussion**

Responsibility, Accountability, Consult and Inform

- **ANYBODY** could have done it, but **NOBODY** did it!

- **SOMEBODY** got angry about that, because it was **EVERYBODY**’s job!
RACI Discussion
Responsibility, Accountability, Consult and Inform

EVERYBODY thought

ANYBODY could do it, but

NOBODY realized that

EVERYBODY wouldn't do it
RACI Discussion

Responsibility, Accountability, Consult and Inform

• It ended up that **EVERYBODY** blamed **SOMEBODY** when **ANYBODY** could have done what **NOBODY** did …..
**RACI Discussion**
Responsibility, Accountability, Consult and Inform

- **Clarifies individual/departmental roles and responsibilities**
- **Improves team efficiencies and effectiveness**
- **Identifies accountabilities**
- **Removes ambiguities with regard to activities and decision points**
- **Assists in defining roles & responsibilities**
- **Improves team communication & coordination**
- **Clear demarcation of authority levels**
- **Assists in defining roles & responsibilities**
- **Identify problems with the existing process**
- **Reduces duplication of efforts or no overlap**
- **Assists in task completion before moving to the next process activity**
RACI Discussion
Responsibility, Accountability, Consult and Inform

Responsible

• These are the individuals who actually complete the task or activity and are responsible for action and/or implementation.

• Responsibility is often shared, with each individual’s degree of responsibility determined by the individual with the “A”
Accountable

- This is the individual who carries the “yes” or “no” authority and has full veto power for an activity.

- Only one “A” can be assigned to a task or activity and authority must accompany accountability.
RACI Discussion
Responsibility, Accountability, Consult and Inform

Consult

• These are the individuals who must be consulted prior to a final decision or action. “Consult” implies two way communication.
RACI Discussion
Responsibility, Accountability, Consult and Inform

Inform

• These are the individuals who need to be informed after a decision or action is taken because they, in turn, may take action or make a decision based on the output.

• “Inform” is FYI and implies only one-way communication.
## RACI Discussion

Responsibility, Accountability, Consult and Inform

### RACI Asset Management

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<th>Activities</th>
<th>Asset Manager</th>
<th>Asset Analyst</th>
<th>Fleet Manager</th>
<th>Fleet Supervisor</th>
<th>Compliance Manager</th>
<th>Director Fleet Operations</th>
<th>Fixed Assets</th>
<th>Asset Supervisor</th>
<th>Director Procurement</th>
<th>Capital Fleet</th>
<th>Operations Leadership</th>
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<td>Dispose Assets - &quot;How&quot;/&quot;Who&quot;</td>
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Organizational and Process Improvement

*Operational Excellence Lean management, and Six Sigma concepts*
Operational Excellence

The 8 Wastes – “SPELL DOWNTIME”

DOWN TIME are the two worst 4 letter words in Fleet
Objectives

• To establish a common language for continuous improvement in YOUR Organization

• To establish a general understanding of ‘waste’, from an Operational Excellence perspective

• To provide an opportunity to identify wastes from a personal perspective
Definitions

• **Waste**
  
  o Those elements of our **system** for which the **customer** is not willing to pay
  
  o System inconsistency, variation, stress, & strain

• **Customer**
  
  o Companies which purchase our products or services for sale (including consignment)
  
  o Our valued consumer base
  
  o Each downstream process within our system

• There are 8 kinds of waste…
The 8 Wastes

- Excess Processing: Waste due to misunderstanding customer requirements.
- Inventories: Waste due to inventory in excess of immediate requirements.
- Motion: Waste related to ergonomics & movement within tasks.
- Transportation: Waste due to movement between processes.
- Defects: Waste due to poor quality and missed expectations.
- Overproduction: Waste related to producing too much or too early.
- Waiting: Waste due to unbalanced processes.

DOWNTIME
# DOWNTIME: The 8 Wastes, explained…

<table>
<thead>
<tr>
<th>Waste</th>
<th>Organization</th>
<th>Support Environments</th>
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</thead>
<tbody>
<tr>
<td>Defects</td>
<td>Waste related to poor quality, including creating, finding, recording, and fixing defects</td>
<td>Waste related to mistakes and missed expectations</td>
</tr>
<tr>
<td>Overproduction</td>
<td>Producing more product than needed for immediate consumption or customer requirements</td>
<td>Performing tasks earlier than needed, pulling resources from higher priorities</td>
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<tr>
<td>Waiting</td>
<td>Product, people, or machines delayed due to earlier processes</td>
<td>System elements which cannot perform tasks, due to upstream considerations</td>
</tr>
<tr>
<td>Not Tapping Potential</td>
<td>Waste due to not fully utilizing resources available, including human intellect</td>
<td>Waste related to resisting new ways of thinking or performing functions</td>
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<tr>
<td>Transportation</td>
<td>Waste related to physical movement of product to different locations</td>
<td>Waste related to moving physical or virtual elements across locations</td>
</tr>
<tr>
<td>Inventory</td>
<td>Waste related to storing product without specific, current requirements</td>
<td>Collecting physical or virtual elements, without actual/immediate need</td>
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<tr>
<td>Motion</td>
<td>Waste related to movement of people or equipment within a task</td>
<td>Waste related to poor ergonomics, or movement within the ‘envelope’ of the body</td>
</tr>
<tr>
<td>Excess Processing</td>
<td>Waste related to not understanding actual customer requirements</td>
<td>Performing tasks &amp; functions with greater depth than actually required for the purpose at hand</td>
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</tbody>
</table>
Waste #1: Defects

This is waste related to poor quality and missed expectations, such as:

- Input errors
- Creating defects
- Routing defects
- Finding defects
- Correcting defects
- Recording defects
- Reporting defects

Examples in SUPPORT SYSTEMS:

- Errors in master data
- Wrong information submitted
- Misunderstood communications
- System crashes
Waste #2: Overproduction

This is waste related to producing too much or too early, such as:

- Over-ordering
- Early scheduling
- Producing more product/services than is required for immediate consumption

Examples in SUPPORT SYSTEMS:

- Preparing reports too early (information changes!)
- Purchasing travel too far in advance (plans change!)
- Ordering & storing years worth of Parts inventory
Waste #3: Waiting

This is waste due to unbalanced processes, such as:

• People waiting for processes to finish
• Processes waiting for the previous process to complete
• Product waiting for the rest of the batch to be completed
• Anything which should be ‘flowing’ but is standing still

Examples:

• Waiting for work assignments
• Waiting for meetings to start
• Waiting for Parts to install
• Waiting for signatures
Waste #4: Not Tapping Potential

Waste due to misuse of human potential & resistance to change, such as:

- Not utilizing human potential
- Not soliciting and using the ideas of others
- Not engaging people in the change process
- General resistance to change

Examples in, SHOPS environments:

- Not using outside resources
- Squashing the ideas of new teammates
- Performing tasks ‘your way’ (not utilizing the approved Standardized Work)
- Not developing your people (or yourself!) for future opportunities
Waste #5: Transportation

This is waste due to movement between processes, such as:

- People and product moving between workstations
- People and product moving within work areas
- Movement of product between functional areas

Examples in SUPPORT SYSTEMS:

- Traveling to remote meetings
- Moving paper around the system
- Moving electronic information around the system
Waste #6: Inventory

This is waste related to materials and product in excess of immediate requirements, such as:

- Raw materials
- WIP (work-in-process)
- Finished goods

### Examples in SUPPORT SYSTEMS:

- Office supplies
- Historical report copies
- Email
- Computer/desktop files
Waste #7: Motion

This is waste related to ergonomics and movement within tasks, such as:

• Hand and arm motion
• Machine stroke/cycle
• Control movement on equipment

<table>
<thead>
<tr>
<th>Examples in SUPPORT SYSTEMS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Repetitive motion can result in ‘carpal tunnel’ syndrome</td>
</tr>
<tr>
<td>• Activities which promote poor posture can increase stress, risk of injury</td>
</tr>
<tr>
<td>• Repetitive motion adds time to tasks</td>
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</tbody>
</table>
Waste #8: Excess Processing

This is waste related to misunderstanding customer requirements, such as:

- Cleaning in excess of requirements (and re-cleaning)
- Inspections
- Moving product, then moving again
- Generating trash
- Other non-value-added steps

Examples in SUPPORT SYSTEMS:

- Signature requirements for minor purchases
- Inspections
- Auto-generated reports
Depending on where you are in the process, some wastes affect you more than others.

In the **value chain**, OVERPRODUCTION is generally seen as the ‘worst’ waste, because it can be the **root cause** all of the other wastes.

In **support functions**, EXCESS PROCESSING is generally seen as the ‘worst’ waste.

REMEMBER, all 8 wastes exist in every process, to one degree or another!
How to Use the Concept of 8 Wastes

• As a Leader:
  o Challenge your teams to continually identify waste
  o Empower project and workshop teams to redesign processes to eliminate wastes from systems

• As a Team Member:
  o Question everything!
  o Point out waste at every opportunity!
Summary

• *Customers* define value as those elements for which they are willing to pay

• If you question whether or not something adds value, ask, “Would our customer want more of it?”

• Waste includes all those system elements for which the customer would rather not pay

• There are 8 kinds of waste:

• Eliminating waste is everyone’s responsibility

  - Defects
  - Over-production
  - Waiting
  - Not tapping potential
  - Transportation
  - Inventory
  - Motion
  - Excess processing
Preventive Maintenance

*The single most important key to successful fleet management and performance*
Review Current PM Program

• Plans and procedures:
  o Review written procedures for vehicles and equipment; and
  o Review OEM technical manuals and literature
  o Review training records and technician training strategy
  o Review shop layout and parts inventory operations
Review Current PM Program

• Gap Analysis of Current PM Program:
  o Meet with management team and key stakeholders (including technicians and supervisors) to determine program goals and expectations; and
  o Identify current program strengths and weaknesses and review opportunities using Mercury’s vast industry knowledge of what should be included in a “Best in Class” PM program
Establishing PM Policies and Procedures

- Regulatory compliant
- Sets comprehensive standards
- Team trained to standards
- Dynamic
- Acknowledged by personnel
Work-flow Standardization

- Visual flow
- Reduces people, processes and technology waste (i.e., Lean, Six Sigma)
- Promotes continuous improvement
Orderly Approach to PM Inspection Increases Technician Efficiency and Productivity
PM Design: Maximizing Productivity, Quality, and Minimizing Waste

Properly sequenced PM steps for efficiency: Reduction of excess motion

Illustrative wrench time analysis to demonstrate excessive movement from poor sequencing

Can move from x% to y% of time spent walking

Getting to best practice
- Refresh sequence of PM steps
- Update materials including training video and module to current standards
- Conduct analysis of technician wrench time and efficiency

What it is
Training program and reference material to ensure proper sequence of PM steps to drive greatest technician efficiency
Process Mapping w/Spaghetti Diagram and Time/Motion Studies Optimize Efficiencies

How?

- Sketch work area (i.e., benches, toolboxes, parts room, etc.) before you begin your observation
- Observe technician movements to identify wasted motion
- Track tech activities to determine value add vs. non-value added (i.e., waste)
- Draw tech movements in a “spaghetti diagram”
- Identify activities that generate the most wasted movement / time (e.g., trips to the parts room)
- Review diagram / data after observations to highlight Non-value added movement
What Tasks are in a PM Program?

- Inspect
- Change
- Clean
- Lubricate
- Adjust
- Prevent/Predict
- Communicate
- Report
Formal PM Checklists Should be Used to Ensure Standard Processes are Followed

**Objective**
- OEM/GOV based task list – All EQ types have own list
- Step-by-step process
- Tasks should be numbered for easy reference
- Ensure regulatory compliance
- Include driver communication (DVIR)

**Benefits**
- Create audit trail
- Increase productivity
- Mitigate liability
- Reduce breakdowns and lower costs
Daily PM Reporting is Critical to Proactive Scheduling, Leveling, and Compliance

Objective

- Schedule PMs in advance
- Review compliance and non-compliance
- Document historical trends
- Promote shop’s value

Benefits

- Identifies gaps and opportunities
- Inform stakeholders
- Promotes continuous improvement
PM Manuals and Multi-Echelon Task Lists
Strengthen Quality and Equipment Reliability

- PM tasks included in each subsequent PM
- PM A tasks included in PM B tasks
- PM B tasks included in PM C tasks
Formal PM Reporting

Objective:
• Schedule PMs in advance
• Review compliance and non-compliance
• Document historical trends
• Promote shop’s value

Benefits:
• Identifies gaps and opportunities
• Inform stakeholders
• Promotes continuous improvement
Multiple Echelon Task Lists

- PM tasks included in each subsequent PM
- PM A tasks included in PM B tasks
- PM B tasks included in PM C tasks
- Etc…
Dedicated PM Bay Setup

Advantages of a Dedicated PM Bay?
- Reinforces PM focus
- Enables Part’s Kitting & Tool Staging
- Maximizes productivity
- Improves employee productivity & safety
Oil Analysis Benefits

- **Enhances Equipment Life & Reliability**
  1. Ensures proper lubrication
  2. Detects excessive wear
  3. Spots contamination

- **Extends Oil Life**
  1. Monitors oil condition
  2. When needed, treats and cleans
  3. Allows longer change intervals

- **Reduces Downtime**
  1. Spots lubrication problems
  2. Corrects problems before serious issues occur
  3. Saves components

Can double change intervals
450 – 900 hours
Summary of PM Best Practices

- Organization focus is clearly on PM services
- Based on OEM recommended interval requirements
- Meets customer convenience (e.g., Swing/Graveyard shift, weekend focus)
- Customers receive advance notice of PMs scheduled
- Ensure safety practices in place (e.g., LOTO, etc.)
- Has a dedicated bay with part kits staged in advance to minimize steps and lost time
- Uses detailed “Checklist” with symbols (e.g., \(\checkmark\), X, O) and form for follow-on repairs
- Sequential flow for greater productivity/fewer errors
Summary of PM Best Practices

- Program incorporates multiple echelons of progressive tasks
- Reports missed and overdue PMs to users
- Work orders used to record PM and follow on maintenance activities
- PM inspection is separated from defects discovered for follow on repairs for greater benchmarking
- Uses DVIRs, history, recalls and campaign data
- Procedures identify vehicles scheduled for replacement, check for overdue PMs, and check for warranties
PM Training
Classroom and Practical Training Examples to Drive Standard PM Performance
Good Training Programs are Highly Dependent on Durable Process

- Existence of robust policies and procedures in a PM Manual
- Set standards with detailed step by step work instructions
- Commit to ongoing technician training (e.g., Classroom and Practical)
- Leader enforcing commitment to Quality Control
- Team accountability for work performed
Technician PM Training Standards: What to look for during the inspection process?

Check Tires/Valve Caps Wheels/Rims:

a. Tread minimums are 5/32 front and 3/32 rear unless otherwise directed.
b. Check tires for excessive curbing, cuts, general sidewall condition.
c. Check wheels around lug nuts for cracking, corrosion and rust.
d. Check tires for an irregular wear pattern.
e. Check wheel alignment to air inner dual.
f. Check and record tire air pressure, correct as needed.
g. Check valve stem condition and assure steel valves are used.
h. Check that tires are properly matched, size and tread design.

Measure Tread in three (3) places.
Tech Training Standards – Testing is Critical to Reinforce Set Standards

• Question 1 (PM)
  
  o What is the minimum tire tread depth permitted by DOT on all steer axle tires on trucks, tractors, or buses?

  A. 1/32 in.       B. 4/32 in.

Certifying PM Technicians

- Safety focused
- Qualified
- Experienced
- Accountable
- Productive
- Standardized
PM – Keeping Score

- Capture accurate data
- Define metrics
- Set goals
- Review progress
- Improve performance

PM Related 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
PM Compliance
On-time PMs reduce unnecessary costs and downtime

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

Goal = > 95%

YOY ~12% improvement in PM Compliance!
Early PM Avoidance
Early PMs create unnecessary costs and technician labor

Goal = < 5%

This reduces labor, materials and costs needed to PM assets!
Late PM Avoidance
Late PMs cost money and risk unscheduled repairs

What does this mean?
_This lessens the risk of an unscheduled repair and reduces costs!_

YOY 7.3% decrease in late PMs

Goal = 0% (No late PMs)