# Course Schedule – Day 1

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Presenter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductions and Discussion of Course</td>
<td>8:30 – 9:00</td>
<td>Paul</td>
</tr>
<tr>
<td>Objectives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elements of an Effective Fleet Management</td>
<td>9:00 – 10:30</td>
<td>Mark/Paul</td>
</tr>
<tr>
<td>Program</td>
<td></td>
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</tr>
<tr>
<td>Break</td>
<td>10:30 – 10:45</td>
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<tr>
<td>Elements of an Effective Fleet Management</td>
<td>10:45 – 11:30</td>
<td>Paul/Mark</td>
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<tr>
<td>Program (continued)</td>
<td></td>
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<tr>
<td>Key Trends in Fleet Management</td>
<td>11:30 – 12:00</td>
<td>Paul/Mark</td>
</tr>
<tr>
<td>Lunch</td>
<td>12:00 – 1:00</td>
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</tr>
<tr>
<td>Computerized Fleet Management Systems and</td>
<td>1:00 – 2:30</td>
<td>Mark</td>
</tr>
<tr>
<td>Analytical Tools</td>
<td></td>
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<tr>
<td>Break</td>
<td>2:30 – 2:45</td>
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</tr>
<tr>
<td>Performance Measurement/ Benchmarking</td>
<td>2:45 – 4:00</td>
<td>Paul</td>
</tr>
<tr>
<td>Supplier Management</td>
<td>4:00 – 5:00</td>
<td>Paul</td>
</tr>
<tr>
<td>Adjourn for Day</td>
<td>5:00</td>
<td></td>
</tr>
<tr>
<td>Course Title</td>
<td>Time</td>
<td>Presenter</td>
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<tr>
<td>------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Managing Fleet Size, Composition, and Utilization</td>
<td>8:30 – 9:00</td>
<td>Paul</td>
</tr>
<tr>
<td>Fleet Analytics</td>
<td>9:00 – 10:00</td>
<td>Mark</td>
</tr>
<tr>
<td>Break</td>
<td>10:00 – 10:15</td>
<td></td>
</tr>
<tr>
<td>Determining Optimal Vehicle Replacement Cycles</td>
<td>10:15 – 11:00</td>
<td>Paul</td>
</tr>
<tr>
<td>Alternative Approaches for Financing Vehicle Acquisitions</td>
<td>11:00 – 11:30</td>
<td>Paul</td>
</tr>
<tr>
<td>Developing a Business Case for Fleet Replacement and Renewal</td>
<td>11:30 – 12:00</td>
<td>Paul</td>
</tr>
<tr>
<td>Lunch</td>
<td>12:00 – 1:00</td>
<td></td>
</tr>
<tr>
<td>Developing a Fleet Management Business Plan</td>
<td>1:00 – 2:15</td>
<td>Paul</td>
</tr>
<tr>
<td>Break</td>
<td>2:15 – 2:30</td>
<td></td>
</tr>
<tr>
<td>Business Plan Group Exercise</td>
<td>2:30 – 3:30</td>
<td>Paul</td>
</tr>
<tr>
<td>Fleet Professionalism in China</td>
<td>3:30 – 4:30</td>
<td>Mark</td>
</tr>
<tr>
<td>Wrap up and Adjourn</td>
<td>4:30 – 5:00</td>
<td></td>
</tr>
</tbody>
</table>
Keys to the Success of this Course for You

- Think about the relevance of the concepts, strategies, and techniques presented here to your organization – no matter how large or small, or how experienced in or new to the realm of professional fleet management

- Think about who in your organization needs to understand and support the elements of an effective fleet management program

- Participate – ask questions, share experiences and ideas
ELEMENTS OF AN EFFECTIVE FLEET MANAGEMENT PROGRAM
Fleet Architecture

Fleet Architecture

Vehicle Allocation & Use Policy
- Vehicle Requirement
- Salary Packaging

Vehicle Requirement
- Novated Vehicle Lease

Vehicle Entitlement
- Fleet Size
- Fleet Mix
- Fleet Selection

Vehicle Allocation Management
- Permanent Allocation
- Temporary Allocation
- Shared Allocations

Vehicle Use
- Fleet Energy Management
- Fleet Emissions Management
- Cost/Kilometre
- Emissions/Kilometre
- Vehicle/Salary Cost Ratio
- Vehicle/Employee Ratio

Vehicle Use Management
- Vehicle Use Monitor
- Electronic Logbook

Vehicle Utilisation Management
- Fleet Utilisation Management

Fleet Financial Management
- Fleet Replacement Policy
- Fleet Funding Policy
- Fleet Risk Policy

Fleet Cycle Management
- Fleet Capital Management
- Fleet Risk Management

Energy Inputs
- Capital Inputs
- Management Inputs

Fleet Size & Mix Optimisation
- Fleet Finance & Risk Optimisation
- Fleet Use Optimisation

Fleet Replacement Optimisation
Business Process Models

ACCIDENT MANAGEMENT BUSINESS PROCESS MODEL

- DRIVER TRAINING
- DRIVER BEHAVIOR
- SAFE DRIVER REWARDS
- UNSAFE DRIVER PENALTIES
- VEHICLE TYPE
- VEHICLE SAFETY ATTRIBUTES
- HUMAN INJURY TYPE

- NUMBER OF COLLISIONS
- SEVERITY OF COLLISION
- COST PER COLLISION
- TOTAL VEHICLE COLLISION COSTS
- INSURANCE PREMIUM
- INSURANCE CLAIM
- INSURANCE EXCESS
- NUMBER OF CLAIMS
- VEHICLE DOWNTIME DURATION
- REPLACEMENT VEHICLE COSTS
- REPLACEMENT VEHICLE SUPPLY

- changes
- influences
- in relation to
- determined by

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Fleet Management Modeling

DRIVER BEHAVIOR PREDICTIVE MODELING

can be modified by

could be assessed by

could be assessed by

classified by

measured by

measured by

DRIVER BEHAVIOR

INFRINGEMENTS
COST OF INFRINGEMENTS
NUMBER OF INFRINGEMENTS
TYPE OF INFRINGEMENTS

COST OF COLLISIONS
TYPE OF COLLISIONS
NUMBER OF COLLISIONS

SURVEYS

DRIVER TESTS

DRIVER BEHAVIOUR CHANGE PROGRAMS

DRIVER SAFETY AWARENESS PROGRAMS
DRIVER TRAINING PROGRAMS

DEMONSTRATED DRIVER BEHAVIOUR CHANGE

DRIVER CLASSIFICATION

VERY HIGH COLLISION PROBABILITY
HIGH COLLISION PROBABILITY
AVERAGE COLLISION PROBABILITY
LOW COLLISION PROBABILITY
VERY LOW COLLISION PROBABILITY

MERCURY
**Salvage Value Business Logic**

**Simulcast Auctions**
- Introduces
- Increases

**Number of Buyers**
- Increases
- Increases

**Bidding Competition**
- Increases

**Buyer Concentration**
- Increases

**Single Auction Location Sales**
- Reduces

**Auction Vehicle Mix**
- Influences

**Auction Vehicle Supply Levels**
- Reduces

**Gross Salvage Prices**
- Determines

**Net Salvage Prices**
- Increases

**Vehicle Transport Costs**
- Increases

**Vehicle Sale Timing**
- Influences
Fleet Lease Systems Architecture

System Architecture

CRM System
- Opportunity Management
- Campaign Management
- Prospect Management

CRM/Fleet Interface

Fleet System
- Customer Management
- Quotations Management
- Order & Delivery
- Vehicle Funding
- Cost & Fleet Management
- Customer Billing
- Returns & Terminations
- Customer Administration
- Lease Administration & Management
- Lease Accounting

Funding Management System
- Funds Administration
- Funds Management

FMS/Fleet Interface

Credit Management System
- Credit Assessment
- Credit Management

FMS/Accounting Interface

Accounting System
- Human Resources
- Business Planning
- Customer Lending
- Asset Funding
- Supplier Payment (Creditors)
- Customer Receivables (Debtors)
- General Ledger
- Asset Management
- Payroll
- Budgets
- Forecasts

Fleet/Accounting Interface

Accounts Payables
Accounts Receivables
Provisions
Fleet System Improvement Plan

COMMERCIAL VEHICLE INFORMATION SYSTEM:
PHASE 1 – PLANNING, FUEL AND REPLACEMENT SYSTEMS

<table>
<thead>
<tr>
<th>1Q 2006</th>
<th>2Q 2006</th>
<th>3Q 2006</th>
<th>4Q 2006</th>
<th>1Q 2007</th>
<th>2Q 2007</th>
</tr>
</thead>
</table>

**FLEET PLANNING SYSTEM PROJECT**

- FLEET PLANNING SYSTEM REQUIREMENTS
- FLEET PLANNING SYSTEM Prototype Development $30,000
- FLEET PLANNING SYSTEM IMPLEMENTATION $25,000
- FLEET PLANNING LIVES $150,000 & 8% INTEREST

**FUEL MANAGEMENT SYSTEM PROJECT**

- FUEL SYSTEM PROCESS AGREEMENT
- BPJA CONSULTING PROJECT $20,000
- FUEL SYSTEM DEVELOPMENT SOFTWARE DEVELOPMENT PROJECT $100,000
- FUEL SYSTEM DEVELOPMENT IMPLEMENTATION PROJECT $30,000
- KILOMETRE UPDATE PROPOSAL SERVICE $48,000 PER YEAR
- FUEL SYSTEM LIVES $200,000 12 MONTHS

**VEHICLE REPLACEMENT SYSTEM PROJECT**

- VEHICLE REPLACEMENT PROCESS REQUIREMENTS
- VEHICLE REPLACEMENT PROCESS AGREEMENTS
- BPJA CONSULTING PROJECT $40,000 ($20,000)
- VEHICLE REPLACEMENT PROCESS SYSTEM DEVELOPMENT PROJECT $150,000
- VEHICLE REPLACEMENT PROCESS IMPLEMENTATION PROJECT $30,000
- VEHICLE REPLACEMENT SYSTEM PROJECT $200,000 12 MONTHS
Fleet Planning Model Design

Replacement Class, Mode & Type Determination

- Define Replacement Class
- Select Replacement Class
- Select Replacement Cycle Rules
- Define Replacement Mode
- Select Replacement Mode
- Define Replacement Type
- Select Replacement Type

Replacement Cycle Selection Input
- Use/Not Use
- Time
- Input Age
- Min/Max
- AND/OR
- Use/Not Use
- Distance
- Input KMS
- Min/Max

Replacement Mode Selection Input
- Use/Not Use
- Time
- Input Age Add/Subtract
- AND/OR

Replacement Type Selection Input
- Like For Like
- Like For Other

Replacement Cycle Selection Output
- Time Only
- Minimum Time and Distance
- Maximum Time and Distance

Replacement Cycle Mode Output
- Early Retirement Age Only
- Early Retirement Distance Only
- Late Retirement Age Only
- Late Retirement Distance Only
- Early Retirement Age and Distance
- Late Retirement Age and Distance

Replacement Type Output
- Normal Retirement
- Replacement Type Table
Vehicle Emissions Reduction

REDUCE VEHICLE EMISSIONS

- Reduce Total Distance Traveled
- Reduce Fuel Consumption Per Vehicle per Distance
- Reduce Emissions Per Volume of Fuel Consumed

- Reduce Number of Vehicles
- Reduce Distance Per Vehicle
- Change Driver Behaviour
- Low Emission Fuel
- Low Consumption Vehicle

Change Use

- Private Use
  - 68%

Change Fuel

- LPG
  - 12%

Change Vehicle

- Small 4 Cylinder
  - No Vehicles

Emission Solution Efficiency
Emission Solution Cost
Speed to Implement
Ease to Implement
Measurement Efficiency
Management Efficiency
Common Misconceptions About Fleet Management

- Fleet management is not important
- Fleet management is not complicated
Why is fleet management (thought to be) not important?

- The fleet operation often is a cost, not a revenue or profit, producer.
- Fleet management usually is an internal support (“back office”) function whose immediate customers are fellow employees.
- Fleet costs are often small in relative, enterprise-wide terms, even if large in absolute terms.
- The contribution of the fleet (and, hence, fleet management) to the fulfillment of enterprise-wide mission(s) often is not clear or well understood.
- Fleet management is not viewed as a “real” profession.
Why is fleet management important?

- Customer service
- Customer confidence
- Organization image
- Employee productivity
- Employee efficiency
- Employee safety
- Public safety
- Cost control
- Regulatory compliance
What’s so complicated about managing a fleet?

Fleet management involves performing two distinct but interdependent types of activities:

- Asset Management
- Enterprise Management
Asset Management Processes

- Vehicle Assignment
- Routing & Scheduling
- Vehicle Acquisition
- Fuel Card Management
- Accident Management
- Replacement Planning
- Operator/Driver Training
- Vehicle Maintenance & Repair
- Parts Procurement & Supply
- Vehicle Operation
- Outsourcing
- Mechanic Operation
- Motor Pool Management
- Vehicle Utilization Control
- Vehicle Outsourcing
- Bulk Fuel Procurement & Dispensing
- Licensing & Titling
- Vehicle Disposal
- Mileage Reimbursement

Sound Vehicle Performance
Enterprise Management Processes

- Risk Management
- Business Planning
- Professional Certification
- Training
- Customer Relationship Management
- Management Reporting
- Management Analysis
- Cost Analysis & Control
- Fund Management & Accounting
- Charge-Back Rate Development
- Personnel Management
- Performance Measurement & Benchmarking
- Contract Management
- Budgeting
- Sourcing/Purchasing
- Performance Reviews
- Information Systems
- Customer Surveys
- Billing & Collections
- Service Level Agreements
- Sound Fleet Management

Enterprise Management Processes
Enterprise Management Activities that Can Have a Big Impact on Fleet Management Practices

- Budgeting
- Finance and Accounting
- Asset Management
- Sourcing
  - Procurement
  - Supplier Management and Payment
- Human Resources Management
- Information Technology Management
- Risk Management
- Facility Management
How do you know if you have an effective fleet management program?

<table>
<thead>
<tr>
<th>Low Quality</th>
<th>High Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Cost</td>
<td>✓</td>
</tr>
<tr>
<td>High Cost</td>
<td>✗</td>
</tr>
</tbody>
</table>
An Effective Fleet Management Program Furnishes Assets that are...

1. Suitable
2. Available
3. Reliable
4. Safe
5. Economical
6. Eco-friendly
A Few Questions About Fleet Management Practices in Your Organization

- Do we have a designated fleet manager?
- If not, who manages the fleet?
- Where did they acquire their fleet management expertise?
- What else do they manage (if anything)?
- Do we have a fleet capital and/or operating budget?
- Documented fleet management policies and procedures?
- A fleet management information system?
- Fleet cost and performance measures and reports?
A Few More Questions

- Do we have the right number of vehicles and pieces of equipment in our fleet?
- Is this number growing? Shrinking?
- Do we have the right types of vehicles?
- Are they reliable?
- Are they safe to operate?
- Are they safely operated?
- Do they comply with applicable rules and regulations?
Some Final Questions

- How much do we spend on our fleet?
- Are these expenditures increasing or decreasing?
- Are they reasonable?
- Who is accountable for them?
- Can we reduce them?
- Which ones? How?
- Will cost reductions affect fleet performance? Customer service?
Key Fleet Management Functions

Vehicle Assignment
- Vehicle acquisition justification
- Acquisition alternatives analysis and decision making

Vehicle Acquisition and Disposal
- Vehicle specifications development and selection
- Purchase contract establishment and management
- Vehicle upfitting and in-servicing
- Commercial vehicle rental
- Vehicle remarketing/disposal

Vehicle Operation Management
- Operator licensing and certification
- Operator training
- Pre-/post-trip inspection and record keeping
- Vehicle misuse/abuse management
- Accident repair and claims management
- Fleet safety management
Key Fleet Management Functions

Vehicle Utilization Management
- Vehicle utilization guidelines
- Routing, scheduling, and dispatching management
- Vehicle utilization data capture
- Investigation of utilization "anomalies"
- Vehicle reassignment or disposal

Vehicle Maintenance and Repair
- Pre-/post-trip inspection and defect reporting
- Preventive maintenance programs
- Work planning and scheduling
- Service writing and job assignment
- Maintenance and repair service delivery
- Mechanic supervision
- Road call management
- Field service management
- Warranty management
- Quality assurance
Key Fleet Management Functions

Fleet Maintenance Services Supplier Management
- Outsourcing v. insourcing determination
- Vendor certification / pre-qualification
- Contract establishment and management
- Service authorization
- Vendor performance management

Fleet Maintenance Parts Provisioning
- Contract establishment and management
- Ad hoc purchasing
- Inventory management and control
- Parts disbursement

Fleet Fueling
- Contract establishment and management
- Bulk fuel inventory management and control
- Bulk fuel facility operation and maintenance
- Commercial fuel card program management
Key Fleet Management Functions

**Fleet Replacement**
- Replacement criteria development
- Replacement planning
- Vehicle condition assessment and replacement budgeting
- Vehicle capital financing alternatives
- Replacement funding levels

**Fleet Personnel Management**
- Organization structure
- Staff levels, assignment, and utilization management
- Employee classification and compensation
- Employee training and professional development

**Fleet Facility and Equipment Management**
- Facility design, construction, and condition
- Facility maintenance and housekeeping
- Shop tools and equipment
- Shop safety management
Key Fleet Management Functions

Fleet Information Management
- Fleet management information systems
- IT infrastructure and support services
- Ad hoc management analysis and reporting

Fleet Customer Relationship Management
- Transaction-based communication
- Operator satisfaction measurement
- Ongoing relationship management

Fleet Financial Management
- Budgeting
- Cost charge-back system design and management
- Revolving fund management
- Cost control
Recap: Key Elements of an Effective Fleet Management Program

- Understanding of fleet management goals (quality versus cost)
- Recognition of the need to promote fleet management as a distinct, important, and complex area of endeavor
- Formally designated responsibilities and authority
- Dedicated budget and cost accounting
- Documented policies and procedures
QUESTIONS
KEY TRENDS IN FLEET MANAGEMENT
Traditional Concerns of Fleet Managers

- Asset management
  - Acquisition
  - In-servicing
  - Deployment/utilization
  - Maintenance and repair
  - Fueling
  - Replacement
  - Disposal
Concerns of Fleet Managers Today

- Asset management
- Financial management
- Decision maker management
- Customer management
- Personnel management
- Supplier management
- Information management
Asset Management Challenges

- Making sense of new automotive and fuel technologies
- Building a sustainable, green, or eco-friendly fleet operation
- Justifying fleet size, composition, and utilization
- Justifying vehicle replacement cycles/policies
- Determining which activities to outsource
Financial Management Challenges

- Quantifying, justifying, and controlling fleet costs
- Distributing costs to fleet users
- Managing dedicated fleet (e.g., “revolving”) funds
- Working through the budgeting process and influencing funding decisions
- Understanding alternative capital financing approaches
Decision Maker Management Challenges

- Articulating the value of the fleet
- Advocating for the needs of fleet users
- Providing enterprise-wide information
- Exerting influence over decision making
- 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’ asset and service needs and how to meet them
- Understanding where you can add value to fleet management processes and where you can’t
- Demonstrating cost competitiveness
- Providing information and technical guidance
Personnel Management Challenges

- Recruiting
- Developing
- Training and Certifying
- Retaining
Information Management Challenges

- Optimizing data capture and processing activities
- Turning data into information and information into insight
- Using information to foster accountability – upward, downward, outward
- Articulating return on employee investment
Effective Fleet Management Today Requires Understanding Trade-offs

- Asset management versus business management
- Value-adding activities versus being a “jack of all trades”
- In-house versus outsourced activities
- Processing data versus producing and using information
Effective Fleet Management Requires Understanding Your Core Competencies

- Operational knowledge
- Customer knowledge
- Management knowledge
- Political knowledge
- Institutional knowledge
Effective Fleet Management Requires Focusing on Core Fleet Management Roles

- Managing vehicle performance
- Managing customer satisfaction
- Managing management satisfaction
- Managing employee performance
- Managing costs
- Producing information
Move to Modern Fleet Management

Static to Dynamic
- Uploads to Integration
- Real Time Data & Decisions

Past to Predictive
- Look Forward (Predict)
- Better Decisions (Optimise)

Corporate FM to Personal FM
- Novated Leases
- User to Owner
<table>
<thead>
<tr>
<th>Move to Modern Fleet Management</th>
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</thead>
<tbody>
<tr>
<td><strong>In-house to Hosted Fleet Systems</strong></td>
</tr>
<tr>
<td>• Data Integrated Software Services</td>
</tr>
<tr>
<td>• New Information Services</td>
</tr>
<tr>
<td><strong>Fleet Decision Support Systems</strong></td>
</tr>
<tr>
<td>• Prediction Software</td>
</tr>
<tr>
<td>• Optimisation Software</td>
</tr>
<tr>
<td><strong>Real Time Vehicle Management</strong></td>
</tr>
<tr>
<td>• Use Informatics</td>
</tr>
<tr>
<td>• Fleet Systems Networking</td>
</tr>
<tr>
<td>• Dynamic Decisions</td>
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</tbody>
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Vehicle Use Management

- Vehicle Use Monitors
- Fleet Mix Optimisation
- Vehicle Use Optimisation
- Fleet Size Optimisation
New Information Services

- Cost Prediction (WOLC) Services
- Intelligent Remarketing Decision Services
- Vehicle Selection Decision Services
Environmental Emphasis

- Vehicle Cost Management
- Vehicle Use Management
- Vehicle CO₂ Management
- Vehicle Selection Management

Fleet Environment
Interesting Ideas

- Tradable Vehicle Use Rights
- Vehicle Allocation & Share Types
- Dynamic Use Management
- Vehicle Supply Optimisation
- Smart Demand Management
- Variable Replacement Cycles
Fleet Architecture

- Mobility Requirements
- Fleet Demand Management
- Fleet Supply Management
- Fleet Responsibility Management

Fleet Architecture
COMPUTERIZED FLEET MANAGEMENT INFORMATION SYSTEMS AND ANALYTICAL TOOLS
Fleet Management Systems

- Fleet Management Systems (FMS) Landscape
- FMS-What they do (and what they don’t do)
- FMS-What are key decisions to make
- FMS-Who gets involved in the decision making
- FMS-Building the Business Case for a new FMS
What is FM really about?

- Fleet Policy (Requirements, Provision, Remuneration)
- Fleet Strategy (Size, Mix, Use, Select, Replace)
- Fleet Management (Use, Costs, Capital)
- Fleet Information (Policy, Strategy, Management)
- Fleet Operations (Buy, Maintain, Sell)
- Fleet Administration (Register, Insure)
- Fleet Information (Operations, Admin, Accounting)
- Fleet Accounting (Operating Costs, Capital Costs)
Why do you need a FMS?

- Collect and consolidate “truckloads” of vehicle, cost and transaction data
- Assist in fleet administration and compliance activities
- Respond to ad-hoc management queries
- Sense you have the fleet under control
- Timely accurate information to make decisions
- Develop improved fleet management strategies
Who needs fleet information?

- CIO
- Fleet Manager
- Human Resources
- CEO
- CFO
Why do we need a FMS?

- We need information on our fleet!
- We need a Fleet Management System!
- What do we want the FMS to do?
- How do you find the best FMS?
What They Do

- Store all Vehicle Data in one System
- Facilitate Vehicle Cost Control
- Provide Management Reports
- Aid Decision Making

FMS
What are the major decisions?

- Hosted OR In-House
- Single OR Multiple Users
- One Location OR Multiple Locations
- Centralised OR Decentralised

FMS Decision
Fleet Systems Decisions

Fleet Management Systems

Build Your Own Fleet System

In-House System Development

Outsource System Development

Buy a Fleet System

On-Premises System

On-Demand Service
## Selection Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Your Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Users</td>
<td>5</td>
</tr>
<tr>
<td>Number of Locations</td>
<td>4</td>
</tr>
<tr>
<td>Number of Assets</td>
<td>1,200</td>
</tr>
<tr>
<td>Type of Assets</td>
<td>Cars, Trucks, Equipment</td>
</tr>
<tr>
<td>Number of Fleet Managers</td>
<td>3</td>
</tr>
<tr>
<td>Systems Environment</td>
<td>Windows</td>
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<tr>
<td>FMS Systems Budget</td>
<td>$25,000</td>
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</tbody>
</table>
Who gets involved in the decision?
What are the major issues?

- Requirements (Your Needs)
- Budget (Your Spend)
- Software (Your Supplier)
- Implementation (Your System)

FMS Issues
System Integration

- Asset Management Systems
- Fleet Management System
- Human Resources Systems
- Workshop Systems
- Accounting Systems
The Business Case for a new FMS

- Benefits
- Costs
- Returns
- Risks
### FMS Business Case - Benefits

<table>
<thead>
<tr>
<th>Why Buy</th>
<th>Business Issue</th>
<th>Desired Outcome</th>
<th>Value Metric</th>
<th>Value Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced Fleet Costs</td>
<td>Requirement to reduce fleet costs</td>
<td>Fleet Cost reduction by 5%</td>
<td>Total Fleet Costs per Year</td>
<td>Saving $500,000</td>
</tr>
<tr>
<td>Reduced Fleet Emissions</td>
<td>Requirement to reduce CO2</td>
<td>Fleet Emissions by 10%</td>
<td>Total Fleet CO2 per Year</td>
<td>Reduction 1200 tonnes CO2</td>
</tr>
<tr>
<td>Improved Vehicle Use Efficiency</td>
<td>Requirement to reduce inappropriate use</td>
<td>Fleet Size reduction by 2%</td>
<td>Total Fleet Size</td>
<td>Reduction 10 Vehicles $120,000</td>
</tr>
<tr>
<td>Improved Management Reporting</td>
<td>Requirement to improve fleet reporting</td>
<td>Regular Fleet Use and Cost Reports</td>
<td>Reporting Quality Index</td>
<td>Index up 8%</td>
</tr>
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</table>
### FMS Business Case - Better Decisions

<table>
<thead>
<tr>
<th>Why Buy</th>
<th>Business Issue</th>
<th>Desired Outcome</th>
<th>Value Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better Vehicle Selection Decisions</td>
<td>Improved Fleet Mix</td>
<td>Optimum Fleet Mix</td>
<td>Reduced Costs &amp; Emissions</td>
</tr>
<tr>
<td>Better Vehicle Replacement Decisions</td>
<td>Improved Vehicle Replacement</td>
<td>Optimum Vehicle Replacement Cycles</td>
<td>Reduced Capital in Fleet</td>
</tr>
<tr>
<td>Better Vehicle Use Decisions</td>
<td>Inappropriate Vehicle Use</td>
<td>Optimum Vehicle Use &amp; Size</td>
<td>Reduced Fleet Size</td>
</tr>
<tr>
<td>Flexible Vehicle Supply Decisions</td>
<td>Private &amp; Commuter Use Employer Vehicles</td>
<td>Reduce Employer Supplied Vehicles</td>
<td>Employee Supplied Vehicles Ratio</td>
</tr>
</tbody>
</table>
# Lessons-12 FMS Implementations

<table>
<thead>
<tr>
<th>Lesson</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Architecture Review</td>
<td>Where is fleet data collected, stored and reported</td>
</tr>
<tr>
<td>Write Business Use Cases</td>
<td>Detail how you want to use the system</td>
</tr>
<tr>
<td>Prepare Implementation Plan</td>
<td>Plan how the FMS will live in your organisation</td>
</tr>
<tr>
<td>Investigate Software Heritage</td>
<td>Find out who and why it was developed</td>
</tr>
<tr>
<td>Vendor Knowledge</td>
<td>How much does the vendor know about FM</td>
</tr>
<tr>
<td>Local Installed Base</td>
<td>How many current FM clients use the FMS now</td>
</tr>
<tr>
<td>Development Cycle</td>
<td>Current version in the software development cycle</td>
</tr>
<tr>
<td>Customer References</td>
<td>You select the customers you want to reference</td>
</tr>
<tr>
<td>Beware the Demonstration</td>
<td>Vendor to run your scenarios in the FMS</td>
</tr>
<tr>
<td>Try before you Buy</td>
<td>Use Trial Software before Purchase</td>
</tr>
<tr>
<td>Use Fleet Systems Consultant</td>
<td>Jointly invest (50%/50%) in FSC for best result</td>
</tr>
</tbody>
</table>
Fleet Systems Acquisition Process

- Needs
- Wants
- Wishes

Requirements

Investigation
- Vendors
- Software
- Services

Selection

Demonstrations
- Negotiations

Contracts
- License Agreements

Implementation

Planning
- Training

Support
- User Training
- Software Upgrades
Trends in Fleet Management Systems

- Software Costs Declining
- Hosted Services gaining Share
- FMS Integration improving
- Automated Real Time Processes
QUESTIONS
Determining Optimal Vehicle Replacement Cycles

\[
EAC = NPV \times \frac{r(1+r)^n}{(1+r)^n-1}
\]

Where:

- **EAC** is the equivalent annual cost of a stream of future costs
- **NPV** is the present value of a stream of future costs
- **r** is the discount rate less inflation
- **n** is the length in years of the stream of costs
Computing Motor Pool Rental Rates

\[ R_i = \frac{TC_i}{U_i} \]

where:

- \( R_i \) is the rental rate for a vehicle (or piece of equipment) of type \( i \)
- \( TC_i \) is the projected annual total cost of providing all vehicles of type \( i \)
- \( U_i \) is the projected annual utilization of all vehicles of type \( i \)
Computing Mechanic Staffing Requirements

\[ M = \frac{\sum H_A N_A}{P} \]

Where:

\( M \) is the number of FTE mechanics needed.

\( H_A \) is the average number of direct in-house M&R labor hours per year to maintain and repair each vehicle of type "A".

\( N_A \) is the number of assets of type "A" typically receiving all in-house maintenance and repair services at the maintenance facility for which staffing requirements are being computed.

\( P \) is the average number of hours per year that each mechanic working in this facility can devote to direct M&R activities.
Relationship of Preventive Maintenance Schedule Compliance Rate to Vehicle Repair Costs

PM Compliance 96%
2004

PM Compliance 94%
2003

PM Compliance 88%
2002

PM Compliance 62%
2001

PM Compliance 64%
2000

$50,000 $100,000 $150,000 $200,000 $250,000 $300,000 $350,000 $400,000 $450,000

- Brakes
- Transmission
- Engine
Average Vehicle Age Relative to Average Annual Vehicle Utilization

Patrol Unit Age and Utilization
(Average age = 2.5 years; Average utilization = 48,000 miles)
Impact of Vehicle Age on LTD Maintenance Costs

![Graph showing the relationship between LTD Mileage and M & R Costs.](image)

- **M & R COST**
  - $0 - $6,000
  - 0 - 20,000 km

- **LTD MILEAGE**
  - 0 - 120,000 km

Correlation observed between vehicle age and maintenance costs, with higher costs associated with greater mileage.
Fleet Replacement Expenditures

Cost (Millions)

Fiscal Year

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009

Recommended

Current

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Fleet Maintenance Expenditures

Fiscal Year

Cost (Millions)

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009

Probable
Preferable
Combined Replacement and Maintenance Expenditures

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Status Quo</th>
<th>Fleet Renewal Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$60</td>
<td>$100</td>
</tr>
<tr>
<td>2001</td>
<td>$80</td>
<td>$120</td>
</tr>
<tr>
<td>2002</td>
<td>$100</td>
<td>$140</td>
</tr>
<tr>
<td>2003</td>
<td>$120</td>
<td>$160</td>
</tr>
<tr>
<td>2004</td>
<td>$140</td>
<td>$180</td>
</tr>
<tr>
<td>2005</td>
<td>$160</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>$180</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>$180</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>$180</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>$180</td>
<td></td>
</tr>
</tbody>
</table>
Ad Hoc Reporting

Plutzer Supply

Current suppliers:
- Milk, Full Head: 25 - 425 g can
- Sweet Sausage: 50 bags x 30 sl
- Brown Rice: 20 bags x 4 sl
- Sparkling Apple Cider: 24 - 1/2 liter bottle
- Sweet Refish: 12 boxes

Order Count Ratio:
- Late Lights 26.31%
- Late Lights 26.31%
- Lates 6.32%
- Lates 6.32%

Summary Stats:
- Lites: 37 16,314 441
- Lights: 27 374 14
- Ovens: 27 805 30
- Total: 91 17,493 192

Monthly Sales:

Alternate Supplies:
- Wilkie's Weiner
  - Star Route 71, Groveland, CA, 95331
  - Wholesale Account Agent: (800) 323-2782
- Milk, Full Head
  - Wilkie's Weiner
  - Star Route 71, Groveland, CA, 95331
  - Wholesale Account Agent: (800) 323-2782
- Sparkling Apple Cider
  - Wilkie's Weiner
  - Star Route 71, Groveland, CA, 95331
  - Wholesale Account Agent: (800) 323-2782
- Sweet Refish
  - Wilkie's Weiner
  - Star Route 71, Groveland, CA, 95331
  - Wholesale Account Agent: (800) 323-2782

Records: 3553 100%
Reporting Portals

Federal Management Tools

Welcome Lt. Daniels
Current Time: 1100
Date: 1/28/2004

Web Reports
- Realtime Dashboard
- Email
- Instant Messaging
- Schedule Maintenance
- Report Issues

Inventory Summary Report (Detailed)
Inventory Summary Report (Basic)
Downtime Report
Parts On Order Report
Work Pending Report
Cost Per Mile
In-Target Repairs
Open Work Order Report
Work Order Summary Report
PM Due By Department
PM Due By Date
PM Due By BCC / Equipment Number
PM History
Out-Of-Target Repairs

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Fleet Management Consulting and Business Solutions
www.mercury-associates.com
Work Orders Open More than 24 Hours by Status

A - ACTIVE / WORK IN PROGRESS: 58
J - ACCIDENT / AWAITING APPROVAL: 2
M - AWAITING A MECHANIC: 40
P - AWAITING PARTS: 21
V - ASSET AT VENDOR: 12
Z - CONTACT MERCURY: 6

Total Number of open work orders = 142
# KPI Dashboard

**Performance Alert Solution for FASTER C/S**

<table>
<thead>
<tr>
<th>Dashboard Indicator</th>
<th>Report</th>
<th>Info</th>
<th>Green</th>
<th>Yellow</th>
<th>Red</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # of Open Work Orders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>42</td>
</tr>
<tr>
<td># of Open Work Orders &quot;ACCIDENT AWAITING APPROVAL&quot;</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Open Work Orders &quot;ACTIVE/WORK IN PROGRESS&quot;</td>
<td></td>
<td></td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Open Work Orders &quot;AWAITING A MECHANIC, NOT AVAILABLE&quot;</td>
<td></td>
<td></td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Open Work Orders &quot;AWAITING PART(S)&quot;</td>
<td></td>
<td></td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Open Work Orders &quot;PREP FOR IN-SERVICE&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Open Work Orders &quot;VENDOR WORK IN PROGRESS, AWAITING RETURN&quot;</td>
<td></td>
<td></td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Comebacks last 30 days</td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td># of Field Breakdowns last 30 days</td>
<td></td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of Work Orders completed within 24 hours</td>
<td></td>
<td></td>
<td>43%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Repair Time Estimation

Select a vehicle, then click a tab for the type of data you want to see: Repair, Estimator, TSB, Maintenance.

Year
2005

Make
Acura

Model
MDX

Products
- Please Select -

- Saved Quotes
- Repair History
- TSB History
## Motor Pool Management Dashboard

### Fleet Dashboard (60 Vehicles in Fleet) Last Refreshed 3/16/2005 5:31:18 PM

**Show for Date:** 03/17/2005

**Vehicle Activity for 03/17/2005**

<table>
<thead>
<tr>
<th>Going out on 03/17/2005:</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coming in on 03/17/2005:</td>
<td>24</td>
</tr>
<tr>
<td>In use on 03/17/2005:</td>
<td>30</td>
</tr>
<tr>
<td>In Maintenance during 03/17/2005:</td>
<td>0</td>
</tr>
</tbody>
</table>

**Admin Queue for 3/16/2005**

- **Pending Requests:** 5
- **Change Requests:** 0
- **Cancelled Requests:** 10
- **Rejected Requests:** 0
- **Late for Pick-Up:** 0
- **Late for Return:** 4
- **In Prep Vehicles:** 0
- **Users Pending:** 0

### 9 Reservations Leaving 03/17/2005

- Jameson - 09:00 AM
- Thompson - 09:00 AM
- Chadderon - 09:00 AM
- Faulkner - 10:45 AM
- Shoenfeld - 12:15 PM
- Schipper - 12:30 PM
- Mazer - 01:30 PM
- Boisvert - 01:45 PM
- Clinton - 02:00 PM

### 24 Reservations Returning 03/17/2005

- Daniels - 10:15 AM
- Mitchell - 11:00 AM
- Reardon - 11:30 AM
- Jameson - 11:30 AM
- Wyss - 11:30 AM
- Thompson - 12:00 PM
- Woo - 01:00 PM
- Buki - 01:30 PM
- Ryan - 01:30 PM
- O’Mold - 02:00 PM
- Vanzo - 02:00 PM
- Schipper - 02:30 PM
- Boisvert - 03:30 PM
- Faulkner - 03:30 PM
- McDermott - 04:00 PM
- Chadderon - 04:00 PM
- Stoddard - 04:00 PM
- Mazer - 04:30 PM
- Shoenfeld - 04:30 PM
- Shangri - 05:00 PM
- Shoenfeld - 05:00 PM
- Dykman - 05:00 PM
- Camel - 06:30 PM
- Hicks - 08:30 PM

**Manage Fleet**

- **Vehicle Optimization Chart**
- **Make Reservation**

**Asset In/Out Report for 03/17/2005**
# Excel®-based Vehicle Life Cycle Cost Analyzer

## Capital Cost

<table>
<thead>
<tr>
<th>Replacement Cycle in Years</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meter at replacement</td>
<td>9,926</td>
<td>19,852</td>
<td>29,778</td>
<td>39,704</td>
<td>49,630</td>
<td>59,556</td>
<td>69,482</td>
<td>79,408</td>
<td>89,334</td>
<td>99,260</td>
<td>109,186</td>
<td>119,112</td>
</tr>
<tr>
<td>Inflation Factor</td>
<td>1.00</td>
<td>1.03</td>
<td>1.06</td>
<td>1.09</td>
<td>1.13</td>
<td>1.16</td>
<td>1.19</td>
<td>1.23</td>
<td>1.27</td>
<td>1.30</td>
<td>1.34</td>
<td>1.38</td>
</tr>
</tbody>
</table>

## Capital Costs

- **Projected Net Residual Value**
  - $10,227
- **Plus Capital Equipment Sold with Vehicle**
  - $10,227
- **Total Residual Value**
  - $10,227
- **Annual Depreciation**
  - $6,496
- **Annualized In-Servicing and Decommissioning Cost**
  - $0
- **Total Capital Costs**
  - $6,496

## Operating Costs

- **Mean Annual M&R Cost from EMS (uninflated)**
  - $617
- **Extrapolated Annual Maintenance and Repair Cost (uninflated)**
  - $564
- **Extrapolated Annual Maintenance and Repair Cost**
  - $564
- **Annual Fuel Cost**
  - $1,006
- **Total Annual Operating Cost**
  - $1,570

## Total Asset Costs

- **Annual Total Cost**
  - $8,066
- **Cumulative Total Cost**
  - $8,066
- **NPV of Cumulative Total Cost**
  - $7,838

## Cost Savings (per vehicle) Associated with Replacing in this Year

<table>
<thead>
<tr>
<th>Age</th>
<th>Exemplar M&amp;R Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$2,091</td>
</tr>
<tr>
<td>2</td>
<td>$24</td>
</tr>
<tr>
<td>3</td>
<td>$674</td>
</tr>
<tr>
<td>4</td>
<td>$1,004</td>
</tr>
<tr>
<td>5</td>
<td>$1,163</td>
</tr>
<tr>
<td>6</td>
<td>$1,218</td>
</tr>
</tbody>
</table>

*NOTE: The first time through or if you change the trendline, run ctrl+t to recalculate the data.*

---

**Average M&R Cost per Unit Based on Mean Annual Usage**

![Graph](https://via.placeholder.com/150)

---

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Questions to Consider

- Do you have an automated fleet management information system? If not, why not?
- If so, how much do you focus on processing data as opposed to analyzing information and creating knowledge?
- How confident are you in the accuracy and completeness of the data in your FMS?
- What information is needed at each level of your organization in order to manage? What information is actually available? Used?
- How well do you employ and disseminate information to help others understand what you are doing and why you’re doing it?
- How has new information technology changed the way you make management decisions?
- Do decision makers base important decisions about your fleet on information you provide them, or on information from other sources? What are these other sources?
QUESTIONS
What is benchmarking?

- A *benchmark* is standard against which something can be measured or judged.
- The term *benchmarking* is used to describe a process used by organizations to assess the soundness of various aspects of their management and operating activities.
- Benchmarking can be undertaken as a one-time event or an ongoing process.
- Benchmarking can be applied to both practices and performance levels.
Why benchmark?

- To develop an *understanding* of fleet conditions and performance attributes that cannot be attained through first-hand observation or second-hand information
- To provide *focus* to process and performance improvement efforts
- To *home in on* underlying causes of performance deficiencies
- To gauge *progress* toward the attainment of explicit goals and objectives
- To *depoliticize* and depersonalize performance evaluation
- To *demonstrate* and publicize competence and competitiveness
The Performance Measurement Process

1. Define Objectives

2. Define Performance Measures

3. Collect Data & Measure Performance

4. Evaluate Conditions & Practices

5. Survey Peers

6. Compare Practices

7. (Re)Engineer Processes

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## Steps 1 & 2: Defining Objectives and Measures of Performance

<table>
<thead>
<tr>
<th>Objective</th>
<th>Performance Attribute</th>
<th>Performance Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>Downtime</td>
<td>% of Units Out of Service/Day</td>
</tr>
<tr>
<td>Suitable</td>
<td>Extent of Use</td>
<td>Utilization in KM, Hours/Mo</td>
</tr>
<tr>
<td>Reliable</td>
<td>Breakdowns</td>
<td>KM, Hours/Breakdown</td>
</tr>
<tr>
<td>Safe</td>
<td>Accidents</td>
<td>Accidents/Million KM Driven</td>
</tr>
<tr>
<td>Economical</td>
<td>Capital, O&amp;M Costs</td>
<td>Cost/KM, Hour</td>
</tr>
<tr>
<td>Environmentally</td>
<td>Fuel Efficiency</td>
<td>KM/Litre</td>
</tr>
<tr>
<td>sound</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Step 3: Collecting Data

- Internal (condition, performance, benchmark) data
  - Historical records
  - Surveys
  - Measurement

- External (benchmark) data
  - Peers
  - Vendors
  - Contractors
  - Manufacturers
  - Trade associations
  - Trade publications
Step 3: Benchmarking Performance, an Example

Quantifying vehicle maintenance and repair cost

- Cost per mile/hour
- Cost per transaction
- Cost per vehicle per year
- Cost per vehicle equivalent unit per year
Step 3: Benchmarking Performance, an Example

Further quantifying maintenance and repair cost

- In-house labor costs
- In-house parts costs
- Vendor/contractor costs
Step 4: Evaluating Conditions and Practices

Examining maintenance and repair labor cost drivers

- Salary and fringe benefit costs
- Indirect maintenance costs
  - Support staff cost
  - Facility costs
  - Overhead costs
- Mechanic performance levels
  - Efficiency
  - Productivity
  - Effectiveness
Step 4: Evaluating Conditions and Practices

**Conditions that affect mechanic performance**

- Fleet composition
- Fleet age and condition
- Fleet utilization and operation
- Organizational structure
- Staffing levels
- Maintenance facilities and equipment
Step 4: Evaluating Conditions and Practices

Practices that affect mechanic performance

- Work planning
- Service writing
- Supervision
- Training
- Compensation
- Parts provisioning
- Use of vendors and contractors
Steps 4-6: Evaluation Methods

- Process mapping and gap analysis
  - Documentation review
  - Interviews
  - First-hand observation
- Comparison with peers
  - Surveys
  - Informal communication
- Comparison with industry best practices
  - Literature review
  - Consulting study
Step 7: Implementing Management and Operating Improvements

Processes that promote good mechanic performance and maintenance cost competitiveness

- Work scheduling
- Defect reporting
- Time and task standards and time reporting
- Training
- Supervision
- Quality assurance
- Pay for performance
Sample Performance Measures

- **Vehicle cost**
  - Purchase price as a percentage of published triple net price (PC Carbook)
  - Residual value as a percentage of average auction value (Manheim Market Reports)
  - Fully loaded cost per motor pool vehicle rental day as a percentage of local commercial rental rate (by vehicle type)

- **Vehicle operation and utilization**
  - Fleet accident rate: accidents per million miles driven
  - Average vehicle repair cost per accident
  - Daily, weekly, monthly, annual usage in miles or hours as a percentage of class average usage (assigned vehicles)
  - Average annual rental days as a percentage of available rental days (motor pool vehicles)

- **Vehicle maintenance / Shop management**
  - Preventive maintenance schedule adherence rate
  - Maintenance and repair backlog: number of vehicles awaiting service as a percentage of average number of vehicles serviced per day
Sample Performance Measures

- Vehicle maintenance (cont.)
  - Downtime rate: percentage of vehicles out of service for repair as a percentage of total vehicles in the fleet (by vehicle and mission type)
  - In-house cost per transaction as a percentage commercial transaction cost (by transaction type)
  - Maintenance and repair cost per vehicle equivalent unit per year
  - Avoidable cost per in-house mechanic labor hour as a percentage of local commercial shop labor rates
  - Mechanic productivity rate: hours charged to work orders as a percentage of pay hours (by mechanic, work crew, shift, shop)
  - Mechanic efficiency rate: average time to complete a specific service as a percentage of recognized service completion time (ditto)
  - Comeback rate: percentage of completed repairs returned to shop for rework (ditto)

- Parts management
  - Parts order fill rate: percentage of orders filled from stock
  - Parts order fill time
  - Inventory turnover rate
Sample Performance Measures

- Parts management (cont.)
  - Inventory utilization rate: percentage of inventory lines used in last 12 months

- Vehicle replacement
  - Average life-to-date usage (miles or hours) by vehicle type
  - Average age
  - Average imputed replacement cycle as a percentage of recommended cycle
  - Average annual replacement expenditure amount as a percentage of average annual replacement cost
  - Replacement backlog as a percentage of total fleet replacement cost

- Staffing
  - Mechanic to supervisor ratio
  - Mechanic to parts technician ratio
  - Ratio of administrative and managerial personnel to direct service personnel
  - Ratio of vehicles to fleet management personnel
Sample Performance Measures

- Miscellaneous
  - Average order to delivery time (weeks) for new vehicles
  - Average days to sale for used vehicles
  - Average road call response time (minutes) or percentage of road calls responded to within X minutes
  - Average subrogation recovery time (weeks)
  - Average subrogation recovery amount as a percentage of accident repair cost amount
  - Average call center call answer time and hold time
  - Monthly per-vehicle maintenance management fee
### Different Performance Measures for Different Decision Makers

<table>
<thead>
<tr>
<th>Role</th>
<th>Performance Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Manager, Customer</td>
<td>• Vehicle availability or downtime rate&lt;br&gt;• In-service breakdown rate&lt;br&gt;• Ratio of actual to budgeted expenses&lt;br&gt;• Accident rate</td>
</tr>
<tr>
<td>Fleet Manager</td>
<td>• PM schedule adherence rate&lt;br&gt;• Work order turn-around time&lt;br&gt;• Average maintenance and repair backlog&lt;br&gt;• Mechanic productivity rate</td>
</tr>
<tr>
<td>Maintenance Supervisor</td>
<td>• Direct/billable hours by mechanic&lt;br&gt;• Efficiency rate by mechanic&lt;br&gt;• Repair comeback rate by mechanic</td>
</tr>
<tr>
<td>Parts Manager</td>
<td>• Parts order fill time&lt;br&gt;• Parts order fill rate&lt;br&gt;• Inventory turnover rate&lt;br&gt;• Percentage of inventory with no movement in last 12 mos</td>
</tr>
</tbody>
</table>
Measuring and Monitoring Static Versus Dynamic Conditions

- Static
  - Quantities of fleet resources
  - Quantities of staff resources

- Dynamic
  - Resource availability levels
    - Vehicles
    - Mechanics
    - Work bays
  - Resource utilization levels
  - Service levels
  - Costs
Recap

- Benchmarking is essential for understanding the strengths and weaknesses of a fleet management organization and fleet operation; you can’t know if you are winning or losing if you don’t keep score.
- Benchmarking is part of a strategic (planned) approach to fleet management that provides focus and direction to performance and process improvement endeavors.
- Benchmarking enables you to demonstrate your value and gain influence.
- Effective benchmarking requires good data.
QUESTIONS
PERFORMANCE MEASUREMENT AND BENCHMARKING GROUP EXERCISE
Define three measures of performance in terms of:

- Objective and performance attribute being examined
- Level of management interest in the area of performance being measured
- Calculation of the performance measure
- Source of a benchmark for the measure
- Ease of development of a peer-based benchmark for the measure
## Sample Definitions of Objectives and Measures of Performance

<table>
<thead>
<tr>
<th>Objective</th>
<th>Attribute</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>Downtime</td>
<td>% of Units Out of Service/Day</td>
</tr>
<tr>
<td>Suitable</td>
<td>Extent of Use</td>
<td>Utilization in KM, Hours/Mo</td>
</tr>
<tr>
<td>Reliable</td>
<td>Breakdowns</td>
<td>KM, Hours/Breakdown</td>
</tr>
<tr>
<td>Safe</td>
<td>Accidents</td>
<td>Accidents/Million KM Driven</td>
</tr>
<tr>
<td>Economical</td>
<td>Capital, O&amp;M Costs</td>
<td>Cost/KM, Hour</td>
</tr>
<tr>
<td>Environmentally sound</td>
<td>Fuel Efficiency</td>
<td>KM/Litre</td>
</tr>
</tbody>
</table>
OUTSOURCING AND SUPPLIER MANAGEMENT
Fleet Management Functions that Cannot be Outsourced

- Policy and procedure development
- Vehicle requirements definition and assignment management
- Vehicle selection
- Financial management
- Supplier management
- Customer service management
- Accountability to upper management
Determining When Outsourcing Makes Sense

<table>
<thead>
<tr>
<th>Low Quality</th>
<th>High Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Cost</td>
<td>Maybe</td>
</tr>
<tr>
<td>High Cost</td>
<td>Probably</td>
</tr>
<tr>
<td></td>
<td>Un-likely</td>
</tr>
<tr>
<td></td>
<td>Maybe</td>
</tr>
</tbody>
</table>
Key Steps in the Outsourcing Process

- Defining objectives
- Defining service requirements
- Defining supplier qualifications requirements
- Determining current costs and service levels
- Bundling versus unbundling
- Preparing tender submission instructions
- Developing the tender evaluation process
- Evaluating tenders and making a selection
- Securing acceptance of findings and recommendations
- Implementing the contract
### Sample Technical Evaluation of Tenders

<table>
<thead>
<tr>
<th>ALL SPECIFICATIONS</th>
<th>MAX PTS</th>
<th>ARI</th>
<th>PHH</th>
<th>GE</th>
<th>Wheels</th>
<th>Donlen</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Vehicle Selection, Acquisition, Upfitting</td>
<td>25</td>
<td>24.00</td>
<td>24.00</td>
<td>21.67</td>
<td>24.00</td>
<td>22.83</td>
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<tr>
<td>C Vehicle Financing</td>
<td>15</td>
<td>11.33</td>
<td>11.33</td>
<td>12.00</td>
<td>11.67</td>
<td>12.00</td>
</tr>
<tr>
<td>D Vehicle Remarketing</td>
<td>15</td>
<td>13.33</td>
<td>13.67</td>
<td>12.00</td>
<td>14.33</td>
<td>14.33</td>
</tr>
<tr>
<td>E Vehicle Licensing</td>
<td>7</td>
<td>6.33</td>
<td>6.67</td>
<td>7.00</td>
<td>6.67</td>
<td>5.00</td>
</tr>
<tr>
<td>F Vehicle Maintenance &amp; Repair</td>
<td>15</td>
<td>14.00</td>
<td>13.33</td>
<td>13.67</td>
<td>14.00</td>
<td>14.17</td>
</tr>
<tr>
<td>G Accident Management</td>
<td>10</td>
<td>9.67</td>
<td>9.00</td>
<td>7.67</td>
<td>8.33</td>
<td>9.33</td>
</tr>
<tr>
<td>H Other FM Services</td>
<td>2</td>
<td>1.67</td>
<td>2.00</td>
<td>1.33</td>
<td>2.00</td>
<td>1.67</td>
</tr>
<tr>
<td>I Customer Service</td>
<td>10</td>
<td>8.67</td>
<td>8.67</td>
<td>8.33</td>
<td>10.00</td>
<td>8.67</td>
</tr>
<tr>
<td>J Data Mgmt</td>
<td>5</td>
<td>4.33</td>
<td>4.67</td>
<td>5.00</td>
<td>5.00</td>
<td>4.67</td>
</tr>
<tr>
<td>K Billing &amp; Payment</td>
<td>5</td>
<td>5.00</td>
<td>4.67</td>
<td>4.67</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>L Contract Management &amp; Perf. Control</td>
<td>5</td>
<td>5.00</td>
<td>5.00</td>
<td>4.67</td>
<td>5.00</td>
<td>4.67</td>
</tr>
<tr>
<td>M Contract Initiation &amp; Termination</td>
<td>5</td>
<td>5.00</td>
<td>4.67</td>
<td>5.00</td>
<td>5.00</td>
<td>5.00</td>
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<tr>
<td><strong>TOTAL SCORE</strong></td>
<td><strong>134</strong></td>
<td><strong>122.667</strong></td>
<td><strong>120.333</strong></td>
<td><strong>115.667</strong></td>
<td><strong>125</strong></td>
<td><strong>121</strong></td>
</tr>
</tbody>
</table>
## Sample Financial Evaluation of Tenders

**Total cost 550 vehicle fleet comparison (150 vehicles acquired/replaced over 36 months)**

<table>
<thead>
<tr>
<th>QTY</th>
<th>SERVICE</th>
<th>ARI</th>
<th>PHH</th>
<th>GE</th>
<th>Wheels</th>
<th>Donlen</th>
</tr>
</thead>
<tbody>
<tr>
<td>550</td>
<td>A) Selection</td>
<td>$4,926,797</td>
<td>$4,885,269</td>
<td>$4,841,609</td>
<td>$4,868,825</td>
<td>$4,933,153</td>
</tr>
<tr>
<td></td>
<td>B) Finance</td>
<td>$312,959</td>
<td>$310,971</td>
<td>$566,412</td>
<td>$285,361</td>
<td>$364,528</td>
</tr>
<tr>
<td></td>
<td>C) Remarketing</td>
<td>$15,000</td>
<td>$14,250</td>
<td>$11,250</td>
<td>$15,000</td>
<td>$15,000</td>
</tr>
<tr>
<td></td>
<td>D) License</td>
<td>$54,450</td>
<td>$29,325</td>
<td>$31,145</td>
<td>$24,750</td>
<td>$21,000</td>
</tr>
<tr>
<td></td>
<td>E) Repair</td>
<td>$83,325</td>
<td>$125,070</td>
<td>$104,000</td>
<td>$64,350</td>
<td>$259,463</td>
</tr>
<tr>
<td></td>
<td>F) Accident</td>
<td>$33,786</td>
<td>$28,170</td>
<td>$25,740</td>
<td>$18,648</td>
<td>$21,276</td>
</tr>
<tr>
<td></td>
<td>H) Other Fees</td>
<td>$1,050</td>
<td>($118,950)</td>
<td>$2,550</td>
<td>($300)</td>
<td>($31,950)</td>
</tr>
<tr>
<td></td>
<td><strong>TOTALS</strong></td>
<td><strong>$5,427,366</strong></td>
<td><strong>$5,274,104</strong></td>
<td><strong>$5,582,706</strong></td>
<td><strong>$5,276,634</strong></td>
<td><strong>$5,582,470</strong></td>
</tr>
</tbody>
</table>

**PRICE VARIANCE AGAINST LOW BIDDER**

<table>
<thead>
<tr>
<th>Fleet Mgt Co</th>
<th>36 months vs. PHH</th>
<th>12 months vs. PHH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHH</td>
<td>Low Bid</td>
<td>Low Bid</td>
</tr>
<tr>
<td>Wheels</td>
<td>$2,530</td>
<td>$843</td>
</tr>
<tr>
<td>ARI</td>
<td>$153,262</td>
<td>$51,087</td>
</tr>
<tr>
<td>Donlen</td>
<td>$308,366</td>
<td>$102,789</td>
</tr>
<tr>
<td>GE</td>
<td>$308,602</td>
<td>$102,867</td>
</tr>
</tbody>
</table>
Supplier Management Considerations

- Obtaining best value, not lowest cost
- Collaborating, not “commoditizing”
- Performance-based contracting
- Data collection and performance measurement
- Electronic data interchange
- Business continuity
- Ownership of data
- Cooperation
- Frequency of tenders
QUESTIONS
MANAGING FLEET SIZE, COMPOSITION, AND UTILIZATION
Overview

- Goals and roles of fleet management organizations
- Techniques for managing vehicle utilization
Goals: Why manage fleet utilization?

- To facilitate vehicle availability
- To control fleet costs
- To avoid public censure
- To even out vehicle usage
- To ensure recovery of vehicle capital costs
Roles: What are the obligations of fleet managers?

- Inherent versus defined responsibility
- Owner versus lessor
- Regulator versus motivator
- Decision maker versus analyst/advisor
Roles: If not the fleet manager, who?

- Management officials
- High-level committees
- Finance officials
- Budget analysts
- User organization officials
Purchase Justification

- **Objective:**
  - Define vehicle and equipment needs and the best way to meet them (own, rent, reimburse, etc.) *before* acquiring vehicles

- **Pros:**
  - Reduces inappropriate vehicle purchases, assignments, and uses
  - Reduces pressure on fleet management organizations to justify fleet size, composition, and utilization levels

- **Cons:**
  - Does not address impact of changing operational needs on suitability of current assignments
Purchase Justification

Key Considerations:

- Vehicle provision as a form of compensation
- Vehicle provision to meet bona fide business needs
  - Predictable transportation requirements
  - Unpredictable transportation requirements
- Qualifications and motives of individuals who review and approve purchase requests
- Selector lists
- Tie-ins with cost charge-back system
Minimum-Use Requirements

- **Objective:**
  - Ensure that permanently assigned vehicles are utilized a minimum amount per month

- **Pros:**
  - Require users to explore alternative approaches to meeting limited vehicle needs
  - Ensure recovery of vehicle capital costs

- **Cons:**
  - Base vehicle assignments on a single, potentially inappropriate measure of vehicle utilization and need
  - May encourage superfluous use of vehicles aimed at meeting established thresholds
Motor Pool Operation

Objective:
- Meet intermittent, short-term transportation needs

Pros:
- Greater vehicle availability than might otherwise exist due to user budget constraints
- High vehicle utilization rates assuming pool is properly sized and managed
- Ability to control operation of specialized equipment

Cons:
- Suitable only for areas with high concentrations of employees
- Poorly designed rental rates can encourage misuse
Cost Charge-Back System

Objective:
- Create economic incentives for efficient vehicle assignment and use

Pros:
- Draws attention to, and requires users to manage, costs of vehicle availability
- Places onus on fleet users to justify vehicle utilization levels and costs

Cons:
- Poor rate design can undermine incentives associated with charging costs back to users
- Centralized budgeting and cost control can undermine user agency motivation to manage and reduce costs
Cost Charge-Back System

Key Considerations

- Enlisting Adam Smith’s “hidden hand”
  - Rate design is critical to creating cost awareness: service versus usage-based rates
  - Billing process must enable users to link rates and charges to specific vehicles and services, behaviors and decisions
Utilization Measurement and Reporting

- **Objective:**
  - Monitor vehicle usage on a continuous basis and alert users, analysts, and decision makers to cost savings opportunities

- **Pros:**
  - Measurement facilitates and promotes ongoing accountability for vehicle usage
  - Reporting creates peer pressure to actively manage vehicle use

- **Cons:**
  - Dependent on availability, accessibility, and quality of data
Utilization Measurement and Reporting

- Where do the data come from?
  - Vehicle usage logs
  - Fuel management system
  - Location tracking/event monitoring
  - Geo-fencing solutions
  - Random moment sampling system
Ad Hoc Right Sizing Analyses

- **Objective:**
  - Identify under-utilized vehicles through periodic, targeted studies

- **Pros:**
  - Can yield immediate savings by uncovering and initiating the disposal of unneeded vehicles
  - Reinforce the importance of making sound resource management decisions

- **Cons:**
  - Expensive and time consuming to perform properly
  - Results may be disappointing depending on effectiveness of other practices
  - Contentious and intrusive
Data Collection Tools: On-line Driver Surveys

State of Alaska Vehicle Utilization Study

The State has engaged Mercury Associates, Inc. to evaluate the appropriateness of the size and type of vehicle utilized by each vehicle for which an initial analysis showed low annual use. The questionnaire must be completed for each vehicle for which an initial analysis showed low annual use. Please do not leave any questions unanswered. If you are not sure how the vehicle is being used, you should consult the vehicle owner. Rather, you should be able to accurately and completely answer the questions as fully as possible. In order to meet the submission deadlines, your response is needed no later than November 5, 2004. If you have any questions, please contact Mr. Rod Lohof of Mercury Associates (Los Angeles, California area office) at (818) 610-3559 for assistance.

1.) Please begin by selecting your Department and then selecting the vehicle assigned to your agency.
   - Collocation Code: Select a State Department
   - Vehicle:

2.) What is the current status of the vehicle? (select one)
   - Active
   - Turned in and not replaced
   - Replaced
   - Sold

Instructions:
This questionnaire is for all Police personnel who have an assigned vehicle. Please:

- Answer all questions truthfully
- Complete this questionnaire by 0600 on July 3, 2004
- Do not discuss it with other officers

There are no right or wrong answers. It will take you approximately 30 minutes to complete the 74 questions in this questionnaire. Please budget sufficient time to answer all of the questions in one sitting.

Answer this questionnaire using your computer. Do not use a paper copy. Use the drop down boxes and radio buttons to select predefined answers and the free-form text fields to type in responses when necessary.

Your answers are important for making the Police Dept as good as it can be and for rendering the best possible service to Tacoma.

This is part of the Assigned Vehicle Program study by Mercury Associates.
The Ideal Fleet Utilization Management Program

- Well-defined, well-documented purchase justification policies and procedures
  - Compensation
  - Predictable need
  - Unpredictable need
  - Budget analyst (not car czar) involvement

- Well-designed and used cost charge back system
  - Fixed rates for recovering fixed costs
  - Timely, itemized billing; no prepayment

- Ongoing utilization measurement and reporting system
Fleet Analytics - What is it?

Fleet Analytics

- Data Mining
- Predictive Analytics
- Modeling Software
- Optimisation Software
Fleet Analytics Applications

- Vehicle Use Management
- Route Optimisation
- Fleet Analytics
- Cost Modeling
- Vehicle Remarketing
Fleet Analytics Applications

- Vehicle Selection (WOLC)
- Vehicle Use Management
- Vehicle Emissions Management
- Vehicle Remarketing
Vehicle Use Management

Cost Management

Use Management

Fleet Management
Vehicle Use Management Overview

VEHICLE USE MANAGEMENT

VEHICLE USE MONITOR generates VEHICLE USE RECORD

compared to

VEHICLE USE RULES generates

VEHICLE USE NON-COMPLIANCE RECORD provides

VEHICLE USE BILLING RECORD provides

used with

VEHICLE USE BILLING RATES

provides

VEHICLE USE BILLING

forms part of

VEHICLE USE BILLING

forms part of

VEHICLE USE PERFORMANCE

measures

VEHICLE USE COMPLIANCE

forms part of

VEHICLE USE EFFICIENCY

forms part of

VEHICLE USE MANAGEMENT

targets

OPTIMUM FLEET SUPPLY comprises

OPTIMUM FLEET SIZE

OPTIMUM FLEET MIX
Vehicle Use Management

- Online Vehicle Use Survey
- Vehicle Use Rules Analysis
- Vehicle Use Review
- Vehicle Use Efficiency Analysis
- Vehicle Entitlements Analysis
- Vehicle Non-Business Use Analysis
- Vehicle Driver Use Analysis
Vehicle Use Efficiency Analysis

Maximum Number of Vehicles Used Per Day Oct-07

Number of vehicles

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Maximum Number of Vehicles Used

Maximum Vehicles Available
Vehicle Use Efficiency Analysis

Maximum Vehicle Used/Active Vehicles Oct-07

- Vehicle Used/Active Vehicles
- Average Vehicle Use (Month)
Vehicle Use Efficiency Analysis

Maximum Vehicle Used/Active Vehicles Oct-07

- Vehicle Used/Active Vehicles
- Average Vehicle Use (Month)
Maximum Vehicle Used/Active Vehicles Oct-07

- Vehicle Used/Active Vehicles
- Average Vehicle Use (Month)
Vehicle Use Analysis Trips

Average Distance (Kms) per Trip

- 10.00
- 20.00
- 30.00
- 40.00
- 50.00
- 60.00
- 70.00
- 80.00
- 90.00

Average Distance (Kms) per Trip

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Project Conclusions

- Pilot (55) shows 20-25% fleet size reduction in locations >20 vehicles
- Full Fleet (880) Reduction Opportunity >$1.0 million
- Recommend Vehicle Use Monitor Trial
Depreciation Modeling

- Past Vehicle Values
- Vehicle Valuation Modeling
- Future Vehicle Values
- Current Vehicle Values
Vehicle Depreciation - Trend Analysis

The chart illustrates the trend analysis of vehicle depreciation from January 2005 to May 2007. The data is categorized into three types: SS Sedan, Exec Sedan, and Exec SW. The depreciation values are shown in a downward trend, with significant decreases observed over the period. The chart helps in understanding the rate of depreciation for different types of vehicles.
Distance Effect on Vehicle Value

- SS Sedan
- Exec Sedan
- Exec SW
Vehicle Sale Month Effect on Vehicle Value

Seasonal Value Component

SS Sedan  Exec Sedan  Exec SW
Effect of Vehicle Colour on Value

SS Sedan  Exec Sedan  Exec SW
### VEHICLE GUIDES LPG PREMIUM CALCULATION

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 BA XT</td>
<td>$14,950</td>
<td>$14,105</td>
<td>$12,540</td>
<td>$13,605</td>
<td>$2,410</td>
<td>$500</td>
</tr>
<tr>
<td>2004 BA MK II</td>
<td>$16,810</td>
<td>$14,090</td>
<td>$14,360</td>
<td>$13,190</td>
<td>$2,450</td>
<td>$900</td>
</tr>
<tr>
<td>2005 BF XT</td>
<td>$18,640</td>
<td>$17,390</td>
<td>$16,240</td>
<td>$16,690</td>
<td>$2,400</td>
<td>$700</td>
</tr>
<tr>
<td>2006 BF XT</td>
<td>$19,610</td>
<td>$19,615</td>
<td>$17,110</td>
<td>$18,815</td>
<td>$2,500</td>
<td>$800</td>
</tr>
</tbody>
</table>

**Average Difference**

$2,440 $725
Vehicle Valuation Model
Fleet Analytics - Other Applications

Selection Modeling

Replacement Modeling

Predictive Analytics

Dynamic Supply Modeling

Vehicle Demand Modeling
DETERMINING WHEN TO REPLACE VEHICLES AND DEVELOPING AN EFFECTIVE FLEET REPLACEMENT STRATEGY AND PROGRAM
DETERMINING OPTIMAL VEHICLE REPLACEMENT CYCLES
Economic Theory of Vehicle Replacement

- **COST**
  - **OPERATING**
  - **CAPITAL**

- **TIME/USAGE**
  - **TOTAL**
Calculating Equivalent Annual Cost

\[ EAC = \text{NPV} \times \frac{r(1+r)^n}{(1+r)^n-1} \]

Where:

- **EAC** is the equivalent annual cost of a stream of future costs
- **NPV** is the present value of a stream of future costs
- **r** is the discount rate less inflation
- **n** is the length in years of the stream of costs
Costs to Include in a Vehicle Life Cycle Cost Analysis

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

- **Operating**
  - Maintenance and Repair
  - Fuel
Sources of Vehicle Cost Data

- Existing Purchase or Lease Contracts
  - Vehicle and fuel purchase prices
- In-House or Fleet Management Company and/or Fuel Card Management Information Systems
  - In-house maintenance and repair labor and parts costs
  - Commercial maintenance and repair charges
  - Fuel consumption and/or commercial fuel charges
Sources of Vehicle Residual Value Data

- **Automotive Lease Guide – ALG Residual Guidebook**
  - Automotive Lease Guide provides residual value information to the automotive industry.

- **Black Book - Used Car Xpress Deluxe**
  - Black Book National Auto Research provides residual value information and used vehicle valuations.

- **Ritchie Bros. Auctioneers - rbauctionRe$sults**
  - Ritchie Bros. Auctioneers is the world’s largest auctioneer of industrial equipment.

- **Manheim Auctions - Manheim Market Report**
  - Manheim Auctions is the largest and highest volume wholesale automobile auction company in the world.

- **Manufacturers**

- **Other Fleet Operators**
Sample LCA Results: Refuse Truck

Capital, Operating, and Total Cost Trend Lines

Cost (000)

Vehicle Age (years)

Capital Cost

Operating Cost

Total Cost
## Sample LCA Results: Refuse Truck

<table>
<thead>
<tr>
<th>Replacement Cycle (yrs)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year-End Odometer</strong></td>
<td>10,578</td>
<td>21,156</td>
<td>31,734</td>
<td>42,312</td>
<td>52,890</td>
<td>63,468</td>
<td>74,046</td>
<td>84,624</td>
<td>95,202</td>
</tr>
<tr>
<td><strong>Capital Cost</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Year-End Residual Value</strong></td>
<td>$123,500</td>
<td>$83,978</td>
<td>$57,991</td>
<td>$44,977</td>
<td>$37,176</td>
<td>$31,991</td>
<td>$28,304</td>
<td>$25,556</td>
<td>$23,436</td>
</tr>
<tr>
<td><strong>Annual Depreciation</strong></td>
<td>$66,500</td>
<td>$77,522</td>
<td>$25,987</td>
<td>$13,013</td>
<td>$7,801</td>
<td>$5,186</td>
<td>$3,687</td>
<td>$2,748</td>
<td>$2,120</td>
</tr>
<tr>
<td><strong>Cumulative Depreciation</strong></td>
<td>$66,500</td>
<td>$106,022</td>
<td>$132,009</td>
<td>$145,023</td>
<td>$152,824</td>
<td>$158,009</td>
<td>$161,696</td>
<td>$164,444</td>
<td>$166,564</td>
</tr>
<tr>
<td><strong>Operating Cost</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Annual Maint &amp; Repr Cost</strong></td>
<td>$19,951</td>
<td>$26,806</td>
<td>$36,017</td>
<td>$48,392</td>
<td>$65,020</td>
<td>$87,361</td>
<td>$117,380</td>
<td>$157,712</td>
<td>$211,904</td>
</tr>
<tr>
<td><strong>Annual Fuel Cost</strong></td>
<td>$8,881</td>
<td>$9,239</td>
<td>$9,611</td>
<td>$9,998</td>
<td>$10,401</td>
<td>$10,820</td>
<td>$11,256</td>
<td>$11,710</td>
<td>$12,182</td>
</tr>
<tr>
<td><strong>Total Ann Oprating Cost</strong></td>
<td>$28,831</td>
<td>$36,045</td>
<td>$45,628</td>
<td>$58,398</td>
<td>$75,421</td>
<td>$98,182</td>
<td>$128,636</td>
<td>$169,422</td>
<td>$224,086</td>
</tr>
<tr>
<td><strong>Cumulative Oprating Cost</strong></td>
<td>$28,831</td>
<td>$64,876</td>
<td>$110,503</td>
<td>$168,894</td>
<td>$244,315</td>
<td>$342,497</td>
<td>$471,133</td>
<td>$640,556</td>
<td>$864,641</td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Annual Total Cost</strong></td>
<td>$95,331</td>
<td>$113,567</td>
<td>$71,615</td>
<td>$71,404</td>
<td>$83,222</td>
<td>$103,368</td>
<td>$132,323</td>
<td>$172,170</td>
<td>$226,205</td>
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<tr>
<td><strong>Cumulative Total Cost</strong></td>
<td>$95,331</td>
<td>$170,898</td>
<td>$242,513</td>
<td>$313,917</td>
<td>$397,139</td>
<td>$500,506</td>
<td>$632,829</td>
<td>$804,999</td>
<td>$1,031,205</td>
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<tr>
<td><strong>Equivalent Annual Cost</strong></td>
<td>$92,633</td>
<td>$84,258</td>
<td>$80,883</td>
<td>$79,672</td>
<td>$81,809</td>
<td>$87,162</td>
<td>$95,824</td>
<td>$108,186</td>
<td>$124,945</td>
</tr>
</tbody>
</table>
Refuse Truck Fleet-wide Cost Savings
(CURRENT v OPTIMAL CYCLE)

<table>
<thead>
<tr>
<th>Replacement Cycle (years)</th>
<th>Annual Cost Savings per Unit</th>
<th>Annual Fleet-Wide Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>8</td>
<td>$16,759</td>
<td>$2,145,121</td>
</tr>
<tr>
<td>7</td>
<td>$29,121</td>
<td>$3,727,511</td>
</tr>
<tr>
<td>6</td>
<td>$37,782</td>
<td>$4,836,150</td>
</tr>
<tr>
<td>5</td>
<td>$43,136</td>
<td>$5,521,452</td>
</tr>
<tr>
<td>4</td>
<td>$45,273</td>
<td>$5,794,962</td>
</tr>
</tbody>
</table>
### Patrol Car Fleet-wide Cost Savings (Current v Optimal Cycle)

<table>
<thead>
<tr>
<th>Replacement Cycle (years)</th>
<th>Annual Cost Savings per Unit</th>
<th>Annual Fleet-Wide Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>7</td>
<td>$142</td>
<td>$244,709</td>
</tr>
<tr>
<td>6</td>
<td>$296</td>
<td>$510,648</td>
</tr>
</tbody>
</table>
### 3/4-Ton Pickup Truck Fleet-wide Cost Savings
(Current v Optimal Cycle)

<table>
<thead>
<tr>
<th>Replacement Cycle (years)</th>
<th>Annual Cost Savings per Unit</th>
<th>Annual Fleet-wide Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>15</td>
<td>$ 400</td>
<td>$ 328,020</td>
</tr>
<tr>
<td>14</td>
<td>$ 775</td>
<td>$ 635,555</td>
</tr>
<tr>
<td>13</td>
<td>$ 1,125</td>
<td>$ 922,495</td>
</tr>
<tr>
<td>12</td>
<td>$ 1,462</td>
<td>$ 1,199,194</td>
</tr>
<tr>
<td>11</td>
<td>$ 1,754</td>
<td>$ 1,438,056</td>
</tr>
<tr>
<td>10</td>
<td>$ 2,028</td>
<td>$ 1,663,264</td>
</tr>
<tr>
<td>9</td>
<td>$ 2,286</td>
<td>$ 1,874,594</td>
</tr>
<tr>
<td>8</td>
<td>$ 2,505</td>
<td>$ 2,053,941</td>
</tr>
<tr>
<td>7</td>
<td>$ 2,675</td>
<td>$ 2,193,278</td>
</tr>
<tr>
<td>6</td>
<td>$ 2,834</td>
<td>$ 2,324,056</td>
</tr>
<tr>
<td>Replacement Cycle (years)</td>
<td>Annual Cost Savings per Unit</td>
<td>Annual Fleet-Wide Cost Savings</td>
</tr>
<tr>
<td>---------------------------</td>
<td>------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>16</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>15</td>
<td>$ 5,434</td>
<td>$ 619,500</td>
</tr>
<tr>
<td>14</td>
<td>$ 10,151</td>
<td>$ 1,157,169</td>
</tr>
<tr>
<td>13</td>
<td>$ 16,214</td>
<td>$ 1,848,420</td>
</tr>
<tr>
<td>12</td>
<td>$ 19,888</td>
<td>$ 2,267,206</td>
</tr>
<tr>
<td>11</td>
<td>$ 23,095</td>
<td>$ 2,632,843</td>
</tr>
<tr>
<td>10</td>
<td>$ 28,842</td>
<td>$ 3,288,027</td>
</tr>
<tr>
<td>9</td>
<td>$ 28,851</td>
<td>$ 3,289,031</td>
</tr>
</tbody>
</table>
## TCO Savings for 12 Vehicle Types

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Current Cycle (years)</th>
<th>Recomd Cycle (years)</th>
<th>EAC Under Current Cycle</th>
<th>EAC Under Recomd Cycle</th>
<th>Annual Per-Unit Savings</th>
<th>Annual Fleet-Wide Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hybrid-Electric Sedan</td>
<td>4</td>
<td>4</td>
<td>$4,053</td>
<td>$4,053</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>7 to 9-Passenger Van</td>
<td>15</td>
<td>8</td>
<td>$7,050</td>
<td>$5,379</td>
<td>$1,671</td>
<td>$138,684</td>
</tr>
<tr>
<td>Patrol Car</td>
<td>8</td>
<td>6</td>
<td>$9,701</td>
<td>$9,405</td>
<td>$296</td>
<td>$510,648</td>
</tr>
<tr>
<td>Investigative Sedan</td>
<td>11</td>
<td>7</td>
<td>$4,777</td>
<td>$4,214</td>
<td>$421</td>
<td>$414,298</td>
</tr>
<tr>
<td>½-Ton Pickup Truck</td>
<td>12</td>
<td>5</td>
<td>$6,821</td>
<td>$4,761</td>
<td>$2,060</td>
<td>$688,102</td>
</tr>
<tr>
<td>¾-Ton Pickup Truck</td>
<td>16</td>
<td>6</td>
<td>$8,823</td>
<td>$5,989</td>
<td>$2,834</td>
<td>$2,324,056</td>
</tr>
<tr>
<td>Utility Truck</td>
<td>20</td>
<td>10</td>
<td>$16,265</td>
<td>$14,098</td>
<td>$2,167</td>
<td>$318,567</td>
</tr>
<tr>
<td>Bucket Truck</td>
<td>17</td>
<td>9</td>
<td>$23,401</td>
<td>$17,947</td>
<td>$5,454</td>
<td>$414,530</td>
</tr>
<tr>
<td>Dump Truck</td>
<td>20</td>
<td>9</td>
<td>$26,731</td>
<td>$19,986</td>
<td>$6,745</td>
<td>$1,112,889</td>
</tr>
<tr>
<td>Refuse Truck</td>
<td>9</td>
<td>4</td>
<td>$147,121</td>
<td>$79,672</td>
<td>$45,273</td>
<td>$5,794,962</td>
</tr>
<tr>
<td>Ambulance</td>
<td>4</td>
<td>2</td>
<td>$27,944</td>
<td>$23,246</td>
<td>$4,698</td>
<td>$483,873</td>
</tr>
<tr>
<td>Fire Pumper Truck</td>
<td>16</td>
<td>9</td>
<td>$77,195</td>
<td>$48,344</td>
<td>$28,851</td>
<td>$3,289,031</td>
</tr>
</tbody>
</table>

**Total Savings:** $15,489,640
Key Considerations Associated with Conducting LCA’s

- Economic versus fiscal impacts
- Avoidability of current operating costs
- Treatment of indirect costs
- Ability to predict future residual values
- Motivations for replacing vehicles
QUESTIONS
DEVELOPING A LONG-TERM FLEET REPLACEMENT PLAN
Why develop a replacement plan?

- To determine and quantify the extent to which a backlog of vehicle replacement needs exists
- To develop an understanding of the magnitude and annual volatility of future fleet replacement costs
- To provide the foundation for comparatively evaluating alternative capital financing approaches
Baselines Replacement Plan

Gross Replacement Costs

Fiscal Year

(Thousands)
## Fleet Statistics

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of units</td>
<td>7,386</td>
</tr>
<tr>
<td>Number of asset types</td>
<td>233</td>
</tr>
<tr>
<td>Current average age (years)</td>
<td>7.5</td>
</tr>
<tr>
<td>Imputed average replacement cycle (years)</td>
<td>15.0</td>
</tr>
<tr>
<td>Average recommended replacement cycle (years)</td>
<td>6.2</td>
</tr>
<tr>
<td>Original purchase price</td>
<td>$248 M</td>
</tr>
<tr>
<td>Replacement cost</td>
<td>$366 M</td>
</tr>
<tr>
<td>Average annual replacement cost</td>
<td>$ 59 M</td>
</tr>
<tr>
<td>Current replacement backlog</td>
<td>$220 M</td>
</tr>
<tr>
<td>Number of units that exceed age and/or usage criteria for replacement</td>
<td>5,340</td>
</tr>
<tr>
<td>Percentage of units that exceed age and/or usage criteria for replacement</td>
<td>72%</td>
</tr>
</tbody>
</table>
## Sample Replacement Cycles

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Months</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulance (cab and chassis)</td>
<td>24</td>
<td>72,000</td>
</tr>
<tr>
<td>Hybrid Electric Sedan</td>
<td>48</td>
<td>50,000</td>
</tr>
<tr>
<td>Refuse Truck</td>
<td>48</td>
<td>42,000</td>
</tr>
<tr>
<td>Patrol Car</td>
<td>60</td>
<td>68,000</td>
</tr>
<tr>
<td>2x4 1/2T Pickup Truck</td>
<td>60</td>
<td>53,000</td>
</tr>
<tr>
<td>2x4 3/4T Pickup Truck</td>
<td>72</td>
<td>60,000</td>
</tr>
<tr>
<td>Investigative Sedan</td>
<td>84</td>
<td>70,000</td>
</tr>
<tr>
<td>Passenger Van</td>
<td>96</td>
<td>60,000</td>
</tr>
<tr>
<td>10-Yard Dump Truck</td>
<td>108</td>
<td>56,000</td>
</tr>
<tr>
<td>Fire Pumper Truck</td>
<td>108</td>
<td>75,000</td>
</tr>
<tr>
<td>Medium-Duty Utility Truck</td>
<td>120</td>
<td>57,000</td>
</tr>
</tbody>
</table>
## Sample Purchase Prices

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambulance (cab and chassis)</td>
<td>$ 30,072</td>
</tr>
<tr>
<td>Hybrid Electric Sedan</td>
<td>$ 20,876</td>
</tr>
<tr>
<td>Refuse Truck</td>
<td>$ 190,000</td>
</tr>
<tr>
<td>Patrol Car</td>
<td>$ 24,357</td>
</tr>
<tr>
<td>2x4 1/2T Pickup Truck</td>
<td>$ 13,593</td>
</tr>
<tr>
<td>2x4 3/4T Pickup Truck</td>
<td>$ 15,843</td>
</tr>
<tr>
<td>Investigative Sedan</td>
<td>$ 16,076</td>
</tr>
<tr>
<td>Passenger Van</td>
<td>$ 18,256</td>
</tr>
<tr>
<td>10-Yard Dump Truck</td>
<td>$ 135,000</td>
</tr>
<tr>
<td>Fire Pumper Truck</td>
<td>$ 445,000</td>
</tr>
<tr>
<td>Medium-Duty Utility Truck</td>
<td>$ 78,616</td>
</tr>
</tbody>
</table>
Smoothed Replacement Plan

Gross Replacement Costs

Fiscal Year

(Millions)

### Key Statistics for Baseline and Smoothed Replacement Plans

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Baseline</th>
<th>Smoothed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1 Replacement Expenditures</td>
<td>$220.2 M</td>
<td>$60.5 M</td>
</tr>
<tr>
<td>Used Vehicle Sale Proceeds in Year 1</td>
<td>$25.5 M</td>
<td>$3.8 M</td>
</tr>
<tr>
<td>Net Replacement Cost in Year 1</td>
<td>$194.7 M</td>
<td>$56.7 M</td>
</tr>
<tr>
<td># Vehicles Replaced in Year 1</td>
<td>5,340</td>
<td>2,192</td>
</tr>
<tr>
<td># Vehicles Replaced in Years 1-5</td>
<td>8,723</td>
<td>7,177</td>
</tr>
<tr>
<td>Total Replacement Expend in Years 1-5</td>
<td>$377.5 M</td>
<td>$305.3 M</td>
</tr>
<tr>
<td>Total Sale Proceeds in Years 1-5</td>
<td>$70.3 M</td>
<td>$39.9 M</td>
</tr>
<tr>
<td>Total Net Replacement Cost in Years 1-5</td>
<td>$307.2 M</td>
<td>$265.4 M</td>
</tr>
<tr>
<td>Average Annual Net Replacement Cost for Years 1-5</td>
<td>$61.4 M</td>
<td>$53.1 M</td>
</tr>
<tr>
<td>Average Annual Net Replacement Cost for Years 1-10</td>
<td>$59.1 M</td>
<td>$51.8 M</td>
</tr>
</tbody>
</table>

All amounts in nominal dollars
COMPARING ALTERNATIVE CAPITAL FINANCING APPROACHES
Methods of Financing Vehicle and Equipment Acquisitions

- Ad hoc (i.e., year-to-year) allocations or appropriations of cash
- Accumulation of cash reserves in a fleet replacement fund, usually through the use of an internal leasing or replacement cost charge-back program
- Borrowing cash from financial institutions, including the financing units of vehicle manufacturers
- Borrowing cash from investors through the issuance of bonds
- Leasing from a leasing company, bank, or commercial finance company
A Note on Terminology

- **Financing:** The method used to pay for the acquisition of an asset

- **Funding:** The amount of money required to acquire an asset under a particular financing method
Why is the type of capital financing you use important?

- Because year-over-year funding requirements can vary dramatically depending on the type of financing used.
## Replacement Funding Requirements by Financing Approach

<table>
<thead>
<tr>
<th>Total</th>
<th>Year 1</th>
<th>Years 1-5</th>
<th>Years 1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing Approach A</td>
<td>$ 56.6 M</td>
<td>$ 265.4 M</td>
<td>$ 517.6 M</td>
</tr>
<tr>
<td>Financing Approach B</td>
<td>$ 58.5 M</td>
<td>$ 265.6 M</td>
<td>$ 526.6 M</td>
</tr>
<tr>
<td>Financing Approach C</td>
<td>$ 4.1 M</td>
<td>$ 93.2 M</td>
<td>$ 339.4 M</td>
</tr>
<tr>
<td>Financing Approach D</td>
<td>$ 11.5 M</td>
<td>$ 158.6 M</td>
<td>$ 420.1 M</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Annual Average</th>
<th>Year 1</th>
<th>Years 1-5</th>
<th>Years 1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing Approach A</td>
<td>$ 56.6 M</td>
<td>$ 53.1 M</td>
<td>$ 51.8 M</td>
</tr>
<tr>
<td>Financing Approach B</td>
<td>$ 58.5 M</td>
<td>$ 53.1 M</td>
<td>$ 52.7 M</td>
</tr>
<tr>
<td>Financing Approach C</td>
<td>$ 4.1 M</td>
<td>$ 18.6 M</td>
<td>$ 33.9 M</td>
</tr>
<tr>
<td>Financing Approach D</td>
<td>$ 11.5 M</td>
<td>$ 31.7 M</td>
<td>$ 42.0 M</td>
</tr>
</tbody>
</table>
Why is the type of capital financing you use important?

- Because year-over-year funding requirements can vary dramatically depending on the type of financing used.
- Because year-over-year funding requirements are a key determinant of how much money most organizations devote to fleet replacement.
- Because the amounts of funds an organization devotes to fleet replacement determine whether it has an old or a young fleet.
Comparative Distribution of Vehicles by Model Year and Capital Financing Approach

Model Year

Percentage of Vehicles


Leasing

Cash

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Comparative Distribution of Vehicles by Model Year and Capital Financing Approach

<table>
<thead>
<tr>
<th>Model Year</th>
<th>Percentage of Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>0%</td>
</tr>
<tr>
<td>1993</td>
<td>5%</td>
</tr>
<tr>
<td>1994</td>
<td>10%</td>
</tr>
<tr>
<td>1995</td>
<td>15%</td>
</tr>
<tr>
<td>1996</td>
<td>20%</td>
</tr>
<tr>
<td>1997</td>
<td>25%</td>
</tr>
<tr>
<td>1998</td>
<td>30%</td>
</tr>
<tr>
<td>1999</td>
<td>35%</td>
</tr>
<tr>
<td>2000</td>
<td>40%</td>
</tr>
<tr>
<td>2001</td>
<td>45%</td>
</tr>
<tr>
<td>2002</td>
<td>50%</td>
</tr>
<tr>
<td>2003</td>
<td>55%</td>
</tr>
<tr>
<td>2004</td>
<td>60%</td>
</tr>
</tbody>
</table>

- **Cash**
- **Reserve Fund**
Key Analytical Parameters Used

- Under a Reserve Fund
  - Charge-back rates are based on net capital cost of each vehicle (i.e., sale proceeds are returned to fund)
  - Replacement rates are calculated for each vehicle and include two components:
    - Depreciation
    - Replacement Surcharge
  - Book value of current assets estimated based on original purchase price less projected residual value
  - Interest earning rate of 3 percent
Key Analytical Parameters Used

- **Under a Bond Program**
  - Financing periods used were 60 or 120 months
    - All vehicles with a life expectancy in excess of 60 months are assumed to be financed over 120 months
    - All others are assumed to be financed over 60 months
  - All-in COC in both cases is 3.89 percent
  - Current approach involves rolling purchases financed with commercial paper into GO bonds with 96 month term
  - Note that average recommended replacement cycle is 75 months
Key Analytical Parameters Used

Under a Lease Program

- Open-ended operating lease
  - Asset must be retained for minimum of 12 months, after which it can be turned in at any time before or after planned lease term
  - City participates in gain or loss on sale of asset at end of lease
- Lease periods range from 48 to 84 months
- Interest rate used is 5.3 percent for all periods
- Sales tax is calculated at 7.5 percent of capitalized cost and is collected at lease inception
## Net Funding Requirements by Capital Financing Approach

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Year 1</th>
<th>Years 1-5</th>
<th>Years 1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad Hoc Allocations of Cash</td>
<td>$ 56.6 M</td>
<td>$ 265.4 M</td>
<td>$ 517.6 M</td>
<td></td>
</tr>
<tr>
<td>Reserve Fund and Charge-Back System</td>
<td>$ 58.5 M</td>
<td>$ 265.6 M</td>
<td>$ 526.6 M</td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td>$ 4.1 M</td>
<td>$ 93.2 M</td>
<td>$ 339.4 M</td>
<td></td>
</tr>
<tr>
<td>Operating Leases</td>
<td>$ 11.5 M</td>
<td>$ 158.6 M</td>
<td>$ 420.1 M</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Annual Average</th>
<th>Year 1</th>
<th>Years 1-5</th>
<th>Years 1-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad Hoc Allocations of Cash</td>
<td>$ 60.5 M</td>
<td>$ 53.1 M</td>
<td>$ 51.8 M</td>
<td></td>
</tr>
<tr>
<td>Reserve Fund and Charge-Back System</td>
<td>$ 58.5 M</td>
<td>$ 53.1 M</td>
<td>$ 52.7 M</td>
<td></td>
</tr>
<tr>
<td>Bonds</td>
<td>$ 4.1 M</td>
<td>$ 18.6 M</td>
<td>$ 33.9 M</td>
<td></td>
</tr>
<tr>
<td>Operating Leases</td>
<td>$ 11.5 M</td>
<td>$ 31.7 M</td>
<td>$ 42.0 M</td>
<td></td>
</tr>
</tbody>
</table>
ESTIMATING OPERATING COST SAVINGS FROM FLEET RENEWAL
Operating Cost Savings Quantified

- Direct Maintenance and Repair
  - In-house Labor
  - In-house parts
  - Vendor charges
- Direct Fuel
- Operator Downtime
Maintenance and Repair Cost per VEU as a Function of VEU Age

\[ y = 381.76x^{0.8605} \]

Annual Cost

Age in Years

$4,500
$4,000
$3,500
$3,000
$2,500
$2,000
$1,500
$1,000
$500
$0

16 14 12 10 8 6 4 2 0
## Annual M&R Cost per VEU by Age

<table>
<thead>
<tr>
<th>% Decrease</th>
<th>Age</th>
<th>Cost</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>--</td>
<td>18</td>
<td>$4,591</td>
<td>5%</td>
</tr>
<tr>
<td>5%</td>
<td>17</td>
<td>$4,371</td>
<td>5%</td>
</tr>
<tr>
<td>5%</td>
<td>16</td>
<td>$4,149</td>
<td>6%</td>
</tr>
<tr>
<td>5%</td>
<td>15</td>
<td>$3,925</td>
<td>6%</td>
</tr>
<tr>
<td>6%</td>
<td>14</td>
<td>$3,699</td>
<td>7%</td>
</tr>
<tr>
<td>6%</td>
<td>13</td>
<td>$3,470</td>
<td>7%</td>
</tr>
<tr>
<td>7%</td>
<td>12</td>
<td>$3,239</td>
<td>8%</td>
</tr>
<tr>
<td>7%</td>
<td>11</td>
<td>$3,005</td>
<td>9%</td>
</tr>
<tr>
<td>8%</td>
<td>10</td>
<td>$2,769</td>
<td>9%</td>
</tr>
<tr>
<td>9%</td>
<td>9</td>
<td>$2,529</td>
<td>11%</td>
</tr>
<tr>
<td>10%</td>
<td>8</td>
<td>$2,285</td>
<td>12%</td>
</tr>
<tr>
<td>11%</td>
<td>7</td>
<td>$2,037</td>
<td>14%</td>
</tr>
<tr>
<td>12%</td>
<td>6</td>
<td>$1,784</td>
<td>17%</td>
</tr>
<tr>
<td>15%</td>
<td>5</td>
<td>$1,525</td>
<td>21%</td>
</tr>
<tr>
<td>17%</td>
<td>4</td>
<td>$1,259</td>
<td>28%</td>
</tr>
<tr>
<td>22%</td>
<td>3</td>
<td>$983</td>
<td>42%</td>
</tr>
<tr>
<td>30%</td>
<td>2</td>
<td>$693</td>
<td>81%</td>
</tr>
<tr>
<td>45%</td>
<td>1</td>
<td>$382</td>
<td>--</td>
</tr>
</tbody>
</table>
Reduction in Fleet Age as a Result of Fleet Renewal

![Bar chart showing the reduction in average fleet age over years from 2007 to 2026. The average age decreases from about 6 years in 2007 to 2 years in 2026.](chart.png)
## M&R Costs Under a Fleet Renewal Program, by Department

<table>
<thead>
<tr>
<th>Dept</th>
<th>Current</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$12,733,961</td>
<td>$7,453,096</td>
<td>$7,271,073</td>
<td>$7,275,786</td>
<td>$6,565,908</td>
<td>$4,950,056</td>
</tr>
<tr>
<td>B</td>
<td>$4,039,596</td>
<td>$3,145,657</td>
<td>$2,559,482</td>
<td>$2,561,256</td>
<td>$2,134,616</td>
<td>$1,958,251</td>
</tr>
<tr>
<td>C</td>
<td>$4,646,643</td>
<td>$3,770,808</td>
<td>$2,826,755</td>
<td>$1,848,383</td>
<td>$1,411,060</td>
<td>$1,932,174</td>
</tr>
<tr>
<td>D</td>
<td>$4,557,185</td>
<td>$3,068,526</td>
<td>$2,517,892</td>
<td>$1,767,316</td>
<td>$1,398,443</td>
<td>$1,641,750</td>
</tr>
<tr>
<td>E</td>
<td>$3,506,579</td>
<td>$1,547,722</td>
<td>$1,411,796</td>
<td>$1,156,405</td>
<td>$1,294,321</td>
<td>$1,281,449</td>
</tr>
<tr>
<td>F</td>
<td>$1,936,004</td>
<td>$853,476</td>
<td>$534,113</td>
<td>$435,548</td>
<td>$605,655</td>
<td>$754,826</td>
</tr>
<tr>
<td>Total</td>
<td>$31,419,968</td>
<td>$19,839,285</td>
<td>$17,121,111</td>
<td>$15,044,694</td>
<td>$13,410,003</td>
<td>$12,518,506</td>
</tr>
</tbody>
</table>
# Distribution and Avoidability of Direct M&R Costs

<table>
<thead>
<tr>
<th>Department</th>
<th>Labor</th>
<th>Parts</th>
<th>Commercial</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>56%</td>
<td>20%</td>
<td>23%</td>
</tr>
<tr>
<td>B</td>
<td>55%</td>
<td>29%</td>
<td>16%</td>
</tr>
<tr>
<td>C</td>
<td>73%</td>
<td>23%</td>
<td>4%</td>
</tr>
<tr>
<td>D</td>
<td>57%</td>
<td>41%</td>
<td>3%</td>
</tr>
<tr>
<td>E</td>
<td>58%</td>
<td>15%</td>
<td>27%</td>
</tr>
<tr>
<td>F</td>
<td>62%</td>
<td>30%</td>
<td>8%</td>
</tr>
</tbody>
</table>
## Fuel Costs Under a Fleet Renewal Program

<table>
<thead>
<tr>
<th>Year</th>
<th>Miles per Gallon</th>
<th>Gallons Used</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>10.8</td>
<td>10,574,939</td>
<td>$23,793,613</td>
</tr>
<tr>
<td>1</td>
<td>10.9</td>
<td>10,367,587</td>
<td>$23,901,530</td>
</tr>
<tr>
<td>2</td>
<td>11.1</td>
<td>10,164,301</td>
<td>$24,027,466</td>
</tr>
<tr>
<td>3</td>
<td>11.3</td>
<td>9,965,001</td>
<td>$24,172,229</td>
</tr>
<tr>
<td>4</td>
<td>11.4</td>
<td>9,769,609</td>
<td>$24,336,701</td>
</tr>
<tr>
<td>5</td>
<td>11.6</td>
<td>9,578,048</td>
<td>$24,521,841</td>
</tr>
<tr>
<td>6</td>
<td>11.8</td>
<td>9,483,216</td>
<td>$24,973,533</td>
</tr>
<tr>
<td>7</td>
<td>11.9</td>
<td>9,389,323</td>
<td>$25,455,073</td>
</tr>
<tr>
<td>8</td>
<td>12.1</td>
<td>9,296,359</td>
<td>$25,968,518</td>
</tr>
<tr>
<td>9</td>
<td>12.3</td>
<td>9,204,316</td>
<td>$26,516,111</td>
</tr>
<tr>
<td>10</td>
<td>12.5</td>
<td>9,113,184</td>
<td>$27,100,294</td>
</tr>
<tr>
<td>20</td>
<td>13.8</td>
<td>8,250,047</td>
<td>$28,386,034</td>
</tr>
<tr>
<td>Description</td>
<td>Value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of vehicles in the fleet</td>
<td>7,386</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work days per year</td>
<td>240</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle work days per year</td>
<td>1,846,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle days out of service per year @ 10 percent downtime rate</td>
<td>184,650</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lost employee productivity per year @ 3 hours per day of vehicle downtime</td>
<td>553,950</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTE employees worth of lost productivity at 1,500 productive hours per employee per year</td>
<td>369</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional salary and fringe benefit costs per year @ $50,000 per FTE employee to cover lost productivity</td>
<td>$ 18,465,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost savings associated with reducing the downtime rate to the industry standard of 5 percent</td>
<td>$ 9,232,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IDENTIFYING TOTAL FLEET COST REDUCTION OPPORTUNITIES
Fleet Renewal Scenario - First 10 Years and Beyond
General Fund Fleet

Gross Replacement Cost (millions)

Fiscal Year

Replacement Costs Under “Status Quo”

Status Quo Scenario - First 10 Years and Beyond
General Fund Fleet

Fiscal Year


Gross Replacement Costs (millions)
Change in Vehicle Age Under Renewal versus Status Quo Scenarios

Average Vehicle Age Under Fleet Renewal and Status Quo Scenarios
General Fund Fleet

Year
- 2007 (Current)
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017

Average Vehicle Age (years)
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9

Fleet Renewal
Status Quo
Key Assumptions

- Vehicle acquisitions are financed with bonds
- All costs increase at an annual inflation rate of 3 percent
- M&R cost savings are only 65 percent achievable in Year 1 and are not 100 percent achievable until Year 5
## Costs of Fleet Renewal versus Status Quo

### Fleet Costs/Asset Value Under Fleet Renewal Scenario (millions)

<table>
<thead>
<tr>
<th>Cost Category/Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Replacement Cost</td>
<td>$57</td>
<td>$58</td>
<td>$58</td>
<td>$57</td>
<td>$58</td>
<td>$56</td>
<td>$57</td>
<td>$69</td>
<td>$92</td>
<td>$79</td>
<td>$641</td>
</tr>
<tr>
<td>Annual Asset Depreciation</td>
<td>$34</td>
<td>$34</td>
<td>$37</td>
<td>$39</td>
<td>$41</td>
<td>$42</td>
<td>$42</td>
<td>$46</td>
<td>$54</td>
<td>$53</td>
<td>$422</td>
</tr>
<tr>
<td>Annual Maintenance and Repair Cost</td>
<td>$24</td>
<td>$20</td>
<td>$17</td>
<td>$15</td>
<td>$14</td>
<td>$16</td>
<td>$17</td>
<td>$17</td>
<td>$17</td>
<td>$17</td>
<td>$175</td>
</tr>
<tr>
<td>Annual Fuel Cost</td>
<td>$15</td>
<td>$16</td>
<td>$16</td>
<td>$17</td>
<td>$17</td>
<td>$18</td>
<td>$18</td>
<td>$19</td>
<td>$19</td>
<td>$20</td>
<td>$174</td>
</tr>
<tr>
<td>Annual Total Cost</td>
<td>$74</td>
<td>$70</td>
<td>$71</td>
<td>$70</td>
<td>$72</td>
<td>$75</td>
<td>$78</td>
<td>$82</td>
<td>$90</td>
<td>$89</td>
<td>$771</td>
</tr>
<tr>
<td>Ending Fair Market Value of Assets</td>
<td>$107</td>
<td>$127</td>
<td>$140</td>
<td>$149</td>
<td>$155</td>
<td>$157</td>
<td>$157</td>
<td>$163</td>
<td>$180</td>
<td>$187</td>
<td>$187</td>
</tr>
</tbody>
</table>

### Fleet Costs/Asset Value Under Status Quo Scenario (millions)

<table>
<thead>
<tr>
<th>Cost Category/Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Replacement Cost</td>
<td>$21</td>
<td>$22</td>
<td>$22</td>
<td>$23</td>
<td>$22</td>
<td>$23</td>
<td>$23</td>
<td>$24</td>
<td>$24</td>
<td>$25</td>
<td>$228</td>
</tr>
<tr>
<td>Annual Asset Depreciation</td>
<td>$24</td>
<td>$20</td>
<td>$20</td>
<td>$21</td>
<td>$21</td>
<td>$21</td>
<td>$21</td>
<td>$21</td>
<td>$21</td>
<td>$21</td>
<td>$210</td>
</tr>
<tr>
<td>Annual Maintenance and Repair Cost</td>
<td>$26</td>
<td>$28</td>
<td>$30</td>
<td>$31</td>
<td>$34</td>
<td>$35</td>
<td>$37</td>
<td>$41</td>
<td>$45</td>
<td>$47</td>
<td>$355</td>
</tr>
<tr>
<td>Annual Fuel Cost</td>
<td>$15</td>
<td>$16</td>
<td>$17</td>
<td>$17</td>
<td>$18</td>
<td>$18</td>
<td>$19</td>
<td>$19</td>
<td>$20</td>
<td>$21</td>
<td>$180</td>
</tr>
<tr>
<td>Annual Total Cost</td>
<td>$65</td>
<td>$65</td>
<td>$67</td>
<td>$69</td>
<td>$73</td>
<td>$74</td>
<td>$77</td>
<td>$81</td>
<td>$86</td>
<td>$89</td>
<td>$745</td>
</tr>
<tr>
<td>Ending Fair Market Value of Assets</td>
<td>$84</td>
<td>$85</td>
<td>$85</td>
<td>$85</td>
<td>$86</td>
<td>$86</td>
<td>$85</td>
<td>$83</td>
<td>$82</td>
<td>$83</td>
<td>$83</td>
</tr>
</tbody>
</table>

### Savings (Costs) Associated with Fleet Renewal (millions)

<table>
<thead>
<tr>
<th>Cost Category/Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase (Decrease) in Value of Assets from Renewal</td>
<td>$23</td>
<td>$41</td>
<td>$55</td>
<td>$64</td>
<td>$69</td>
<td>$71</td>
<td>$72</td>
<td>$80</td>
<td>$97</td>
<td>$104</td>
<td></td>
</tr>
<tr>
<td>Net Annual Savings (Costs) from Fleet Renewal</td>
<td>$14</td>
<td>$28</td>
<td>$38</td>
<td>$44</td>
<td>$51</td>
<td>$52</td>
<td>$52</td>
<td>$60</td>
<td>$73</td>
<td>$78</td>
<td></td>
</tr>
<tr>
<td>NPV Savings (Costs) from Fleet Renewal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$41</td>
</tr>
</tbody>
</table>
QUESTIONS
DEVELOPING A STRATEGIC BUSINESS PLAN
Key Concepts

**Strategy:** The science of planning and directing large-scale operations, specifically of maneuvering into the most advantageous position prior to actual engagement.

**Tactics:** The science of arranging and maneuvering to attain short-range objectives.

**Confusion:** An indiscriminate mixing or putting together of things; a disturbance of the proper order or arrangement of parts or activities.
Enterprise Management Processes

Sound Fleet Management

- Business Planning
- Focus Groups
- Professional Certification
- Training
- Customer Relationship Management
  - Annual Reports
  - Management Analysis & Reporting
  - Cost Analysis & Control
  - Fund Management and Accounting
  - Charge-Back Rate Development
- Personnel Management
- Purchasing
- Information Systems
- Service Level Agreements
- Customer Surveys
- Billing & Collections
- Performance Reviews
- Performance Measurement & Benchmarking
- Contracts
- Budgeting
- Focus Groups
- Professional Certification
- Training
- Customer Relationship Management
- Annual Reports
- Management Analysis & Reporting
- Cost Analysis & Control
- Fund Management and Accounting
- Charge-Back Rate Development
- Personnel Management
- Purchasing
- Information Systems
- Service Level Agreements
- Customer Surveys
- Billing & Collections
- Performance Reviews
- Performance Measurement & Benchmarking
- Contracts
- Budgeting
Why develop a business plan?

- To guide and achieve improvement
- To manage the effects of change
- To attain stature and influence
- To promote autonomy and self-sufficiency
- To provide opportunities for growth and professional advancement
Ancillary Benefits of Developing a Business Plan

- Developing an understanding of the complexity of your business
- Developing an understanding of the limits of your authority and responsibility
- Clarifying the mission of your organization and the enablers and impediments to fulfilling it
- Fostering a sense of teamwork within your organization
- Strengthening relationships with your customers
Who should develop your business plan?

- Fleet manager
- Other fleet management organization staff
- At least one senior official in your organization
- Representatives of key ancillary support organizations (e.g., finance and accounting, strategic sourcing / purchasing, IT)
Who should know about your business plan?

- All of your employees
- All of your customers
- Upper management
Overview of a Business Planning Process

1. Define Your Business
2. Determine Limits of Authority and Responsibility
3. Identify Strengths and Weaknesses
4. Prioritize Areas for Improvement
5. Define Improvement Strategies
6. Develop Action Plans
7. Reengineer and Implement
8. Measure Results
9. Refine/Define New Strategies
Step 1: Defining Your Business

- Business Processes to be Managed
- Management Roles
- Management Responsibilities
- Management Authority
Sample Asset Management Activities

**Maintenance Shop Management**

- Pre-trip inspection
- PM program development
- Work planning and scheduling
- Defect reporting and service writing
- Work estimation and assignment
- M&R service delivery
- Work supervision
- Road call management
- Field service management
- Warranty management
- Quality assurance
Sample Business Management Activities

Human Resources Management

- Organization structure definition
- Definition of job responsibilities
- Staff assignment and utilization management
- Employee classification and compensation
- Employee recruiting
- Employee training and professional development
- Employee performance management
Management Roles

- Business process execution
- Policy and procedure development
- Best practices and technology monitoring and educating
- Industry liaison
- Goal setting and performance reporting
- Fleet user advocacy
- Executive management support
Step 2: Identifying Responsibilities and Authority

- Fleet management organization alone
- Fleet user organizations alone
- Fleet management lead
- User organizations lead
- Shared equally between fleet management and fleet user organizations
- Other entities
Step 3: Identifying Strengths and Weaknesses in Current Practices

- **Input perspective**
  - Process definition
  - Intrinsic soundness
  - Soundness relative to industry best practices

- **Output perspective**
  - Conditions
  - Performance statistics relative to benchmarks; trends
  - Customer satisfaction
  - Management satisfaction
Step 4: Prioritizing Business Processes for Improvement

- Importance
  - Impact on vehicle performance
  - Impact on fleet management organization performance
- Quality of current practices
- Reengineerability
- Compatibility with enterprise-wide priorities (e.g., sustainability)
- Opportunity for innovation
- Resource requirements versus capacity
- Low-hanging fruit
Setting Priorities: An Example

- **Business Practice Area**
  - Vehicle Operation

- **Business Practices Included**
  - Operator licensing and certification: H (E)
  - Operator training: M (F)
  - Pre-/post-trip inspection and record keeping: L (P)
  - Vehicle misuse/abuse management: M (G)
  - Accident repair and claims management: H (E)
  - Fleet safety management: M (P)

- **Improvement Priorities**
  1. Fleet safety management
  2. Operator training
  3. Vehicle misuse/abuse management
# Functional Improvement Identification and Prioritization Matrix

## Management Function

<table>
<thead>
<tr>
<th>Year</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact on Quality of Current Practices</strong></td>
<td><strong>Reengineerability</strong></td>
<td><strong>Opportunity for Innovation</strong></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

### Equipment Assignment

1. **Equipment Business Need Definition**
   - **Impact on Performance**: H
   - **Quality of Current Practices**: L
   - **Reengineer-ability**: H
   - **Opportunity for Innovation**: L
   - **Timing**: 1
2. **Equipment Provision Alternatives Analysis / Decision Making**
   - **Impact on Performance**: H
   - **Quality of Current Practices**: L
   - **Reengineer-ability**: H
   - **Opportunity for Innovation**: M
   - **Timing**: 2
3. **Pov Reimbursement Management**
   - **Impact on Performance**: M
   - **Quality of Current Practices**: L
   - **Reengineer-ability**: L
   - **Opportunity for Innovation**: H
   - **Timing**: 3
4. **Take-Home Use Management**
   - **Impact on Performance**: M
   - **Quality of Current Practices**: L
   - **Reengineer-ability**: H
   - **Opportunity for Innovation**: M

### Equipment Acquisition and Disposal

5. **Equipment Specifications Development**
   - **Impact on Performance**: H
   - **Quality of Current Practices**: M
   - **Reengineer-ability**: H
   - **Opportunity for Innovation**: H
   - **Timing**: 2
6. **Contract Establishment and Management**
   - **Impact on Performance**: H
   - **Quality of Current Practices**: M
   - **Reengineer-ability**: M
   - **Opportunity for Innovation**: H
   - **Timing**: 2
7. **Ad Hoc Purchasing**
   - **Impact on Performance**: H
   - **Quality of Current Practices**: L
   - **Reengineer-ability**: H
   - **Opportunity for Innovation**: H
   - **Timing**: 2
8. **Equipment Acceptance, Prep, and Delivery**
   - **Impact on Performance**: H
   - **Quality of Current Practices**: M
   - **Reengineer-ability**: H
   - **Opportunity for Innovation**: M
   - **Timing**: 2
9. **Commercial Equipment Rental**
   - **Impact on Performance**: H
   - **Quality of Current Practices**: L
   - **Reengineer-ability**: H
   - **Opportunity for Innovation**: M
   - **Timing**: 2
10. **Equipment Deaccessioning**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: M
    - **Reengineer-ability**: M
    - **Opportunity for Innovation**: L
    - **Timing**: 2
11. **Equipment Disposal**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: M
    - **Reengineer-ability**: H
    - **Opportunity for Innovation**: M
    - **Timing**: 2
12. **Equipment Performance Management**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: M
    - **Opportunity for Innovation**: H
    - **Timing**: 2

### Equipment Operation Management

13. **Operator Certification and Record Keeping**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: H
    - **Opportunity for Innovation**: M
    - **Timing**: 2
14. **Operator Training**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: M
    - **Opportunity for Innovation**: H
    - **Timing**: 2
15. **Pre-Trip Inspection and Record Keeping**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: M
    - **Opportunity for Innovation**: H
    - **Timing**: 2
16. **Equipment Misuse/Abuse Management**
    - **Impact on Performance**: M
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: M
    - **Opportunity for Innovation**: M
    - **Timing**: 2
17. **Accident Reporting, Investigation, and Management**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: H
    - **Opportunity for Innovation**: H
    - **Timing**: 2
18. **Subrogation**
    - **Impact on Performance**: M
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: M
    - **Opportunity for Innovation**: M
    - **Timing**: 2

### Equipment Utilization Management

19. **Equipment Utilization Guidelines Establishment**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: H
    - **Opportunity for Innovation**: L
    - **Timing**: 2
20. **Equipment Utilization Data Capture**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: H
    - **Opportunity for Innovation**: H
    - **Timing**: 2
21. **Investigation of Utilization "Abnormalities"**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: H
    - **Opportunity for Innovation**: L
    - **Timing**: 2
22. **Equipment Reassignment or Disposal**
    - **Impact on Performance**: H
    - **Quality of Current Practices**: L
    - **Reengineer-ability**: H
    - **Opportunity for Innovation**: L
    - **Timing**: 2
Step 5: Defining Improvement Strategies

- *What* you are going to improve
- *Why* you are going to improve it
Sample Improvement Strategy

• Issues and Opportunities

  - The Motor Pool’s short-term rental vehicle inventory may be larger than necessary to meet customer needs.
  - Using commercial rental vehicles can be a cost-effective means of supplementing an inventory of company-owned vehicles to meet peaks in customer demand.
  - Utilizing rental vehicles as a back-up supply source might enable the Motor Pool to downsize the company-owned rental fleet without compromising vehicle availability or customer service.
  - The company currently has a contract in place for the short-term vehicle rental. However, the Motor Pool does not use this contract as a secondary source of vehicle supply for its customers.

• Improvement Strategy

  Confirm the economic benefits of using commercial rental vehicles to supplement an optimally-sized inventory of company-owned short-term rental vehicles and, subject to such confirmation, develop an integration strategy and plan under which the Motor Pool would procure such vehicles on an as-needed basis on behalf of its customers.
Step 6: Developing Action Plans

- How you are going to improve the business process
  - Actions and Tasks
  - Timelines and Milestones
  - Work Products
  - Responsibility Assignments
  - Resource Requirements
    - Internal
    - External
Sample Action Plan

1. Identify and evaluate potential cost savings.
   a. Analyze historical motor pool rental transaction data to determine average daily and peak demands for rental vehicles.
   b. Determine core rental vehicle inventory requirement based on analysis of historical usage trends.
   c. Quantify marginal avoidable costs of furnishing pool vehicles in excess of core demand.
   d. Compare avoidable cost per vehicle rental day with current contract rental rates.
   e. Decide whether potential cost savings are large enough to warrant additional investigation. If so, document analysis results and proceed to Task 2.

2. Implement commercial vehicle rental contract to accommodate trip pool backup objectives.
   a. Develop contract specifications.
   b. Evaluate existing rental contract terms and conditions in consultation with Procurement Department for consistency with new requirements. Identify needed changes, if any.
   c. Renegotiate and/or re-bid contract as necessary to secure required services.
   d. Evaluate bid results (if necessary) and award new or modified contract.
Sample Action Plan (cont.)

3. Implement new policies and procedures for using commercial rental vehicles to supplement trip pool.
   b. Solicit feedback from selected stakeholders and finalize.
   c. Secure management approval for implementation.

4. Establish performance measurement process.
   a. Define key performance indicator(s) (KPI's) for measuring Motor Pool and commercial rental company performance in meeting contract objectives.
   b. Identify associated data requirements, data sources, analytical procedures, and reporting methods.
   c. Design and implement performance measurement and reporting process.
Step 7: Reengineering Business Processes

- Realistic number of improvement initiatives
- Detailed action plans
- Shared responsibility
- Accountability for progress and results
- Public commitment
- Continuous interaction with stakeholders
- Recognition of political realities
- Low-hanging fruit
QUESTIONS
PROMOTING FLEET MANAGEMENT PROFESSIONALISM IN CHINA
Trade Associations and Conferences

Fleet Management Conferences

USA (NAFA)
USA (NFLA)
AUS (AfMA)
UK (Jaama’s FM Workshops)
UK (BVRLA)
Professional Development Initiatives

- Professional Training Seminars
- Mini-Master Classes
- Showcase Site Visits
- Professional White Papers
- China Fleet Management Association
Trends

Fleet Administration  Fleet Management  Fleet Architecture
## FOR MORE INFORMATION

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Address</th>
<th>Phone</th>
<th>Email</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul Lauria</td>
<td>Mercury Associates, Inc.</td>
<td>16051 Comprint Circle, Gaithersburg, MD 20877</td>
<td>301 519 0535</td>
<td><a href="mailto:plauria@mercury-assoc.com">plauria@mercury-assoc.com</a></td>
<td><a href="http://www.mercury-assoc.com">www.mercury-assoc.com</a></td>
</tr>
<tr>
<td>Mark Bernard</td>
<td>Fleet Software and Services Pty</td>
<td>10 Monaro Road, Kooyong, Victoria, Australia, 3144</td>
<td>0419 59 59 00</td>
<td><a href="mailto:mark.bernard@fleet.com.au">mark.bernard@fleet.com.au</a></td>
<td><a href="http://www.fleet.com.au">www.fleet.com.au</a></td>
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