

Vehicle Data Acquisition Through Alternative Technologies

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Not Everything That Counts Can Be
Counted

and

Not Everything that can be Counted,
Counts

Albert Einstein



Agenda

- Acquire a broad understanding of the fleet technology ecosystem
- Recognize opportunities for leveraging existing systems for data acquisition, reporting and action
- Discuss technology roadmap framework for fleet asset management

Fleet Asset Management has several focus areas and many Processes and Tools...

Key Areas of Focus

Processes

Tools

- **Performance**
- **Optimization**
- **Utilization**
- **Risk Management**

- Fuel Management
- Route Optimization and Scheduling
- Vehicle Acquisition / Disposal
- Depreciation
- Dispatching
- Accident Management
- Replacement Planning
- Driver Training
- Procurement
- Vehicle Utilization
- Mileage Capture / Reimbursement
- Vehicle Specification / Selection
- Motor Pool Management
- Driver Training
- Time Reporting
- Licensing and Insurance
- Maintenance and Repair

- **ERP**
- **Fleet Management Information Systems**
- **Fuel Management**
- **AVL and GPS Systems**
- **Business Intelligence Systems**
- **Enterprise Integration**
- **Report Writers**
- **Document Management**
- **RFID**
- **HID**
- **Etc.**

Fleet Asset Management

There are several emerging trends for Data Acquisition for Fleet Asset Management

Today

Future

Vehicle Data Availability

- Vehicle sensors are available, but access to the data is often proprietary or difficult to interpret
- Data is non-standardized in Light Duty and in some instances Heavy Duty Vehicles
- Discrete sensors readily available in after market



- New models continually provide additional sensors and information across vehicle networks
- Standardization is happening, but the OEM retains protocol to manage internal vehicle network.

Wireless Technology

- Private Networks (e.g. Fuel Management Systems)
- 802.11xx
- Bluetooth
- Cellular
- RFID



- Private Network bandwidth and adoption
- WiMax introduction
- Broadband services
- ASP models

Telematics

- Internal Vehicle Electronics Integration
- Preventive Maintenance
- Tracking and AVL
- Communications



- Predictive and Prognostic Maintenance
- Driver Behavior Monitoring
- Optimization and Utilization

Predictive Maintenance

Input

- Vehicle Data Availability
- Accuracy
- Reliability
- Predictability
- System Integration

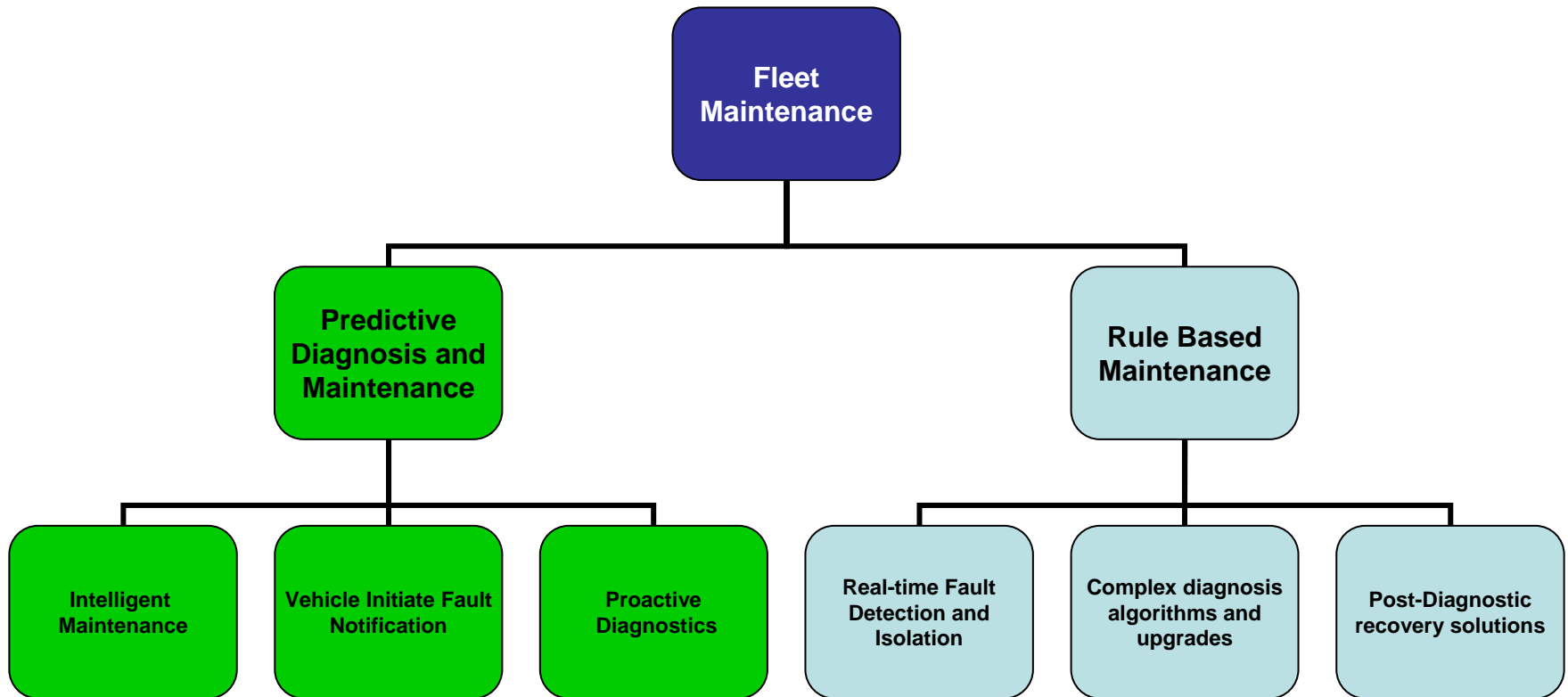


Output Goals

- Reduced Maintenance Cost
- Greater vehicle uptime performance
- Reduced Road Calls
- Increased Customer Satisfaction
- Risk Reduction

The Challenge – Identifying, collecting and reporting actionable information for Predictive Maintenance

While conventional time-based or rule-based vehicle maintenance strategies can serve as a starting point...



...It is anticipated that more complete vehicle information can be used to infer more intelligent and cost effective maintenance schedules

Ward created the first OBD II / J1708 device for vehicle data capture and fueling automation...



Benefits

- Easy to install
- 100% Accurate Odometer Engine Hours
- Fully Automated Fueling = No Manual Entry
- Green Fleet Management

Additional Fleet Data

- Idle Time
- Engine Time
- Fuel Consumed
- Engine Oil Level
- PTO Time
- Diagnostic Trouble Codes
- VIN
- Stop Idle Time
- Max Speed
- + Many others...

Reliable

- Thousands of implementations
- Solid-State design

...and can be used as the data acquisition device for vehicle faults prior to failure

Asset Tracking

Common Features Today

- Tracking
- Reporting
- Idle Reduction
- Risk Mitigation
- Speeding
- After Hour Violations
- Geofence Violations



Enhanced Capabilities

- Driver Metrics and Performance
- Risk Profile Reduction
 - Insurance Premium Optimization
- Route and Schedule Optimization
- Accident Reduction
- Green House Gas Reductions
- Fleet Operating Expense Reduction
- Automated Exception Reporting
- Universal Fuel Management
- Enterprise Information Integration
- Navigation
- Traffic & Weather Info

The Challenge – Identifying, collecting and reporting actionable information for Predictive Maintenance

Fuel Management System for data acquisition...

Common Features Today

- Fuel Access Control
- Multiple Media Authorization
- Fuel Accountability
- Lubricant Accountability
- Employee Validation
- Vehicle Validation
- Odometer/Meter Capture
- Tank Level Interface
- Networking, Modem and Wireless Connectivity



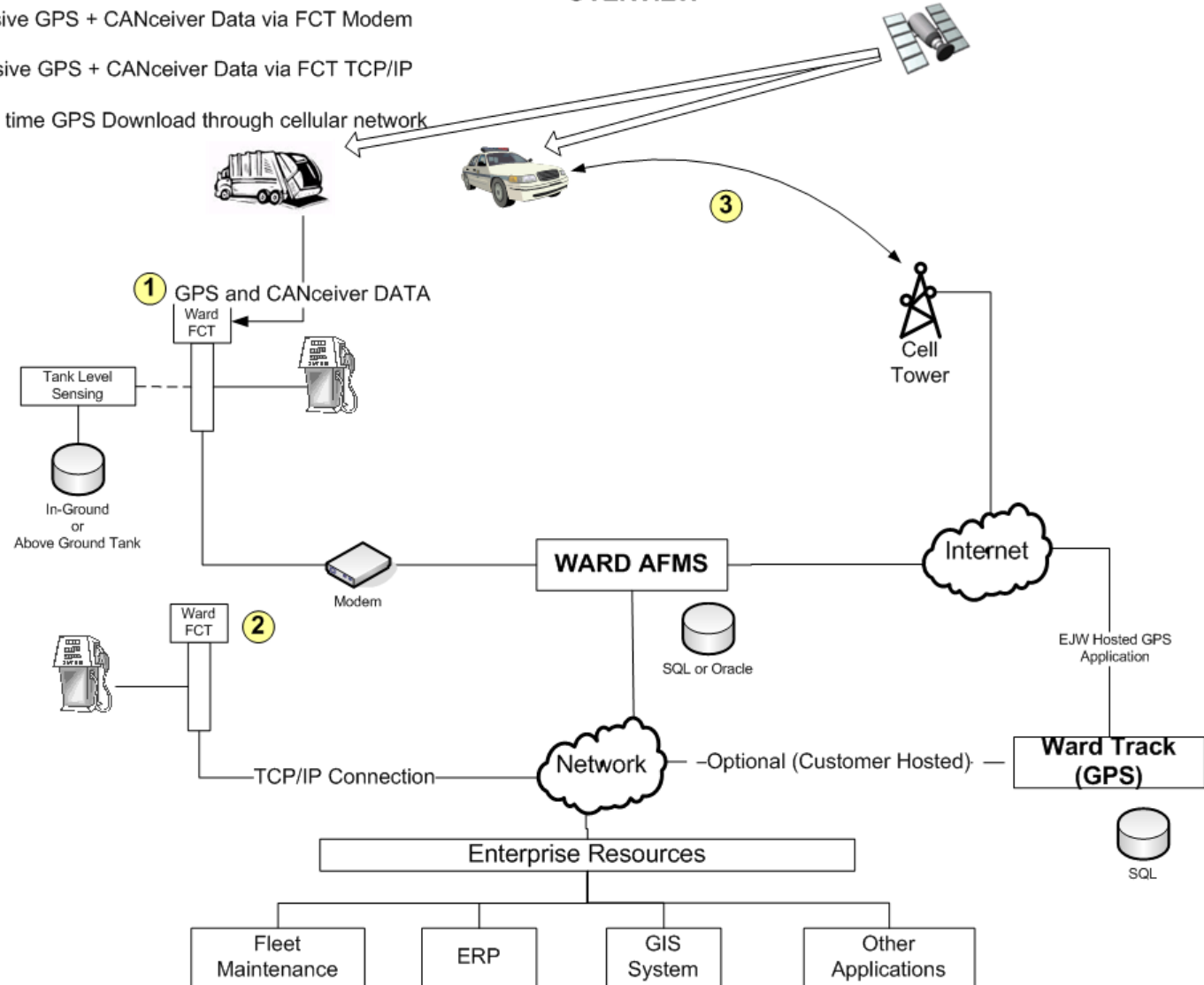
Enhanced Capabilities

- Business Process Enforcement
- Data Acquisition Device for Telematics
- Distributed Network Interface
- Enterprise Information Integration

...Leveraging the Fuel Management System for enhanced capabilities brings a greater ROI to both new and future investments

WARD FLEET ASSET MANAGEMENT SYSTEM OVERVIEW

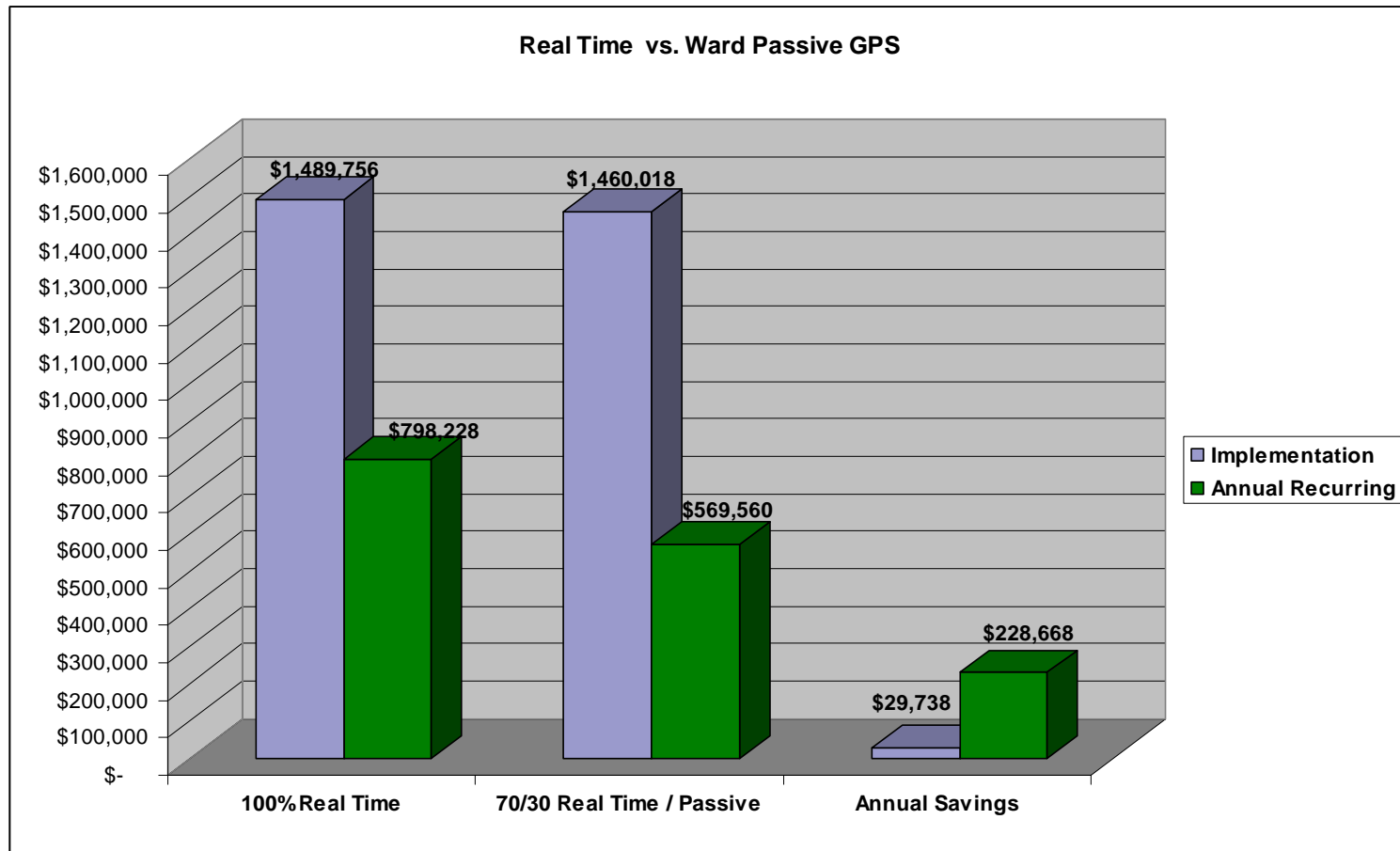
- ① Passive GPS + CANceiver Data via FCT Modem
- ② Passive GPS + CANceiver Data via FCT TCP/IP
- ③ Real time GPS Download through cellular network



Passive vs. Real Time Data Acquisition

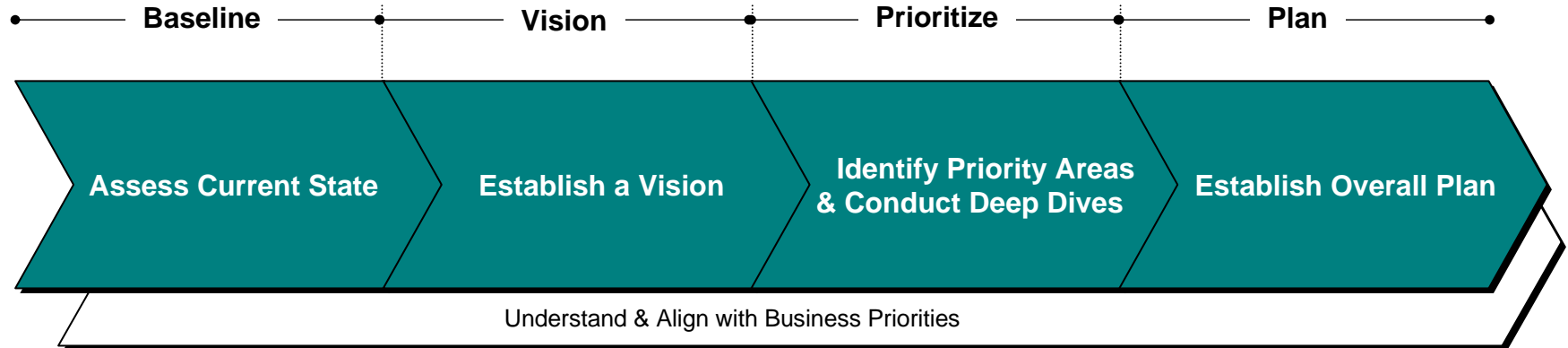
	Passive	Real Time
Pros	<ul style="list-style-type: none">•High Data Bandwidth•Increased data elements and frequency•Low or No Operating Expenses•Secure Network	<ul style="list-style-type: none">•Near real time access to data•2-way communication and exchange
Cons	<ul style="list-style-type: none">•After the fact data delivery•No 2-way communication real time	<ul style="list-style-type: none">•Annual Operating Expenses can be significant depending on bandwidth required•Requires internal staff to monitor activity in real time to achieve returns

Case Example: 70/30 Passive vs. Active tracking for 1300 vehicle fleet



Technology Strategic Planning Framework

Strategic Planning Framework



Activities

- ▶ Develop IT Baseline (Fact base includes costs, key processes, FTEs, infra & app maps, KPIs, org views, etc...)
- ▶ Define Targeted IT Strategy Hypotheses (efficiency considerations, IT effectiveness)
- ▶ Conduct interview campaign for Business Demand Drivers – shared and by business unit
- ▶ Define Vision Statement
- ▶ Develop IT Guiding Principles – overarching and by defined areas to address needs of mature and maturing businesses:
 - Applications
 - Infrastructure
 - People
 - Processes
 - Governance
- ▶ Compare to Best Practices (processes, service levels, skills, costs, capabilities, etc.)
- ▶ Opportunities sizing to improve efficiency & effectiveness in defined areas
- ▶ Capability Gap Analysis vs. current state
- ▶ Perform Selected Deep Dives (as needed)
- ▶ Prioritized set of improvement opportunities
- ▶ Demand Management
- ▶ IT Governance Model
- ▶ Action Plan

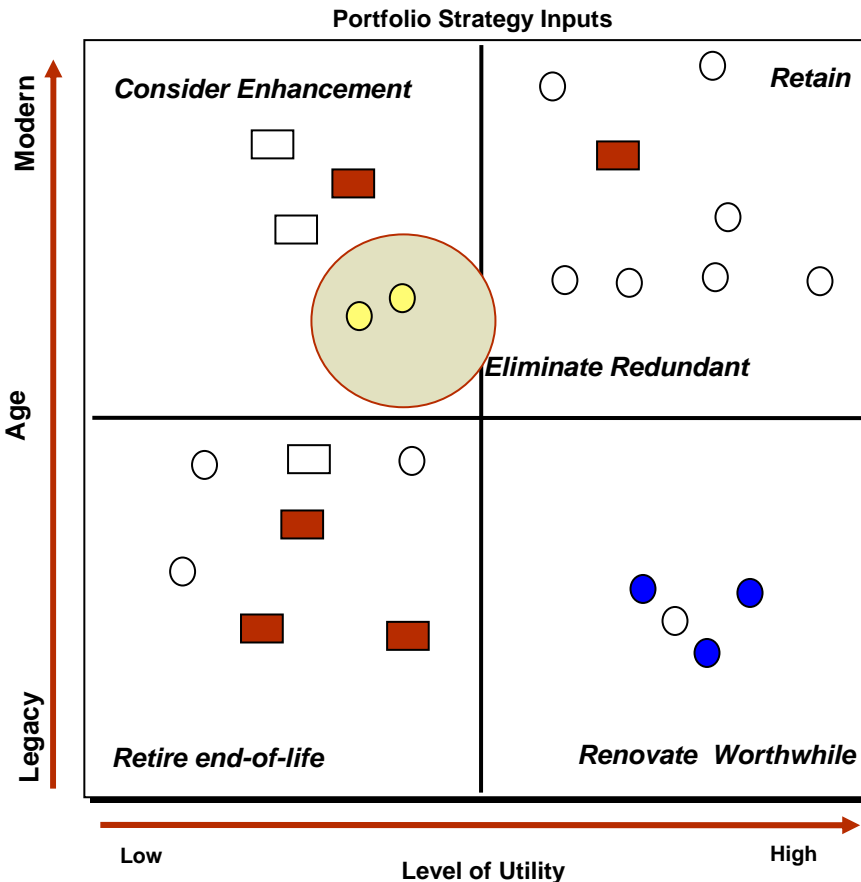
IT Strategy Hypotheses and Baseline Discussion

IT Vision and Preliminary Opportunity Discussion

Final Recommendations

Opportunities for applications rationalization should be made when evaluating alternative technologies






Inventory of Applications



Benefits of Portfolio Rationalization

- Reduced support & maintenance costs
- Decreased system complexities for both users and IT support staff
- Elimination of redundant and/or obsolete functionality
- Implementation of common, consistent support infrastructure
- Improved span of control and work flexibility

An integrated framework for evaluating technology will assist in defending business case requirements...

Criteria	Weight	Definition / Subcategories	SCORES				
							
Strategic Importance	40%	-Competitive Edge -Value to customer -Window of Opportunity -Sustainable -Fleet Technology Roadmap	Very Low 80 Points	Low 160 Points	Moderate 240 Points	High 320 Points	Very High 400 Points
Initiative Cost	15%	-Cost of Implementing	Very High >\$1M 30 Points	High Use Formula	Moderate Use Formula	Low Use Formula	Very Low <\$50K 150 Points
NPV	15%	-Present value of the net benefits (3-year)	Very Low NPV<\$500K 30 Points	Low \$500K - \$1M 60 Points	Moderate \$1M - \$3M 90 Points	High \$3M - \$10M 120 Points	Very High >\$10M 150 Points
Elapsed Time	10%	-Implementation time period (conception to deployment)	Very Long >16 Months 20 Points	Long 12 - 16 Months 40 Points	Moderate 8 - 12 Months 60 Points	Short 4 - 8 Months 80 Points	Very Short <4 Months 100 Points
Interdependencies	10%	-Degree to which the initiative is dependent on other initiatives	Very Interdependent 20 Points	Relatively Interdependent 40 Points	Moderately Interdependent 60 Points	Relatively Stand-Alone 80 Points	Stand-Alone 100 Points
Risk/Complexity to Implement	10%	-Operational Risk -Technology Risk	Very Large Alpha 20 Points	Significant Beta 40 Points	Moderate Not New 60 Points	Not Significant Not New 80 Points	Very Small Not New 100 Points
Total	100%		Range for Initiative Total Scores: 200 - 1,000 Points				

Conclusions

- Emerging Trends for vehicle and asset data continue to increase
- Predictive Maintenance in concert with Preventative Maintenance continue to show promise for future adoption
- Opportunity exists to leverage existing and new technology for enhanced value and ROI
- Fleet Asset Management remains and will continue to drive requirements for technology enhancements



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