Telematics Options and Capabilities

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National Renewable Energy Laboratory
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Project Overview

Overview of the telematics market

The Marine Corps experience

Fleetwide recommendations
Telematics options and capabilities

- Automaker vs. aftermarket vs. temporary
- System hardware
- System capabilities
- Cyber security issues
- Specific providers
- Economics

Recommendations for Marine Corps

- Fleet manager survey
- Driver safety
- Improve fuel efficiency
- Facilitate reporting
- Support vehicle acquisition process
What are telematics?

- Capture location and other data about vehicle operation
- Visualize that data remotely
- Data sources include vehicle, GPS, meters in hardware, even video with some providers
**OEM / Aftermarket / Temporary**

**OEM systems**
- Pre-installed
- Embedded network gateway
- Full access to proprietary ECU codes
- Brand specific

**Aftermarket systems**
- Can order installed from GSA
- Connected through OBD-II port
- Access to generic DTCs and reverse-engineered codes
- Function with mixed fleet

**Temporary applications**
- Mobile phone applications
- Short term data loggers
- Not permanently integrated
- Best for acquisition decisions
Telematics Distinctions

Every Major Company

- AVL using GPS asset tracking
- Geofences
- Mileage
- Driver behavior metrics e.g. speeding, idling
- Maintenance alerts

Distinctions by Company/Package

- Dashboards, reports, and interface
- Customizability
- Video
- Emergency notification
- Fuel sensor pairing and fuel consumption monitoring
- Cellular/wireless connection
- Frequency of data uploading
- Mobile application
- Cyber security features
- Fuel efficiency score

Potential Applications

- FMIS upload
- FAST reporting
- Driver scores
- Safety response
- Maintenance
- Fleet efficiency dashboard
- Vehicle acquisition
- Motor pooling
Marines’ Telematics Companies

**Lytx DriveCam**
- Most deployed in Marine vehicles
- Video capability

**PEGASAT WBC Fleet**
- Recent Marines deployment
- Traditional telematics

**Verizon NetworkFleet**
- Previously on GSA Schedule

**AT&T Fleet Manager**
- New addition to GSA Schedule

**Larger Telematics Market:**
- Dozens of other companies
- Mobile applications
- OEM systems
- Heavy duty specific
- Growing Market
- PS Market Research: Market to grow from $26.34B in 2015 to $140.10B in 2022
WBC Fleet Geofence

Geofence Applications
• Parking area
• Operational area (e.g. military installation)
• Routing
• Parking/idling for more than set time

Images from wbcfleet.com/info
WBC Fleet Speeding and Vehicle Tracking

Classify vehicle speeds
- Identify speeders or stop-and-go drivers
- Available for idling, harsh braking, cornering

Mapping vehicle routes
- Tracks can be converted to line geofences for a set route
- Zoom into track for speed
WBC Fleet Reports and Chat Feature

Reports
- Mileage
- Engine hours
- Speed (avg/max)
- Trips
- Parking
- Fueling fillings
- Fuel thefts
- Drivers
- Sensor trigger

Eco Driving Score
- Quick acceleration
- Hard braking
- Cornering/turning
- Speeding
- Reckless driving
- Customizable
- Calculates to efficiency score

Chat with Driver:

<table>
<thead>
<tr>
<th>Time</th>
<th>Sender</th>
<th>Text</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016-04-07 11:34:32</td>
<td>Driver</td>
<td>Order received</td>
<td>1</td>
</tr>
<tr>
<td>2016-04-12 11:58:58</td>
<td>Driver</td>
<td>Filled 20 gal.</td>
<td>1</td>
</tr>
<tr>
<td>2016-05-20 09:55:50</td>
<td>Operator (user)</td>
<td>Route 45 for today.</td>
<td>1</td>
</tr>
<tr>
<td>2016-05-20 09:56:28</td>
<td>Driver</td>
<td>Connection test.</td>
<td>1</td>
</tr>
<tr>
<td>2016-05-20 09:59:36</td>
<td>Driver</td>
<td>Route 125. Started at 08:15.</td>
<td>1</td>
</tr>
<tr>
<td>2016-05-25 12:18:27</td>
<td>Driver</td>
<td>On the way to warehouse.</td>
<td>1</td>
</tr>
</tbody>
</table>

Image from wbcfleet.com/info
WBC Fleet Mobile App
WBC Fleet: Uses CalAmp Hardware

Can include a GPS module for the driver

MDT-7™

Download: Datasheet PDF

CalAmp’s MDT-7 serves as a powerful user interface in an integrated mobile communications system. Customers can develop Android OS-based applications or license applications from CalAmp and/or its development community to optimize value to long-haul trucking, local fleet, asset delivery, and mobile workforce management.

Share this product with your network:
Lytx DriveCam GPS Tracking

GPS tracking options:
• Real-time
• Last known location
• Geofence
Lytx ActiveVision

Lytx DriveCam Video Capabilities

Preemptive Tracking:
- Notifications when unsafe behaviors are observed without accident
- Specific event coaching is provided

Collision Tracking:
- Collision events are immediately highlighted
- Behaviors leading to collisions are immediately identified

<table>
<thead>
<tr>
<th>Event Triggers</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggressive</td>
<td>Following Distance: $\geq 3$ sec to $&lt; 4$ sec</td>
</tr>
<tr>
<td>Aggressive - Level 2</td>
<td>Food / Drink - Observed</td>
</tr>
<tr>
<td>Blank Stare</td>
<td>Food / Drink - Distraction</td>
</tr>
<tr>
<td>Camera Issue</td>
<td>Incomplete Stop</td>
</tr>
<tr>
<td>Cell Handheld - Observed</td>
<td>Intersection Awareness</td>
</tr>
<tr>
<td>Cell Handheld - Distraction</td>
<td>Late Response</td>
</tr>
<tr>
<td>Cell Hands Free - Observed</td>
<td>Mirror Use</td>
</tr>
<tr>
<td>Cell Hands Free - Distraction</td>
<td>Near Collision</td>
</tr>
<tr>
<td>Collision</td>
<td>Near Collision - Unavoidable</td>
</tr>
<tr>
<td>Driver Unbelted [Roadway]</td>
<td>Not on Designated Roadway</td>
</tr>
<tr>
<td>Driver Unbelted [Residential Roadway]</td>
<td>Not Scanning Roadway</td>
</tr>
<tr>
<td>Driver Unbelted [Off Identifiable Roadway]</td>
<td>Other Communication Device - Observed</td>
</tr>
<tr>
<td>Driver Unbelted [Company Premises]</td>
<td>Other Communication Device - Distraction</td>
</tr>
<tr>
<td>Driver Unbelted [Parking Lot]</td>
<td>Other Concern</td>
</tr>
<tr>
<td>Driver Unbelted [Yard]</td>
<td>Other Distraction</td>
</tr>
<tr>
<td>Driver Unbelted [Landfill]</td>
<td>Other Violation</td>
</tr>
<tr>
<td>Drowsy</td>
<td>Passenger</td>
</tr>
<tr>
<td>Electronic Device - Distraction</td>
<td>Passenger Unbelted</td>
</tr>
<tr>
<td>Electronic Device - Observed</td>
<td>Positive Recognition</td>
</tr>
<tr>
<td>ER Obstruction</td>
<td>Possible Collision</td>
</tr>
<tr>
<td>Failed to Keep an Out</td>
<td>Red Light</td>
</tr>
<tr>
<td>Failed to Stop</td>
<td>Smoking</td>
</tr>
<tr>
<td>Falling Asleep</td>
<td>Speed Policy Violation</td>
</tr>
<tr>
<td>Following Distance: $\geq 2$ sec to $&lt; 3$ sec</td>
<td>Posted Speed Violation</td>
</tr>
<tr>
<td>Following Distance: $&lt; 1$ second</td>
<td>Too Fast for Conditions</td>
</tr>
<tr>
<td>Following Distance: $\geq 1$ sec to $&lt; 2$ sec</td>
<td>Unsafe Lane Change</td>
</tr>
</tbody>
</table>
Detailed fuel use tracking reports

- **Fuel Score** is created based on efficient driving behaviors
- “Lost” fuel is calculated

Mileage and other reports available
• Two Options on GSA Schedule:
  – GPS tracking with speed, location, idling, and periodic maintenance
  – Additional vehicle diagnostics (DTCs), fuel consumption, emissions data, and efficiency scorecards
  – Latter is similar to WBC Fleet
• Available through GSA Fleet
  – [https://www.gsa.gov/portal/content/102676](https://www.gsa.gov/portal/content/102676)
  – Pricing available to all federal fleets

<table>
<thead>
<tr>
<th>Aftermarket telematics device/plans (BPA number: GS-30F-2A051)</th>
<th>GPS tracking only</th>
<th>GPS tracking and vehicle diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Device (per unit)</strong></td>
<td>$100.00</td>
<td>$100.00</td>
</tr>
<tr>
<td><strong>Installation (per unit)</strong></td>
<td>$46.55</td>
<td>$46.55</td>
</tr>
<tr>
<td><strong>Data plan and web access (per month)</strong></td>
<td>$10.00</td>
<td>$12.00</td>
</tr>
<tr>
<td><strong>Total costs – year 1</strong></td>
<td>$266.55</td>
<td>$290.55</td>
</tr>
<tr>
<td><strong>Total cost – years 2-5</strong></td>
<td>$120.00</td>
<td>$144.00</td>
</tr>
<tr>
<td><strong>On-Site Installation (Per Installer/Day)</strong></td>
<td>$142.50</td>
<td>$142.50</td>
</tr>
</tbody>
</table>
Verizon

• Recent acquisitions have consolidated the market
  – NetworkFleet was a 2012 acquisition
  – Fleetmatics and Telogis acquired in 2016
  – ExpressFleet now targets government customers

• All are traditional telematics systems, but Verizon has tiered them to distinguish the products
Verizon

- NetworkFleet could provide tailored idling, speeding, and fuel economy reports
### Economics of Telematics

Potential savings if implemented to maximum extent →

**Marine Corps’ Safety Program:**
- Monitor drivers and road with Lytx DriveCam
- Driver’s Alert estimates that telematics-led safety program can reduce annual fleet accidents from 20% to 13%

<table>
<thead>
<tr>
<th>Measure</th>
<th>Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>$660</td>
</tr>
<tr>
<td>Idling</td>
<td>$143</td>
</tr>
<tr>
<td><strong>Aggressive Driving</strong></td>
<td>$112</td>
</tr>
<tr>
<td>Reduced VMT</td>
<td>$123</td>
</tr>
<tr>
<td>Maintenance</td>
<td>$99</td>
</tr>
<tr>
<td>Reporting</td>
<td>$312</td>
</tr>
<tr>
<td>Right-Sizing</td>
<td>$695</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,144</strong></td>
</tr>
</tbody>
</table>
## Economics of Telematics

<table>
<thead>
<tr>
<th>Savings Methods</th>
<th>Petroleum Reduction gal/yr</th>
<th>GHG Reduction tons CO₂/yr</th>
<th>Fuel Cost Savings $/yr</th>
<th>Impact on Plan percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace Vehicles</td>
<td>0.00</td>
<td>0.00</td>
<td>$0.00</td>
<td>0%</td>
</tr>
<tr>
<td>Use Alternative Fuel in Existing Vehicles</td>
<td>0.00</td>
<td>0.00</td>
<td>$0.00</td>
<td>0%</td>
</tr>
<tr>
<td>Reduce Idling</td>
<td>ADD ANOTHER 60</td>
<td>1</td>
<td>$143</td>
<td>38%</td>
</tr>
<tr>
<td>Reduce idling in 1 small gas pickup from 2 hours per day to 1 hour per day</td>
<td>60</td>
<td>1</td>
<td>$143</td>
<td>38%</td>
</tr>
<tr>
<td>Reduce Mileage</td>
<td>ADD ANOTHER 52</td>
<td>1</td>
<td>$123</td>
<td>33%</td>
</tr>
<tr>
<td>Reduce miles traveled in 1 small gas pickup from 10,000 miles to 9,000 miles</td>
<td>52</td>
<td>1</td>
<td>$123</td>
<td>33%</td>
</tr>
<tr>
<td>Drive Efficiently</td>
<td>ADD ANOTHER 47</td>
<td>1</td>
<td>$112</td>
<td>30%</td>
</tr>
<tr>
<td>Improve efficiency in 1 small gas pickup by 10%</td>
<td>47</td>
<td>1</td>
<td>$112</td>
<td>30%</td>
</tr>
<tr>
<td>Total savings from plan per year</td>
<td>159 gallons</td>
<td>2 tons of CO₂</td>
<td>$378</td>
<td>100%</td>
</tr>
</tbody>
</table>
Questions?

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