

Telematics Framework for Federal Agencies



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



LMU-2700 SERIES



LMU-300 SERIES



LMU-3030



LMU-4200 SERIES

Telematics options and capabilities

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

Recommendations for Marine Corps

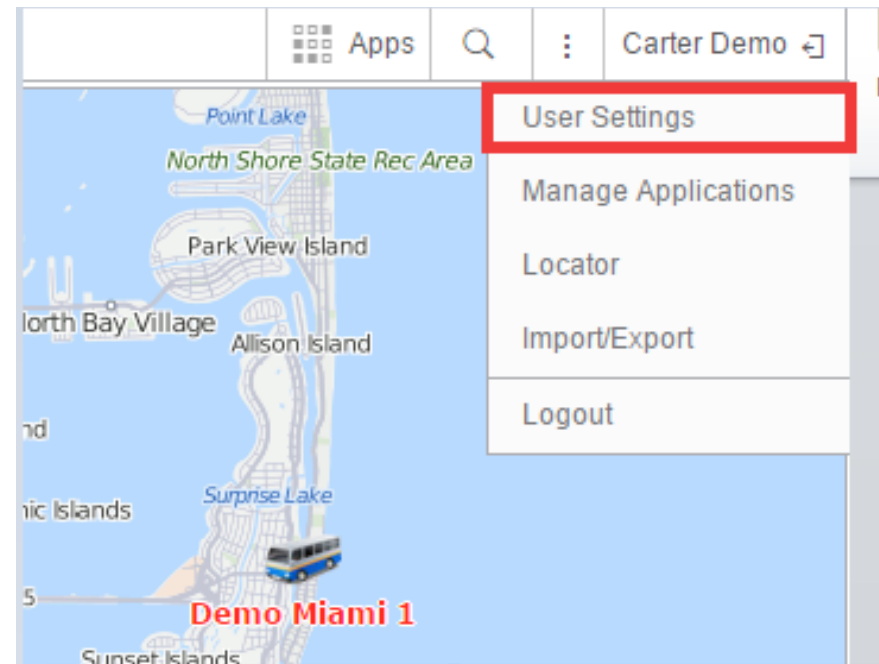
- Fleet manager survey
- Driver safety
- Improve fuel efficiency
- Facilitate reporting
- Support vehicle acquisition process

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



CalAmp LMU-3030



WBC Fleet User Interface

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

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

Verizon NetworkFleet

- Previously on GSA Schedule

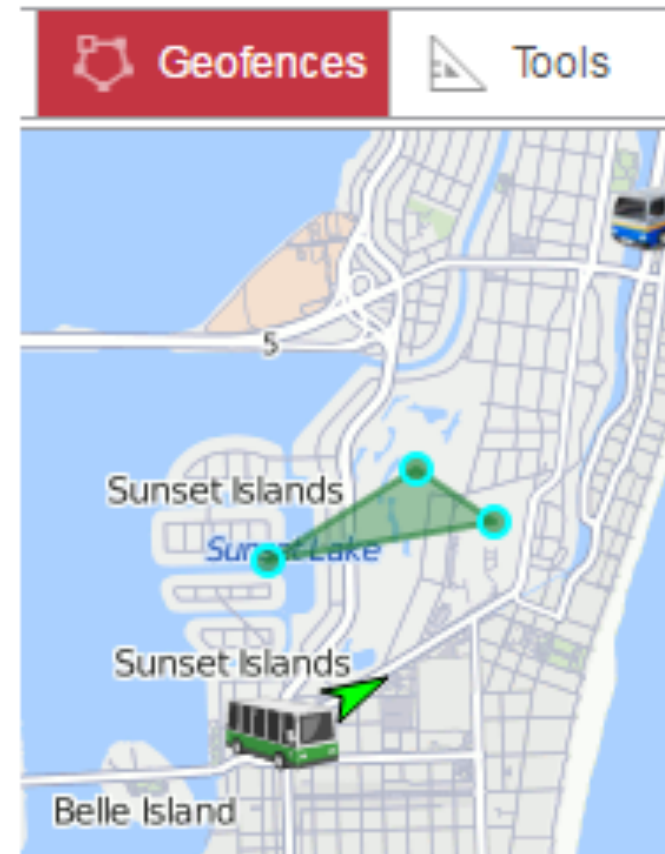
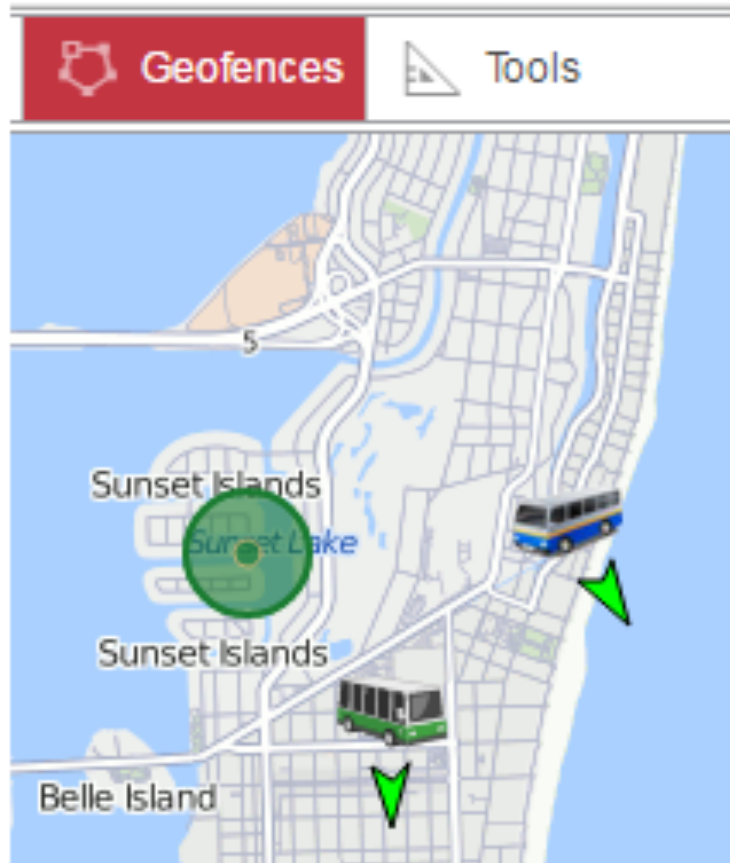
AT&T Fleet Manager

- New addition to GSA Schedule

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

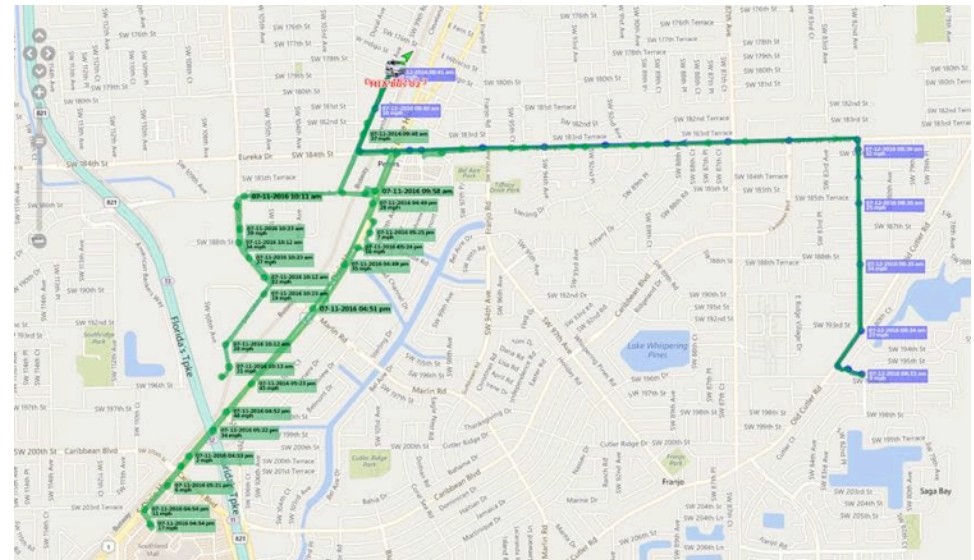
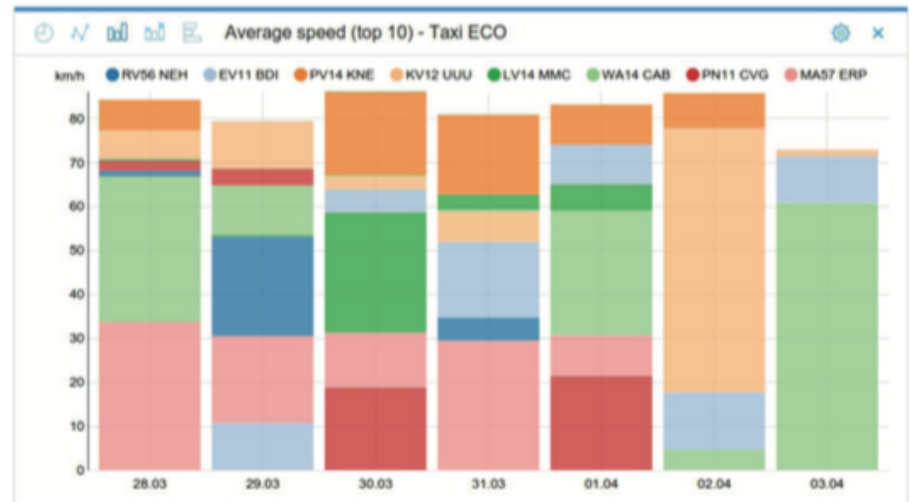
WBC Fleet Speeding and Vehicle Tracking

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

Chat with Driver:

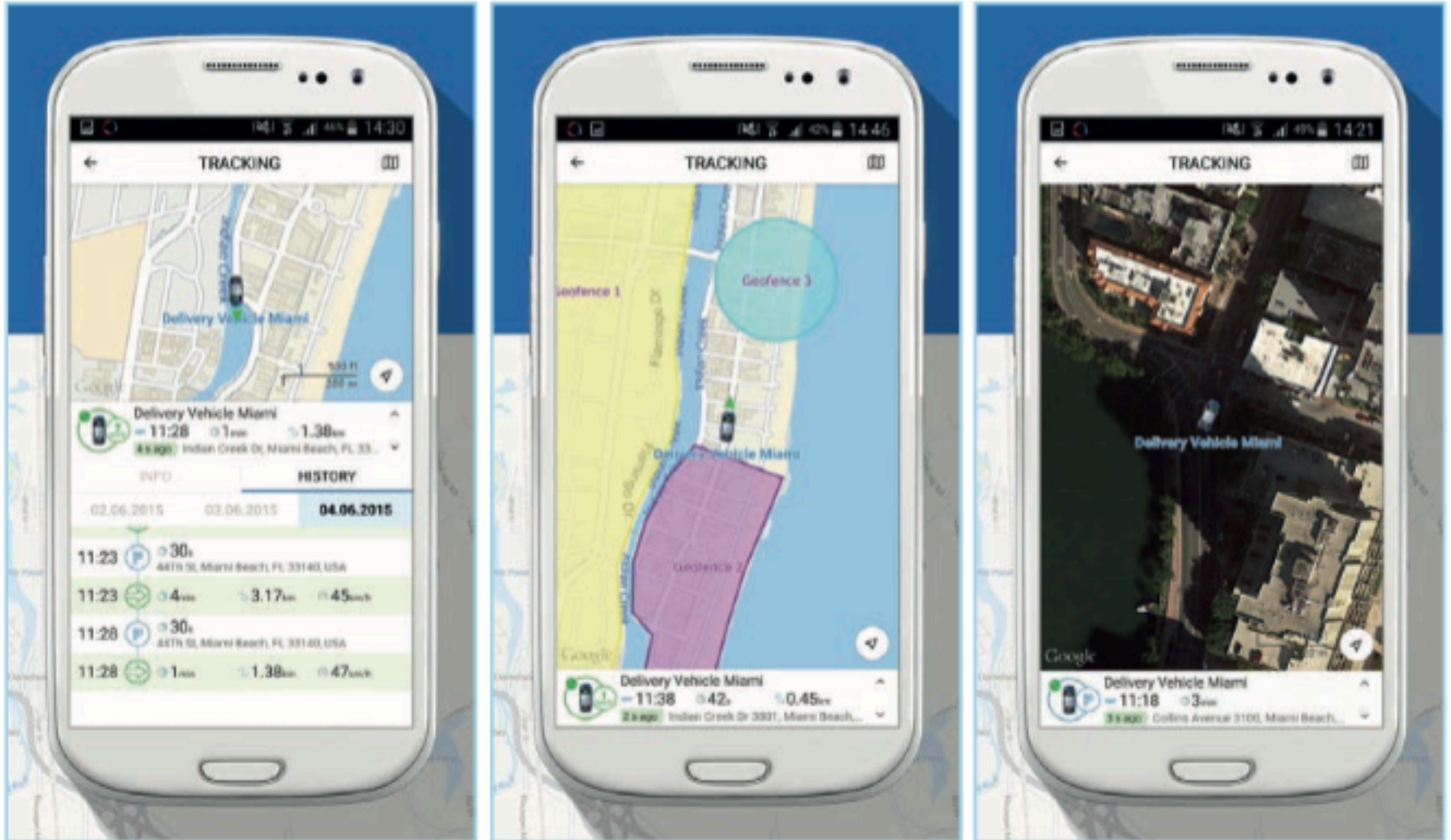
Image from wbcfleet.com/info

Eco Driving Score

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

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

WBC Fleet Mobile App



Images from wbcfleet.com/info

WBC Fleet: Uses CalAmp Hardware

Can include a GPS module for the driver



DATAREMOTE
POWER WITH YOUR HARDWARE

ABOUT US SOLUTIONS **PRODUCTS** MARKET SEGMENTS NEWS CONTACT

PRODUCTS / FLEET, ASSET & CARGO TRACKING / **MDT-7™**

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:

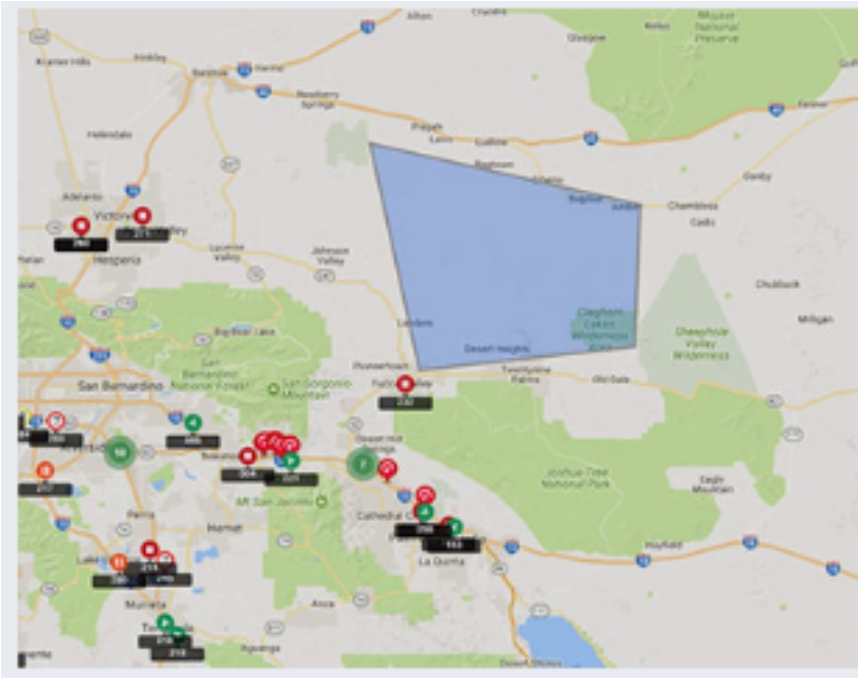
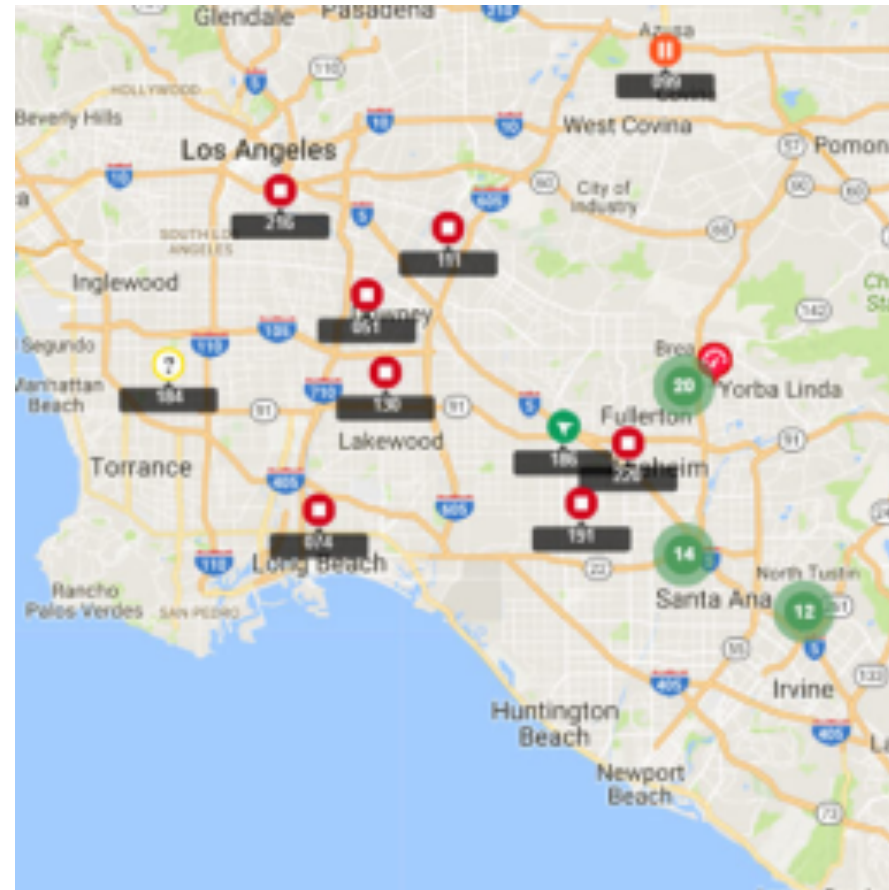
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Lytx DriveCam GPS Tracking

GPS tracking options:

- Real-time
- Last known location
- Geofence

Lytx Website



Lytx Website

Lytx ActiveVision

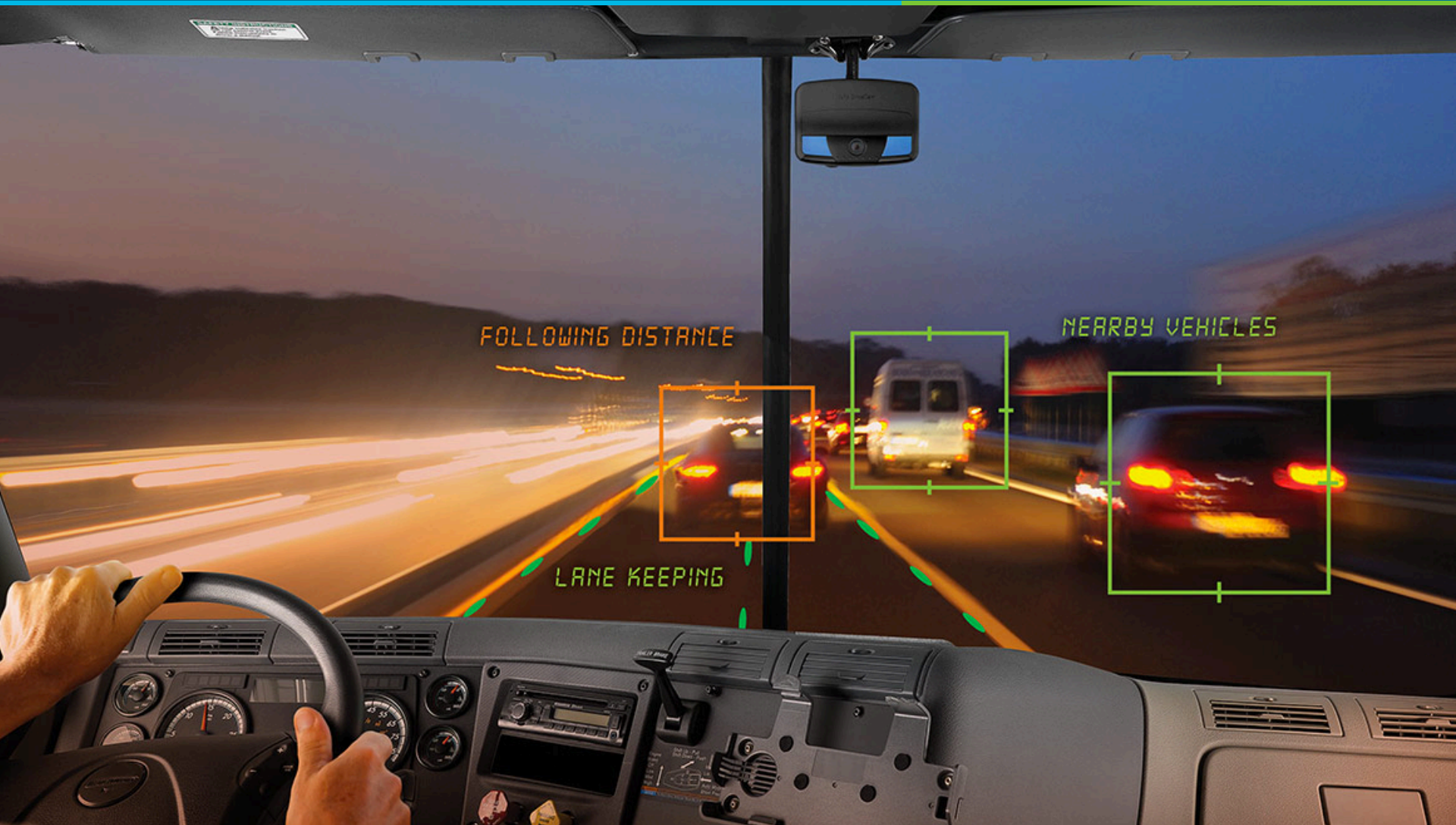


Image from www.lytx.com/en-us/fleet-services/program-enhancements/activevision-fleet-safety-alerts

Lytx DriveCam Video Capabilities

Event Triggers

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

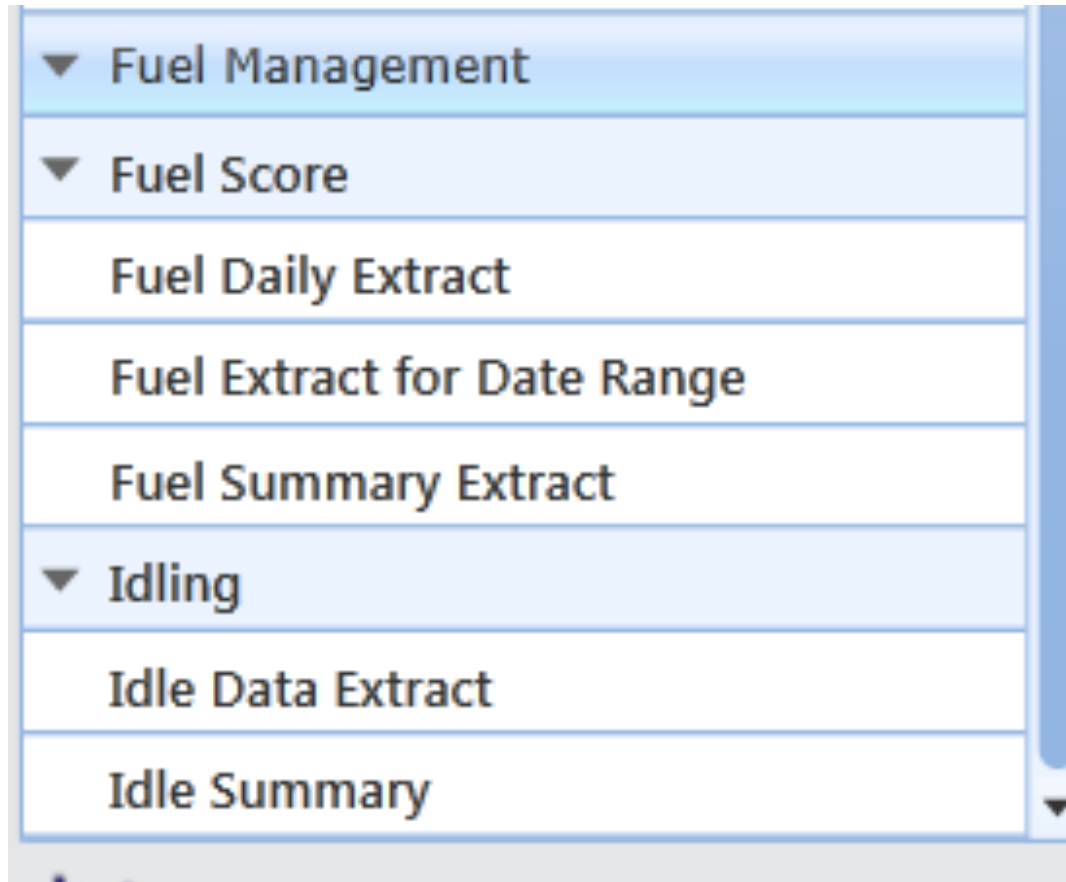
Aggressive	Following Distance: ≥ 3 sec to < 4 sec
Aggressive - Level 2	Food / Drink - Observed
Blank Stare	Food / Drink - Distraction
Camera Issue	Incomplete Stop
Cell Handheld - Observed	Intersection Awareness
Cell Handheld - Distraction	Late Response
Cell Hands Free - Observed	Mirror Use
Cell Hands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

Lytx DriveCam Fuel Management

Detailed fuel use tracking reports

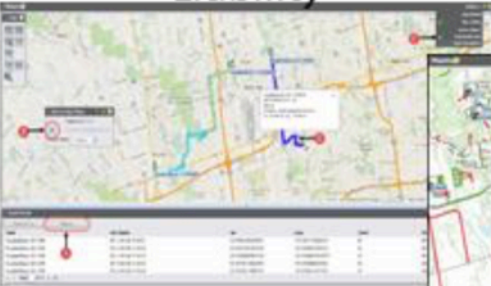
- **Fuel Score** is created based on efficient driving behaviors
- “Lost” fuel is calculated

Mileage and other reports available

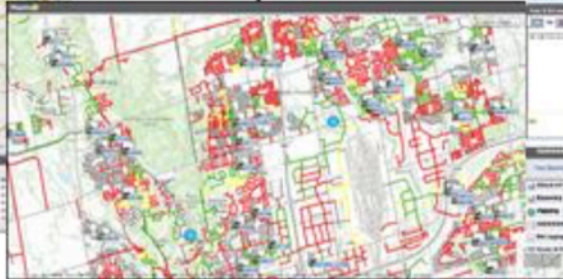


- Two Options on GSA Schedule:
 - GPS tracking with speed, location, idling, and periodic maintenance
 - Additional vehicle diagnostics (DTCs), fuel consumption, emissions data, and efficiency scorecards
 - Latter is similar to WBC Fleet

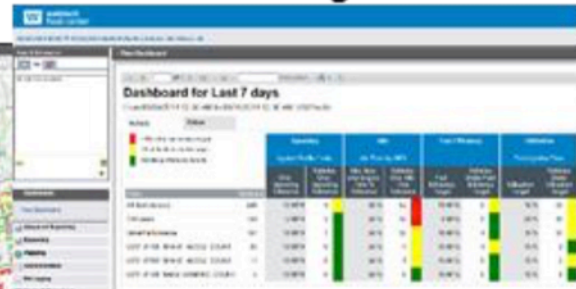
Liability



Compliance



Fleet Management



Accountability



- Available through GSA Fleet
 - <https://www.gsa.gov/portal/content/102676>
 - Pricing available to all federal fleets

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

- 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

- NetworkFleet could provide tailored idling, speeding, and fuel economy reports

Map Vehicle Fleet Connect Reports Admin Support Networkfleet

Overview Map Location Detail Track Vehicles Overview Map

VEHICLE LIST

Group: ALL VEHICLES

Attribute: All Attributes

View by: Vehicle Label

Refine:

Select a Vehicle

- 9900412960-005
- 9900509425
- 9900542306
- 9900542443
- 9900542495
- 9900543543
- 9900543579
- 9900544842
- 9900544894
- ARROW BOARD 1
- ARROW BOARD 2
- CHARLIE'S TEST
- COMPANY SALES CAR # 1
- COMPANY SALES CAR # 10
- COMPANY SALES CAR # 2
- COMPANY SALES CAR # 3
- COMPANY SALES CAR # 4
- COMPANY SALES CAR # 6
- COMPANY SALES CAR # 8
- COMPANY SALES CAR #11
- COMPRESSOR 1
- CONSTRUCTION FOREMAN
- CONSTRUCTION FOREMAN # 10
- CONSTRUCTION FOREMAN # 5
- CONSTRUCTION FOREMAN # 8
- CONSTRUCTION FOREMAN # 9

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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%

Measure	Annual Cost Savings
Safety	\$ 660
Idling	\$ 143
Aggressive Driving	\$ 112
Reduced VMT	\$ 123
Maintenance	\$ 99
Reporting	\$ 312
Right-Sizing	\$ 695
Total	\$ 2,144

Economics of Telematics

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

Contact Information



Questions?

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