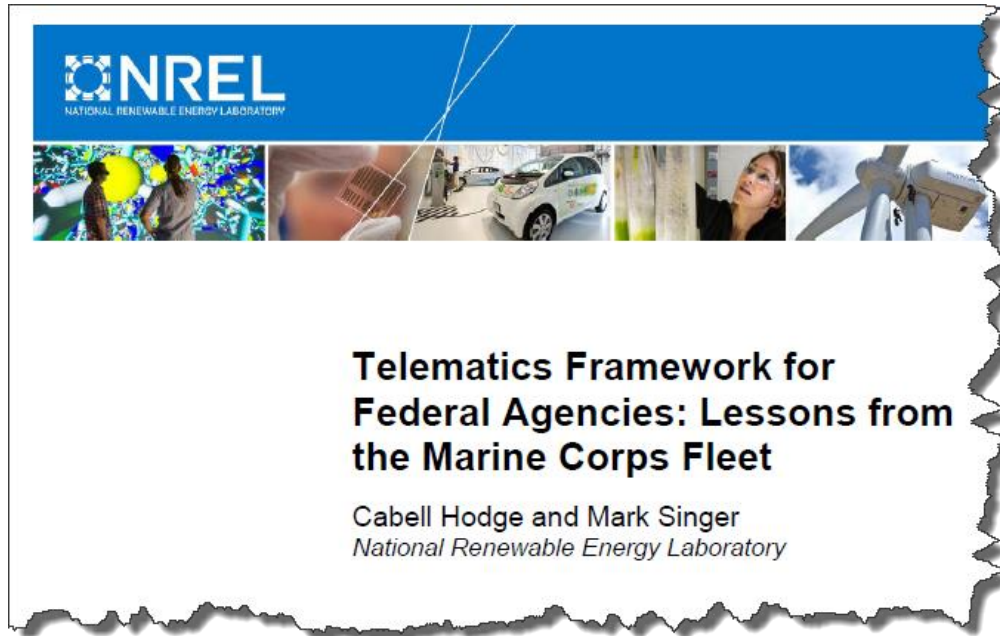


Telematics in the Federal Fleet

Mark Singer
07/10/2019

2017 NREL Telematics Report



<https://www.nrel.gov/docs/fy18osti/70223.pdf>

In 2017 NREL supported the U.S. Marine Corps and the Federal Fleet overall with a report on the state of the telematics market.

Funding was provided by the Federal Fleet Program within the U.S. Department of Energy, Federal Energy Management Program (FEMP).

Agenda

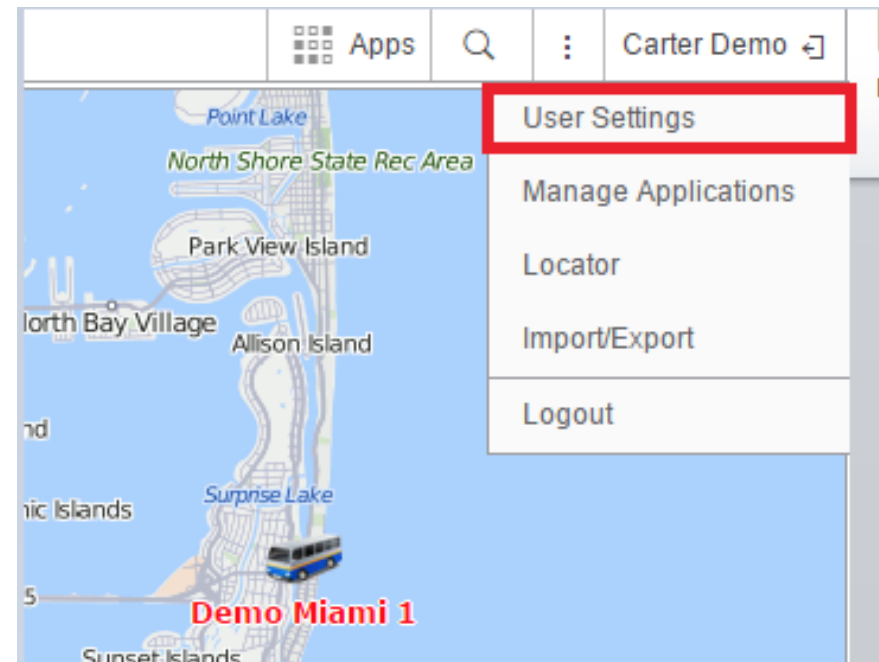
- **Telematics overview and the USMC experience**
- **Economics of telematics**
- **Telematics metrics**

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 electronic control unit (ECU) codes

Brand specific

Aftermarket systems

Can order installed from GSA

Connected through OBD-II port

Access diagnostic trouble codes (DTC): generic and reverse engineered

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

- Automatic Vehicle Location (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
- Proprietary metrics

Potential Applications

- Fleet management system upload
- Regulatory 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

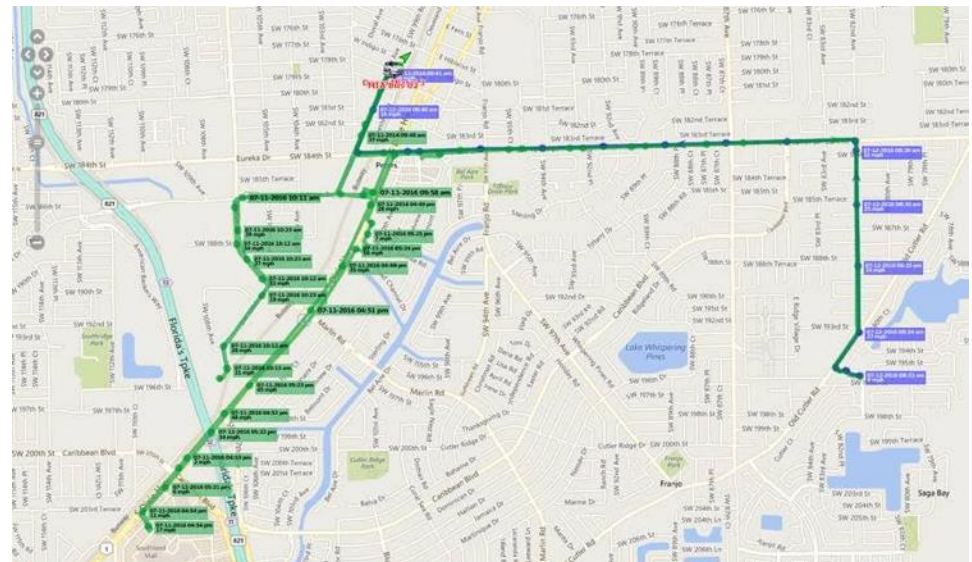
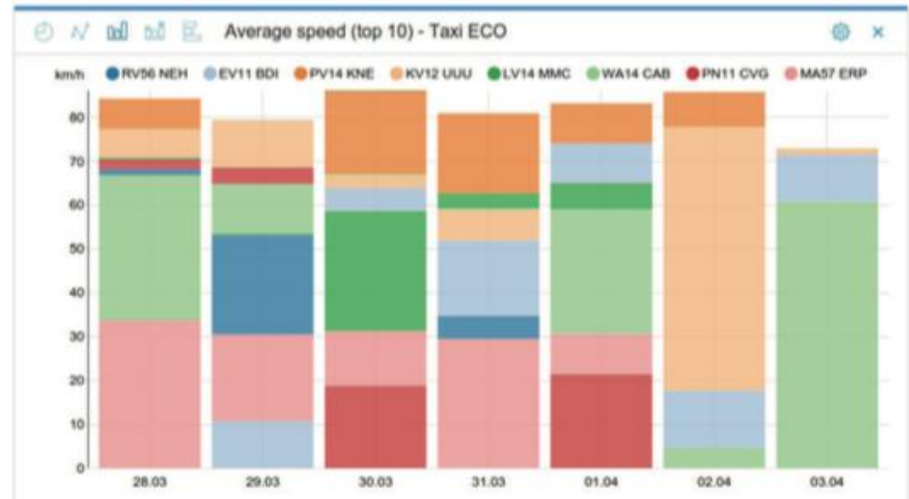
WBC Fleet Interface

Classify vehicle speeds

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

Mapping vehicle routes

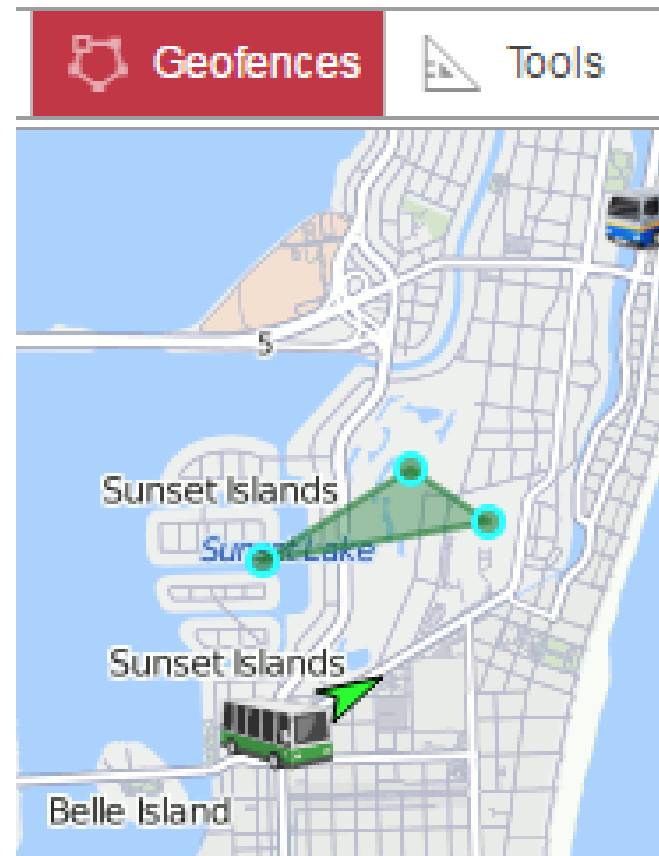
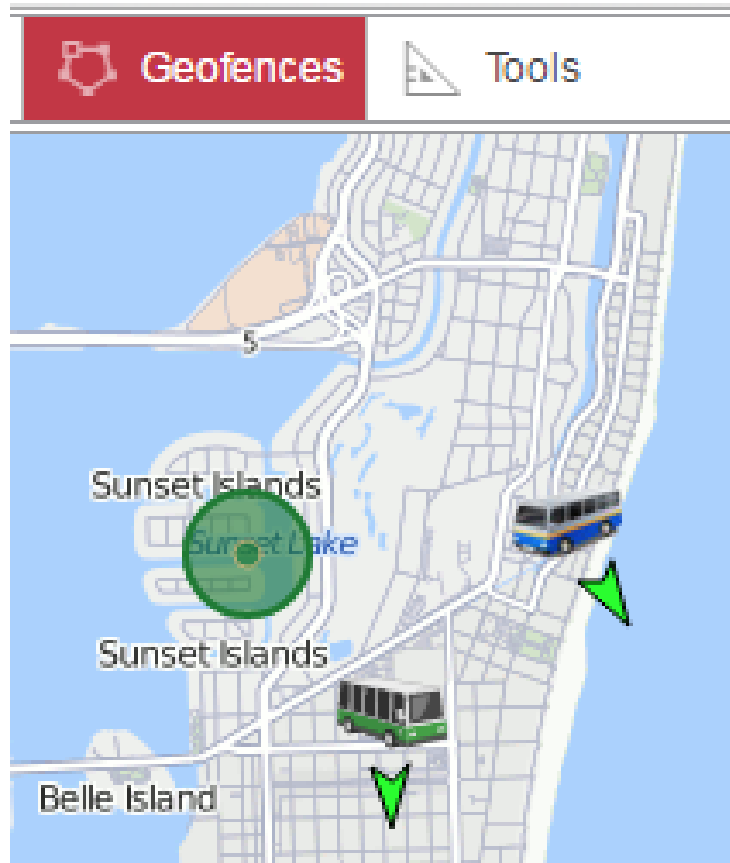
- Tracks can be converted to line geofences for a set route
- Zoom into track for speed



WBC Fleet Interface

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 Mobile App



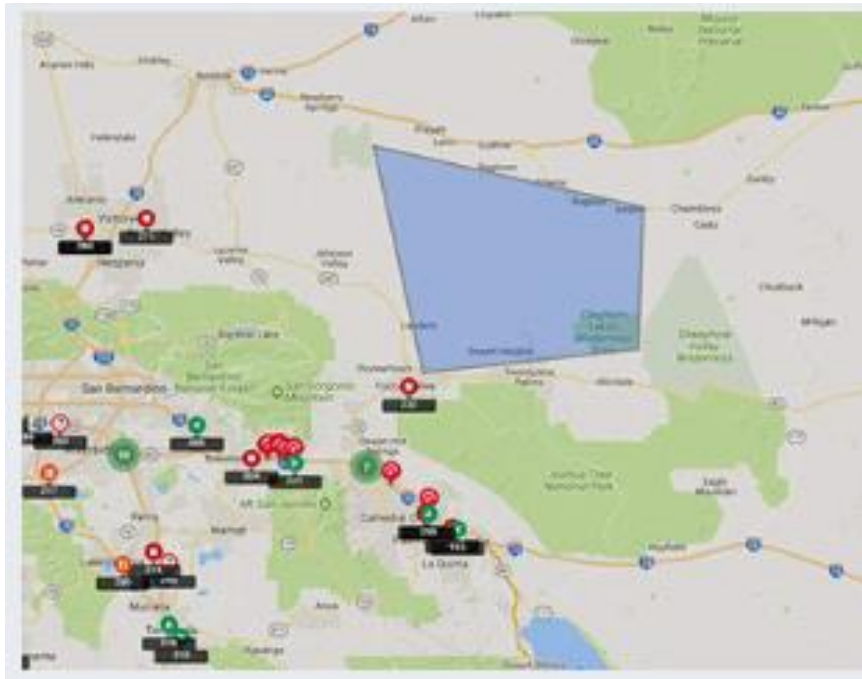
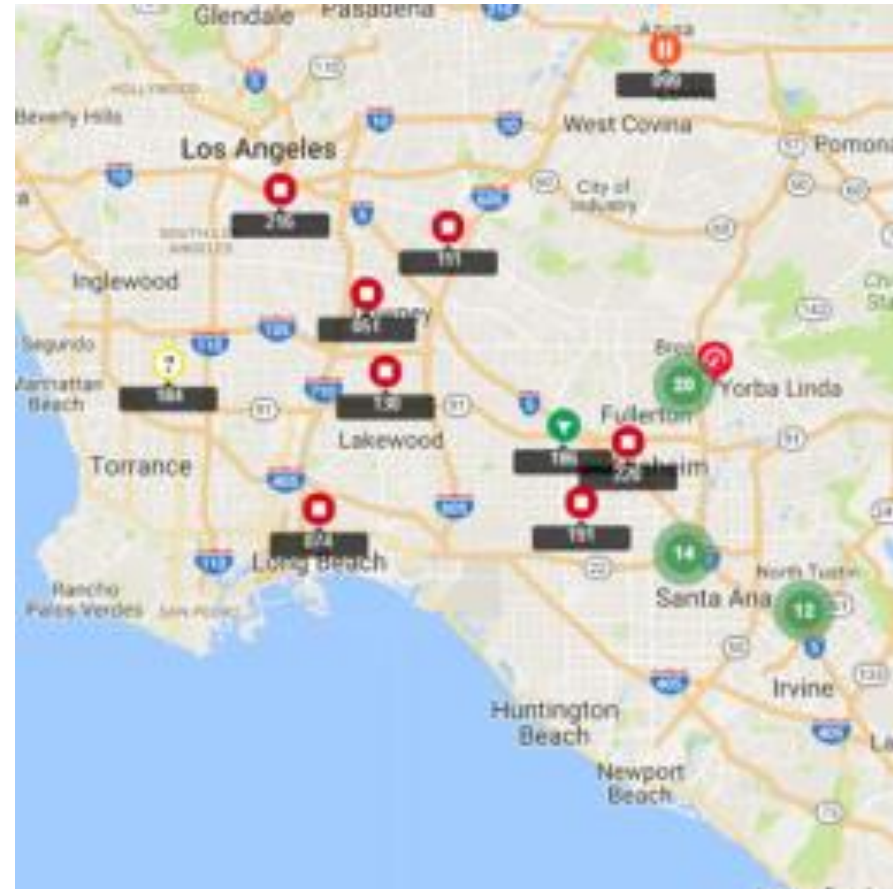
Images from wbcfleet.com/info

Lytx DriveCam GPS Tracking

GPS tracking options:

- Real-time
- Last known location
- Geofence

Lytx Website



Lytx Website

Lytx ActiveVision

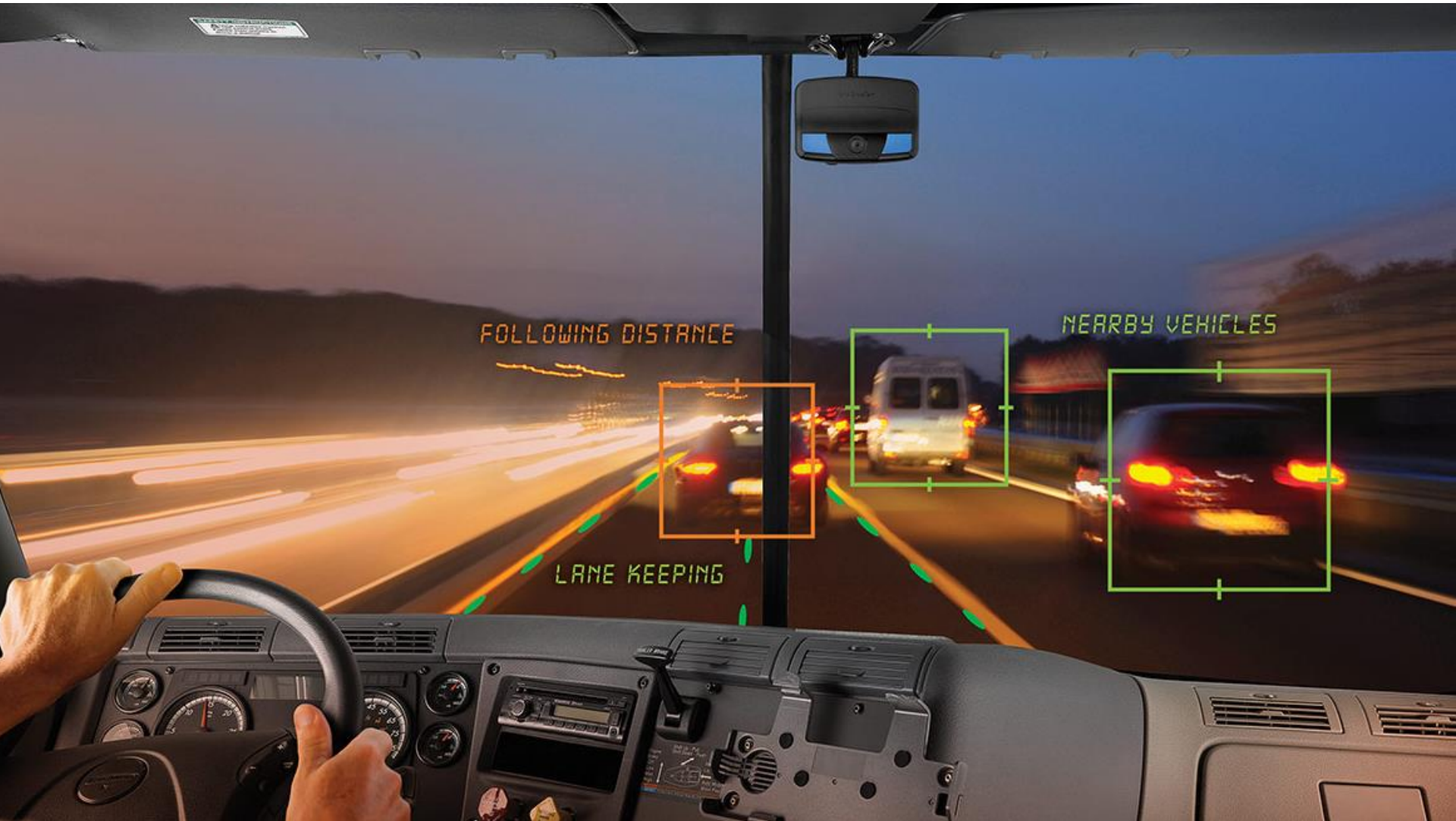


Image from www.lytx.com/en-us/fleet-services/program-enhancements/activevision-fleet-safety-alerts

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

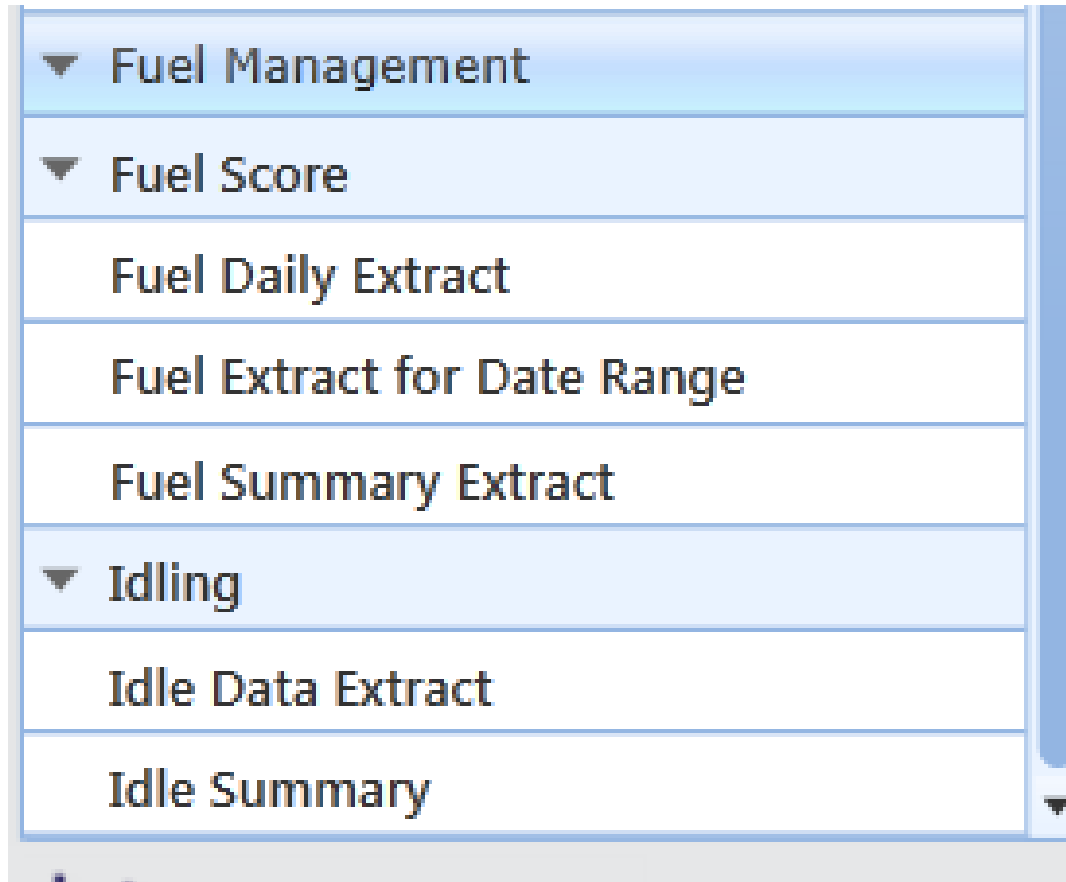
Aggressive	Following Distance: ≥ 3 sec to < 4 sec
Aggressive - Level 2	Food / Drink - Observed
Blank Stare	Food / Drink - Distraction
Camera Issue	Incomplete Stop
Cell Handheld - Observed	Intersection Awareness
Cell Handheld - Distraction	Late Response
Cell Hands Free - Observed	Mirror Use
Cell Hands 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



Federal Fleet Telematics Pricing

- GSA blanket purchase agreement with AT&T for telematics services:
 - Pricing available to federal fleets for owned vehicles.
 - 2015 agreement runs through March 2020.

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

USMC Perspective

- The Marine Corps' non-tactical vehicle (NTV) fleet consists of approximately 13,000 vehicles
- Why are telematics important?
 - Telematics can improve safety, reduce fuel consumption, reduce operating/maintenance costs, and allow access and analyze data crucial to smart fleet planning



USMC Benefits of Telematics

Operations

- Providing real-time vehicle data including location tracking (e.g., can assist in finding and recovering stolen NTV assets)
- Reducing fuel consumption
- Identifying and mitigating vehicle misuse
- Allowing granular fleet analysis for the purposes of billing, electrification potential, alternative fuel consumption, utilization and fleet right-sizing







Safety

- Improving Marines' driving behavior – tend to drive more safely when they know telematics is monitoring vehicle diagnostics
- Reducing occurrence of accidents

Cost Savings

- Reducing maintenance costs and downtime
- Exonerating drivers and the Marine Corps from 3rd party accident claims
- Reducing fuel consumption costs

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%

Economics of Telematics

Range of 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

Overall estimates from 2015 NREL Report:

<https://www.nrel.gov/docs/fy18osti/70223.pdf>

Driver' Alert safety program estimate:

<https://www.driversalert.com/attention-fleet-manager-fleet-safety-is-important-too/>

Telematics Supporting Fleet Efficiency

How can telematics services support fleet efficiency?

What should we ask for from telematics providers?

Notes:

- Technologies will continue to evolve, and capabilities will continue to expand.
- Successful telematics efforts will likely require close coordination between the provider and fleet personnel.
- Expect a shift from manual tracking of data to analysis and management of behaviors.
- Efficiency gains require engaged management focused on improved behaviors.

Fleet Efficiency Metrics from Telematics

Organizational summaries can highlight success and areas for improvement.

Example:

Org ID	Driver ID	Idle Events Per Trip	Total Idling Time (mins)	Fuel Used Idling (Gallons)	Speeding Count	Speeding Duration (mins)	Avoidable Mileage	Avoidable Fuel Use (gallons)	Fuel Saved With Downsize
Org 1	Driver 1	0	0	0	2	5	0	0	13
Org 1	Driver 2	1	10	0.02	10	90	2	0.1	0
Org 1	Driver 3	4	90	1.5	1	1	50	1.7	0
Org 1	Driver 4	0	0	0	0	0	5	0.25	10
Org 1	Driver 5	1	7	0.01	0	0	100	3	5

Fleet Efficiency Metrics from Telematics

Continuous updating of utilization statistics.

Example:

Vehicle ID	Org ID	Date Assigned	Prior 12 months				Time at Job Site (hrs)	LSEV Possible	4X4 Required	Mission Type
			Trips	Weeks w/ 0 Trips	Miles	Weeks With <10 Miles				
Veh 1	Org 1	5/1/2014	100	23	11,000	23	0	N	N	Commuter
Veh 2	Org 1	6/1/2015	50	2	3,000	30	200	N	Y	Mb Wk Stn
Veh 3	Org 2	3/1/2014	600	2	10,000	4	0	N	N	Regional
Veh 4	Org 2	4/1/2015	90	36	1,000	40	0	Y	N	Campus

Fleet specific business rules could be applied to highlight low and high use vehicles.

Thank you!

Mark Singer

NREL

mark.singer@nrel.gov

(303) 275-4264

www.nrel.gov

