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Telematics-Driven Transformation: **Part 3**
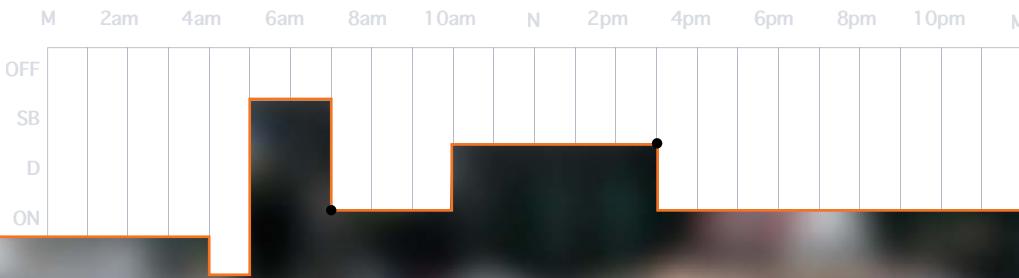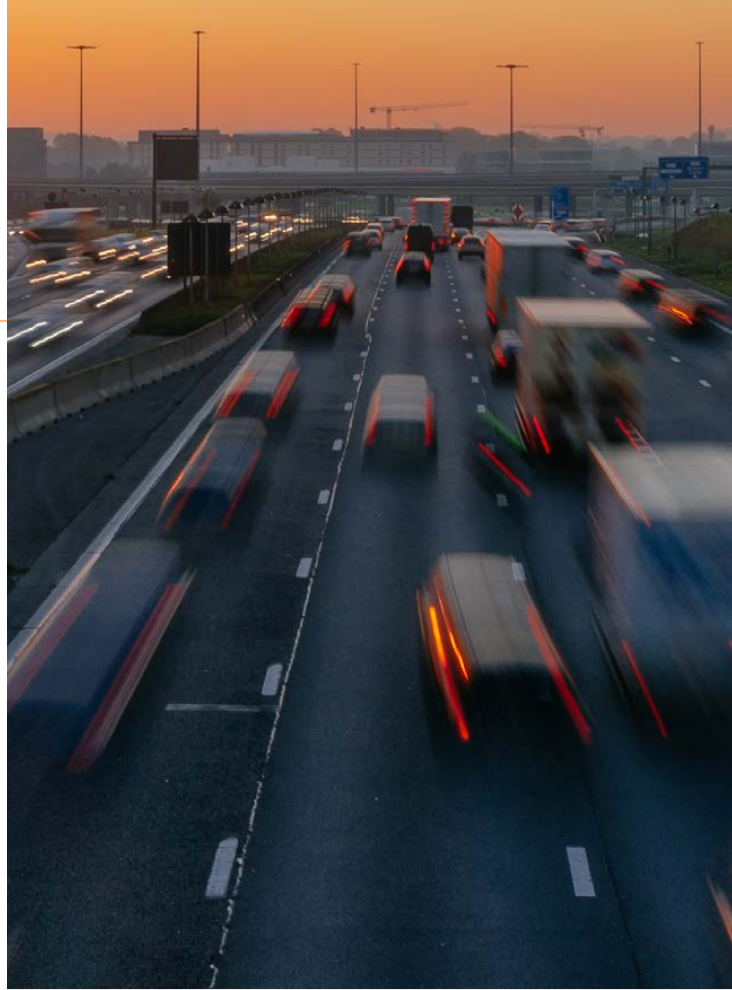
Selecting the Right Solution

By Bill McBeath | June 2019

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This is the third and final piece in a three-part series on the use of telematics to transform performance in carriers and fleet owning organizations. In Part One, we looked at the mandates and best practices for dealing with them. In Part Two, we explore what value-add use cases we are seeing adopted. Here in Part Three, we discuss the characteristics to look for in an ELD solution.

To implement the use cases described in Part Two and gain the value discussed there, it is important to select the right ELD solution. This requires assessing not only the device itself, but also the software platform, driver app, other value-add applications and services, and key characteristics of the solution provider. We start with the platform characteristics first, as these are key and are one way to narrow the field quickly.

Platform Characteristics

Cloud-based solution

Most of the value-add use cases require central retention of information. To achieve that, it is quicker and easier to implement a cloud-based SaaS[1] solution than to host your own on-premise server. With a SaaS solution, you always have the latest revision, security patches, and upgrades. With an on-premise approach, you will have to pay for and install your own upgrades. The cloud provider takes responsibility for uptime, security, and system management. With an on-premise system, you have to do all of that yourself.

Open Platform/Evolvability

Virtually all of the use cases require integration with one or more other systems, such as ERP, CRM, billing, supply chain control towers, and BI/analytics applications. Look for solutions that provide a well thought out set of APIs (Application Programming Interfaces), a robust SDK (Software Development Kit), and ease of integration. Look for a 'future-proof' system, with a flexible architecture, and the ability to evolve the system and devices as needs or regulations change.

Security[2]

The system should encrypt all data transmitted and stored. You should have complete control over your account and access rights. Try to find a provider with good physical security at the data center, rigorous background checks, security training and ongoing testing for all employees, and a strong technology infrastructure security.[3] Ask what type of security audits the solution provider has done, how often and whether or not they are SSAE 18 Type 2 certified.

Scalability and Availability

Find out what kinds of volumes the platform is currently handling and what kind of stress testing the solution provider has done to test scalability. If you can talk to a reference, ask if they have had any performance or availability issues. Regarding availability, a good SaaS provider will guarantee at least 99.9% uptime (that is downtime of about nine hours per year) in their Service Level Agreement. You should ask if they can share records of their actual uptime performance.

Data ownership

Make sure you are granted full control over the data generated by your ELDs. The data should not be shared with anyone else without your permission. There should be no extra charges for you to access or share your own data. Some providers may want to use aggregated data for analytics to provide value-add services, such as benchmarking. In most cases that is OK, provided you get something out of it, such as being able to benchmark yourself against peers.

ELD Device and Driver App Characteristics

It is critical to do your homework when selecting an ELD device. In the US, manufacturers are allowed to self-certify their ELD. As a result, **even though a device is on the [FMCSA's list of registered ELDs](#), it in fact may be non-compliant**. The FMCSA itself has been encouraging ELD buyers to [check for frequently reported issues](#)[4] before purchasing a device. Canada is trying to avoid these issues by mandating that ELDs are certified by an approved third-party tester.

All devices must provide functionality mandated by the ELD rule, such as interfacing with the engine, automated capture of each duty status change, capturing location at least every 60 minutes when the vehicle is in motion, record engine-on/off, a graphical grid of duty status changes, auto-change of status when vehicle has been in motion for five consecutive minutes, telematic or local communications, resistance to tampering, and identification of sensor failures.

There are a number of other things to consider when selecting an ELD device, such as:

Price

The most expensive device is not necessarily the best one. The average price for an ELD is around $500, with some costing over $1,000. However, there are some excellent ELDs for around $200 that meet virtually all of the criteria described here. Some providers have many extra hidden charges not included in the upfront charge or base monthly fee, so it is a good idea to probe and find out all of the fees you may be liable for.

Telematics vs. Local

Devices may transfer data using either telematics or local methods, as described on the [FMCSA site](#). It is strongly recommended to select a device with telematics capabilities, as most of the value-add uses are dependent on a real-time remote connection. A device may provide a remote connection using Bluetooth connected to the driver's phone. However, that requires use of the driver's private phone (which drivers might rightfully resist) and adds a layer of complexity and possibilities for things to go wrong as the driver tries to pair their phone with the ELD. Therefore, telematics support in the device should be a requirement.

Device form factor and installation

Look for a small device form factor that works well for all of your vehicles. It should be as plug-&-play as possible. Try to find out the expected time, cost, and expertise required for installation of the ELDs, as these can vary considerably. Installation should take less than 30 minutes. Some devices require external antennas, which adds significant installation time and cost.

Device warranty and reliability

Look for at least a one-year warranty. Better yet, some ELDs offer life-time warranties. Ask for statistics on device failure rates, such as MTBF (mean time between failures).

Troubleshooting and firmware upgrade

Look for a device that has simple troubleshooting and supports remote diagnostics and simple firmware upgrade for the ELD. Inquire about remote support, and RMA and replacement processes.

Vehicle remote diagnostics

The device should provide immediate remote (online) visibility into engine faults when they occur. It should be able to interpret and normalize manufacturer's proprietary fault codes. Both driver and dispatcher should be provided with a fault code action plan, and map tools for locating nearby towing services, repair services, and hotels.

Device security

Devices and server software should mutually authenticate, to ensure that only authorized software is connecting to only authorized devices.

Vehicle data collected

By law, all ELDs must interface with the CMV's Engine Control Module (ECM) to automatically capture engine power status, vehicle motion status, miles driven, and engine hours.

- See if the device collects at least fuel usage, voltage, coolant, and engine temperature as well.
- Check which manufacturer's proprietary engine codes the device can capture, and whether the system is capable of mapping/normalizing those into a standard set of diagnostic codes.

Pub/Sub[5] Data Gathering

The device should proactively generate and send events as they occur, rather than having to be polled by software to find out the status.

Device UI

The interface on the ELD must be very user friendly, requiring near zero training. Features to look for:

- Familiar android or iOS interface.
- Support for NFC key fob or NFC cell phone driver identification and login.
- Simple intuitive interface, with large buttons.
- Spoken voice alerts for warning the driver of aggressive driving or geofence departure.

Collision detection and warning

Some ELDs provide optional forward collision alarm, safe distance warning, and lane departure warnings.

IoT Support

Since a telematics ELD already has cellular service, look for devices that can leverage that to share IoT information from the vehicle. This could include reefer temperature and humidity readings, shock and vibrations, tire pressure, asset tracking, camera/video, trailer door alarm, and collision warnings.

Driver Communications

Some ELDs provide driver-dispatcher messaging and voice communications

Driver's App

Here are some things to look for in the driver's app:

Inspection capabilities
Easy, automated daily DVIR (Driver Vehicle Inspection Reporting), easy to report maintenance findings.

HOS verification & editing
Simple and quick review of HOS records. Single click annotations and edits, with forms and/or checkboxes, for common issues.

Admin tasks
Intuitive easy login/logout, changing status from work to personal mode, etc.

iOS and Android support
Keeping up with latest versions.

Integration
Integration of ELD data with other company-supplied drivers apps, such as navigation, dispatch, messaging, forms, electronic signature capture, and invoicing.

Value Add Applications and Services

Some ELD solution providers offer a rich set of value-add services and applications, such as:

Prebuilt analytics

Look for a full library of prebuilt analytics and reports:

- Driver safety/performance
  Idling, fuel consumption, speeding, unsafe driving behaviors (speeding, seatbelt usage, braking, hard cornering, acceleration, after-hours vehicle usage) with scorecards and ability for each driver to see their own scores and how they stack up.

- Fleet and driver productivity
  Utilization reports, productivity metrics, scorecards.

- Trip analytics and reporting
  Stored trip histories, aggregate statistics (e.g. by route, vehicle, date, etc.), drill down to individual trips.

Customizable analytics

It is important that you can create your own analytics and customize the prebuilt reports. Also look for easy exporting into standard analytic tools.

Machine learning

Advanced providers are starting to offer machine learning capabilities.

Customizable alerting and rules

Ability to set your own thresholds and logic for when alerts should be generated for the driver, dispatcher, fleet manager, and others.

'Blackbox'/accident reconstruction

The system saves second-by-second information leading up to the moment of impact, for later analysis and reconstruction of exactly what happened at the accident.

Internal benchmarking

The ability to benchmark drivers, vehicles, and arbitrary groups within your own company. Ability to let each person or manager see how they stack up against the others in the company. The tools should allow any of the parameters to be compared, common ones may be fuel economy, safety record, and utilization.

External benchmarking data and analytics services

Benchmarking your performance against others in the industry with a similar profile. This requires a sufficiently large database of other companies' performance data to be statistically significant within your peer group.[6] It also requires that the provider's licensing agreement allows for sharing aggregate data.

Dispatcher application/tools

View vehicles and drivers on a map, driver and vehicle status updates, communicate with drivers (messaging via ELD and/or driver's phone, auto-dial their phone), alerts for situations needing attention (e.g. accident, vehicle breakdown, geofence deviation), ability to easily forward critical information to law enforcement, ambulances, towing services, etc., find and instantly contact nearby repair services, hotels, etc. when vehicles break down. Integration with existing dispatcher applications.

Remote vehicle diagnostics and predictive maintenance

Tools to normalize, interpret, and analyze manufacturer's proprietary fault codes, as well as standard fault codes. Tools for doing predictive maintenance or exporting data to predictive maintenance systems.

GIS integration

Data collection into and from GIS[7] systems. This could include things like maximum vehicle height and weight for different routes, dangerous intersections, rough road detection and warning, and so forth.

Route planning and optimization

Some providers offer route planning and optimization tools, leveraging the ELD data.

Third party applications

Some popular ELDs have a rich set of applications written by third parties and, in some cases even provide an online app store/marketplace to find those.

Solution Provider Characteristics

Beyond their technology, not all solution providers are equal. Some things to check:

Depth of Expertise and Experience

Find out how many of the solution provider's devices are in use today. How many engineers, technicians, and support people they have. What type of training program they have for their employees? Do they have a dedicated research staff? How do they keep up with changes to regulations, vehicles, technology, and use cases?

Customer experience

What is their reputation and what kind of references can they provide? Will you have a dedicated account manager and how many other companies will that person be handling.

Implementation, Training, Technical Support

What is their role in installation? What is the cost and timeframe? What types of training do they provide? How is support provided? What types of plans are available? What kind of KPIs and guarantees are in their Service Level Agreement (SLA)? Are there any penalties or financial consequences for them not meeting the SLA?

One-stop shop for transportation needs

A solution provider with a broad portfolio to serve all of your transportation and fleet management needs can provide a one-stop shop, with well-integrated applications and more comprehensive support (less finger-pointing when things need fixing).

Partnerships

A solution provider with strong implementation and technology partners, including deep integration with a broad set of capabilities, will likely be able to serve you better.

A good example of a solution provider with capabilities and products that have virtually all of these characteristics is Descartes. By selecting the right ELD system and solution provider, a carrier or fleet owner greatly increases the chances of success for their ELD initiatives and improves their ability to extract maximum value and ROI from those ELD investments.

Notes:

1   SaaS = Software-as-a-Service, i.e. a cloud-based application.

2   A good article on telematics security is 15 Security Recommendations for Building a Telematics Platform Resilient to Cyber Threats.

3   An excellent set of resources on what to look for in security from a SaaS provider can be found at the Cloud Security Alliance website, including guidance on assessing and ensuring cloud security (free registration required).

4   Issues they warn about include erroneous fields in the ELD output file, device not preconfigured with the FMCSA's email address or web service endpoints, complete set of data transfer options not supported, event time formats incorrect. The FMCSA is also maintaining a list of revoked ELDs.

5   Pub/Sub is short for the publish and subscribe messaging pattern, a type of software communications architecture.

6   For example, it would not make sense to compare fuel economy nor safety records for a fleet of class 3 trucks doing local delivery compared to class 8 trucks doing long haul. Ask about the number of companies in your cohort.

7   GIS = Geographic Information Systems. For more, see *Geospatial Intelligence: The Role of Geospatial Systems in Supply Chain*.

About ChainLink Research

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