Why Automakers Should Support Aftermarket Telematics

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What is Telematics?

Telematics is the transmission of useful information remotely or wirelessly to and from a vehicle.
What is this useful information? (1/2)

- GPS Navigation including all the apps that provide location for businesses and products as well as traffic alerts and alternative routes.
- Focused video and sound entertainment content that goes beyond AM, FM and satellite radio
  - Services such as Pandora Radio and Hulu TV
- Emergency Services
  - Manual
  - Automatic – requires data from the vehicle’s on-board network
- Driver tracking
  - Uses data from other services listed here including data from the vehicle’s on-board network. Use cases include:
    - Insurance company safe driving programs
    - Rental car tracking
    - Fleet services
    - Teen driver programs

Note: The red ones require access to the vehicle on-board network. The green ones do not.
• Vehicle maintenance information
  – Includes maintenance schedules based on time and mileage
  – Repair requirements based on code setting
  – Remote Diagnostics
    • Limited to code notification now, but could include complex diagnostics in the future including self tests, such as cylinder balance, rich/lean diagnostics, EGR activation, etc.
    – Remote Inspection (was once called OBD III)
      • Convenience seems to trump right to privacy. Remote OBD tests are incredibly inexpensive to perform and are very convenient for the motorist. Some day these tests will be commonplace.
• As many ancillary applications under the above as the mind can dream up.

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In 2010 ETI did some research regarding Telematics. The objectives were:

- Measure the market’s current level of familiarity with telematics technology
- Evaluate what factors are important to industry in implementing a remote diagnostic system (like everyone else the shops are struggling with this)
- Explore price points for the hardware and monthly service fees associated with telematics services
- Explore the industry’s opinion relative to “who should bear the expense” of telematics hardware and services
- Learn more about concerns and questions the industry has relative to telematics
ETI’s Study assumed the following

• Aftermarket Telematics assumed the following
  – Most systems would consist of a hardware box that plugs into the J1962 connector and has a cellular transceiver on board to communicate with a data facility
  – Most telematics products will require collaboration of companies providing different parts of the total solution. The elements of collaborations include:
    • Overall system developer
    • Independent shops, fleets, etc.
    • Parts companies or warehouse distributors (with supplier loyalty programs)
    • Tool and equipment companies
    • Cellular providers
    • Motorists (customers)
Research Study Results (2/4)

Reasonable Cost of Hardware Device

- **Overall**
  - $50 or Less: 26%
  - $51 - $100: 31%
  - $101 - $250: 18%
  - More than $250: 25%

- **Franchise repair**
  - $50 or Less: 38%
  - $51 - $100: 31%
  - $101 - $250: 15%
  - More than $250: 18%

- **Independent repair**
  - $50 or Less: 27%
  - $51 - $100: 25%
  - $101 - $250: 17%
  - More than $250: 7%

- **New Car Dealer**
  - $50 or Less: 33%
  - $51 - $100: 33%
  - $101 - $250: 27%
  - More than $250: 21%

- **Other**
  - $50 or Less: 39%
  - $51 - $100: 29%
  - $101 - $250: 11%
  - More than $250: 8%

- **Tire Dealer**
  - $50 or Less: 38%
  - $51 - $100: 23%
  - $101 - $250: 8%
  - More than $250: 31%
Research Study Results (4/4)

Who Should Cover the Cost (Average)

- Owner/Driver: 44% (Hardware), 67% (Monthly Service)
- Shop: 35% (Hardware), 19% (Monthly Service)
- Supplier Loyalty Program: 19% (Hardware), 12% (Monthly Service)
- Other: 2% (Hardware), 2% (Monthly Service)
Summary of Survey Comments

• Shops do not feel they have enough information to make decisions regarding telematics.
  – When asked about importance on a scale of 1 to 10, the average was 5.4 for all shop types

• They are concerned about the cost of this type of system and whether there will be enough customer demand for this type of service given the potential cost to customers.
  – This is the same concern everyone has.

• Many of the independent shops felt that:
  – telematics is a way to push business to dealers
  – is a gimmick
  – is another way for “Big Brother” to know customer’s business.
So Who is Interested?

- Automakers
  - New Car Dealers
  - Dealer support like Reynolds and Reynolds, or ADP
- Wireless companies
- Fleet Service Companies
- Insurance Companies
- The government
  - Crash notification and event recording
  - Remote emissions and safety testing
- Tool and Equipment companies
  - Telematics specialists
  - Third party information companies like Alldata and Mitchell One
  - App providers
- Parts manufacturers
  - Parts suppliers like NAPA, Carquest and AutoZone
- Aftermarket repair shops
  - National Chains
  - Independents
• Today’s repair scenario
  – Thanks to Clean Air act, R2R legislation and NASTF volunteer efforts:
    • Motorists are notified by dealer or aftermarket notification systems that maintenance is required
    • Check engine light or some other symptom notifies the motorist that something is wrong and the vehicle requires service.
    • The motorist then makes a decision as to where he takes the car for service.

• Repair after Telematics proliferation
  – The motorist is notified by whichever telematics system is on board when and what maintenance is due as well as any system failures that have set a code.
  – Whichever telematics system is on board has an advantage because it will notify a repair facility in its network and inform the motorist that this is where the car should be taken.
  – If the automaker has exclusive access to the vehicles diagnostic system, they will have exclusive control over repair recommendations.
Automakers own the vehicle network and this gives them an advantage. If they do not allow access, or provide information, others could be locked out creating another Right to Repair scenario.
Why should the OEMs embrace Aftermarket Telematics? (1/2)

• Automakers and new car dealerships are not interested in all of the services telematics can provide.
  – Government remote OBD inspection is one example.
  – OEMs are courting app developers to get their ideas regarding what apps should be on their vehicles. This is good and needs to be expanded to include diagnostics

• Many multi-brand fleets want to have one telematics solution that covers all of their vehicle brands.

• There is plenty of business out there for everybody in the Telematics Market.

• It is in everyone's best interest to avoid another Right to Repair fight.
Motorists begin migrating away from dealerships as their vehicle ages. Who will provide telematics services for older vehicles?

On board telematics systems have a tendency to become obsolete long before a vehicle’s transportation value is used up

- OEM telematic hardware and software will become obsolete even if it still works and is supported with data

The repairs required for older vehicles are different than the repairs required on newer vehicles. The aftermarket can be more knowledgeable

Embracing aftermarket diagnostic solutions pays dividends because it makes for happy owners and happy owners have a tendency to become loyal to the brand
How do we prevent this from becoming another R2R battle?

• Organizations like NASTF, ETI, SAE along with R2R entities need to work together to develop some robust standards that will allow safe and secure telematics access to more than just the OEMs.

• Stakeholder wishes may require more than one solution
  1. We need to develop a method of access to the vehicle that allows companies to develop complete and separate telematics diagnostic systems from those provided by the OEMs.
  2. We need packaged delivery methods that require OEMs to send certain information that would normally be sent from OEM data centers to dealers and instead redirect this information to the repair center of the owners choice.
How OEM Telematics Works

- **Vehicle Network** - Diagnostic network utilizing OBD II and proprietary protocols

- **Telematics Network Gateway** - This is the device that allows signals from cell phone transceiver access to the vehicle network

- **Vehicle Transceiver** - CDMA or GSM cell phone technology. Embedded or Motorist provided

- **Land Transceiver** - Cell phone tower provides data transfer to and from data center and vehicle transceiver

- **OEM Data Center** - Database of customer and car dealer relationships, service records, contact information, etc.
How Aftermarket Telematics Works

The main difference is that the aftermarket system cannot access the Telematics Network Gateway and therefore must plug into the J1962 connector normally reserved for temporary scan tool connections.

This is problematic because:

1. Constant connection to the J1962 connector disables OEM telematics access. It is a requirement of the spec. for this to happen.
2. Only one device can be connected at a time. For example, an insurance company dongle cannot be used at the same time a diagnostic device is connected.
3. Since all J1962 diagnostic connectors must be mounted under the dash and near the pedals, permanently plugging in a telematics device causes wires to hang in the same area. This can be dangerous.
4. Since vehicle systems were never designed to have devices permanently plugged into them, critical network functions can be interfered with and/or slowed down.
This system does not require the OEMs to do anything except standardize a Bluetooth or USB hub interface to the Telematics gateway into the vehicle network that can support multiple devices at once. OEMs do not have to provide any access to their infrastructure. Third parties will develop their own infrastructures.
• The network gateway is where outside access to the vehicle begins

• The gateway must be made secure against malicious attack
  – There is similar concern in an ISO committee known as ISO 13400 or DoIP (Diagnostics over Internet Protocol).
  – At some point DoIP could allow a standard device such as a PC, a tablet, or even a smart phone to communicate directly with a vehicle without the use of a VCI (vehicle communication Interface)
  – When this becomes a reality, the same exact fear of a security breach will be possible as there might be with telematics. In fact the line between the two may be fade completely.
• Since Ethernet is being used as the transport protocol, more than one external connection will be allowed, similar to what was described above using either a USB hub or Bluetooth.

• Specific address ranges will be used by different kinds of devices so that communication priorities can be established based on the importance of the external device and how it might affect critical network communications. Examples:
  – External Legislated Diagnostics Test Equipment for emissions test scan-tool use
  – External vehicle manufacturer (dealership) / aftermarket enhanced diagnostics test equipment
  – Internal data collection / on-board diagnostic equipment (for vehicle manufacturer use only)
  – External prolonged data collection equipment (e.g. insurance tools, vehicle data recorders, etc.)

• In addition to the communication priorities above, diagnostic system access needs to be segregated from access to security and other network functions that might allow software hacking, vehicle theft, safety problems or emissions failures.
• SAE, ETI, NASTF, CARE along with the automaker associations need to sit down and work this out. And take advantage of existing and in-progress work like:
  – ISO 13185, ITS/Telematics applications supported by nomadic and mobile devices and in vehicle gateway operate on a common software interface.
  – AUTOSAR (AUTomotive Open System ARchitecture) is an open and standardized automotive software architecture, jointly developed by automobile manufacturers, suppliers and tool developers.
  – NGTP (Next Generation Telematics Pattern) is an approach for delivering over-the-air services to in-vehicle devices and handsets alike, with the focus on open interfaces across the entire service delivery chain.
• ETI and other organizations have shown an interest in spending some money and providing personnel to help develop the necessary agreements and standards.
• It is paramount that we avoid another prolonged R2R battle only to end up with difficult to implement requirements that no one is happy with.

Thank You!