



**COLLISION INDUSTRY**  
CONFERENCE

# The OEM – Aftermarket Partnership in the Ecosystem

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SPECIAL PRESENTATION BY: EQUIPMENT & TOOL INSTITUTE

GREG POTTER      ETI

# Equipment and Tool Institute - ETI

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ETI is a not-for-profit trade association formed in 1947 currently representing over 100 companies in the automotive and HD aftermarket repair tool and equipment business.

ETI has 4 main vertical groups that members participate in one or more of:

- Scan Tool Group
  - Telematics Subcommittee
- Mechanical Systems Group
- Collision Repair Group
- Service Information Group



ETI's Mission is to advance the vehicle service industry by providing technical data and open dialog between the manufacturers of transportation products, government regulators and the providers of tools, equipment and service information.

# My Background

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- I'm a car guy with over 30 years in the automotive service tool and equipment space
- Been involved with ETI Since 1994 (Past President, Board of Directors, Technical Director)
- Treasurer and Board of Directors for the National Automotive Service Task Force (NASTF)
- A. Ap. S. Mechanical Engineering Technology, BS Electrical Engineering, MBA
- I currently sit on 9 ISO Committees and 26 SAE Committees
- Past I-CAR Board Member (2007-2013)

# Key Regulations and Agreements

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California Clean Air Act 1988 -> OBD (later called OBD1)

- Enacted in 1991

US EPA Clean Air Act 1990 – (Picked up from CARB) (ETI is referenced in the reg.)

CARB OBD2 1996 MY

California Senate Bill 1146 2000 (Further definitions of what is required)

Dorgan Letter 2002 (Beyond Emissions)

Massachusetts R2R 2012

R2R MOU 2014



# “Rule of Thumb”

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The overseeing “Rule of Thumb” is that OEM’s are obligated under regulations and or agreements to provide to the aftermarket several key items.

- Access to their dealership tool(s)
- Access to an OEM provided web-based diagnostic software that utilizes a standardized interface (J2534)
- Provide aftermarket scan tool developers access to all the data necessary to implement all the same functionality of their dealer level tool
- Access to all service information



# The Business Case for the Partnership

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The Aftermarket in the US today fulfill over two-thirds of the total automotive service business. According to the National Automotive Dealers Association (NADA) in 2015 the after-sales service industry was a \$310 Billion industry in the US. The franchised dealers were providing \$85 billion or roughly 27% of that number.

Franchised dealer capacity issues require the support of the aftermarket domestically.

In an industry survey conducted by ETI in 2015, 9% of consumers acknowledged seeking the recommendation of their aftermarket shop regarding what car to buy next.

According to technicians, 1 in 3 ask for recommendations and that 2 in 5 that ask for a recommendation do in fact take their advice.

# The Business Case for the Partnership

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It is essential that tools and equipment used in the aftermarket are designed and built to fulfill the manufacturers basic requirements in order to complete a safe and proper repair.

The number one source of official information and collaboration comes from ETI's Summer and Winter Tech Weeks and our ToolTech event.

ETI's Tech Weeks are a unique series of meetings between OEM's and aftermarket tool and equipment developers that dates back more that 30 years

- Direct interaction between OEM service engineers and tool development engineers

# The Process (Scan Tool Data)

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Data and implementation information are provided to ETI on a periodic basis (Minimum once a year)

Data and support information are uploaded into the ETI Tek-Net Library, a Subversion system hosted by Amazon Web Services (AWS) high-security cloud. It is an SSL secured system that has user and password authentication.

Notifications are sent to subscribers of that OEM's information that new data has been uploaded into the library

Scan tool manufacturers obtain the new information and work to code and validate their implementations

If missing data is identified, developers will notify ETI and we will work with the OEM to fill and gaps.



# The Importance of Standards

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None of this would be possible without a very complex, but essential, series of standards that OEM's and aftermarket scan tool providers adhere to that allow interoperability and between vehicles and external tools. e.g.;

SAE J1979 Diagnostic Services (OBD)

SAE J1962 Diagnostic Link Connector

ISO 15765 Diagnostics on CAN

SAE J1978 OBD Scan Tool

ISO 14229 Unified Diagnostic Services (Beyond 1979)

SAE J2534 Pass Thru Vehicle Programming



# Example from ISO 15765-4

**Table 1 — Enhanced and legislated OBD diagnostic specifications applicable to the OSI layers**

Applicability	OSI 7 layers	Vehicle manufacturer enhanced diagnostics	Legislated OBD (on-board diagnostics)	Legislated WWH-OBD (on-board diagnostics)
Seven layers according to ISO/IEC 7498-1 and ISO/IEC 10731	Application (layer 7)	ISO 14229-1, ISO 14229-3	ISO 15031-5	ISO 27145-3, ISO 14229-1
	Presentation (layer 6)	Vehicle manufacturer specific	ISO 15031-2, ISO 15031-5, ISO 15031-6, SAE J1930-DA, SAE J1979-DA, SAE J2012-DA	ISO/PAS 27145-2, SAE 1930-DA, SAE J1979-DA, SAE J2012-DA, SAE J1939 Appendix C (SPN), SAE J1939-73 Appendix A (FMI)
	Session (layer 5)	ISO 14229-2	ISO 15765-2, ISO 15765-4, ISO 11898-2	ISO 14229-2
	Transport protocol (layer 4)	ISO 15765-2		ISO 15765-4, ISO 15765-2
	Network (layer 3)	ISO 11898-1		ISO 27145-4
	Data link (layer 2)			
	Physical (layer 1)	User defined	ISO 15765-4, ISO 11898-1, ISO 11898-2	

# The shifting winds

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The long established agreements and relationships with OEM service entities have provided a good strong working relationship between the OEM's and Aftermarket tool and equipment suppliers.

The system has worked well for many years. The tailwinds have been smooth.

But due to rapidly changing technology we constantly face new headwinds....

- oEmerging technology
- oCybersecurity
- oThe "Data" dilemma



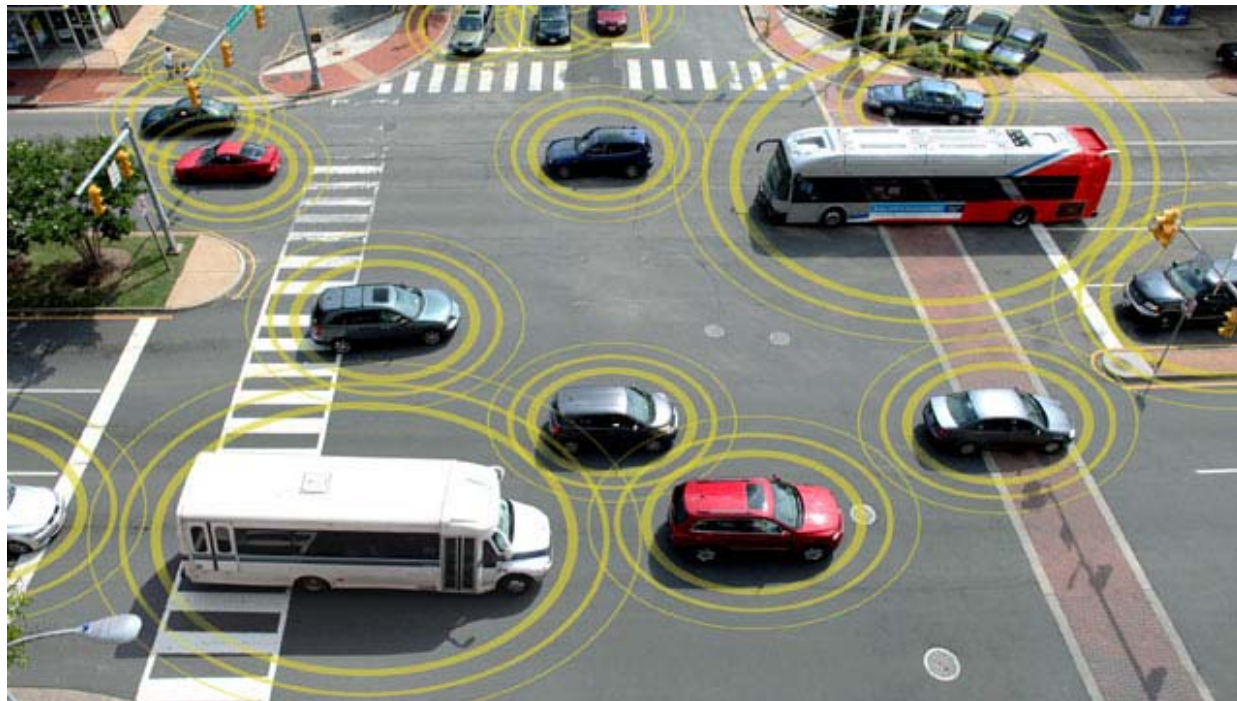
# Emerging Technologies

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- The Fantastic 4
  - Electrification
  - Connectivity
  - Shared Mobility
  - Automated Mobility
  
- Repair procedures are getting very complex and require new skill levels and tools to repair

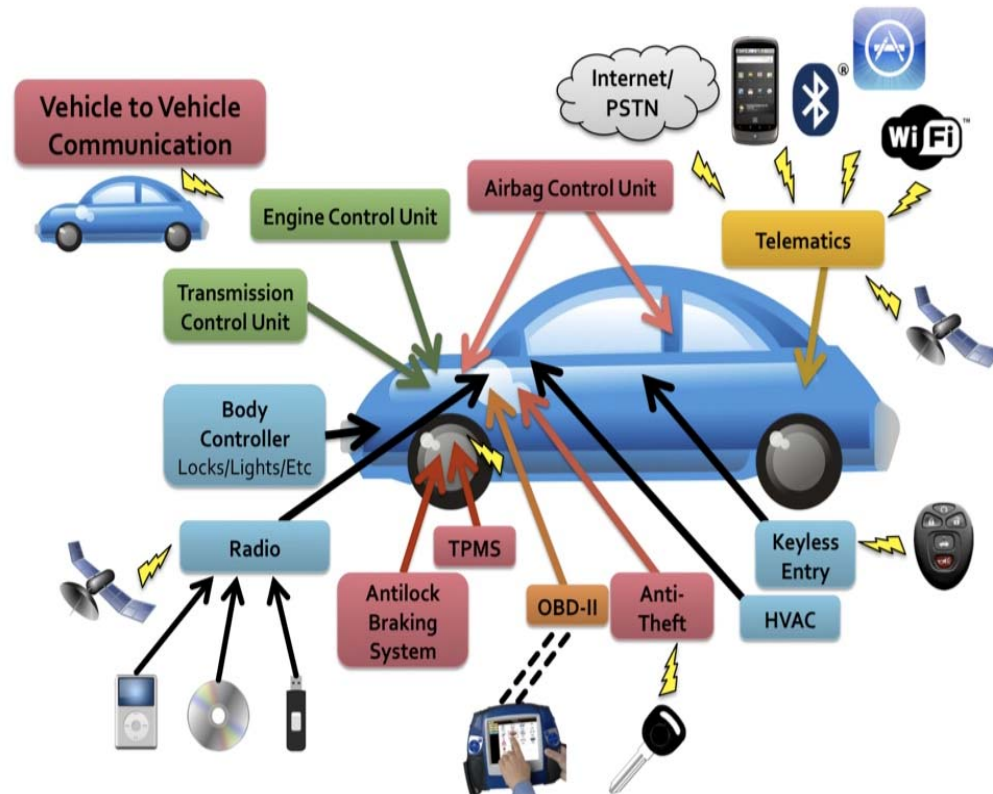
# Connectivity

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# Connectivity

- Multiple “Radio” Connections
  - TPMS
  - E-Call
  - OEM Telematics
  - Aftermarket Telematics
- Intelligent Transportation Systems
  - 5G (28,37,39GHz) (Cellular)
  - DSRC (5.9GHz) (WiFi)
- Radar
- LidAR



# Connectivity

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- By 2020 Toyota is expecting 42% of US vehicles will be equipped with some sort of “Cooperative automated driving” technology tied to DSRC or 5G, and by 2030 they forecast 68% (Gaurav Bansal - Toyota InfoTechnology Center)
- Intel has predicted that automated vehicles will generate 4 TB of observation and measurement data per day
- "There will be no border between a home and a vehicle. Whatever you can do at home, you should be able to do it in cars." (Qi Lu, Baidu [EE Times](#))

# Connectivity

- o Security!
  - o Vehicles
  - o Peripherals
    - o Tools
    - o DOT Study





# Data

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Data has been labeled the new Gold

Vehicle manufacturers are facing a rapidly changing business environment

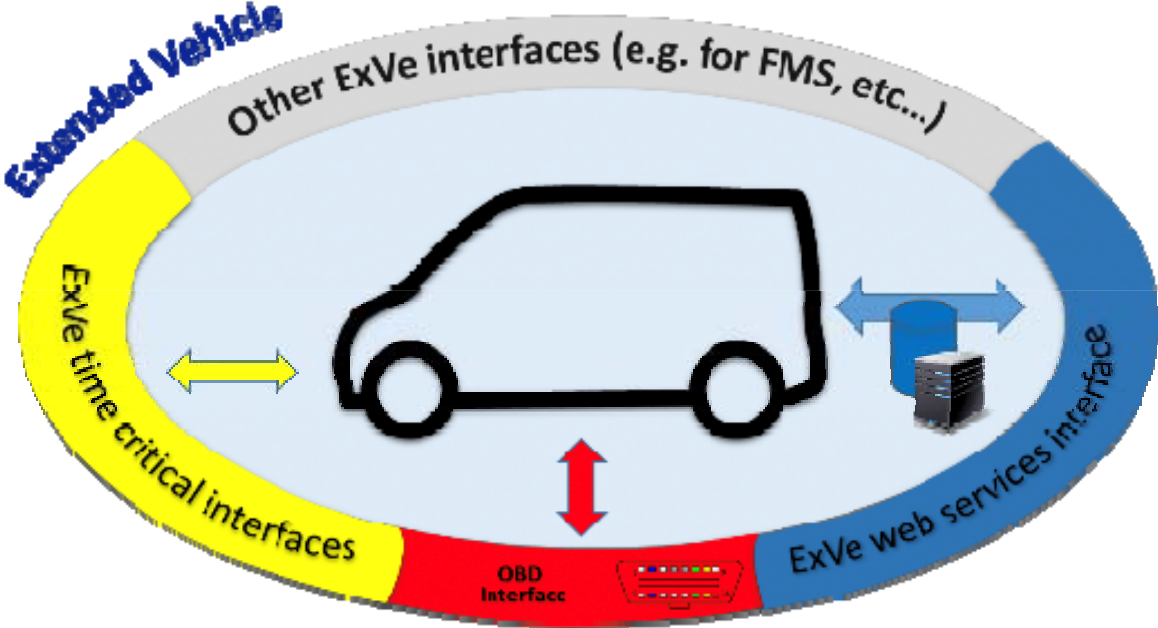
- Shared mobility
- Urban migration
- Changing mind sets for vehicle ownership desires
- Utilization rates due to shared mobility and fleets providing this service will take rates ~5 to ~90%
- Less cars to sell....

Many are looking to the tech industry for new business models

- Monetizing the data

Monetizing diagnostic data?? – Extended Vehicle Concept

# Data



# Data

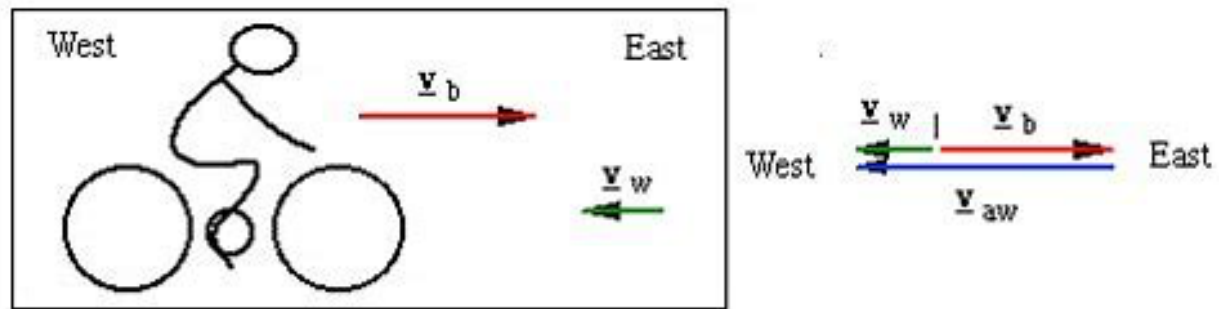
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## ETI Core Beliefs

- A vehicles owner has the right to control who gets access to what data
- A vehicle owner has the right to choose their own service provider
- Vehicle diagnostic data is to be obtained by the service provider directly from the vehicle
- Vehicle manufacturers cannot designate who can, or who cannot, service vehicles they have produced
- A more complete document of ETI's stance of secure vehicle communications can be found on ETI's web-site - [www.ertools.org](http://www.ertools.org)

# Prevailing headwind

For more than 25 years, SAE, ISO and ETI have successfully worked on diagnostic protocol standards with the objective that vehicles comply with regulations and that diagnostic tools can successfully be used to perform bidirectional communications for the purpose of performing diagnostics and repair, inspections & maintenance, flash reprogramming, etc.



# Prevailing headwind

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New implementations of security measures in diagnostic protocols have been designed to protect against unauthorized access and manipulation of communications between test equipment and vehicles.

Many of these security measures are requiring certificates or key based algorithms with role-based access control information that enable test equipment and vehicles to establish a trusted connection for authorized secure communication between the test equipment and vehicles.

# Prevailing headwind

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The issue we see being initiated currently, is that these security methods are being developed unilaterally by every automaker implementing unique custom security solutions.

We are currently in a situation where a vehicle manufacturer has implemented a security process that is preventing aftermarket tools from running many of the needed diagnostic routines.

With the potential for dozens of diverse implementations, the standardization effort we have embarked on for the last 25 years stands to be broken!

Aftermarket scan tools may not be able to operate in this new environment.

# Prevailing headwind

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Consequently, the near-term auto manufacturers unique, custom implementations of security measures without a standardized process and handling will become a key challenge, or show stopper, for test equipment to successfully communicate with multi-brand vehicles worldwide.

# Prevailing headwind – Call to action

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Policy and standardization efforts are needed to enable the continual success of the aftermarket repair industry.

The success of the aftermarket can be directly traced to the success of the standardization efforts put forth and promoted by SAE, ISO and ETI.



# Prevailing headwind – Call to action

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We must continue that cooperative effort to make sure we do not abandon our customers whether we are vehicle or tool manufacturers.

Again, with roughly 70% of automotive service being performed out-side of the automakers franchised dealer network. We need each other to keep our mutual customers satisfied.

This can only be accomplished through cooperation and standardization.

# THANK YOU!

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