


Top Issues Facing the Automotive Industry in 2016



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NHTSA Enforcement and Recalls

USA TODAY

BMW hit with \$40M fine for recall violations

Nathan Borely, USA TODAY, 3:10 p.m. EST December 21, 2015

Detroit Free Press

NHTSA fines FCA additional \$70 million

Brian Staszewski and Greg Gardner, Detroit Free Press, 4:58 p.m. EST December 10, 2015

THE WALL STREET JOURNAL

U.S. Auto Regulator Hits Takata With \$70 Million Fine in Air-Bag Settlement

South Bend TRIBUNE

Forest River faces up to \$35 million in penalties for safety violations


Automotive News

Fiat Chrysler hit with record \$105 million U.S. penalty over recalls

Safety practices to be overseen by independent monitor

DUI Announces Civil Penalty, Increased Oversight for Wheelchair Lift Manufacturer


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NHTSA Enforcement and Recalls

- **Exceptionally Aggressive Enforcement**
 - Civil Penalties
 - Deferred Prosecution Agreement (GM)
 - Consent orders
 - Monitors
 - Industry Outreach and Education
 - Penalties Held in Abeyance
 - All Industry Segments
 - Passenger Cars
 - Trucks
 - Motorcycles
 - Original and Aftermarket Equipment

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NHTSA Enforcement and Recalls

What to Expect in 2016

- **Continued Aggressive Enforcement**
 - More civil penalties and consent orders
 - Recent law increased penalty maximum to \$105 million
 - Much of the industry is being monitored under consent agreements
- **Focus areas: Recall timeliness, TSBs, Accuracy of EWR reporting**
- **Criminal Prosecution?**
- **Recalls to continue in high numbers**

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NHTSA Enforcement and Recalls

What to Expect in 2016

- Implementation of FAST Act
 - Whistleblower awards
 - Prohibition on rental of recalled vehicles
 - Dealer obligations to check for open recalls
 - Tire Recall Database
 - Study Feasibility of Direct Recall Notification to Vehicles
 - Extension and Expansion of Document Retention
 - No rights conferred by NHTSA “Guidelines”
- Continued focus on recall completion rates
- NHTSA and “Big Data”

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NHTSA Enforcement and Recalls

What Should Manufacturers Do?

- Conduct Complete Compliance Audit
 - Safety Defect Evaluation and Reporting
 - Early Warning Reporting
 - TSB Submissions
 - Foreign Recalls
 - Other requirements
- Conduct Periodic Training
- Regulatory Monitoring
- Recall and Investigations Monitoring
- Contract Review

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NHTSA and CYBERSECURITY

WIRED

SECURITY 07.21.16 9:00 AM

HACKERS REMOTELY KILL A JEEP ON THE HIGHWAY—WITH ME IN IT



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NHTSA and CYBERSECURITY

Automotive News

Fiat Chrysler recalls 1.4 million vehicles to install anti-hacking software

NHTSA to assess effectiveness of fix

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NHTSA and CYBERSECURITY

- NHTSA Investigations
- NHTSA Research
- Auto-ISAC (Information Sharing and Analysis Center)
- Proposed Legislation
- NHTSA and FTC Rulemaking (Safety and Privacy)

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NHTSA and CYBERSECURITY


THE WALL STREET JOURNAL.

TECH

Is a Hacked Vehicle Also Defective?


Car makers face significant consequences in safety debate over cybersecurity

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NHTSA and CYBERSECURITY

SPY Car Act	SPY Car Study Act
<ul style="list-style-type: none"> ■ Standards to prevent hacking into vehicle control systems ■ Hacking Protection ■ Data Security ■ Hacking Mitigation Technology ■ Privacy Standards (disclosure and transparency, opt-out rights, and prohibitions on marketing owner data) 	<ul style="list-style-type: none"> ■ Requires agency studies to determine appropriate standards for the federal regulation of vehicular cybersecurity. ■ Isolation measures ■ Detection and prevention of anomalous codes associated with malicious behavior ■ Techniques for detecting and preventing intrusions (such as continuous penetration testing) ■ Best practices for securing driving data.




The (Long?) Road to Autonomous Vehicles

“AEB systems, along with promising innovations such as vehicle-to-vehicle communications (V2V) and automated vehicle technologies, hold great promise to save even more lives and prevent even more crashes, building upon the successes of crashworthiness and crash avoidance technologies currently available in vehicles today. As these technologies mature, NHTSA will continue to accelerate its push on innovative and effective solutions to reduce the staggering toll of motor vehicle crashes in the U.S. through our research, regulatory, and consumer information programs.”

DOT Secretary Anthony Foxx, January 22, 2015

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The (Long?) Road to Autonomous Vehicles

- Ann Arbor Driverless Vehicle Pilot Project - 2012
- NHTSA's 2013 Preliminary Statement of Policy Concerning Automated Vehicles
- 2014 ANPRM on V2V standard – FMVSS No. 150
 - NPRM Targeted for May 2016
 - According to NHTSA, “by mandating V2V technology in all new vehicles, but not requiring specific safety applications, it is NHTSA’s belief that such capability will in turn facilitate market-driven development and introduction of a variety of safety applications, as well as mobility and environment-related applications that can potentially save drivers both time and fuel.”

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The (Long?) Road to Autonomous Vehicles

What Should We Expect in 2016

- V2V Rulemaking – NPRM by May?
- NHTSA New Car Assessment Program (NCAP)
 - An Incremental Approach toward Federal Regulation of Fully Autonomous Vehicles?
- Voluntary Commitment to Install Automatic Emergency Braking (AEB)
- Update to Agency’s 2013 Policy on Automated Vehicles?
- Evolving State Laws; Liability

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Warranty and Recall

Matt Paroly
Chief Legal Officer
TI Automotive

Top Issues Facing the Automotive Industry in 2016


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Warranty & Recall Issues

- Warranty has always been a tension point between Customers and Suppliers
- Exponential increase in publicity and cost associated with OEM recalls, service campaigns and warranty repairs
 - Increasing complexity of components and systems
 - Large global platforms and volumes
 - Higher expectations of safety, quality, performance and reliability
- Customers more aggressively seeking to push these significant costs to Suppliers

Warranty and recall are becoming much higher and harder risks to anticipate, size and manage




Warranty Categories

Warranty can be categorized by: (i) Occurrence/Timing, (ii) Root Cause, (iii) Incident Rate and (iv) Severity of Failure Effect

Factory or Zero Mile Warranty	Ordinary Warranty	Special Warranty	Recall
Lower Cost	Moderate Cost	High Cost	Highest Cost
Manage via quality process	Manage via quality process and warranty agreement	Manage on engineering and commercial basis Potential for arbitration and litigation	Manage on engineering and commercial basis Potential for arbitration and litigation Insurance may be an option

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General PO Terms

- The high level contractual relationship between Customer and Supplier has not changed
- PO Terms that are highly Customer-favorable are standard in the auto industry
- Exceptions and limitations are hard to negotiate absent unique circumstances or non-auto products
- Suppliers generally accept unlimited liability for a broad range of costs resulting from non-conforming parts

Just negotiating PO terms is not likely to be an effective way to manage warranty and recall risk


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Warranty Agreements

- Most OEMs have standard warranty agreements and programs that supplement the PO terms
 - Suppliers pay costs under a formulaic agreement if ordinary warranty rate exceeds target threshold but is not a spike or special cause
 - Procedure to review returned parts, cause analysis as well as related trouble/repair codes
 - Often some cost sharing or incentive arrangements
- OEMs set standard processing fees, mark-ups, labor rates, etc. which are used to establish cost recovery for ordinary warranty but also special warranty and recalls
- Some flexibility for negotiation and course of dealing

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Warranty Agreements

- Recently, OEMs have begun to increase warranty burden and repair costs (ordinary and special warranty)
 - Warranty period is increasing (up to 5 years)
 - Mileage limitation is increasing or being eliminated (time only)
 - Processing fees going up (per vehicle)
 - Increase in mark up for internal processing and handling costs as well as cost of commissioning 3rd parties (up to 45% of the spare parts cost)
 - Higher labor rates
- New terms should be prospective only and factored into pricing and processes

***Must widen focus beyond just PO terms
to review and consider warranty arrangements***

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Managing Supplier Liability for Special Warranty and Recall

- Resolution is an iterative process that is adversarial and collaborative at same time
- An element of mistrust exists and Customers do not always engage with Suppliers upfront and/or provide complete data transparency
- Customers have begun to pursue recovery for warranty and recalls conducted well in the past
- An array of skill sets is required to reach resolution while preserving the ongoing business relationship

Essential to have a response team consisting of engineering, commercial, legal and senior executives

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Managing Supplier Liability for Special Warranty and Recall

- Ideally, establish an ongoing proactive review of warranty data and returns for spikes, trends, recurring issues, severe failures, etc.
- React quickly to identify root cause
- Contain problems and establish clean points
- Consider efficient service solutions
 - Testing, retrofits, and modifications may be just as effective as total replacement

Cooperation upfront to limit the problem and costs will reduce everyone's liability on the backend

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Managing Supplier Liability for Special Warranty and Recall

- Supplier liability arises when a part does not meet agreed upon specifications
- Non-conformance (fault) is not a simple determination
 - Many issues stem from system and vehicle integration, not an isolated component problem
 - Design and integration responsibility often not clearly delineated in sourcing agreements and specifications
 - Customers argue that they rely on the “expert” Supplier to anticipate conditions and issues
 - Customer-directed design or subcomponent may be cause or contributing factor
 - Transport, handling and assembly may also be factors

Expect to see Customer specifications, RASICs and procedures that more clearly shift responsibility to Suppliers

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Managing Supplier Liability for Special Warranty and Recall

- Identifying and bundling commercial issues has been the key to crafting “win-win” deals to resolve special warranty and recall claims
 - Recently, Customers have shown more openness to separately arbitrate with Suppliers concerning warranty and recall liability
 - Could signal trend towards de-linkage
- Recall insurance is more readily available, especially in North American market
 - Small but growing number of Suppliers carry the coverage
 - Recall insurance is required under new BMW terms, although specific expectations are not yet clear

Traditional means to resolve special warranty and recall may have to change or become part of a mixed approach

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Connected Car Perspective

By Praveen Chandrasekar
Consulting Director & Research
Manager, Frost & Sullivan
cpraveen@frost.com

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14.1009

Internet of Cars is Truly Impacting Every Facet of the Automotive Industry

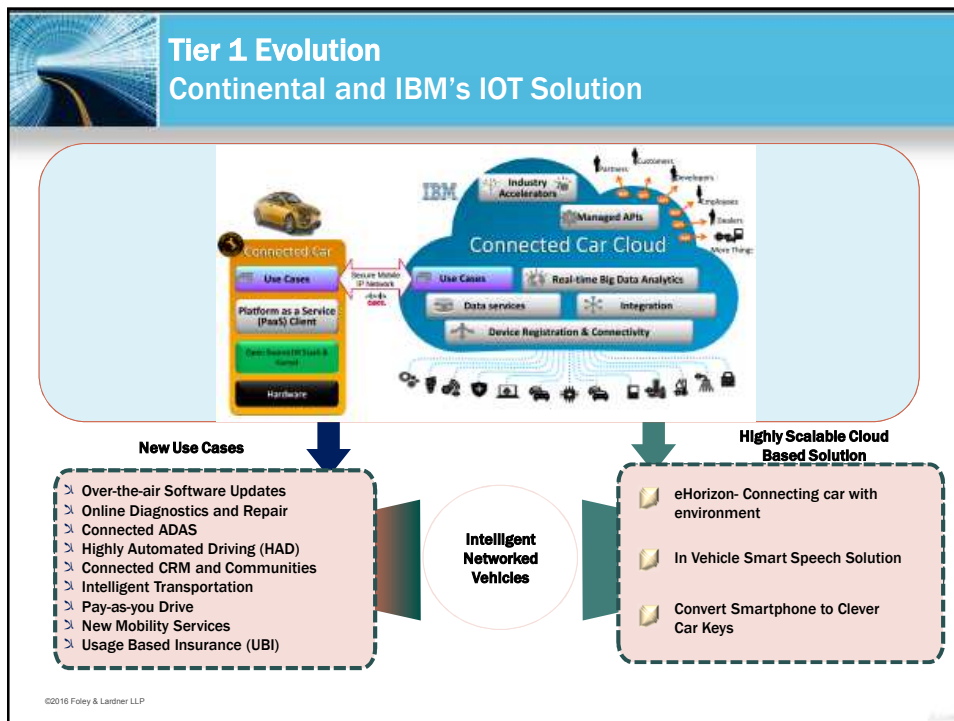
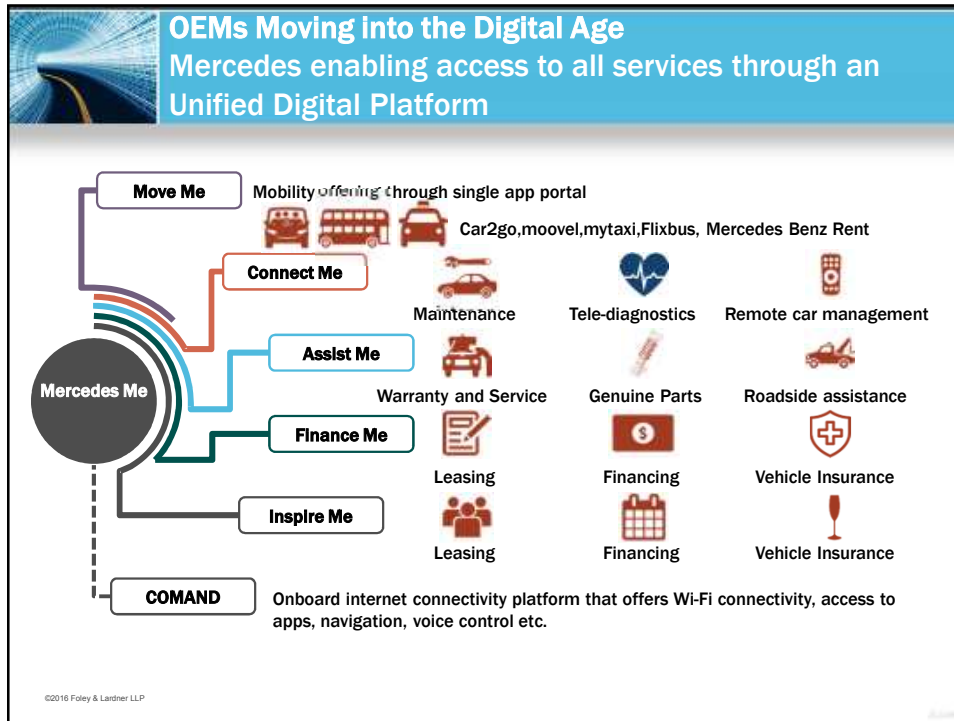
<p>Aftersales</p> <p>Retail</p> <p>Mobility</p> <p>Connected Services</p> <p>Automation</p> <p style="font-size: small;">Autonomous Car</p>	<p>From Products to Services</p> <p>Car manufacturers and vendors are expected to push new service business models, e.g. GM OnStar</p> <hr/> <p>Industry Convergence</p> <p>From Apple to Google to Uber, Auto market is now the hot bed for CE innovators, e.g. GM LYFT</p> <hr/> <p>New Retailing Experiences</p> <p>Pureplay dealerships to bricks and clicks retail strategy with new digital experiences, e.g. Mercedes ME</p> <hr/> <p>From Vehicle to Autonomous Mobility</p> <p>Bringing automated driving capabilities on multiple models is the key trend, e.g. GM/VW/Toyota building own maps with Mobileye for automated driving</p>
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Contextual Intelligence

Jaguar and Here maps, in partnership with Intel, have provided a “Google Now” like in-car experience


<p>Learns your preferences Recommends fuel stations not only according to prices but your preferred chain.</p> <p>Traffic updates Traffic is taken into account irrespective of active route guidance.</p> <p>Input destination Detects keywords and uses recent locations to provide suggestions.</p> <p>Companion App Companion app allows users to enter destination from the phone.</p>	<p>Add waypoints Known users can send waypoints. For example, a spouse requests you to pick up dry cleaning en route.</p> <p>Shares ETA Shares ETA and updates delays to selected contacts.</p> <p>Parking suggestions On approaching destination, it displays street view and available parking spaces.</p> <p>Last mile navigation Last-mile route guidance is given through the phone.</p>	
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©2016 Foley & Lardner LLP Source: Here maps; Jaguar; Frost & Sullivan




Meaningful data sets is expected to grow from 10MB to 5GB in an average connected car by 2017/2018


As of 2013 less than **2 per cent** of vehicle data was useful for monetization. OEMs can have annual savings of about \$800 per vehicle




Parking As a Service




Peer to Peer Marketplace




Integrated Traffic Management



Cooperative & Automated Driving



Usage Based Insurance



Integrated Multimodal Transport

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Even Aftermarket Startups are Opening up True IOT Models












Key Offers/Features

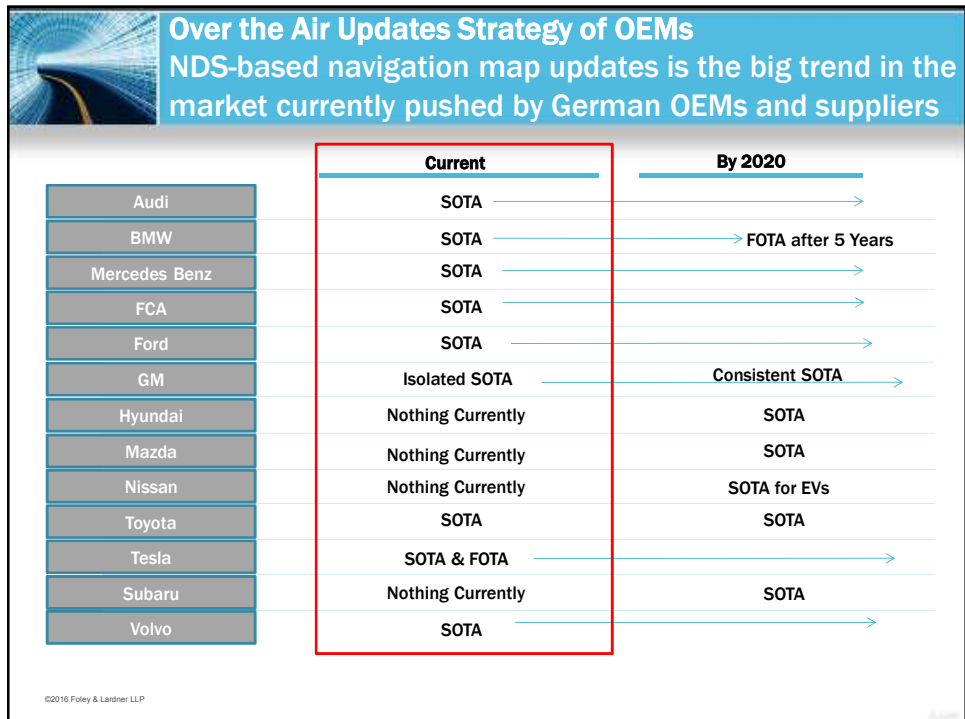
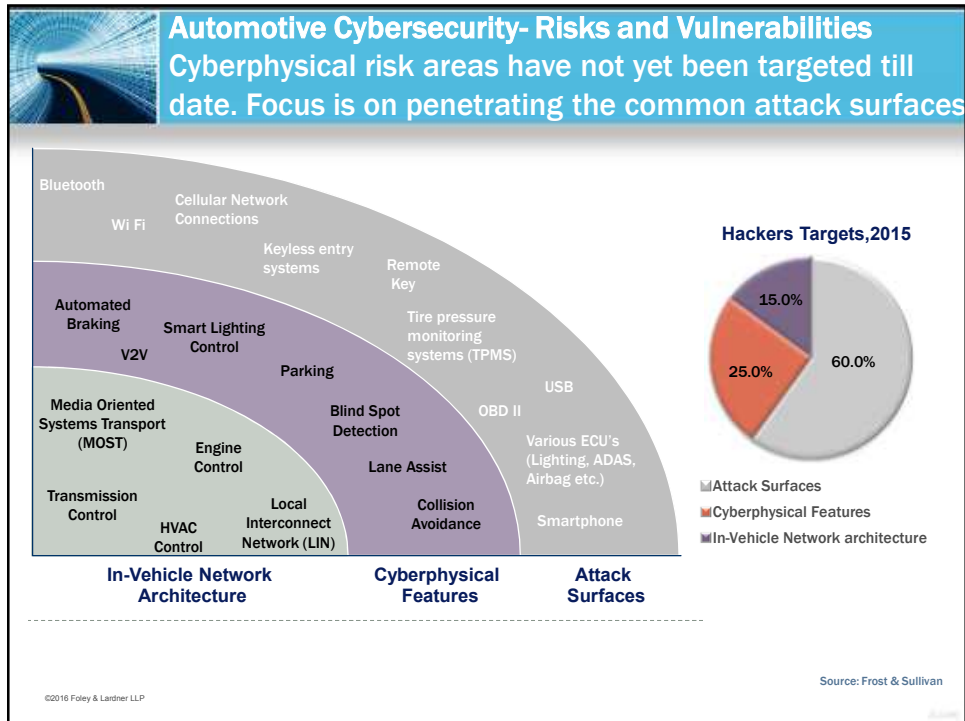
- Emergency assistance, real-time roadside assistance, insurance discounts, service/repair data brokerage, driving data analysis and so on
- Business distribution channels – wireless companies, insurance companies, wholesale parts suppliers (automation) and direct B2C (Apple stores)




**Over 20 Apps
All Vehicle Data Based**

- Breakdown assistance (Urgent.ly)
- Car locator apps
- Advanced diagnostic alert apps
- Auto insurance shopping
- Access to repair shops
- Jobs dispatching
- Expense creation apps
- Most of these are categorized into connected life, enterprise, fleet management, insurance, maintenance, productivity and safety/security

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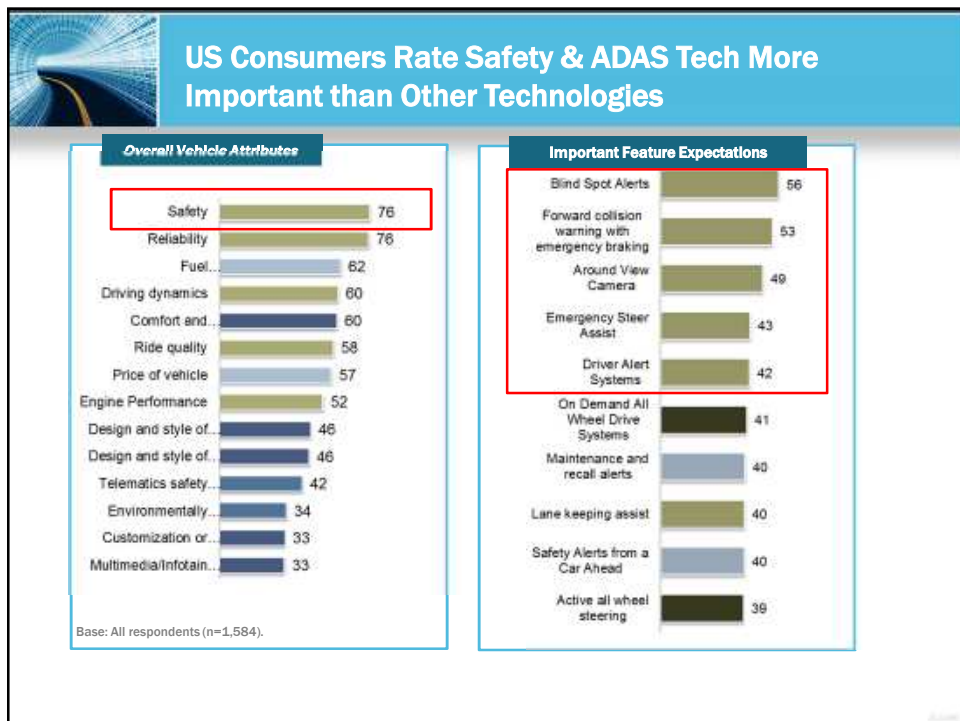
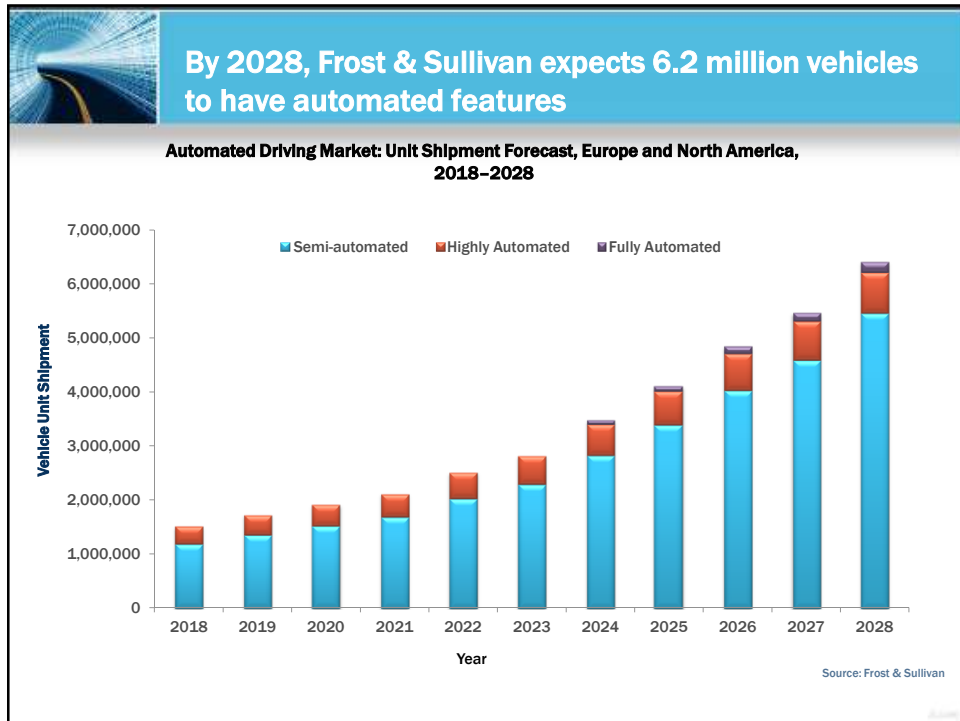
OEM HMI Analysis

Fully digital clusters are expected to penetrate mass market vehicles as a key line of sight safety trend

OEM	Embedded Voice	Capacitive Touch	Handwriting Recognition	HUD	Gesture Recognition
Audi	✓	N/A	✓	✓	2018
BMW	✓	2016/17	✓	✓	2018
Chrysler	✓	✓	x	x	2016
Chevrolet	✓	✓	x	x	x
Cadillac	✓	✓	Only in China	✓	Touch
Ford	✓	✓	x	2016	2018/19
Honda	✓	✓	x	2016/17	2018/19
Hyundai	✓	✓	x	2016	2018/19
Lexus	✓	✓	x	✓	x
Mercedes-Benz	✓	x	2015 C Class	✓	x
Toyota	✓	✓	x	x	2018/19

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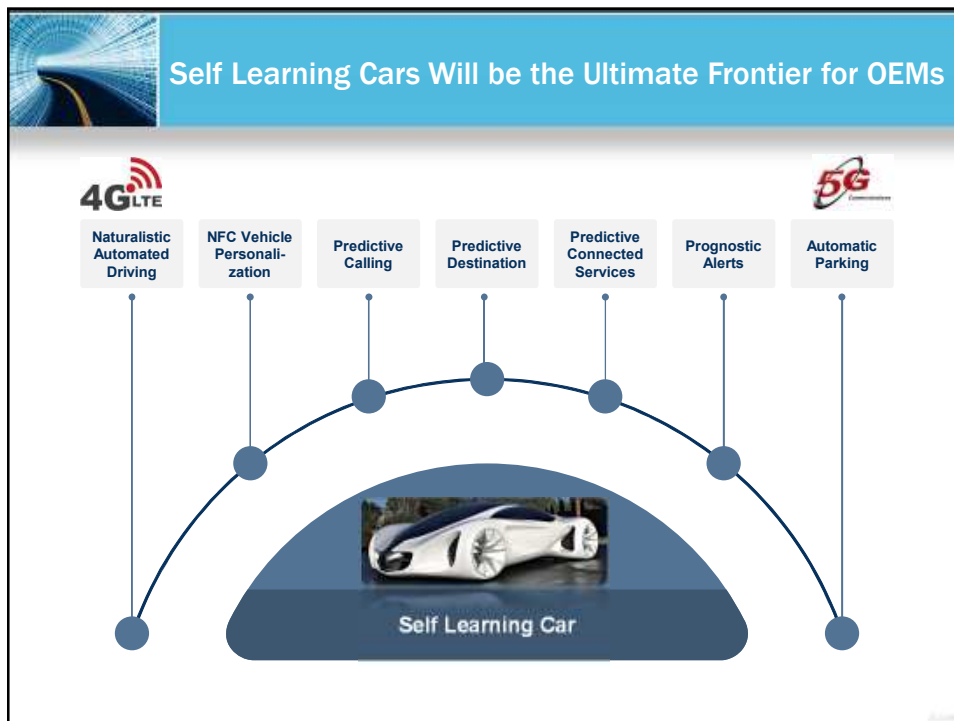
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- ### ADAS/Automation is the Fastest Growing Segment in the European and US Automotive Market
- 1 Overall ADAS Market Growth**
 ADAS Market is Expected to Grow in Excess of 25% by 2020. Primarily driven by adoption in C/D vehicle segments and contribution from volume hitters
 - 2 Regulations are Evolving Fast**
 Crash imminent braking and dynamic brake support added to FCW, LDW and RVC to obtain 5 Star Rating in US.
 - 3 Low Cost Collision Avoidance Tech is Fast Scaling Up**
 Rear end collisions, Lane keeping and improved pedestrian/night time detection , including low and high speed scenarios
 - 4 Automation Features are Getting In**
 Besides the obvious OEMS, Tesla is coming out with update 7.0 that will feature L3 at high speeds and L4 at low speeds in private property
 - 5 Cooperative ITS System Deployment**
 Ann Arbor trials extended, EU ITS Corridor going live but HERE is doing something very different with its digital infrastructure






Key Takeaways


- 1 Software Defined Car is the Road Forward**
Security and functionality for vehicle lifecycle will require a very tightly defined over the air update strategy which many OEMs are pursuing beyond just Tesla
- 2 Data Security will be Crucial**
OEMs are getting into building maps using vehicle sensors for automated driving, a critical piece is to anonymize and secure that data to gain consumer trust
- 3 Most OEMs will go down the Automated Driving Route in Increments**
From Hyundai, Kia to GM to premium OEMs like Audi and BMW, the road to automated driving will be in increments from semi to partial to full
- 4 Suppliers are Desperately Trying to Transform Component Image**
Suppliers like Harman have made 3 SW acquisitions in the last 1 year worth more than a billion. Idea is to get out of the cost focused component business
- 5 Deep Learning and AI are the Next Big Frontiers**
Semiconductor and tech vendors like NVIDIA are bring a very important piece – building AI into the algorithms for contextualization & path planning



Self Learning Cars Will be the Ultimate Frontier for OEMs



Naturalistic Automated Driving



Automatic Parking


NFC Vehicle Personalization

Predictive Calling

Predictive Destination

Predictive Connected Services

Prognostic Alerts



Self Learning Car

Thank You

Our Research Value Proposition:
We Analyse the Future Trends and Hot Topics Within the Industry to Help you Develop Winning Positions

 New Mobility Business Models (e.g. Car Sharing)	 Hot Industry Topics (e.g. Big Data)	 Future of Car Retailing	 Vehicle Connectivity
 Future Fuels, Powertrain, CO2 Strategies	 Vehicle Aftermarket	 Automated Mobility	 Vehicle Leasing and Ownership


FROST & SULLIVAN
Praveen Narayanan
Consulting Director and Research Manager
Automotive & Transportation
P: 248.536.2008
M: 313.515.0614
cpraveen@frost.com

Cybersecurity
Karl Heimer
Founder / Partner
AutoImmune, Inc.
karl.heimer@outlook.com

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The image shows the Tacoma Narrows Bridge in a state of collapse. A large section of the bridge deck is falling away from the support structure, with debris and dust visible. The bridge's suspension cables and towers are visible in the background. An inset image in the top left corner shows a close-up of the bridge deck's edge as it begins to break apart.

Tacoma Narrows Bridge
- Opened June 1940
- Collapsed November 1940
- Aeroelastic flutter
- 42 mph wind

+ engineering analysis lead to revolution in bridge engineering

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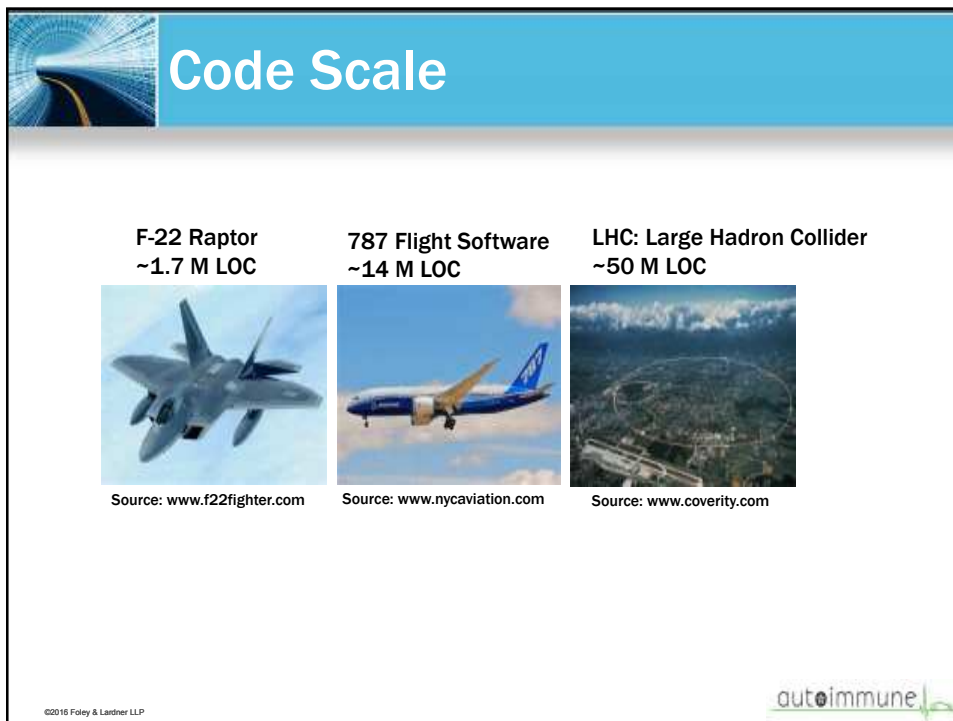
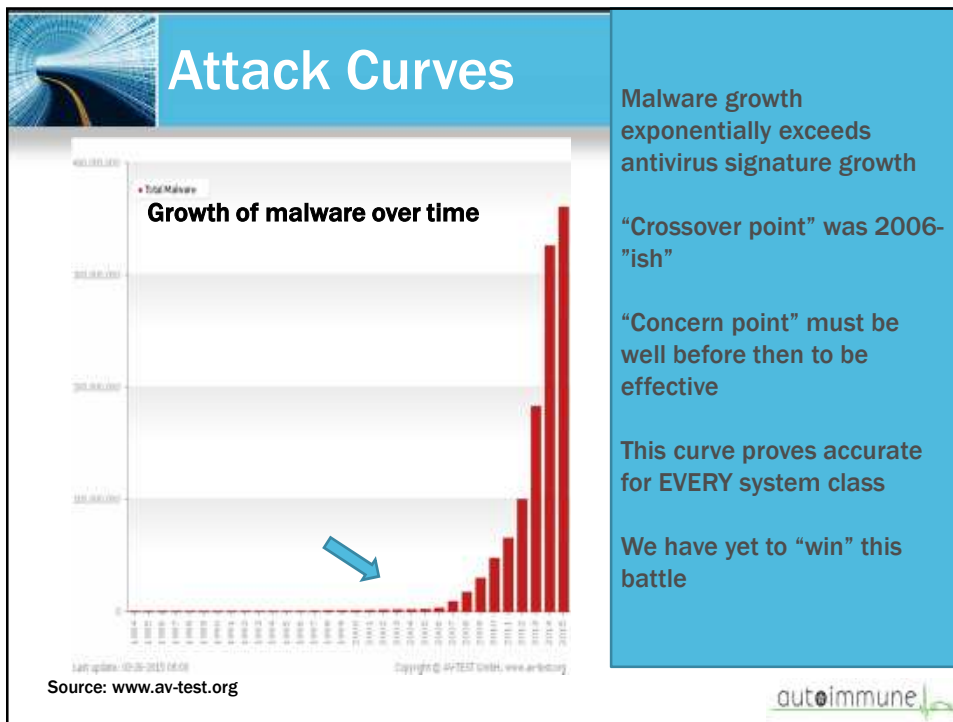


A photograph of a football game in progress. Two teams are lined up at the line of scrimmage on a grass field. The team on the left is wearing white jerseys with red helmets, and the team on the right is wearing blue jerseys with white helmets. The center of the white team is about to snap the ball. The background shows a blurred crowd of spectators.

Two Models:


- Competitive Athletic Model
- Operational Model

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Code Scale

F-22 Raptor
~1.7 M LOC




Source: www.f22fighter.com

787 Flight Software
~14 M LOC



Source: www.nycaviation.com

LHC: Large Hadron Collider
~50 M LOC



Source: www.coverity.com







Modern Cars
Volt ~ 10M
Luxury 100-200M



Source:
Volt: www.cbsnews.com
Luxury: www.spectrum.ieee.org

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Code Scale

		F-22	787	Linux	Windows	LHC	Modern Car
		1,700,000	14,000,000	16,000,000	45,000,000	50,000,000	150,000,000
General	20	34,000	280,000	320,000	900,000	1,000,000	3,000,000
MS	0.5	850	7,000	8,000	22,500	25,000	75,000
Harlan	0.1	170	1,400	1,600	4,500	5,000	15,000
Vulnerability	0.005	9	70	80	225	250	750

As a proof point, Coverity states that they found 40,000 defects in the LHC codebase. [Source: www.coverity.com]


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Consequences worth Legal Consideration

- Cars have well-defined EULAs
- Cars will have defined EOL & conditions
- Licensed or shared resource cars
- Formal OEM liability limits and exemptions

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Discussion

Contact: Karl Heimer
karl.heimer@outlook.com
+1.248.270.0117