MARSH

SOLUTIONS...DEFINED, DESIGNED, AND DELIVERED.

NAVIGATING THE RISKS AND REWARDS OF EVOLUTION IN THE AUTOMOTIVE INDUSTRY

SEPTEMBER 12, 2018

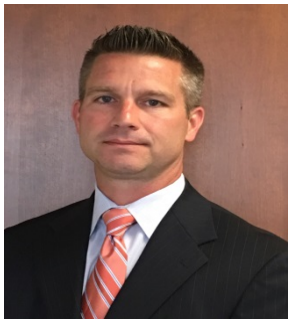
New York, NY

MARSH & McLENNAN COMPANIES

Agenda

• **Welcome and introductions**	*David Carlson, Manufacturing and Automotive Industry Practice leader*
• **Manufacturing industry 4.0**	*David Carlson, Manufacturing and Automotive Industry Practice leader*
• **Subscription service and ride-share risks**	*Jose Heftye, managing director, Marsh Risk and Insurance Services*
• **Securing information technology and manufacturing assets**	*David Kennedy, CEO, Trustedsec*
• **Questions and answers**	*David Carlson, Manufacturing and Automotive Industry Practice leader*

Introduction
Today's Speakers



DAVID T CARLSON
Managing Director
US Manufacturing and Automotive Industry Practice Leader
Marsh
+1 216 937 1361
david.t.carlson@marsh.com

- Extensive experience in risk management, insurance and manufacturing & automotive industry.
- Previously worked as environmental, health, and safety manager for two global automotive Tier I suppliers.
- May 2018 he testified before the US House Financial Services Committee, Subcommittee on Housing and Insurance in the hearing: "The Impact of Autonomous Vehicles on the Future of Insurance."

DAVID KENNEDY
CEO
Trustedsec, LLC
+1 877.550.4728 x700
David.Kennedy@TrustedSec.com

- Founder and CEO of TrustedSec and Binary Defense.
- Formerly Chief Security Officer for Diebold Incorporated, where he developed a global security program that tackled all aspects of information security and risk management.
- Deployed to Iraq twice as a member of the US Marine Corps for intelligence-related missions.
- Numerous guest appearances on Fox News, CNN, CNBC, MSNBC, the Huffington Post, Bloomberg, and the BBC, etc.
- Regular contributor to various industry publications.
- TrustedSec was created to serve as technical security experts and advisors for companies of all sizes and industries.

JOSE HEFTYE
Managing Director
Marsh
+1 415 743 7713
jose.heftye@marsh.com

- Leads Marsh's Sharing Economy and Autonomous Mobility Practice based in San Francisco, working with clients and prospects around the world.
- Jose has been with Marsh since July 2016. Prior to joining Marsh, Jose worked at Uber, Flextronics, and PepsiCo, having various responsibilities in both insurance and treasury functions.

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Manufacturing 4.0 and beyond…

Harnessing Radical Change to Make a New Beginning

David Carlson
Marsh Manufacturing and Automotive Industry Practice

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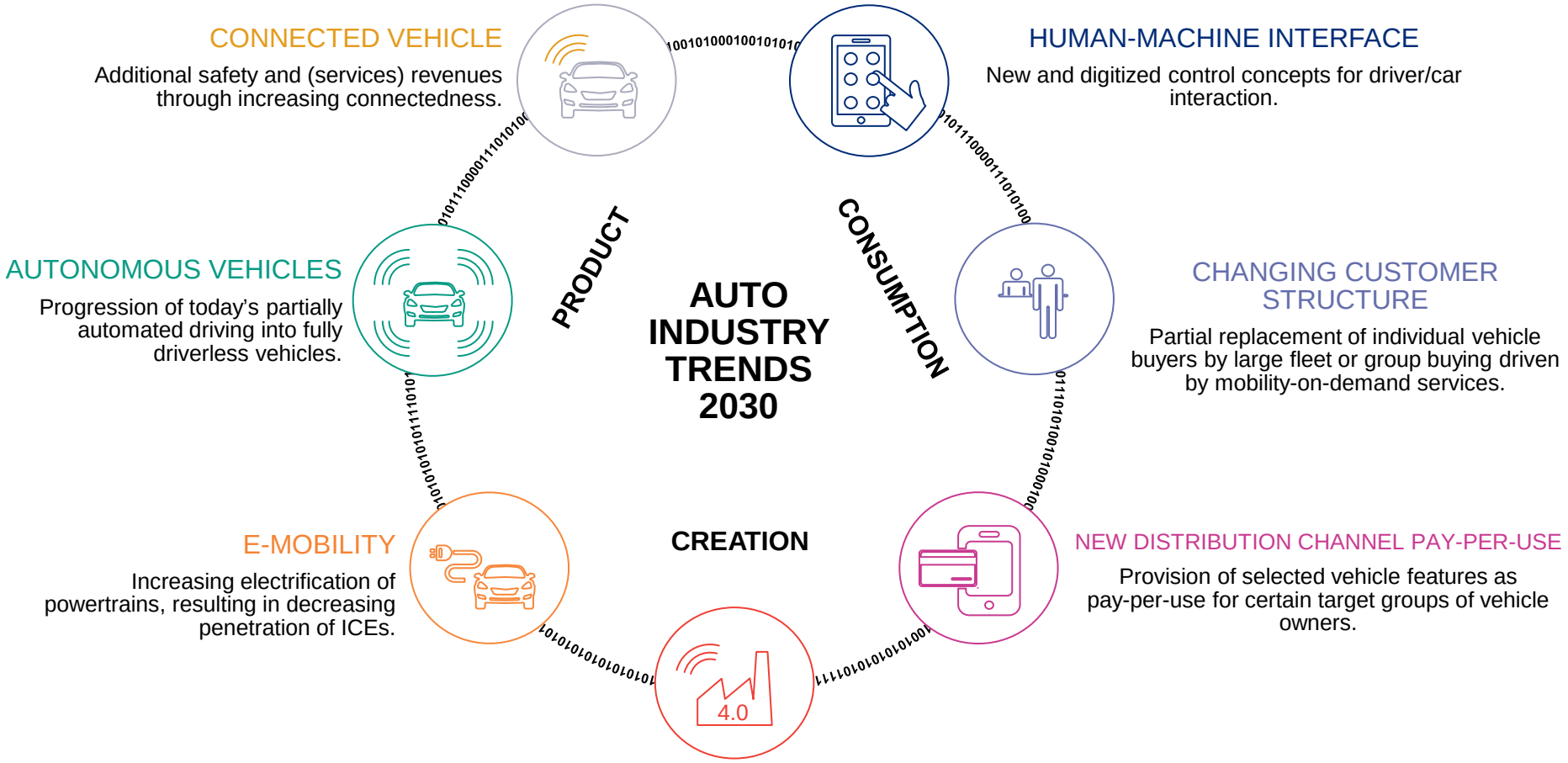
The Mighty Seven: Automotive Industry Trends Until 2030

Seven fundamental trends will drive the automotive/manufacturing industry until 2030, enabled and accelerated by digitalization, AI, and machine learning.



CONNECTED VEHICLE

Additional safety and (services) revenues through increasing connectedness.

HUMAN-MACHINE INTERFACE

New and digitized control concepts for driver/car interaction.

AUTONOMOUS VEHICLES

Progression of today's partially automated driving into fully driverless vehicles.

CHANGING CUSTOMER STRUCTURE

Partial replacement of individual vehicle buyers by large fleet or group buying driven by mobility-on-demand services.

E-MOBILITY

Increasing electrification of powertrains, resulting in decreasing penetration of ICEs.

NEW DISTRIBUTION CHANNEL PAY-PER-USE

Provision of selected vehicle features as pay-per-use for certain target groups of vehicle owners.

DIGITAL INDUSTRY

Increasing digitization of processes through predictive and adaptive data capability.

Source: Oliver Wyman analysis

Autonomous technology is here and threatens the very existence of traditional automakers!

- Partnerships between **OEMs**, **technology service providers,** and **e-mobility platforms** are causing car companies to reimagine themselves as mobility/service companies.
- Companies must align their operations to take advantage of the mobility ecosystem and **digitization and connectivity**.
- Consumer demand for **environmentally friendly** vehicles is driving a rapid shift to EVs and other **green energy** sources.
- **Regulatory** changes are encouraging OEMs to reassess compliance and conformance to standards impacting their business.

Digital Industry

Driven by changing customer preferences and new technical solutions, the “Digital Industry” is gaining ground.

Changing customer preferences

- Product individualization
- Permanent connectivity
- Personalization through Big Data
- Product as a service
- Hassle-free solutions
- Willingness to share data

Digital automotive industry

Technical enablers

- Data availability
- Declining technology costs
- Mechanical development progress
- Accelerating innovation cycles
- New production techniques
- Changing R&D patterns

Source: Oliver Wyman analysis

The scope of the impact of autonomous vehicles is unfolding.

Companies that fall behind will:

- Lack insight into the complexity of required innovation and supply chain resilience.
- Misunderstand the role of emerging markets and associated production shifts.
- Be unable to enter the e-mobility space.

Successful companies will sustain their leadership position by:

- Building value-added service networks with partner markets.
- Forming nontraditional business alliances, that is, e-mobility and tech firms.
- Aggressively pursuing additive (3D) manufacturing, electrification, and safety-oriented technologies.
- Developing their own intelligent cars and mobility platforms.
- Claiming new touch points with their current and potential consumers.

Companies that offers mobility services will transcend today's norms.

Businesses must pivot their business models to embrace change through:

- Manufacturing capabilities that take advantage of connected operations and new technologies.
- Differentiated products manufactured in an environmentally friendly fashion.
- Better B2B marketing driven from a better understanding of B2C dynamics.
- Green products supported by new revenue streams.
- Innovation-based partnerships to remain front-footed.
- Building e-mobility across platforms/brands.

Technology and mobility ecosystems will create substantial impact, both upstream and downstream, and give rise to new risks and opportunities.

Rebrand business to deliver:

- **Manufacturing capabilities that take advantage of small design settings.**
- **Differentiated products manufactured in an environmentally friendly fashion.**
- **Better B2B marketing driven from a better understanding of B2C dynamics.**
- **Green products supported by new revenue streams.**
- **Innovation-based partnerships to remain front-footed.**

Risks	Insights
Technology risk: cyber, critical infrastructure, and sharing economy and autonomous.	• Cyber risk modeling and analysis. • Internet of Things and Industrial Internet of Things.
Reputational and product recall risk.	Product liability and recall solutions.
Property and business interruption risk.	• Property asset protection and resiliency. • Business interruption insurance review.
Autonomous Vehicles.	Test vehicle insurance.
Human capital: skilled labor, workers' compensation, and benefits risk.	• Workforce safety strategies and safety program development. • Employee benefit diagnostics

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Sharing Economy and Autonomous Vehicles– The Future Is Now

Jose Heftye

Marsh Sharing Economy and Autonomous Mobility

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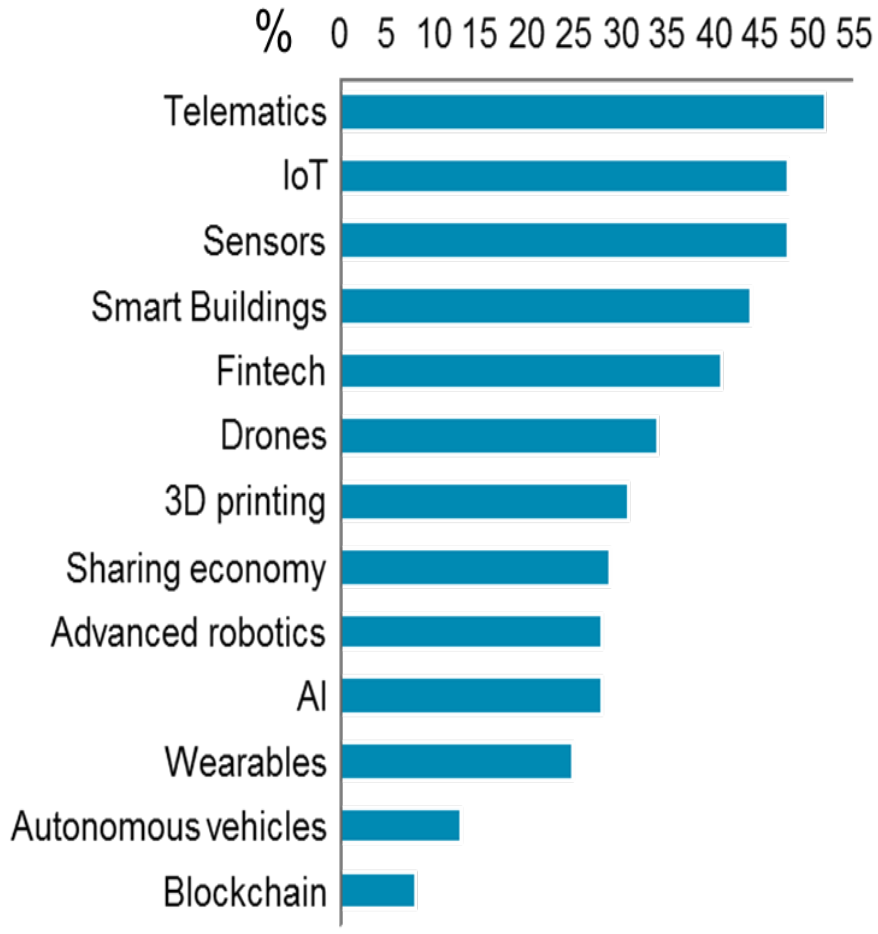
What difference can a couple of decades make?

1998 — 2018

- Don’t get into strangers’ cars.
- Don’t meet people on the internet.

- Literally summon people on the internet and get into their cars.

Companies using or planning to use disruptive technologies

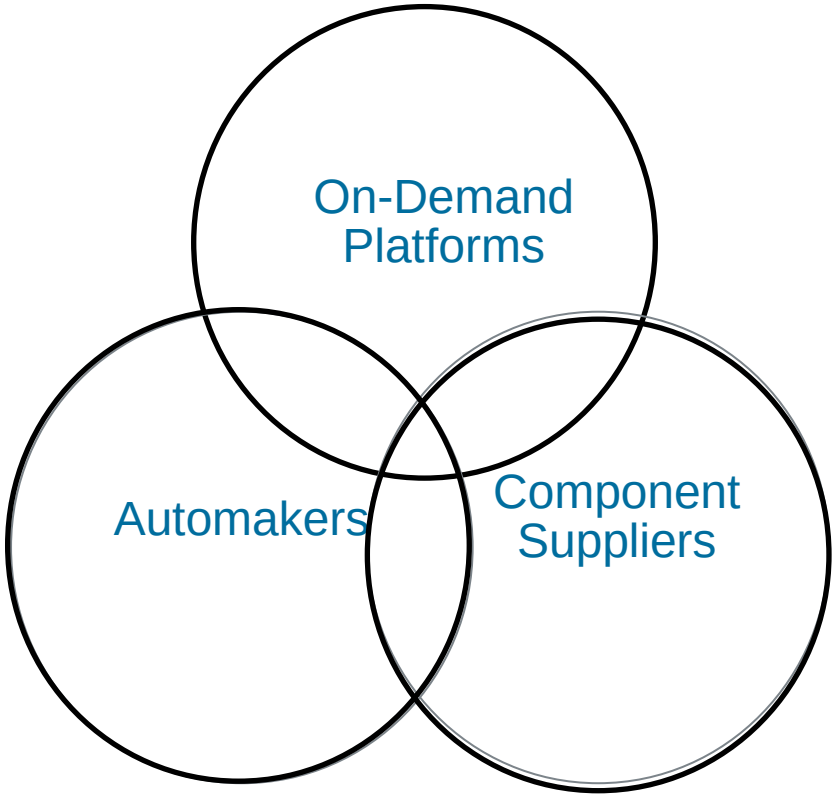


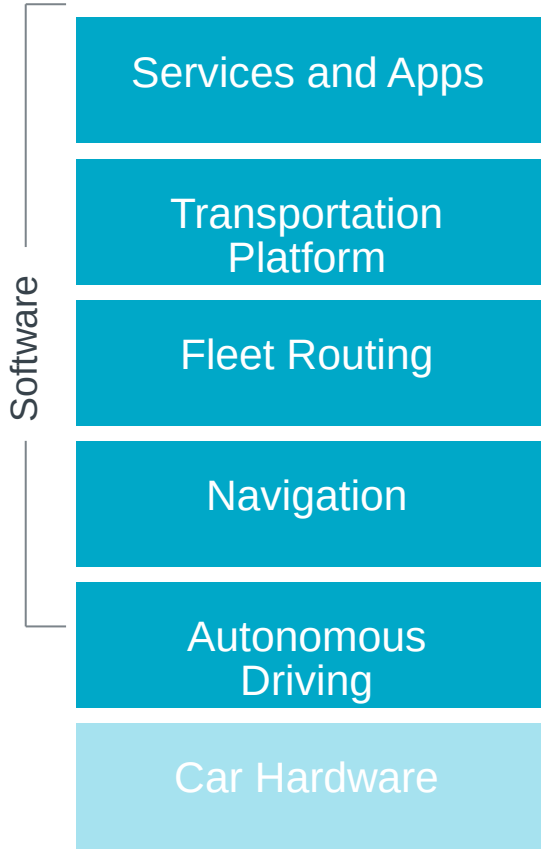
76%

of organisations currently use or plan to use at least one disruptive technology

Source: Marsh *Excellence in Risk Management,* 2017

Mobility: Ecosystem and Platforms

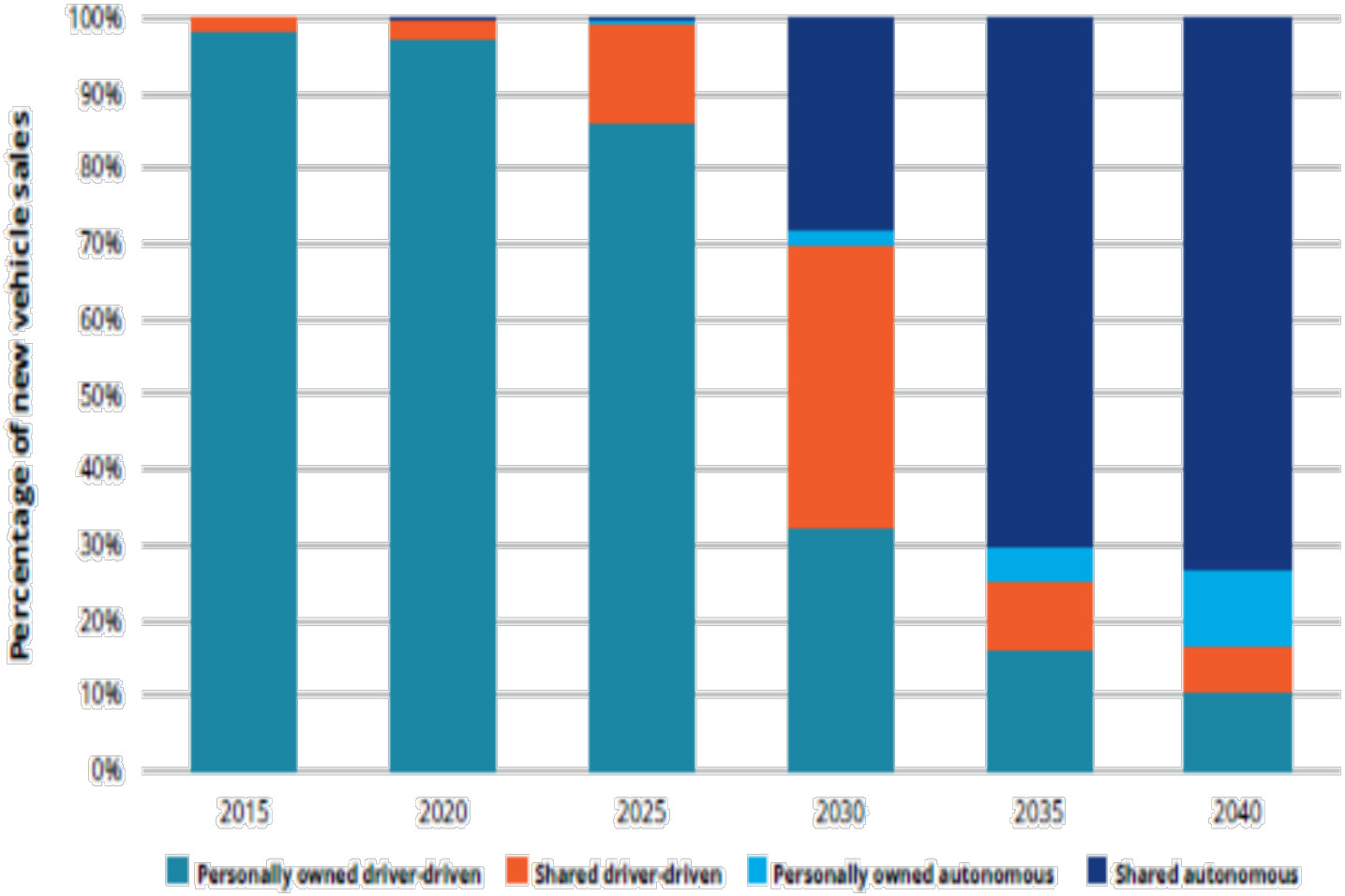




Future State of Mobility

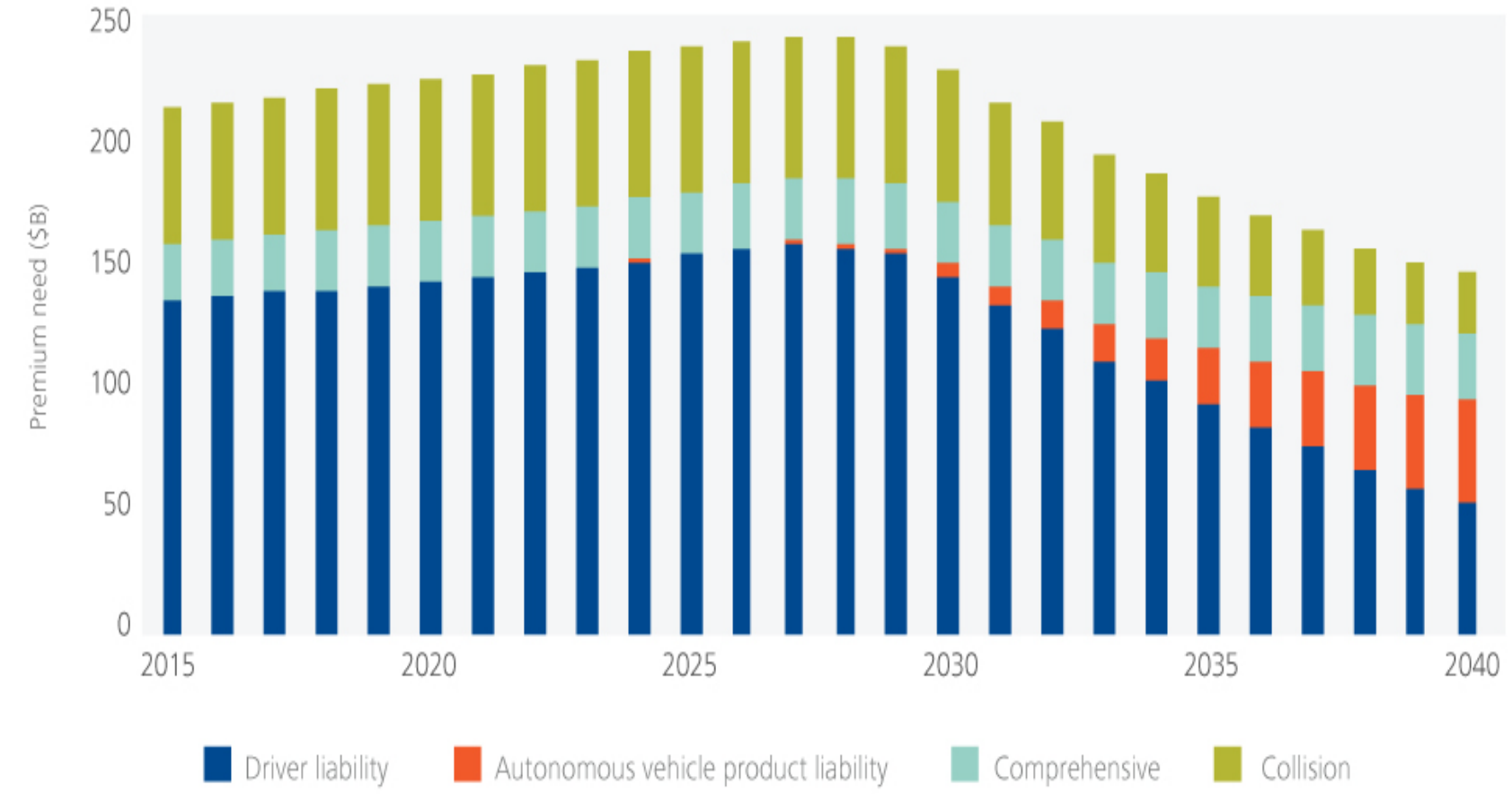
	Past	Near future	Future state
			
Mobility assessment	• Driver-owned. • Driver-operated.	• Mix between driver-owned and shared ownership. • Driver-assisted.	• Primarily shared ownership. • Autonomous.
Insurance implications	• Personal auto liability.	• Decreasing auto personal liability and increasing commercial auto liability.	• More product liability-related losses, fewer personal liabilities.

Forecast: New Vehicles Distribution in Urban Areas (US Sample)



Source: Deloitte analysis based on publicly available information. See appendix for data sources.

Insurance Industry Perspective: Premium Shift by Coverage Type

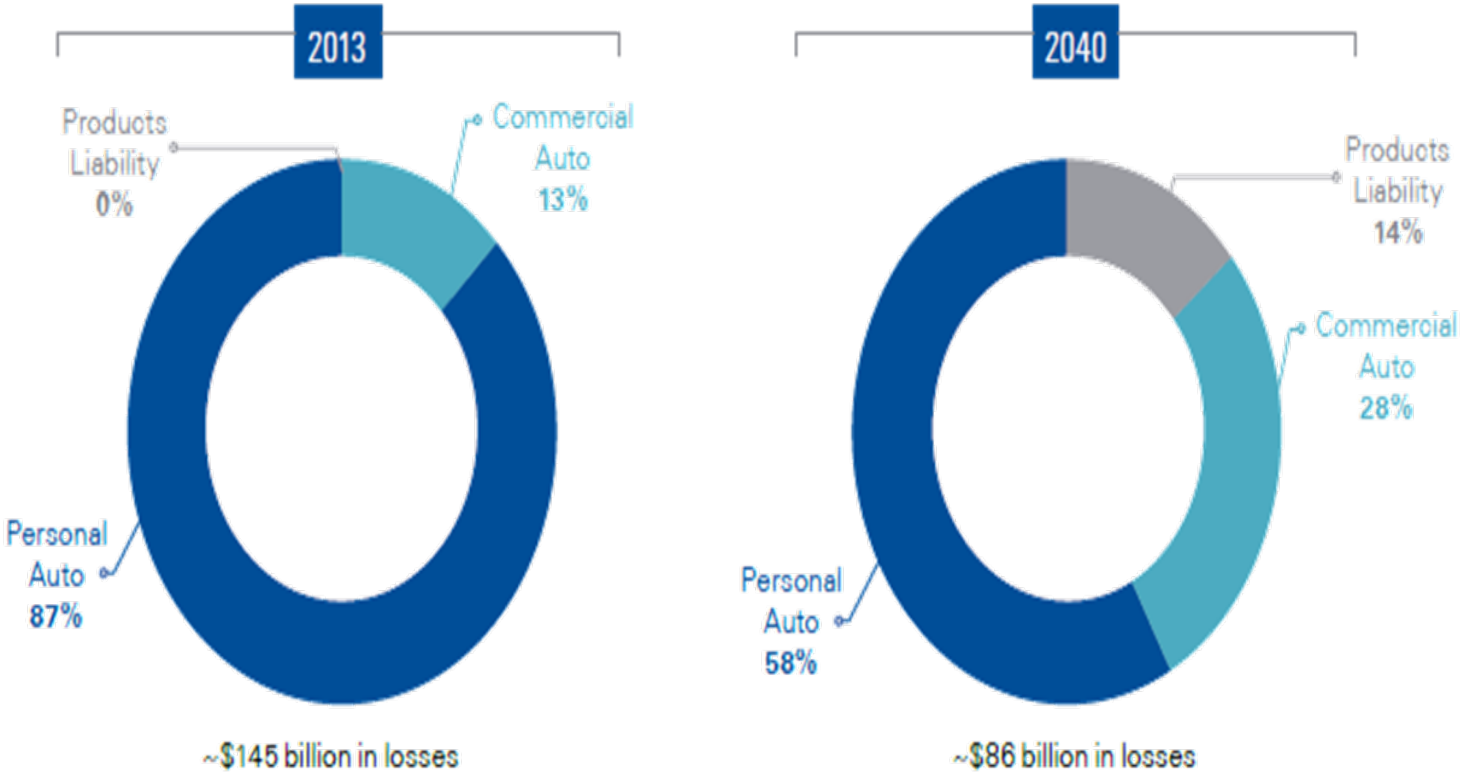


Note: Premium estimates do not account for the effect of self-insurance by large commercial fleets or vehicle manufacturers
Source: Deloitte Future of Mobility actuarial model preliminary findings.

Graphic: Deloitte University Press | DUPress.com

Insurance Industry Perspective: Shift In Loss Allocation

Loss split between products liability, personal auto, and commercial auto.



Source: KPMG LLP actuarial analysis

Marsh's Autonomous Mobility Timeline

November 2016

Marsh was tasked with creating an insurance solution for startup AV trucking company.

February 2017

Marsh placed **first** AV primary auto liability program.

September 2017

Marsh launched an autonomous vehicle facility to secure excess capacity.

October 2017

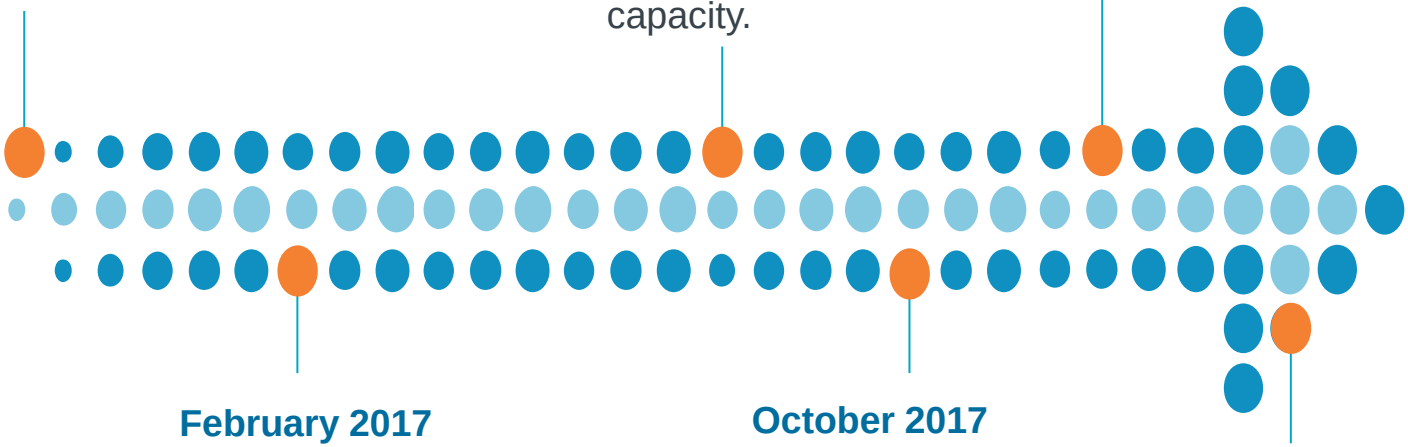
Marsh placed its **third** AV trucking company

December 2017

Marsh placed private passenger auto liability for more than 50 vehicles through facility.

2018

Autonomous vehicle focus on consumer segment.



Other Industries Impacted by Autonomous Vehicles

- **Real estate:**
  - Parking garage and lots: save billions of square meters of unnecessary parking space.
  - Opportunity cost of commutes goes down: people are willing to move out of the city.
- **Hotels:** Eliminate single-night stays at roadside motels.
- **Airlines**: Short-haul flights will be reduced by on-demand self-driving cars.
- **Food delivery**: With more and more restaurants offering food delivery, people will no longer go out for casual dining.
- **Energy and oil**: Electricity consumption will go up while gasoline demand will go down.
- **Media and entertainment:** San Francisco residents spend an average of 52 minutes on a one-way commute, giving them plenty of time to consume news and other content.

Autonomous Driving

The Security Impact

Presenter: David Kennedy
Founder – TrustedSec & Binary Defense

ystems

BinaryDefense.com @Binary_Defense

TrustedSec.com @TrustedSec

Experience

- Founder of TrustedSec and Binary Defense
  CSO of a Fortune 1000
- USMC Intel Analyst

Author

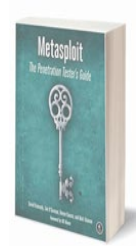
- Author of several open-source tools
- Co-Author of Metasploit Book

On the News

- Routine guest on major news outlets
- Testified at Congress

Speaker

- Speak at a number of conferences across the globe



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BINARY DEFENSE

About Us

- At the forefront of innovation.
  - Having the right team.
  - Research and development.
  - Pushing industry forward.

- Focused on Risk Management.
  - Understanding business risk, threats, and addressing based on priority.

- Partners and Friends.

Binary Defense

Managed Security Services

Security Information
and Event Management

Endpoint Detection
and Response

Counterintelligence

Introduction

TrustedSec

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Dynamics of Autonomous Cars

- **Telemetry:** Car manufacturers have or are in process of monitoring cars similar to computer networks. Network and Security Operations Centers (NOC/SOC). “Telemetry” being collected off fleet of cars for diagnostics, security, and monitoring.

- **IoT:** We hear this term a lot, but it holds true to the progression in the automotive industry.

- **Connectivity:** Connectivity is a must for user experience.

Car Connectivity / Pro-Con

- **Pro:** Ability to push sweeping changes to cars including bug-fixes, security updates, enhancements, and real-time data.

- **Con:** Ability for mass fleet takeover becomes a probability and infrastructure usually similar to medical devices – large sweeping changes are tough.

Infrastructure Vulnerable

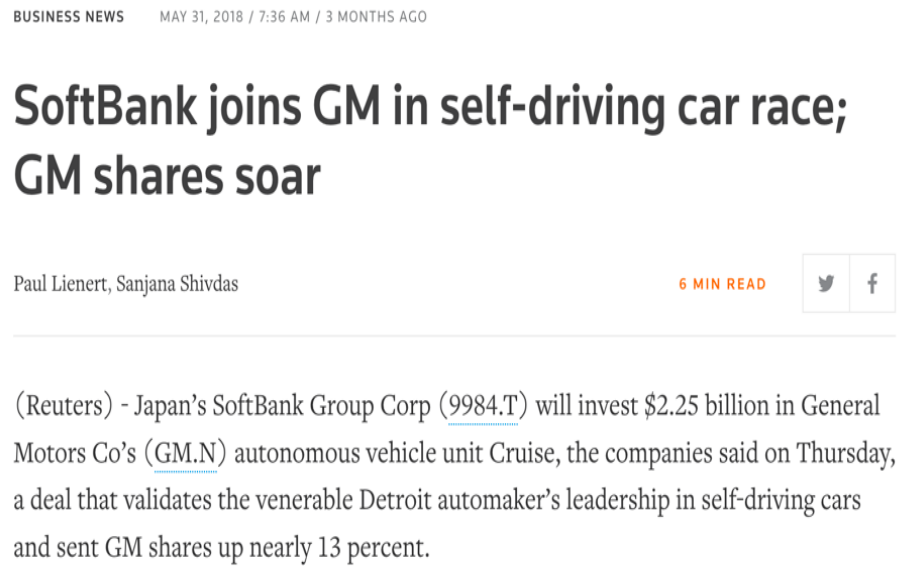
- Often times the backend infrastructure and security practices are subpar.
- Companies are manufacturing first, software development second.
  - Yes, even Tesla ☺

Autonomous Vehicles

- Constant connectivity for updates, pattern analysis, and “machine learning”.
- Full Disclosure: I own a Tesla, “auto pilot” is great but it’s far from self-driving.

(Continued).

- Google, Apple, and Uber believed to be in the lead in this market.
- Promising market – we are talking multi-multi billion dollar investments in R&D.



BUSINESS NEWS MAY 31, 2018 / 7:36 AM / 3 MONTHS AGO

SoftBank joins GM in self-driving car race; GM shares soar

Paul Lienert, Sanjana Shivdas 6 MIN READ

(Reuters) - Japan's SoftBank Group Corp (9984.T) will invest $2.25 billion in General Motors Co's (GM.N) autonomous vehicle unit Cruise, the companies said on Thursday, a deal that validates the venerable Detroit automaker's leadership in self-driving cars and sent GM shares up nearly 13 percent.

Security Implications

- Manufacturer first - security often a “bolt on” after.
- Manufacturers less concerned with individual hacks, but mass fleets attacks.
- Infrastructure and ability to modify code to cars most concerning. Mass fleet CAN access also.

Looking Ahead

- Security will be a much needed component of any type of additional inner connectivity.
- Most car manufacturers are considered at some of the lowest bars of information security.
- Long road ahead.

General Closing Thoughts

Thank you!

@HackingDave

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QUESTIONS?

Thank You For Attending Today's Webcast

Upcoming Events:

Marsh & McLennan Companies hosts

"The Changing Automotive & Manufacturing Industry Landscape Summit"

on October 16th at the MGM Grand Detroit

Use the following link to register:

https://starcite.smarteventscloud.com/rsvp/invitation/invitation.asp?id=/m2faf12c-523XBHUG8M5QN