

TU-Automotive Detroit 2018 Conference Report

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# **HIGHLIGHTS AND INSIGHTS TO SHARE WITH YOUR COLLEAGUES, CLIENTS AND PARTNERS CONFERENCE WRAP UP:**

A CONCISE OVERVIEW OF THE CONFERENCE BUZZ AT A GLANCE

8 KEY TAKEAWAYS: YOUR REVIEW OF THE MAIN INDUSTRY THEMES AND TOPICS ADDRESSED

*Author: Susan Kuchinskas*



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# 1. OVERVIEW: A MORE EQUAL ECOSYSTEM

A few years ago, startups were scrabbling at the gates of automotive OEMs and tier 1s. Even as the big players realized they needed technology innovation, they didn't have processes in place to meet and evaluate the plethora of auto-tech companies.

Now that most automakers have venture arms, incubators, heads of innovation and Silicon Valley labs--and are embracing startup culture themselves--there's a new sense of equality among OEMs and their partners.

" When you can get automakers aligned around a vision with equitable ownership, you can do amazing things. It's showing that we can work together even though we are definitely competitors"

**Mike Tinskey, Ford Motor Company**

Steve Surhigh, vice president and general manager of applications services for HARMAN International, noted that OnStar was originally a way for drivers to engage with the vehicle. "Now, it's about how other entities can engage with the vehicle." An example is the recent deal with

Amazon that allows it to deliver packages into General Motors vehicles equipped with OnStar. "It's about how you can integrate the vehicle into the value chain and create value in other business models."

OEMs are also opening up to sharing. Mike Tinskey, director of emerging services of connected vehicle, Ford Motor Company, presented progress on Ionity, a joint venture of BMW Group, Daimler AG, Ford Motor Company and the Volkswagen Group with Audi and Porsche.

All of them are committed to battery-electric vehicles, but charging infrastructure in Europe, as elsewhere, is lacking. Ionity is building a pan-European network of high-power charging stations that aims to let BEV drivers go anywhere in Europe without range anxiety.

He sees this kind of framework being applicable to other areas of the industry where collaboration is needed.

Said Tinskey, "When you can get automakers aligned around a vision with equitable ownership, you can do amazing things. It's showing that we can work together even though we are definitely competitors."

This newfound collaboration is especially important as data becomes the key to differentiation and success in the industry. Said Martin Rosell, managing director of WirelessCar, "Sharing and collaboration around the data is the most important thing. We have a lot of data, but not a way to share it. We need interconnectivity between every part [of the ecosystem] that feeds the flow."





## 2. KEY TAKEAWAYS

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### EVOLUTION OF CONNECTED CAR SERVICES

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One shift evident at the conference was that automakers have come to terms with the idea that their customers are mostly unwilling to pay for connected-car services. Subaru and Hyundai, for example, now offer free three-year subscriptions.

In his keynote speech, Roger Lanctot, director of automotive connected mobility for Strategy Analytics, painted a picture of how digital assistants will improve the driving experience while offering automakers new opportunities.

Just as Google has made billions off phone data, he said, there is at least another \$100 billion in opportunity for monetizing decisions we all make while driving. But he

warned, "The A Team is coming. Amazon and Alphabet recognize that the greatest source of unrealized market in the world today is what's happening in vehicles."

#### **Case studies: Subaru, Hyundai and Toyota**

Conference attendees were treated to several in-depth looks at how OEMs designed and built their connected-car services. In a Subaru case study, Brian Simmermon, CIO of Subaru of America, was joined by partners in describing how they worked together to release Subaru Gen2 Services.

The partnership included Oracle for cloud services; Agero for call center operations; WirelessCar for connected-car services; and Aria Systems for cloud-based billing.

As Subaru added more services in the next generation, it found it needed partners to support their integration.

Greg Geiselhart, director of solution delivery and Operation America for WirelessCar, said that the business models for services have changed over the last five years. Closed



ecosystems have become open, and OEMs are looking for true customer value not in subscriptions but using data to create internal value through reducing warranty costs, capturing fault codes and diagnostics, and improve their R&D.

With an open model, he said, "What Subaru has launched in the U.S. could go into other markets with relative ease. We can swap out different telcos and follow different regulations."

Brendan O'Brien, chief innovation officer and co-founder of Aria Systems, said that not every OEM is comfortable with cloud services. To make this work, "You have to be comfortable with a best-of-breed coalition of systems. Lots of enterprises are accustomed to one provider giving them everything, but you should think about an architecture where you can decouple out one system and add another," he said.

In addition, the cloud-based approach requires an accounting switch; instead of software and services as a capital expenditure, cloud services become an operational expense.

These partnerships also enable OEMs to scale as they receive ever-larger amounts of data—up to 4 terabytes every hour generated by autonomous vehicles. "As you forge deeper technology partnerships, they can help enable that scale," he said. At the same time, OEMs must be able to hold partners accountable.

One example of how connected services can create internal value for a car maker is repairs and warranties. According to Simmermon, Subaru has data scientists who model data and compare it to warranty claims and other reports in order to predict failure of a part.

Then, Subaru can communicate to dealers so that, when a customer brings in a car for repair, the right parts are ready, reducing the time the vehicle is out of operation. Geisel: doesn't take that much data to give customer satisfaction. Communicate to dealer so has right part when car comes in; reducing time at dealer. Changing the process is more important.

Loginov advised putting all car data, whether structured or unstructured, into a central data lake so that the OEM can pull out those nuggets of data that provide insights.

While traditionally, automakers have held on tight to their data, said Bob Elsasser, vice president of automotive sales, Agero, "In our world, data plays a brand-reinforcing role. Subaru data gives insights and creates customer profiles that help call-center agents have brand-reinforcing conversations."

Simmermon explained that Subaru's first generation provided one free year; Gen2 offers a three-year free subscription. He said, "We don't want to lose money, but how do we as a company reduce warranty costs while

increasing satisfaction? It's not always about making money on the front end. Connected services are a cost of doing business. It's no longer optional."

### Hyundai looks to partners

Cason Grover, senior group manager, vehicle technology planning, Hyundai Motor America, was another executive who provided an extensive look into the design and execution of services.

In the past two months, Hyundai Motor America made two critical announcements regarding services: A partnership with E-Risk Services will provide driver feedback and potentially lower rates on insurance; and Xevo, an automotive telematics provider, will enable payments from the car's screen for things like gas, tolls and takeaway food.

With generation two of Blue Link, the carmaker took the platform in-house. Since then, it's integrated with wearables, Alexa and Google Assistant. In the 2019 model year, all models will ship connected.

Hyundai plans to launch its All-Access Programme later this year. It will allow even more third-party services, and Grover characterized this as an evolution of the platform.

"The focus on third-party integrations will help build customer value and help offset cost of the platform," he said.

"What Subaru has launched in the U.S. could go into other markets with relative ease. We can swap out different telcos and follow different regulations."

**Greg Geiselhart, WirelessCar**

Blue Link launched 2011; 2014 saw the second generation, in which Hyundai internalized the platform in the company and extended interfaces from the smart phone. In 2015, it broke into wearables, while 2016 saw Hyundai become the first OEM to offer an Alexa skill. Google Assistant soon followed.

The free, three-year subscription is easier for customers to understand, and it lets dealers use connected-car features to sell cars, because they don't have to worry about asking for more money late in the sales process. It's also good for Hyundai, Grover said, because it will driver greater brand and service loyalty.

In 2017, Hyundai vehicles experienced 11.8 million remote starts; 1.4 million remote door locks; 5,000 automatic collision notifications; and 7.9 monthly vehicle reports.

"This is a great CRM opportunity for us," Grover said.

### Building on the Toyota Mobility Platform

Zack Hicks, executive vice president and chief digital officer at Toyota Motor North America, as well as CEO and president at Toyota Connected, exemplified this new thinking in his presentation. Hicks detailed how Toyota built a car-sharing program with distributors in Hawaii—and rolled it out in six weeks.

Toyota's Mobility Service Platform will be the foundation for interactivity with the vehicle going forward. It contains a network operations center and security center. Then, an interaction layer with containers and APIs lets Toyota partner with companies like Avis that want to ingest their own data.

Servco Pacific is the Toyota, Lexus, and Subaru distributor for Hawaii. The company thought it wanted an app, Hicks said, "but they really wanted a fleet tool."

The Hui car sharing service is based on a simple mobile app that scans a driver's license, does a background check, and provides facial recognition of registered drivers. Then, the phone is used to unlock the car.

On the fleet management side, it provides insights into usage and demand, so cars can be moved where they're needed.

From its partnership with Getaround in San Francisco, Toyota had learned how much operational work was involved: finding cars, cleaning them and keeping them fueled. "Building this with a dealership network was fantastic, because they had the infrastructure," Hicks said.

To sum it up, Hicks said, "Platforms matter as the auto industry moved from a closed ecosystem of partners to a more open ecosystem, but it must maintain security and software assurance when it gets into the vehicle."

### AI for smart services

Mardan Kerimov, a managing consultant with the IBM Global Automotive Center of Competence, told attendees that artificial intelligence will help us ingest large amounts of data and create that desirable customer experience.

He explained that AI is not just one technology. It includes robotics, machine learning, predictive and prescriptive analytics, natural language processing and deep learning.

" Insights in how people are using our vehicles will inform product decisions."

**Mardan Kerimov, IBM Global Automotive Center of Competence**

Kerimov said 37 percent of OEMs are in a more mature phase of implementing AI.

IBM is exploring "cognitive guided shopping," in which AI will help consumers decide which car to buy and find the financing option based on their personal situation.

In the factory, AI can make sure operations run correctly and predict quality issues before they reach the customer. At the dealer, it can advise technicians about the best processes and parts to be used in a particular issue.

IBM's artificial intelligence technology, branded as IBM Cognitive, powers Honda Motors' Ask Dave digital customer assistant, as well as Daimler's Ask Mercedes, a chatbot that uses AR to understand a function and learn more about it.

Cognitive Fleet Advisor analyzes data and optimizes to drive utilization in fleet vehicles.

AI applies to every area of automotive design, product, marketing and sales, Kerimov said. "Insights in how people are using our vehicles will inform product decisions."



# AUTONOMY HITS THE REAL WORLD

Cars keep getting smarter—faster than automakers' communication strategies can keep up. As we continue to put more A in ADAS, some drivers are expecting too much from these systems—and dying.

"We have too little data on how drivers using production level tech in the wild," said Bryan Reimer, a research scientist at MIT. Reimer leads the Advanced Vehicle Technology (AVT) consortium, a group studying how drivers use emerging vehicle technologies including production level automated driving systems.

AVT has done longitudinal studies of level-2 driver assistance, as well as Tesla Autopilot and Cadillac Super Cruise.

It wanted to find out when drivers are turning them on and off, and whether they are using these features to increase safety.

It found that drivers disengaged the system because of a planned turn or deceleration; a complex situation; or accidentally. When the system disengaged itself, the top reasons were because the system needed human help; speed exceeded 90 miles per hour; or the driver's hands were off the wheel.



He also presented data from Agero's Driver360 Mobile UBI that showed that automation, including cruise control, increase phone usage. Eighteen percent of highway miles driven were under cruise control, and phone manipulation increased 22 percent during that time.

"Drivers are beginning to do a lot more in the car," Reimer said. "That's good, because driving can be more productive, but confusion occurs. ... The myth of automation is that the driver needs less expertise. But the driver might not know what is happening with an alert or warning."

He warned that auto tech doesn't work on its own. "Human trust, risk perception and system expectations impact a

technology's capabilities, as well as does the environment. We can reduce the level of confusion with education and feedback."

## The right message to the public

The industry hasn't found the right way to communicate about autonomous and semi-autonomous features. The SAE levels definitions don't resonate with consumers, said Pete Bigelow, transportation technology and mobility editor for Car & Driver. Worse, he said, "The levels themselves are philosophically off. Better to describe levels 2 and 3 as ADAS; 4 and 5 would be never a human involved."

When Autotrader did a consumer survey, according to senior analyst Michelle Krebs, consumers were confused. "The self-driving name seemed to resonate, but they knew next to nothing. We need to work with media and dealers for a trickle-down process," she said.

Alan Hall, Ford's senior communications manager, autonomous vehicles and electrification, made an important point: The ecosystem must not be limited to technology. He said, "It's important to reach out to government officials, local regulators, local businesses and community groups."

In Ford's Miami pilot of autonomous delivery services, he said that approach has helped the pilot get accepted. "Then, those groups become advocates and explainers to consumers."

Accidents and fatalities do occur with autonomous features—as they do when people drive themselves. Bigelow pondered differences in how we accept the 35,700 conventional traffic deaths as opposed to those under semi-autonomous or autonomous driving.

"We all assume self-driving cars will be safer. Then, do they have to be twice as good? One hundred times as good? Statistics are one thing, but emotion will play a big role." He thinks autonomous vehicles will have to cause less than 1,000 deaths a year to be accepted.

Are OEMs doing enough to educate the public about what current levels of autonomy can and can't do? Andrew Hart, director of SBD Labs, identified a schism in our thinking about autonomy: dreamers versus realists.

Dreamers think that self-driving cars will quickly arrive and replace drivers. Realists think it will happen slowly, and that the short-term opportunity is in supporting drivers, not replacing them.

"Dreamers are terrified about being second or losing momentum," Hart said. "Realists are more worried about how making a mistake could reflect on the brand."

Where the two sides agree, he said, is, "People come first, and there's no one size fits all."



## 5G ON THE HORIZON

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We're seeing the first commercial rollouts of 5G in 2018, according to Juergen Daunis, vice president of global sales connected vehicles, Ericsson—and he and others are touting the benefits for connected vehicles.

Ericsson's goal is "connecting everything," and its IoT approach aims to connect automakers, fleet owners, logistics companies, municipalities and application developers.

The 5G technology will have higher speeds and make better use of existing spectrum. That translates to close to real-time transmission of data for mission-critical operations like platooning.

"Today's networks are built to support mobile phones. They have never been optimized for industrial uses, but 5g will provide the opportunity to put specifications into the system and provide monetization for the auto industry," Daunis promised.

In the networks of the future, Ericsson sees the car as holding sensor ware and non-critical consumer software. The intelligent network edge will provide rapid responses for critical IoT communications with further reach and secure data authentication. The cloud will run backend software for data aggregation, analytics and services.

"The car is now entering into the stage where the value will be at the system level in an ecosystem. This is where we need to go as an industry," he said. As big players outside the auto industry begin to interact with the car—big data companies, cities, device manufacturers, cloud and software providers—the car is just part of the overall system, so we need to have a more balanced approach to partnerships."

Vishnu Sundaram, vice president of HARMAN International, noted that the key elements of intelligent cars, including autonomous driving systems, multi-functional cockpits, and energy management systems, all rely on connectivity.

Because 5G provides high bandwidth and low latency while using less power, it will enable new use cases, Sundaram explained. This will massively improve the functions inside and outside the car and take auto use cases to a new level. Most important, will better maintain connectivity at all times," he said. "Infotainment and productivity will change the perception of travel, transforming the car into an entertainment and productivity hub."

Intelligent and autonomous cars won't be differentiated by their mechanical features, Sundaram said. "They'll be differentiated by the amount of intelligence embedded inside them. And the key enabler for this intelligence is connectivity."

### Readying for v-commerce

One intelligent feature that could be convenient and desirable is the ability to transact from the car's head unit, according to Tom Freeman, senior vice president of land mobile at Kymeta, provider of satellite technology and services.

He thinks that v-commerce will help pay for connectivity. "The OEMs must make money off this post-sale in order to pay for things including autonomy, safe automobiles and cybersecurity," he said. "That larger 5G pipe will beget larger revenues plus smarter and safer cars."

Freeman noted many examples of revenue from vehicle data, including traffic info, parking and weather; road hazard alerts; UBI; and audience measurement.

But in order to enable the necessary connectivity, Freeman said satellites must be part of the automotive connectivity network. In his scheme, OEMs would become MVNOs in order to take a toll on the activities of consumer services companies including not only the big five of Facebook, Apple, Microsoft, Google and Amazon, but also smaller e-commerce and services players who might want a bite of v-commerce.







## URBAN MOBILITY STILL A COMPLEX PROBLEM

TU-Automotive E-Mobility was another conference co-located with TU-Automotive Detroit, bringing together technology companies, automakers, experts and government representatives.

While e-mobility—all-electric vehicles as part of the urban mobility mix—was the theme of this conference, it was clear that mobility as a whole remains a puzzle for most municipalities. Due in part to the slow processes of government, public transportation still largely relies on traditional modes.

There are plenty of companies eager to provide last-mile or only-mile services. Conveniences such as one payment for multiple modes and unified route and schedule information are still a dream.

Mobility companies must work with cities to move this forward. Unlike some mobility providers, "Zipcar realizes you can't just show up in a city. It necessitates a conversation," said Sabrina Sussman, manager of public partnerships, Zipcar.

While transit agencies are an integral part of creating mobility services, she said it can be difficult to find the right officials to begin those conversations. Still, there's a growing trend of committing someone at the city level to working on changing mobility.

A big issue for cities, according to Edwin Olson, CEO of May Mobility, a self-driving micro-transit service, is that some dayparts don't have enough demand for transportation, while other times of day are too crowded. May's solution is fixed route circulators that may connect office complexes to entertainment, parking or shopping. He said there's a good niche for third parties to provide

transportation outside of peak hours and/or where public transportation isn't profitable.

"Only-mile trip are the best first opportunity," he added. For example, travel from a hotel to the beach or a golf course.

Zipcar surveys have found that the top two reasons for using a Zipcar are grocery shopping and errands.

Kristin Welch, a member of the autonomous delivery team at SPLT, a provider of enterprise carpooling services acquired by Bosch, added that non-emergency medical transportation is another important vertical. "Using Lyft cars adds a layer of accountability, so if you take a Lyft to dialysis, you're assured of your ride home," she said. Integration with partners is critical for both mobility

" Developers don't have to worry about data protocols and formats, or differences in different makes and models. They can just focus on building unique experience"

**Nithin Rao, Autonomic**

providers and municipalities, according to Zipcar's Sussman. B2B partners can come together with cities to offer them a mobility suite and collaborate to solve those public challenges.

Two Ford executives talked to Strategy Analytics Senior Director Roger Lanctot about how Ford wants to make its Transportation Mobility Cloud (TMC), a multi-use, multi-user platform for connecting OEMs with customers and developers.

TMC will provide APIs that let developers and third parties access data from the network. "Developers don't have to worry about data protocols and formats, or differences in different makes and models. They can just focus on building unique experience," said Nithin Rao, co-founder and VP of product management, Autonomic, a Ford company.

Ultimately, Ford hopes TMC will become an industry-wide platform: Data contributed by other OEMs would remain discreet but accessible to partners. Cities can leverage the cloud to interact with both OEMs and developers in order to create solutions.

Sundeep "Sunny" Madra, vice president of Ford X, the automaker's division that incubates new ideas and interacts with startups, said that Ford has had relationships with various cities for a long time. For example, it gets involved in smart city challenges, partnering with a municipality to define requirements and gather proposals.

"Cities represent unique challenges," he said. "There are a lot of siloes that exist there."

Nithin Rao, co-founder and vice president of product management for Autonomic, a Ford company, noted that the problems cities face may not seem sexy, but they're solvable. "It's basic efficiencies like fuel utilization and vehicle health that cities are concerned with," he said. "There's not one isolated solution that contains everything they need."



" Launching a car share is easy. What's difficult is making a profit"

**Aarjav Trivedi, Ridecell**

### **Designing mobility services**

"Launching a car share is easy. What's difficult is making a profit," said Aarjav Trivedi, CEO of Ridecell.

Defining the right model for a car sharing service isn't easy, either.

Said Matthew Hall, senior product manager, partnerships, at Porsche Digital, "Utility, not cost, is the main driver for using mobility services. Sometimes getting goods to people is a better solution than getting people to goods."

That's why it's important not to launch copycat services, according to Trivedi, who added, "Companies in the space should bring their own strengths to create unique services rather than making copycat services. Differentiation is critical."

For example, regional differences can provide new opportunities. Yes, density is critical for ride hailing and car sharing, but less-dense regions can be served differently. Ridecell has a municipal transit customer that replaced expensive fixed routes with on-demand pickups.

"It's cheaper and can cover hundreds more square miles. It doesn't pick you up in five minutes, but it's the difference between waiting two hours and waiting 15 minutes," he said.

Paul Asel, a managing partner in NGP Capital, has found that people are responsive to information about estimated time of arrival and cost of various mobility services. "When better options come up," he said, "they take them."

User experience is critical for launching mobility services, said Sylvano Carrasco, vice president of connected car at Getaround, a peer-to-peer car-sharing service. "So, decrease friction at the beginning," she advised. "The product experience has to be crisp and clean and apps must be simple to use. If multiple services can be integrated into one app, it's even more convenient."

To that effect, Getaround lets users book cars to use as Uber drivers. Carrasco said, "Delivering multiple uses for vehicles drives up utilization."

### **Autonomous vehicles in urban mobility**

The ultimate vision for urban mobility is fleets of self-driving vehicles: autonomous busses and ride-hailing services that will increase safety and vehicle utilization while making transport more convenient and, theoretically, cheaper for people.

Stephen Lesh, head of vehicle programs at Uber ATG,

outlined how autonomy will work within Uber's overall operations. He said that self-driving vehicles will need to be able to automatically connect with different kinds of data; monitor safety and performance; access high-level maps with much more information than today's; and be part of a network that connects riders to vehicles while handling customer service and payments.

"Uber already has all that," he said. "When we introduce self-driving cars, they won't be their own network, they will be part of Uber's transportation network. When we start, self-driving cars will have a small operational domain that overlaps the larger Uber domain."

Without a driver, Uber's fleet will need cameras, speakers and microphones, so passengers can interact with customer assistance. And the autonomous Ubers will need to be able to identify safe places to drop people off. Over time, Uber will increase their capabilities to handle different kinds of weather, traffic and terrain.

"Decoupling autonomy and electrification is important. You don't need autonomy to get the benefits of electrification."

**Steve Vozar, May Mobility**

#### **Electrification in urban mobility**

Michael Ramsey, a Gartner research director, notes that both autonomy and mobility services could make quality

of life better while keeping the air cleaner. But autonomous electric vehicles consume a lot of electricity.

The limited range and charging time are the biggest barriers to electrified vehicles in urban mobility, autonomy aside.

Other barriers to using BEVs for urban mobility, Ramsey said, are that the charging infrastructure is very limited and there are limited body styles, making them less-than-ideal for taxi services.

When New York City ran a pilot program of using Leafs for taxis, they typically ran out of charge after four hours of operation. There were too few charging locations and multiple instances of chargers malfunctioning, plus a lack of customer service to help drivers. This resulted in the electric taxi drivers sticking to surface streets and avoiding bridges and overpasses.

London has mandated that all new black cabs must be electric—and it's building a special fast-charging station to just for the cabs.

But cabbies know the more fares they have, the more money they make. How to get them to accept sitting around waiting for the cab to charge? Some makers of electric cabs are creating ROI calculators to get owners to look past the fewer trips.

"They are encouraging cabbies to look more holistically at their business, for example, how much money they'll save [with an electric vehicle], not just the fares," he said.

Steve Vozar, CTO of May Mobility, reminded us, "Decoupling autonomy and electrification is important. You don't need autonomy to get the benefits of electrification."





## DATA: FIRING UP VALUE

Connected services—to say nothing of SDCs themselves—run on data. Almost every conference session at least made some reference to the need for more data and for better ways of crunching it.

Simply moving data around within the car presents its own challenge. Paul Hedtke, an advisor at Valens Automotive, said his company is working with Daimler on the best way to move data from ECUs to the head unit and media devices in the back seat. "With 5G data rates coming into the vehicle, along with all the sensors, we need multi-gigabit connections between ECUs that support very low latencies." Noting that in-car data will continue to grow exponentially, he added, "You need high-speed cabling to allow multiple streams."

Advanced services driven by data analytics—rather than revenue from subscriptions—will be the way OEMs can monetize the hardware and software they install in cars, according to Sofia Granath, director of strategy and product management at WirelessCar.

"Digital services need mass usage, low effort and zero cost [to the consumer] to begin with," she said. "Unless you make use of digital intelligence and consumer insights, there's no use in creating services."

Frank Weith, director of connected and mobility services for Volkswagen Group of America, suggested leveraging other services that consumers already pay for in their households and bringing those into the vehicle to bring costs down. "If you leverage technologies that are cloud-based or IoT-based, you bring your cost structure down."

To that end, VW is building API integration layers to enable it to bring in partner services. As well, it's building in flexibility to allow it to test different services to see if they're used by consumers.

" Unless you make use of digital intelligence and consumer insights, there's no use in creating services. "

Sofia Granath, WirelessCar

### Insurance: data beyond risk and ratings

A panel discussed which data is most important and valuable to insurers—and what can be done with it beyond risk and pricing.

Jim Levendusky, vice president of IoT/Telematics, Verisk, noted that regulators on the federal and state levels are now taking a closer look at how vehicle data is used. But there is a lack of uniform requirements in the industry. Regulators are asking whether data being used by insurers is accurate and uniform across sources.

"This is where the heavy lifting comes in—taking data from different sources, understanding the idiosyncrasies and making it usable for insurance companies," he said.

Cyril Zeller, senior vice president of global sales and mobile devices at Ingenierie, agreed. "If I want to design a new smartphone, we all know the specs. For UBI, it's wild," he said. "Because there are no common ideas about software components, if you want to have a broad access and vast amounts of data, you will have to go for the smallest common denominator."



Zeller added that his company looks beyond the data needed for usage-based insurance. "If you want to go after data monetization, the data that has a lot of value either helps the dealer or service chain to anticipate services or helps to take proactive action. All this information can change the paradigm of customer relationship."

Insurance companies should use data for more than underwriting, said Grady Irey, vice president of data science and analytics lead, Arity. Data can help insurers understand people's needs and offering services to suit or anticipate their needs.

Adam Hudson, senior director, US Connected Car Team, LexisNexis Risk Solutions, gave an example. "We can tell insurers when a customer has a significant life experience like buying a new home, having a child and even when they're shopping for insurance," he said.



## SECURITY: TOP OF THE TO-DO LIST

Automotive security has moved front-and-center, and the TU-Automotive Cybersecurity Conference, co-located with TU-Automotive Detroit, dug into the issues with substantive programming. Security experts examined industry initiatives such as Auto-ISAC, best practices and standards, staffing and security tactics.

An innovation of the conference were cybersecurity roundtables, in which experts moderated frank and free-wheeling discussions with small groups of attendees.

### Critical updates

A huge advantage of connected cars is the ability for automakers and suppliers to respond to emerging security threats by updating firmware and software. Sam Lauzon, lead engineer in research, electronics and software engineering, cybersecurity and privacy, for UMTRI, detailed best practices for protecting automotive systems, detecting issues and responding.

Lauzon noted that there are a variety of automotive threats, including not only hackers but malicious mechanics and lazy release engineers. And, as

"There is no one single defense that will keep you safe through the lifetime of your vehicle."

**Sam Lauzon, UMTRI**

infrastructure gets smarter, V2X systems may provide false information or incorrectly trigger driver-assistance systems.

"One single defense should never be relied on," he said. "There is no one single defense that will keep you safe through the lifetime of your vehicle."

Lauzon noted that data authentication, while it's being investigated, is difficult in real-time systems.

His research investigates adding systems to detect anomalies in operations or intrusions into systems. For example, an ECU may transmit periodic messages; if it failed to do so, the anomaly detection system might flag this.

A major problem for anomaly detection is that, as a vehicle ages, sensor readings may change and devices fail. As well, one central detector would itself be subject to attack. A better approach, he thinks, is to put detectors throughout the vehicle and allow them to communicate with each other.

A question from the audience sparked an interesting discussion: Should an intrusion detection system be able to refute hacking claims? Lauzon pointed out that a customer claiming to have been hacked won't be happy if the vendor refutes the claim. But a detector should be able to help customer at least identify what happened.

### Safer OTAs

Over-the-air updates, or OTAs, are a prime weapon against security attacks; however, they also provide an attack surface in themselves, according to Srin Adiraju, director of cybersecurity for Visteon, a pure play in automotive cockpit electronics.

Automotive architectures have begun to consolidate ECUs into domain controllers, he explained, requiring a different approach to OTAs. "They're complex networks of interdependent ECUs," he said. Moreover, with the desire to provide fresh content and a constantly improving user experience, "It's not a software update for a small feature."

Other challenges to successful OTAs are complex vehicle architectures, multiple kinds of connectivity, and interoperability among them. For example, updating Bluetooth might break V2X.

#### **Adiraju outlined some best practices:**

- Using a multi-layered security architecture
- Updating at the ECU component level
- Updating multiple domains within a domain controller
- Creating a two-copy update and rollback strategy to recover if an update goes bad
- Background downloading
- Having a pre-defined update sequence
- Block-level updates to avoid breaking one service when updating another
- Scheduled periodic updates instead of reacting to issues
- Beta test programs, bug reporting mechanisms and bug bounties

#### **Securing the supply chain**

In the complex automotive supply chain, it's difficult for any vendor to have insight into and traceability of the components they ship, while the problem is multiplied for the OEM.

Andre Weimerskirch, vice president of cybersecurity and functional safety, Lear Corporation, said that taking a legal approach of requiring companies down the supply chain to certify the security of their products isn't enough. Just because a supplier accepts the terms doesn't mean that the item is secure.

"We need minimum requirements in firmware," he said. "We ask for evidence, and we double-check."

He added that some car makers define exactly every security practice, but it can be a challenge for tier 1s and suppliers to deal with differing requirements from their customers.

"We cannot build a different process for each car maker," he said. "We need to build one process and have the car maker believe us that it's secure."

Billy Kihei, cyber safety advocate for I Am the Cavalry, a global grassroots organization focused on the intersection of computer security and public safety, pondered whether there could be cybersecurity standards for the automotive industry. While NIST and other standards bodies have made a good start, he thinks the process will take as long as ten years, with a lot of trial and error. "Bringing in outside observers, white hats and lawyers will go a long way to speed up this process," he said. "And a culture of security does a lot more than using a checklist."





# STARTUPS: AN ESSENTIAL PART OF THE MIX

A new innovation at TU Detroit 2018 was the Project Kairos innovation stage, sponsored by PlanetM. Project Kairos is an exclusive startup program and community bringing together select investors and some of the most innovative startups on the tech scene.

One session led by Mark Fitzgerald, associate director, automotive technology, IHS Markit covered trends in the auto tech and mobility sectors, determining their impact on the ecosystem with an eye on investing. He spoke with Sean Simpson, investment manager at GM Ventures; Anil Rachakonda, director of startup co-operations, co-pace, the Continental startup program; and Alex Smout, a principal of InMotion Ventures, which is "powered" by Jaguar Land Rover.

Each had a different emphasis and touted different advantages to their models.

Simpson said GM Ventures offered startups not only investment but also development partners. Through it, GM can relay the voice of the customer. "Customer insight is hard to get unless you're working directly with a company," he said.

When his team finds an interesting technology, they can vet it with technical experts on GM engineering teams to make sure it's something they would want to use.

GM will look at deals with other corporate and financial VCs, Simpson said. "The best investments have a good mix of financial investors, OEMs and tier 1s. We look at what is best for a particular startup."

Rachakonda, of Continental's startup program, said, "Working with startups is a new form of R&D. You can accelerate development and time to market."

The advantage to Continental, he said, is "Startups are thinking beyond the OEMs. And being a tier 1, we can work with all OEMs and startups. We're not fighting for the same startups, we're partnering. It's a friendly scene."

Smout noted a shift in the corporate VC mentality: "They're investing with the same kind of terms as financial VCs. Startups aren't locked into commercializing through the OEM. For our startups to be successful, they need to work with other auto manufacturers, as well "

Then Fitzgerald asked the key question: "How does a startup's idea work itself all the way up the chain to corporate?"

Said Smout, "Getting noticed is easy. Standing out is not as easy. It's being able to quickly demonstrate what you've achieved in actual time. It has to be more than the idea."



Rachakonda advised, "Tell them why the venture makes sense for them, rather than for a financial VC. 'You have this portfolio, and I fit in here. By investing in me, you can accelerate your value proposition.'"

And Simpson advised, "Understand how you can get yourself into the supply chain. Getting on the vehicle is the final thing, but how do you get there? What supplier will you work with, and what will make that supplier interested?"

## Startup pitch-off

That panel was followed by a pitch-off—a chance for selected startups to spend fifteen minutes talking about their companies and technologies, getting feedback from three VCs.

**Acerta Analytics Solution** provides AI-driven fault detection for automotive systems., predicting failures and identifying anomalies in real time.

**Atlatic** uses vision-based 3d mapping to create maps for autonomous driving with a low-cost package that's attached to a vehicle with accuracy of a few centimeters.

**Cognata** offers a cloud-based platform that simulates cities, conditions and behaviors of vehicles, pedestrians, etc. to train autonomous driving systems.

**Derq** focuses on artificial intelligence and V2X software for road safety, providing alerts in real time to avert incidents.



## 3. CONCLUSION

" We need to build one process and have the car maker believe us that it's secure."

**Andre Weimerskirch, Lear Corporation**

Details, details. Autonomy is here: Autonomous pilots are ubiquitous, while self-driving shuttles are tooling around. Certainly, behind closed doors at OEMs and tier 1s, there is much work to be done in the design of autonomous driving systems.

Meanwhile, there are so many details to be figured out about how the electric, autonomous, multi-modal future will work:

- Where does data sit and how is it used?
- How can automakers monetize their investments in connectivity and services?
- How will consumers pay for v-commerce transactions?
- What are FAMGA (Facebook, Amazon, Microsoft, Google and Apple) doing?
- Where and how will we fit more charging stations into the landscape?
- Who can provide a unified view of transit options?
- What's the best system for multimodal transportation payments?
- What are the best practices and strategies for securing the connected car?

We're sure you have many more questions. When there are answers, you'll hear them at TU-Automotive Detroit.