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5 Key Issues and Trends Facing Automotive and Aerospace Professionals in 2023

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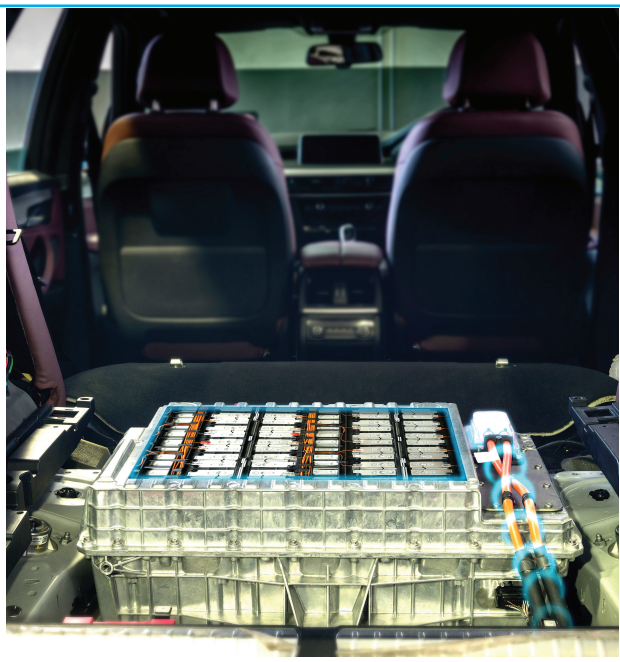
Introduction

Like all industries, the technology across the mobility industry is advancing at light speed, and as a community we are just doing our best to keep up. As we focus on the year ahead, it's no surprise that innovations will be fundamental to future success to create safe, clean, and accessible solutions across both the automotive and aerospace sectors. The mobility industry will need to rely on new innovations and strategic collaborations as the industry continues to drive forward.

As the global leader in connecting and educating mobility professionals, *SAE International*® is committed to its mission to advance mobility knowledge and solutions for the benefit of humanity. With constant changes, there always seems to be a new problem to solve. It's also challenging to stay up to date on what's keeping our engineers, and our industry leaders up at night. If you are hoping to provide new solutions, then staying abreast on what's going on in the industry is vital. Your time is valuable, so let's dive into just a few key items that will be a focus for the industry as we look ahead to 2023.

#1

Recycling Lithium-Ion Batteries — Putting tens of millions of new EVs on the road every year will create a critical materials supply challenge.



Analysts predict a coming surge in electric vehicle sales. The leading technology today to power those vehicles is lithium-ion batteries. Battery recycling is vital because one solution to the looming supply issue would be a closed-loop setup, with batteries processed at end-of-life to recover cobalt, lithium, and other critical materials that can then be used to make new batteries. Significant recycling already takes place. In 2018, 20 companies worldwide recycled just under 100,000 metric tons of Li-ion batteries, about half of the global volume of batteries disposed that year. (Hogan, 2022)

#2

Vehicle electronics can often last two decades or longer— and that can pose a problem for connectivity.

With the number of connected vehicles increasing steadily and the growing number of plug-in vehicles makes connectivity even more important than in the past. It's critical for managing and monitoring battery charging and preconditioning. Most automakers have developed upgraded solutions for at least higher-volume modules. In most cases, these upgrades are costing customers several hundreds of dollars, and many are likely to think twice before committing. With many OEMs aiming to double revenue in the next decade, mostly thanks to connected services, it's more important than ever to ensure a vehicle can retain its connectivity for most, if not all, of its useful life. (Abuelsamid, 2022)

#3

Additive Manufacturing is Pushing the Boundaries of RF Passive Hardware

Following significant impacts from COVID-19, the demand for satellite telecommunications services is rebounding to its historical strong growth. With this resurgence comes a growing need to improve the performance and economy of telecommunications satellites. Sending a vehicle into a geostationary orbit can cost as much as $20,000 per kilogram, and the typical service life is 10–15 years. As such, technologies are required that can boost performance, reduce cost, weight, and volume, and drive improvements across design and supply chain processes.

One increasingly important technology driving aerospace innovation is additive manufacturing (AM). With greater design and manufacturing flexibility, AM offers compelling opportunities to revolutionize critical elements of the aerospace workflow. One exciting application of AM is its use for radio frequency (RF) passive hardware in telecommunications satellites. In recent years RF engineers have begun to apply additive manufacturing to RF components. Engineers are no longer limited by conventional manufacturing and assembly processes and have dramatically greater flexibility to tailor their RF components for performance and system-wide efficiency. The benefits can be profound—improved RF performance, lower weight and volume, and large reductions in part count through unitization. (Shepard, 2022)

#4

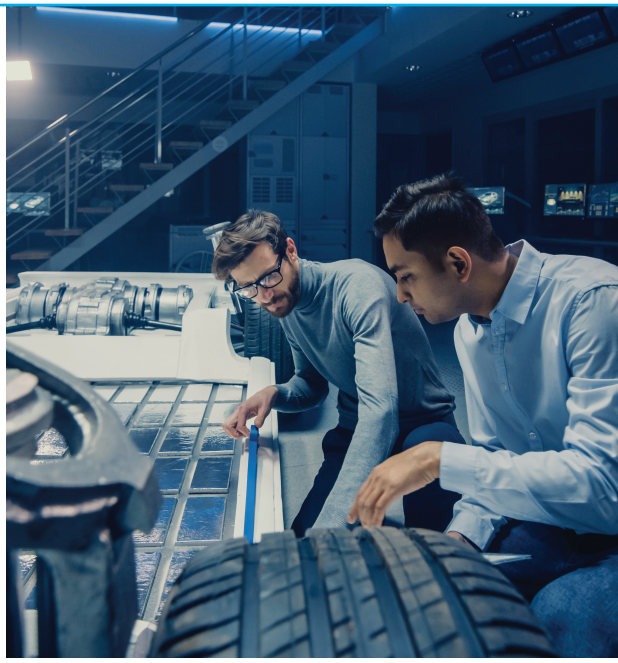
Imaging radar is the next big thing.

Radar is nothing new to the automotive industry. Although radar is a great way to measure the distance and closing speed to other vehicles, current-generation sensors offer woefully low resolution. That's why imaging radar is set to come on strong over the next several years.

Guidehouse Insights projects that the annual market for imaging radar will grow to more than 128 million units by 2030. These are expected to be a key element in improving the capabilities of driver-assist features as the industry and regulators globally strive to reduce the number of crashes and fatalities that have spiked in recent years. (Abuelsamid, 2022)

#5

As electric vehicles (EVs) become more popular, EV batteries become more important. Testing these batteries to assure reliability and extended life is a critical step for all EVs.



SAE International spoke with Keysights Technologies' Jim Duffey, Business Development Manager for electric vehicle test solutions about the rapidly evolving demands of EV battery testing.

What are the most prominent challenges for engineering groups currently doing battery testing?

"There are issues with operating costs as power levels continue to go up. We're going through these charge-and-discharge cycles even at cell formation until a cell is formed; we're going through charge-and-discharge cycles all the way up through and including pack-level testing. So, keeping down the costs of that energy is important, because on the discharge cycle, normally you'd waste that energy in heat – not only are you wasting electricity, but you're also dealing with getting rid of a substantial amount of heat, which, for example, can tax HVAC systems in your facility. And as these power levels continue to go up, safety also is very important." (Duffy, 2022)

CALL FOR PAPER CALLOUT

All these issues — and more — will be tackled throughout a variety of industry events hosted by SAE International® in 2023. Engineers from across the world come to SAE events each year in search for answers to their biggest problems.

It's more important than ever for today's researchers to share their latest research and ideas that can help shape the future of the industry. With just a 250-word abstract, you can start on the road to position yourself as a leading industry expert in 2023. If selected, you can gain access to several speaking and publishing opportunities to help take your career to the next level.

Learn More

The items outlined above are excerpts from *SAE International* publications, including Automotive Engineering, Autonomous Vehicle Engineering and Aerospace & Defense Technology magazines. They have been shortened for length.

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