

**AUTOMOTIVE PLASTICS &  
POLYMER COMPOSITES**
**A ROADMAP FOR  
FUTURE MOBILITY**

➤ **Advanced plastics and polymer composites are essential to the personal mobility REVOLUTION**

The revolution underway in personal mobility is driving automakers to rapidly invent mobility solutions suited to an **autonomous, connected, electrified, and environmentally responsible automotive future**. To do so, automotive designers need new material solutions that only advanced plastics and polymer composites can provide.

➤ **Our new roadmap outlines an updated strategy that will equip automakers with the materials solutions they need**

Led by the American Chemistry Council (ACC) Plastics Division, *Automotive Plastics & Polymer Composites: A Roadmap for Future Mobility* describes the megatrends shaping the future of automotive design and provides an industry-led perspective on the research, technology, and workforce development necessary to ensure automakers have access to the advanced plastics and polymer composites they need to transform mobility in the next five years and beyond.

**What's driving the PERSONAL MOBILITY REVOLUTION?**

**Convergence of IT & Auto industries**



**Improved battery technology**



**Increasingly urban populations**



**Emergence of alternatives to personal vehicles**



**Rise in automotive-buying populations in growing economies**



**Proliferation of artificial intelligence**



**Growing global environmental concerns**



**Modernization of regulations and standards to enable self-driving vehicles**



**Implementation of fuel economy standards encouraging automotive lightweighting**



# The ACCESS Framework

The technological, cultural, and economic megatrends driving the personal mobility revolution require new ways of thinking about automotive innovation. This roadmap offers a new framework for capturing the opportunities created by today's automotive transformation.

## AUTONOMY

Advanced driver-assist safety technologies and other technological breakthroughs are helping to gradually relieve human drivers from controlling passenger vehicles.

## CONNECTIVITY

Future vehicles will offer greater levels of connectivity and communications, driven not only by in-vehicle comfort and convenience but also by safety considerations.

## CIRCULARITY

Principles of a circular economy emphasize recovering materials at the end of their usable life, refurbishing and repairing materials to extend product lifecycles, and remanufacturing and reusing them in new products.

## ELECTRIFICATION

Electric vehicle (EV) sales are accelerating and projected to represent between 30% and 50% of worldwide vehicle sales by 2040, up from just 1% of worldwide vehicle sales in 2016.

## SHARED MOBILITY

Adoption of ridesharing has grown from 15% of U.S. consumers having used ridesharing in 2015 to as many as 23% of U.S. consumers in 2018, helping to reduce travel costs and environmental impact of passenger vehicles.

## SUSTAINABILITY

Automakers are working to achieve sustainable automotive design that reduces environmental impacts and improves the efficiency of products throughout their lifecycle.

# Top 10 Priority Collaborative Activities

The advanced plastics and polymer composites industry will work together and with automotive partners, government agencies, and academic researchers to conduct pre-competitive activities that will significantly accelerate the advancement of plastics and polymer composites and enable their integration into future mobility design through 2030.



- 1 Demonstrate and prove the effectiveness of plastic and polymer composite components for increasing the ability of autonomous vehicles to detect surroundings during poor weather conditions
- 2 Establish materials-agnostic automotive industry standards to permit the use of innovative materials for lightweight mixed-material assemblies

- 3 Define material performance requirements required to safeguard electrical and electronic system components

- 4 Establish an industry group or committee to identify and set LCA standards for automotive materials
- 5 Pursue high-speed nondestructive testing and evaluation (NDT/NDE) techniques for end-of-life sorting to rapidly identify grades of plastics and polymer composites for reuse and remanufacturing
- 6 Collaborate with state and local economic development groups and the automobile salvage industry on effective chemical and mechanical recycling strategies for non-commodity/mixed plastics

- 7 Increase collaboration efforts among NHTSA and key advocacy groups to develop collision test methods for vehicle battery systems

- 8 Conduct a demonstration project for durable interior automotive plastics and polymer composites with high usage rates

- 9 Demonstrate the performance benefits of structural adhesive joining techniques or plastics-based fasteners as a means for ease of maintenance, repair, and disassembly
- 10 Develop embedded non-destructive failure and damage detection systems (e.g., structural health monitoring) suitable for all polymeric materials systems

# ***The automotive plastics and polymer composites industry is ready to work with automakers to accelerate progress toward safe, modern mobility solutions***

With the ACC Plastics Division as a steward, industry partners—automotive advanced plastics and polymer composites providers, automotive OEMs, and suppliers—as well as academic and national laboratory researchers and government agencies will all work together to conduct the activities and lead the initiatives outlined in the roadmap. Leveraging the collective, cross-sector expertise and resources of these mobility stakeholders will unleash the full potential of advanced plastics and polymer composites and create the breakthrough innovations needed to realize more affordable, accessible, sustainable, and environmentally responsible mobility solutions for all.

**To get involved in this roadmap's activities, contact  
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