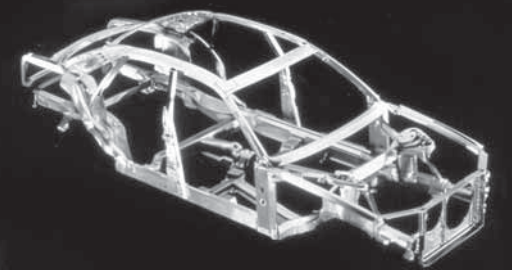


A lighter future



by **Robert T. Alexander**,
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Audi A8 spaceframe



Subaru Legacy hatch

Automotive design is at a critical crossroads as the world braces for the dramatic environmental ramifications of explosive population growth and urbanization.

The challenge facing the industry is clear: How can we design cars and trucks that will be environmentally friendlier in the future, without sacrificing safety and performance?

From my perspective, one trend of the future will be the accelerating use of aluminum and other lighter-weight materials in automotive designs to help minimize the potential environmental impact of millions of new cars. The need for lighter, more fuel-efficient cars and trucks will be driven to a large extent by the trends of rapid population growth and urbanization in the BRICK countries: Brazil, Russia, India, China, and Korea.

As the world continues to add 80 million people each year, roughly 40% of the population will be living in China and India by 2007. Although the majority of the world's population will still be poor, there will be 1 billion more people living in cities by 2015.

To be sure, the trends of population growth and urbanization will create new and exciting opportunities for the global auto industry as designers respond to the needs and preferences of millions of first-time car owners. Based on current projections, for instance, the BRICK countries alone could generate demand for as many as 200 million new vehicles in the years to come.

But the increased global demand for transportation will also create opportunities for OEMs and automotive designers to integrate materials and technologies that reduce energy consumption and emissions. One of the design solutions will be integrating more fabricated aluminum components to drive down vehicle weight. These aluminum components will include bumpers, hoods, spaceframes, suspension systems, and wheels, to name just a few.

The environmental advantages of fabricated aluminum components are compelling. By substituting lower-weight aluminum for steel, automotive designers

can achieve substantial fuel savings while enhancing performance and safety. Studies confirm that a 10% reduction in vehicle weight results in fuel economy improvement of 5-8%.

The trend of increased aluminum use in cars and trucks shows no signs of slowing down. The amount of aluminum used in vehicles made in North America is expected to climb to 318 lb (144 kg) per vehicle by 2010. That's a 23% increase from 258 lb (117 kg) in 2000. Experts forecast sharp increases in Europe and Japan as well.

Aluminum is one of the key solutions for the future of automotive design because it offers many advantages, including strength, versatility, safety, styling, and performance. It's a fact that aluminum absorbs almost twice as much crash energy as steel, and it is also true that lighter cars generally accelerate quicker and require shorter stopping distances than heavy vehicles.

As a company with nearly \$3 billion in annual sales to automakers, Alcoa is manufacturing a variety of fabricated aluminum components for OEMs such as Audi, Chrysler, Ford, Nissan, and Subaru. Our goal is to drive the success of our customers through research and development, innovation, collaboration, and world-class manufacturing.

Through our new Automotive Center in Farmington Hills, MI, we are also integrating the efforts of Alcoa's global automotive resources to provide new product and process solutions. Working closely with our customers, we believe one of the keys to future success will be to develop innovative automotive designs that demonstrate our shared commitment to the environment.

As Henry Ford once said, "Before everything else, getting ready is the secret of success." Almost 100 years after the first Model T hit the road, today's automotive designers are getting ready for a future that will introduce millions of new people to vehicles that are even more compatible with the goals of sustainable development and environmental responsibility. **aei**