



IN PARTNERSHIP WITH



## About Steel E-Motive

### Sustainable Future Mobility Only Steel Can Make Real

Steel E-Motive (SEM) is an autonomous, electric vehicle body structure concept showcasing the strength and durability of steel for ride sharing vehicles. Launched in 2023, the program, led by WorldAutoSteel and in partnership with Ricardo plc, enabled the development of one of the world's first battery electric, fully autonomous vehicle structures tailored for MaaS applications, while delivering critical cost, sustainability and safety performance.

### Supporting the Path to Net Zero

Steel E-Motive can accelerate the transition to autonomous ride sharing for achieving Net Zero goals by 2050: concept designs provide the potential for ~86% total lifecycle CO<sub>2</sub> emissions reduction by 2035 and feature a mass reduction of nearly 25 percent over reference vehicles. Additionally, high average passenger occupancy (3+) enables optimization of CO<sub>2</sub> emissions per passenger mile.

### Designed for Comfort, Ease of Use

SEM concepts are purpose-fit for autonomous Mobility as a Service, exhibiting spacious, airy and open-cabin environments to enhance passenger comfort. Key features, including low-step in height, a one-meter wide door opening and short turning radius, make it an accessible mode of transport for a wider variety of users.

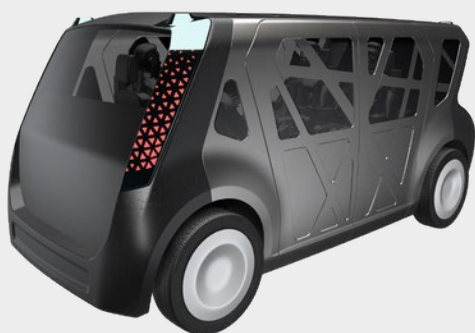
### Technical Specifications

- Our design team benefitted from the expansive WorldAutoSteel portfolio of 64 distinctly different grades of Advanced High Strength Steels to apply the right grade to the right part for the right performance. Steel E-Motive's body structures feature 18 AHSS grades and seven AHSS structural innovations – including a battery carrier structure that is 37% lighter than average benchmarked structures at 27% less cost.
- Concept designs are engineered to meet global high-speed crash requirements, including performance that achieves the Insurance Institute for Highway Safety (IIHS) "Good" rating.
- Manufacturable using global manufacturing and supply infrastructure at costs that can support profitable margins, both for the vehicle manufacturer and mobility service providers.

### Background

Steel E-Motive is the latest in a 26-year history of AHSS-enabled flagship programs from WorldAutoSteel, which together represent more than €100 million in steel industry investment.

WorldAutoSteel is the automotive applications group of the World Steel Association, comprised of 18 of the world's largest automotive major global steel producers from around the world. Its mission is to advance and communicate steel's unique ability to meet the automotive industry's needs and challenges in a sustainable and environmentally responsible way.



### AHSS

Advanced High-Strength Steels have been developed with unique mechanical properties to make them very strong, and in some cases also highly ductile so they can be formed into complex shapes. Offering the highest impact protection and crash absorption among automotive structural materials, today's vehicle structures contain as much as 60 percent AHSS content to keep passengers safe. They also contribute to vehicle lightweighting, requiring less material for the same functionality. Being the most energy efficiently converted material in this industry, AHSS rewards automotive applications as the only material with emissions reductions in all three phases of a vehicle's Life Cycle – production, operation and end-of-life recycling. .

# STEEL E-MOTIVE TEAM



## Cees ten Broek

*Director, WorldAutoSteel*

Cees ten Broek has been a Director of WorldAutoSteel since 2011 and is a member of its management team. Before joining the automotive industry, he held senior positions in finance and strategy with ITT Corporation, Alcatel and Xerox in Europe and the USA. He is a member of the editorial board of Automotive Innovation, published

by Springer, and a member of the Industry Advisory Board of OPJ University, Raigarh, India.

A graduate in Economics, Law and Business Administration from the University of Amsterdam, Netherlands, Cees has also completed additional studies at the Oxford School of Economics, and the IMD Business School in Lausanne, Switzerland.



## George Coates

*Technical Director, WorldAutoSteel*

As technical director for WorldAutoSteel, George leads the organization's Steel E-Motive program, the global steel industry's vision for fully autonomous, electric vehiclebody structure concepts for ride sharing. He also oversees key initiatives, including the online Advanced High Strength Steel Application Guidelines, as well as studies on global trends that will transform future mobility and related material solutions.

George's career spans more than 35 years in the automotive industry, providing engineering and consulting

services to the steel, automotive and manufacturing industries. His areas of expertise include project management, lean practices for automotive stamping productivity, and metal formability and reference panel systems. Following a degree in metallurgical engineering from the University of Cincinnati, his career has included lead Ford Automotive Applications Engineer for AK Steel Company and serving as President and CEO of the Phoenix Group.



## Neil McGregor

*Chief Engineer, Vehicle Integration, Ricardo*

Neil McGregor is responsible for delivering complete vehicle engineering programmes. He has a background in vehicle structural analysis, vehicle mass reduction and energy efficiency. He has over 29 years of powertrain and vehicle engineering experience working across a number of industry sectors including passenger car, commercial vehicle, defence, niche/performance and electric vehicles.

His current role at Ricardo is Chief Engineer for the Steel E-Motive project programme in collaboration with WorldAutoSteel. He is an associate member of the Institute of Mechanical Engineers and has a degree in Mechanical Engineering from the University of Leeds, UK.



## Russ Balzer

*CEO, The Phoenix Group  
Technical Director, WorldAutoSteel*

Russ Balzer is CEO of The Phoenix Group, a consulting firm providing environmental, quality and operations services for the automotive, steel and manufacturing industries. He also serves as technical director for WorldAutoSteel, a global consortium focused on advancing steel research for the automotive sector. In this role, he manages engineering and life cycle assessment (LCA) programs, working closely with stakeholders to improve their understanding of the impact of material choices on achieving greenhouse gas reduction objectives.

Russ is also the liaison to World Steel Association's LCA Expert Group, which develops and aligns procedures

and processes for the global steel industry. He leads the organization's global efforts to move automotive emissions regulations from tailpipe-only measurement to regulations that embrace Life Cycle thinking as the pathway to emissions mitigation for transportation.

Russ earned a BSS in Environmental Compliance from Ohio University and is a Life Cycle Assessment Certified Professional through the American Center for Life Cycle Assessment (ACLCA). Russ was an ACLCA Rising Star Award recipient in 2018, recognized for his work in the field of LCA.

## US media

For interview/comment and image requests, please contact:

**Michelle Caldwell**  
Communications Manager

✉ [mcaldwell@worldautosteel.org](mailto:mcaldwell@worldautosteel.org)  
825 Elliott Ave., Middletown, OH 45054

[steelemotive.worldautosteel.org](http://steelemotive.worldautosteel.org)

Scan or click the QR code to link to the media portal on the Steel E-Motive website

