BOOKS & ARTS

Evolution of the motor car

A proposed reinvention for urban motoring based on ultra-small electric vehicles does not address the bigger environmental or social challenges, finds **Daniel Sperling**.

Reinventing the Automobile: Personal Urban Mobility for the 21st Century
by William J. Mitchell, Christopher E. Borroni-Bird and Lawrence D. Burns
MIT Press: 2010. 240 pp. $21.95, £16.95

How do we reconcile people's desire to own cars with the need to reduce pollution and dependency on oil? This dilemma has inspired much technological and policy innovation, from hybrid electric vehicles and smart traffic information to congestion charging and car-sharing schemes. Yet these developments have had little impact on the function and performance of our urban transport systems, which have barely changed in the past 50 years.

As remarkable consumer products, conventional cars can last for more than 10 years with little maintenance and withstand huge forces if they crash. But they still require someone to grasp the steering wheel and press the pedals. Because they run using combustion engines and petroleum fuels, they have a huge carbon footprint. And they take up valuable space. They are also an extravagance, sitting unused for 90% of the time on average and costing more than US$8,000 a year to own and operate.

The solution, according to authors William Mitchell, Christopher Borroni-Bird and Lawrence Burns, is to "reinvent the automobile" to accommodate the growing demand for cars in the megacities of India, China and the rest of the world. What's needed, they propose, is an ultra-small vehicle powered by electricity or hydrogen that will not cause the environmental and social disruption of today's models, particularly in cities. Such a proposal might be expected from Mitchell, an architect who directs the smart cities research group at the Media Lab of the Massachusetts Institute of Technology in Cambridge, Massachusetts. Yet the promotion of small vehicles seems surprising coming from Borroni-Bird, a General Motors executive, and Burns, the firm's former head of research and development and strategic planning. General Motors is a company with a long commitment to large cars and trucks that, in the past, has vociferously opposed regulations on fuel and greenhouse gases aimed at reducing vehicle size.

Reinventing the Automobile is provocative, aiming to overturn more than a century of vehicle and urban design. It proposes four main ideas: transform the basic principles of car design; connect vehicles wirelessly to share information on roads and traffic; set up 'smart' electricity grids that manage energy supply and demand; and impose real-time pricing and travel-on-demand services that give people greater flexibility and reduce the cost of transportation systems.

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The authors focus mainly on upgrading car design. They also address the practicalities of shifting to their proposed system, including how to convert combustion-engine vehicles to electric propulsion, how information and communication technologies might be used to increase vehicle flows without increasing road space, how electric vehicles might be integrated with a smart grid and how the adoption of road pricing might encourage the transition to small, energy-efficient vehicles. Focusing on large cities, they do not address inter-city or even suburban travel.

It is easy to be sceptical: small, electric, connected cars in big cities will not solve our transportation and energy challenges. Large, dense cities house only about 20% of the world's cars and light trucks. And there are many challenges that the authors hardly mention. Will ultra-small vehicles be economically attractive? Is there much demand for small cars? Will the pricing of road space be widely accepted? Is it feasible to build specialized roads for small vehicles in cities?

Yet they introduce some big ideas that could play an important part in building livable cities and a low-carbon world. More connected and automated vehicles — not just cars but trucks operating on dedicated high-speed roads — are desirable and inevitable.

Reinventing the Automobile is well written and its ideas are illustrated by many drawings, graphs and tables. Above all the authors deserve credit for taking on a challenging issue. As they put it, reinventing the car will be harder than putting a man on the Moon — and much more important. ■

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