

The Tip of the Iceberg

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December 3, 2018

Last week, my old employer, General Motors, made two big moves, each of which roiled participants in the auto industry and contributed to the nation's growing understanding of the extent that self-driving cars will reshape the economic landscape.

The first move saw the Detroit-based automaker citing an increased focus on autonomous and electric technology as a primary reason for its decision to shut down three assembly plants and two transmission plants. It was the first time an American automaker cited autonomous technology as a reason for job cuts—and it won't be the last.

Next came the news that GM's widely respected president, Dan Ammann, was changing jobs to become the CEO of Cruise Automation, GM's San Francisco-based self-driving subsidiary.

On the face of it, this was an astonishing move—the number-two executive of America's largest car company, with a market-cap of \$54 billion, leaving his 180,000-employee Fortune 500 firm to go to a start-up of 1,000 employees, with zero revenue.

Yet few paying attention to the car industry questioned Ammann's wisdom. The same week as the GM moves, the Alphabet self-driving subsidiary, Waymo, made two key executive hires: A chief safety officer and a chief commercial officer, the latter of which is charged with rolling out the firm's autonomous taxi service, in the Phoenix area, potentially followed by expansion around the country, and later, the world.

Ford has estimated the self-driving car business could be worth \$300 billion annually. That sounds conservative to me. What I am hoping is that the American public understands the scale of the disruption to come. Based on my research at Columbia University, \$4 trillion per year of the US economy could be redistributed among companies and consumers when autonomous vehicles become commercially viable.

In the next decade, the mobility market will shift from people driving themselves around in personally-owned automobiles to transportation-service companies selling miles, trips and experiences. Why? Because these companies will provide better mobility experiences at radically lower consumer and societal cost.

Many more thousands of existing auto job cuts will result from the shift to self-driving and electric vehicle technology over the next decade.

Here's why: The new transportation service companies will focus on minimizing their fleet vehicles' operating cost per mile. Trading human drivers for autonomous software reduces operating costs. Similarly, electric vehicles are cheaper to operate than their gas-powered counterparts. And because 80% of the car trips Americans make have only one or two occupants, the vehicles can be tailored to be much smaller and lighter. All of these factors together mean that transportation service vehicles will have far fewer parts. They'll be much simpler to develop and build—

and consequently, the manufacturers will require far fewer salaried and hourly workers. The jobs impact is further compounded by the fact that transportation service vehicles will likely last twice as long (in miles) as today's vehicles, reducing the number required to serve American's travel needs.

To date, most of the discussions involving the employment effects of the self-driving disruption have involved the fate of those paid to drive—for taxi companies or ride-share firms like Uber and Lyft, and long-haul trucking operators as well as those employed by logistics companies like Fed-Ex and UPS.

But equally affected will be hundreds of thousands of well-paid workers whose jobs are in, or related to, the automotive industry. When this thing shakes out, my estimates indicate that traditional auto jobs in product development, manufacturing and sales could shrink to less than half of what they are today.

GM's intention to close assembly plants in Hamtramck, Michigan, Lordstown, Ohio, and Oshawa, in Canada, and reduce its salaried staff, is unfortunate to the extent that it will put out of work many thousands of good people. But those job losses are the mere tip of the proverbial iceberg. In three to five years, all the forces that spell the demise of the auto industry as we know it today will have converged and start to scale rapidly.

America is headed toward a future of widespread labor disruption as a result of the adoption of transportation services provided by driverless electric vehicles. The demise of the U.S. auto industry will not happen overnight. If we begin planning today, there should be enough time to retrain and transition those who once derived their livelihood from manufacturing conventional automobiles.

Politicians, take note.

*Lawrence D. Burns is the author, with Christopher Shulgan, of *Autonomy: The Quest to Build the Driverless Car—And How It Will Reshape Our World*. He is an advisor to Waymo, and was the vice-president of research, development and planning for General Motors from 1998-2009.*