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Fully Self-driving Cars by 2021, Says Ford CEO

On Tuesday, during a hectic day of media interviews about the coming revolution being caused by autonomous vehicles (AVs), Ford's CEO Mark Fields told Wall Street analysts that such vehicles "could have just as significant an impact on society as [Henry] Ford's moving assembly line did 100 years ago." He told workers at a Ford plant in Palo Alto, "This is a transformational moment in our industry … it is a transformational moment in our company. We are making people's lives better by changing the way the world moves."

He said that his company's foray begins with e-hailing services such as Uber and Lyft and will expand to the consumer market by 2021 if not sooner.

He's not alone. Johann Jungwirth, VW's head of Digitalization Strategy, said in April that he expects the first completely self-driving cars to be on the market no later than 2019, just three years from now. GM's Richard Holman, head of the company's "foresight and trends" division, agrees, telling the *Wall Street Journal* in April that they "will be on the road by 2020, or sooner."

Uber just might beat them all to the punch. By the end of this month, customers in downtown Pittsburgh will be able to e-hail self-driving vehicles through their Uber phone app. And those rides will be free in order to acquaint them with the new technology. In a partnership with Volvo (and an investment of $300 million), Uber will have 100 Volvo XC90s responding to those e-hails. Uber's goal, according to John Bares who joined the company from Carnegie Mellon University's robotics department last year, is to replace every one of Uber's more than one million human drivers with self-driving cars "as quickly as possible."

The reason for the free rides in Pittsburgh, at least for the moment, is not only to acclimate customers to the new technology, but to raise the likelihood that, over time, riding in Uber driverless cars, according to Uber CEO Travis Kalanick, "will be cheaper … than in a private car."

That's just the tip of the iceberg. Cheaper is good but it is only the beginning, according to McKinsey & Company. Dead time driving to and from work can be turned into productive time: reading, writing, researching on the Internet, Skyping, and so on. Drivers in Los Angeles spend on average three hours every weekday driving to and from work. McKinsey says the average drive time across the country is 50 minutes per day per driver, every day of the week. Added up, if turned to productive use, that amounts to more than a billion hours of time becoming productive each year.

The AV revolution is already having an impact in unlikely places, such as employment in the robotics industry. As AVs replace drivers, this will increase the need for engineers to develop the software. For instance, Ford first opened its Research and Innovation Center in Palo Alto last year, occupying 30,000 square feet. It is planning to add two new 75,000-square-foot buildings to house the influx of engineers and designers needed to develop the new software. That's a five-fold increase in square footage in less

than two years. Ford is planning on doubling its current workforce of researchers, scientists, and engineers over that time period.

While AVs are shown to reduce emissions by as much as 60 percent, thanks to better optimized travel routes, the AV revolution is likely to change the independent vehicle-service industry, whose small shops are unlikely to be able to afford the technology required to maintain the new four-wheeled computers. In addition, according to McKinsey, AV makers "will have a strong incentive to service these vehicles since regulators could ultimately force them to take on the greatest portion of the responsibility and risk associated with crashes caused by AV technical failures."

This could turn the insurance industry upside-down as well. Instead of issuing millions of individual policies to drivers to insure them against driver error, the industry would likely insure just the manufacturers instead, much like they do for cruise lines and shipping companies.

The impact could be felt in unseen ways as well, such as the amount of real estate dedicated to parking. Since AVs don't require space to open the doors for entering and exiting passengers (they would just enter and depart at their destination), parking spaces will be at least 15 percent tighter.

The savings in car crashes alone could be monumental. McKinsey says that "for every person killed in a motor-vehicle accident, eight are hospitalized and 100 are treated and released.… Advanced technology operating AVs would reduce accidents by up to 90 percent … potentially saving about $190 billion [annually]."

The impact on the home-care industry for the elderly could be enormous as well. Self-driving cars that can be summoned with a phone call are likely to allow those currently forced to stay at home the freedom to shop, visit, and travel. The demand for in-home care specialists could decline, along with the demand for off-site assisted-living facilities.

The AV revolution could also impact residential land values. Living far away in the suburbs could become more attractive as drive time is turned productive, pressuring the value of properties closer to downtown.

Fields could be more correct than he knows. The moving assembly line turned the world upside down 100 years ago. The AV revolution is likely to do the same.

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