APS1012 Management of Innovation in Engineering

University of Toronto – School of Graduate Studies

Group 3 Final Project Report

Topic: Innovation in Self-driving and Autonomous Cars

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Executive Summary

The world has been changing dramatically in the past few decades. With recent technology advancement, the car industry has been shifting towards autonomous vehicles (also known as driverless cars or AVs). Countries like China and U.S. have been investing large amounts of money and labor in researching and developing new features in the industry, which we predict, will spur a revolutionary change after AVs arrive to the market.

In this report, our group has thoroughly analyzed the AV industry and its corresponding technologies, market demand, software/hardware advancement, government regulations, advantages and disadvantages, public concerns, and case studies on collisions. With this information, we provide our estimate on the future direction and recommendations for the driverless cars industry and its stakeholders.

In conclusion, we found the AV industry still has a long way to go based on the current technologies, lack of public acceptance, and unclear government regulation. Based on this, we estimate that we won't see driverless cars completely replace regular cars in the next 15 to 20 years. But more and more companies in the world have shown strong interest and placed large investments in this area, both before and after the pandemic. Public concerns from North America have been centered around safety, privacy, and employment issues, and governments need to frequently update their laws to adapt to a rapidly evolving industry. While AVs offer numerous advantages, they also could bring a number of unintended consequences as well. To take advantage of the benefits AVs most successfully, both need to be considered by the industry as it pushes forward. To do this, we recommend further improvements to the technology to prove that it works and is reliable which will garner support from both governments and the public for the future.

A case study of autonomous buses, or Robobus, application and market analysis in China has also been included in this report. It concludes that the Chinese government prioritizes safety over funding and labor requirements, while investors care more about the returns from the projects. In conclusion, the Chinese government, as well as a several other countries, have been trying hard on AV technologies in the last few years, however, they are still far from reaching level 5 automation. Sensor technology and other hardware, machine learning algorithms, and AI still needs further advancement to obtain this goal. However, competition between the U.S. and China, as well as several European countries has begun and will hopefully spur further innovation in the coming years.