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## **In-depth case study: Autonomous vehicles**

Writer: Mattias Goldmann

### **Reducing road accidents, increasing competitiveness**

China sees self-driving cars as an important part of the Made in China 2025 roadmap, launched by the State Council in 2015, with the goal of transforming the country into an innovation hub in a variety of sectors, including the automotive industry<sup>1</sup>. Whilst other countries may have a technological advantage over China when it comes to conventional vehicles, China may be able to compete on more equal terms in this section of the market, which is also believed to be growing much faster than the overall automotive sector.

A key reason for China’s ambition is to reduce the traffic-related death toll, responsible for the death of more than 250,000 Chinese each year. About 60% of the accidents happen to cyclists, pedestrians or motorbikes and cars and trucks, most of which could be avoided with autonomous vehicles. Autonomous vehicles may also be part of reducing Chinese traffic congestion, since they can be operated much more efficiently, reducing the need for parking space and decreasing the needed space between vehicles driven. Furthermore, there are clear environmental and climate benefits when vehicles are driven more efficiently than with humans behind the wheel<sup>2</sup>.

### **Driverless cities**

The Chinese city Wuhu aims to become the world’s first totally driverless city by 2025, working with the Chinese search engine giant Baidu, which has also been given the permission to test its autonomous vehicles on 33 roads in Beijing’s less-populated suburbs<sup>3</sup>. Chinese-owned, Swedish-based car manufacturer Volvo has also been testing autonomous vehicles in Beijing. Ride-sharing giant Didi is also moving into autonomous driving, opening a research lab in Silicon Valley in 2016<sup>4</sup>, and has established a research institute focusing on how AI technologies can optimize city transport, working with Jinan, Wuhan and other cities<sup>5</sup>. China also plans solar-powered 150km expressway, charging vehicles as they go, and designed to support driverless cars between cities. The first part of the highway is expected to open in 2021<sup>6</sup>.

### **National targets**

China has the potential to become a world leader in self-driving cars, according to research institution IHS, which predicts that 5.7 million cars on Chinese roads will have some degree of

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<sup>1</sup> English.gov.cn, 2018-04-05

<sup>2</sup> Business Sweden, 2016

<sup>3</sup> Reuters, 2018-03-23

<sup>4</sup> The Verge, 2016-10-06

<sup>5</sup> The Beijinger, 2017-08-30

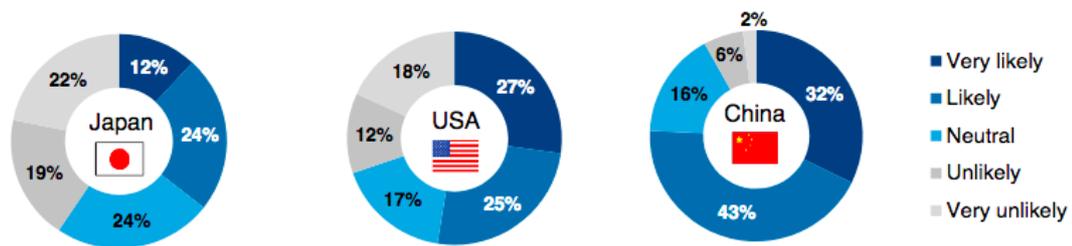
<sup>6</sup> The Daily Mail, 2018-03-01

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autonomy by 2035<sup>7</sup>. Boston Consulting Group believes that China will by then be the largest market for autonomous features, accounting for at least a quarter of global demand. A committee is currently drafting a national roadmap to achieve highway-ready, self-driving cars within 3-5 years and autonomous vehicles for urban driving by 2025. This would be well received; in the 2015 World Economic Forum survey, 75% of the Chinese said they would want to ride in a self-driving car, compared to around half of the Americans<sup>8</sup>.

### **Figure 1. Consumer attitudes towards self-driving cars**

Consumer attitudes, % of respondents likely/unlikely to try a self-driving car



Source: World Economic Forum 2015

Source: World Economic Forum 2015

China’s Ministry of Industry and Information Technology aims for extensive autonomous highway driving by 2020 and fully autonomous urban driving by 2025. This should reduce traffic accidents by more than 30%, lower energy consumption by 10%, and reduce emissions by more than 20%. The first steps, after the current trials, will most likely be dedicated bus and fixed route taxi lanes in major cities, since such pre-defined and measurable trips are the easiest to implement<sup>9</sup>.

### **Obstacles to overcome**

The Chinese regulatory processes related to autonomous vehicles are national rather than regional or city-based, which enables China to develop the framework faster than many other countries. Even so, a coherent national policy framework for autonomous vehicles is yet to be designed, with a need for greater clarity on who regulates what. Another issue of concern for the Chinese development is the restrictions on roadmap development, since very detailed maps are needed for fully automated driving. Furthermore, current Chinese rules stipulate that drivers must be in the vehicle with their hands on the steering wheel, which obviously complicates the introduction of autonomous vehicles<sup>10</sup>.

<sup>7</sup> CKGSB Knowledge, 2016-11-21

<sup>8</sup> Fortune, 2016-04-23

<sup>9</sup> Forbes, 2016-02-02

<sup>10</sup> West, D.M., Brookings Center for Technology Innovation, 2016

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