The Impact of Industrial Policy on Public Acceptance of Intelligent Vehicle in Test Site Phase

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Abstract. The biggest change that smart cars bring to people's daily travelling is to achieve autonomous driving. In recent years, with the gradual popularisation of assisted driving technology, accidents related to it have often triggered heated discussions among the public, and the public's acceptance of intelligent vehicles greatly depends on its view of autonomous driving. In the test site phase it is difficult for the public to have direct access to the testing process, and the support of industrial policies for test site construction indirectly affects public acceptance. Relying on 720 panel data of 10 cities, this paper constructs a mechanism model of the influence of industrial policy on public acceptance and explores the influence of industrial policy on public acceptance.

Keywords: Intelligent vehicle; Industrial policy; Public trust and acceptance.

1. Introduction

Intelligent vehicles are equipped with advanced sensors and other devices, integrated with big data, intelligent navigation, artificial intelligence and other emerging technologies, and are committed to transferring the car from a simple transportation tool to an intelligent mobility space, so as to ultimately realize a "human-centered" intelligent mobility space, and to achieve a safer, more convenient, and more efficient travel experience. It can realize the information sharing and exchange of three networks, with information sharing, complex environment perception, intelligent decision-making, automated collaborative control functions, can reduce traffic accidents, ease traffic congestion, improve energy efficiency, is the product of the rapid development of big data and other emerging technologies, and is also the inevitable trend of the development of the automobile industry.

Intelligent vehicles are now widely used in a variety of scenarios, but in recent years, Intelligent vehicle accidents have occurred frequently, whether the problem stems from the product or brand, which has triggered public skepticism, and is not conducive to the healthy development of the industry. However, the public is the most crucial part in realizing the commercialization of intelligent vehicles. Only when the public fully trusts and accepts this emerging industry will there be enough demand and sufficient purchasing power to drive the industry to develop rapidly. In this context, how to gain public trust and enhance public acceptance has become a major concern for governments and intelligent vehicle enterprises. At present, China's intelligent vehicle testing process has not yet fully entered the stage of complete public operation, and there are still some areas that use closed or semi-closed testing, still in the stage of test field where the public cannot directly access the testing process. Based on the test field stage of intelligent vehicle development, this paper takes the mechanism of the influence of industrial policy on public acceptance as the research object, and draws conclusions on how to enhance the public acceptance of intelligent vehicles through industrial policy.

2. Definition of the Test Site Phase

In the current challenging and competitive dynamic business world today, automotive companies have been rapidly developing and promoting autonomous vehicles (AVs), which aim to reduce crashes, energy consumption, pollution, and congestion and increase transport accessibility(Sim J H, Chen B T, Chai T L, et al, 2023) In the test site phase of intelligent vehicle, test vehicles cannot conduct intelligent vehicle road tests in open areas. Cities that allow road tests have designated
specific road sections for intelligent vehicle road tests, and most of the test sections have relatively simple traffic environments; test vehicles must not carry personnel or goods unrelated to the test and must be equipped with a safety driver. The public cannot directly witness and participate in the testing process.

3. Relevant Industrial Policies

The policy environment is a strong guarantee for a thriving industry. In recent years, more and more countries have begun to pay attention to the development of the autonomous driving industry, and have taken it as an important direction for the development of the automotive industry from the national strategic level. In this context, the government’s role emerges as pivotal, with a responsibility to craft public policies that robustly support industrial development initiatives (Demirel and Kesidou, 2011). In order to achieve high-volume commercialisation of intelligent vehicles, both the global, as well as our central and local governments, are strengthening their policy support. The relevant policies, laws and regulations of major countries and regions around the world, represented by the United States, Europe, Japan and China, are being gradually improved to accelerate the process of promoting the industrialisation of autonomous driving.

![Fig. 1 Overview of the number of smart car-related policies by country](image)

China has been actively promoting the construction of test and demonstration zones for intelligent networked vehicles in order to establish China's first-mover advantage in the field of intelligent vehicles and intelligent transport. Since 2015, China has continuously introduced relevant policies for the intelligent vehicle industry, from the initial macro planning to the current trial plan, the construction of laws and regulations has become increasingly perfect. In terms of the construction of test demonstration zones, in 2015, there were only two national test and demonstration zones in Hangzhou and Shanghai, and with the advancement of time, the test zones continued to increase and expand to all parts of China, and many car companies also invested in the construction of demonstration areas.

4. Impact of Industrial Policy on Public Acceptance

In the test site phase, self-driving car tests are completely closed, and the public cannot perceive their safety and reliability with first-hand experience. However, the popularity of the test field means that the number of self-driving car tests has increased dramatically, which also means
that the safety and practicality of intelligent vehicles will be gradually upgraded, which can further dispel the public's doubts about their existence and enhance user acceptance. Through the existing literature as well as research results, we can find that the support of local governments for the intelligent vehicle industry often becomes the driving force for the rapid development of test and demonstration zones. Driven by the policy, the intelligent vehicle industry has gained rapid development and provided strong support for the high-quality and sustainable development of the automotive industry, played an important role in accelerating the construction of intelligent transport and realising green travel, and also had a far-reaching impact on the transformation and upgrading of the automotive industry as well as the socio-economic development of various regions. Accordingly, this paper puts forward the following hypotheses:

**H1:** The effective implementation of intelligent vehicle industrial policies has a significant positive impact on the construction of urban test and demonstration zones.

The promulgation of the policy on intelligent vehicles is of great significance for China to accelerate the transport power, promote the application of automotive intelligent and networked technologies and industrial development, and regulate the road testing and demonstration application of intelligent networked vehicles.

**H2:** Intelligent vehicle industrial policy can facilitate the construction of test and demonstration zones by promoting industrial structural transformation.

The technological innovation activities of enterprises cannot be separated from the guidance of government supply policies, the pull of demand policies and the support of environmental infrastructure policies(). Technological innovation can rely on the transformation of achievements and drive the development of related industries to promote the construction of test demonstration zones, and the promulgation and implementation of the policy on the intelligent vehicles industry can precisely provide a theoretical basis for technological innovation in the intelligent networked automobile industry.

**H3:** Intelligent vehicle industrial policy can promote the construction of test and demonstration zones by enhancing technological innovation capabilities and thus facilitating the construction of test and demonstration zones.

The introduction of policies on the intelligent networked automobile industry is of great significance in increasing the investment in R&D funds for infrastructure construction and investment in scientific and technological research and development. The investment in R&D funds provides a favourable external environment for the development of the intelligent networked automobile industry and is conducive to improving the material conditions for innovation.

**H4:** Intelligent vehicle industrial policy can facilitate the construction of test and demonstration zones by increasing R&D capital investment and thus promoting the construction of test and demonstration zones.

Due to the differences in the geographical location of cities, economic development level, city scale, administrative level, etc., the effect of the implementation of the intelligent vehicle industrial policy will have different degrees of impact on the construction of the test and demonstration zone. Accordingly, this paper proposes the following hypotheses:

**H5:** Intelligent vehicle industry policies have been more effective in promoting the construction of test and demonstration zones in eastern and central cities.

Due to their geographical location advantages, eastern and central cities are better than western cities in terms of economic development level, scientific research capacity, infrastructure construction and consumption capacity, etc., and most of the top ten domestic vehicle
manufacturers are concentrated in the eastern and central cities, with stronger industrial agglomeration effect, which also drives the development of related industries in the industry chain, in which case the driving effect of the intelligent vehicle industry policy will be more obvious. Under the impetus of industrial policy, the construction of test and demonstration zones in eastern and central cities will be more superior.

**H6:** Intelligent vehicle industry policy has a greater role in facilitating the construction of test and demonstration zones in cities with high administrative levels.

Relevant research shows that the difference in the administrative level of the city is an important factor in the difference in the economic development of the city, the city with a higher administrative level in the process of economic development can obtain a greater degree of support from the government, which attracts more funds and talents.

Based on six hypotheses, Relying on the 720 panel data of 10 cities in China from 2011 to 2020, this paper preliminarily deduces the influence mechanism of smart networked vehicle industrial policy on user acceptance and explores the influence mechanism of smart networked vehicle industrial policy on public acceptance, as shown in Fig 2.

5. **Summary**

As the initial stage of the commercialisation of intelligent vehicles, that is, the "0" stage, the construction and operation of the test and demonstration zones for intelligent vehicles is crucial to their development. Before intelligent vehicles formally enter the market, they must undergo repeated road tests in a completely realistic traffic environment to control their potential risks and safeguard road traffic safety, and in this way enhance public acceptance of smart vehicles. Compared with traditional cars, the development of technologies related to intelligent networked vehicles is more important for the construction of modern transportation system network, and the current traffic regulations and policies to improve the formation of new challenges, the future of a more efficient and intelligent transportation network, supporting the perfect traffic regulations will become the mainstream (Bagloee S A, Tavana M, Asadi M, et al, 2016). As a result, the central and local authorities should introduce policies and plans for the development of the intelligent industry, and create a favourable environment for road testing and the construction and application of testing demonstration zones.

**References**

