

Feasibility Study on Launching of Shared New Energy Vehicles in Wuxi City

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Abstract: Shared vehicles not only bring convenience to urban people to use cars, but also meet the needs of "car-free people", and have been recognized among many citizens. This paper discusses the status quo and development of shared vehicles in Wuxi city, and provides reference for the future entrepreneurship of shared vehicles. Through scientific design of research content and reasonable development of practice plan, different objects were investigated and surveyed in the form of field visit and consultation of users, by distribution of survey questionnaire.

1. Introduction

High oil prices have led to a shift in many people's attitudes towards car-sharing, and they tend to join the "car-sharing" team. The number of car-sharing members in the United States, Canada and other countries has increased rapidly, with nearly 100,000 members in the United States. "Car-sharing" is also booming in countries such as the Netherlands, Belgium, Denmark, Italy and the United Kingdom. Major cities in Belgium have set up special parking spaces for shared vehicles like taxis [1]. The government wants the number of "car-sharing members" to triple by 2010. The Dutch capital, Amsterdam, has 310 shared car stops. Germany is considering amending its laws, allowing special parking spaces for shared cars in residential areas. In the future, "car-sharing" could develop into a daily car service that is more flexible in terms of time, more spatial and less expensive than traditional car rental services, according to George Welk, a sociology and automotive expert at the Institute of Climate, Environment and Energy in Uptal, Germany [2]. The introduction of shared vehicles into the Chinese market coincides with the initial development period of domestic new energy vehicles, and the cars launched by most of the shared vehicle enterprises in the market are new energy vehicles. New energy vehicles are more economical than fuel vehicles and are low cost in terms of recharging expenses and maintenance costs and so on. On the other hand, the use of new energy vehicles can reduce the dependence on traditional energy, which is conducive to the sustainable development of energy. Shared vehicles play an exemplary role in new energy vehicles and provide an effective promotion channel for the market popularization of new energy vehicles. Consumers can directly feel the performance of new energy vehicles through their own use of shared vehicles. Combined with the cost advantages of new energy vehicles compared with traditional fuel vehicles, new energy vehicles become one of the choices for consumers to purchase and change vehicles.

2. Product or Service Prospects

Relying on a certain degree of autonomous driving and wireless recharging, vehicles move at a low speed in the unmanned stage, which solves the problem of vehicles entering and leaving the garages. Rental vehicle pickup points can be completely separated from recharging points to realize the self-management of recharging. Wireless recharging and automatic parking and out of garage: the matching ratio of recharging piles can be reduced and adjusted according to the electric quantity of vehicles by replacing the original conducting recharging of vehicles with wireless recharging, supplemented by automatic parking[3]. Customers only need to park some distance near the coils of wireless recharging to realize automatic parking of the vehicles to the recharging positions and start the recharging process.

Autonomous driving function of vehicles to a greater extent can be configured to the position of the customer according to the requirements of the customer, and the customer can return the vehicle within a certain range [4]. Low speed unmanned dispatching: through the integrated use of images and radar, vehicles can be parked arbitrarily after low speed automatic operation is realized. Vehicles are configured to enter the nearest rental points or to enter wireless recharging mode according to the demands of the server side. High speed unmanned dispatching: after further increasing the processing speed, the demand response of vehicles can be achieved. According to the actual needs of users, position matching is made and the vehicles are delivered to the positions required by the users.

A vehicle is reaching the unmanned stage, which will make such a mode have a very wide space. Customers can choose to drive by themselves or to drive automatically [5]. Road adaptation: this is the most ideal mode; according to the demand response, users can choose the automatic mode and non-automatic mode, plan the path according to the destination and match the most appropriate operation route according to the deployment of the system [6][7].

3. Status Quo of Shared Vehicles in Wuxi City

A total of three companies in Wuxi have launched shared new energy vehicle services, namely Guolian Zhixing, Qingke Travel, and Gofun Shared Vehicles.

Guolian Zhixing plans to build one demonstration base of new energy vehicles, 10 comprehensive service centers, 100 convenient recharging points, 500 new energy vehicles and 1000 recharging piles in Wuxi urban areas. Guolian Zhixing has four new energy stations, namely Wuxi Citizen Center, Guolian Building, Wuxi Railway Station and Guolian Talent Apartment. The usage method is as follows: 1. Download "Wuxi Travel" APP on mobile phone; 2. Register with mobile phone number, upload ID card and driving license; 3. After 5-10 minutes of approval; 4. Pay a deposit of 1000 yuan online, and you can drive to go out.

Wuxi Qingke Travel based in Huishan Life Science and Technology Industrial Park, has currently built four car rental recharging points in in Wuxi namely, YouHui Life Park, Mingdu Hotel, Huishan Software Park, and Changan Farmer's Market. With 10 Chang'an EADO cars launched in Wuxi market, the company plans to increase 50 new cars on the end of the year, and 2000 cars within the three years. Search "Wuxi Local Category" with WeChat and reply "shared vehicle" in the WeChat dialog box to download Qingke Travel APP! Use the following methods: 1. After downloading Qingke Travel APP, carry out real name authentication, check the driving license and ID card, make an appointment, pick up and return the car at the station! 2. Link Zhima Credit: open the APP and find Zhima Credit in the personal center, and link successfully by following the operation tips. After successful linking, any person with up to 650 points of Zhima Credit and above can use without deposit.

Wuxi Gofun shared vehicles are all launched all over Wuxi. Search "Wuxi Local Category" with WeChat or scan QR code and send "Shared Vehicles" to get the download address of Wuxi Gofun Shared Vehicles. The using method is as follows: 1. Download the APP, and register: input mobile phone number and verification code to register! 2. Verification: then upload the ID card and driving license, and pay a deposit of 699 yuan. After the verification, you can start Gofun trip!

4. Comparison of Three Existing Shared New Energy Vehicle Companies

Comparison of deposit and fees is shown as Table 1, and the cost measurement and comparison is shown as Table 2. The three companies basically use the same methods: scanning the code, downloading the APP, registering mobile phone number, and uploading the ID card and driving license. The difference is that Qingke Travel does not require a deposit and starts with 20 minutes, which means its starting price is 6 yuan. It is worth mentioning that they also launch a discount service for night use, from 5 pm to 9 am next day, and the night charge is 48 yuan. However, there are a few stations of Qingke Travel, but the advantage of Guolian Zhixing lies in the large number of stations, and it is convenient and expensive to use cars. Wuxi Gofun has the advantage of being

cheap, but has not possessed many stations.

Table 1 Comparison of deposit and fees

Shared vehicle	Model	Deposit	Fees
Guolian Zhixing	BAW EC180, BAW EX260, Emgrand EV300, Denza 400, Iveke V20	1000 yuan	0.45 yuan per minute
Qingke Travel	Changan Eaido	No deposit	0.3 yuan per minute
Gofun Travel	Chery EQ	699 yuan	0.1 yuan per minute +1 yuan/km

Table 2 cost measurement and comparison

Comparison	Traditional fuel private cars	Shared new energy vehicles
Purchasing cost	150,000	0
Annual travel cost (20,000 kilometers)	11,000 yuan fuel fee (9L/100km)	2,200 yuan electricity fee (borne by the company) + 3,000 yuan rental fee (borne by the user)
Annual maintenance cost	3000 yuan (regular maintenance)	0
Annual repair cost	500 yuan (regular maintenance)	0
Annual insurance cost	3500	0
Total	168,000	5200

5. Suggestions on Development of Shared Vehicles

Wuxi covers an urban area of 1643.88 square kilometers (there are also 397.8 square kilometers of Taihu Lake), with a population of 3,620,900. Liangxi district has the highest population density, followed by Xinwu district, Huishan district, Xishan district and Binhu district. The comparison of the above district population densities is shown as Table 3.

Table 3 Comparison of population densities in all districts of Wuxi

District	Area (Km ²)	Population (Ten thousand)	Population density
Liangxi	65.95	95.3	1.445
Binhu	628.15	69.85	0.111
Huishan	325.12	70.66	0.217
Xishan	399.11	70.28	0.176
Xinwu	220.01	56	0.255

In the future, the development of shared vehicles will become more and more popular. For the Wuxi market, the following suggestions on development are proposed:

(1) Cooperate with Alipay and use the number of Ant credit points to exempt the deposit (such as 700 points). Specifically, consider how many points are common at that time and how many deposits should be paid in different intervals. Alipay page contains this application shared new

energy vehicle, which can be opened easily. Give a coupon like the Take-Out Service "ele.me?" (For example, if you use it for many times, you will get a discount of unlimited time and kilometers, and you will get a better discount in the evening.)

(2) The use of new energy vehicles belongs to green travel, and green travel points are set and can be exchanged for membership level and public service activities.

(3) Cooperate with the government to establish stations at large shopping malls, residential areas and other places with large population flow, and establish multiple parking stations in the densely populated Liangxi district, Xinwu district and Huishan district to solve the problem of difficulty in finding cars and parking. Charge according to the number of miles, and set a time limit, that is, traffic jam or waiting time exceeding the limit will lead to additional cost. In this way, the factors such as traffic jam caused by rush hours are humanized and taken into account, and users are also reminded to return their cars in time and reduce the costs. At present, the parking must be at the specified stations, and the cars cannot be returned at the non-specified stations. Efforts should be made to solve this technical problem. Namely the cars can be parked and cars can be returned at the places where there are recharging piles.

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