

# ■ Strategy on User Experience: constructing ■ intelligent mobility and ecosystem

--- Proposal for XPeng



WARWICK CONSULTANT GROUP

Team Member: GUANDA CHEN, YIMING ZHOU, XIAOJUN NI, CHENTAO YANG

# SUMMARY

Marketing analysis

Market overview

Customer and Positioning

Created customer profile  
by secondary research

Proposal for Xpeng

Business Strategy

Company Positioning on Mobility  
and Ecosystem

## 1 Market overview

- The development of electric vehicle boosted by macro factors.
- Global passenger vehicle market shows a positive trend.
- Electric vehicle will be the mainstream.

### Business model for OEM:

- Dealership + direct selling are the current business model for Xpeng.
- Future trend for OEM is direct-selling and vendor model.

## Mobility

Technologically improving people's usage. Short-time renting

## Ecosystem

Car becomes a terminal getting into people's life, with internet of things

## Future branding strategy

## 2 Customer and Positioning

### Features for customers:

- Safety, Comfort, Supporting Service, appearance and Price are important for sampler.
- Gen Z is replacing Gen Y as the main customer.
- Interested in user's experience.
- Consumption preference are nudged by online information.
- Safety, comfort and user experience performance most important factors when buying a car.

### Company Positioning:

- SWOT analysis for Xpeng.
- Company future positioning on Mobility and ecosystem.

## 3 Business Strategy

- Company future positioning on Mobility and ecosystem.

### Mobility:

- Biometrics with automatic driving helps with maximizing the duration of mobility time using XPeng service.

### Ecosystem:

- IoT makes the car an interconnected system, extending consumers' digital lifestyles into their vehicles.



# Agenda

**01**



## MARKET ANALYSIS

- Policy & environment overview
- Global market overview
- Chinese market overview
- Main business models intro
- Future trend for OEMS



**02**

## CUSTOMER ANALYSIS & COMPANY POSITION



**03**

## BUSINESS STRATEGY



**04**

## APPENDIX



# The Environment Promotes the Development of New Energy Vehicles



## Policies support the development of new energy vehicles

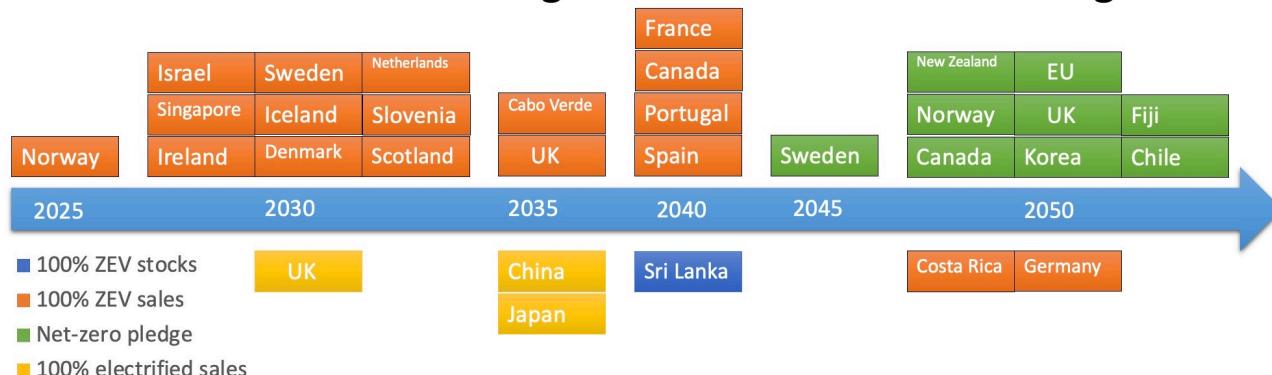
### ➤ Worldwide:

- More than 20 countries have vehicle electrification targets or ICE bans, and eight countries and the European Union have announced net zero emission commitments.

### ➤ China:

- New Energy Vehicle Industry Development Plan (2021-2035).
- New energy vehicles were exempted from purchase tax in 2014
- Tighten fuel economy standards
- Energy-saving and new energy vehicle technology roadmap

## Internal combustion engine bans or electrification targets



Data from: [iea.org](http://iea.org)

## State of earth does NOT support the development of fuel vehicles

### ➤ The Oil Crisis:

- The world will run out of oil in 2068, 46 years from now.
- The transportation sector emits 20.5% CO<sub>2</sub> which is a result of burning fossil fuels.
- According to the UNEP, emissions must fall by 25 % before 2030.

### ➤ The Environmental Pollution:

- By 2030, an estimated 127 million vehicles will be produced globally.
- By 2035, the total number of vehicles could be 2 billion.
- The transport sector is one of the largest sources of global greenhouse gas emissions.
- Particulate matter in the air alone is responsible for up to 30,000 premature deaths a year.
- Electric cars could cut greenhouse gas emissions in half by 2030 compared with fossil fuel-powered vehicles.

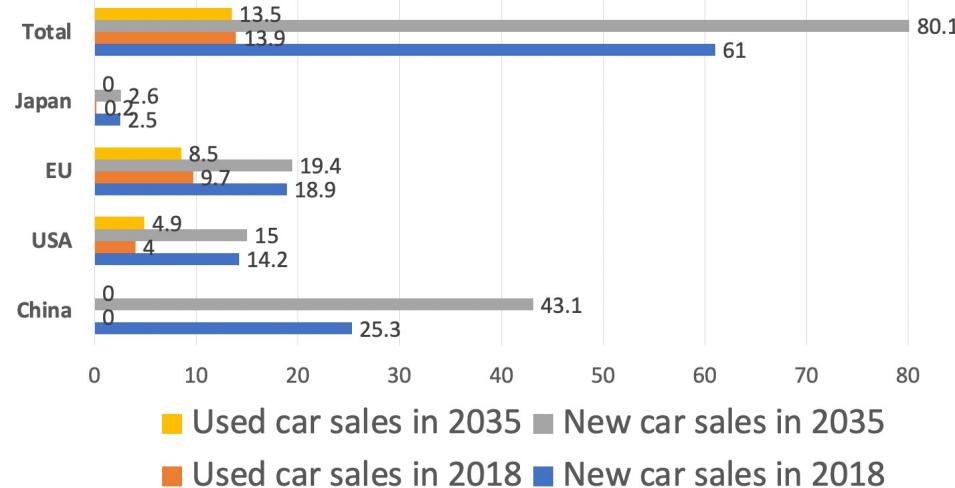
# Global Market Scale Steadily Increases



## Global market scale grows steadily

- Global car sale increases 25% from 74.9 to 93.6(million-dollar)
- Average growth rate at 3.6%
- Affordable customers quantity increases due to higher income

Auto sales revenue for 2018 and 2035 in the base case Unit:  
\$ billion



## China sales volumes performs best

- Estimated sales revenue increases **most**: inclines 70% from 2018 to 2035.
- **The largest consumption population** : 40.6% of global sales revenue.

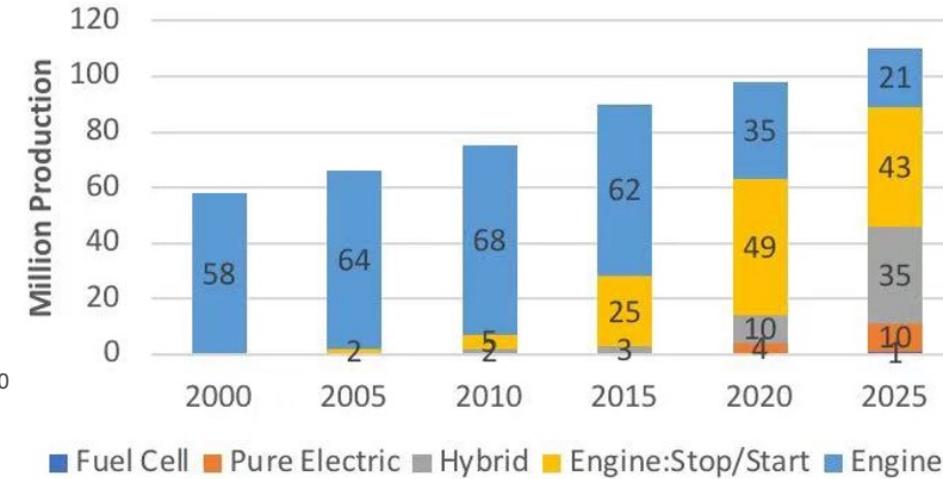
Global electric vehicles perform well, may replace oil-fueled vehicles in the future



Electrical vehicle sales quantity increase rapidly whereas, fueled vehicles performs inferior

- **The production of combustion vehicles decreases:** from 70 million in 2010 to 30 million in 2020, with a further decrease in 2025 to 20 million.
- **The production of electric vehicles and Hybrid electric cars increases:** from 2 million to 8 million in 2025.

Passenger Car Powertrain Trends



**Future Market:**  
➤ The electrical vehicle will weigh more and more percentage of the global vehicle market.

# Promising View of Electric Vehicle Market: guides OEMs' transitions

Global market share in 2021 was **6 times** of that in 2017

Increased from 1.36% to 8.57% due to:

- Low and affordable selling prices attracts vast demand.
- The low and stable charging fee, comparing to unstable oil price, makes electric vehicles become more competitive.

## The electric vehicle performs well in Europe and China

### Europe

- Global electric car sales increased from 1.4 million to 2.29 million in 2021

### Reason

Government regulation:

- Fuel economy and emission target: half of the OEMs are facing related penalty payment.
- OEMs are seeking ways to reduce emissions through increased electrification.

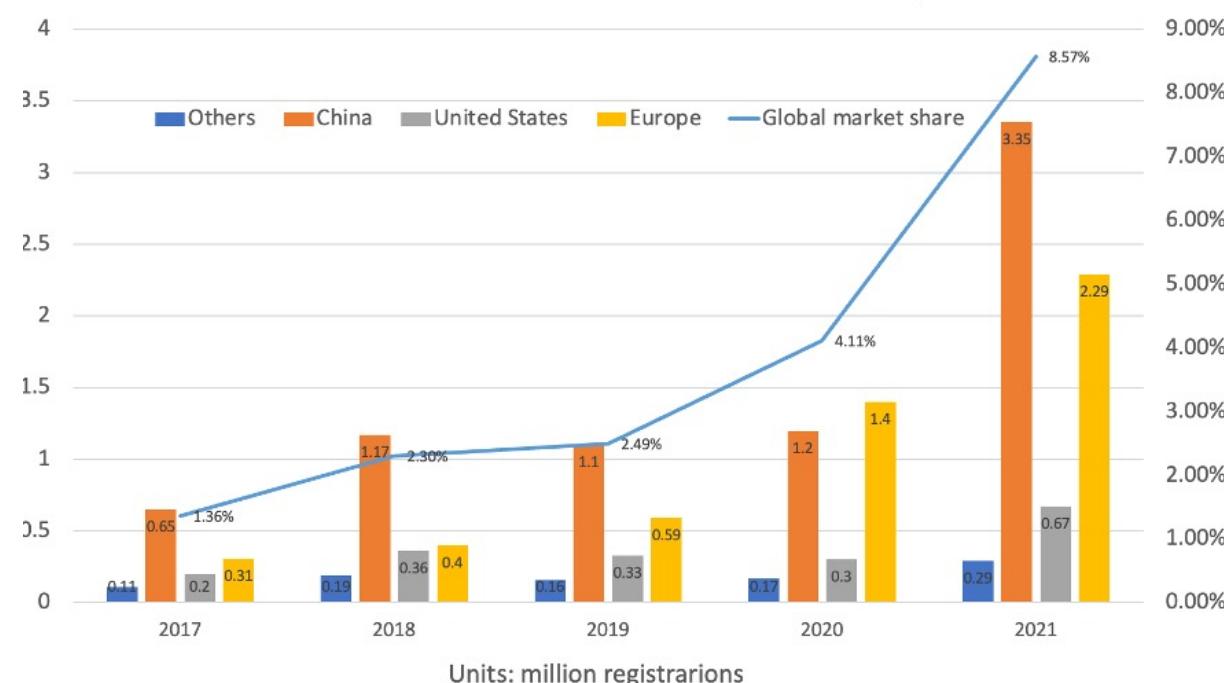
### CHINA

- ◆ Global electric sales increased from 1.2% to

### Reason

- ◆ Development of autopilot, cloud-computing.
- ◆ Customer's intention to buy electric cars increased from 20% to 63%.

Global sales and sales market share of electric cars, 2010-2021



Units: million registrations

- ❑ The global auto industry is facing structural adjustment.
- ❑ OEMs all in their resources in electrification after fitness the success of Tesla.

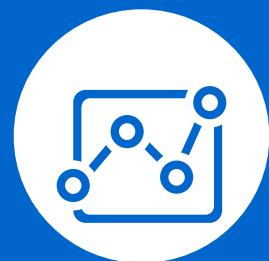


- ✓ Reduce fuel consumption and emissions, and maintain global growth, especially in China.
- ✓ Focus on electric vehicles and autonomous driving.

Data from: Deloitte

# Chinese Vehicle Industry Present Well

--- electric vehicle market starts booming fueled auto vehicle performs normal

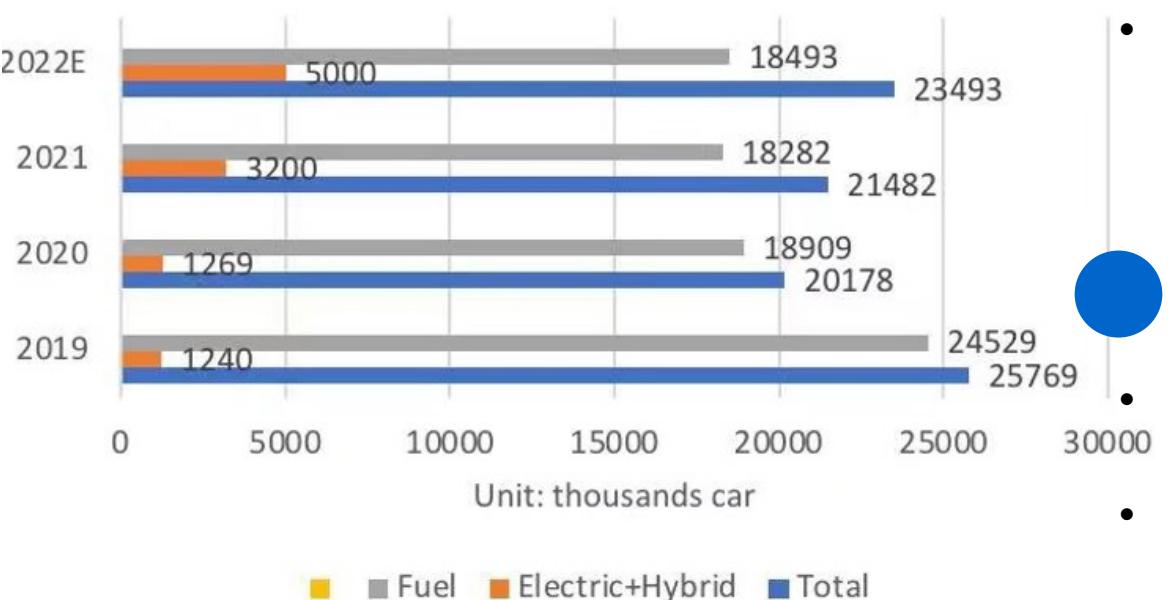


## Chinese overall vehicle presents stable and positive trend

Sales volume recovered steadily:

- From 21482000 increases to 23492731. YoY 9.7%

Passenger vehicle sales and future trends by power



## Electric vehicle booms, market penetration keep increasing rapidly

- Electric vehicle volumes in 2021 were triple times of electric vehicle volumes in 2019
- 2022 electric estimated vehicle volume increases 56%
- The estimated market penetration increases from 4.5% in 2019 to 21.3% in 2022

## Fueled vehicle sales volume grows slowly

- Estimated 2022 sales volume at 18493, YoY 1.15%
- The penetration market rate keeps reducing.

More and more OEMs wants and transit to join in this promising industry:

- Although sales volume of electric vehicle still small, its growth rate drives the growth rate of Chinese passenger Vehicle.

In order to gain more future revenue from electric vehicle industry :

- Occupy market share and establish initial customers' royalty at this early entry state.

The Business Model For OEMs	MODE	Pros and Cons Analysis		
		Bargaining Power	Management Cost	Expanding Ability
<b>Dealership:</b> Company to company  E.g.:XPeng	<p>OEMs</p> <p>Dealers</p> <p>Customers</p> <p>Transaction</p> <p>Order</p>	<ul style="list-style-type: none"> <li>OEMs have the weak bargaining power to maintain final profits</li> <li>Dealers want discount to keep competitive</li> </ul>	<ul style="list-style-type: none"> <li>OEMs do not need to spend too much cost in management costs, compared to direct selling</li> <li>Dealers bear most of the management cost in marketing and selling.</li> </ul>	<ul style="list-style-type: none"> <li>OEMs could expand their brand rapidly through dealers, even in three-tier city</li> <li>Dealers contain a great number of real store networks</li> </ul>
<b>Direct selling and vendor model:</b> Company to customer  E.g.: Tesla & NIO	<p>OEMs/Agent(real or online)</p> <p>Customers</p> <p>Transaction &amp; orders</p>	<ul style="list-style-type: none"> <li>OEMs have strong bargaining power since they contact customers directly</li> <li>Save discounts from dealer</li> </ul>	<ul style="list-style-type: none"> <li>OEMs need to spend extra investment in training employees for selling and marketing</li> </ul>	<ul style="list-style-type: none"> <li>The expanding ability is weak in direct selling</li> <li>Usually, OEMs need to locate their real store in a big shopping malls at first-tier city, in order to attract customers</li> <li>Rent cost is huge</li> </ul>

# The Future Trend for Global OEMs

----more concentrated business model, providing more diversified service, smart technology →

Direct selling and vendor model are adopted by more companies;  
“OEMs’ idea with the core of services”;  
“Market size may be changed”.

## Direct-selling and vendor model improve OEMs competitiveness

### Direct selling + vendor model become popular:

- Tesla’s success prompt utilization of direct selling, especially for new electric vehicle brands.
- Direct selling helps firm contact customers directly, better locating their customer location and then increase trade success rate
- Vendor model, especially the third internet platform, helps firm expanding their influence on the internet in a fast way.

➤ **For those conventional fueled vehicle OEMs who takes dealership as their main business model, direct selling and vendor model may become their better choice.**

## The vehicle becomes the evolvable smart product, which is determined by software”

- Under the joint promotion of intelligence and the Internet of vehicles, the car is determined as an intelligence space. All the services and riding ability can be updated on time.”

## The market size may be widened by including more after-sale services

- After the vehicle has been upgraded to a “smart” space, in-car service can connect with other around services.
- Market core changes from “vehicle production” to “vehicle + human”
- More after-sale services will be included in the service scale.



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- Primary research
- Company positioning analysis
- Business model analysis
- SWOT analysis



03

## BUSINESS STRATEGY



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## APPENDIX



# Customer Profile: Gen Z (23-28)

---More adopted to new digital services and online platform services

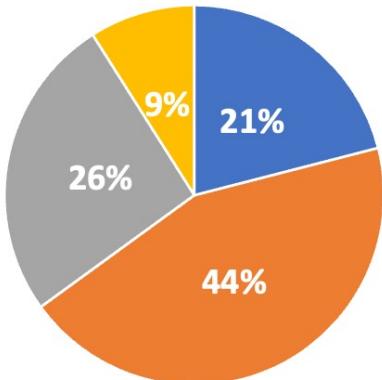
**1** Most young customers just step into society (work experience less than 5 years)



- Income level: Lower middle
- Digital natives: Consumption preference influenced by online information

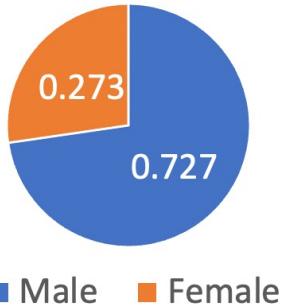
**4** Most young customers need financial support from family

Most Gen Z are involved in family car buying decisions

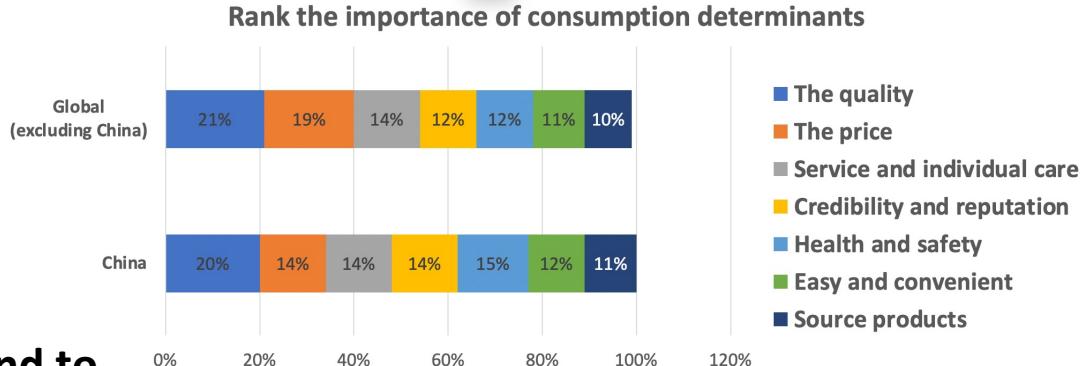


- Fully Determined
- Role in Major Decisions
- Role in Partial Decisions
- Not Involved

**2** Male potential buyer is much more than female

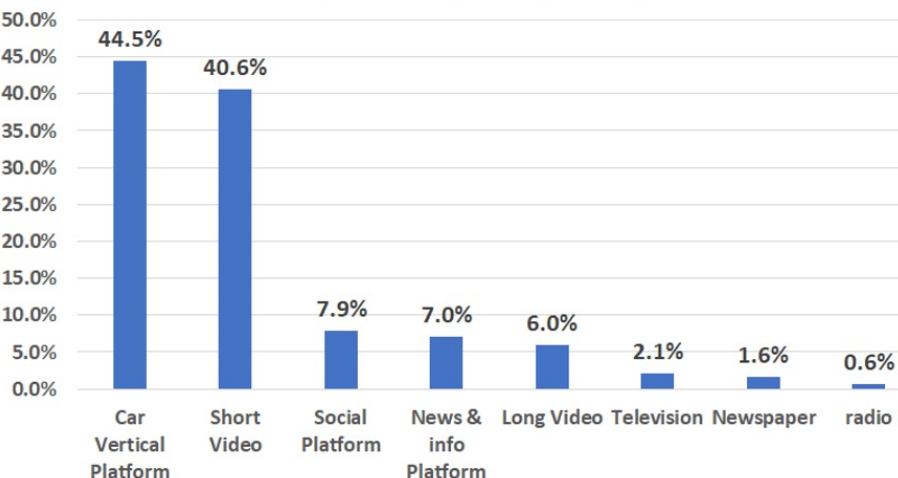


**3** Quality, price and service and individual care are the Top 3 determinants

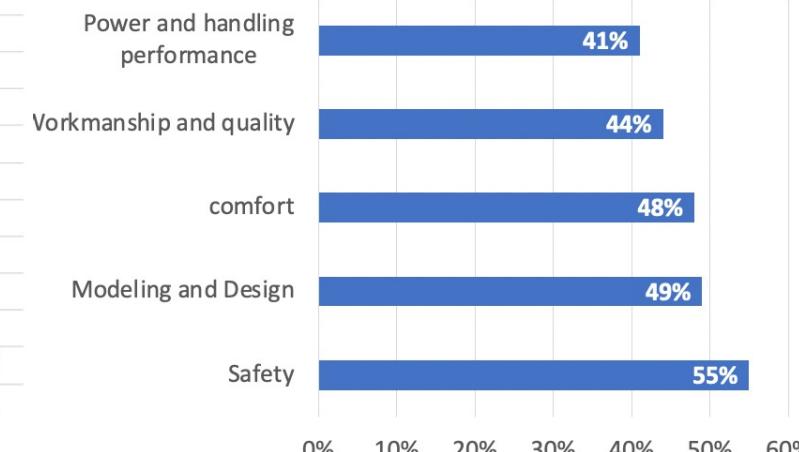


**5** Young customers tend to receive information from online platform and videos

Main media sources of information acquisition of interested car buyers in China(18~24years old)



Gen Z's Top 5 considerations when buying a car



# Customer Profile: Gen Y (80s – 90s)

---Traditional customers prefer services based on their basic needs

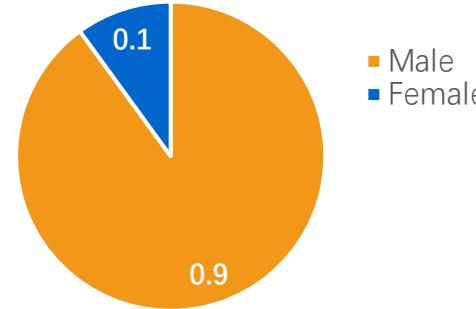
1

Most Gen Y customers have stable job



2

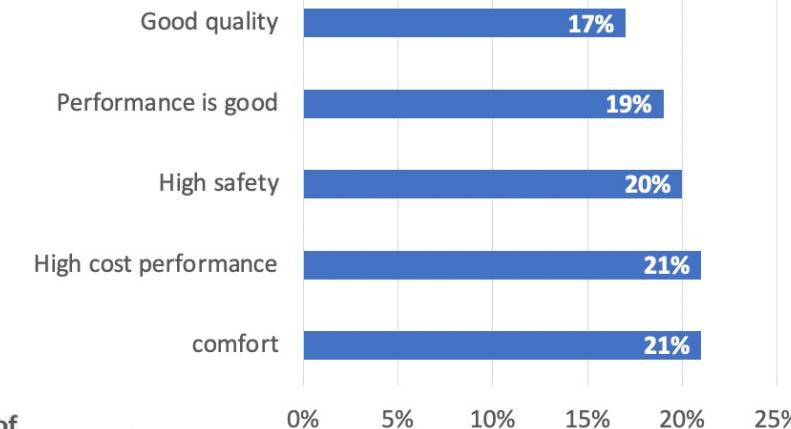
Male potential buyer is much more than female



3

Comfort, high cost performance and safety is Y generation customers' Top 3 consideration

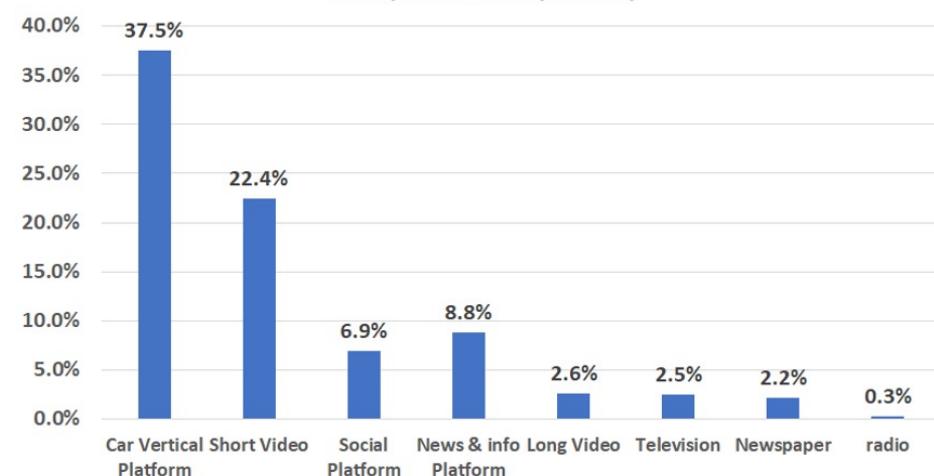
Gen Y's Top 5 considerations when buying a car



4

Gen Y customers research information on online platform and short videos

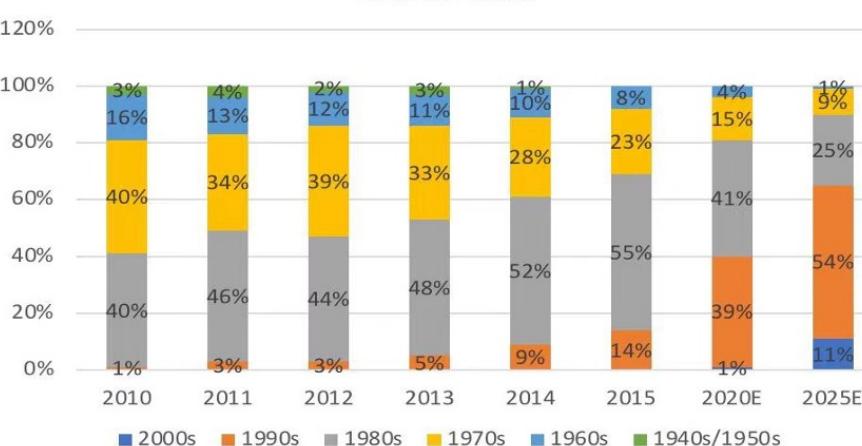
Main media sources of information acquisition of interested car buyers in China (more than 24 years old)



5

Generation Z will replace Gen Y as the main customer in the market

The Change of the Age Distribution and Future Trend of New Car Users



Compared to Gen Y, Gen Z can better accept Xpeng's future development in the innovation of mobility and ecological space.

Data source: Ocean Engine

# PRIMARY RESEARCH on People's attitude

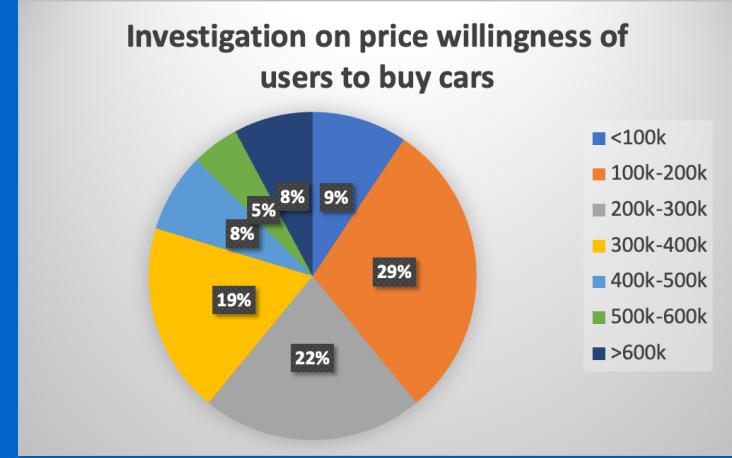
We have sent out 100 questionnaires to investigate young people's perspective on buying cars. Here are the key conclusion based on the data.

1. Safety, Comfort, Supporting Service, appearance and Price are five biggest consideration when buying cars (Factors scoring over 7.5)

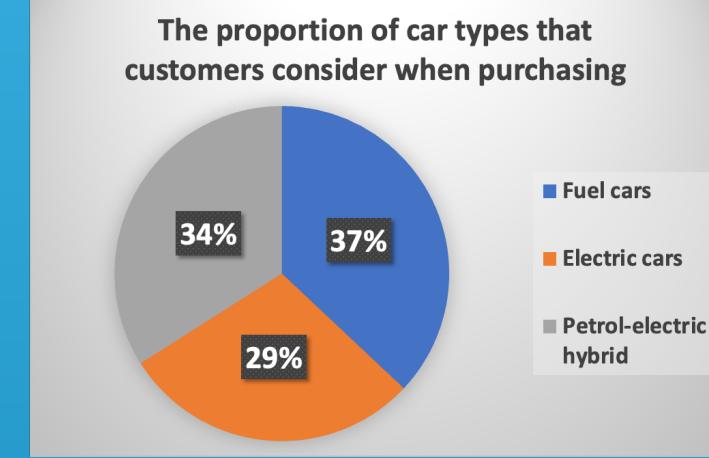


**Conclusion of the questionnaire:** Continue researching on Safety, Comfort and supporting service, and appearance with relationship to price.

2. Most of people would consider the price interval 100k - 200k, 200k - 300k and 300k -400k which takes 70 percent altogether. The price interval is what Xpeng set up, which means the market potential is really large.



3. Young customers tend to buy Alternative fuel vehicles rather than fuel vehicles, as the data indicates that only 21% of Z-generation would buy fuel cars, while 79% of them have the tendency on purchasing an electric car or petrol-electric hybrid.



# Company Positioning Analysis:

Modeling and Qualifying Marketing by the car ranking and Questionnaires Data

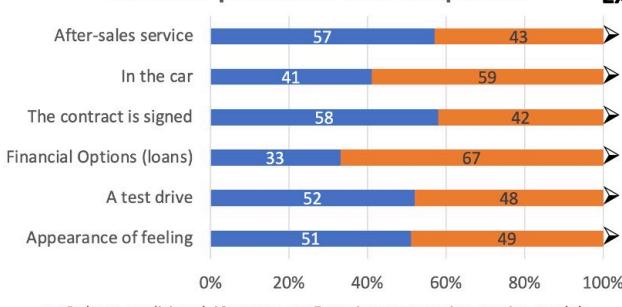
- Service(user experience) is becoming significantly important for the future auto market.

Conclusion from the graphs:

Safety and appearance marketing are too competitive to position on most price interval, however, there are not enough data indicating most of cases for service coefficient.

Data shows about 50% of customers prefer advanced service model.

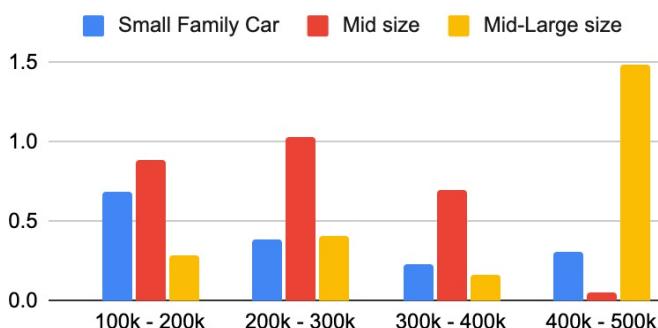
Customer preference level comparison



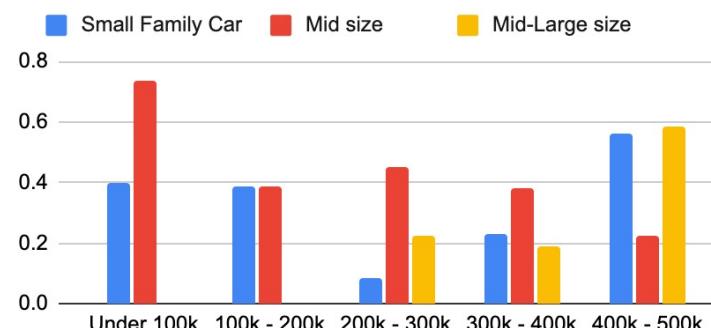
Examples of new service pattern

- The nearest service outlet
- Send the car to the door, other nearest authorized outlets
- Sign up online, sign up in other physical stores
- Online loans, diversified financial services
- Send car door, test drive center
- Car delivery, sales centers, online research, pop-up stores

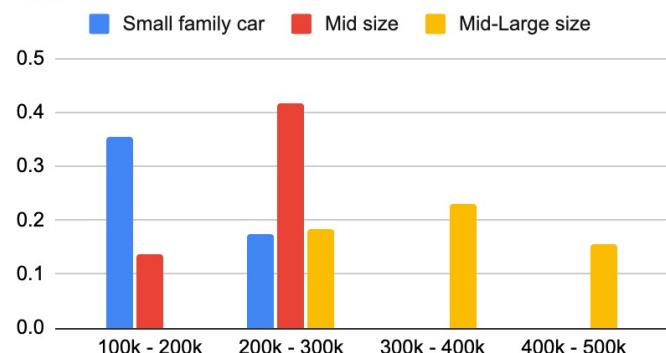
Comfort Coefficient for fuel vehicle



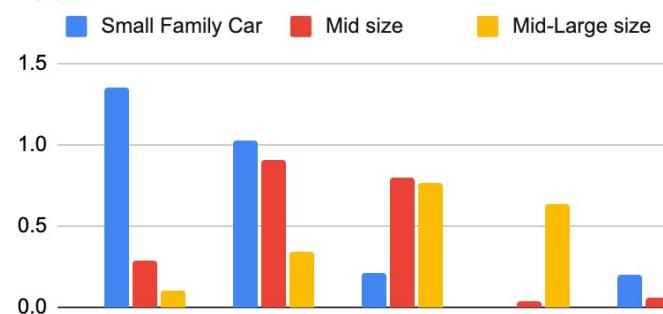
Comfort Coefficient for electrical vehicle



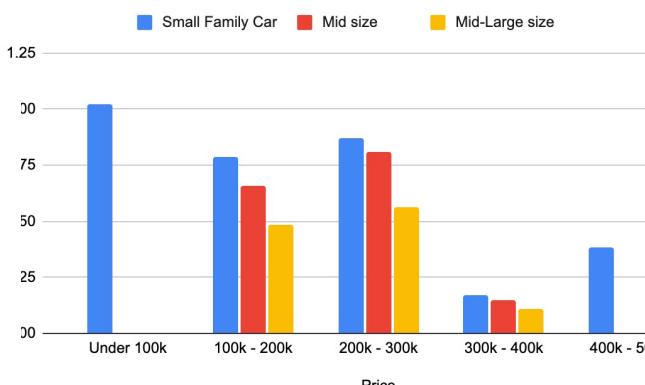
Appearance Coefficient for electrical vehicle



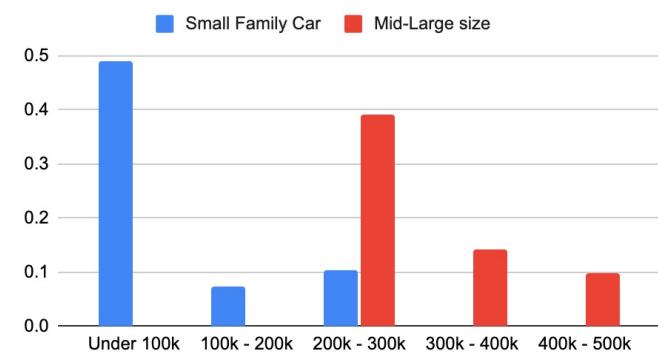
Appearance Coefficient for fuel vehicle



Service Coefficient for fuel vehicle



Service Coefficient for electrical vehicle



# Business Model Analysis --- XPeng and NIO

## Mixed business model direct selling + online vendor model+ dealership:

**Online vendor model:** provide more internet exposure, and locate potential customers according to data algorithm

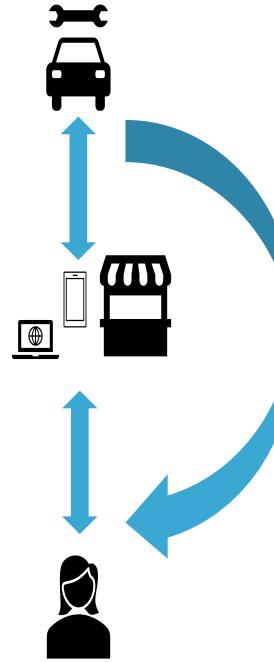
- Dealership: work as the 3S store, with the elimination of sales.
- Direct selling: set up an online store, locate real store in city center
- **Provide more on-time and high-quality after-sale services, improve customers experience:** Since the real direct-sale store always locate in city center and its expansion speed is slow. Their after-sale service is overdue and low in quality. After outsourcing this service to dealers, customer's demand can be satisfied.
- **Cooperating vendor model with the third online platform such as Tik Tok, and Taobao accord with the digitalization of the young.**

## XPeng's business model:

OEMs

Sales channels

Customers



Dealers' main service here is providing after-sale services.

Selling still is the mission of direct selling stores.

## Competitors' business model

### NIO's business model:

**Marketing mode:** directing selling, aim in producing users community

- **NIO House location:** shopping mall in first tier city center.
- **Brand strategy:** develop NIO app to advertise, products marketing, service appointment.
- **Company positioning :** a service company
- **Services includes:** Lifetime warranty, wash, battery replacement
- **Target population:** early adopters of electric cars

## S Strengths for XPeng

- ✓ Independent research and development of full-stack autonomous driving technology.
- ✓ Intelligent Technology is in a leading position in the Automobile industry.
- ✓ Its Omnichannel consumption model not only standardizing the price, but also accelerating the marketing expansion.
- ✓ It gets started on its ecosystem.

## O Opportunities for XPeng

- **Large Marketing:**  
Growth in Chinese Electric vehicle market are large
- **Technology:**  
Its full-stack autonomous driving system and intelligent technology will simplify the expansion of marketing on Mobility.
- **Customer relationship:**  
Its advanced consumption model makes Xpeng connect directly with customers, which helps with developing the customer relationship in the future.

## W Weaknesses for XPeng

- The company is still under deficit but researching and marketing costs are high.
- Haven't had products such as Tesla model 3, BYD Tang which monthly sales over 10000.

## T Threatens for XPeng

- The new energy market is facing the competitive threat from the new forces of automobile manufacturing and traditional automobile enterprises.
- In the future, the development of the new energy vehicle market may be less than expected.
- Slow charging and difficult charging are still the problem of tram penetration.
- As competition intensifies, tesla catfish effect emerges.

# Company Future Positioning

Recommendation on future positioning: Investing on **Mobility and ecosystem** to enhance **user experience** and lead the future marketing trend.

## REASONS:

### ➤ Customer:

1. User experience and service are becoming the third important factors when users purchasing
2. People are willing to
3. Alternatives alter driver lifestyles. Also, 40% of those surveyed were very interested in new multi-modal integration that would allow them to move seamlessly among different modes of transportation.
4. By investigation of Accenture, compared with other countries, Chinese consumers are more receptive to new business models and new ways of purchasing products and services.

### ➤ Company:

1. Intelligence technology in a leading position.
2. Company and Customers are in direct connection by its advanced Consumption model.



Importance, %

	Unimportant	Important, but unwilling to pay	Important, willing to pay	Avg WTP <sup>1</sup> , RMB
In-car payment	52	10	38	2800
After-sales services e.g. on-board diagnostics, maintenance reservation	54	11	35	2600
Voice recognition	56	13	32	1800
Seamless social app integration	58	11	32	1800
Advanced key fob	61	11	28	2600
Smart parking system i.e. car park real-time reservation	65	9	26	2500
Facial recognition	69	10	21	2100
Advanced navigation	73	8	19	2800
Mobile remote control (air con, music)	76	16	9	2500

## Strategy on Mobility and Ecosystem

### Mobility:

Increase the usage of our service on daily living travel

- ◆ Automotive driving automotive configuration to technologically maximize the consumer usages.
- ◆ Use Car-sharing and short-time rental to diversify mobility

### Ecosystem:

Integrate car into every part of daily life – mobility as a service.

- ◆ Internet of vehicles technology will make cars and people more closely connected.
- ◆ Lateral collaboration between enterprises will create a complete ecosystem.



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## BUSINESS STRATEGY



- Mobility
- Strategy for mobility
- Automotive Ecosystem
- Brand positioning
- Future brand strategy



04

## APPENDIX



# Strategy on Mobility

---Increase the usage of XPeng by technologically improving user's experience and short time rental



## Automotive driving with BIOMETRIC:

- ✓ Biometric identification of human behavior, with learning and memory functions, according to personal habits to provide highly customize services.
- ✓ Under automatic driving, inform people when identifying possible risk.
- ✓ Or in the case of autopilot, braking measures will be taken to minimize the damage of the accident.
- ✓ Using biometric and intelligent technology to analyze user's data to offer the best automobile experience.

## Go-to-market model:

### WHAT:

- We provide a automatic configuration system to analyze user's behaviour and offer personalized music, driving mode, seat comfort level.

### Recommendation of Technology:

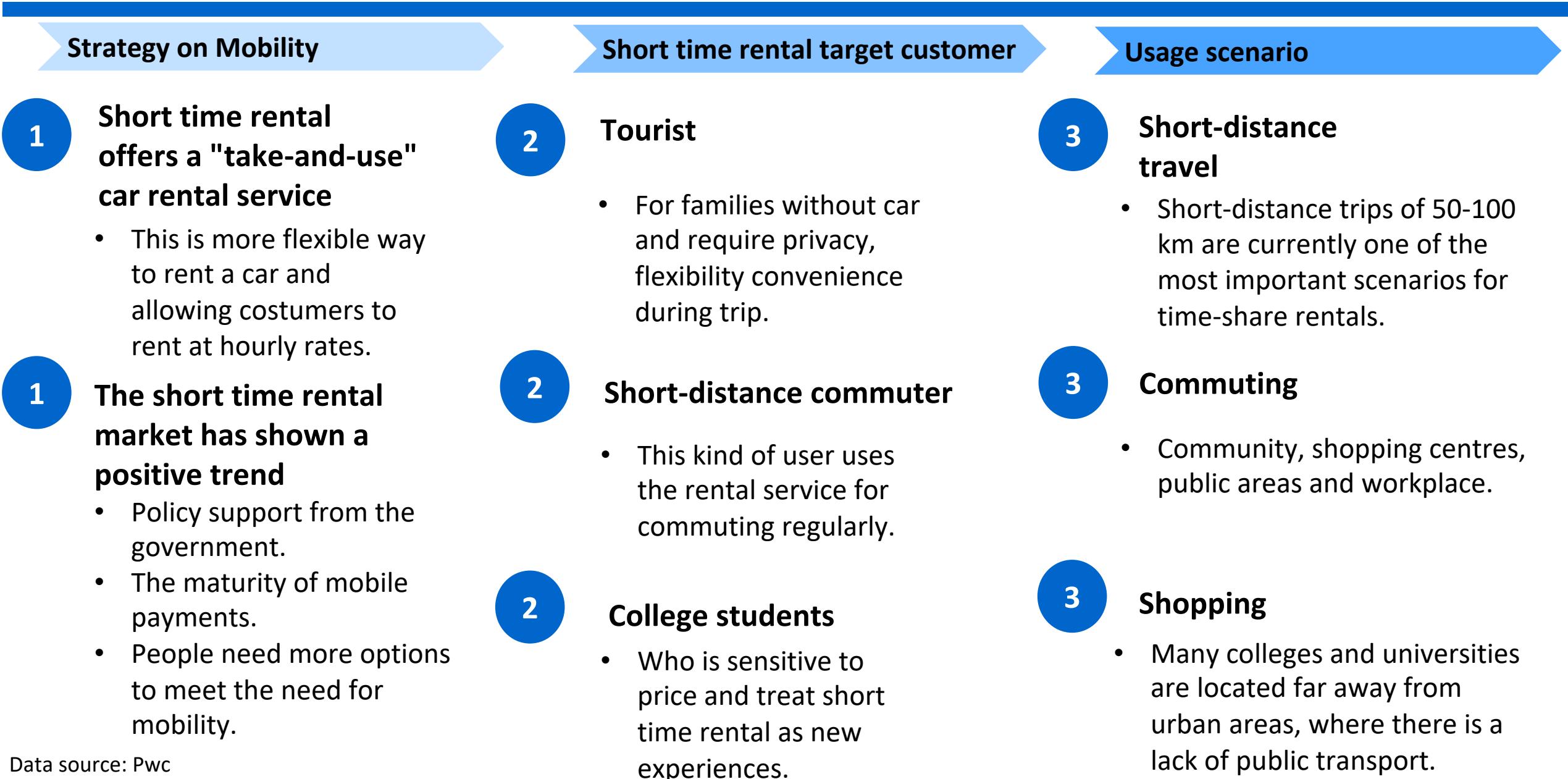
- Cooperate with top biometric company such as Hisign technology with its advanced automatic driving technology.

### Marketing and Sales plan:

- Charged optionally to customers, it is recommended to design a Sales-combo option with automatic driving as data shows 60%—70% of consumers are open to paying for autonomous driving after initial car purchase.

	% of consumers think it is important	% of consumers willing to pay	Amount willing to pay per feature, RMB	Top features
ADAS (L2)		88%	10%-35% 2200 - 4100	Collision avoidance / pre-collision system Adaptive cruise control (ACC) Lane keeping assist system
Connectivity		87%	10%-40% 1700 - 2800	In-car payment After-sales services e.g. on board diagnostics, maintenance reservation Voice recognition and vehicle-human interaction
Autonomous driving (L2.5/3)		80%	15%-30% 3800 - 4900	Autonomous parking after driver leaves Autonomous distance-keeping in traffic jams Autonomous driving on expressways

# Short time rental is a suggested strategy as it satisfies customers' need for mobility



# Technology Will Reshape the Automotive Ecosystem in the Future

- ◆ With tech companies moving into cars, they develop software that allows cars to evolve into “computers on wheels”, creating a complex, laterally constructed automotive ecosystem in the future.



## OPPORTUNITIES ---- Internet

### ➤ Connectivity (Internet of Everything):

- I. (*Vehicle Identity Standard*) Cars will no longer be confined to the road and play a greater role in everyday life. OEMs can cooperate with Alipay or WeChat, so people don't need to use mobile phones or cash to pay in the future(e.g. ETC payment on expressway ). People can pay by “scan cars” to meet daily needs.
- II. The smart home is connected to the smart car. Every day when the car stops at home after work, when the distance between the car and the home is less than 1km, the lights and air conditioner in the home will be turned on in advance.
- III. Cars will also be connected to each other and also to the infrastructure around them; e.g. connected cars will improve traffic by uploading data about vehicle movements.

### ➤ Lateral Construction (Multi-industry cooperation):

- I. It is impossible for a single OEM to integrate the upper, middle and lower reaches. For example, XPeng might build home system together with Mi smart home, and vehicle payment system together with Alipay or WeChat. The future will be a win-win situation.



## RISKS --- Data

### ➤ Company (Funds & Collaboration):

- I. Insufficient funds.
- II. It's hard for companies in different industries to get a consensus

### ➤ Personal (Data leakage):

- I. Personal, driving and in-car camera data are all at risk of leakage.
- II. Due to the remote control of Internet vehicles, if the vehicle control data is changed, personal safety will be threatened.

### ➤ Society (Security):

- I. Car companies will be able to observe vehicle driving data, the security of classified national locations and workplaces will be threatened.
- II. Remote control systems of vehicles could become tools of criminals.



## MITIGATION --- Trust

- Companies need to guarantee not to leak data and pay a bond to the government, the **government** should legislate to protect customers' rights; **customers** should trust car companies.
- Three parties agree to create a complete automotive ecosystem.

# Go To Market Model

Determined to use behavioural Internet technology, Internet of things, intelligent sensors to achieve real-time predictive analysis, inform users of the real-time situation to provide more users to make decisions, strengthen the indispensable car in the automotive ecological chain.

- |                                 |  |
|---------------------------------|--|
| Target audience<br>And location | <ul style="list-style-type: none"><li>Young people: 20-28 white collar, annual wage at 200,000. first-tier city: Shenzhen...</li><li>The acceptance rate of smart technology is high in this generation. More affordable customers in these cities</li></ul>         |
| Product or service              | <ul style="list-style-type: none"><li>The smart vehicle contains diversified travelling space, high mobility, smart online platforms which connect to other online services</li><li>Industry future trends, enter smart vehicle market as fast as possible</li></ul> |
| Market and sales plan           | <ul style="list-style-type: none"><li>Advertise in third online platforms, cooperate with influencers</li><li>Online marketing accord with young people's characteristics</li></ul>  |

## Brand Positioning

- A car factory dedicated to creating intelligent ecological circle and multi-functional mobile space

- |      |   |
|------|---|
| When | <ul style="list-style-type: none"><li>2022 Q3: develop mobile service platform and put into service</li><li>2022-2023: contact to each manufacturers that contains in firms ecological cycle, order future cooperation plan</li></ul> |
|------|---|

**2 billion RMB**

Estimated financial investment needed

**20+**

Ecological experience store will finish and locate in first tier city

**1,000k+**

Estimated volume after the month that new innovative vehicles enter the market

# Future Brand Strategy : build brand image on user experience



## Brand Goal:

- ✓ Use science and technology to create a enjoyable travel experience with XPeng.



## Vision:

- ✓ Future automatic technology leader
- ✓ Offer best user experience



## Value:

- ✓ Simplicity, efficiency, quality, respect, integrity, common interests and shared success



## Belief:

- ✓ Technology is bound to transform the future mobility.



## Media:

- Organize Charitable activities with propaganda by media to build a corporate image.



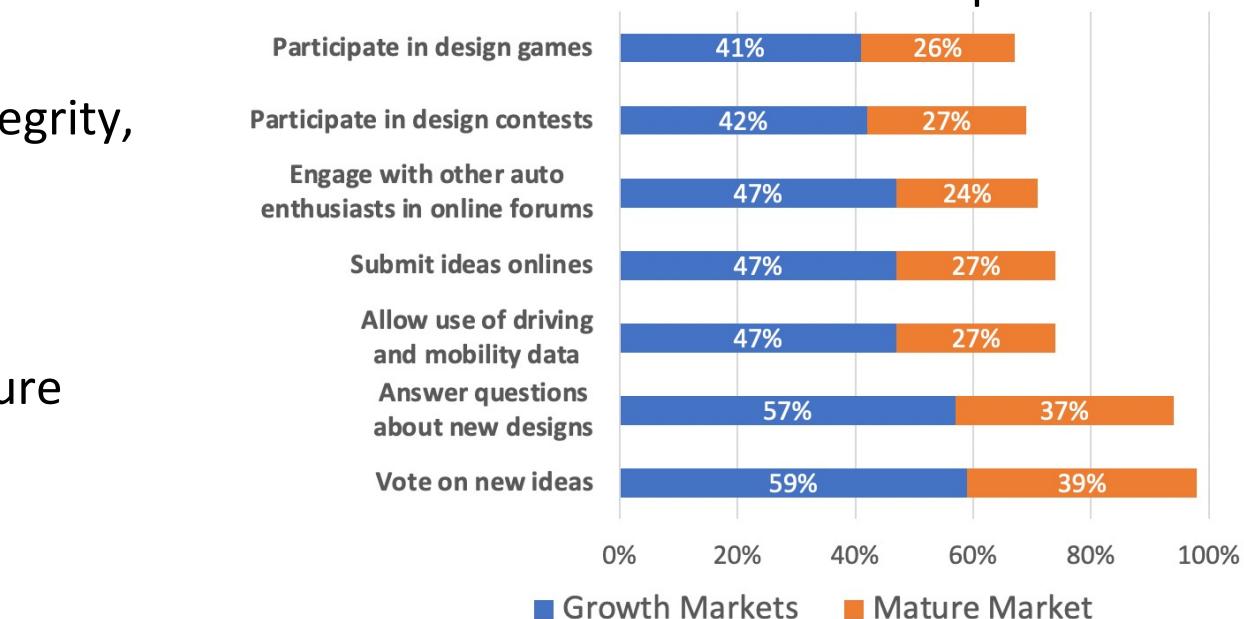
## Products:

- Focus on the products and use the ecosystem platform as a social forum.



## Customers:

- Invite customer to participate on future products design and ideas to build closer relationship with customers.





# Agenda



04

APPENDIX

# Appendix 1

Quantify the marketing situation to distinguish the potential of entering the market: Comfort, Appearance, Safety and service which come from the 5 highest score terms from the questionnaire

Formula on finding appearance, comfort and marketing coefficient for fuel cars and electrical cars:

$$M = PC \frac{Q \sum_{i=1}^n b_i}{5n}, \text{ where } n_{max} = 10$$

**M:** M evaluates the potential of entering a market, the smaller the M is, the more potential the market will be.

**P:** Price Coefficient. P is dependent on the data from the questionnaires, if the price interval is larger than the average, then P would be smaller than 1, which would make the result slightly smaller. If the price interval is smaller than the average, then P would be larger than 1, which would make the result slightly larger. The piecewise function is used to model P

**C:** Competitor coefficient. C is dependent on the number of competitors. We assume less competitor will result in larger potential entering the market.

**bi:** Company influence coefficient. bi is dependent on the ranking of the company in selling. x on the b formula denotes the ranking of a certain company.

**Q:** Customer Attitude Coefficient. C is recorded by our questionnaire data, which asks potential customers about their attitude on 8 different factors. The questionnaire data is provided below.

n: Number of Company

$$b = \begin{cases} 10 & x \leq 10 \\ 8 & 10 \leq x \leq 30 \\ 6 & 30 \leq x \leq 50 \\ 4 & 50 \leq x \leq 70 \\ 2 & 70 \leq x \leq 100 \\ 1 & otherwise \end{cases}$$

, where x indicates the marketing of ranking of a company from 2016 to 2021

$$Q = \begin{cases} 1 - \frac{|c_a - \tilde{c}|}{\tilde{c}} & c_a > \tilde{c} \\ 1 + \frac{|c_a - \tilde{c}|}{\tilde{c}} & c_a \leq \tilde{c} \end{cases}$$

, where c is the value of people's attitude from the questionnaire

$$C = \begin{cases} 0.3 & n \leq 3 \\ 0.5 & 3 < n \leq 6 \\ 0.7 & 6 < n \leq 10 \\ 1 & otherwise \end{cases}$$

$$P = \begin{cases} 1 - \frac{p_a}{64} & p_a/64 > 1/6 \\ 1 + \frac{p_a}{64} & p_a/64 \leq 1/6 \end{cases}$$

, where p = (6, 19, 14, 12, 5, 3, 5)

# Appendix 2

## Python programming to represent the mathematical marketing model defined in Appendix 1

```
##Define Customer Coefficient function
def CustomerCoeff(x):
    c = [6.31,7.53,7.86,8.38,6.48,8.05,5.55,6.6]
    if x > Ave_c:
        Q = 1 - abs(x-Ave_c)/Ave_c
    else:
        Q = 1 + abs(x-Ave_c)/Ave_c
    return Q

def PriceCoeff(x):
    p = (6, 19, 14, 12, 5, 3, 5)
    if x/sum(p) > 1/6:
        return 1 - x/64.0
    else:
        return 1 + x/64.0

#Define Company Competitor Coefficient function
def CompanyCompetitorCoeff(x):
    if len(x) <= 3:
        C = 0.3
    elif len(x) <= 6 and len(x) >3:
        C = 0.5
    elif len(x) < 10 and len(x) >6:
        C = 0.7
    else:
        C = 1
    sumb = 0

    for i in x:
        if(i <= 10):
            b = 10
        elif(i >= 10 and i <= 30):
            b = 8
        elif(i >= 30 and i <= 50):
            b = 6
        elif(i >= 50 and i <= 70):
            b = 4
        elif(i >= 70 and i <= 100):
            b = 2
        else:
            b = 1
        sumb += b
    n = len(x)
    return C*sumb/(5*n)

def mktCoeff(Customer,Company,PriceCoe):
    return CustomerCoeff(Customer)*CompanyCompetitorCoeff(Company)*PriceCoeff(PriceCoe)

def mktCoeffSafety(Customer,Company):
    return CustomerCoeff(Customer)*CompanyCompetitorCoeff(Company)
```

# Appendix 3

## Applying the mathematical marketing model to calculate comfort coefficients for different price intervals and different sizes of cars

Comfort Level Coefficient for Electrical Cars:

Price (R.M.B. ¥)	Small Family Car	Mid size Car	Mid-Large size Car
Under 100k	0.398	0.738	No Datas
100k - 200k	0.389	0.389	No Datas
200k - 300k	0.085	0.451	0.223
300k - 400k	0.232	0.380	0.190
400k - 500k	0.560	0.224	0.583

The file below records the ranking of cars we found, which were used to calculate the coefficients

<https://docs.google.com/spreadsheets/d/1w8vGG-sZOq30TiMrLNKYC6bEJ6qapo0Yek5FsPISv2g/edit?usp=sharing>

Comfort Level Coefficient for fuel Cars:

Price (R.M.B. ¥)	Small Family Car	Mid size Car	Mid-Large size Car
Under 100k	1.287	0.341	No data
100k - 200k	0.682	0.888	0.292
200k - 300k	0.389	1.028	0.406
300k - 400k	0.232	0.701	0.169
400k - 500k	0.308	0.056	1.493

Smallest coefficients are labelled.

# Appendix 4

## Applying the mathematical marketing model to calculate appearance and service level coefficients for different price intervals and different sizes of cars

**Appearance Level Coefficient for fuel Cars:**

Price (R.M.B. ¥)	Small Family Car	Mid size Car	Mid-Large size Car
<b>Under 100k</b>	1.347	0.293	No data
<b>100k - 200k</b>	1.029	0.903	0.341
<b>200k - 300k</b>	0.209	0.802	0.763
<b>300k - 400k</b>	No data	0.043	0.638
<b>400k - 500k</b>	0.201	0.058	1.042

**Service Level Coefficient for fuel Cars:**

Price (R.M.B. ¥)	Small Family Car	Mid size Car	Mid-Large size Car
<b>Under 100k</b>	<b>1.024</b>	<b>No data</b>	<b>No data</b>
<b>100k - 200k</b>	<b>0.784</b>	<b>0.659</b>	<b>0.483</b>
<b>200k - 300k</b>	<b>0.871</b>	<b>0.810</b>	<b>0.561</b>
<b>300k - 400k</b>	<b>0.173</b>	<b>0.147</b>	<b>0.109</b>
<b>400k - 500k</b>	<b>0.381</b>	<b>No data</b>	<b>No data</b>

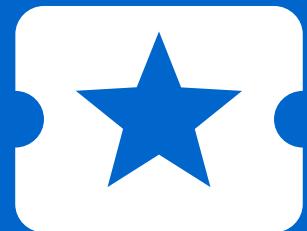
**Appearance Level Coefficient for electrical Cars:**

Price (R.M.B. ¥)	Small Family Car	Mid size Car	Mid-Large size Car
<b>Under 100k</b>	No data	No data	No data
<b>100k - 200k</b>	0.355	0.138	No data
<b>200k - 300k</b>	0.174	0.418	0.185
<b>300k - 400k</b>	No Data	No data	0.231
<b>400k - 500k</b>	No Data	No data	0.156

**Service Level Coefficient for electrical Cars:**

Price (R.M.B. ¥)	Small Family Car	Mid size Car	Mid-Large size Car
<b>Under 100k</b>	<b>0.491</b>	<b>No data</b>	<b>No data</b>
<b>100k - 200k</b>	<b>0.073</b>	<b>0.056</b>	<b>No data</b>
<b>200k - 300k</b>	<b>0.104</b>	<b>0.203</b>	<b>0.391</b>
<b>300k - 400k</b>	<b>No Data</b>	<b>No data</b>	<b>0.141</b>
<b>400k - 500k</b>	<b>No Data</b>	<b>No data</b>	<b>0.098</b>

# THANK YOU



WARWICK CONSULTANT GROUP