Sustainable and shared mobility: the Chinese way

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Background

- The need for shared mobility in China is high
  - In China, car ownership rate is still very low, e.g. when compared to **Denmark**.
    - In 2015, the car density in Denmark was **497** passenger cars per 1,000 people.
    - In comparison, Chinese has a car density of **118** cars per 1,000 people.
  - We cannot afford to more vehicles on the road
    - Although car density in China was only about a fifth of that in Germany, it does not mean that Chinese roads were not jammed.
      - According to the 2017 Tom Traffic Index, **10 of the 25** most congested cities in the world were in mainland China: Chongqing, Chengdu, Beijing, Changsha, Guangzhou, Shenzhen, Hangzhou, Shijiazhuang, Shanghai and Tianjin.

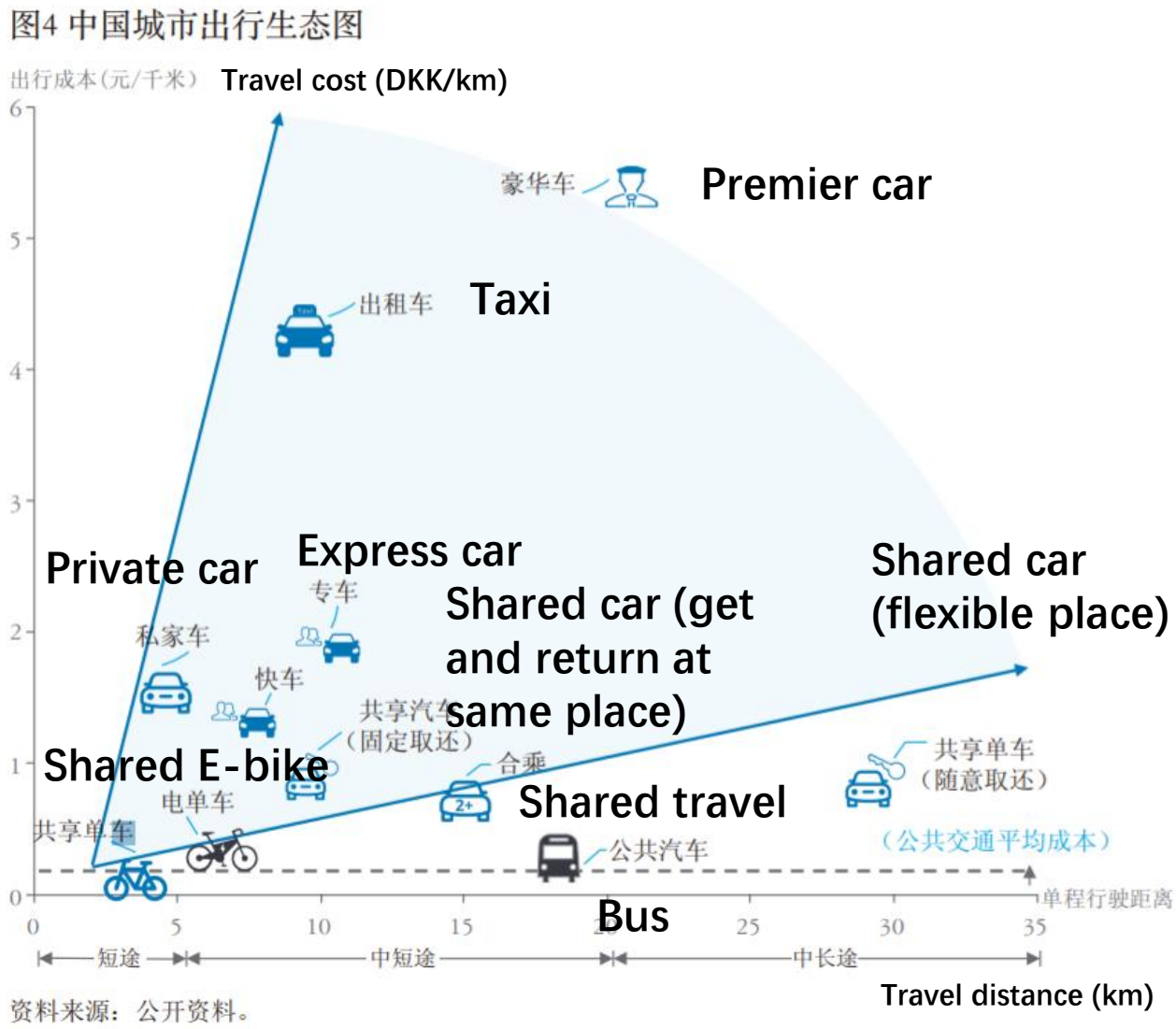
Solutions

- In order to avoid a collapse of the infrastructure system, the Chinese government promotes the development of a low carbon and “green” transport sector. This includes
  - the massive expansion of public transport infrastructure,
  - the boost of intelligent mobility systems
  - A focus on CASE (Connected-Autonomous-Shared-Electric).
    - In particular **shared mobility** is a key to ensure more sustainable transportation systems.

Shared mobility

- Over the past years China has become a trailblazer in new mobility services, such as car-sharing and bike-sharing
- While most people in Europe and the US have heard about Uber and Car2Go, only a few people outside of China heard of **Didi Chuxing or GoFun**. In fact, however, Didi Chuxing, China`s version of Uber (Didi acquired Uber China in 2016), has about **6 times more** users than Uber.

China urban mobility landscape



Changes in the customer's perception of the car as a status symbol

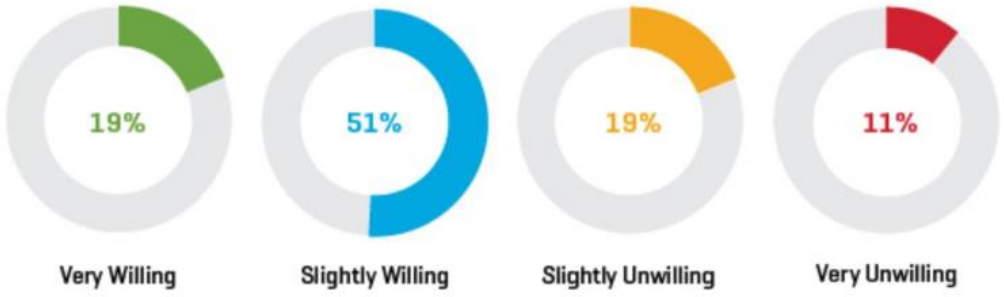


Figure 3: Willingness to give up car ownership in China [Source: JD Power]

- In Beijing, **the average daily usage frequency of each shared car reaches 5.1, and the average driving distance is 20 kilometers**, which is more than **4 times** that of ordinary private cars.
- In the first-tier cities of Beijing, Shanghai, Shenzhen and Guangzhou, **the average parking space saved by shared cars** is 330,000 square meters per day, equivalent to 46 standard football fields.
- Since China's shared vehicles currently use mainly small-displacement vehicles and new energy vehicles, their **energy consumption is 38% lower than** the industry average. A shared car **saves 700L of gasoline per year and reduce carbon dioxide emissions by 1.7 tons per year**

Reasons for the growing role of car-sharing in China

- **1. Strong government support**
  - In February 2016, the Shanghai local government set the targets for car-sharing to have 6,000 service spots, 20,000 **new energy vehicles (NEV)** and 30,000 charging piles by 2020 (**infrastructure**).
  - Further, **free parking space** was provided to car-sharing operators
  - Subsidies were granted, e.g. Shanghai`s Jiading district is subsidizing car-sharing with gives **EUR 5,180 per NEV per year**.
  - In June 2017, the National Development and Reform Commission (NDRC) released a guideline for the **development and promotion of the sharing economy, which is expected to account for more than 10 percent of China`s GDP by 2020**.

- **2. Citizens needs**
  - Yet insufficient public transport
    - The public transportation systems in China are still insufficient and often cannot meet the demand, resulting in overloaded systems and low comfort levels.

2. Citizen needs (cont.)

- **Limited availability of license plates**
  - In many Chinese cities, license plates are limited.
    - In Shenzhen only **one in 300 people** with driving licenses can get license plates needed to purchase vehicles.
    - In Shanghai`s plate auction system only 11,388 out of 244,868 applicants got a plate for an average price of about EUR 11,400.
- **Driving restrictions**
  - In cities such as Hangzhou or Beijing, due to traffic control, congestion and air quality control stringent traffic restriction policies are in place. In Beijing, automobiles with end numbers 1 or 6, 2 or 7, 3 or 8, 4 or 9 and 5 or 0 respectively from Monday to Friday are required to refrain from driving

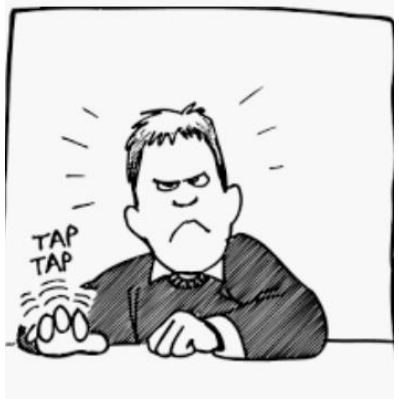
Number plate lottery

2. Citizen needs (cont.)

- **High costs of owning a car**
  - Compared to owning a car, no purchase and maintenance costs, low service costs (often with discounts cheaper than taxi), insurance and fuel often included, no parking fees.
- **Limited taxi availability**
  - In particular in rush hours, taxis are often not available and at rail stations or airports there are long queues.

Current challenges for car-sharing market in China

- **1. High requirements of customers**
  - Little patience for non-availability
  - Limited availability of parking spaces also for shared vehicles
  - Need for high service-levels and seamless booking solutions



One platform for everything

- **2. Operational challenges for car-sharing companies**
- Local government requirements
  - Car-sharing operators have to fulfil governmental requirements such as acquiring operating licenses and specific certificates. Operators also have to provide infrastructure such as parking or charging infrastructure, which has a significant cost effect.
- High initial investment and after sales costs
  - The costs for fleet purchase, insurances, after sales maintenance but also car recycling are the major costs for operators. This is reinforced by a lack of synergies with players along the value chain. Further costs related to consumer malpractice such as damaged cars, incorrect parking or traffic violations are a burden for car-sharing operators.
- Low utilization rate
  - According to Roland Berger, **the breakeven point for operators is at a utilization rate of around 20 percent**, which cannot be reached by almost all of the current car-sharing operators, based on a calculation for a station-based scheme operator with a fleet of 200 cars in a Tier 1 city. The average industry was **at 12 percent** in 2016.
- Competition and pricing pressure
  - In China, transportation services are relatively cheap. The availability of alternative affordable and convenient mobility solutions (e.g. bike-sharing, ride hailing) results in a high pricing pressure, particularly on short distances.
  - In order to win over customers, some car-sharing operators, have started to offer services cheaper than bike-sharing (e.g. EUR 0.13 per kilometre plus EUR 0.01 per minute)

The future of car-sharing in China?

- China will have 600,000 shared vehicles on the road by 2025, which will also depend, how well car-sharing companies will manage the major disruptions and opportunities in the mobility markets:
- 1. Advanced technologies
  - Electro-mobility. today, more than 90 percent of the vehicles for car sharing business are NEVs. This has mainly three reasons:
    - 1. Minimize operational costs of the operators;
    - 2. Easy to obtain license plates for NEV car-sharing fleets in cities with license plate restrictions;
    - 3. Strengthening the perception by customers as “green” and sustainable mobility service providers

- Autonomous driving (AD)
  - Today **privately owned vehicles have a utilization rate of about 5 percent**. A free-floating system based car-sharing vehicle has a five **to six times higher utilization rate**. AD potentially can lead to a further increase of fleet efficiency.
  - The development and promotion of advanced technologies such as next generation wireless systems (5G), LIDAR (light detection and ranging) technology, charging infrastructure and artificial intelligence as the foundation of demand prediction, fleet management and fleet intelligence are the game changers towards next generation mobility.

- 2. Platform economy
  - Multi-level service platforms
    - In China, the most popular app for shared-mobility services is Didi Chuxing with about 450 million users and 21 million drivers in China. It operates a **ride-hailing app, as well as taxi, minibus and car/bike rental services**.
    - In China, Tencent`s mobile internet platform "**Wechat**", which started in 2011 as a mobile messaging app and became the ultimate allrounder app for more than 1bn active users worldwide, already offers such **All-In-One-App solutions**.
  - Highly **dynamic mobility ecosystems**
    - Companies such as Didi Chuxing (i.a. ride-hailing) or Meituan Dianping (i.a food delivery services), which are backed by the investment arms of Alibaba and/or Tencent, are stepping aggressively into the competitors business areas and start all-out price and investment proxy wars.

Conclusions

- China is a **trendsetter** at the forefront of shared-mobility services.
  - Even if technologies, such as **autonomous driving (AD)** could fundamentally revolutionize transport and mobility **in the medium to long run**, car-sharing will be an important and integrated part of the shared-mobility ecosystem in China in the near future.
  - Car-sharing operators will find ways to operate profitable business models by
    - **lowering** vehicle production-, operation- and maintenance **costs**
    - cutting-edge **technology**, innovative and inspiring products and business models tailored to different customer groups
    - high service standards, **commitments to environmental protection**
    - strong **cross-industry alliances and partnerships** are key to success.