AP 2021
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Recent Developments of ITS in China

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CONTENTS

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1 ITS Application Status in China

ETC

Cover more than 155,000 km expressway,

User more than **204 million**

24588 ETC gantry are constructed

City Traffic control center:

More than **400**

Smart phone navigation

more than **700 million** users

Train ticket sale via internet

more than 80%

Online car-hailing:

Service: more than **400** city

User: **360 million**

Peak Day Order : **27 million**

Buy goods online:

more than **710 billion** USD/year

Express package:

more than **80 billion** units in 2020

Support by smart logistics

Beidou Navigation Satellite System User:

More than : **500 million**

Car navigation sale more than

3.6 million/ year

Public Transport IC Card

430 million

Expressway ITS:

cover **155,000km**

National Highway Monitoring System

Cover **400,000 km**

Airplane ticket sale via internet

more than 85%

2 National Policy and Strategy @ ITS

-- Construction Outline for Powerful Nation of Transportation

--issued by CPC Central Committee and the State Council , Sep. of 2019

- National top-level design and vision planning for transportation in China
- Drawing goals and road map for China's transportation modernization in the next 15 to 30 years
- Building a new generation of ITS becomes the goal of national transportation development and construction
- The construction outline has been planned in regard of all aspects of ITS
  - Intelligent road, intelligent high-speed train, intelligent shipping
  - Cooperative-ITS (C-ITS)
  - MaaS
  - Personal Mobility
  - Smart and Green logistics
  - New technology development
    - ✓ Intelligent Connected Automated Vehicle(ICAV), AI and big-data in transport, etc.

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3. Cooperative-ITS

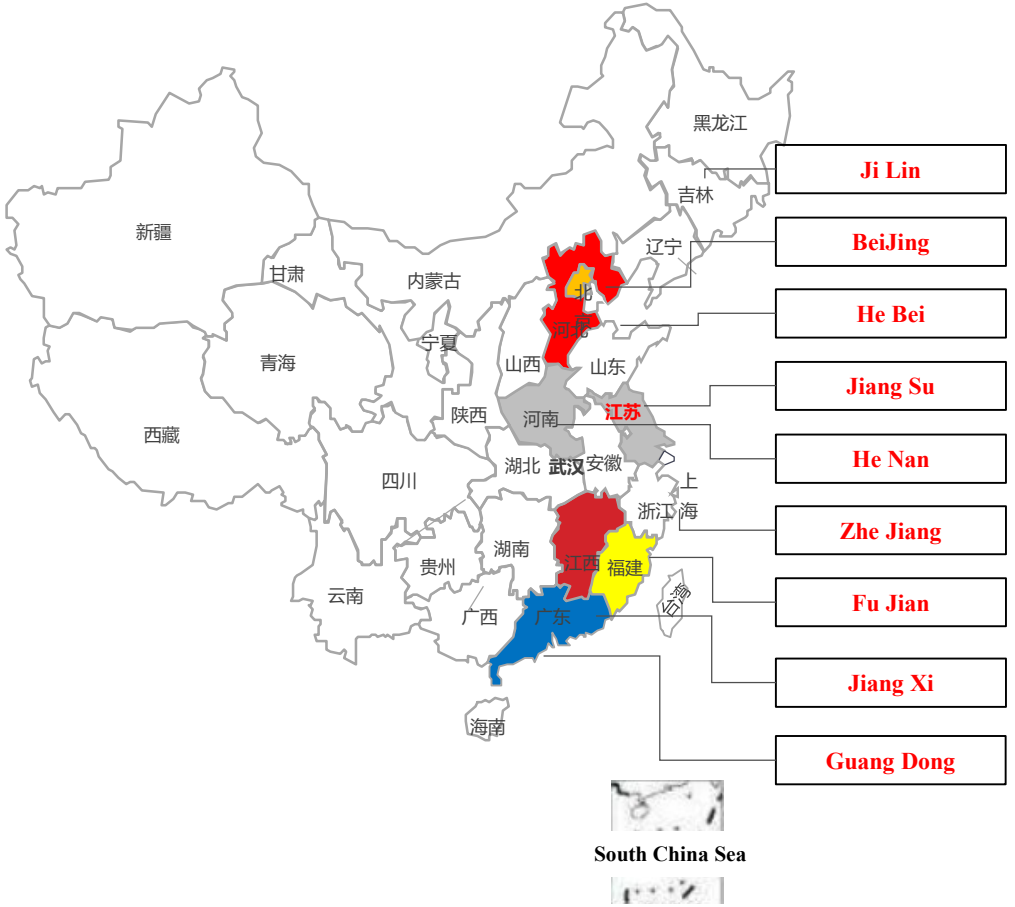
1. Smart Highway Demonstration

- **"The Smart Highway and New Generation of National Traffic Control Network Demonstration" Project**

  --supported by MOT， issued in February of 2018

- **Demonstration in 9 provinces and cities**
  - Beijing, Hebei, Jilin, Jiangsu, Zhejiang, Fujian, Jiangxi, Henan and Guangdong

- **Demonstration in 6 different topics:**
  - Expressway network management based on big data
  - Infrastructure Digitizing
  - Integrated service for Highway network via internet
  - Cooperative ITS
  - Beidou high-precision positioning
  - National Internet traffic control network Upgrade



Demonstration Areas

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3. Cooperative-ITS

2. National ETC System Upgrading Project

- **"National ETC System Upgrading" Project**

  --promoted by the State Council，from May to December in 2019

- **Main Task**
  - Remove the main toll station between provincial expressway networks
    - ✓ One ETC network in all expressways, cover 144,000 km
  - Set ETC gantries between expressway interchanges
    - ✓ The ETC gantry is responsible for charging the passing section and writing the starting point information of the next section
    - ✓ ETC gantry will also serve as the ITS station in future
- **By 1st Jan 2020,**
  - **487** Provincial Expressway Toll Stations removed
  - **24,588** ETC Gantries installed
  - **48,211** ETC Lanes reconstructed
  - **204** million ETC users reached

144,000km

South China Sea

--data from: http://www.mot.gov.cn

--by 2020.01.01

4. Intelligent Connected Automated Vehicle(ICAV)

1. Policy && Test && Demenstration

■ MIIT, MOT and MPS jointly released the "**ICAV Testing Specification**" in 2018.

■ **40+Testing Sites**

•Beijing, Shanghai, Chongqing, Jiangsu...

■ **300+** automated driving road testing licenses have been issued,cover **20+** cities and regions :

•Beijing, Shanghai, Shenzhen, Chongqing...

■ Test Area Categoary:

•Enclosed Area+Public Road

■ **ICAV Demonstration:**

Ports

Sweeper

Mining Areas

Logistics

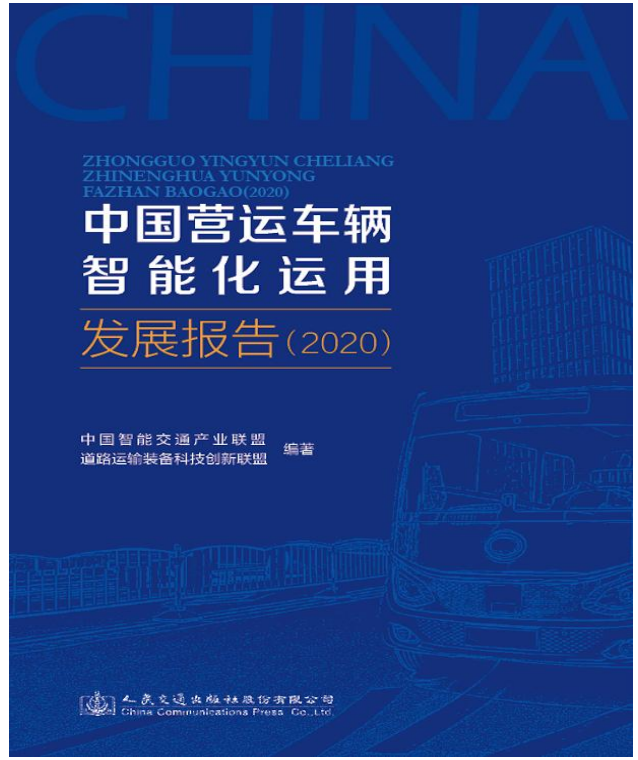
Robo-Bus

Robo-Taxi

4. Intelligent Connected Automated Vehicle

2. Intelligent Commercial Vehicles（ICV)

- ***Intelligent Application Development Report in Commercial Vehicle(2020) , issued in December 2020***
  - Carried out by China ITS Industry Alliance (China ITS), Research institute of Highway (RIOH) and Tsinghua University, etc. from 2019 to 2020
  - Focus on the application of intelligent driving technology in Intelligent Commercial Vehicles (ICV)
  - Puts forward the classification and intelligent levels of ICV
  - Puts forward the application evolution road map of ICV



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The Long Time Application Evolution Road Map of Intelligent Commercial Vehicles



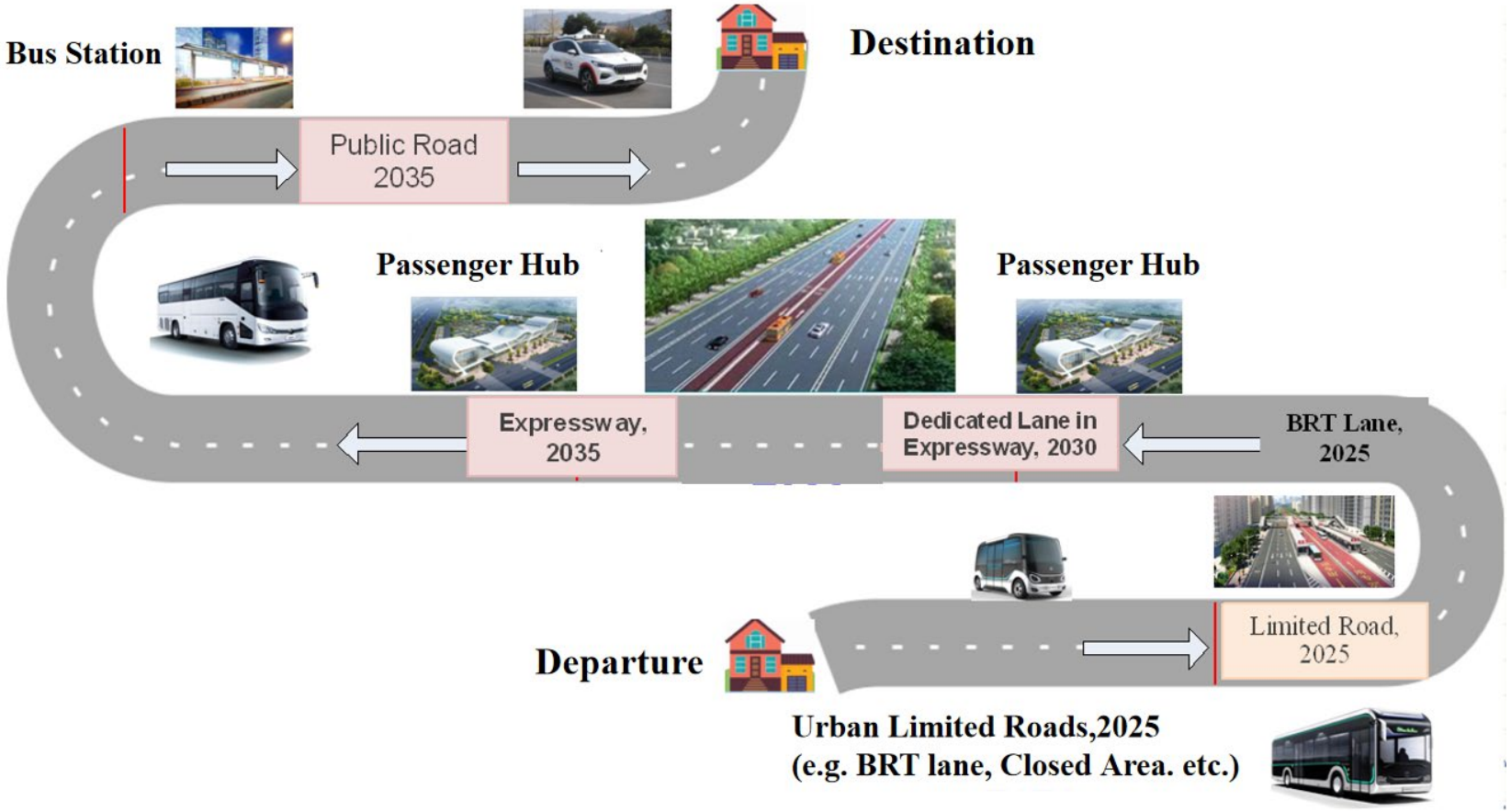


Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Driving Assistance-Warning	Driving Assistance-Control	Driverless-Closed Area	Driverless-Limited Area	Driverless-Public Area
Human driver control and take whole responsibility of the vehicle. Compulsory: FCW Optional: LDW etc.	Human driver take whole responsibility of the vehicle, Compulsory: AEB Optional: ACC, LKA etc.	Vehicle totally control itself in closed areas, e.g. park, passenger hub station etc.	Vehicle totally control itself in limited areas, e.g. BRT lanes, restricted expressways lanes etc.	Vehicle totally control itself in public areas.

Assisted Driving- Human Control

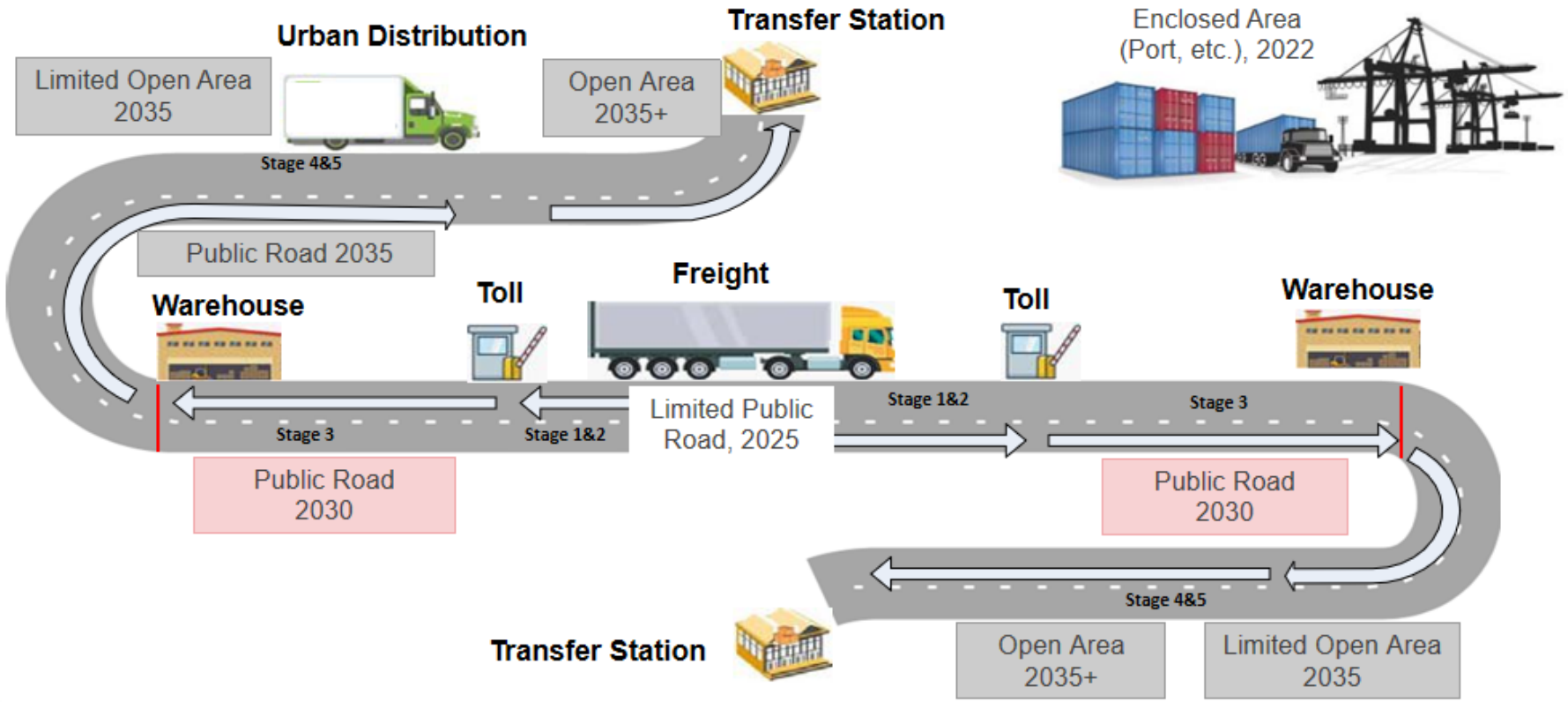
Autonomous Driving- Vehicle Control

Intelligent Bus && Taxi Roadmap



- **By 2025,** realizing the commercial applications of automated Robo-bus and Robo-taxi in some urban limited roads (e.g. BRT lane, fixed driving routes, and enclosed areas. etc)
- **By 2030,** realizing the commercial applications of intercity passenger transport in dedicated lane of expressway.
- **By 2035,** realizing the commercial applications of Robotaxi in urban road.

Intelligent Freight Vehicle Roadmap



- **By 2025,** realizing the commercial applications of automated freight vehicles in some enclosed areas, e.g. ports and mining areas.
- **By 2030,** realizing the commercial applications of automated freight vehicles from Warehouse to Warehouse in public road (e.g. arterial road and secondary road).
- **By 2035,** realizing the commercial applications of automated freight vehicles in urban motorway and urban transportation lanes.

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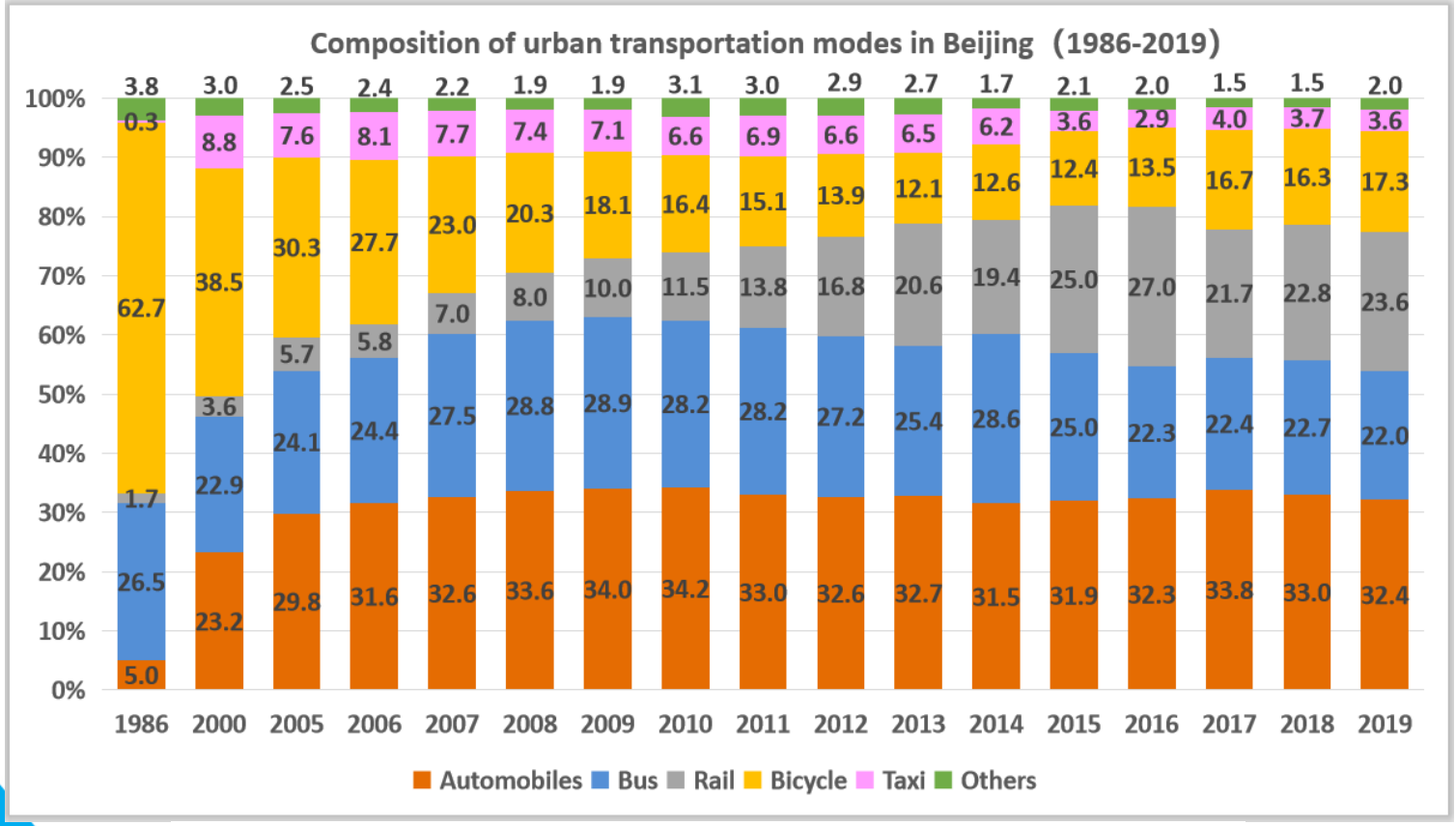
5. Personal Mobility



Composition of urban transportation modes in Beijing

- In the **1990s**, the main mode of travel for Chinese citizens was bicycle.;
- **Now,** passengers can select their personal mobility type based on their needs and preference, e.g. bicycles, buses, subways, taxis, etc.
- Chinese personal mobility type has changed a lot.

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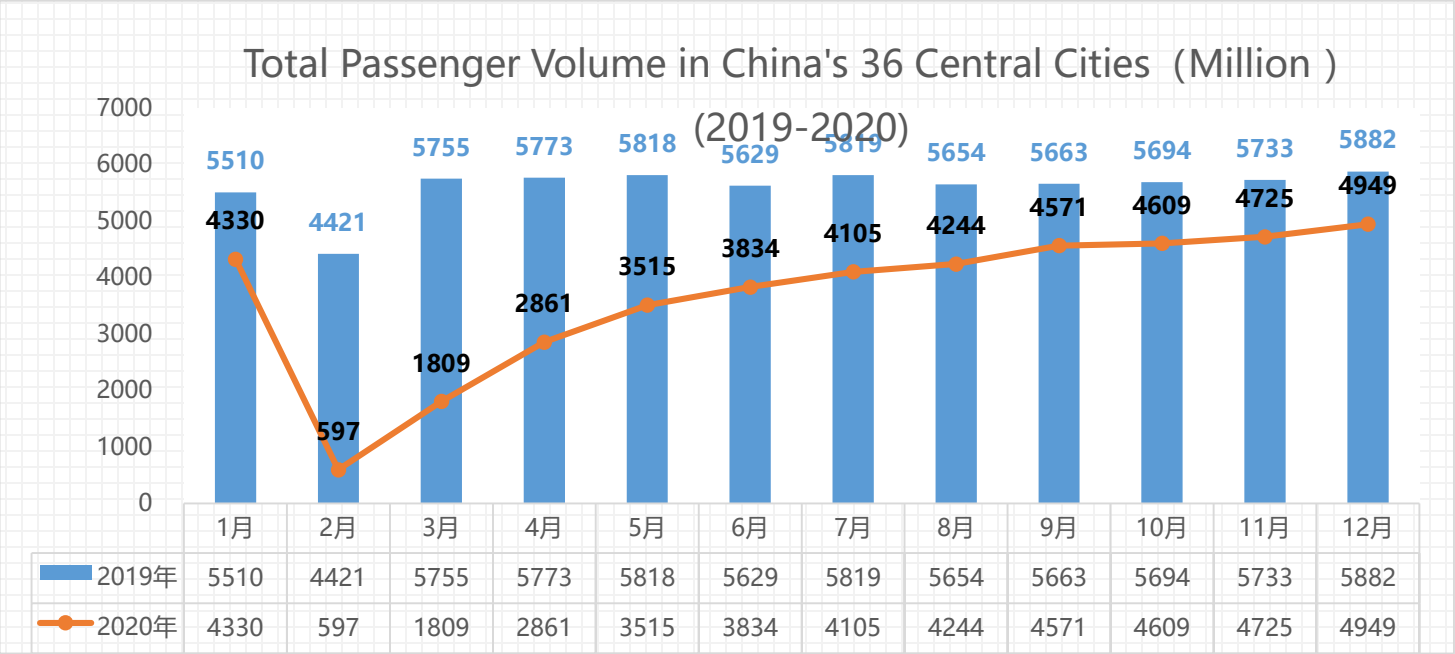
Chinese Personal Mobility During and After COVID-19



Bei jing	Tian jin	Ji nan	Tai yuan	Hai kou	Shen yang	Da lian	Chang chun	Shi jiazhaung
Shang hai	Nan jing	Lan zhou	Ning bo	He fei	Guang zhou	Xia men	Nan chang	Ha erbin
Qing dao	Hang zhou	Wu han	Shen zhen	Fu zhou	Chang sha	Nan ning	Zheng zhou	Hu hehaote
Cheng du	Gui yang	Kun ming	La sa	Xi'an	Chong qing	Xi ning	Yin chuan	Wu lumuqi

——data from：MOT of P.R.C，http://www.mot.gov.cn

- Because of COVID-19 in 2020, Chinese personal mobility has changed a lot. There was about **50%** decrease in the average passenger volume of public transport in the first half of 2020.
- With the recovery of China's economic, urban public transport has been restored to a certain level now.
- In the next 5~10 years, public transport is still the main mode of urban travel in China.
- But the new personal mobility mode provides more choices for urban residents, such as online car-hailing and online bicycle-sharing, etc.

SUMMARY

- The Next Stage of ITS is an important measure to improve traffic safety and service level in China
- Intelligent road and intelligent commercial vehicles will be important areas for the next five years.
- Autonomous vehicle has a long way for real use
- Public transport is still the solution for urban transport in China.
- China’s transportation development will shift from pursuing speed and scale to paying more attention to quality and efficiency.
- Building a safe, convenient, efficient, green, and economical modern comprehensive transportation system is the goal of next generation of ITS in China.

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THANKS

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