



China Urban Sustainable Transport Research Center



Addressing Congestion in China Cities

Haitao Zhang, Associate Professor

China Urban Transport Research Center
China Academy of Transportation Sciences, MOT



China Academy of Transportation Sciences, MOT



China Urban Sustainable Transport Research Center



Traffic congestion is one of urban sicknesses.

In 2003, economic losses due to traffic congestion as much as 250 billion Yuan, 2% of our GDP.

Frequent traffic accidents



Automobile
exhaust emissions



Traffic noise pollution



Increased
photochemical pollution





- **Current Status of China Urban Traffic Congestion**
- Main Reasons of China Urban traffic congestion
- Beijing's Experience Introduction
- Strategy to alleviate China urban traffic congestion



Morning peak :

Parking lot or main road?



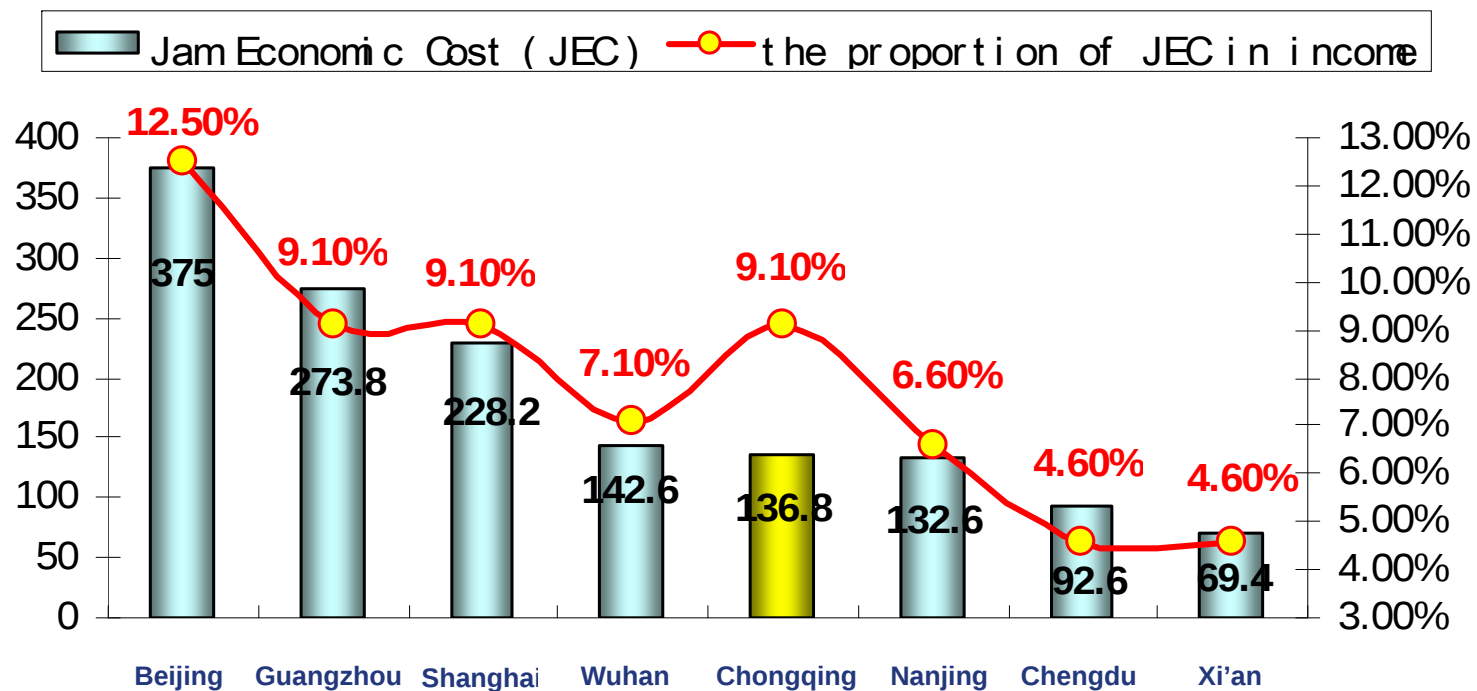
AM peak and PM peak:
public transport is overcrowded





Travel speed in major cities:

城市 City	机动车保有量 The amount of motor vehicle (万辆)	车速 speed
BeiJing	350*	the average is still only 24.2 km/h and 20.1 km/h, in part of the arterial as low as 12 km/h In the morning and evening peak hours
ShangHai	268*	In the morning and evening peak hour ,the average speed is 14.6 km / h in the area of Jing'an Temple, at the same time, the average speed is only 12.8 km / h in the People's Square area
GuangZhou	120	The average speed is 17.3 km / h In the peak hour
NanJing	101	The average speed is 17.6 km / h In the morning peak hour and 14.2km/h in the evening hour
ChengDu	200	In central city ,the average speed is 18km / h In the peak hour *2008年数据



The proportion of JEC in income:

Beijing-20.5%, Guangzhou-14.6%, Shanghai-11.6%, Xi' an-6.6%



- Current Status of China Urban Traffic Congestion
- **Main Reasons of China Urban traffic congestion**
- Beijing's Experience Introduction
- Strategy to alleviate China urban traffic congestion



The lack of Integration of urban Planning and transport planning

Growing demand for high-speed motorized

Overall low level of public transportation

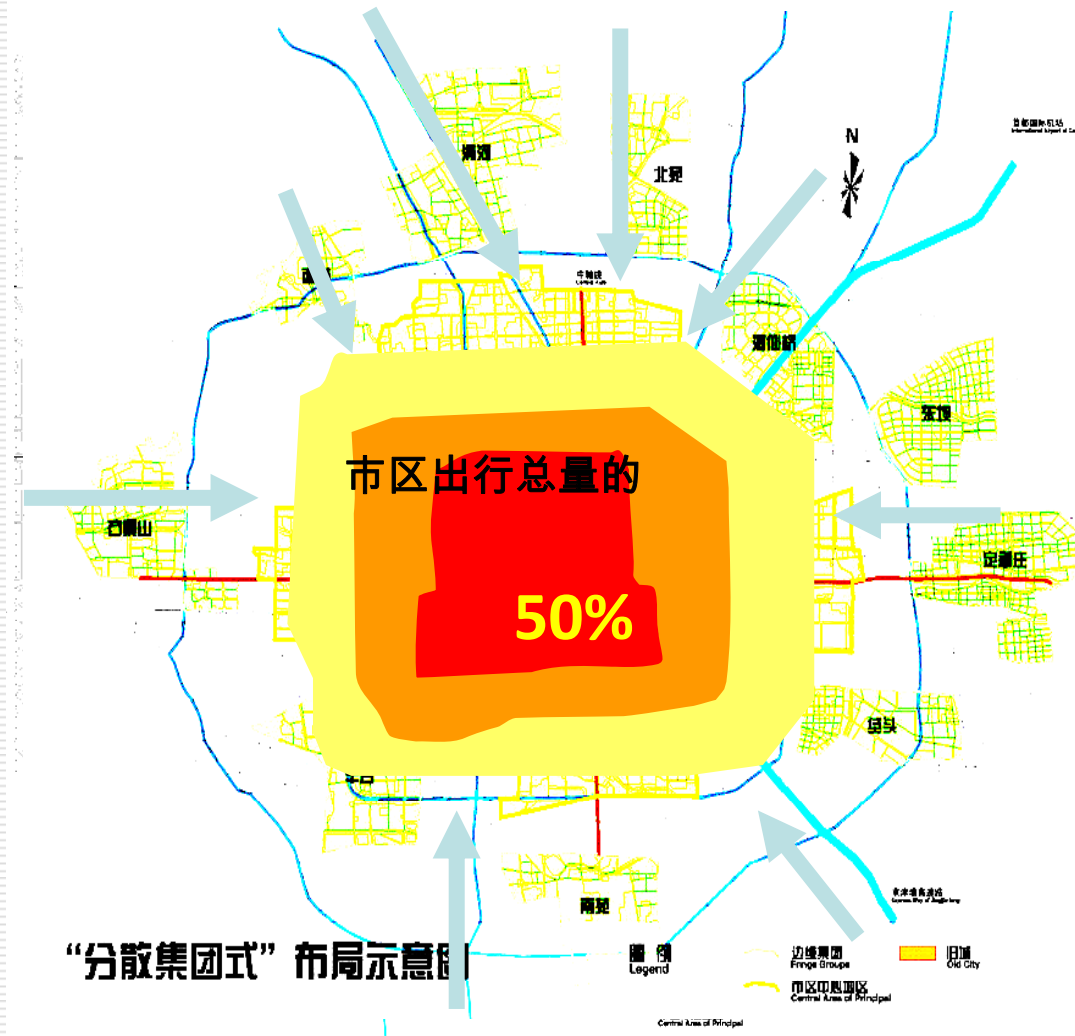
The low cost to own and use a car

Non-motorized travel environmental degradation

Urban Traffic Congestion



Single central mode

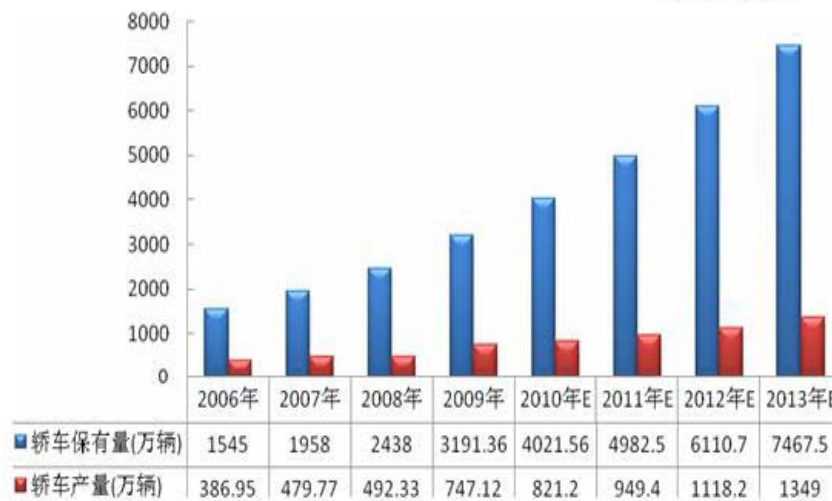
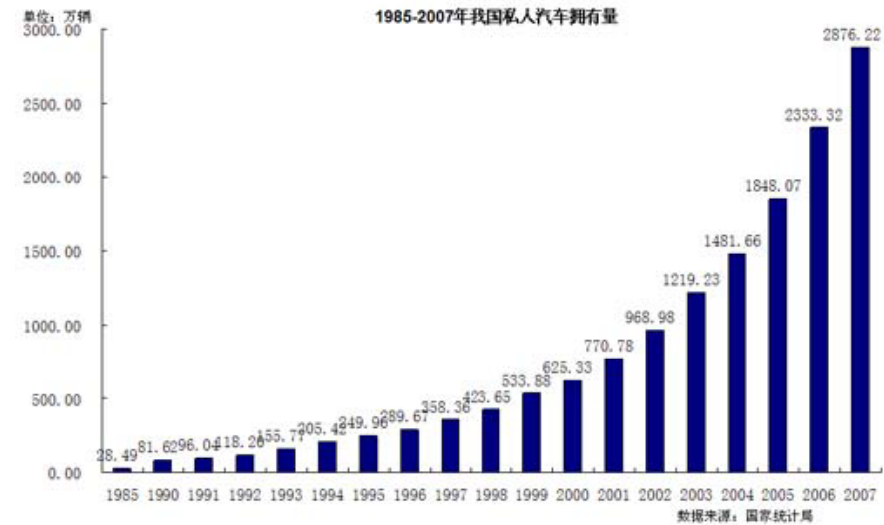
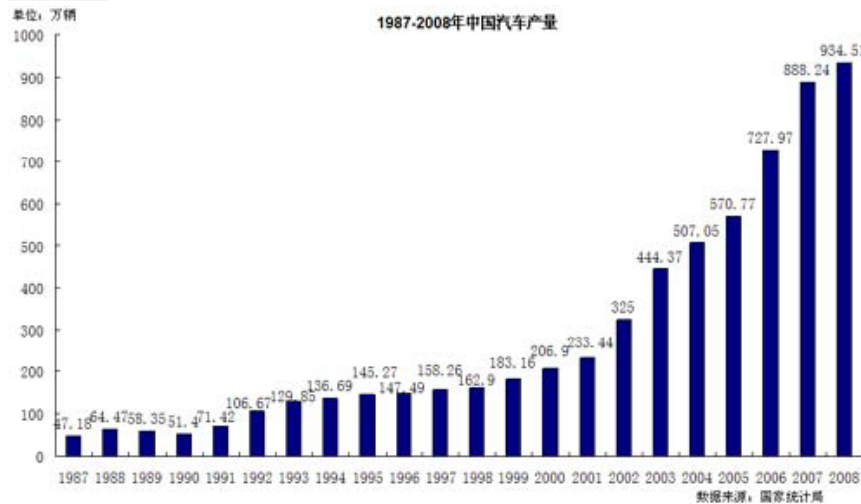


More than 50% trips made within 3-ring roadway



Private car growing rapidly

China is now the world's largest automotive producer and consumer in 2010.



- civilian vehicle :
11 million ten years ago
76 million 2009
- private car :
2.9 million ten years ago
40 million 2009



Beijing Case

Starting point	Milestone	agelimit
2300 in 1949	1 million in 1997	48年
1 million	2 million in 2003	6 年
2 million	3 million in 2007.5.26	3.8 年
3 million	4 million in 2009.12.21	2.6 年



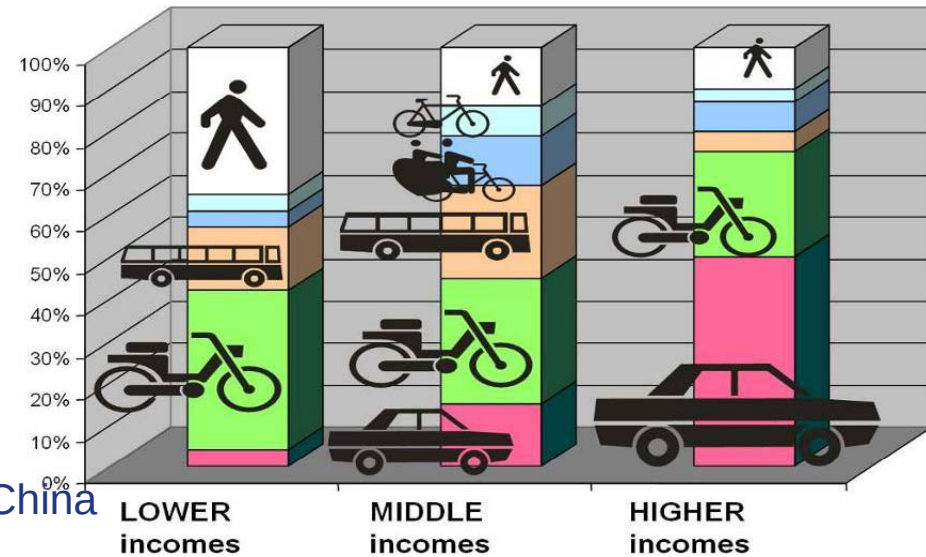
Socio-economic development and urbanization are growing fast.

Percent of urbanization :

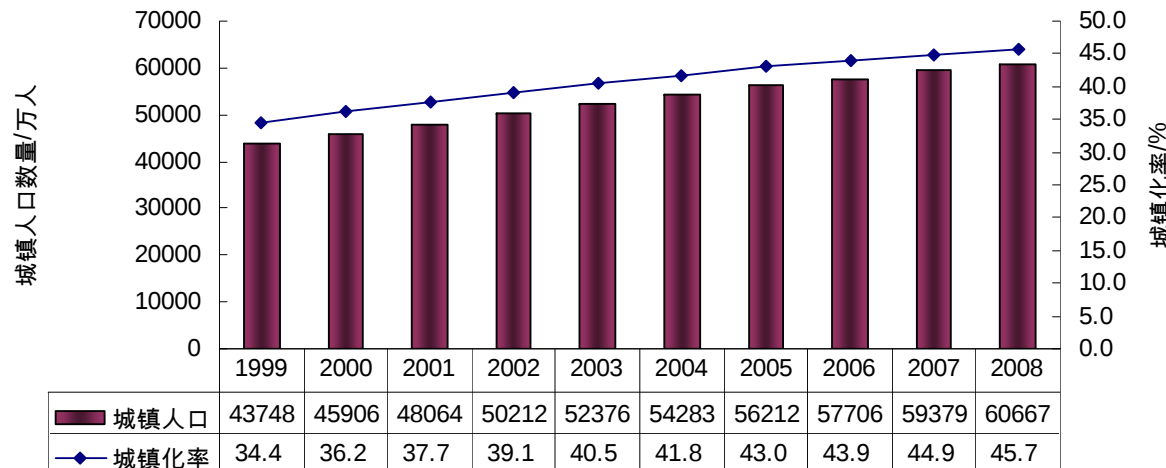
✓ 1978 : 17.8% ;

✓ 2004 : 41.8%

✓ 2020 : 57%



Urbanization tendency development chart of China



✓ BeiJing : 4.45 million total , 1900 daily

✓ ChengDu : 2.24 million total , 1500 daily

Average annual growth of urban vehicle passenger trips from 1998 to 2010 : 9.0%



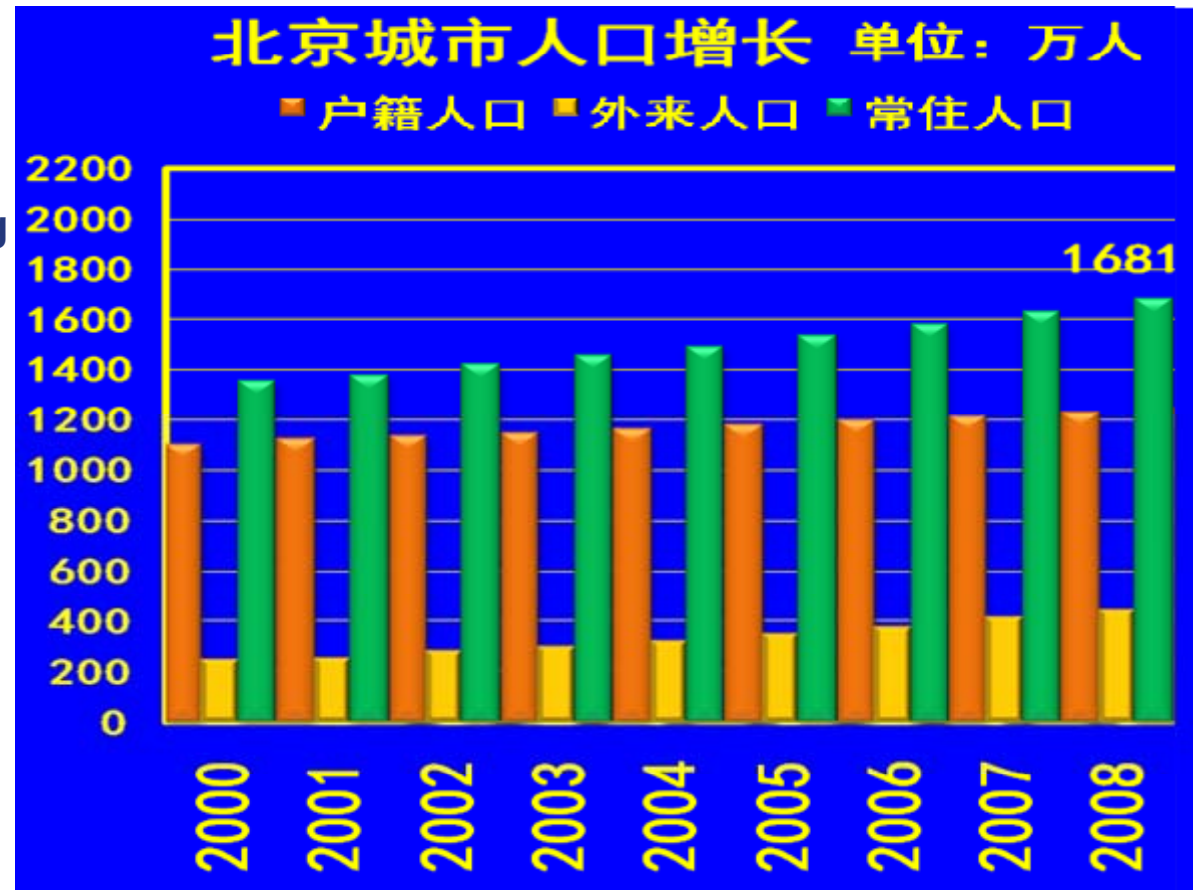
Urban population growth

Beijing population including floating :

20 million

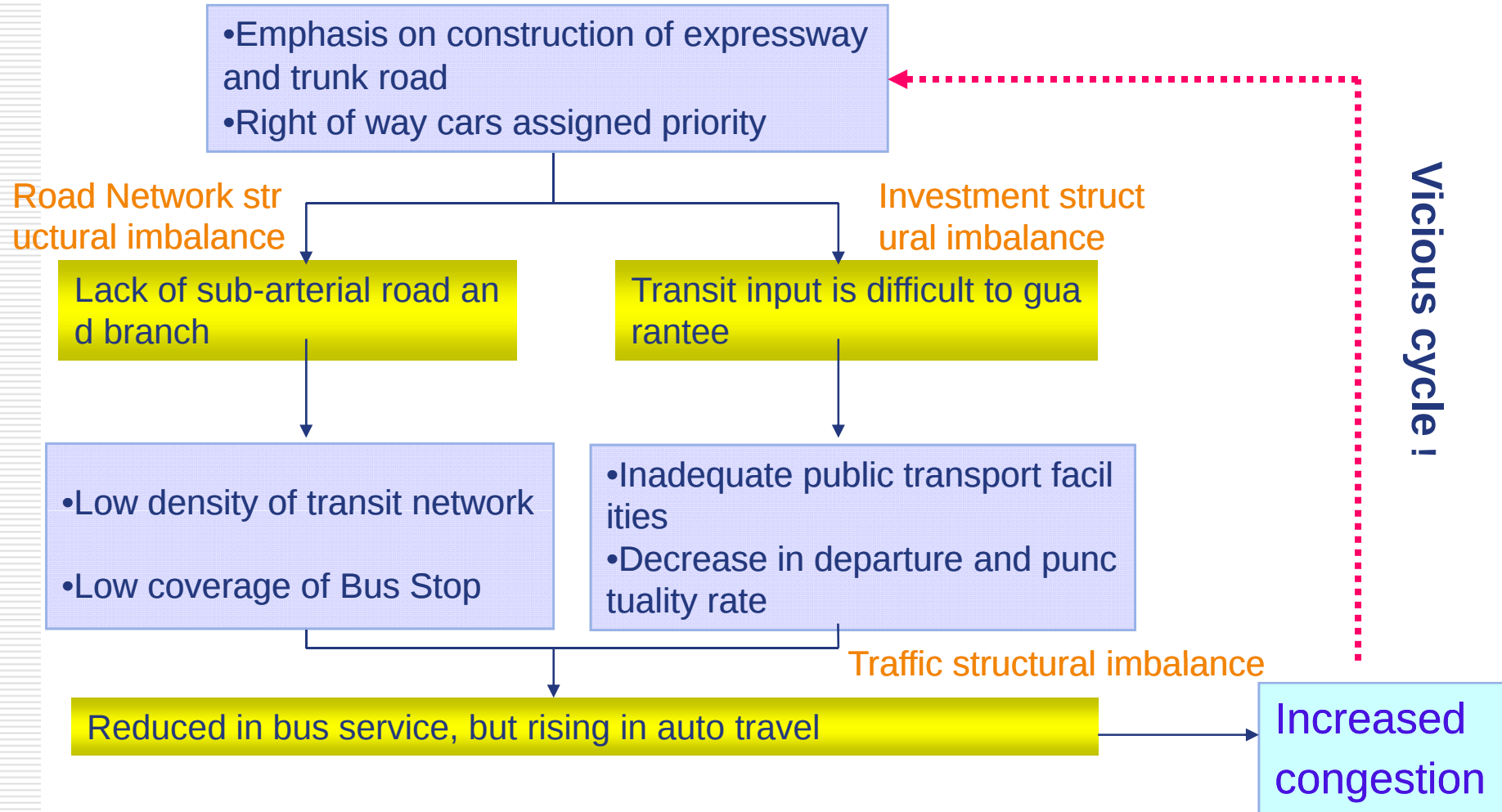
The forecasting in 2020:

18 million



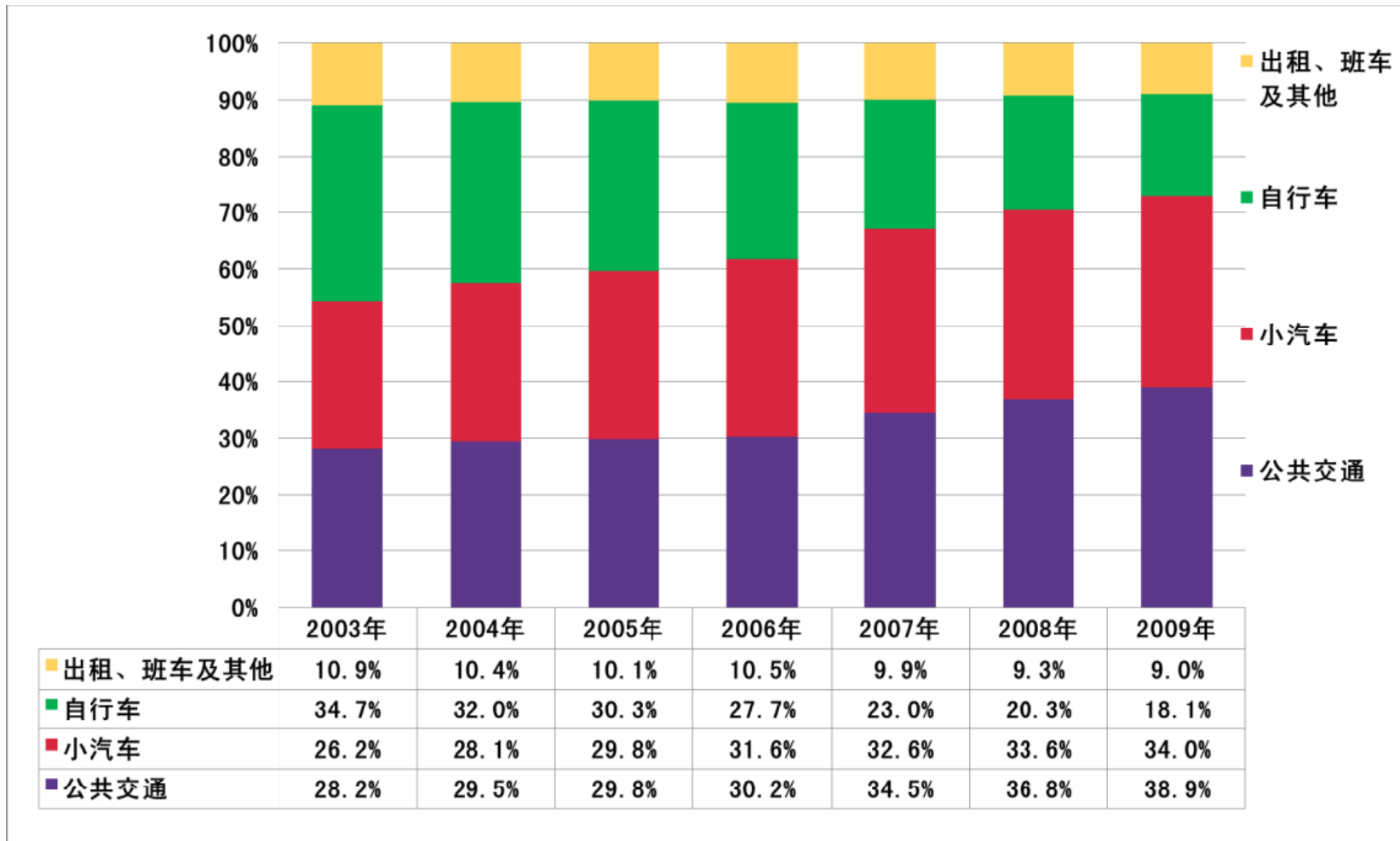


The more roadway construction, the worse traffic



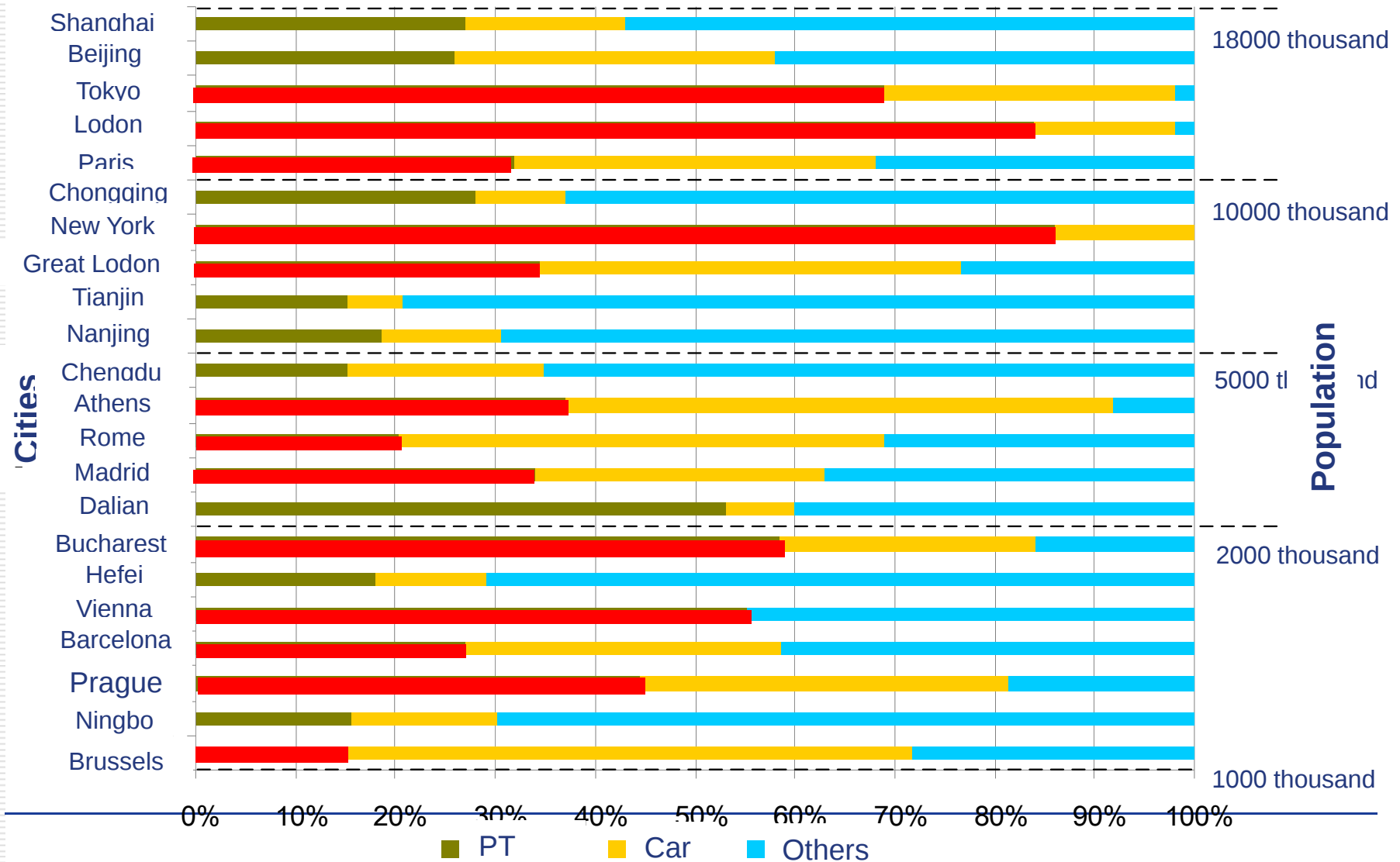


Beijing transit share in 2009:38.9%





Share of public transport in different countries





- Current Status of China Urban Traffic Congestion
- Main Reasons of China Urban traffic congestion
- **Beijing's Experience Introduction**
- Strategy to alleviate China urban traffic congestion



Effort 1: Transport infrastructure expanding





Effort 2: Public Transport developing rapidly



Beijing's experience of dealing with the traffic problem

➤ Make a very methodical approach

“the task of reducing traffic congestion during different stages” was compiled by Beijing municipal committee of transport, according to the decision of Beijing's government in 2004. Six stages task have finished until 2009, as follows;

- Give priority to the development of transit
- Carry out Travel Demand Management
- Enforce the construction of traffic facilities
- Enhance traffic management level

Beijing's experience of dealing with the traffic problem

➤ Give priority to the development of transit

■ Beijing's total subway mileage now has reach 228 km ,including 114km of new added line.

■ shorten the departtime interval, the minimum is 2 minutes

■ to improve the environment by updating and adding ,about 660 air - conditioned trains.



Line	Departtime interval	
Line 1	3 minutes	2 minutes 15 seconds
Line 2	2minutes 45seconds	2minutes
Line 5	4 minutes	2 minutes 50 seconds
Line 13	4 minutes	3 minutes
Batong line	4 minutes	3 minutes



Beijing's experience of dealing with the traffic problem

➤ Give priority to the development of transit

■ adjust and optimize the bus network
followed such approach “reduce line overlap,
enlarge the coverage of suburban”

■ strengthen bus road priority, total length
of bus lanes reach 258.5km

■ three BRT lines, which is southern –
centre corridor , and ChaoYang road Anli
road, operates in Beijing

■ accelerate the update process to
guarantee reaching the environmental
protection standard for all buses



Beijing's experience of dealing with the traffic problem

➤ Give priority to the development of transit

■ Bus reform

- Took effect on July 1, 2007
- standardization of rates and fares
- Issued public transportation IC card ,60% off used by adults and 80% off used by student
- Suburb line enjoy the same benefits

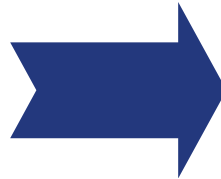
■ Railway reform

- Took effect on October 7, 2007
- The price of railway 2 Yuan and transfer between lines without hindrance



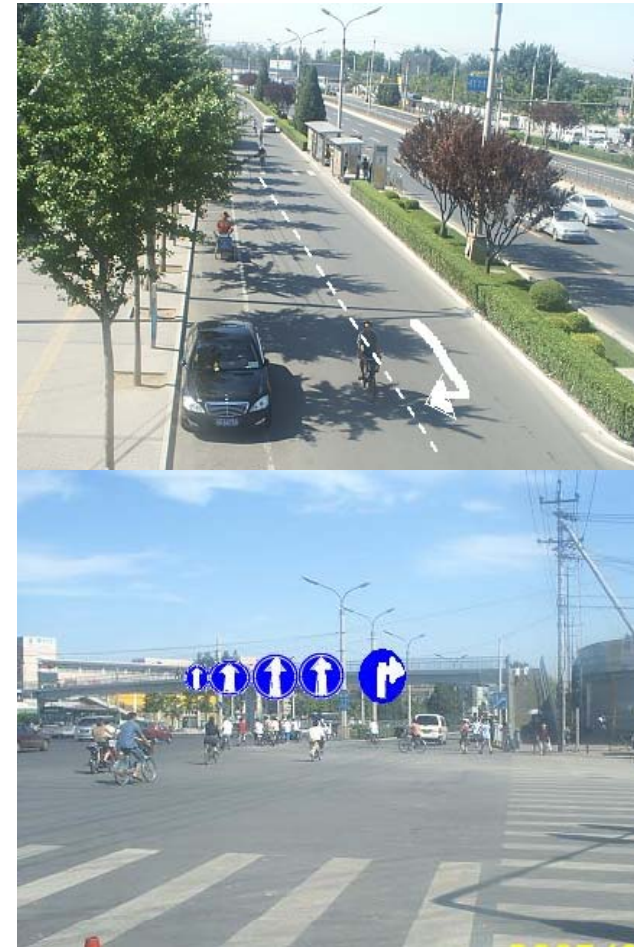
Beijing's experience of dealing with the traffic problem

➤ Improve traffic facilities



Beijing's experience of dealing with the traffic problem

➤ Improve traffic facilities



Beijing's experience of dealing with the traffic problem

➤ Travel Demand Management



Before Olympic Games: 3.39 million cars used per day



During the Olympic Games:

**Odd-even plate number system,
Restriction for 30-70% govt. cars,**

Flexible working time:

- ✓ 1.95 million cars reduction
- ✓ 23% traffic flow reduction
- ✓ 28.5% speed increasing
- ✓ Air quality much improved

Now After the Olympic Games:

Weekly car-free-day, Restrict. 30% govt. cars:

- ✓ 0.85 million cars reduction
- ✓ 6.5% traffic flow reduction
- ✓ 8.3% speed increase in morning rush hour





Experience of Beijing to Solve
Traffic congestions

➤ Traffic demand management

- ◆ *Some vehicle use restriction*
- ◆ *Parking policy and management*
- ◆ *Flexible working hours*
- ◆ *Park & ride program*
- ◆ *Improving walking trip & cycling trip system*
- ◆ *.....*



- Current Status of China Urban Traffic Congestion
- Main Reasons of China Urban traffic congestion
- Beijing's Experience Introduction
- **Strategy to alleviate China urban traffic congestion**



- 1. Develop public transport**
- 2. Carry out demand management**
- 3. Promote green transport**
- 4. Use Intelligent Transportation Technology**



Strategy 1. develop public transport

Way 1: Speed up rail construction

- The State Council approved 22 subway construction plans, totally invest 882 billion Yuan
- By 2010, the number of metro line in Chinese cities will reach 55, mileage up to 1,500 kilometers, more than 6000 vehicles are need.
- Increase the rail network density and site coverage, increase the proportion of rail traffic



Strategy 1. To develop public transport

Way 2: Construction of bus lane

- Reduce transfer times, and enhance the attractiveness
- Improve the reliability and competitiveness of conventional bus

Way 3: Reward the company with high proportion of bus travel

- public transport subsidies, tax incentives ,etc.





Strategy 2. To implement demand management



TDM Measure

Promoting P & R strategy

Differential parking policy

Encouraging HOV priority

Congestion Pricing

Staggering of working hours

Flexible working



Strategy 3. Promote green transportation

Way 1: " People-oriented " in road design

Way 2: Comfortable, convenient slow system

Way 3: Promoting green transport

- Electric taxi, electric vehicles, clean fuel bus





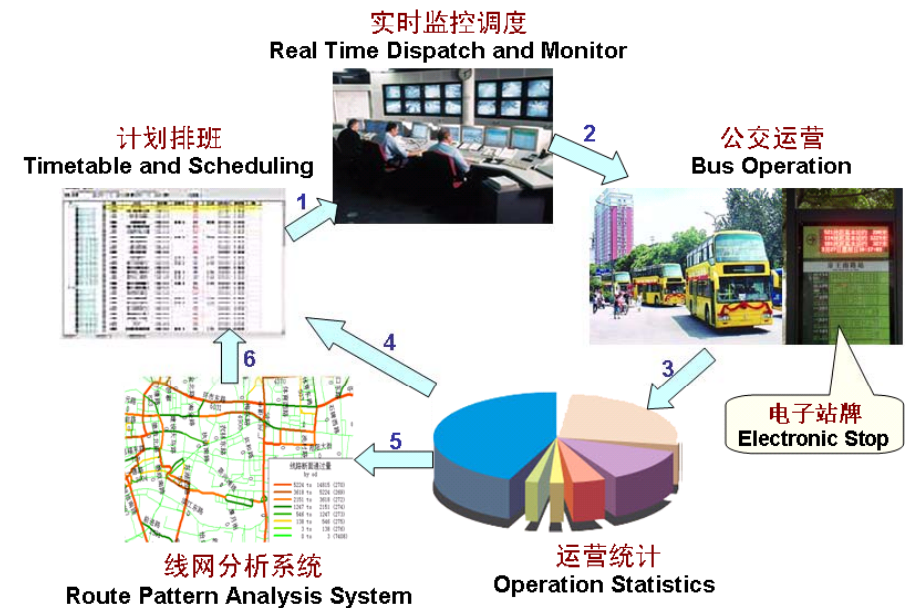
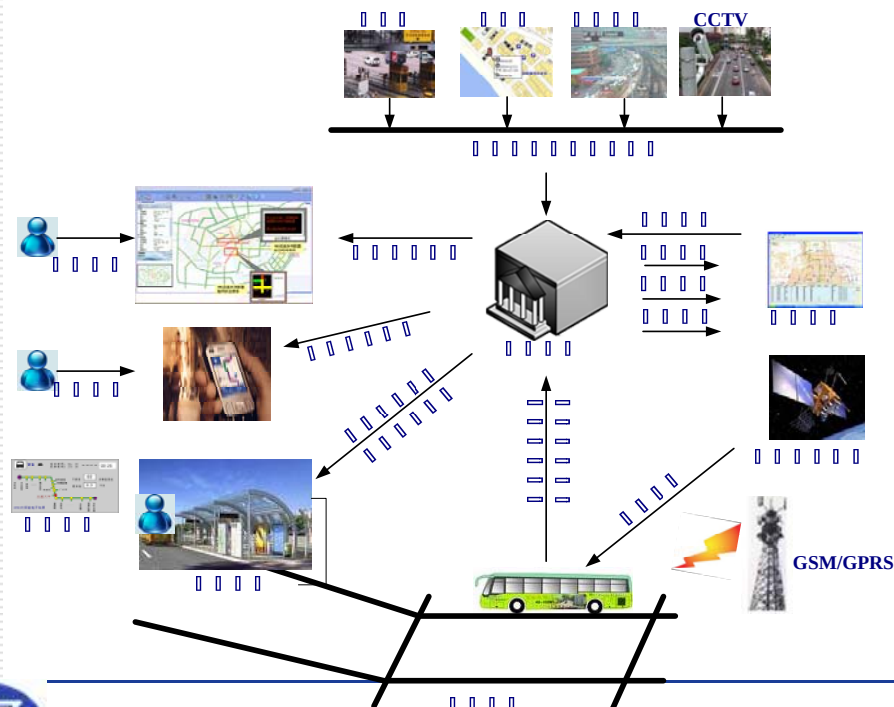
Strategy4 : Application of Intelligent Transportation Technology

Way1: the networking technology without stopping to pay toll

Way2: Intelligent Public Transport

Way3: Travel information service system

Way4: Traffic Signal Optimization



- Intelligent Bus scheduling and fleet management system
- Geographic Information System
- Transit operations software system
- Traffic signal priority system
- Bus Travel Information System



China Urban Sustainable Transport Research Center



***Thank you very much
for your attention !***



China Academy of Transportation Sciences, MOT