Urban Development and Transport Demand Management
城市发展与交通需求管理

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Part 1
第一部分

Analysis
分析

- The car production in the world is growing

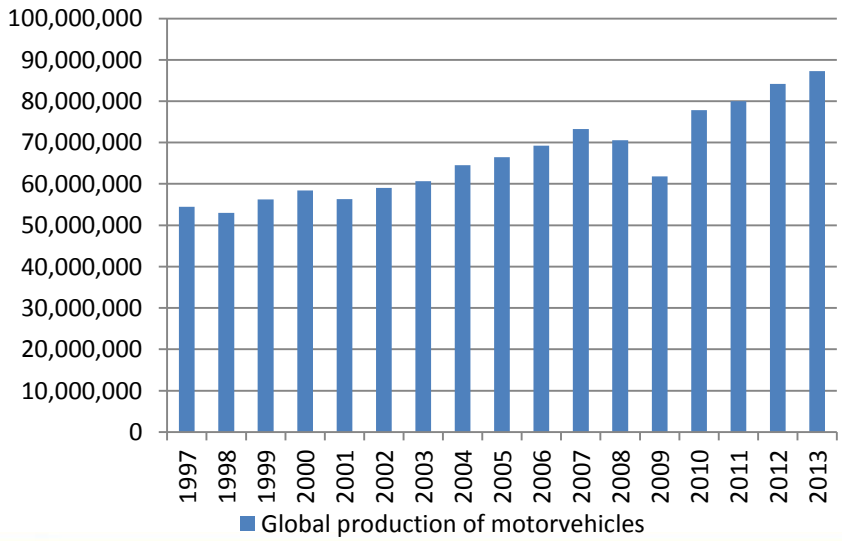
  世界车辆生产数量持续增加，我国机动车保有量由1990年的1476万辆迅速增长到2013年的2.5亿辆，且正以每年13.5%的速度递增。

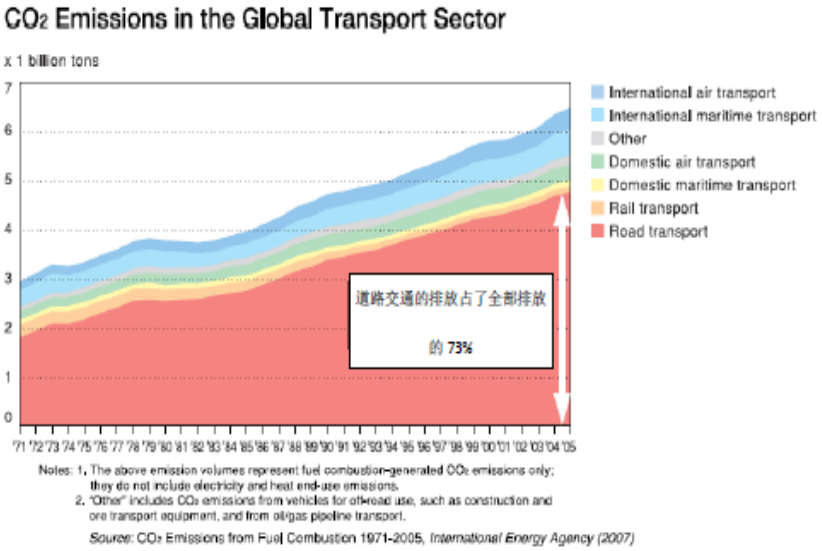
- The carbon dioxide emission from transportation is growing

  世界交通行业二氧化碳排放持续增加，交通行业是中国二氧化碳增长最快的行业之一。

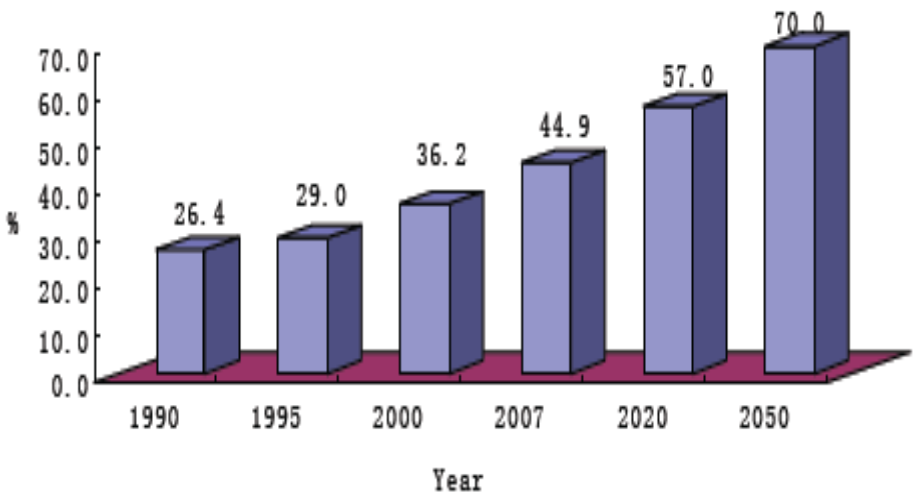
- More and more congestion in China, from big cities to middle size and small size cities

  中国城市交通拥堵愈发严重，除了大型城市，中小城市拥堵越来越多。





（1） Fast speed of urbanization in China
中国的快速城镇化



Next 15 years in China
今后15年中，

- **Urban population will be 1.5 times than now, where do they live? 城市人口将是现在的1.5倍，他们住在哪里？**
- **Where new industries, residence and CBD will be located?新的工业区、居住区和商业区会在哪里？**

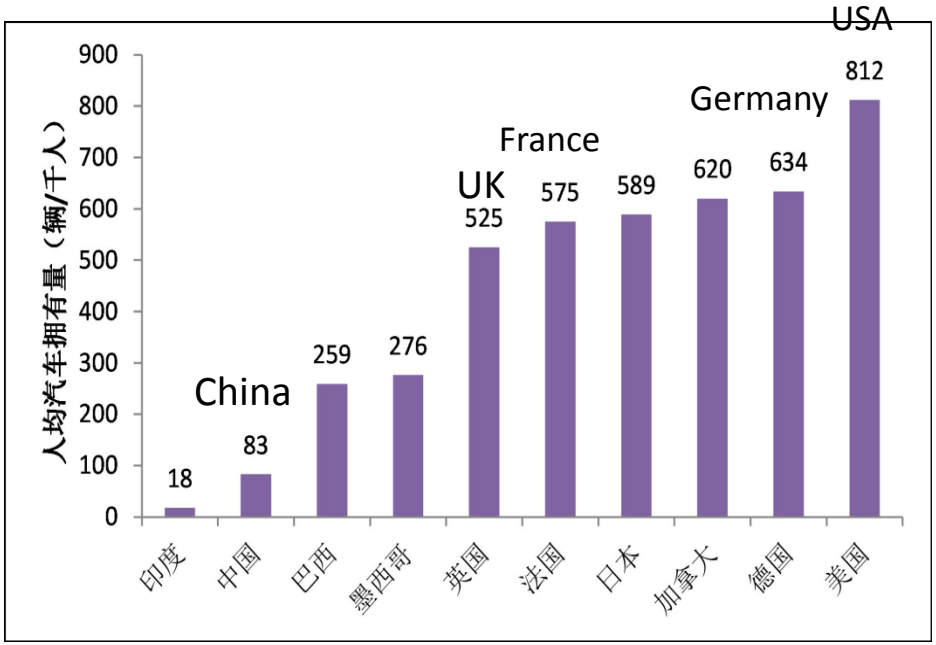
The years spent for the urbanization growth from 20% to 40% in different countries
不同国家城镇化率从20%增加到40%所需时间

Country	Britain	France	Germany	USA	Former U.S.S.R	Japan	China
Year	1720-1840	1800-1900	1785-1865	1860-1900	1920-1950	1925-1955	1981-2003
Period	120 Years	100 Years	80 Years	40 Years	30 Years	30 Years	22 Years

（2）Rapid motorization快速机动化

China published Automobile Industry Policy in 1994 to encourage car purchasing.
中国在1994年颁布了鼓励购买小汽车的汽车行业政策。

The Automobile Industry Development Policy was published in 2004, continuing encouraging the private consumer as the main body of car purchasing, improving car using environment, protecting consumer rights.
2004年颁布了汽车行业发展政策，继续鼓励私人作为小汽车购买主体，提升小汽车使用环境，保护消费者权益。



（2）Rapid motorization快速机动化

Four Milestones of Beijing Automobile Development
北京汽车发展的四个里程碑

Year	Since	To	Time (years)
1949-1997	2300	1 mil	48
1998-2008	1 mil	2 mil	6
2004-2007	2 mil	3 mil	4
2008-2009	3 mil	4 mil	2
2010-2011	4 mil	5 mil	1.5
2020			

200→300，北京用4年，东京10年　10 years in Tokyo

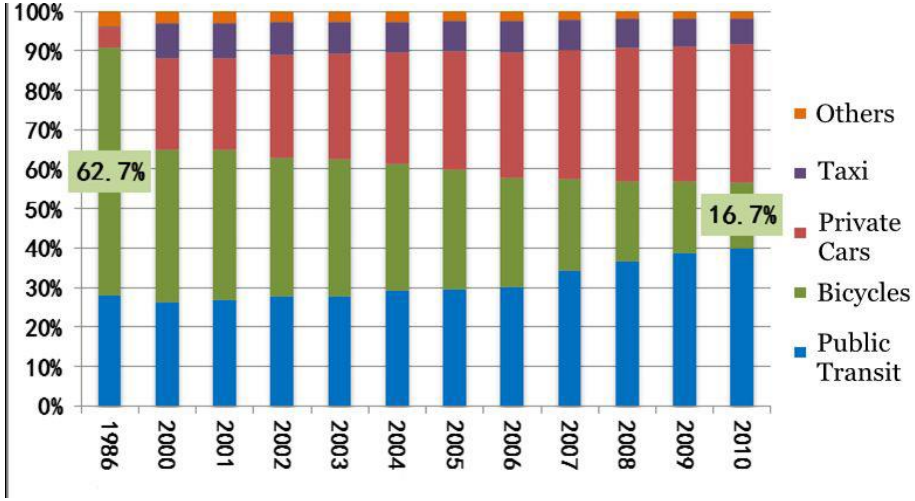
300→400，北京用2年，东京用12年　12 years in Tokyo

In China, 53.08 mil cars in 2012, 22.8% more than 2011, 80 mil expected by 2020.
中国在2012年有5308万辆小汽车，较2011年增长了22.8%，预计2020年将达到8千万辆。

5 times cars as much as present, where to park and run?
5倍于现在的数量，这些车停放和行驶在哪里？

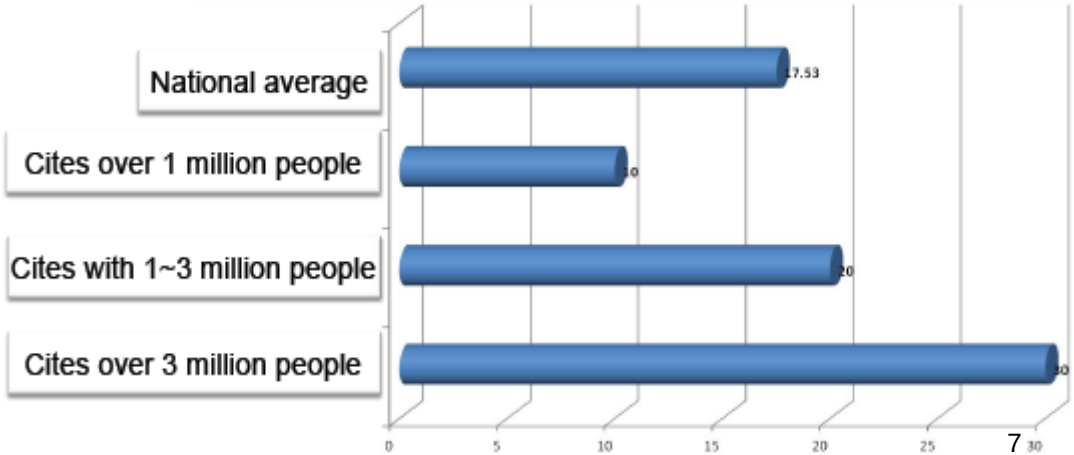
（3） Dramatic change of travel mode and Transit service system not matching the travel demand巨大的出行模式以及交通服务系统的改变不能满足出行需求

Travel mode changes in Beijing 北京出行模式的改变



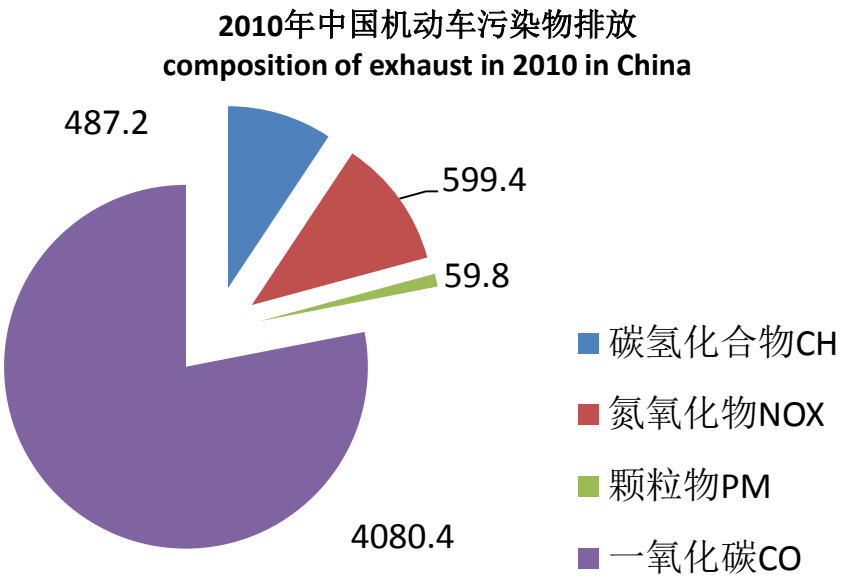
Bicycle: 1-2% of decrease;
自行车：1-2%的下降；
Public transport: increasing
公共交通：缓慢增加

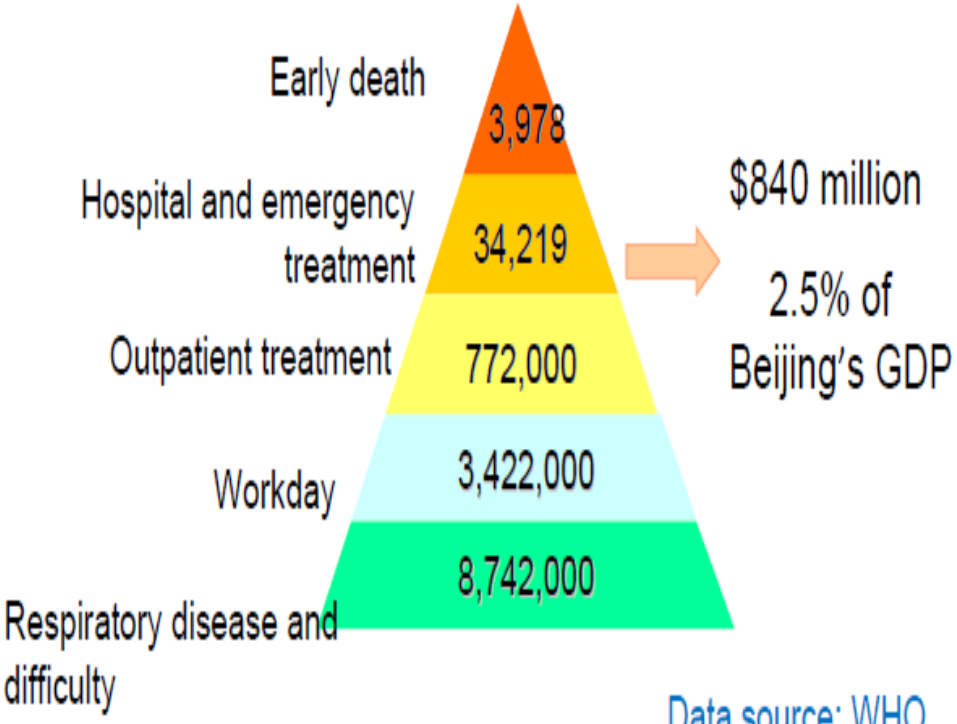
Share of transit
公交出行比例



（4）High health hazard 健康危险

Vehicle particulate matter emission influence health (Beijing)
汽车排放的颗粒物影响健康（北京）

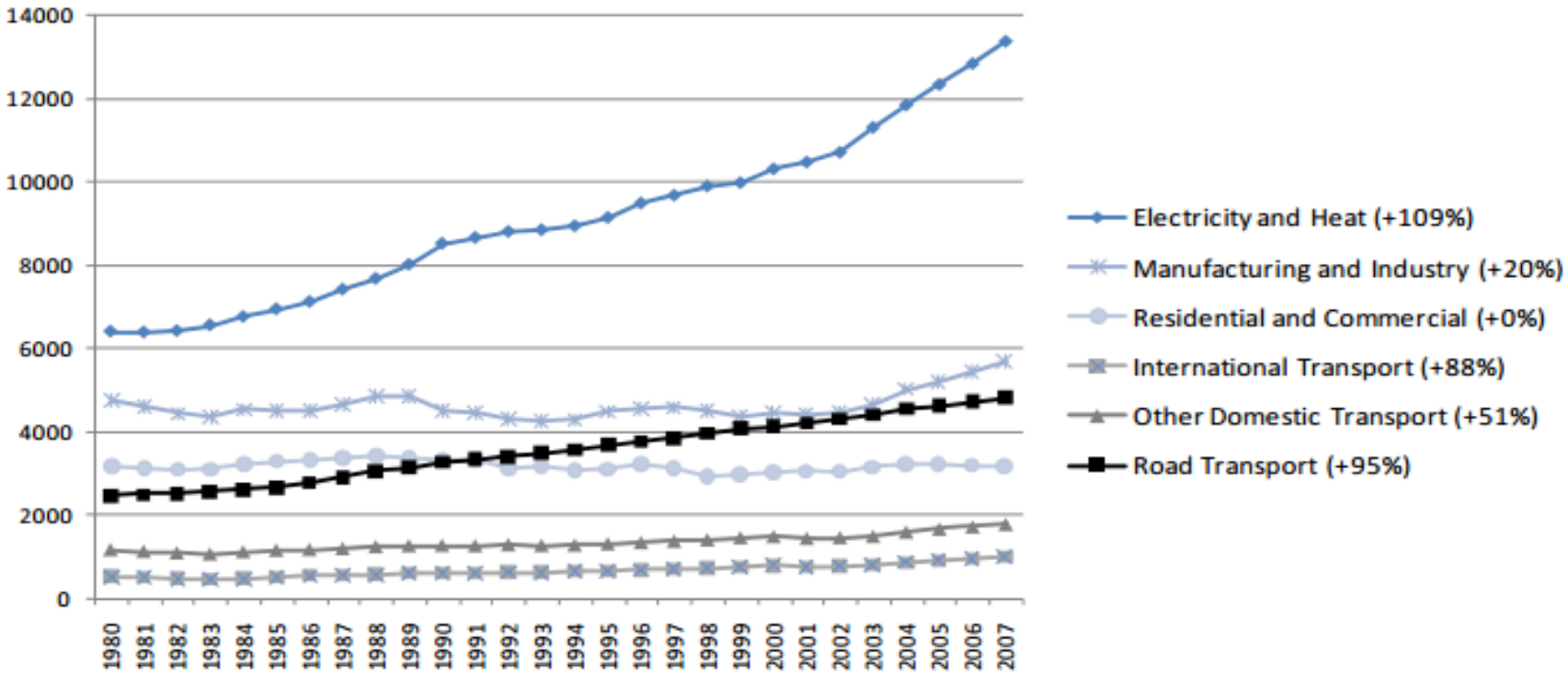




Data source: WHO，2005

（5）High CO_2 growth　CO_2高速增长

1980-2007年道路交通二氧化碳排放增加95%。
The carbon dioxide emission from road transport increase 98% from 1980 to 2007.



Opportunities and Challenges 机遇与挑战

Consequences = Cost of Time + Health + Energy Consumption + Living quality + City Image

城市交通拥堵与空气污染带来的损失=花费的时间+健康+能源消耗+生活质量+城市印象

Disproportionate impact on low-income residents who use public transport and no motorized transport (NMT) for daily travel

对于日常出行使用公共交通和非机动化交通的低收入居民的不公平的影响

—— longer travel time, over crowding, unfriendly environment for NMT and high rate of traffic accidents

——更长的出行时间，过度拥挤，非机动交通环境恶劣，交通事故频发

Opportunities and Challenges机遇与挑战

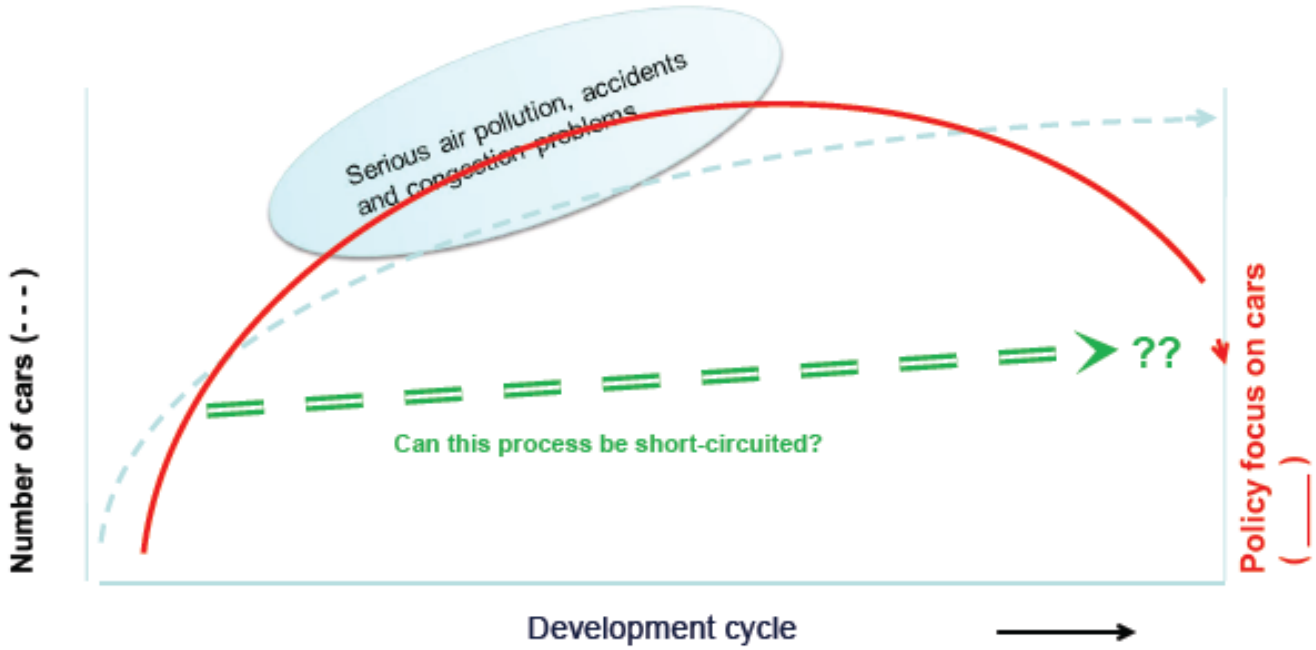
- The number of cars increased by 20% over the past 5 years in many cities
  在很多城市，小汽车数量在过去的5年里增长了20%
- Extensive urban traffic congestion and air pollution - now spreading to medium-size cities
  普遍的城市交通拥堵和空气污染——现在已扩散至中等城市
- Rapid decline of green travel mode share, in particular cycling and walking – but still higher than in most western countries
  绿色出行比例的快速下降，尤其是骑行和步行——但是仍然比很多西方国家高
- However, without a sufficiently attractive green travel system for potential car consumers and effective car ownership and using management policies, Chinese cities will miss this opportunity to cultivate green travel modes.如果中国城市政府不能尽快给潜在的小汽车消费者提供高吸引力的绿色出行系统，并采取足够影响小汽车消费的果断、有效的管理政策，**中国城市将错过培育绿色出行方式的最佳时机**。

Opportunities and Challenges机遇与挑战

China's urban transport systems are presently on the wrong course – the course towards low density and socially divisive car dependency. This is not a viable future for China, economically or socially. The central government should urgently address the promotion of urban green travel as part of the necessary transformation of China's urban development strategies. This requires attention to cross-sector coordination and cooperation; strengthening of the ability of the central government to encourage and pressure local governments to develop urban green travel through financial leverage and other means; providing clear guidance for Chinese cities to promote green travel, and enhancing local governments' capacity to finance, supervise and assess the urban transport system.

中国城市交通系统正朝着一个错误的方向发展——土地低密度开发且过度依赖小汽车。不管是经济层面还是社会层面，这都不应该是中国的未来。中央政府需要认真审视城市交通发展在中国发展战略绿色转型中的定位、政策与工作重点，高度重视政府跨部门职能与目标的协调与配合，通过行政与经济杠杆加强政府对城市交通可持续发展的影响力，对中国城市交通管理实施分类指导，有效遏制城市交通拥堵快速蔓延与恶化的趋势。

Can China short-cut the ‘car policy’ trajectory?
中国的“小汽车政策”能走捷径吗？



Including both transportation supply and demand management (TS-DM) measures underpins the development of an effective transportation management strategy.

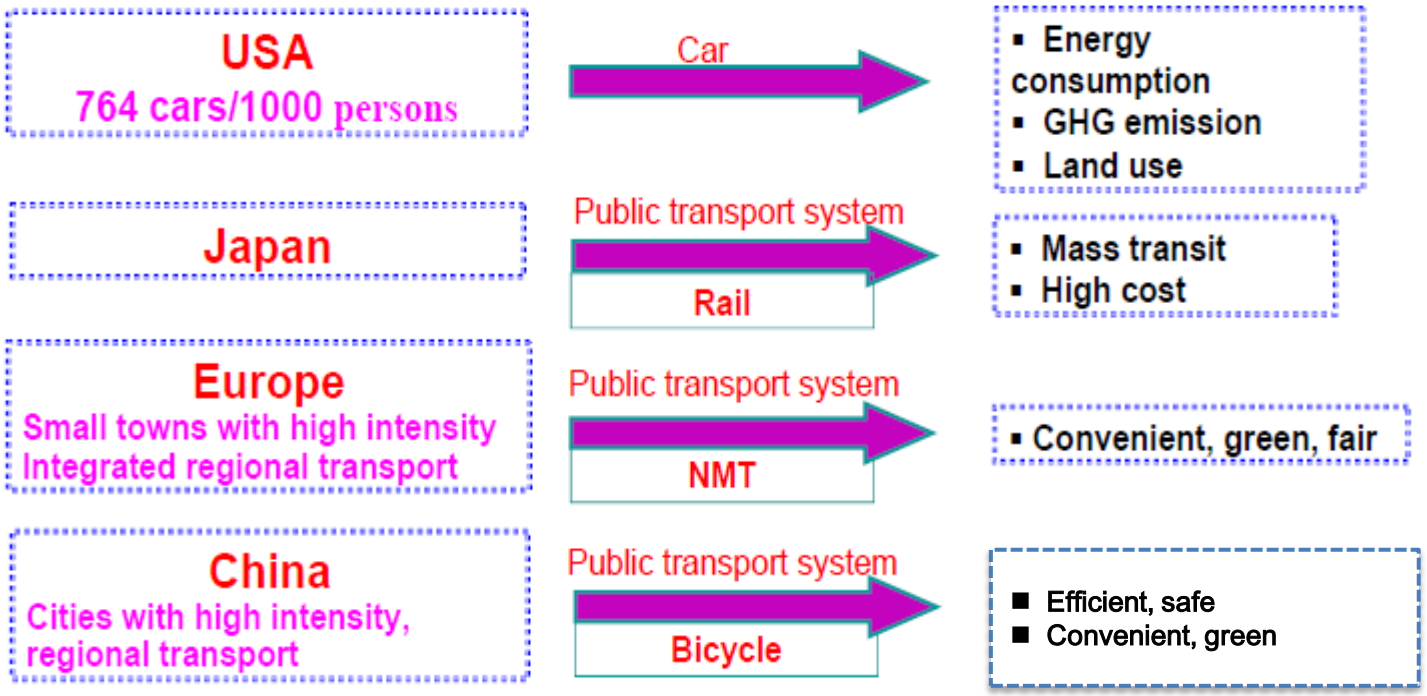
交通供给与需求管理措施支撑了高效的交通管理战略

Part 2
第二部分

Development Strategies
发展战略

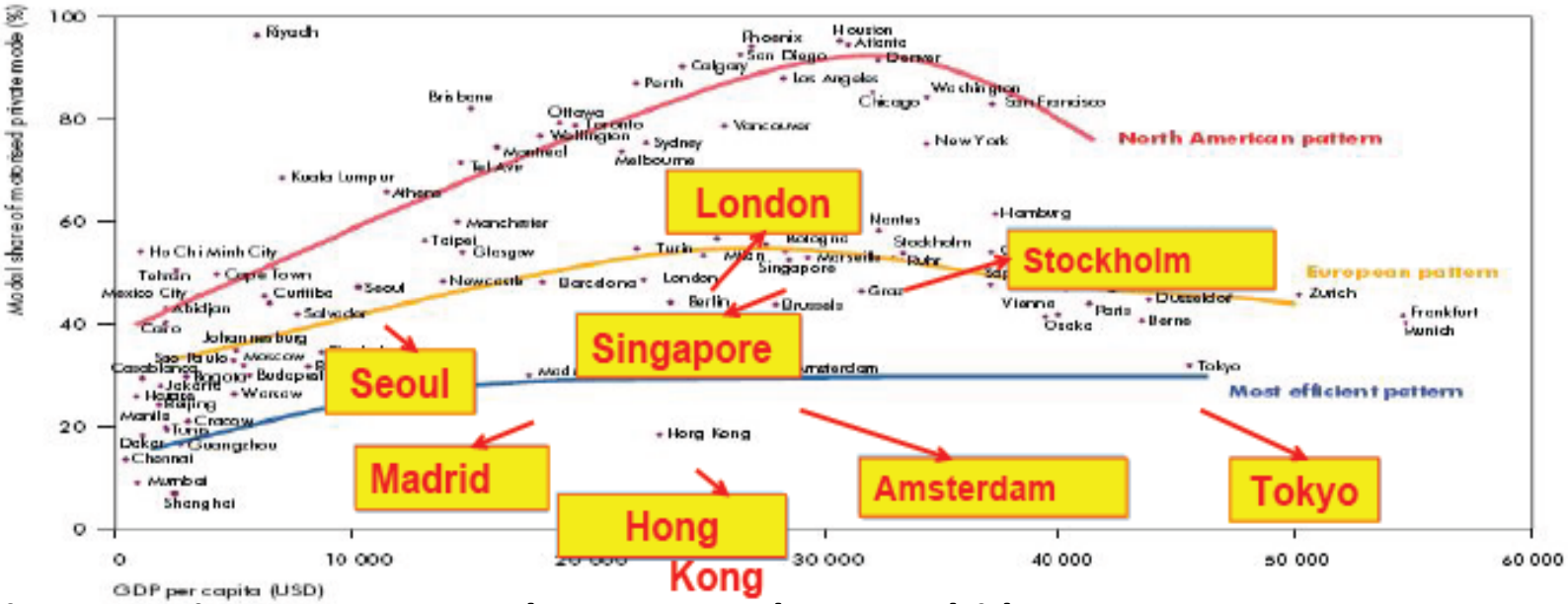
The characteristics of main urban transport types in the world

世界上主要城市交通类型的特点



International experiences: Transit priority + car management

国际经验:公交优先+小汽车管理



1. **Efficient transit: Hong Kong, Tokyo, Amsterdam, Madrid**
   高效的公共交通：香港，东京，阿姆斯特丹，马德里
2. **Congestion management + transit: Singapore, London, Seoul, Stockholm**
   拥堵管理+公共交通：新加坡，伦敦，首尔，斯德哥尔摩
3. **Severe congestion, unclear development strategy: Moscow, Mexico**
   严重的拥堵，不明确的发展战略：莫斯科，墨西哥城
4. **Best practice of small and medium sized city transit development: Curitiba BRT, Zurich(prioritized transit)**
   中小城市公交发展的示范案例：库里提拔BRT，苏黎世（公交优先）

Vision愿景

China should build a urban transport system for green travel:

中国城市应致力于构建具有以下特征的绿色出行系统：

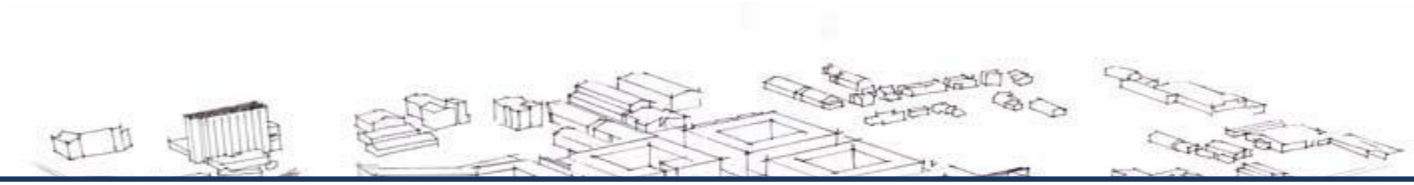
1. Compact, green, efficient transit system 集约、绿色、高效的公共交通系统

2. Walking and cycling friendly 适宜步行和自行车出行的良好环境

3. Well designed regulations and measures on car use 精心设计的对小汽车使用的政策措施

4. Ecological, harmonious city development mode 紧凑型的生态、宜居、和谐城市发展模式

Vision 愿景



- **Make public transport attractive –** so that all social groups including bankers, senior government officials, cleaners and the disadvantaged are all willing to use it.使公共交通具有吸引力——以便所有社会团体包括银行家，政府高官，清洁工都愿意使用它。

- **Providing safe and convenient environment -** for all citizens to walk and cycle. 提供安全和便捷的环境——给大多数市民步行和骑行

Strategy 战略

Prioritizing Green Travel

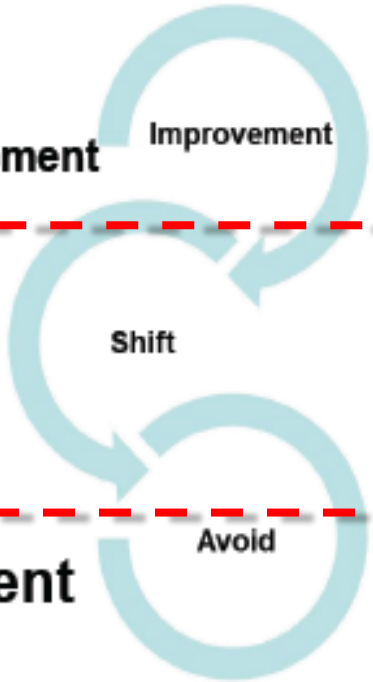
Prioritizing public transport, and transit metropolis development

Travel Demand Management

Implement TDM, rational car use (regulation, management, economic)

Transit Orientated Development

Strengthen planning coordination, build ecological and harmonious community



Part 3
第三部分

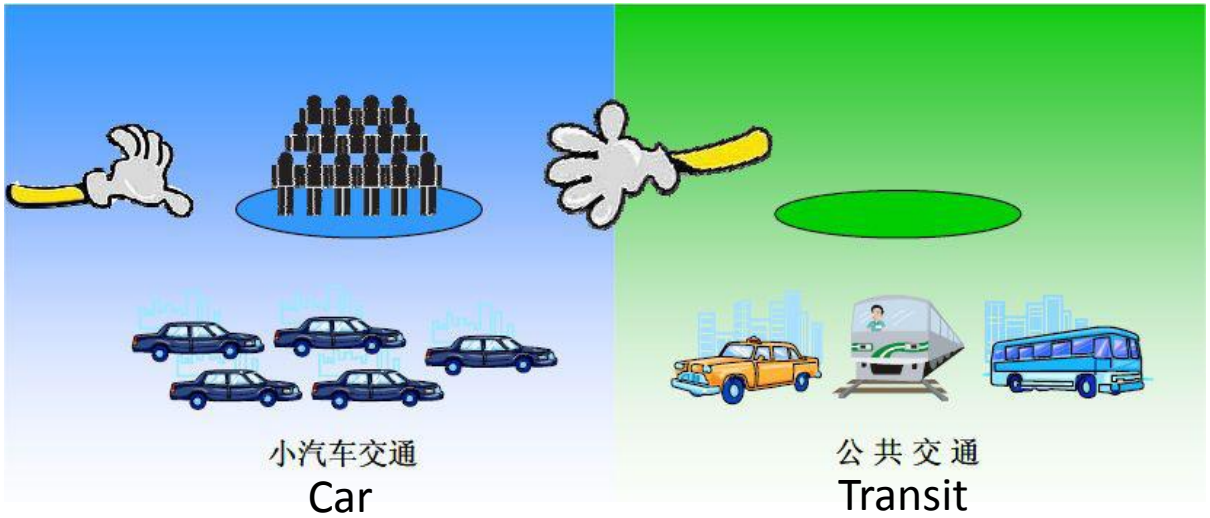
Policies and measures
政策和措施

Transport Demand management

交通需求管理

Push (regulate car use), Pull (prioritize transit), shift travel mode from car to transit

推（控制小汽车使用），拉（公交优先），出行模式从小汽车转变为公共交通



What's TDM?
什么是TDM?

简单来讲，考虑城市基础设施规模，通过影响出行者的行为，而达到减少或重新分配出行对空间和时间需求的目的。

Regulate car use:

	Ownership	Use	Parking
Admin	Purchase limit	flexible working time	Parking limit
Economy	Car plate auction	Congestion charge, car sharing	Differential parking fees

Measurement	City
Congestion charge	London, Singapore, Stockholm
Car number limit	Singapore, Beijing, Shanghai, Guangzhou
Car use limit	Seoul, Mexico, Beijing
Parking management	Seoul, Tokyo
Car sharing	NYC
Flexible working time	Germany

黄标车限行

今日
限行尾号
3和8
07:30–09:30
17:00–19:30

Transport for London
Congestion charging
Central ZONE
Mon - Fri
7 am - 6 pm

限行
20XX

1. **Access management 准入管理**
   - Restrictions based on the vehicle license plate numbers**基于汽车尾号的限行**
   - License-plate lottery车牌**摇号**
   - License-plate auction 车牌**拍卖**

2. **Parking management and control 停车管理和控制**
   - Information and availability of parking spaces 停车位信息公布
   - Parking pricing **差别化**停车收费

3. **Traffic management 交通管理**
   - Congestion Charging 拥堵区收费
   - Environmental zones **低排放区**

4. **Intelligent Transportation Systems (ITS) ITS技术**

1. Access management 准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

目的：车辆尾号限行的目的是限制城市部分区域部分机动车的出行，达到减少交通拥堵，降低尾气污染。

Objectives： the purpose of the restrictions based on the vehicle license plate numbers is to restrict the use of private vehicles in many area of city， meet the aim of reducing traffic congestion, decreasing the pollution from exhaust.

1. Access management准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

中国开展基于尾号限行措施的城市
Cities with the measure of Restrictions based on the vehicle license plate numbers in China

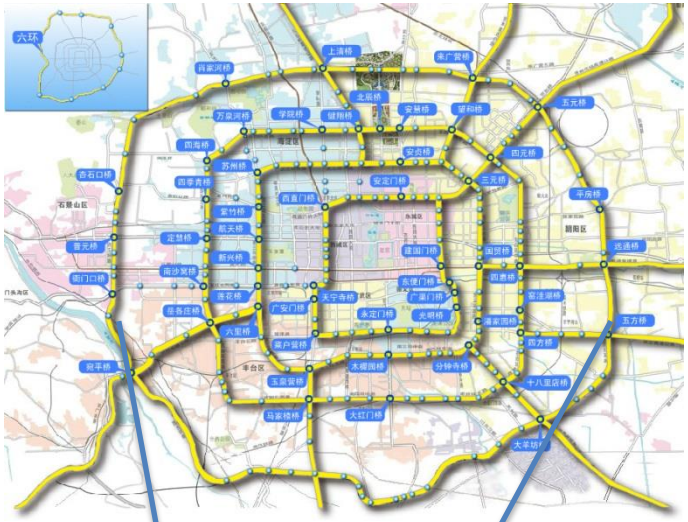
城市City	起始日Date	时间Time	区域Area
北京 Beijing	2008.10.11	7：00—20：00 Monday-Friday	五环内 Inner fifth ring road
南昌 Nanchang	2009.6.20	7：00—21：00 Monday-Friday	主城区 Urban area
兰州 Lanzhou	2010.9.18	7：00—20：00	城关、七里河两区 Two districts
贵阳 Guizhou	2011.9.9	7：00—20：00 Monday-Friday	一环路 First ring road
杭州 Hangzhou	2011.10.8	7：00—8：30 17：00-18：30 Monday-Friday	中心城区 Urban area
长春 Changchun	2010.5.4	6：00—20：00	部分路段 Several roads
天津 Tianjin	2014.3.1	7：00—19：00	天津外环线 outer-ring road

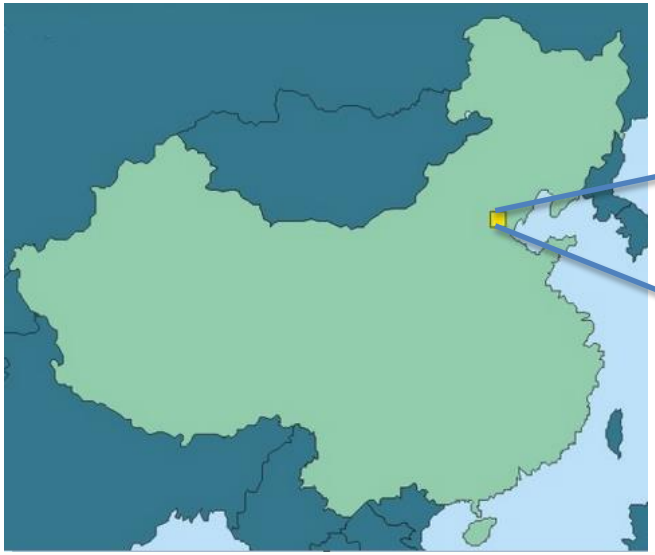
1. Access management准入管理

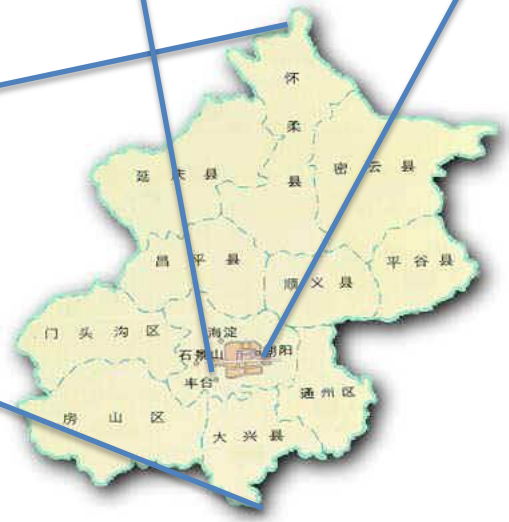
- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

案例1: 北京 Case1： Beijing

面积：16410.5km²
Area： 16410.5km²
人口： 2114.8万（2013）
Resident：21.14 million
注册车辆： 537.1万辆（2014）
licensed vehicles ： 5.37 million （2014）



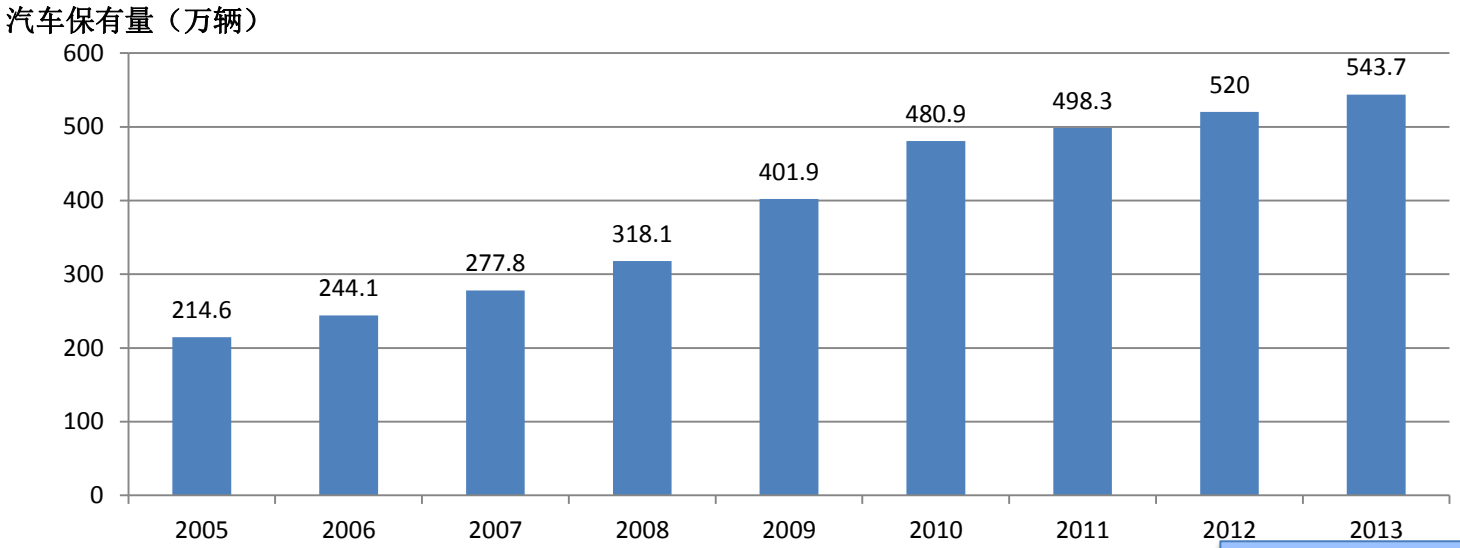




1. Access management准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

案例1: 北京 Case1： Beijing



2008年7月20日-9月20日北京实行单双号限行
Beijing began to implement odd-and-even license plate rule during 2008.7.1-9.20

2009年4月3日北京决定延长尾号限行政策一年
On 2009.4.3 Beijing decides to extend the restriction based on the license plate number rule to the next year

北京决定延长尾号限行政策至2014.4.11
Beijing extends the restriction based on the license plate number rule to 2014.4.11

2008年9月20日-2009年4月10日北京延长限行
Beijing extends the restriction based on the license plate number 2008.9.20-2009.9.207

2010年4月11日-2012年4月11日北京决定延长尾号限行政策两年年，之后顺延至2013年4月11日
On 2010.4.11 Beijing decides to extend the restriction based on the license plate number rule to the next 2 years，and then extend to2013.4.11

1.Access management准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

案例1: 北京 Case1： Beijing

车辆限行期间（7:00-20:00），私人车辆不得在市行政区域内行驶。出租车、公交车、救护车，急救车不在此列。

In the restriction day（7:00-20:00）, the private vehicles are forbidden to be used in the fifth ring road

Taxi, bus, ambulance, emergency vehicles etc. are exceptional

由摄像头监控识别尾号

Use shooting camera to reach the vehicle license plate recognition

1.Access management准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

案例1: 北京 Case1： Beijing

“单双号”尾号为单号的车辆只能在单日出行，双号的车辆在双日出行。
“尾号限行” 按5和0 、1和6、2和7、3和8、4和9五组差不多每三个月一轮换。
周末及节假日不限行。

The Odd-Even and One Day policies restricted vehicles based on the last digit of their license plate numbers. During the Odd-Even policy, license plates ending in odd numbers could drive only on odd-numbered dates and those ending in even numbers.

The pairing of digits remained the same week-to-week ((0, 5), (1, 6), (2, 7), (3, 8), (4, 9)) but the assignment of these pairs to weekdays were initially rotated every three month, no restriction for weekend and vacations.

1.Access management准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

案例1: 北京 Case1： Beijing

车辆限行当天（0:00-24:00），国家机关、社会团体、事业单位的车辆不得在市行政区域内行驶。

In the restriction day（0:00-24:00）, the vehicles which are affiliated to state organs, community and institutions are forbidden to be used in the municipal administrative area.

1.Access management准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行

案例1: 北京 Case1： Beijing
Effect: 效果：

- ✓ The congestion delay is decrease
  由于拥堵造成的出行延迟降低
- ✓ Exhaust pollution decrease
  尾气污染有所好转
- ✓ Obvious effect of energy saving
  节能减排效果明显

Notice: 注意：

- 如何防止购买注册第二个辆车号
- How to prevent people to buy another car and register a new license plate

1. Access management 准入管理

- license-plate lottery 车牌摇号

Objectives: the aim of license-plate lottery is to meet the requirement of the reasonable amount, smoothly increase of private vehicles , to ease the traffic congestion, reduce energy consumption and environmental pollution.

目的：实现小客车数量的合理、有序增长，有效缓解交通拥堵状况，降低能源消耗和减少环境污染

1. Access management准入管理

- license-plate lottery 车牌摇号

实施车牌摇号的城市：北京、天津、广州、贵阳、杭州

The cities implement license-plate lottery policy: Beijing, Tianjin, Guangzhou, Guiyang, Hangzhou

城市 City	人口（万） population（10thousand）	面积 Area（km2）	每年新增指标（10thousand/year）
北京 Beijing	2114.83	16411	24/15
天津 Tianjin	1472.21	11,946.88	10
广州 Guangzhou	1292.68	7434	12
贵阳 Guiyang	468.4	8034	2.4
杭州 Hangzhou	880.02	16596	8

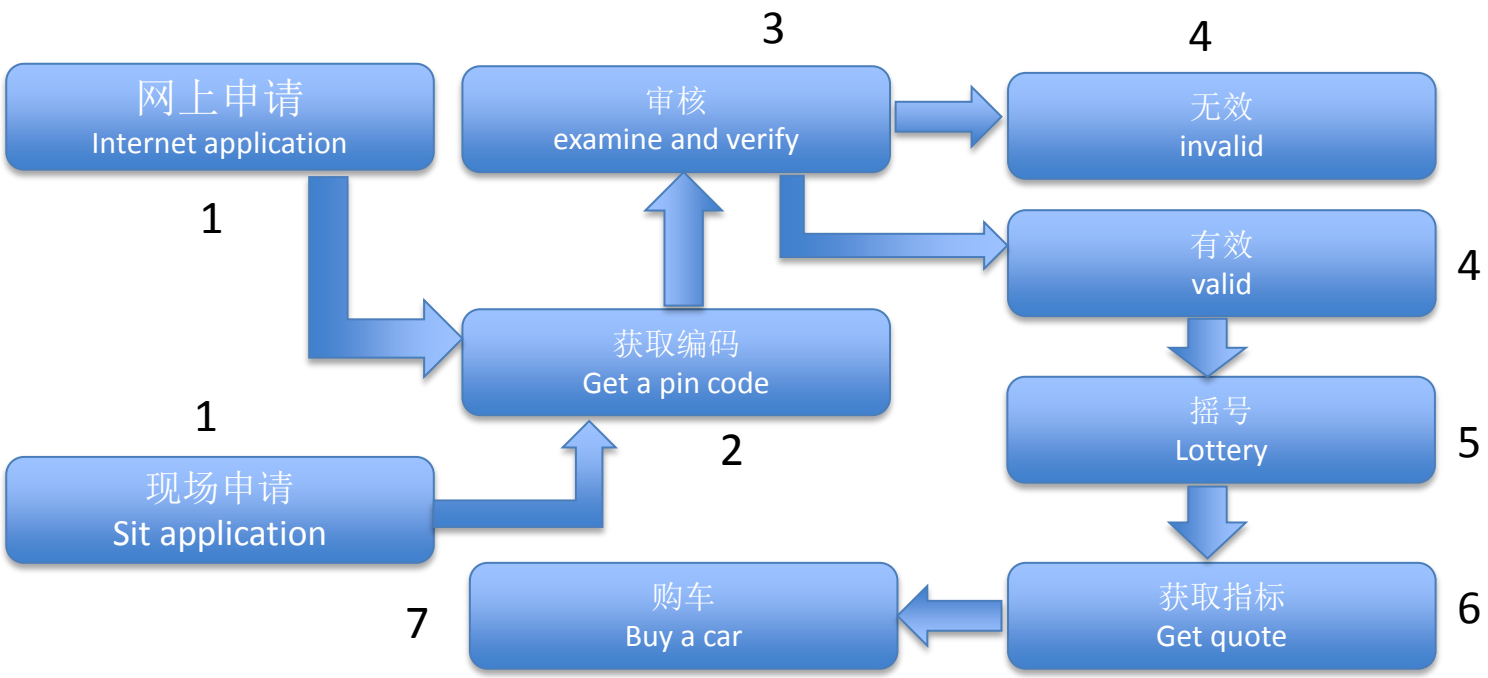
1. Access management准入管理

- license-plate lottery 车牌摇号

案例：北京Case：Beijing

北京每年的小汽车指标有24万个（包括：个人指标为17600个，单位指标为1600个，营运类小客车还有800个，2014年，新调整为15万个），参加摇号的申请者共有181万余人（2013年12月），中签比例为1：100，新能源车辆也需要参与摇号。

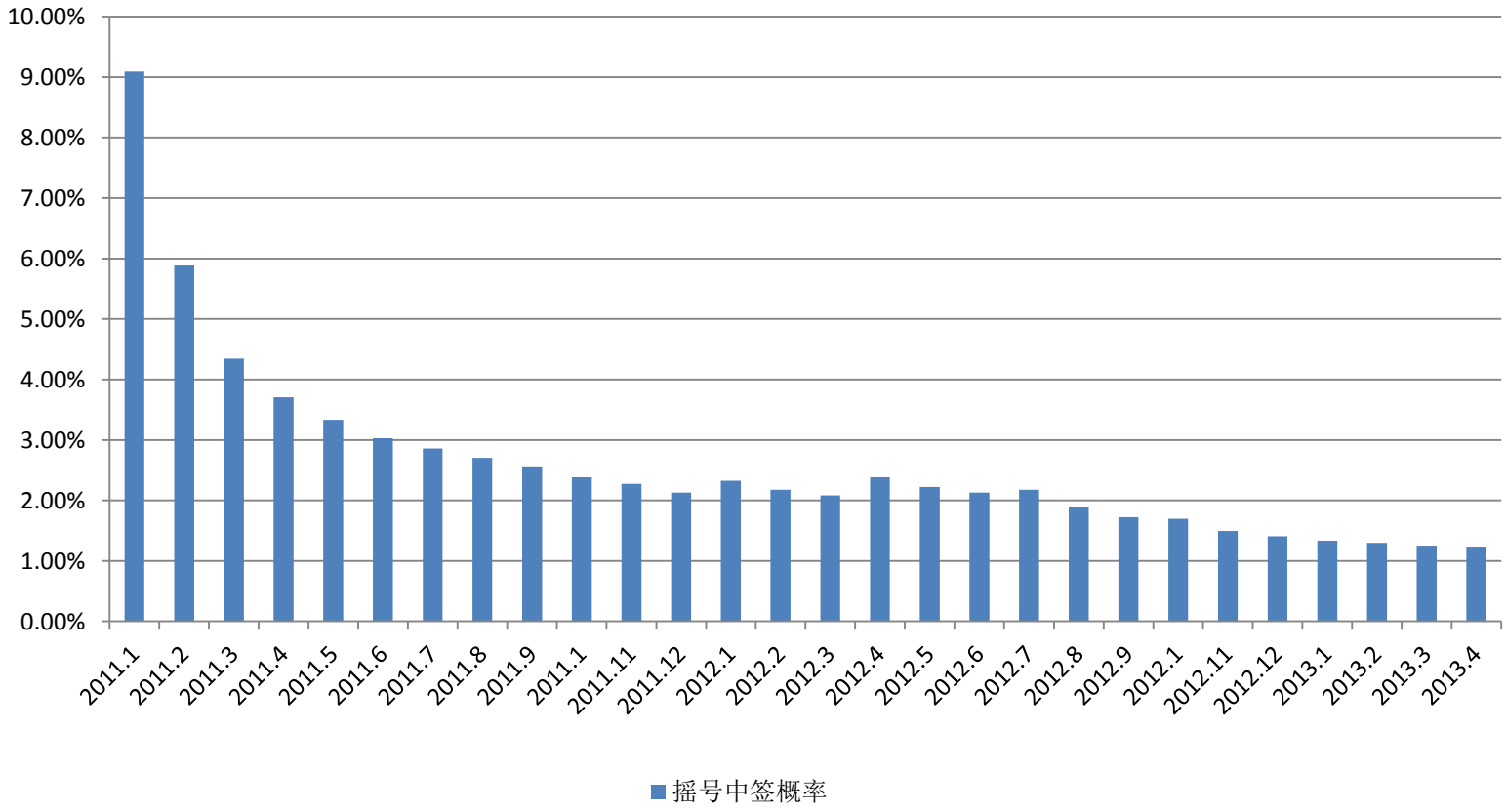
In Beijing, 240, 000 licenses per year, By 12nd, 2013, there are 1.81 million.



1. Access management 准入管理

- license-plate lottery 车牌摇号

案例：北京Case：Beijing



1. Access management 准入管理

- License-plate auction 车牌拍卖

案例：上海 Case：Shanghai

➢ Passenger car slow increase, better road service, provided time and space for transit development

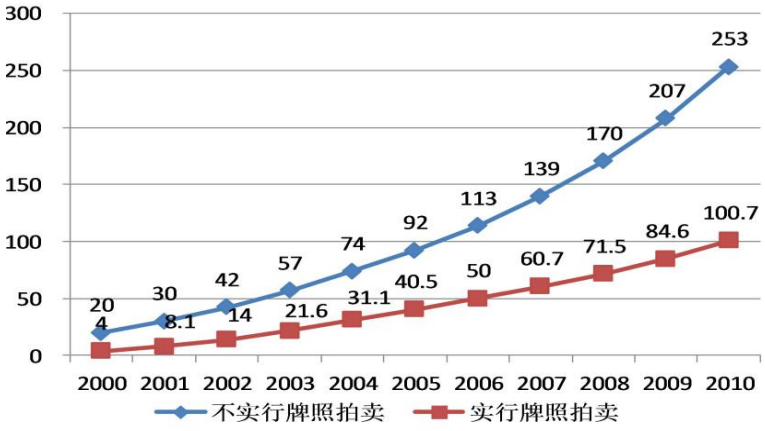
延缓小汽车的增长速度，为城市公交的发展争取时间和空间。

➢ Financial insurance for transit development

争取公交的发展资金。

➢ Insufficient management nonlocal vehicle

对外地车辆缺少管理手段，降低车牌拍卖措施效果。

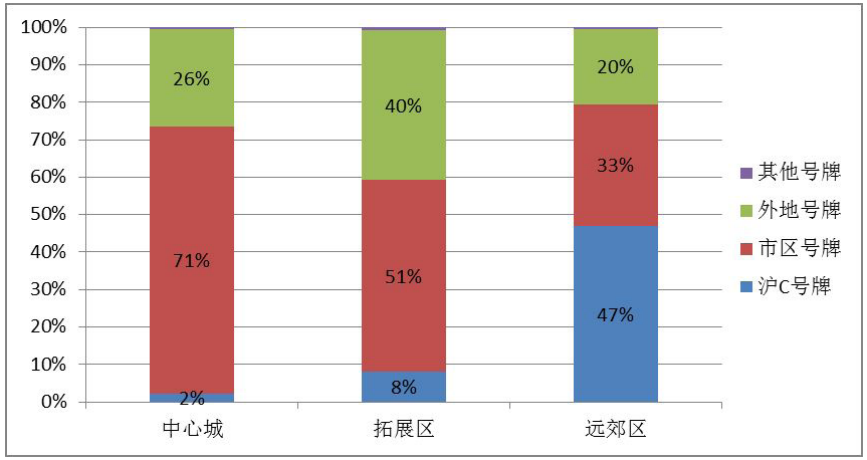


Build national network on car information management,
classification on car use
应建立全国联网的小汽车信息管理系统，对城市小汽车使用进行分类管理。

1. Access management 准入管理

- License-plate auction 车牌拍卖

案例：上海 Case：Shanghai



Downtown Suburb

上海市小客车构成
Vehicle stock in Shanghai

市区号牌（Downtown）：约130万辆
郊区号牌（ Suburb ）：约 48万辆
外省市号牌（Nonlocal）：约50-60万辆
合计（Total）：约240万辆

3类牌照的比较
Comparison among three license-plates

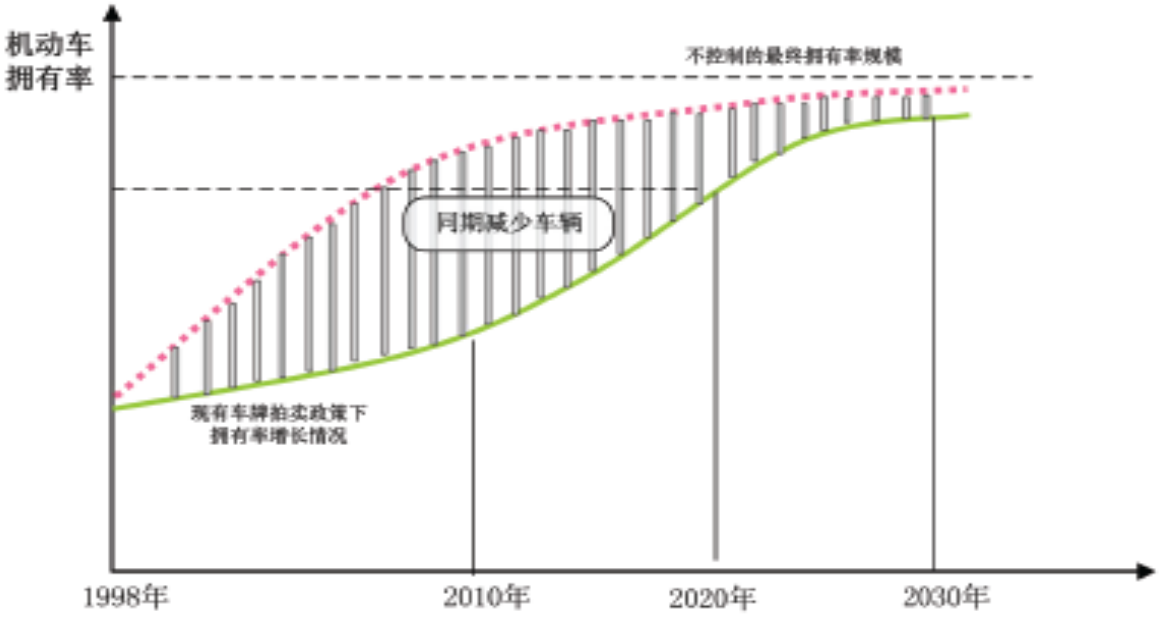
Downtown Suburb

		沪牌	外地号牌	郊区号牌
Cost	费用成本	最高（额度拍卖6万/张）	居中（0.5-1万/张，异地验车等时间成本）	最小（手续费）
Right	通行权	最大（全市域，全路段）	居中（高峰高架系统限行）	最小（不得进入外环线以内）

1. Access management 准入管理

- Restrictions based on the vehicle license plate numbers 基于汽车尾号的限行
- License-plate lottery 车牌摇号
- License-plate auction 车牌拍卖

权宜之计!
A temporary policy!



2.Parking management and control 停车管理和控制

- Information and availability of parking spaces 停车位发布信息

目的 objectives

车位引导系统是能够引导车辆顺利进入目的车位的指示系统。

Parking guidance system is to be able to guide the vehicle smoothly into the available parking Spaces.

Increasing emissions of green house gases and noise caused by parking-space-search-traffic Cruising for curb parking generates about 30% of the traffic in central business districts

停车位寻找交通造成的温室气体和噪音排放的增加；路边停车巡航造成中心商务区大约30%的交通量。

2.Parking management and control 停车管理和控制

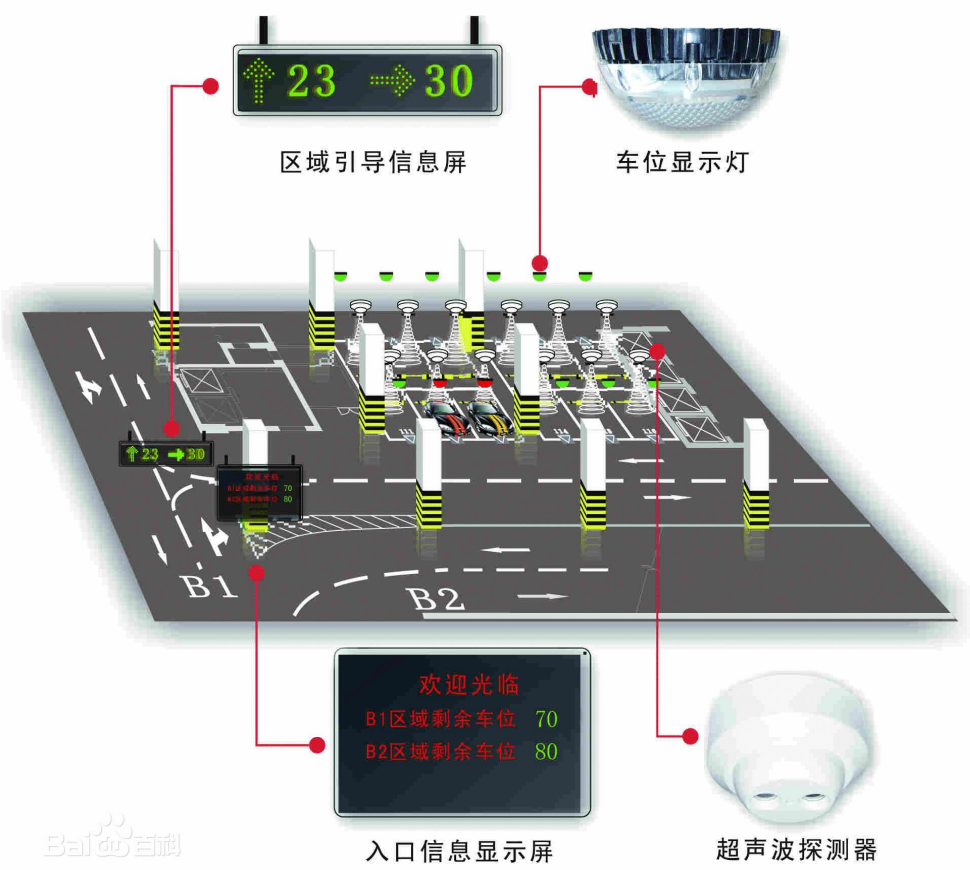
- Information and availability of parking spaces 停车位发布信息

利用车辆探测器来实时获得车位占用信息。中央控制器根据预先定义的停车策略对显示屏和引导牌进行相应的显示，用户只需按照指示就可以顺利将车量停入车位。

车位引导系统分为几个模块：车位数据探测模块，中央处理模块，信息发布模块，信息显示模块。

Vehicle detector is used to obtain real-time parking information. Central controller was carried out on the screen and guide card according to the predefined parking strategy , users only need to order the car into a parking space.

Parking guidance system can be divided into several modules: parking data detection module, central processing module, information release module, information display module.



2.Parking management and control停车管理和控制

- Parking pricing 停车收费

目的：objectives：

通过提升车辆拥挤区域、高峰时段停车费用的手段，达到影响特定时间、区域内出行方式比重的目的。

The transportation mode share in specific location and time be impacted by increased parking fee of congestion area and peak time.

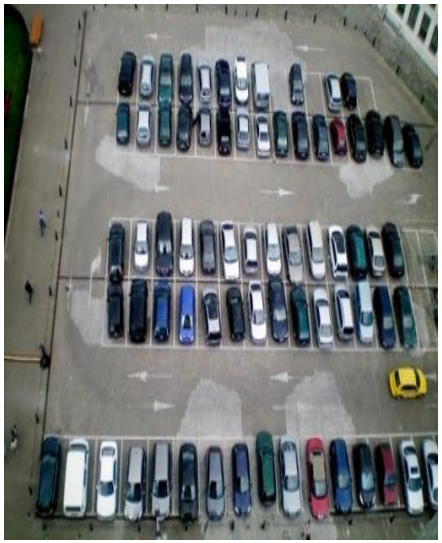
Advantage：优势：

Improve road safety 提升道路安全

Support local economic development支持地方经济发展

Revenue earner 创造收入来源

- Congestion 道路拥堵
- Safety安全
- Environment环境
- Block bus stop, lane, footway阻碍公交道路，人行道，车站



费用高昂：

- Surface：3k€/space
- 地面停车位：3千欧/车位
- Structure：15-20k€/space
- 结构：15-20千欧/车位
- Underground：25k€/space
- 地下停车位：25千欧/车位

2. Parking management and control停车管理和控制

- Parking pricing 差别化停车收费

- 原始问题 Original Problem
  - 停车位的需求超过了可用空间的供给：超过容 量或居民停车空间不足
  - Demand for parking space exceeds supply of available space: Capacities are exceeded, lack of parking space for residents
- 目标 Target
  - 消除停车空间的压力
  - Removal of parking space pressure
- 主要影响 Main Effects
  - 对外来车辆停车的制止 Deterrence of “alien parking“?
  - 增加对公共交通的需求 Increasing demand for public transport
  - 促进短时间停车 Facilitating short-term parking
  - 促进 住宅空间停车 Facilitating residential parking
  - 减少由于寻找停车位而 产生的交通 Reduction of parking search traffic
- 副作用和后续作用 Side & Follow-up Effects
  - 停车已经转移到管理区域的边缘Parking is shifted to the edges of the managed areas

2. Parking management and control停车管理和控制

- Parking pricing 差别化停车收费

案例1: 北京 Case1： Beijing

2011年，北京开始新的差别化停车政策。

2.Parking management and control停车管理和控制

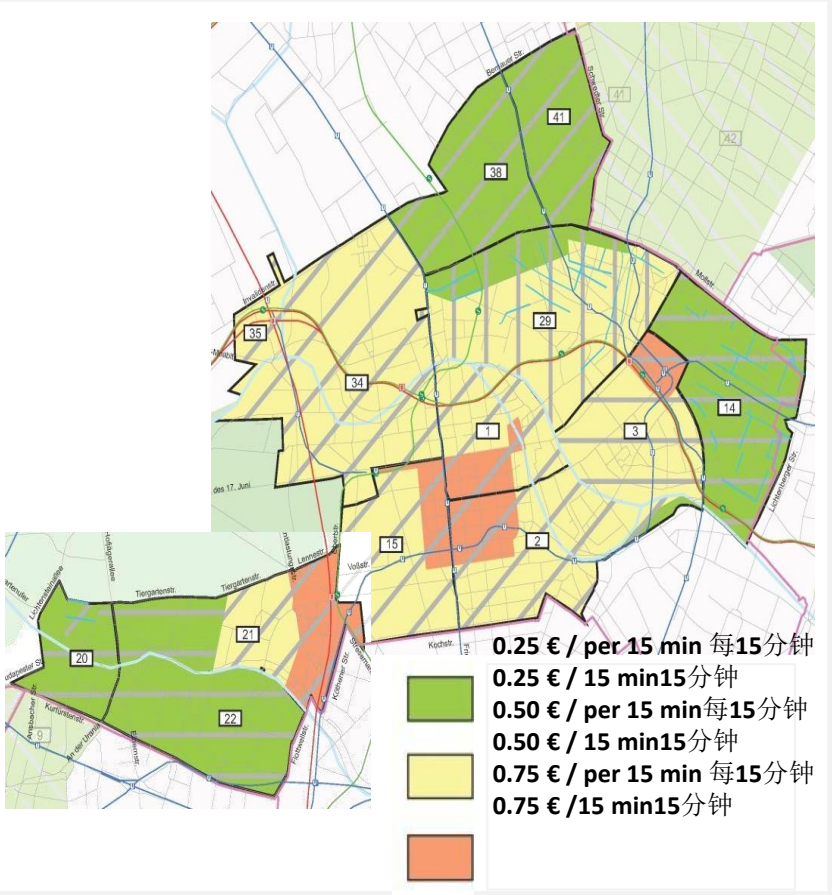
- Parking pricing 停车收费

案例2: 柏林 Case2： Berlin

- 大部分区域将居民停车（成本价年票）与短时间停 车（停车费）结合应用
- Mixture of residential parking (budget-priced annual ticket) and short-term parking (parking fees) covering large areas

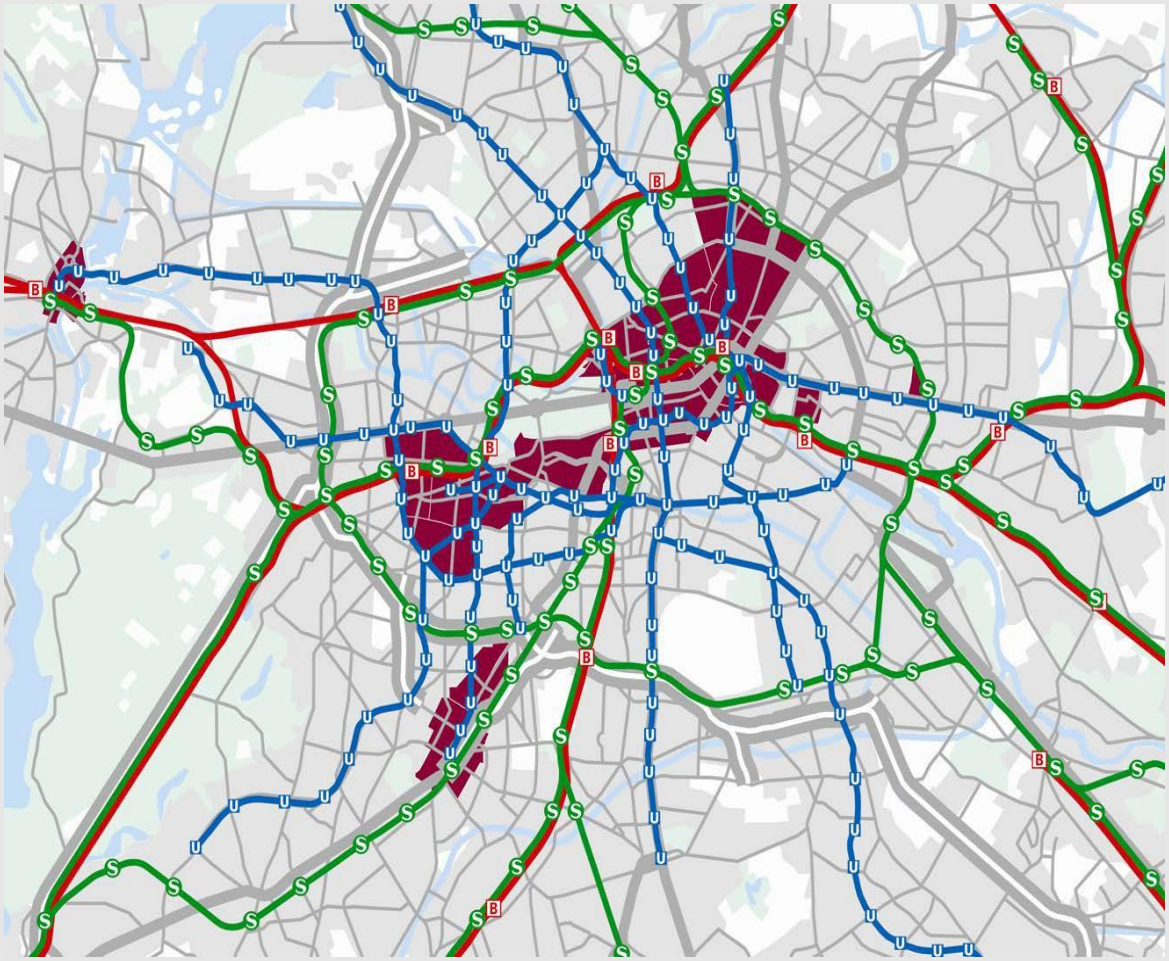
- 收费范围：每小时1-3欧元
- Range of fees from 1 - 3 € per hour

- 管理的时间的变化——没有星期天，没有深夜（夜间时间）
- variation of management times- no Sundays, no late evenings (Night time hours)



2.Parking management and control停车管理和控制

- Parking pricing 停车收费



公共街道受管理的停车位为 大约为9万4千个

•Number of managed car-parking spaces on public property: ca. 94,000

•停车区域总面积大约为2525公顷

•Total area of parking zones: ca. 2,525 ha

•地区总面积大约为 **47500** 公顷

Total area of district: ca. 47,500 ha

•该地区受管理的停车面积占总面积的**5%**

•Proportion of managed parking area to total area of districts; 5%

Discussion

3.Traffic management 交通管理

- Congestion Charging 拥堵收费

Why congestion charge？ 为何采取拥堵收费？

- 减少市中心的堵车

To reduce traffic and congestion in urban centres

- 支持地方经济

To support the local economy

- 提高所有道路和交通用户的安全

To improve safety for all road and transport users

- 减少出行的环境影响

To reduce the environmental impacts of travel

- 促进健康

To promote better health and fitness

- 提高城市宜居性

To improve livability in cities

- 提高公平度和社会共融

To enhance equity and social inclusion

- 为更好的公共交通筹集资金

To generate funds for better public transport

3.Traffic management 交通管理

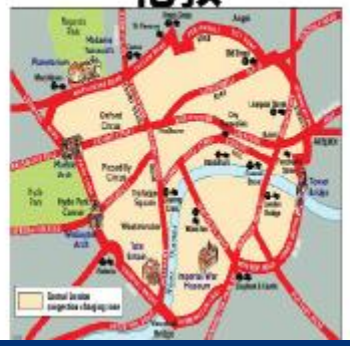
- Congestion Charging 拥堵收费

采取拥堵收费的城市 Countries implement congestion charging

1. 利用经济杠杆调节城市中心城区与主要交通干道的交通流量 To control the traffic flow by economy
2. 力争改变居民出行选择行为, 减少车辆尾气排放, 改善空气质量 Shift to green travel
3. 增加交通收费, 用于改善城市交通环境 Finance for PT and infrastructure
4. 抑制小汽车快速增长 Reduce the rapid vehicle growth

Singapore
新加坡

London
伦敦



Stockholm
斯德哥尔摩

3.Traffic management 交通管理

• Congestion Charging 拥堵收费

案例1：伦敦 Case1：London

- Population in London: 7,512,400 (2006)

大伦敦人口：7,512,400 (2006)

- Population living within original central London Congestion Charging area: 136,000

居住在原中心伦敦拥堵收费区域的人口：136,000

- The central London Congestion Charging Zone covers 22 km^2

中心伦敦拥堵收费区域面积为**22** km^2

- The Western Extension covered a further 20 km2 but has been removed again

西部延伸区的面积为**20** km^2，但后来被取消了。

3.Traffic management 交通管理

- Congestion Charging 拥堵收费

案例1：伦敦 Case1：London

Objectives：目的

To reduce congestion
减少拥堵
To make radical improvements to bus services
大力改进公共汽车服务
To improve journey time reliability for car users
提高汽车用户的出行时间可靠性
To make the distribution of goods and services more efficient
使货物和服务的分配更加有效

3.Traffic management 交通管理

- Congestion Charging 拥堵收费

案例1：伦敦 Case1：London

Zone based system 基于区域的收费系统

- Payment options 支付方式

-A daily charge of £10 按日收费£10

-Weekly, monthly or annual payments possible 也可以按周、按月或按年支付

-Payment on the following day is permitted but the charge is £12 可以在第二天支付，但费用为£12

-Between 7am and 6 pm from Monday to Friday 收费时间为周一至周五的7am- 6 pm

•Technology is ANPR (Automatic Number Plate Recognition) and people who pay too late get a fine

•应用了ANPR（自动车牌识别系统），付款太晚会受到处罚。

3.Traffic management 交通管理

- **Congestion Charging 拥堵收费**

案例1：伦敦 Case1：London

- Impacts 影响
- Traffic reduced by 21 % 交通量减少了21%
- Environmental impact 环境影响

  NOx下降了13%
  PM10下降了15%
  CO2下降了16%

- Between 40 – 70 fewer accidents per year compared to background trend

相对于背景趋势而言，每年的事故次数减少了40-70起。

- Bus patronage up, reliability and journey time improved

公共汽车载客量上升，可靠性和行车时间改进。

3.Traffic management 交通管理

- Congestion Charging 拥堵收费

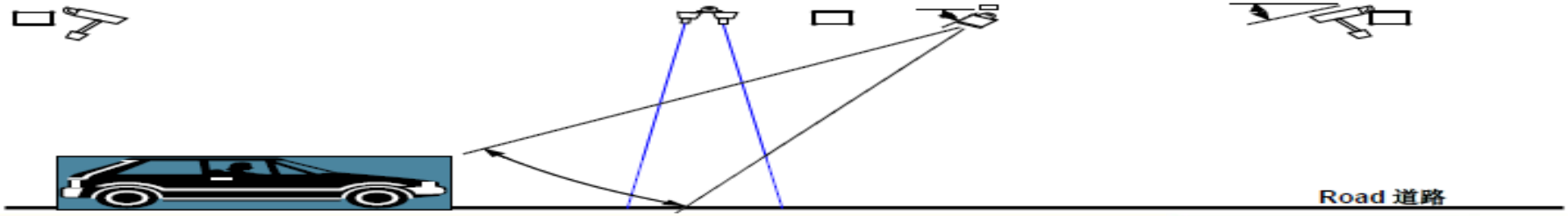
案例2：斯德哥尔摩 Case2：Stockholm

10-20 kr / passing the charging stations (depending on time of the day)

- **10-20**克郎**/**驶经收费站（取决于时间段）
- **Max. 60 kr / day**
- 最高**60**克郎**/**天

Time 时间段	(SEK) Amount 金额
06.30-06.59	10 kr
07.00-07.29	15 kr
07.30-08.29	20 kr
08.30-08.59	15 kr
09.00-15.29	10 kr
15.30-15.59	15 kr
16.00-17.29	20 kr
17.30-17.59	15 kr
18.00-18.29	10 kr
18.30-06.29	0 kr

Camera Rear摄像头后部　Laser Detector激光探测仪　Antenna天线　Camera Front摄像头前部

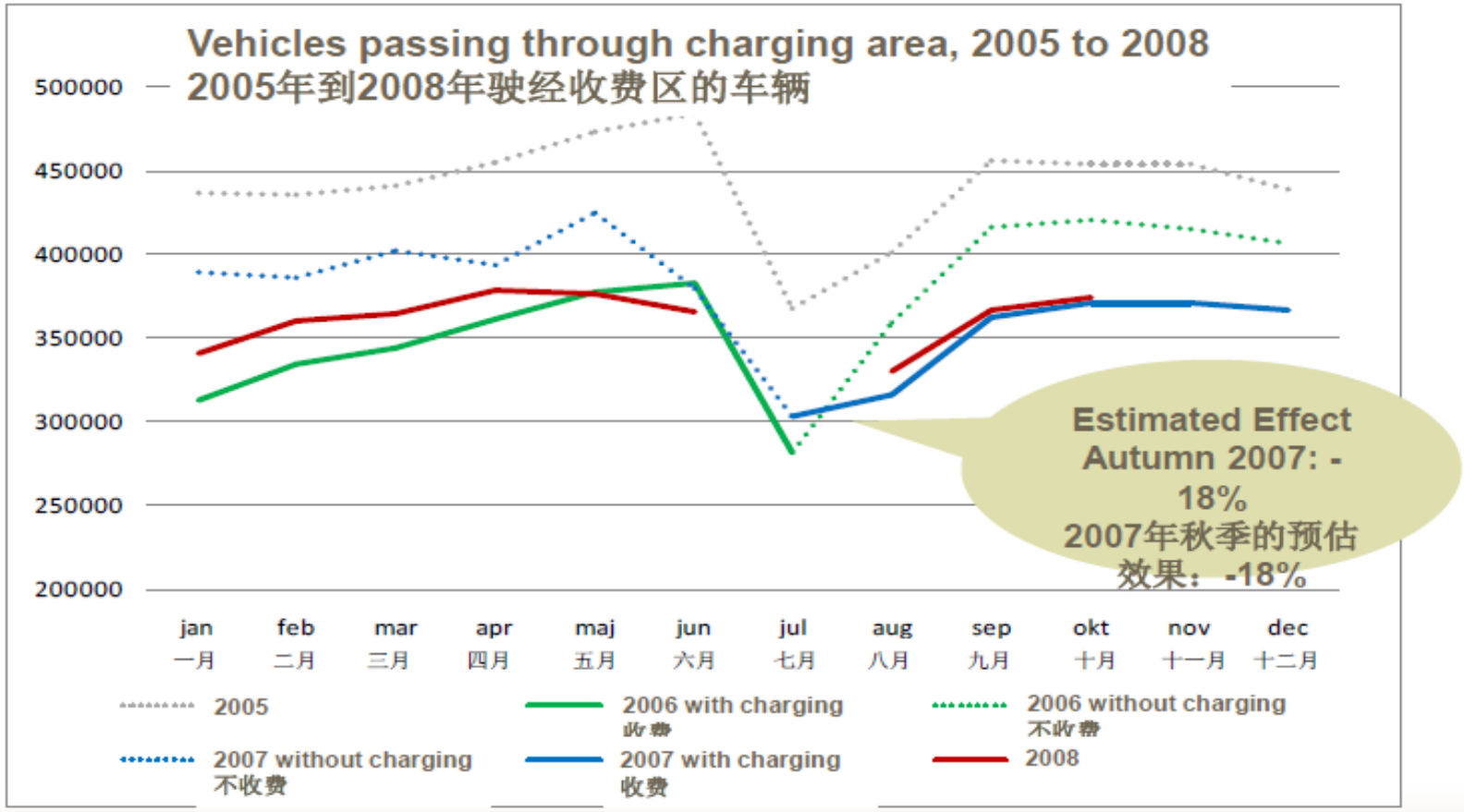


3. Traffic management 交通管理

- Congestion Charging 拥堵收费

案例2：斯德哥尔摩 Case2：Stockholm

影响 Impacts：



3. Traffic management 交通管理

- Environmental zones (Low emission zone) 低排放区

目的：通过禁止高污染车辆的进入，降低空气中PM10、PM2.5、二氧化氮、二氧化碳等排放物，从而提高低排放区内居民的生活水平品。

Objectives： reduce the emission of PM10, PM2.5, nitrogen dioxide, carbon dioxide etc. by forbidden the entrance of high pollution vehicles, and therefore, increase the living standard of local residents.

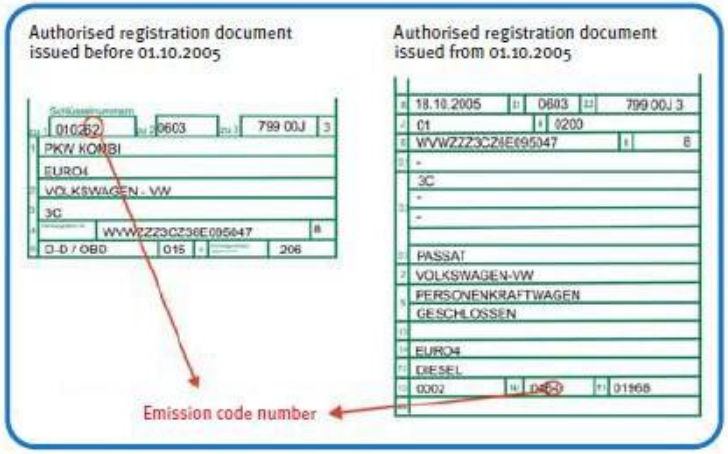
3. Traffic management 交通管理

- Environmental zones (Low emission zone) 低排放区

案例1: 柏林 Case1： Berlin

	Requirement for diesel vehicles 对柴油车辆的要求	Requirement for petrol vehicles 对汽油车辆的要求
Without Sticker 无标识	Euro 1 or less 欧1或低于欧1标准	Without a catalytic converter 未安装催化转化器
	Euro 2 or Euro 1 particular filter 欧2标准或欧1标准加装颗粒物过滤器	PM >50mg/km
	Euro 3 or Euro 2 particular filter 欧3标准或欧2标准加装颗粒物过滤器	PM <50mg/km Can also achieved by retrofit 可通过改装实现
	Euro 4 or Euro 3 particular filter 欧4标准或欧3标准加装颗粒物过滤器	Euro 1 With catalytic converter PM >25mg/km 欧1并安装催化转化器

Vehicle sticker allowed to enter; Penalty:40 euro and 1 point
允许进入的车辆标签；处罚：40欧元记1分



The car which registered in Germany will receive a sticker based on the number of the license
在德国注册的车辆将会根据车牌照和证书上的排放编号收到相应标签

3. Traffic management 交通管理

- Environmental zones (Low emission zone) 低排放区

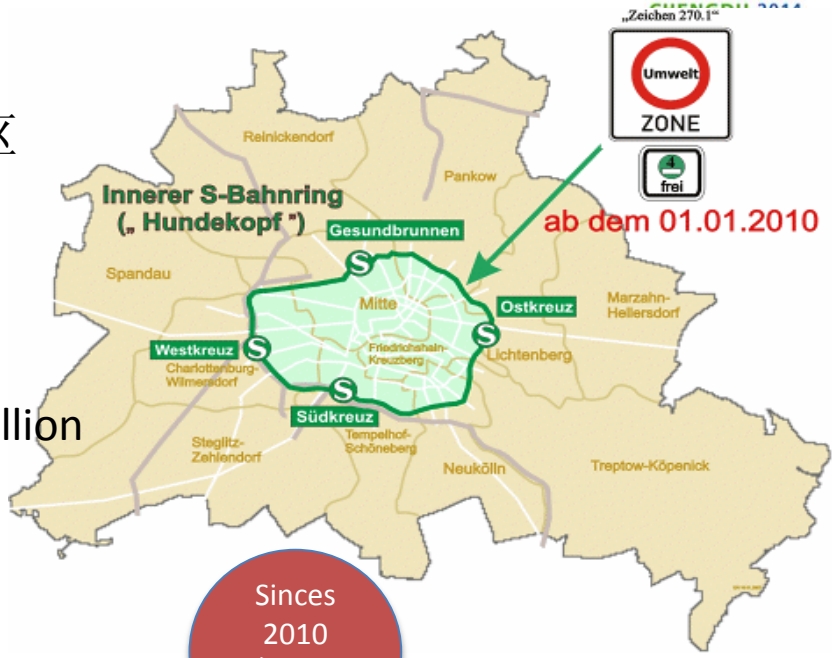
案例1：柏林 Case1：Berlin

面积：88 km^2；柏林地区总面积：892 km^2

Area： 88 km^2；Berlin total area：892 km^2

居民：约100万；柏林地区总人数340万

Inhabited：1 million； Berlin total inhabited：3.4million



Stage 1 — Sinces 2008 自2008年开始

- Diesel vehicles: Euro 2 or Euro 1+retrofit
- Petrol vehicles: Euro 1
- 7% of vehicles fleet affected
- 柴油车：欧2标准的车辆或欧1标准的车辆改装
- 汽油车:欧1标准
- 柏林7%的车辆受到影响

→

Stage 2 — Sinces 2010 自2010年开始

- Diesel vehicles: Euro 4 or Euro 3+particle filter
- Goods vehicles: retrofit to Euro 4
- 10% of vehicles fleet affected
- 柴油车：欧4标准的车辆或欧3标准的车辆加装颗粒物过滤
- 货运车辆：改装至少达到欧4
- 柏林10%的车辆受到影响

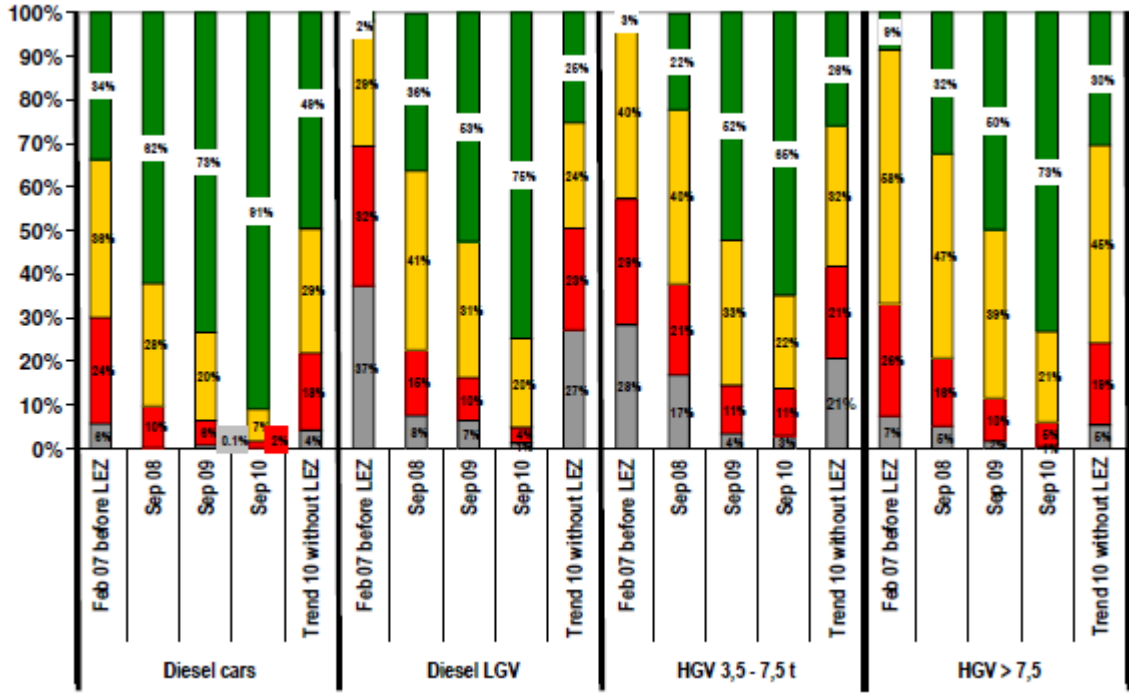
3. Traffic management 交通管理

- Environmental zones (Low emission zone) 低排放区

案例1: 柏林 Case1： Berlin

效果: 车辆变化

Effect： Change of the vehicle fleet composition



通过车牌号码识别，无标识和红色标识车辆所占比例降低。

the share of vehicles without sticker and vehicles with red sticker are decreased . （Based on the number plate recognition ）

德国境内环保区示意图：红点（红色、黄色、绿色标识的车辆可以通过）；黄点（黄色、绿色标识的车辆可以通过）；绿点（绿色标识的车辆可以通过）

Environmental zone in Germany: Red pot (vehicle with red, yellow and green sticker can pass through); Yellow pot (vehicle with yellow and green sticker can pass through); Green pot (vehicle with green sticker can pass through)

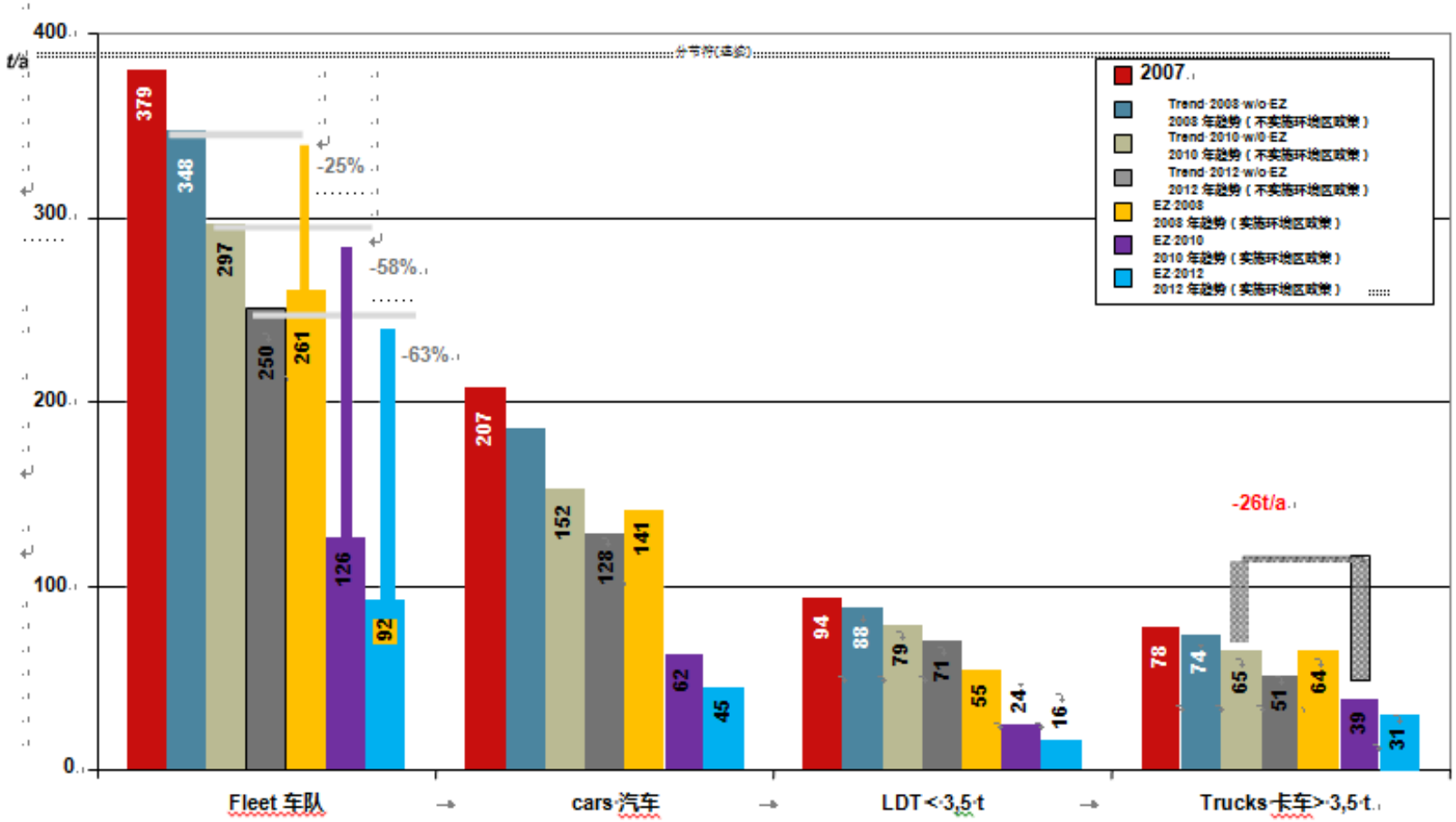
3. Traffic management 交通管理

- Environmental zones (Low emission zone) 低排放区

案例1: 柏林 Case1： Berlin

效果：环境区使汽车尾气炭黑颗粒排放总量减少

Effect： The diesel soot-emissions by the environmental zone is reduced



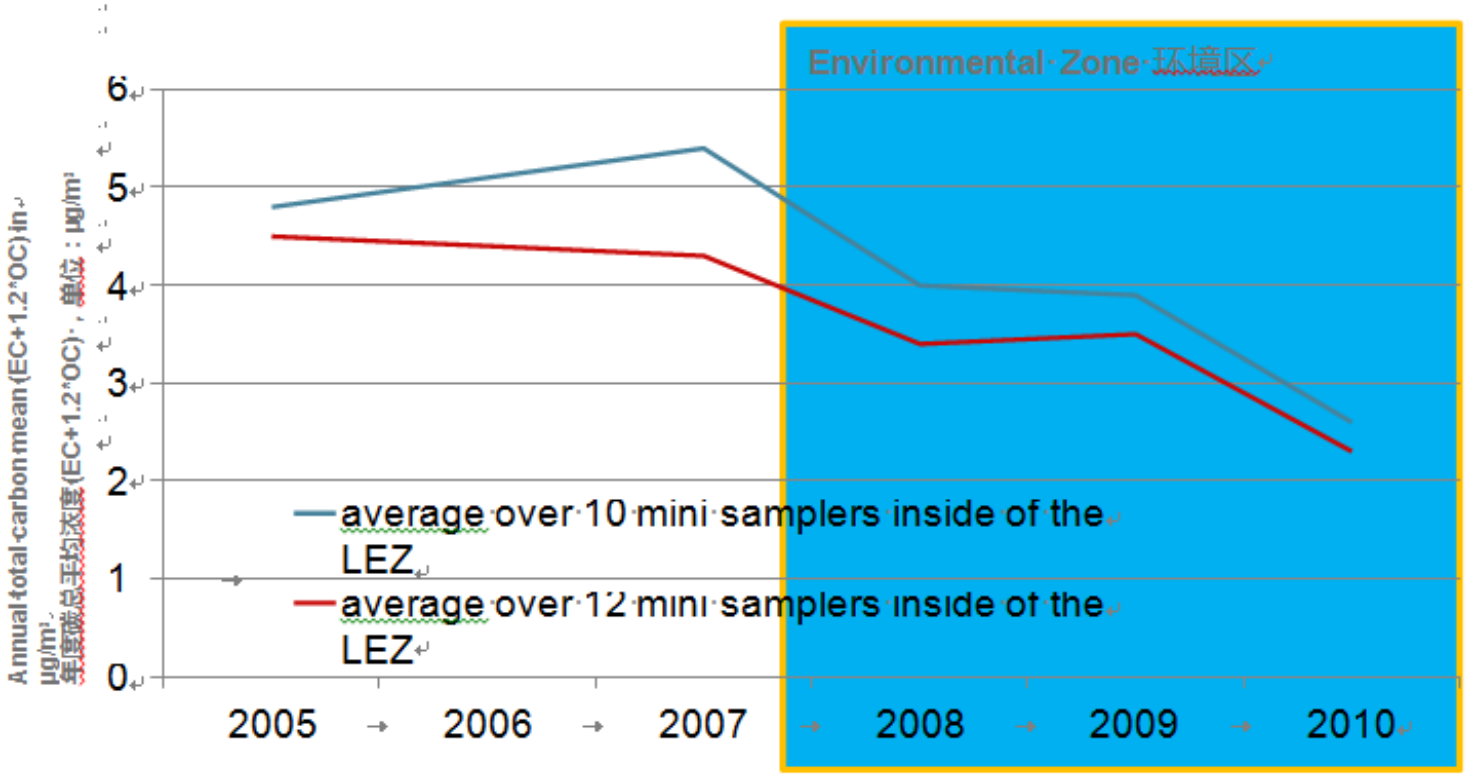
3. Traffic management 交通管理

- Environmental zones (Low emission zone) 低排放区

案例1: 柏林 Case1:Berlin

效果：环境区使汽车尾气炭黑颗粒排放浓度降低

Effect： Traffic related black carbon particle concentration is decreased



3. Traffic management 交通管理

- Environmental zones (Low emission zone) 低排放区

Notice：注意：

Charge is not the goal; 收费不是目的；

lack of control and enforcement ; 缺乏控制和执行力;

Too small；size matter；规模小

3.Traffic management 交通管理

- Congestion Charging mode 拥堵收费方式

各国现行的收费方式：
Current charging methods

非完全信息拥堵收Congestion charge based on incomplete information

根据进入收费区域车辆的部分信息收费，只考虑
- 车型**Vehicle type**
- 出行时间**travel time**

不考虑
- 行驶线路**travel route**
- 对道路使用强度**intensity of road usage**

未来可能的收费方式：Possible charging methods in future

完全信息拥堵收费Congestion charge basing on complete information

由于城市道路交通拥堵受时间维和空间维的影响，根据Factors considered
- 车型**Vehicle type**
- 出行时间**travel time**
- 行驶线路**travel route**
- 对道路使用强度**intensity of road usage**

对车辆实现差别化收费。

跑多少收多少！

开展了拥堵收费技术实施方案研究的城市有：

北京、上海、广州、深圳等。Beijing, Shanghai, Guangzhou, Shenzhen, etc.

3.Traffic management 交通管理

- Congestion Charging problems 实施拥堵收费政策的问题

在我国探讨交通拥堵收费时必须解决的问题
Problems for Congestion

- 哪些城市具有实施拥堵收费的资格? Which city is qualified to implement congestion pricing?
- 需要从国家层面出台相关标准与法律依据relevant national standards and regulation are needed
- 由哪个部门来收取并负责资金的管理? Which department is responsible for collect ion and management of funds?

  需要交通、环保、公安、财政、发改委多部门协调Transport, environmental, Police, finance development and Reform Commission need to work together
- 所收资金的使用The use of the funds.

  用于发展公共交通和基础设施建设For the development of public transport and

3.Traffic management 交通管理

- Congestion Charging problems 实施拥堵收费政策的问题

在我国探讨交通拥堵收费时必须解决的问题
Problems for Congestion

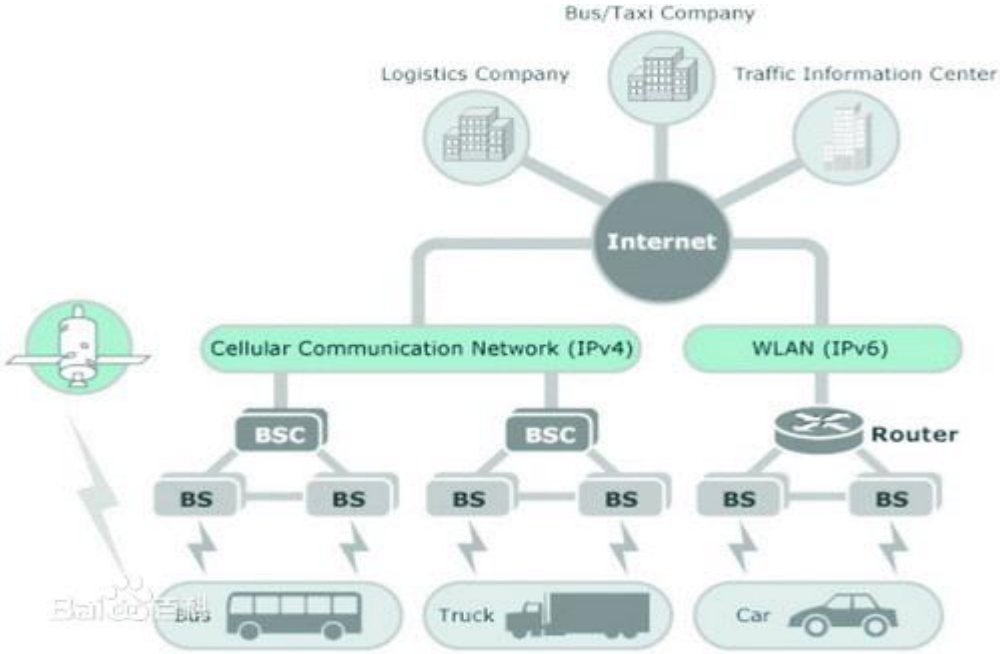
- 有针对性的拥堵收费实施方案The congestion charging scheme

  收费时间, 收费区域, 收费方式(静态或动态), 收费手段Charging time, charging zone, charging methods (static or dynamic), charging technology

- 交通信息共享制度（车辆、道路、动态交通）The traffic information sharing system (vehicle, road, traffic)

4.Intelligent Transportation Systems (ITS) ITS技术

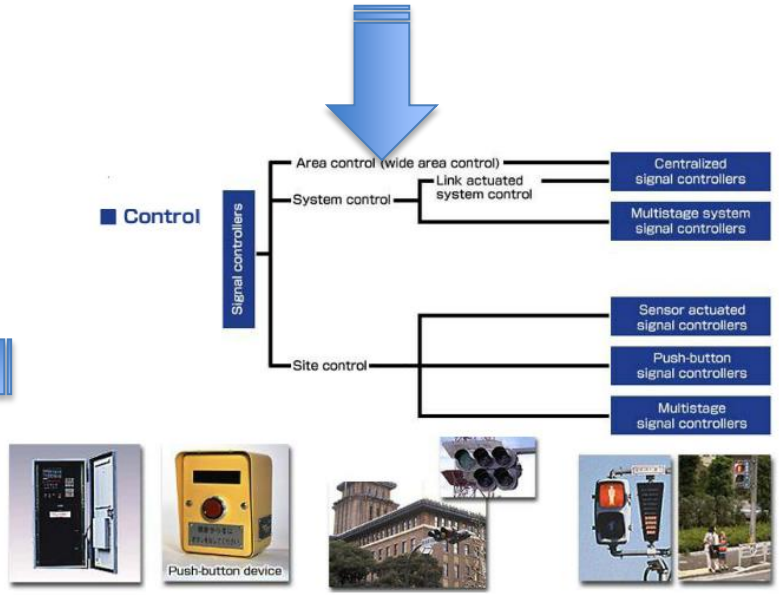
Objective：目的：
利用信息技术，综合人、车、路，系统的管理交通
To use information technology, integrated human, vehicle, road, and manage the traffic systematically



4.Intelligent Transportation Systems (ITS) ITS技术

Information collection

Information analysis



Control

Information supply

Part 4
第四部分
Conclusions
结论

(1) 交通需求管理包括很多项政策措施，多项政策的综合措施会比单项政策的实施取得较好的效果。结合本国国情，制定合理的交通需求管理政策，将经典交通规划理论与交通需求管理理念相结合，政策的实施会更有效果。

TDM includes many policy measures and the effect of comprehensive multi-policy measures is better than that of single policy. Combined with the current situation of China, by making rational TDM policies.

(2) 汽车租赁、汽车合乘迎来了一个新的发展机会。A good chance for can rental and car sharing

(3) 要有较发达的城市公共交通体系，在中国或其他人口大国中，应建立”城市公交+自行车/步行”为主体的城市综合交通体系。A good PT system is important, In China, PT + bicycle/walk oriented system is necessary

(4) 公众要有很强的参与意识，主动和积极参与低碳出行、绿色出行，摈弃将小汽车作为通勤出行工具的错误理念。Green concept, active and positive for green travel, don’t take car as commuting

China Urban Sustainable Transport Research Centre

■CUSTReC established and supported by Volvo Research & Education Foundation (VREF) in 2005 and recongized as a sub-division of CATS by MOT, 2009

■CUSTReC has been officially recognized as an independent urban transport center of CATS

Vision:

To apply innovative transport solutions which fully integrate high-priority public transport, land use and mobility management to promote sustainable urban transport for benefit of Chinese citizens.

To be an international center of excellence for sustainable transport in high growth cities.

This CoE is to be:

A think tank to provide policy decision making and technical support to the central, MOT and the local city level.

Activities :

- Research & development
- Training & education
- Dissemination.& comm.

绿色交通，城市未来，生活更美好

Green transport, Sustainable City, Better Life

谢谢

Thank You !

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