

# 中国停车 政策研究



楼下



外面

Bram van Ooijen  
2015年03月11日，北京

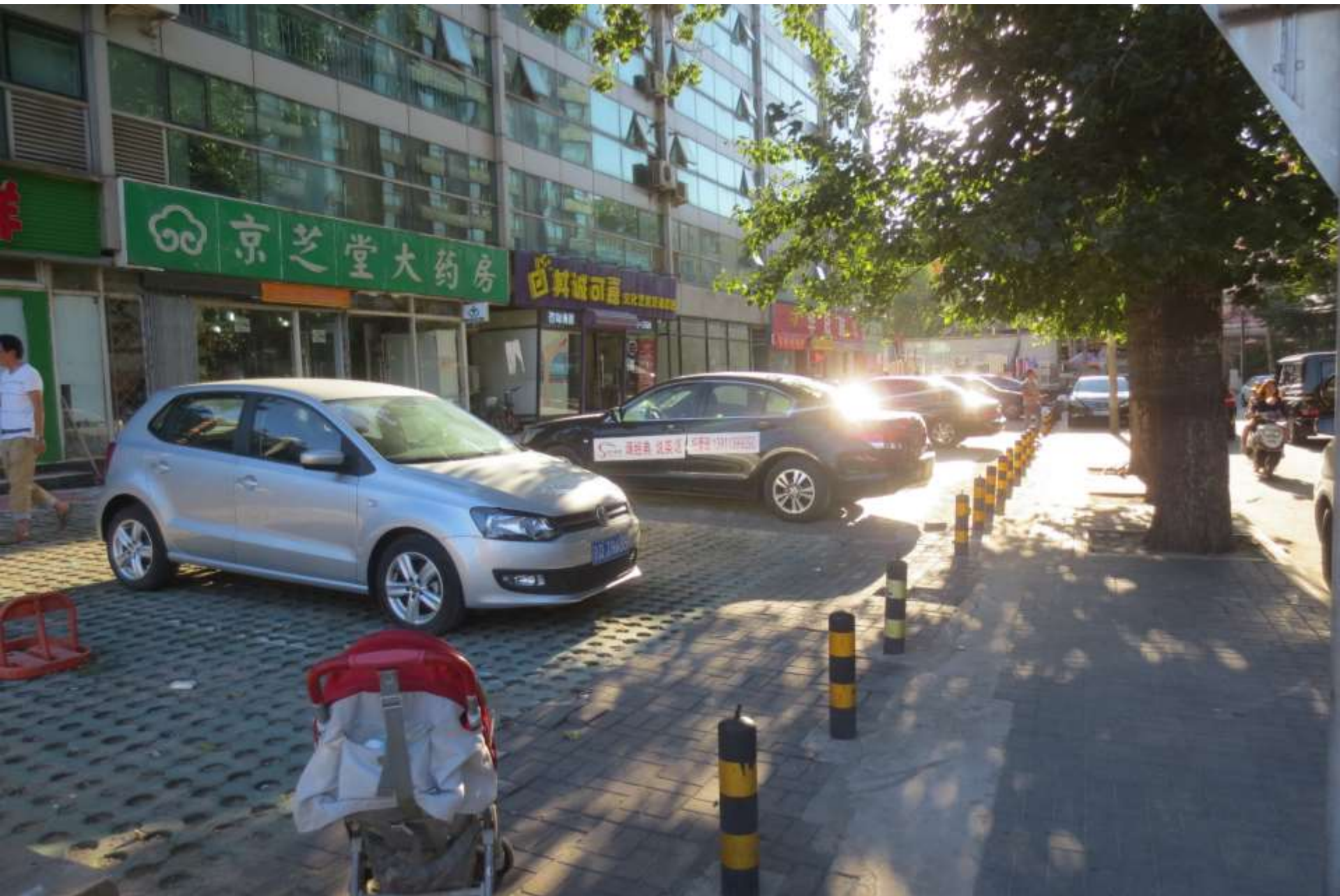


广州市现代快速公交  
和可持续交通研究所  
Institute for Transportation  
& Development Policy





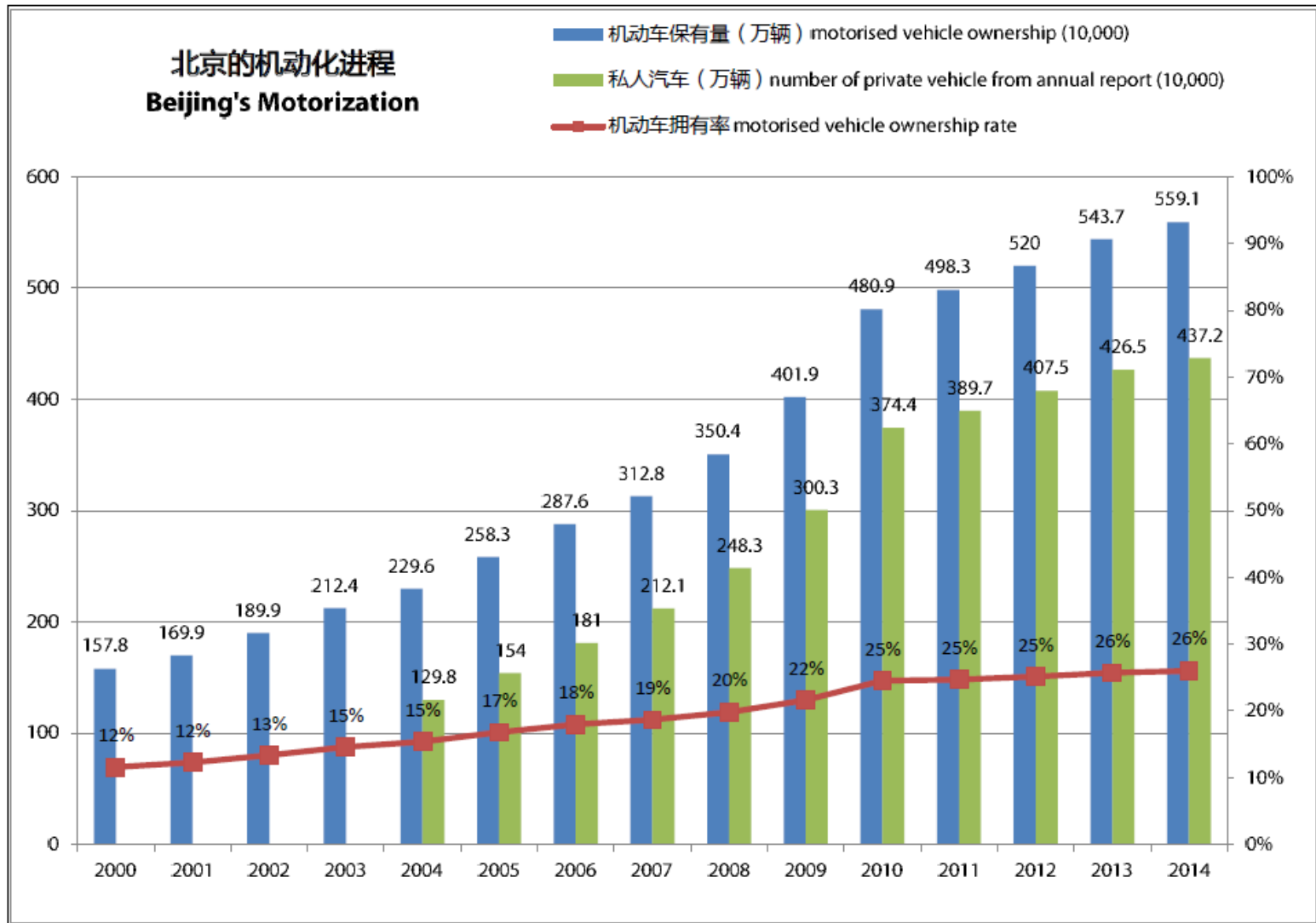








# 2000年以来北京的机动化进程



*Growing motorization in Beijing is putting pressure on road capacity and contributing to air pollution*

Sources: 1. Beijing Traffic Management Bureau (2014), Traffic Management Data from 2000, <http://www.bjtg.gov.cn/publish/portal0/tab803/>; 2. Annual report of Beijing Statistics Bureau, <http://www.bjstats.gov.cn/xwgb/tjgb/ndgb/>





快速公交 ( BRT )  
绿道  
公共自行车  
自行车和行人设施  
道路设计 ( 完整的街道 )  
**停车 ( 路内及路外 )**  
城市发展及城市设计  
宣传及最佳实践的推广



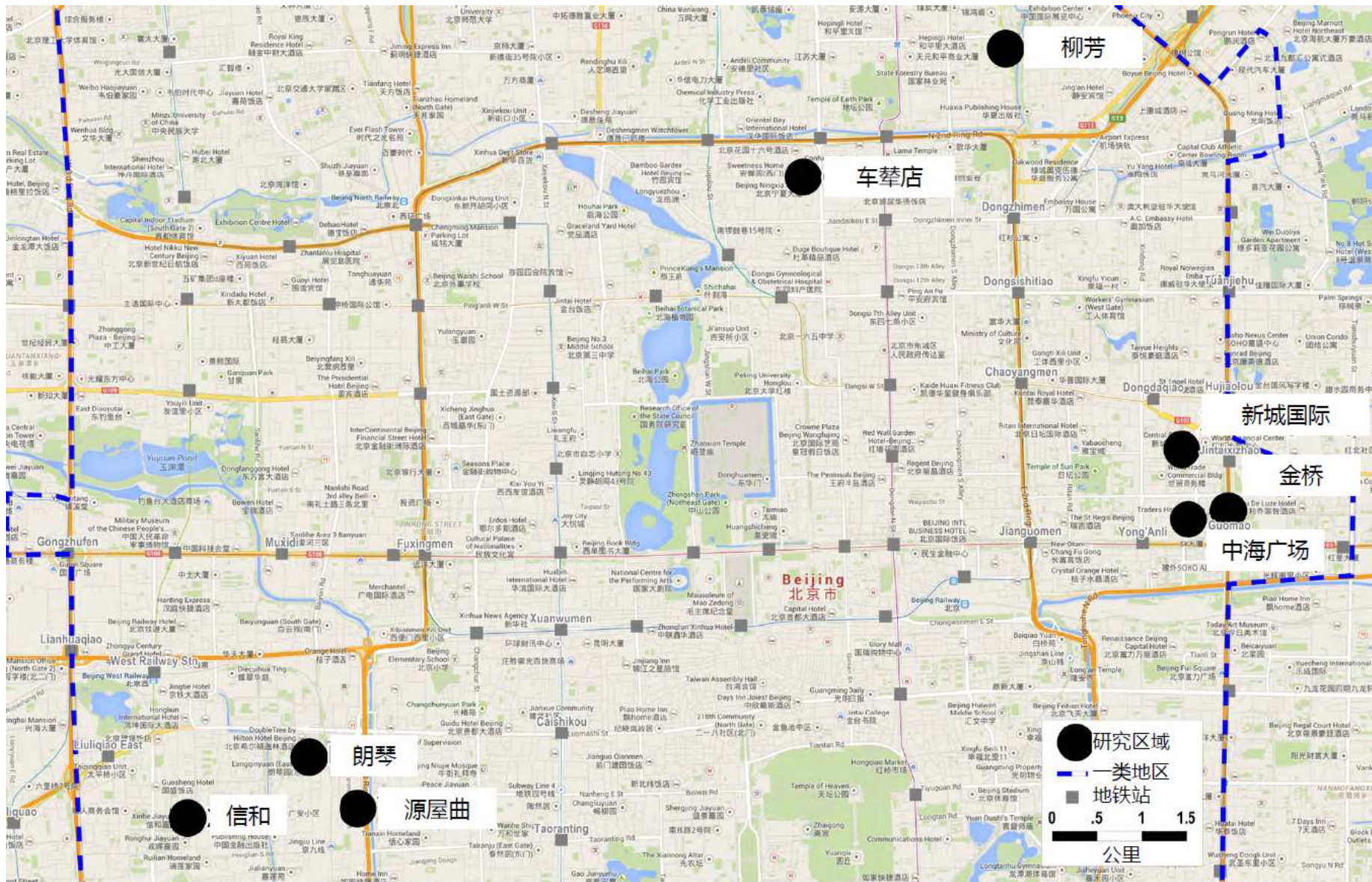
# 主要的项目城市

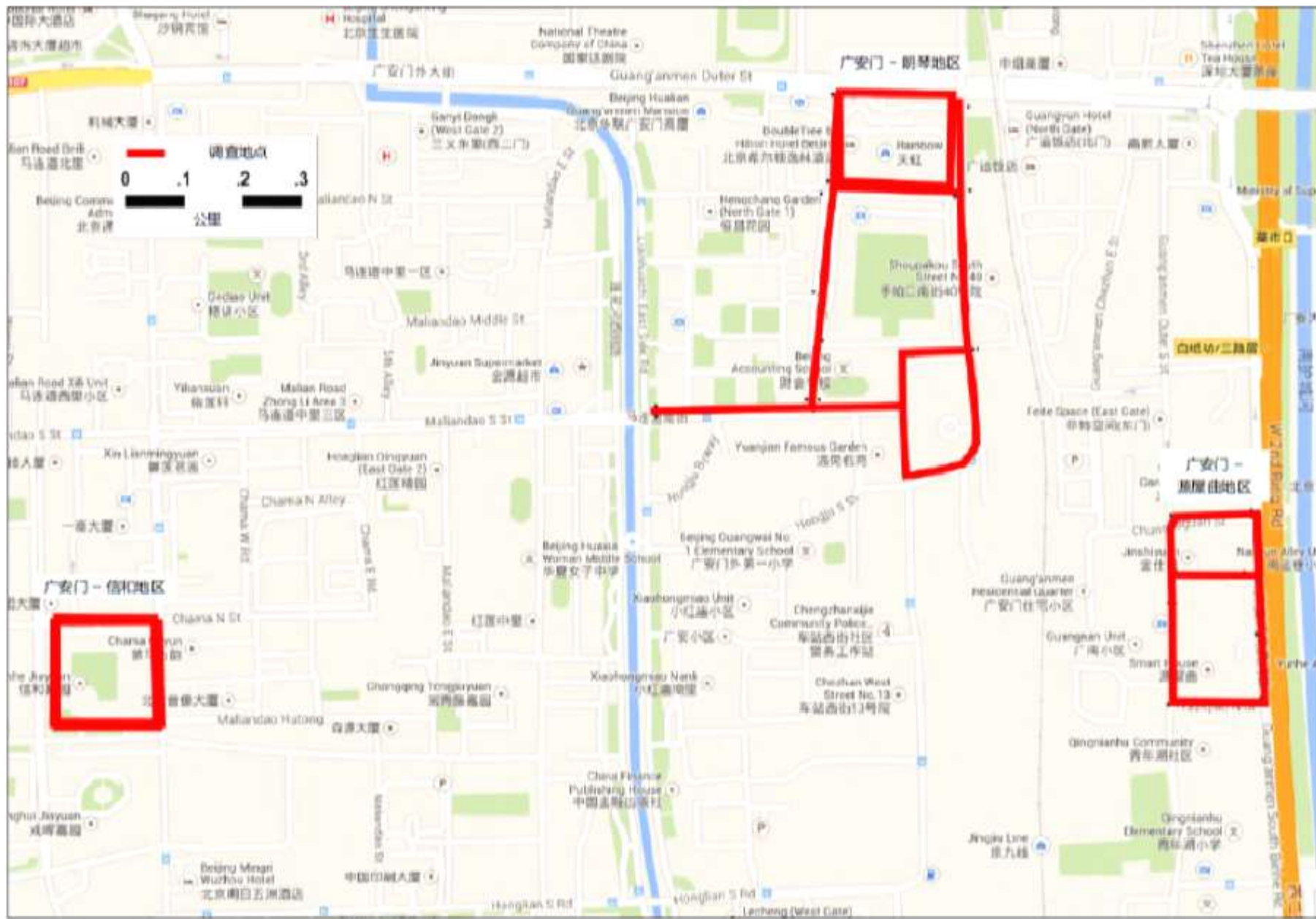
- 广州
- 甘肃兰州、酒泉
- 宜昌
- 天津
- 哈尔滨
- 武汉
- 万象,老挝
- 马来西亚吉隆坡、新山市
- 印尼雅加达、棉兰市
- 蒙古乌兰巴托
- 老挝万象

国内其他城市包括：北京、常州、长沙、抚州、南宁、东莞、惠州、江门、深圳、佛山、武汉、西安等



# 调查地点



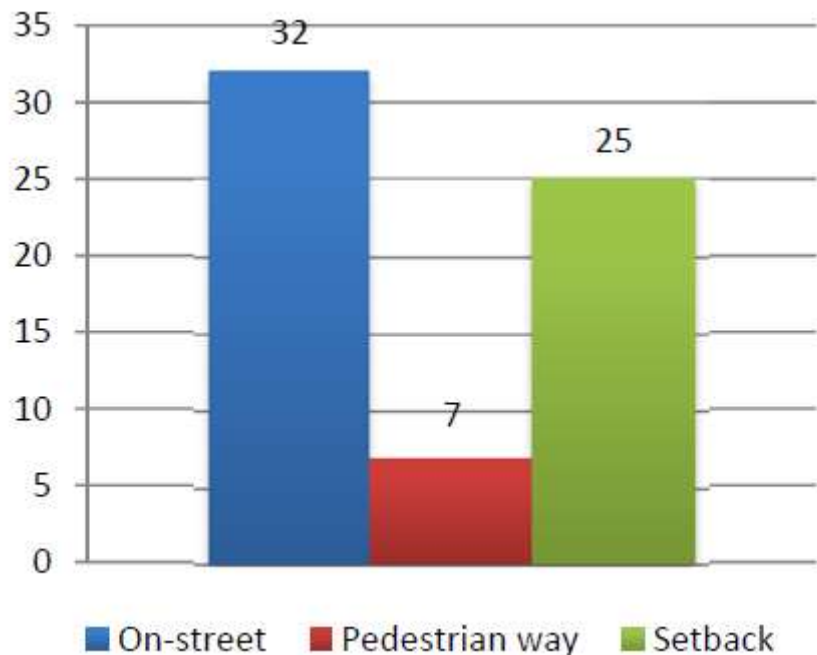


# 红居街（广安门）

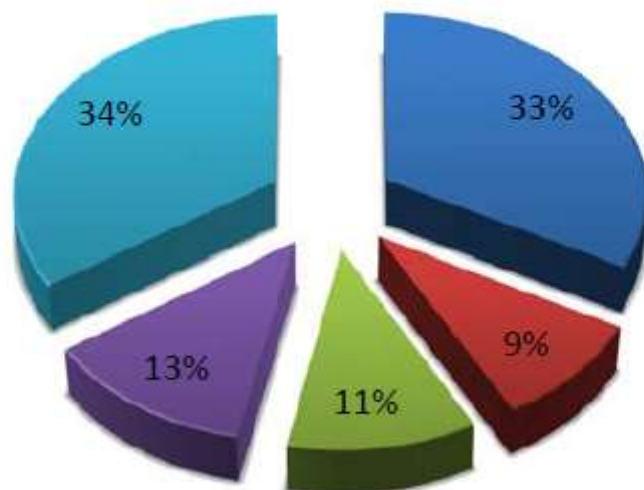
车高峰期：11:00

50% 路内, 39%后退区停车

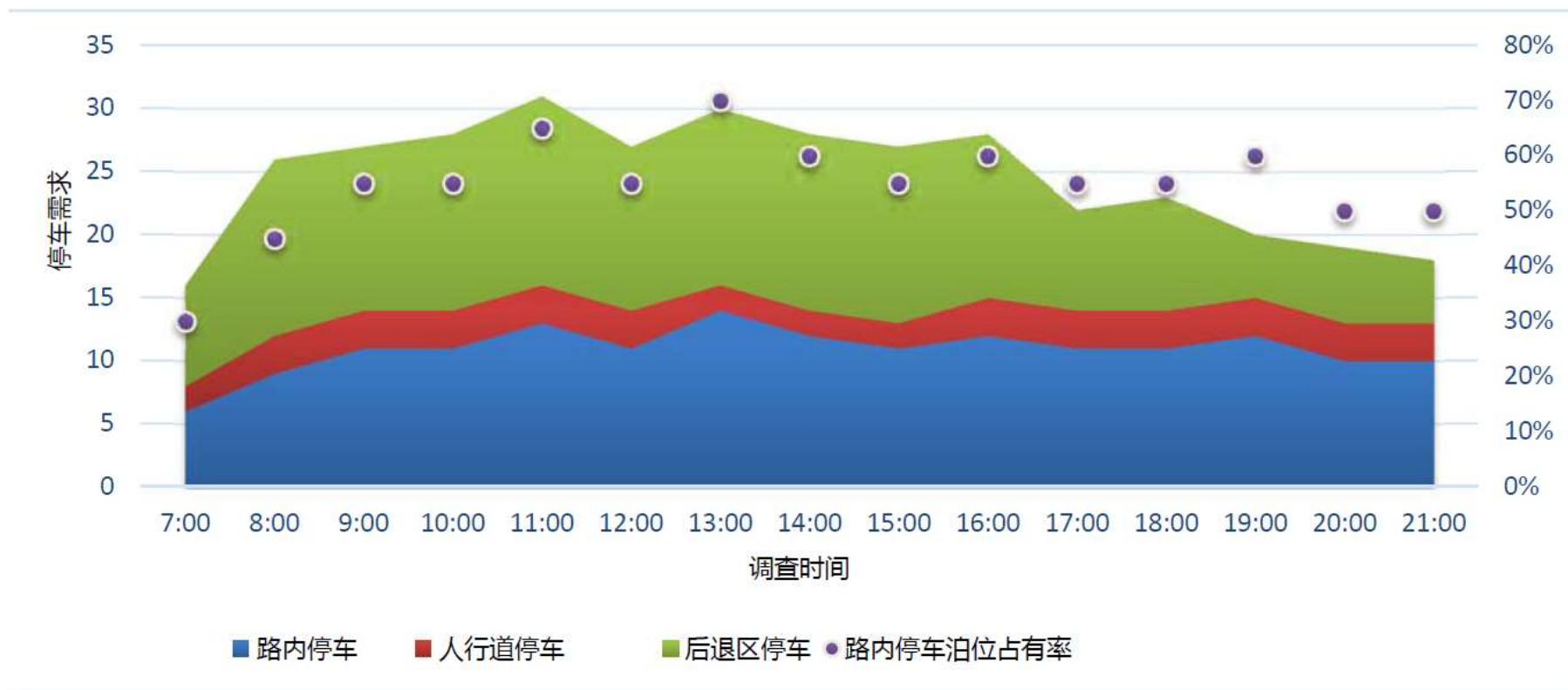
58% > 两个小时

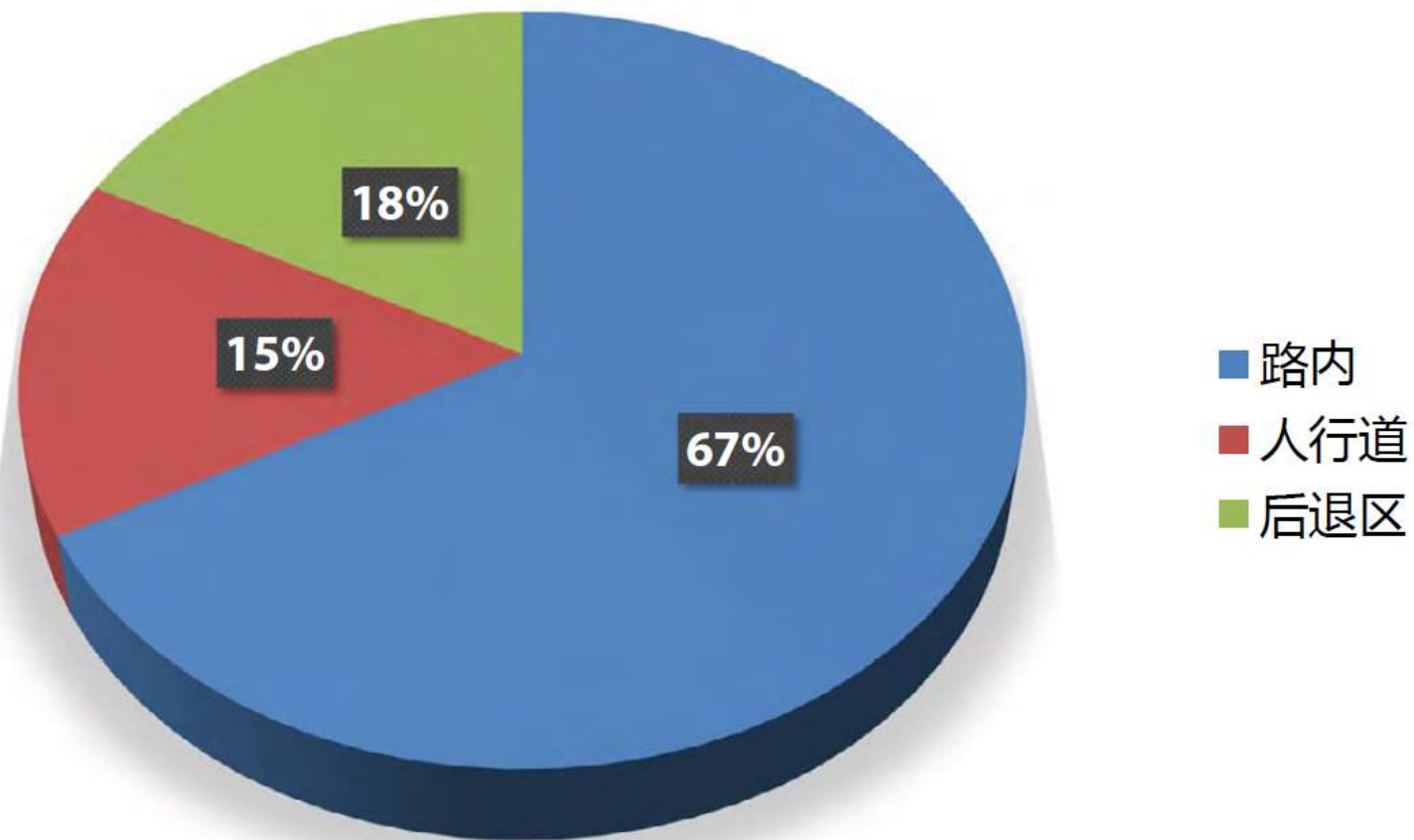


■ <1 hr ■ 1-2 hrs ■ 2-4 hrs ■ 4-8 hrs ■ >8 hrs



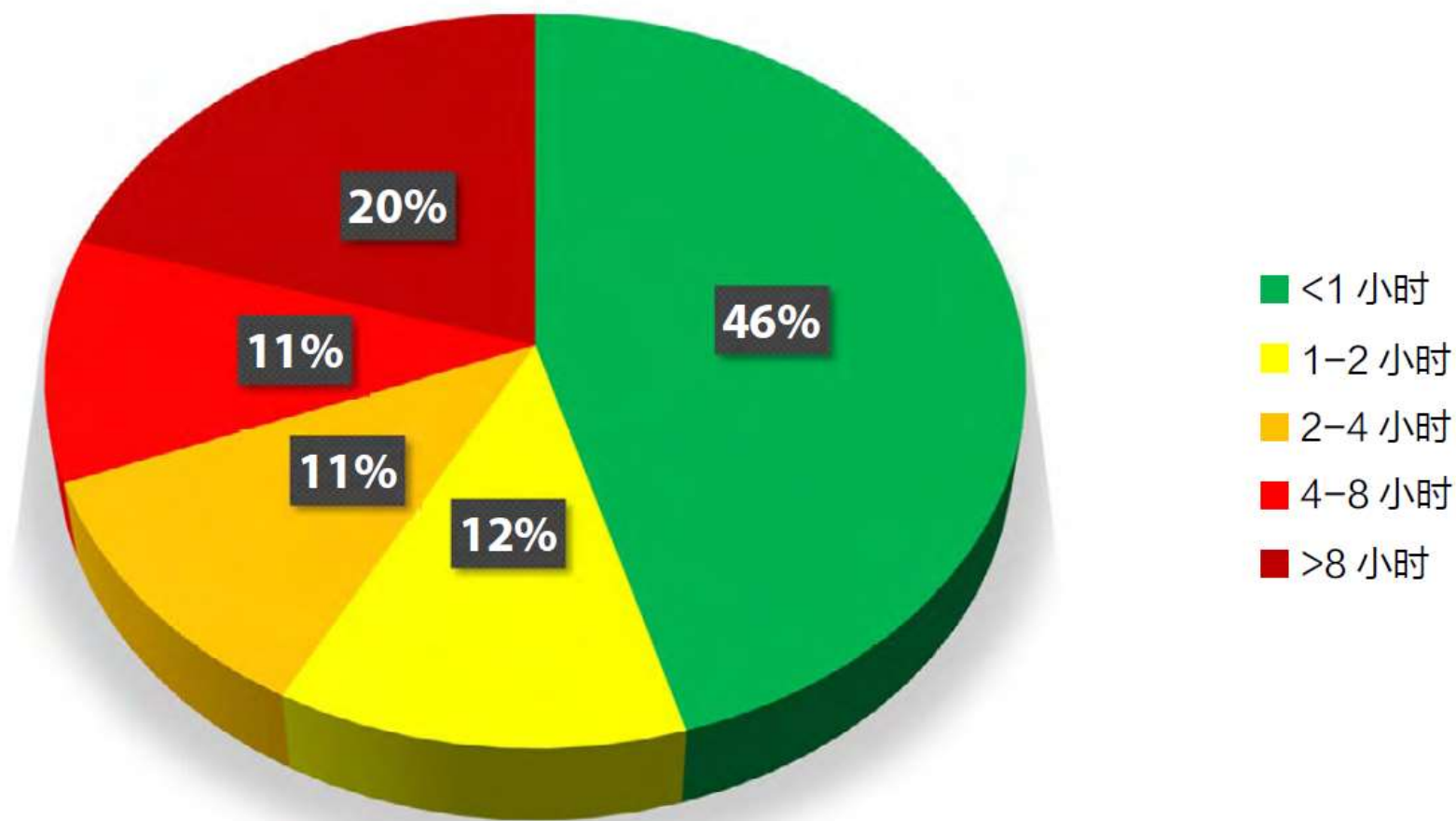
指标	数值	单位
路内停车位	20	车位数
平均路内停车位占有率	55	%
14 小时内路内停车位周转率	1.6	次数
最高停车需求（包括违章停车）	31	车辆数
停车高峰期	11:00	上午





有三分之一的驾驶者把车停在人行道和后退区



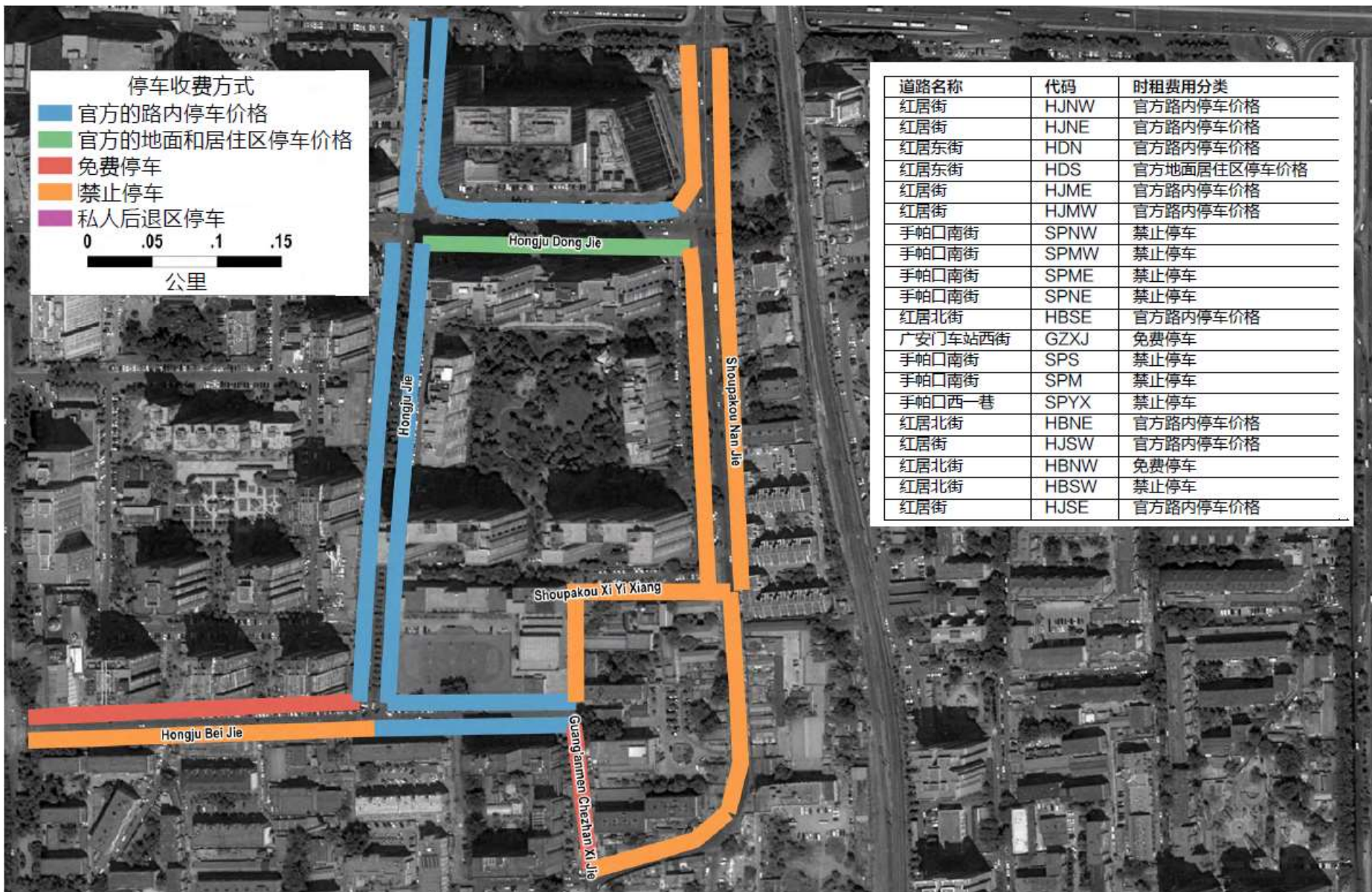


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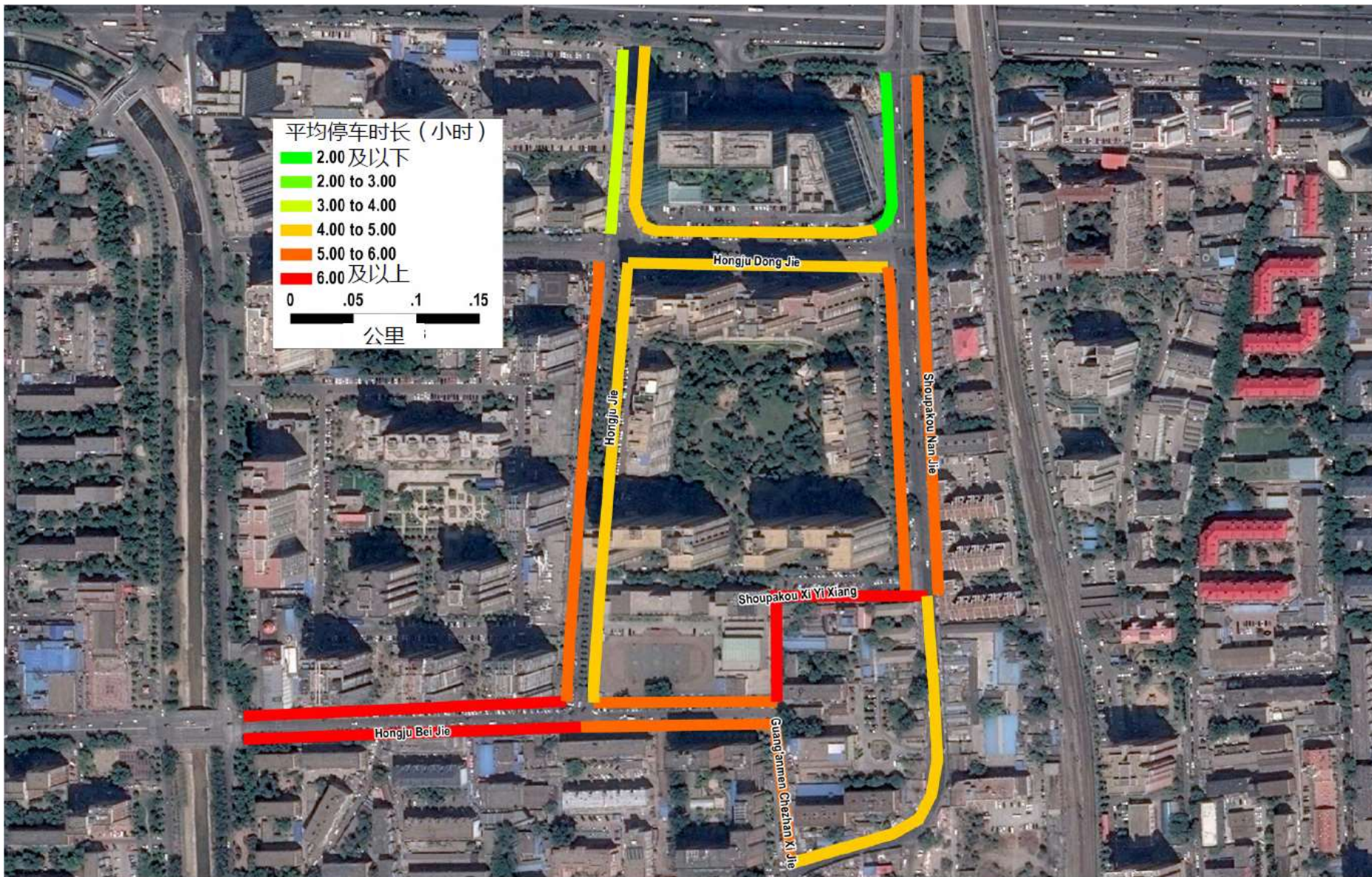
42%的驾驶者在路内停放的时间超过2小时。







上图：停车价格在区域内部有差异，导致驾驶者的环绕游弋，以寻找价格更低地方停车



整个区域的平均停车时间较长，而路内停车的停车时长也超过了2-3个小时的理想时长，尤其是在红居北街。

平均：5.02 小时

46% > 两个小时





上图：在晚上8点即停车需求达到最大的时候，违章停车的现象非常普遍，尤其是在红居北街和手帕口南街。尽管道路条件允许，红居北街也没有合法的路内停车。在手帕口南街，大部分的违章停车都在人行道上。这里的停车应被引导使用朗琴国际和朗琴园的地下停车场的空置车位。



上图：高峰期的路内停车空置情况。如果执法力度足够，驾驶者会放弃违章停车，使用这些空置的路内停车位，实时停车指引系统可以帮助指导驾驶者更快的寻找车位。

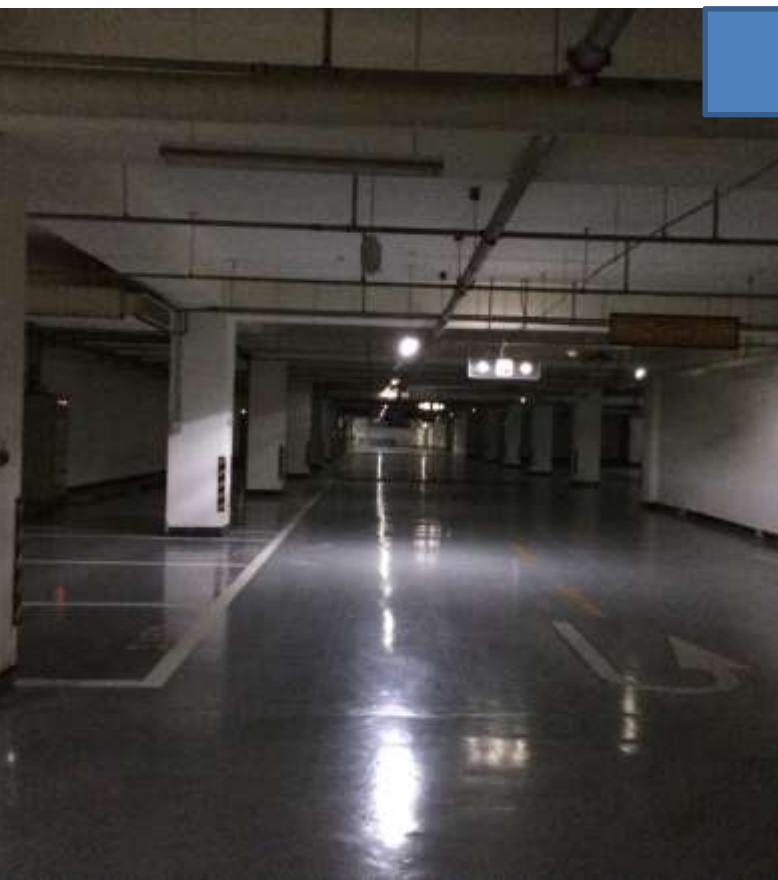
# 朗琴国际 ( 广安门 )

Retail, office and Double Tree Hilton hotel

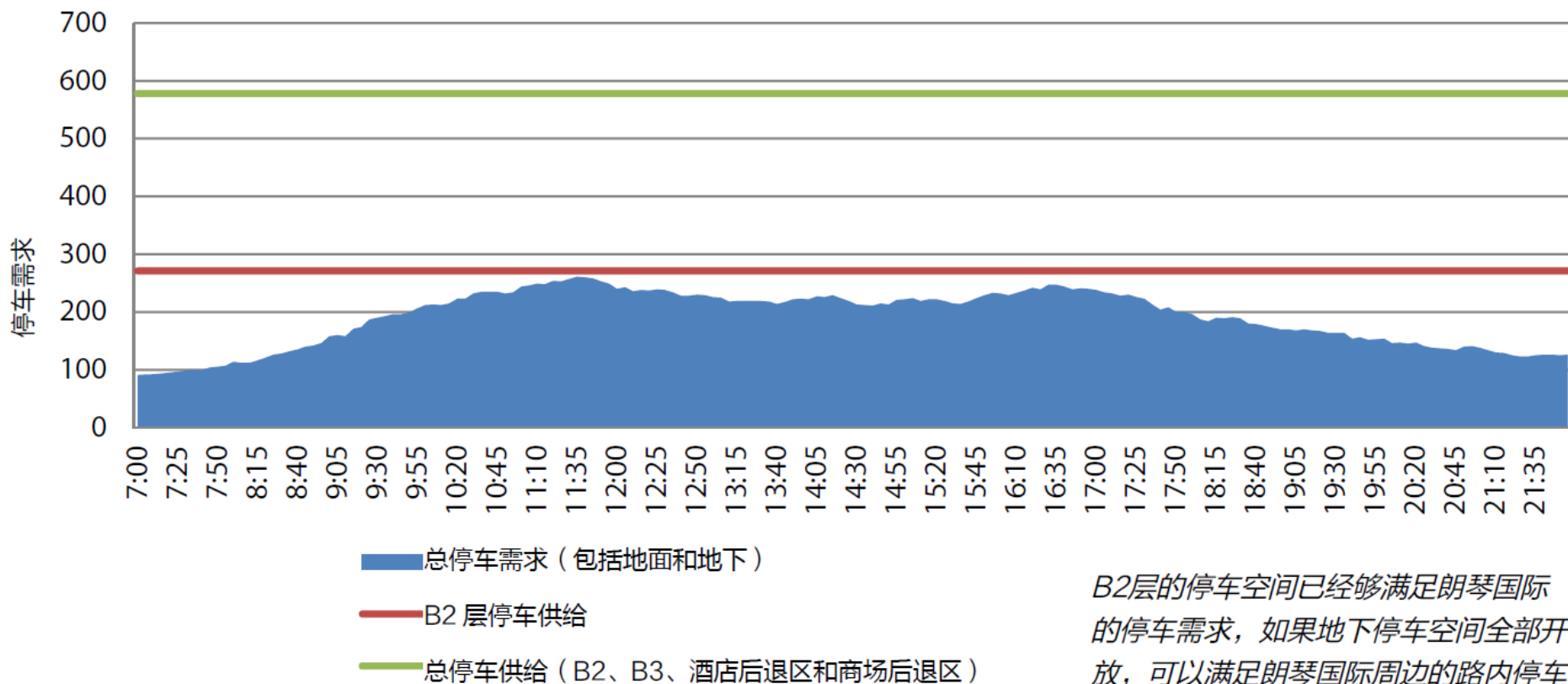
Site area: 19,703 m<sup>2</sup>, Floor area: 150,552 m<sup>2</sup>

Average vacancy: 81.3%



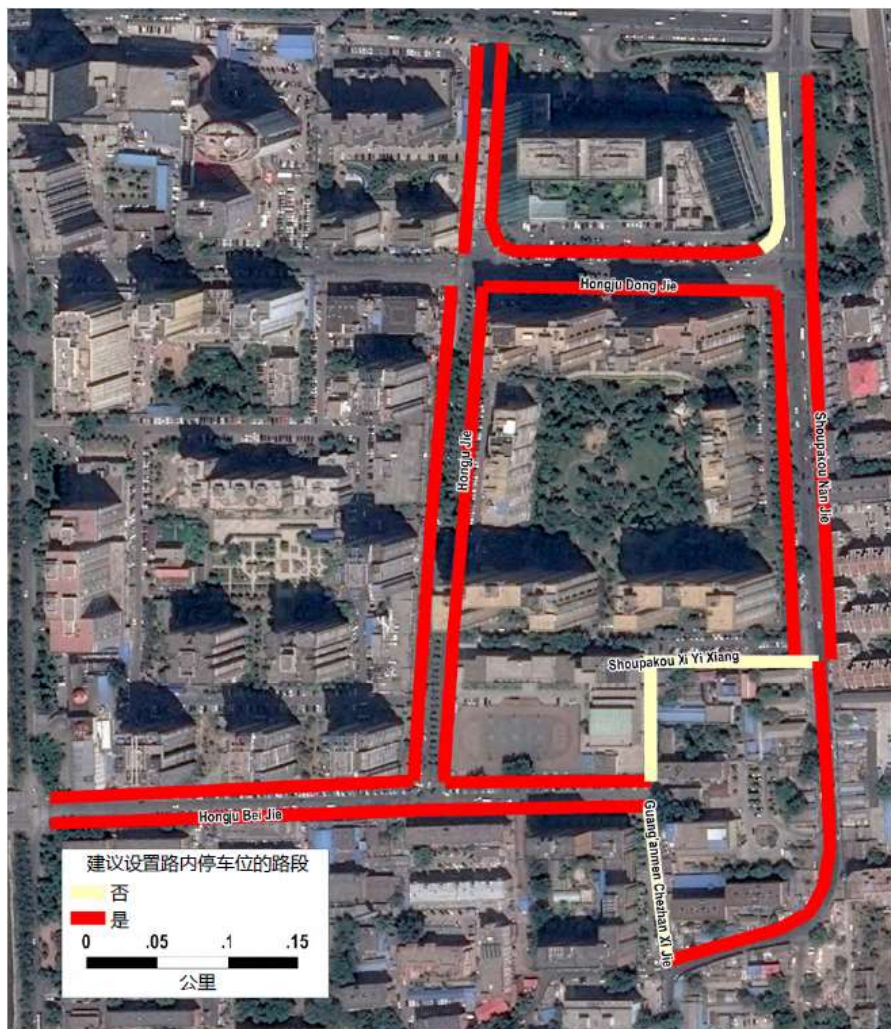


## 朗琴国际地块的停车占有率

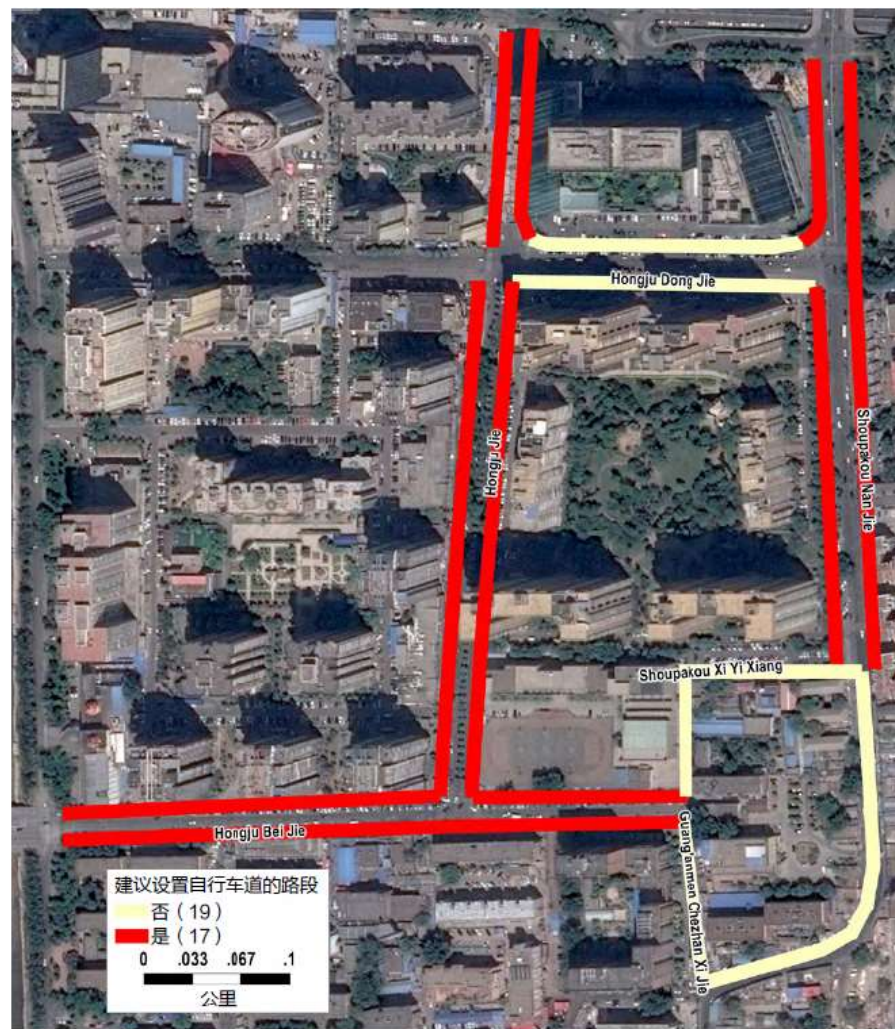


B2层的停车空间已经能够满足朗琴国际的停车需求，如果地下停车空间全部开放，可以满足朗琴国际周边的路内停车需求。





上图及下图：建议的设置路内停车泊位的路段（上图）和泊位数（下图）



上图：建议设置的自行车专用道的路段





道路名称	代码	路内停车位供应(个)	后退区停车位供应(个)	停车需求(区域停车需求最大时)(个)	停车供需平衡(区域停车需求最大时)(个)	规划路内停车位供应(个)	规划后退区停车位供应(个)	停车形式	规划供给平衡(停车位)
红居街	HJNW	19	0	17	2	22	0	平行	5
红居街	HJNE	17	0	16	(4)	21	0	平行	5
红居东街	HDN	12	0	20	(3)	31	0	平行	11
红居东街	HDS	0	50	93	(43)	50	0	平行	(43)
红居街	HJME	19	0	13	6	29	0	平行	16
红居街	HJMW	20	0	19	1	25	0	平行	6
手帕口南街	SPNW	0	0	5	(5)	0	0	禁止停车	(5)
手帕口南街	SPMW	0	0	65	(65)	43	0	平行	(22)
手帕口南街	SPME	0	0	37	(37)	44	0	平行	7
手帕口南街	SPNE	0	0	5	(5)	20	0	平行	15
红居北街	HBSE	31	0	58	(27)	42	0	垂直与平行	(16)
广安门车站西街	GZXJ	0	26	47	(21)	0	26	斜放	(21)
手帕口南街	SPS	0	0	5	(5)	18	0	平行	13
手帕口南街	SPM	0	0	28	(28)	29	0	平行	1
手帕口西一巷	SPYX	0	0	8	(8)	0	0	禁止停车	(8)
红居北街	HBNE	51	0	60	(9)	59	0	垂直	(1)
红居街	HJSW	24	0	56	(32)	35	0	平行	(21)
红居北街	HBNW	0	0	87	(87)	93	0	垂直	6
红居北街	HBSW	0	0	104	(104)	95	0	平行	9
红居街	HJSE	24	0	37	(13)	31	0	平行	(6)
总计或平均		217	76	780	-86	687	26	总体平衡	(67)
								朗琴国际空余车位	377
								总空余车位	310

停车需求和建议的停车供给显示这里只有很小的停车位供应短缺，但这很容易就能被朗琴国际的路外的停车位空余吸纳。

注意：带括号的红字表示负值。







# 中海广场（国贸）

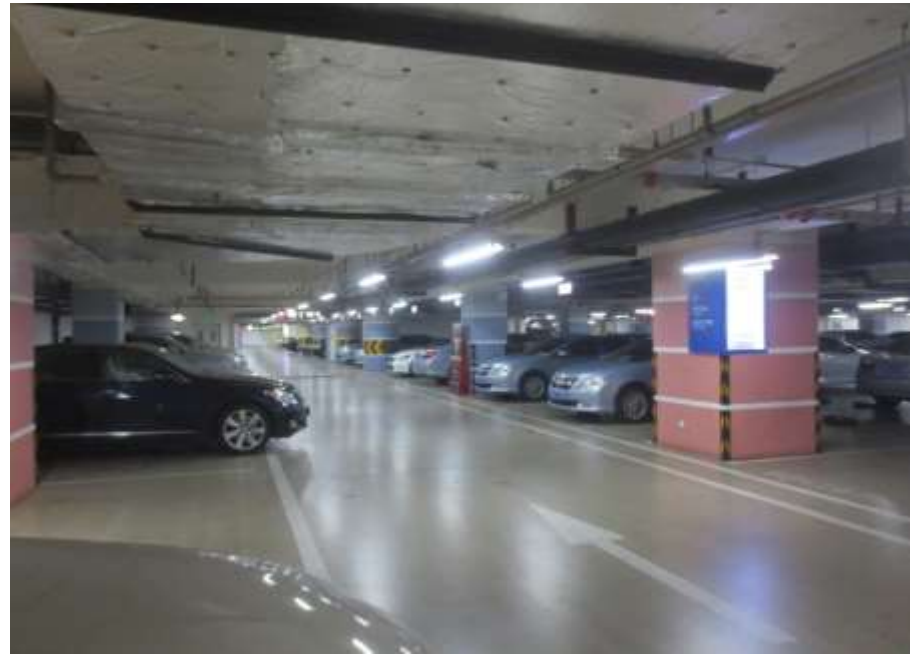
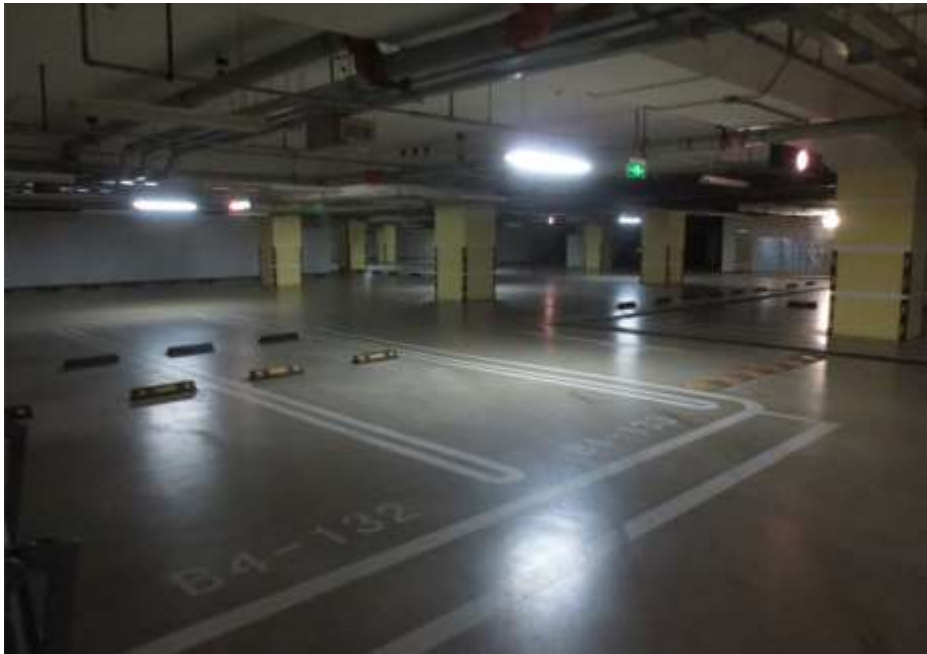
用地类型：零售商业、办公

地块面积：19,000 m<sup>2</sup>

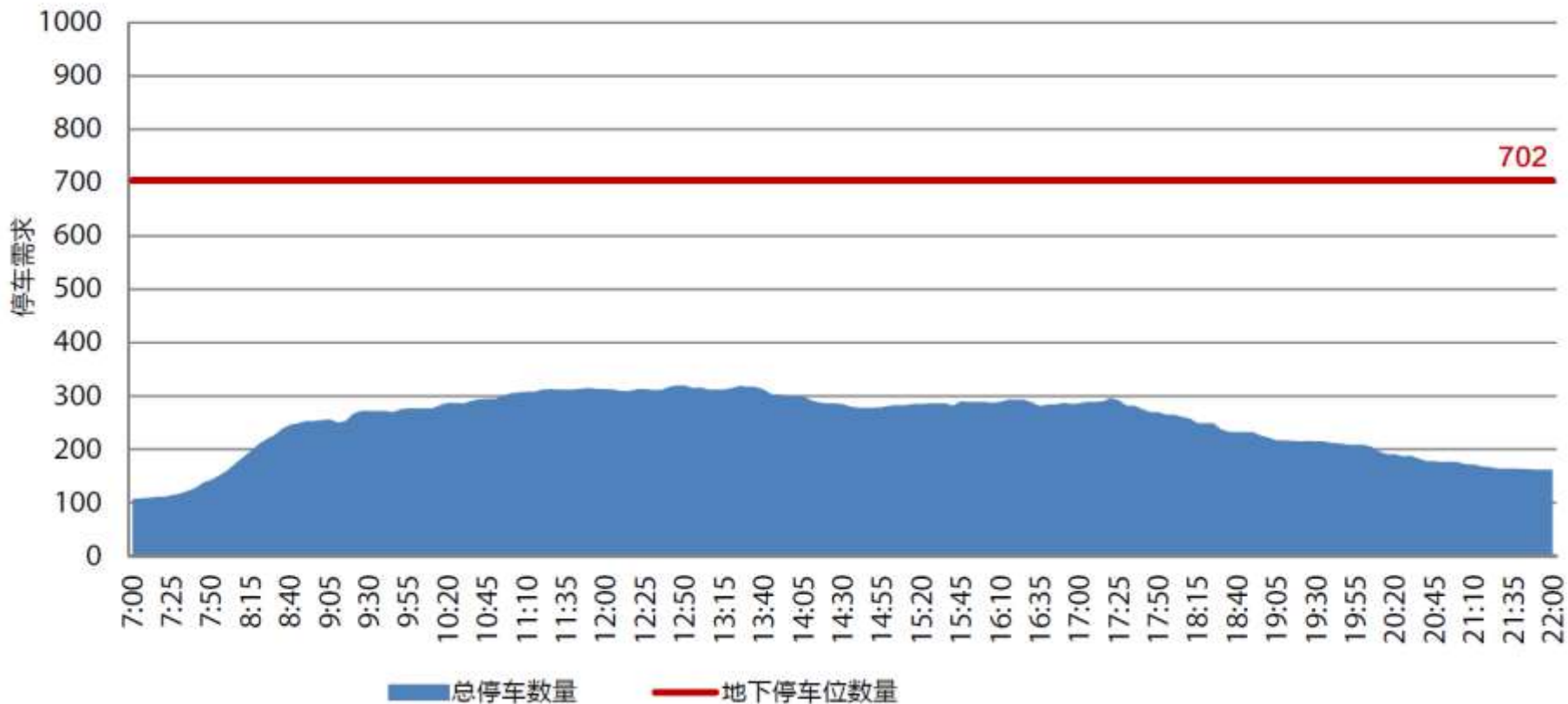
建筑面积：151,000 m<sup>2</sup>

地下停车库平均空置率：64.3%





## 停车位供需情况



# 新城国际公寓（国贸）

用地类型：居住、商业（服务式公寓和零售）

地块面积：105,000 m<sup>2</sup>

建筑面积：320,000 m<sup>2</sup>

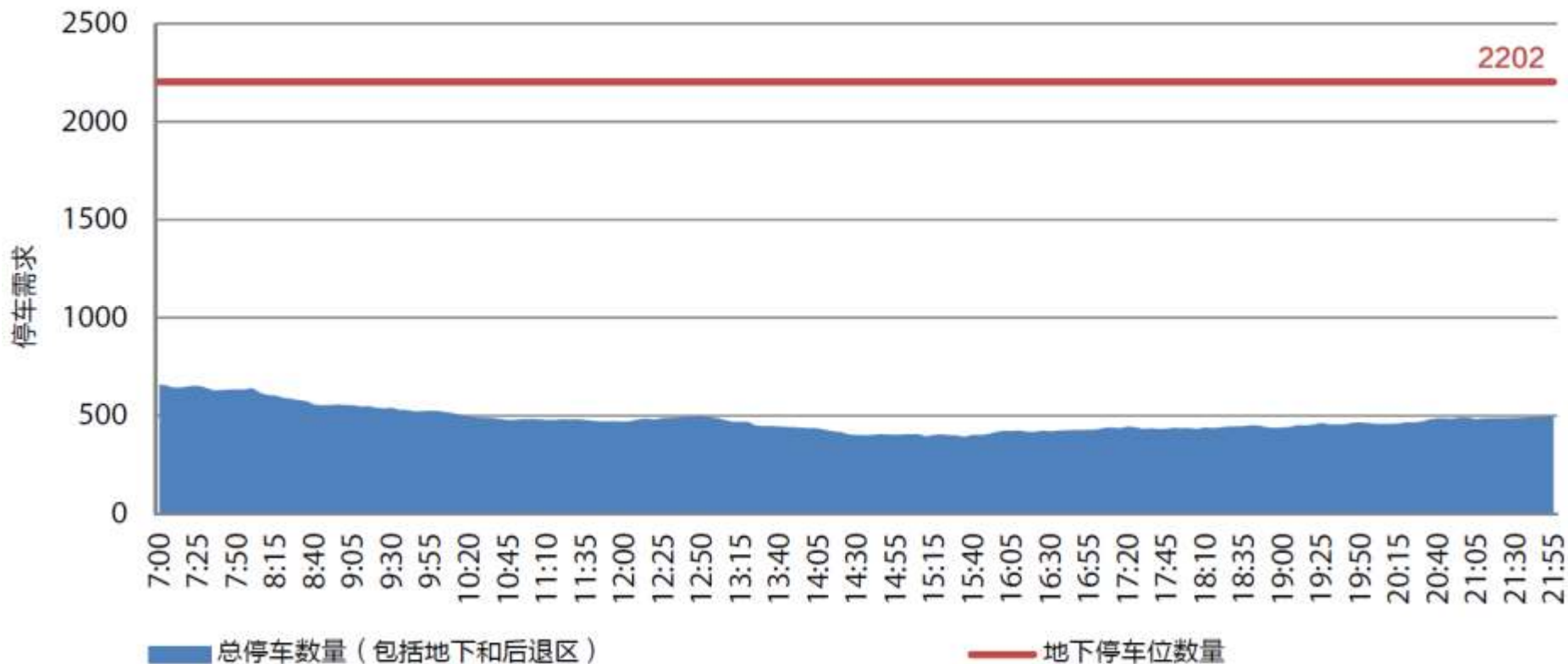
地下停车库平均空置率：80%







## 停车位供需情况



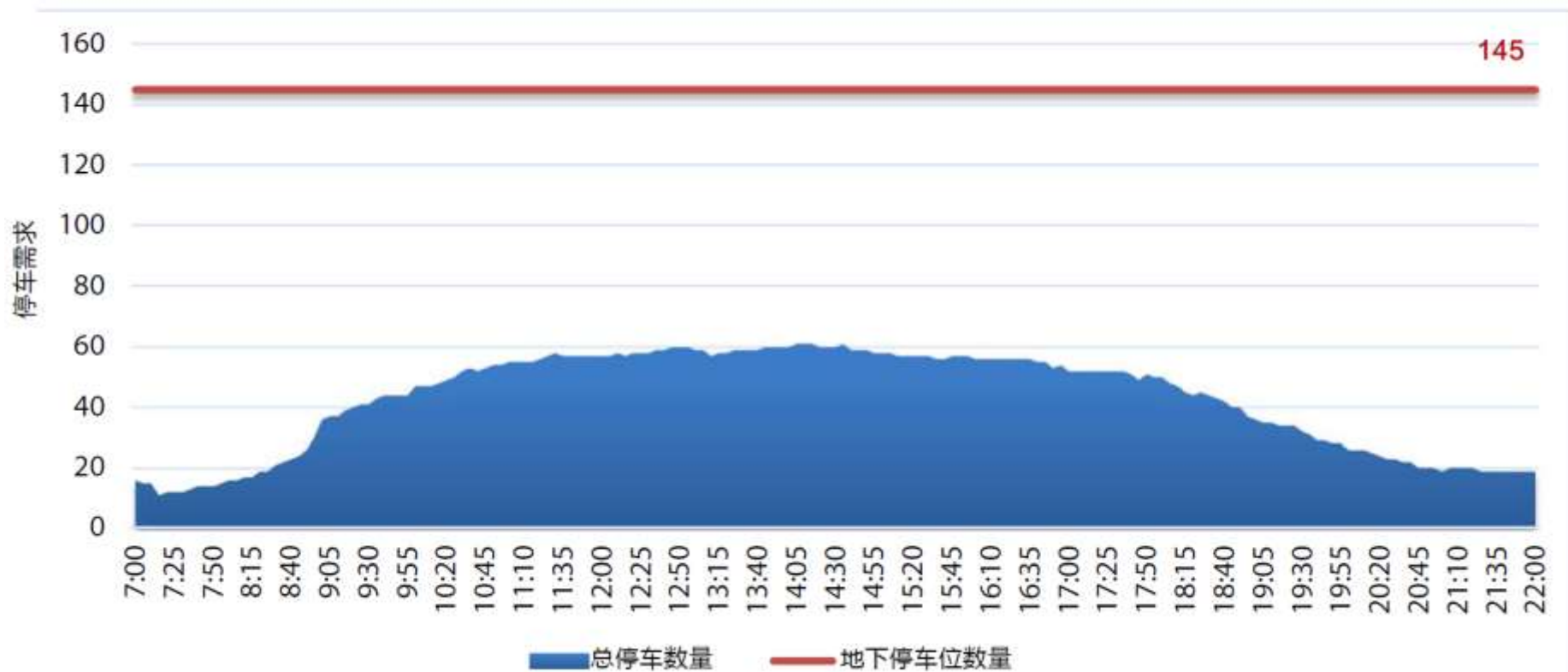
# 金桥停车场（国贸）

东三环高架桥下的公共停车场（国贸地铁站以北）

平均空置率：70.6%



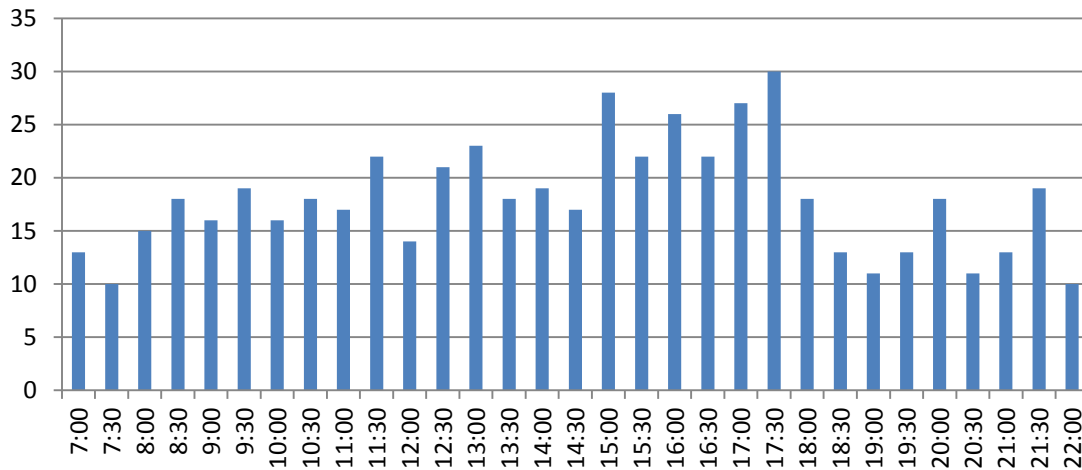
## 停车位供需情况



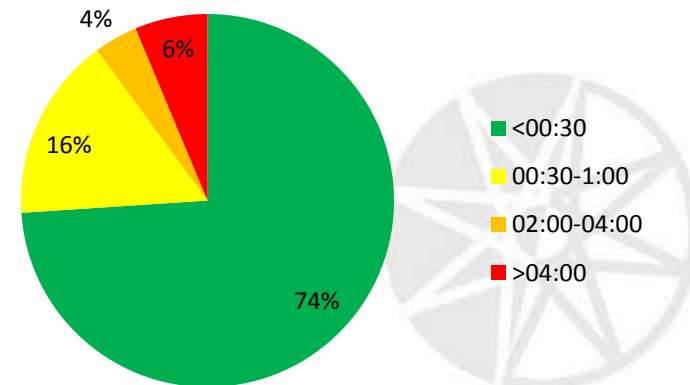
# 东三环中路西侧：违章路内停车



## Parking demand



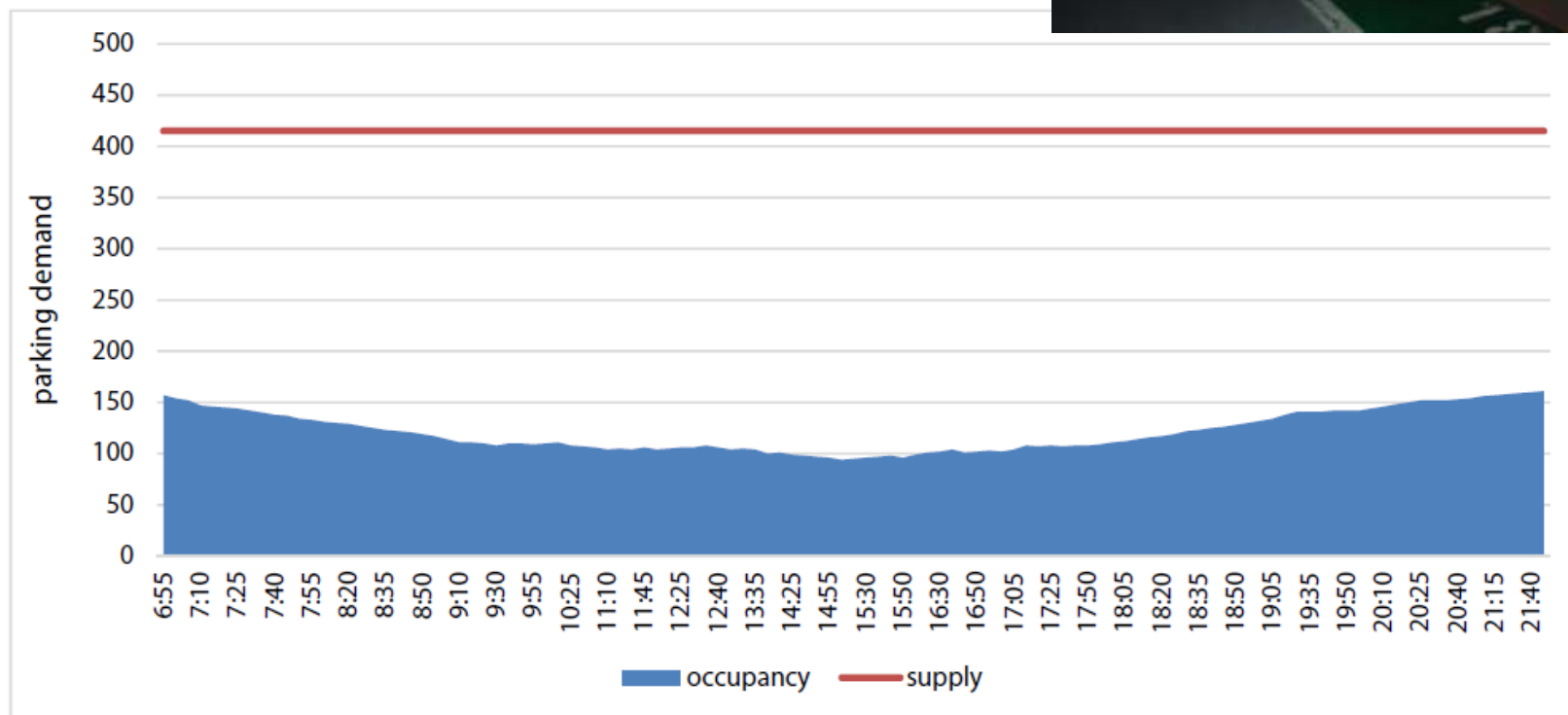
## Parking Duration



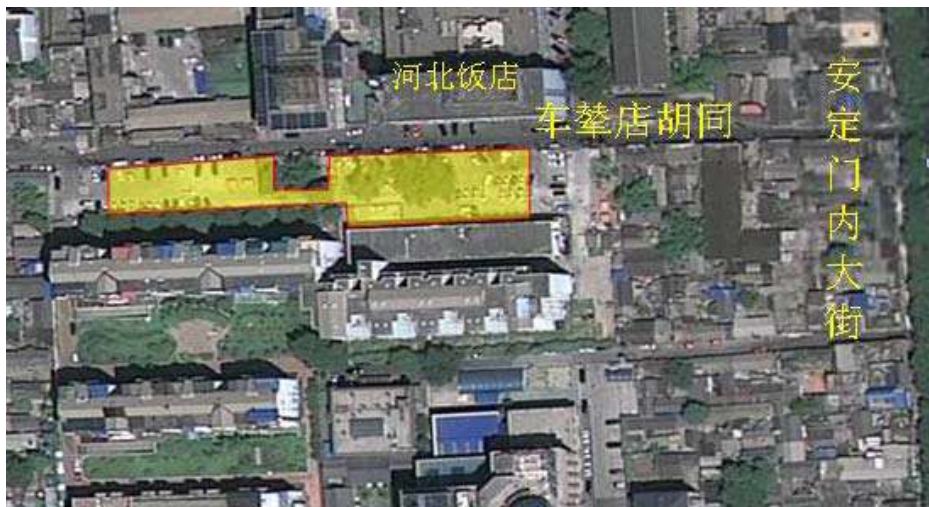
# 信和嘉园（广安门）

用地类型：居住（底层有商铺）

地下停车场平均空置率：70.7%



# 车辇店胡同机械停车场

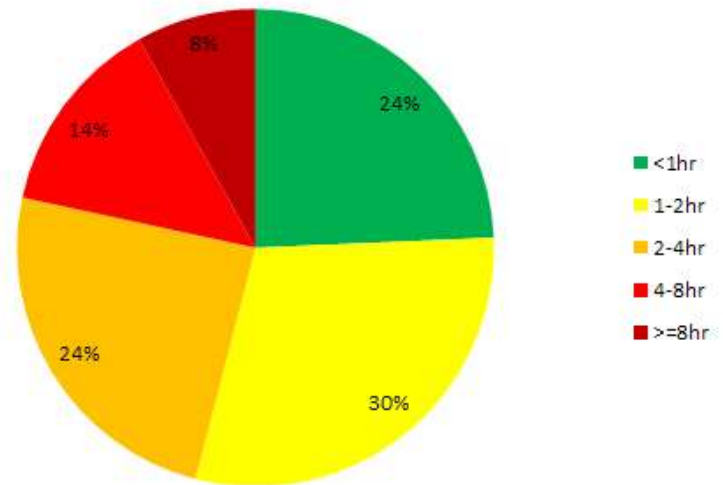


车辇店胡同的立体停车场于2012年中开业，为北京第一个胡同立体停车场，目的是为了解决老城区停车难的问题。该停车场共4层（地下3层，地上的1层），总停车位193个。停车场对于胡同居民的收费为300元每月，对于外来车辆的收费是800元每月或2元/15分钟。





- 平均占有率53%;
- 周转率0.62辆/泊位
- 每车位建设成本22000元;
- 由于占用道路红线，国土规划部门一直未正式批准;



怎么办？



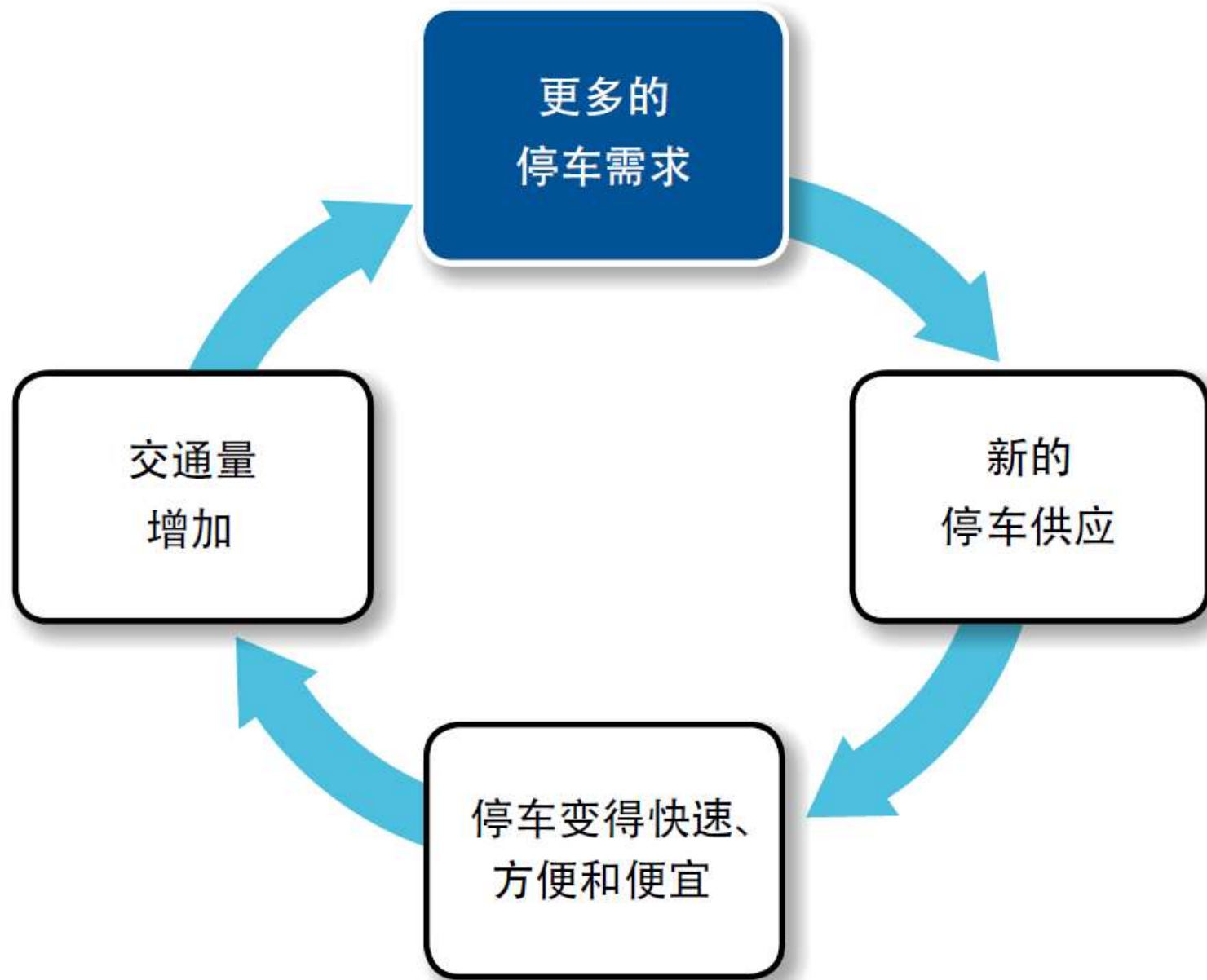


# **PARKING:** Searching for the Good Life in the **City**



停车：寻找城市的美好生活





增加停车泊位供应无法解决停车需求



我们需要更多的路外停车场

无序的街道

司机在路内违章  
停车

我们需要更多的  
路外停车场

违章停车执法不力和较  
高的停车收费，导致路  
外停车位的高空置率

建设新的路  
外停车泊位

构建路内停车收费系统和强化停车管理  
应优先于新建路外停车场。

投资者和政府需要  
需要支付高昂的建  
设及运营成本



# 评估 停车位

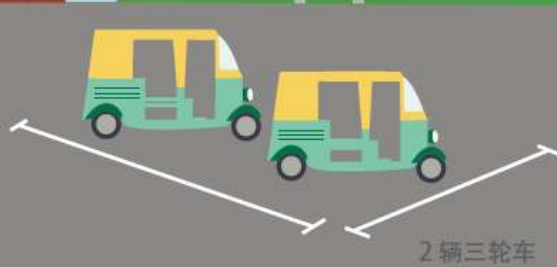
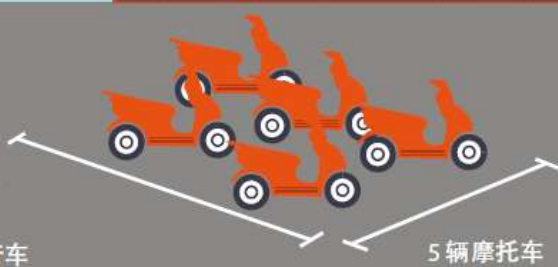
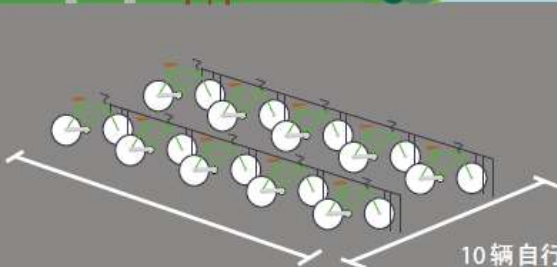
一个停车泊位  
会占用18平米空间



6米

3米

这部分空间可用于...



每个路内停车位，特别是路外停车泊位通常需要在寸金寸土的市区占用35平方米（包括汽车进出通道和坡道）的空间。每个停车位使用的面积相当于一个小型的一居室公寓、3张办公桌、15个餐馆座位或10个自行车停车位。图表来源：ITDP

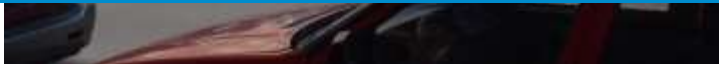


人们必须认识到停车泊位是一种商品而不是人的基本权利。路内停车空间占用道路，属于公共空间，政府有权决定是否提供一定面积的道路空间用作路面停车，但这个空间必须是有偿（出租）使用的。政府没有责任为每个市民提供停车位。

## 6. 停车最佳实践案例 – 布达佩斯



- 亚洲城市不应重蹈欧洲城市的覆辙
- 北京的机动化增长速度大大的超过案例中欧洲城市，因而更加亟需解决问题
- 学习这些城市如何控制其交通情况和停车管理



# 更多的车，更差的健康状况

- 欧盟对其成员国有一个强制性的规定，即城市的污染不能超过某个数值（例如，粉尘浓度，PM10）
- 2000年，高粉尘浓度导致了数十万匈牙利人产生了不同的呼吸疾病，血管疾病以及其他各类疾病。
- 交通对于城市的可居住性以及人民的健康有直接的影响



THE ONLY SOLUTION FOR ALL THESE PROBLEMS IS THE COMPLEX  
HANDLING OF THE CITY TRAFFIC.

所有这些问题的唯一解决方法就是城市交通的综合主题



- Getting car drivers to change from car to public transport
- Directing cars – parking more than 2–3 hours long (commuters)  
– into garages and parking lots outside public place.
- Strengthening the competitiveness of public transport against private transport. PRIVATE TRANSPORT MUST ALWAYS BE MORE EXPENSIVE THEN PUBLIC TRANSPORT!
- Securing the operability of the affected area
- Creating a balance between the supply and demand for parking



- Budapest put more than 70.000 parking lots under control and created its on-street parking zone system.

		public transport ticket	1,2 EUR	< 1 liter petrol
zone	1	2	3	4
multiplicator	1,5	1,25	1	0,75
fee	1,8 EUR	1,5 EUR	1,2 EUR	0,9 EUR



- If occupancy of parking places reached 70 % it is obligatory for municipal governments to implement on-street parking payment zones
- If occupancy reaches 90 % (85 % would be ideal) than prices have to be raised!



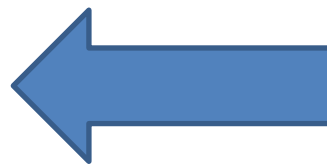


**BEFORE**



**AFTER**





**BEFORE**



**AFTER**







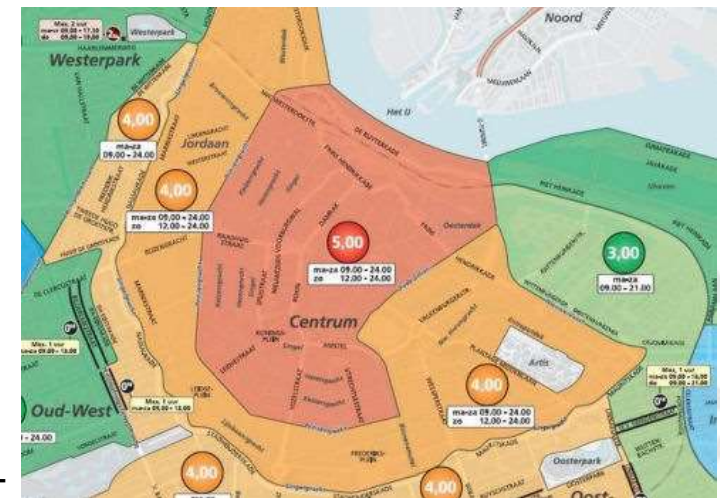


# 路内停车分区收费

- Implement parking zones
  - \* all on-street parking spaces are uniformly priced
  - \* more valuable areas are more expensive
  - reduces cruising for free/cheap parking
- Implement in:
  - \* areas that need to be protected (CBD, historic/tourist centers/etc.)
  - \* where parking occupancy is high (>70%)
  - \* where traffic problems are worst
- Start with high-quality demonstration project in one area (Guang'anmen, two zones)



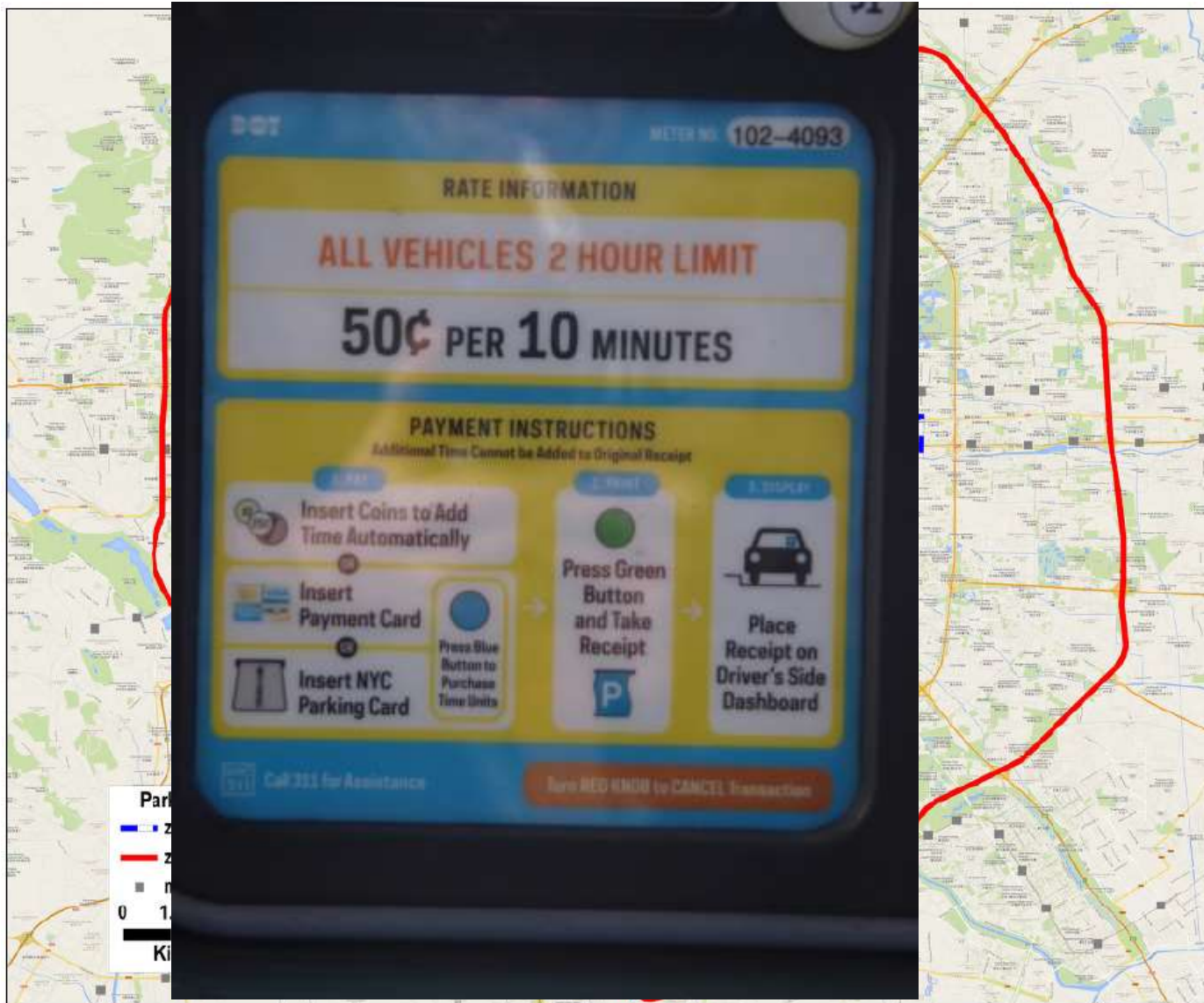
奥克兰



阿姆斯特丹



# 路内停车分区收费



Current parking zones in Beijing

Source: based on Development and Reform Commission (2010), <http://www.bjpc.gov.cn/zcfg10/201106/t813591.htm>



# On-street recommendations: parking price

- Keep parking price policy the same
- BUT: make sure parking prices are actually charged according to policy
- Make prices uniform within each zone
- Especially target commuters who park the entire day (create turnover)
- Consider incremental parking fees and time limits
- Raise residential on-street parking fees
- Aim for 85% occupancy by raising the parking fee
- DRC is in a poor position to decide on price; Communication Commission needs a stronger position

路内停车收费最高价格		
伦敦	44元/小时	(2011年6月)
阿姆斯特丹	40元/小时	(2011年4月)
斯德哥尔摩	36元/小时	(2011年6月)
乌特勒支	34元/小时	(2012年4月)
苏黎世	33元/小时	(2011年6月)
哥本哈根	31元/小时	(2011年4月)
安特卫普	28元/小时	(2011年6月)
巴黎	24元/小时	(2011年4月)
慕尼黑	20元/小时	(2012年7月)
巴塞罗那	19元/小时	(2011年4月)
旧金山	19元/小时	(2011年7月)
深圳	15元/小时	(2011年7月)
高雄	11元/小时	(2012年7月)
成都	10元/小时	(2012年3月)
广州	5元/小时	(2012年3月)
Strasbourg	10 yuan/hr	1.30 euro/hr (Jun-11)
Sao Paolo	9 yuan/hr	2.80 BRL (Jul-12)
Tianjin	4 yuan/half hour	(Mar-12)
Harbin	7 yuan/hr	(Sep-12)
Hangzhou	6 yuan/hr	(Apr-11)
Jinan	6 yuan/hr	(Mar-12)
Nanning	3 yuan/half hour	4.5 yuan/hr if >4hrs of parking (Apr-11)
Changchun	5 yuan/hr	3 yuan/hr for following hours (Apr-12)
Kunming	5 yuan/hr	(Jun-11)
Ningbo	2.5 yuan/half hour	(Mar-12)
Zhuhai	5 yuan/hr	first half hour 2 yuan; following half hours 3 yuan (Mar-12)
Lanzhou	4 yuan/hr	(Apr-12)
Mexico City	4 yuan/hr	2 pesos/15 minutes (Jul-12)
Shijiazhuang	4 yuan/hr	first half hour for free (Apr-12)
Vientiane	4 yuan/3 hours	5,000 LAK/event (Mar-14)
Xian	6 yuan/hr	5 yuan/hr for following hours (Apr-11)
Zhengzhou	4 yuan/hr	2 yuan/half hour for following hours (Mar-12)
Jiuquan	3 yuan/event	(Nov-13)
Shenyang	3 yuan/hr	2 yuan/half hour after first hour (Jun-12)
Taiyuan	3 yuan/hr	2 yuan/half hour for following hours (Apr-12)
Wuhan	20 yuan/hr	(Apr-11)
Yichang	3 yuan/hr	maximum 15yuan/day (Sep-12)
Kuala Lumpur	1.5 yuan/hr	0.80MYR/hr (Jun-14)

# On-street recommendations: technology

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Modern on-street parking management is much more than installing parking meters!

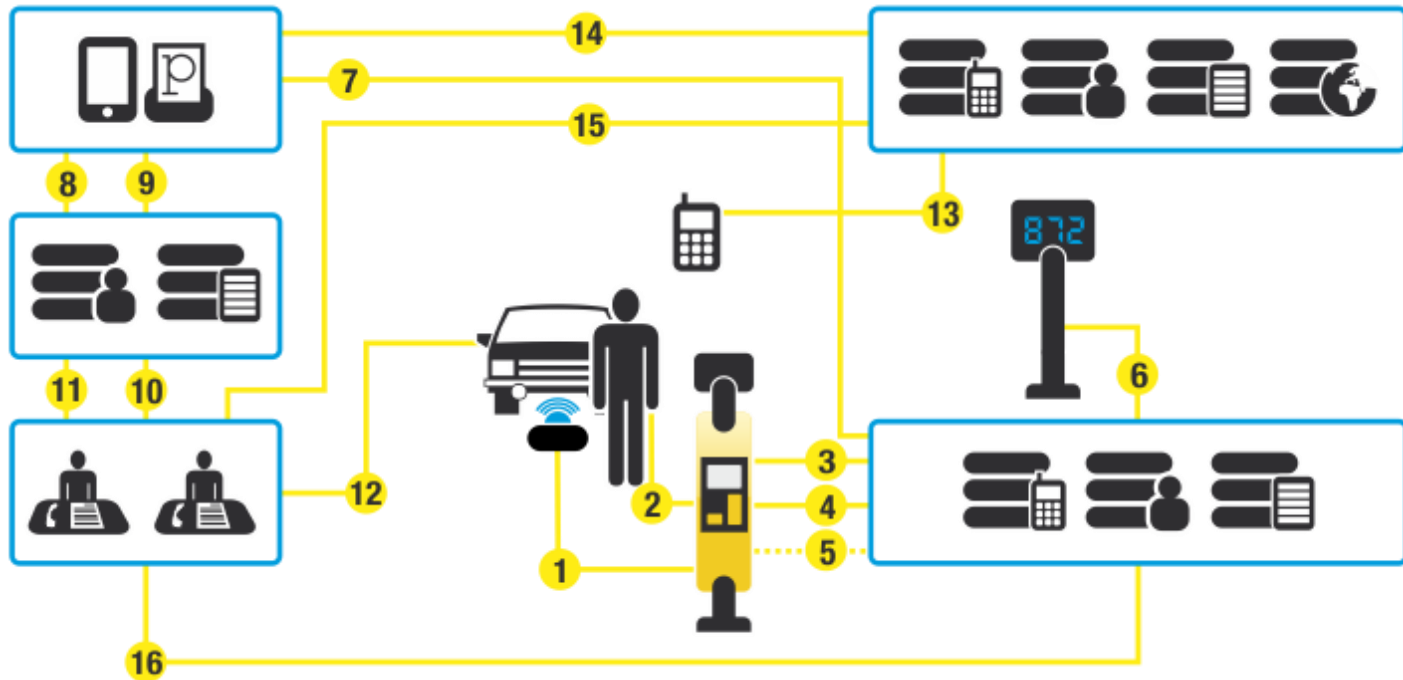
Parking management includes:

- Clear communication with end users (traffic signs, road markings, etc.)
- Customer service
- Implementation, operation and maintenance of hard- and software systems
- Enforcement of parking regulations, including the fining and collection processes,  
monitoring and supervising the operations, modifying and trouble-shooting
- Analysing operations data sets (financial, usage, etc.) and data to improve and plan operations and ensure good service





# Integrated system: operation, enforcement, customer service, traffic data, financial data



**10.** The front and back office server sending the data of the non-paying car drivers to the front and back office employees

**11.** The front and back office server sending and receiving the maintenance data to the front and back office employees

**12.** Customer service between car driver and front office

**13.** Data communication via GPRS (3G/4G) and/or SMS and/or voice call for cell phone payment between the car drivers phone and the mobile payment server

**14.** Data communication via GPRS (3G/4G) between the cell phone payment server and the controllers PDA – for check on parking payment

**15.** Data communication between the mobile phone payment server and the front and back office server

**16.** Data communication between the front and back office employees and the data center via the internet

1. Sensor - detecting the magnetic field of the car and sending the signal via RFID to the parking meter
2. Parking meter - communicating to data center via GPRS (3G/4G)
3. Financial data - sent by the parking meter to the data center via GPRS (3G/4G)
4. Technical (maintenance) date sent by the meter to the data center via GPRS (3G/4G)
5. Parking places occupancy data sent by the meter to the data center via GPRS (3G/4G)
6. Server sending real-time parking occupancy data to LED parking space occupancy signs via GPRS (3G/4G)
7. Communication between parking controllers' and technicians' PDAs and the data center via GPRS (3G/4G)
8. The controllers' PDA sending data of non-paying car drivers to front and back office server via GPRS (3G/4G)
9. The technicians' PDA sending and receiving via GPRS (3G/4G) the maintenance data to the front and back office server

# On-street recommendations: technology – parking terminals

- Serve multiple pa
- Solar powered (v
- Multiple payment bank card, cash (tag)
- Touch screen for
- Can print receipt



# On-street recommendations: technology – controllers' PDA



Wireless (3G)  
communication with  
central system

PDA's - license plate recognition    Automatic fine printing    PDA-camera



Photo evidence of parking violation

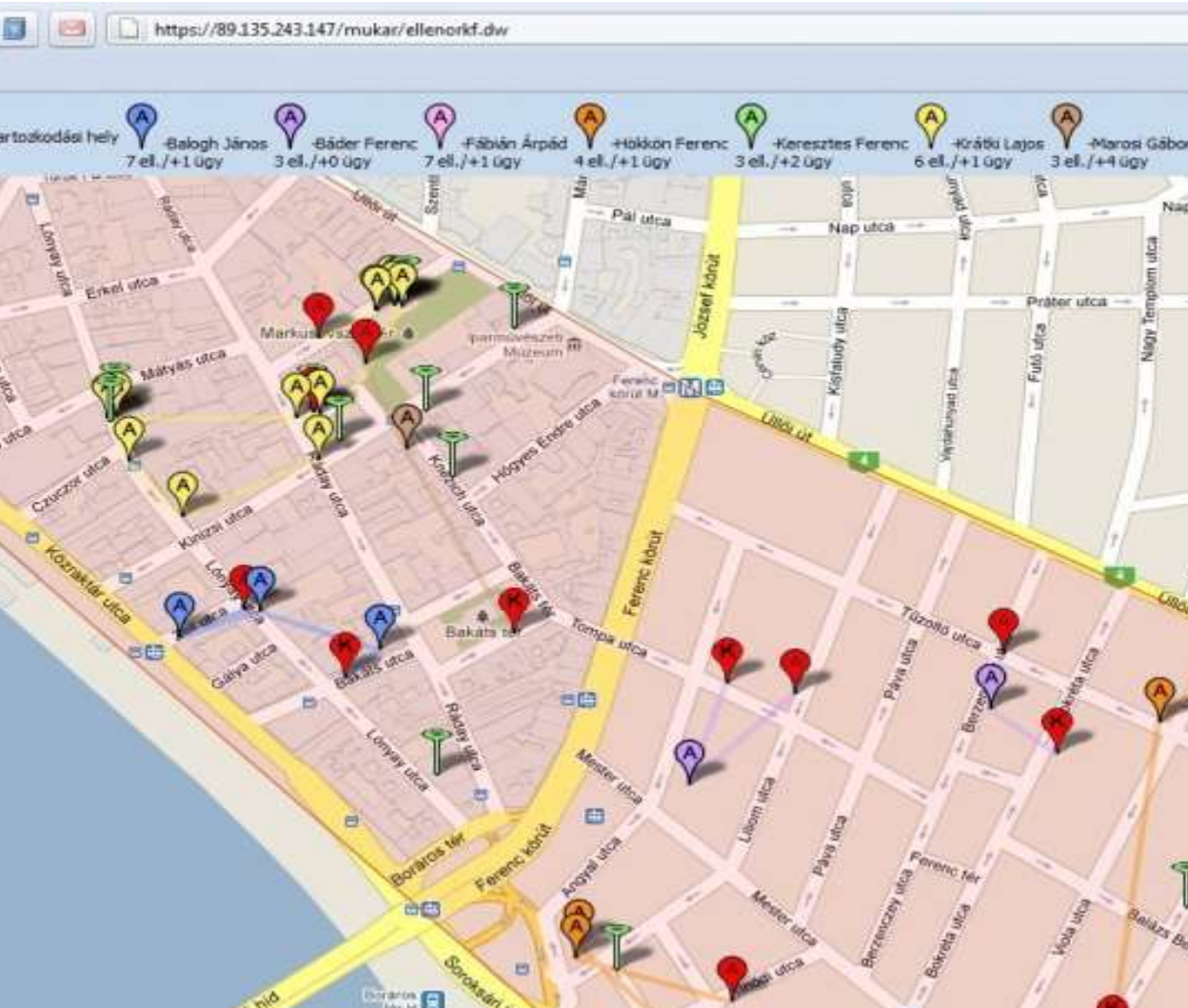
## Simultaneous parking operation & enforcement



Clamping of non-paying drivers



Parking controller does not handle payment  
His PDA 'reads' license plates to check for payment  
No opportunities for 'leakage'



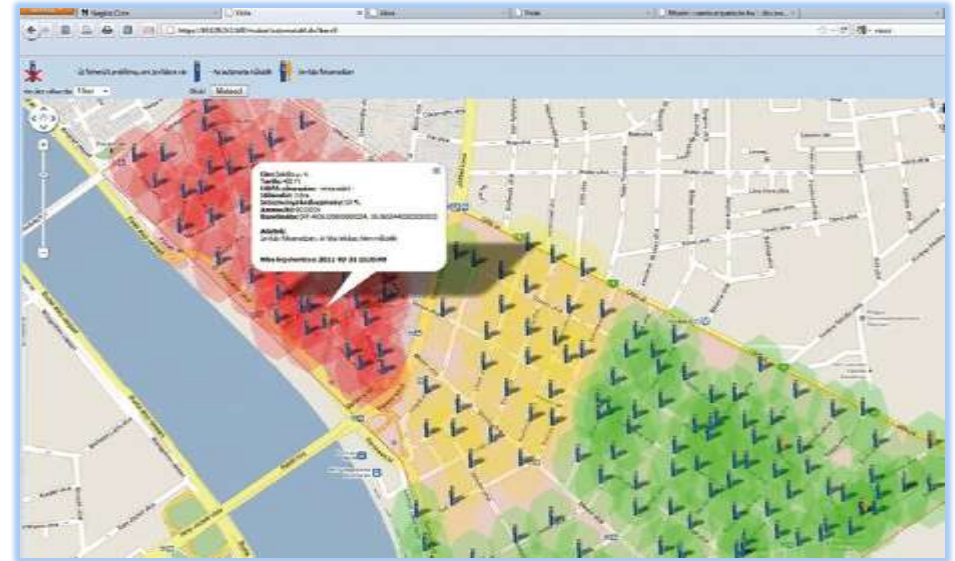


# Technology – real-time occupancy signs

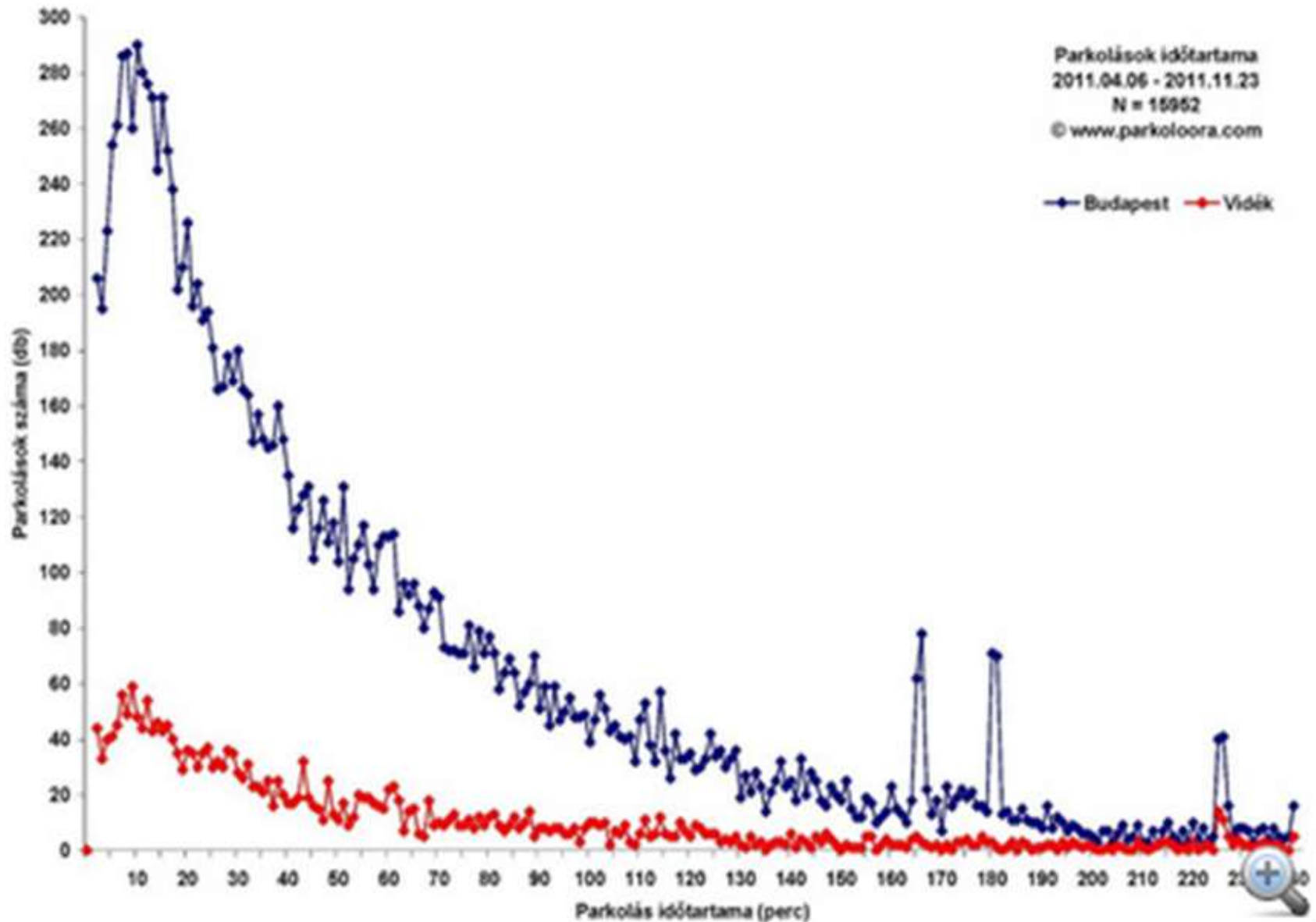


Real-time vacancy information directs drivers to vacant parking

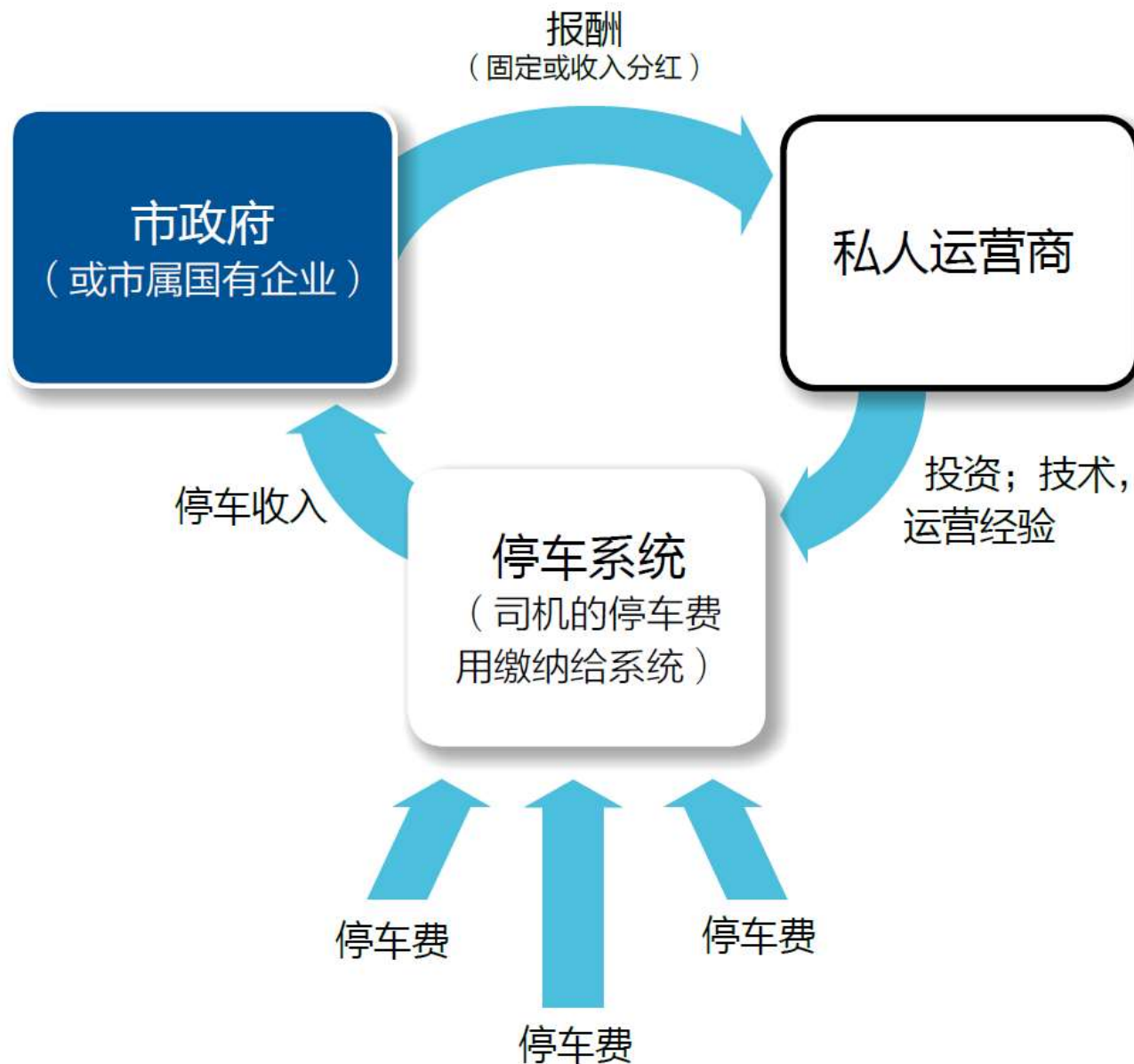
# Technology – control center



# Cell phone payments generate parking data



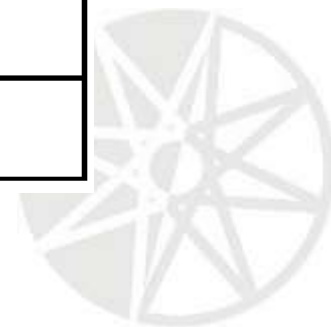
# On-street recommendations: cooperation-BOOT model



# Financial calculation – investment costs

## 广安门12000个路内停车位试点项目的直接投资成本

直接投资成本	个数	总成本 ( RMB )
智能停车咪表	400	16,000,000
停车咪表的安装	400	600,000
泊位占用传感器	12,000	18,000,000
PDA 和独立打印机	250	1,750,000
车载标签	12,000	9,600,000
停车诱导 LED 屏	120	9,600,000
软件	1	3,000,000
停车位划分标线	12,000	720,000
5% 的不可预见费用		2,963,500
总计		62,233,500







Enforcement: backwards, though efficient and unseen in other parts of China



# On-street recommendations - design







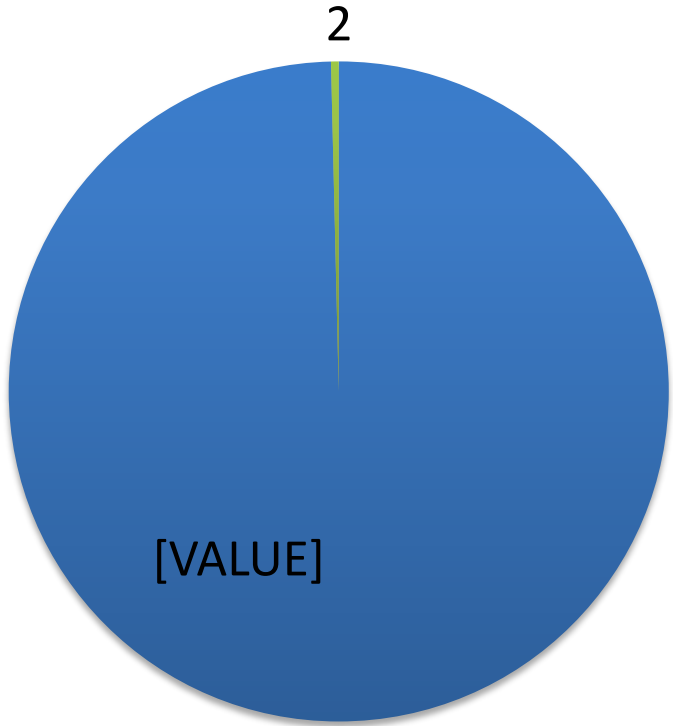


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京N T6717



# 后退区停车



■ Pedestrian ■ Vehicle



## Prohibit setback parking 取消后退区停车



*Before improvements*

Shop fronts are lined with parking, creating a poor shopping environment

## Prohibit setback parking 取消后退区停车



*After improvements*

Clear setbacks make for a better shopping environment



宜昌夷陵区夷陵大道（现状）

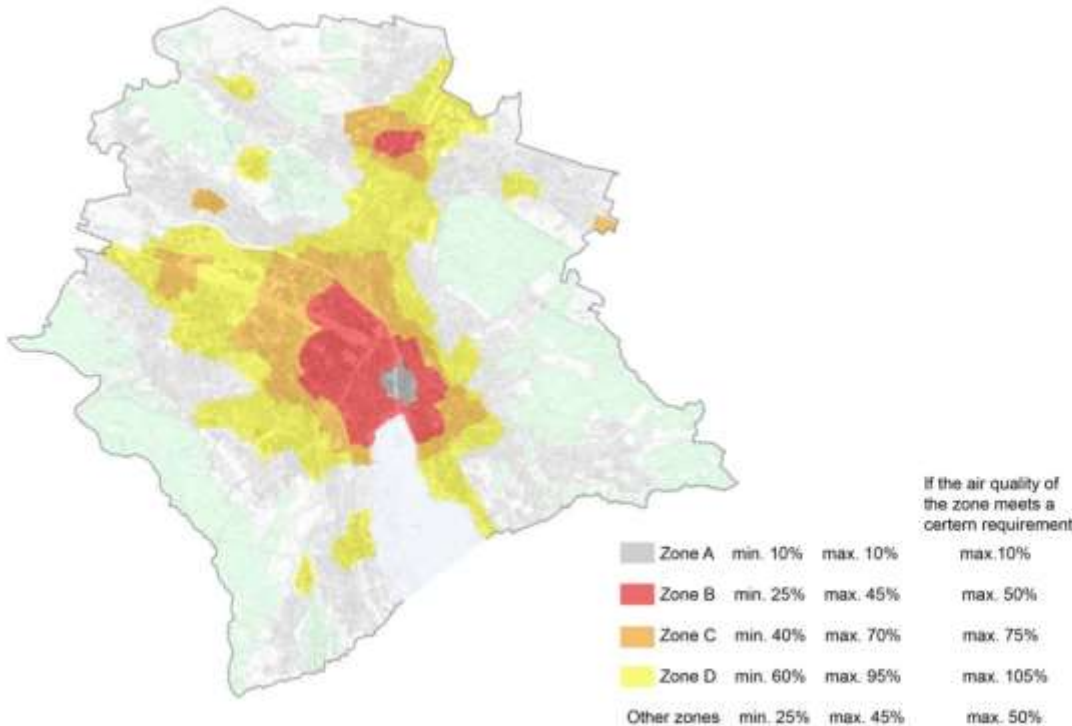


宜昌夷陵区夷陵大道（建议）



# Abolish parking minimums and implement cap

- Abolish parking minimums
- Set parking caps (maximum number of on-street and off-street parking spaces)
- Set these parking caps based on a mix of factors: traffic congestion, desired modal split, air quality levels, etc.



*Maximum parking standards for different zones in Zurich, Switzerland*

## Off-street recommendations – implement parking maximums

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- Set parking maximums in valuable areas
  - \* areas that need to be protected (CBD, historic/tourist centers/etc.)
  - \* where traffic problems are worst
  - \* within 500m of metro corridors (Shenzhen, Shanghai)
- Besides the size, also the **location** of new parking supply needs to be controlled, through 'zoning'. This to prevent negative traffic impact and prevent (too much) land being used for parking
- Examples: Shenzhen, Shanghai, Hong Kong, London, New York, Boston, Zurich



# Private residential parking

城市	最低居住停车标准 (停车位)	备注
布达佩斯	1.0/ 单元	但在公共交通站点 500m 范围内为 0.5 / 单元
香港	0.057-1.275/ 单元	变化范围大, 取决于公共交通的可达性和公寓面积大小
斯特拉斯堡	0.5/ 单元	在公共交通站点 500m 范围内
斯德哥尔摩	0.14/ 室	假设每户有 3 个居室
上海	0.3-0.8/ 单元	单元面积 <100m <sup>2</sup> , 则 0.3/ 单元; 单元面积为 100-150m <sup>2</sup> , 则 0.5/ 单元; 单元面积 >100m <sup>2</sup> , 则 0.8/ 单元
东京	0.28/100m <sup>2</sup>	
汉堡	0.2/ 单元	
巴塞罗那	0.17/ 单元	每 2-6 个单元 1.0 个车位, 取决于所在区域
伦敦	0	最大值: 1.0/ 单元 (2 居室)
巴黎	0	最大值: 1.0/ 单元
旧金山	0	最大值: 0.25/ 单元
纽约 (曼哈顿, 第 60 街以下区域)	0	最大值: 0.20/ 单元



# Private residential parking

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London – Central St. Giles



3分钟即达地铁岗顶站，百步即达BRT快速公交系统站点  
每一种从容姿态，都是别人仰慕的风景

广州



兰州

# Off-street recommendations – shared parking

Parking demand at each location varies throughout the day:

- residential areas have higher demand at night than during office hours
- offices have higher demand during office hours than at night

Shared Parking:

- similar to a ‘food court’ where restaurants share tables
- helps balancing parking supply and demand and further reduces the need for new off-street parking lots



# Commercial (office) parking

城市	最低商业停车标准 (停车位)	备注
上海	0.6/100m <sup>2</sup>	
斯德哥尔摩	0.4-0.6/100m <sup>2</sup>	
东京	0.3/100m <sup>2</sup>	
新加坡	0.2/100m <sup>2</sup>	
首尔	0.1/100m <sup>2</sup>	
斯特拉斯堡	0	如果周边地区没有停车需求 0.5/100m <sup>2</sup>
阿姆斯特丹	0	最大值: 1.0/250m <sup>2</sup>
旧金山	0	最大值: 总建筑面积的 7%
伦敦	0	最大值: 1.0/1,000-1,500m <sup>2</sup>
香港	0	



# Off-street recommendations – development without parking



London – Swiss Re building

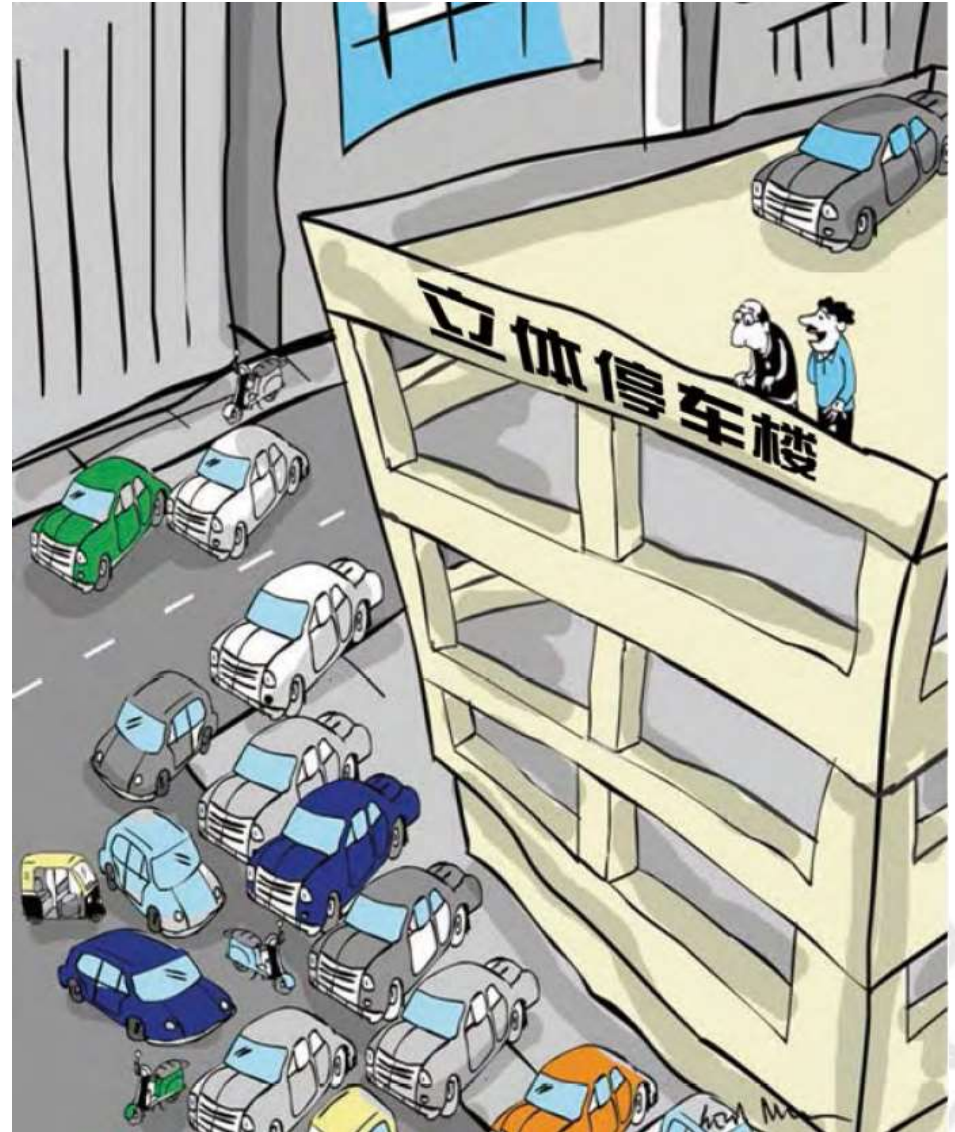




# Public off-street parking

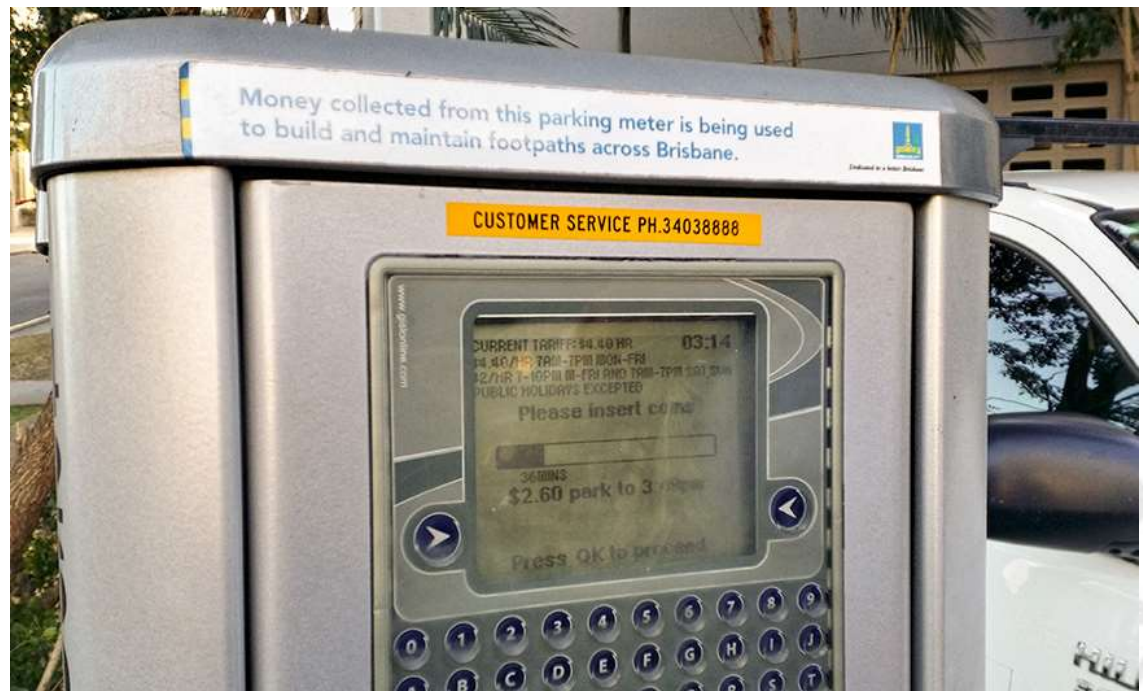
Higher parking prices and enforcement of on-street parking system will:

- shift on-street parking demand to empty off-street (policies already in place)
- make private investment in off-street parking viable, as (esp. full-day) on-street parking becomes costly and drivers will look for cheaper parking



# Other recommendations - ringfencing

- Ring-fence parking profits to finance other sustainable transport projects: public transport, NMT, bike sharing, public space improvements, etc.
- Transparency increases car drivers' acceptance of paid on-street parking
- Reinvest where you charge for parking: increases local (business) support
- Explain (the need for) and promote your on-street parking system as part of a larger package of transportation and city center improvements





Many gentlemen happen to meet the wrong ladies when going out.

Die Bekanntheit mit einem teuren Mobiltelefon steigt, wenn Sie das Auto in Zürich abparken lassen. Und auf Taxis und Bus ansteigen. In der Stadt ist die nächste Haltestelle im Durchschnitt nur gerade 300 Meter entfernt. Dort finden Sie ein ganz strukturiertes Angebot. Und können sich eine Parkplatz-  
probleme im Büro, im Restaurant oder an der Party abarbeiten lassen. So können Sie in jeder Hinsicht besser an  
Für erste Konsultationen steigt ein von über die ZVP-Tageskarte für CHF 7.20. Weitere Informationen unter [www.vzb.ch](http://www.vzb.ch)

**vzb ZürichLine**  
Umsteigen lohnt sich.

<http://itdp-china.org/cities/beijing/parking>

[www.itdp-china.org](http://www.itdp-china.org)

[www.globalparking.net](http://www.globalparking.net)

**谢谢！**

