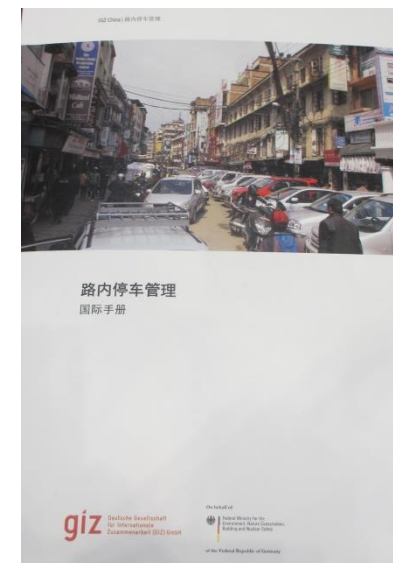


TAKE ON-STREET PARKING MANAGEMENT SERIOUSLY

HIGHLIGHTS FROM A GIZ TOOLKIT



认真看待路内停车管理 GIZ手册中的重点内容

Paul Barter

2015年3月

为GIZ China编写



交通转型与创新知识平台

On-street parking management: an international toolkit

路内停车管理：国际手册

1. **Introduction** and overview 介绍及回顾
2. **Keys to better on-street parking management** 改善路内停车管理的关键
3. **Institutional** basics 体制基础
4. **Design and location** of on-street parking 路内停车位的**设计和布局**
5. **Pricing** to ration on-street parking 路内停车**收费**
6. **Enforce** effectively, efficiently and fairly **执法效率与公平**
7. **Collect key parking data** and use it wisely **收集关键的停车数据并智慧应用**

DON'T TRUST CASUAL
OBSERVATIONS!
不要相信偶然的观测！

On-street chaos does not prove shortage 路内停车混乱不能证明停车不足

Inventories often reveal more supply than
was known of

通常清单表明实际供给比想象的多

Off-street parking is often
under-used, even when
nearby on-street parking
is saturated and chaotic
通常路外停车利用不足，
即使周边的路内停车已
经饱和并且非常混乱

Shenzhen, China
中国，深圳



Full on-street parking at a particular spot does not mean full parking around the corner. Parking saturation often varies over short distances
 特殊地点的路内停车饱和不能说明周边地区也如此。通常在短距离内，停车饱和程度也有很大区别



Results of an occupancy survey of on-street parking in Seattle's commercial core on a weekday in 2013.
 2013年西雅图商业区工作日的路内停车占有率调查结果

Source: Report by Seattle's Department of Transportation via the Sightline Institute (<http://daily.sightline.org/2013/09/27/theres-a-place-for-us/>) 来源：西雅图交通局报告

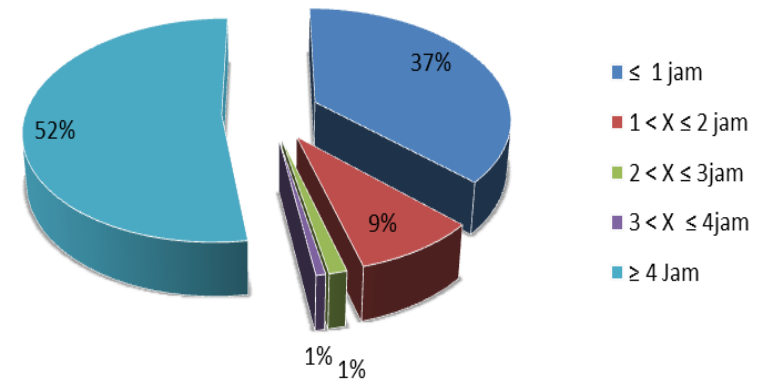
Is all-day street parking taking most of the spaces? 全天停车是否占用了大部分的车位？

Vehicles parked all day often occupy a high % of the space despite being a small % of the vehicles arriving to park
全天停车位占用率很高，尽管车辆到达率很低

Big parking space benefit if we can shorten average on-street parking durations (by pricing for example)
缩短停车时间，一样可以带来巨大停车收益（以价格举例）

Parking Duration (% of vehicles)
停车时间（车辆百分比）

≤ 1 hour 小时	$1 < X \leq 2$ hours 小时	$2 < X \leq 3$ hours 小时	$3 < X \leq 4$ hours 小时	≥ 4 hours 小时
68%	8%	1%	1%	23%



Percentage of spaces occupied by cars in each duration range (Indonesian example)
每个停放时段的停车位占用率（印尼案例）

Casual impressions can be misleading

偶然的印象可能造成误解

There may be more supply than you think
(*inventories*)

供给可能比想象的多 (**清单**)

On-street chaos does not prove shortage
(*occupancy surveys both on and off-street*)

路内停车混乱不能证明车位短缺 (**路内及路外占有率调查**)

Even if on-street parking right here is full, parking around the corner may be half empty (*occupancy surveys*)

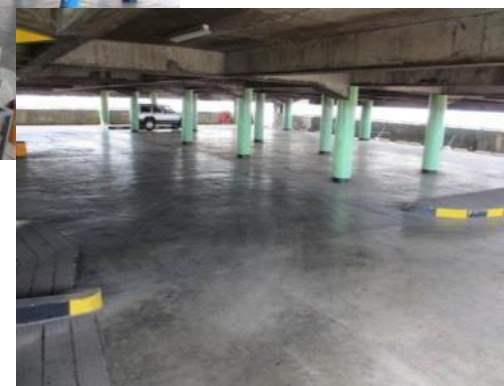
即使此处路内停车已饱和，拐角处可能有一半的空位 (**占用率调查**)

Long-duration parking may occupy most on-street spaces (*duration surveys*)

长期停车可能占用大部分路内停车位 (**时长调查**)



Palembang,
Indonesia
印尼，巴邻旁



DECIDE WHERE TO ALLOW
PARKING AND DESIGN CAREFULLY

确定允许停车区域并精心设计

Parking must fit the street design 停车必须与街道设计相协调

Toulouse 图卢兹

Street design comes first
首先考虑街道设计

In line with the multiple
roles of that street
与街道的多种功能协调

Make parking fit purposes of
the street and leave room
for other things

停车符合街道功能定位并
为其他功能预留空间



San Francisco. Photo by San Francisco Planning Department on [Flickr](#)
旧金山. 来源：旧金山规划局

Where and when is traffic a reason to ban parking?

何时何处需要从交通的角度禁止停车

Traffic is not always a good reason to remove parking

不能总是以妨碍交通为理由取消停车

Keep parking well away from intersections but removing mid-block parking may make no difference

让停车远离交叉口但是在路段上取消停车意义不大

Part-time parking bans are an option

可以在部分时段禁止停车

Frankfurt am Main
法兰克福



Shenzhen深圳



Removing this mid-block parking will not increase traffic capacity if it is the intersections that are the limiting factor

如果交叉口是通行能力的制约因素，取消路段上的停车位不会提高通行能力

Communicate and guide clearly

清晰的沟通与引导

Signage and marking need care. Not easy to do well.

要仔细设计指示牌与引导标志。做好并不容易。

Confusing signage or markings hinder enforcement and make it unpopular

让人混淆的标志与标牌会妨碍执法并降低接受度

High quality national standards can help

制定高质量的国家标准



A confusing parking sign in Washington, DC
(Photo by 'Dada1960' in Wikimedia Commons)
华盛顿引起混淆的停车标志

Parking orientations 停车方向

Parallel, Angled and 90°

平行，倾斜或者垂直

Street width and street purpose are key considerations

关键考虑因素是街道宽度和功能

Little difference in total area per parking space (both parallel and 90° better than angled)

每个车位的面积差别不大（平行式和垂直式优于倾斜式）



IMPROVE (AND DIGITIZE) ENFORCEMENT

改善（数字化）执法

Enforce effectively, efficiently and fairly 执法兼顾效率和公平

Legal and institutional
foundations are important
立法和体制基础很重要

Best by a dedicated force of
parking wardens
最好有专门的收费员负责

Make enforcement decisions
based PRIMARILY on parking
management priorities
执法首先考虑的是停车管理的
优先目标

Shenzhen



Shenzhen

Beijing

Make enforcement less unpopular 让执法更容易接受

Lax enforcement is not the answer

并不是疏于执法

Focus on behaviour change not penalty revenue

关注出行行为而不是罚款

Target habitual violators and be gentle with first timers

目标是习惯性违规者而不是初犯

Make penalties 'proportionate'
罚款“适度”

Appeal for support from relevant stakeholders

获得相关方的支持

Phase in stronger enforcement based on widely agreed priorities (such as dangerous parking)

基于广泛共识的循序渐进式执法（例如危险停车）

Enable appeals against mistaken or unfair enforcement

反对执法失误或者不公正

Calibrate enforcement intensity and penalties

校核执法密度和罚款

		Fine levels 罚款等级	
		Cheap 便宜	Expensive 贵
Enforcement intensity 执法密度	Low 低	Unacceptably low compliance 违章普遍	Fines become an unfair lottery and source of corruption 罚款变得不公平并成为腐败的来源
	High 高	Fines treated as price of parking (high revenue, low compliance) 罚款变成变相的停车费 (税收高, 守法者廖)	"Overkill" (high compliance but at excessive cost to city) “执法过度” (以过高的代价换来城市的有序停车)

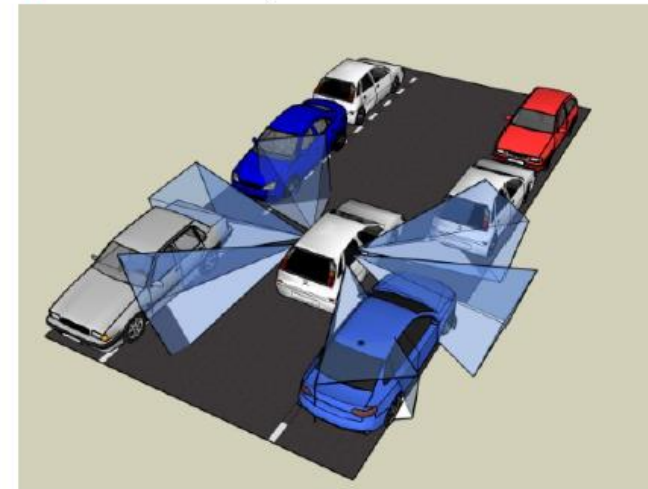
Sweet spot found
by trial and error
不断尝试找到平衡点

License Plate Recognition (LPR) in Enforcement 执法中的车牌识别

Greatly enhances
enforcement efficiency
大大提高执法效率

Links well with several
digital pricing mechanisms
与几种数字收费方式充分
结合

Digitization 电子化
由“扫描车”执法
▪ Enforcement by 'scan car'



Amsterdam
阿姆斯特丹

All parking permits, payments and
enforcement is digital

所有的停车许可、付费和执法都是电子化的

LPR-based enforcement well-integrated
有效结合通过车牌识别实现的执法

SMART PRICES

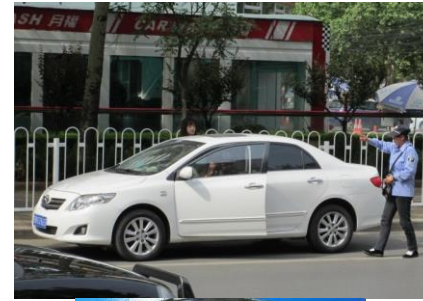
智能收费

Smart prices for parking 停车收费智能化

Charge different prices in small zones to keep parking occupancy about right (70 to 90% roughly)
小范围内差别化收费，确保占有率在合理的范围（大约70-90%）

Modernize pricing mechanisms
现代收费机制

Can we make on-street parking pricing less politically painful?
能不能使路内停车收费政治层面敏感度降低呢？



Non-digital (NOT smart) parking pricing mechanisms:
Attendant with paper tickets in Beijing;
Pre-purchased tear-and-display coupons in Singapore;
Mechanical single-space meters;
Multi-space pay-and-display meters (basic electronic)
(Photos by Paul Barter, except bottom left by Jonathunder via Wikimedia Commons)
非电子（非智能）停车收费机制：
北京收费员开具纸质发票；
新加坡预付费手撕停车券；
机械式单车位咪表；
多车位凭票泊车咪表（基本电子化）；
（来源：Paul Barter，除左下为Jonathunder）

Parking search traffic

FULL on-street parking causes
'cruising for parking', double
parking, and waiting

路面停车过满往往引起车辆
巡驶寻找车位，带来双重停
车压力

Even if the parking itself is
orderly and no obstruction

即使这个情况下路内停车是
有序无碍的

寻找停车位



Seoul, Korea
首尔，韩国

Saturated parking prompts double and illegal parking 停车过度饱和带来更大停车压力并容易造成违停



Saturated parking causes slow searching and reversing for parking
停车过度饱和造成来回缓慢巡驶寻找车位



So one key to reducing congestion from on-street parking is to avoid saturation
利用路内停车减少拥堵的关键是避免饱和

This requires good parking management
需要良好的停车管理

It does not necessarily
require more parking to be built
不必建设更多的停车位



Set prices to target 15% vacancies 定价目标是收费后停车位空置率为15%

Target occupancies of 60 to 80%
or 70 to 90% for example

例如目标占有率在60 - 80% 或者70-90%

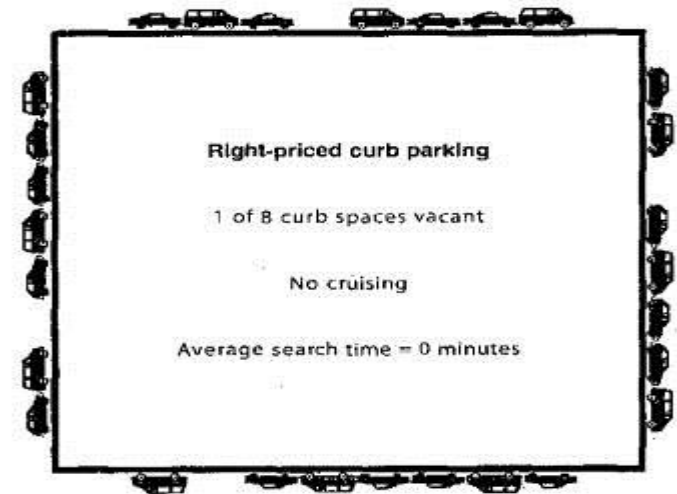
Always some vacancies 保持有一些空置停车位
so no searching for parking 这样没人会寻找停车位
prices send useful market signal
价格传递出有用的市场信号

Vacancy rates are also often used to guide choices:
空置率也**经常**被用于引导以下方面的决策：

on pricing **hours** 收费**时间**的设置

on price zone **boundaries** 收费**区域界线**的设置

Source: Shoup, D. The High Cost of Free Parking
来源：Shoup D. 免费停车的代价



San Francisco's SFPark trial

旧金山- 停车实验

An extremely precise and ambitious application of demand-responsive pricing.

采纳了一个十分精细和有雄心的反应需求的价格机制

Within the pilot areas, prices can differ from street block to street block and between morning, midday and afternoon periods.

在示范区，停车价格甚至在不同的街区也不同，同时早晨、中午和下午时间段也不同

Adjusted by small amounts every month during trial.

在试验期，每个月对价格进行小幅调整

Los Angeles 洛杉矶

LA Express Park™, a demonstration project from the City of Los Angeles Department of Transportation

“洛杉矶快速停车”，一个由洛杉矶市交通局设立的示范性项目

In Downtown Los Angeles, wireless sensors monitor parking occupancy continuously.

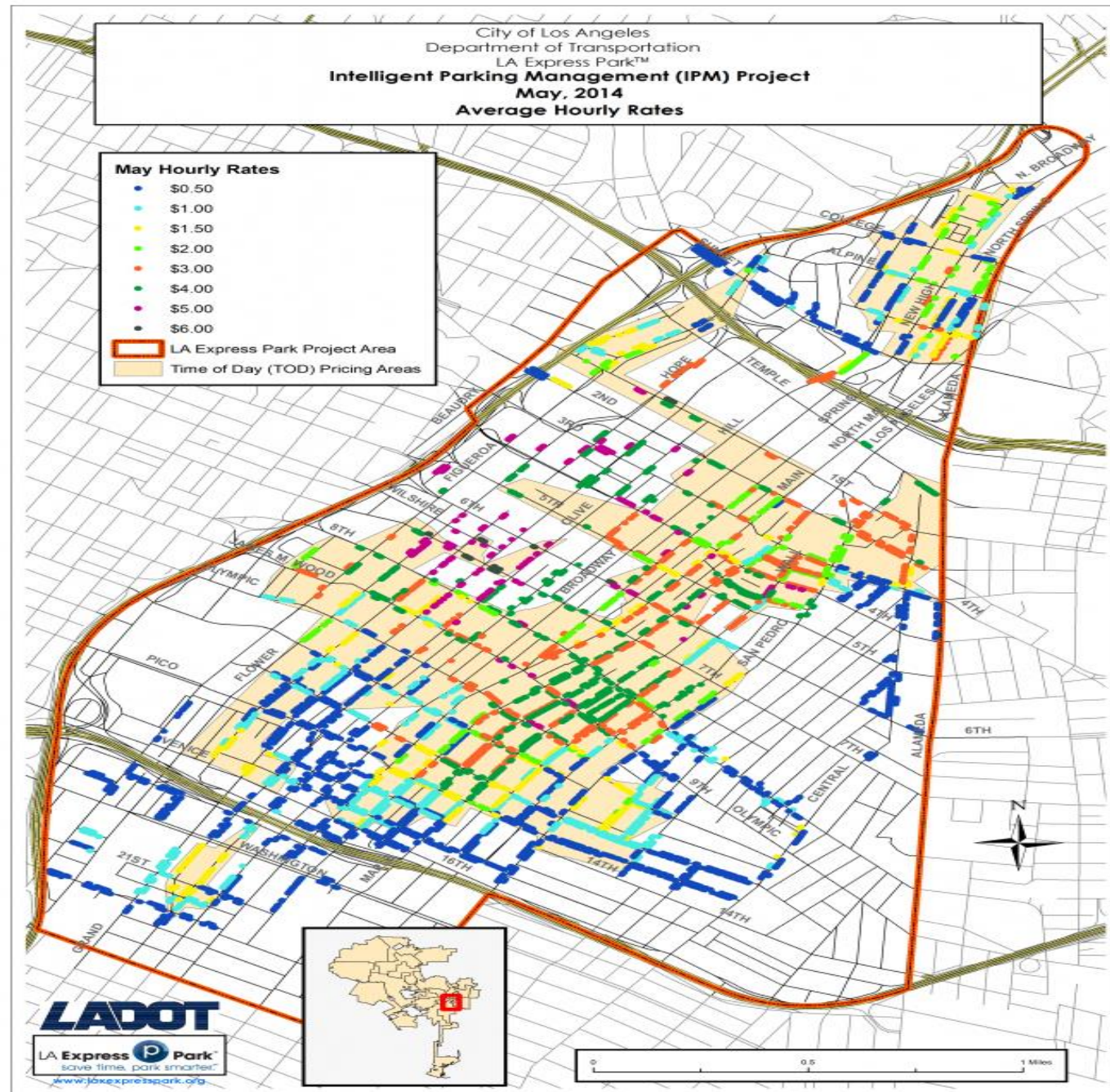
在洛杉矶中心区，无线的感应器不断监控者停车位的占有率

Parking meters with time-of-day rates have different hourly rates matching the parking demand in the morning, midday, evenings and weekends.

停车咪表收取不同的每小时价格。这个价格匹配早晨、中午、夜间和周末不同时期不同停车需求状况



Los Angeles 洛杉矶

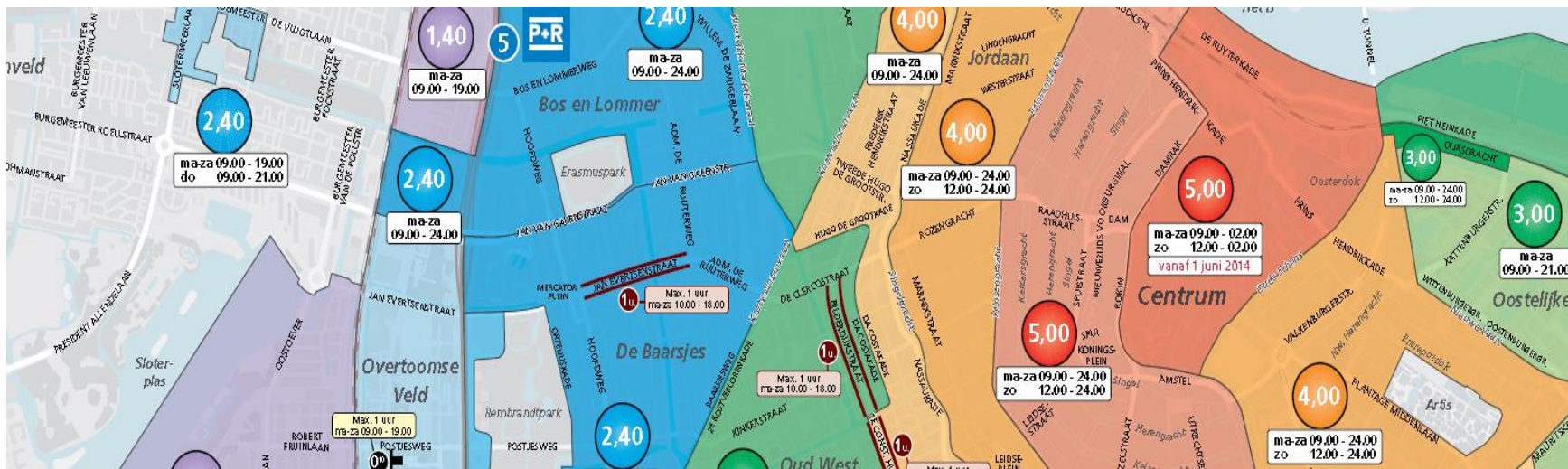


Rotterdam and Amsterdam

鹿特丹和 阿姆斯特丹

Both Rotterdam and Amsterdam have priced on-street parking with prices varying from zone to zone. Adjustments based on targeting an occupancy range.

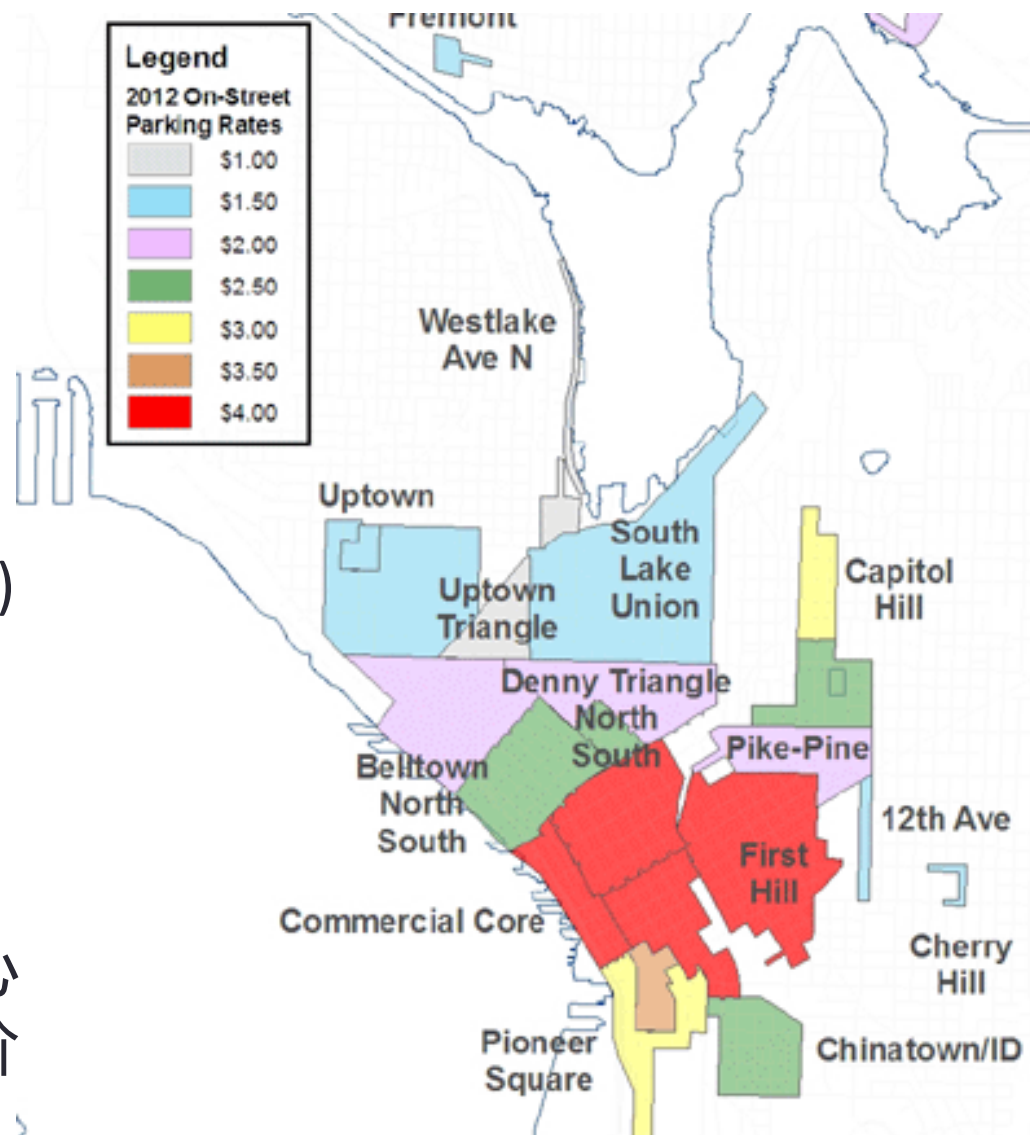
在鹿特丹和阿姆斯特丹大部分城中区域，路内停车的价格在不同价格分区不同。价格的调整主要是依据于停车位占有率的目标设定



Central Seattle 西雅图市中心

Chinatown Zone was split recently into core (high price) and peripheral (lower price and shorter pricing hours) zones

唐人街片区最近被分成核心区（价格高）和外围区（价格低，且停车收费时间短）两个分区域



See <http://www.seattle.gov/transportation/parking/paidparking.htm>

Calgary, Canada 卡尔加里, 加拿大

Time periods that can have different prices for the same location are: Weekdays: 09:00 – 11:00, Weekdays: 11:00 – 13:30; Weekdays: 13:30– 15:30; Weekdays 15:30 – 18:00; and Saturdays 9:00 – 18:00.

在同一地点，不同时间可以有同的价格。比如：工作日09:00 – 11:00, 工作日: 11:00 – 13:30; 工作日: 13:30– 15:30; 工作日15:30 – 18:00; 以及周六 9:00 – 18:00.

工作日 9:00–11:00

Weekdays: 09:00 – 11:00

Legend

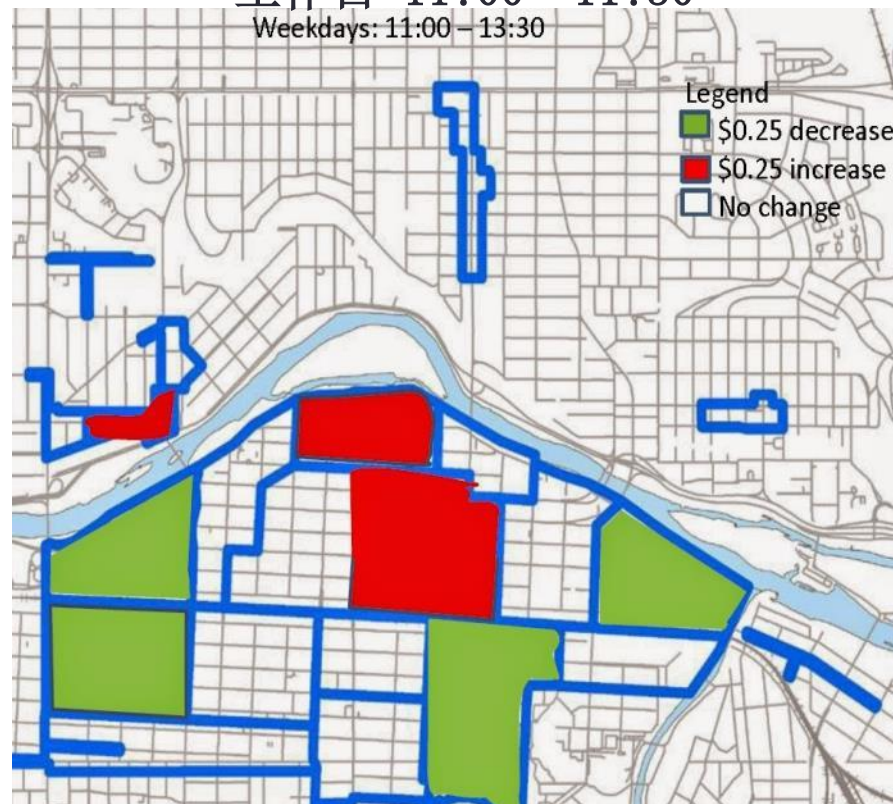
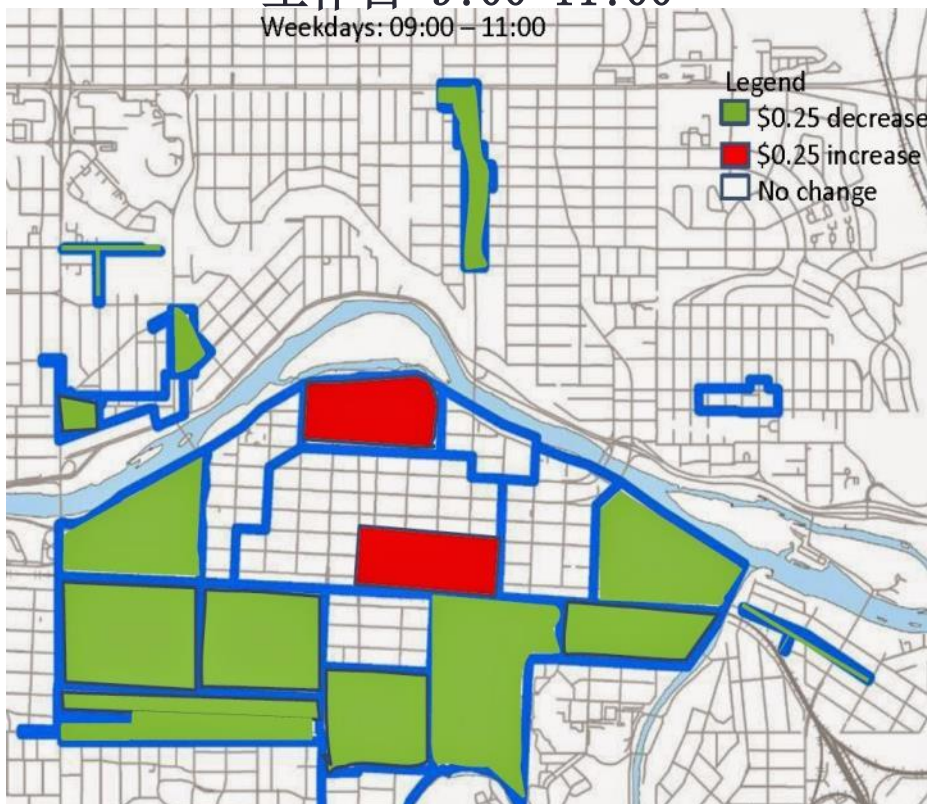
- \$0.25 decrease
- \$0.25 increase
- No change

工作日 11:00 – 11:30

Weekdays: 11:00 – 13:30

Legend

- \$0.25 decrease
- \$0.25 increase
- No change



Calgary, Canada 卡尔加里, 加拿大

On-street rates are reviewed annually using ParkPlus occupancy data.

路内停车价格每年重新测算一次, 利用Parkplus系统

In areas where occupancy is below 50%, prices will decrease by \$0.25;

在停车位占有率低于50%的区域, 价格会下降\$0.25

In areas where occupancy is above 80%, prices will increase by \$0.25;

在停车位占有率高于80%的区域, 价格会上升\$0.25

In areas where occupancy is between 50-80%, prices will stay the same.

在停车位占有率处于50-80%的区域, 价格保持不变

OTHERS 其他

Taipei - to some extent ,
台北在某些程度上是
Westminster, London
威斯敏斯特，伦敦

The City of Westminster has price
zones that seem to be demand-
responsive

市政府已经设定了小的价格区，
看上去比较能响应市场需求

And many others

Taipei



Modernize pricing mechanisms

现代收费机制



Smart (digital) single-space meter in San Francisco (Photo by Carlos Gomez on Flickr)
旧金山智能 (电子) 单车位咪表 (来源: Carlos Gomez)



Price mechanism criteria 价格机制标准

Capital cost and Operating cost
(including *transaction costs*)

建设成本和运行成本
(包括交易成本)

Convenience for users

用户使用便利

Ease of price adjustments

方便调价

Ease of enforcement

方便执法

Ease of central data collection

方便中心数据搜集

Trustworthiness (robust against
theft and leakage)

安全性 (防盗性和防数据泄
露性)

Robustness/reliability (weather,
vandalism, power failures, computing
failures, human error)

稳固可靠性 (不受天气, 故意破坏, 电
源故障, 程序故障, 人为操作失误等影响)

Convenience for users 用户使用便利

Convenient mode of payment,
便利的付费方式

Options for payment mode,
付费选择

Lack of a need to predict length of stay,
无需预测停车时长

Ability to extend parking sessions,
可随时延长停车

Ability to avoid paid-but-unused time
可避免已付款却未停车的时间



Smart (digital) multi-space meter in Ann Arbor (Photo by Dwight Burdette via Wikimedia Commons)

在安阿泊市的智能（电子）多车位咪表
（来源：Dwight Burdette）

Go straight to only mobile payment mechanisms? 直接步入唯一的手机支付时代?

Pay-by-Phone 手机付费

Pay-by-sms (text message) 短信付费

Pay-by-smart-phone-app 智能手机软件付费

Best with license plate logged for integration
with enforcement

最好与执法用的车牌信息相结合

Best with 'mobile wallet' to reduce
transaction costs

最好使用 '手机钱包' 以减少手续费

In-vehicle meters 车载式咪表

Pay-by-Phone in Washington DC
华盛顿手机支付



In-vehicle meter (Photo by Eliavnl via Wikipedia)
车载咪表 (来源: Eliavnl)

Go straight to only mobile payment mechanisms? 直接步入唯一的手机支付时代?

Emerging cases with pay-by-phone (sometimes with in-vehicle meter option too) as the sole payment option
慢慢形成手机付费或车载咪表成为唯一付费方式

Tel Aviv, Israel, example

Shenzhen too now

以特拉维夫（以色列港口城市）为例

Pay-by-Phone (two companies) and In-Vehicle Meters (one company)

手机付费（两个公司）和车载咪表（一个公司）相结合

No other options (paper pre-paid coupons now abolished)

没有其他付费方式选择（预付券已取消）

LPR-based enforcement well-integrated

有效结合通过车牌识别实现的执法

Low infrastructure costs, so no need for exclusive contract with private sector pricing operator

基础设施成本低，因此不需要单独外包给私营收费运营部门

Can we make on-street parking pricing less politically painful?

能不能使路内停车收费政治层面敏感度降低呢？

Focus on pricing as a parking management tool

强调收费是为了实现更好的停车管理

NOT on the revenue!

而不是为了增加政府收入



Can we make on-street parking pricing less politically painful?

能不能使路内停车收费政治层面敏感度降低呢？

High prices only needed at busiest places

只在最繁忙路段高价收费

Dramatically improved parking conditions

大力改善停车条件

Visible improvements
to area

显而易见的区域性改善



Shenzhen

Can we make on-street parking pricing less politically painful?

能不能使路内停车收费政治层面敏感度降低呢？

Spend local parking revenue locally
从哪儿收的钱，还是用在哪儿

Examples include EcoParq in Mexico City; Old Pasadena in the LA area; Houston; and others

例如墨西哥城的EcoParq；洛杉矶的老街；休斯顿等等



ITDP Mexico

Can we make on-street parking pricing less politically painful? 能不能使路内停车收费政治层面敏感度降低呢?

Could we give resident compound committees control over their own parking and autonomy on prices?

可以试行：住宅区下放权力给如居民委员会进行自主管理停车，自主支配停车费用？

So they can benefit if local parking prices rise

如此一来，如果地区停车费用上涨，住户可以真正受益。



Shenzhen

Taipei 台北

Most cities around the world
do NOT control the price of
private-sector parking

世界上大多数城市私有停车场的
定价是不受政府调控的



GOOD ON-STREET PARKING
MANAGEMENT DRAMATICALLY
IMPROVES THE STREETS

良好的路内停车管理
大大改善街道环境

On-street parking management helps many kinds of parking problem

路内停车管理有助于缓解多种停车问题

Disorderly parking that obstructs vehicle movement and the pedestrian environment

停车混乱影响车辆通行和人行环境



Obstructive on-street parking in Amman, Jordan; Kiev, Ukraine; and Beijing, China (Photos by Andrea Broaddus, Manfred Breithaupt and Paul Barter)
约旦阿曼及中国北京的路内停车影响交通及行人， Kiev, Ukraine； Andrea Broaddus, Manfred Breithaupt 及 Paul Barter

On-street parking management helps many kinds of parking problem

路内停车管理有助于缓解多种停车问题

Kathmandu
加德满都

Saturated (full) on-street parking and its side-effects of illegal parking, double parking, and extra traffic searching for parking

饱和的路内停车及非法停车，并排停车及寻找车位交通的负效应

All-day parking in busy streets by employees (which would be best off-street, on quieter streets, or shifted to other transport modes)

在繁忙区域员工的全天停车
(最好在路外，流量小的街道或者转移到其他出行方式)



On-street parking management helps many kinds of parking problem

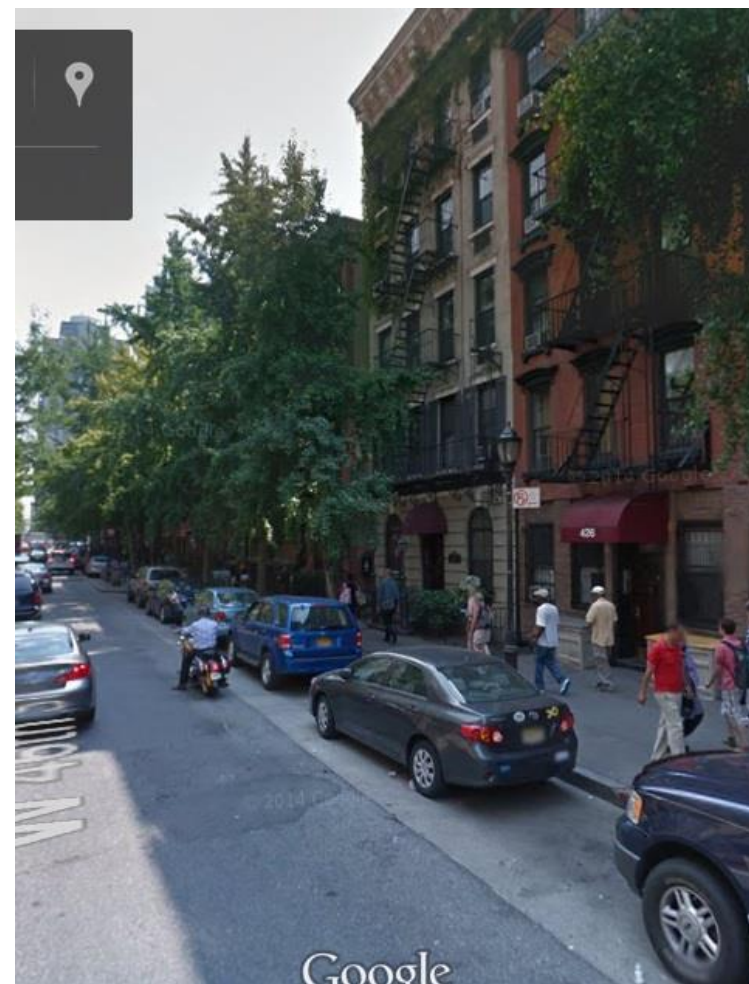
路内停车管理有助于缓解多种停车问题

Problems in restaurant or nightlife areas (conflict, double parking, illegal parking, waiting in traffic lanes, and circling for parking)

餐饮及夜生活区域的问题
(冲突, 并排停车, 非法停车, 机动车道等候及占用非机动车道停车)

Saturated overnight & weekend parking (competition for parking among residents themselves)

饱和的夜间及周末停车
(与居民停车需求的竞争)



East side Manhattan near Midtown
曼哈顿东部, 靠近市中心区

ON-STREET PARKING MANAGEMENT EASES OFF-STREET PARKING DILEMMAS TOO

路内停车管理也能缓解路
外停车的困境

How good on-street parking management can ease your off-street parking problems

如何利用良好的路内停车管理缓解路外停车问题

Often reveals there is no shortage!

通常并不存在停车位不足！

And makes off-street supply easier, more financially viable and more efficient, if you really do need more parking

如果真的需要更多的车位，可以使路外停车供给变得简单，路外停车市场更有活力

Increases policy options about off-street parking supply

为路外停车供给提供多种政策选择

Without strong parking management, it is difficult to know:
没有严格的停车管理，很难了解：

which areas **really** have shortages

哪个区域真的停车不足

which areas **only** have parking management problems

哪些区域只是存在停车管理问题



Guangzhou 广州



Jakarta 雅加达

Efficient pricing increases
perceived capacity
有效的定价提高感知能力

Mostly NOT by shifts to public
transport

大多数停车者不会改变出行方
式，选择公共交通

Most by reducing parking
durations (including by nudging long-
duration parking to less convenient parking)
而是减短停车时长



Makati, Metro Manila
马尼拉中部，马卡迪



Often reveals there is no shortage! 通常并不存在停车位不足!



Palembang, Indonesia
印尼，巴邻旁



Shenzhen, China
中国，深圳



Better on-street management can help even if you really do want more parking supply 即便真的需要增加停车供给，良好的停车管理也很有用

Increases the use of off-street parking

提高路外停车的使用

Improves willingness to pay for off-street parking and, hence, financial feasibility

改善路外停车的支付意愿，因此经济上可行

Improves location decisions for off-street parking investments

改善基于场所的路外停车投资决策



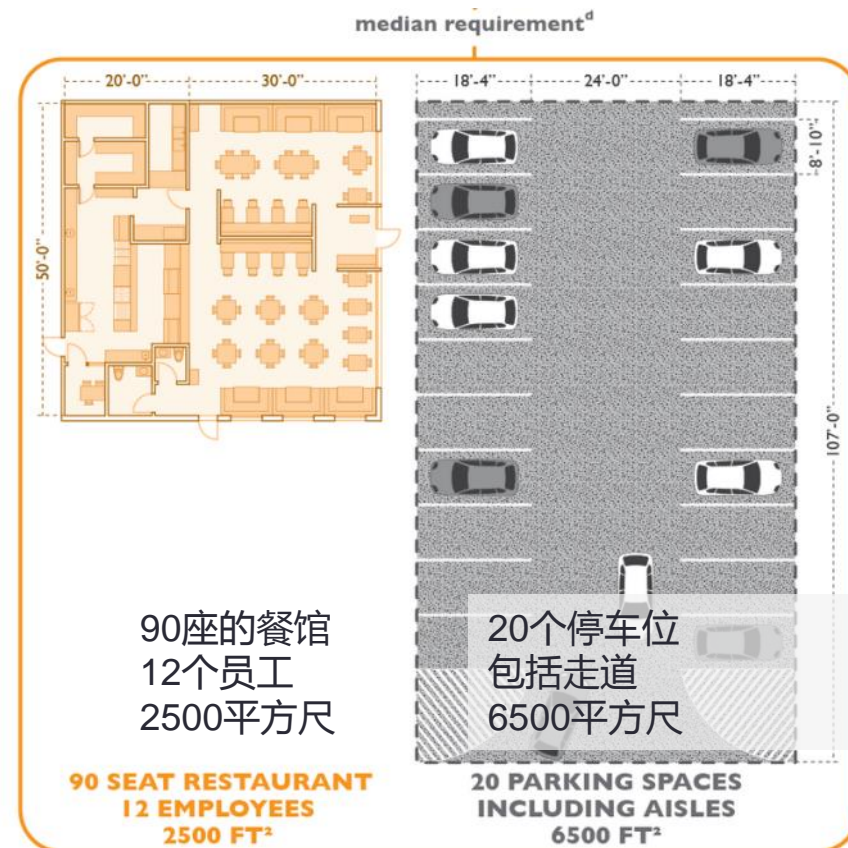
Seoul, Korea 首尔，韩国

On-street management expands off-street parking policy options

路内停车管理扩展了路外停车政策选择

Weak on-street parking management makes municipalities think they have no choice but to promote off-street parking supply

薄弱的路内停车管理让政府部门认为除了增加供给别无选择



A framework for classifying parking policy approaches. 停车政策分类方法的框架

Diagram from Barter, P.A. (2014 forthcoming), “A Parking Policy Typology for Clearer Thinking on Parking Reform”, International Journal of Urban Sciences 图表来自Paul Barter最新发表论文

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有多少停车供给？
How much parking supply?

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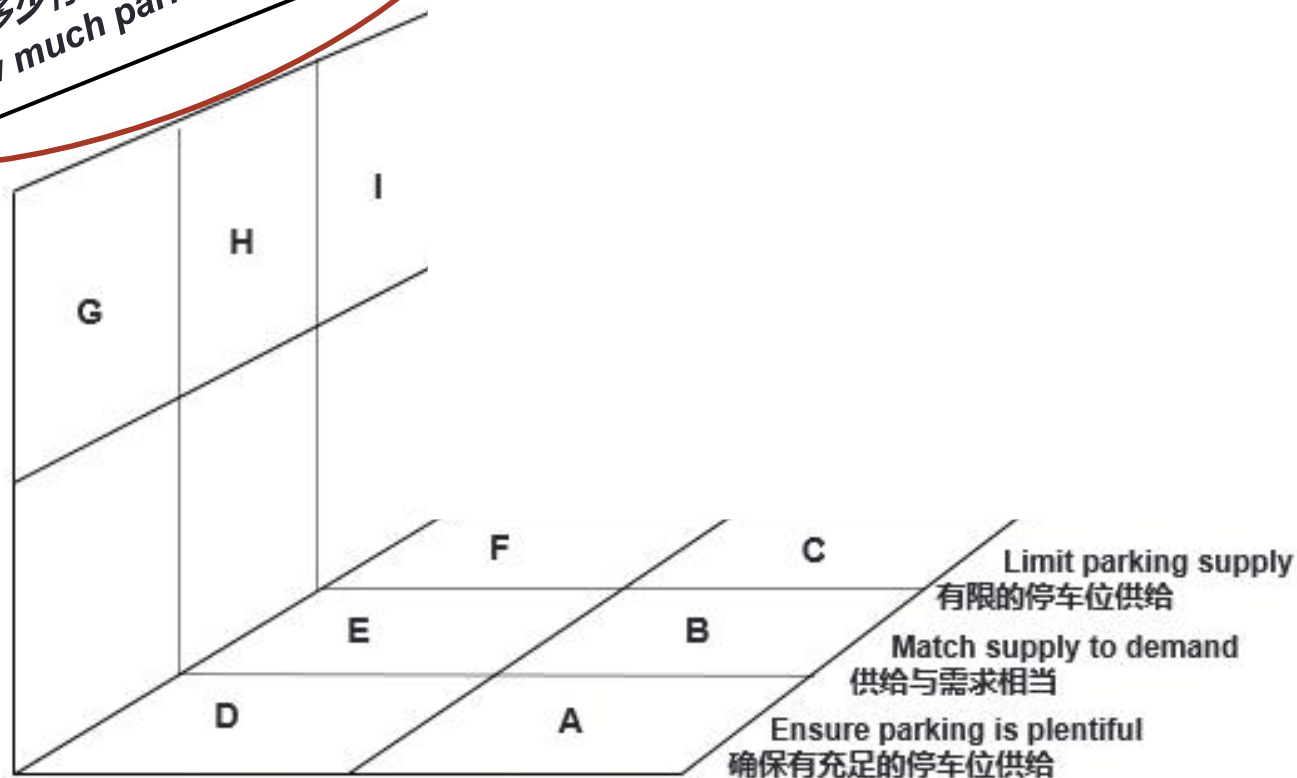


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Should a parking space serve its own site or the district?

停车空间应该为谁服务，点还是片？

有多少停车供给？
How much parking supply?

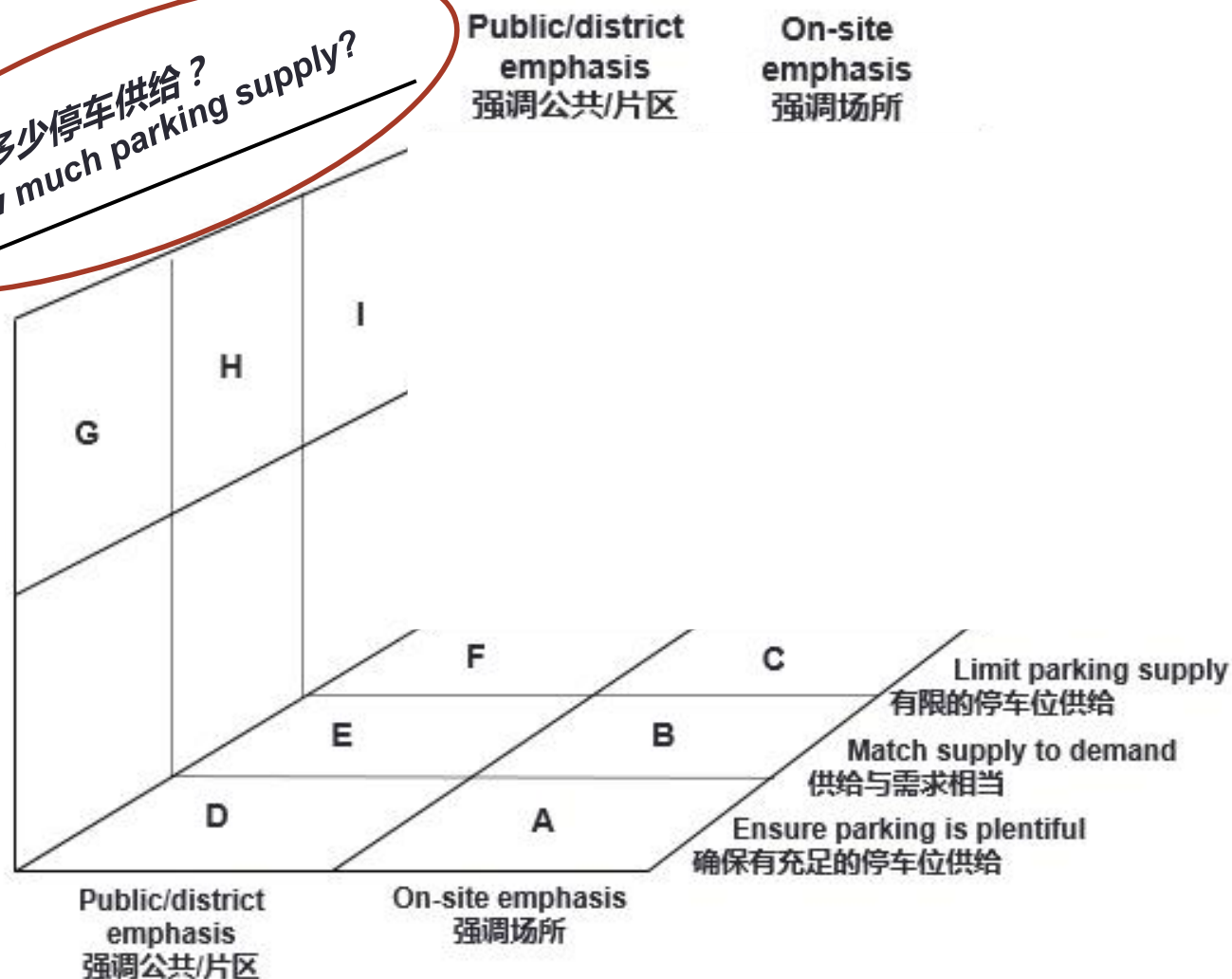


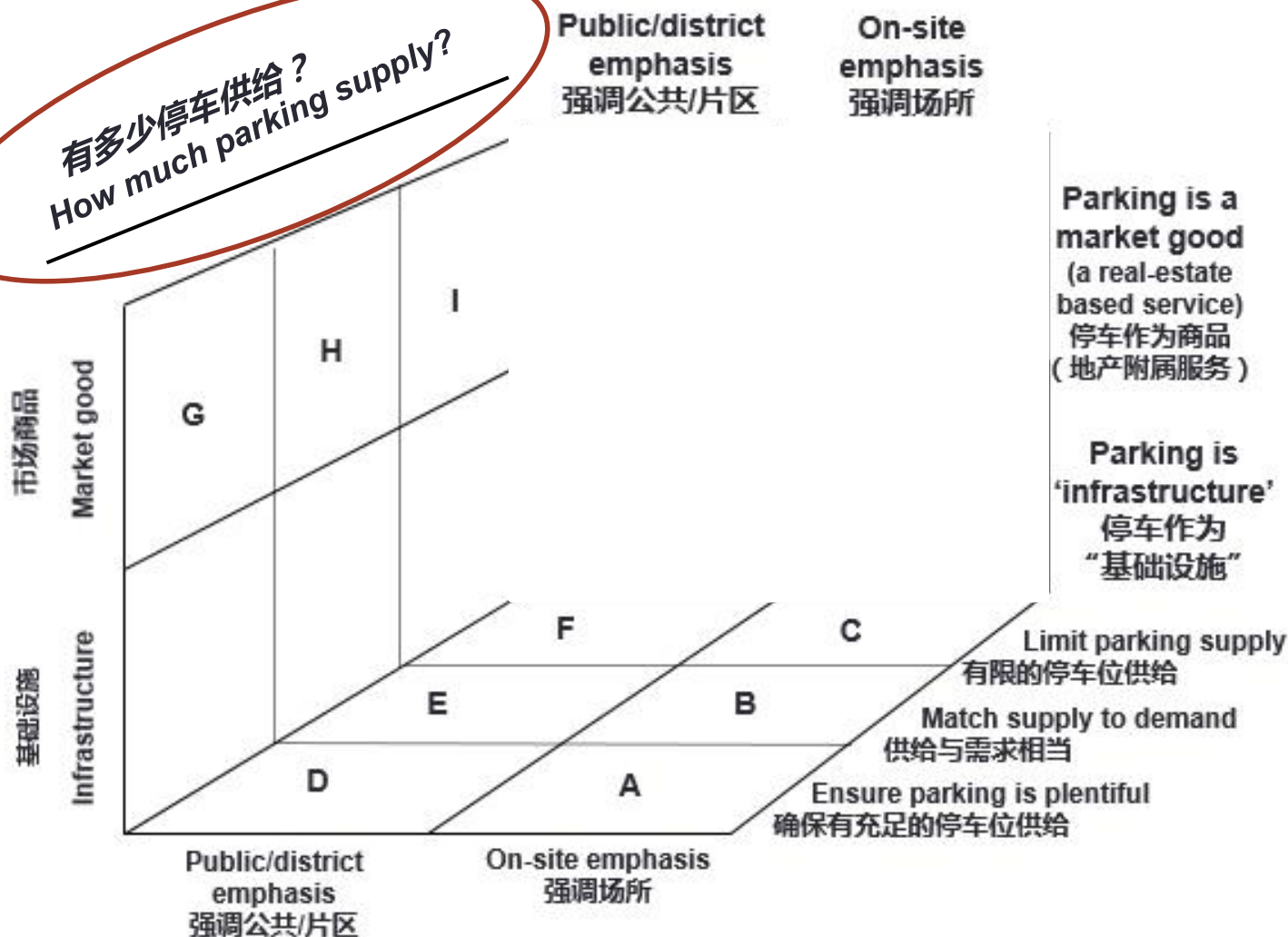
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Parking is a market good (a real-estate based service)
停车作为商品 (地产附属服务)

Parking is 'infrastructure'
停车作为“基础设施”

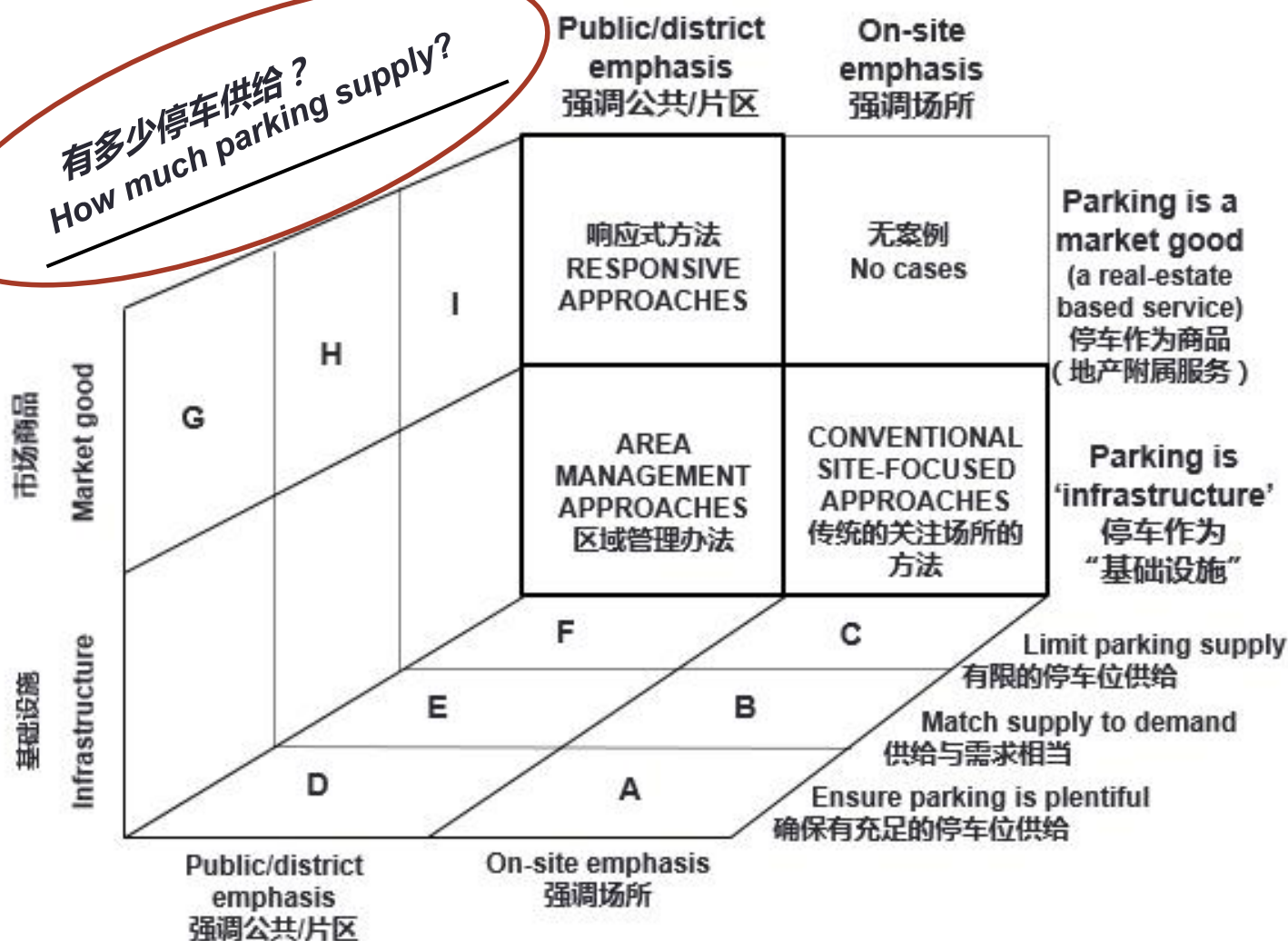
Is parking a market good or must it be planned, like infrastructure?
停车应该是市场化的商品还是必须受到规划的基础设施？

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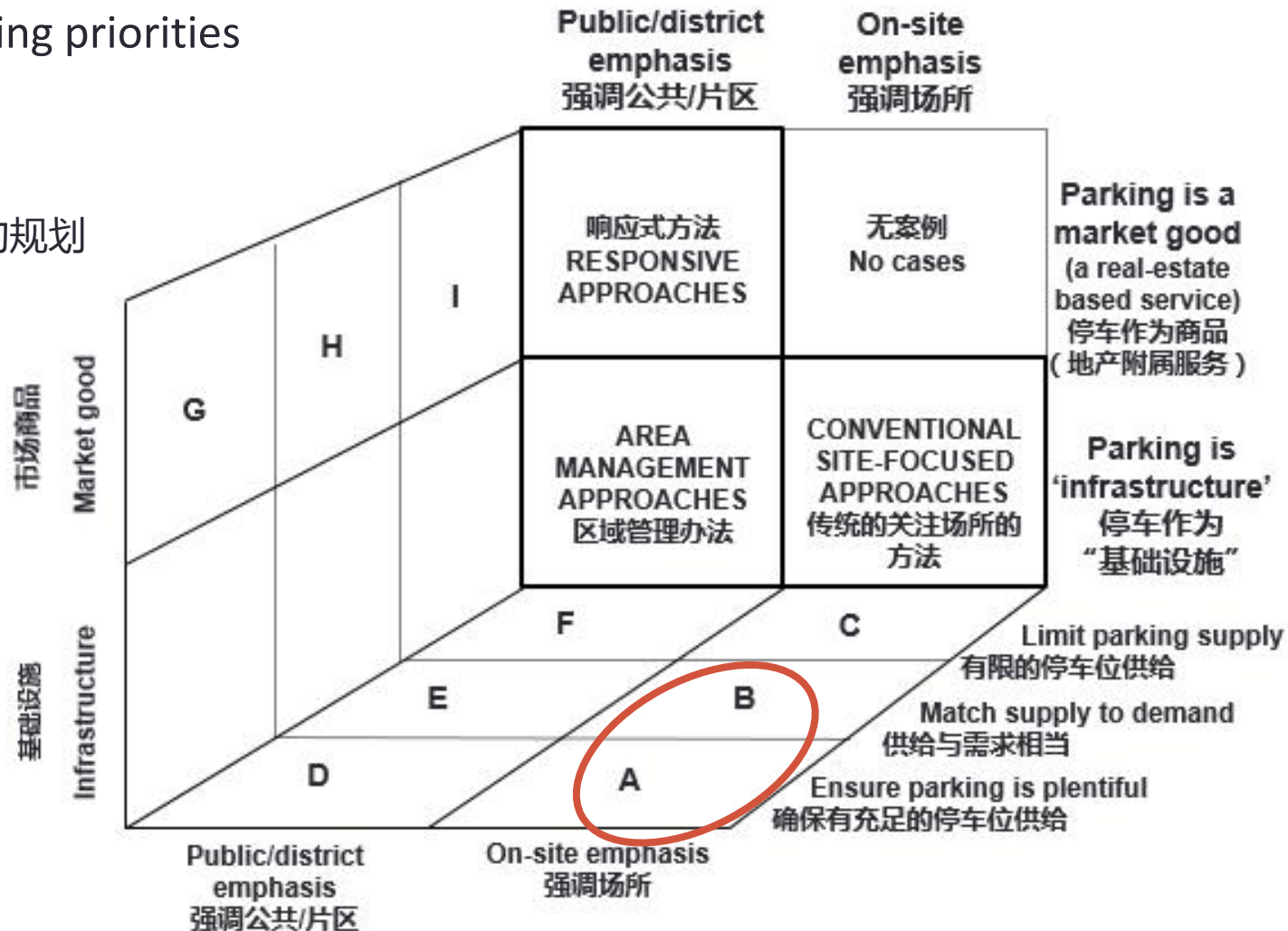
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‘Suburban’ North America, Australia, etc 北美郊区，澳大利亚等地

Car-oriented planning priorities
since the 1940s

自40年代起，

以小汽车出行为主导的规划



Denser, older parts of western cities

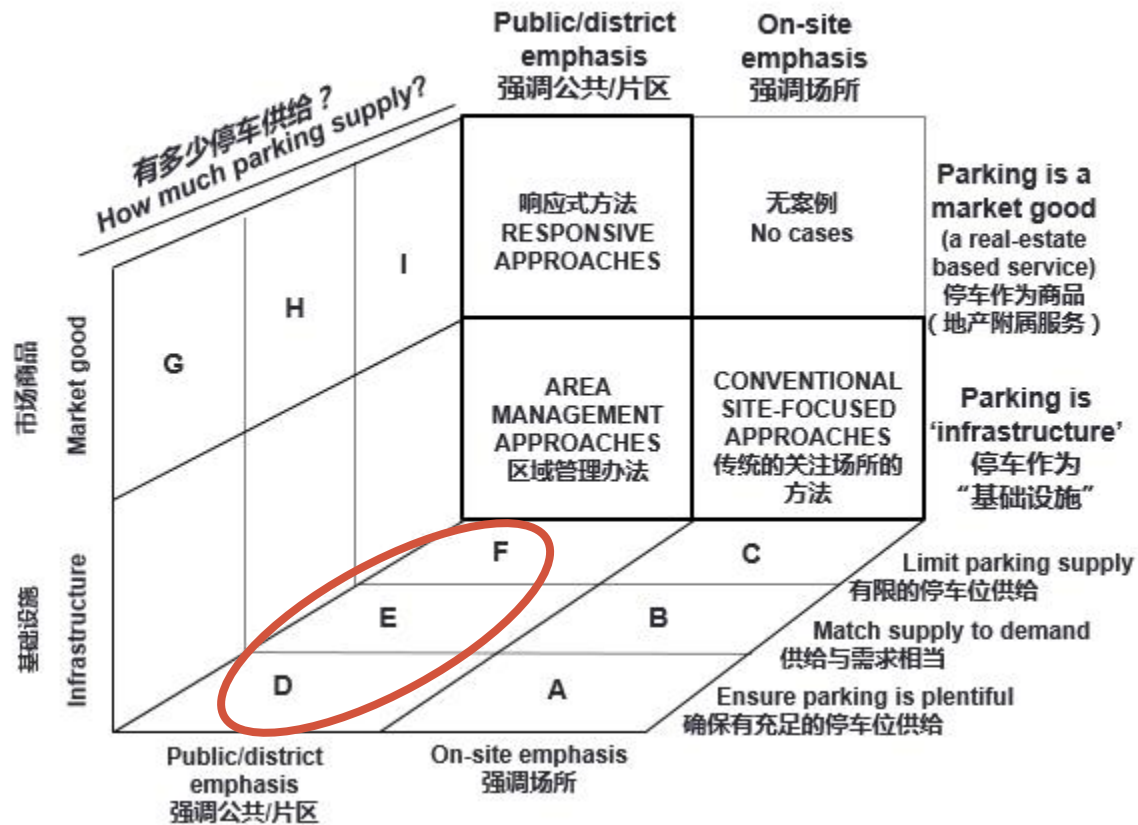
密度更大、历史更长的西方城市

In dense older areas this site-focused approach is often destructive and disappointing

关注于场所停车的方法，在老旧街区的表现一般是破坏性的和非常令人失望的

In the West, dense, old inner areas tend to switch to area management approaches

在西方，古老而高密度的中心区试图转变为区域管理的方法

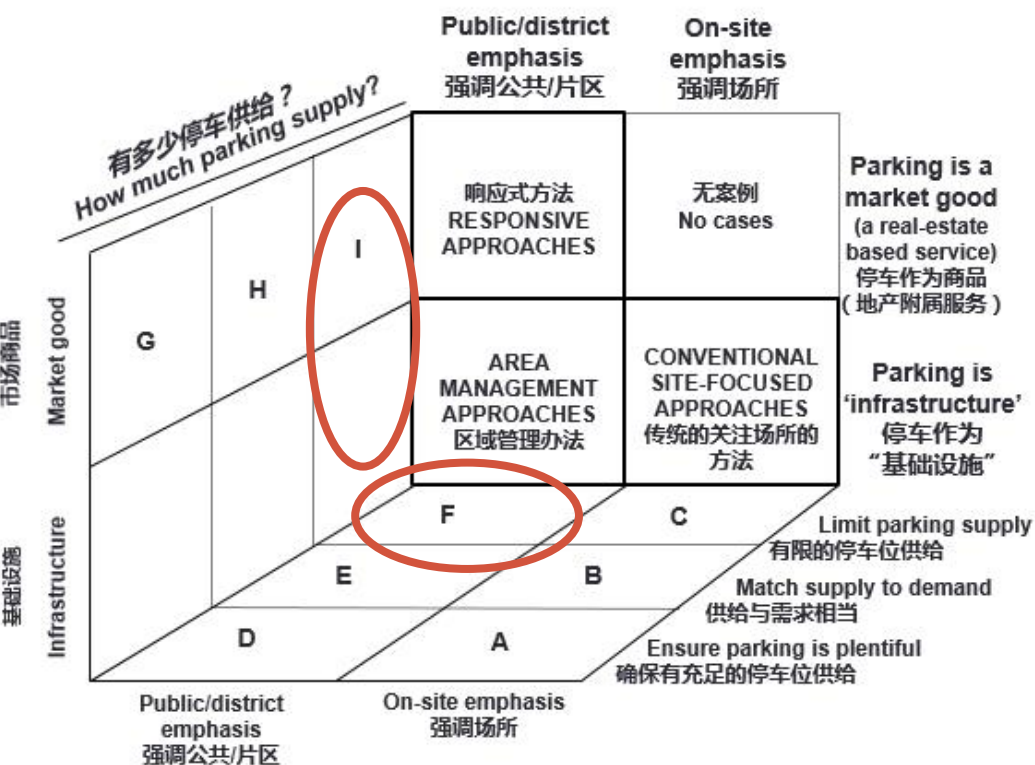


Intense central business districts (CBDs)

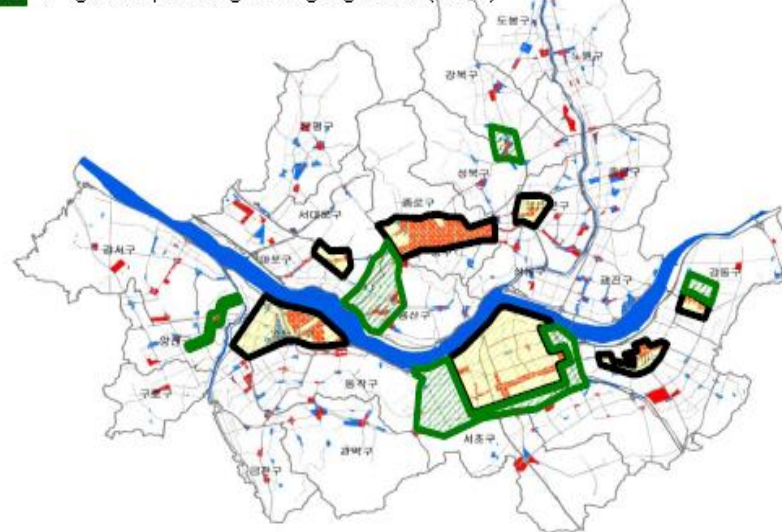
密集的中心商务区 (CBD)

Especially those served by pre-car era mass transit systems

特别是那些服务于小汽车时代之前的公共交通系统



- Commercial Area 商业区
- Semi-residential Zone 半居住区
- 1st grade parking charging zone(existing) 一级停车收费区 (现存)
- 1st grade parking charging zone(new) 一级停车收费区 (新建)

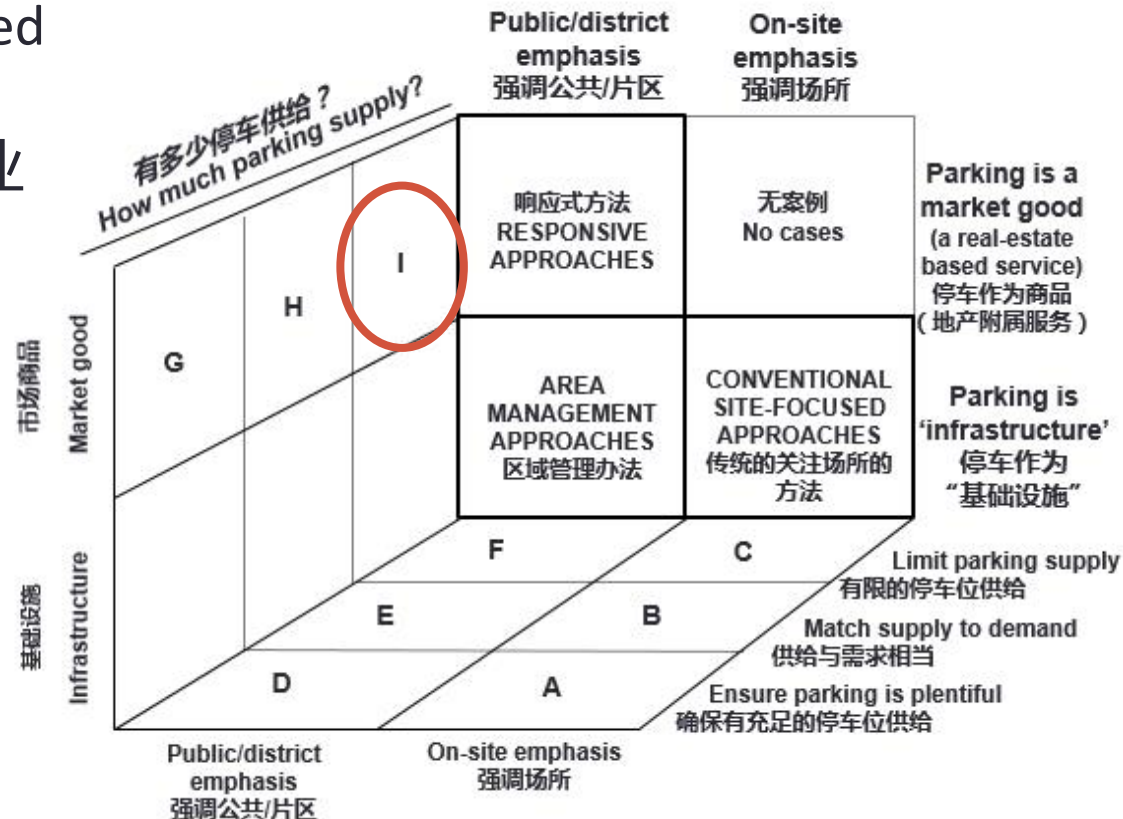


Source for map: Presentation by Sang Bum Kim (Assistant Mayor for City Transportation), "Policy Directions of Seoul for a Clean and Green City" to CUD Global Conference Seoul 2009

Japan 日本

Accidentally created a mainly commercial and market-oriented parking system

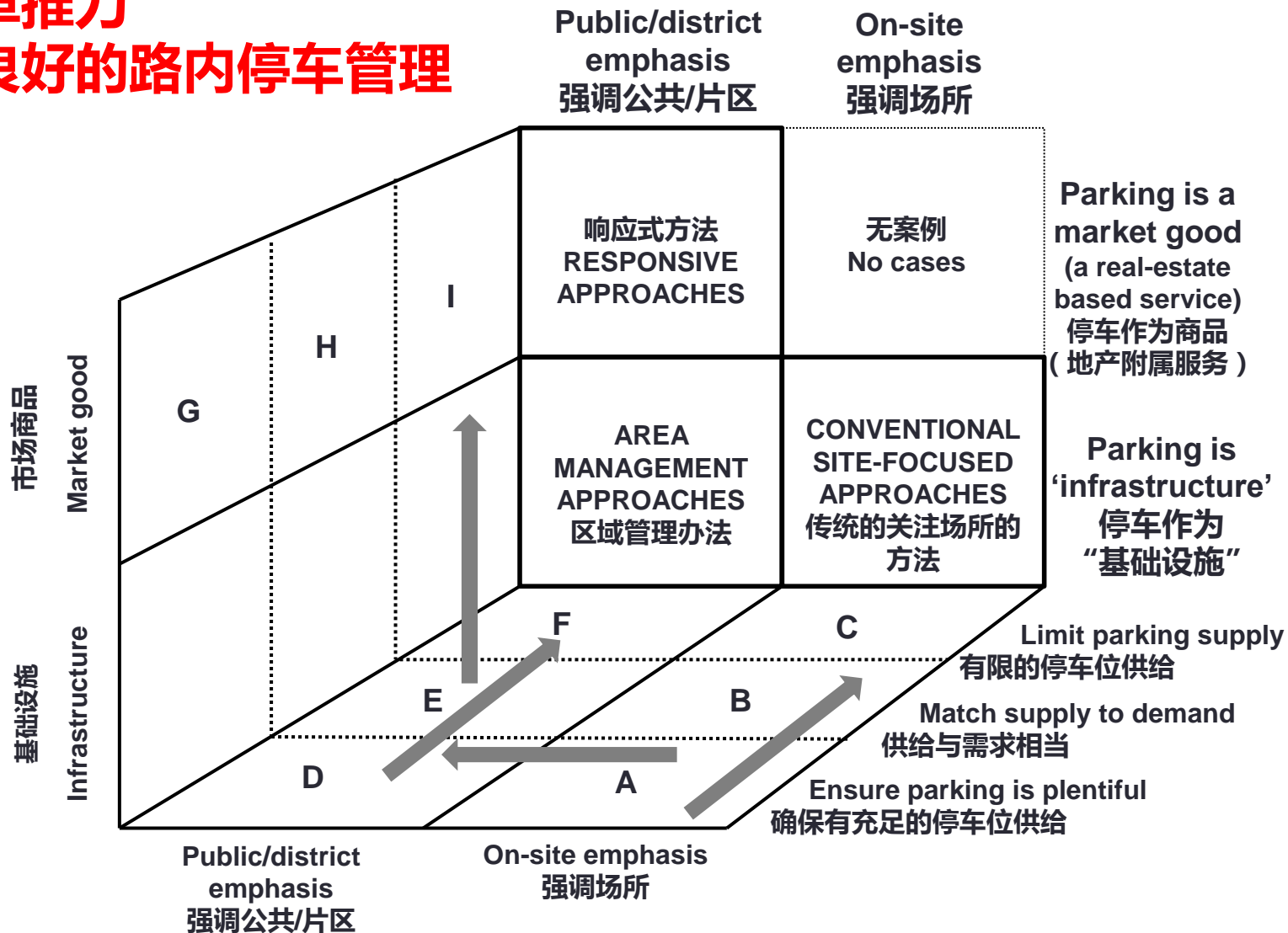
意外地创建了一个主要由商业和市场导向的停车系统



Common reform thrusts ALL need good on-street parking management

常见的改革推力

全部需要良好的路内停车管理



QUESTIONS OR CLARIFICATIONS?

提问时间