



交通转型与创新知识平台

# SINGAPORE'S URBAN TRANSPORT STORY

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## 新加坡城市交通发展历程

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March 2015

For GLZ China



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# KEY DECISIONS IN THE EARLY 1970S

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## 上世纪70年代初的主要决策

# Situation by the early 1970s

## 上世界70年代情况

Industrialization and rising car ownership

工业化和汽车保有量增长

Increasing traffic problems

交通问题增多

Very poor bus service

公交服务非常差

‘Pirate taxis’ (shared taxis filling bus gaps)

“无证出租车”（出租车共享，弥补公交不足缺陷）



Archives and Oral History Department Singapore



A Changi Bus Company Limited bus. Image credit: Yeo Hong Eng  
(via <http://www.yeohongeng.blogspot.sg/2012/11/buses-of-singapore-in-50s-60s-and-70s.html>)

# Late 1960s urban planning effort with UN help

## 上世纪60年代后期联合国支持下的城市规划工作

### Concept Plan 1971

#### 1971年概念总图

Strong city centre planned

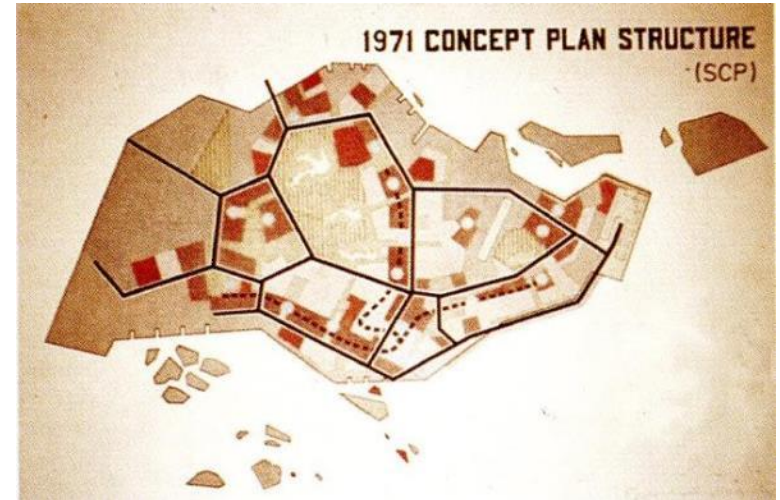
计划发展壮大城市中心

Dense transit corridors planned

计划增加交通要道密度

Assumed mass transit rail system coming even though MRT decision not yet made

即使发展地铁系统决策尚未制定，  
但开始设想大运量轨道运输系统的发展



Analysis in plan showed need to limit traffic and improve public transport  
规划分析显示，需要限制交通并改善公共交通

# Several key actions 1971 to 1975

## 1971年至1975年之间的一些重要行动

Ten bus operators merged to three then one

10个公交运营商合并为3个，最后为1个

Vehicle purchase taxes increased  
(‘Additional Registration Fee’ ARF)

车辆购置税增长（“额外注册费”）

Gasoline taxes increased

燃油税增长

Congestion pricing (low-tech cordon for central area called the ‘Area Licensing Scheme’ ALS)

拥堵收费（区域通行证制度）



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# TRANSIT ORIENTED PLANNING

## 公交导向规划

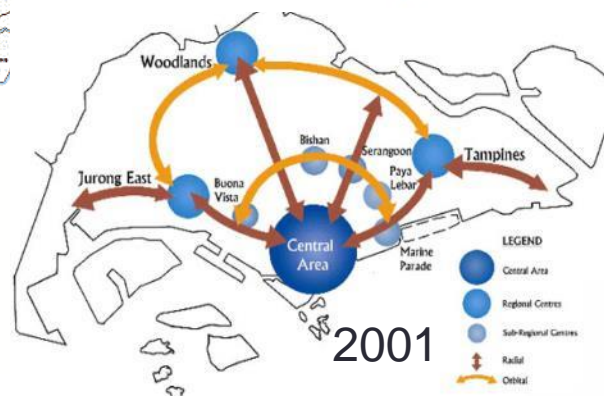
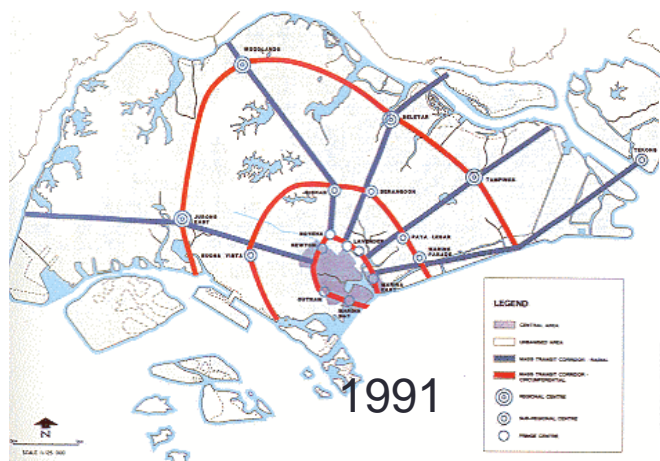
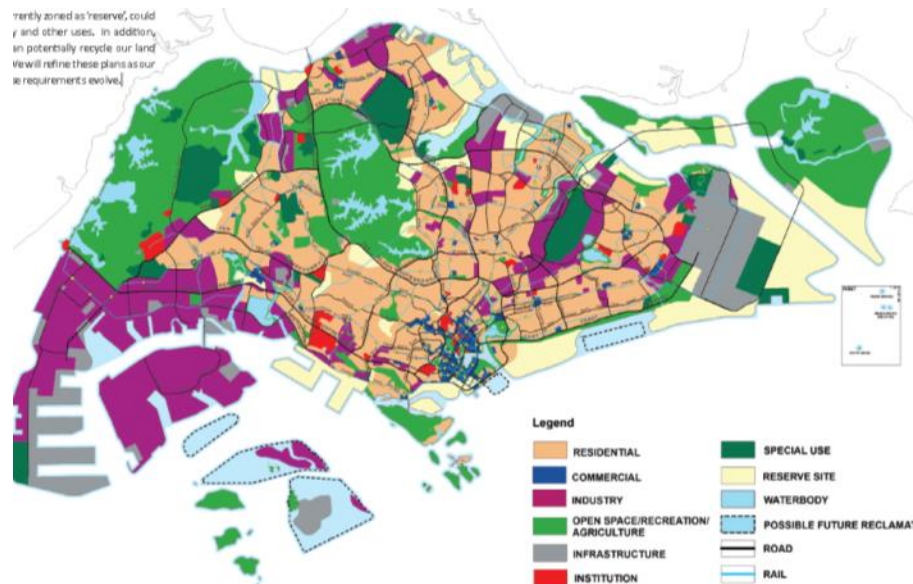
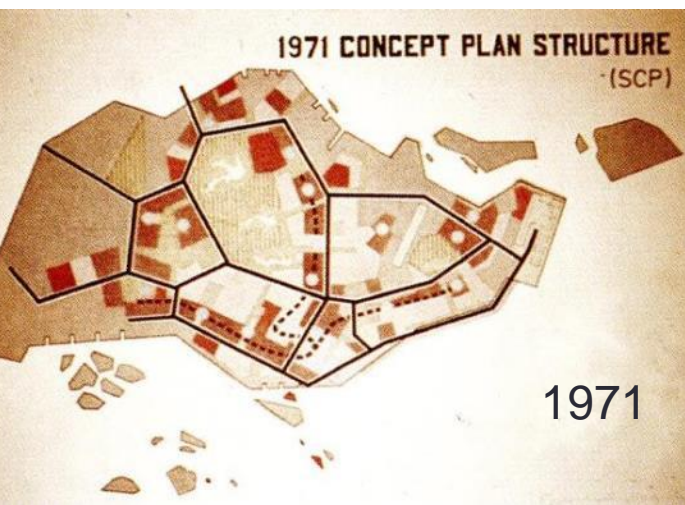
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Which preceded the final mass transit decision  
先于最终的公共交通运输决策



# Forty+ years of transit-oriented strategic planning

## 四十余年的公交导向战略规划



Land Use Plan  
Jan. 2013  
2013年1月  
土地利用规划

# Early '80s MRT debate hinged on urban planning

## 80年代初地铁系统辩论取决于城市规划

Debate between team urging metro (MRT) and those urging bus-only approach

关于大力发展地铁（地铁系统）和仅大力发展公交车之间的辩论

Bus-only system would have required revised plan (less concentrated)

如果仅发展公交车系统，就会要求修订规划（降低集中度）

Growing strong central business district and dense housing corridors made MRT essential

中央商务区的不断壮大以及居住空间的日益密集使得发展地铁系统成为必然

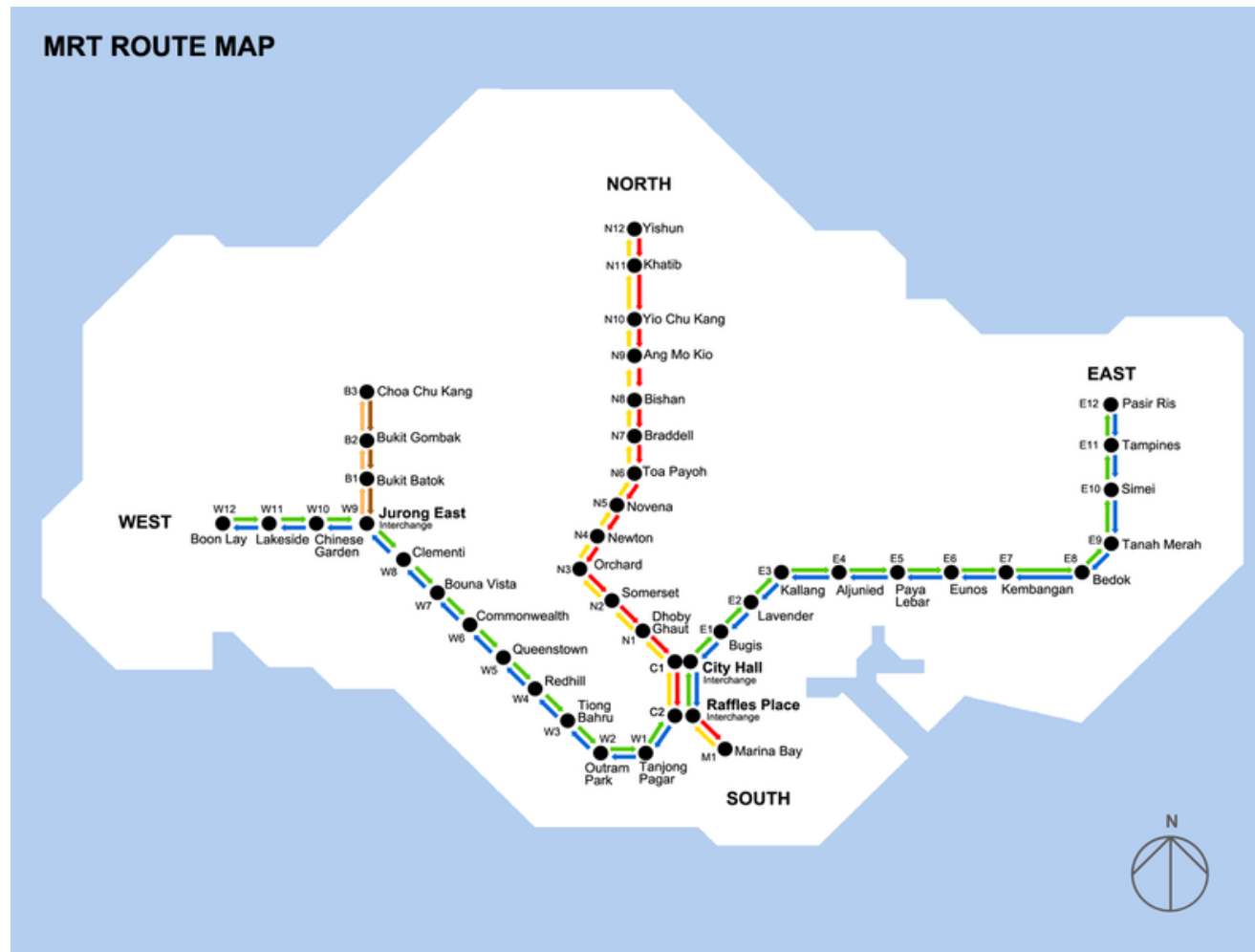




# Singapore urban rail 新加坡城市轨道

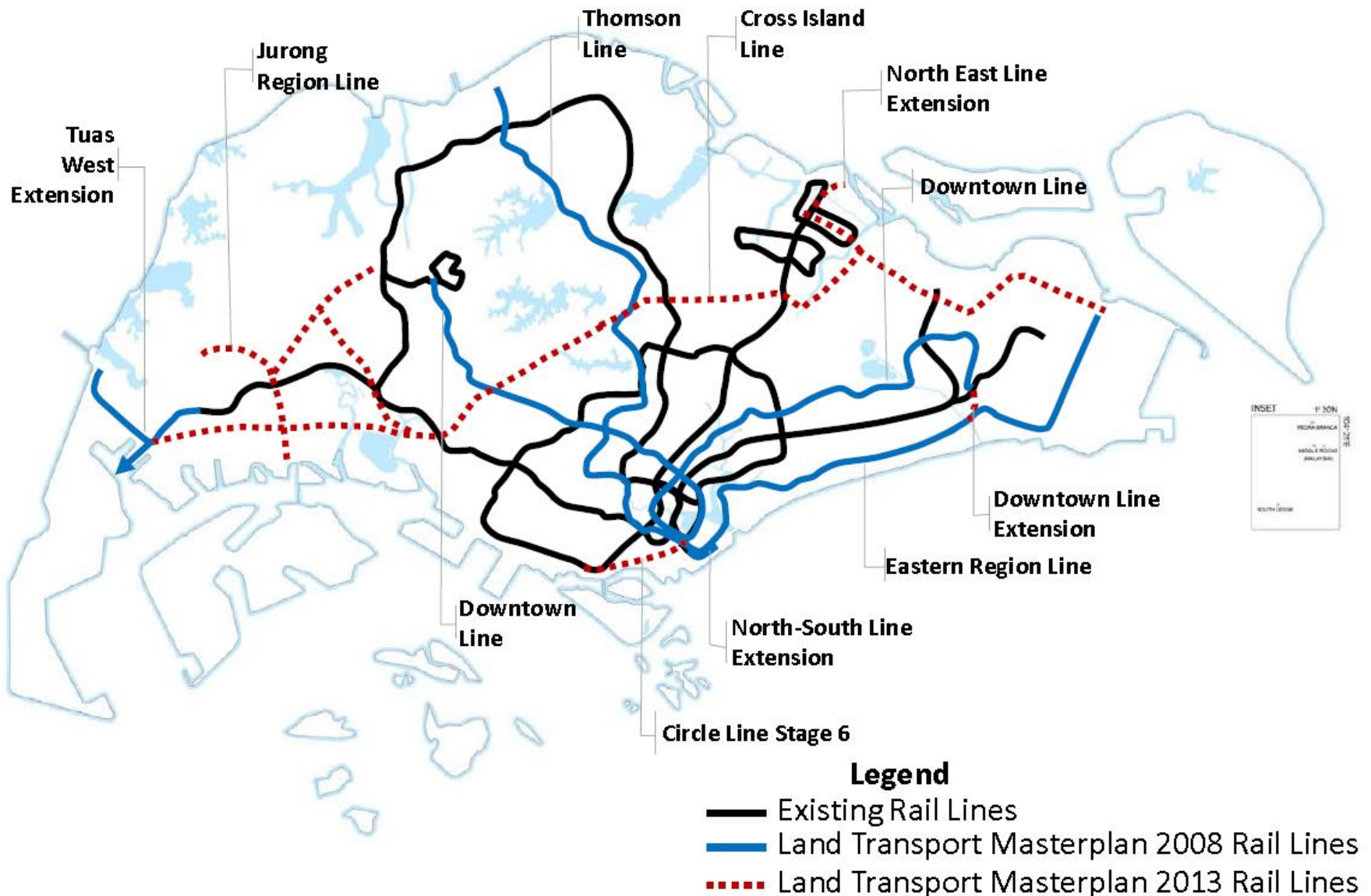
The initial MRT system opened in 1987. This is the 1989-1996 system.

新加坡地铁系统开放始于1987年。下图是1989年-1996年地铁路线图



# MRT Development has continued

## 地铁发展得到继续



# Forty years of transit-oriented strategic planning

## 四十年公交为导向的战略规划



Tampines new town



# Most of Singapore's high-density is transit-oriented but there are some mistakes

大多数新加坡的密集区域都以公交为导向，但还是存在一些问题

Part of Potong Pasir is dense but not transit-oriented

部分Potong Pasir 地区密集度很高，但是并不以公交为导向

Far from MRT and not on the way to anywhere

离地铁站点过远且不在去往任何地方的通道上



# Surprisingly, Singapore has parking minimums

令人惊讶的是，新加坡设有有最低停车位配建标准限制

But they were lowered in 2003

2003年，该标准得到降低

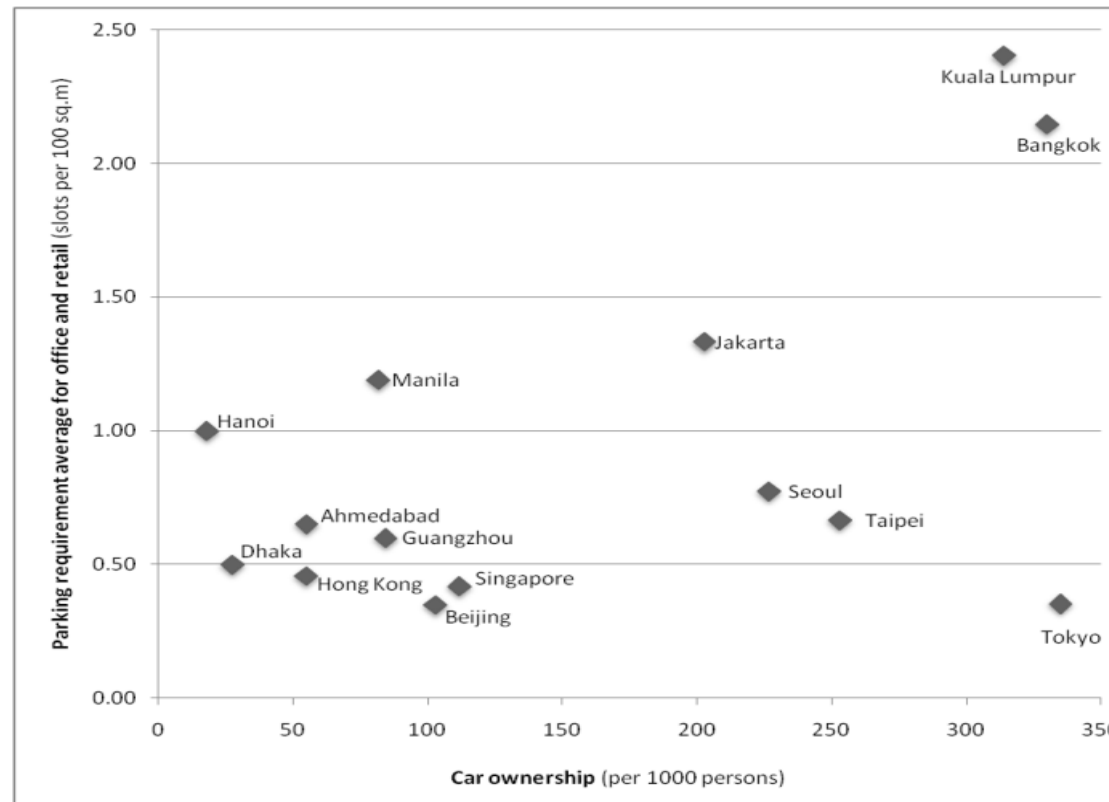
To modest levels for most buildings (typically about 0.5 per 100 sq.m)

达到大多数建筑停车位配给的温和水平（典型情况为每100平米0.5个停车位）

Much lower near MRT and in city centre

地铁附近和市中心配建标准还要低很多

Barter (2011) Parking Policy in Asian Cities, ADB





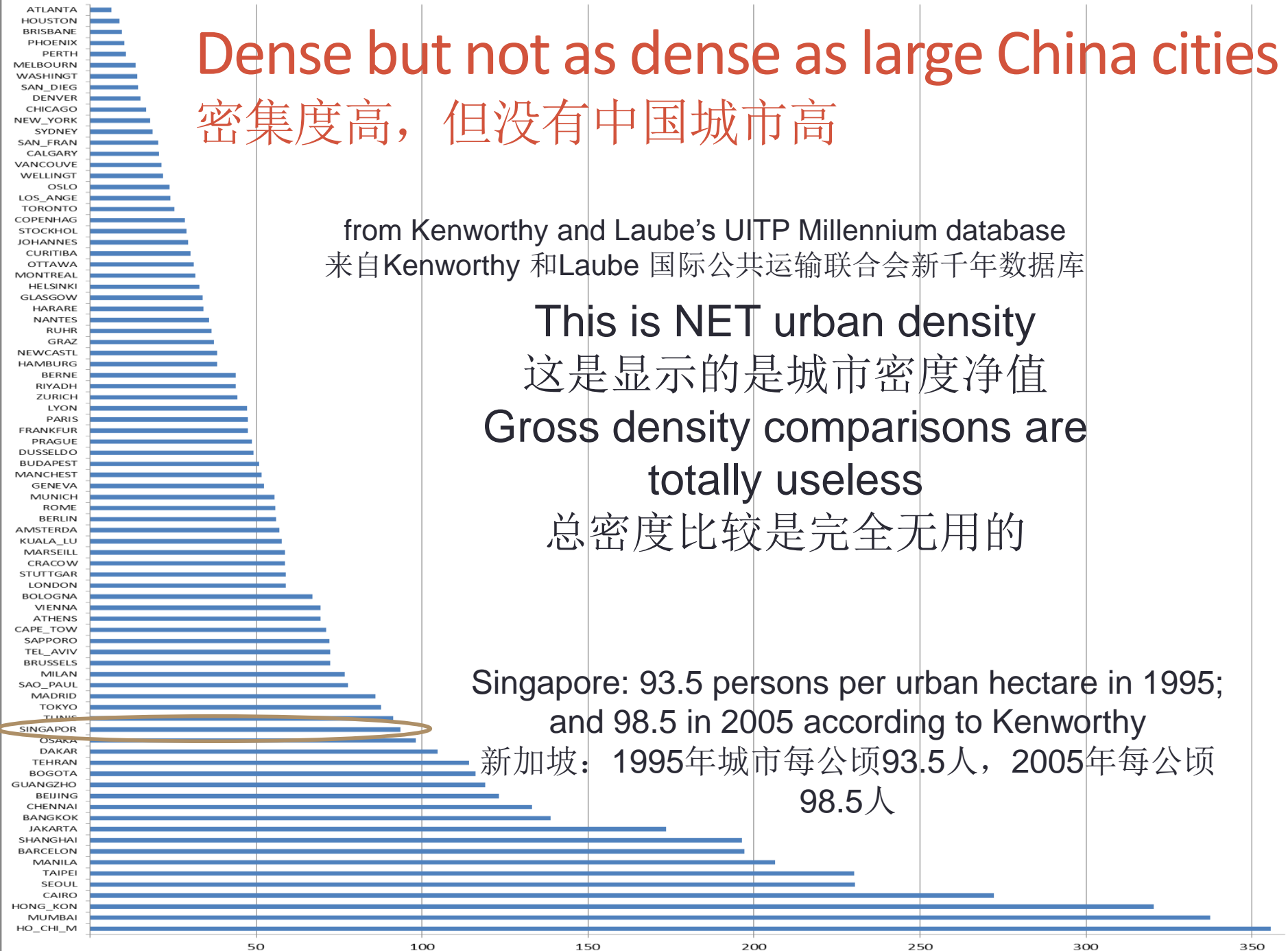
# Dense but not as dense as large China cities

## 密集度高，但没有中国城市高

from Kenworthy and Laube's UITP Millennium database  
来自Kenworthy 和Laube 国际公共运输联合会新千年数据库

This is NET urban density  
这是显示的是城市密度净值  
Gross density comparisons are  
totally useless  
总密度比较是完全无用的

Singapore: 93.5 persons per urban hectare in 1995;  
and 98.5 in 2005 according to Kenworthy  
新加坡：1995年城市每公顷93.5人，2005年每公顷  
98.5人





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# EVOLVING TRAVEL DEMAND MANAGEMENT

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逐步发展交通需求管理

# Ownership restraint has been more significant than deterrents to vehicle use 所有权限制比使用限制 更为意义重大

## Usage-based tools

基于使用的工具

Cordon price (ALS) then  
ERP

区域通行证制度与电子道  
路收费系统

Parking restraint  
(intermittently)

停车限制（间歇性）

Fuel tax  
燃油税

## Ownership restraint **more** significant

所有权限制更重要

ARF, excise duty and road  
tax

额外注册费，消费税和道  
路税

Parking unbundled in  
public housing (HDB)

公共住房停车场划分（公  
共组屋）

Vehicle Quota System  
(VQS)

车辆配额系统



Singapore's vehicle quota is more powerful than  
its famous congestion pricing  
新加坡的车辆配额系统比拥堵收费更有力有效

# Slowed traffic growth had many benefits

缓慢的交通增长带来很多有利因素

Revenue

收入

Road space for bus lanes

为公交车道提供更多道路空间

Time to gradually improve

infrastructure without traffic crisis

没有交通危机的情况下获得更多  
逐渐改善基础设施的时间

Less urgency on road capacity

(just one short section of expressway until 1980s)

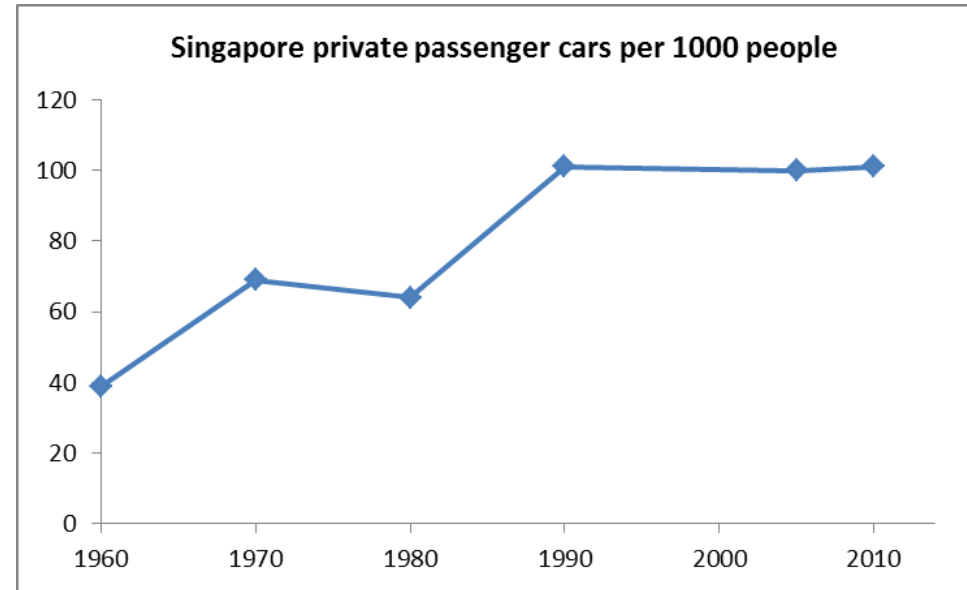
道路通行能力得到改善（80年代以前只有一条较短的快速道）

Retain and grow the market for buses and metro

保持且扩大公交和地铁市场

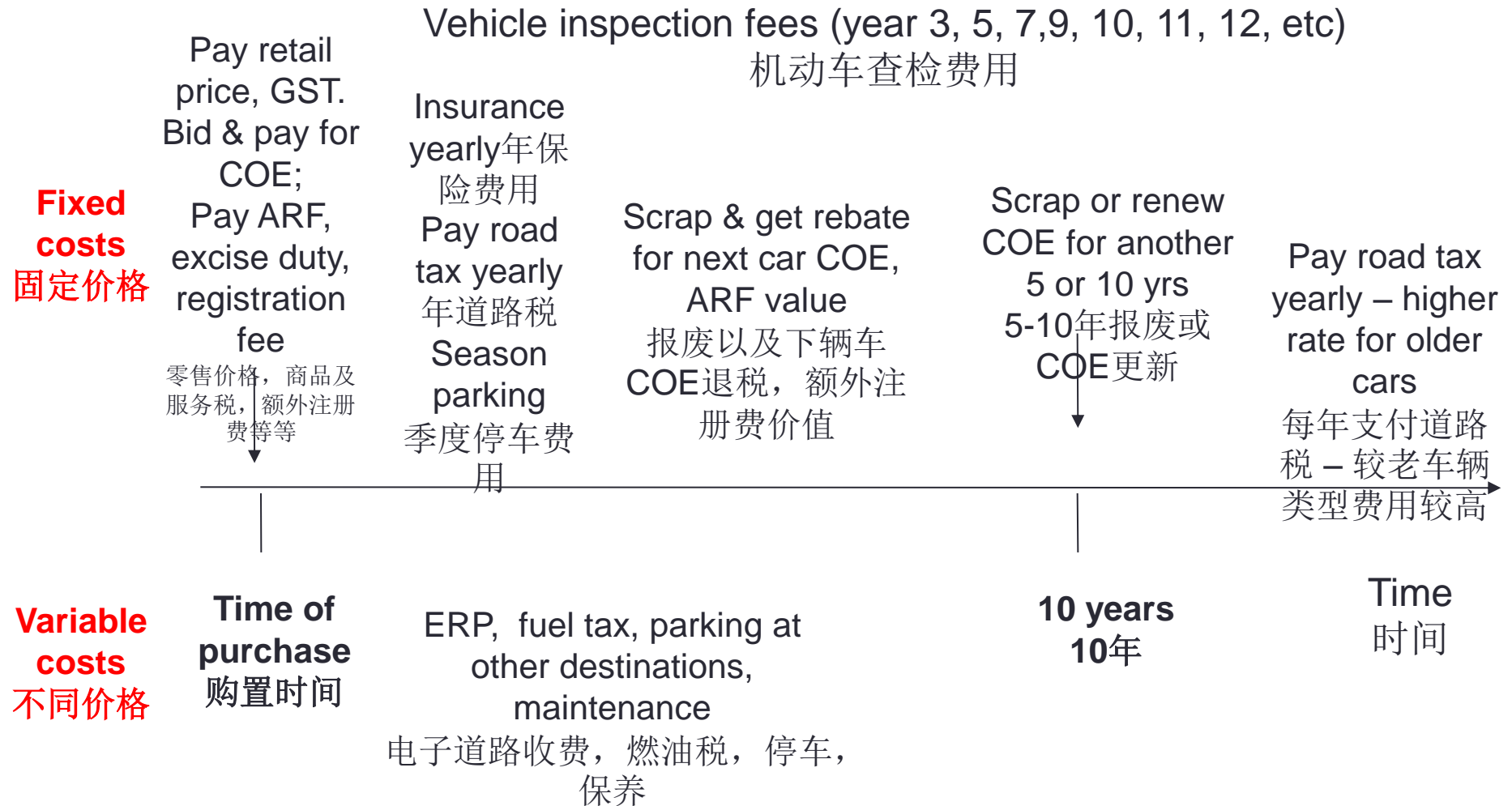
Political power of motorists limited and delayed

机动车出行人员政治力量被限制或延迟



# Singapore's vehicle prices system. Problems with this?

## 新加坡机动车价格系统。是否存在问题？





# TDM strategy changes?

## 交通需求管理战略改变?

In the 2000s the government spoke of allowing lower car prices and the fleet to increase faster

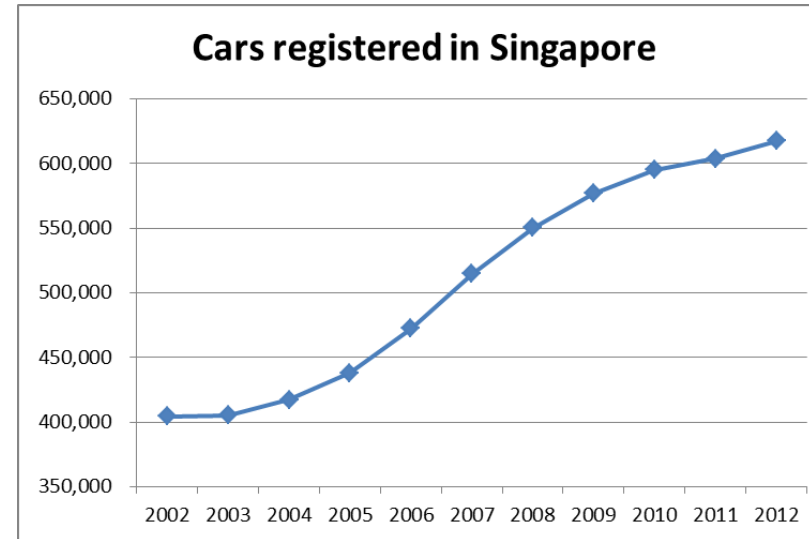
2000年以来，政府提到允许更低的机动车价格，更快地增长车辆总数

The vehicle fleet did indeed rise faster than usual and COE prices dropped (mistake or experiment?)

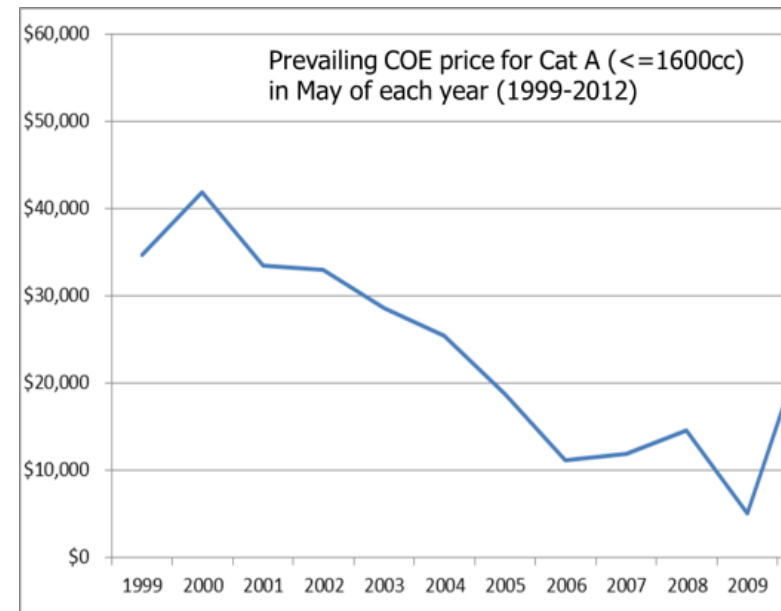
车辆总数增长之速确实比以往更快，而COE价格则下跌（错误或者试验？）

But rising congestion and anger over rising ERP prices has led to a reversal

但是道路的日益拥堵以及电子道路收费增长带来的公众愤怒导致逆转



Source: <http://www.mytransport.sg/content/mytransport/home/dataMall.html>



ERP unhappiness is worse than over vehicle purchase taxes

电子道路收费系统比过高的车辆购置税更加令人不悦

ERP works as expected but resentment surprisingly high (out of proportion with revenues)

电子道路收费系统效果符合预期，但是公众对此的高度反感却在预料之外（和收入不成比例）



# TDM strategy changes?

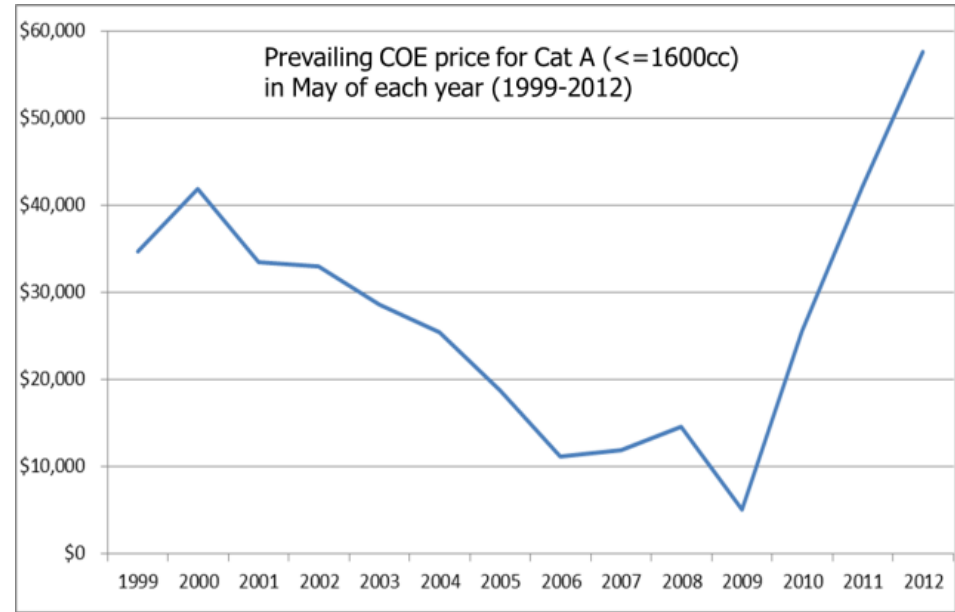
## 交通需求管理战略改变?

Rising congestion and anger over rising ERP prices has led to a reversal

道路的日益拥堵以及电子道路收费增长带来的公众愤怒导致逆转

Annual fleet increase greatly reduced (was 3% now only 0.25% per year)

年机动车增长速度大幅减小（由之前的3%降为现在的0.25%/年）



What percentage of “Singapore resident” households own one (or more) cars?

多少比例的“新加坡居民”家庭拥有至少一辆车？

In 2006, 38.5% of resident households owned a car

2006年，38.5%居民家庭拥有一辆车

By 2011, around 45% owned one (Straits Times, 11 Jan 2012, p.a3)

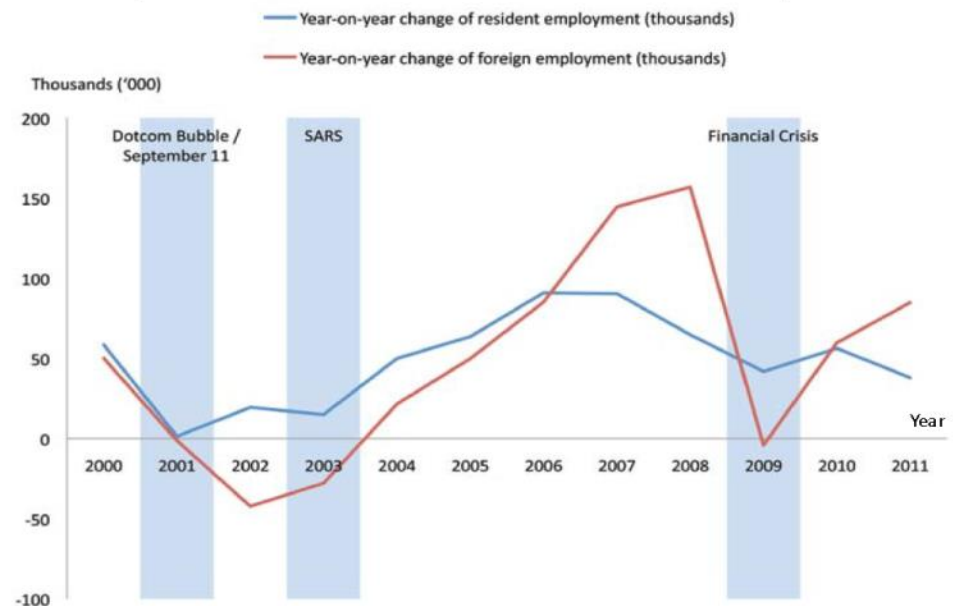
到2011年，约45%拥有一辆车

Note that this excludes people in Singapore on work passes and employment passes

注意，这里不包括在新加坡工作就业的外来人士

Source: Population White Paper, 2013

**Chart 3.3 Change in Resident and Foreign Employment Levels<sup>14</sup>**



Source: MTI



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# THE LITTLE KNOWN BUS STORY

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极少受关注的公交车情况



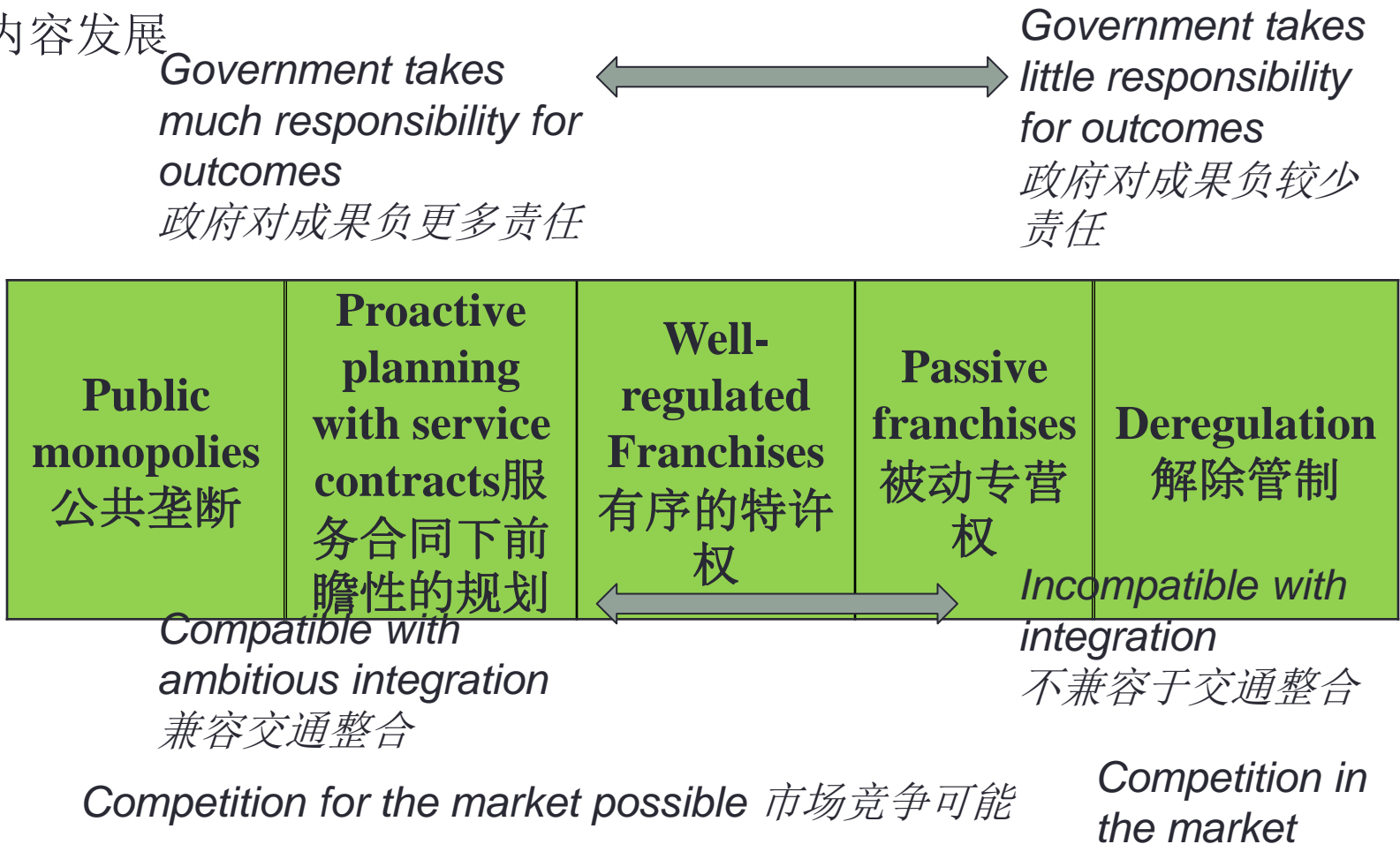
# Bus Regulation in Singapore

## 新加坡公交车监管制度

Singapore's bus system has always been privately owned and has been shifting slowly (step-by-step) to the left on this diagram

新加坡公交车系统向来为私营性质并慢慢在下面图表中往左侧内容发展

Bus regulatory options (diagram by Paul Barter)



# 1935 – 1973 bus regulation

## 1935年-1938年公交车监管制度

### Ten 'Chinese' bus companies

(1935-1970) “中国”公交公司

route monopolies and fare regulation but ...

weak and little-enforced service obligations

路线垄断和票价监管，但是...

薄弱且很少强制的服务义务

### Pirate taxis (1960s - early 70s)

无证出租汽车（1960年代 – 70年代初期）

### Three consortia (1970-1973)

三个协会（1970年 – 1973年）



A Changi Bus Company Limited bus. Image credit: Yeo Hong Eng  
(via <http://www.yeohongeng.blogspot.sg/2012/11/buses-of-singapore-in-50s-60s-and-70s.html>)

<b>Public monopolies</b>	<b>Proactive planning with service contracts</b>	<b>Well- regulated Franchises</b>	<b>Passive franchises</b>	<b>Deregulation</b>
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# On-road priority efforts

## 路内管理优先

Kerb-side bus lanes since 1974

All-day bus lanes (7.30am-8pm) since 2005

自1974年以来的路边公交专用道

自2005年开始为全天公交专用车道(7.30am-8pm)

By 2014, 23km of full-day bus lanes and 155km of normal bus lanes

至2014年，共有23km全天公交专用车道和155km普通公交车道

Since 2008: Give way to buses exiting bus bays

自2008年起：让路给从站点驶出的公交车



Image credit: Flickr user Merlijn Hoek



## 1973 – 2008 Bus regulation

## 1973年-2008年公交车监管制度

1973 - : SBS regulated bus monopoly

1973年 -: SBS监管公交车垄断

1982 - : SBS and TIBS (now SMRT)

1982年-: SBS和TIBS（现在是SMRT）

- Fare regulation (balanced) 票价监管（平衡）
- Quality of Service Standards 服务标准质量
- Regulator permission for route changes 路线调整许可



Successful for 4 decades but new challenges require change

过去四十年取得一定成功但面对新的挑战需要作出调整和改变

Public monopolies	Proactive planning with service contracts	Well-regulated Franchises	Passive franchises	Deregulation
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# EMERGING CHALLENGES

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新的挑战



# What to do about disappointment over lack of expansion of car ownership?

如何面对公众对机动车所有权的抑制带来的不满？

Current policies point to future lower car ownership even for “resident population”

目前的政策指明未来方向还是控制机动车所有权，甚至针对“常住人口”

So renewed urgency to improve alternatives

所以改善可替代选择变得极为紧迫



Problem: excellent mobility is still equated with car ownership  
问题：优良的机动性依然等同于小汽车保有权



Can Singapore delink mobility aspirations from desire for private car ownership?

新加坡是否可以将机动愿望和私有小汽车拥有愿望分离开来？

Focus on enabling car-free lifestyles

关注培养无车生活方式

High potential for dense cities

高密度城市潜力巨大

Much innovation is happening internationally

国际上很多创新

But not easy

但不是一件易事

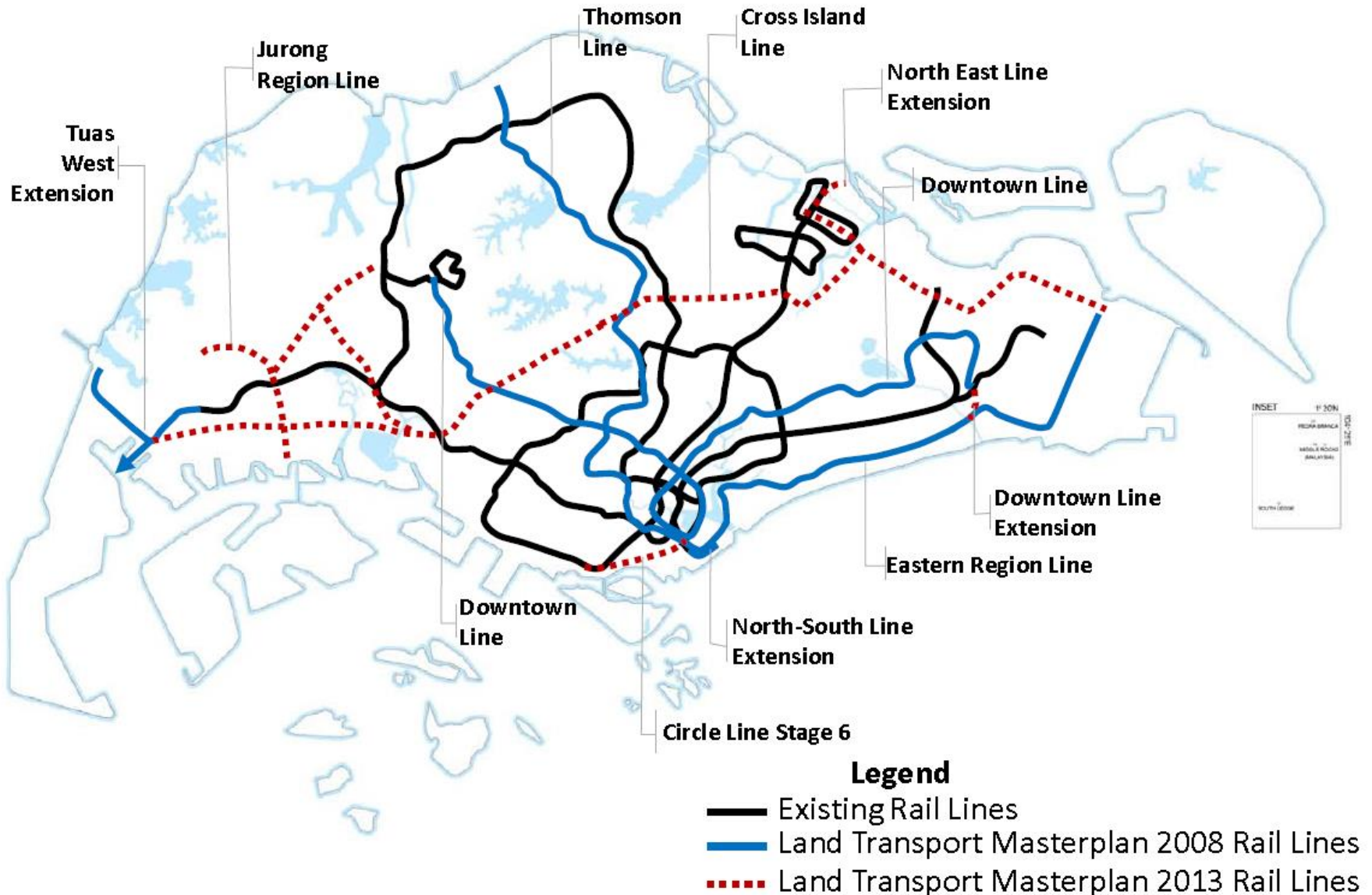


Paris Autolib carsharing (or 'public cars'). Image via wikipedia commons.  
巴黎Autolib汽车共享



# MRT Development has been accelerated recently

## 地铁发展近几年来发展迅速



# A more ambitious bus system is ALSO needed 同时需要建立更高效的公交系统

Simpler “connective” bus network

更简单的“互连”公交网络

High-profile “frequent network”

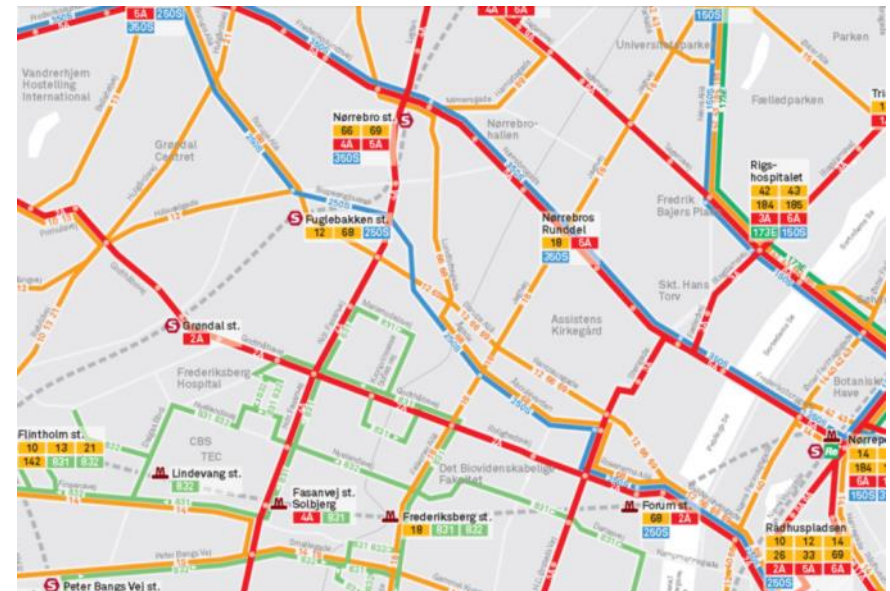
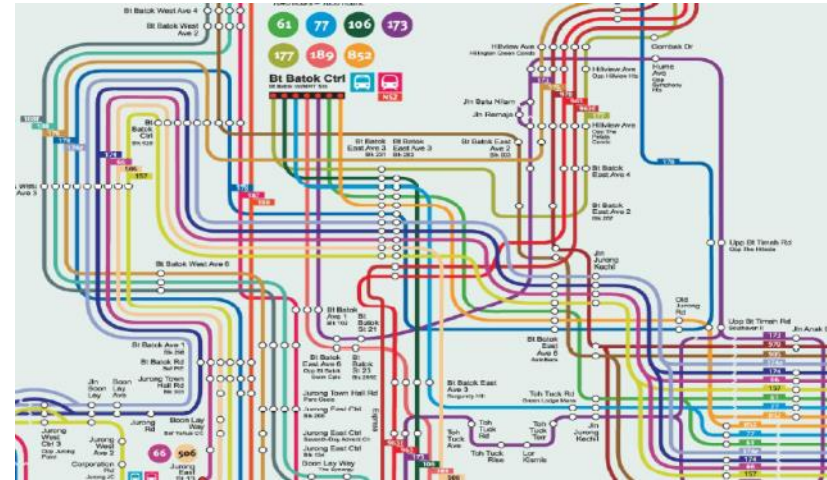
备受瞩目的“频繁网络”

More on-road priority

更多路内优先

Better funded

更好的资金支持

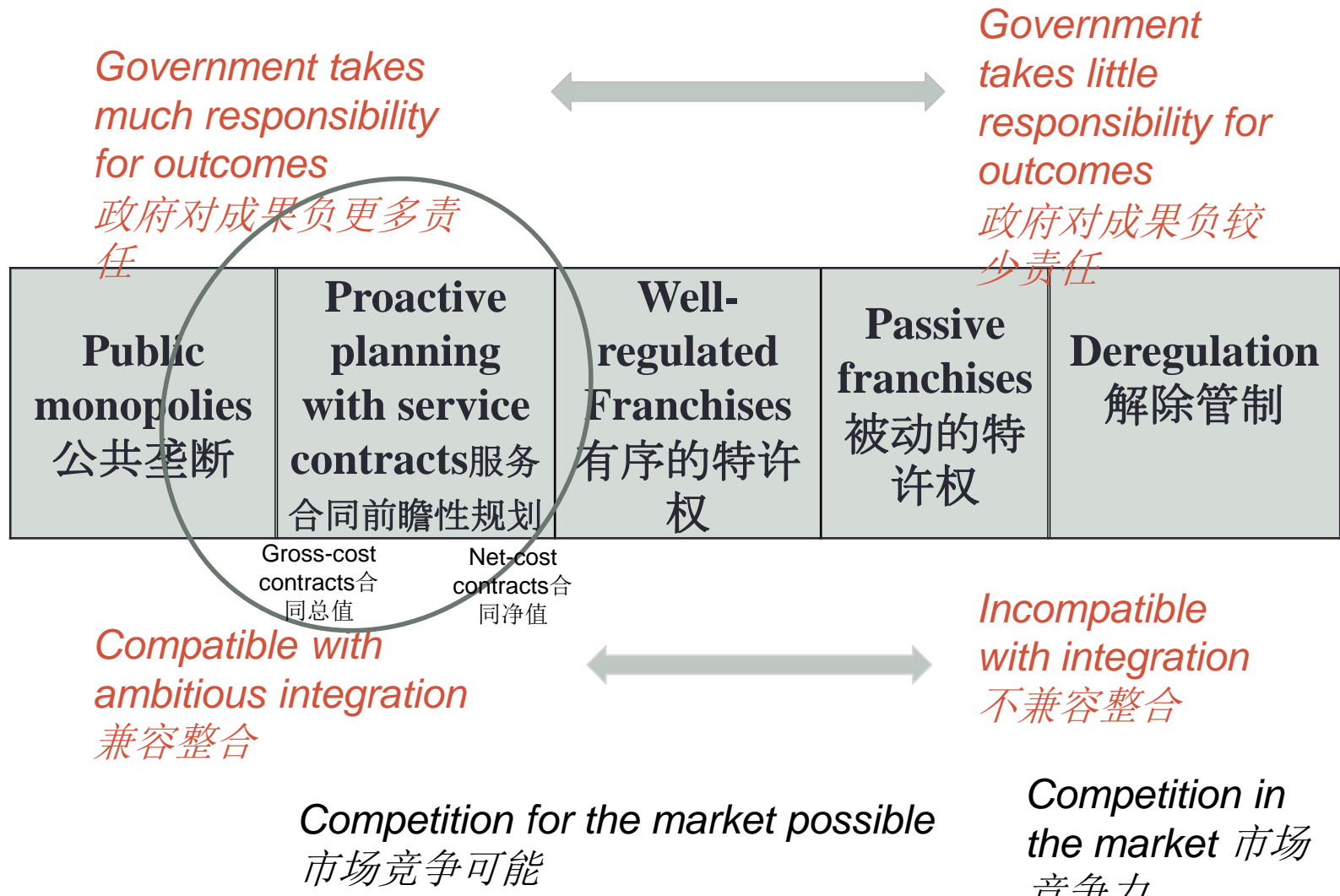


**Copenhagen's “A-Bus”  
frequent bus network  
(shown in red)**



# Ambitious and better-funded buses requires a COMPATIBLE REGULATORY APPROACH

高效且有更好资金支持公交车系统需要一个  
兼容的管理方法



# Recent interest in integration of ALL alternatives

## 整合所有替代选择的近期设想

Improve each alternative  
to private cars

改善小汽车的所有替代选择

Recent attention to bicycles

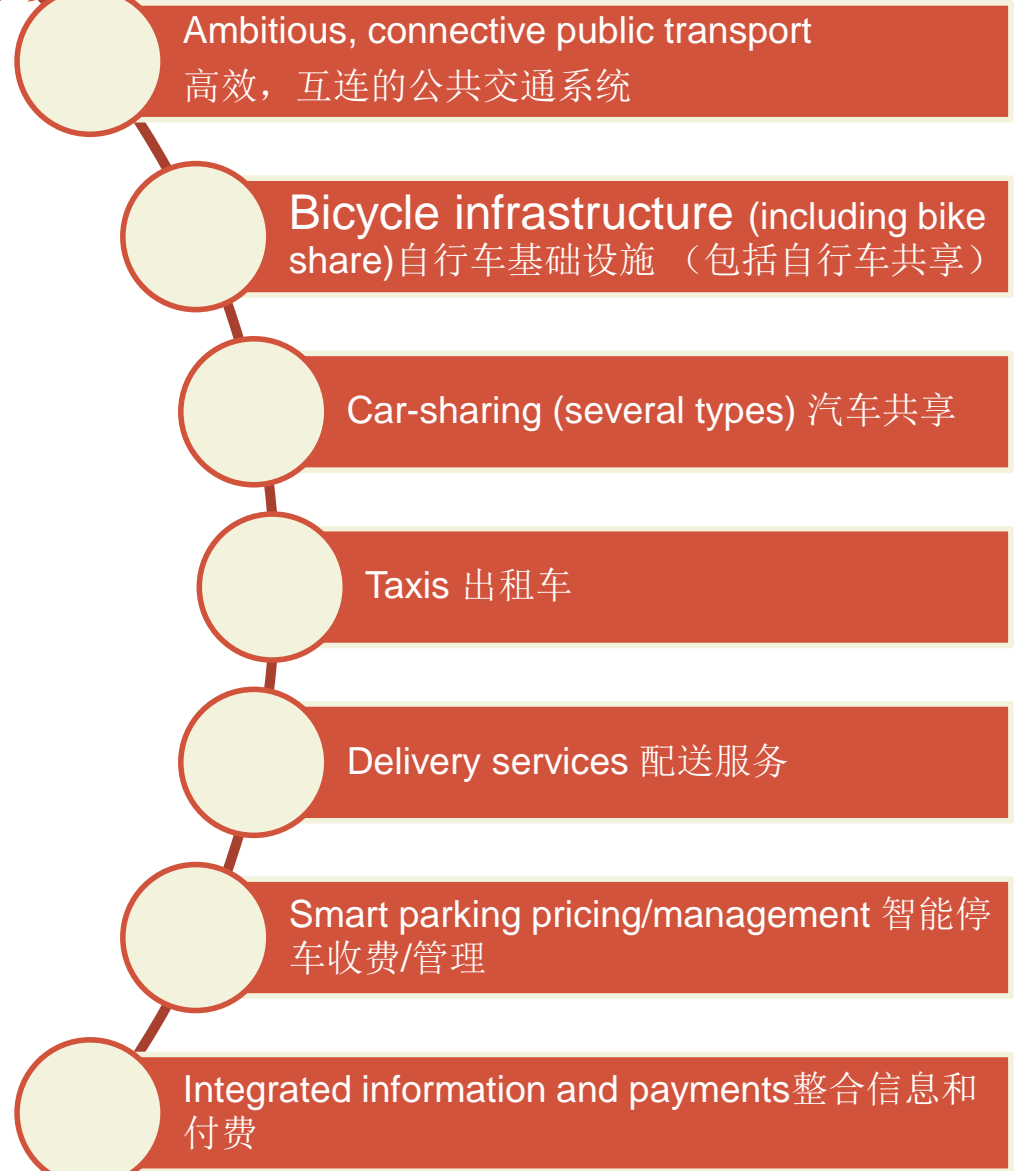
自行车日益受到关注

Focus on 'mobility gaps'

专注于“机动缺口”

Integrate them together  
(apps; 'combined mobility')

整合所有替代选择





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# QUESTIONS?

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## 问题？