

The Balance Effect of Bike in Multi-Modal Urban Transport

自行车在多模式平衡型绿色交通的作用

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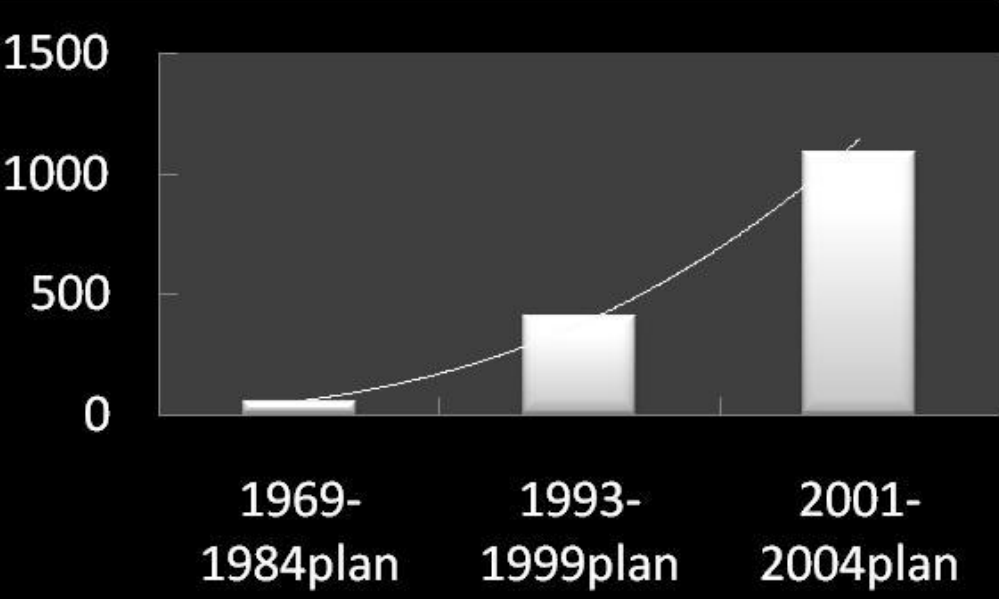
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Severe Congestion after the Construction of Major Urban Road

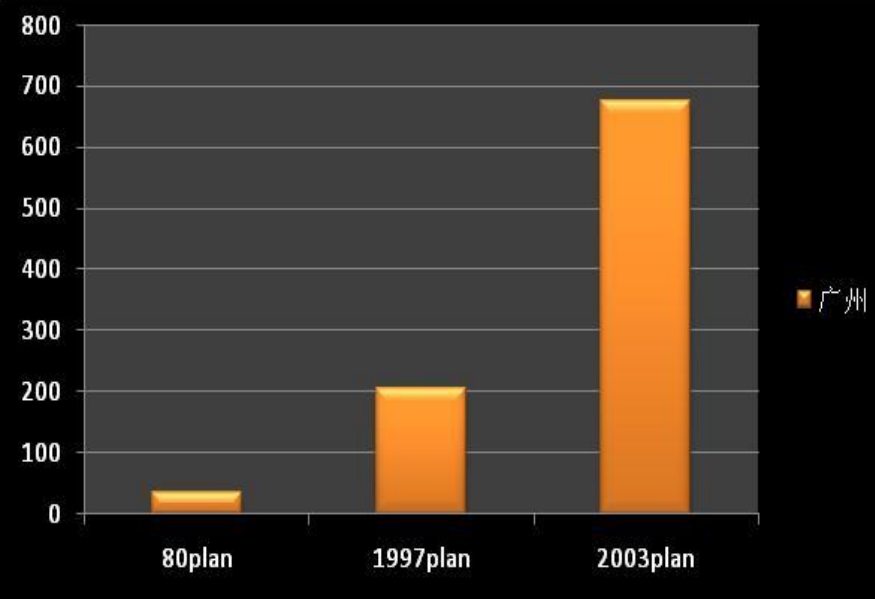
大规模的道路建设后，交通问题依然十分严重



Public Transport as Back Bone, Dominated mode of Urban Transport



Networks Size in Beijing



Networks Size Planned in Canton

公共交通成为骨干
公共交通为主导交通模式？



Metro Network Plan in 1999(left, 408km) and 2001(Right, 1085km)
Pan Haixiao, Professor, Tongji University.

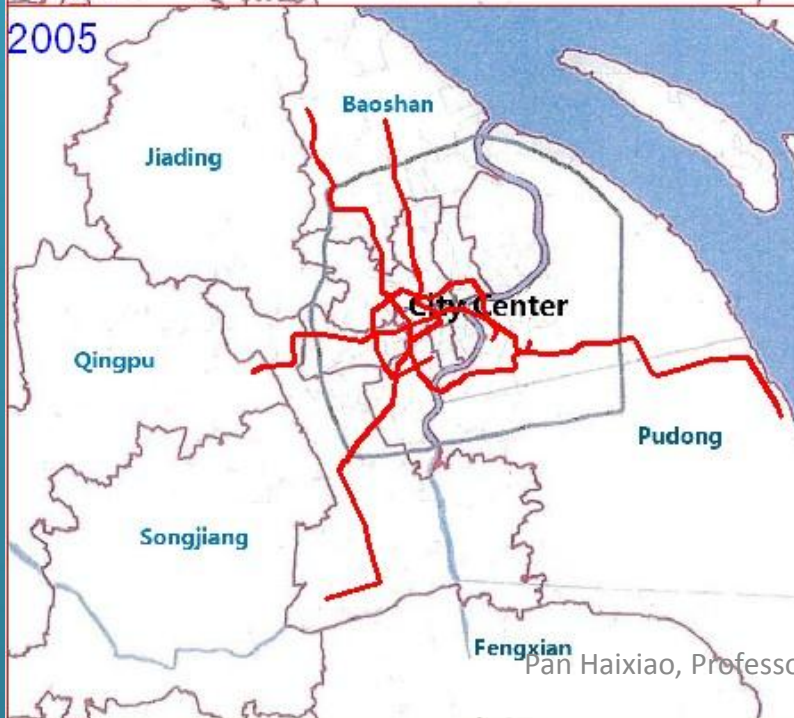
1995



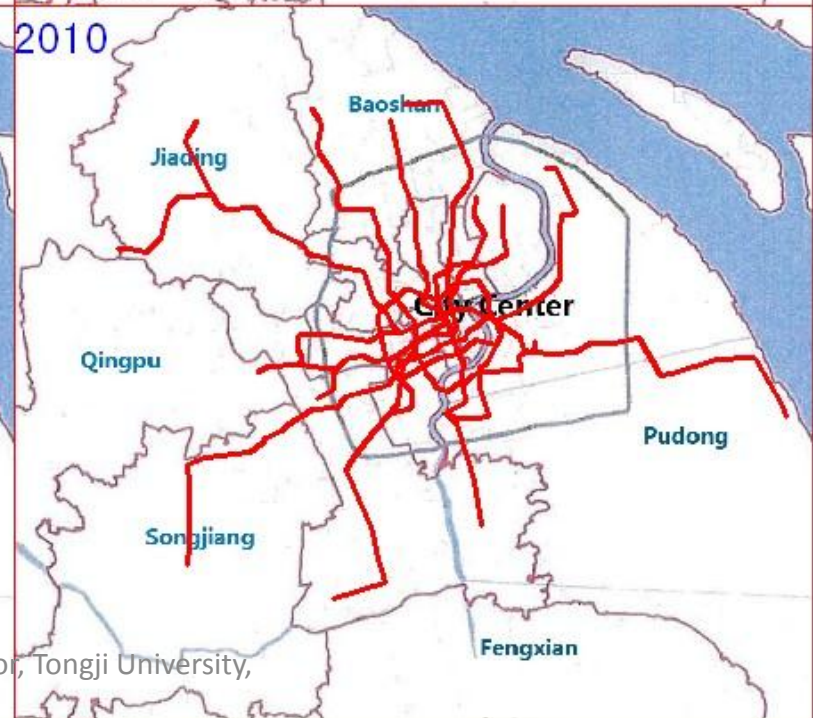
2000



2005



2010



700

➤ 7~8 million daily Passenger now, 7~8百万的客流

600

➤ 643% increasing in 10 year (10年内增长 700%)

500

400

300

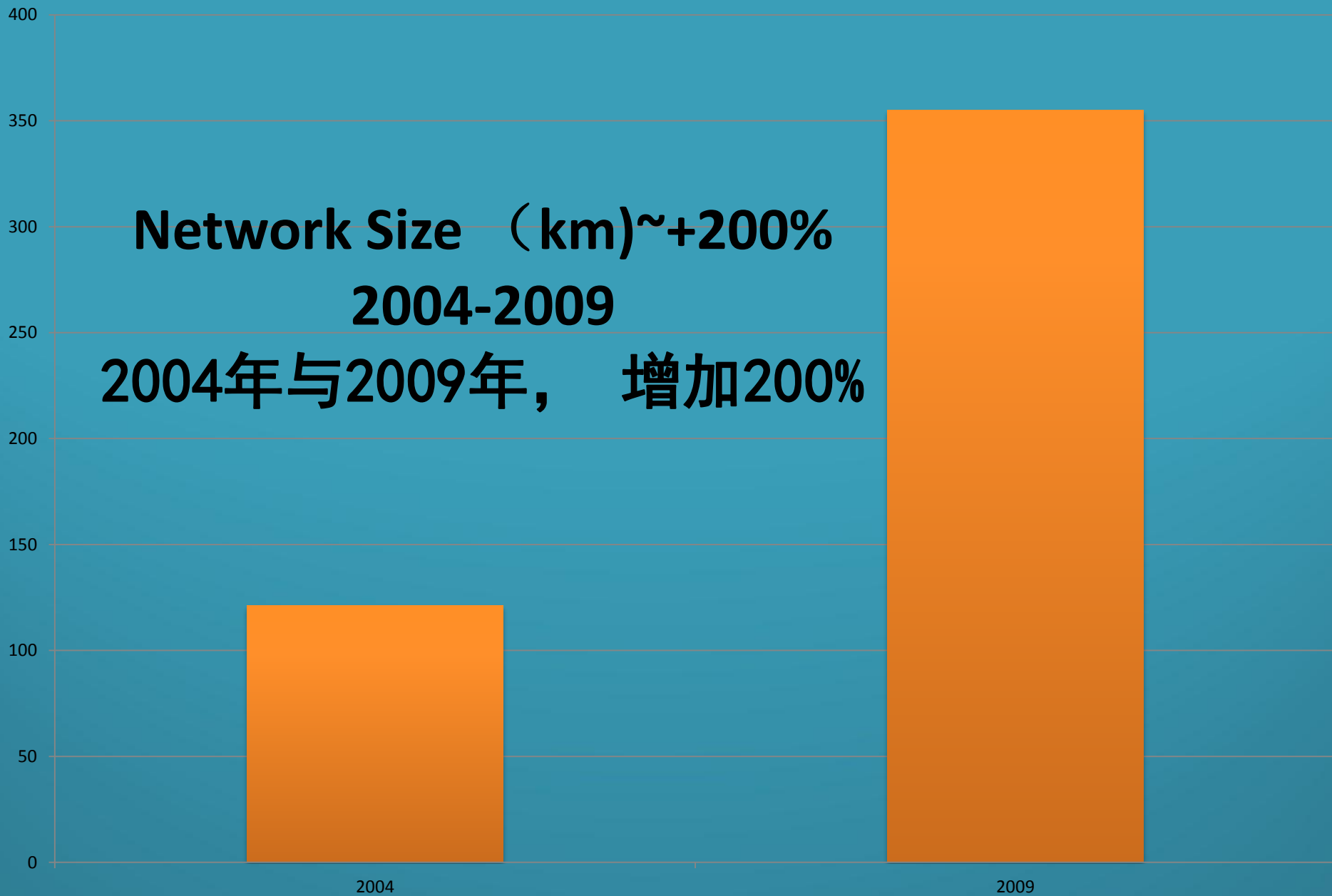
200

100

0

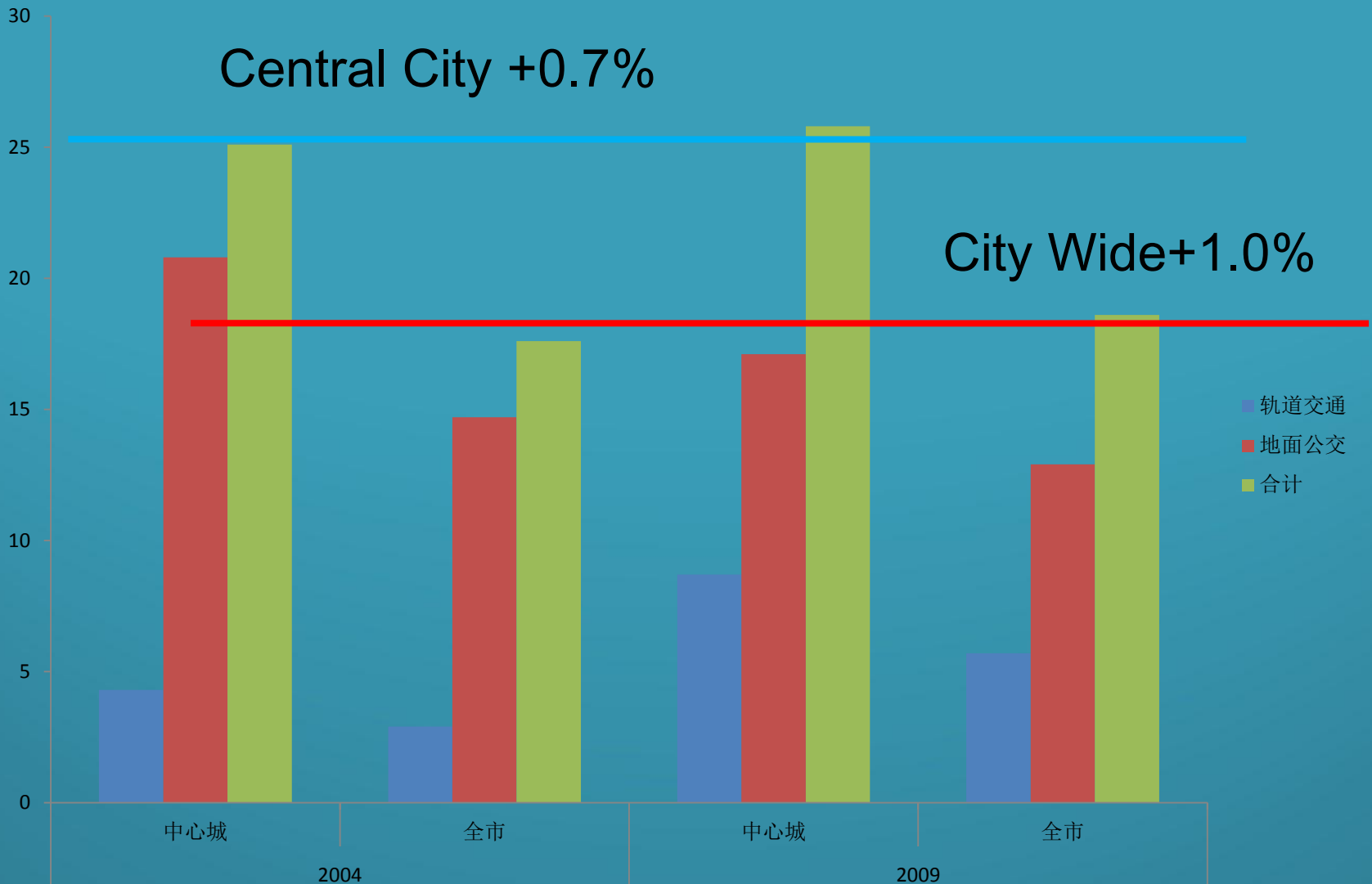
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011



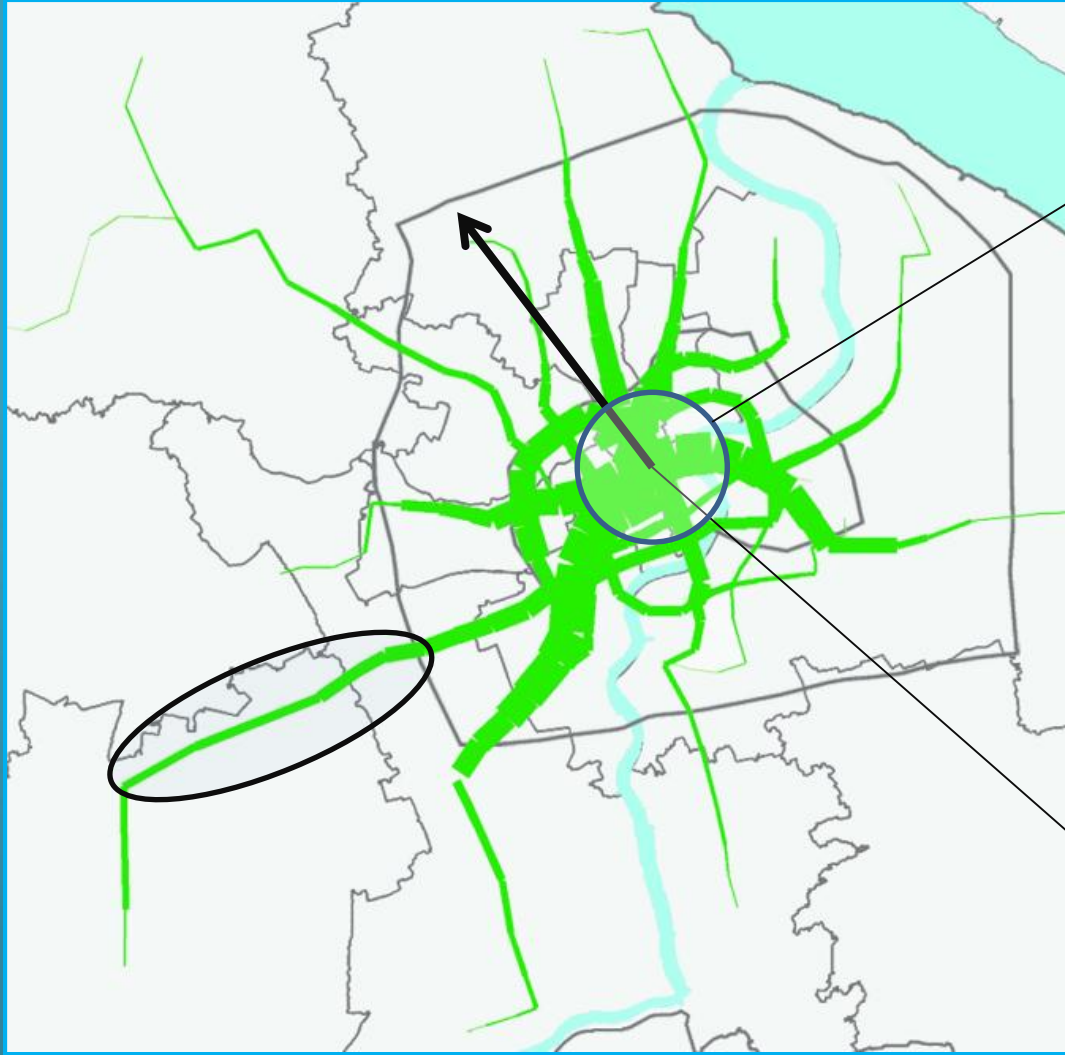


Public Transport Modal Split Change in 2004-2009

公共交通比例变化， 中心城市+0.7%， 全市+1.0%



Unbalanced Passenger Load 非常不平衡的客流



Crowded 2-3km



12-15km

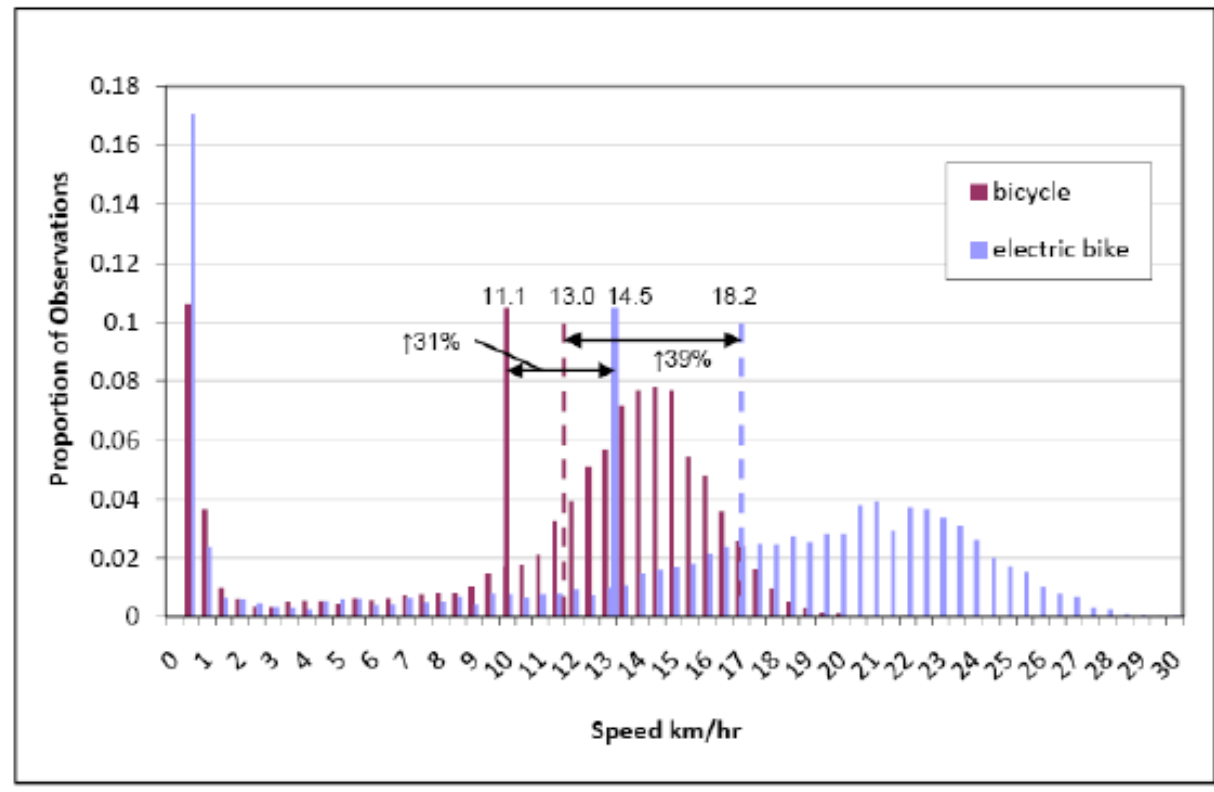
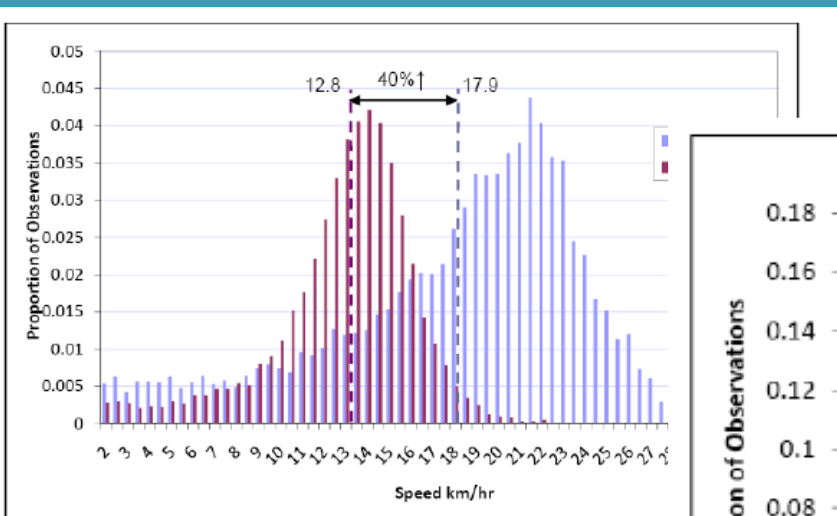
不可避免的细长尾现象

Is Metro Very Fast? 地铁到底有多快?

One-way travel distance, time, cost, and speed
of trips by O-D locations

	Distance (kilometers)	Time (minutes)	Cost (yuan)	Speed (km/hour)
Trip O and Trip D both inside Inner Beltway	9.70	49.11	4.71	11.85
Trip O or Trip D between Inner and Outer Beltways	14.46	55.23	5.50	15.71
Trip O or Trip				

自行车平均速度： 14km/h（不停车）， 11km/h（停车）
电动自行车： 18km/h（不停车）， 14.5（停车）



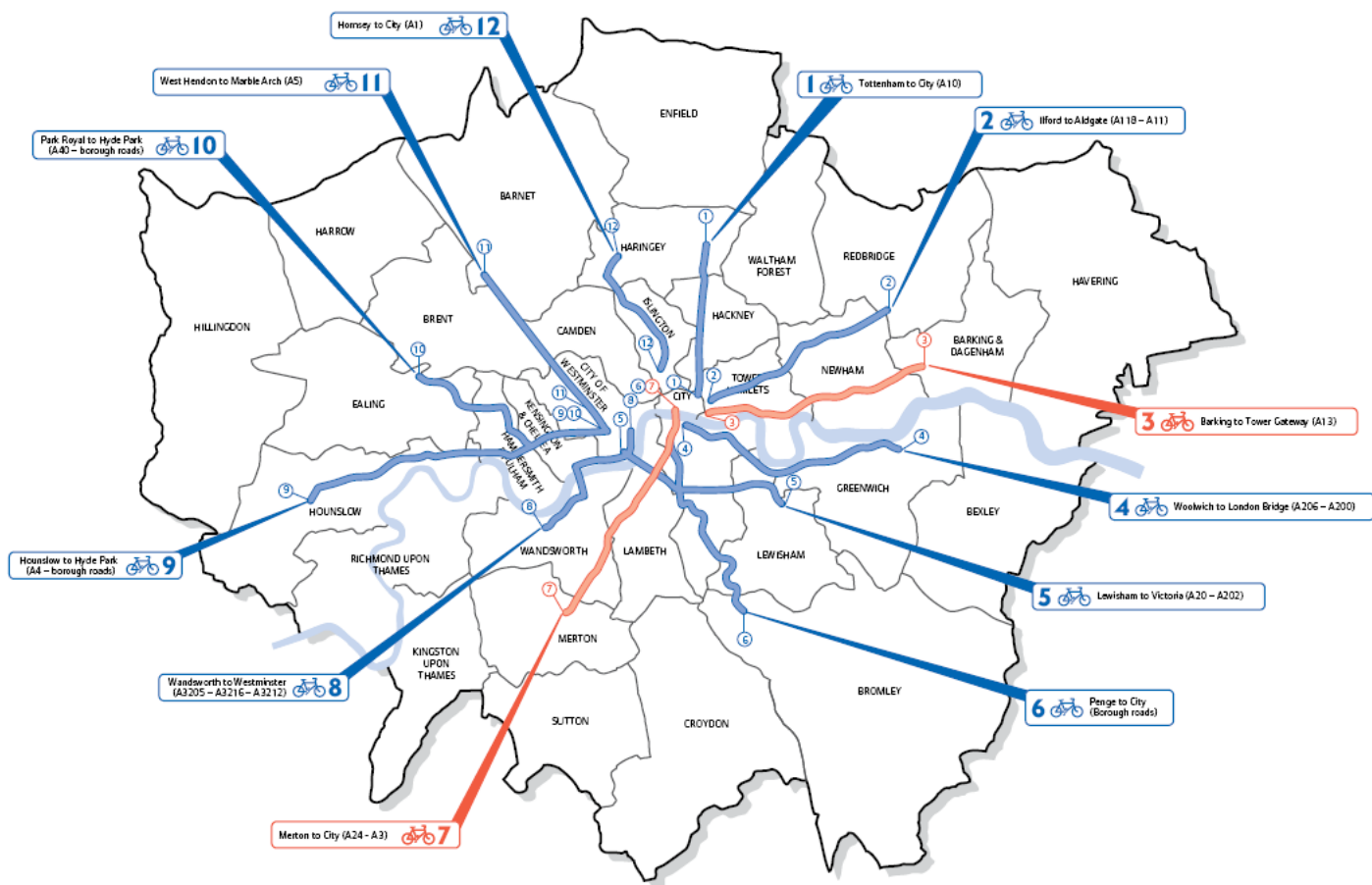
引自： Chris Cherry 的博士论文

Pan Haixiao, Professor, Tongji University,

自行车是解决长距离交通的有效工具

自行车覆盖了大多数的出行距离





伦敦12条自行车高速公路====绿道

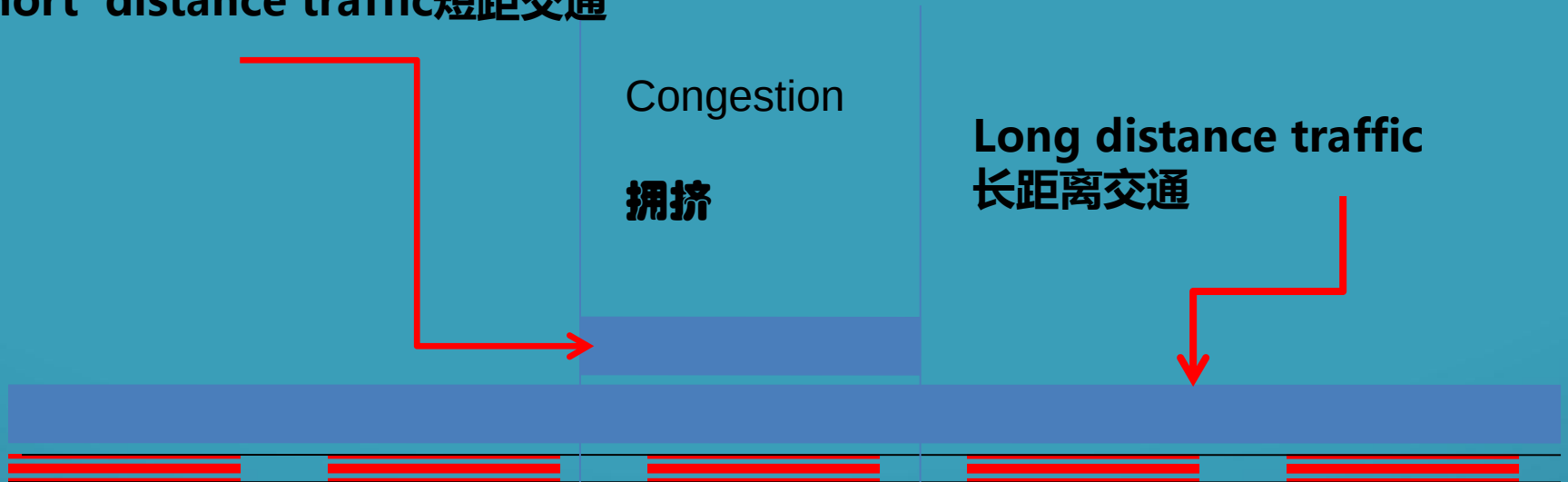
轨道线路拥挤并不一定通过增加线路来解决

Short distance traffic 短距交通

Congestion

拥挤

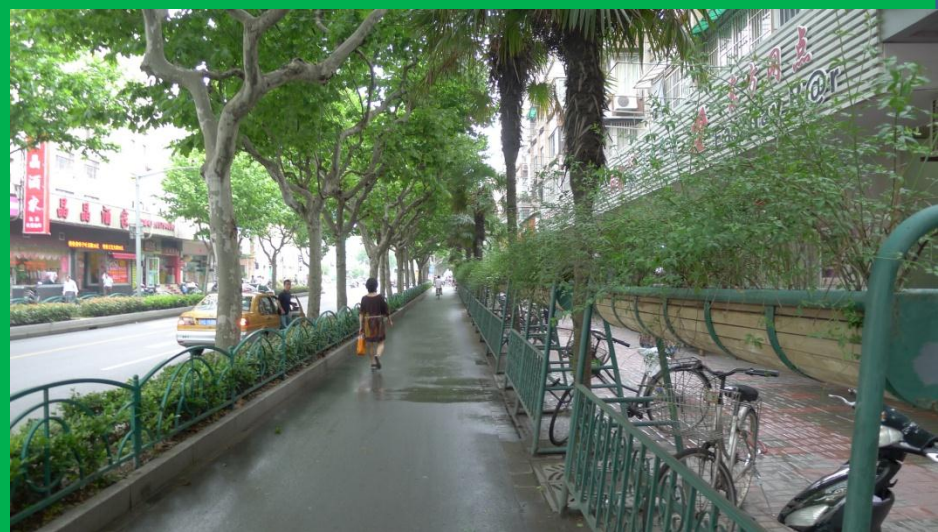
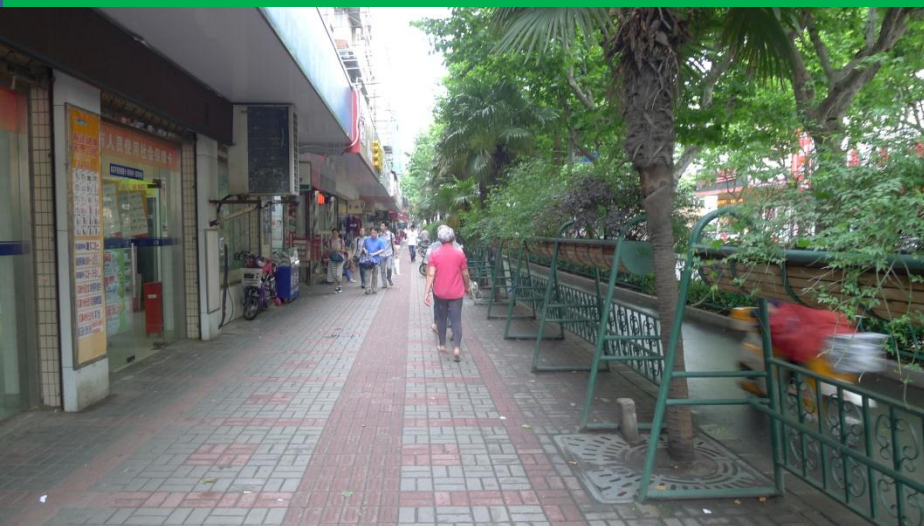
Long distance traffic
长距离交通



New Lines to Increase Capacity

Long Distance Traveler --→ Car

Metro + Bike









Metro Service in Suburban Less Covered



The “TOD” Area 传统的TOD -500米范围

Widely cited and applied in contemporary urban planning practice:

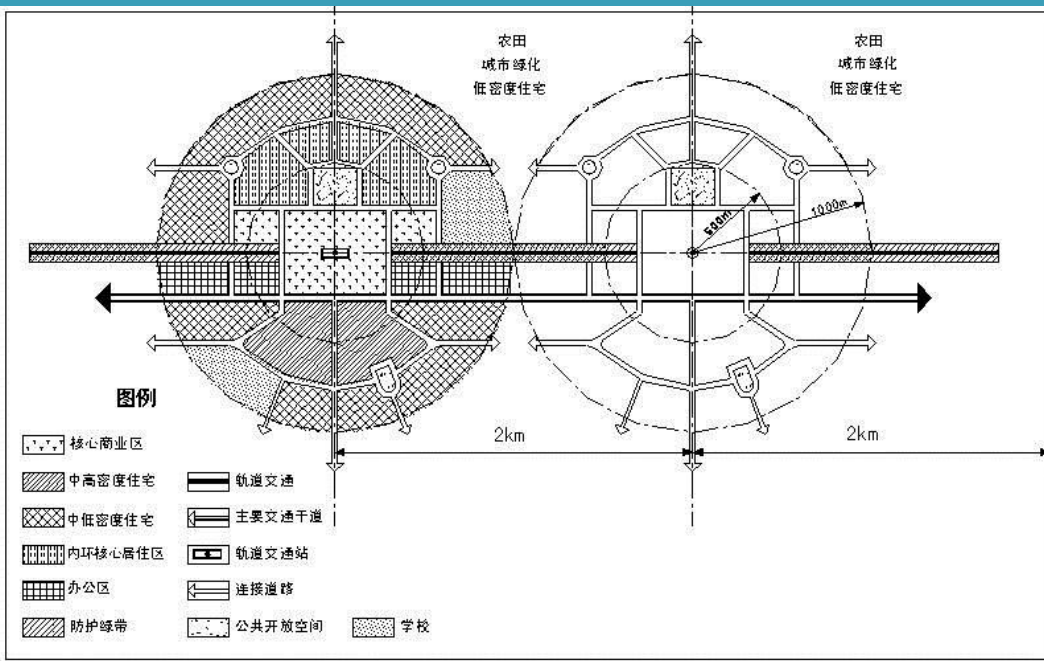
Over investment to increase the density of the networks

Less serviced in the area away from the metro station , more tend to use car

We have

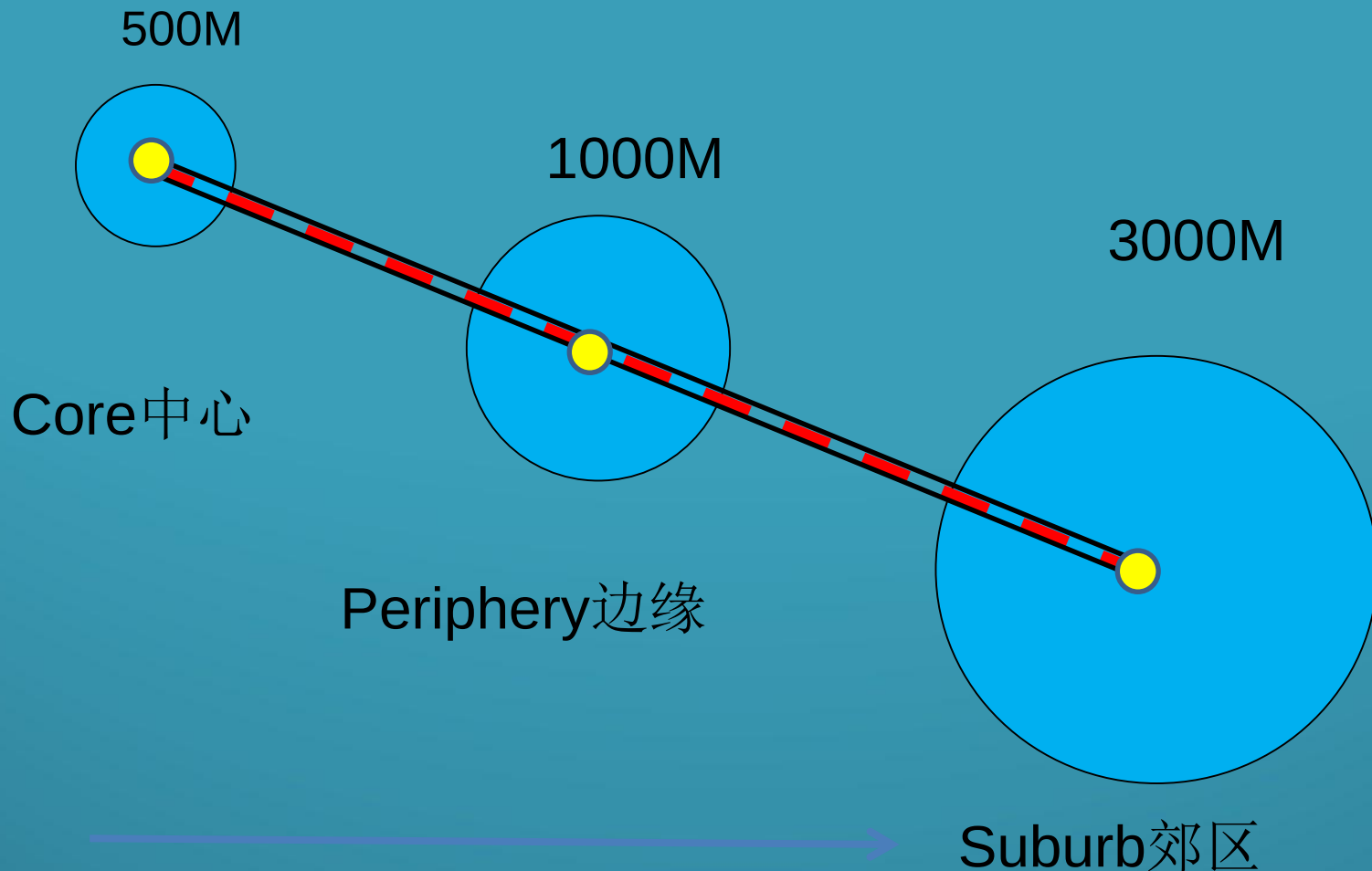
Widely using of Bike(e-bike)

Bus networks



The typical TOD model within 500 meter radius around metro station

TOD Area in Shanghai 轨道交通影响范围



Connecting in far end of metro is very important

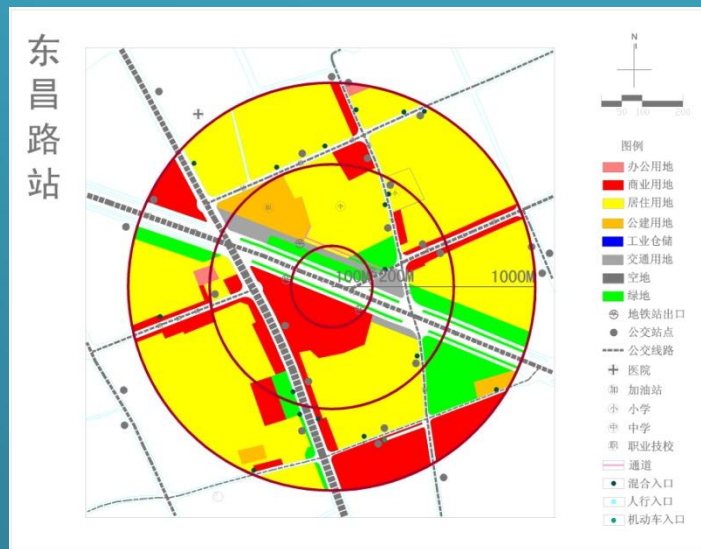
Government Policy: 流行的政策

- Promote public transportation (公交换乘)

The main focus has been on improving the bus-rail transfer

- Park-and-ride P+R

The auto-rail connection is gradually gaining major attention, especially for stations located in peripheral areas



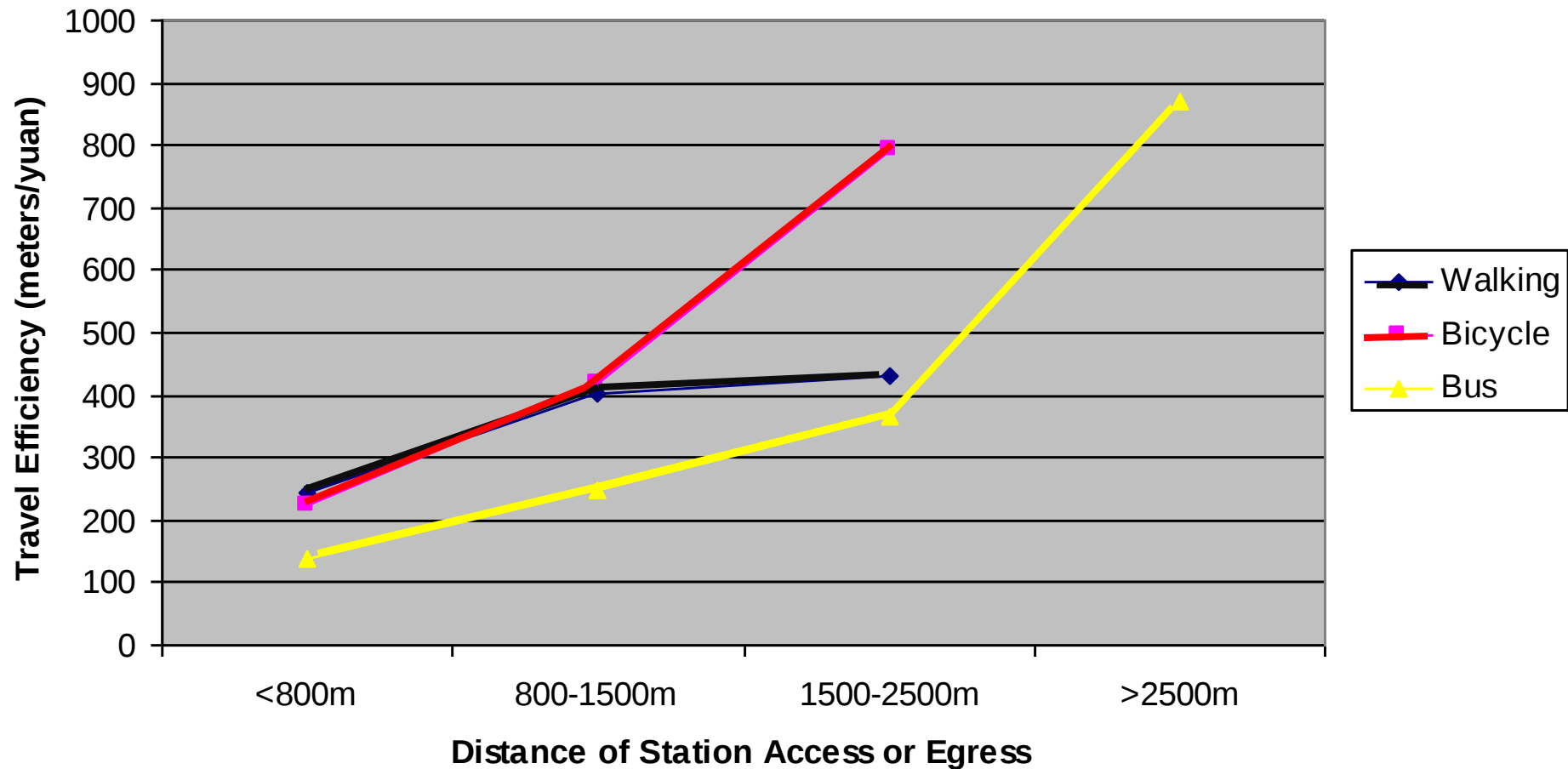
问题：

1. 换乘的低效
2. P+R是抑制TOD
3. 短途小汽车出行的环境影响

自行车，公交车和步行换乘效率的比较

自行车是公交车效率的两倍

Much of the efficiency gain would be realized only if bicycle is the chosen mode for most station access and egress trips that have an intermediate distance.



荷兰3万人小镇， 轨道交通站的4000辆自行车





**Unattended
rental stops**
(digital control,
24h service)

上海闵行非常
成功

Combine with Metro stations



Shanghai

In residential communities

Prize for Innovation on Mobility Solution in China



法国动态城市基金会
PSA PEUGEOT CITROËN

Better mobility,
Better life

机动性，让生活更美好

——城市交通出行创新实践竞赛——

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www.10mchina.org.cn

优秀奖

Excellence Award

上海永久自行车有限公司
Shanghai Forever Bicycle Co., LTD

陈冈先生
Mr. CHEN Shan

在“城市交通出行创新实践竞赛”中，您的参赛作品——上海城市外圈地区公共自行车与大运量公共交通结合的机制性，因成绩优异，特此授予

For **best** work in promoting the following innovative urban mobility solution:
BICYCLE RENTAL SYSTEM COMBINED TO MASS TRANSIT SYSTEM IN SUBURBAN AREAS, CITY OF SHANGHAI

机动性，让生活更美好——城市交通出行创新实践竞赛
Better mobility, Better Life — Prize for innovative urban mobility solutions

荣誉证书
Certificate

上海近郊新城安置社区附近的公共自行车系统

2008年，永久自行车为一家具有悠久历史的自行车制造商，与上海外圈的松江高科技产业园以及从上海市区行政区域向外延伸建立了自行车租赁系统。旨在通过提供多样的出行方式帮助和城市的绿色公共交通系统基本平衡。该系统对于自行车租赁系统的支撑，为持有特殊卡的居民提供方便。通过高科技手段

Bicycle Rental System Combined to Mass Transit System in Suburban Areas, City of Shanghai

In 2008, the Forever group, a long-standing bicycle manufacturer, set up a vehicle hire scheme in partnership with organisations in the Shanghai suburbs: the committee of the Zhangjiang high-tech business zone and the Minhang district local government. The aim is to provide a mobility service that will compensate for the often poor public transport in the suburbs. The scheme is based on the development of cycle parks accessible to people holding a special card: there are 80 of these parks in Zhangjiang (1200 bicycles) and 170 in Minhang (6000 bicycles). Each park is centrally managed and computerised. Every card holds 100 credits: points begin to be deducted after two hours of use, but if the usage time is shorter, the card is credited with one point. A survey conducted in Minhang shows that users of the service, mostly working people aged between 20 and 40, find it a useful mobility solution in their day-to-day lives. The Forever group is now looking to extend the service by approaching other local partners in Shanghai.

在郊区建立了80个公共自行车租赁站点（1200辆公共自行车），闵行设立了17个租赁站（6000辆公共自行车）。在闵行站点对各个租赁点进行统一管理



Il manque
PSA Peugeot
Citroën en
chinois?

法国动态城市基金会
Institut pour la ville en mouvement/
PSA Peugeot Citroën

2010年9月9日
Thursday, September 9th, 2010





Pan Haixiao, Professor, Tongji University,

Approaches to Improving Bicycle-Rail Transfer 如何改进自行车换乘

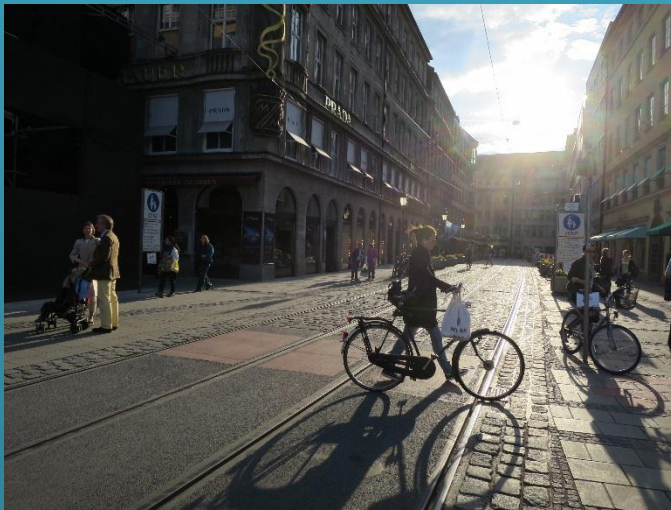
Better parking and service 更好的停车

60% of survey respondents indicate that they would choose bicycle

Among the respondents who lived 800-1500 meters from a rail transit station and did not choose bicycling, **why?**
为何住在800-1000米范围的人不用自行车?

- lack of bike parking facility 19%, 停车缺乏
- inconvenience of bicycling 11%, 骑车有很多不便
- and fear of bike theft 18% 害怕被偷





5D模式

POD》 BOD》 TOD》 XOD》 COD

Bike not only Green, But Very Efficient Mode in Dense Urban Area, 自行车不仅绿色, 而且高效

Bike is the Key to Balance the Un-Balance in Multi-Modal Transport System in City Center and Suburb

自行车是多模式交通的平衡器, 不仅是短途

Better Use of the Bike Infrastructure already there in China

虽然有很好的基础设施, 但依然缺乏观念的转变

Strong Government Support is Crucial for the back of Bike to City

只有政府的行动才能实现这个转变

More Innovative Solutions

需要鼓励更多的创新

公共自行车是促使自行车文化回归的触媒——》更多的私人自行车车

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欢迎参加2016在同济大学举办世界交通研究大会！

2015年3月论文摘要提交

Thank You!