# 空间规划与低碳交通
# Spatial Planning and Low Carbon Transport

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1970年代关于自动驾驶的设想

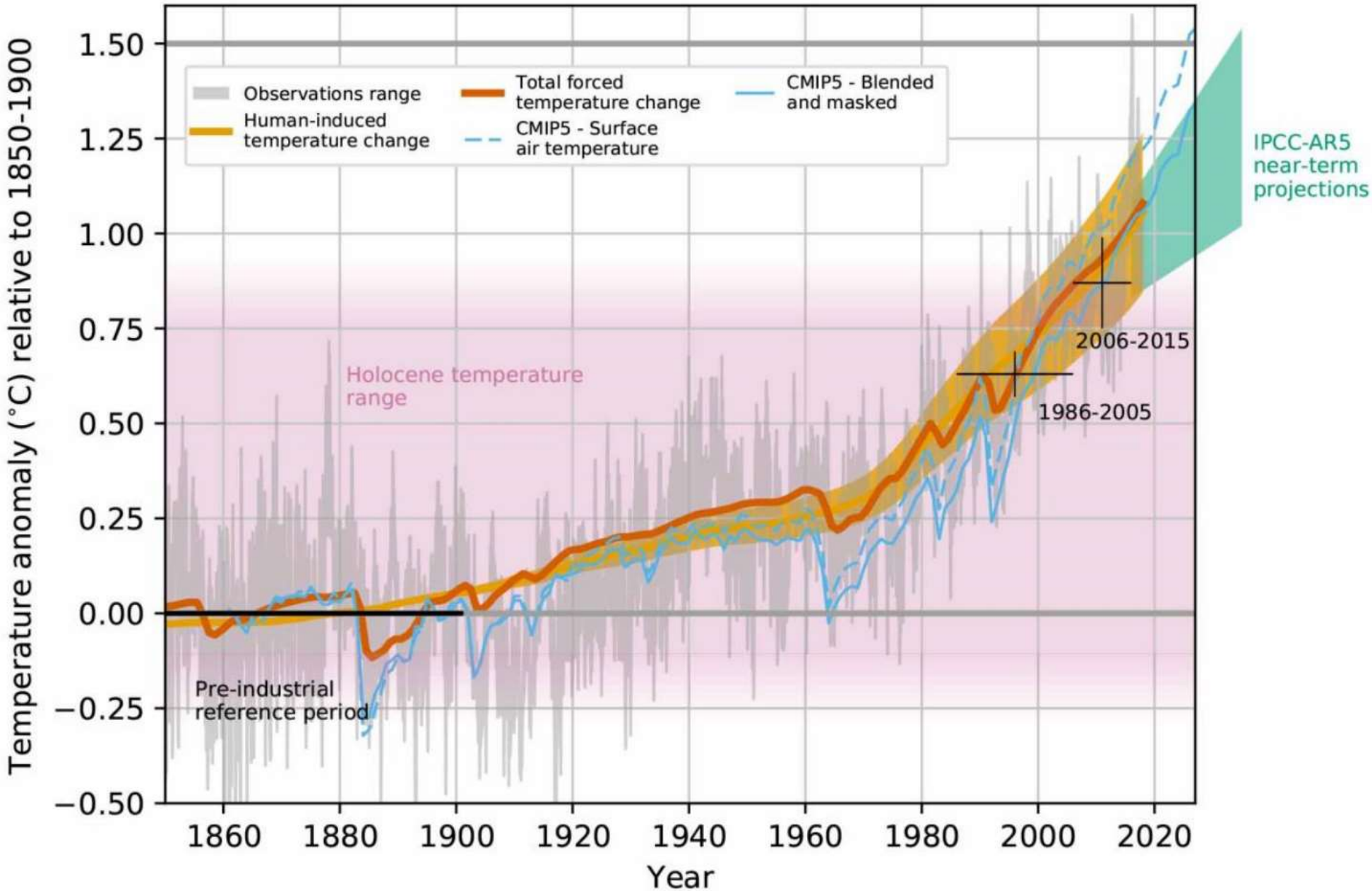
巨大的生态足迹，资源消耗

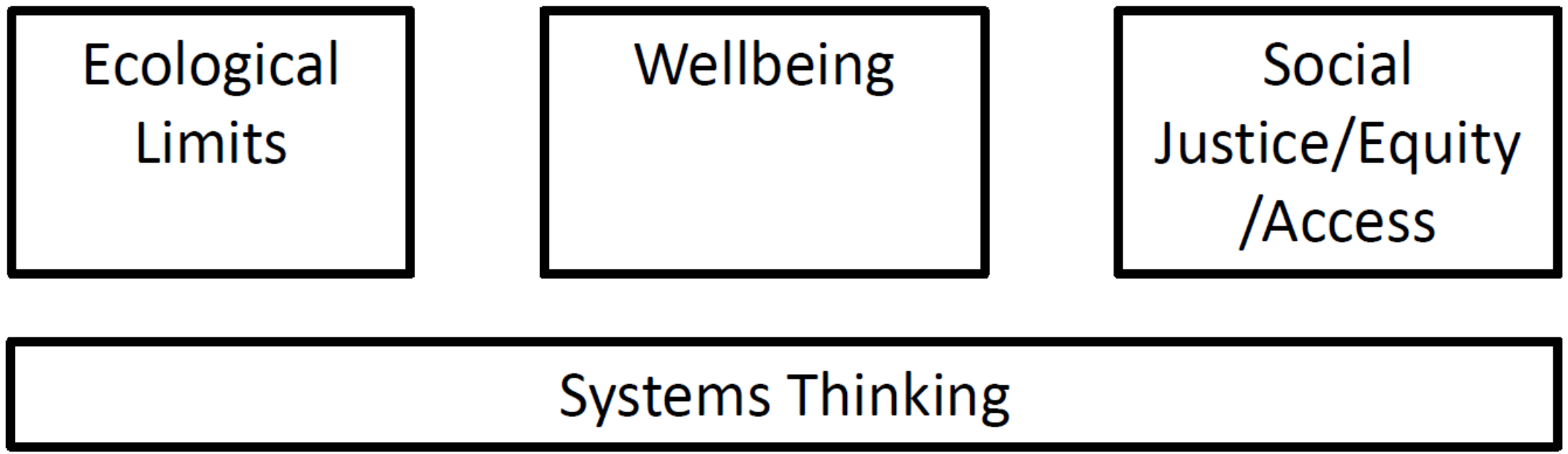
Before Rome Club Report—Growth Limits

罗马俱乐部增长极限前

# GLOBAL WARMING OF 1.5 °C

an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty


Observations range
Human-induced temperature change
Total forced temperature change
CMIP5 - Surface air temperature
CMIP5 - Blended and masked
IPCC-AR5 near-term projections
Holocene temperature range
2006-2015
1986-2005
Pre-industrial reference period
Temperature anomaly (°C) relative to 1850-1900
Year
1.50
1.25
1.00
0.75
0.50
0.25
0.00
−0.25
−0.50
1860
1880
1900
1920
1940
1960
1980
2000
2020




From IGES Sustainable living project

Transport accounted for 28% of global final-energy demand and 23% of global energy-related CO2 emissions in 2014.

Emissions increased by 2.5% annually between 2010 and 2015, and over the past half  century the sector has witnessed faster emissions growth than any other.

The transport sector is the least diversified energy end-use sector; major challenges for deep decarbonisation.

# Deep emissions reductions in the transport:

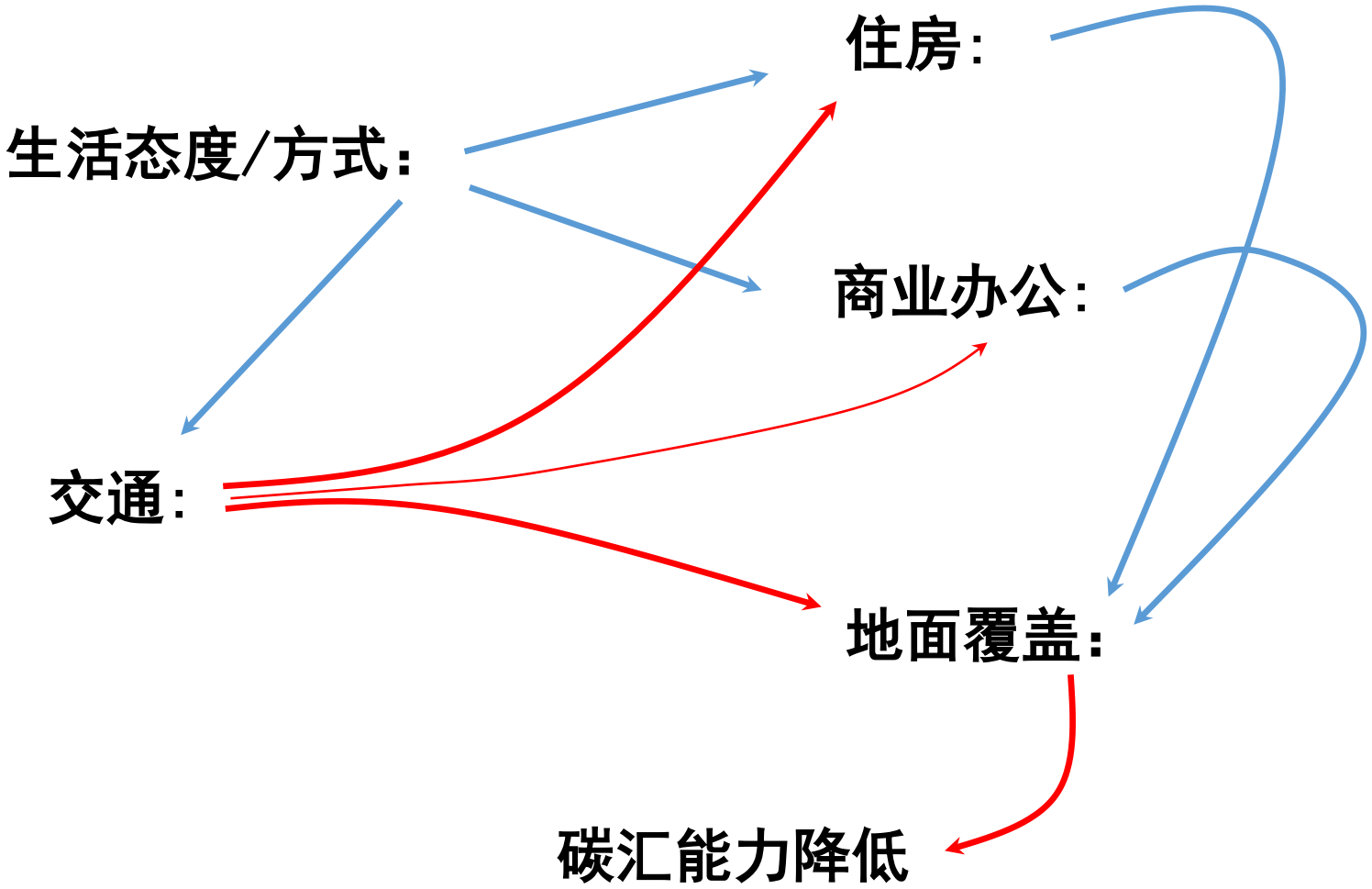
1. Energy efficiency and fuel-switching

2. Structural changes that avoid or shift transport activity

Passengers and freight from less- to more-efficient travel modes

Increasing vehicle load factors (occupancy rates) and outright reductions in travel demand (e.g., as a result of integrated transport, land-use and urban planning),


低碳交通的
协同效益
Lower
energy costs
节约能耗
Less noise
降低噪声污染
Less
imported fuel
减少燃料进口
Better
road safety &
less accidents
提高道路安全
&减少交通事故
Better
energy security
提高能源安全
Less
externalities
减少外部侵扰
Reduced
congestion &
time savings
缓解交通拥堵&
节省时间
Less
health risks
降低健康危机
Stronger economic
development
促进经济增长
Increased
quality of life
提高生活质量
More
local jobs
增加就业
Lower
welfare costs
(hospitals, etc.)
减少福利支出
（就医等）
Increased
private
investments
增加私人投资
Better
air quality
提高空气质量

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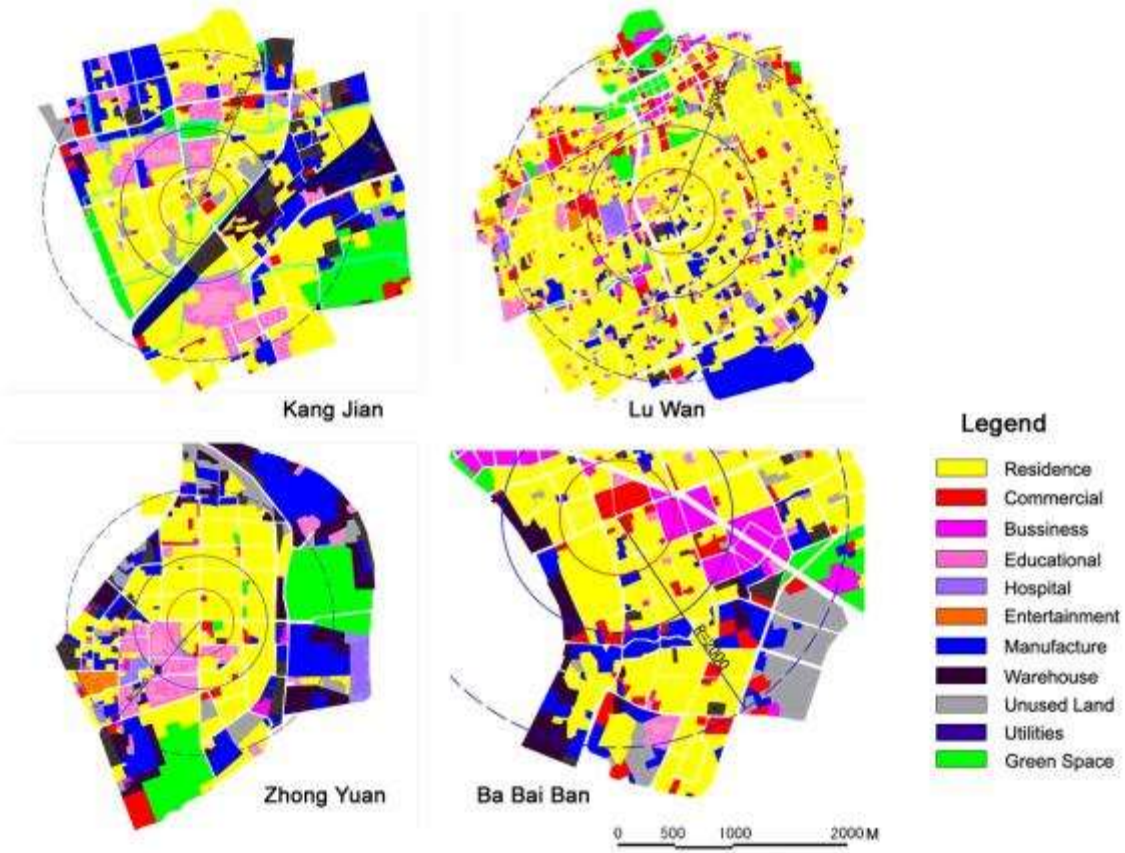
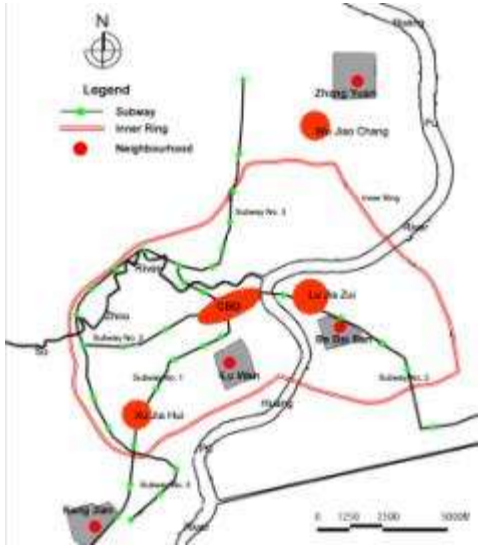
# Mixture of Land Use 土地使用的混合

Urban Form Characteristics in the Land Use Configurations and Street Network



# Sample Modal Shares in Four Selected Neighborhoods

| | Kang Jian (康健) | | Lu Wan (卢湾) | | Zhong Yuan (中原) | | Ba Bai Ban (八百伴) | |
|---|---|---|---|---|---|---|---|---|
| **Mode** | **Counts** | **%** | **Counts** | **%** | **Counts** | **%** | **Counts** | **%** |
| **Non-Motorized 非机动车** | **166** | **36.97** | **399** | **71.51** | **344** | **53.17** | **69** | **42.33** |
| **Transit公交** | **225** | **50.11** | **121** | **21.68** | **265** | **40.96** | **74** | **45.40** |
| **Driving开车** | **58** | **12.92** | **38** | **6.81** | **38** | **5.87** | **20** | **12.27** |
| **Total** | **449** | **100** | **558** | **100** | **647** | **100** | **163** | **100** |

Non-Motorized Modes: Walk, Bicycle, E-Bike

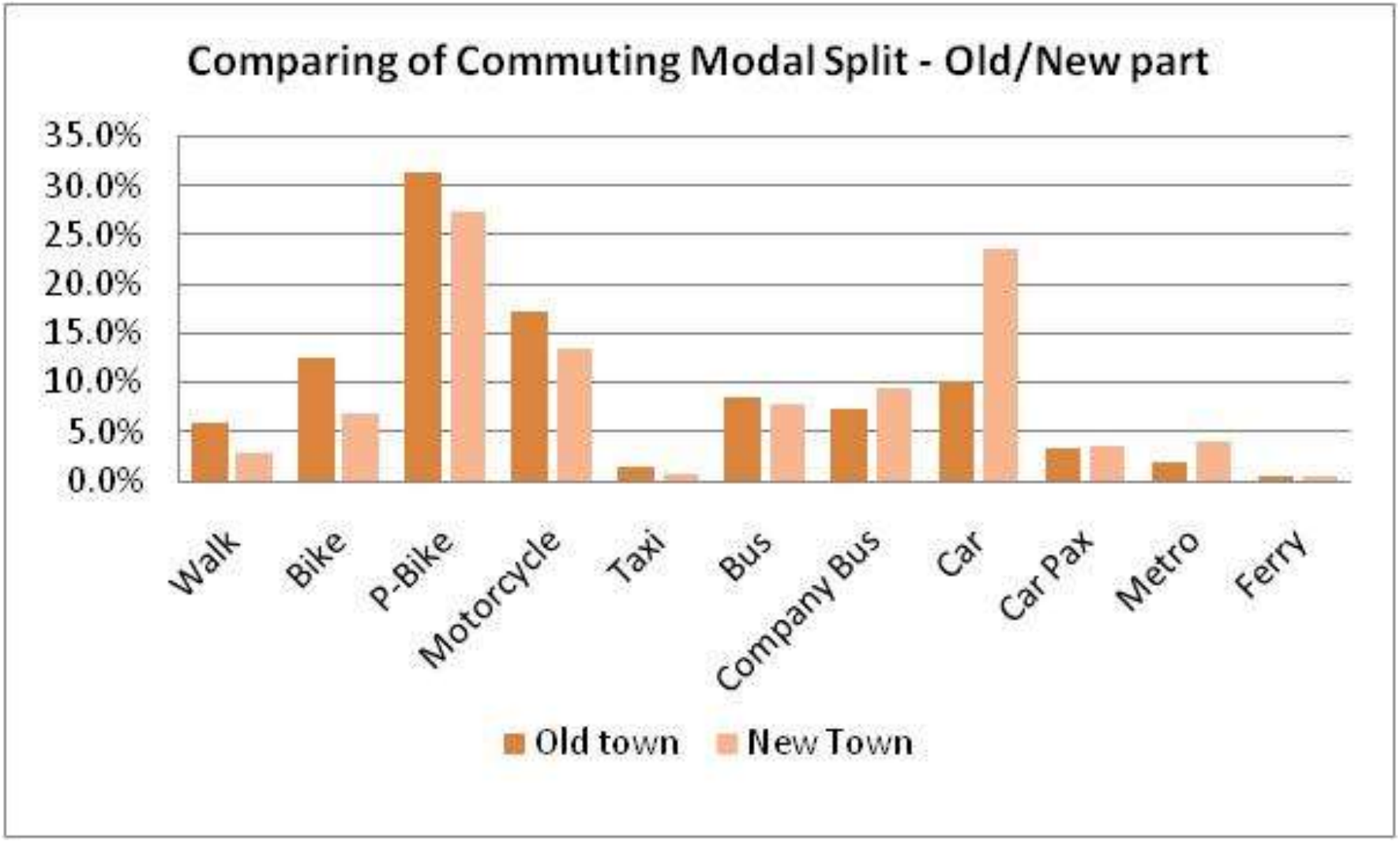
Transit: Bus, Metro

Driving: Motocycle, Taxi, Car

新区建设，屋大，路宽， 树绿，天蓝

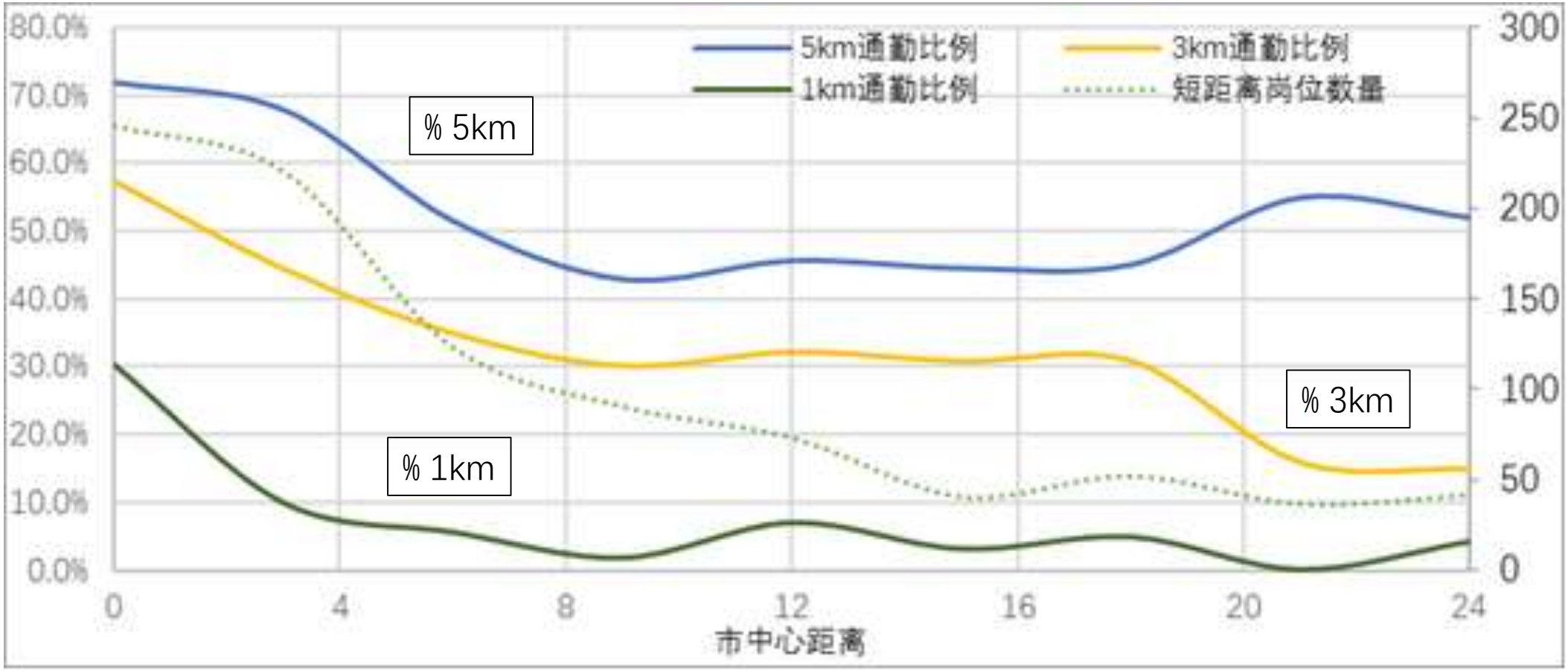
# 人少，车多，味乏

## Less People, More Car and Less Attractive




上海某老城和新城的比较

# % Short Distance Commuting




**Dist to City center(km)**

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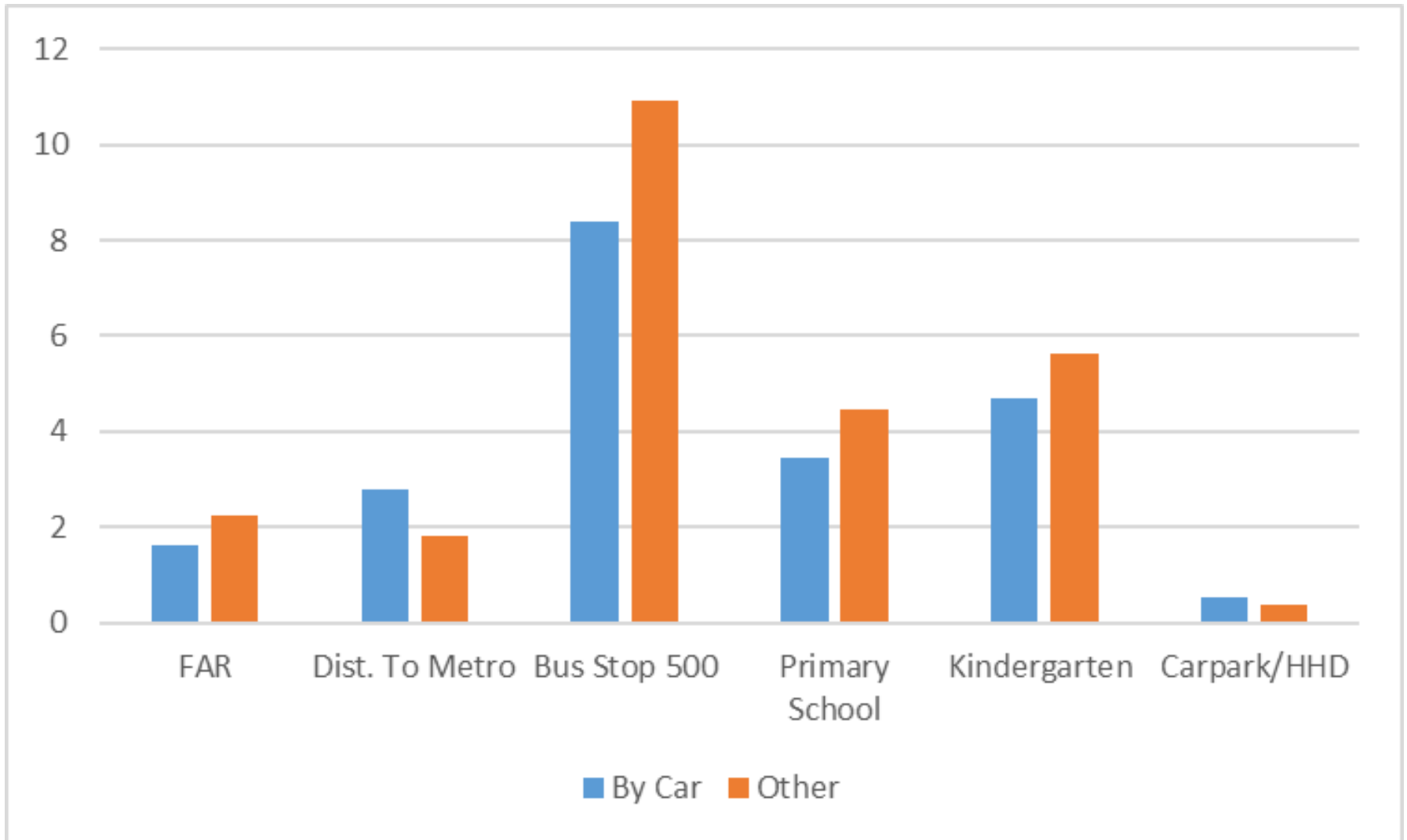
## Built Environment and Short Dist. Travel Mode—By car or not




**Consistent with general knowledge**

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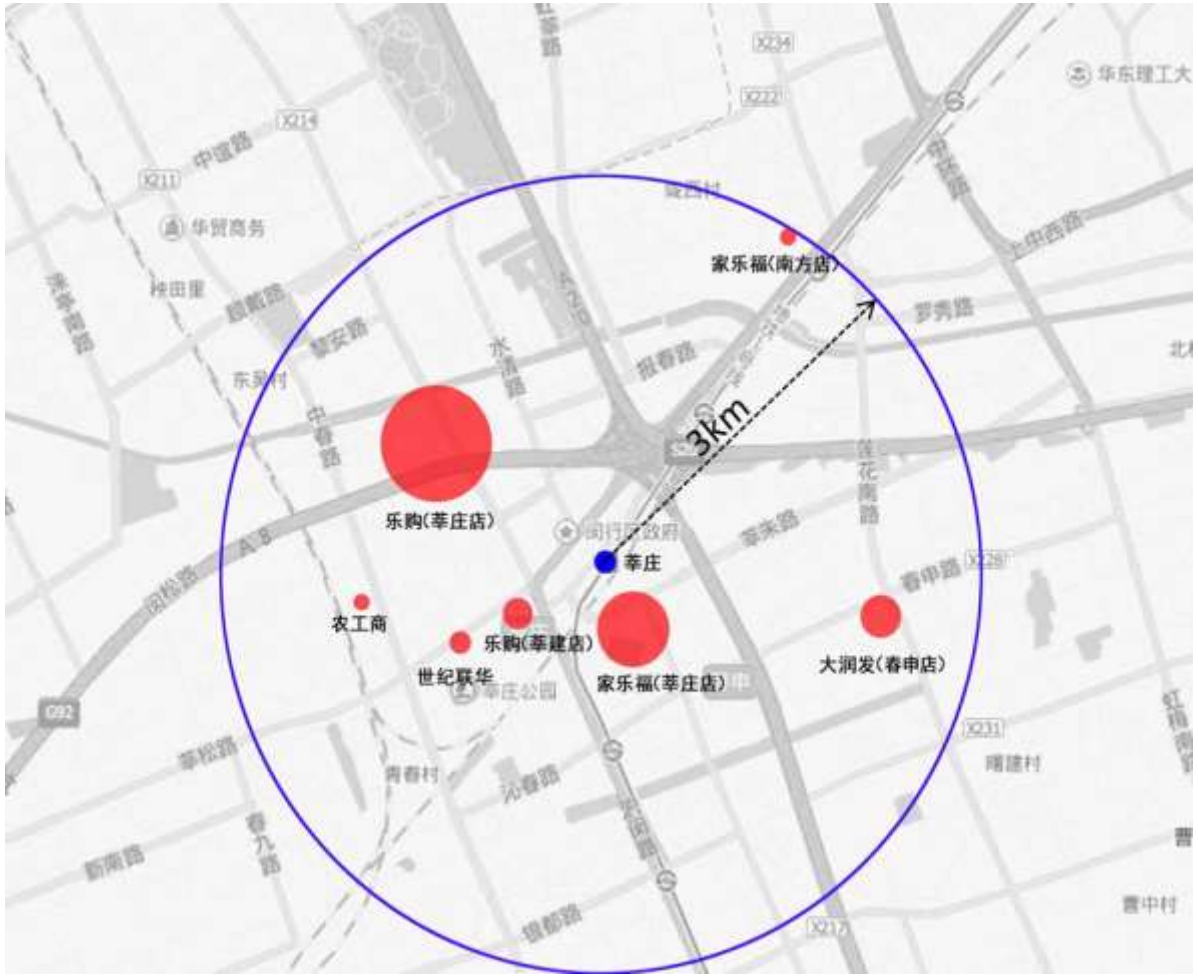
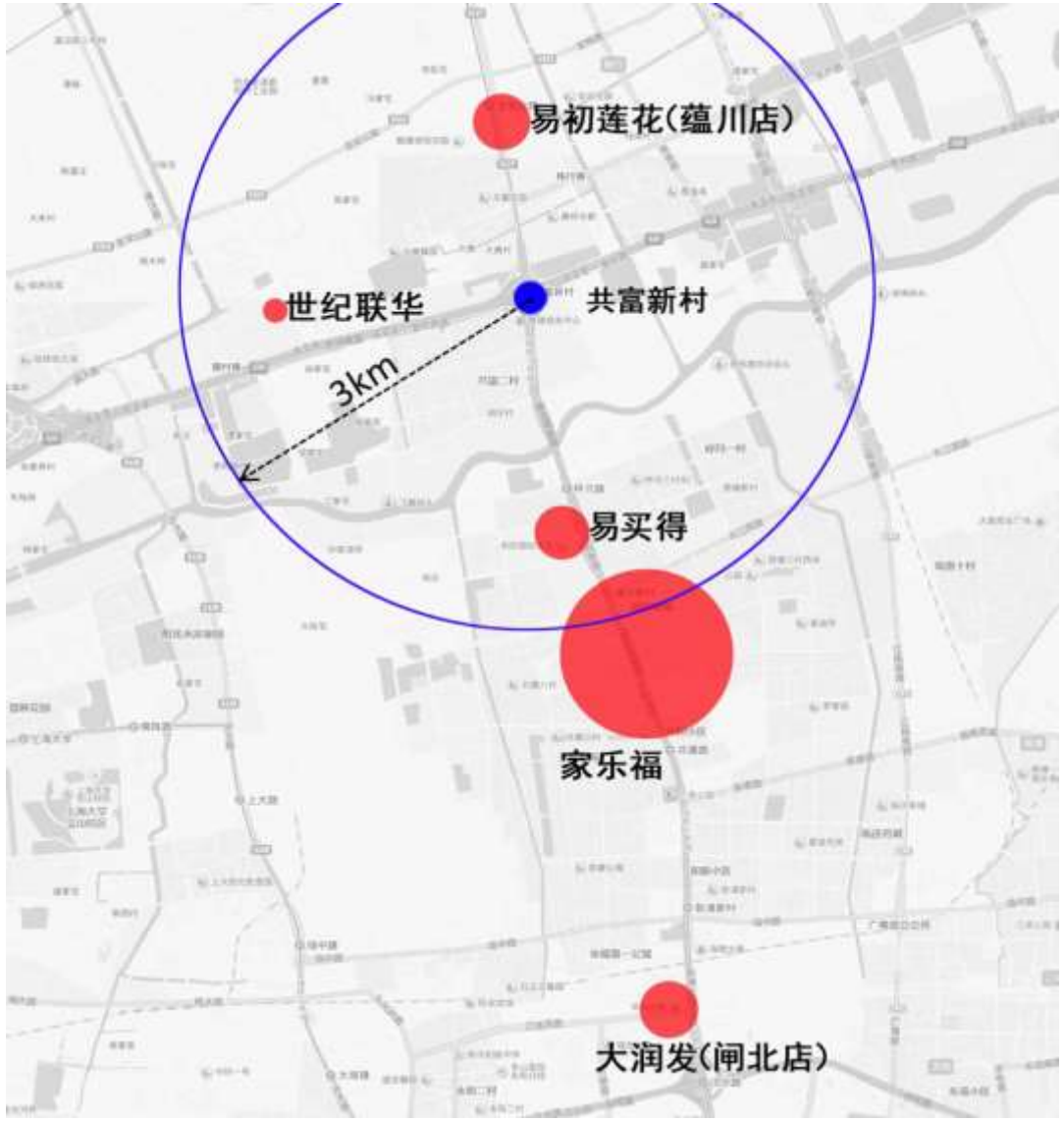


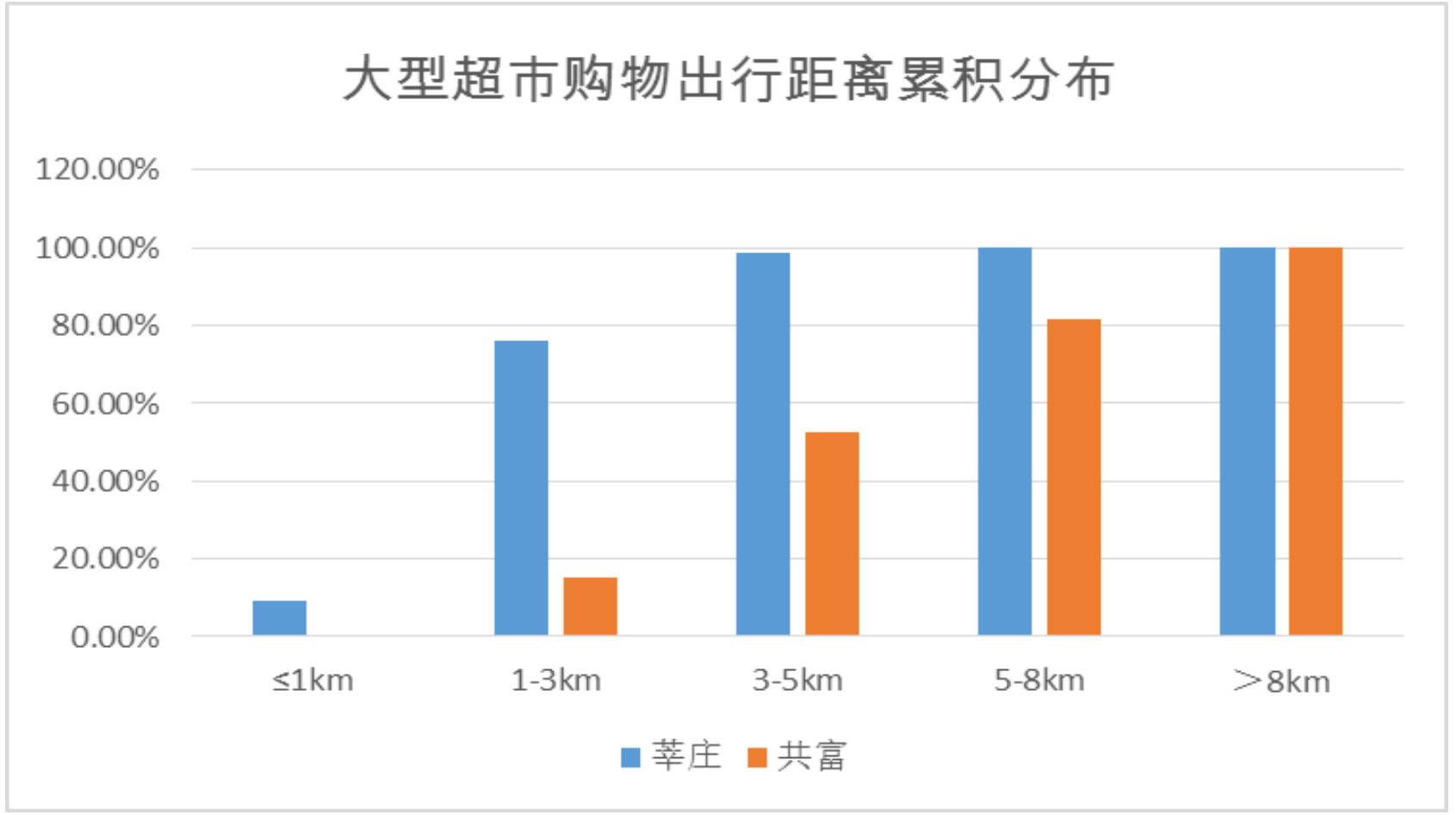

Xinzhuang

Gongfu




Place of Frequent Visit

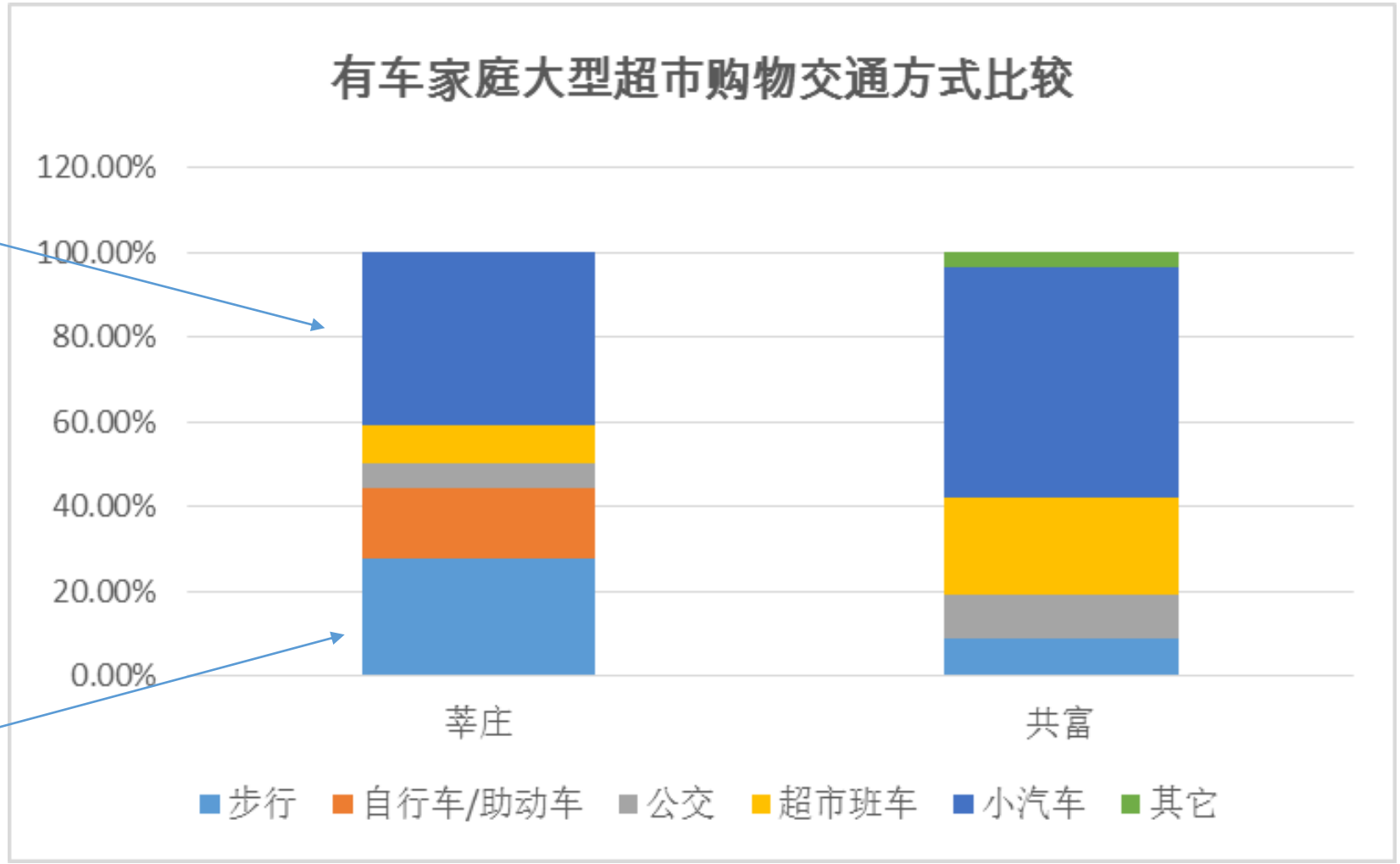
# Distance Accumulation Distribution



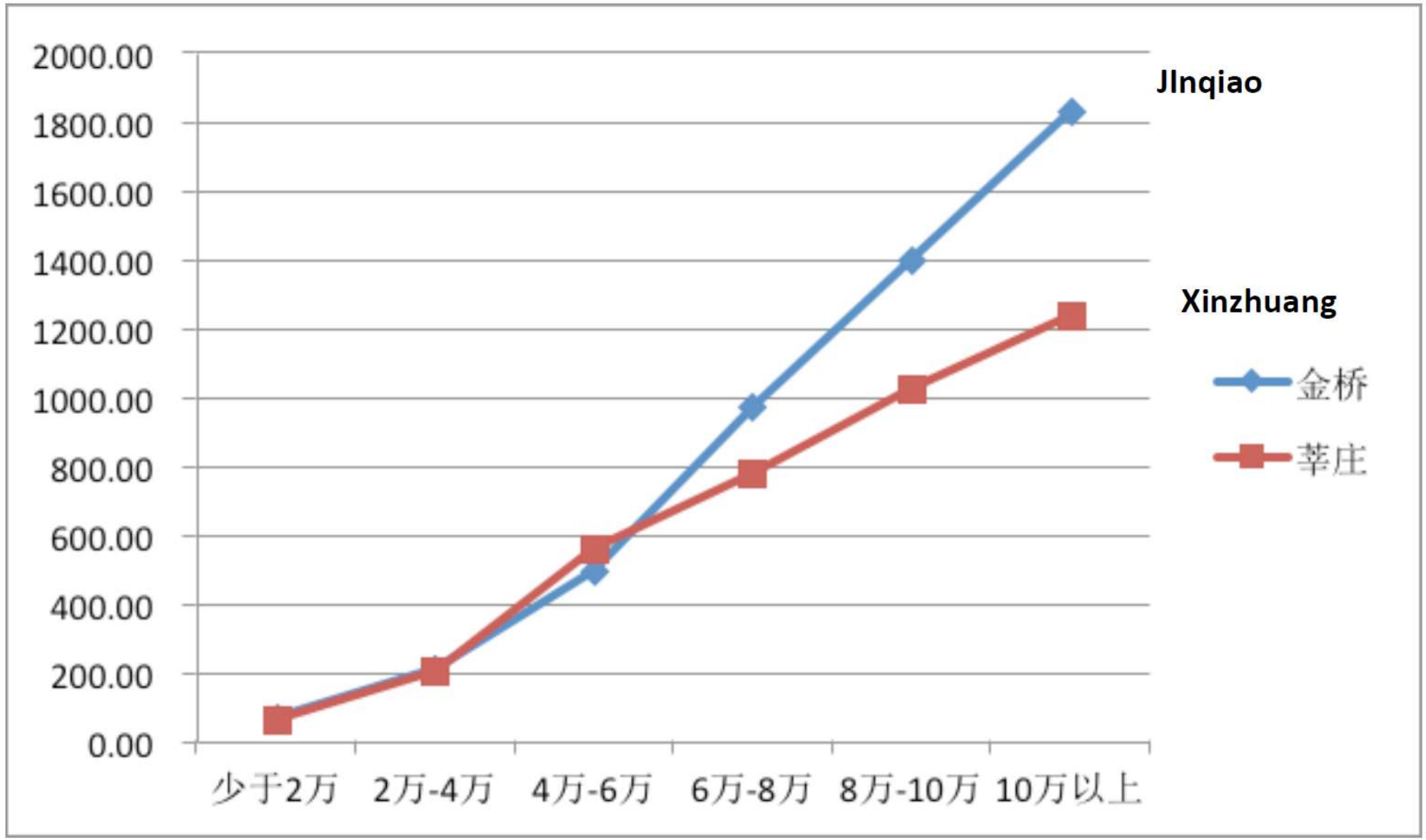
# Shopping Travel Mode Split for the Family with Car

Car

Walking




市中心—人民广场
People's Square
金桥
Jin qiao
13km
15km
莘庄
Xin zhuang
上海西站
上海火车站
上海虹桥机场
上海新国际博览中心
上海世博会场馆区
上海南站
上海浦东机场


2000.00
1800.00
1600.00
1400.00
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
少于2万
2万-4万
4万-6万
6万-8万
8万-10万
10万以上
JInqiao
Xinzhuang
金桥
莘庄

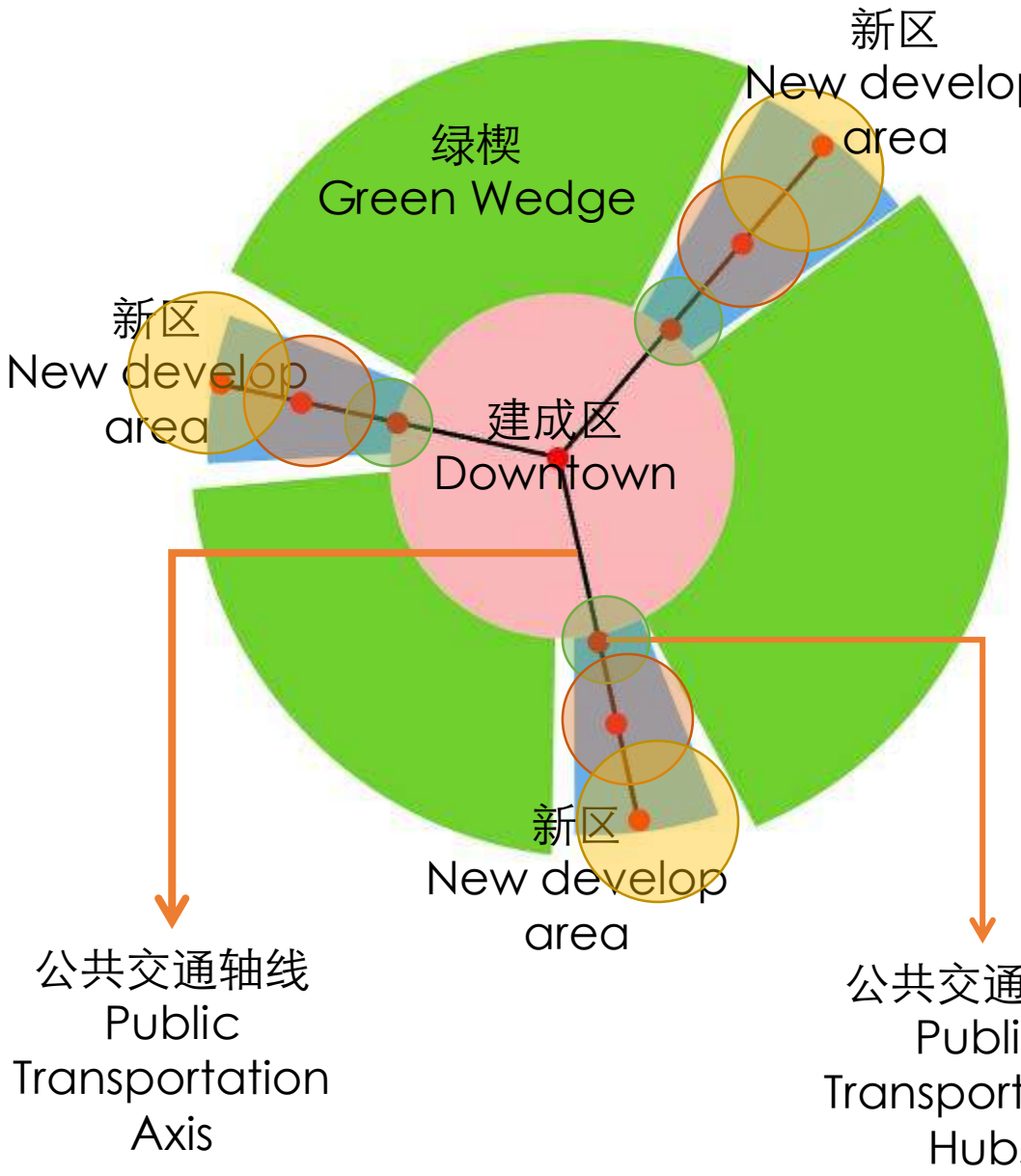
**XZ– Only car and income**

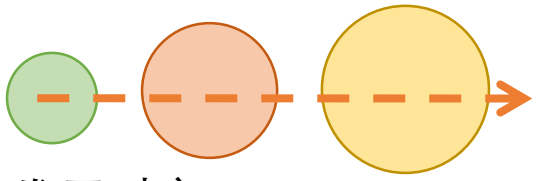
| | Model 1 | | Model 2 | | Model3 | |
|---|---|---|---|---|---|---|
| Variable | B | Sig. | B | Sig. | B | Sig. |
| Income | 0.294 | 0.000** | 0.3 | 0.000** | 0.294 | 0.000** |
| Car | 0.388 | 0.000** | 0.388 | 0.000** | 0.385 | 0.000** |
| Metro ST<2km | -0.003 | 0.952 | | | | |
| Busline to metro>4 | 0.029 | 0.563 | | | | |
| Bus stop in 300 m | | | 0.02 | 0.683 | | |
| Busline to center in 300 m | | | -0.014 | 0.757 | | |
| other busline in 300m | | | 0.004 | 0.929 | | |
| Bus stop in SRD | | | | | -0.014 | 0.817 |
| Busline to center in SRD | | | | | 0.055 | 0.216 |
| Other buline in SRD | | | | | 0.038 | 0.494 |

## JQ– Public Transport Service, three model to avoid collinearity

| | Model 1 | | Model 2 | | Model3 | |
|---|---|---|---|---|---|---|
| Variable | B | Sig. | B | Sig. | B | Sig. |
| Income | 0.295 | 0.000** | 0.289 | 0.000** | 0.265 | 0.000** |
| Car | 0.378 | 0.000** | 0.368 | 0.000** | 0.355 | 0.000** |
| Metro ST<2km | -0.056 | 0.073* | | | | |
| Busline to metro>4 | 0.034 | 0.293 | | | | |
| Bus stop in 300 m | | | -0.052 | 0.051* | | |
| Busline to center in 300 m | | | 0.077 | 0.024** | | |
| other busline in 300m | | | -0.033 | 0.33 | | |
| Bus stop in SRD | | | | | -0.162 | 0.000** |
| Busline to center in SRD | | | | | 0.202 | 0.001** |
| Other buline in SRD | | | | | -0.038 | 0.342 |

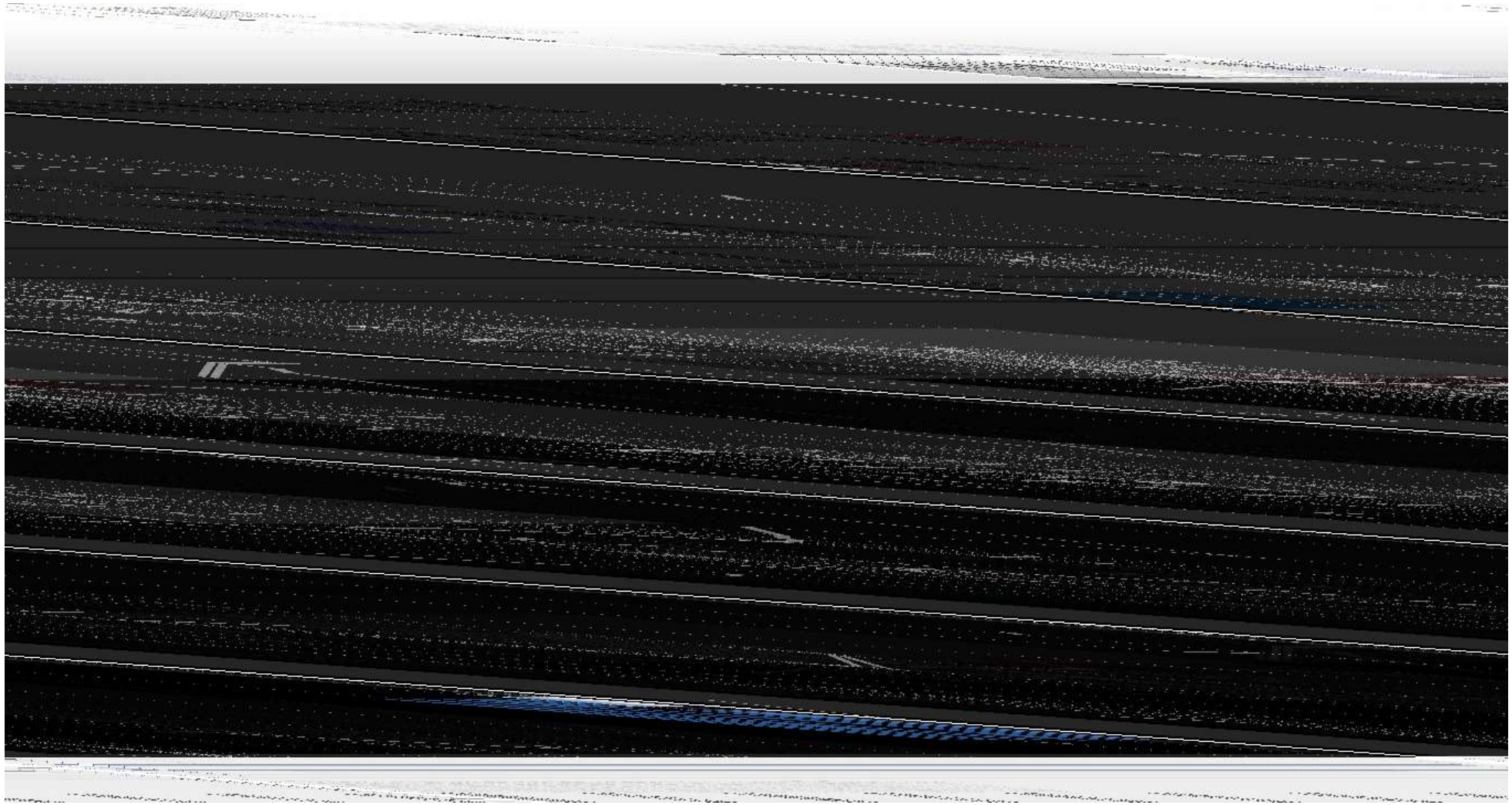
# 绿楔的城市发展模式
# Green wedge style

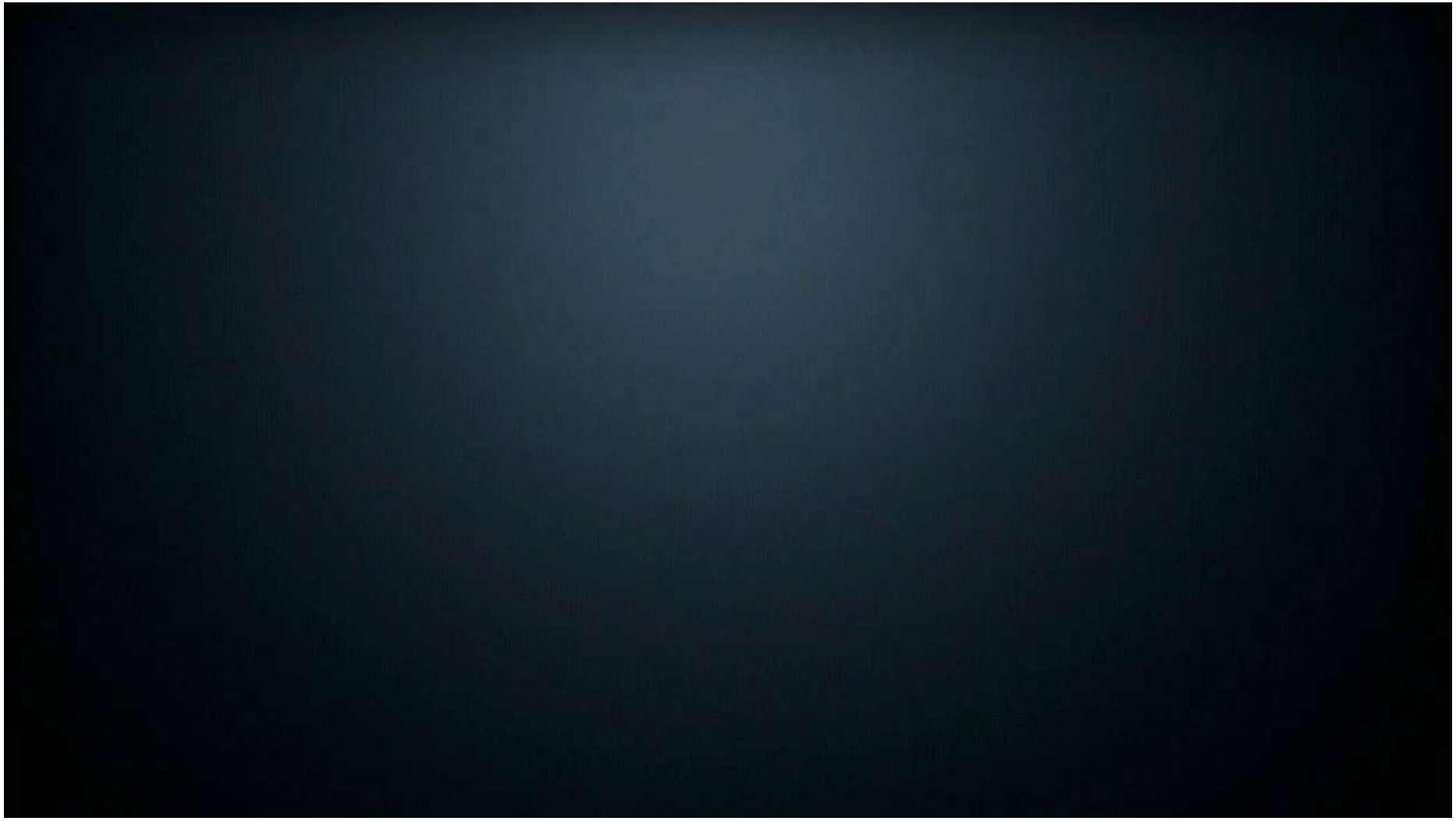


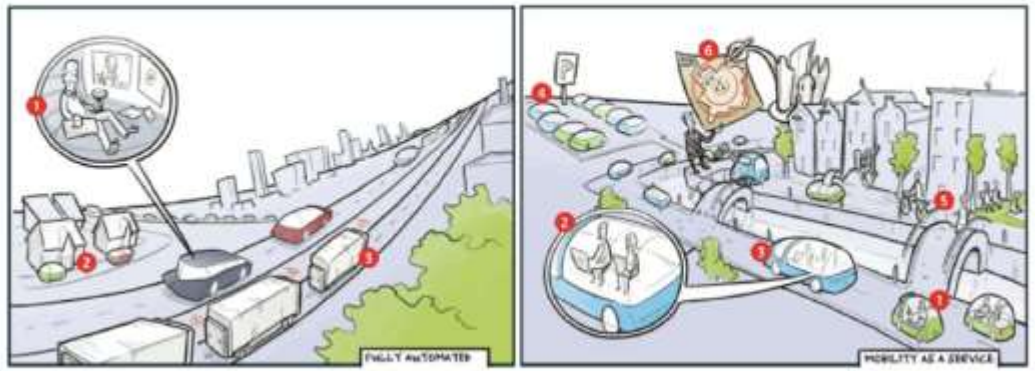
发展时序
Develop Timetable

有利于组织公共交通，紧缩型发展，节约能源。
Easy to organize public transportation and improve compact city, save energy.





# AV 自动驾驶的影响



**Undesirable AV futures**
Very low VOTT
No sharing

Much more trips
Increased congestion, especially in city centre
No land use savings

灾难

**Desirable AV futures**
Low VOTT
High level of sharing

| Land use saving | City centre | Other urban districts |
|---|---|---|
| Road infrastructure | - | 4% |
| Parking | 8% | 5% |

小的改进

TU Delft

1. More Green Space, Anti-density not Less Carbon Emission, Gross Density is the Key for short distance travel and No Car Dependent Mobility– Structure Change

2. Transit first for new territory development, Balanced Multi-Modal Green Transport System(5D modal)---Travel Light

3. Drastic planning and regulation are  critical for harmony society and the survival of human being, pursuing new paradiam in urbanization

# Thank You!