

Transit-Oriented Development (TOD) for Resilient cities and Communities


Regional EST Policy Dialogue and Training Workshop for South Asia and South-East Asia,
Li Wei, 10-Oct-2017



Agenda

- Why: Why Transit-oriented Development
- What: Defining TOD
- How: Using TOD as a solution

Why?

A satellite night view of Earth, showing the glowing lights of cities and urban areas across the globe. The lights are concentrated in the Eastern Hemisphere, particularly in Asia and Europe, with a dense network of lights in East Asia. The background is the dark blue of the night sky.

By 2030, China's cities will be home to **1 billion** people, or **70%** of its population.

By 2035, **70%** of the increase in global fuel oil consumption due to rapid motorization in Asia and Pacific developing countries.

Cities are growing extremely fast.





Growth is happening outside the city, like this new development in Changsha: car-oriented, people-alienating



Of this very wide, precious public space, only a sliver is for people and then even then, it is crowded with cars.



But will contribute to increasing air pollution
and will worsen climate change

And declining access

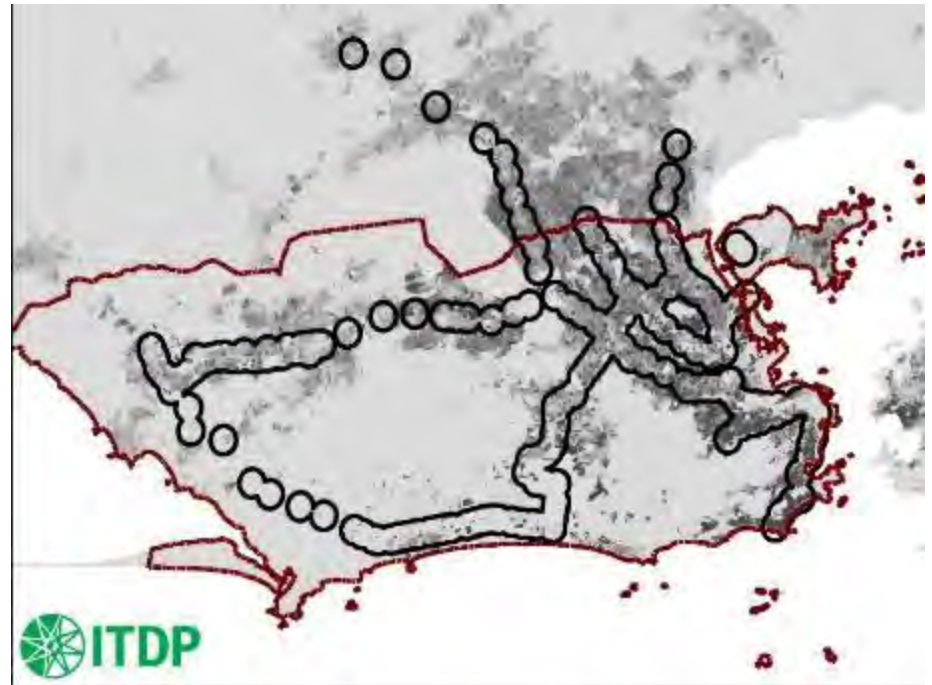
$$\text{PNT} = \frac{\text{Population within 1 km of rapid transit}}{\text{Total population of urban area}}$$

Rio de Janeiro

Metro PNT = 28%

City PNT = 47%

As cities grow, so
does the disconnect



To counter this disconnect, we look to TOD



What?

There is no one definition for TOD, but the basic concept is more-or-less commonly agreed.

In a TOD site:

- Transit stop in the center
- Higher density
- Mixed use
- Walking and bicycle-friendly and easy access to station

Expected benefits of TOD:

- Higher transit ridership and higher farebox revenue
- Environmentally sustainable transportation system
- Prevent sprawl and promote compact city development pattern
- Economic development and revitalization
- Encouraging healthy lifestyles

Market Station TOD, Miami



<https://plusurbia.com/>

TOD image in Capetown, South Africa



<https://www.capetownpartnership.co.za>

What is TOD?

- Dense, mixed and compact land use centered around public transport and grounded around walkability



BRT Corridor in Curitiba, Brazil

TOD is fundamentally about understanding the relationship between sustainable transport and urban development



PRINCIPLES, PERFORMANCE OBJECTIVES AND METRICS (not form-based)

WALK

Principle 1 - 15 points

OBJECTIVE A.
The pedestrian realm is safe, complete, and accessible to all.

Metric 1.A.1 Walkways
Percentage of walkway segments with ADA-compliant sidewalks, 3 points

Metric 1.A.2 Crosswalks
Percentage of intersections with safe, accessible crosswalks in all directions, 3 points

OBJECTIVE B.
The pedestrian realm is active and vibrant.

Metric 1.B.1 Visually Active Frontage
Percentage of walkway segments with visual connection to interior building activity, 6 points

Metric 1.B.2 Physically Permeable Frontage
Average number of shops, business entrances, and other pedestrian access per 100 meters of block frontage, 2 points

OBJECTIVE C.
The pedestrian realm is temperate and comfortable.

Metric 1.C.1 Shade and Shelter
Percentage of walkway segments that incorporate adequate shade and shelter elements, 1 point

CYCLE

Principle 2 - 15 points

OBJECTIVE A.
The cycling network is safe and complete.

Metric 2.A.1 Cycle Network
Access to safe cycling, street and path network, 2 points

OBJECTIVE B.
Cycle parking and storage are ample and secure.

Metric 2.B.1 Cycle Parking at Transit Stations
Ample secure, long-term cycle parking facilities are provided at all transit stations, 1 point

Metric 2.B.2 Cycle Parking at Buildings
Percentage of buildings that do not have dedicated cycle parking, 1 point

Metric 2.B.3 Cycle Access to Buildings
Percentage of buildings with bicycle storage spaces for cycles, 1 point

CONNECT

Principle 3 - 11 points

OBJECTIVE A.
Walking and cycling routes are short, direct and varied.

Metric 3.A.1 Small Blocks
Density of shortest pedestrian blocks, 3 points

OBJECTIVE B.
Walking and cycling routes are shorter than motor vehicle routes.

Metric 3.B.1 Pedestrian Connectivity
Ratio of pedestrian footpaths to motor vehicle intersections, 5 points

TRANSIT

Principle 4 - 10 points

OBJECTIVE A.
High quality transit is accessible by foot.

Metric 4.A.1 Walking Distance to Transit
Walking distance to the nearest transit station, 10 points

MIX

Principle 5 - 15 points

OBJECTIVE A.
Opportunities and services are within a short walking distance of where people live and work, and the public space is activated over extended hours.

Metric 5.A.1
Complementary User Residences and non-residential uses within same or adjacent blocks, 8 points

Metric 5.A.2 Access to Local Services
Percentage of buildings that are within walking distance of an amenity or facility such as a health care service, or pharmacy and a source of fresh food, 3 points

Metric 5.A.3 Access to Parks and Playgrounds
Percentage of buildings that are within 500 meter walking distance to a park or playground, 7 points

OBJECTIVE B.
Diverse demographics and income ranges are included among local residents.

Metric 5.B.1 Affordable Housing
Percentage of local residents that are included as either blue housing, 8 points

Metric 5.B.2 Housing Freshness
Percentage of households using on-site before the subject area are maintained or relocated within walking distance, 3 points

Metric 5.B.3 Business and Services Preservation
Percentage of existing local, resident-serving businesses and services that the subject area that are maintained or relocated within walking distance, 2 points

DENSIFY

Principle 6 - 10 points

OBJECTIVE A.
High residential and job densities support high-quality transit, local services, and public space activity.

Metric 6.A.1 Nonresidential Density
Nonresidential density in comparison with best practice (e.g. 10 jobs per acre), 7 points

Metric 6.A.2 Residential Density
Residential density in comparison with best practice (e.g. 10 units per acre), 3 points

COMPACT

Principle 7 - 10 points

OBJECTIVE A.
The development is in, or next to, an existing urban area.

Metric 7.A.1 Urban Site
Number of sides of the development that are existing built-up areas, 8 points

OBJECTIVE B.
Traveling through the city is convenient.

Metric 7.B.1 Transit Options
Number of Transit options that are accessible within walking distance, 7 points

SHIFT

Principle 8 - 10 points

OBJECTIVE A.
The land occupied by motor vehicles is minimized.

Metric 8.A.1 Off-street Parking
Total off-street parking located on parking as a percentage of the development area, 8 points

Metric 8.A.2 Driveway Density
Average number of driveways per 100 meters of block frontage, 1 point

Metric 8.A.3 Roadway Area
Total road bed area used for motor vehicle travel and on-street parking as percentage of total developed area, 6 points



WALK

Safe and Complete Walkways for All Users



WALK

Safe and Complete Crosswalks for All Users





WALK:
Active and Vibrant

Visually active street frontages
Physically permeable street frontages

WALK: Comfortable

Guangzhou, China

Shade and Shelter



CYCLE

Safe and complete cycle networks



Hangzhou, China

CYCLE



Secure & Ample Parking

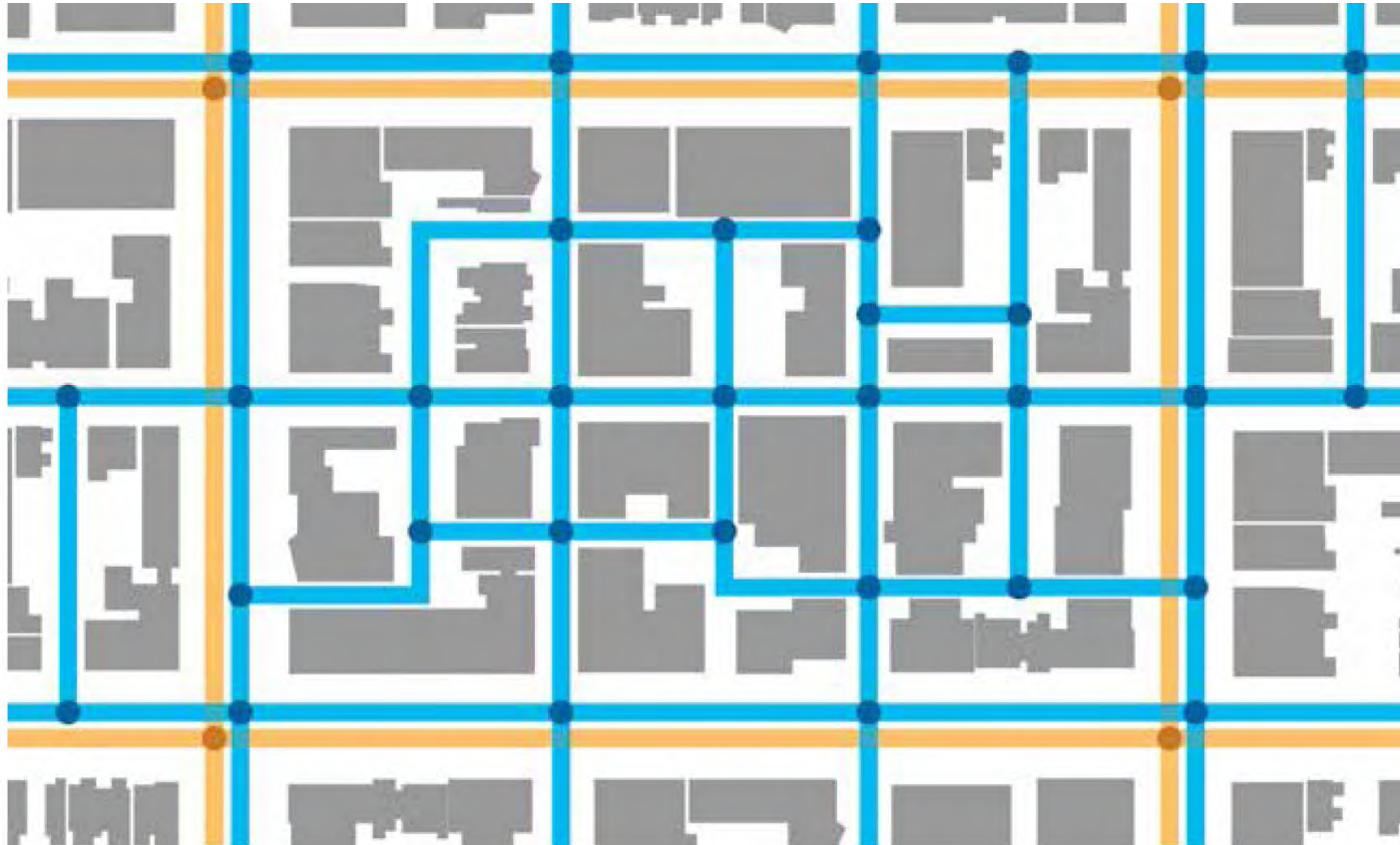
CONNECT

Walking and cycling paths are short, direct, and varied
= Short blocks

Pedestrian prioritized path in Buenos Aires, Argentina

CONNECT

Walking and cycling routes are shorter than motor-vehicle routes



TRANSIT

Locate development near high-quality public transport



MIX

Plan for a mix of uses, incomes, and demographics
- shorter trips possible (walking, cycling)
- public space activation

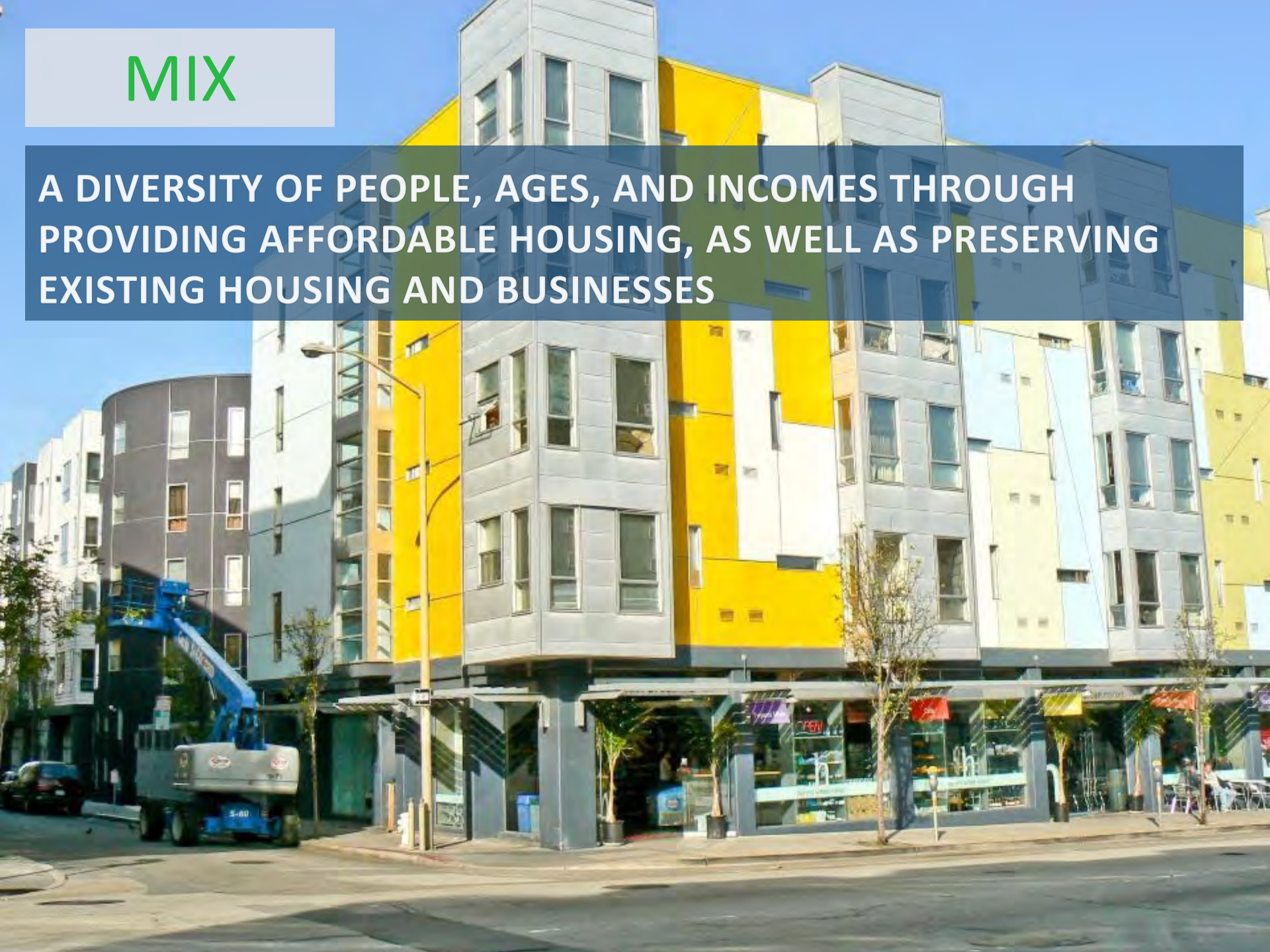


Whampoa, Hong Kong

A diversity of land uses and services,
such as schools, health care, grocery stores, parks

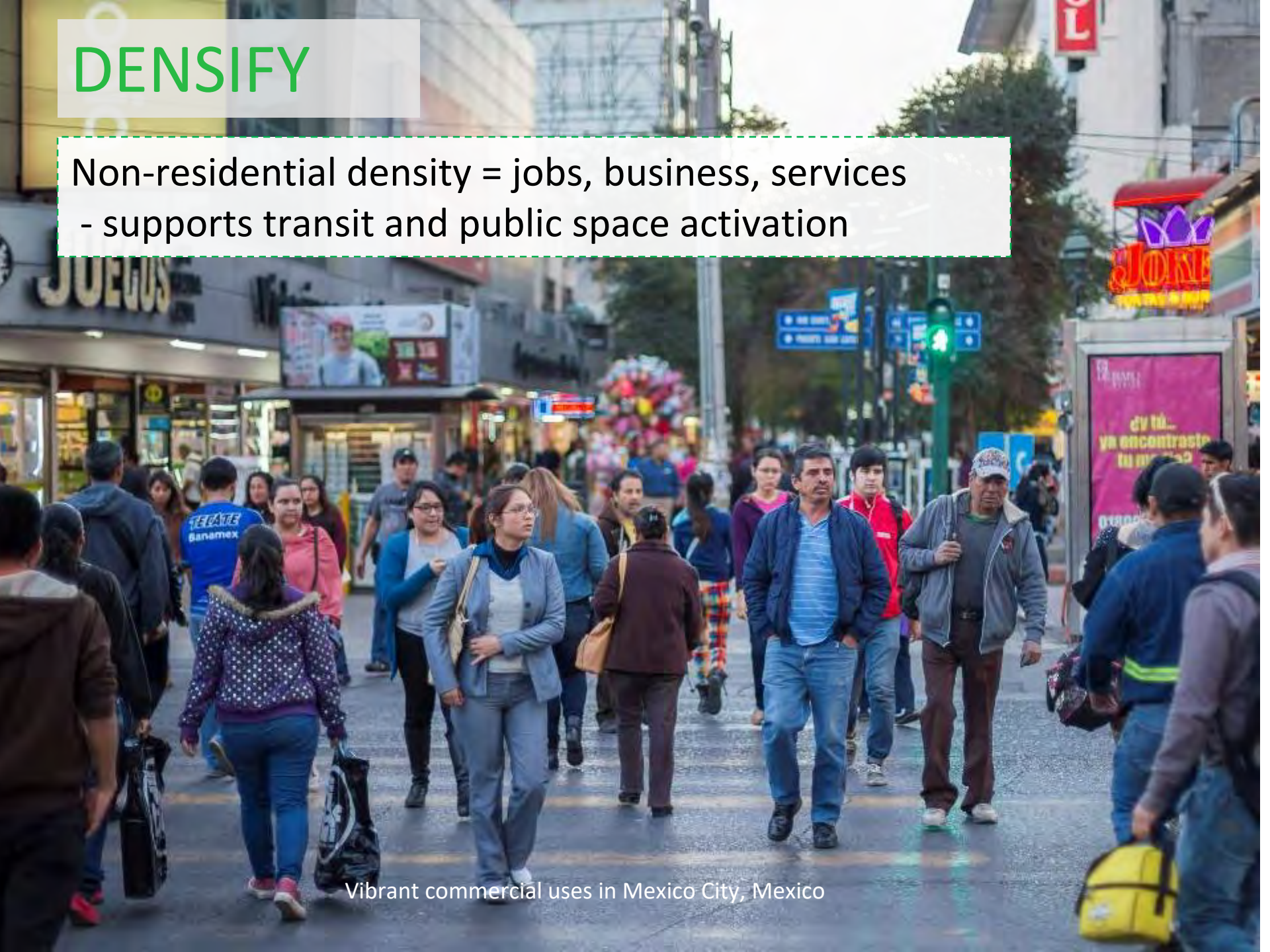
MIX

A DIVERSITY OF PEOPLE, AGES, AND INCOMES THROUGH PROVIDING AFFORDABLE HOUSING, AS WELL AS PRESERVING EXISTING HOUSING AND BUSINESSES



DENSIFY

Non-residential density = jobs, business, services
- supports transit and public space activation



Vibrant commercial uses in Mexico City, Mexico

DENSIFY

Residential density = people

- supports those businesses, transit and public space activation



COMPACT

Create regions with short transit commutes

- Infill development
- Multiple transit options

Curitiba. Brazil

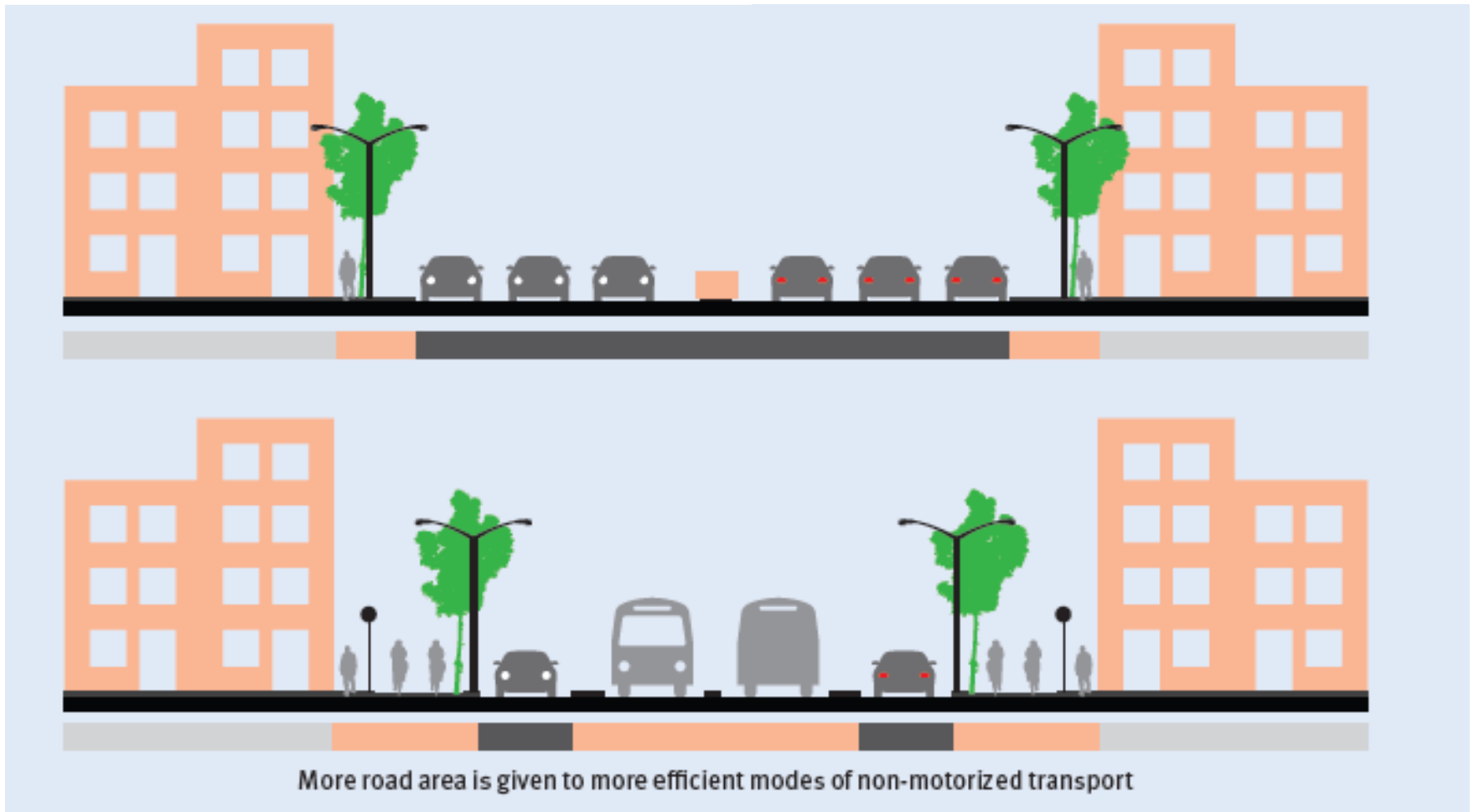


SHIFT



**Creating less space for cars:
- parking spaces and access**

SHIFT



COMPACT

DENSIFY

SHIFT

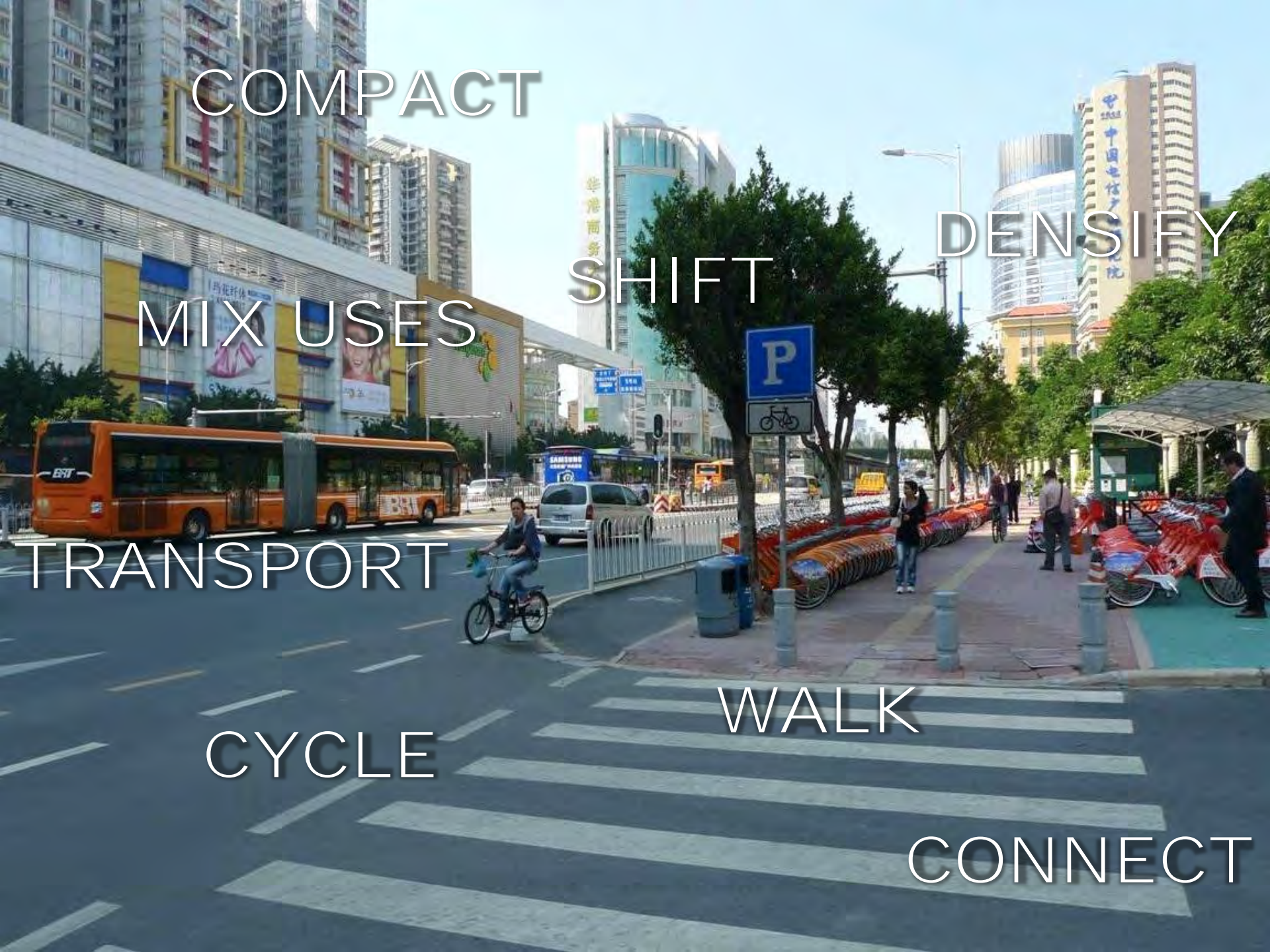
MIX USES

TRANSPORT

CYCLE

WALK

CONNECT



How?

珠三角最佳实践范例 Best Practice

– 开放式商住社区：天河六运小区（广州）

Evolution to mixed use community: Liuyun Community (Guangzhou)

复合型开放住宅社区：天河六运小区

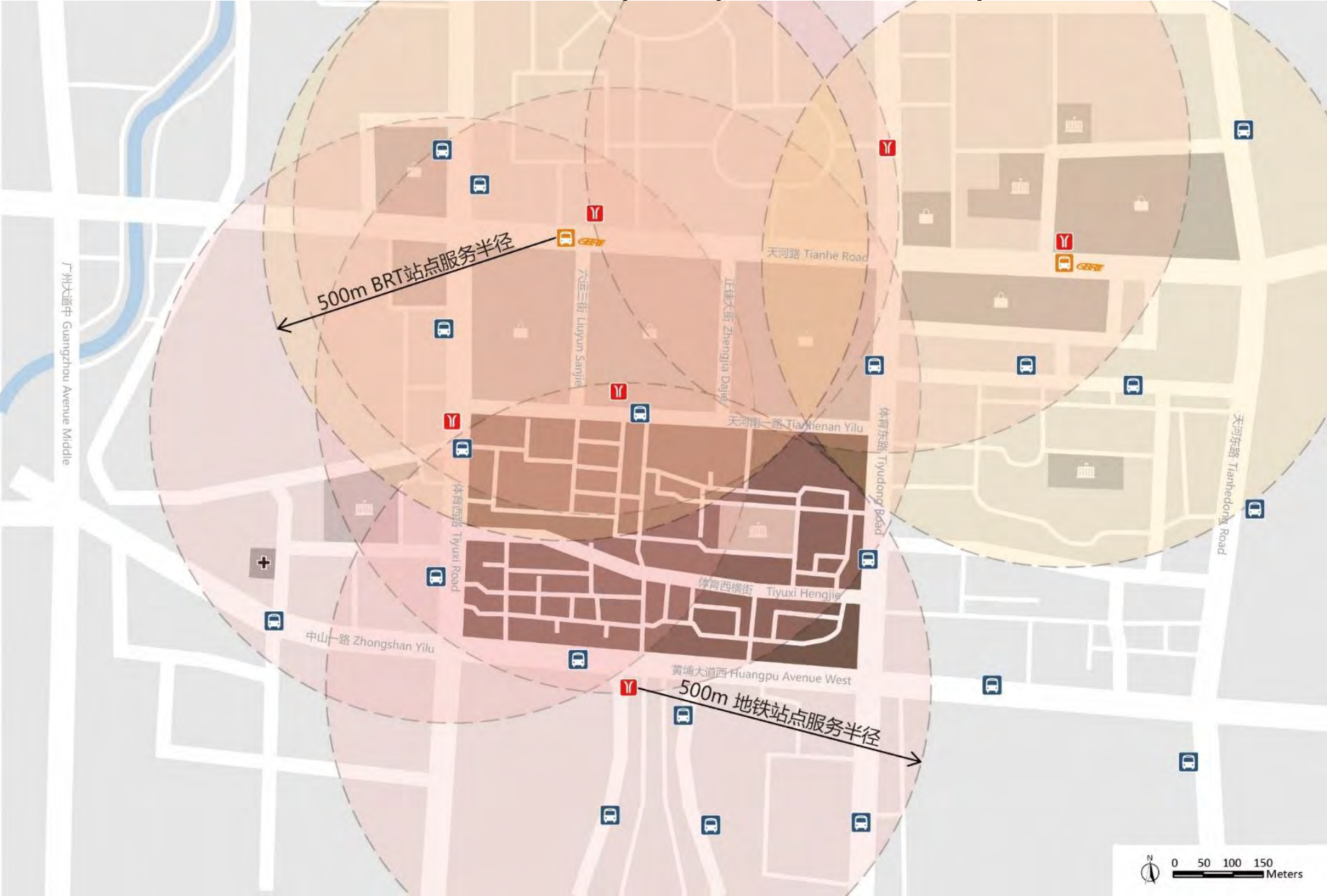
Evolution to mixed use community: Liuyun community



复合型开放住宅社区：天河六运小区

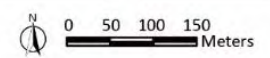
Evolution to mixed use community: Liuyun community

TRANSIT



500m BRT 站点服务半径

500m 地铁站点服务半径



复合型开放的商业中心 Mixed use commercial area

MIX/COMPACT

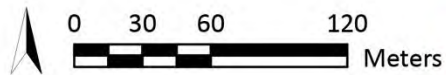
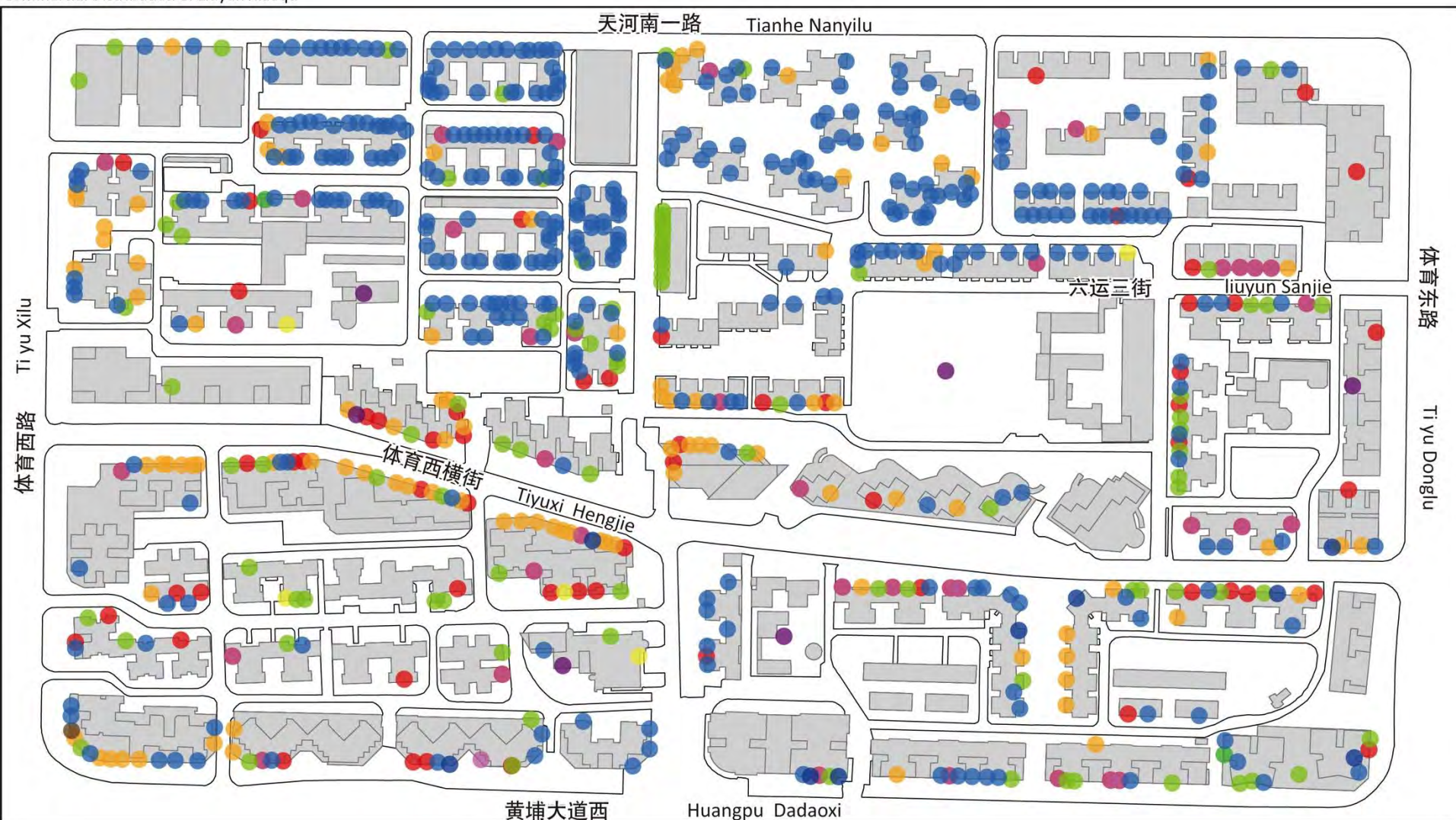


小区的商业分布图

Commercial distribution

MIX/COMPACT

六运小区商业分布图
Commercial Distribution of Liuyun Xiaoqu



- 日用品 Grocery
- 个人服务 Personal Services
- 娱乐设施 Entertainment
- 医疗保健 Health
- 餐饮 Dining
- 社区服务 Community Services
- 商业设施 Goods Shopping
- 教育设施 Education
- 酒店 Hotels
- 公共服务 Urban Services

安全、连续、舒适的步行空间

Safe, complete and comfortable walkways for All users

WALK



行人过街设施

Intersections with qualifying crossing facilities

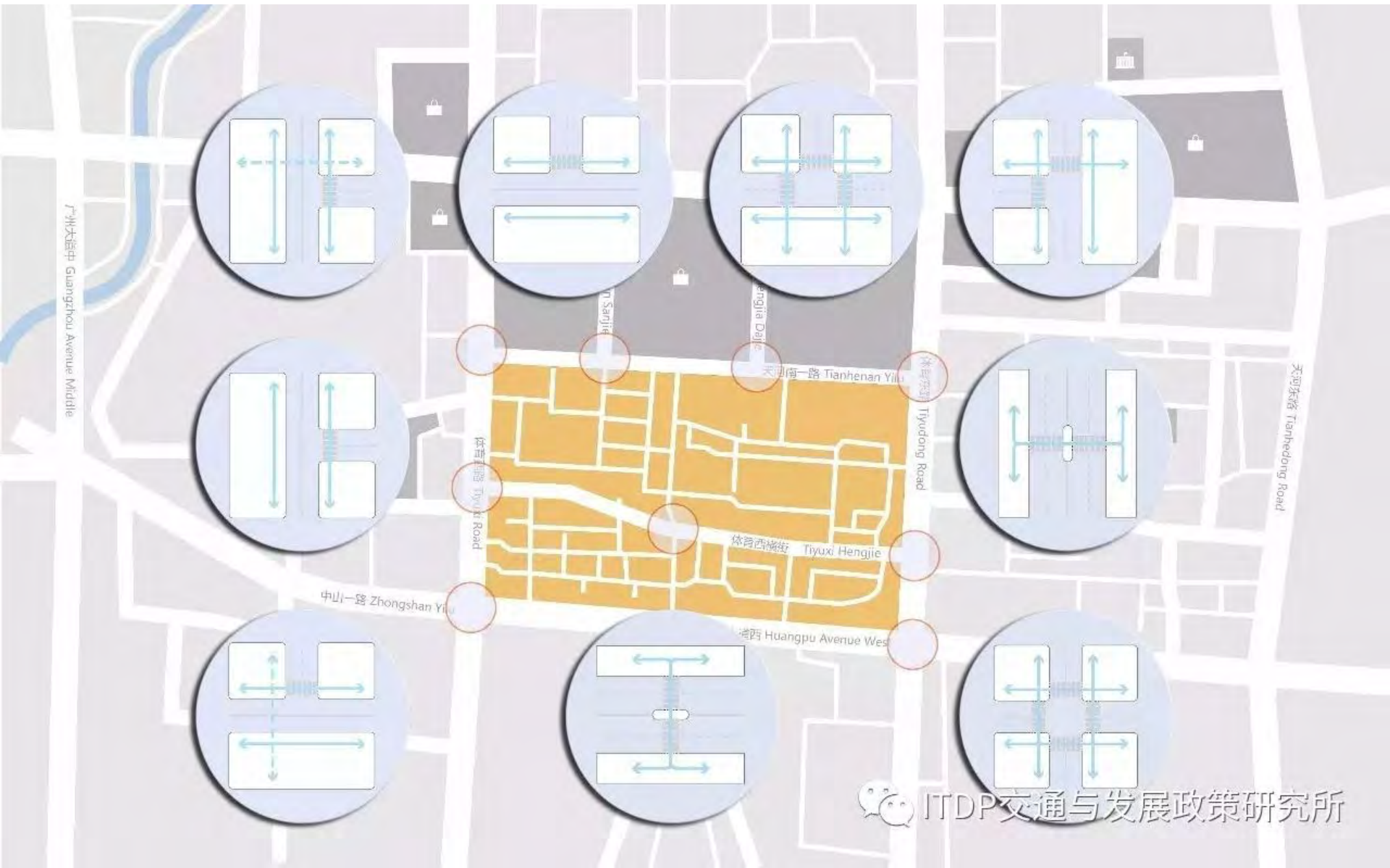
WALK



行人过街设施

Intersections with qualifying crossing facilities

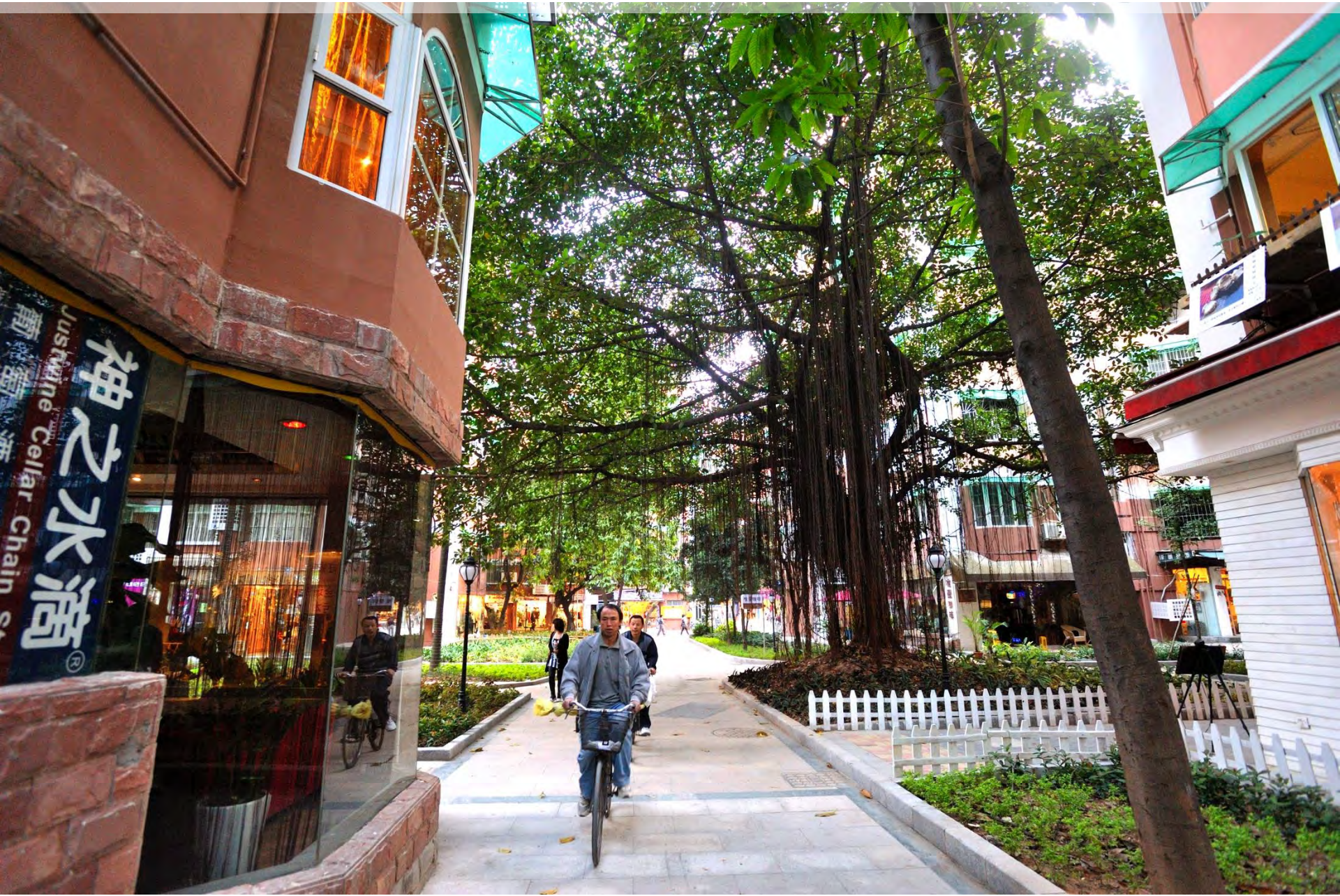
WALK



区内自行车和步行网络

Road network for pedestrian and cyclist

CYCLE



区内自行车和步行网络

Road network for pedestrian and cyclist

CYCLE

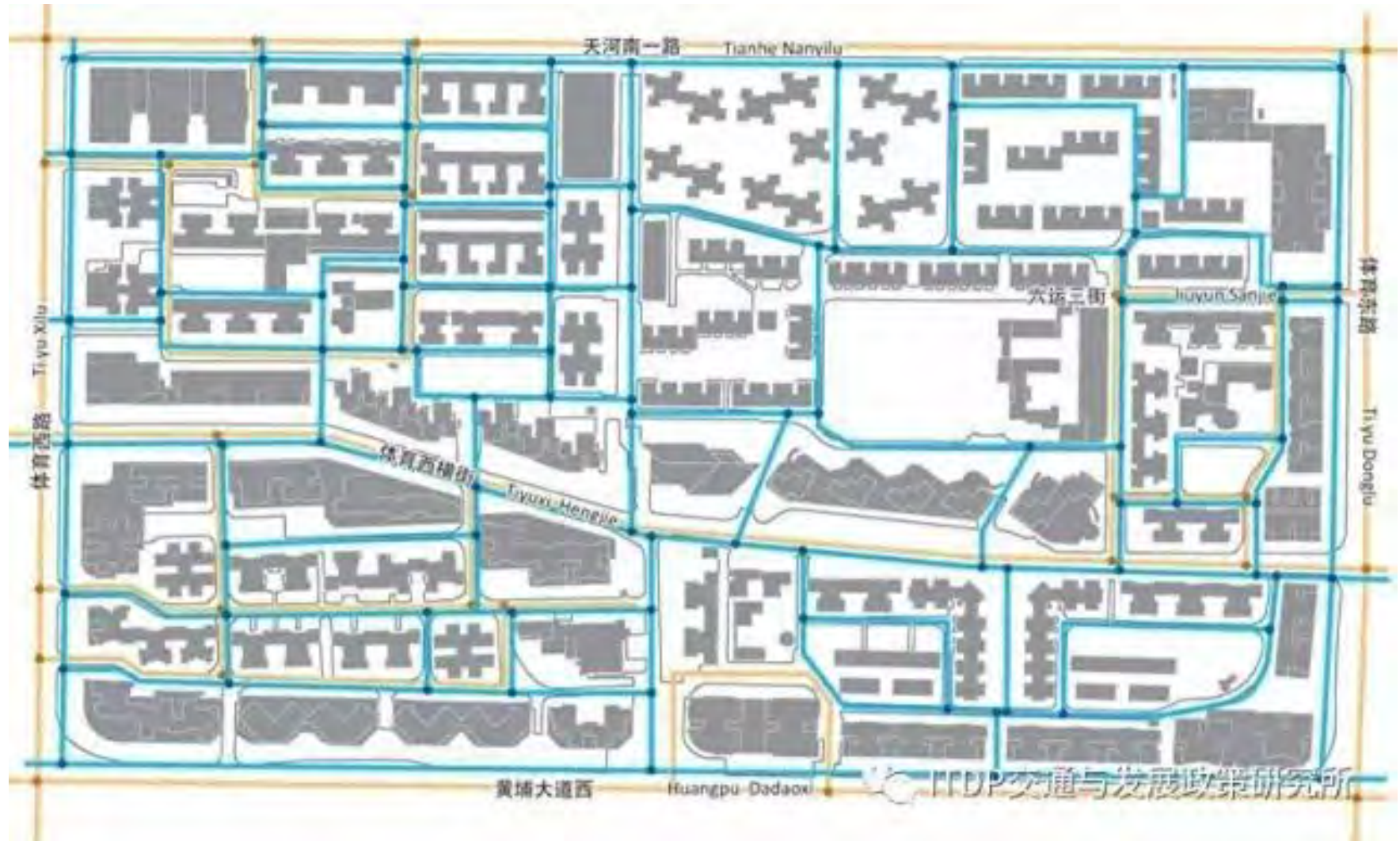


自行车停放设施

Cycle Parking

CYCLE





开放社区不代表完全开放给机动车，更多的是针对非机动化交通的公共化，增强片区内部以及与周边的可达性。

夜间商业气氛浓厚
Commercial environment at night time

DENSIFY



高密度发展带来人流、不同类型的服务及商机，促进社区的商业发展
公交引导的高密度社区营造热闹、安全的环境，实现24小时 / 7天 / 365天运营

夜间商业气氛浓厚
Commercial environment at night time

DENSIFY



社区公共空间和绿化空间

public space and green space for residence

MIX



内部道路改造前

Inner road - before

SHIFT



before

内部道路改造后
Inner road - after

SHIFT



共享停车位

Off street parking sharing

SHIFT



Lessons Learned: Smart Government Needed

- City vision to set the goals for the site – for what the city wants to achieve
- This vision = predictability for developers - Predictability matters to developers.
- TOD is about negotiation – the government needs to be a good negotiator - can either bring people to a weak market or extract better development or amenities in a strong market
- Public investment is critical (transit, upgrading of utilities, parks, streetscape improvements)





ITDP

Institute for Transportation
& Development Policy



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So we can create complete street and complete communities for the young and the elderly...



Thank you!

For more information:

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