# PLANNING & DESIGNING ROAD SAFETY MEASURES IN TOD

## Webinar Series.
## Session 3

### Integration of Road Safety Considerations in Transit-Oriented Development Projects

15 October 2020

WORLD BANK GROUP

*Supported by:*

UKaid from the British people

GRSF Global Road Safety Facility

*Conducted by:*

WRI INDIA

**Alina Burlacu**
*Senior Transport Specialist*

The World Bank

**Prerna Mehta**
*Lead-Urban Development*

WRI India

**Abhishek Behera**
*Consultant Sustainable Cities & Transport*
WRI India

**Gerald Ollivier**
*Lead Transport Specialist*

The World Bank

**Greg Smith**
*Managing Director, Strategic Projects*

iRAP

WORLD BANK GROUP UKaid GRSF Global Road Safety Facility WRI INDIA

## Session 1

**TOD and Road Safety**

October 1, 2020

## Session 2

**Assessing and Enabling Road Safety within a TOD project cycle**

October 8, 2020

## Session 3

**Planning and Designing Road Safety measures in TOD**

October 15, 2020

## Session 4

**Financing and Implementing Road Safety measures in TOD**

October 22, 2020

WORLD BANK GROUP UKaid GRSF Global Road Safety Facility WRI INDIA

# PLANNING SAFE ACCESS IN TOD PROJECTS

## Webinar Series. Session 3

### Integration of Road Safety Considerations in Transit-Oriented Development Projects

15 October 2020

WORLD BANK GROUP

*Supported by:*

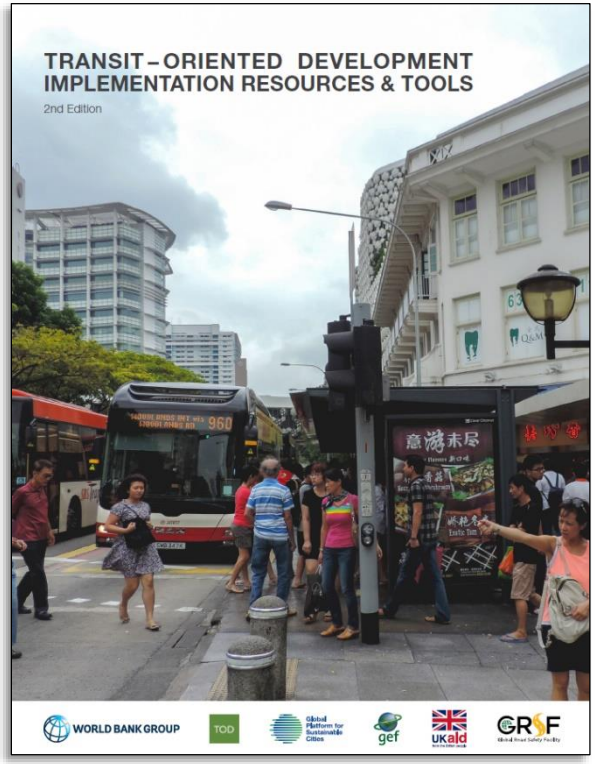
UKaid from the British people

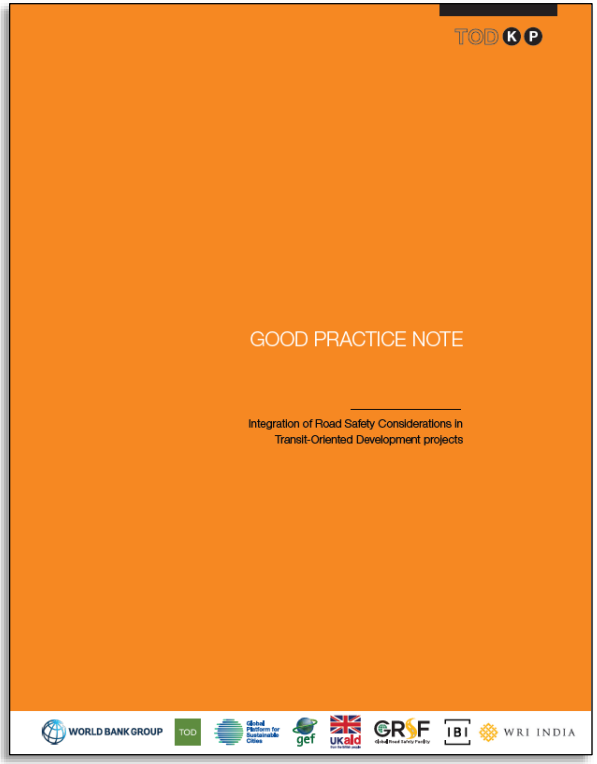
GRSF Global Road Safety Facility

*Conducted by:*

WRI INDIA

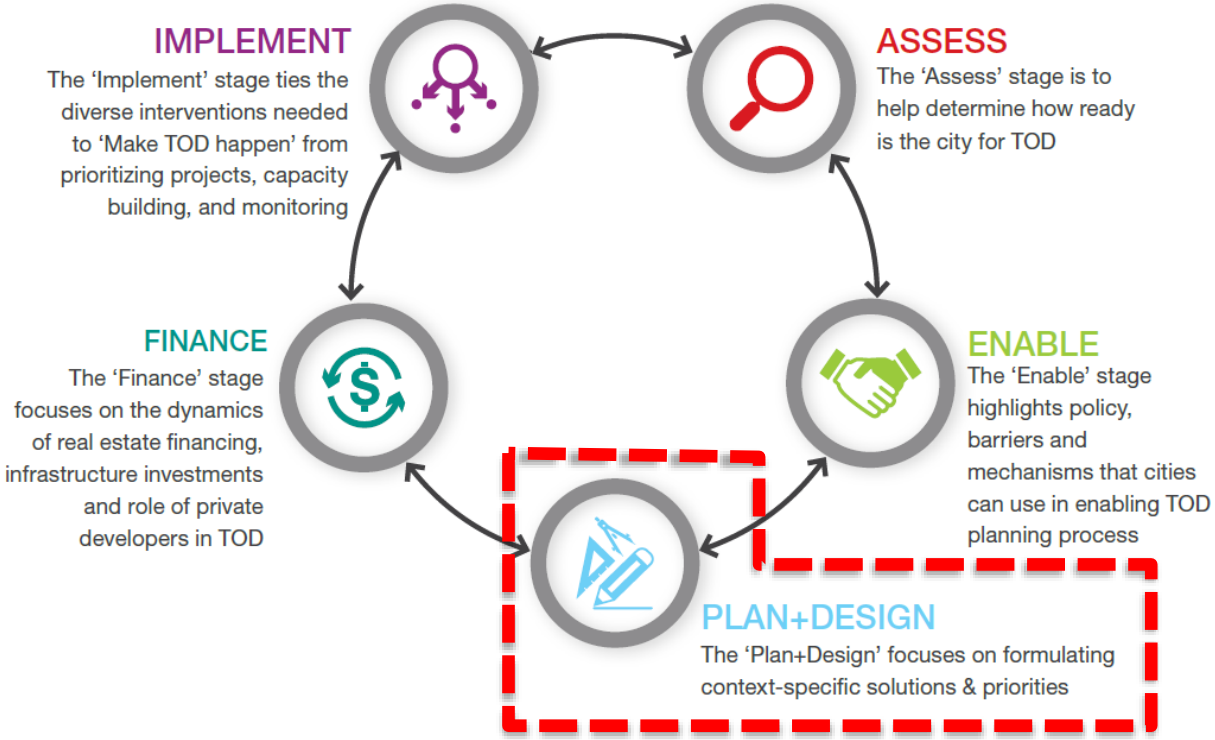
# TOD TOOLKIT & FRAMEWORK



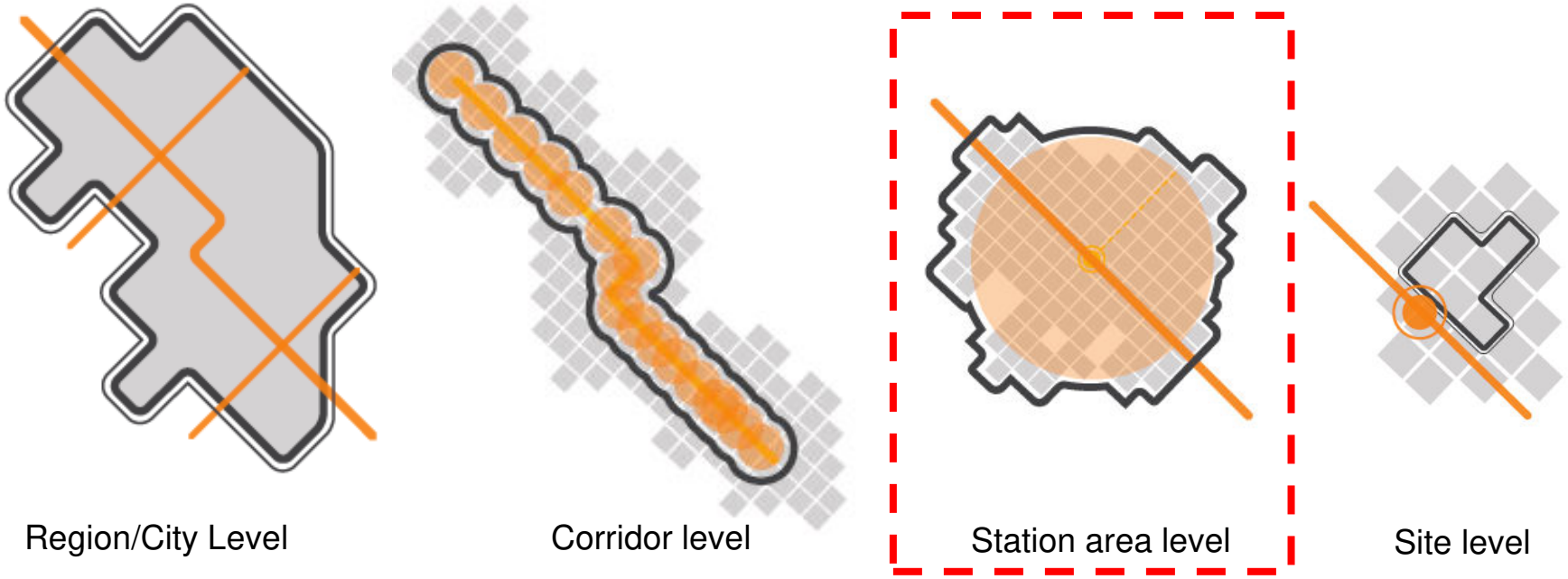




WORLD BANK GROUP
UKaid
GRSF
Global Road Safety Facility
WRI INDIA

# TOD FRAMEWORK



# SCALES OF PLANNING



Region/City Level

Corridor level

Station area level

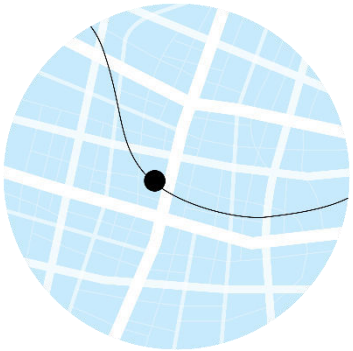
Site level



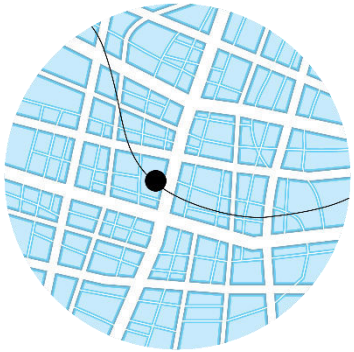
Source: TOD guidance Document Executive summary

# NETWORK PLANNING

The most critical aspect for the creation of a strong interlinkage between the transit station and the  developments within station area is *network planning*.



**Coverage**



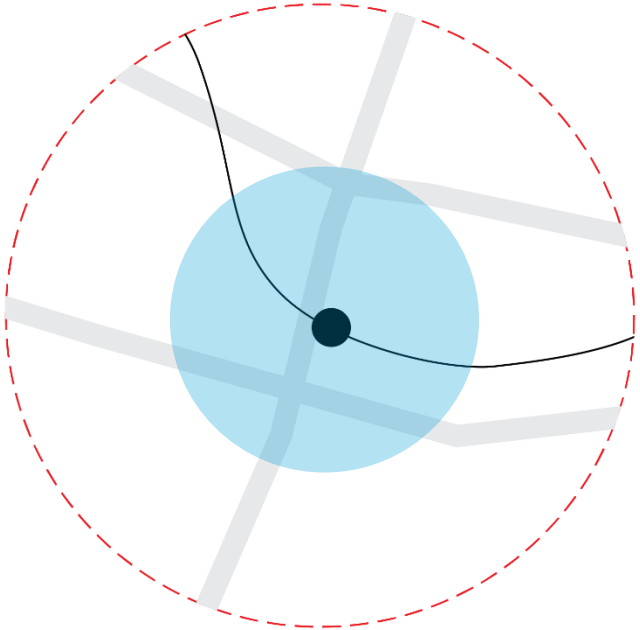
**Continuity**

**Orientation**

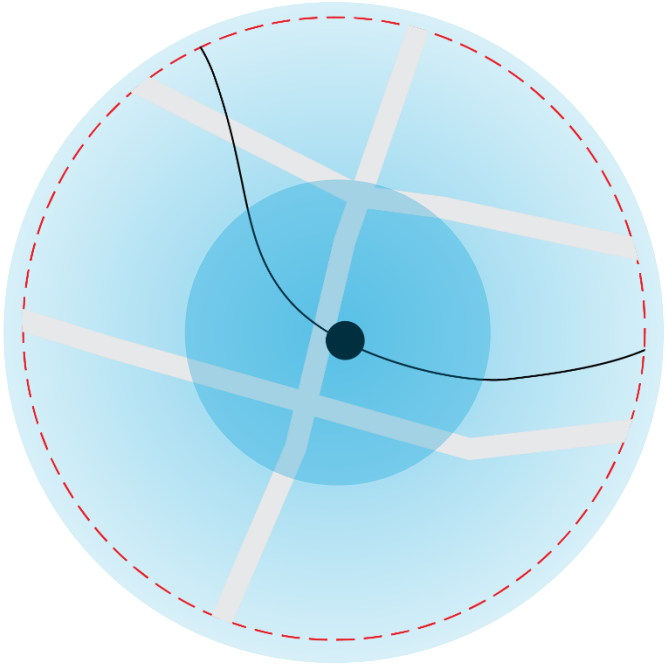
**Capacity**

**Safety**

# COVERAGE

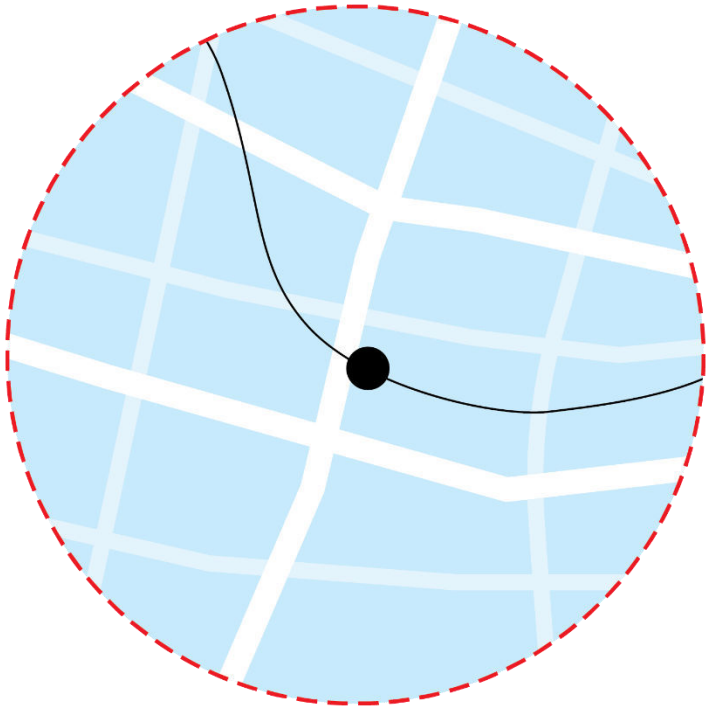


Walking Realm

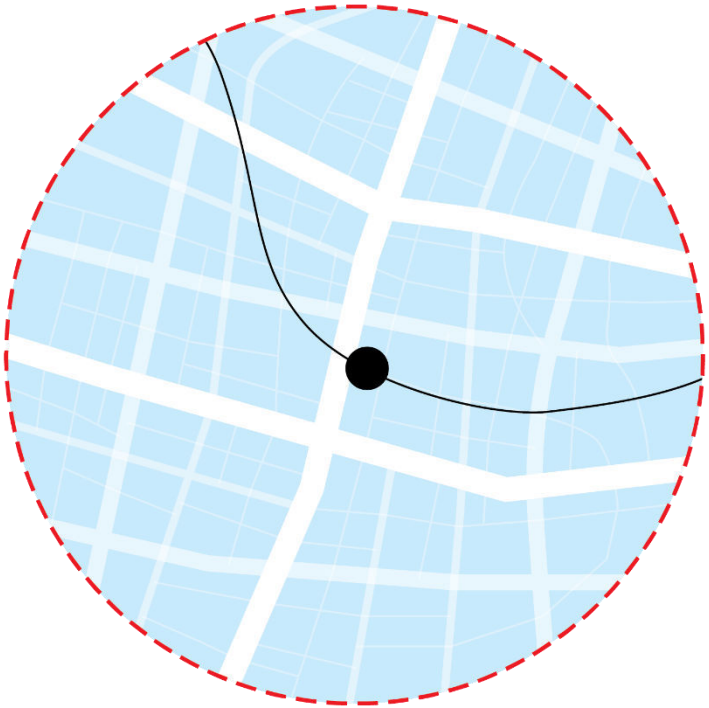


Area outside Walking Realm

# COVERAGE



Trunk routes



Connections to Trunk routes and station

# NETWORK HIERARCHY

**1. Walking**

**2. Cycling & Feeder Transit**

**3. Paratransit & Shared vehicles**

**4. Personal motor vehicles**

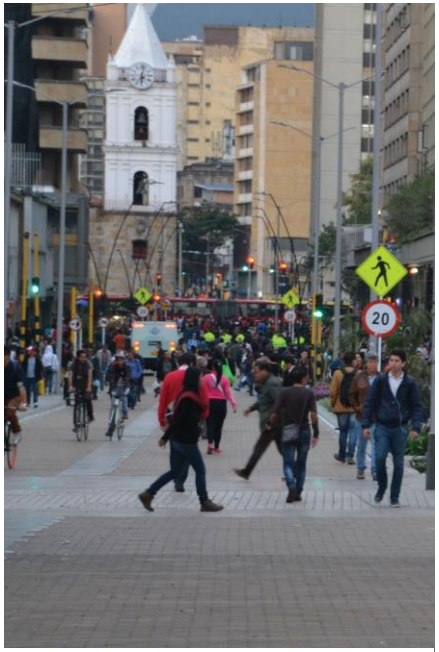
# CONTINUITY

**Pedestrians walking on the travel lane instead of sidewalk, Mumbai India** *(WRI)*

# CONTINUITY

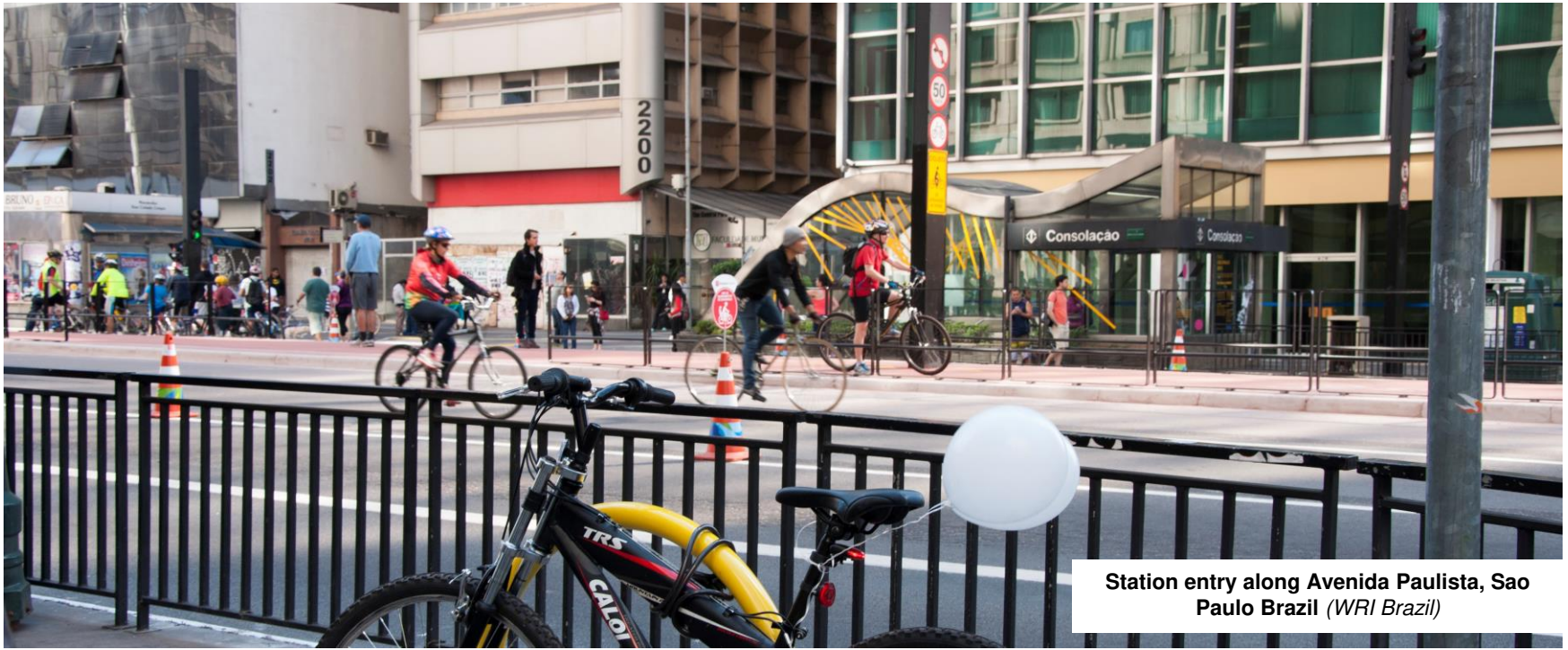
- Developing off-road connectors
- Using development incentives to augment the network.
- Developing grade-separated
- Designing for shared infrastructure

**Grade separated skywalk at Thane station India** *(WRI India)*




**Shared Street in Bogota, Colombia** *(NACTO-GDCI)*

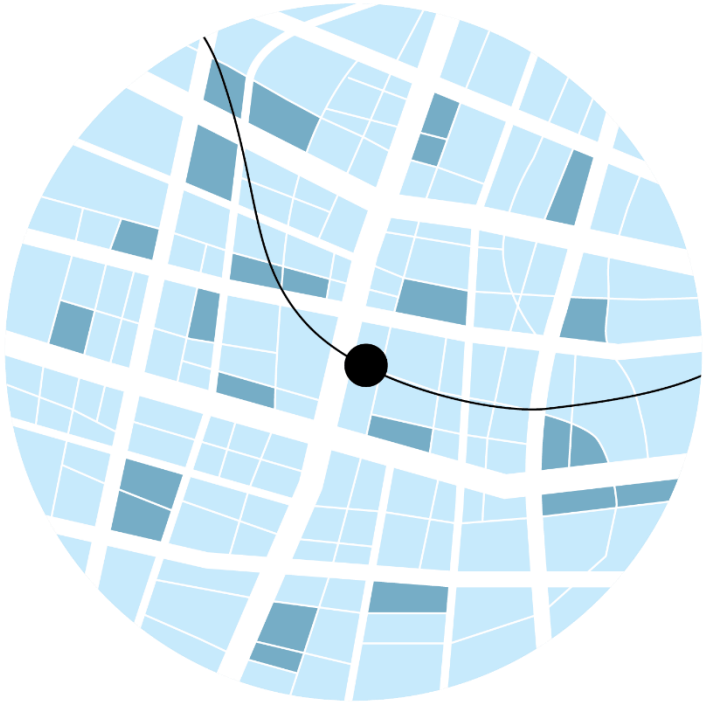
# ORIENTATION




**Station entry along Avenida Paulista, Sao Paulo Brazil** *(WRI Brazil)*

# ORIENTATION

Determining the main nodes



# ORIENTATION

Determining the main nodes

Assessing strategies to minimise deviations

# ORIENTATION

Determining the main nodes

Assessing strategies to minimise deviations

Assessing favourability of local conditions

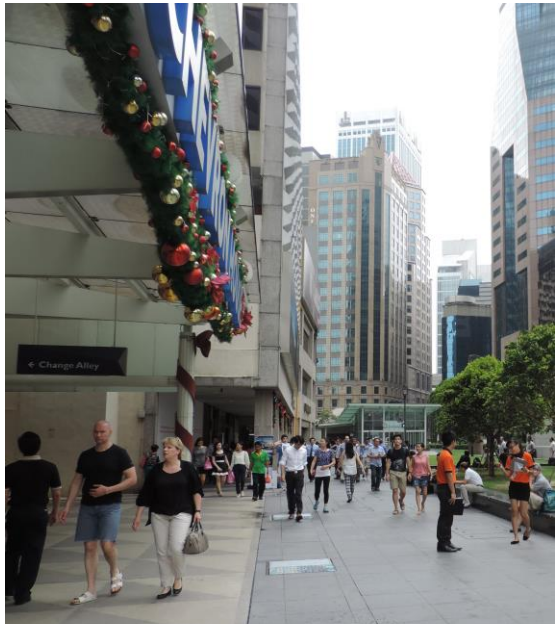
# CAPACITY


**Inadequate pedestrian space outside Borivali Station area, Mumbai India** *(WRI)*

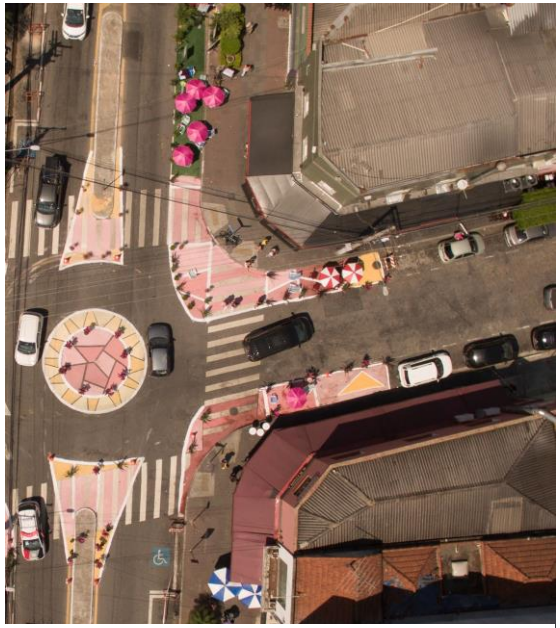
WORLD BANK GROUP UKaid GRSF Global Road Safety Facility WRI INDIA

# CAPACITY

**Reallocated space in travel lane for pedestrians, Sao Paolo Brazil** *(WRI Brazil)*

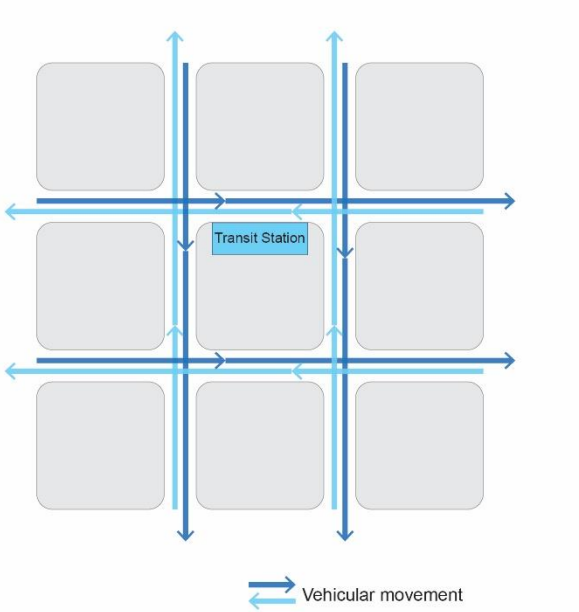



**Building setbacks used for pedestrians needs, Singapore** *(The World Bank)*

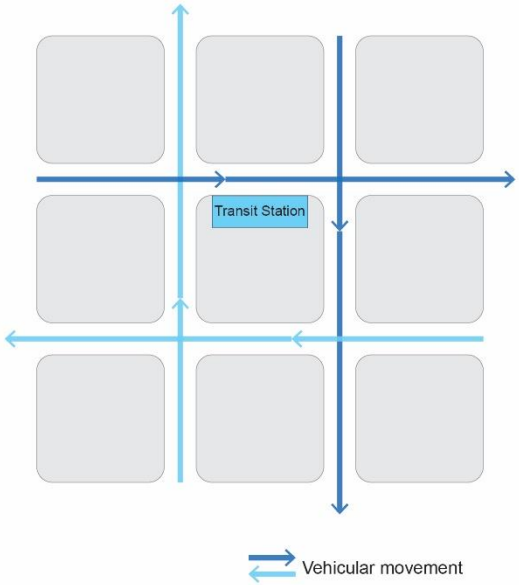


**Onstreet parking removed for curb extension and parklets, Sao Paolo Brazil** *(WRI)*

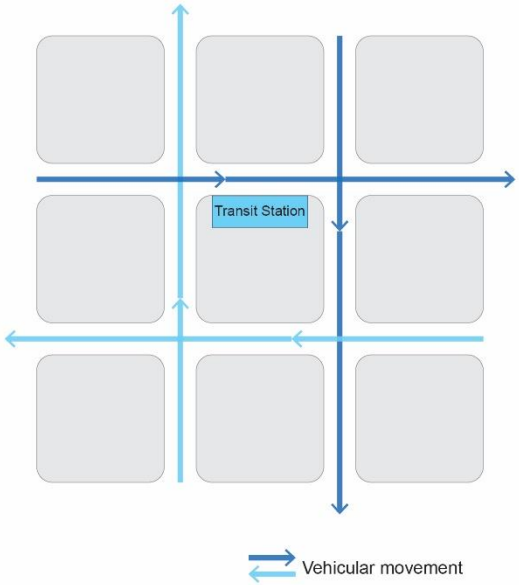
# CAPACITY

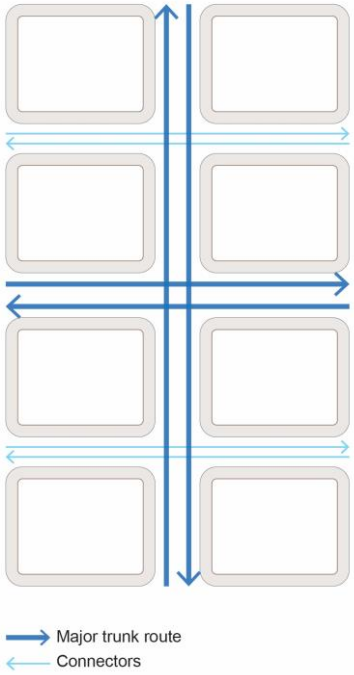


# CAPACITY

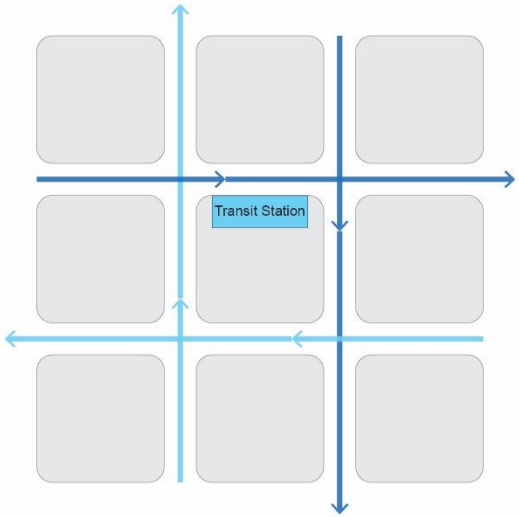


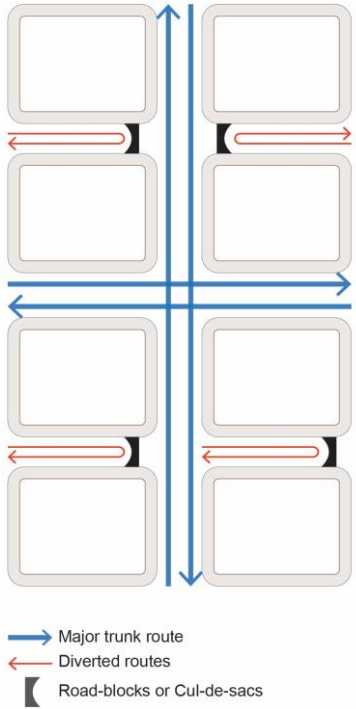
# CAPACITY


Transit Station
Vehicular movement

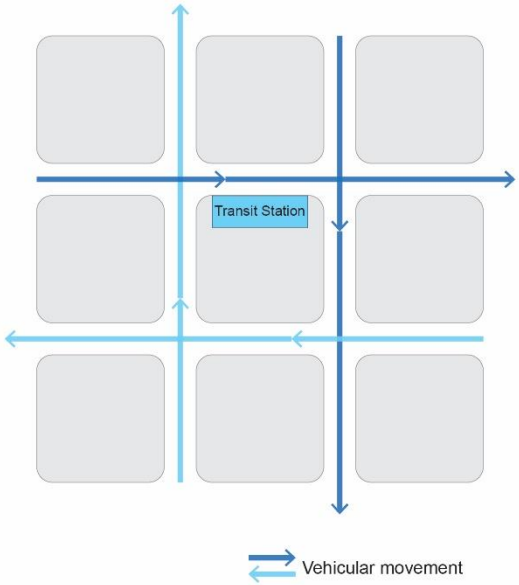

Major trunk route
Connectors

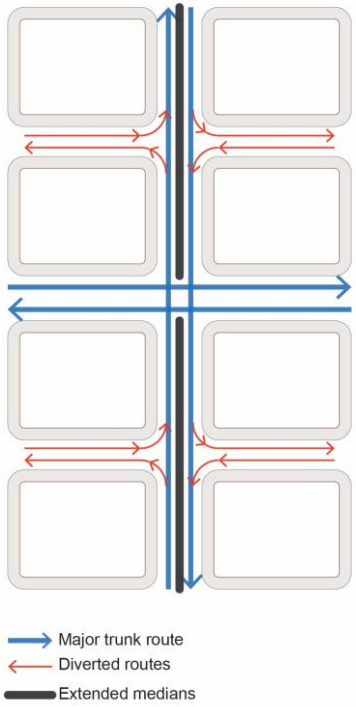
# CAPACITY


Transit Station
Vehicular movement

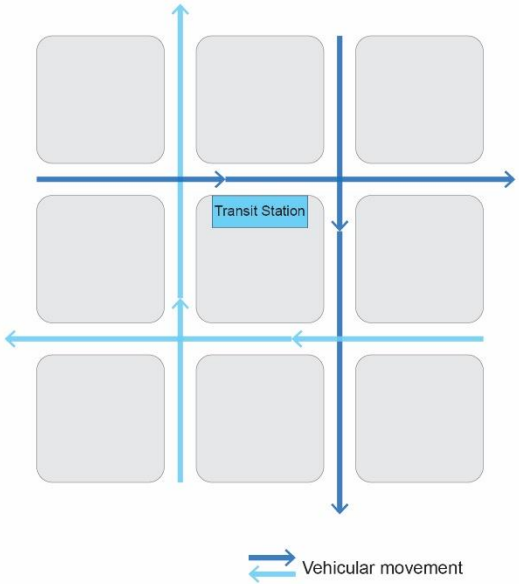

Major trunk route
Diverted routes
Road-blocks or Cul-de-sacs

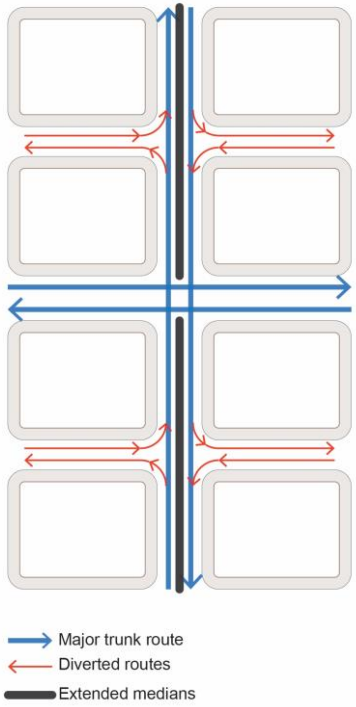
# CAPACITY


Transit Station
Vehicular movement


Major trunk route
Diverted routes
Extended medians

# CAPACITY





**One of the many entrances to Consolacao station on Avenida Paulista, Sao Paulo Brazil**
*(Wikimedia Commons)*

# SAFETY

WORLD BANK GROUP

UKaid

GRSF Global Road Safety Facility

WRI INDIA

# SAFETY

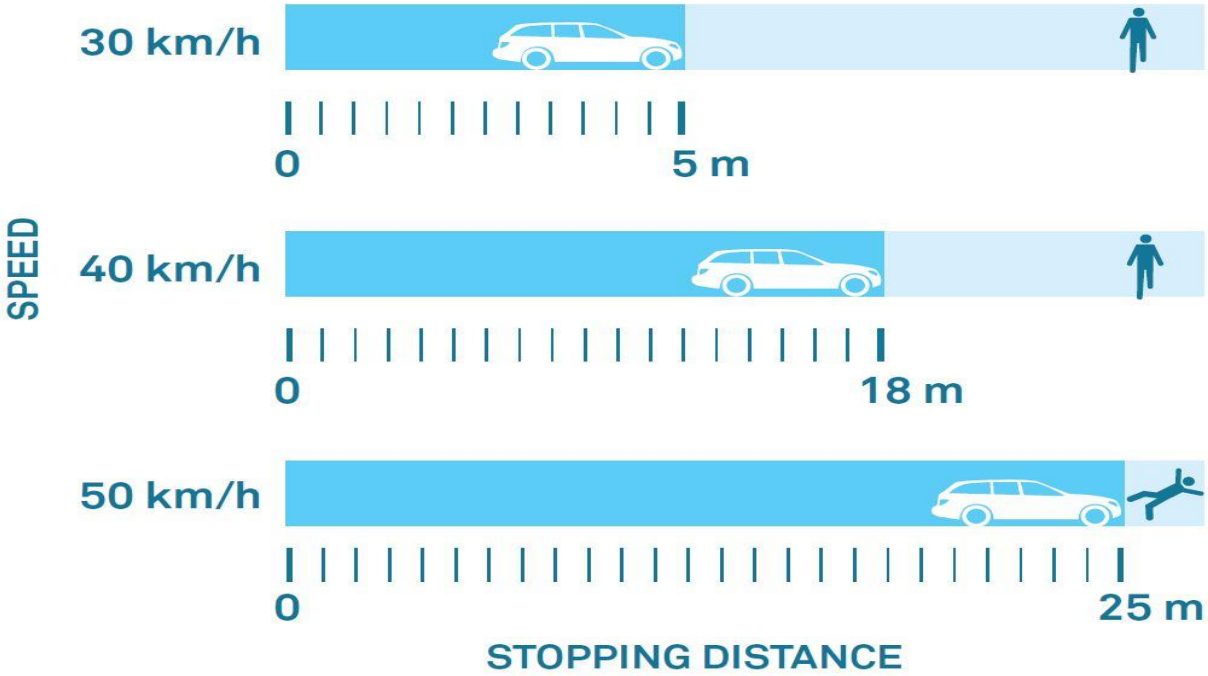
## Provide Dedicated Infrastructure

Segregated cycle lane in Rio de Janeiro Brazil *(WRI)*

Lane markings for cyclists in Mexico City *(WRI)*

# SAFETY

## Speed zoning & Traffic calming



# SAFETY

## Reducing vehicular traffic volume


**Different traffic restrictions on a street in Amsterdam, Netherlands** *(WRI)*

**Pedestrian only street in Sao Paolo, Brazil** *(The World Bank)*

# DESIGNING FOR SAFE ACCESS IN TOD

## Webinar Series. Session 3

### Integration of Road Safety Considerations in Transit-Oriented Development Projects

15 October 2020

WORLD BANK GROUP

*Supported by:*

UKaid from the British people

GRSF Global Road Safety Facility

*Conducted by:*

WRI INDIA


**Congested street in Mexico City, Mexico** *(WRI)*

WORLD BANK GROUP

UKaid

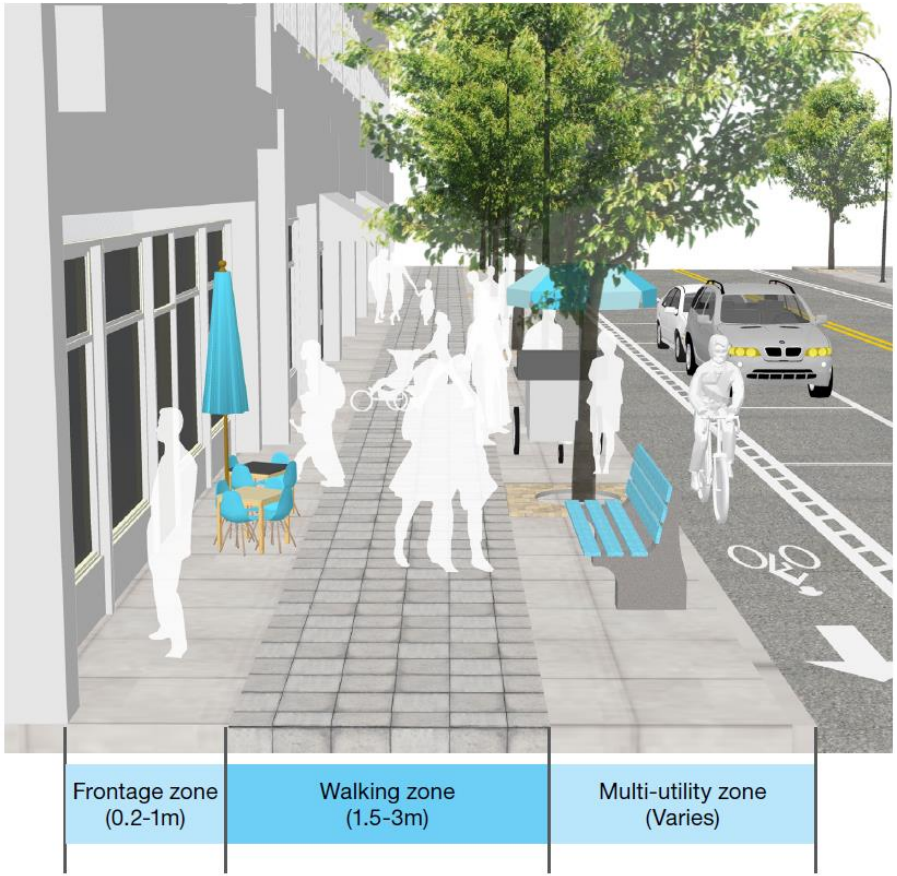
GRSF
Global Road Safety Facility

WRI INDIA

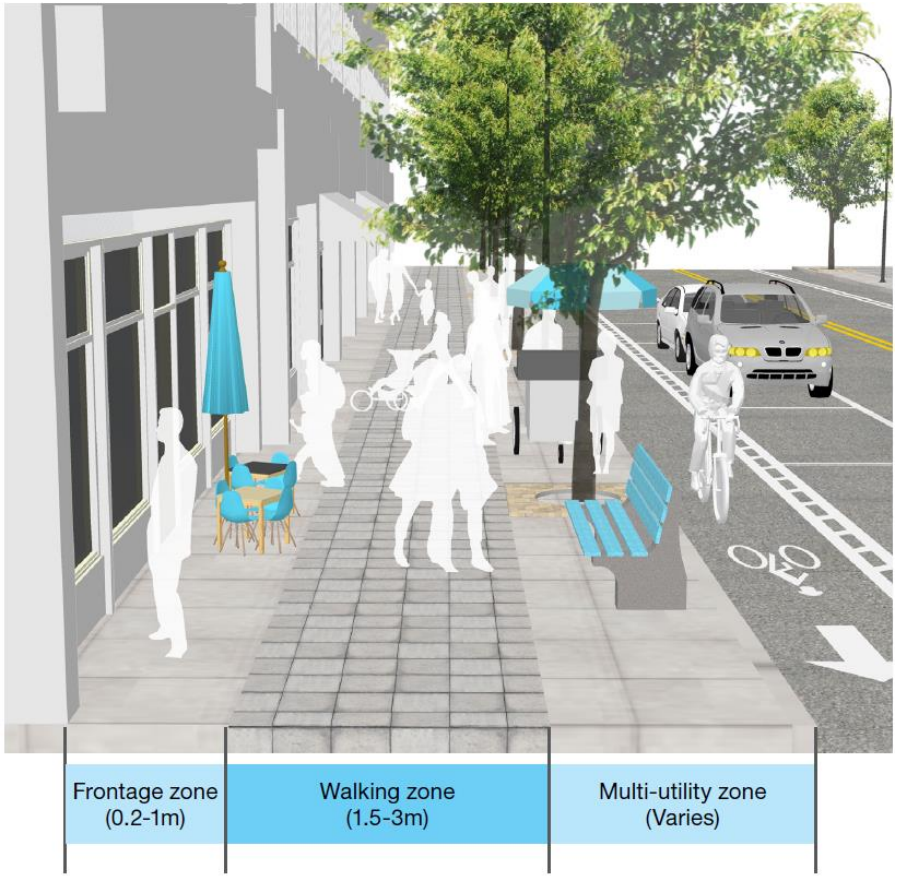
# WALKING INFRASTRUCTURE: SIDEWALK

**Pedestrian sidewalk near MG Road metro station in Bengaluru, India** *(WRI)*

# WALKING INFRASTRUCTURE: SIDEWALK

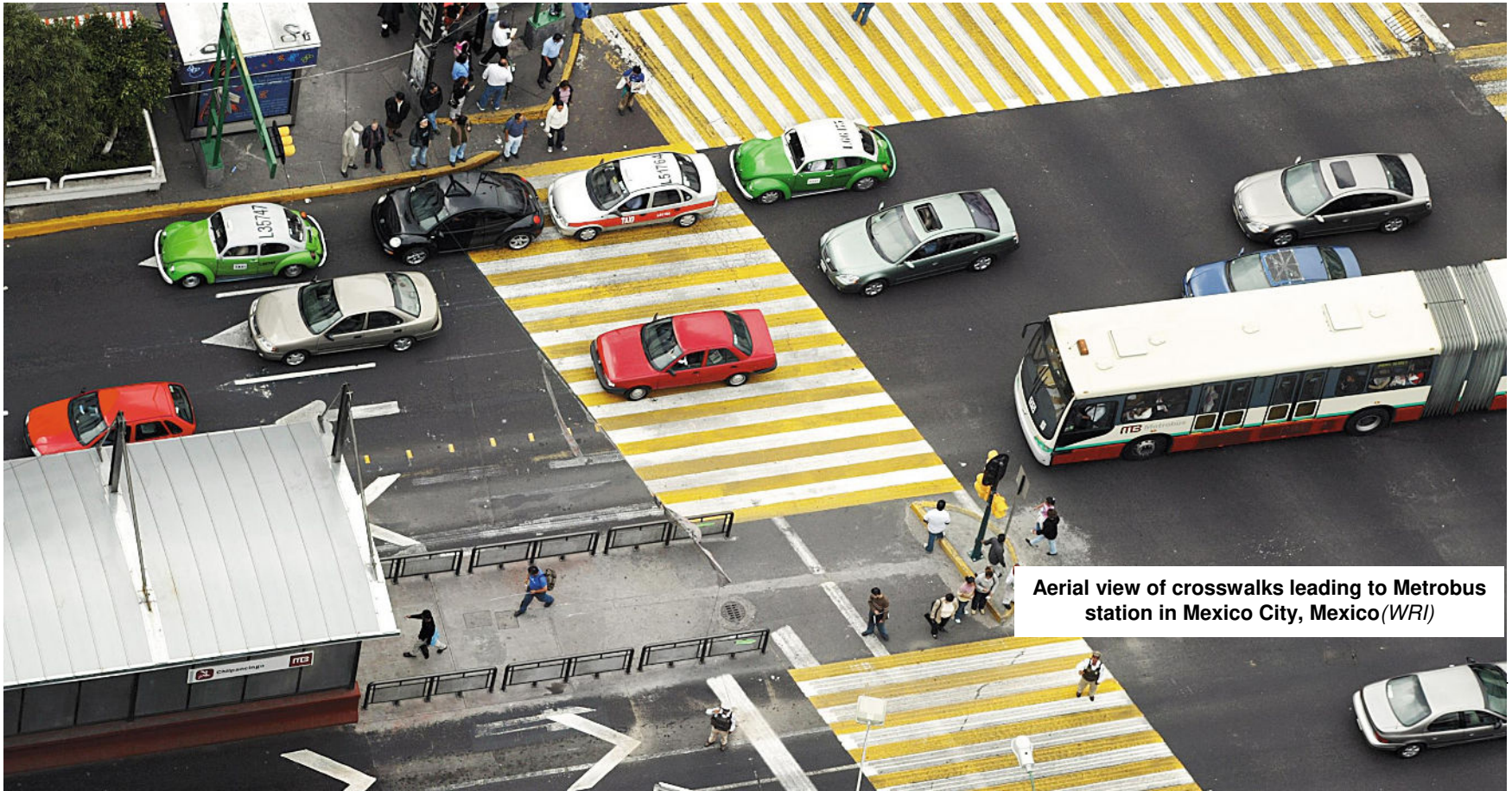


# WALKING INFRASTRUCTURE: SIDEWALK



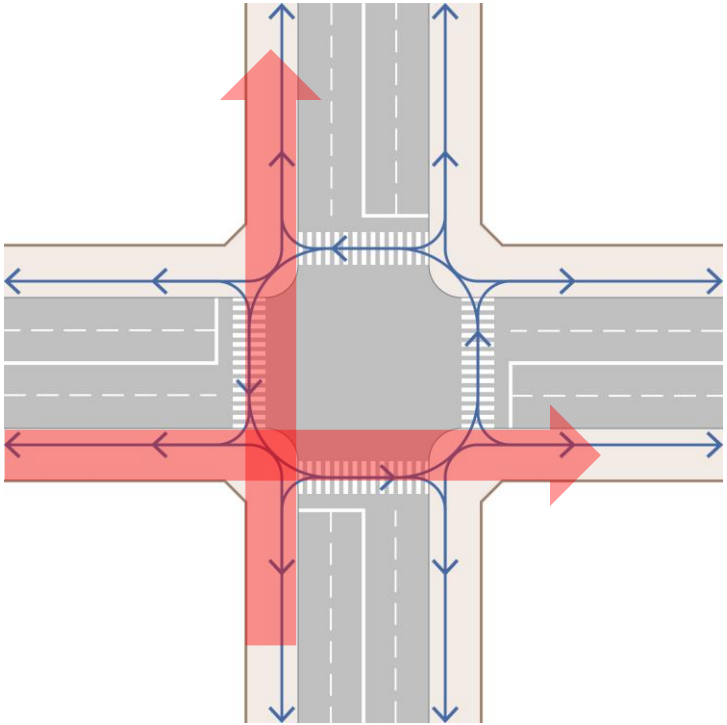

**Active sidewalk with on street vending in Mumbai, India***(The World Bank)*

# WALKING INFRASTRUCTURE: CROSSINGS

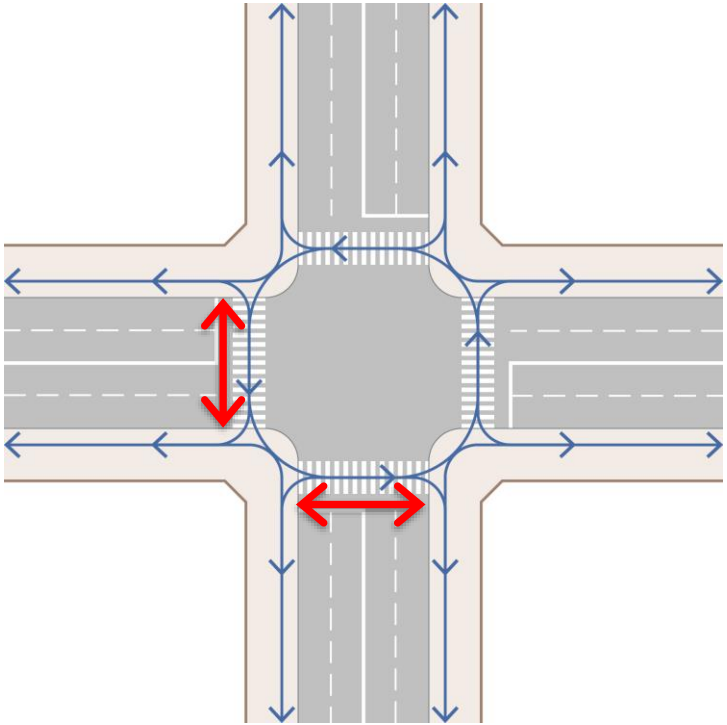


**Aerial view of crosswalks leading to Metrobus station in Mexico City, Mexico** *(WRI)*

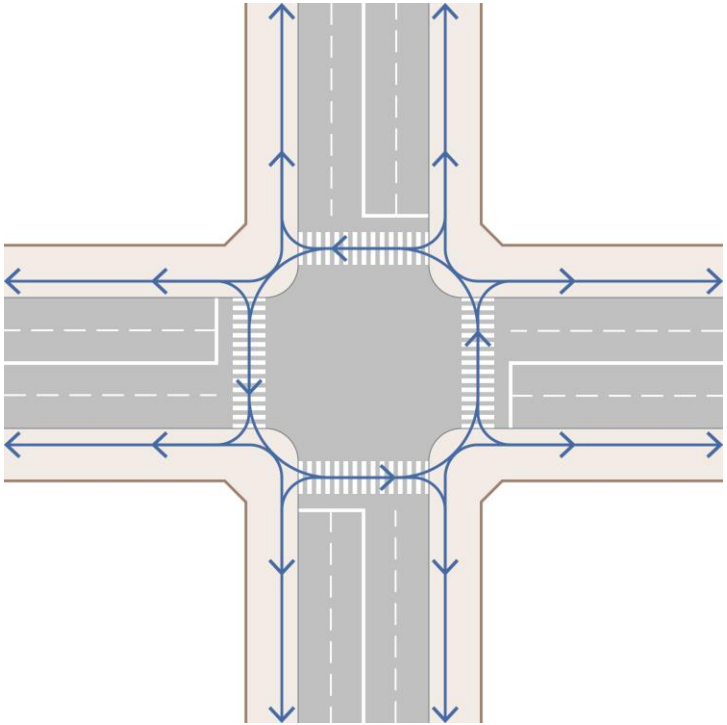
# WALKING INFRASTRUCTURE: CROSSINGS

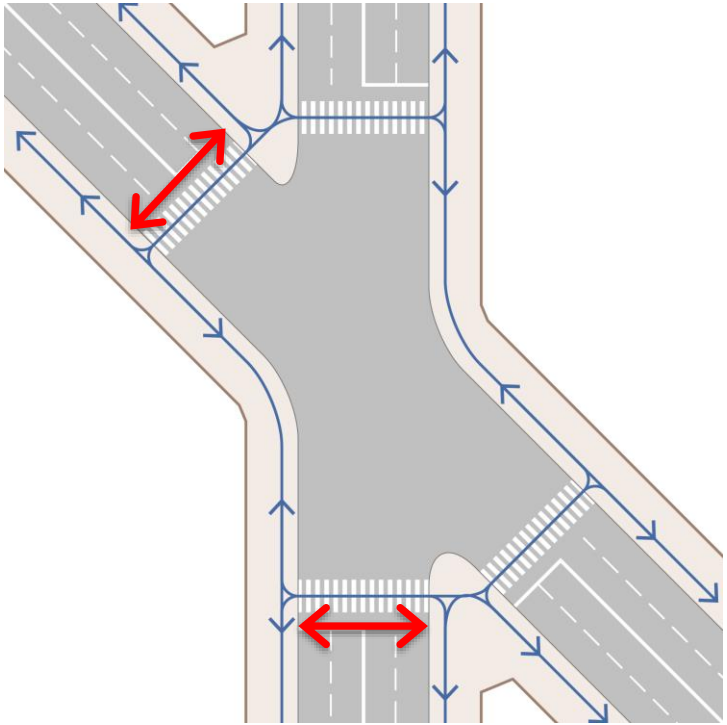


# WALKING INFRASTRUCTURE: CROSSINGS

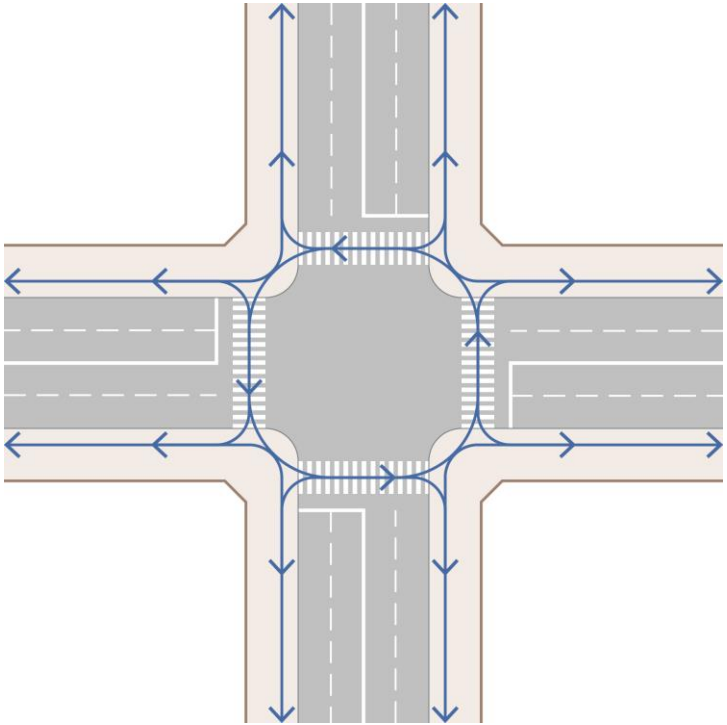


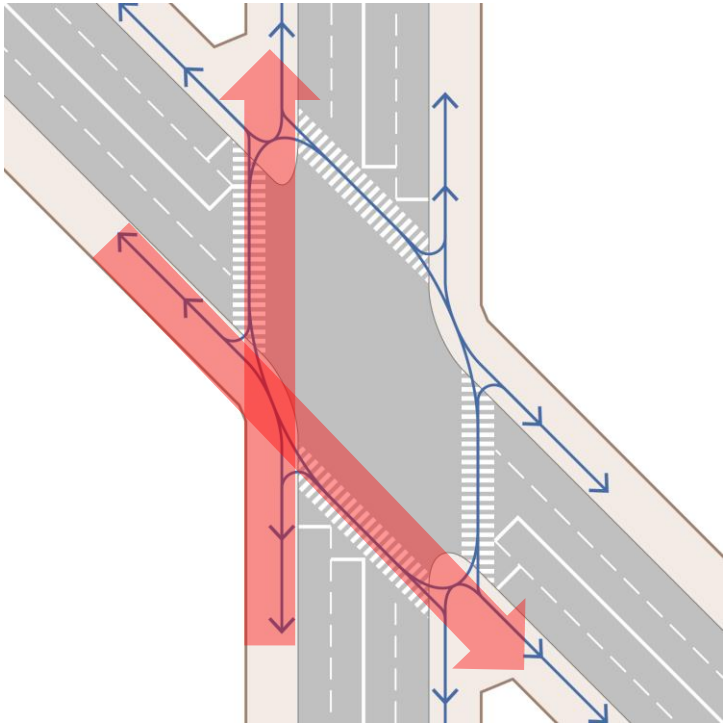
# WALKING INFRASTRUCTURE: CROSSINGS



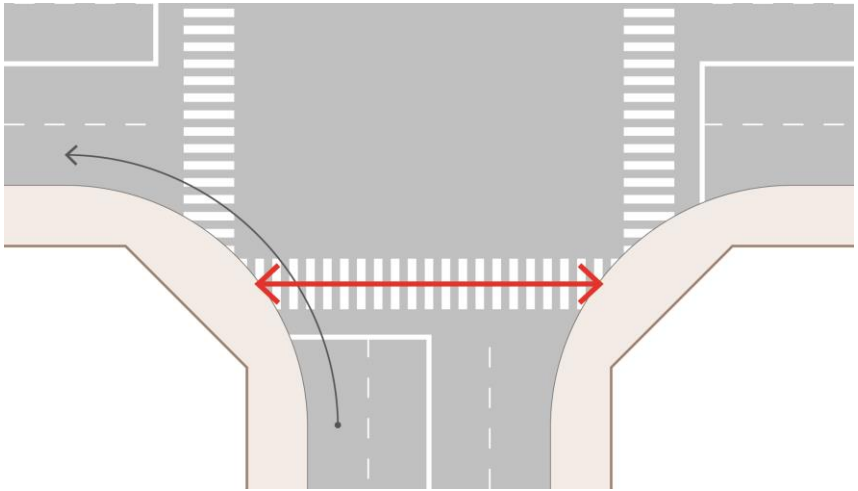


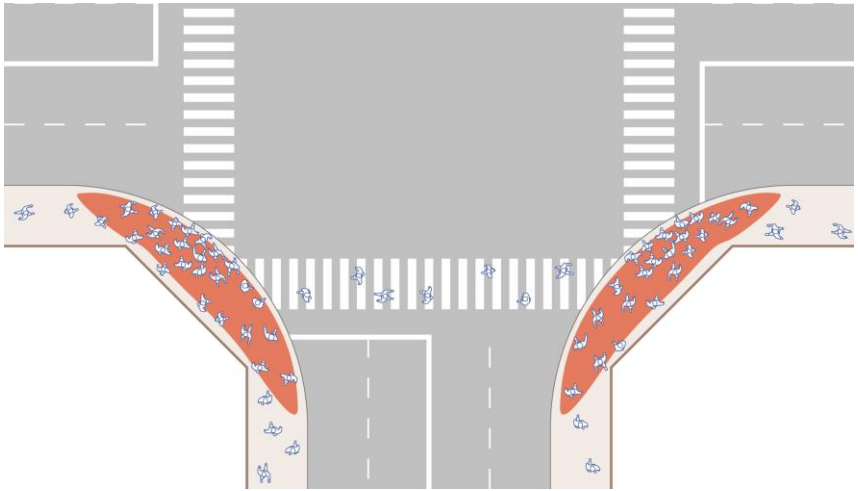
# WALKING INFRASTRUCTURE: CROSSINGS



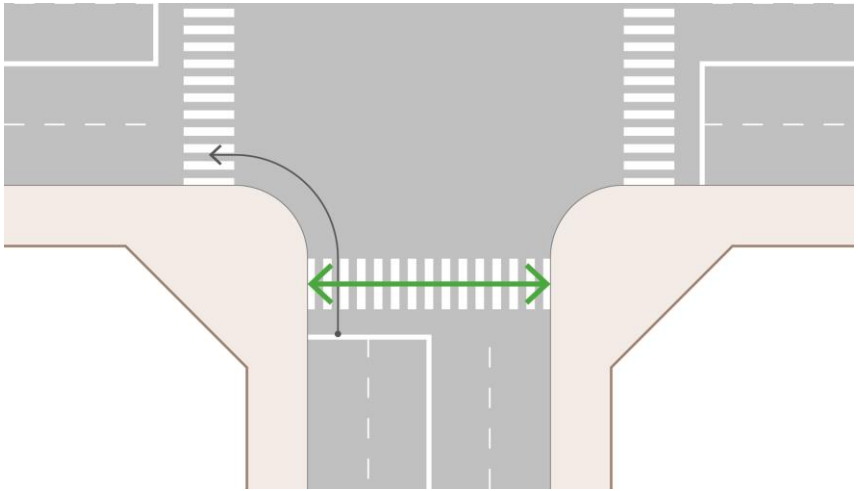


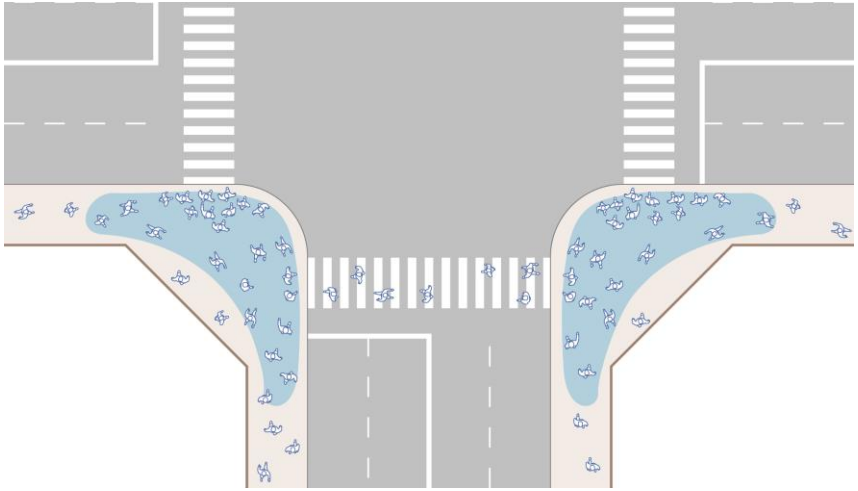
# WALKING INFRASTRUCTURE: CROSSINGS



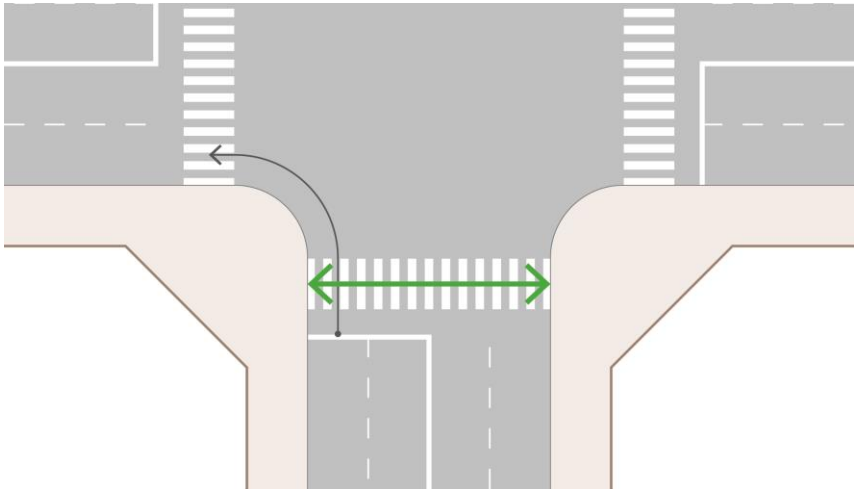


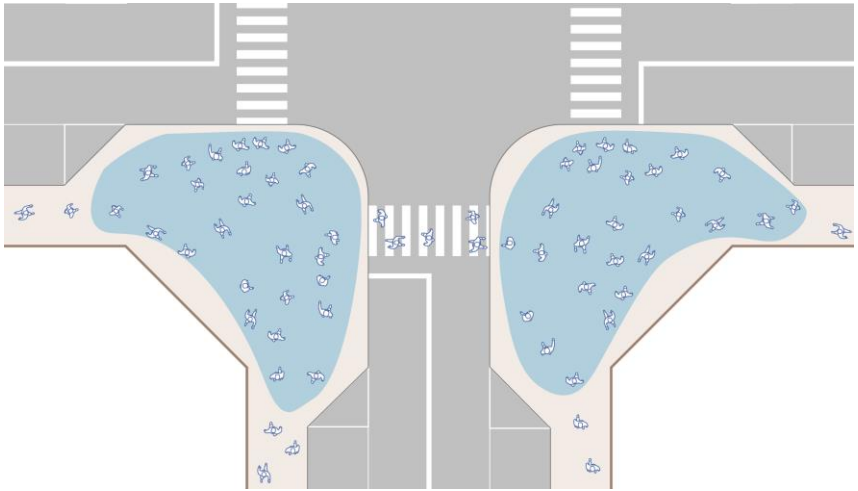
# WALKING INFRASTRUCTURE: CROSSINGS





# WALKING INFRASTRUCTURE: CROSSINGS





# WALKING INFRASTRUCTURE: OFF-ROAD CROSSING

**Pedestrian foot-over-bridge near ITO metro station in New Delhi, India** *(The World Bank)*


**Pedestrian walkway connecting to Novena metro station from nearby developments in Singapore** *(The World Bank)*

# CYCLING INFRASTRUCTURE

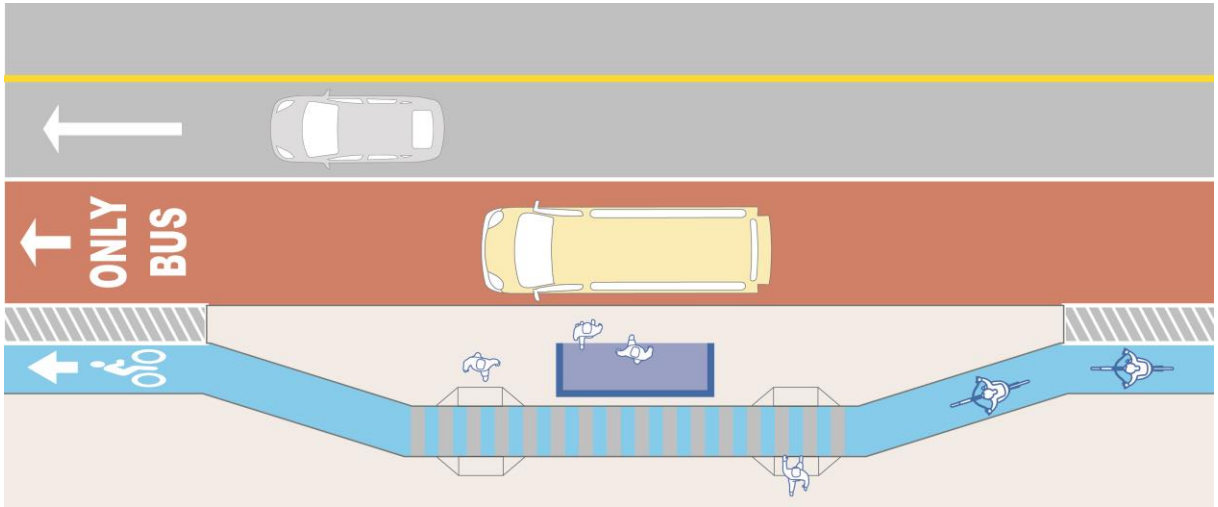

***Marked cycle lanes in Shanghai, China*** *(WRI)*

**Segregated cycle lane in Ahmedabad, India** *(WRI)*

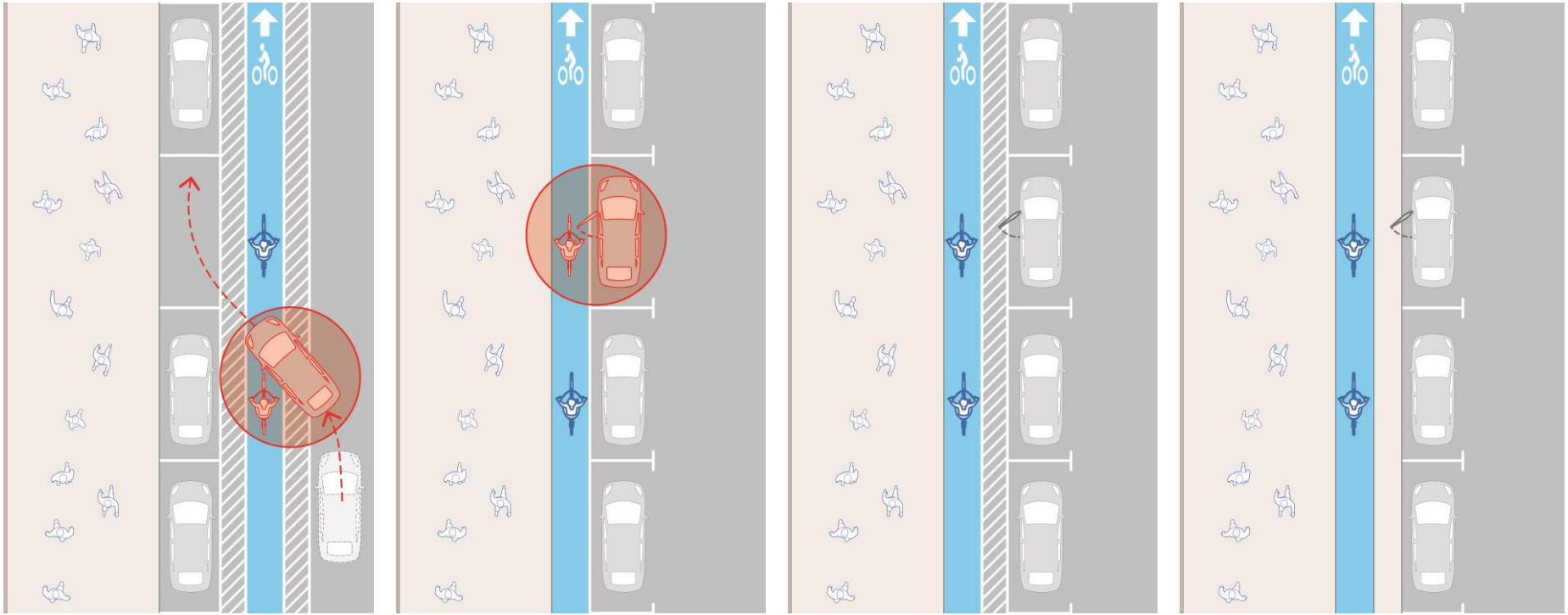
# CYCLING INFRASTRUCTURE: CONFLICTS


**Cyclist going around a feeder bus in London, UK** *(WRI)*

# CYCLING INFRASTRUCTURE: CONFLICTS



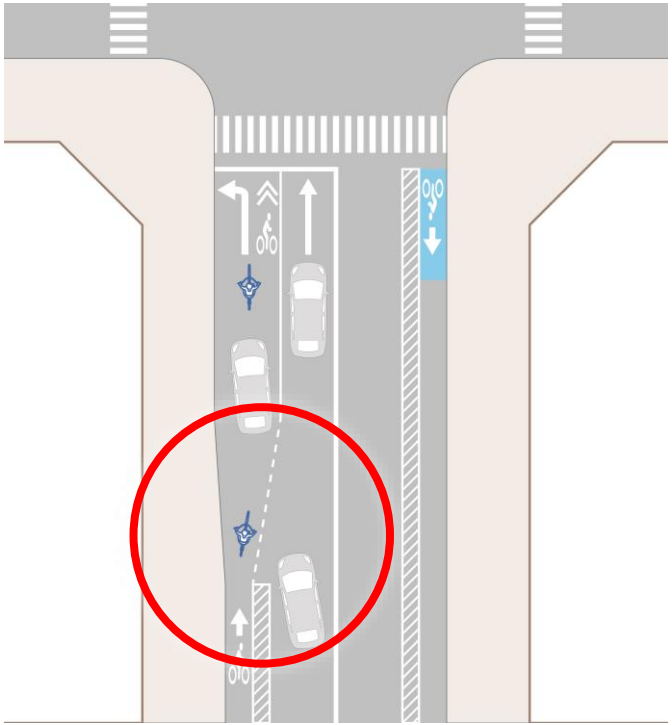
# CYCLING INFRASTRUCTURE: CONFLICTS

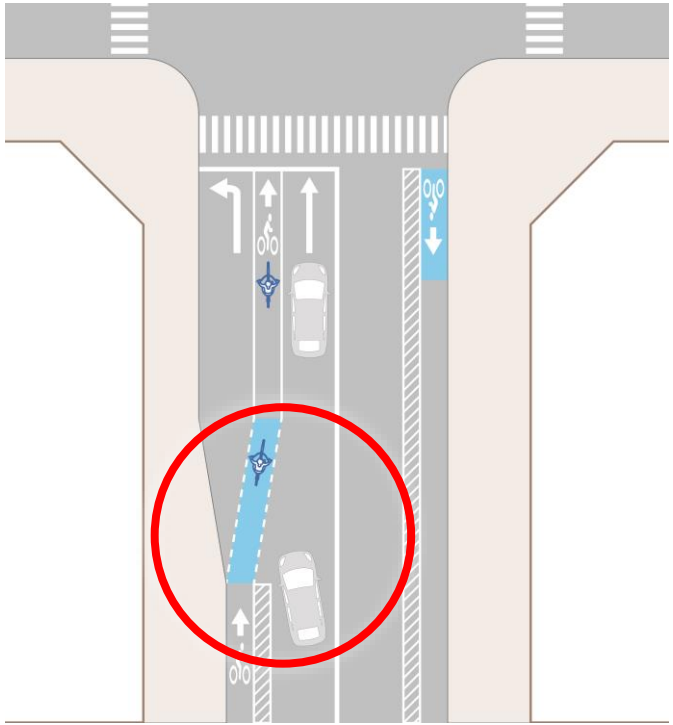


# CYCLING INFRASTRUCTURE: INTERSECTIONS

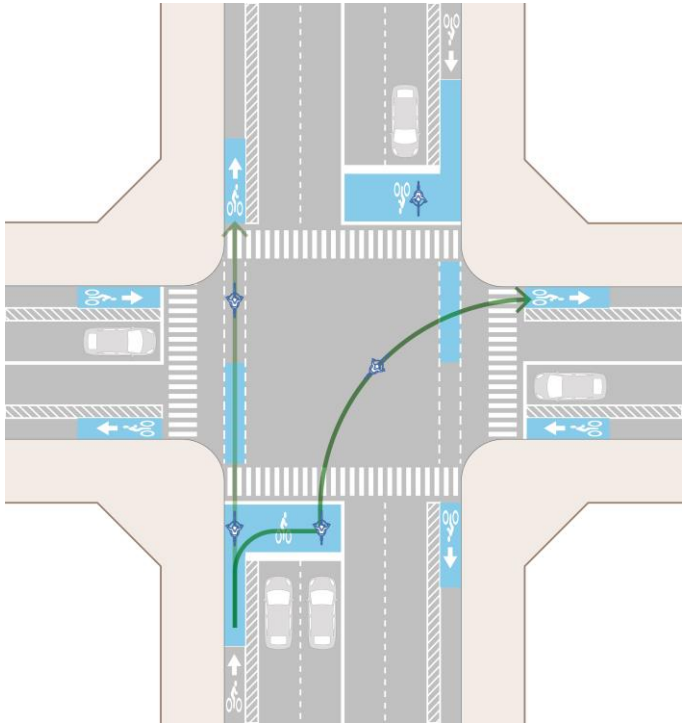

**Large unsafe intersection for cycle infrastructure, China** *(WRI)*

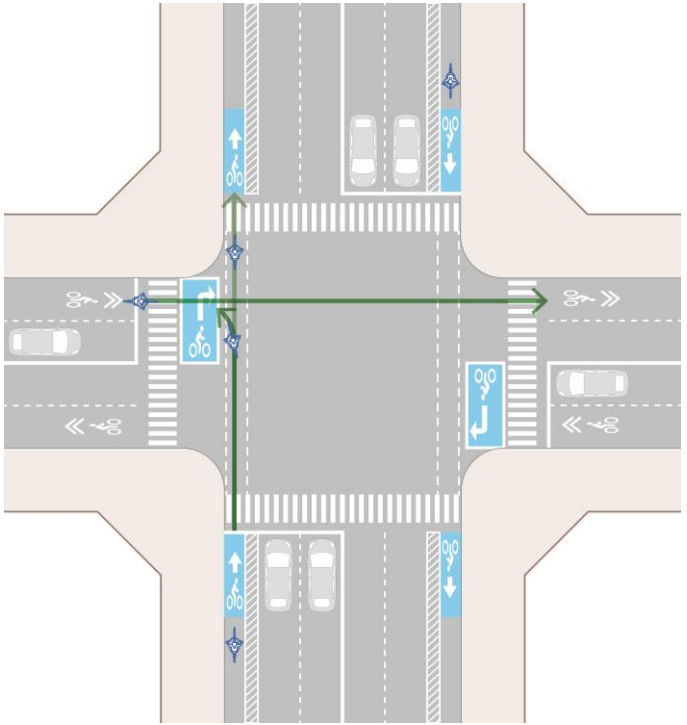
# CYCLING INFRASTRUCTURE: INTERSECTIONS



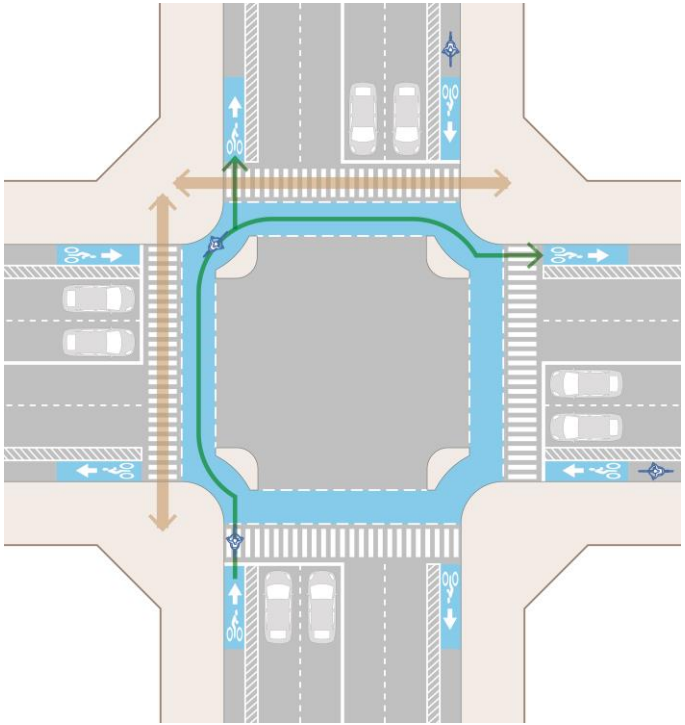


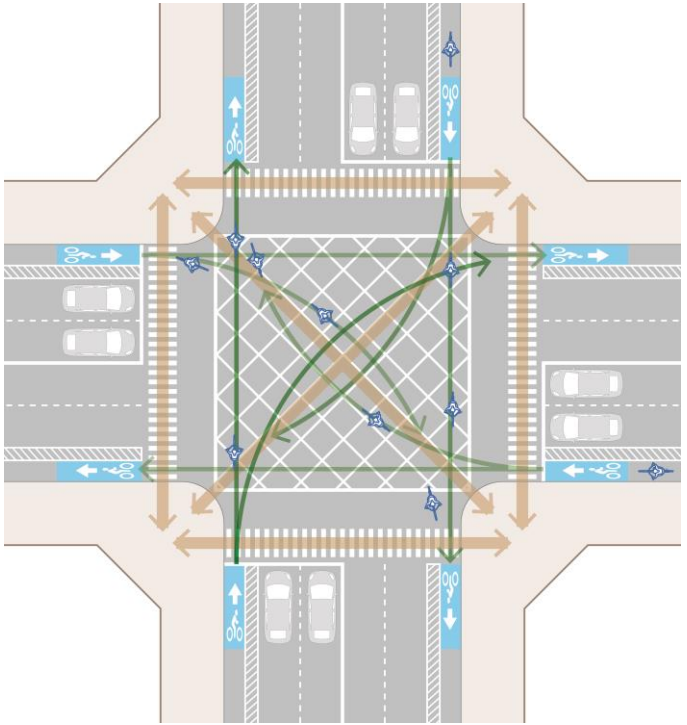
# CYCLING INFRASTRUCTURE: INTERSECTIONS





# CYCLING INFRASTRUCTURE: INTERSECTIONS





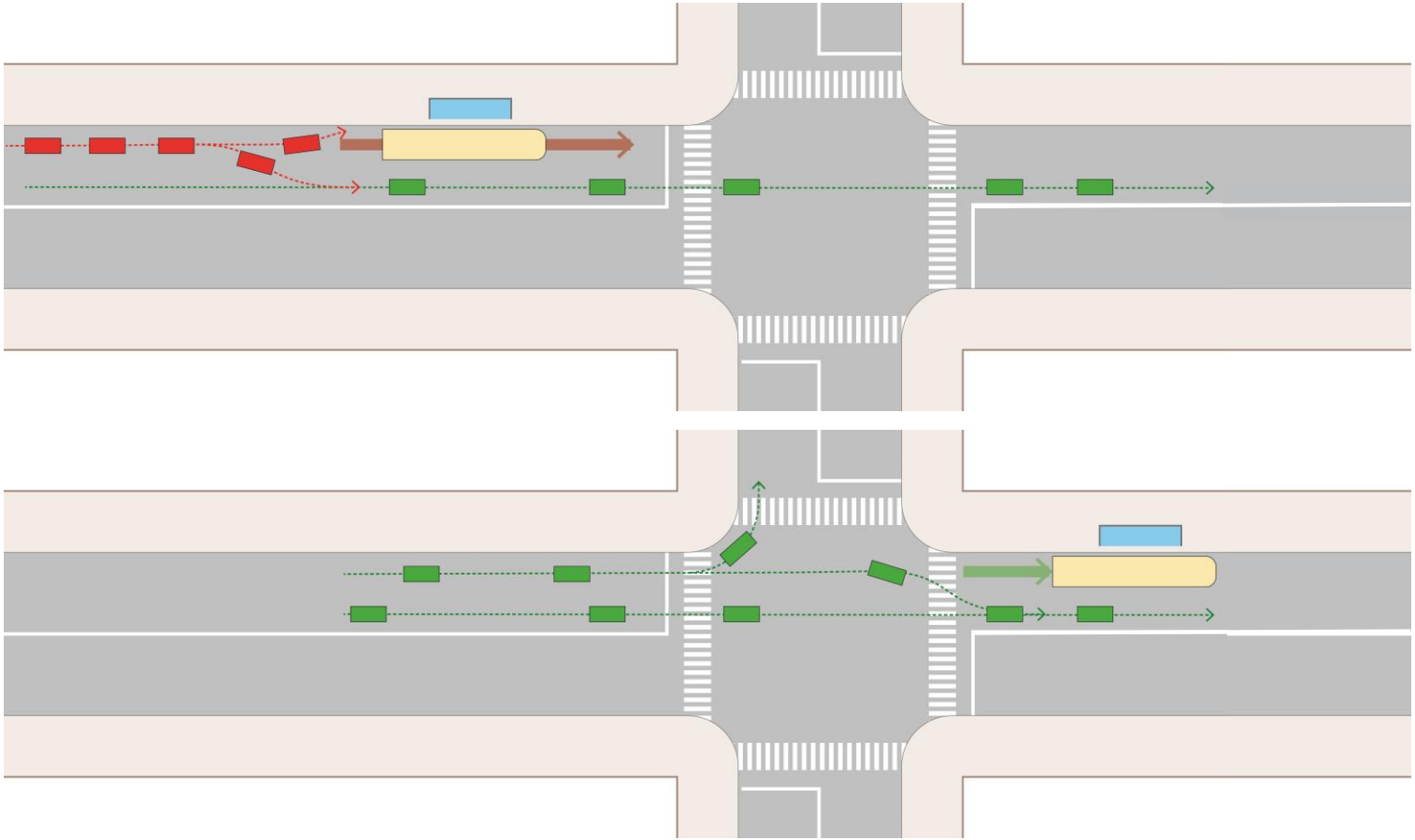
# FEEDER NETWORK

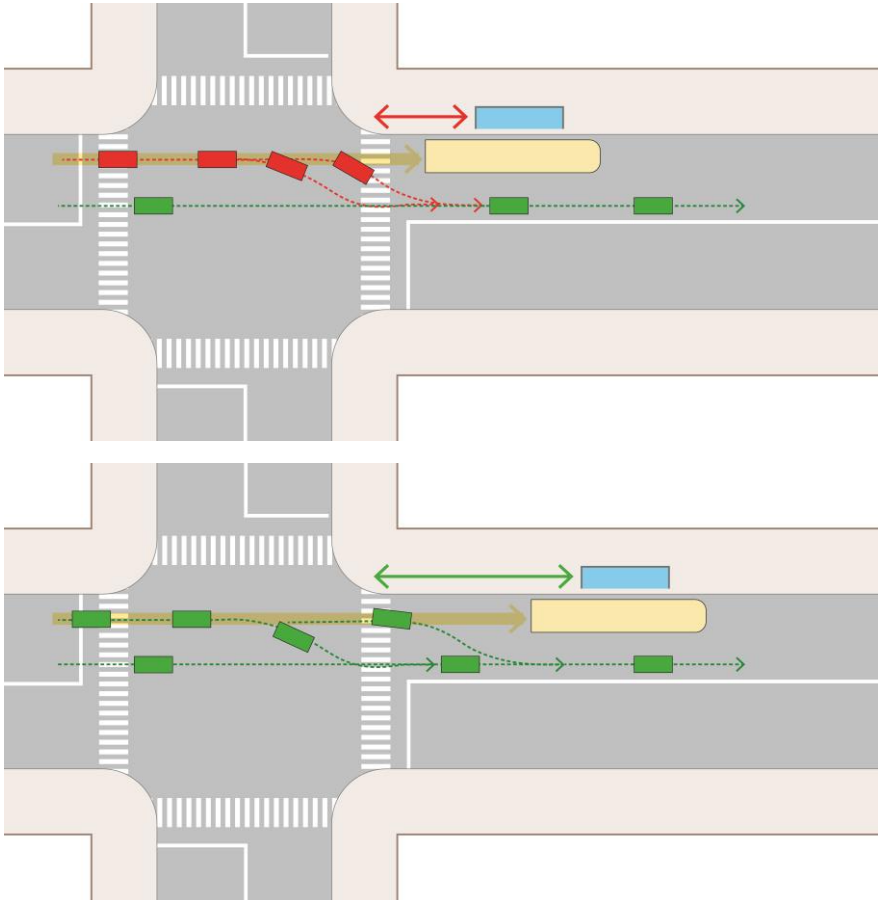

**Commuters waiting at feeder bus stop in Porto Alegre, Brazil** *(WRI)*


**Paratransit taxi service in the Historic Peninsula area of Istanbul, Turkey** *(WRI)*

# FEEDER NETWORK: BUS INFRASTRUCTURE

# FEEDER NETWORK: BUS INFRASTRUCTURE





# FEEDER NETWORK: BUS INFRASTRUCTURE

# FEEDER NETWORK: PARATRANSIT

**Autorickshaws and other paratransit modes queued up outside a metro station in New Delhi, India** *(The World Bank)*

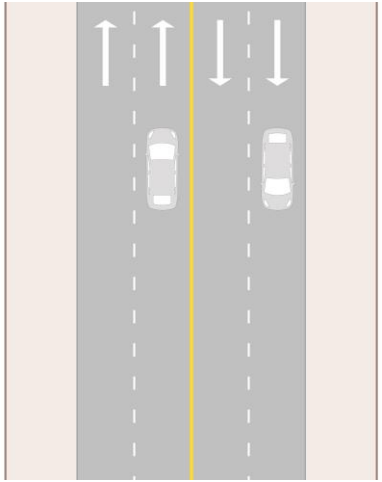
**Autorickshaws and pedestrians queueing up outside Bandra suburban rail station in Mumbai, India***(WRI)*

# SHARED STREET INFRASTRUCTURE

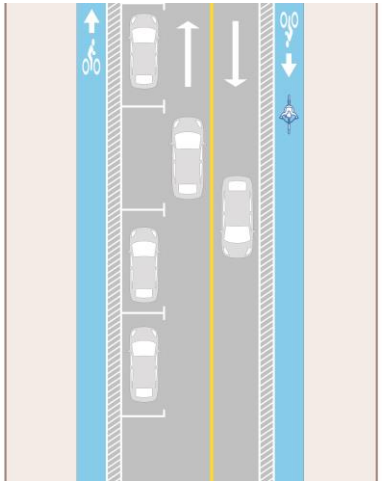

**Shared space in Bogota, Colombia** *(NACTO)*

# SHARED STREET INFRASTRUCTURE

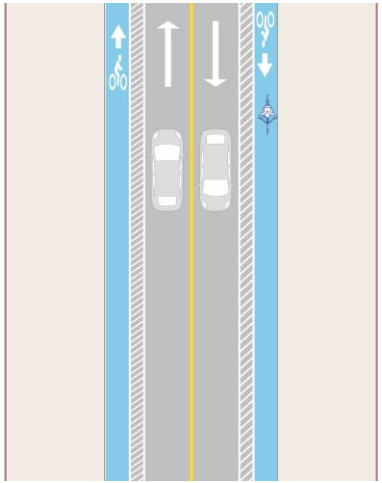
Existing



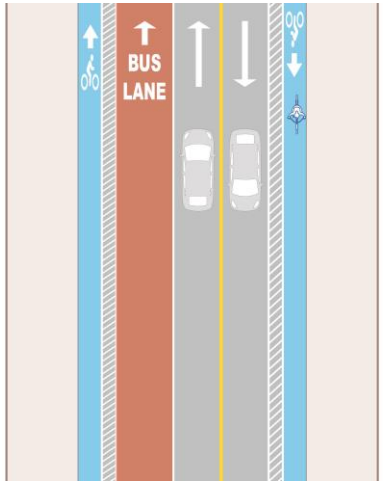
Parking with bike lanes



Wide sidewalks with bike lanes



Feeder bus lane



# SHARED STREET INFRASTRUCTURE


**Parklet designed along Robson Street in Vancouver, Canada** *(Flickr)*

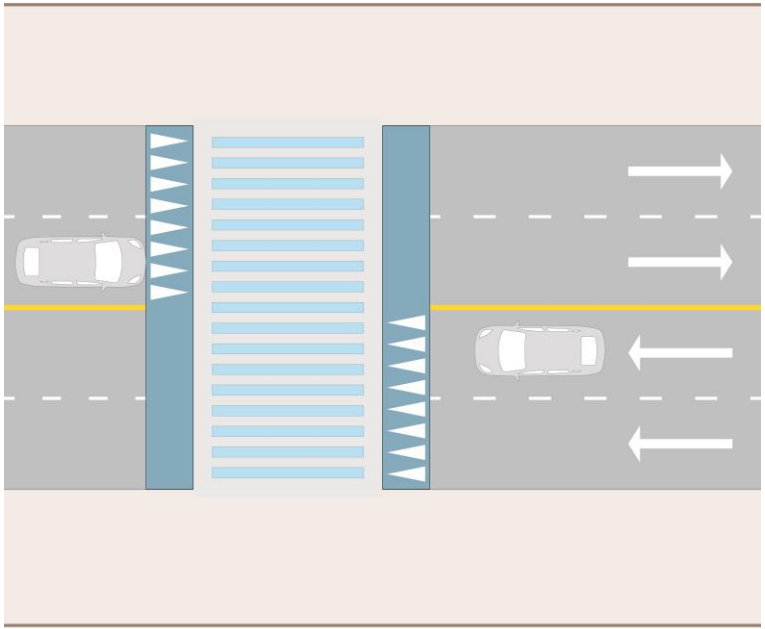
# SHARED STREET INFRASTRUCTURE

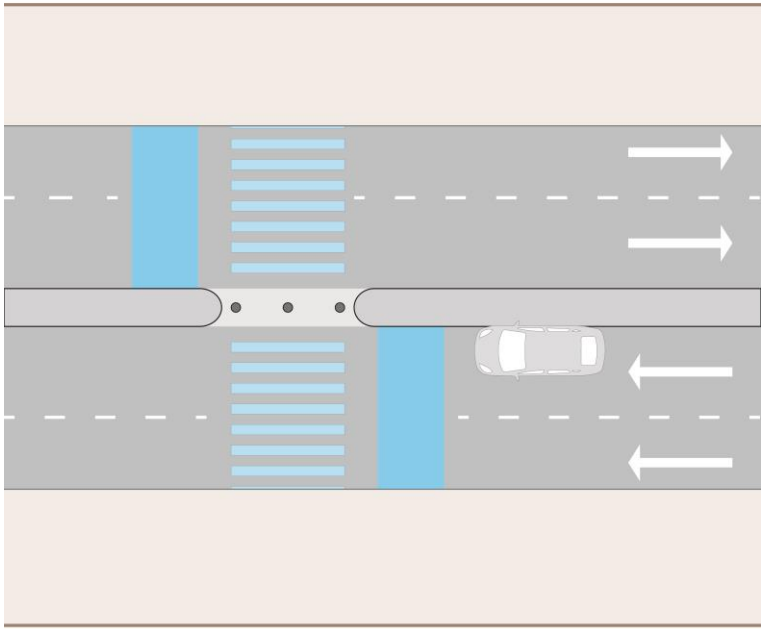
**Speed bumps**

**Speed hump**

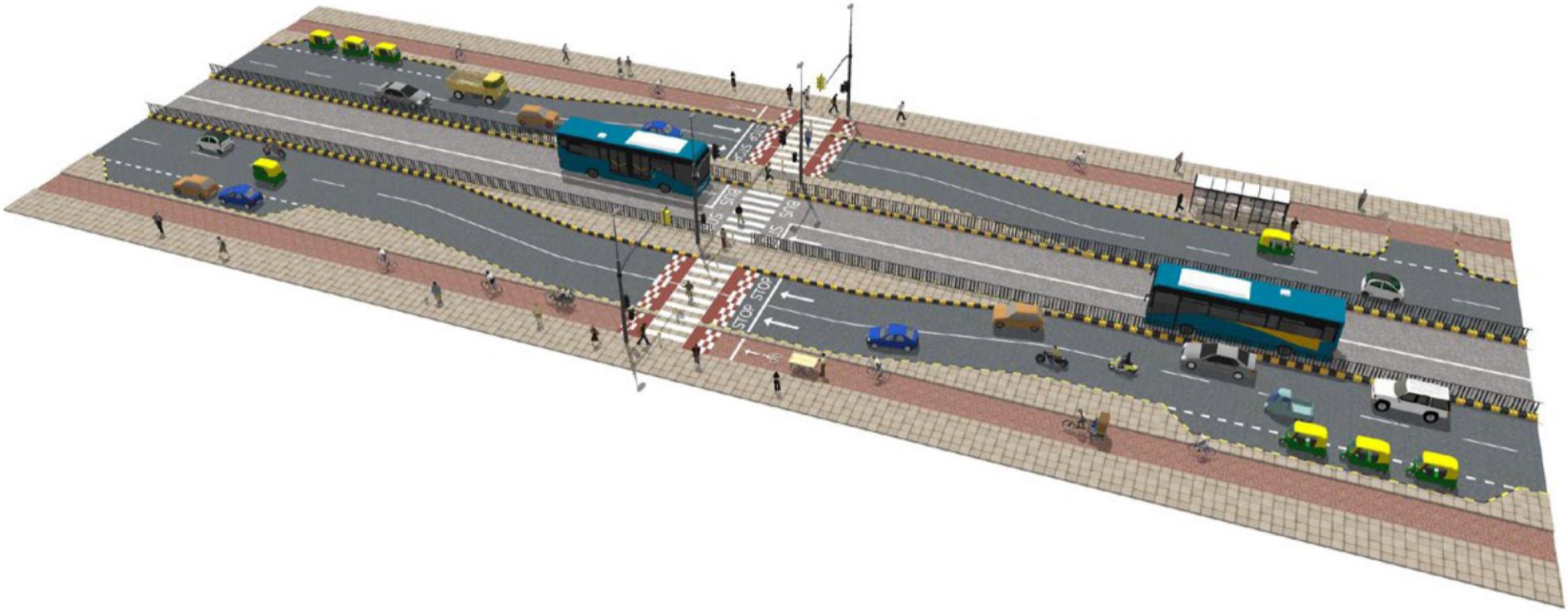
**Speed Table**

# SHARED STREET INFRASTRUCTURE

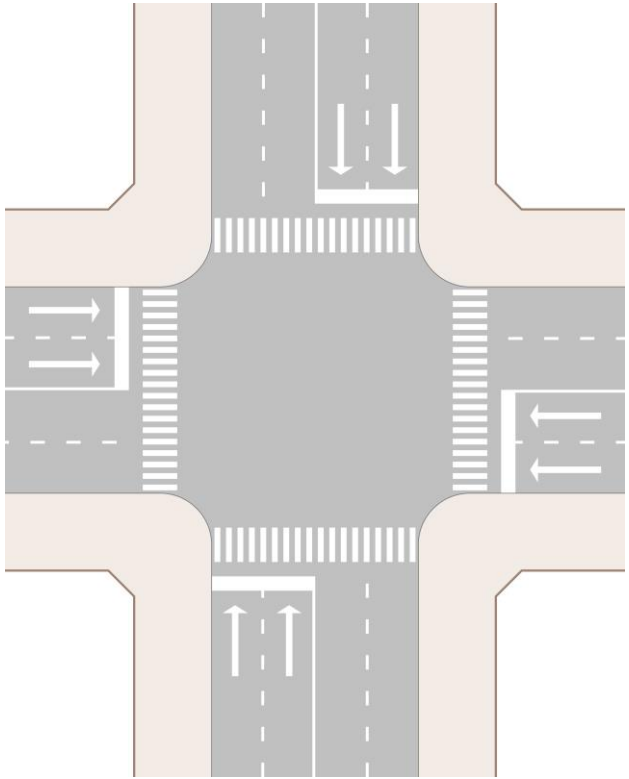


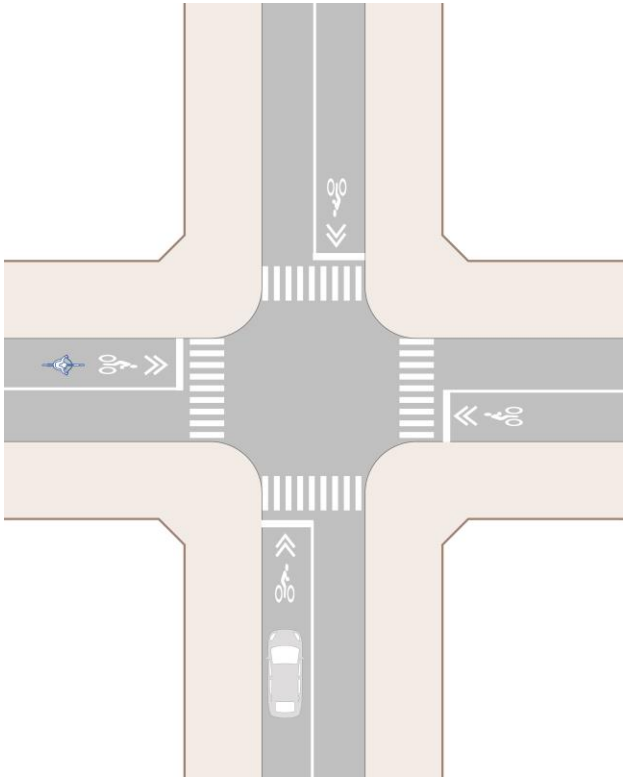


# SHARED STREET INFRASTRUCTURE

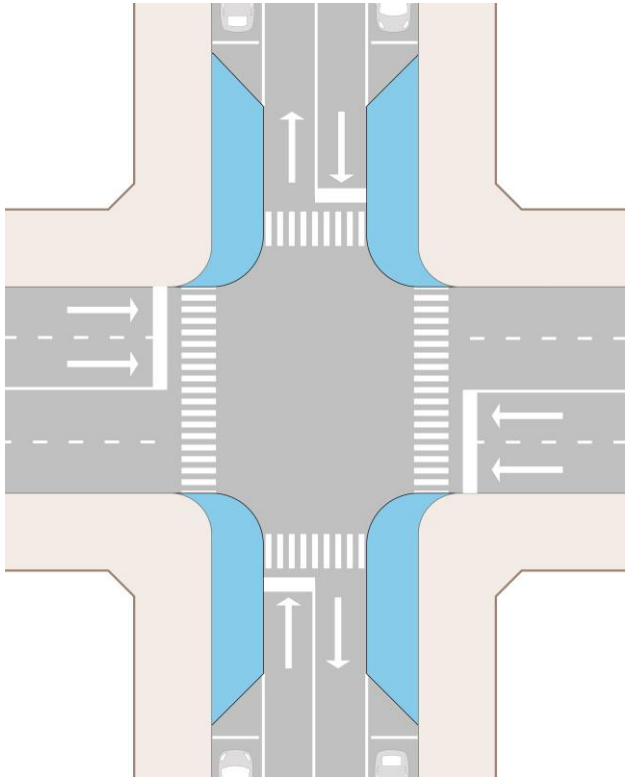


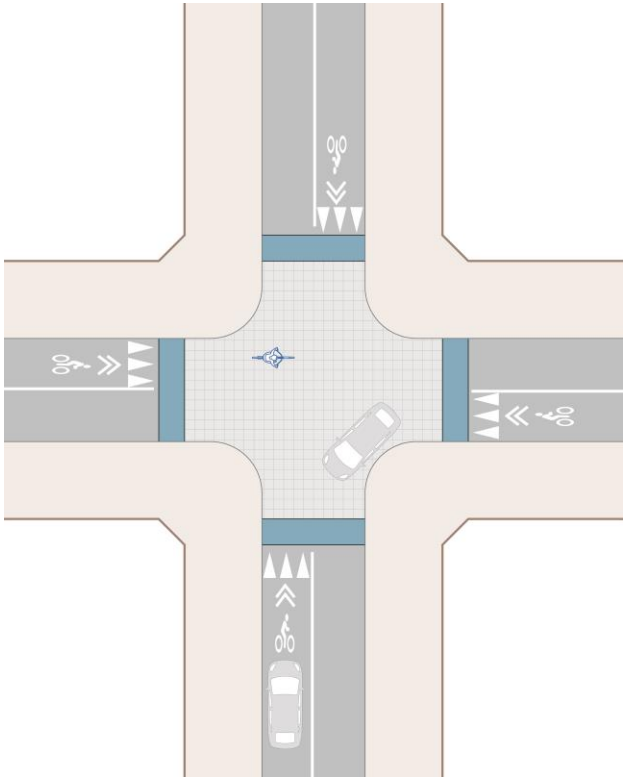
# SHARED STREET INFRASTRUCTURE



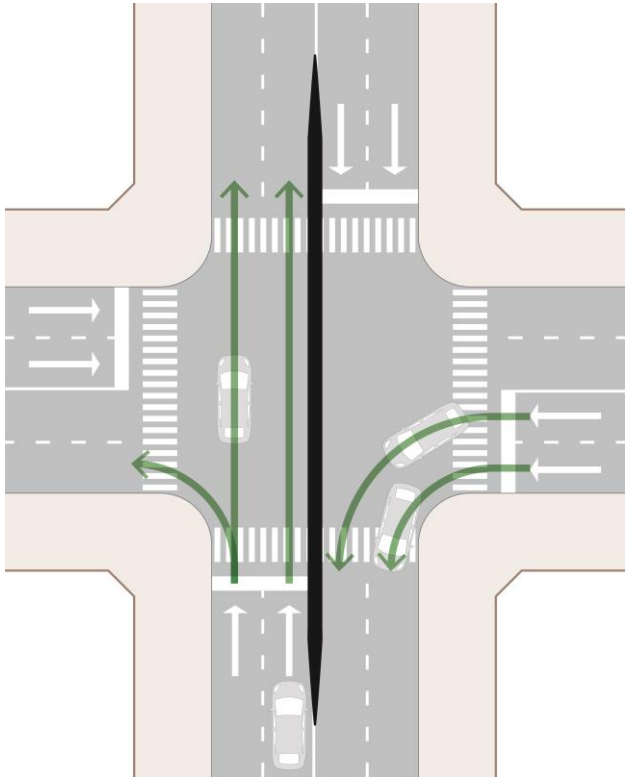


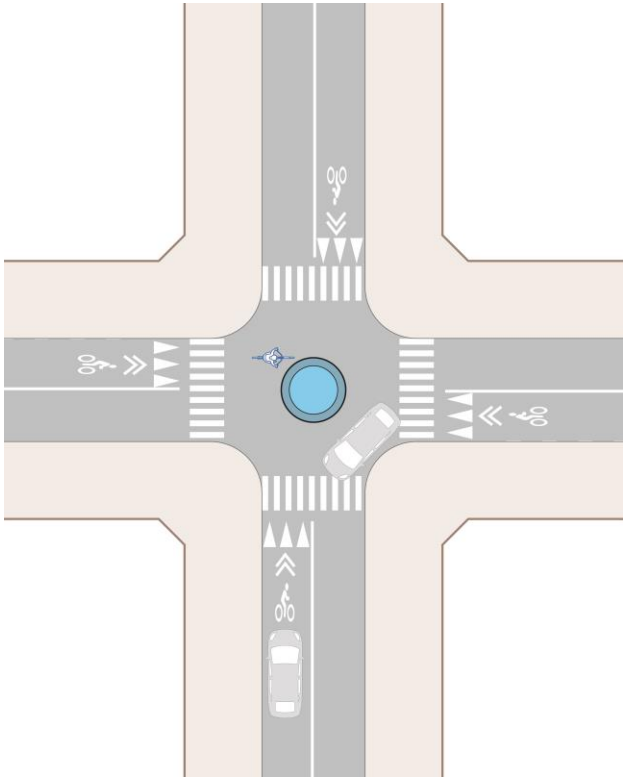
# SHARED STREET INFRASTRUCTURE





# SHARED STREET INFRASTRUCTURE





# PRIMARY STATION AREA DESIGN


**Accessing BRT in Belo Horizonte, Brazil** *(WRI)*

# PRIMARY STATION AREA DESIGN: ACCESS


DN Nagar metro station access stairs obstructing pedestrian movement in Mumbai, India *(WRI)*


Bus stop obstructing pedestrian movement in Mumbai, India *(WRI)*

# PRIMARY STATION AREA DESIGN: ACCESS


**At-grade crossing and ramps for accessibility by persons with disability Bogota Colombia** *(WRI)*


**Jaywalking outside Lower Parel suburban train station in Mumbai, India** *(WRI)*


**Guardrail protect BRT lanes to minimize jaywalking in Ahmedabad, India** *(WRI)*

# PRIMARY STATION AREA DESIGN: ACCESS

**Pedestrian ramp connecting to BRT station in Bogota, Colombia** *(The World Bank)*

**Pedestrian FOB providing access to developments along BRT in Bogota, Colombia** *(The World Bank)*

# PRIMARY STATION AREA DESIGN: TRANSFERS

**Outdoor bicycle rack in Bogota, Colombia** *(The World Bank)*


**Bikeshare station in Porto Alegre, Brazil** *(WRI)*

WORLD BANK GROUP UKaid GRSF Global Road Safety Facility WRI INDIA

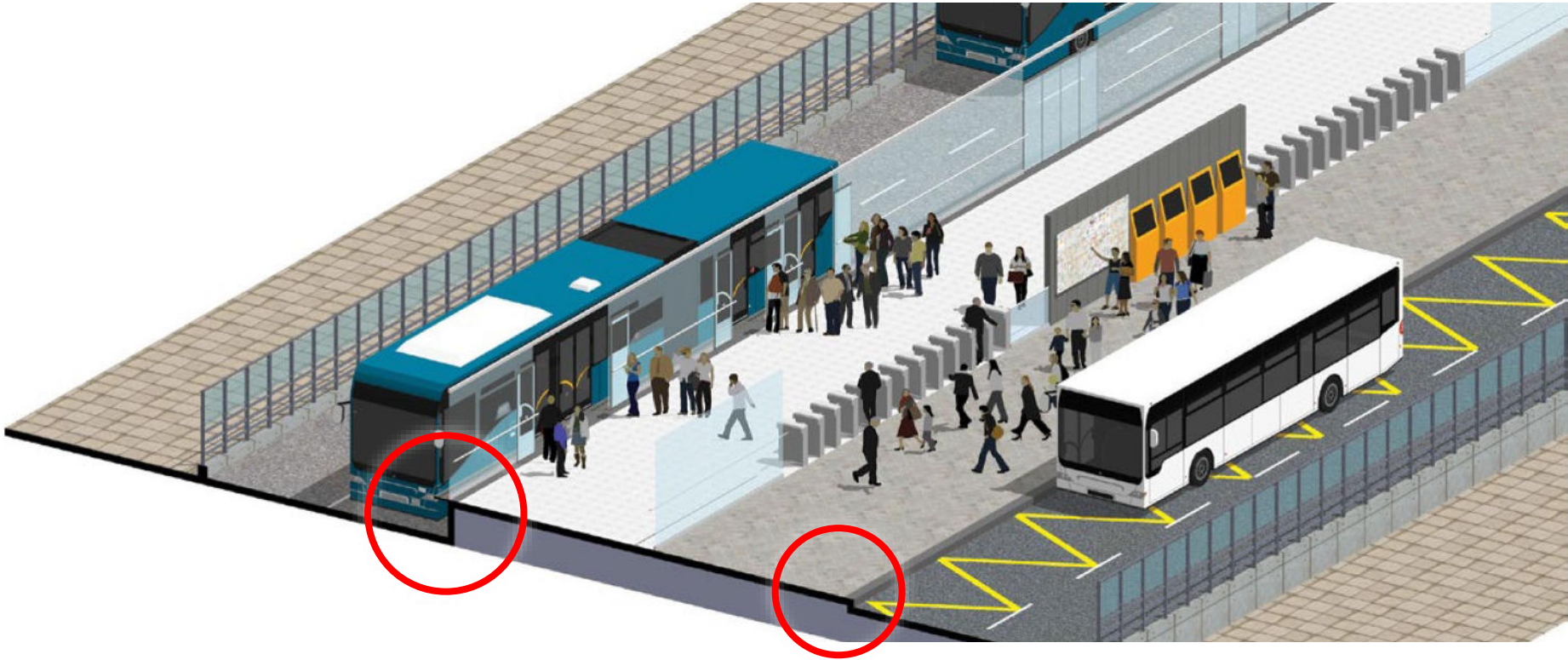
# PRIMARY STATION AREA DESIGN: TRANSFERS

Feeder bus access ramp to upper level access at Thane station, India *(WRI)*

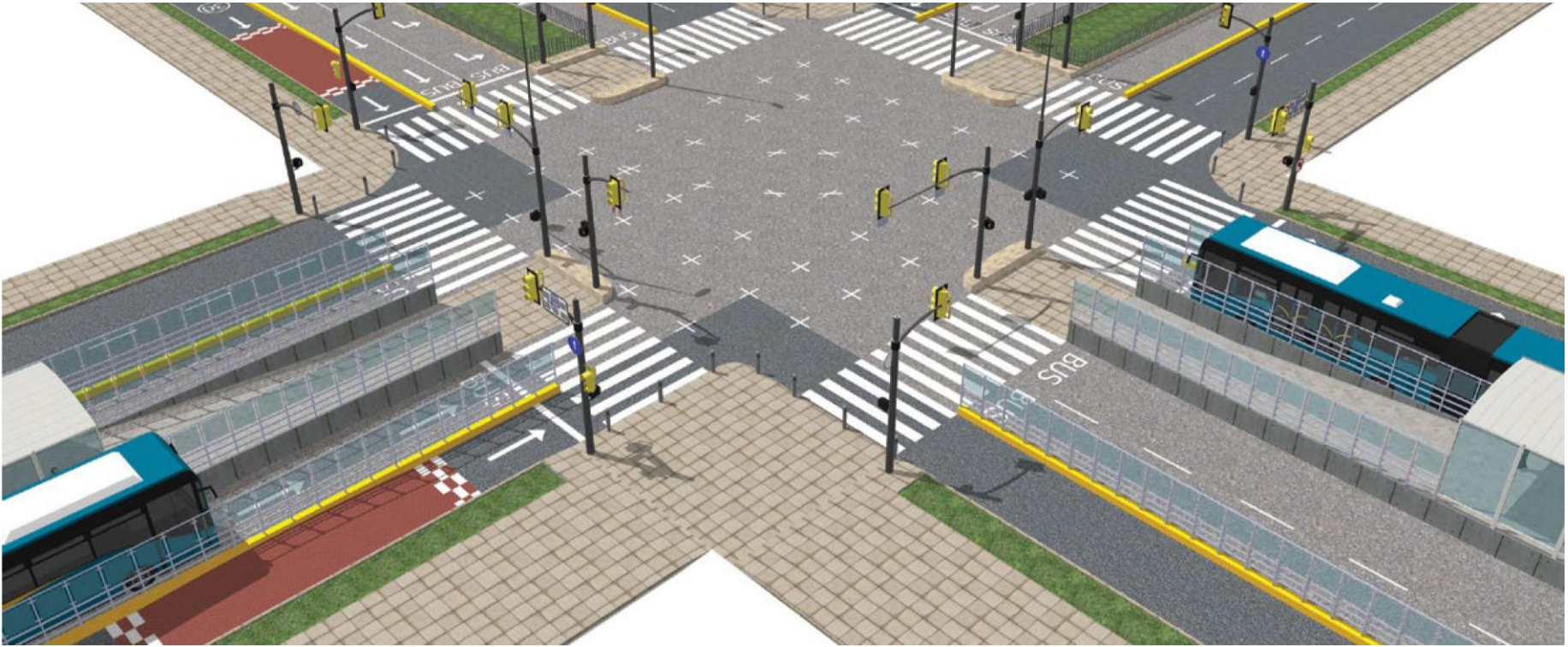

Paratransit facility queueing at lower level of Thane station, India *(WRI)*

WORLD BANK GROUP UKaid GRSF Global Road Safety Facility WRI INDIA

# PRIMARY STATION AREA DESIGN: TRANSFERS



# PRIMARY STATION AREA DESIGN: TRANSFERS




**Capacity redistribution along a street in Brazil** *(WRI)*

# THANK YOU

**Prerna V. Mehta**
Lead - Integrated Urban Development
prerna.mehta@wri.org

**Abhishek Behera**
Consultant – Sustainable Cities & Transport
abhishek.behera@wri.org

# CASE STUDIES: PLANNING AND DESIGNING ROAD SAFETY FOR TOD

## Webinar Series.
## Session 3

**Integration of Road Safety Considerations in Transit-Oriented Development Projects**
**Case of Tianjin**

15 October 2020

Gerald Ollivier, Lead Transport Specialist

WORLD BANK GROUP

*Supported by:*

UKaid from the British people

GRSF Global Road Safety Facility

*Conducted by:*

WRI INDIA

# Overview

- Context
- Challenges
- Overall Approach
- Tianjin Green Transport Strategy
- Focus on TOD, Walking and Cycling

*The following slides draws on the detailed work from consultancies engaged under the project: CSTC and Tianjin Urban Planning and Design Institute*

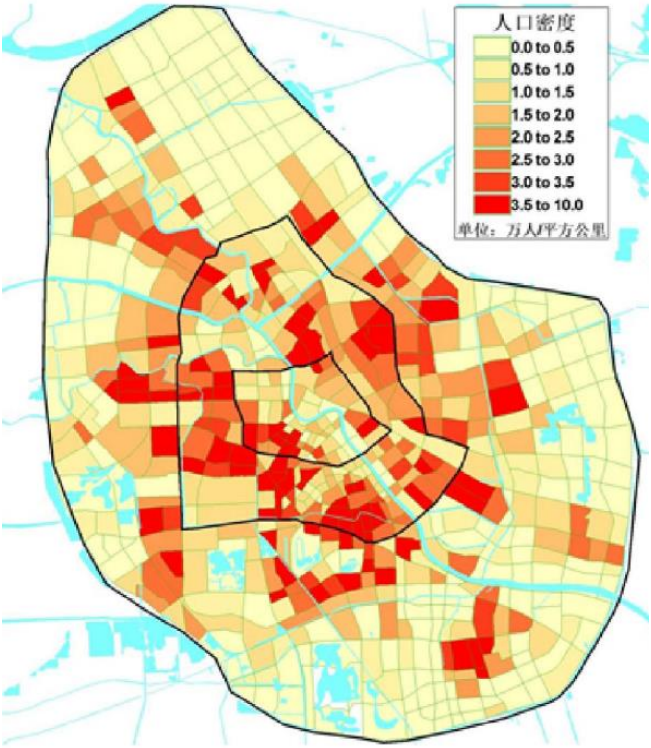
# Tianjin Central District at a Glance

**1** **One of the four Chinese Municipalities, with over US$200 billion in GDP**

Central Tianjin (2013)

- 334 km2/ 5.1 m people/ 15,400 in people density/km2
- Disposable household income of 5200 US$/capita
- 2.4 trips per capita of 4.8 km and 30 minutes
- 41% of trips for work and commute, 8% for school
- High but declining non-motorized mode share
- Annual growth in cars by 20% (157/1000 people)
- Low road density (4.6 km/km2)
- 4 metro lines (130 km) and only 0.8 m passengers
- 5700 buses serving 3.5 m trips with 71% coverage
- Plans for 13 metro lines

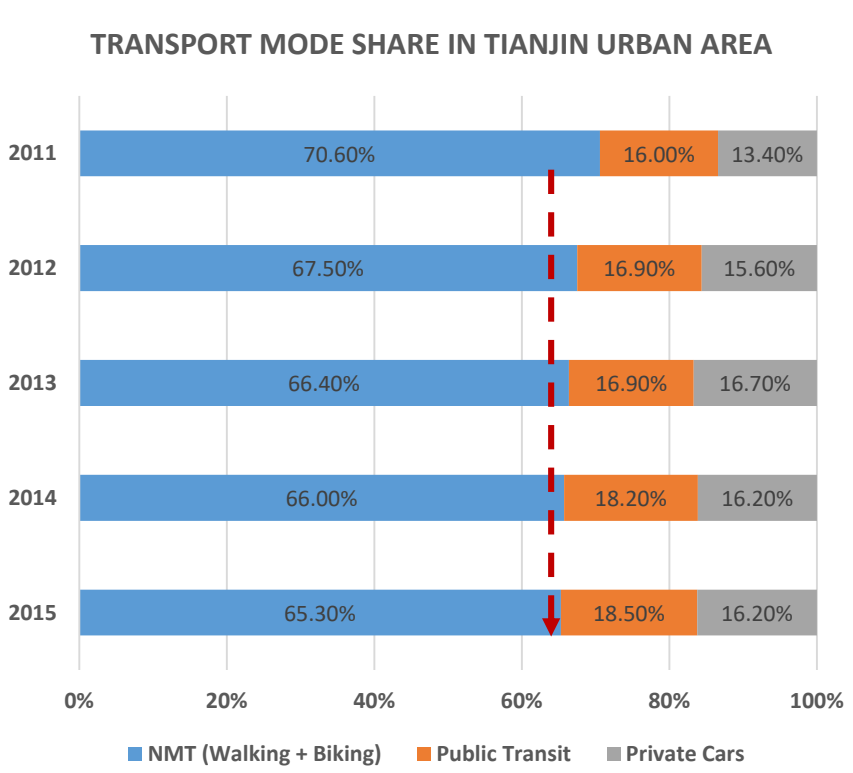
A system under pressure



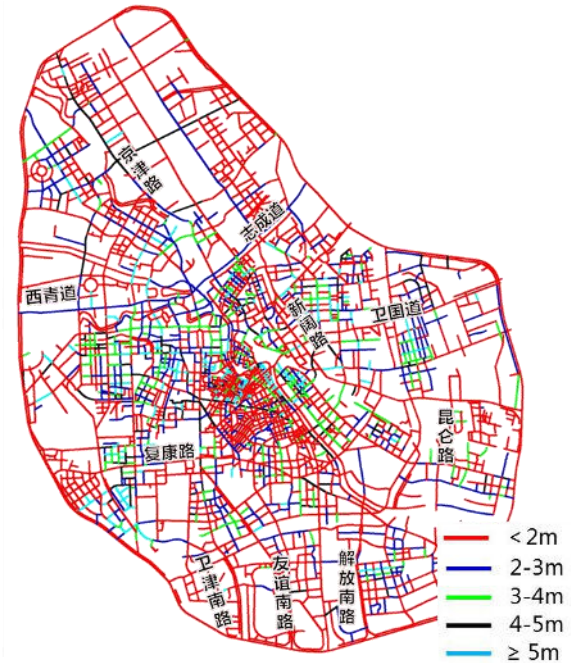

Need for rethinking urban transport approach

# The Challenges of Non-Motorized Transport (NMT)

## II Deteriorating NMT Environment Resulting in a Decreasing of NMT Mode Share




NMT mode share decreased by 5%




78% of side walks width < 3 m

# Car-oriented urban planning and traffic design has impeded the development NMT

# The Challenges of NMT in Tianjin

## II Streets Lose Vitality as a Result of Car-oriented Planning in Newly Built Areas


# The Challenges of Integration in Tianjin

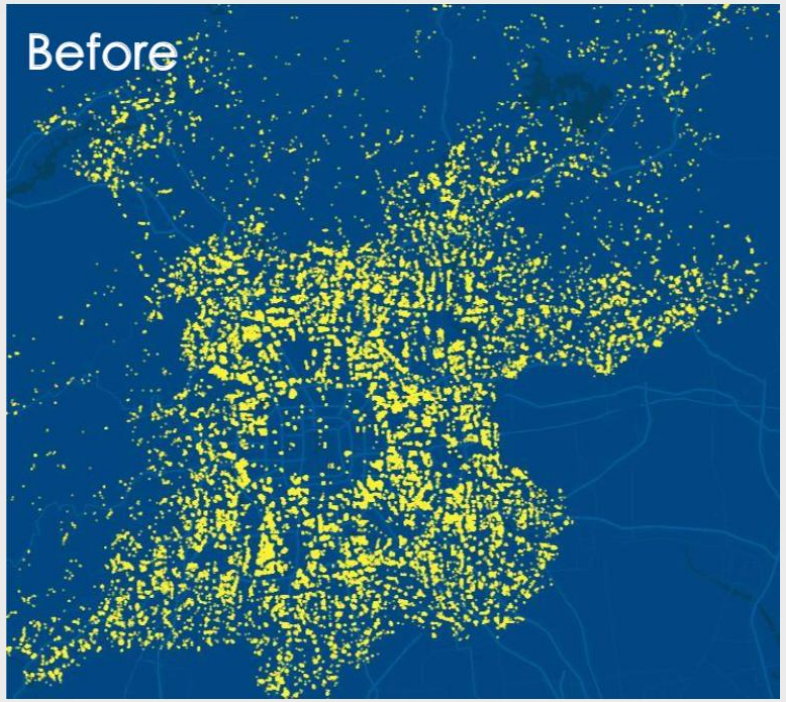
## II The Metro System insufficiently integrated with Bus Network and NMT


Long Transfer Distance

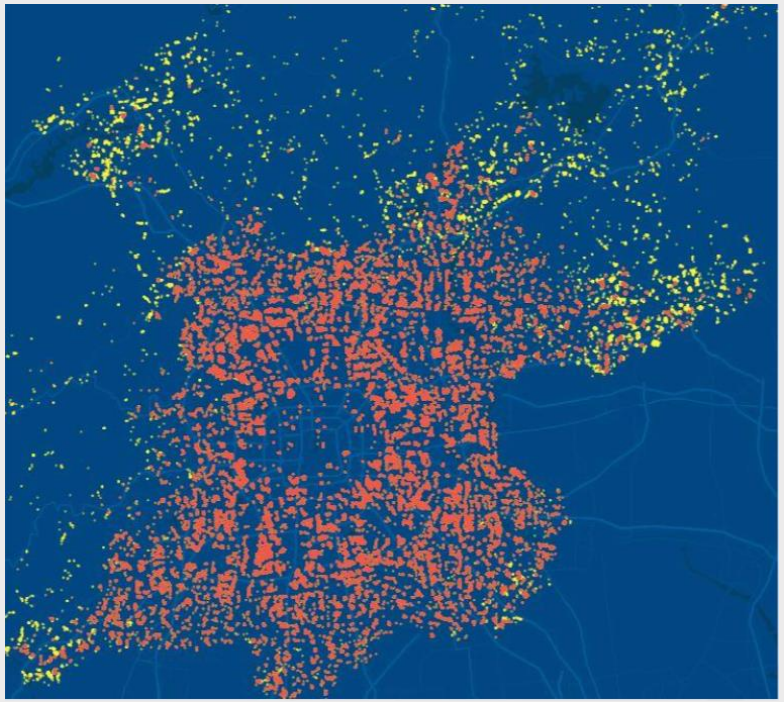
No Protected Bike Lanes
Connecting Metro Stations

# “Public bike sharing + Public Transit” eliminates the blind area of public transport service

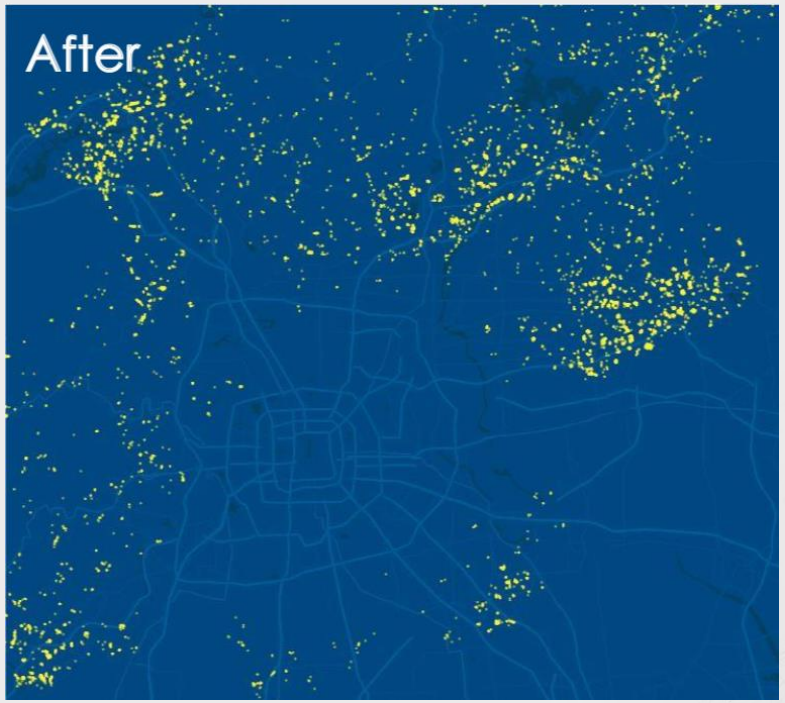
**In Beijing, 92.7% population are covered with public transit service within biking distance**




Yellow areas are not covered by public transit service within walking distance, mainly outside the 4th ring road



Orange areas are increased service coverage of public transit accessible within biking distance




Remaining yellow areas are not covered by public transit service within biking distance.

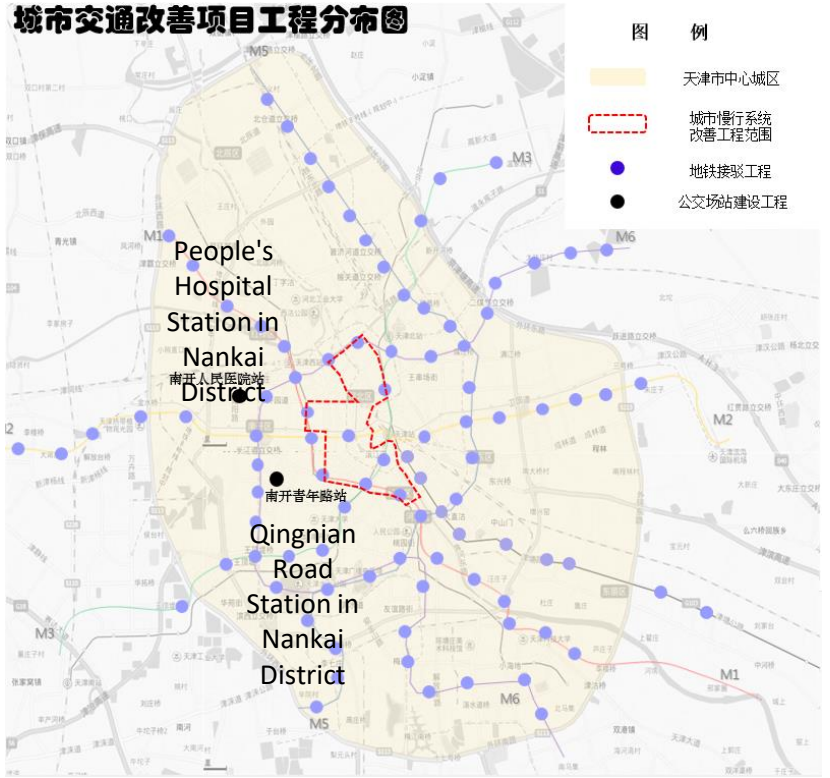
Source: Wanli Fang

# Overall Approach: the US$224 m project

## III Project Development Objective (PDO) and Components

The objective is to leverage the Tianjin metro system and to promote walking and biking in the urban core (in Heping, Nankai, **and Hebei**) in order to make transport greener and safer in Tianjin and draw lessons for other large cities.

| | Components |
|---|---|
| Works | (i) Green Transport Improvement in Heping, Nankai, and Hebei Districts |
| | (ii) Metro Access Improvement (111 stations) |
| | (iii) Bus Terminal Development |
| TAs | (iv) TA for Green Transport Strategy TA Phase I and II |
| | (v)TA for Car Parking Mechanism in Tianjin Core Urban Area |
| | (vi)TA for Impact Analysis on Economic Vitality in NMT Zones |
| | (vii)TA for Performance Evaluation and ICR |



# Overall Approach: Walk and Cycle in urban core

**III** **Expansion of concept from 7.2 km2 to 11.7 km2**

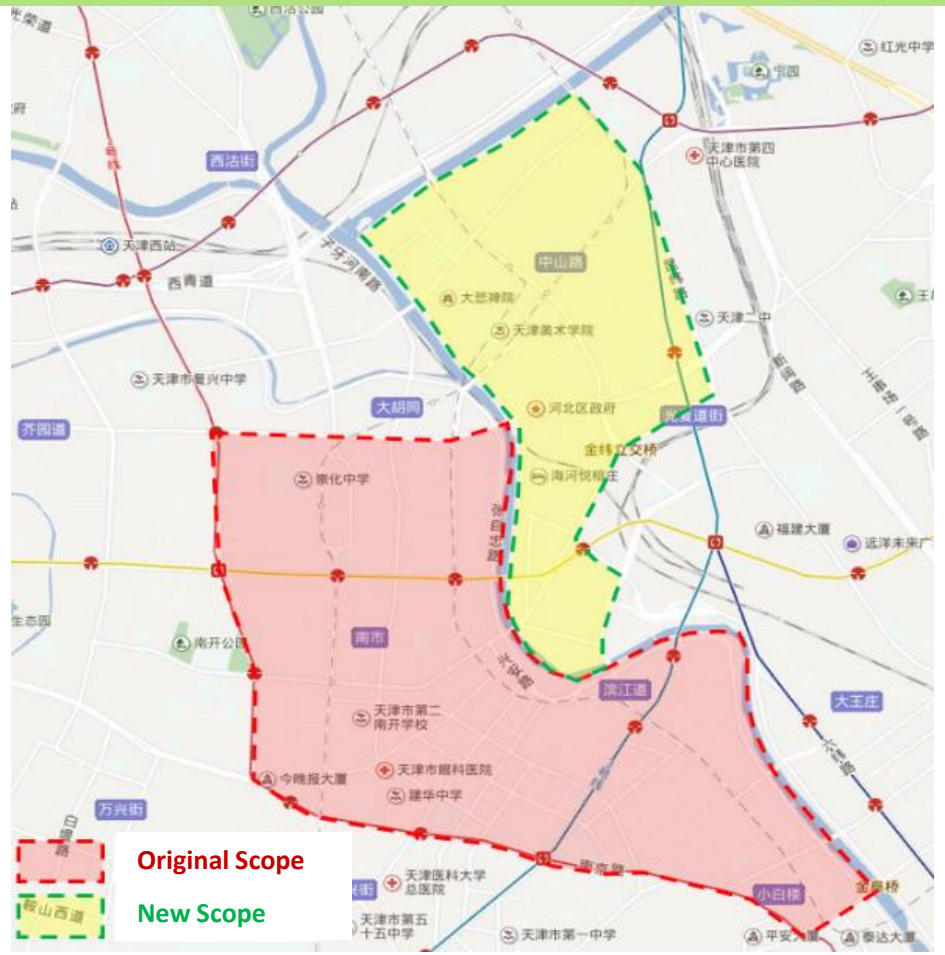
**Newly Proposed Activities**

- Green Transportation Improvement in Hebei District, Tianjin

**Green Transportation Improvement in Hebei District, Tianjin**

**Rational for Proposed Changes:**

- ❖ Replicate best practices of NMT development from Bank financed activities in Heping and Nankai Districts.
- ❖ Make the best use of the Bank loan to implement Green Transport Development Strategy in Tianjin

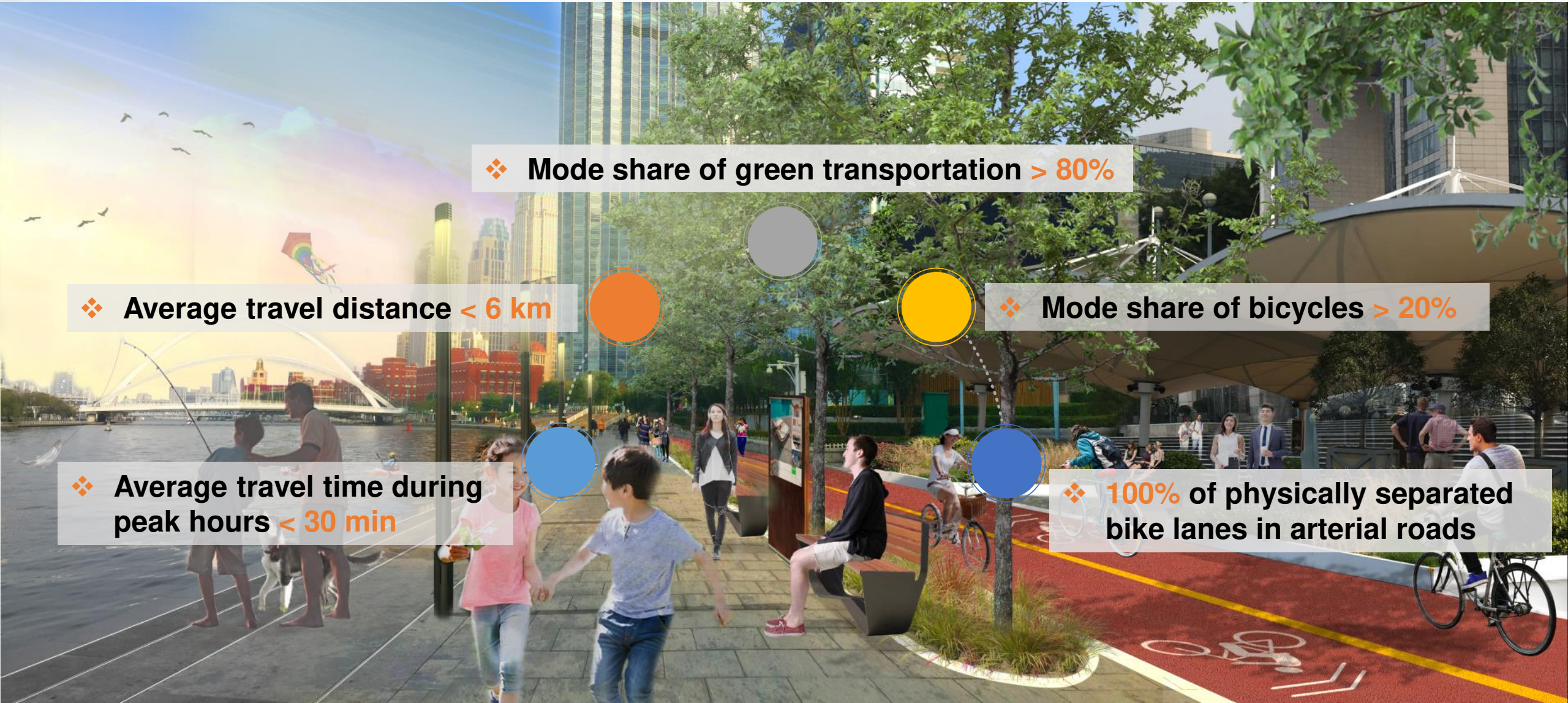


# Tianjin Green Transport Development Strategy

**OBJECTIVE**

**By 2030, the downtown area of Tianjin will be an engaging, prosperous, lively, green, low-carbon and competitive city center, which will be equipped with a people-oriented, smart and efficient transportation system that meets citizens' demand on safe, comfort and convenient travel for better life.**

# Tianjin Green Transport Development Strategy



# Tianjin Green Transport Development Strategy

## IV Overall Strategic Plan for Green Transportation Development in Tianjin Downtown Area

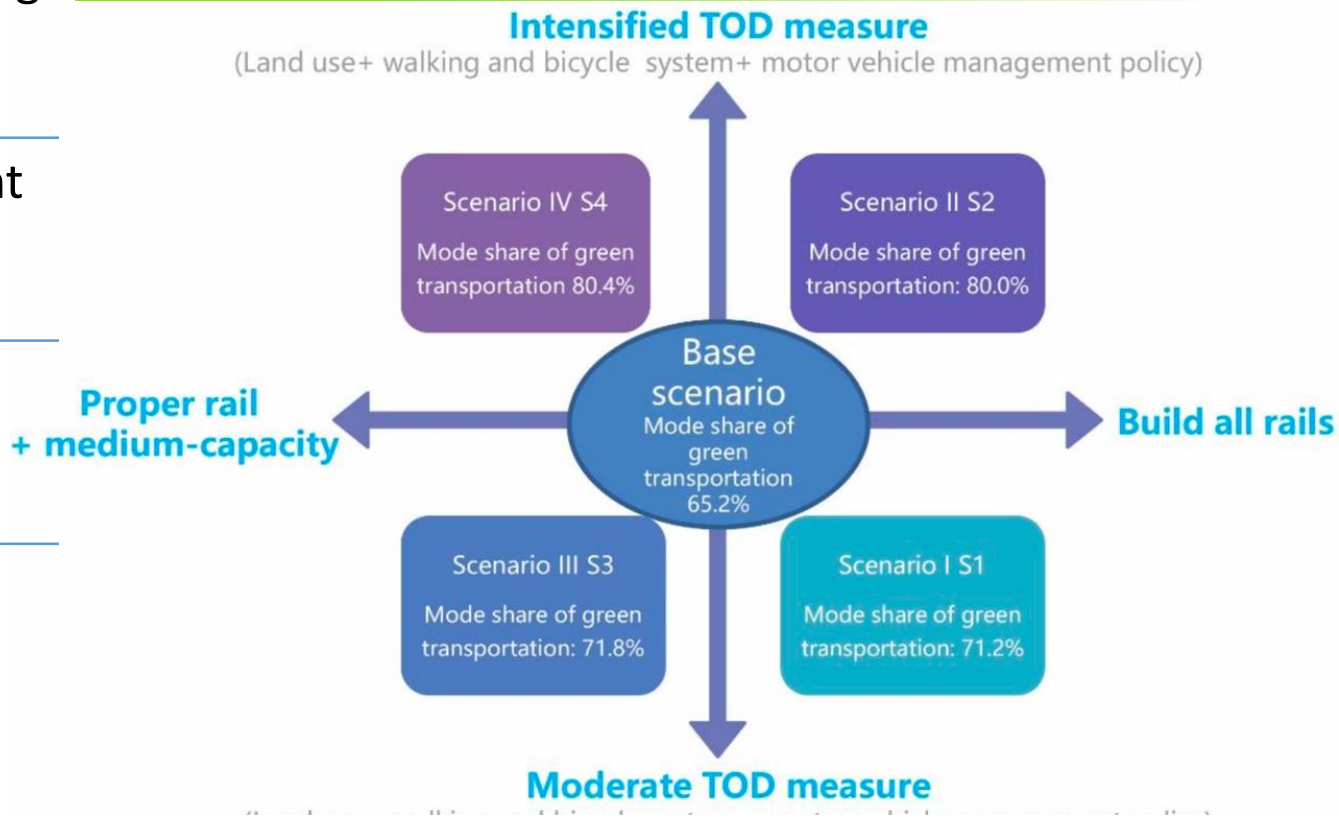
I. Build the trunk public transit network integrating rail transit with medium-capacity transit

II. Adopt intensified Transit-Oriented Development (TOD) policy for land use

III. Build a high quality and people-oriented pedestrian and biking system

IV. Implement intensified motor vehicle transportation management policy

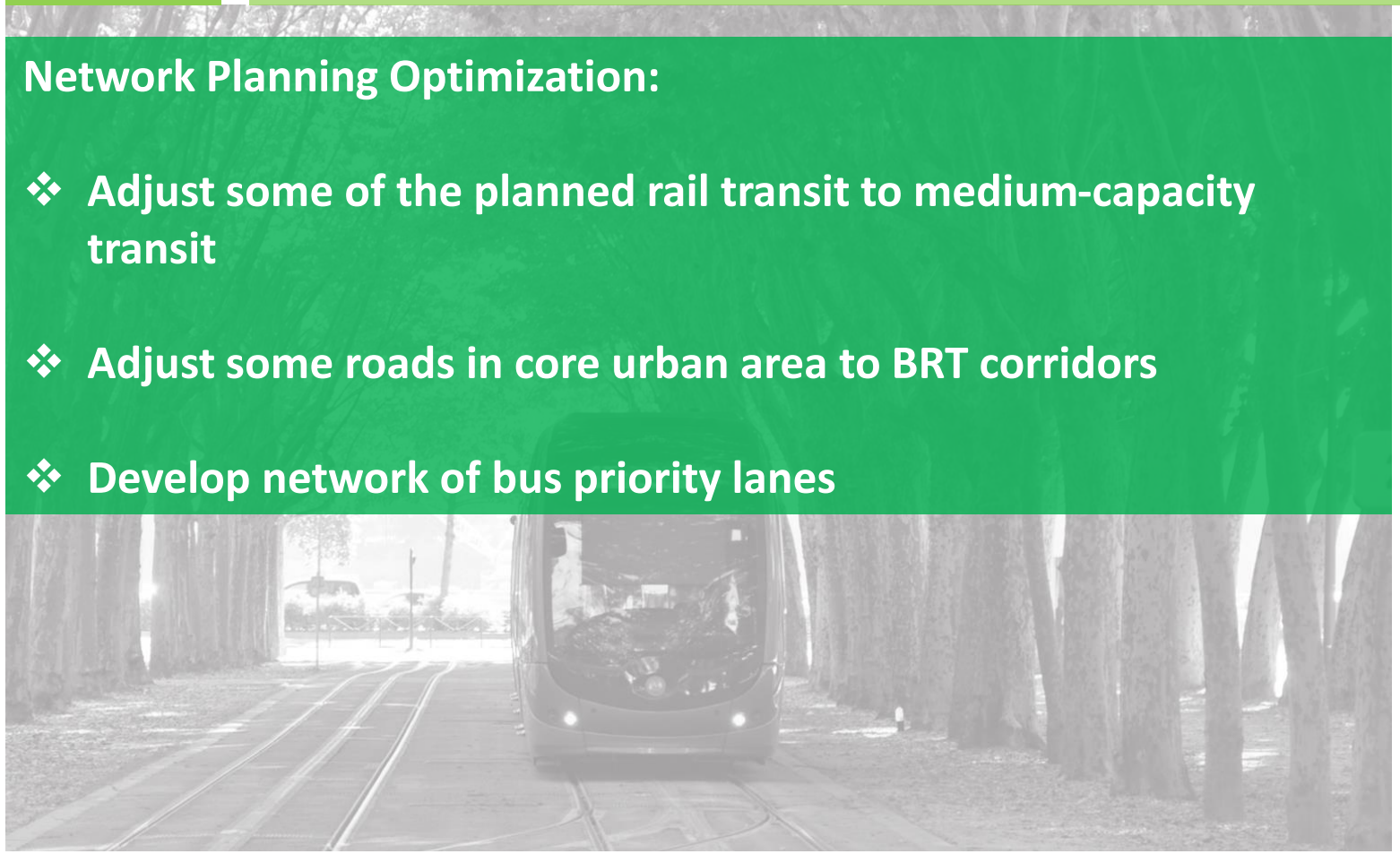
**Based on Scenario Analysis**



# Tianjin Green Transport Development Strategy

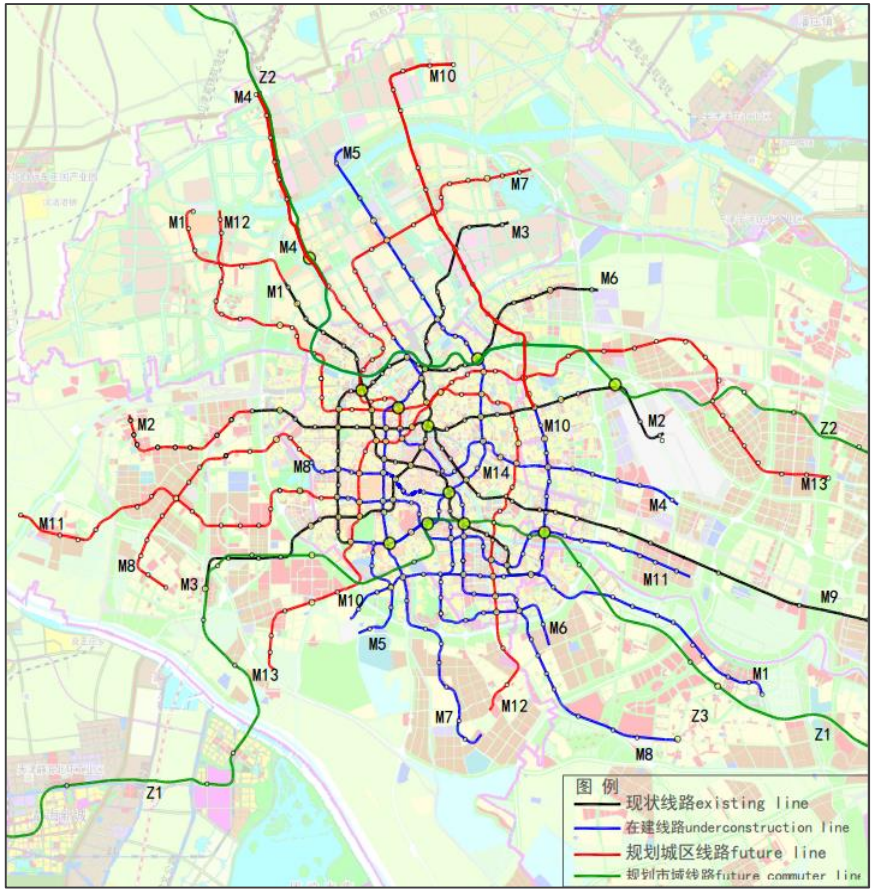
## IV

## I. Build the Trunk Public Transit Network Integrating Rail Transit with Medium-capacity Transit



**Network Planning Optimization:**

- ❖ Adjust some of the planned rail transit to medium-capacity transit
- ❖ Adjust some roads in core urban area to BRT corridors
- ❖ Develop network of bus priority lanes

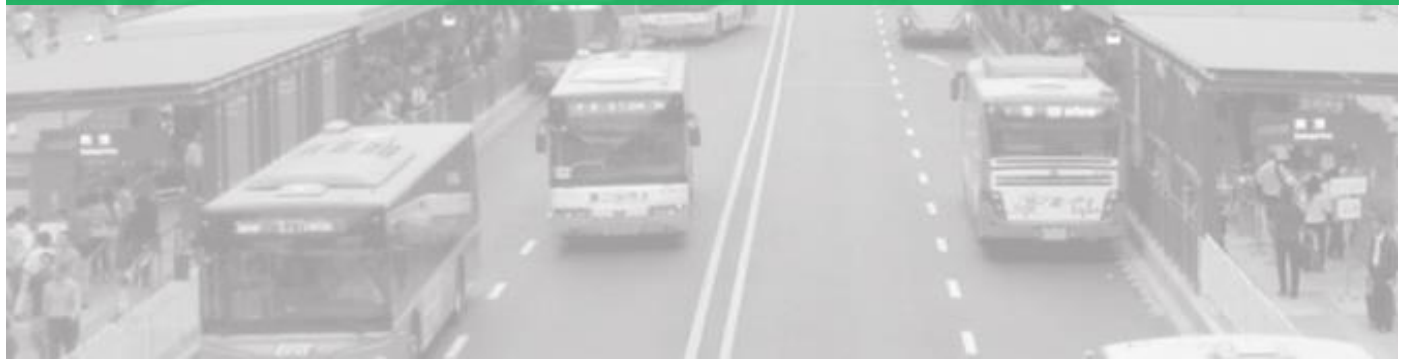


# Tianjin Green Transport Development Strategy

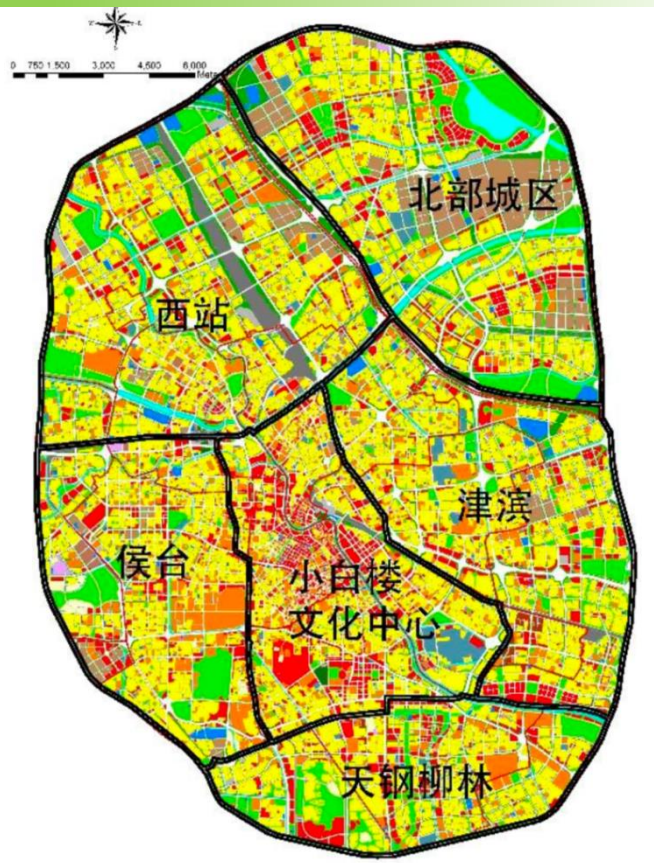
## IV

## II. Adopt Intensified Transit-oriented Development (TOD) Policy for Land Use

- Improve the development intensity of residential land with relatively low floor area ratio (FAR)
- Increase FAR of new commercial office land
- Adjust some newly developed land to park greenbelts



### Jobs-housing Balance Zones



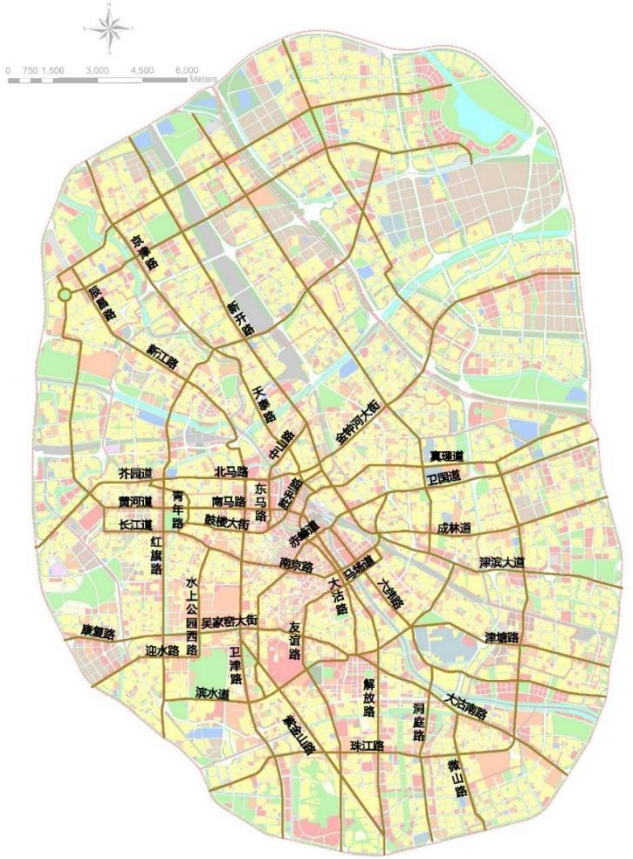
# Tianjin Green Transport Development Strategy

**IV**

## III. Build a High Quality and People-oriented Pedestrian and Biking System

- Enhance the density of non- motorized network
- Increase the bike lanes with independent right of way
- Increase the proportion of shading for bike lanes to no less than 90%
- Build bicycle express-lanes
- Introduce shared bikes vigorously and in a large scale
- Build bike corridors: ensure that the bicycle corridor has independent and coherent rights of way, set physical isolation, improve facilities for crossings, and provide good shading

### Planned Bike Corridors



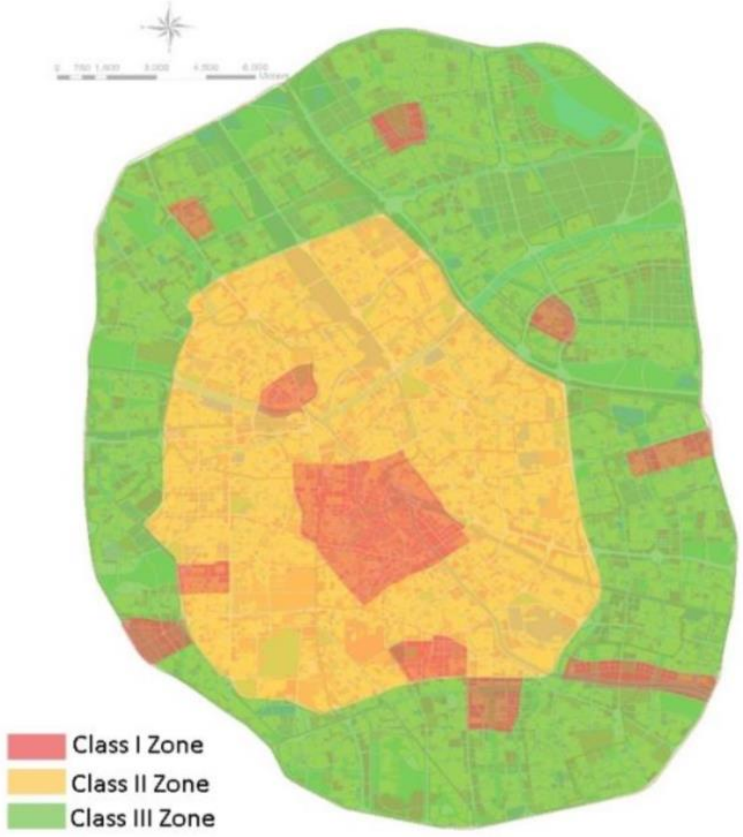
# Tianjin Green Transport Development Strategy

## IV

## IV. Implement Intensified Motor Vehicle Transportation Management Policy

- Continue implementation of existing car ownership restrictions
- Control the total number of passenger vehicles in core urban area within 1.6 million by 2030
- Establish differentiated charging parking zones
- Improve the capacity of parking management and strengthen illegal parking enforcement

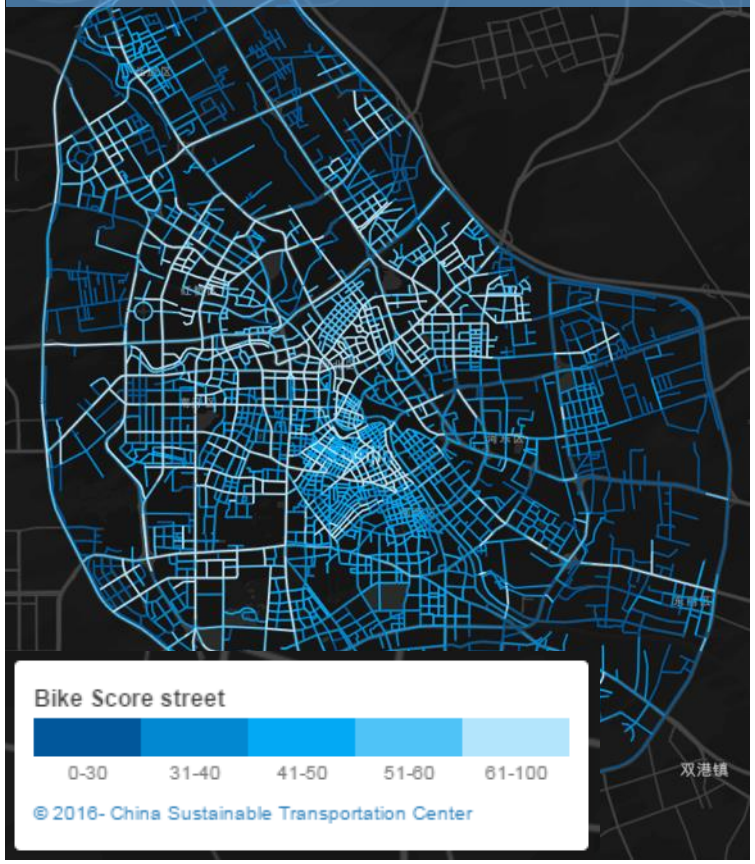
### Differentiated Parking Zones



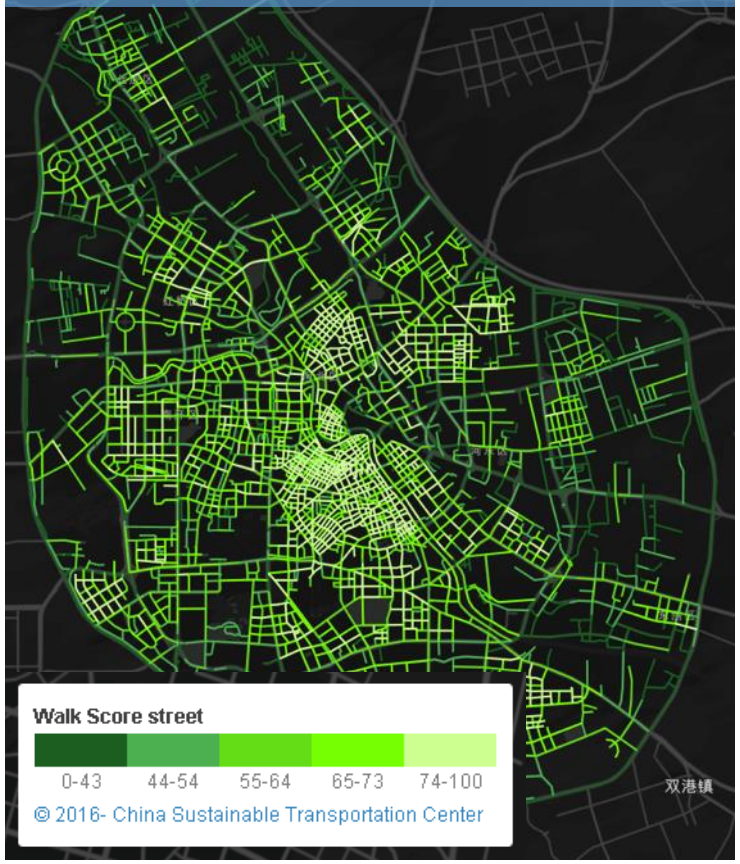
# Understanding Walking and Cycling

## V Diagnosing NMT Environment at a Network Level

### Bikeability Score of Streets in Tianjin Urban Area




### Walkability Score of Streets in Tianjin Urban Area




### Identify bottlenecks of bike lanes at the network level

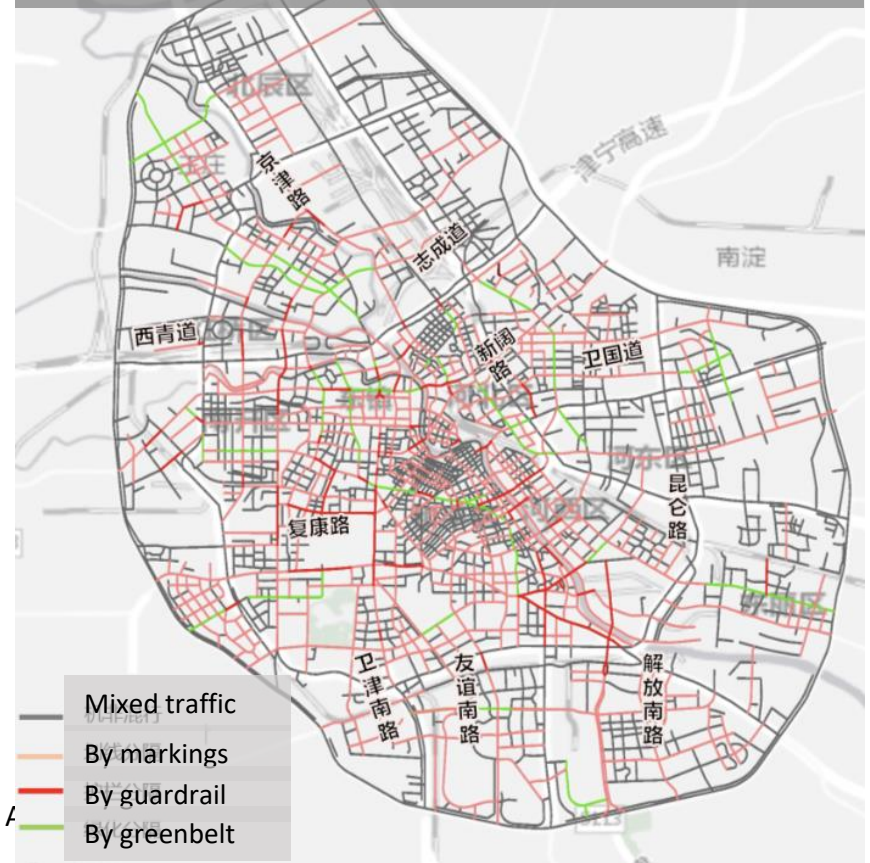
Source: Technical Assistance under Project, Jiang Yang and al.

# Understanding Walking and Cycling

## V Diagnosing NMT Environment at a Network Level


echnical A

**Apply computer vision and AI to identify bike lane separation facilities**




**Spatiotemporal Distribution of PBS Traffic Volume**

# Rethinking Street Organization for TOD

V

**Mass Transit offers an opportunity for a rethink**

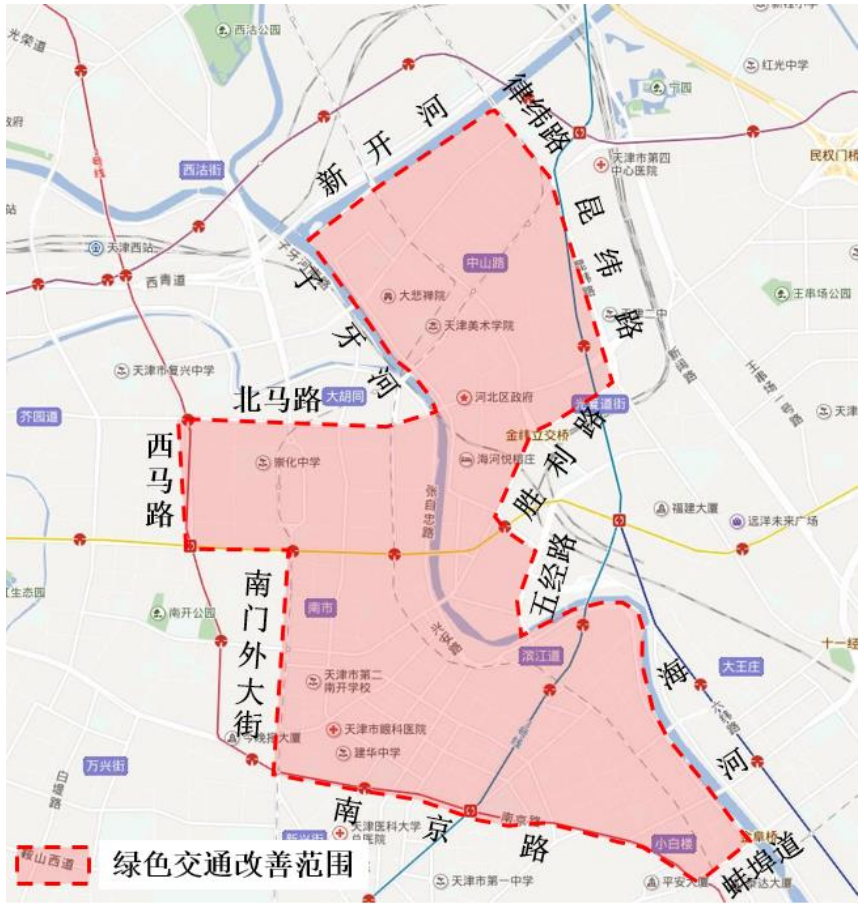
◆The total area is 11.7 square kilometers

◆3 districts with high density in city center

◆The total area of the reconstructed road is 813,400 square meters

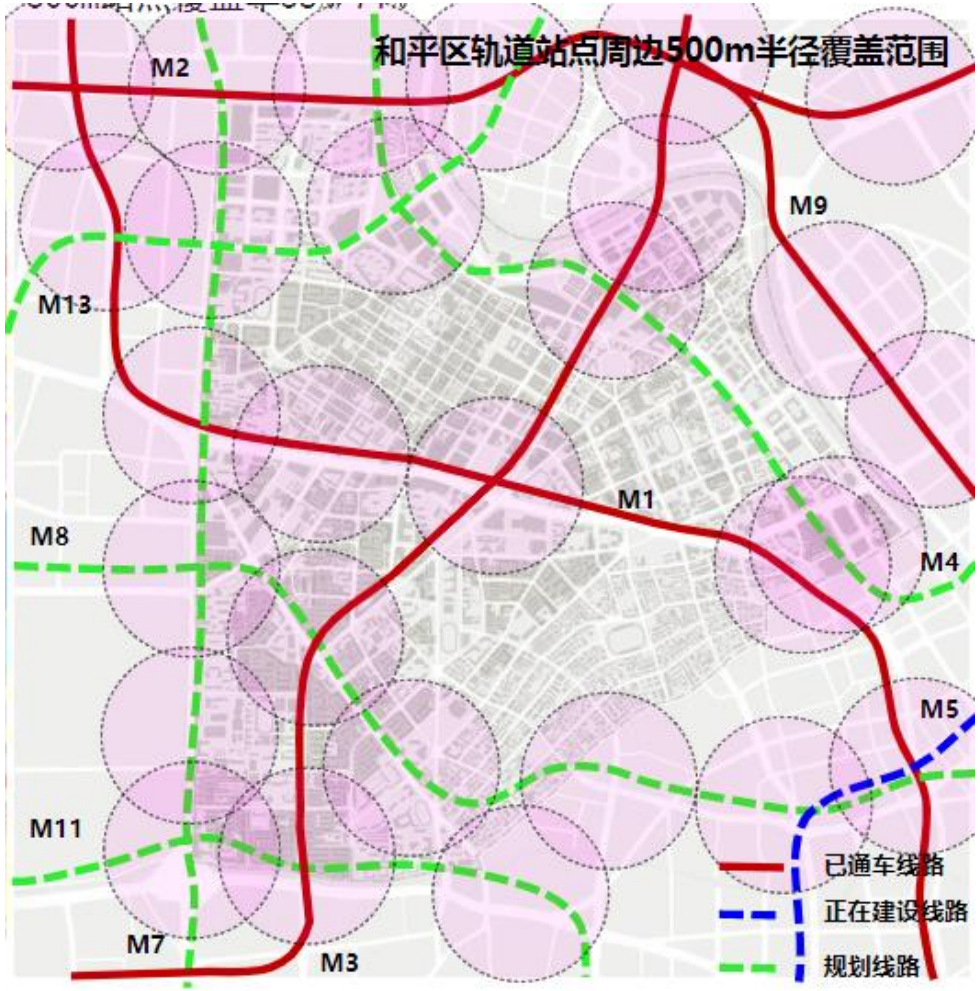
◆Hyper connected to metro lines in future

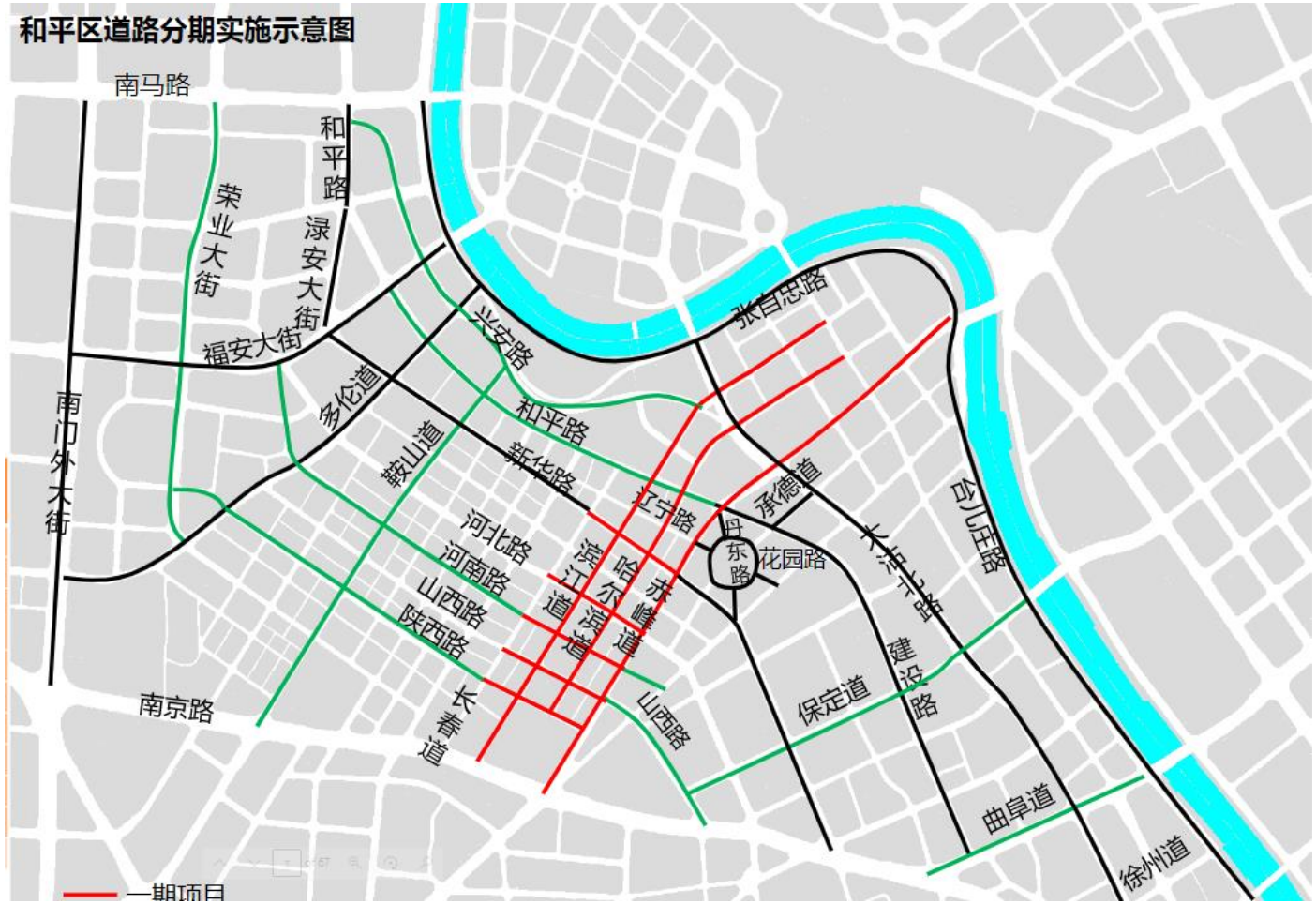
- ◆Heping: 4 lines today- 10 lines in plans with 2km/km2 and 71% of coverage at 500m
- ◆Nankai 100%



# Rethinking Street Organization for TOD

**V** **Mass Transit offers an opportunity for a rethink: Heping District**



# Rethinking Street Organization for TOD

## V Example in Heping

**Before**


**After**

# Rethinking Street Organization for TOD

V

**Example in Heping**

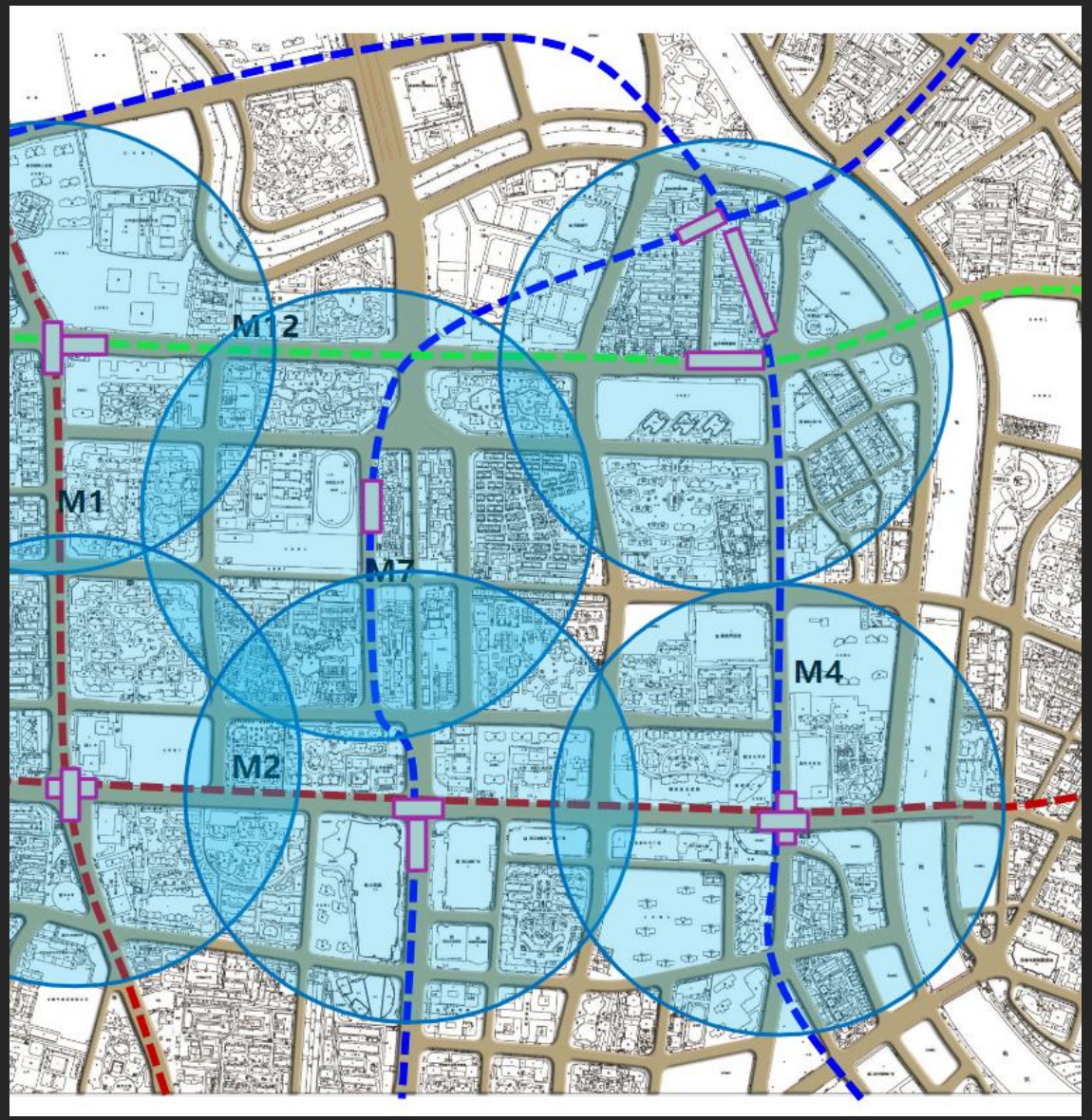
**Before**

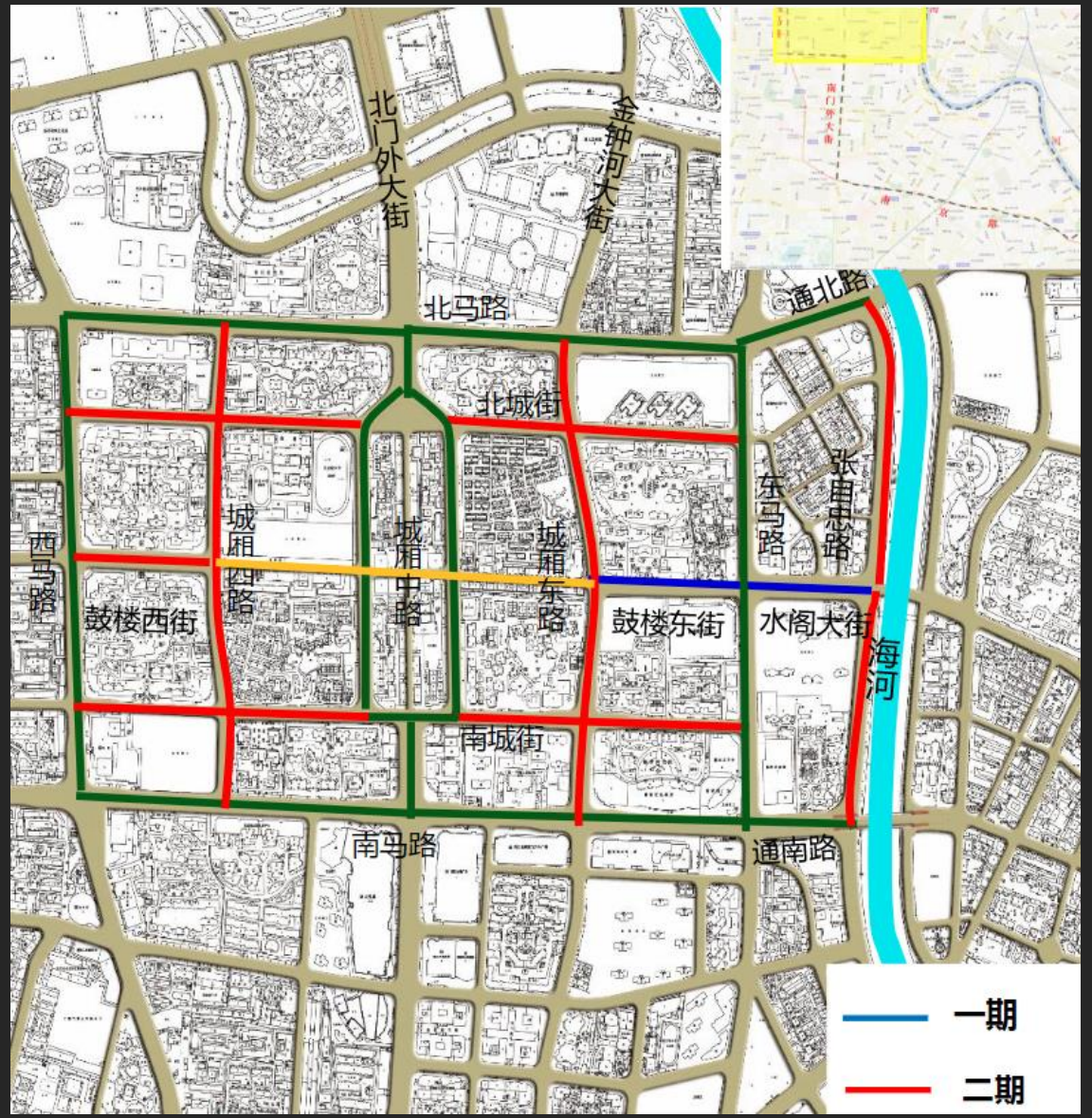
**After**


After
BIKE

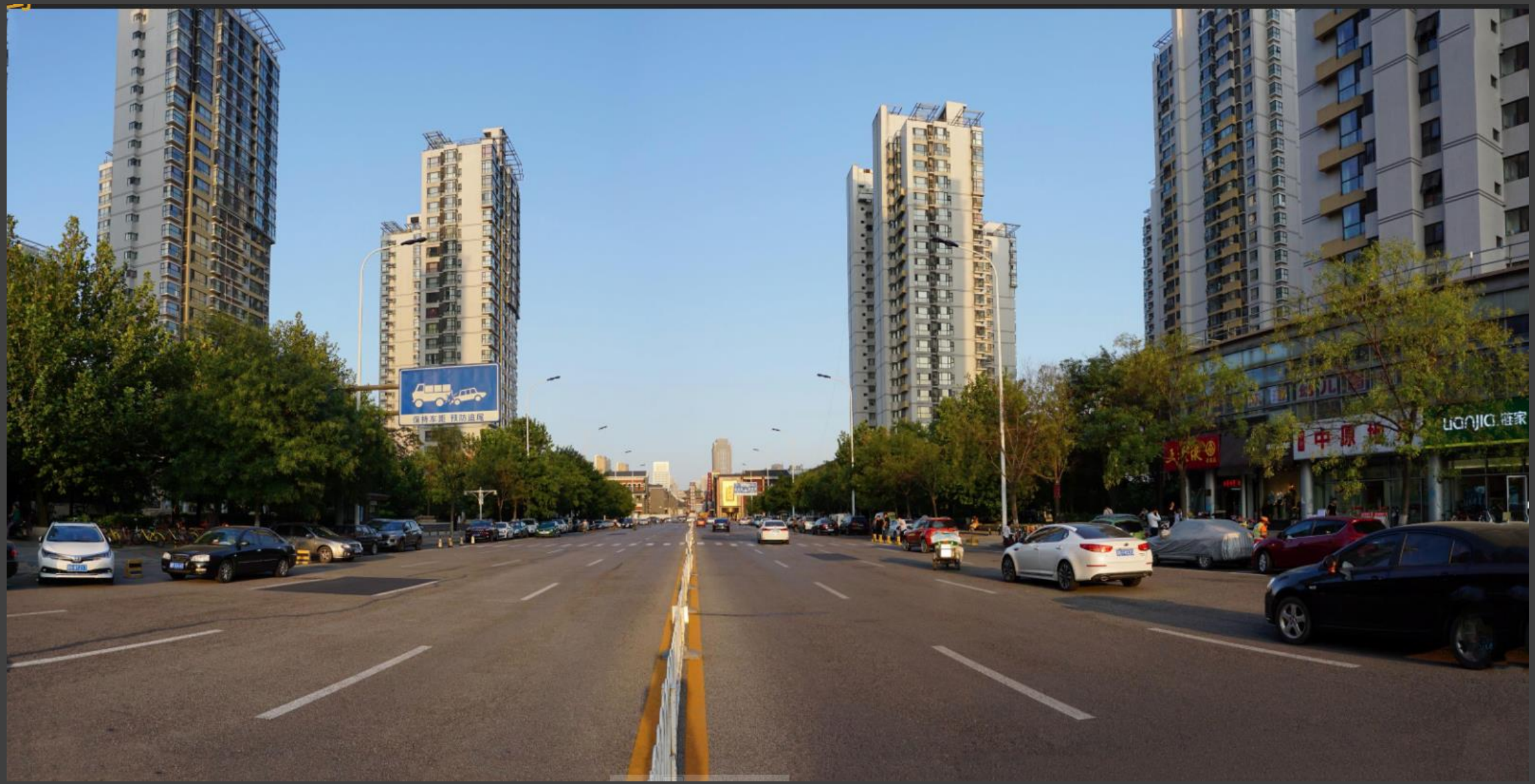

After


After


M12
M1
M7
M4
M2


北门外大街
金钟河大街
北马路
通北路
北城街
西马路
鼓楼西街
城厢四路
城厢中路
城厢东路
东马路
张自忠路
鼓楼东街
水阁大街
海河
南城街
南马路
通南路
一期
二期

Before



After

After

After

Before

After


After

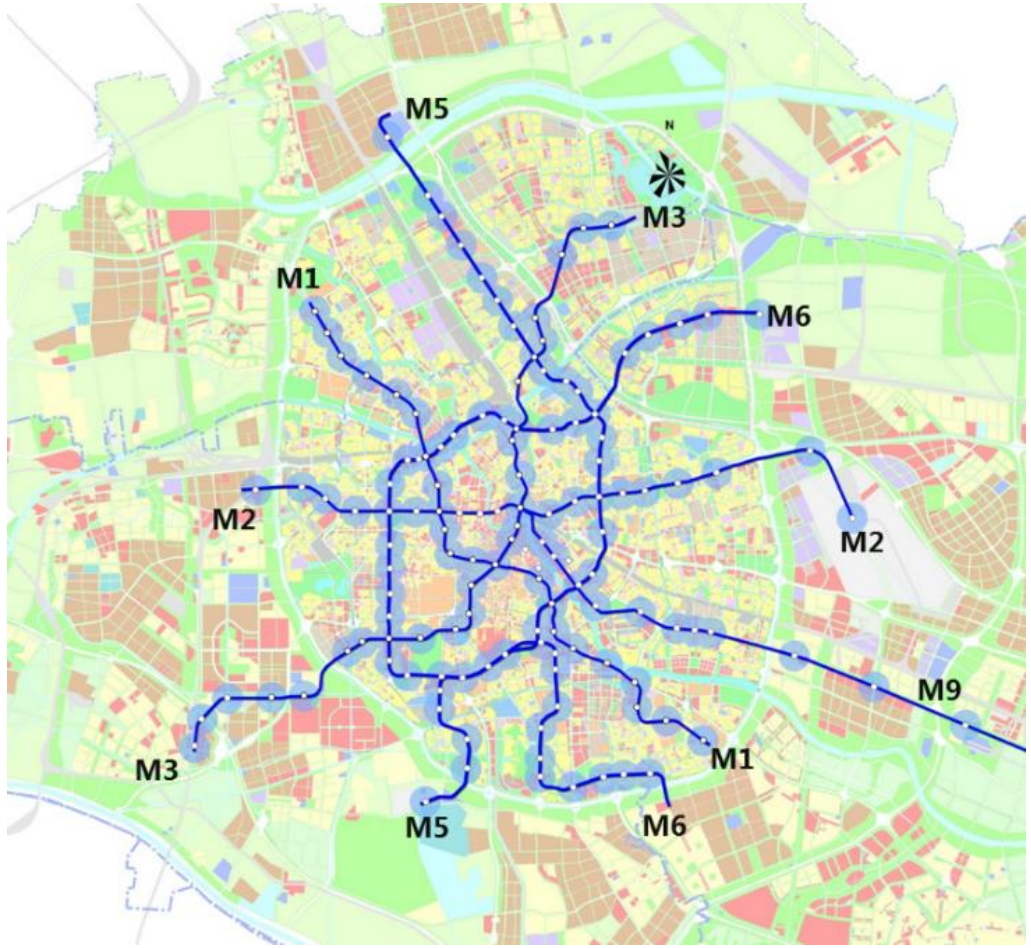

Before


After

# Adjusting Mass Transit Station Environment

**V** **Integrated Transport and Urban Space Design at Metro Station**

- Improvement at 111 stations
- stations which are close to the urban area on the metro lines 1, 2, 3, 5, 6, and 9
- Connecting facilities

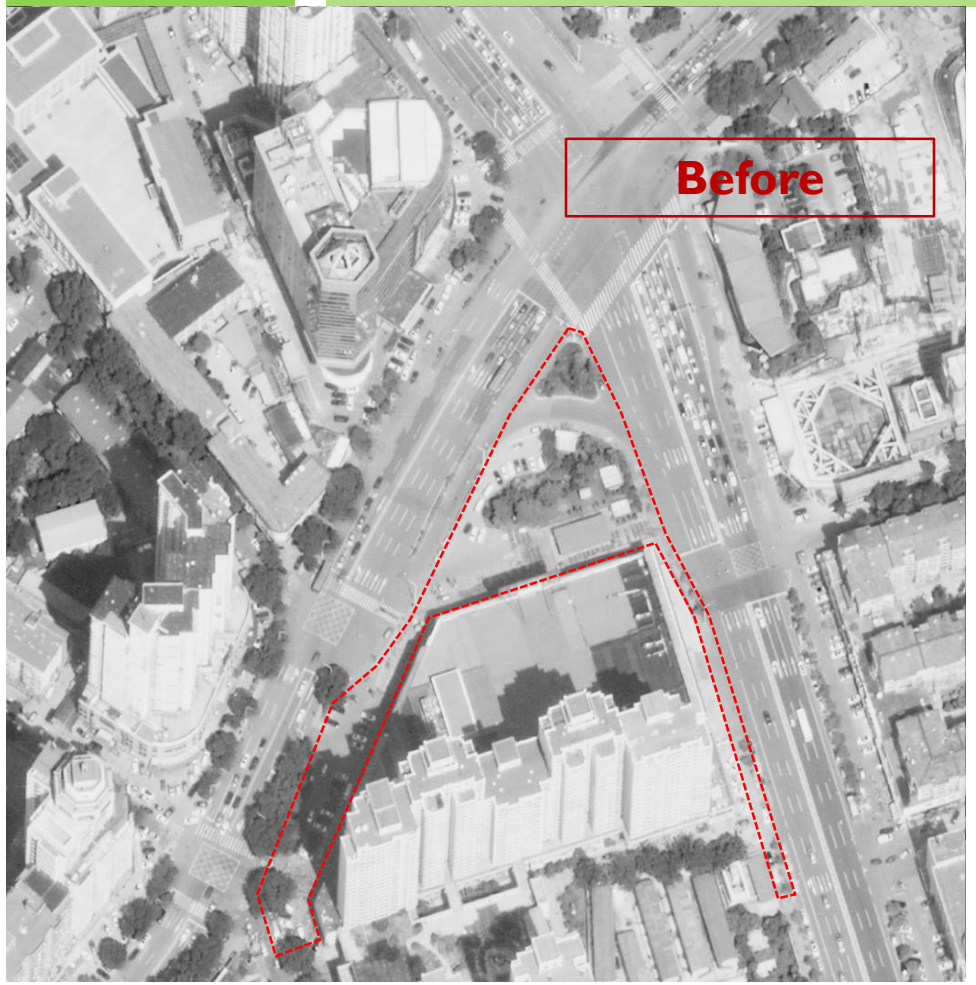


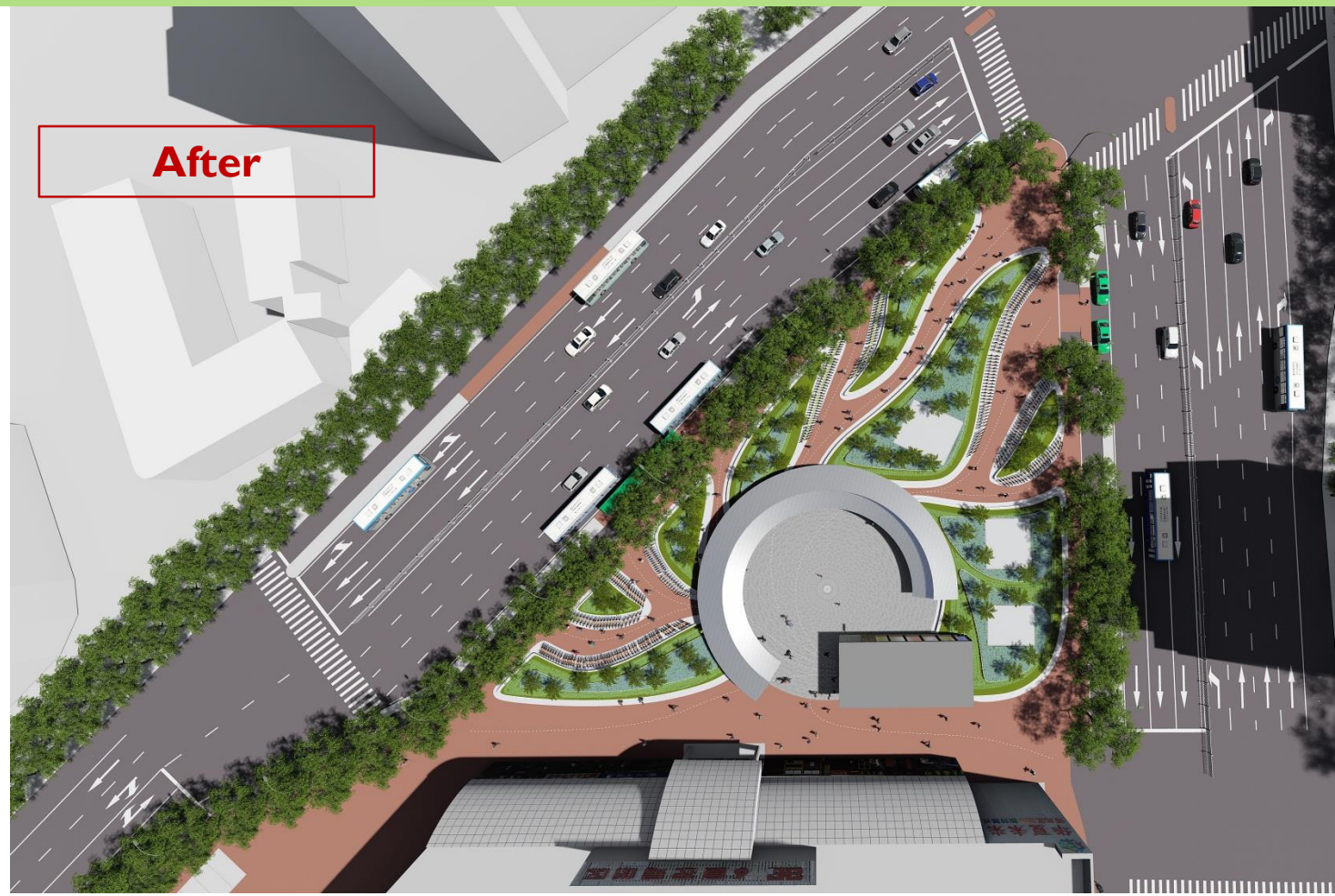

Source: Technical Assistance under Project

# Adjusting Mass Transit Station Environment

## V

## Integrated Transport and Urban Space Design at Metro Station




Source: Technical Assistance under Project

# Adjusting Mass Transit Station Environment

v

**Green, Safe, and Open Space under Flyovers allowing for connectivity**

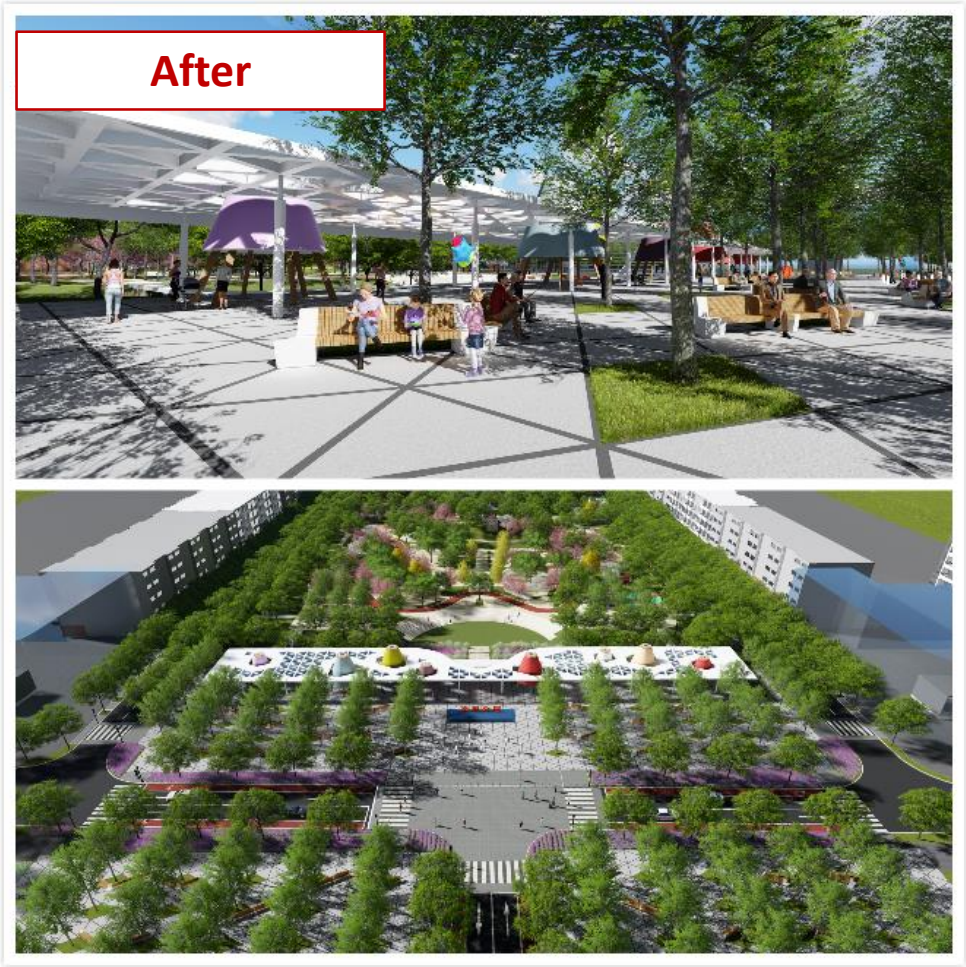


Source: World Bank Technical Assistance Project

# Adjusting Mass Transit Station Environment

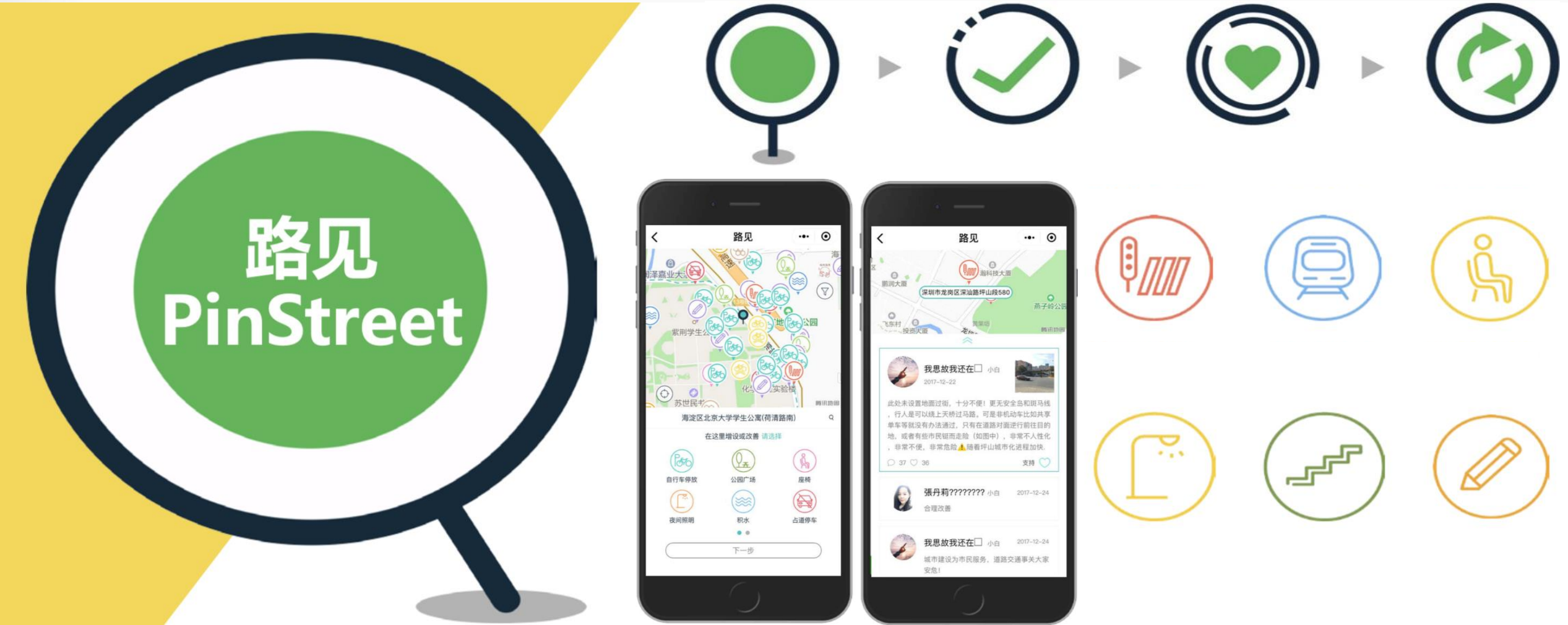
V

**Park + Metro Neighborhood**

# CSTC PinStreet: Voice of every urban transport participant matters

**Public engagement - Pin any street problem on the map**



# For this to work:

Road safety had to be a core consideration (2000 crashes per annum)

The project partnered with ChinaRAP to assess the existing conditions and proposed design

# Tianjin Green Transport Development Strategy

**KPI**

## Key Performance Indicators for Green Transport Development in Tianjin

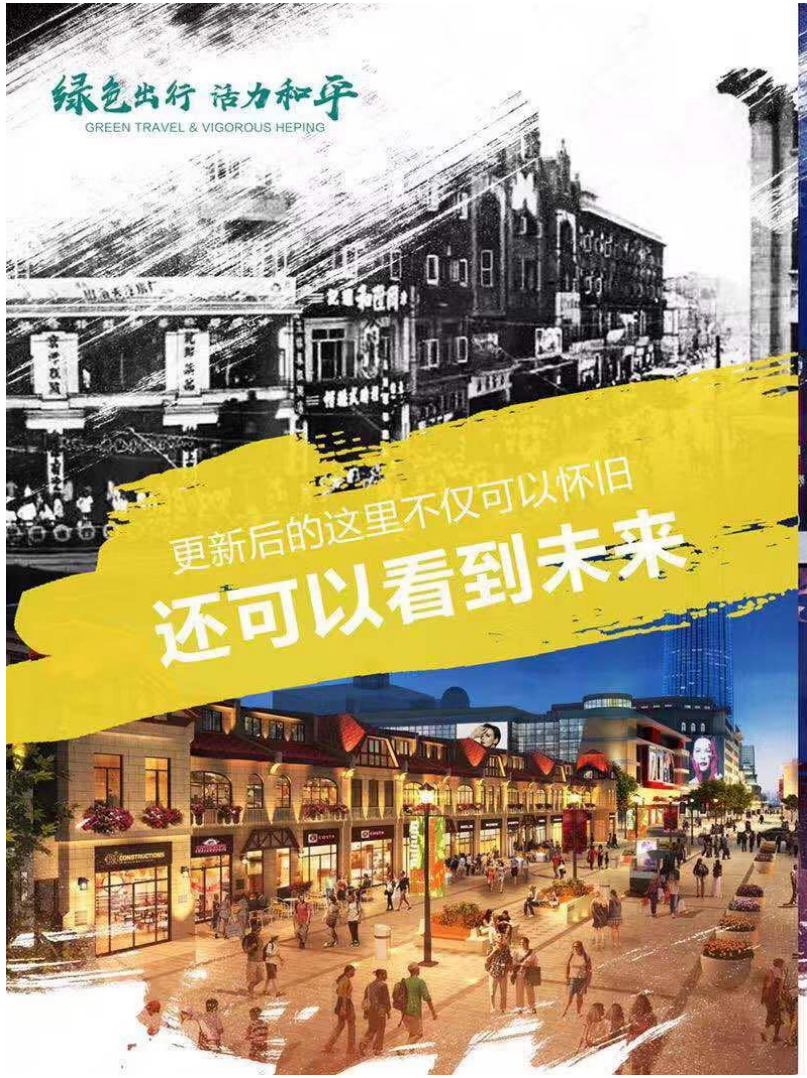
- Mode share of green transportation – more than 80%
- Per capita travel distance – less than 6 km
- Average travel time during peak hours – less than 30 min
- Proportion of cross-district travel – less than 50%
- Mode share of bicycles – more than 20%
- Proportion of physically separated bike lanes in arterial roads - 100%
- Length of bicycle corridors – 500 km
- 500-meter coverage rate of rail transit and medium-capacity transit stations - 60% population and 65% jobs
- Agglomeration degree of new construction land within 800m radius of rail stations – above 60%
- Proportion of bus lanes in arterial roads – above 50%
- Road network density – 8 km/sq km
- 400-meter accessibility of park greenbelts and squares with an area of over 0.5 hectare – above 90%
- Proportion of eco-friendly vehicles – above 20%

# Progress in Implementing the Green Transport Strategy

## IV. Progress

**Implementation of the Green Transport Strategy**

1. Promoted greener urban development
2. Improved urban transport safety level
3. Increased mode share of public transit
4. Promoted TOD
5. Built capacity for urban transport operation and maintenance




# Progress in Implementing the Green Transport Strategy

**Publication - Urban Transport of China**
**(special edition for Tianjin Green Transport)**

- **"Urban Transport of China" (a core journal for professionals in China) would publish a special issue on the Tianjin green transport strategy supported by TA-1 in November 2018, and comprise six thematic articles from the TA-1**

# CASE STUDIES: PLANNING AND DESIGNING ROAD SAFETY FOR TOD

## Webinar Series.
## Session 3

### Integration of Road Safety Considerations in Transit-Oriented Development Projects: Tianjin, China Case Study

15 October 2020

Greg Smith (iRAP)

WORLD BANK GROUP

*Supported by:*

UKaid from the British people

GRSF Global Road Safety Facility

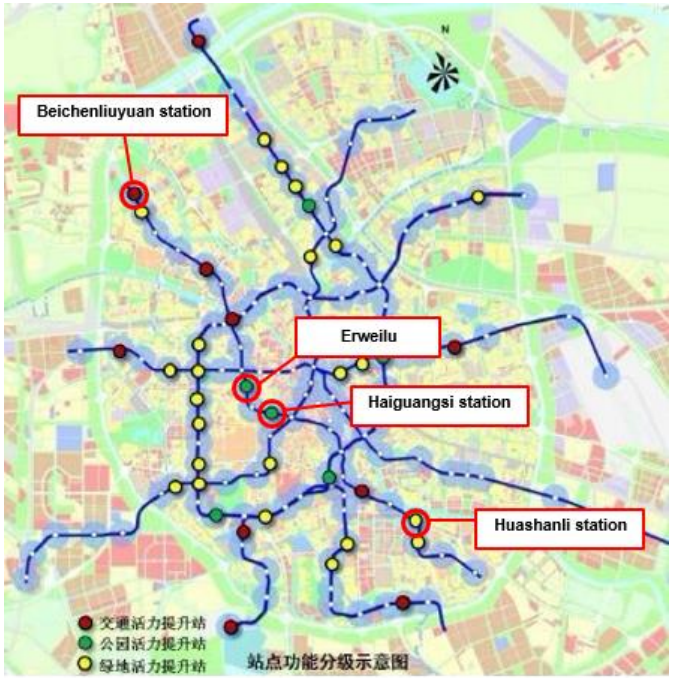
*Conducted by:*

WRI INDIA

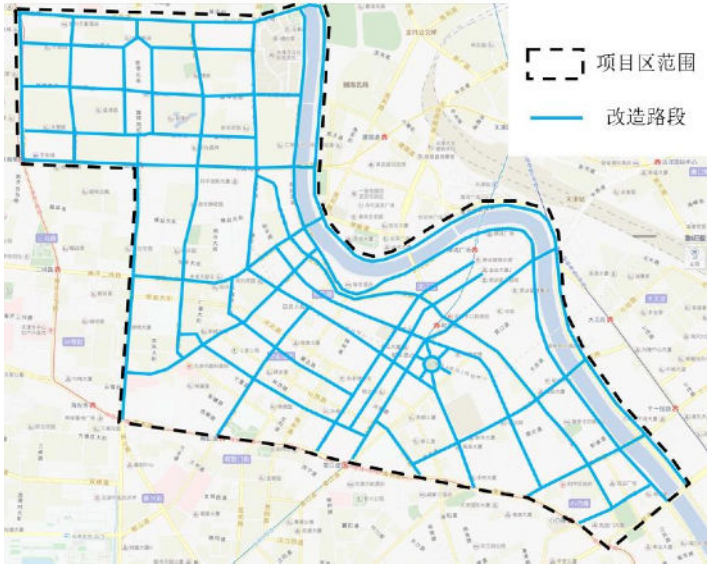
# ABOUT US

- ChinaRAP is part of the Research Institute of Highway (RIOH), Ministry of Transport
- Tianjin Urban Construction Design Institute was established in 2003, as state-owned holding company of Tianjin Urban Construction Group
- iRAP is an international charity dedicated to safer roads [www.irap.org](http://www.irap.org)

# ASSESSMENT PROCESS



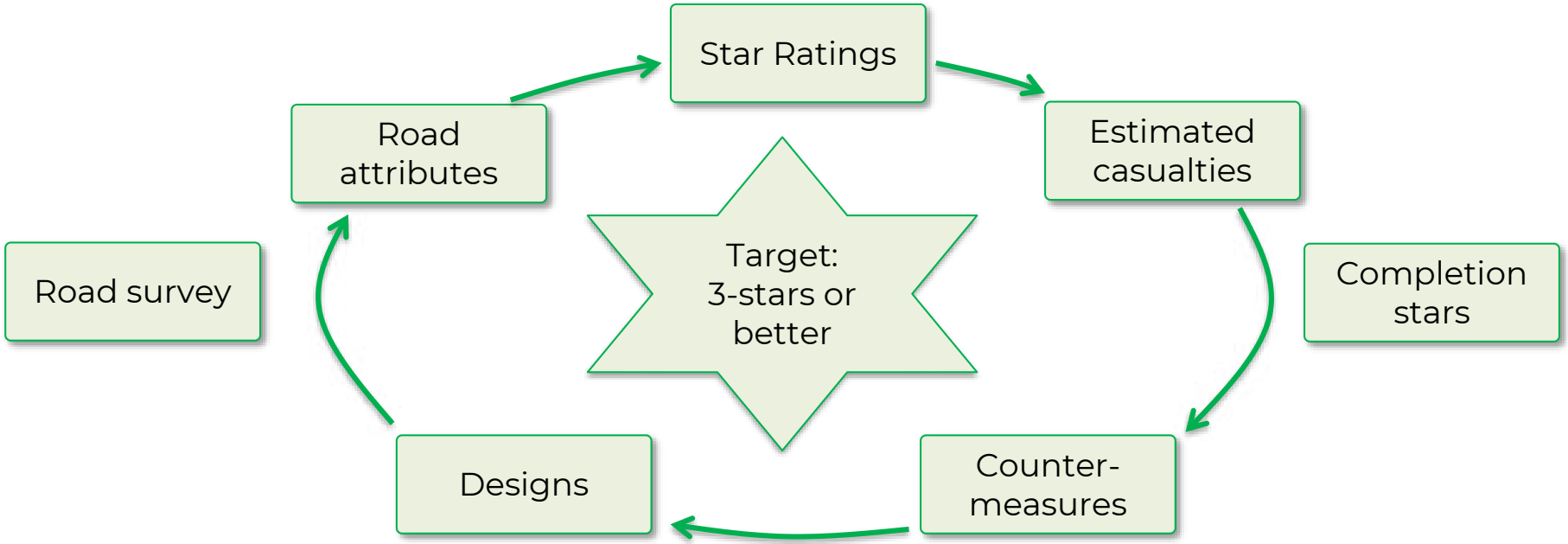

Target:
3-stars or
better



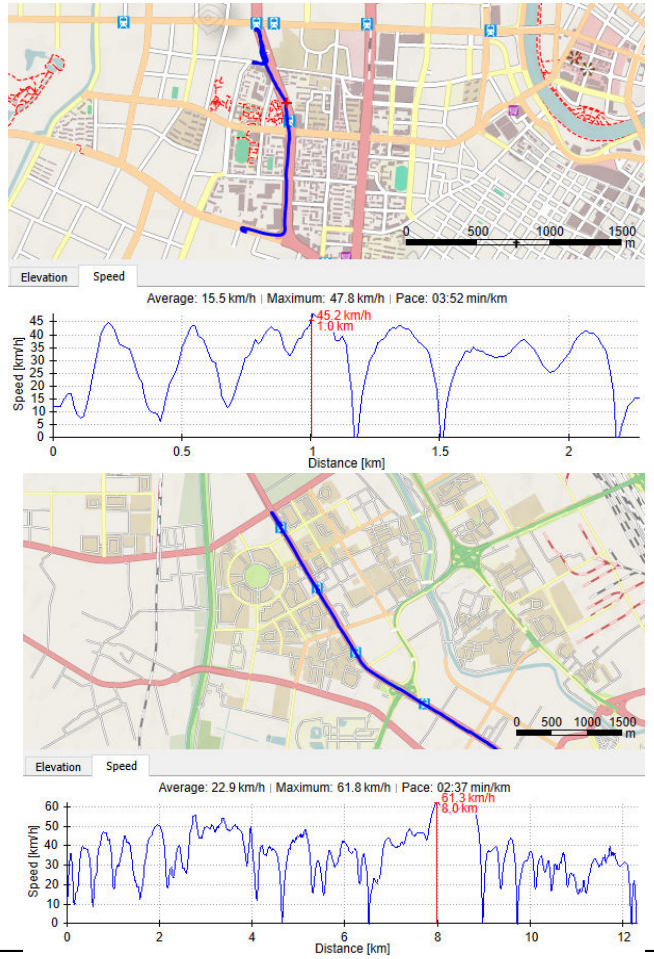

http://documents1.worldbank.org/curated/en/465901467991052298/pdf/PAD1145-PAD-P148129-R2015-0237-1-Box393264B-OUO-9.pdf

WORLD BANK GROUP UKaid GRSF Global Road Safety Facility WRI INDIA 天津城建设计院 ChinaRAP CHINA ROAD ASSESSMENT PROGRAM iRAP

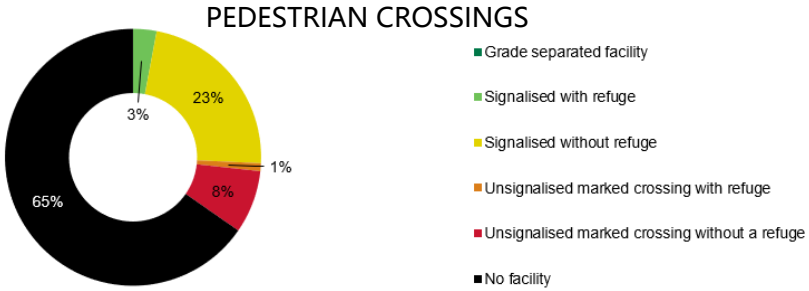
# ASSESSMENT PROCESS



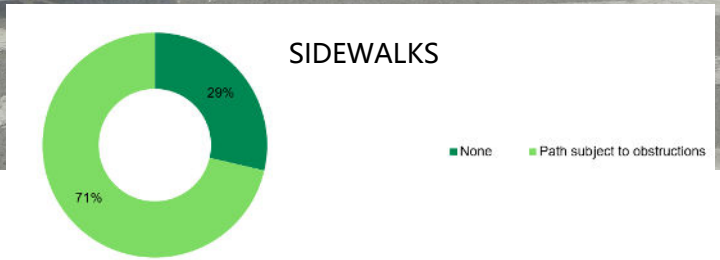
# TRAFFIC SPEEDS




# PEDESTRIAN CROSSINGS


# SIDEWALKS





50km/h

Footpath obstructed

5 lanes in each direction

Signalised crossing

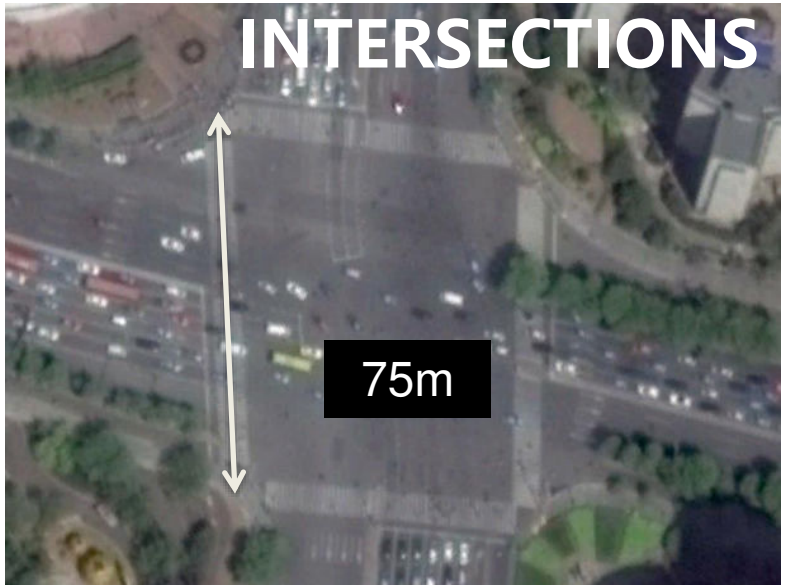
Parked vehicles

Street lighting

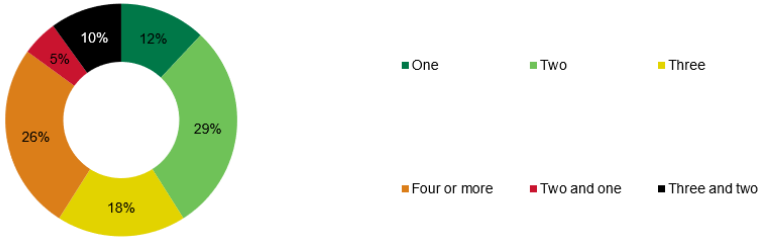
Adequate sight distance

Median island

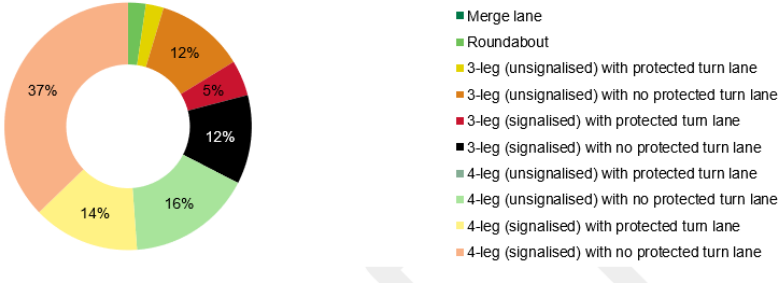
# INTERSECTIONS

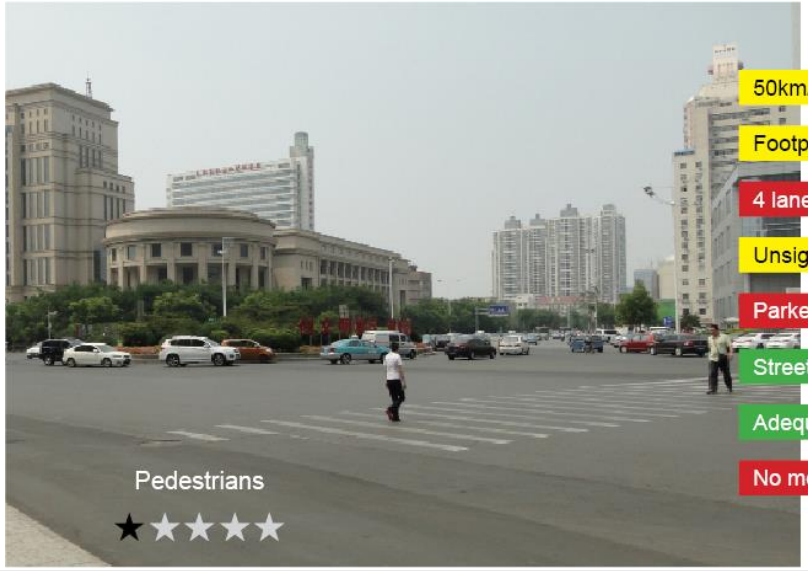



## LANES IN EACH DIRECTION




## INTERSECTIONS




WORLD BANK GROUP · UKaid from the British people · GRSF Global Road Safety Facility · WRI INDIA · 天津城建设计院 TIANJIN URBAN CONSTRUCTION DESIGN INSTITUTE · ChinaRAP CHINA ROAD ASSESSMENT PROGRAM · iRAP


50km/h

Good pavement

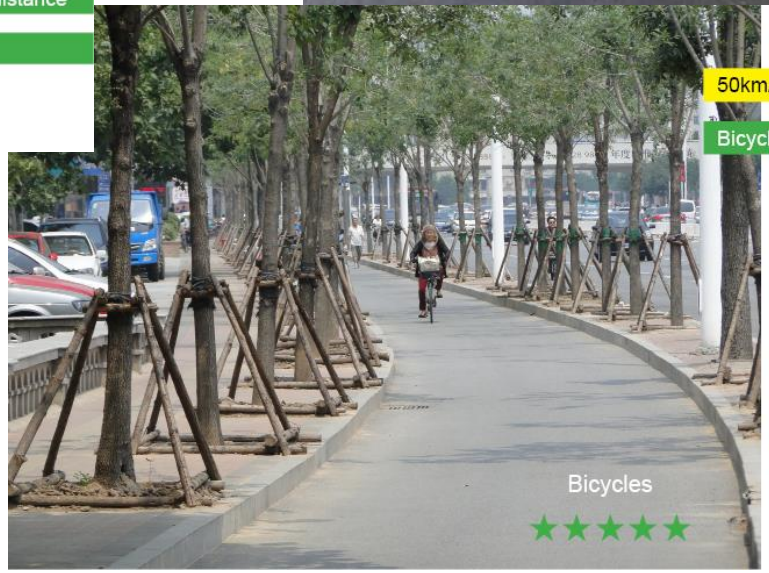
2 lanes in each direction

Wide paved shoulder

Street lighting

Adequate sight distance

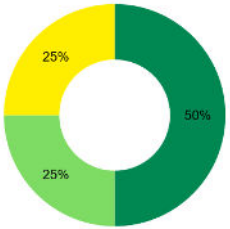
Divided




50km/h

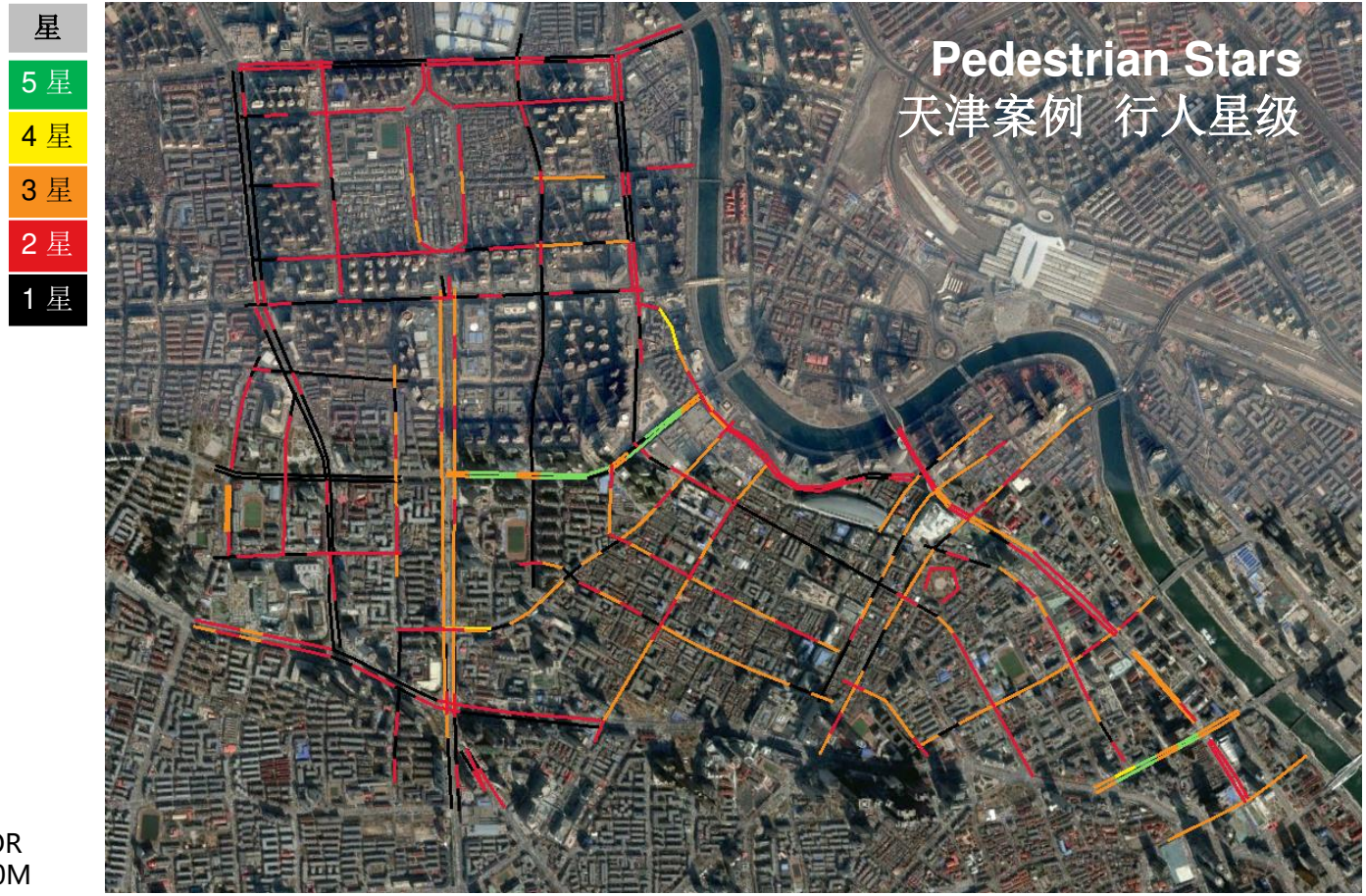
Bicycle lane

# BICYCLE FACILITIES




Bicycle lane  Wide paved shoulder  None

WORLD BANK GROUP  UKaid from the British people  GRSF Global Road Safety Facility  WRI INDIA  天津城建设计院 TIANJIN URBAN CONSTRUCTION DESIGN INSTITUTE  ChinaRAP CHINA ROAD ASSESSMENT PROGRAM  iRAP




STARS FOR
EACH 100M

WORLD BANK GROUP
UKaid
GRSF
Global Road Safety Facility
WRI INDIA
天津城建设计院
ChinaRAP
CHINA ROAD ASSESSMENT PROGRAM
iRAP

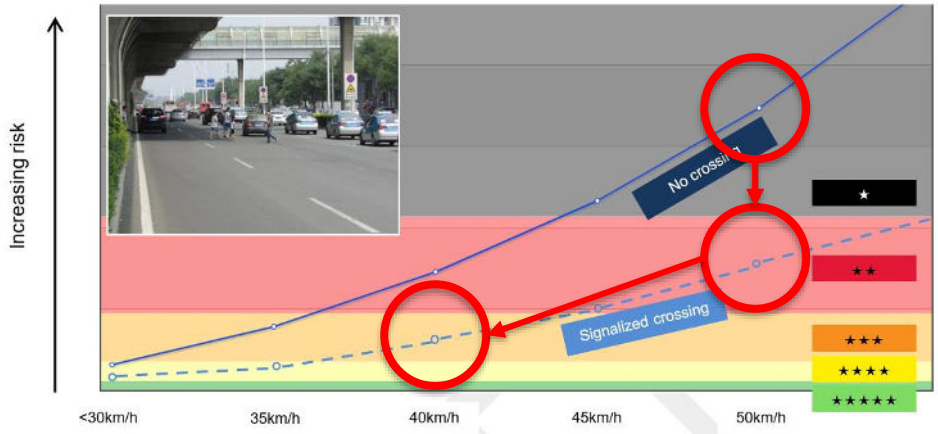
星
5 星
4 星
3 星
2 星
1 星


STARS FOR
EACH 100M

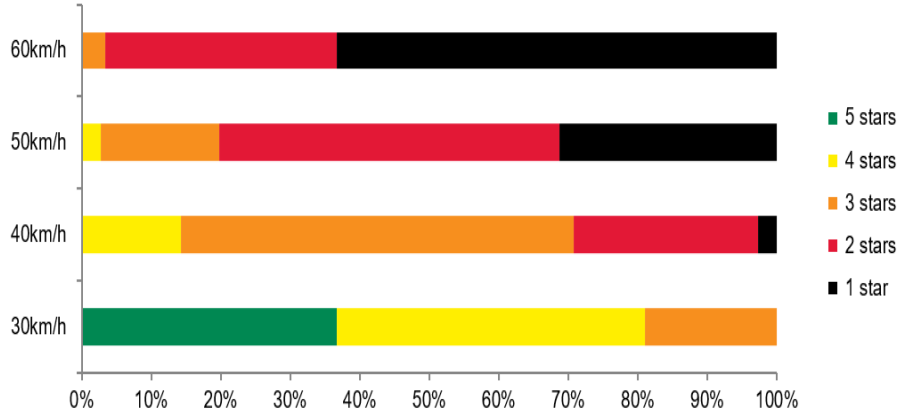
WORLD BANK GROUP
UKaid from the British people
GRSF Global Road Safety Facility
WRI INDIA
天津城建设计院 TIANJIN URBAN CONSTRUCTION DESIGN INSTITUTE
ChinaRAP CHINA ROAD ASSESSMENT PROGRAM
iRAP

# SPEED AND INFRASTRUCTURE

PEDESTRIAN STARS VS SPEED AT ONE LOCATION



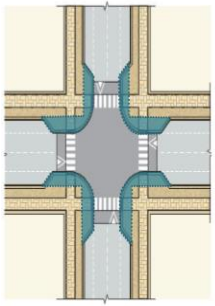

PEDESTRIAN STARS FOR SPEED SCENARIOS FOR MULTIPLE ROADS

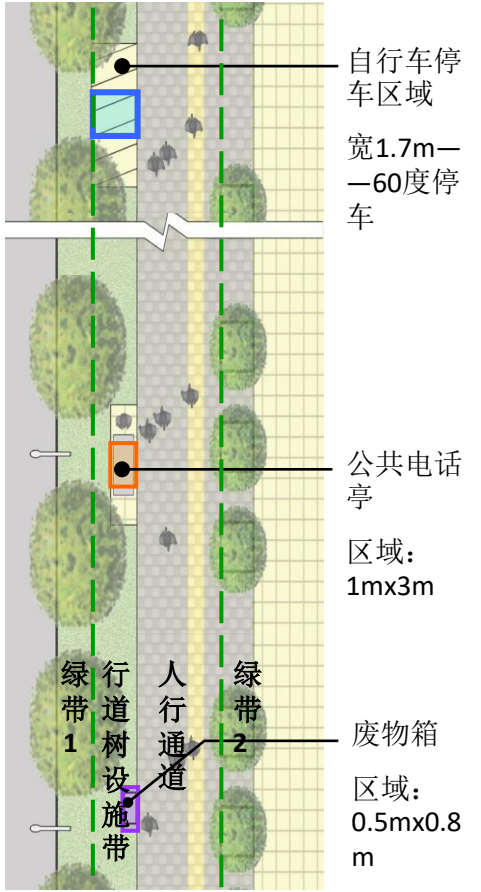


# DESIGN STRATEGY

## SAFE + GREEN + HEALTHY + SMART

**Separating vehicles from active transport modes and slowing traffic**

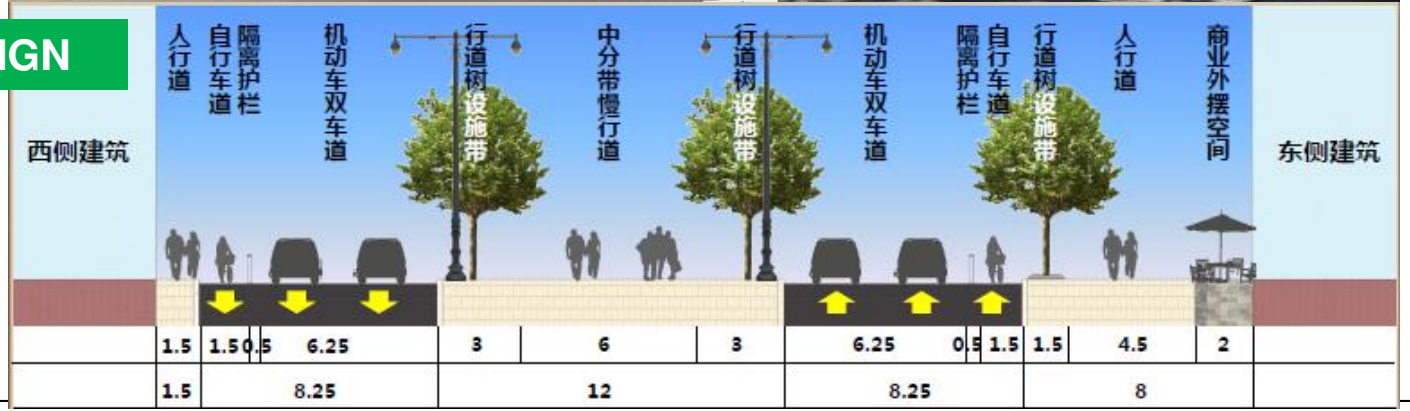




# DESIGN STAR RATINGS

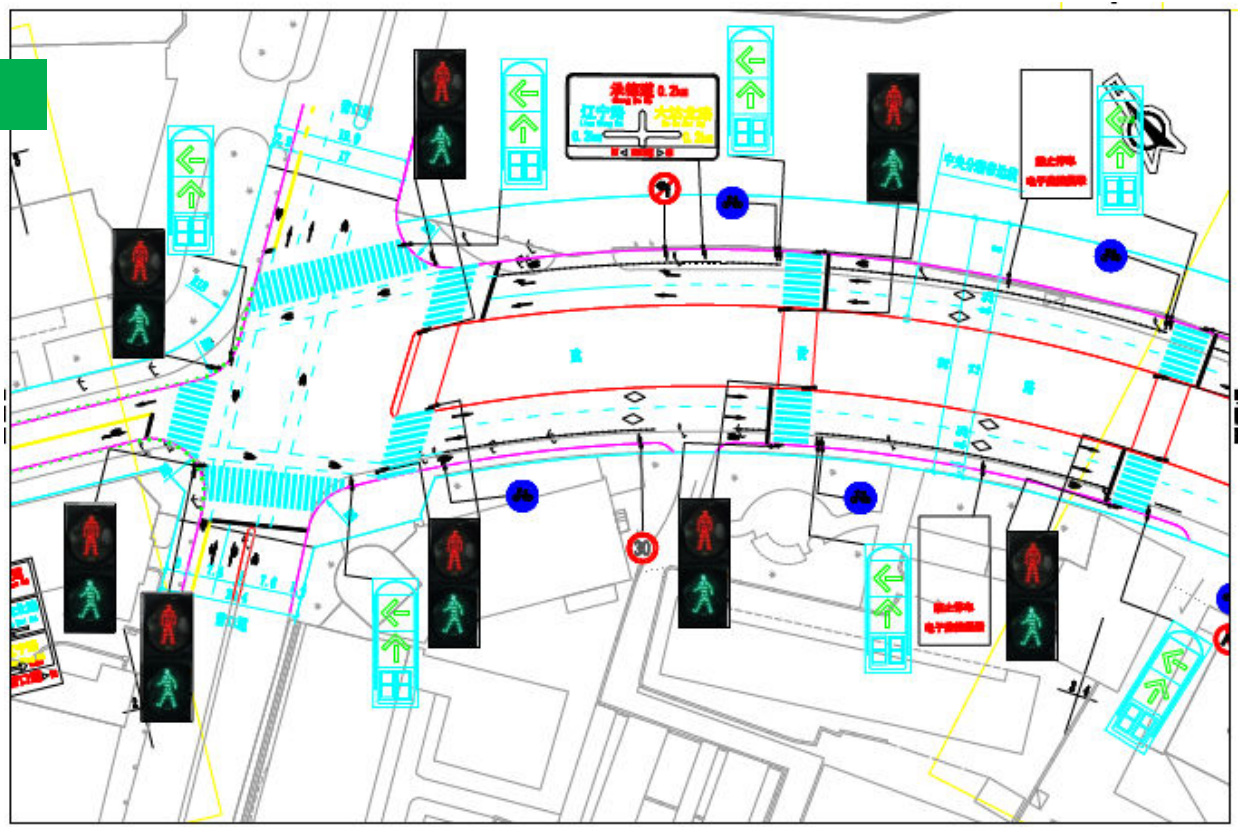
**BEFORE**

**DESIGN**




WORLD BANK GROUP · UKaid · GRSF Global Road Safety Facility · WRI INDIA · 天津城建设计院 · ChinaRAP CHINA ROAD ASSESSMENT PROGRAM · iRAP

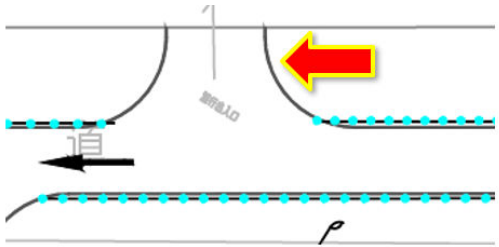
DESIGN



和平路、建设路交通工程平面图

# DESIGN STAR RATINGS

**Figure 4:** Little detail is provided on the design of vehicle crossing points on sidewalks. Designs should ensure that pedestrians have priority. Suggest extending use of bollards on either side of crossovers (Binjiang Road shown)



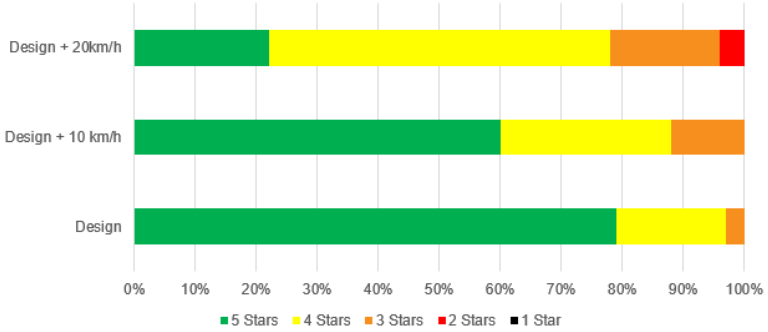



**Figure 9:** It is suggested that kerb radii be minimised at intersections to help reduce speeds (Binjiang Road shown)

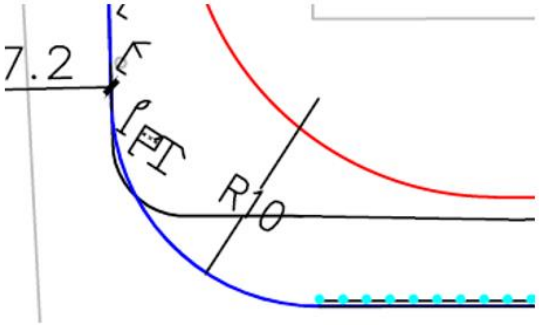
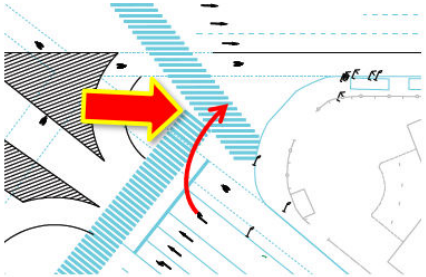
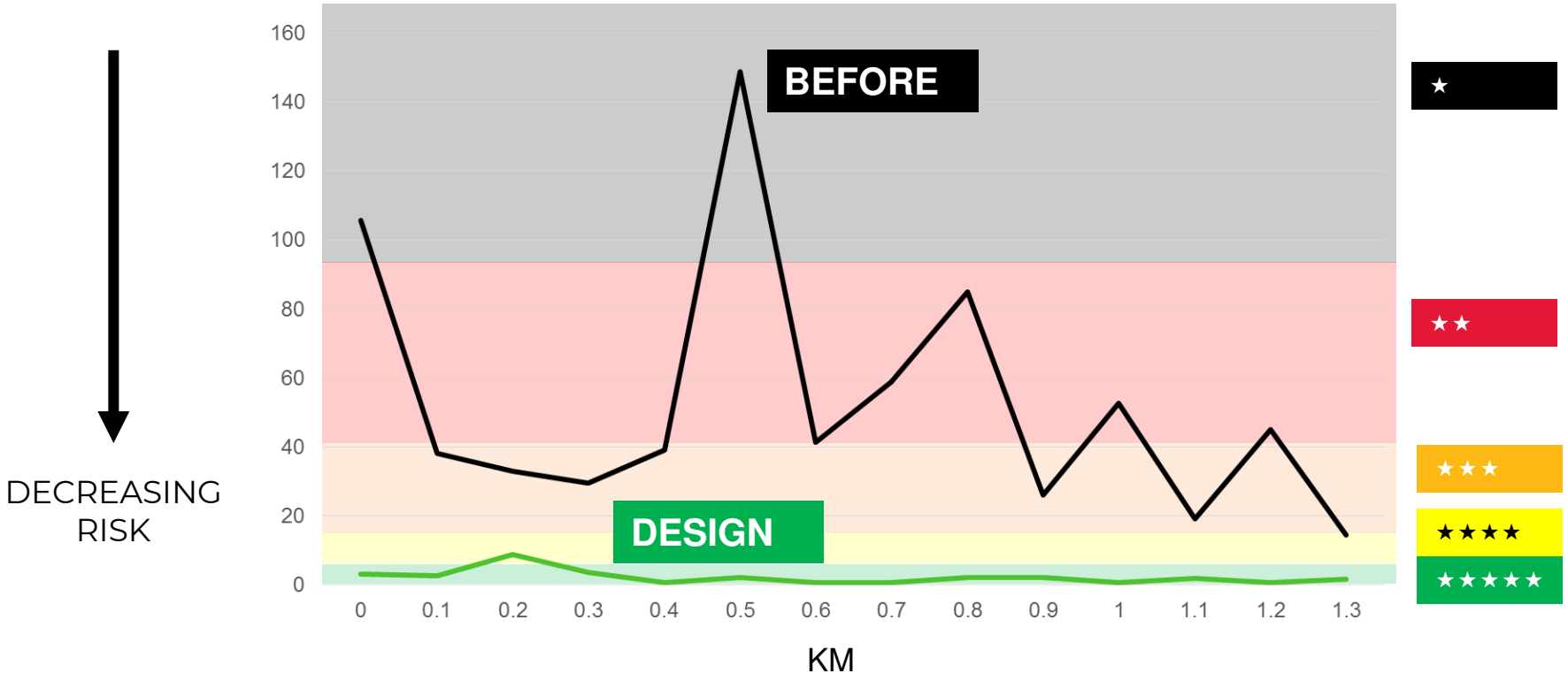



**Figure 22:** Misalignment of pedestrian crossings. A very large kerb radius also risks conflicts between turning vehicles and pedestrians and bicyclists (Qufu Road and Tianjin Road)



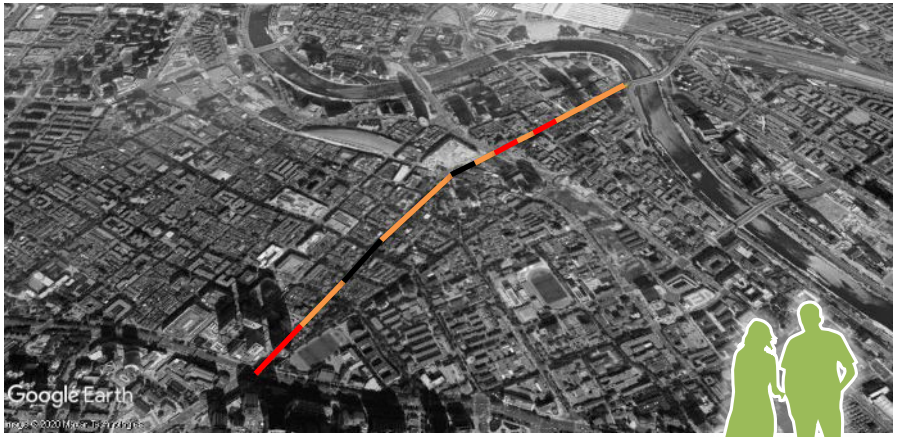
# DESIGN STAR RATINGS



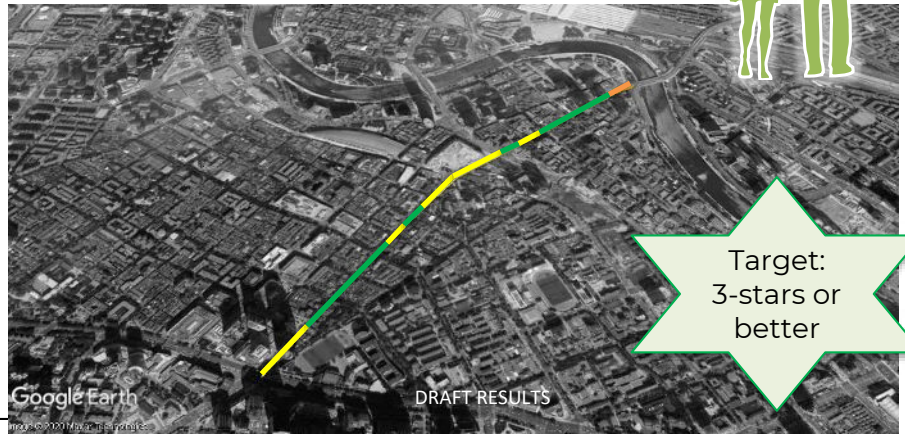

WORLD BANK GROUP · UKaid from the British people · GRSF Global Road Safety Facility · WRI INDIA · 天津城建设计院 · ChinaRAP CHINA ROAD ASSESSMENT PROGRAM · iRAP

# IMPLEMENTATION

**2015**

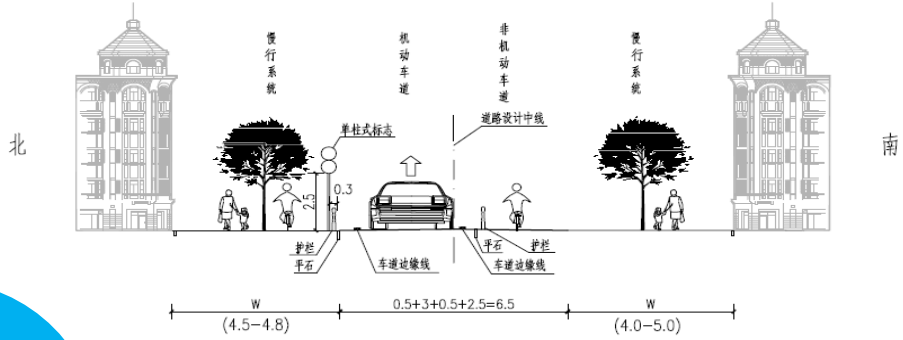



**2020**

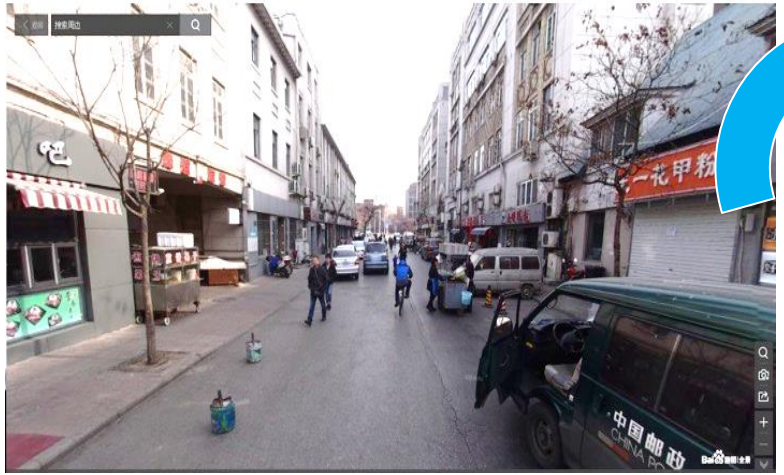

WORLD BANK GROUP · UKaid from the British people · GRSF Global Road Safety Facility · WRI INDIA · 天津城建设计院 TIANJIN URBAN CONSTRUCTION DESIGN INSTITUTE · ChinaRAP CHINA ROAD ASSESSMENT PROGRAM · iRAP

# IMPLEMENTATION




交通横断面设计图
(兴安支路~兴安路)

Tianjin Urban Construction Design Institute, 2020




WORLD BANK GROUP · UKaid from the British people · GRSF Global Road Safety Facility · WRI INDIA · 天津城建设计院 TIANJIN URBAN CONSTRUCTION DESIGN INSTITUTE · ChinaRAP CHINA ROAD ASSESSMENT PROGRAM · iRAP

# IMPLEMENTATION

**2015**

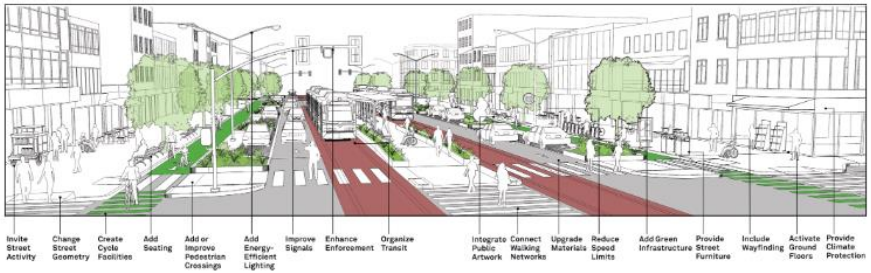
**2020**

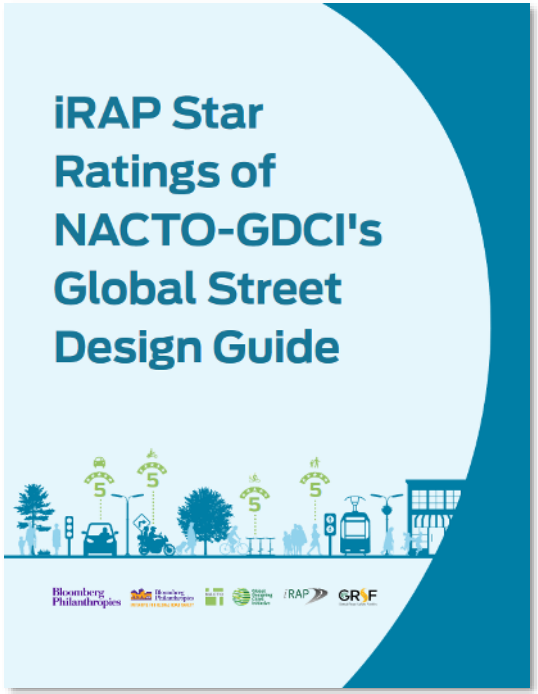
Tianjin Urban Construction Design Institute, 2020

# STARS FOR STREET DESIGN GUIDE

**Street design that prioritizes pedestrians, cyclists, and transit riders**

The Global Street Design Guide invites cities to ask what's possible of their streets, encouraging them to rethink, reimagine, and redesign how this finite space in cities can serve more people and more functions.

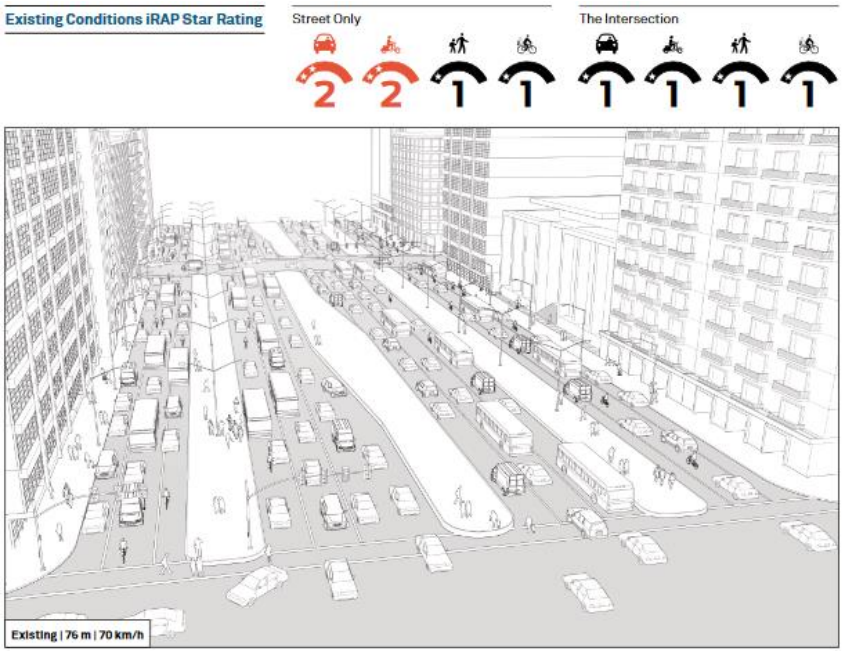


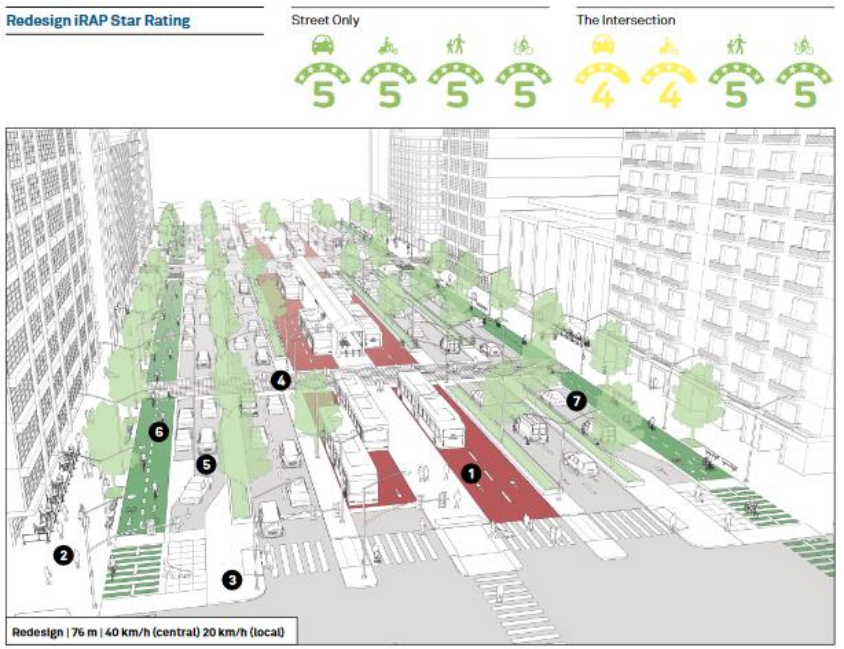




https://www.irap.org/street-design-guide

WORLD BANK GROUP · UKaid from the British people · GRSF Global Road Safety Facility · WRI INDIA · 天津城建设计院 · ChinaRAP CHINA ROAD ASSESSMENT PROGRAM · iRAP

# STARS FOR STREET DESIGN GUIDE




https://www.irap.org/street-design-guide

WORLD BANK GROUP UKaid GRSF Global Road Safety Facility WRI INDIA 天津城建设计院 ChinaRAP CHINA ROAD ASSESSMENT PROGRAM iRAP

# FOR MORE INFORMATION

Research Institute of Highway (RIOH)
www.rioh.cn

Tianjin Urban Construction Design Institute
www.tucdi.net

Greg Smith
iRAP
greg.smith@irap.org, www.irap.org

FIA FOUNDATION
GRSF Global Road Safety Facility
Bloomberg Philanthropies INITIATIVE FOR GLOBAL ROAD SAFETY

WORLD BANK GROUP
UKaid from the British people
GRSF Global Road Safety Facility
WRI INDIA
天津城建设计院 TIANJIN URBAN CONSTRUCTION DESIGN INSTITUTE
ChinaRAP CHINA ROAD ASSESSMENT PROGRAM
iRAP

# QUESTION & ANSWERS


## Session 4: **Financing and Implementing of road safety in TOD**

22nd October, 2020. 5.00pm IST (7.30am EST)
*Session type: Online presentation followed by panel discussion. 90 minutes.*

Speakers: Project team, The World Bank & WRI India. Chaired by Felipe Targa (Senior Transport Specialist, The World Bank)
Panelists: Radoslaw Czapski (Senior Transport Specialist, The World Bank), **Mriganka Saxena (Principal, HTAU), TBC**

The final session will discuss allocation of funds, innovative financing tools and incentives for ensuring road safety within TOD that benefit both the public and private sectors. Actions to be undertaken for implementing a TOD project including project prioritization, capacity building, and monitoring will also be discussed, together with challenges related to the incorporation of roads safety considerations in the five-steps of TOD framework. The panel will explore solutions for these challenges through case examples and project implementation experiences and discuss different short-, mid- and long-term strategies that could be adopted for implementation of road safety in TOD projects.