

Sustainable Urban Transport Planning

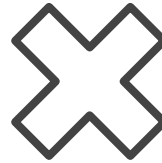


Jakarta IEA Energy Efficiency in
Emerging Economies
Udayalaksmana • July 2018

The Case of **Emerging Economies**



HUGE APPETITE FOR MOBILITY



LIMITED PUBLIC RESOURCES



PRIVATE VEHICLES

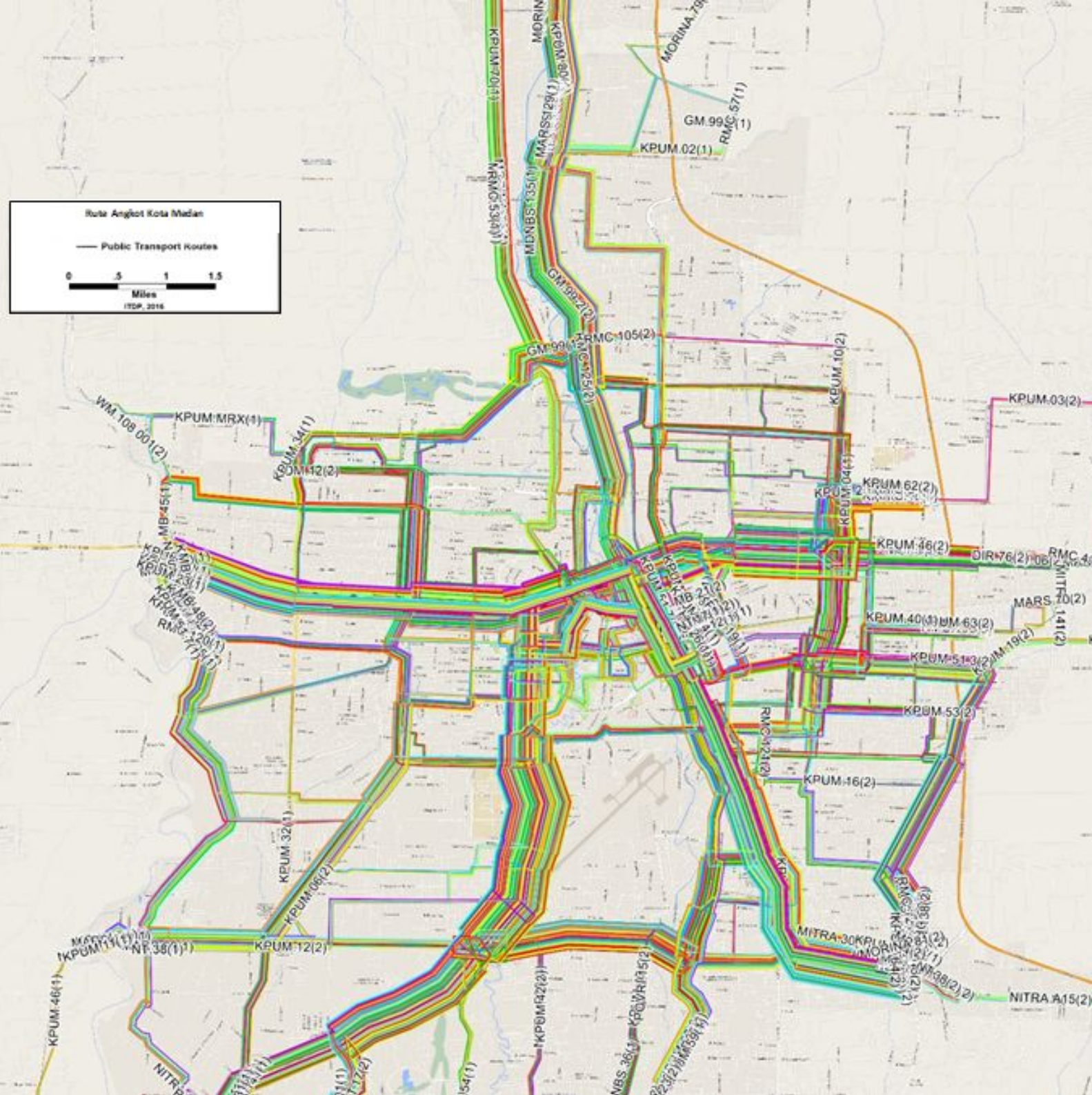


SPACE
LACK OF FUNDING AVAILABILITY
DATA

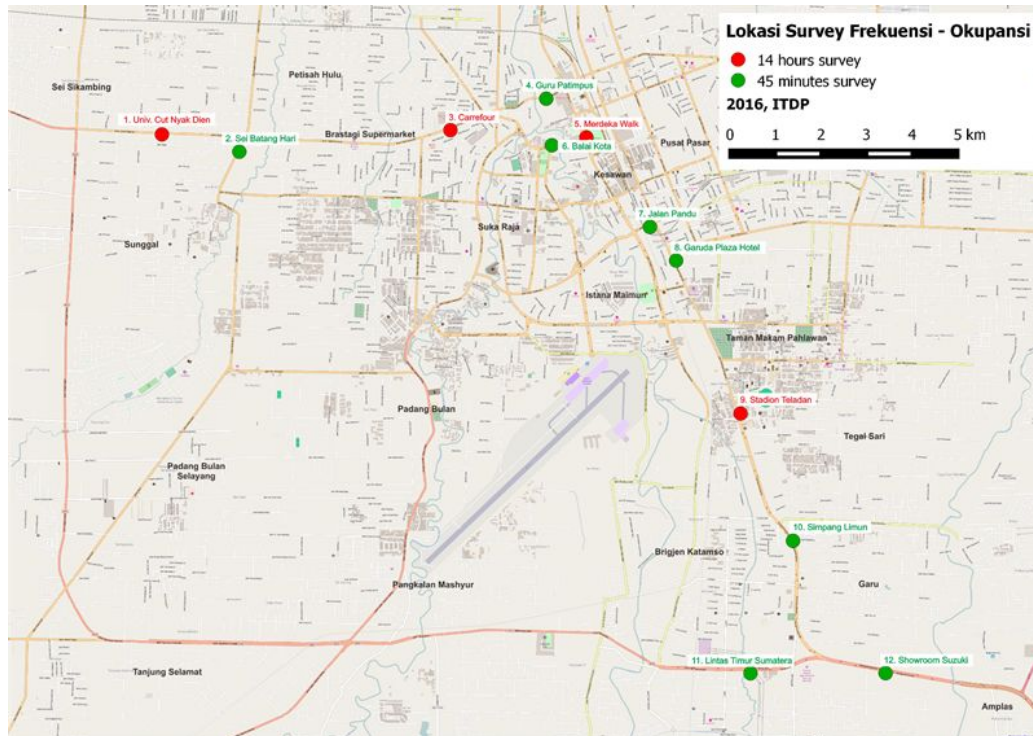
START FROM WHAT WE HAVE

ANGKOT

- 12 seater
- Individual operator



Existing Transit Performance



Note: Frequency and occupancy survey taken at peak hour, on 25–29 January 2016

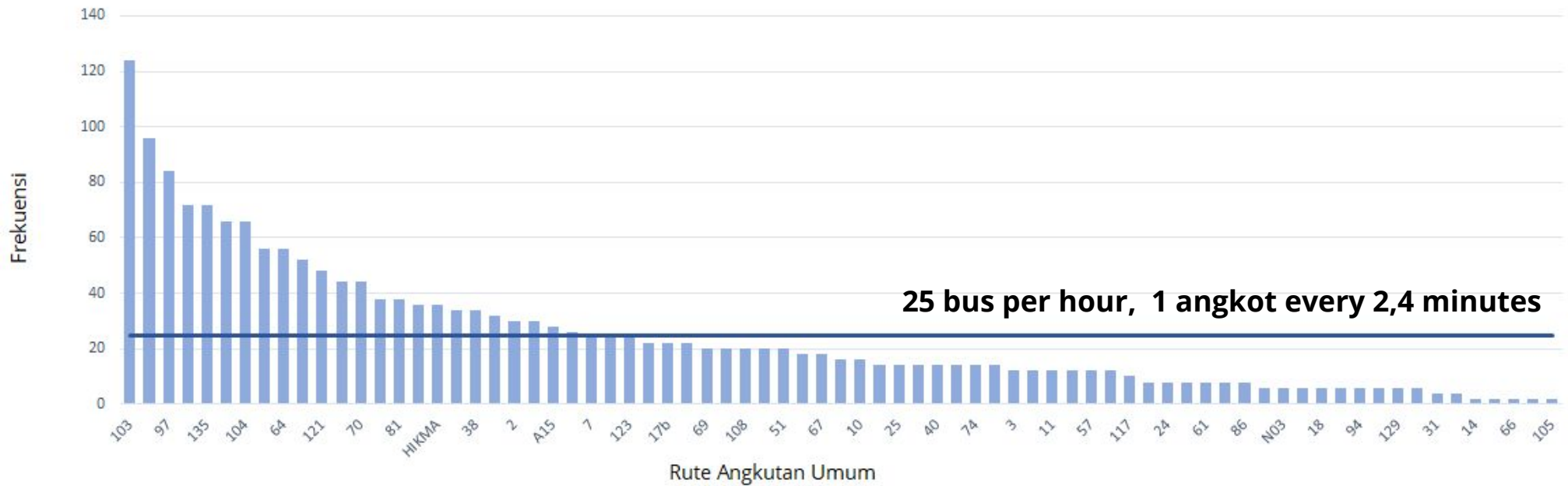
No.	Location	Frequency (bus/hr/dir.)	Passenger Volume (pax/hr/dir.)
1	UNIVERSITAS CUT NYAK DIEN	228	1,686
2	SEI BATANG HARI	106	592
3	CARREFOUR	626	1,960
4	GURU PATTIMPUS	240	1,266
5	MERDEKA WALK	782	2,980
6	BALAI KOTA	242	1,164
7	JL. PANDU	234	646
8	GARUDA PLAZA HOTEL	158	1,828
9	STADION TELADAN	416	1,254
10	SIMPANG LIMUN	410	2,172
11	LINTAS TIMUR SUMATERA	544	3,916
12	SHOWROOM SUZUKI	468	3,884

Comparison with BRT Systems in the World

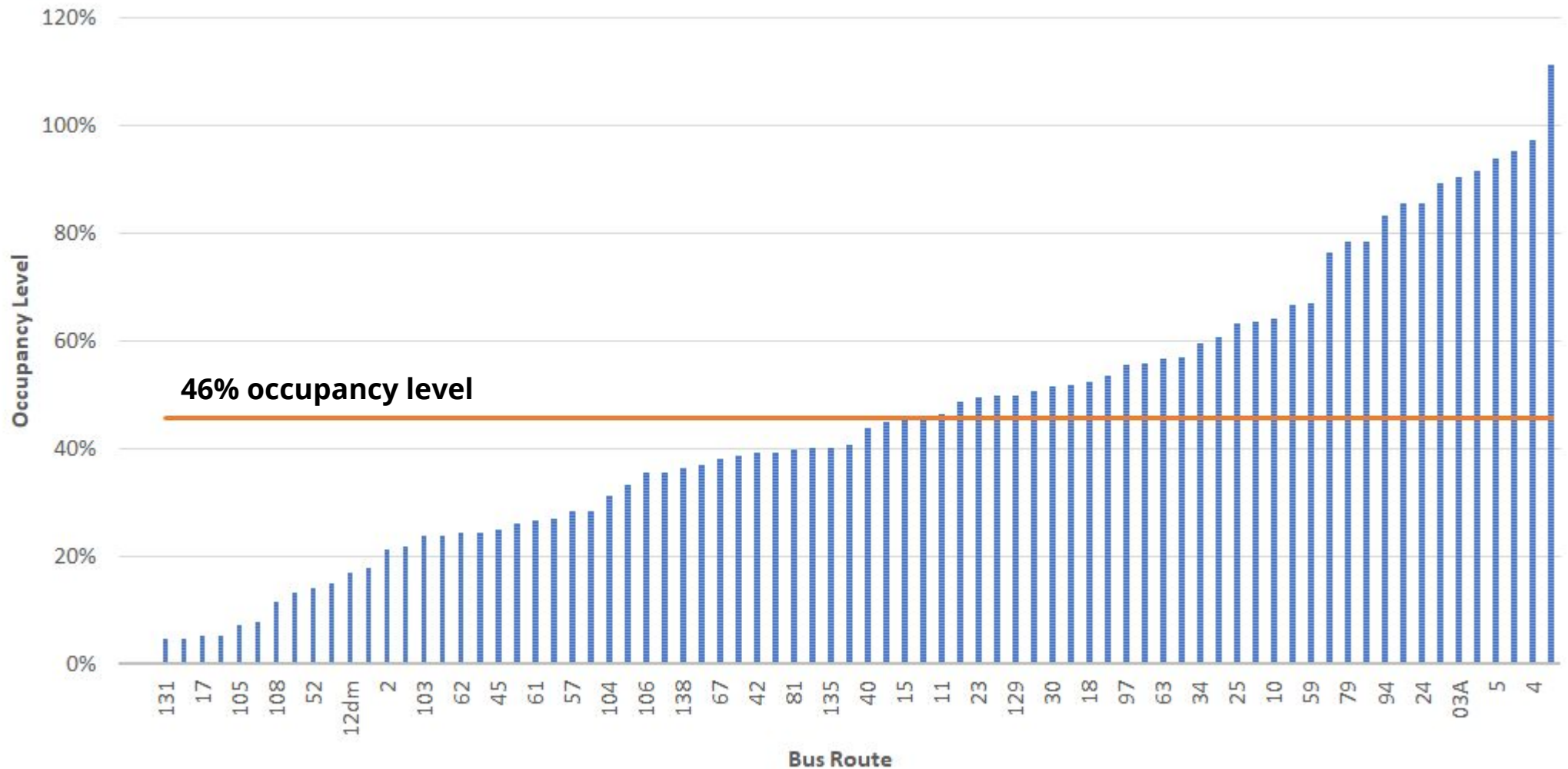


Bogota	37,700	Nth of Calle 76 stn, S-N, PM peak 21-Jan-13. AM N-S 35,160 (1-13)
Guangzhou	27,400	3-Jun-11, east of Shidajida station, AM peak east-west (1-14)
Istanbul	18,900	East of Cevizlibag station, W-E, AM peak, 6-Jul-12 (1-12)
Lima	13,950	South of Uni, N-S, AM peak, 2011.8.24. PM peak 9,700 Uni Stn S-N (1-11)
Cali	11,100	24-Jun-2013, east of San Pascual, PM peak, W-E (1-13)
Xiamen	9,850	East of Wolong Xiaocheng, W-E, PM peak, 2015.12.16 (1-15)
Chengdu	9,320	South of Hongpailou Dong, AM peak, N-S, 2015.11.25 (1-15)
Brisbane	8,750	South of Buranda, north-south, 3-Aug-2015, PM peak (1-15)
Mexico City	7,550	18-Jan-13 south of Insurgentes Stn, AM peak, N-S (1-13)
Zhengzhou	7,230	Zhongzhou Ave, Hongzhuanlu, N-S, AM peak, 22 Aug 2014 (1-15)
Lanzhou	6,630	West of Xingfuxiang, E-W PM peak, 29-May-2015 [19-Oct-15 similar] (1-15)
Dalian	6,430	South of Cunliu station, into city, AM peak, 24 Feb 2014 (1-14)
Quito	6,000	In corridor 3. Corridors 1 and 2: 3,500 (October 2008) (1-08)
Urumqi	5,470	North of Youailu station, PM peak, S-N, 2015.11.27 (1-15)
Yichang	5,400	South of Gezhouba Stn, AM peak, N-S, 4-Aug-2015 (1-15)
Johannesburg	4,510	West of Mayumbi Station 4-Jul-2012 AM Peak (1-12)
Hangzhou	3,700	1-Jul-15 AM peak Wulin Guangchang Bei, E-W (1-15)
Jakarta	3,400	15 May 2012, south of Tosari station (line 1), N-S (1-13)
Changzhou	2,980	South of Huaidelu Yanlinglu stn, PM peak S-N, 2015.11.27 (1-15)
Paris	2,900	East of Choisy Le Roi station, AM peak, 28-Jan-2016 (1-16)
Beijing	2,850	South of Tiantan, N-S, PM peak, 11-Jun-2015, Corr. 2-4 1,100-1,350 Jan 2013 surveys (1-15)
Yinchuan	2,770	West of Shangchengs stn, PM peak, E-W 2015.11.25 (1-15)
Hefei	2,680	West of Sipailou, AM peak, W-E, 2015.11.24 (1-15)
Islamabad	2,100	AM peak eastbound, west of Stock Exchange Station, 2015.12.2 (1-15)
Jinan	2,050	East of Lishan Lu station, 16-Jul-2014, east-west, PM peak (1-14)
Leon	1,950	East of Industrial Station, PM peak, east-west, 2013.6.14 (1-13)
Yancheng	1,760	South of Daqing Lu station, PM peak, south-north, 3-Jul-2015 (1-15)
Lianyungang	1,650	North of Longhe Guangchang, N-S, PM peak, 22 Jan 2013 (1-13)
Zaozhuang	1,400	East of Guishan park, W-E, AM peak, 4 Mar 2014 (1-14)
Bangkok	1,200	18-Oct-11, PM peak, north-south, south of Arkan Songkroh (1-11)
Nantes	1,200	South of Cite International des Congress, S-N, AM peak 24-Jun-10 (1-11)
Shaoxing	1,150	AM peak, N-S, north of Songmeiqiao station, 28-Oct-2013 (1-13)
Zhongshan	1,020	East of Nongshangyinhang Dongquzhihang stn, E-W PM peak, 16-Jul-2015 (1-15)
Los Angeles	1,000	27-Jun-13, east of Van Nuys Stn, PM peak, E-W (1-13)
Amsterdam	960	East of Hooftdorp Station, east-west, PM peak, 2011.6.27 (1-11)
Changde	800	South of Huangmuguan station, S-N, PM peak, 21-Mar-2013 (1-13)
Cape Town	750	Surveys 5-Jul-2012, PM peak (1-12)
Zhoushan	600	East of Haiyunxueyuan, E-W AM peak, 8 Mar 2014 (1-14)
Nagoya	500	South of Moriyama Stn, 7-Oct-2013, S-N, PM peak (1-13)
Kuala Lumpur	120	South of Mentari Station, N-S, AM peak, 17 Nov 2015 (1-15)

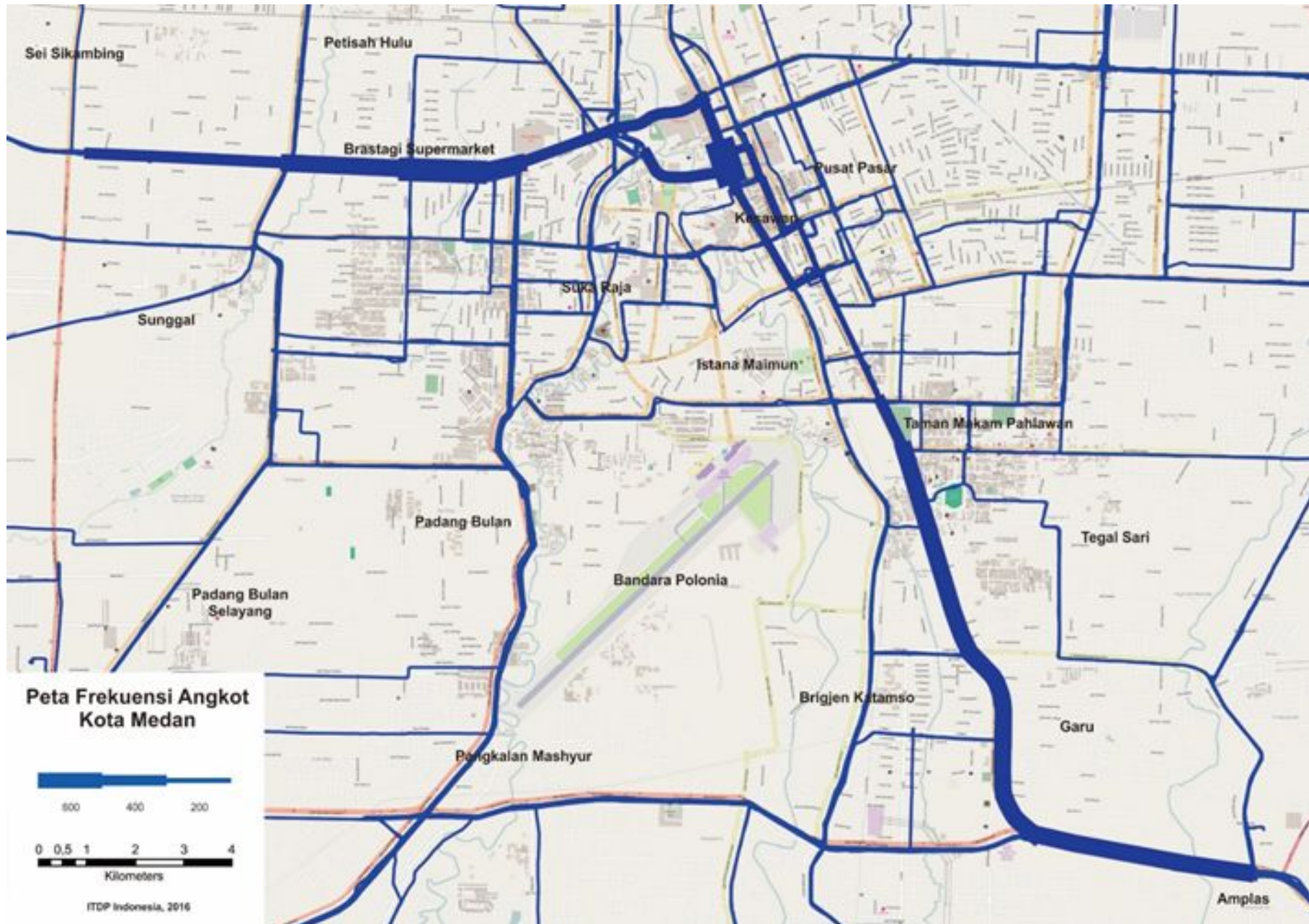
High Frequency Routes



High Occupancy Routes



Routes With Highest Demand



Proposed Mass Transit Corridor



CHOICE OF MODE

High Quality Mass Transit



BRT



MRT



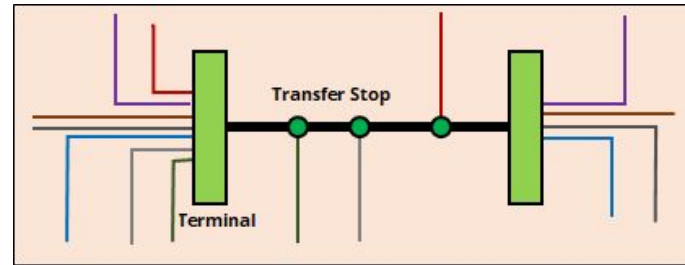
LRT



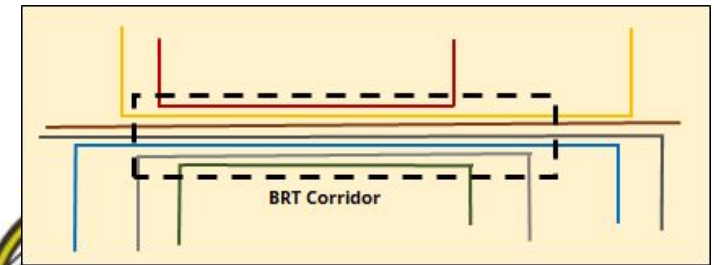
“Direct-Service” Concept



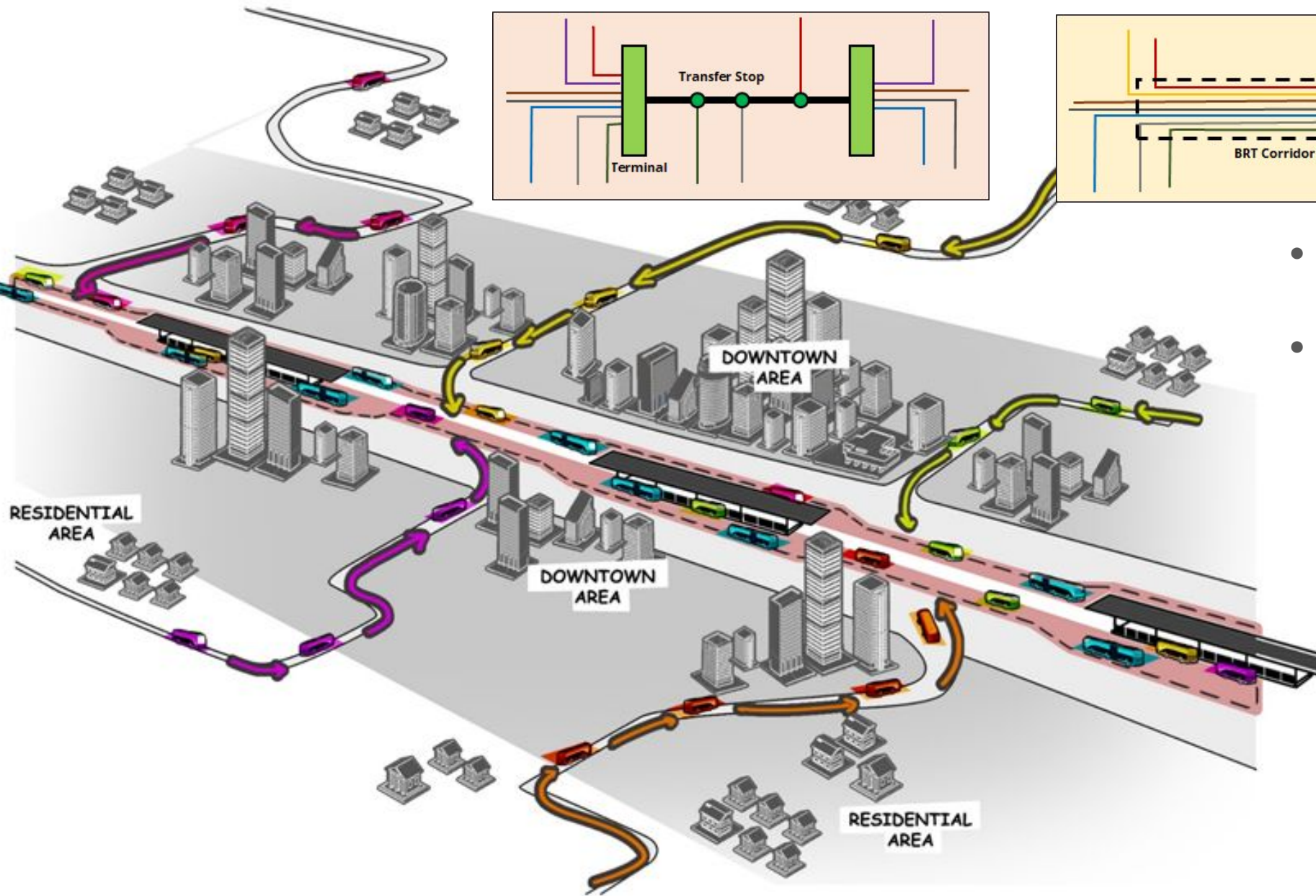
SEPARATE TRUNK & FEEDER SYSTEM



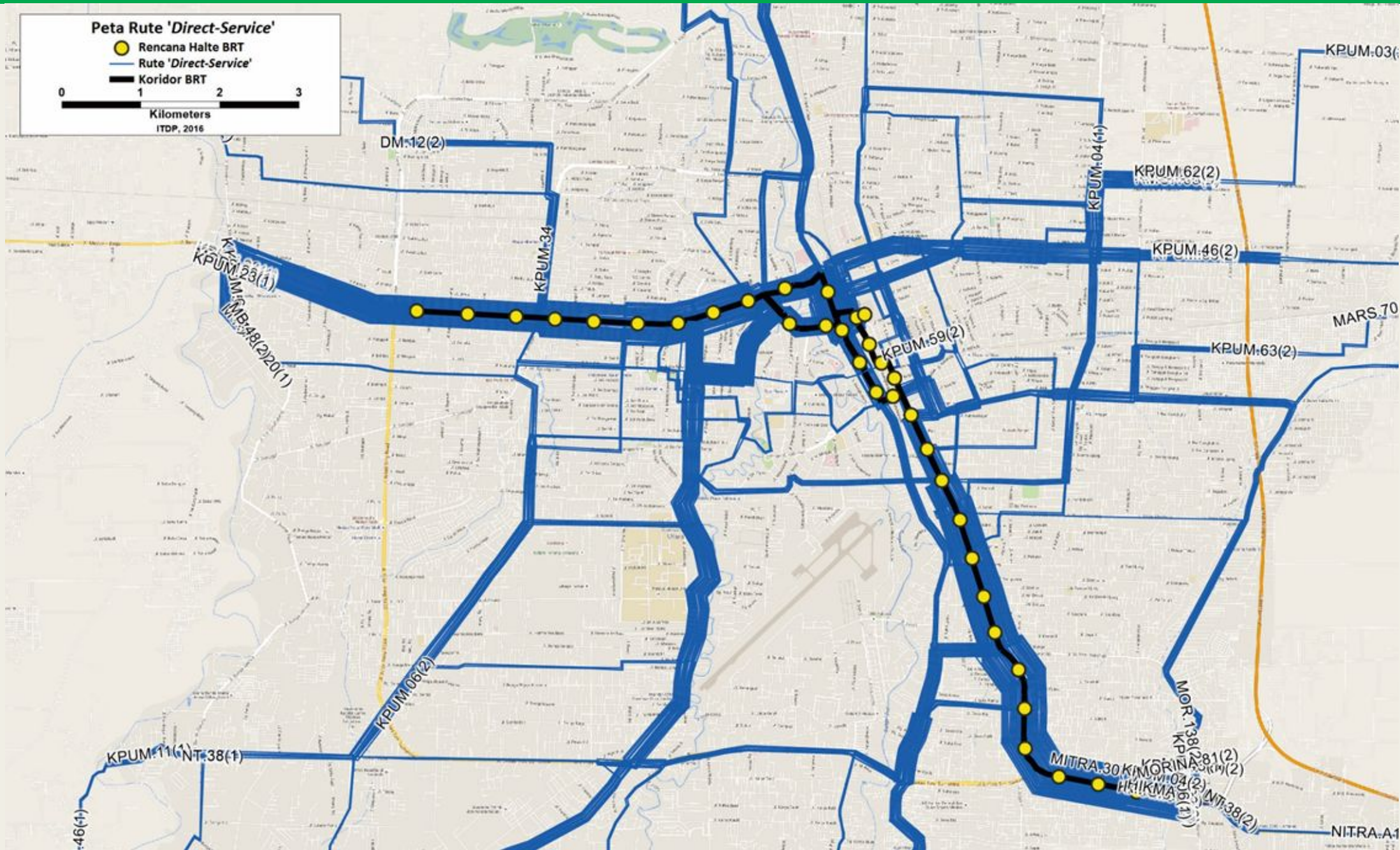
DIRECT-SERVICE SYSTEM



- Less transfer, less waiting time
- No need of big transfer terminal



Direct-Service BRT

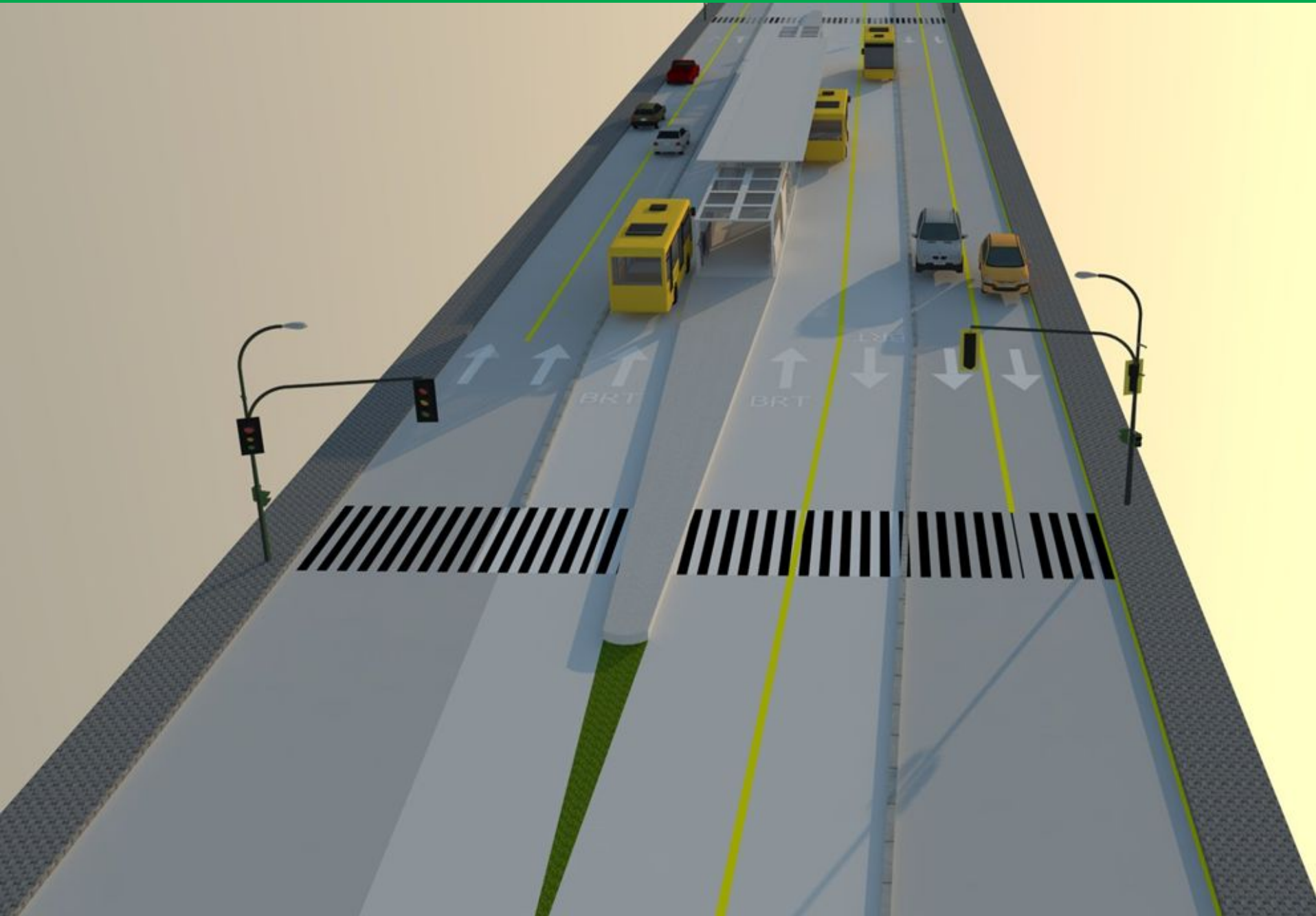


Daily Passenger Demand



No.	Route		Daily Passenger Demand		
			Westbound	Eastbound	Total
1	DM	12	8,406	13,106	21,511
2	KPUM	3	1,696	2,220	3,916
3	KPUM	4	2,038	3,466	5,504
4	KPUM	6	2,038	2,780	4,818
5	KPUM	7	2,620	1,300	3,920
6	KPUM	23	5,407	7,187	12,595
7	KPUM	24	778	846	1,623
8	KPUM	32	3,499	5,232	8,731
9	KPUM	34	371	634	1,005
10	KPUM	63	14,410	16,896	31,306
11	KPUM	64	10,189	13,142	23,330
12	KPUM	65	3,499	4,650	8,149
13	KPUM MRX	51	2,651	2,907	5,557
14	MARS	70	4,665	5,813	10,478
15	MB	48	1,528	3,033	4,561
16	MITRA	30	3,930	7,473	11,403
17	MJ	117	1,590	2,774	4,365
18	MORINA	122	3,693	5,522	9,216
19	MORINA	138	10,407	25,345	35,752
20	MORINA	81	1,590	2,378	3,969
21	NATIONAL	38	19,795	22,709	42,504
22	NITRA	A15	8,660	5,054	13,715
23	RMC	57	1,965	2,383	4,348
Total Daily Passenger			115,426	156,850	272,275

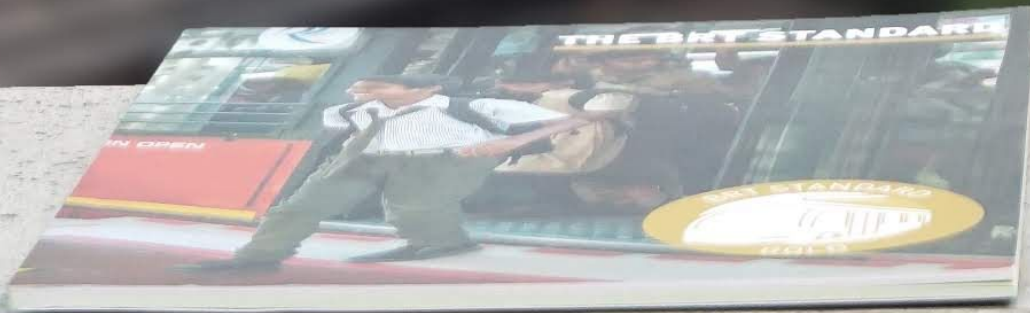
Infrastructure Design



Infrastructure Design



More About BRT Planning



The Important Role of Walking & Cycling



TRANSIT ORIENTED DEVELOPMENT



TOD STANDARD



WALK

CYCLE

CONNECT

TRANSIT

MIX

DENSIFY

COMPACT

SHIFT

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 safe, all-accessible walkways. **3 points**

Metric 1.A.2 Crosswalks
Percentage of intersections with safe, all-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, building 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 or shelter elements. **1 point**

CYCLE

Principle 2 | 5 points

OBJECTIVE A.
The cycling network is safe and complete.

Metric 2.A.1 Cycle Network
Access to a 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, multi-space cycle parking facilities are provided at all transit stations. **1 point**

Metric 2.B.2 Cycle Parking at Buildings
Percentage of buildings that provide ample, secure cycle parking. **1 point**

Metric 2.B.3 Cycle Access in Buildings
Buildings allow interior access and storage within tenant-controlled spaces for cycles. **1 point**

CONNECT

Principle 3 | 15 points

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

Metric 3.A.1 Small Blocks
Length of longest pedestrian block. **10 points**

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

Metric 3.B.1 Prioritized Connectivity
Ratio of pedestrian intersections to motor vehicle intersections. **5 points**

TRANSIT

Principle 4 | ^{TOD} REQUIREMENT

OBJECTIVE A.
High quality transit is accessible by foot.

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

MIX

Principle 5 | 25 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 Uses
Residential and nonresidential 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 elementary or primary school, a healthcare service or pharmacy, and a source of fresh food. **3 points**

Metric 5.A.3 Access to Parks and Playgrounds
Percentage of buildings located within a 500-meter walking distance of a park or playground. **1 point**

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

Metric 5.B.1 Affordable Housing
Percentage of total residential units provided as affordable housing. **8 points**

Metric 5.B.2 Housing Preservation
Percentage of households living on site before the project that are maintained or relocated within walking distance. **3 points**

Metric 5.B.3 Business and Services Preservation
Percentage of pre-existing local resident-serving businesses and services on the project site that are maintained on site or relocated within walking distance. **2 points**

DENSIFY

Principle 6 | 15 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 in similar projects and station catchment areas. **7 points**

Metric 6.A.2 Residential Density
Residential density in comparison with best practice in similar projects and station catchment areas. **8 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 adjoin existing built-up sites. **8 points**

OBJECTIVE B.
Traveling through the city is convenient.

Metric 7.B.1 Transit Options
Number of different transit options that are accessible within walking distance. **2 points**

SHIFT

Principle 8 | 15 points

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

Metric 8.A.1 Off-Street Parking
Total off-street area dedicated to 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 development area. **6 points**



Shared Mobility Principles for Liveable Cities

The future of mobility in cities is multimodal and integrated. When vehicles are used, they will be right-sized, shared*, and zero emission. These principles guide urban decision-makers and stakeholders toward the best outcomes for all.

9

Promote integration and seamless connectivity

*Shared vehicles include all those used for hire to transport people (mass transit, private shuttles, buses, taxis, auto-rickshaws, car and bike-sharing) and urban delivery vehicles.



SharedMobilityPrinciples.org
#LiveableCities
#10principles

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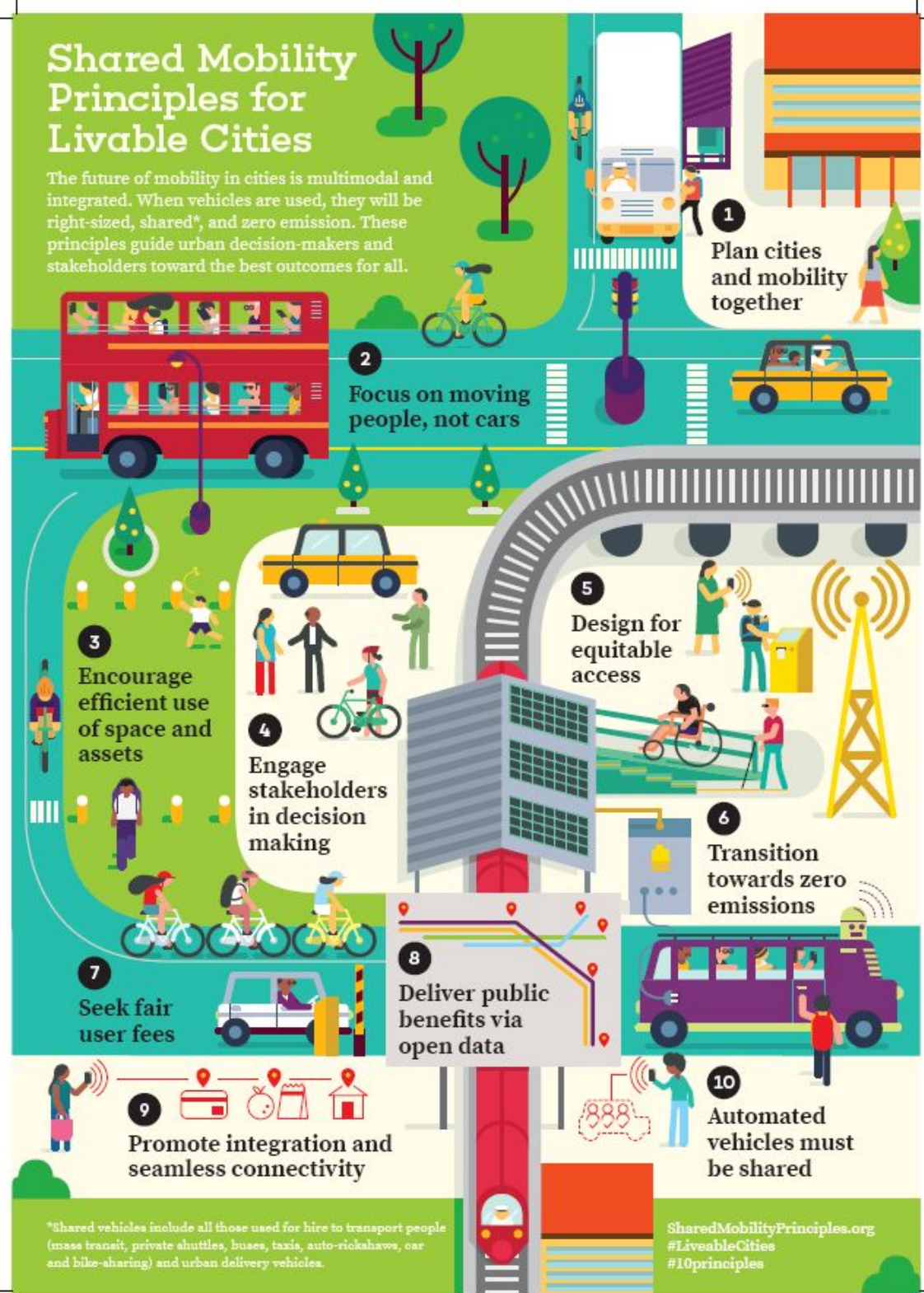
www.sharedmobilityprinciples.org



9

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Sustainable Urban Mobility



-means that nowadays you can
have your bus stop inside-

**“GOING ELECTRIC MEANS YOU CAN HAVE BUS
STOP INSIDE THE BUILDING YOU LIVE IN”**



ITDP

Institute for Transportation
& Development Policy

Promoting sustainable and equitable transportation worldwide.

07

COUNTRIES

32

YEARS

'99

IN INDONESIA

**BUS RAPID TRANSIT . NON-MOTORIZED TRANSPORT . TRANSIT-ORIENTED DEVELOPMENT
TRANSPORT DEMAND MANAGEMENT . SUSTAINABLE URBAN DESIGN**

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