National Capacity Building Workshop on Road Safety

19, 21 and 22 March 2019, Kathmandu

Urban Transport and Road Safety

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Pattern of Urban Development

- More than 2 billion Urban residents- 55% of world's urban population
- 23 of world's 37 megacities are in Asia
- 90% of world's urban expansion in developing countries- growing urban sprawls & slums
- Rapidly growing small & medium sized cities/ towns
- Cities account for more that 2/3 of energy use and GHG emissions
- Cost of Air pollution, congestion, road crashes: 5-10% of GDP
- Car centered developments & lack of affordable public transport
- Secondary and small sized cities- opportunities to plan and implement sustainable urban transport policies

Traffic congestion

% change in travel time

Source: Tomtom Traffic Index 2016

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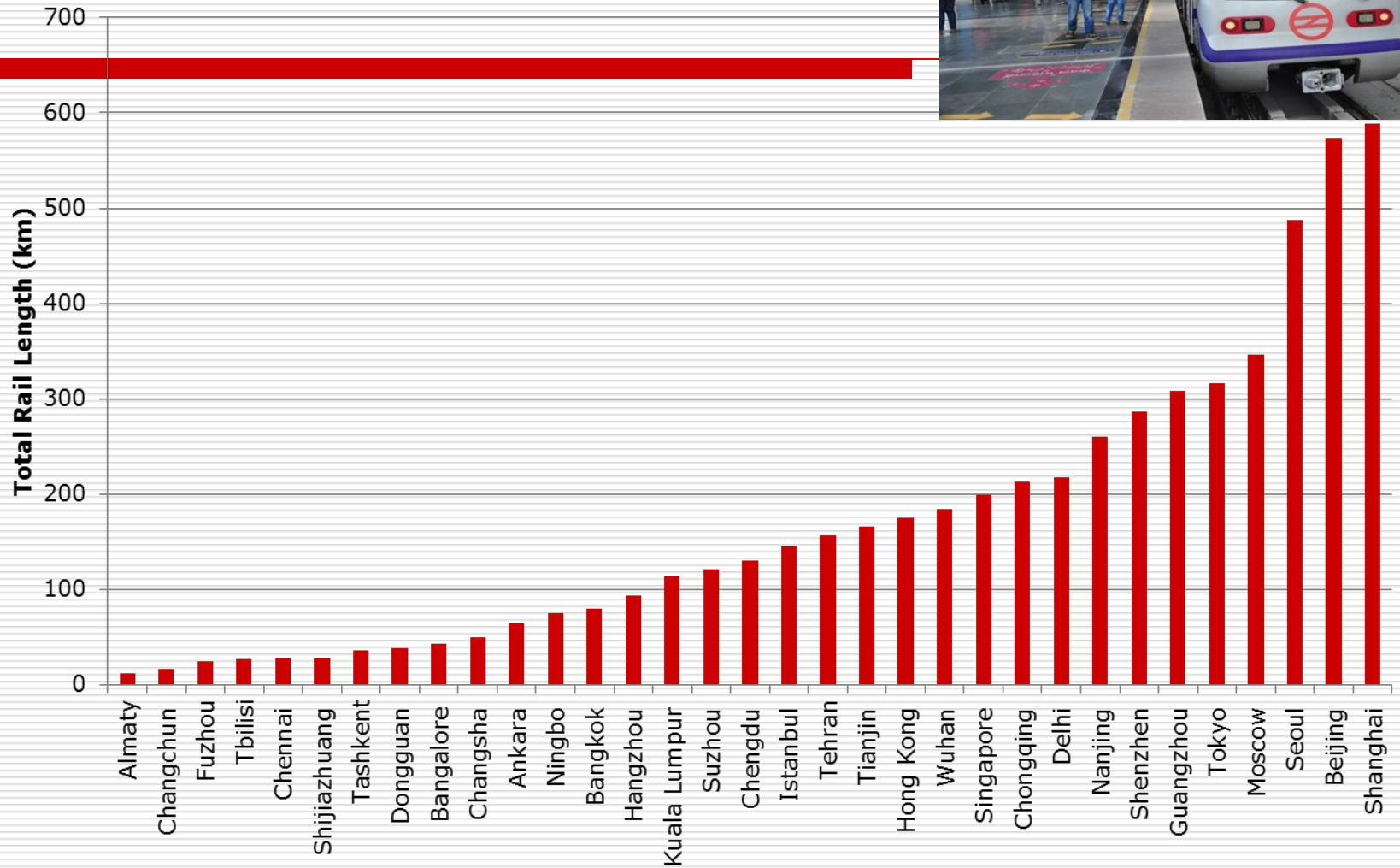
Urban Transport in Asian cities

- Cities with good example of public transport : Tokyo, Singapore, Seoul, Hong Kong, China
- Mass transit system: Bangkok, Beijing, Delhi, Jakarta, Kuala Lumpur, Moscow, Tehran, etc.
- Bus Rapid Transit: Many cities in China and India
  - 43 Asian cities, 1593 route Km, 9.3 mil passengers/day
  - Tehran highest capacity-2 m, Jakarta longest route-207 km
- Cities of LDCs, LLDCs
  - Mass transit: Almaty, Baku, Tashkent and Yerevan
  - Public mass transport in still developing stage
- Non-Motorized Transport: A significant population depends on walking & bicycling
- Bus service, para-transit, private vehicles
- Variance in the use of intelligent transport systems

Rail based MRT in Asian Cities



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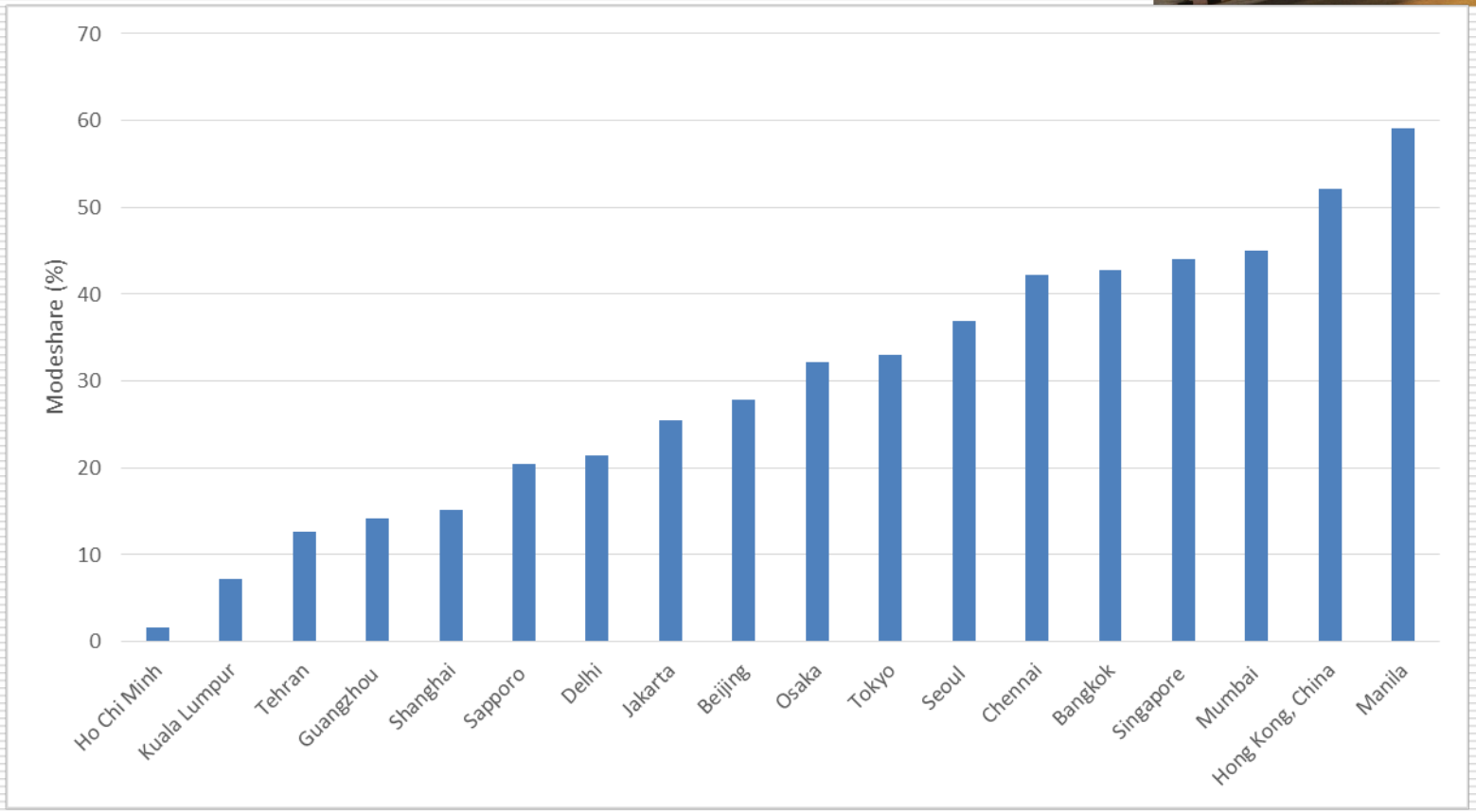
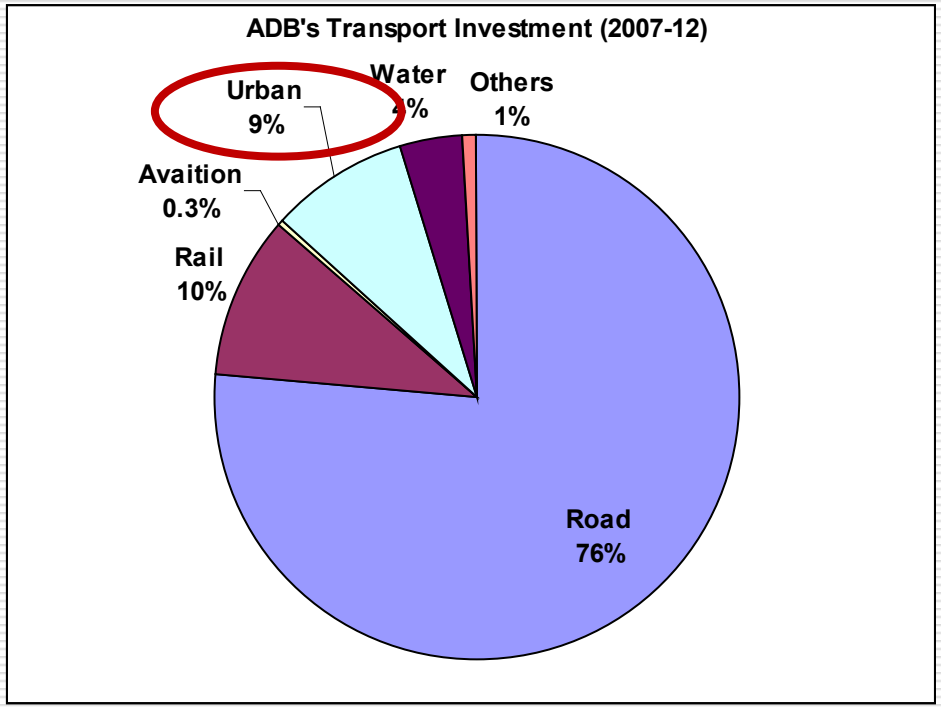
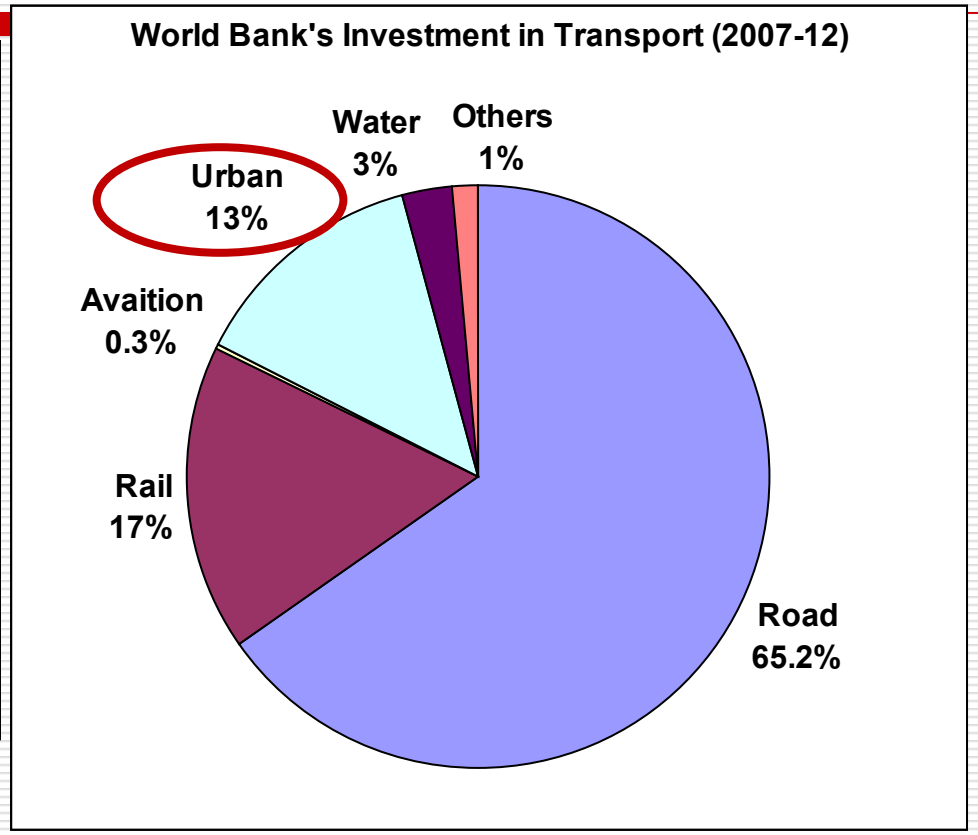
Public transport mode share in Asian cities



Pattern of Investment in Transport





(ESCAP, 2013)

- Majority of investment is in roads
- Rail and Urban transport investment increasing
- Limited investment aviation, inland water transport and coastal shipping

Capital costs of development of different mass transit systems

City	Type of system	Length, Km	Cost per km (mil $/km)
Janamarg, Ahmedabad	BRT	82	2.4
Kuala Lumpur (PUTRA)	Elevated rail	29	50.0
Kuala Lumpur Monorail	Monorail	8.6	38.1
Bangkok (BTS)	Elevated rail	23.7	72.5
Beijing Metro	Metro rail	113	62.0
Shanghai Metro	Metro rail	87.2	62.0
Bangkok MRTA	Metro rail	20	142.9
Hong Kong Subway	Metro rail	82	220

Source: Wright and Hook, 2007 and D. Hidalgo and A. Carrigan, 2010

Nepal: Road Safety Situation

- Total Vehicle: 2,339,169 (2015/16)
- Reported Fatality: 2006 (2015)
- Fatality 2,385 fiscal year 2073/74(2018)
- WHO estimated: 4622 (2016)
- Estimated rate: 15.9/100,000 (2016)
- Kathmandu: 6.33/100,000 (2016)

ROAD SAFETY MANAGEMENT, STRATEGIES AND TARGETS IN NEPAL

Lead agency

- A lead agency is present **Yes**
- The lead agency is funded Yes

Functions of the lead agency

- Coordination **Yes**
- Legislation **Yes**
- Monitoring & evaluation **Yes**

Road safety strategies

- There is a national road safety strategy **Yes**
- The strategy is funded **Partially funded**

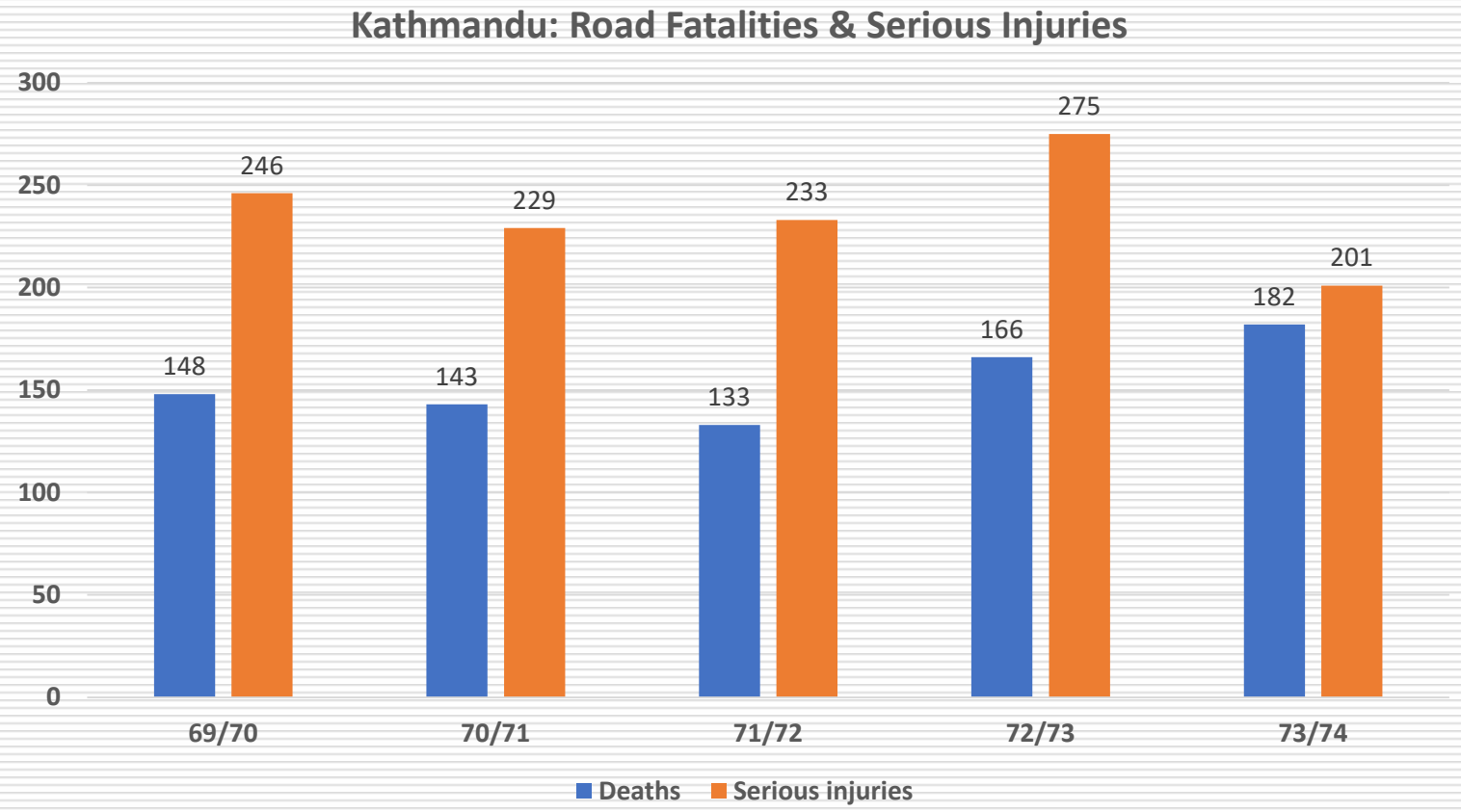
Road safety targets

- Fatal -
- Non-fatal -

SAFER MOBILITY PRACTICES IN NEPAL (WHO,2018)

Number of registered vehicles	**2 339 169**
Audits or star rating required for new road infrastructure	**Partial**
Inspections / star rating of existing roads	**Yes**
Design standards for the safety of pedestrians / cyclists	**Partial**
Investments to upgrade high risk locations	**No**
Policies & investment in urban public transport	**Yes**
Policies promoting walking and cycling	**No**

SAFETY Data Kathmandu



Motorcycle helmet law

- National motorcycle helmet law **Yes**
- Applies to driver **Yes**
- Applies to adult passengers **Yes**
- Applies to all roads **Yes**
- Applies to all engines **Yes**
- Helmet fastening required **Yes**
- Standard referred to and / or specified **No**

Road Safety Situation

Estimated losses due to road traffic crashes (2013)	Estimated GDP lost (%)	Estimated lost (million USD)
Armenia	1	104.39
Australia	2.1	32,103.98
Bangladesh	1.6	2,456.08
Cambodia	2.1	324.45
India	3	58,082.64
Indonesia*	2.9-3.0	22,652.82
Iran (Islamic Republic of)	6	30,697.26
Japan	1.3	63,954.64
Lao People's Democratic Republic	2.7	290.52
Malaysia	1.5	4,697.37
Myanmar	0.5	310.71
Nepal	0.8	145.82
New Zealand	1.6	3,031.90
Philippines	2.6	7,073.74
Republic of Korea	1	13,056.05
Russian Federation*	1.9	28,973.42
Thailand	3	12,605.01
Turkey*	1.1	8,042.58
Viet Nam	2.9	4,965.44
Total (19 countries)		293,568.83

Road Safety Situation

Road Safety Situation in Asia-Pacific

The change in road traffic fatalities between 2010 and 2013							
Countries with a reduction (per cent)				**Countries without reduction (per cent)**			
Palau	-66.67	Republic of Korea	-12.57	Micronesia (F.S.)	no change	Mongolia	21.59
Kiribati	-50	India	-10.16	Samoa	no change	Philippines	22.12
New Zealand	-31.66	Japan	-9.87	Malaysia	0.62	Bangladesh	23.29
Marshall Islands	-25	Indonesia	-9.79	Russian Federation	1.72	Tajikistan	24.04
Georgia	-24.96	Australia	-8.14	Viet Nam	3.55	Sri Lanka	29.33
Singapore	-23.94	Thailand	-7.89	Uzbekistan	4.28	Tonga	33.33
Afghanistan	-23.76	Fiji	-5.56	Vanuatu	7.69	Solomon Islands	36.71
Turkey	-23.65	China	-5.3	Cambodia	8.39	Papua New Guinea	38.12
Lao PDR	-23.3	Armenia	-2.15	Kazakhstan	13.35	Myanmar	50.61
Azerbaijan	-21.5	Nepal	-1.55	Bhutan	18.75	Maldives	100
Pakistan	-14.44	Iran (Islamic Rep. of)	-1.3	Kyrgyzstan	19.37	Cook Islands	150
Timor-Leste	-14.16						
ESCAP Average				**-5.60**			

Global Regional Mandates on Urban Mobility

- Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
- New Urban Agenda, 2016
  - Promote access for *all-safe, affordable, sustainable urban mobility*
  - TOD
  - Develop Comprehensive Mobility Plan
  - Develop *mechanisms and frameworks*
  - Greater *coordination of implementation*
- Regional Action Programme on Sustainable Transport Connectivity (2017-2021): Sustainable urban transport

Sustainable Urban Transport Index (SUTI)

- To **measure sustainability** of urban transport and progress towards SDG target 11.2
- To help **summarize, compare and track** the performance of urban transport in cities
- To **facilitate** discussion to develop plans and policies to improve urban transport
- **Simple Approach:**
  - Not too many indicators
  - Not complex calculations,
  - Simple, based on existing methodology, policies
- **Framework:** Sustainable Development, Sustainable Mobility, relevant SDG targets

Identification of potential indicators

- **Consultative process with cities, countries and experts**
- Reviewed & agreed at two UNESCAP meetings:
  - Expert Group Meeting, Kathmandu, September 2016
  - Regional Meeting, Jakarta, March 2017
- Resulting list of **10 indicators** in **four domains** :
  - Transport system, Social, Economic & Environmental domain
- SUTI Workshop, Colombo, Oct 2017
- Workshop on Urban Mobility and Sustainable Urban Transport Index, 12-13 September 2018, Dhaka

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10 SUTI Indicators

No	Indicators	Measurement units	Weights	Range	
				MIN	MAX
1	Extent to which transport plans cover public transport, intermodal facilities and infrastructure for active modes	0 - 16 scale	0.1	0	16
2	Modal share of active and public transport in commuting	Trips/mode share	0.1	10	90
3	Convenient access to public transport service	% of population	0.1	20	100
4	Public transport quality and reliability	% satisfied	0.1	30	95
5	Traffic fatalities per 100,000 inhabitants	No of fatalities	0.1	20	0
6	Affordability – travel costs as part of income	% of income	0.1	35	3.5
7	Operational costs of the public transport system	Cost recovery ratio	0.1	22	100
8	Investment in public transportation systems	% of total investment	0.1	0	50
9	Air quality (pm10)	µg/m3	0.1	150	10
10	Greenhouse gas emissions from transport	CO2 Eq. Tons	0.1	2.75	0
	SUM		1.00		

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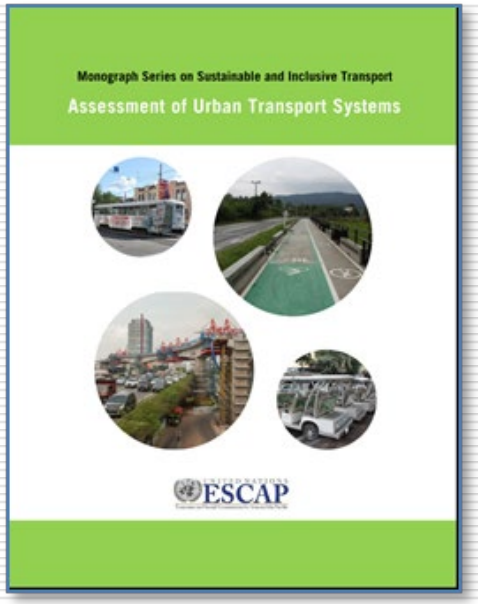
SUTI-Publication, Data Collection Guidelines & Excel Calculation Sheet

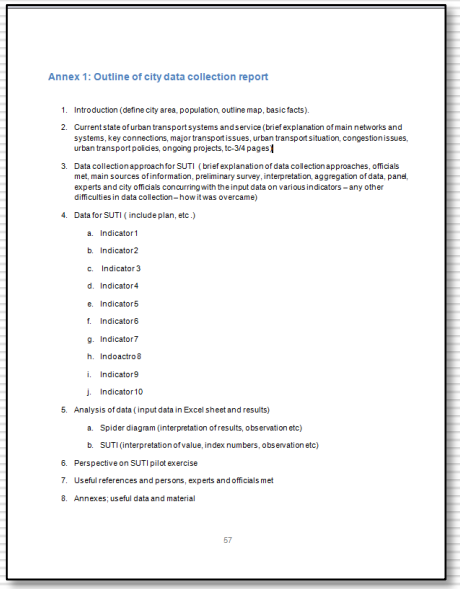
Monograph Series- Assessment of Urban Transport Systems

http://www.unescap.org/publications/monograph-series-sustainable-and-inclusive-transport-assessment-urban-transport-systems

SUTI Data Collection Guideline

http://www.unescap.org/events/capacity-building-workshop-sustainable-urban-transport-index-suti

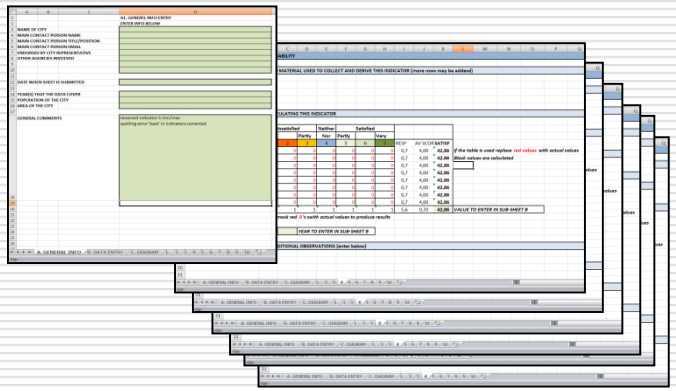



Annex 1: Outline of city data collection report

1. Introduction (define city area, population, outline map, basic facts).
2. Current state of urban transport systems and service (brief explanation of main networks and systems, key connections, major transport issues, urban transport situation, congestion issues, urban transport policies, ongoing projects, to-3/4 pages)
3. Data collection approach for SUTI (brief explanation of data collection approaches, officials met, main sources of information, preliminary survey, interpretation, aggregation of data, panel, experts and city officials concurring with the input data on various indicators – any other difficulties in data collection – how it was overcame)
4. Data for SUTI (include plan, etc.)
   a. Indicator 1
   b. Indicator 2
   c. Indicator 3
   d. Indicator 4
   e. Indicator 5
   f. Indicator 6
   g. Indicator 7
   h. Indoactro 8
   i. Indicator 9
   j. Indicator 10
5. Analysis of data (input data in Excel sheet and results)
   a. Spider diagram (interpretation of results, observation etc)
   b. SUTI (interpretation of value, index numbers, observation etc)
6. Perspective on SUTI pilot exercise
7. Useful references and persons, experts and officials met
8. Annexes; useful data and material

57

SUTI Excel Sheet



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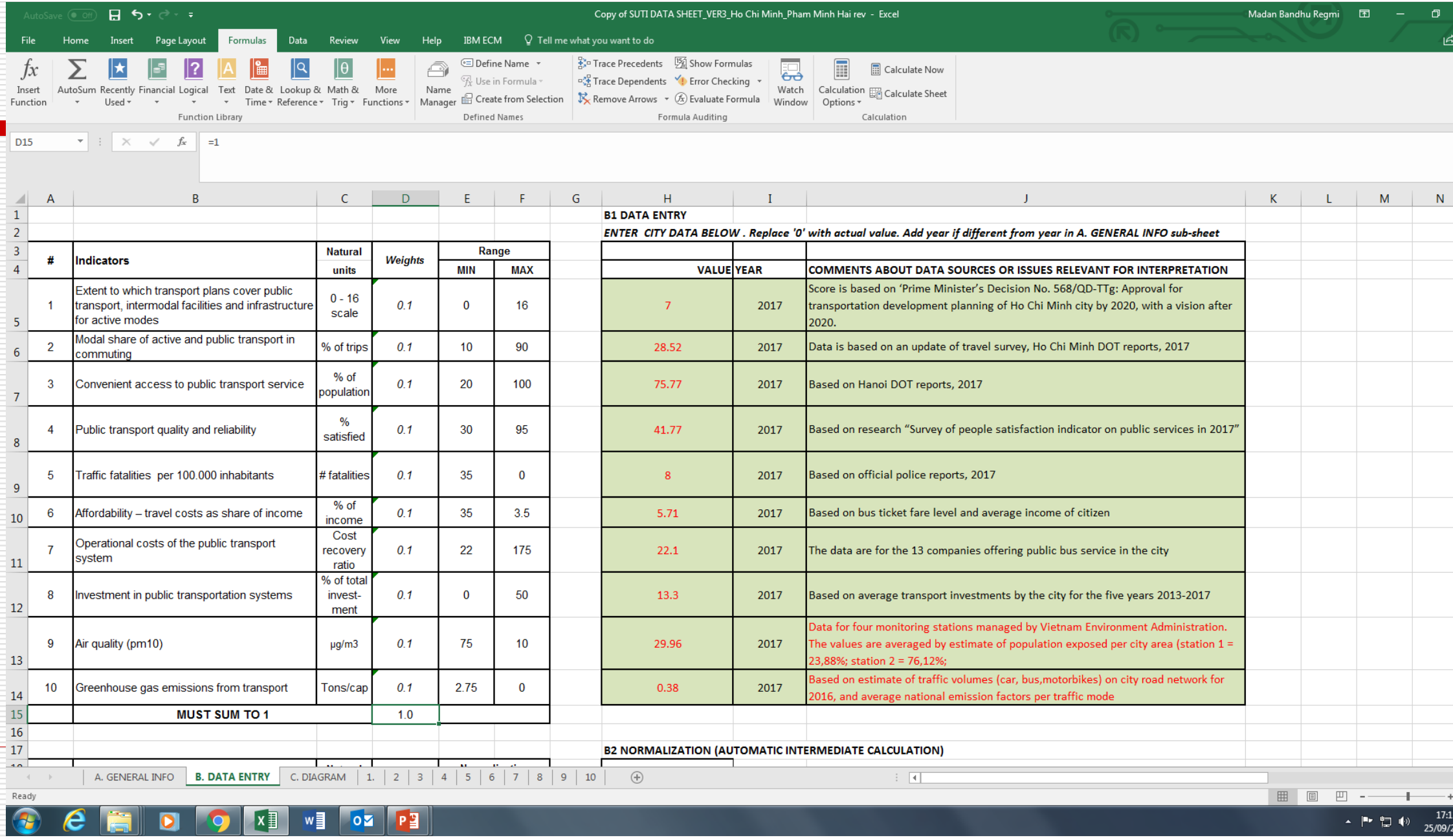
Details on 10 indicators

- Indicator **relevance** for sustainable transport framework
- Proposed **definition**
- **Unit** of measurement
- **Interpretation** in regard to sustainable transport
- **Minimum and maximum values** of indicator scale to use in the index construction
- Sources in the **literature**
- **Comments** on data availability and methods to provide data
- **Examples**

Data entry and normalization



Copy of SUTI DATA SHEET_VER3_Ho Chi Minh_Pham Minh Hai rev - Excel

Madan Bandhu Regmi

File Home Insert Page Layout Formulas Data Review View Help IBM ECM Tell me what you want to do

Insert Function | AutoSum | Recently Used | Financial | Logical | Text | Date & Time | Lookup & Reference | Math & Trig | More Functions — Function Library

Name Manager | Define Name | Use in Formula | Create from Selection — Defined Names

Trace Precedents | Trace Dependents | Remove Arrows | Show Formulas | Error Checking | Evaluate Formula — Formula Auditing

Watch Window

Calculation Options | Calculate Now | Calculate Sheet — Calculation

D15 =1

B1 DATA ENTRY

ENTER CITY DATA BELOW . Replace '0' with actual value. Add year if different from year in A. GENERAL INFO sub-sheet

#	Indicators	Natural units	Weights	Range MIN	Range MAX	VALUE	YEAR	COMMENTS ABOUT DATA SOURCES OR ISSUES RELEVANT FOR INTERPRETATION
1	Extent to which transport plans cover public transport, intermodal facilities and infrastructure for active modes	0 - 16 scale	0.1	0	16	7	2017	Score is based on 'Prime Minister's Decision No. 568/QD-TTg: Approval for transportation development planning of Ho Chi Minh city by 2020, with a vision after 2020.
2	Modal share of active and public transport in commuting	% of trips	0.1	10	90	28.52	2017	Data is based on an update of travel survey, Ho Chi Minh DOT reports, 2017
3	Convenient access to public transport service	% of population	0.1	20	100	75.77	2017	Based on Hanoi DOT reports, 2017
4	Public transport quality and reliability	% satisfied	0.1	30	95	41.77	2017	Based on research "Survey of people satisfaction indicator on public services in 2017"
5	Traffic fatalities per 100.000 inhabitants	# fatalities	0.1	35	0	8	2017	Based on official police reports, 2017
6	Affordability – travel costs as share of income	% of income	0.1	35	3.5	5.71	2017	Based on bus ticket fare level and average income of citizen
7	Operational costs of the public transport system	Cost recovery ratio	0.1	22	175	22.1	2017	The data are for the 13 companies offering public bus service in the city
8	Investment in public transportation systems	% of total invest-ment	0.1	0	50	13.3	2017	Based on average transport investments by the city for the five years 2013-2017
9	Air quality (pm10)	µg/m3	0.1	75	10	29.96	2017	Data for four monitoring stations managed by Vietnam Environment Administration. The values are averaged by estimate of population exposed per city area (station 1 = 23,88%; station 2 = 76,12%;
10	Greenhouse gas emissions from transport	Tons/cap	0.1	2.75	0	0.38	2017	Based on estimate of traffic volumes (car, bus,motorbikes) on city road network for 2016, and average national emission factors per traffic mode
	MUST SUM TO 1		1.0					

B2 NORMALIZATION (AUTOMATIC INTERMEDIATE CALCULATION)

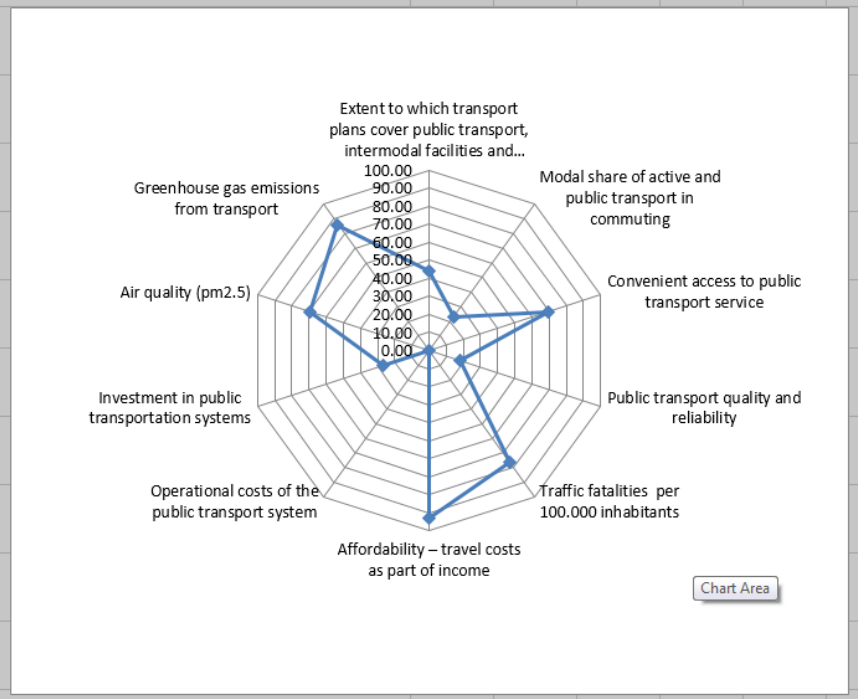
A. GENERAL INFO | B. DATA ENTRY | C. DIAGRAM | 1. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

Ready

SUTI spider diagram

Copy of SUTI DATA SHEET_VER3_Ho Chi Minh_Pham Minh Hai rev - Excel

	C1 RESULT SPIDER DIAGRAM	
1	Extent to which transport plans cover public transport, intermodal facilities and infrastructure for active modes	43.75
2	Modal share of active and public transport in commuting	23.15
3	Convenient access to public transport service	69.71
4	Public transport quality and reliability	18.11
5	Traffic fatalities per 100.000 inhabitants	76.21
6	Affordability – travel costs as part of income	92.98
7	Operational costs of the public transport system	0.07
8	Investment in public transportation systems	27
9	Air quality (pm2.5)	69.29
10	Greenhouse gas emissions from transport	86.28
	Index, Geometric Mean	**25.3953**



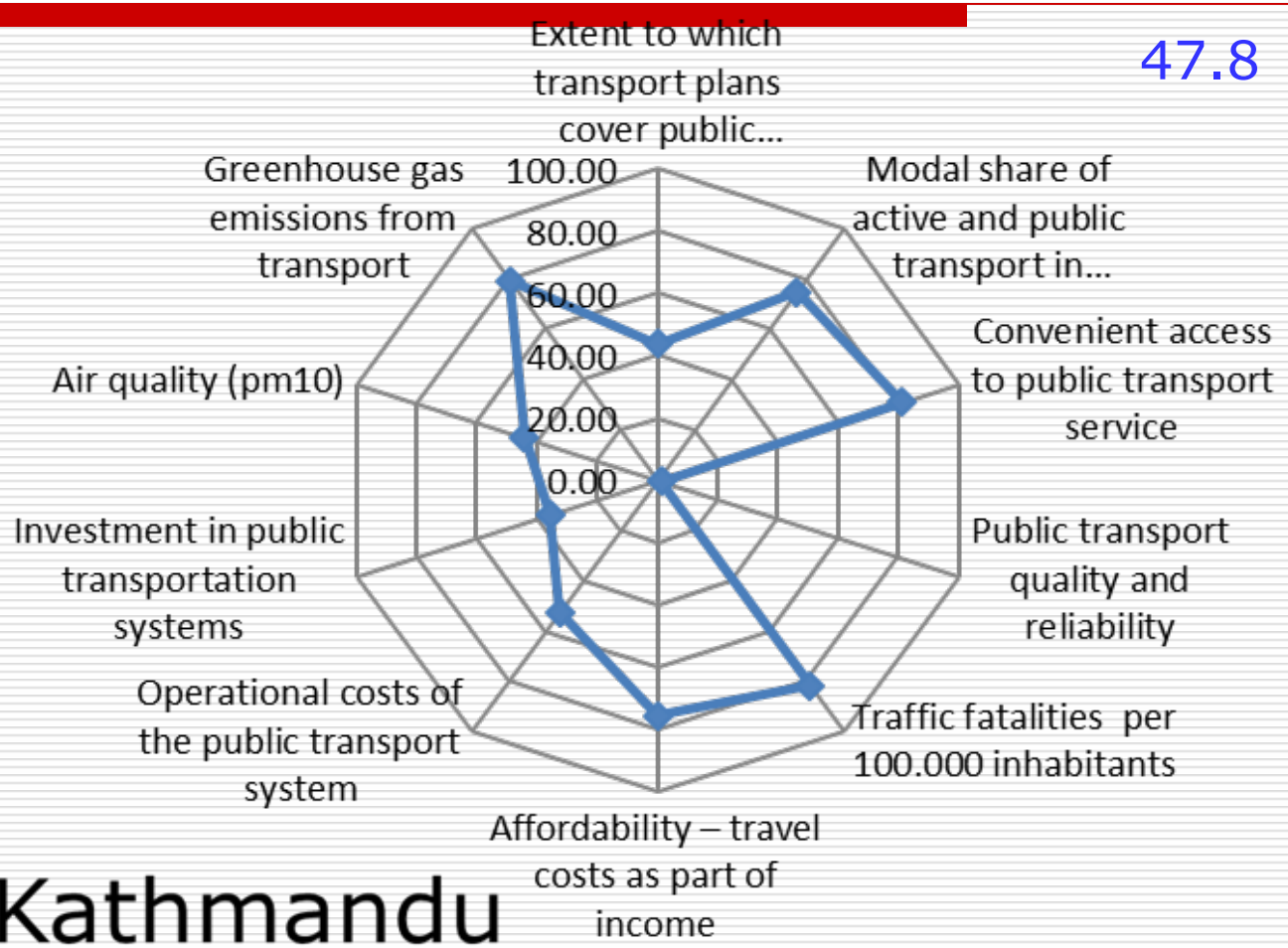
A. GENERAL INFO | B. DATA ENTRY | C. DIAGRAM | 1. | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10

Ready

Average: 27.93233348 Count: 33 Sum: 586.5790032

SUTI Pilot Application in Kathmandu, 2017

47.8



Kathmandu

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Key indicators

- Planning no Integrated Mobility Plan- Score 7/16
- Mode share- 69.77% (public- 27.5%, Active mode 42.2%)
- Accessibility- 85% (JICA Study)
- Quality & reliability -21.61%
- Safety- 6.33/100,000 pop
- Affordability- 11.1%
- Fare Box-96.68% of ticket income
- Investment- 17.84%
- Air Quality- 88 micro g/cu m
- GHG- 0.57 gm/capita

Improve urban mobility and safety

- Encourage informed policy decisions – SUTI can help
- Integrated urban transport planning- comprehensive mobility plan (Governance)
  - Develop mass public transport
  - NMT- Pedestrian walkways, bicycle tracks
  - Bus stops, transfer stations
- Increase mode share, accessibility (routes), & improve quality and reliability
- Parking policy, check private vehicle population
- Safety – safety infrastructure, enforcement, safety audits, reducing risks to VRU
  - Compliance of safety and quality standards (DOR, Urban roads, ring road)
- Improve funding for public transport
- Air quality and GHG

Bogota: Integrating road safety & urban mobility

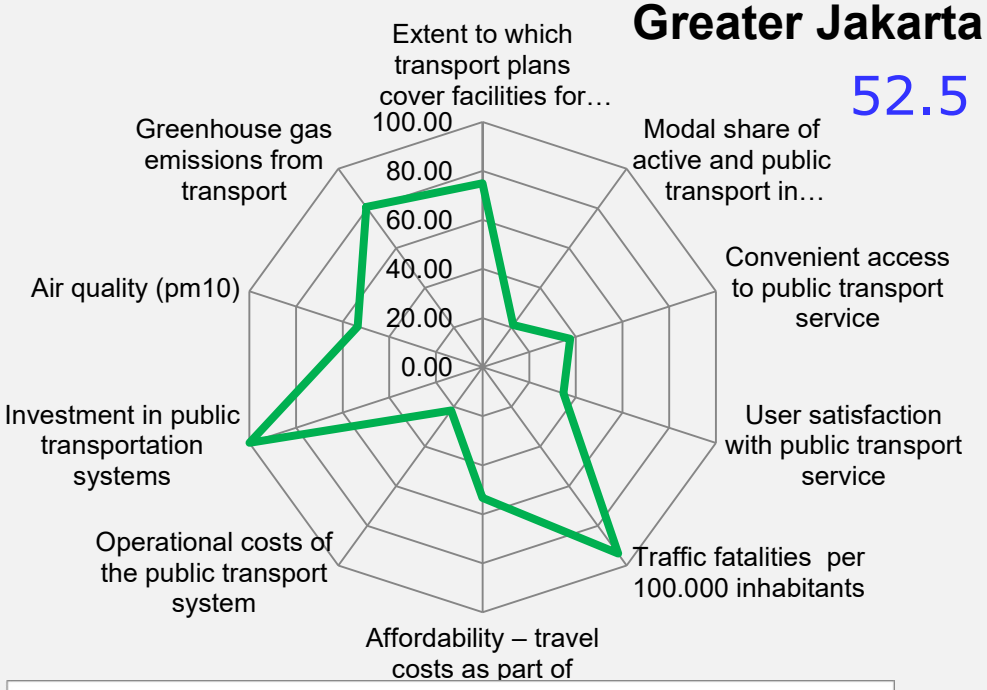
- Reduced fatalities by 50% during 1996-2006
- New investment to improve
  - Public transport (BRT)- 80 km
  - 300 km of bikeways
  - 60,000 sq m of paved pedestrian infrastructure
- Safer public transport, enforcement- seat belt, drink driving, improved side walks and cycle lanes
- Bogota now has a vision zero plan (Dec 2017)

Purabara Intercity Bus Terminal

Innovation: Suroboyo Bus, Surabaya

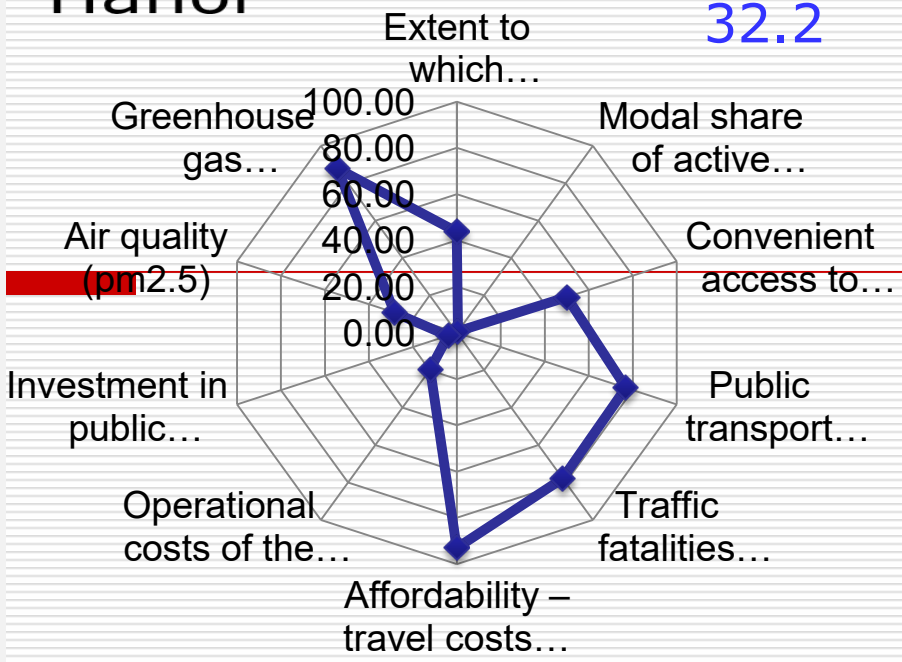
Greater Jakarta

52.5

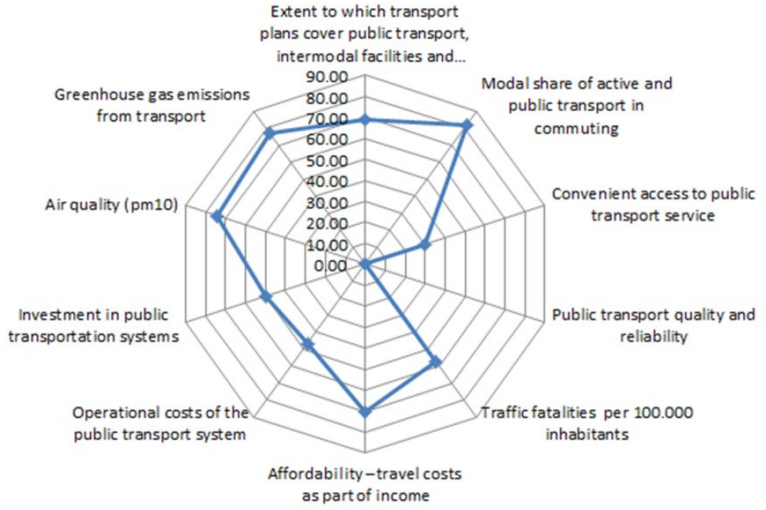


Hanoi

32.2

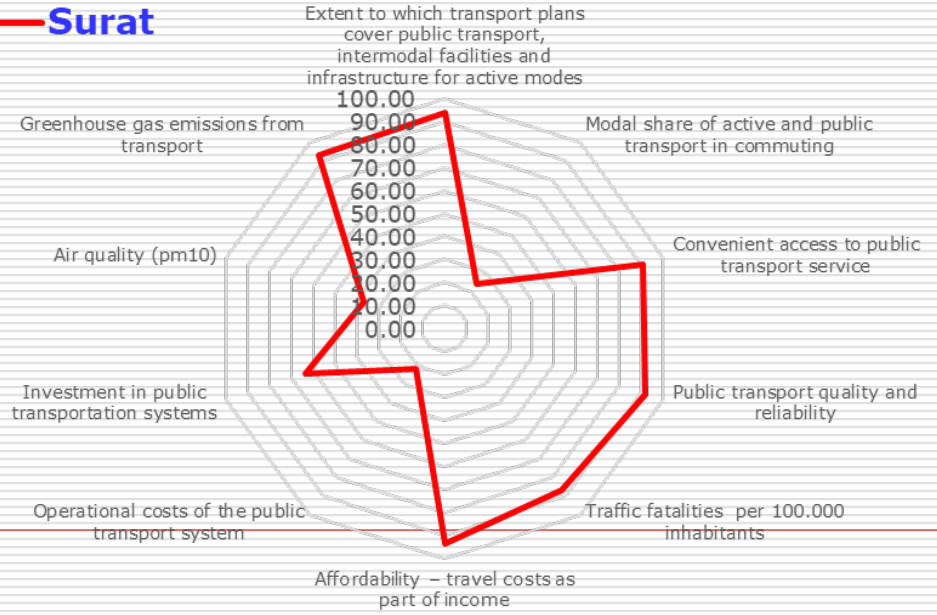


Colombo



32.7

Surat



Bandung

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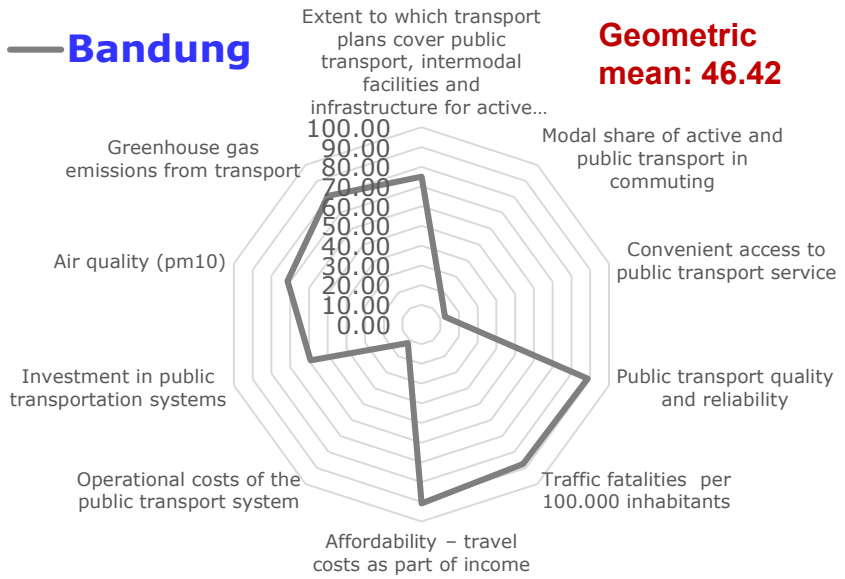
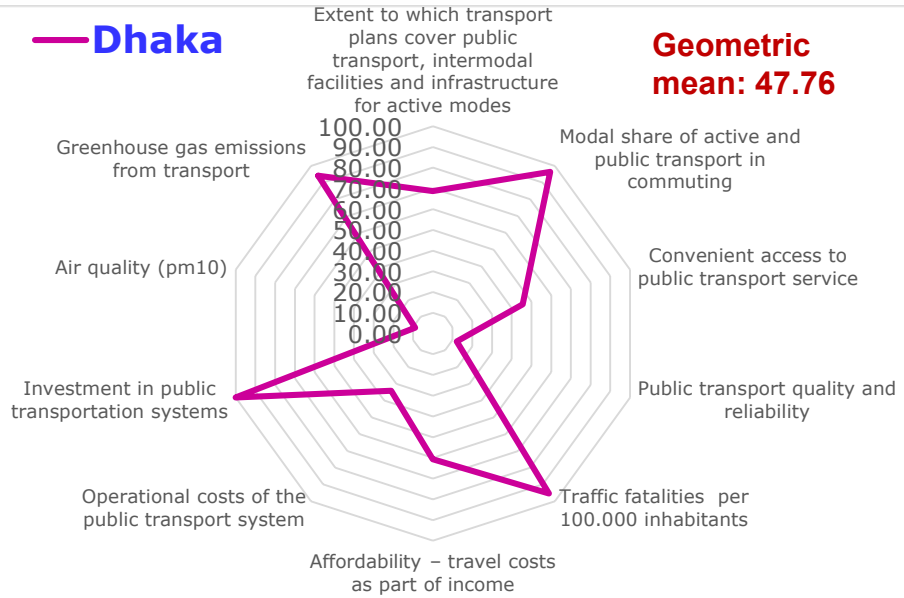


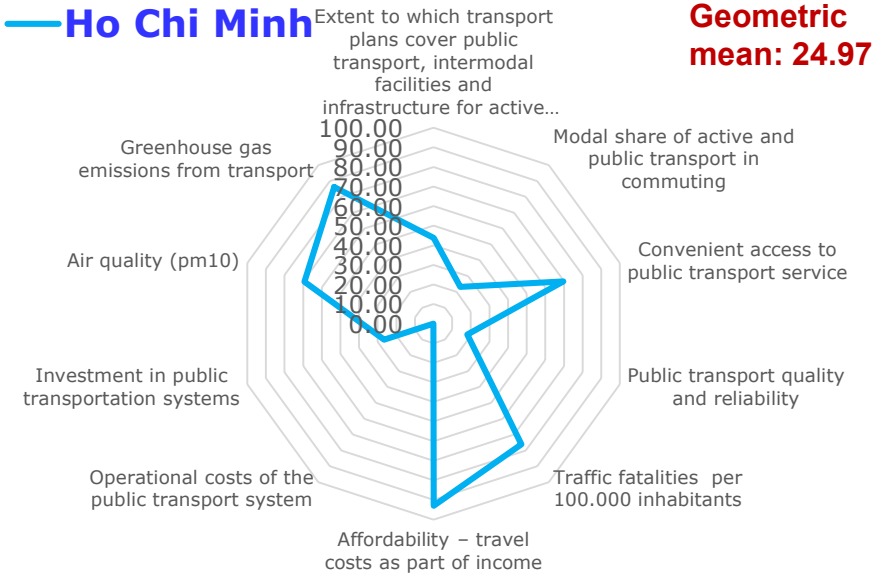
Dhaka

Geometric mean: 47.76



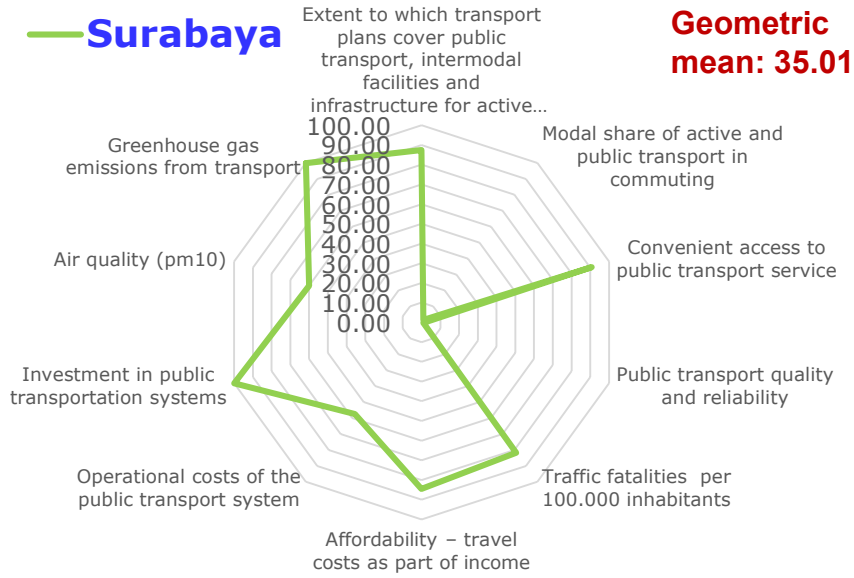
Ho Chi Minh

Geometric mean: 24.97



Surabaya

Geometric mean: 35.01



Application of SUTI in 2018

Thank you

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