Resilience & Transportation Webinar Series: Lessons from India while responding to COVID-19

- **O.P. Agarwal, Chief Executive Officer, WRI India**

- **Laghu Parashar, Senior Technical Advisor, GIZ India**

- **Sarika Panda Bhatt, Associate Director, Nagarro & co-founder, Raahgiri Foundation**

Bus Transport & Impacts of COVID -19

Impacts of the lockdown on transport services and possible solutions to ensure sustainable mobility is not compromised

Lockdown and COVID-19: Impact in environment and transport policy in India. Long-term perspective.

BUS TRANSPORT & IMPACTS OF COVID-19
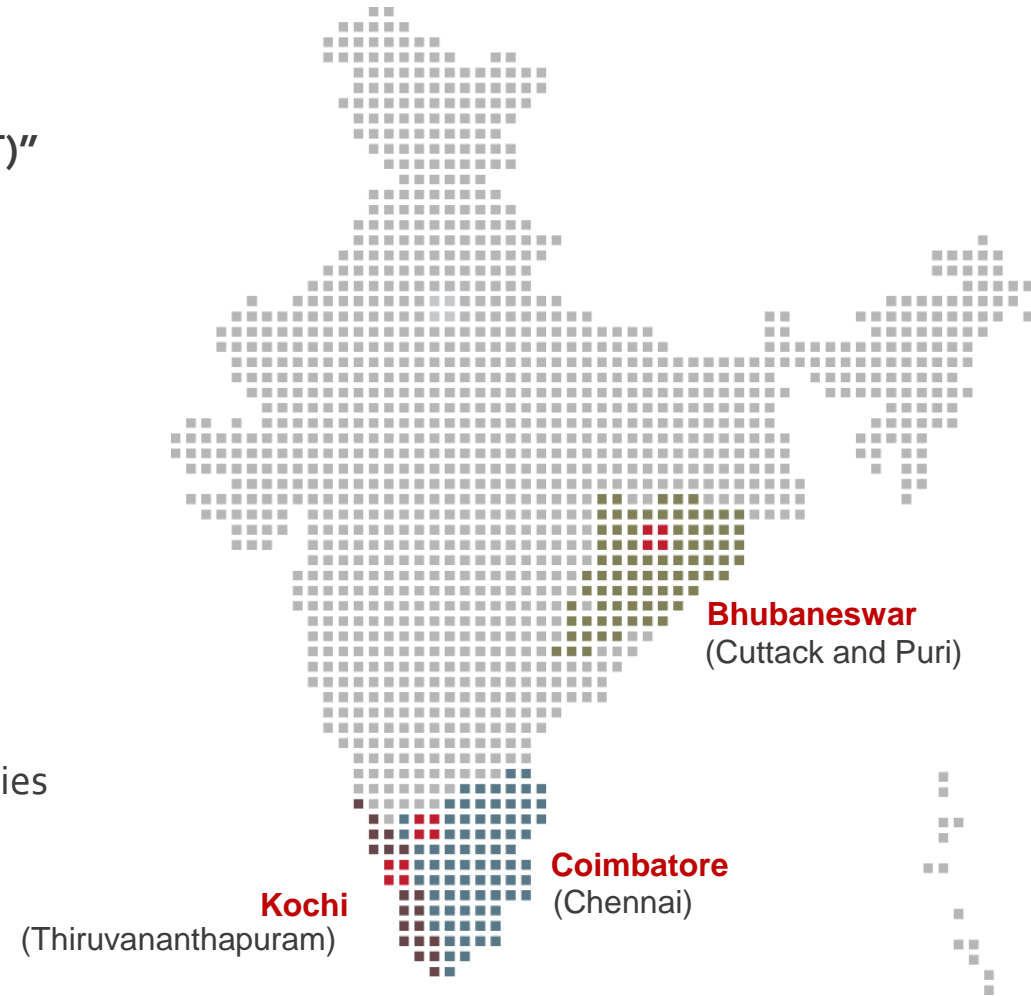
Implemented by

Mr. Laghu Parashar
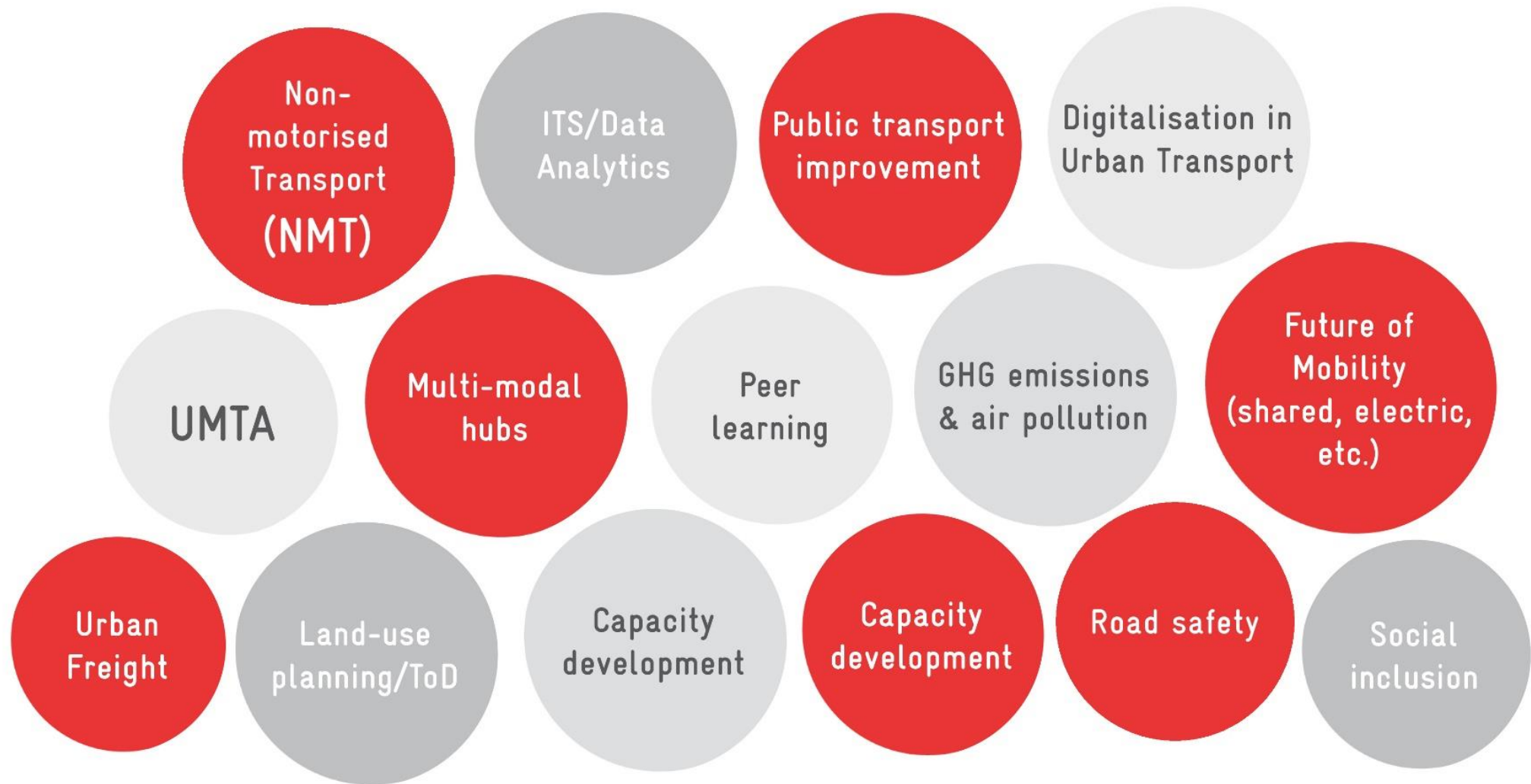Senior Technical Advisor (SMART-SUT)
GIZ, India

SMART-SUT PROJECT BACKGROUND

- **Project Brief:** GIZ is implementing the bilateral technical cooperation project **"Integrated and Sustainable Urban Transport Systems for Smart Cities in India (SMART-SUT)"** on behalf of the Federal German Ministry for Economic Cooperation and Development (BMZ) with the Ministry of Housing and Urban Affairs (MoHUA) as a political partner

- **Project Objective:** Improvement in planning and implementation of sustainable urban transport in selected cities

- **Project Cities:** The implementation focuses on the pilot cities of Bhubaneswar, Coimbatore, and Kochi

Partner States & Cities

Bhubaneswar
(Cuttack and Puri)

Coimbatore
(Chennai)

Kochi
(Thiruvananthapuram)

KEY SUPPORT AREAS

Non-motorised Transport (NMT)

ITS/Data Analytics

Public transport improvement

Digitalisation in Urban Transport

UMTA

Multi-modal hubs

Peer learning

GHG emissions & air pollution

Future of Mobility (shared, electric, etc.)

Urban Freight

Land-use planning/ToD

Capacity development

Capacity development

Road safety

Social inclusion

IMPACTS OF COVID-19 ON MOBILITY

COVID19 LOCKDOWN

LOCKDOWN SINCE MARCH 24th

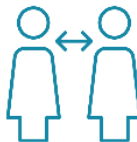Lockdowns are meant to **slow down the spread of virus**
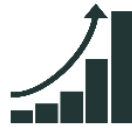
Going by the numbers, as of now, **Indian has not seen an exponential rise**

To put it in simple terms, a country can face a **severe crisis if a lockdown is not implemented**

This will be a long fight and it needs utmost **patience and consistency**

A few of the states in India have done really well

Source: Various Government Data

MOBILITY CHANGES IN INDIA   (Mobility change from March 15th to April 26th with baseline)

Source: Google Mobility Report
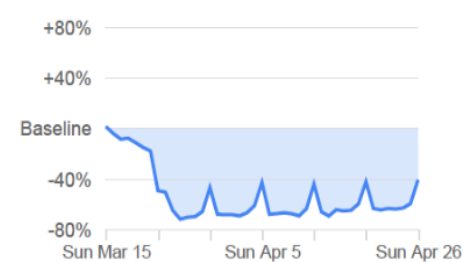
MIGRATION

Migrant workers walking on a highway with their families on the outskirts of New Delhi, Source: Scroll

A migrant worker runs behind a truck to return to their villages, Source: Quartz India

The movement of migrant workers in Delhi, Source: Hindustan Times

- The nationwide lockdown in India which started about a month ago **has impacted nearly 40 million internal migrants**

- Lockdowns, loss of employment, and social distancing prompted a chaotic and painful process of mass return for internal migrants

- Special trains and buses are being deployed for stranded migrants and students

Source: The World Bank report titled, COVID-19 Crisis Through a Migration Lens

Inside the India's largest lockdown, there are no flights, no cars and few functioning industries. But one thing is remarkably abundant: cleaner air and cleaner water bodies.

System of Air Quality and Weather Forecasting and Research (SAFAR), between March 24 and 31, showed 63% reduction in nitrogen oxide (NOx) and 49% reduction in PM2.5 presence in Delhi's air


Delhi Pollution Control Committee (DPCC) stated that Yamuna's Biological Oxygen Demand (BOD) levels have improved by up to 33 per cent.

Image 1: This is Dhauladhar mountain range of Himachal, visible from Jalandhar (Punjab)
Image 2: For the first time in over three decades, snow-capped peaks of Gangotri became visible from Saharanpur
Both due to improved AQI (reduced particulate matter in the atmosphere)

Source: The Washington Post and Twitter

PUBLIC TRANSPORT & IMPACTS OF COVID-19
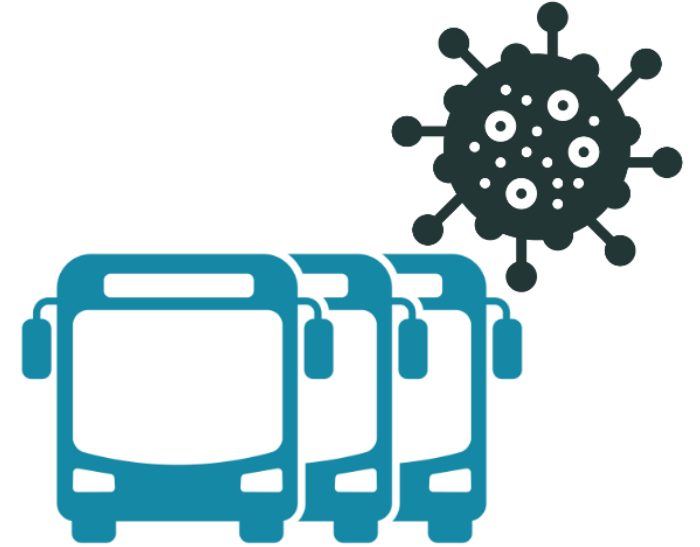
ROLE PLAYED BY BUS TRANSPORT DURING COVID-19 LOCKDOWN

Limited public transport for 10 essential services* | Acting as Guardians of Mobility[1] during pandemic scenario

Number of buses operated during COVID-19 lock down

BEST Mumbai	MSRTC Maharashtra	BMTC Bangalore	DTC Delhi	MTC Chennai	UPSRTC Uttar Pradesh	WBTC West Bengal
1500 buses	350 buses	200 buses	25% of the actual operations	150 buses	250 buses	15 buses

Sources: Compiled from various sources including personnel interview, news articles

Multiple Roles adopted by bus transport agencies amid COVID-19 lock down

Passenger transport provider ⟶

Goods delivery

Sanitation vans

Dedicated medical service buses

Dedicated services for stranded migrants and students

ROLE PLAYED BY BUS TRANSPORT DURING COVID-19 LOCKDOWN

Grocery on Wheels, MoBUS, Bhubaneswar

Vegetable vending at bus stop, MoBUS, Bhubaneswar

ROLE PLAYED BY BUS TRANSPORT DURING COVID-19 LOCKDOWN

Buses for emergency services, MoBUS, Bhubaneswar

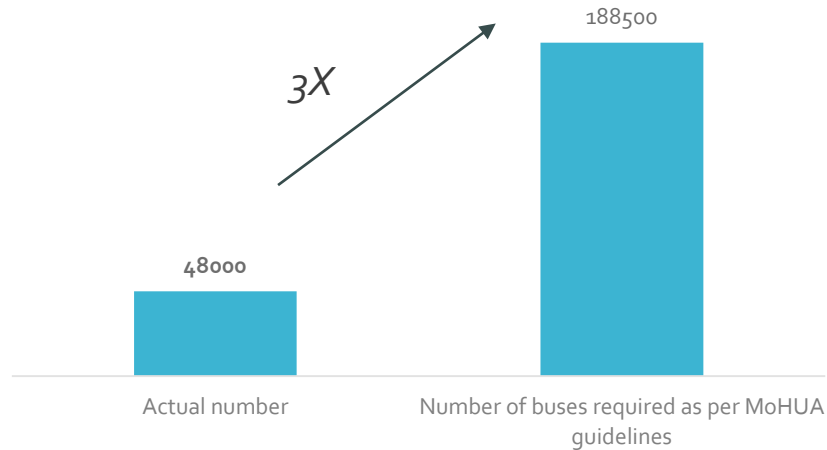KSRTC's sanitizer bus, KSRTC, Karnataka

BUS TRANSPORT IN INDIA

149,000

Public Buses

Served by **52** Govt. owned state transport undertakings and special purpose companies

Number of buses in Urban areas

188500

3X

48000

Actual number

Number of buses required as per MoHUA guidelines

Source: Road Transport Year Book, MoRTH; Performance of STUs, CIRT; Efficient and sustainable city bus services, SUTP

25.01 Billion*

Passengers served in 2016-17

586.61 Billion*

Passenger kms served in 2016-17

Bus transport in India is already deficit in supply to meet the demand and is incurring financial losses continuously

* Data from 41 reporting STUs for the year 2016-17

IMPACT OF COVID-19 LOCKDOWN ON BUS TRANSPORT

Components	Lockdown Phase	Recovery Phase	Post 1 year- Normal phase
Duration	April 24- May 17*	Upto 9 months post lockdown	Beyond 9 months
Personnel Cost	✔	✔	✔
Material Cost	✘	✔	✔
Taxes	✔	✔	✔
Interest	✔	✔	✔
Miscellaneous	✔	✔	✔
Payment to hired buses	✔	✔	✔
Depreciation	✔	✔	✔
Traffic Revenue	✘ 0% demand: 0 Traffic Revenue	⬇ Gradual increase	✔ Expected to achieve 100% of normal days

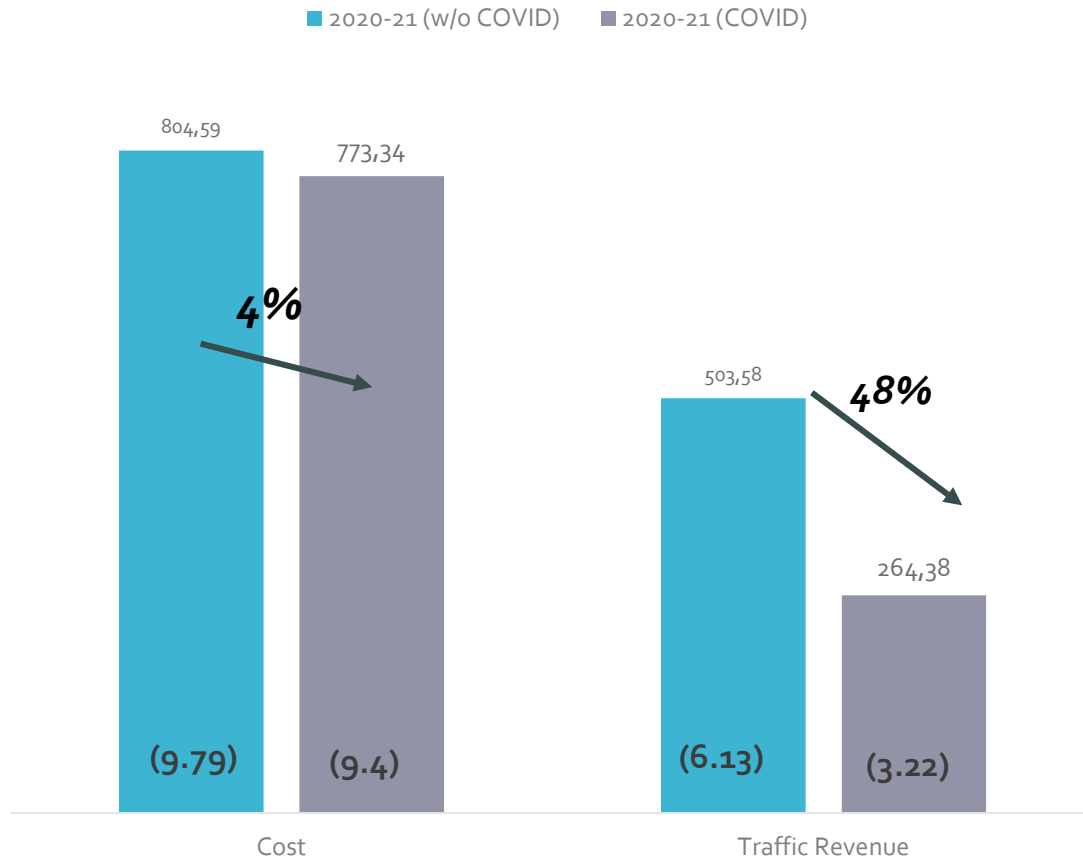**Bus transport will incur almost equivalent costs during lock down and recovery phase.**

**However, the revenue is expected to be way below the normal**

IMPACT OF COVID-19 LOCKDOWN ON BUS TRANSPORT

Impact of COVID-19 lock down on total cost and traffic revenue compared to Normal operations (in INR Billion)- 2020-21

- ■ 2020-21 (w/o COVID)
- ■ 2020-21 (COVID)

804,59

773,34

4%

503,58

48%

264,38

(9.79)   (9.4)

(6.13)   (3.22)

Cost

Traffic Revenue

Impact of COVID-19 lock down on Annual VGF requirement* (In INR Billion) in 2020 values- 2020-21

69%

508,96

260

301

(3.16)   (3.66)   (6.19)

2016-17   2020-21 (w/o COVID)   2020-21 (COVID)
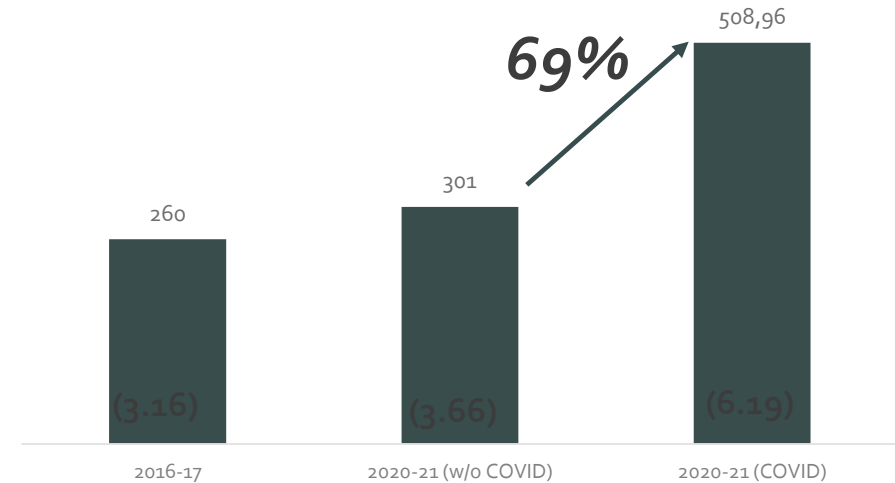
When the cost reduced by 4%, the traffic revenue reduced by 48%.

This created a 69% increase in the annual VGF requirement of bus transport agencies in India

* Estimated for period from March 2020 to February 2021 considering regular operations from May 2020

Numbers in parenthesis indicate value in Billion Euro

KEY CHALLENGES

Financial management challenges
- **Working capital to pay staff salaries**
- Financial needs for fuel expenses, maintenance expenses
- Capital for payment to operators

Operational and service delivery challenges
- **Service planning for uncertain demand**
- **Crowd management inside and outside buses**
- Difficulty in flexible scheduling

Crew management challenges
- **Training of staff on physical distancing**
- **Lack of equipment to ensure safety of crew**
- **Unavailability of crew**

Fleet management challenges
- **Availability of sanitization material**
- **Availability of fleet infrastructure post lockdown**

surveys done by WB & UITP

Standard Operating Procedures (SOPs) for Bus Transport Post COVID-19 Lockdown

ADAPTING BUS TRANSPORT FOR POST COVID-19 LOCKDOWN

STANDARD OPERATING PROCEDURES (SOPs)" FOR BUS TRANSPORT POST COVID19 LOCKDOWN

TIMELINES

3

MONTHS POST LOCKDOWN
and to be reviewed thereafter
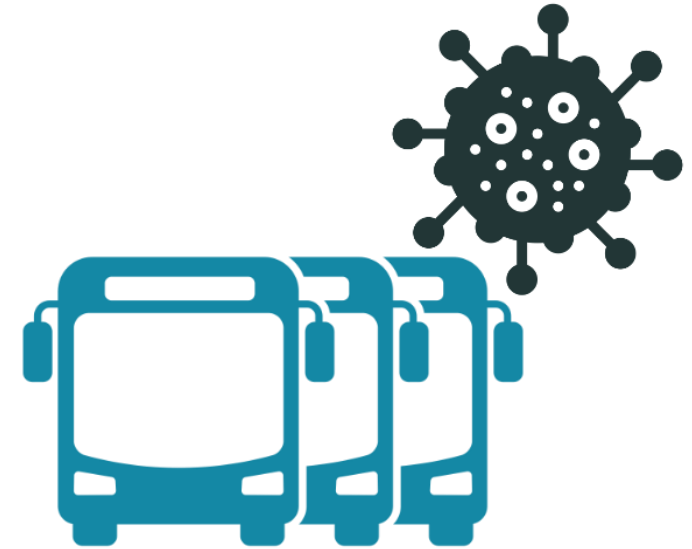
Measures listed out in the document should be implemented after assessing the aftereffects of COVID19 in the state. These measures are suggestive and should be used in combination with various instructions issued by Government time to time

SOPs for

1 **Offices/markets/work zones/employers**
Work from home, staggered working hours.

2 **Buses and transport authority/operator**
Increase supply of buses, occupancy < 1/3rd, disinfecting buses, CCTV cameras for monitoring & No AC

3 **Passengers**
Mandatory masks, unidirectional passenger movement, rear door boarding and front door alighting

4 **Driver and conductor**
Temperature checks, separating driver area by screens and Mandatory use of mask and gloves, cash box, digital ticketing

5 **Bus shelters**
Maintain distance in queue, frequent sanitization

6 **Bus stops/terminals/depots/interchanges**
Floor marking for social distancing, regular sanitization

7 **Pedestrian and cyclist infrastructure**
Reclaiming streets for crowd management, min footpath width of 2.5 m and dedicated cycling lanes

Download Link: https://www.sutp.org/publications/standard-operating-procedures-sops-for-bus-transport-post-covid19-lockdown/
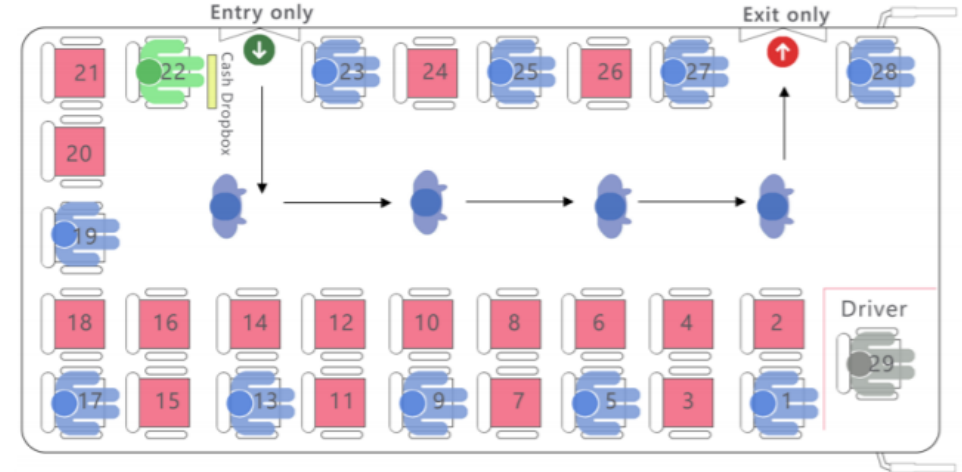
ADAPTING BUS TRANSPORT FOR POST COVID-19 LOCKDOWN

Typical layout of 12m (standard) and 8-9m (midi) bus, marking passenger location, unidirectional movement, seating of conductor and location of cash drop box
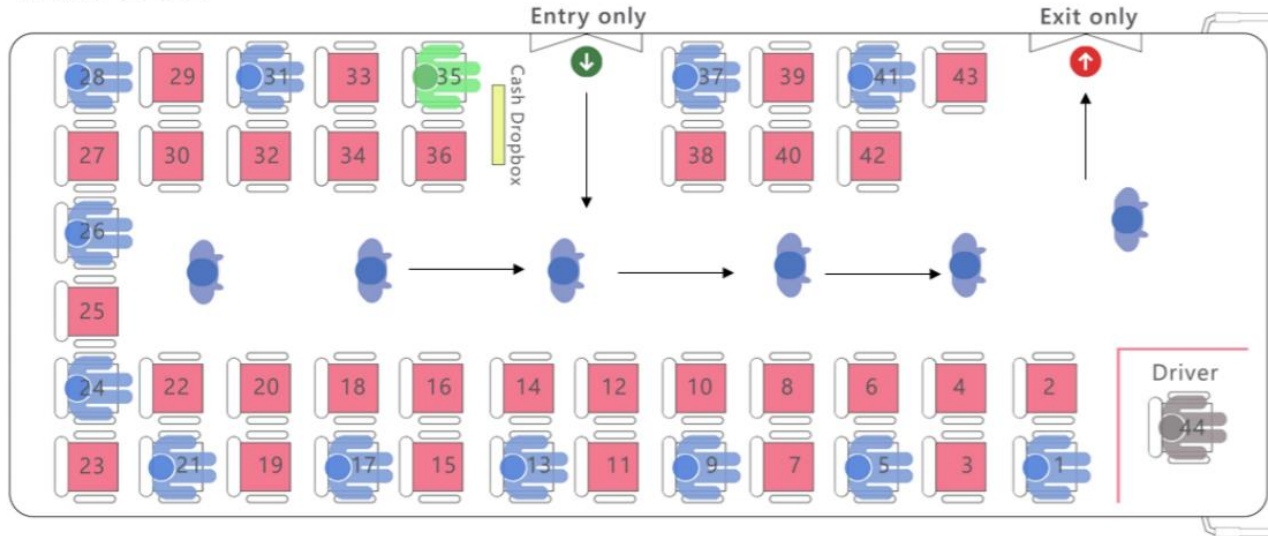
Key actions:

- Increase supply of buses/frequency on high demand routes by hiring private buses, school and college buses
- Fare collection through digital wallets or cash drop box facility with option of flat fare and passes
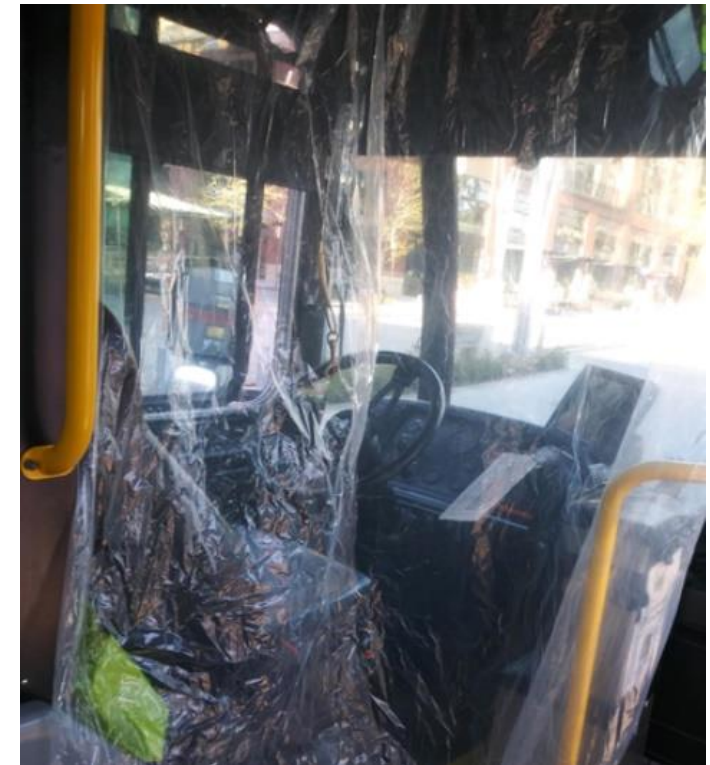- Marking seats for seating inside the bus, at bus stops and terminals

SOPs for BUS STOPS & BUS DRIVER

SOPs FOR BUS SHELTERS

A typical CRUT bus shelter with social distancing message, one passenger seated per seat and with floor markings for passengers to wait at a bus shelter (Source: GIZ/ CRUT)

SOPs FOR BUSES

Transparent curtain separating driver's area (Source: TriMet, Oregon)

ADAPTING BUS TRANSPORT FOR POST COVID-19 LOCKDOWN

**Staggered working hours to reduce the demand and hence to maintain desirable social distancing**

Normal operations

Post COVID-19 lockdown scenario
Maintain safe social distancing

8:00 AM   9:00 AM

Peak hour

7:00 AM   8:00 AM   9:00 AM   10:00 AM

Staggered peak hour
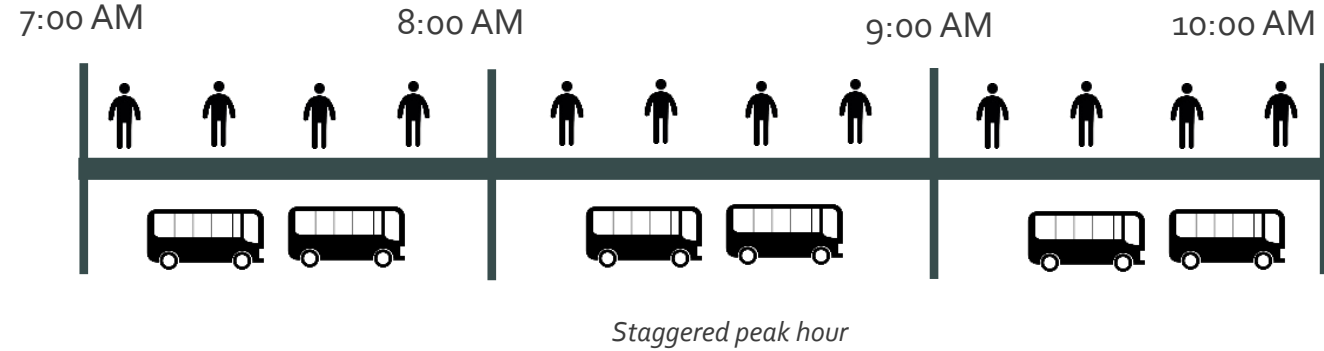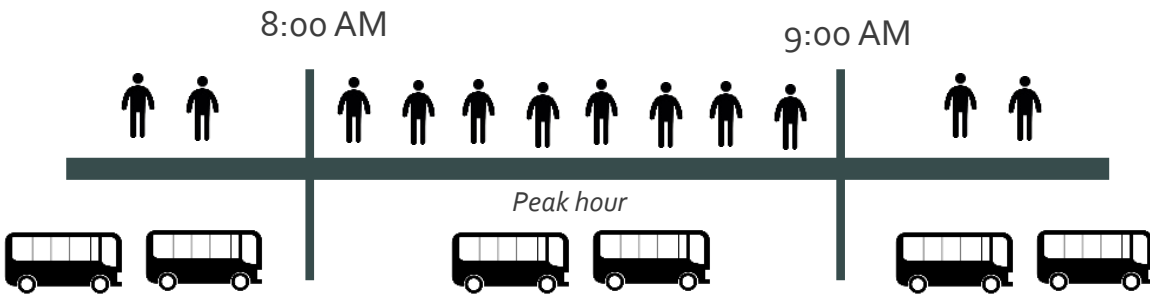
Peak Passenger demand needs to be reduced by **adopting staggered working hours** for offices/markets/work places

Demand   *Bus Supply*

DEMONSTRATION OF STAGGERED DEMAND (BHUBANESWAR CASE)
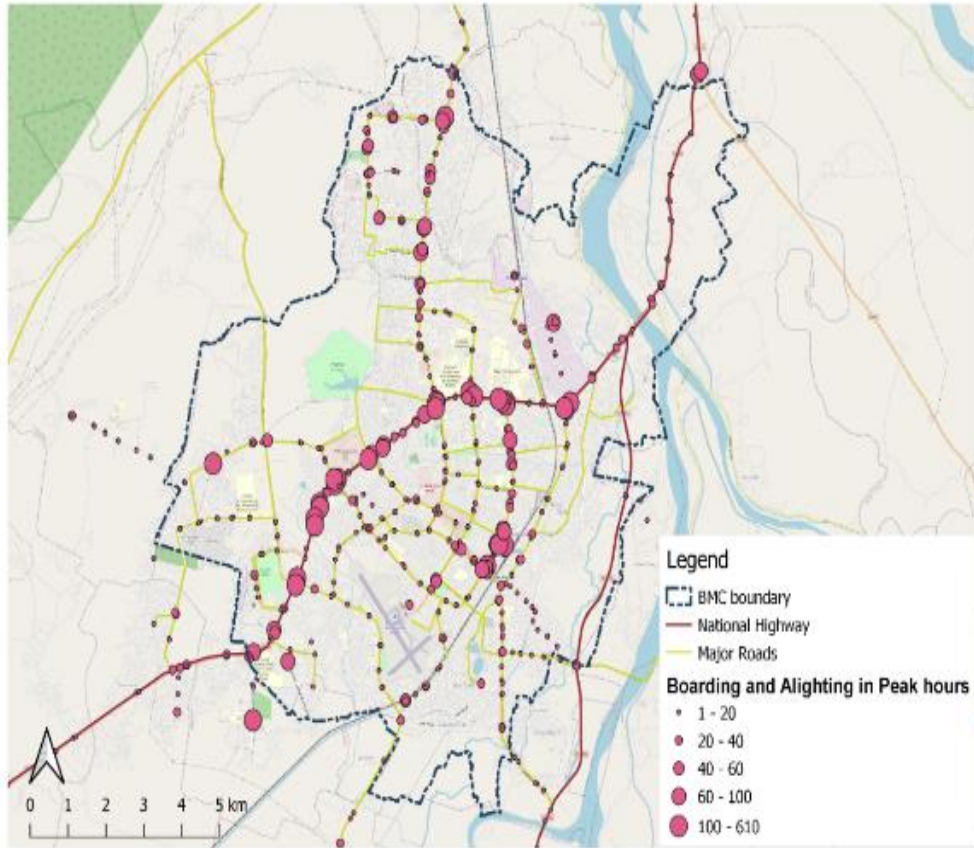
Step-1: Identification of **high demand bus stops**

High passenger demand bus stops in Bhubaneswar
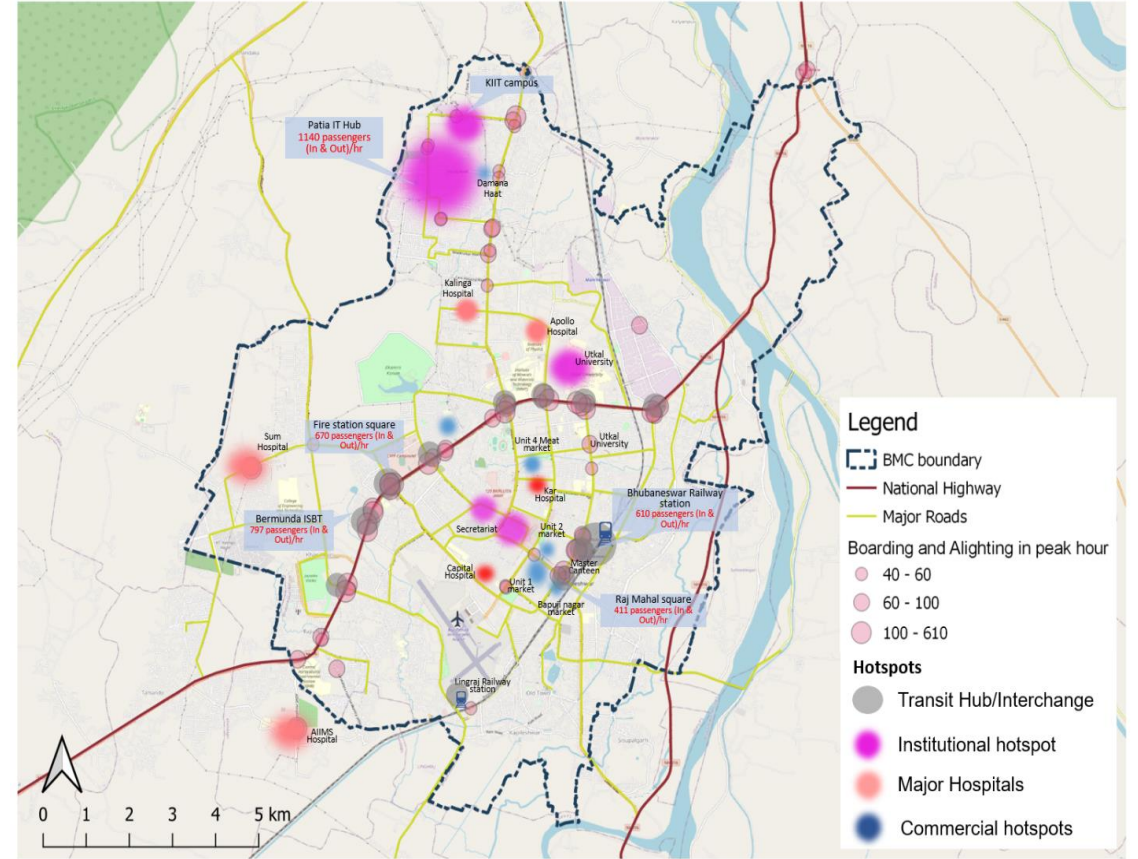
Step-2: Activities locations around **influence zone of 1 km**
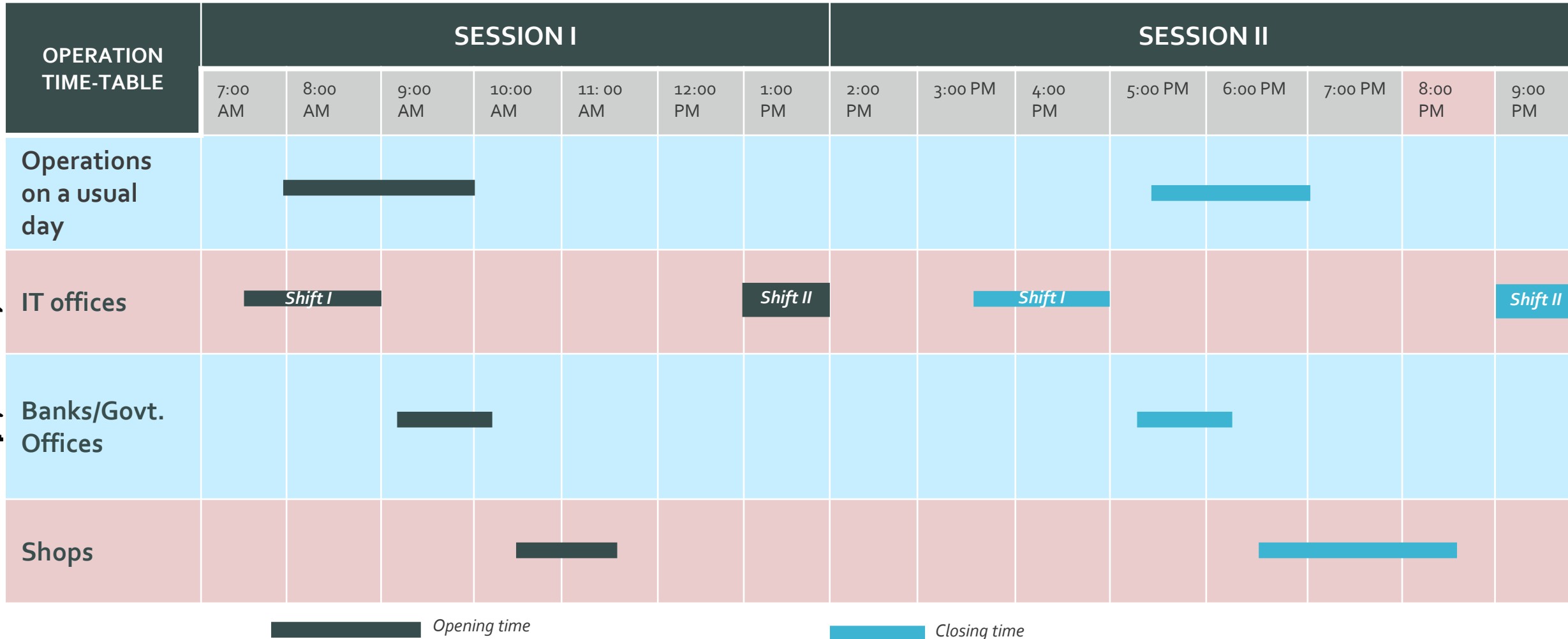
Major locations with high passenger demand bus stops in Bhubaneswar

DEMONSTRATION OF STAGGERED DEMAND (BHUBANESWAR CASE)

Recommended operation hours for various activities at Patia IT-Hub

OPERATION TIME-TABLE	SESSION I							SESSION II							
	7:00 AM	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM	9:00 PM
Operations on a usual day		▬▬▬▬									▬▬▬				
IT offices		Shift I					Shift II		Shift I						Shift II
Banks/Govt. Offices			▬▬▬								▬▬▬				
Shops				▬▬▬								▬▬▬▬			

▬▬▬▬ Opening time   ▬▬▬▬ Closing time

With 15 minutes gap between each activity, for crowd management

FEW STEPS TAKEN TO MANAGE COVID-19 FINANCIAL REQUIREMENTS

Taxes and surcharges:

- **Nagaland** imposed a COVID-19 cess of Rs 5 per litre on diesel and Rs 6 per litre on petrol and other motor spirits through a notification

- **Assam** government increased taxes on petrol by Rs 6 and on diesel by Rs 5

- **Meghalaya** government imposed 2% sales tax surcharge on both petrol and diesel

- **In Delhi,** Petrol price is hiked by Rs 1.67 per litre while diesel price is increased by Rs 7.10 per litre

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- **O.P. Agarwal, Chief Executive Officer, WRI India**
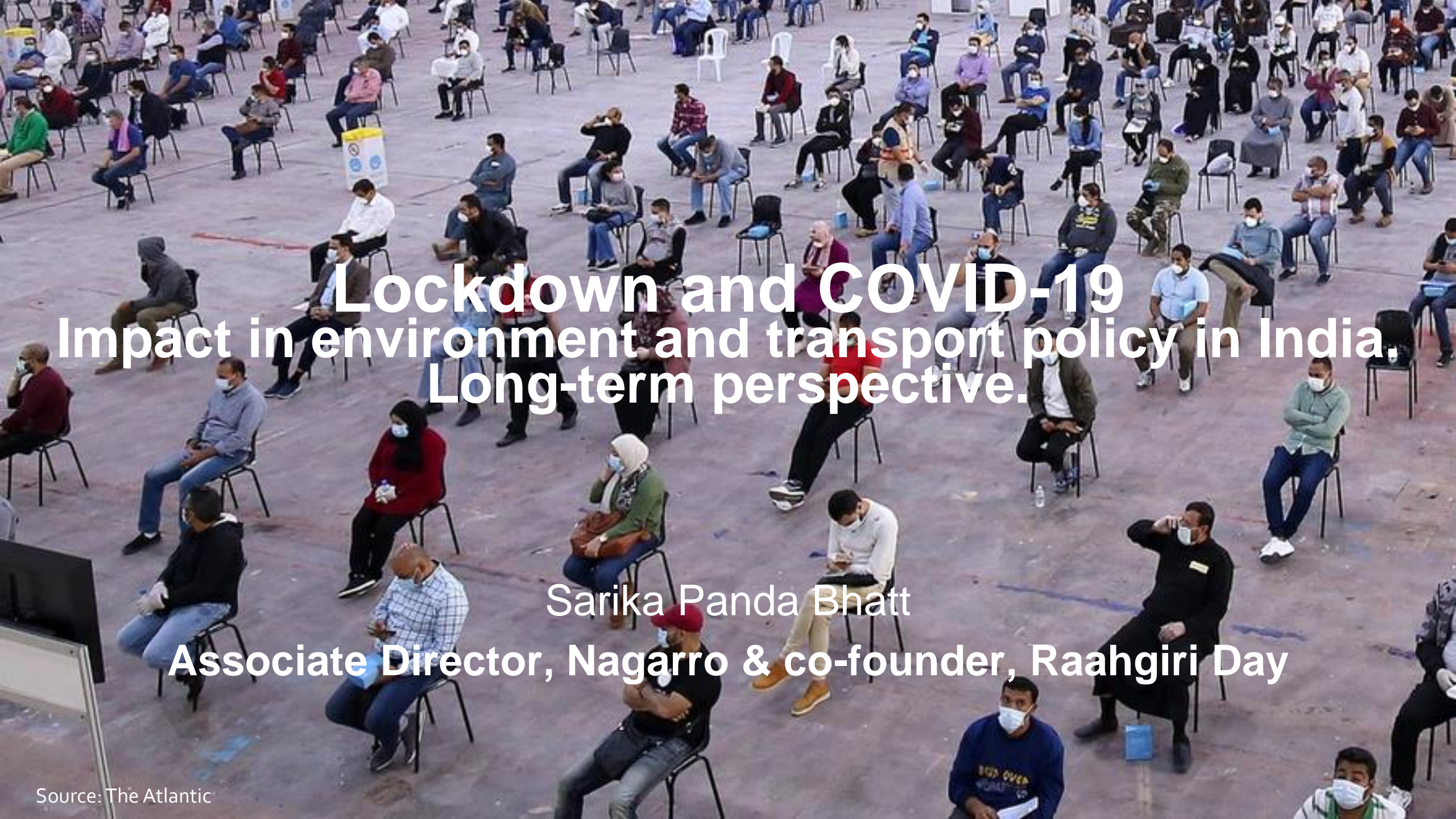
Lockdown and COVID-19
Impact in environment and transport policy in India. Long-term perspective.

Sarika Panda Bhatt

Associate Director, Nagarro & co-founder, Raahgiri Day

COVID 19

🇮🇳 India

Confirmed	Recovered	Deaths
42,533	11,707	1,373

🌐 Worldwide

Confirmed	Recovered	Deaths
3.51M	1.13M	247K

🌐 Worldwide ▾

Confirmed	Recovered	Deaths
3.51M	1.13M	247K

Location	Confirmed ↓	Recovered	Deaths
🇺🇸 United States	1.18M	153K	68,286
🇪🇸 Spain	217K	119K	25,264
🇮🇹 Italy	211K	81,654	28,884
🇬🇧 United Kingdom	187K	-	28,446
🇩🇪 Germany	166K	126K	6,866
🇷🇺 Russia	145K	18,095	1,356
🇫🇷 France	131K	50,784	24,895
🇹🇷 Turkey	126K	63,151	3,397
🇧🇷 Brazil	102K	42,991	7,051

Updated less than 10 mins ago · Source: Wikipedia · About this data

Source: Google

Pandemic

ACTIVE cases in countries with 50000+ confirmed cases, and India & Japan as of May 03
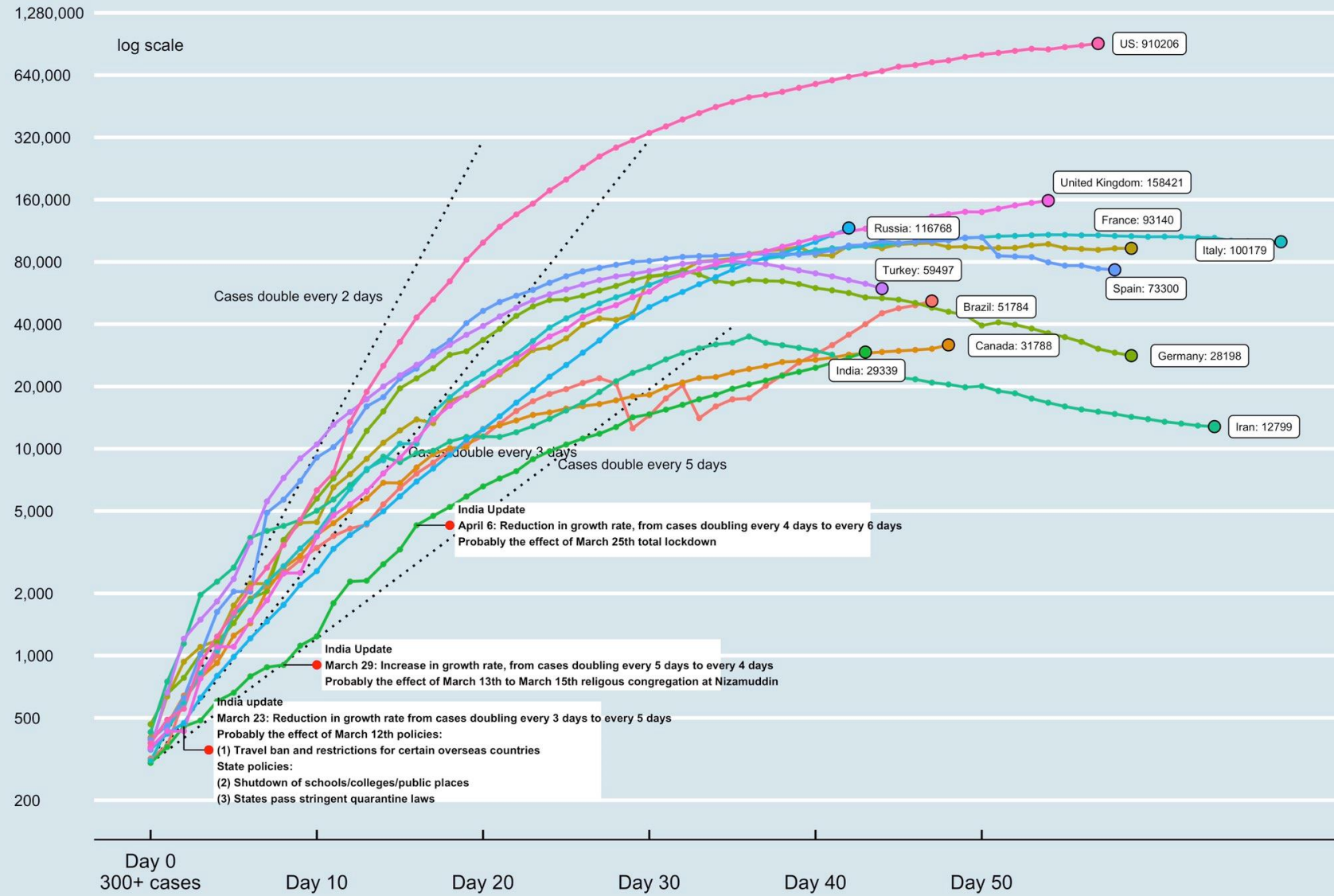
Source: https://twitter.com/ShamikaRavi/status/1257160648515031041/photo/1

Social Distancing

Lockdown

Decline in transit use

Bangladesh — Nepal — Sri Lanka — New York — London — Singapore — South Korea — **India**
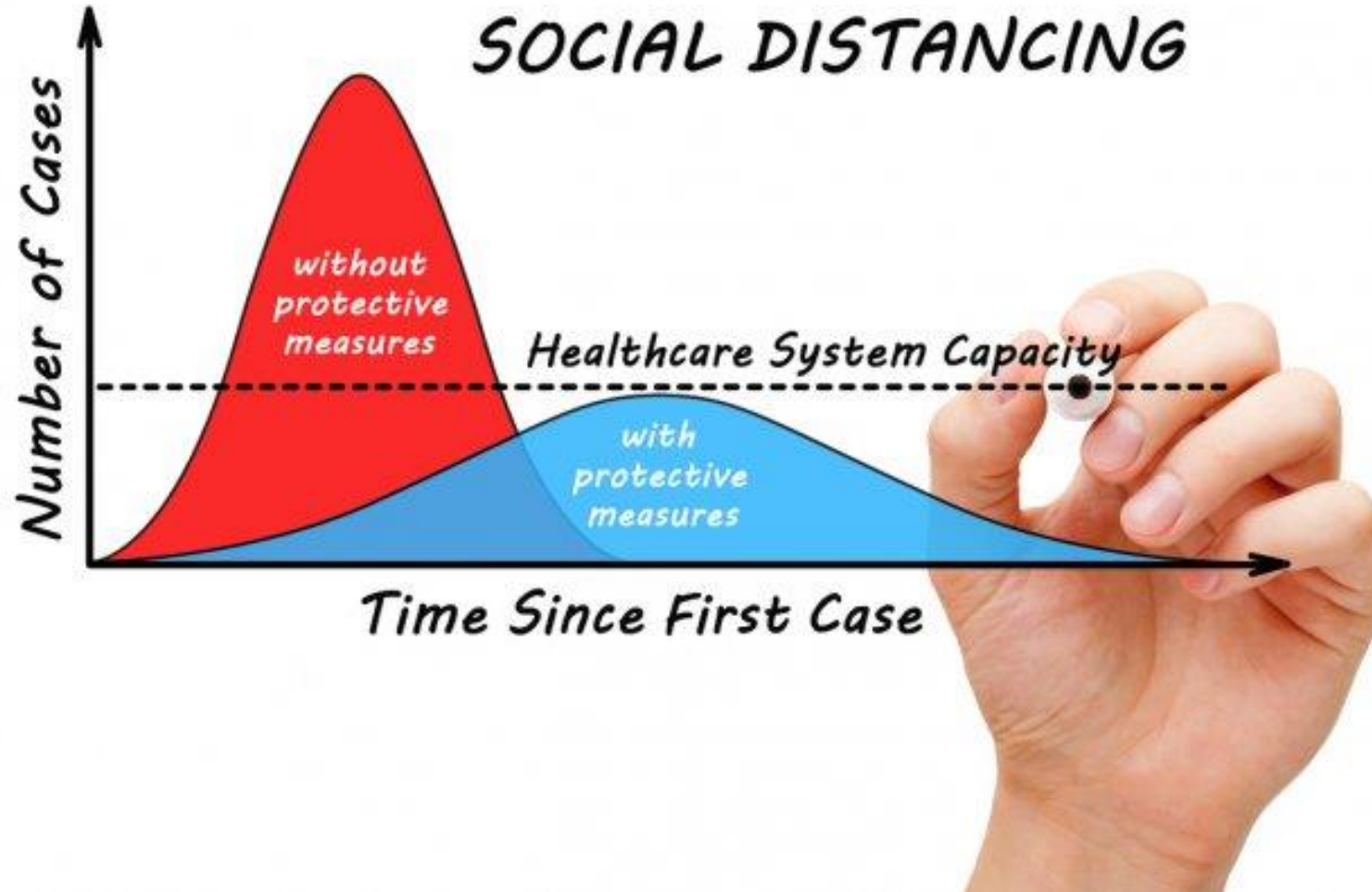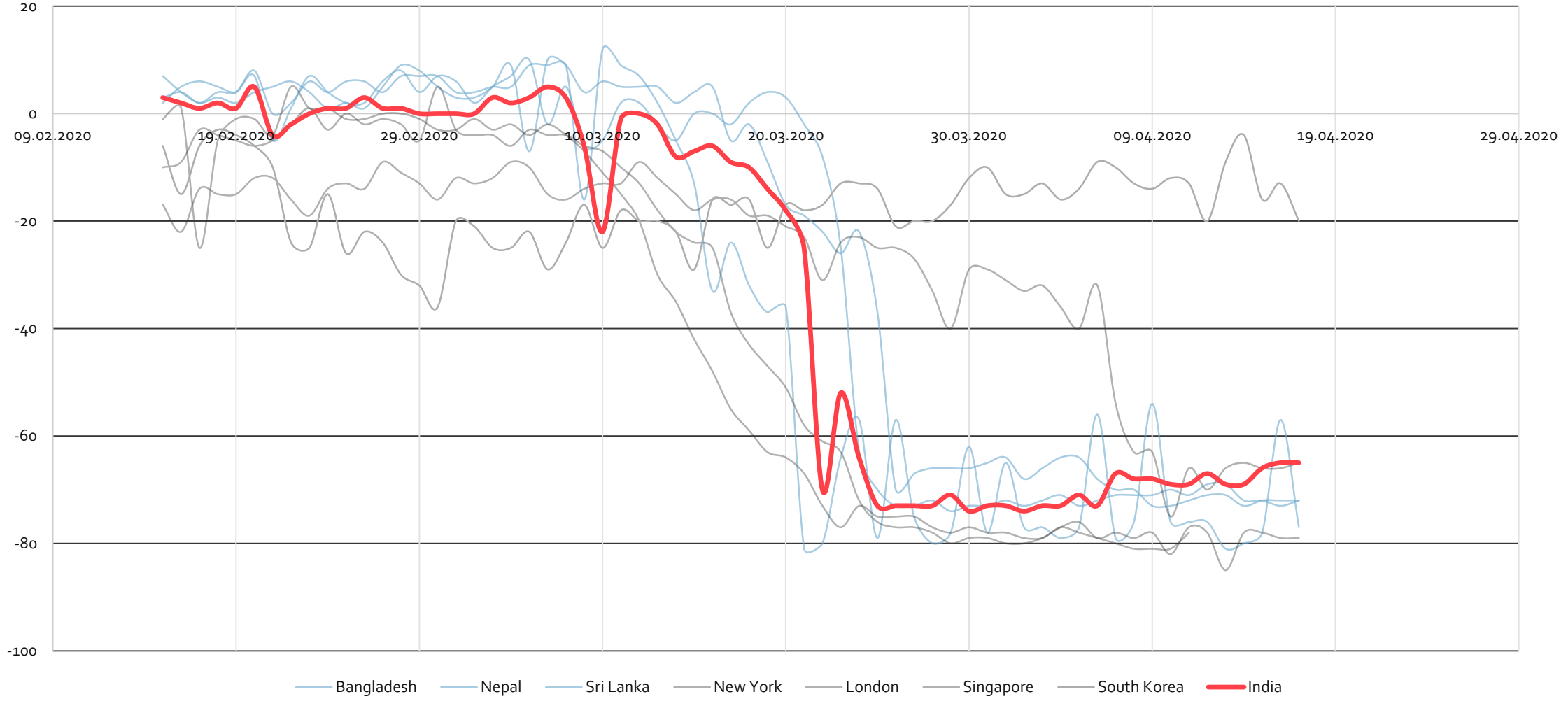
Economic Impact

The impact of coronavirus on stock markets since the start of the outbreak

Nikkei: -22.2%
Dow Jones: -24.1%
FTSE 100: -28.8%

Source: Bloomberg, 01 April 2020, 09:00 GMT

BBC

Image: Image: BBC/Bloomberg

Source: https://www.weforum.org/agenda/2020/04/how-to-build-back-better-after-covid-19/

Solution

ILLUSTRATION: ROHNIT PHORE

Air quality

Nov 3, 2019

Mar 30, 2020
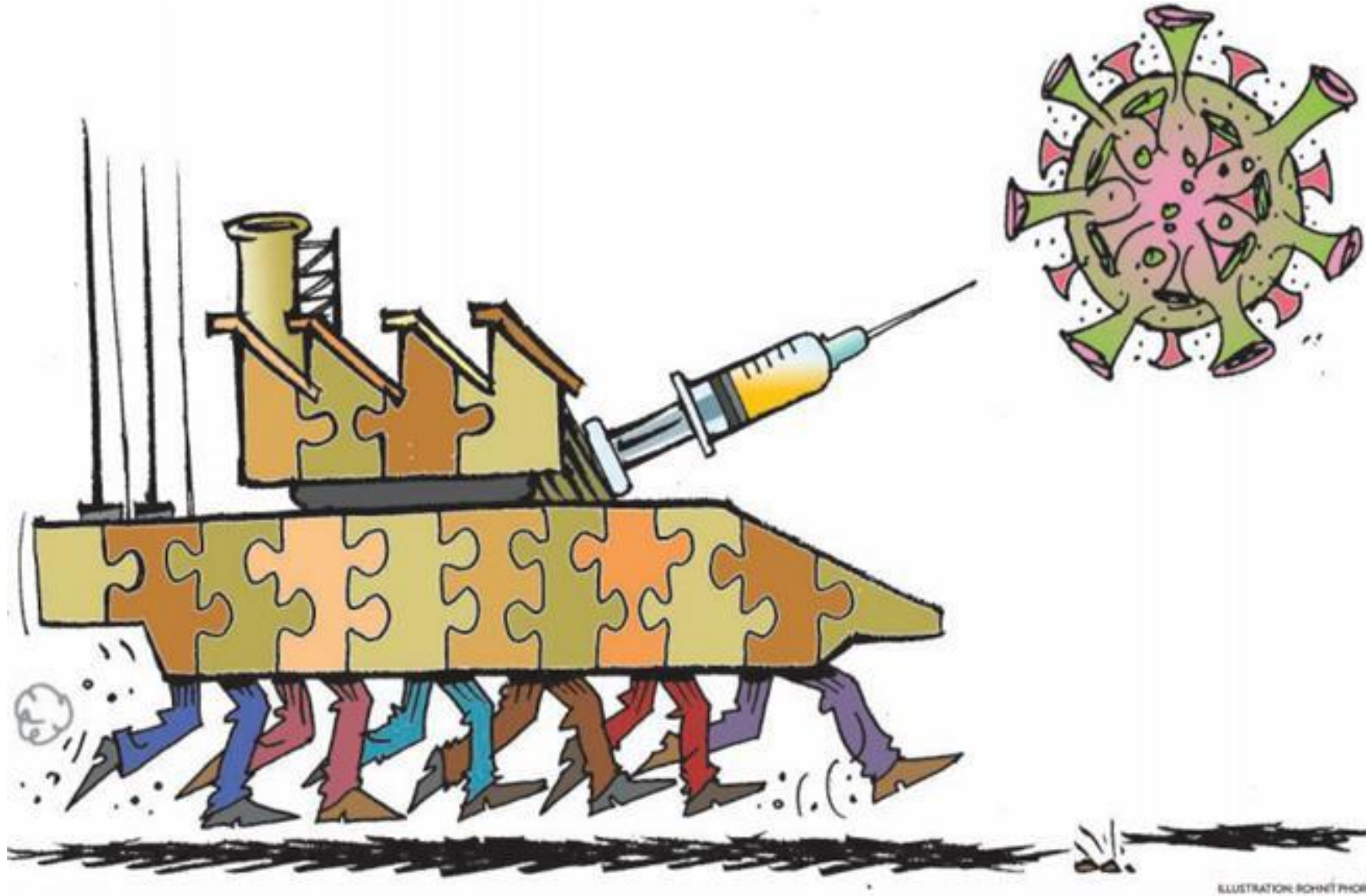
Air quality improvements

#	City	PM2.5 % Difference	SO2 % Difference	NOx % Difference	PM10 % Difference
1	Delhi	-43.59%	-18.71%	-54.57%	-52.83%
2	Mumbai	-22.86%	-22.88%	-67.72%	-47.42%
3	Bengaluru	-17.74%	-13.24%	-53.65%	-30.39%
4	Kolkata	-13.76%	-23.52%	-56.24%	-27.23%
5	Patna	-25.02%	1.49%	0.71%	-23.32%
6	Noida	-51.62%	-17.50%	-61.97%	-54.80%
7	Hyderabad	15.58%	27.17%	-49.75%	-13.39%
8	Lucknow	-29.90%	-23.32%	-59.75%	----
9	Gurgram	-50.29%	-3.67%	-43.58%	-56.48%
10	Jaipur	-53.77%	-7.98%	-58.90%	-55.13%
11	Thiruvananthapuram	-22.35%	-12.59%	-35.84%	-16.05%
12	Visakhapatnam	-8.57%	5.10%	8.94%	-13.28%
13	Kanpur	-14.27%	-13.36%	-72.05%	----
14	Chandigarh	-27.24%	-1.06%	-39.11%	-43.90%
15	Ahmedabad	-32.90%	-24.05%	-8.22%	-24.68%
16	Guwahati	-1.97%	14.49%	-54.41%	-1.18%
17	Pune	-41.15%	-37.33%	-44.85%	-55.68%

atmos
real-time air quality
Respirer Living Sciences

Source: Raunak Urban Sciences

Improved road safety

Wild life is back

Three phase response to COVID 19 pandemic

Lockdown

Opening up

New Normal
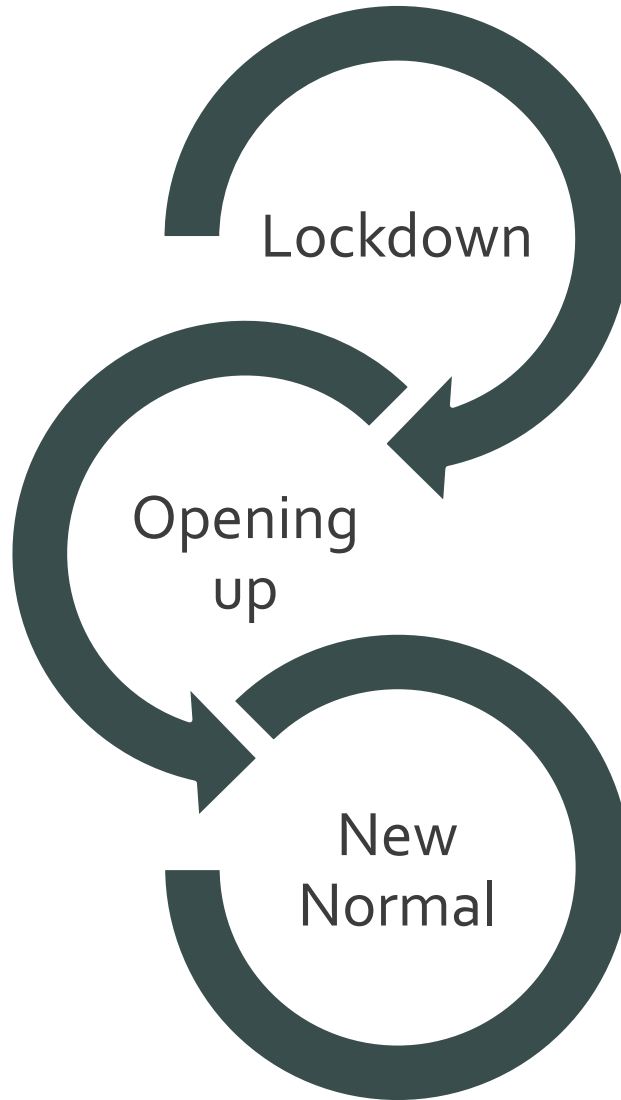
Increased technology adoption

On demand transit

Re-cycling cities

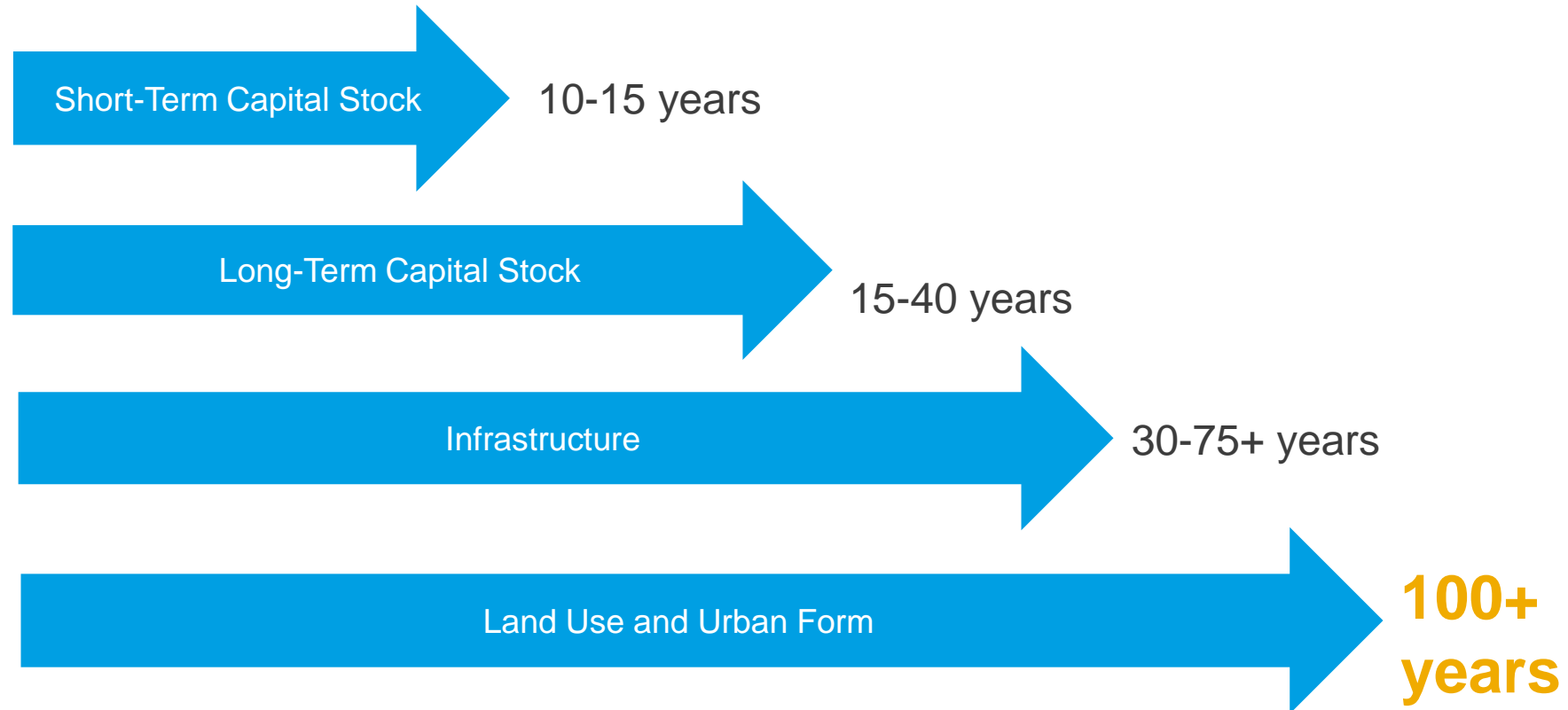Plans for the Strade Aperte project at Corso Buenos Aires, Milan. (Image courtesy: The Guardian)

Source:

Urban deliveries

Zero emission transport

Life in a post COVID world

Short-Term Capital Stock — 10-15 years

Long-Term Capital Stock — 15-40 years

Infrastructure — 30-75+ years

Land Use and Urban Form — **100+ years**

Thank You

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Questions & Answers

Please feel free to ask your burning questions from now on.

Send us your questions via the chat function on the bottom of your GoToWebinar dashboard.

Please also state which speaker you would like to adress.

We will filter all questions and forward them to the speakers.

Thank you for you interest!

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