

ENVIRONMENTAL IMPERATIVES OF SUSTAINABLE TRANSPORT



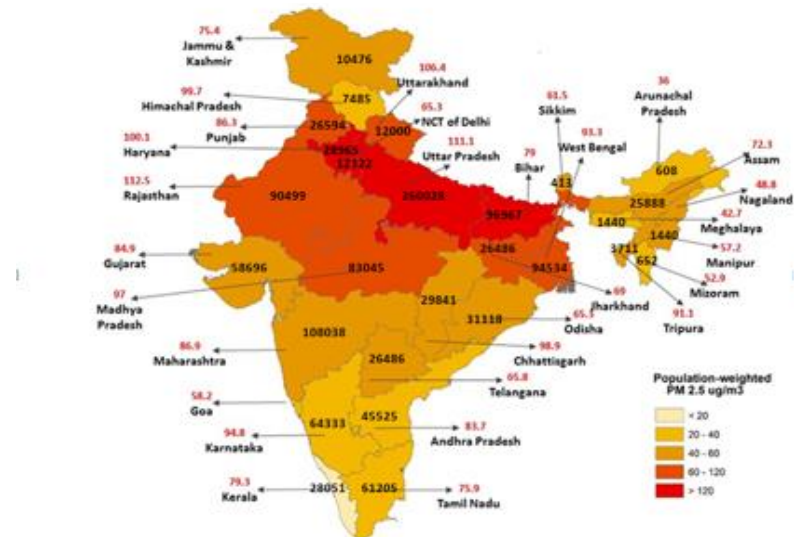
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ENVIRONMENT



CHALLENGE OF PUBLIC HEALTH AND CLIMATE CHANGE RISK: NEED CO-BENEFIT AGENDA FOR TRANSPORT SECTOR

Transport sector contributes to:

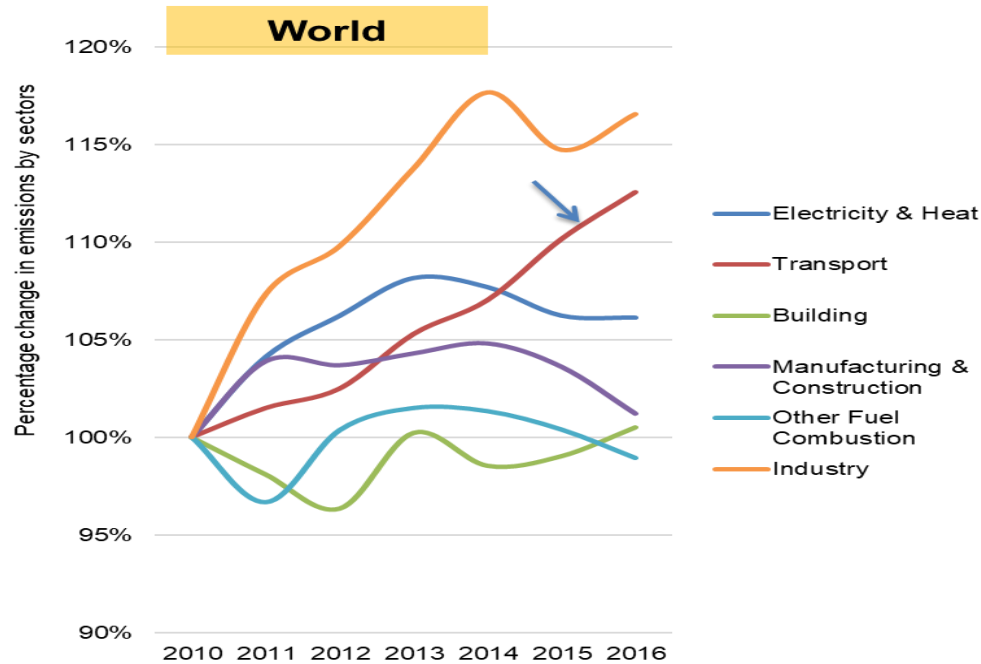
Local pollution and toxic exposure;
enhances public health risk



Heat trapping green house gas emissions;
enhance climate change risk

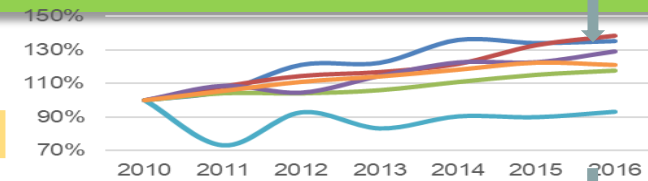


GLOBAL TREND -- CO2 EMISSIONS FROM TRANSPORT SECTOR RISING

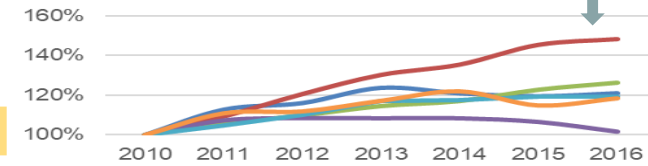


Source: ourworldindata.org

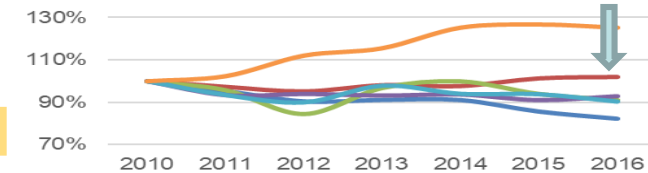
India



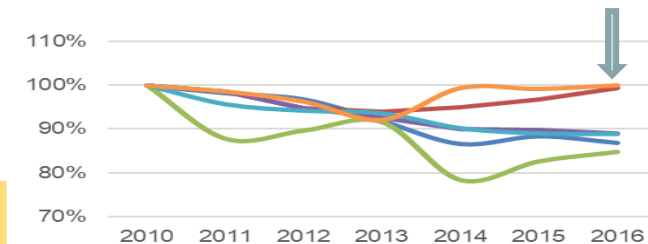
China



USA

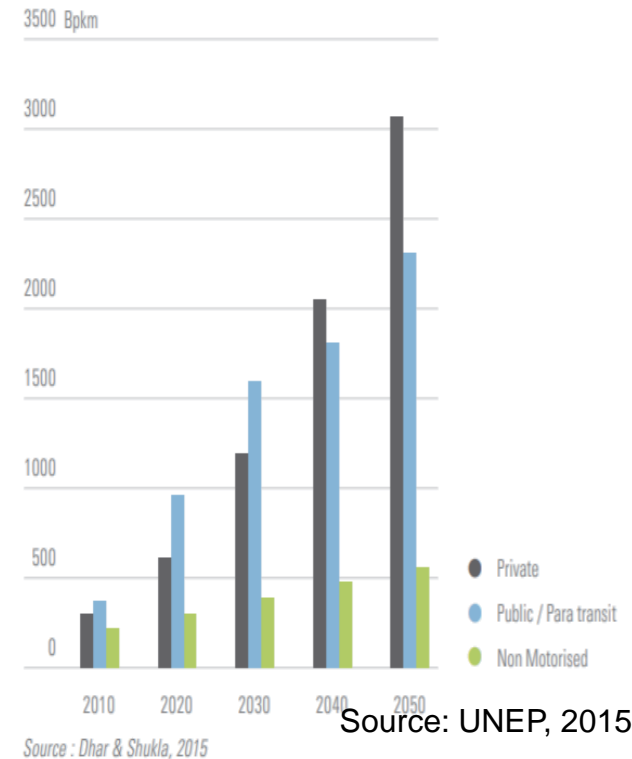
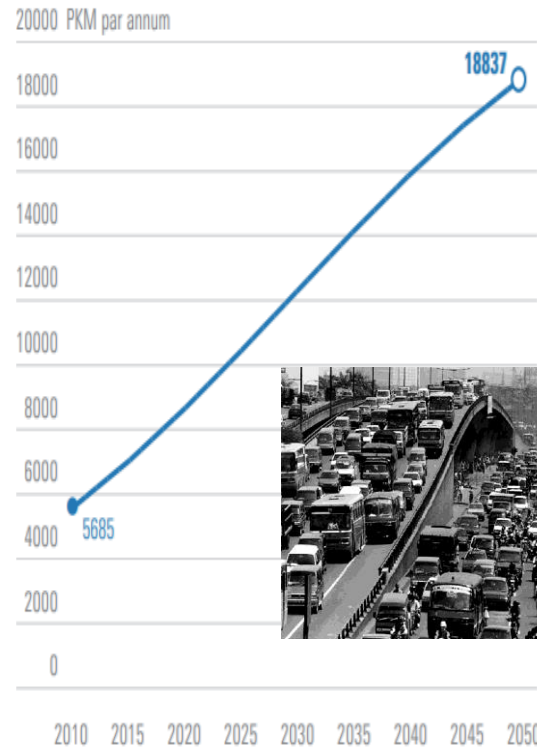
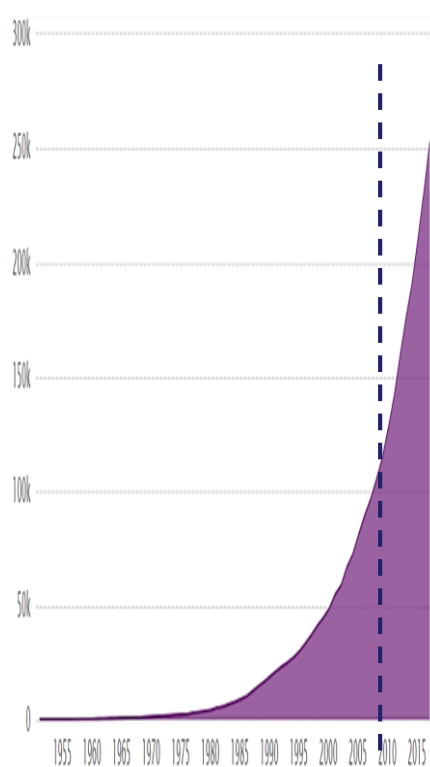


EU-27



- **Energy intensity must drop by 3.2% on average annually from 2020 to 2030 – more than double the annual average rate of decrease since 2000**
- Road vehicles account for **nearly three-quarters of transport CO2 emissions**

MOTORISATION AND MOBILITY DEMAND IN INDIA: EXPLOSIVE

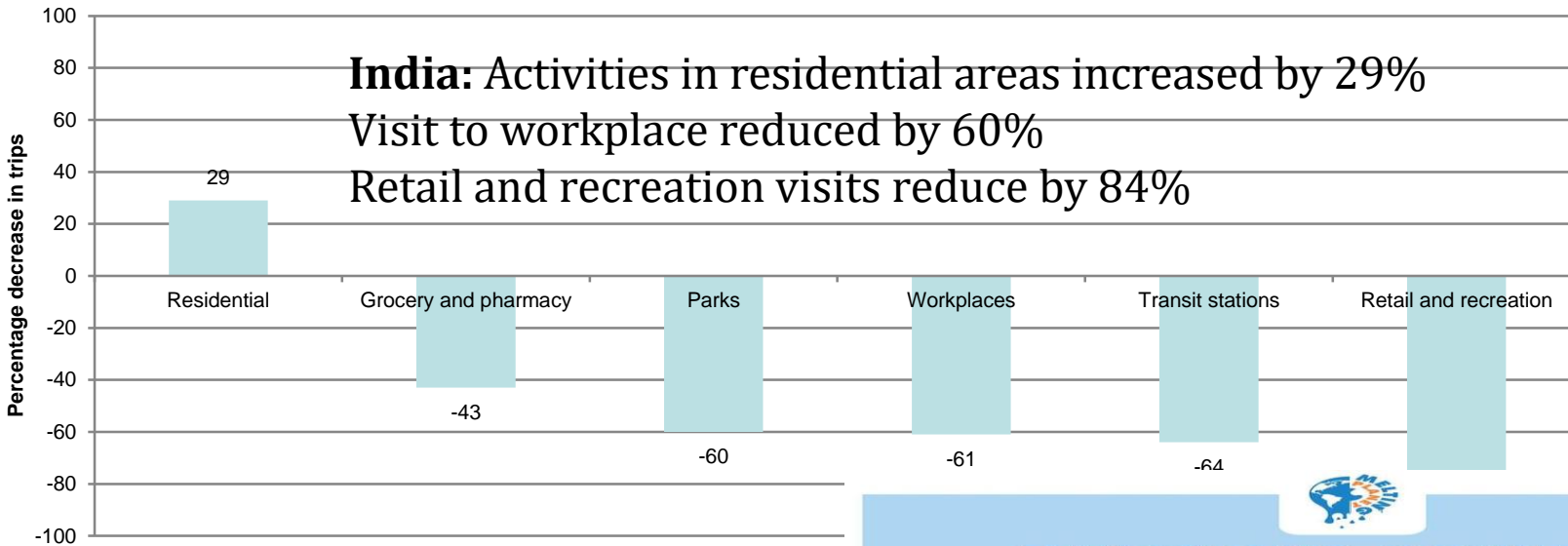


Trend of Registered Motor Vehicles in India
(1951 – 2017); Added approx. **1.5 billion vehicles** in past 10 years

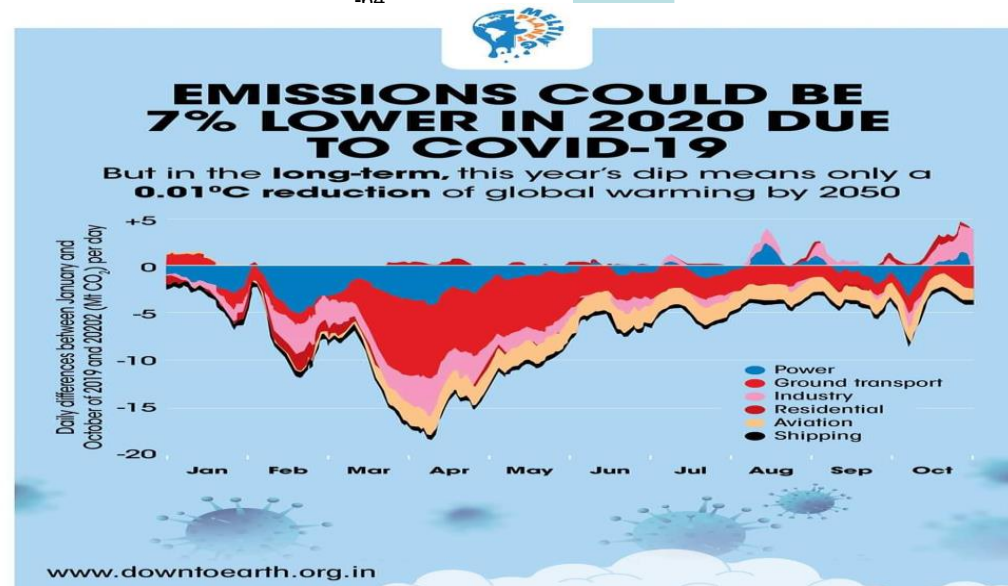
- Passenger km to increase more than 3 times by 2050
- Trip length and rate to increase with city size and income
- Private transport to overtake public transport by 2040.
- Peak traffic to crawl

LOCKDOWN: CHANGE IN ACTIVITY PATTERN REDUCED CO2 EMISSIONS – BUT BOUNCING BACK

India: Activities in residential areas increased by 29%
Visit to workplace reduced by 60%
Retail and recreation visits reduce by 84%

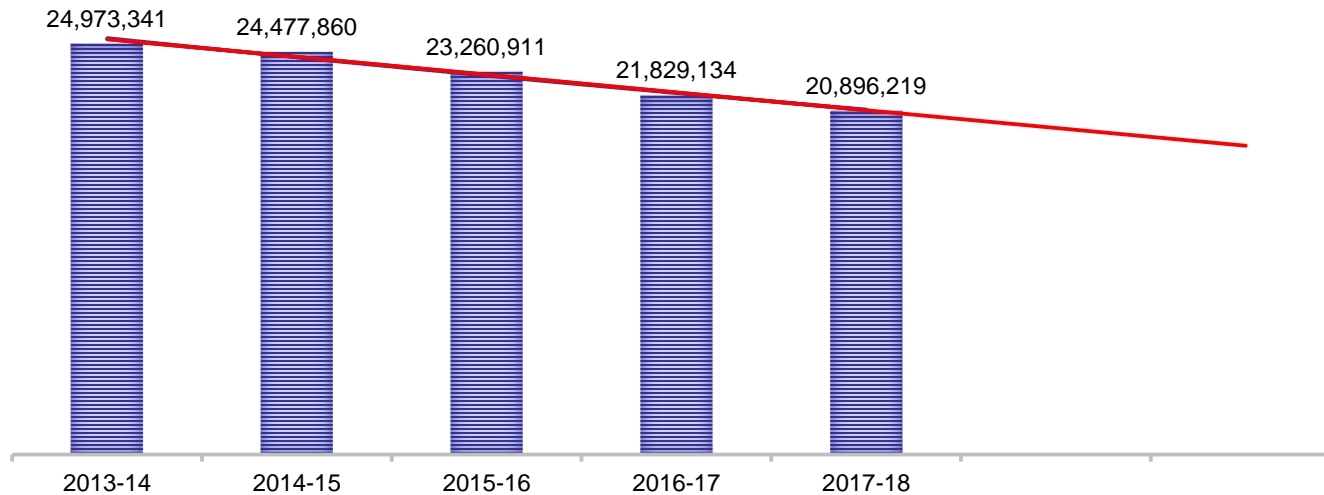


**Global pandemic and transport CO2:
Nose dives; but recovers
Emissions Gap report 2020**



POST PANDEMIC CHALLENGES: REVIVE PUBLIC TRANSPORT

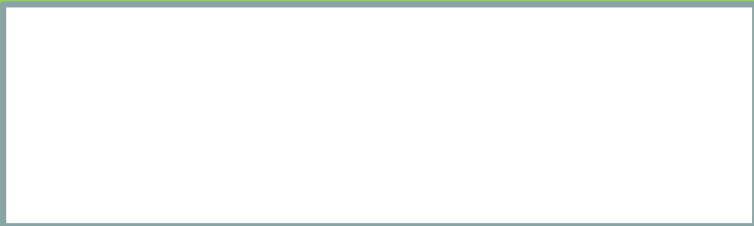
Combined Daily Bus Ridership in Indian Cities
(Ridership of 17 major cities in India)



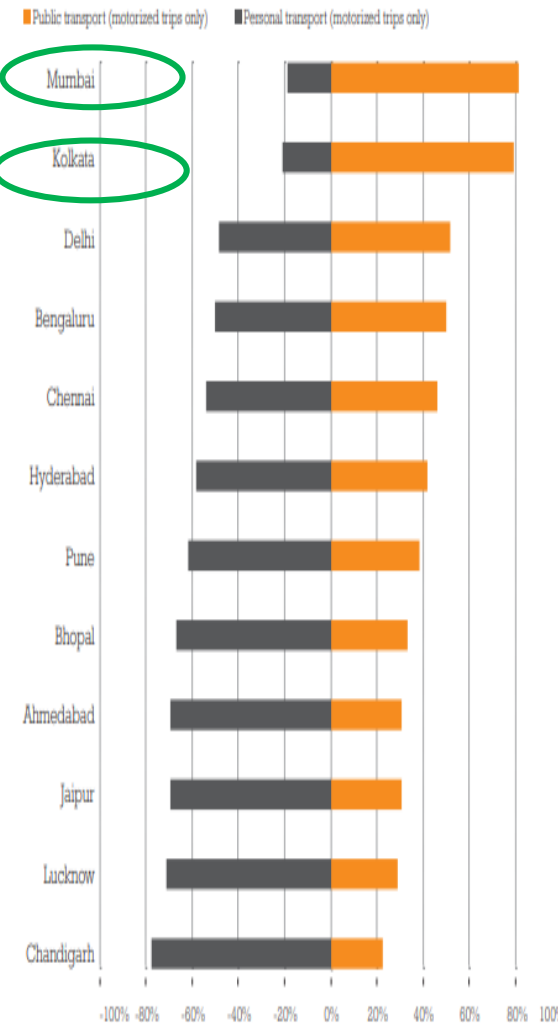
Source: Analysis by CSE,
2019

- Between 2013 - 18, 12 cities have lost combined ridership of 40.8 lakhs
- Impact of COVID-19 lock down on total cost and traffic revenue compared to Normal operations (in INR Billion)- 2020-21
- Annual VGF requirement increased by 69% in 2020
- Massive drop in traffic revenue

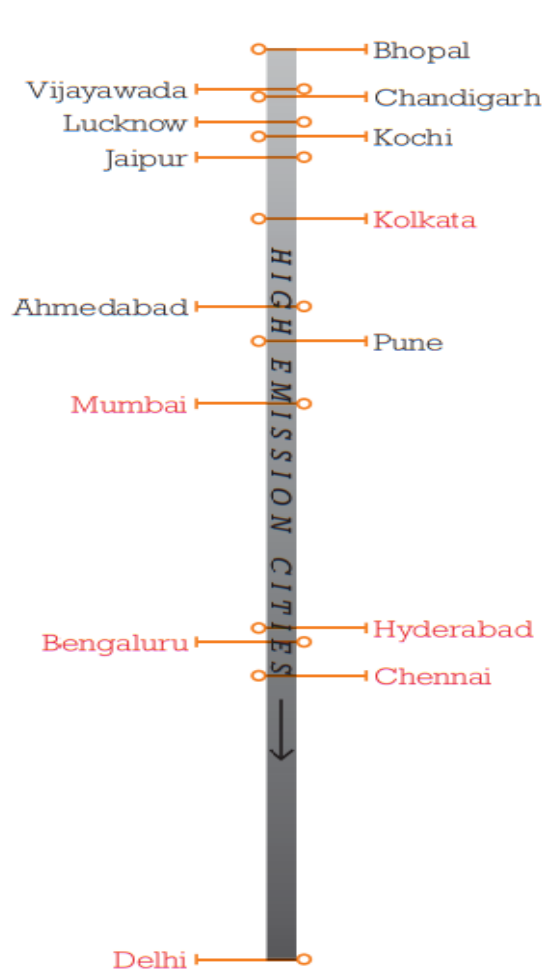
CITIES WITH HIGHER SHARE OF PUBLIC TRANSPORT RIDERSHIP HAVE LOWER EMISSIONS FROM URBAN COMMUTE



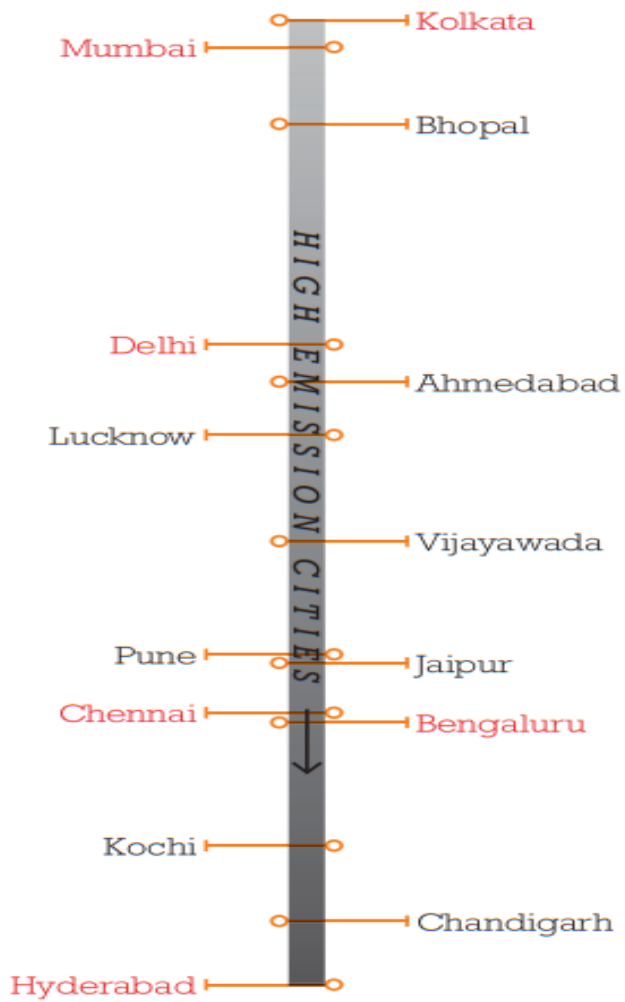
Share of personal and public transport in motorized trips



Based on overall emissions and energy consumption



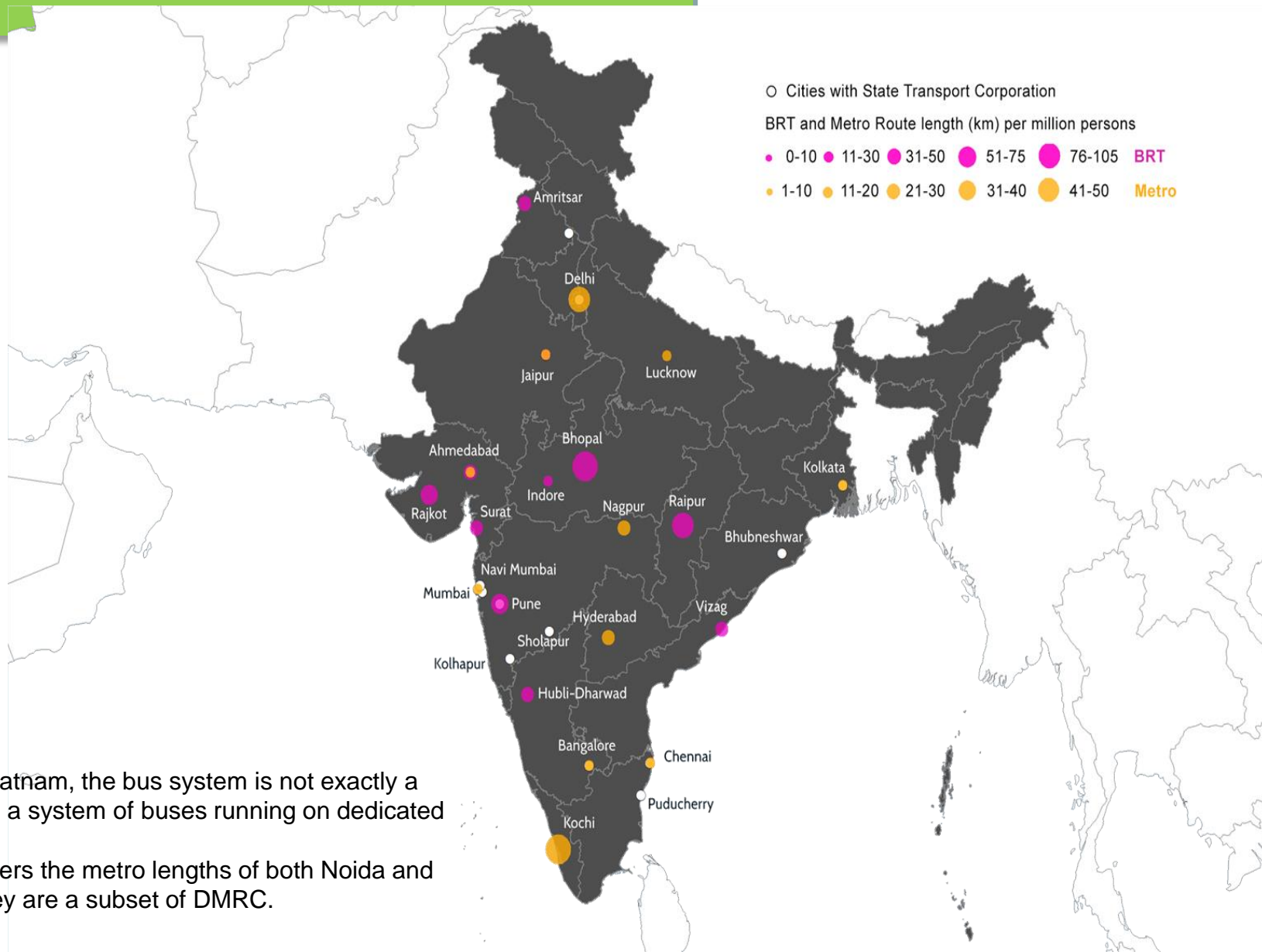
Based on per travel trip emissions and energy consumption



Source: CSE analysis

MASS TRANSIT SERVICES IN INDIA: NEEDS SCALE

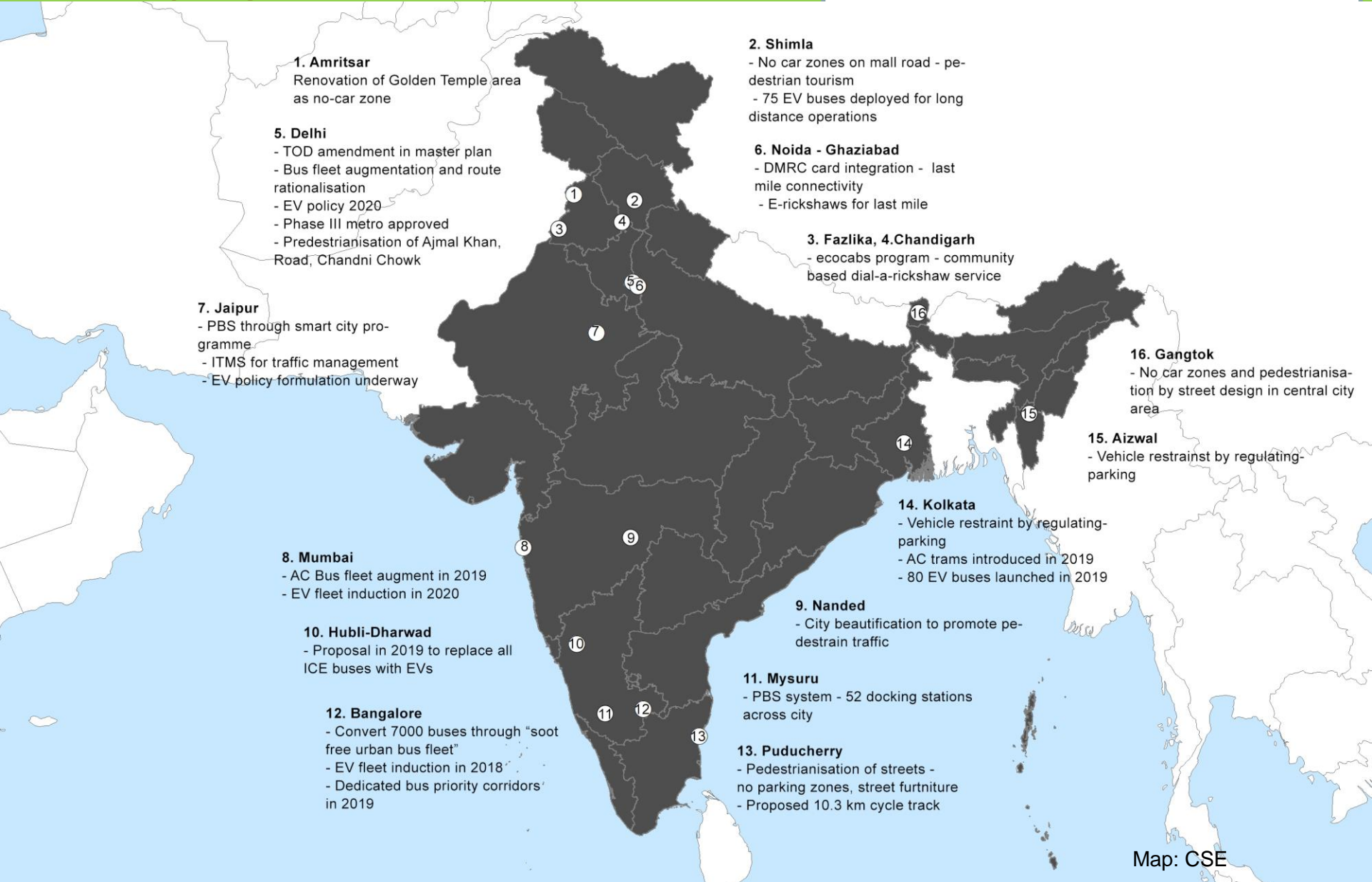
(SERVICE LENGTH PER MILLION POPULATION):



Note: Vishakhapatnam, the bus system is not exactly a BRT system, but a system of buses running on dedicated lanes.

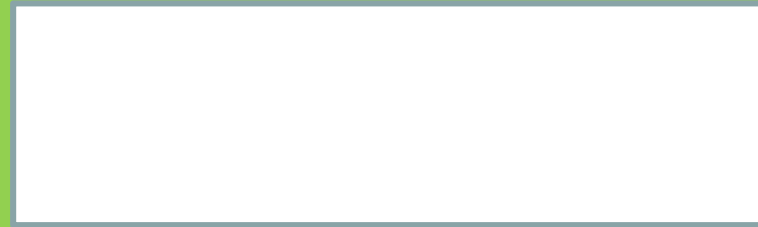
*Delhi Metro covers the metro lengths of both Noida and Gurgaon and they are a subset of DMRC.

EMERGING STRATEGIES ON MOBILITY AND VEHICLE RESTRAINT MEASURES: NEED TO MULTIPLY



URBAN FORM AND CO2 LOCK-IN

RETAIN THE ADVANTAGE OF COMPACT URBAN FORM



- India has a better opportunity in high-density, mixed-use urban forms
- **IPCC:** Transport activities may plateau at lower GDP level in non-OECD countries due to high urban densities and greater infrastructure constraint
- Transport sector inertia due to large scale need for infrastructure funding – needs to be addressed
- Prevent car-dependent, spatial planning
- India's TOD policy, National Habitat Standards, guideline for smart cities etc needs leveraging
- Bridge the gap with implementation

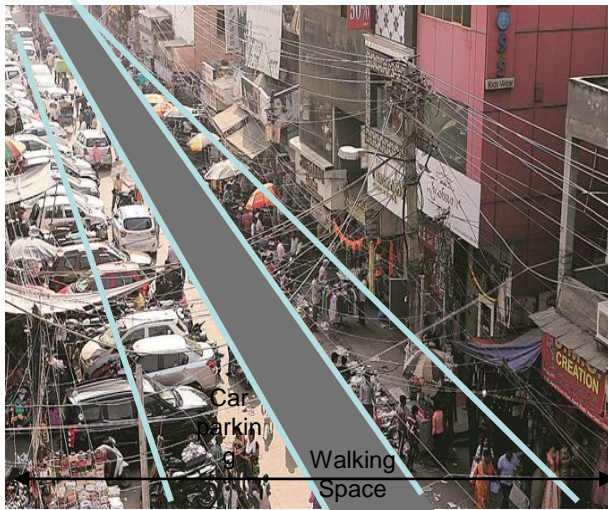
PREVENT LOCK IN OF CARBON AND ENERGY INTENSITY IN INFRASTRUCTURE

Engineering changes once made cannot be reversed easily... It permanently decides our travel choices



PROGRESSIVE CHANGE: NEED SCALE

Restructuring Ajmal Khan road



22 streets in
Delhi
identified for
pedestrianisa
tion

Restructuring Chandni Chowk



BUILD COMPACT AND CONNECTED CITIES



Adopt TOD Building typology and compact form based code for all development

- Roof of retail used as public space for residents.
- Zero Setbacks.
- Mixed Use (Commercial/ Civic/ Residential within same block)
- Retail facing the street with homes overlooking, keeps pedestrians (women) safe



Prevent
urban
sprawl

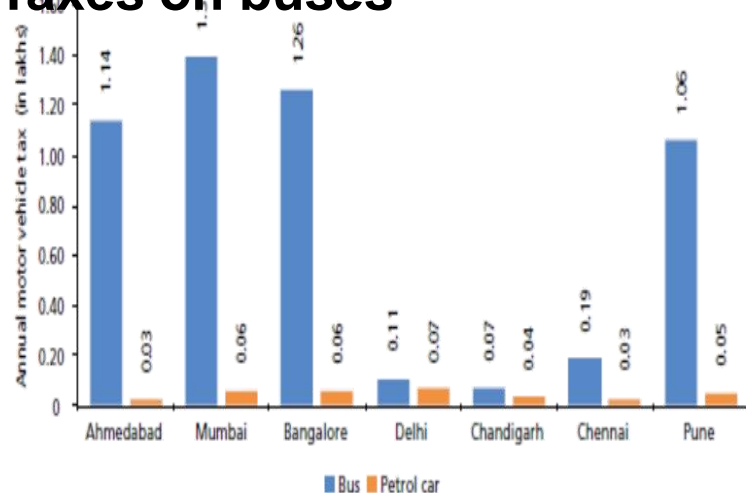


**Mainstream mixed use
development
Reduce distances
Improve public transport access**

BUSES AND TAX REFORMS AFFORDABILITY CHALLENGE

- **Remove Tax burden --** More than 10 different taxes on bus services-- MV tax about 20% of total operational cost of STUs. (2017)

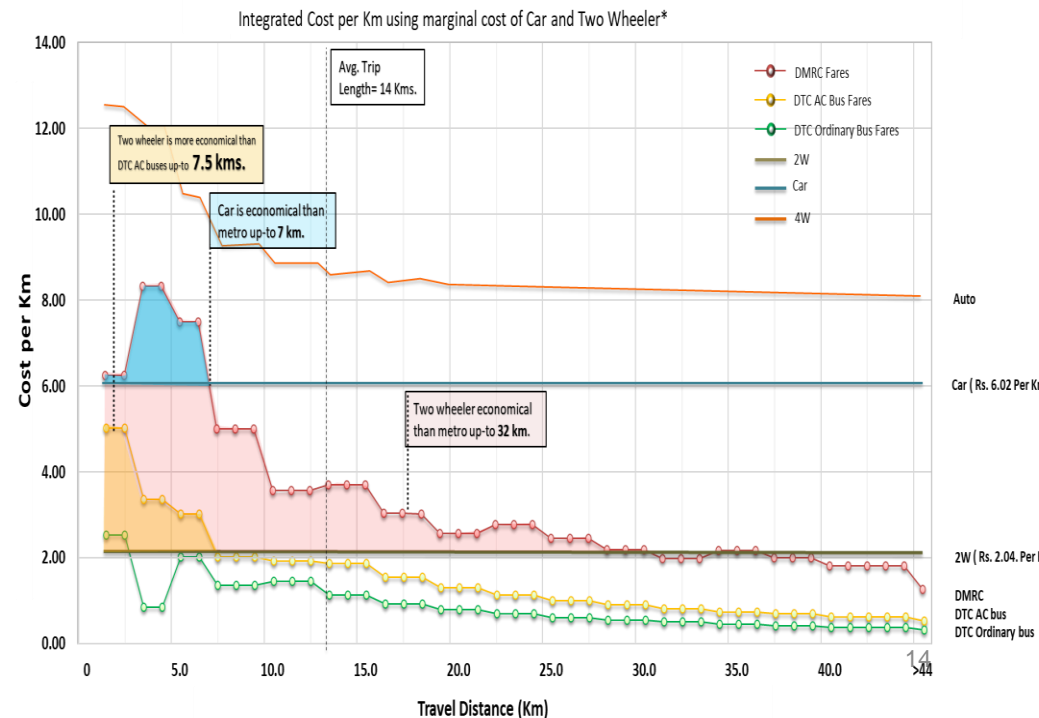
Taxes on buses



Note: Cost of a car is assumed as Rs 0.8 lakhs, lifetime as 15 years; Bus capacity is assumed as 35 seating and 15 standees.

Source: Estimation done by CSE as per tax structure provided by MoRTH

Address affordability gap in cities



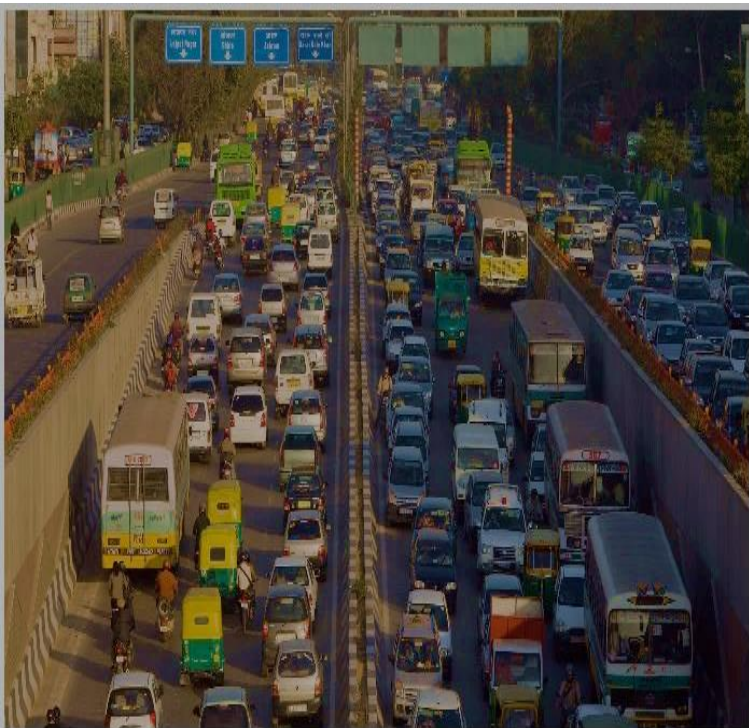
* Extra 25% cost is added for last mile connectivity For Metro to Calculate Integrated Cost

HOW DO WE MOVE FORWARD TOWARDS NEW NORMAL?

- **City-wide integrated and affordable public transport services**
- **Accessible neighbourhoods**
- **Pro-poor mobility and housing for habitat planning**
- **Adopting vehicle restraint measures** – paid parking, congestion pricing, low emission zones etc.
- **Electric mobility**
- **Fiscal package/stimulus** for public transport; Reform taxes
- **Sustainable financing**

Prevent lock in of pollution and carbon in transport infrastructure

Understand the problem



Modernise this paradigm



Image Credit: istockphoto.com/Radiokukka

Thank You