Reinventing Mobility
Cities are growing bigger

50% of India’s population will lived in Cities by 2050
(According to United Nations)

As per census 2011 – 30% of total population

All top 10 fastest growing cities of the world shall be from India
(According to oxford economics, in between 2019-35)

Source: Oxford Economics
Cities are growing bigger and so its transport demands:

In 10 years (2005 -2014), Daily trips of Greater Mumbai has increased from 10 to 14 million. (source: CTTS, MMR 2005 & CMP, Greater Mumbai 2014)

In 10 years (2009 -2018), Avg. trip length of Jaipur has increased from 5 to 5.5 km. (source: CMP, Jaipur 2009 & CTS Jaipur 2018)
Cities are growing bigger and so its transport demands:

Source: Review of Urban Transport India, IUT & C\textsubscript{S} TEP
Higher transport demands leads to higher vehicular traffic:

**Trend of Registered Motor Vehicles in India (1951 – 2017)**

Added approx. **1.5 billion vehicles** in past 10 years
More vehicles means more polluted air:

A study conducted by System of Air Quality Weather Forecasting And Research (SAFAR), has reported that approximately 41% of Delhi’s pollutions (particularly particulate matters – 2.5 & 10) are sourced from the transport sector, highest among other sectors. (in 2018)

Global forum of C40 Cities – Avg. 30% of the cities pollution are sourced from transport sector.
Problem of air pollution is getting worse:

According to WHO, 18 out of world’s top 30 most polluted cities are from India.

1. Muzaffarpur (UP)
2. Gwalior (MP)
3. Allahabad (Prayagraj) (UP)
4. Varanasi (UP)
5. Raipur (CG)
6. Delhi (DL)
7. Agra (UP)
8. Ludhiana (PN)
9. Gurgaon (HR)
10. Khanna (PN)
11. Firozabad (PN)
12. Amritsar (PN)
13. Gobindgarh (PN)
14. Patiala (PN)
15. Dehradun (UK)
16. Howrah (WB)
17. Dhanbad (JK)
18. Bhopal (MP)
Accepted Standard is 60 ug/m³ (micrograms per cubic meter) per annum

However, it started impacted our health in 20 ug/m³ (WHO)
### How to Improve? How to reduce Vehicular emission??

#### Objective:
- Adopting more sustainable transport modes.
- Discouraging the use of polluting modes.
- Reducing distance of travel.
- Reduce the requirement of travel.

#### Strategies:
- Promote Active mode of transport; Walking & Cycling
- Develop efficient and affordable Public Transport network
- Use of Green Energy; EV, BSVI
- Use of Parking Regulation as vehicle restrain measure.
- Create Low Emission Zones
- Car free Zones
- Encourage mixed use, compact development; TOD
- Use of Information Technology (IT)
Promote Active mode of transport:

**Passenger Capacity of different Transport Modes**

**Passengers per hour**
on 3.5m wide lanes in the city

- 1,000 average passengers / hour
- 1,000 potential passengers / hour
Promote Active mode of transport:

- Develop High quality NMT Infrastructure:
  - Wide Sidewalks
  - Dedicated Cycle Tracks

Image: [https://twitter.com/bscl_bbsr/status/1158358491238502401](https://twitter.com/bscl_bbsr/status/1158358491238502401)
Promote Active mode of transport:

- Develop High quality NMT Infrastructure:
  - Wide Sidewalks
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[Image: http://oasisdesigns.org/pune.asp]
Promote Active mode of transport:
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- Develop Public Bicycle Infrastructure:
  - Dedicated Cycle Tracks
  - Cycle Parking Area

Promote Active mode of transport:

- Develop Public Bicycle as last mile connectivity:

Image: https://www.capitalregiontransport.in/transit-services/mo-cycle
Promote Active mode of transport:

- Develop Pedestrian Only Streets:
  - Busy commercial area
  - Old city area.

Copenhagen

Promote Active mode of transport:

Before

After

Meenakshi Temple, Madurai

Image: Pedestrianisation in India and across the Globe, ITDP
Develop efficient and affordable Public Transport network
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Ridership has gone up from 23K to 1 Lakh per day within one year.

Introduce/ Improve bus service:
- Reliable
- Comfortable
- Affordable
- Clean

MoBus, Bhubaneswar

Image: https://tiktogram.com/tag/naveenpattnaik
Develop efficient and affordable Public Transport network

- Introduce high quality mass transport system:
  - Bus Rapid Transit System
  - Metro Services.

Use of Green Energy:

- Use greener fuel technology:
  - Electric Vehicles
  - BSVI complied vehicles
Use of Parking Regulation as a vehicle restrain measure:

Grosvenor Square, London

No meters

Meters

Prices quadrupled

Image: TRL in ITDP (2011): Europe's Parking U-Turn
Creating low emission zones:

Central London Ultra Low Emission Zone operates in the same area as the Congestion Charge Zone.
Creating Car free zones:

Madrid, Spain

Barcelona
Encouraging mixed use, compact development:

- Density
- Diversity
- Design
- Destination accessibility
- Distance from Transit

20 minute city, Portland
Task force ask corporates to encourage employees to work from home to reduce vehicular pollution

A Central Pollution Control Board-led task force has recommended that corporates and government offices should encourage employees to use public transport or car-pooling to reduce vehicular pollution in the next few months.
Multi-Pronged Strategy:

We have to act holistically:

SAI Approach – Shift | Avoid | Improve

Shift - PT and NMT

Avoid - Use of Private Vehicles (2W and Cars), Restriction on uses.

Improve - Vehicle technology; EV & BS VI

World - Cities in China- Guangzhou, European cities - Madrid, Oslo
India - Bhubaneswar & Pune