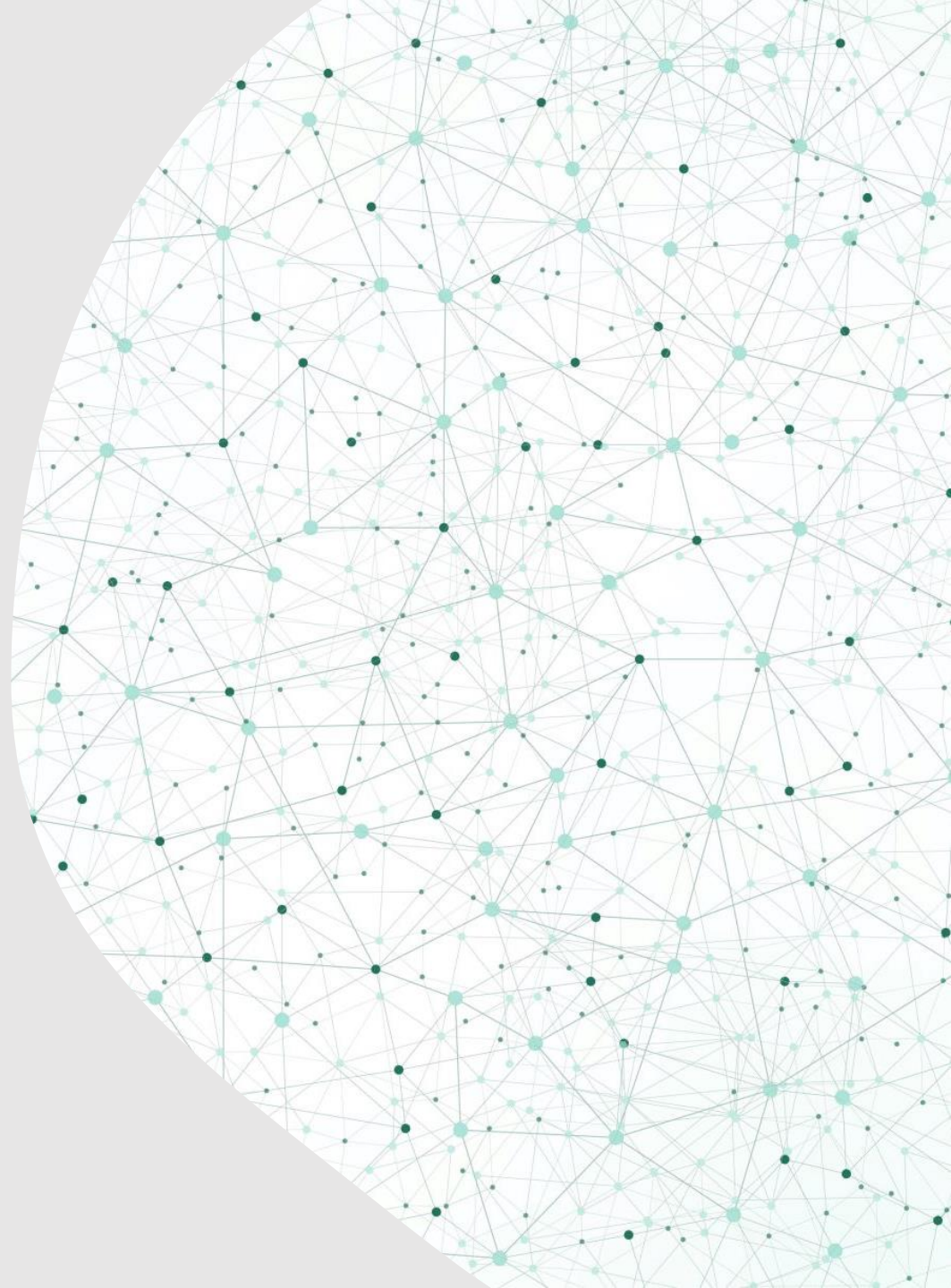


# Urban Mobility for Just and Low-Carbon Transition

Mahesh Moroney

Sr. DGM MMI

Maharashtra Metro Rail Corporation



# CITY

- City is the place where people meet to exchange ideas, trade or simply relax and enjoy themselves.
- City's streets, squares and parks (Jan Gehl says, 'the street, the footpath and the park are the grammar of the city') is the stage and the catalyst for these activities.
- A humane city - with carefully designed streets, squares & parks - creates pleasure for visitors and passers- by as well as those who live, work & play, i.e., citizens of the city.
- Everyone should have the right to open spaces & that too, should be easily accessible, everyone should be able to see a tree from their window, or to sit on a bench close to the home with a safe play space for children, or to walk to a park within 10 mins.
- Well designed neighbourhoods inspire the people who live in them as against poorly designed cities (Jan Gehl says, 'We shape cities & they shape us').



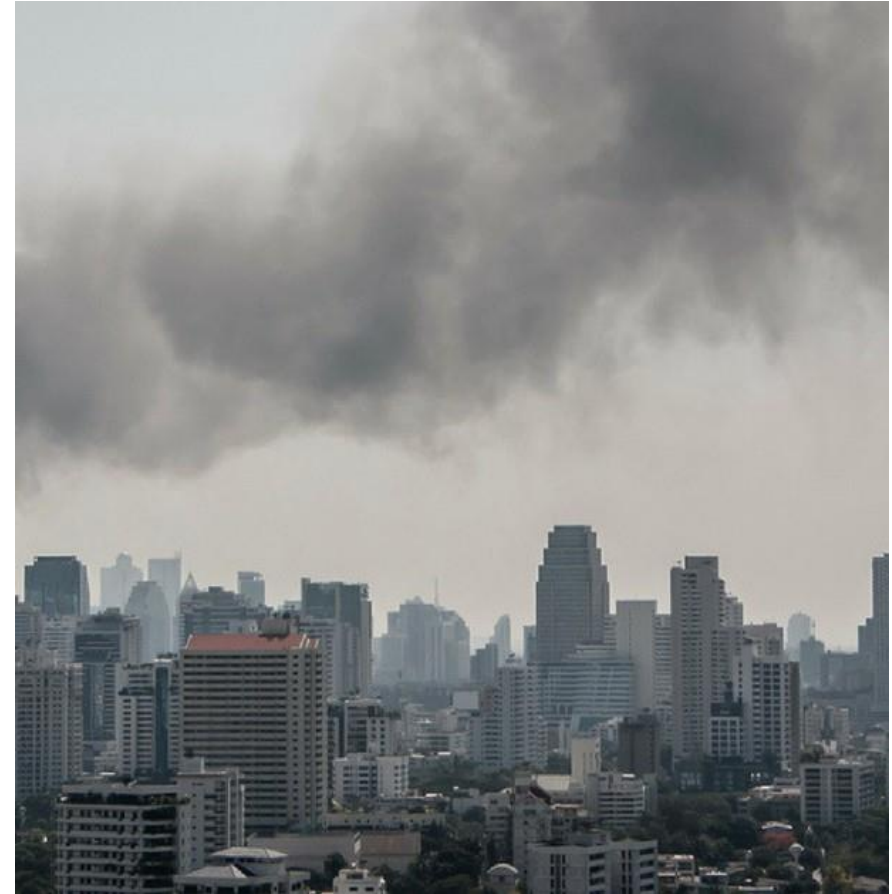
# CITY-COMMON SCENARIO

- Human dimension is overlooked in Urban Planning
- Automobile (car) centric design - cities for cars, not for people
- Low priority on public space, pedestrianism & the role of city space as meeting place
- Individual building centric approach
- No importance to transport planning
- Limited space, obstacles, noise, pollution, risk of accident & disgraceful conditions in general
- Result..... The people who still use city space in great number have been poorly treated



# Effects Of Urbanisation

- Rapid Urbanisation results in expanding cities & shrinking green space - sprawl
- Developing countries - poor victims
- Rapid motorisation - deteriorating traffic conditions - worsening congestion levels
- Transport sector - major contributor to global climate change
- Road fatalities per thousand inhabitants is often 4 times higher in developing countries than in developed ones. (World Bank Report)



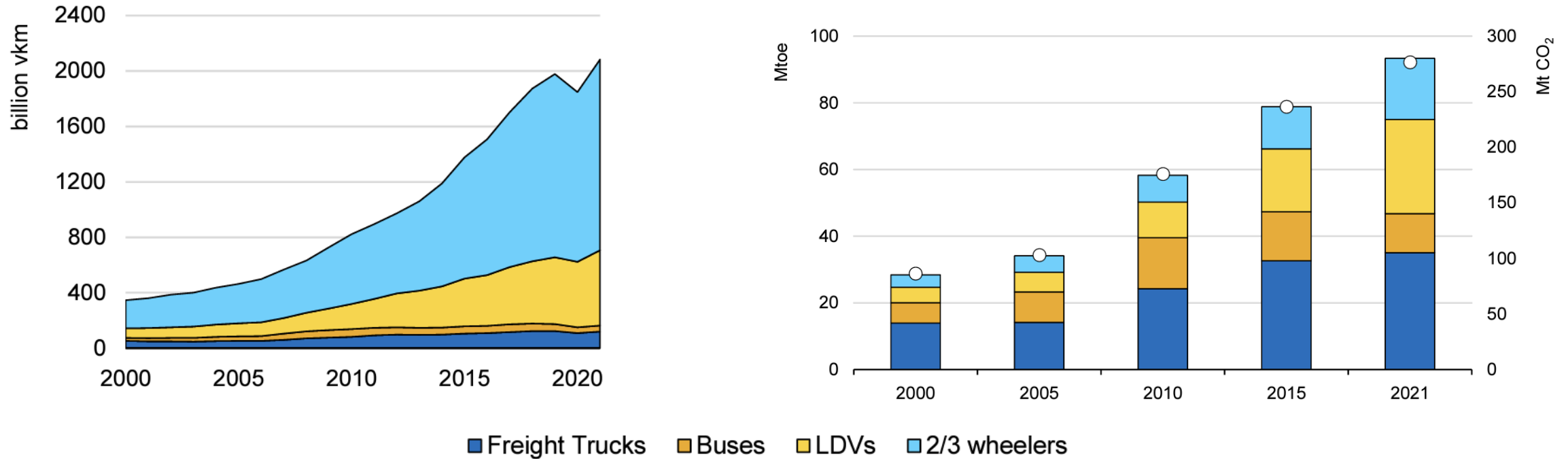
# Towards Lively, Safe, Sustainable & Healthy City

## Human Dimension - Necessary Planning Dimension

- Greater focus on the needs of the people who use cities - a key goal
- To reinforce pedestrianism as an integrated city policy
- Equally urgent to strengthen the social function of city space as a meeting place that contributes towards the aims of social sustainability and an open & democratic society
- All these 4 key objectives - lively, safe, sustainable & healthy city can be strengthened immeasurably by increasing concern for pedestrians, cyclists & city life in general.
- A unified, citywide intervention to ensure that the residents of the city are invited to walk & bike as much as possible in connection with their daily activities is a strong reinforcement of the objective



# Growth in India's transportation sector



*Road transport vehicle kilometers, fuel consumption and related CO2 emissions (Source: IEA)*

- With rapid urbanisation and population increase, road transport in India is growing exponentially.
- Along with increased vehicle travel, fuel consumption and emissions are also rising.

# Need for Just and Low-carbon Mobility



Improved air quality



Better for the environment



High accessibility



Reduced oil costs

Sustainable transportation aims to provide efficient, equitable, and environmentally friendly mobility options that reduce the negative impacts of transportation on our planet. Cities are at the forefront of this transformation.

# Benefits of sustainable urban transportation



## **Environmental Impact:**

Sustainable transportation reduces air pollution, lowers greenhouse gas emissions, and mitigates the negative effects of climate change. This results in cleaner air, reduced urban heat islands, and overall improved environmental quality.



## **Economic Advantages:**

Investments in sustainable transportation infrastructure create jobs and stimulate local economies. Reduced traffic congestion and lower vehicle operating costs save residents money and increase their disposable income.



## **Social Equity:**

Accessible public transit, safe walking and cycling options, and reduced reliance on personal vehicles improve mobility for all, including low-income communities, the elderly, and people with disabilities.



## **Quality of Life:**

Sustainable transportation leads to less traffic noise, reduced stress, and more enjoyable urban spaces. It also enhances the livability and attractiveness of cities, making them more desirable places to live and work.



# Key Factors in Achieving Sustainable Transportation

## Public Transit

Cities can invest in comprehensive and efficient public transit systems, including buses, trams, subways, and commuter rail, making it easy for residents to opt for public transport instead of personal vehicles.

## Active Transportation

Encouraging walking and cycling by building dedicated lanes and pedestrian-friendly infrastructure not only reduces emissions but also promotes a healthier lifestyle.

## Urban Planning

Well-thought urban planning can promote mixed land use, reducing the need for long commutes and supporting a sense of community. Compact, walkable neighborhoods are more sustainable.

## Electrification

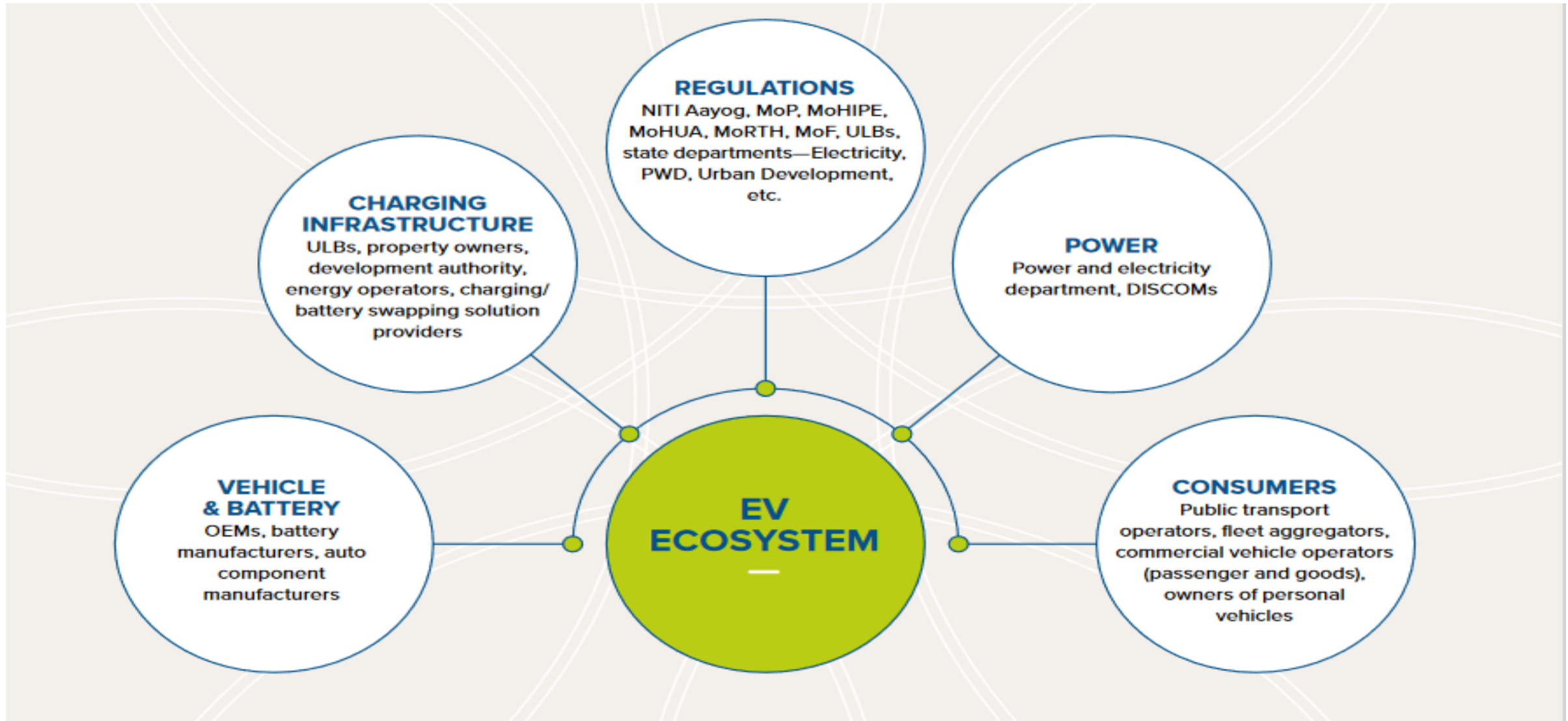
Transitioning to electric public transit and promoting electric vehicle (EV) adoption among citizens can significantly reduce carbon emissions from transportation.

# Why promote electric mobility?

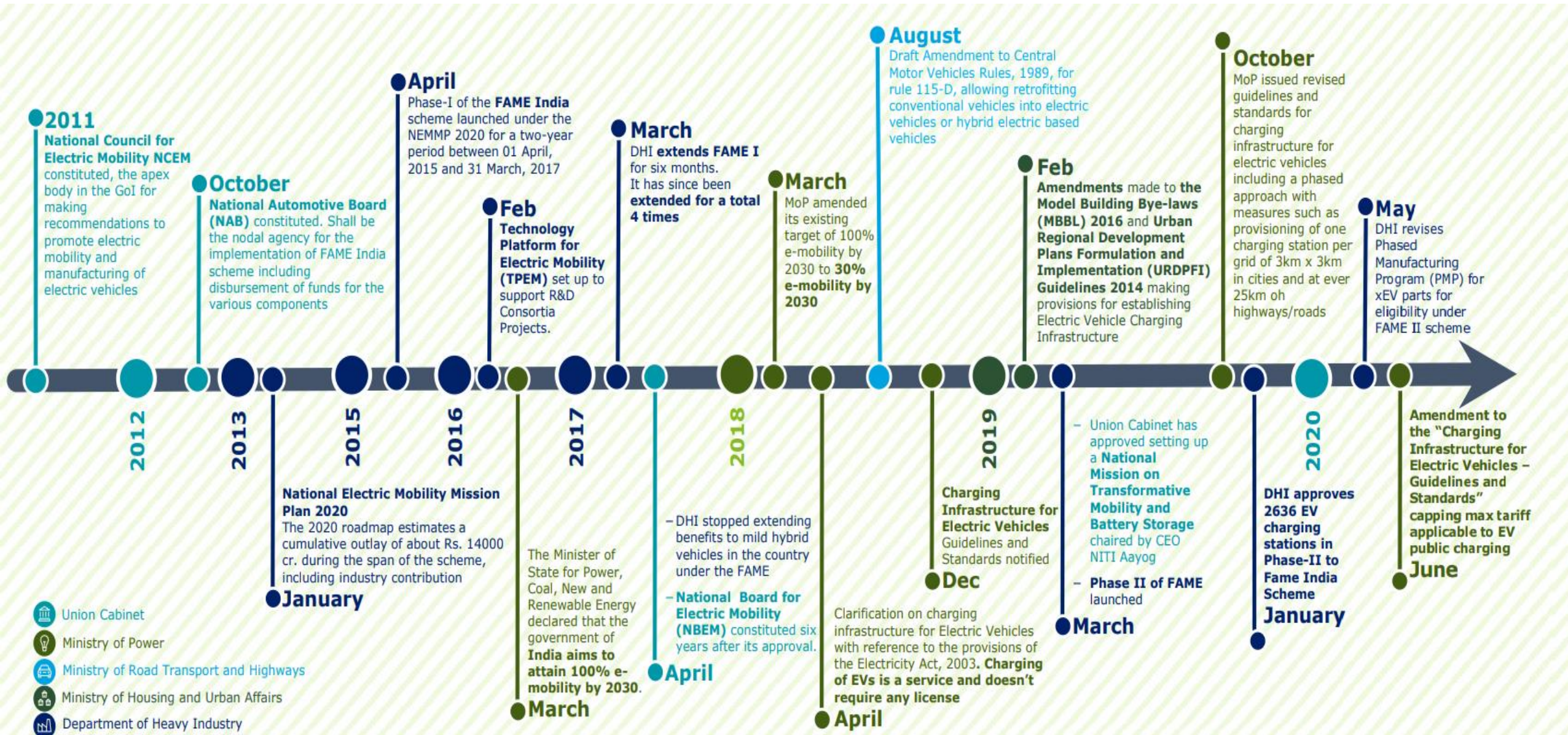


- Improving Air Quality
- Reducing Carbon Emissions
- Reducing dependency on fossil fuels

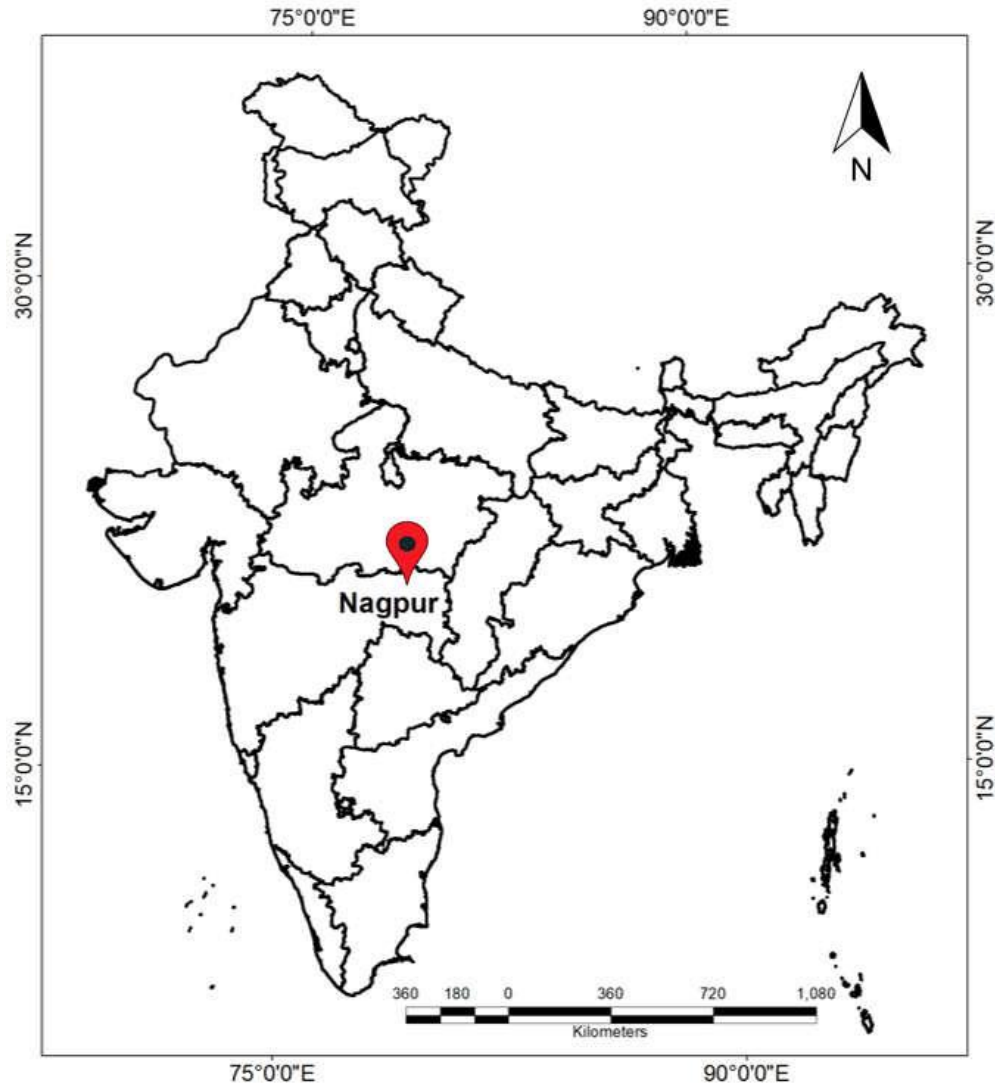
# EV Ecosystem



# India's efforts towards Just and Low-carbon Mobility



# Case Study: Nagpur



- Nagpur, often referred to as the "Orange City," is located in the central part of India. It is the third-largest city in the state of Maharashtra and is known for its rich cultural heritage and economic significance.
- Population: 3 million
  - Nagpur is home to a diverse population, and it plays a pivotal role in the region's economic and industrial activities.
- Importance: Economic and industrial hub
  - Nagpur's strategic location and connectivity make it a vital economic and industrial hub. It hosts various industries, including manufacturing, mining, and information technology, contributing significantly to the state's economy.

## VISION

*To create an energy efficient Metro Rail System of International standard which will enhance the quality of life of the citizens of Nagpur and be instrumental in the overall development of the city by making it more vibrant & attractive and utilize the full potential of 'Green Energy' in the form of Solar, Wind, etc.*

## MISSION

*To provide a safe, reliable, efficient, affordable, commuter friendly and environmentally sustainable rapid public transport system for the Nagpur Metro Region.*

# CASE OF NAGPUR METRO



**Length:** 38.2 km  
**Stations:** 34  
**Commencement:**  
May 2019



**Capital cost:**  
INR 8680 Crores  
(Phase 1)



**Estimated  
Ridership** 3.83 lakh  
by 2021



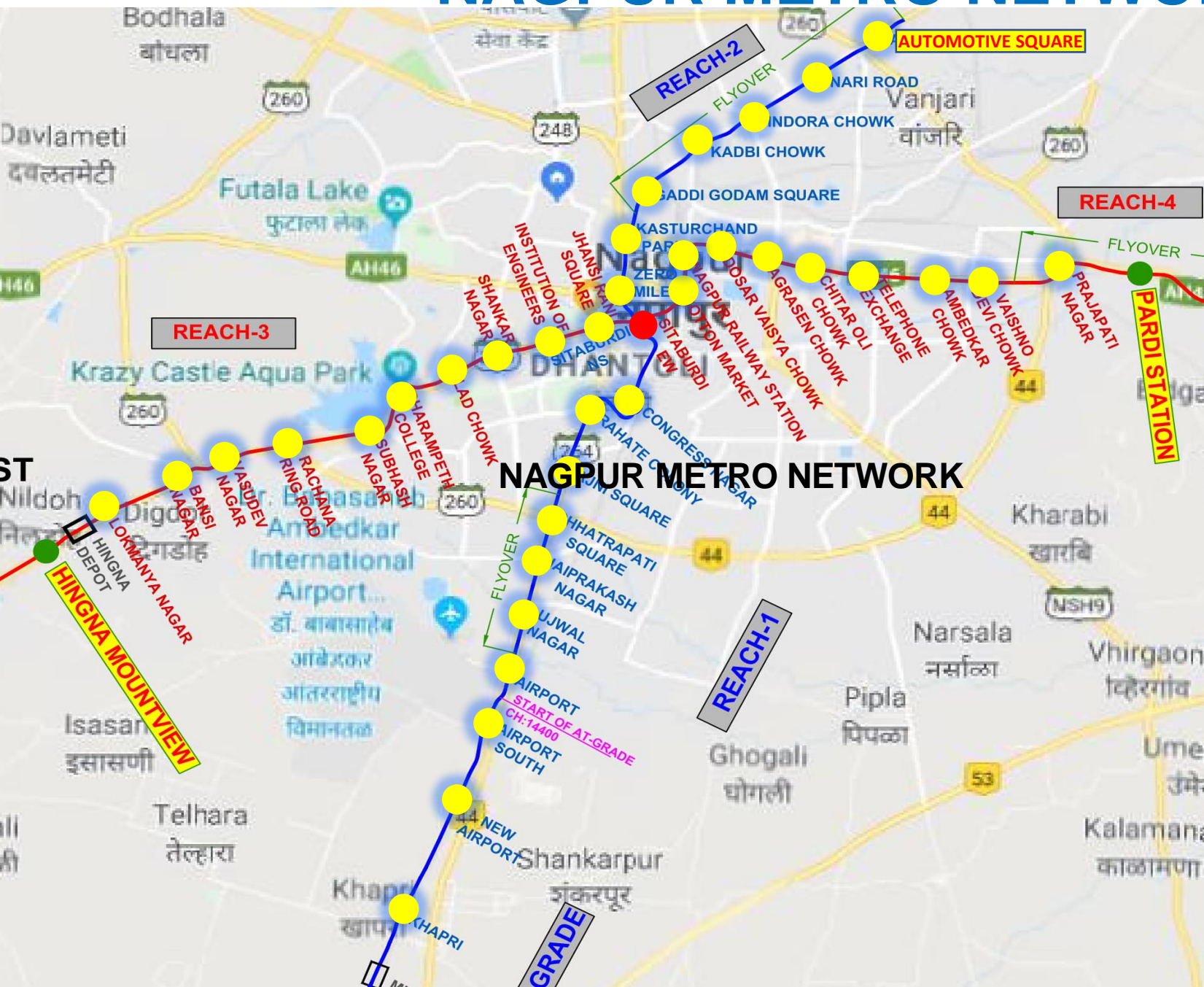
Non-farebox  
revenue estimated  
at **50% of total  
revenue** by 2020

Tools like  
**Additional Stamp  
Duty (Betterment  
Levy), Property  
Development and  
Sellable FSI**

Additional 1%  
Stamp Duty  
Notification August  
2015

TOD regulation  
notified in June  
2017

# NAGPUR METRO NETWORK Phase-I



S N	CORRIDOR	LENGTH (KM)	STATIONS
1	NORTH – SOUTH CORRIDOR (REACH-1 & 2)	19.658	19
2	EAST – WEST CORRIDOR (REACH-3 & 4)	18.557	19
	<b>TOTAL</b>	<b>38.215</b>	<b>38</b>

- Sitabuldi (CBD) is the main Interchange Station
- Connects major transport hubs- Railway Station & Airport and Govt. offices, hospitals & malls and CBD areas.



# Initiatives for Just and Low-Carbon Mobility in Nagpur

Electric Mass Transit System (Nagpur Metro)

Pedestrian-friendly infrastructure

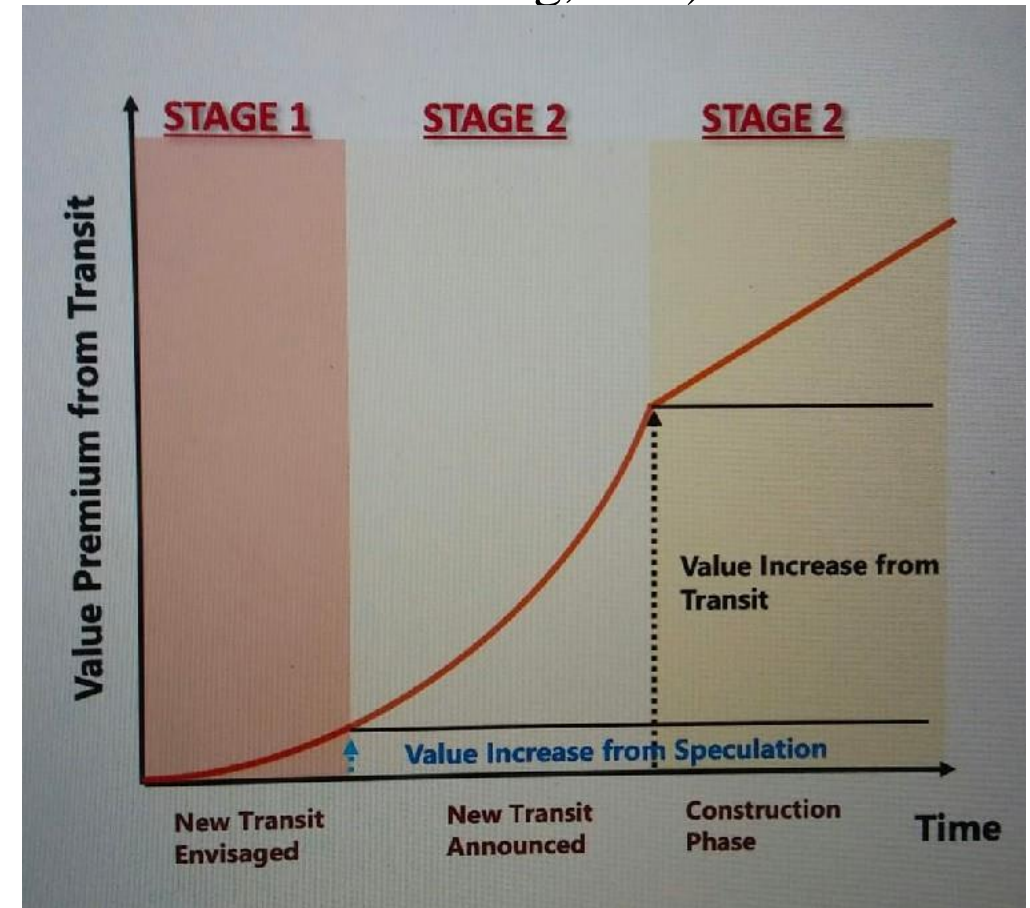
Integration of technology for smarter mobility solutions

Promotion of electric vehicles

# Value Capture

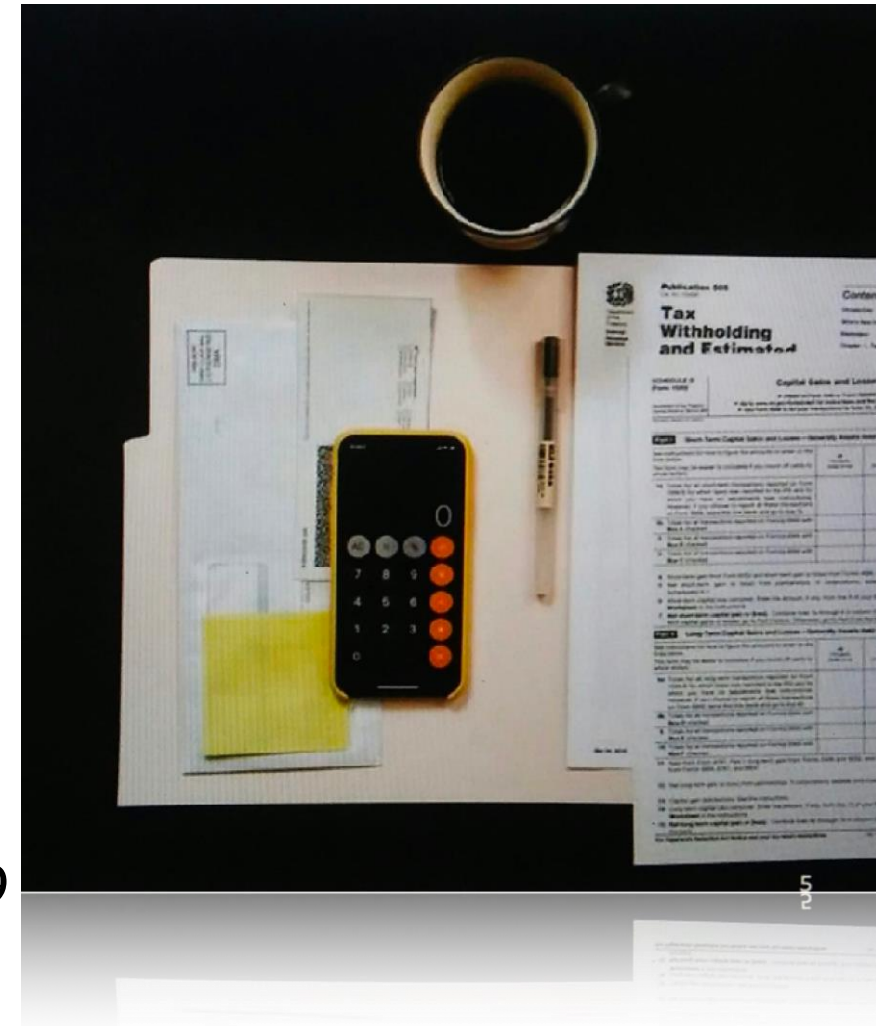
- **DIRECT VALUE CAPTURE**
  - Disposal of land
  - Convert land into Income Generating Asset (Self or JV)
- **INDIRECT VALUE CAPTURE**
  - Improved carrying capacity (Additional FSI)
  - Improved quality (Land Value Tax, Betterment Levy, Impact Fee, Tax

Incremental Financing, etc.)



# Surcharge on Stamp Duty (Betterment Levy)

- State Government has increased stamp duty from 6.5% to 7.5% (**additional 1% surcharge - betterment levy**) in the Metro corridor (500 metres on both sides)
- Revenue **equally shared** between Nagpur Metro Rail Corporation Limited & Nagpur Municipal Corporation
- Estimated revenue per year is **INR 60 crores**
- Revenue generated between September 2015 & March 2019 is **INR 150 crores**



# Transit Oriented Development

- TOD corridor is 500 m on either side from centre of Metro
- Urban Development Department of GoM has permitted additional FSI along the Nagpur Metro Rail Corridor

Plot Area (SQM)	Minimum Road Width	Maximum FSI
Below 1 000	9 meters	2
1 000 to 2 000	9 meters	3
2 000 or above	9 meters	3
2 000 or above	12 meters	3.5
2000 or above	15 meters	4



# Electricity Requirement for Metro Station

- 29 MU (MKWH) Per Year
- 20% i.e. about 6 MU generated through Solar System
- Target to reach 50% i.e. 15 MU generation through Solar by the end of 2024
- 25 Metro Stations – Equipped with EV Charging infrastructure for Four Wheelers
- 2 Metro Stations (Airport South & Subhash Nagar- Charging infrastructure for 3 Wheelers
- Boundary wall of at grade Metro Station provided with Solar Panels

# INTEGRATION WITH NMC FEEDER BUSES

- NMC feeder bus routes

NMC Feeder Buses					
S.N.	Route No.	From (Metro Station)	To	Trips per day	Avg pax per day
1	332	Khapri	Tech Mahindra (SEZ Mihan)	8	44
2	330	Khapri	Butibori MIDC- AIIMS-Bloomdale- MRO Last Gate	25	155
3	332	Khapri	AIIMS	32	244
4	314	Jaiprakash Nagar	Jaitala	26	112
5	313	Jaiprakash Nagar	Besa-Mhalgi Nagar	20	83
6	337	Jaiprakash Nagar	Beltarodi	28	117
7	373	Bansi Nagar	Isasani	44	74
<b>Total</b>				<b>183</b>	<b>829</b>





# E-RICKSHAW FEEDER SERVICES (ETO MOTORS, Hyderabad)

## ETO Motors E-Rickshaws

Deployment	Number
Orange Line	45
Aqua Line	20
Nagpur Airport to Nagpur Airport Metro Station	4
Charging Stations (Airport South & Subhash Nagar)	2
<b>Total E-Rickshaws</b>	<b>91</b>



Fleet at Airport South Metro Station

Ridership increased by approx. 15,000 per month due to this service



E-Rickshaw shuttle service between Airport Metro Station & Nagpur Airport

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

# Last-mile connect: Share-a-rickshaw feeder plan to catch Metro soon

## Proposal To Fix Fares For Auto Travel Between 37 Stations

TIMES NEWS NETWORK

**Nagpur:** Here is some good news for frequent metro travellers: the RTO plans to introduce share-a-rickshaw between Metro stations and different locations in city. The proposal, sent to DCP (traffic) Chetna Tidke for approval, will also encourage those who wish to take a metro ride but are unable to do so because reaching metro station is inconvenient.

The transport department plans to connect 303 areas with 37 metro stations on two routes — east to west and north to south. Additionally, the RTO suggests share-a-rickshaw between 15 major places in the city like railway station, medical college, Ajni railway station, Mor Bhavan, Ganespeth bus stop, Mayo Hospital etc and 181 other localities.

Once approved by traffic police, the proposal will be sent to Regional Transport Authority chairman and collector Vipin Itankar for a nod.

Under the plan, three passengers can come together and travel to a destination for a fixed rate — a provision that has evaded Nagpur residents who are forced to shell out exorbitant sums often dictated by the whims and fancy of autorickshaw drivers.

The share-a-rickshaw

### TRANSPORT TO AIRPORT – A LANDING TROUBLE

Travel to and from Dr Babasaheb Ambedkar International Airport to any part of the city is a pain, mainly because of poor public transport or the absence of it between 10pm and 6am.



#### FLIGHT FREQUENCY

**38** Total number of flights that operate from Nagpur airport each day

**6** Flights that operate between 10pm and 6am



RTO has suggested share-a-rickshaw between 15 major places in the city like railway station, medical college, Mor Bhavan, Mayo Hospital & 181 other localities

#### REASONS METRO

> Nearest metro station is just about a kilometre from the airport, but in the absence of feeder service, commuters are forced to rely on cabs/auto rickshaws that charge exorbitant fee, especially during night.

> At best, MahaMetro has an 'informal' arrangement with e-rickshaw owners who provide shuttle service — ₹15 per passenger on seat-sharing basis or ₹50 for an entire e-rickshaw

#### BUS SERVICE

> The NMC is operating 2 AC e-buses between Sitabuldi and airport. The 18 trips are made between 6am and 10pm only with no provision for flyers travelling at night

65 Vehicle owners are forced to pay anything between ₹60 and ₹160. Cab drivers often demand ₹100 more from passengers

**A FLYER**

scheme is not new though. It was first approved by the regional transport authority (RTA) on January 31, 2012. As per the resolution, each passenger was charged 1/3 of the total fare plus 20%.

Earlier, the Regional Transport Office (RTO) had failed to convince Nagpur Municipal Corporation to ply 'Aapli Bus' as feeder service to MahaMetro stations. On October 20, Maharashtra Metro

Rail Corporation Limited (MMRCL) too urged the NMC to start Aapli Bus feeder service to encourage people to travel by metro. In a meeting with NMC officials, MMRCL managing director Shraavan Hardikar gave a target to increase metro ridership to 2 lakh. He said that if NMC supports, the metro ridership can go up to 3 lakh per day.

Citing recommendations of the Khatua Committee —

formed to fix autorickshaw fares in the state — the RTA too okayed the revised fare per km for three-seater CNG/petrol fuelled auto rickshaws on June 6, 2022. Accordingly the fare for 'share-a-rickshaw prepaid scheme' has been fixed at Rs 27 for the first 1.5km effective June 15, 2022. For better implementation, display boards citing fixed rates for share-a-rickshaw will be erected at all the designated places in city.



# E-SCOOTER FEEDER SERVICES (KHS ASSOCIATES, Nagpur)

KHS E-Scooters	
Deployment	Number
Ajni	5
Khapri	6
Airport	4
Rahate	2
Jaiprakash	3
Lokmanya Nagar	2
Ujjwal Nagar	2
Bansi Nagar	3

Other E-Scooters have been hired on monthly basis



## AUGMENTATION OF FEEDER SERVICES-MIHAN SEZ E-Zone

- Meeting held with IT Companies in MIHAN SEZ, (where @3500 employees are commuting daily from the city) area to review & augment feeder buses. Maha Metro in coordination with NMC has made available required number of E buses from the terminal metro station (Khapri) 2 suiting the working timings & **whole MIHAN SEZ area has become e-zone now. Number of**
- National Cancer Institute stopped plying their own buses from city. Now, most of their employees use Metro till New Airport Metro Station and reach the destination by their buses.

(Increased ridership by 2000)

# MahaMetro spreads word about green transport

To create awareness, MahaMetro conducted customer outreach programmes (**Metro Samwads**) wherein a detailed presentation was given about various facilities provided by MahaMetro. One such programme was organized at **New Era Hospital** in East Nagpur. The programme was well received by the attendees. Many purchased Maha Cards. Maha Metro gives **10% discount on every Metro ride** through Maha Card. Whereas for students up to graduation, Maha Metro gives **30% discount on every Metro ride through Maha Card**. 30% discount is also given to all on weekends & gazetted holidays. Unlimited travel pass is available for ₹100 per day. **Mahesh Moroney** (Sr DGM/MMI), **S G Rao** (DGM/MMI), **Ankit Nayak** (assistant/MMI) from MahaMetro & **Dr Anand Sancheti** and **Nishant Agrawal** (Jt director) from New Era Hospital were present.



**THU**  
OCT

**MARK YOUR DIARY**

Kumar will be the chief guest at **Vanamati Sabhagruh, VIP Road, Dharampeth, at 4pm**

Times of India

# OTHER PROPOSALS

- Meeting held with Mahindra & Mahindra-
  - Big chunk of 4000 labourers, 400 supervisory & executive staff working there
  - Goal of M&M to become Net zero by 2030
  - Enthusiastic to use green mode of transport
- Meeting held with MIDC Industries Association, Hingna
  - Target – to move 25,000 workers from their personalised mode of transport to Public transport i.e. Metro & City Buses
  - Identification of pain points being done
  - Information being collected from all establishments

Data of MIDC Industries

Sr.No	Name of Industrial Establishment/ Company	Address	Name of Contact Person & Contact Number	No. of Employees			Shift timings with no. of staff	Part of City where Employees Reside	Present mode of travel (NMC Bus/Company bus/2w/4w)	Approx. no. of Employees using Metro			Difficulties faced for using Metro ( first mile connectivity not available/ last mile connectivity not available/ feeder service ( bus- rickshaw) not available. Metro train is not available enroute)	Suggestion from the company	Action required from Maha Metro	Remarks
				Workers	Supervisory	Managerial				Workers	Supervisory	Managerial				

# OTHER PROPOSALS Continued...

- Metro Samwad program was held at 2 Engineering colleges i.e. St. Vincent College of Engg. & Gaikwad Patil College of Engg.
- Request letter sent to NMC for deploying some E-buses from New Airport Metro Station to St. Vincent College of Engg. & to Gaikwad Patil College of Engg.. (Shall be deployed by NMC after Diwali)
- Process of arrangement of Maha Cards & City bus passes shall be done through special camps in colleges only.
- Estimated increase in ridership- initially 2500

**THANK YOU !**