Compact Cities Pathways towards India's Sustainable Mobility Future
2006: A year of transformed transport priorities!

Ministry of Urban Development, Government of India (MoUD) issued the National Urban Transport Policy (NUTP) in 2006, to bring about comprehensive improvements in urban transport services and infrastructure, with a focus is on moving people rather than vehicles.

National Urban Transport Policy 2006 (NUTP)

The objective of the policy is to ensure safe, affordable, quick, comfortable, reliable and sustainable access to transport facilities.
Numerous national government schemes have followed since then...

Central government approves 'PM E-Bus Seva' scheme to deploy 10,000 electric buses nationwide

In a significant stride toward promoting electric mobility in public transportation, the Central government has granted its approval for the 'PM E-Bus Seva' scheme. This groundbreaking initiative will see the deployment of 10,000 new electric buses across the length and breadth of the country. An announcement was made by Union Minister Anurag Thakur, revealing that the scheme is estimated to cost Rs. 57,613 crore. The Centre is poised to contribute Rs. 20,000 crore to the endeavor, which will also entail supporting bus operations for a duration of 10 years. This momentous announcement is in alignment with India's ambitious aspiration of integrating 50,000 electric buses into the existing fleet by 2030.

Centre assures to release Rs 745 crore JNNURM funds

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Govt extends FAME scheme till 2024

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More than 90% of funds allocated under Smart Cities Mission utilised, says Hardeep Singh Puri

As much as Rs 1,261 crore has been utilised on projects, the Minister informs the parliamentary committee.

June 15, 2018, 12:01 AM IST – NewDelhi

Government decides to extend Smart Cities mission deadline till June 2024

Government decided to extend on June 28, 2016 and 2018 mission utilised for extending through this stage. The mission is scheduled to be operational through this stage from January 2019 to June 2023.

All 7,000 e-buses under FAME-II may ply on Indian roads in next 1 yr: Heavy Industries Ministry official

All 7,000 electric buses under the FAME-II scheme are expected to try in different cities of the country in the next one year. A senior official of the Heavy Industries ministry said on Thursday. Out of the 7,000 electric buses under the FAME-II scheme, over 3,000 e-buses are already operating in the country.

In 2019, the Faster Adoption and Manufacturing of Electric Vehicles in India Phase II (FAME India Phase II) scheme for promotion of electric mobility in the country was approved.

Through the scheme, it is planned to support 10 lakh e-two-wheelers, 5 lakh e-three-wheelers, 35,000 four-wheelers and 7,000 e-buses.
More buses, Better buses

Provision of ~30,000 buses under JnNURM, FAME schemes and PM EBus Sewa Scheme; 300 km of BRTS was built in 10 cities across the country
A growing network of Metro rail

850+ km of Operational Metro Network in 15 Cities & over 600 km Under Construction

Source: Analysis by Ganesh Babu R P
Transforming roads to Healthy streets

Through initiatives like JNNURM, Smart Cities Mission, over 1000 km of roads have been transformed into safe and liveable streets.

Source: SCM & ITDP Documentation - Elements
Accelerating the transition towards electrification since 2015

Big push for electric vehicles to boost demand, cut air pollution

Policy Notified
Delhi will show the way when the world holds discussions on EVs five years later, says CM Kejriwal

Delhi Electric Vehicle Policy, 2020
Dec 23, 2019
Delhi cabinet approves policy
Aug 07, 2020
Policy is notified

Across all vehicle categories, all financial incentives will be applicable for both fixed battery models and rechargeable hybrid models.

A Big Push Towards PM’s Vision of Sustainable Transportation under FAME Scheme

FAME Phase II
Being implemented for 3 years w.e.f 1st April 2019, with a budgetary support of Rs 10,000 crore

Incentives on offer under phase II of FAME

- Rs 10,000 per kW
  Planned incentive on the basis of battery size

- Rs 20,000 per kW
  Planned incentive for electric buses

- Rs 8,596 crore
  Total incentive sanctioned

- Rs 1,000 crore
  Incentive for setting up charging stations

Lower operating cost, subsidies push e-bus sales

Varun Singh
New Delhi, June 5

Lower operating costs and availability of charging infrastructure has made electric buses a viable option in the country, primarily due to government’s push through various schemes and incentives such as the FAME, GST reduction, production linked incentive scheme and subsidies provided under the FAME scheme.

Tata Motors’ 9-metre electric bus is cost-effective when compared to its petrol counterpart.

26 States have Draft EV policies and have set targets for electrification ~6% rate of electrification for new vehicles in India

With this model and the current subsidy from the government, the electric city buses have already become a viable option in the country,” Babu said.

Two-wheeler segment

Mahesh Babu, director and CEO, Switch Mobility India, said that the operational cost of electric buses is almost four times lower compared to conventional buses due to the fact that:

- Electric buses have a share of 3.6% of the overall bus volume in FY22, according to a report
- Tata Motors currently offers the Starbus electric model in the 9-metre and 12-metre segments. The company has already sold around 630 electric buses, which have covered 36 million km cumulatively. It recently emerged as the lowest bidder for the largest electric bus tender floated by Convergence Energy Services (CESL).
- There has been a 25-30% drop in operating costs of electric buses over the past five years. With government incentives and the gross cost contract (GCC) business model, the per-kilometre operating cost for electric buses is already lower than conventional diesel-powered buses, Srivastava said.
- Switch Mobility, the EV arm of commercial vehicle major Ashok Leyland, is developing a wide range of buses to cater to intra-city and intercity categories.
- Mobility India, said that the operational cost of electric buses is almost four times lower compared to conventional buses due to the fact that:
- The city buses are on a 10-12-year GCC contract, which lowers the TCO over the years. With this model and the current subsidy from the government, the electric city buses have already become a viable option in the country,” Babu said.

Nichant Arya, IC and MD, IBM Auto, said that electric buses have emerged as the future of mass public transport, given climate change issues and the rising oil import bill. IBM Auto showcased its maiden electric bus in 2016 and at present, its electric buses, including the Eco-Life model, are operating in Mahanagar, Delhi, Kannur, Gujrat, Hariana, Uttar Pradesh and Andaman and Nicobar, among others, across various applications and platforms.

Sudhir Mehta, chairman, EKA and Finance Industries, said that the government’s goal to achieve net-zero emissions by 2050, various policy initiatives and state government incentives have propelled the focus on electric buses and overall commercial electric mobility.
Yet, Indian cities are witnessing an unabated growth in private (ICE) motor vehicles!

It took 60 years (1951 to 2008) for India to cross the mark of 10.5 crore registered vehicles. But thereafter, the same number was added in a mere six years (2009-15).

Source: Centre for Science and Environment

Urban population grew by 26%, whereas Private Motor Vehicle (PMV) grew by 138%!

PMV: MoRTH and Vahan Data Dashboard
Traffic congestion costs four major Indian cities ~Rs 1.5 lakh Crores a year!
Congestion in Delhi, Mumbai, Bengaluru and Kolkata costs the economy Rs 1.5 lakh crores annually, according to a study conducted by global consultancy firm.*
Transport is responsible for 10% of air pollution related deaths in India.*

\*Study by ICCT, 2015 - swachhindia.ndtv

India ranks 2nd in the world in terms of deaths linked to transport emissions

India is the world’s fourth most significant greenhouse gas (GHG) emitter – contributing 7% of all global emissions.**

**Vehicle emissions in India, CEEW-2021
Sprawl and trip lengths increasing in Indian cities

**Urban sprawl** actually accounts for **55.3% of India’s total population**.

Low density centres of cities lack infrastructure, yet these cities are home to populations that cannot afford housing in the centre and **commute to jobs within core cities using unsustainable commuting modes**.

Source: https://www.brainkart.com/article/Urbanization-of-the-World-and-India_37192/
Our study shows that if India continues the trajectory of the last decade, private motorized travel will increase ~8 times by 2050, as per the forecasts by the International Energy Agency (IEA).
What is the solution ahead?

ITDP and the University of California, Davis compared the impacts of maximum-feasible electrification, modal shift through 4 scenarios:

1. **Business As Usual**: India continues the trajectory of the last decade. Private motorized travel increases rapidly, reaching roughly eight times current levels by 2050.

2. **Electrification Only**: All new or imported vehicles are electric by 2040—in line with the COP 26 Glasgow Declaration.

3. **Mode Shift Only**: Compact city planning is combined with reallocation of both funding and street space to walking, bicycling, and public transport. Car travel continues to increase but much more slowly, reaching less than half of Business as Usual levels by 2050.

4. **Electrification + Shift**: Compact cities and mode shift, combined with rapid electrification
Electrification + Modal Shift the Only Way Forward to Achieve Net Zero Target

- Only the combined Electrification + Shift scenario is sufficient to keep India’s cumulative urban passenger transport emissions within a level potentially compatible with limiting climate change to 1.5°C in this century.

- It is the only scenario that approaches India’s goal of achieving Net Zero by 2070.

- Electrification (Only) and the Mode Shift (Only) scenarios would each cause considerable reductions in greenhouse gas emissions but not enough to attain the target.
Need to Minimize Life Cycle Emission of Cars to Achieve India’s Net Zero Target

The use of cars, electric or not, still leads to substantial emissions from

- paving and maintenance of roads,
- production of steel,
- production of batteries, and
- other industrial processes involved in vehicle manufacture and disposal.

For India to reach Net Zero by 2070, these “life cycle” emissions must be minimized, which can only be accomplished with an equal focus on mode shift to public transport, walking and cycling.
Savings of ~400 lakh crores in Mode Shift and Electrification + Shift Scenario

- Mode Shift (Only) and Mode Shift + Electrification would lead to enormous economic savings for the Indian economy: a cumulative savings of more than 400 lakh crore INR (5 trillion USD) through 2050.

- The costs of expanding public transport service in these 2 scenarios are high, they are more than balanced by the savings brought by a reduced need to pay for road and highway expansions.

Note: Only the direct impacts: the costs of manufacturing, maintaining, fueling, and operating vehicles and the costs of building and maintaining infrastructure were considered.
Paris decreased car travel by almost **50 percent in 30 years** by investing in other modes and traffic control strategies!
What must India do differently to accelerate the shift to compact liveable cities built on the foundation of public transport, walking and cycling; where motorised travel is clean yet controlled?
Thank you