



WRI INDIA
—ROSS CENTER

PLANNING FOR BUS BASED PUBLIC TRANSPORT

Transitioning towards sustainable public bus transport

Photo Credit: Rajesh Mindi / WRI India

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Urban Mobility India 2022, Kochi

India's Net Zero Pledge

500 GW
Non-renewable energy capacity by 2030

Sustainable planning in Bus based Public Transport has the potential to contribute and assist achieve each of these **National Targets**.

Reduce the economy's carbon intensity by 45% by 2030.



Target of Net Zero Emissions by 2070

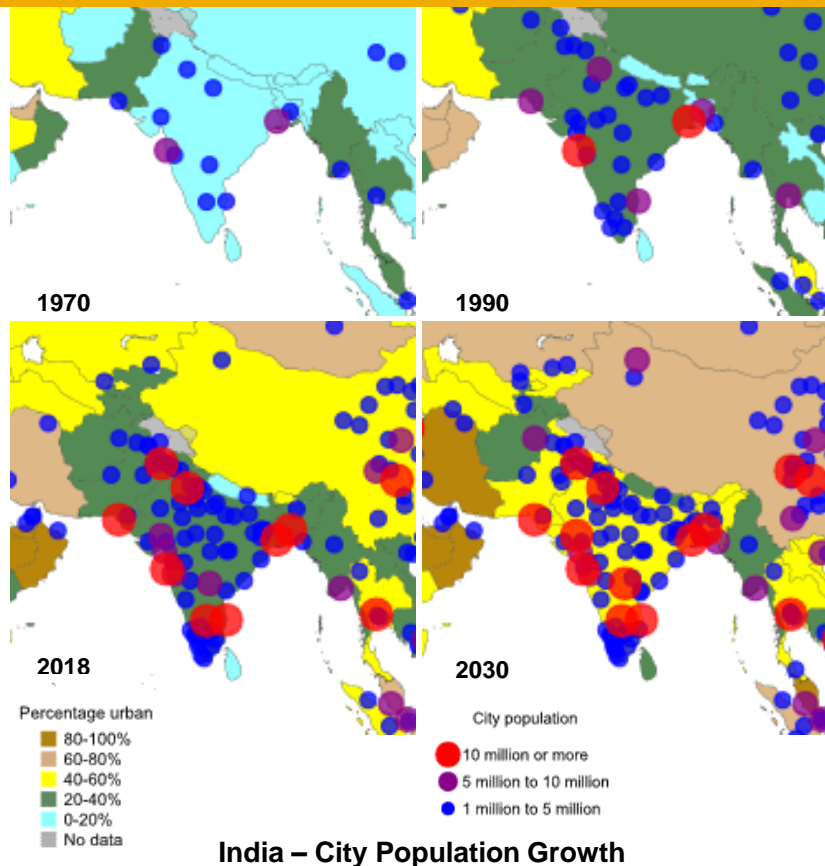


50% of energy demand from renewable energy by 2030



Carbon emissions reduction by 1 billion tonnes by 2030

INDIA URBANIZATION TRENDS



- Today, 1 in 4 urban Indians live in the top 10 largest city agglomerations.
- In India, 87 crore people will live in Cities by 2050
- In less than a decade India will be home to the world's largest metropolitan regions
- The top 10 city agglomerations in India contribute more than 50% of the country's urban GDP
- The transport sector witnesses the fastest growth – 5% CAGR - in CO2 emissions by 2050 (compared to other major energy consuming sectors like power and industry).

India's policy initiatives to adopt zero-emission electric vehicles



60,000

Clean fuel Buses by 2030

Status of Public Bus Transport in India

Public Buses

0.44

Lakh
Urban

~1

Lakh
Intercity

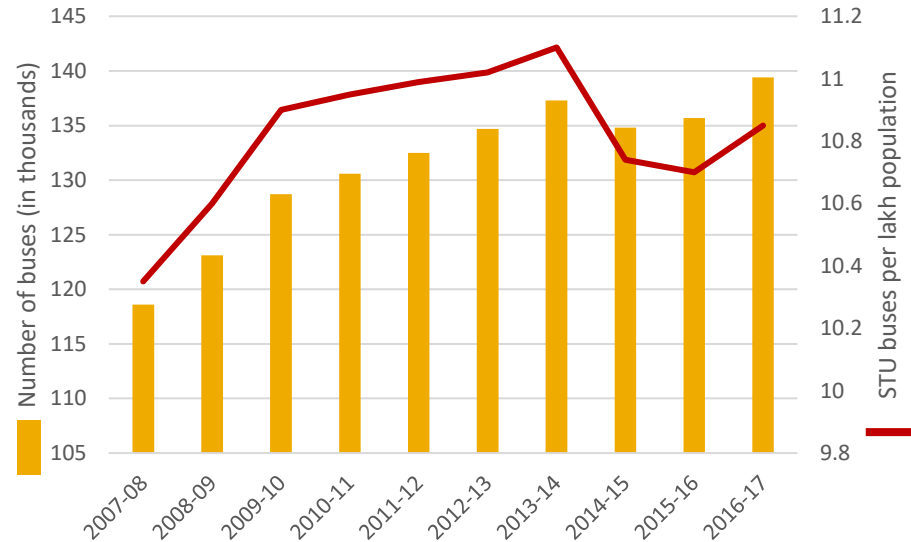
Private Buses

1.45

Lakh
Stage carriage permits

0.71

Lakh
Contract carriage
Including omni bus



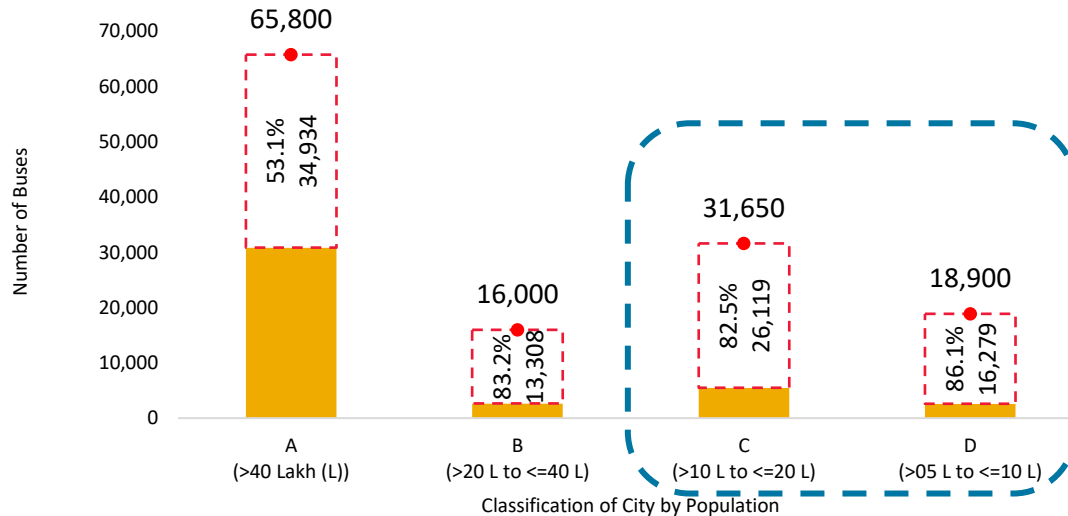
12.8 Crore passengers ply on 2.91 lakh stage carriage permit buses daily ~ 1 in 10 people in India!

Considering an average ridership of 442 passengers per bus per day

Current Deficit of urban buses in India

Buses/lakh population:

- ~ **28.1** for (9) cities with population more than 40 lakh
- ~ **8.2** for (88) cities with population between 5 to 40 lakh



- 1.32 Lakh** is the current **requirement** of urban buses
- There is a **deficit** of ~**65%** - 91,600 buses
- *majority of the deficit in tier II and III cities*
- An **immediate requirement** of at least **1 lakh buses**, **while current outlay is for 60,000 buses only**

■ Existing Buses (Organized City Bus Service)

■ Deficit of Buses (estimated)

● Required Buses (estimated)

Challenges for urban buses in India

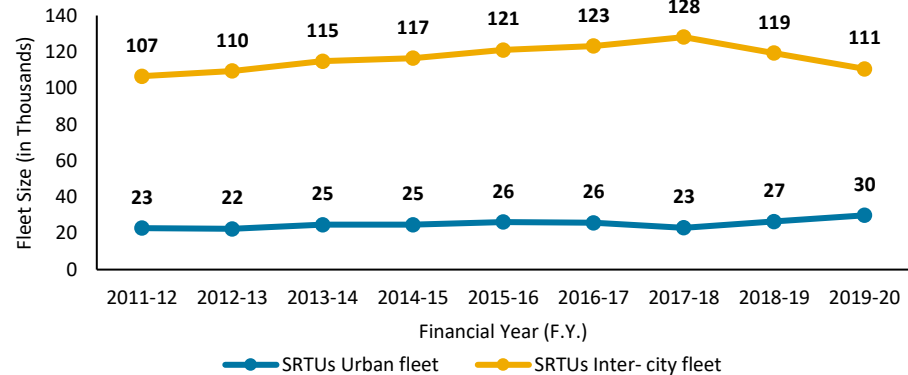


- **Regulation** is built around the 'Road Transport Corporations Act of 1950', where the intent of the act was nationalization where state has monopoly and takes full responsibility to plan, operate and maintain.
- **Quality of bus fleet**
- **Use of technology is limited**, mostly only use vehicle tracking and very limited use of automatic fare collection.
- There is **very limited planning and operations** continue on past history.
- Struggle to cover **the gap between cost and revenue** is constant, and has become bigger in the context of COVID
- Buses are **stuck in traffic**
- Bus operators have **very few trained professionals**.

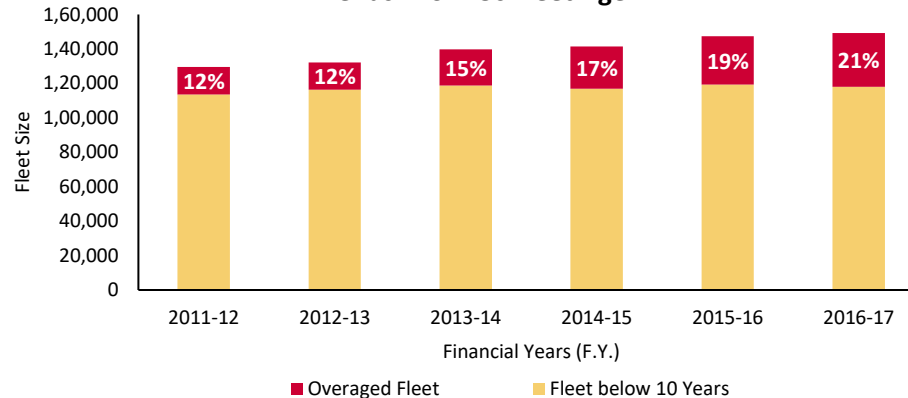
SRTU Operational challenges

- Bus fleet growth not commiserate to growing urbanization in India
- **21%** of STU's fleet is **overaged** - **1 in 5 buses** – Around **40,000** buses are due for **scrapping** currently
- **27%** of total cost of operations is spent on **fuel and lubricants**
- Overall increase of buses has been only 16000 buses between 2011 to 17 – *most of the buses added were replacement to overaged fleet*
- Overaged buses not only pollute more, they are also costlier to maintain

Trend in SRTUs Fleet Size



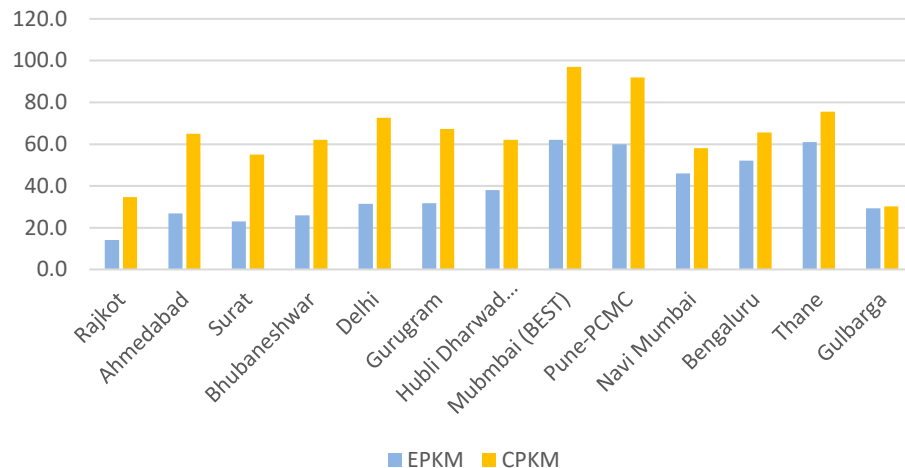
Trends in SRTUs Fleet Age



SRTUs' Financial Challenges – Urban Operations

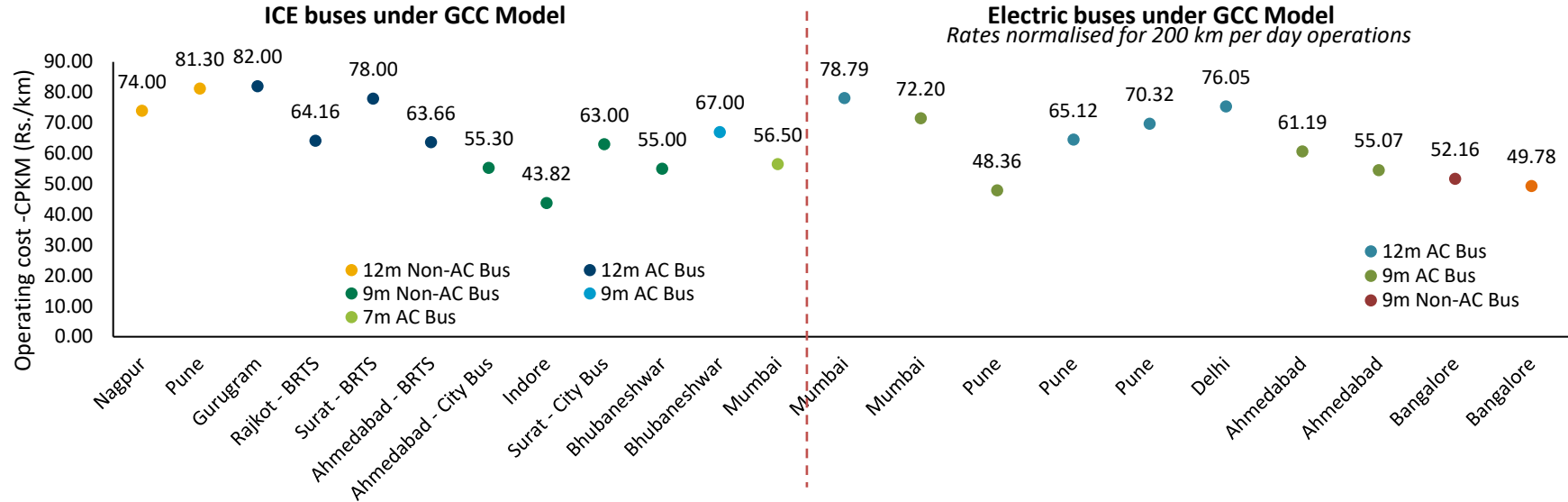
- **Steady increase** in EPKM and CPKM
- **A financial gap between EPKM and CPKM exists and is widening** which calls for sustainable financing of bus operations
- **Fuel costs** have gradually increased and form **~15%** of total cost of operations
- **Staff costs** contribute to **more than 60%** of total cost of operations
- **COVID** has affected cost of operations and ridership adversely

Earnings and Cost of Bus Operations



Urban STUs **recover only about 55%-60%** of their total cost of operations

Cost of Operating buses in India



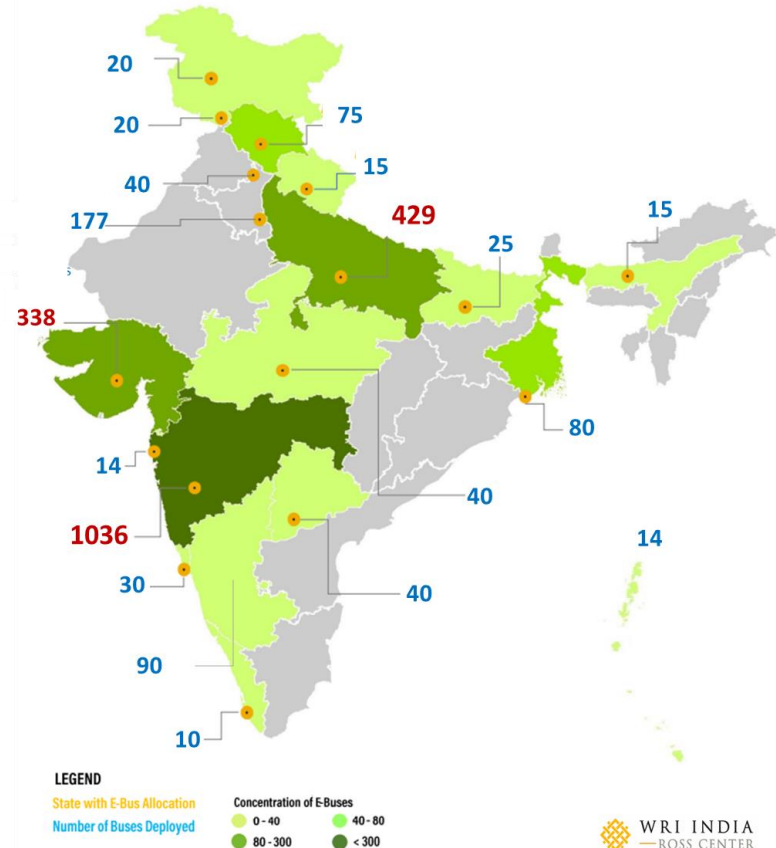
Electric buses have achieved parity with ICE buses, especially with demand aggregation

Status of E-buses in India

~2,800 are operational across
Electric Buses 40 Indian cities.

As on 30th June 2022

- The top three states leading e-bus deployment - **Maharashtra, Gujarat and Uttar Pradesh** - account for nearly **72%** of the total e-buses currently operational in the country.
- **7,000 e-bus outlay** under FAME I and II since 2016, only 2400 operational
- **5,450 e-buses** price discovery by CESL under Grand Challenge
- **50,000 e-buses** to be procured under National Electric Bus Program (NEBP)
- **Mega cities' targets:**
- *Delhi to procure 8000 e-buses by 2025*
 - *Mumbai to target 100% electrification by 2028*



CASE STUDIES

- *Gujarat CMUB Scheme*
- *Delhi Route Rationalisation*

2 mins



CMUB Scheme in Gujarat

- Consistent and adequate financial support mechanism helped growth of public transport across 17 cities in Gujarat; 5 more cities are in process of introducing bus services.
- About 2000 buses are operationalized under VGF scheme.



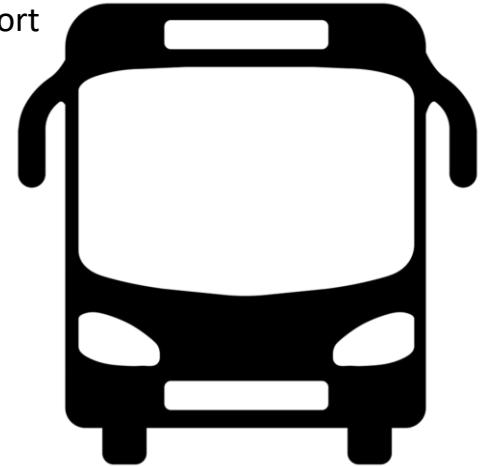
Before VGF Model

8 Cities operated

Organized Public Transport

CM-UBS Scheme, Gujarat

- **VGF of 50% or Rs.12.50 per km** for CNG buses; on equivalent share by City (July 2018) – applicable for 30 cities with 1 lakh+ population
- **Extended VGF to 50% or Rs.25 per km** for electric buses; on equivalent share by City (Sept 2019) – applicable for 4 cities (Ahmedabad, Surat, Rajkot, Vadodara)
- Only for running / adding **new buses**
- Only for **PPP based** bus operation
 - Support for **7 years**

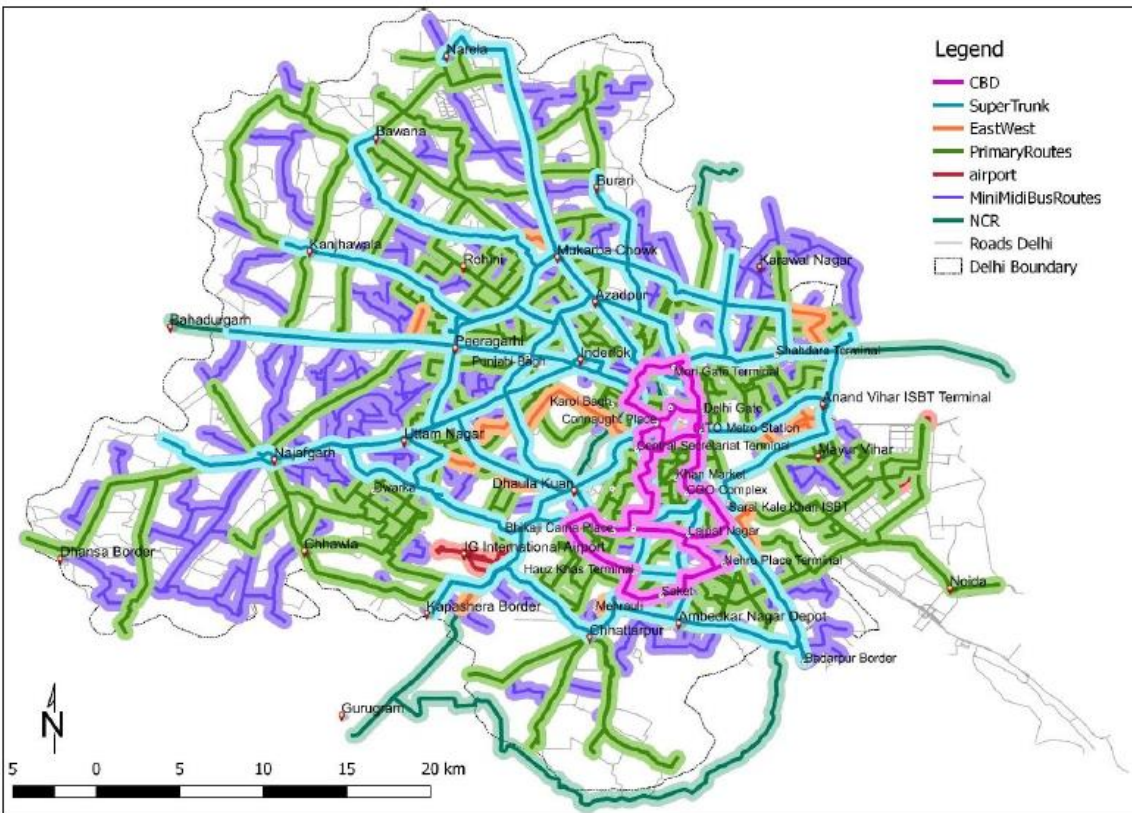


Post VGF Model

17 Cities operates

Organised Public Transport

Delhi Route Rationalisation for buses



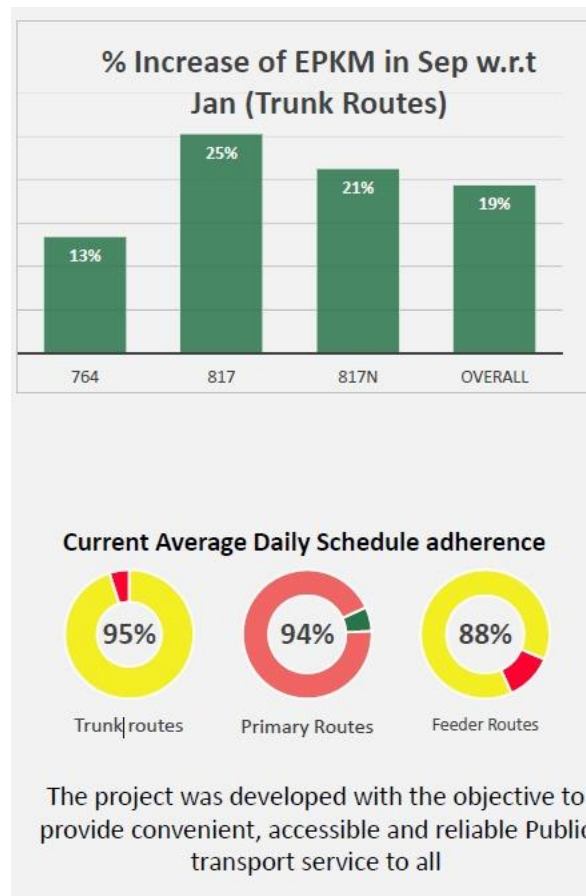
Hierarchy based routes identified

Source: DIMTS

- Vision for Delhi Route rationalisation was to create an accessible, reliable and affordable bus system in Delhi.
- Hierarchy based route network developed to optimally utilize bus fleet, develop high frequency reliable network, & improve accessibility.
- **Hierarchy of Routes:**
 - **CBD circulator: 5-10mins Freq.**
 - **Trunk Routes (directional): 5-10 mins Freq.**
 - **Primary Routes (connecting zonal hubs): 10-20 mins Freq.**
 - **Village Connectivity Routes**
 - **Airport Routes**
 - **NCR Routes**

PILOT OF DELHI ROUTE RATIONALIZATION (JAN – SEPT 2019)

- First pilot in Najafgarh area was for 17 routes (including 1 Trunk route) in 2019
- Findings as on Sept, 2019:
 - A **17% increase in average daily ridership** was observed, i.e., these routes are catering over 11,000 more trip per day today than what was in January 2019
 - Translated to an overall **19% increase in EPKM** on these 17 routes
 - Over **25% increase in EPKM on trunk route** no. 817, in the same period
- Based on the success of pilot Govt of Delhi had additionally rationalized around 30 route in 2021-22.



STRATEGIES FOR AN ADAPTIVE ECO SYSTEM FOR BUSES

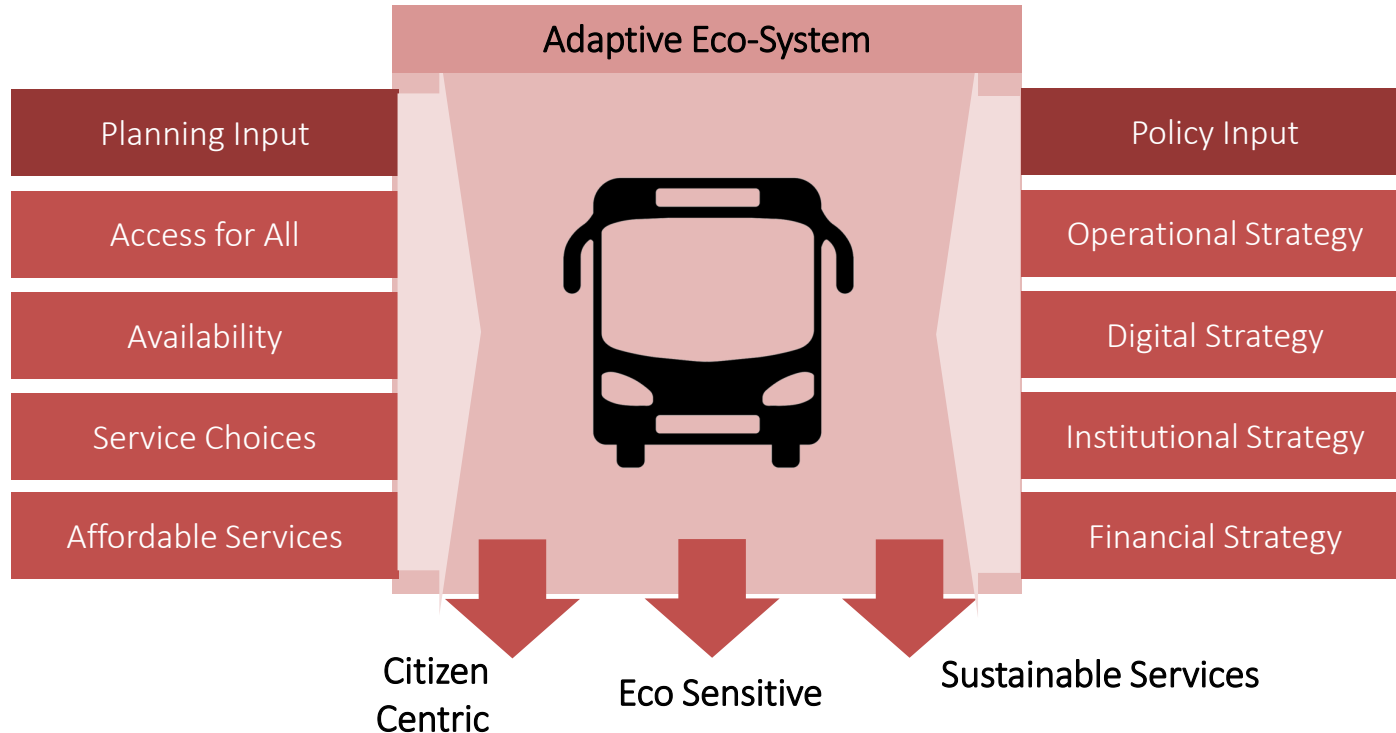


Sustainable Mobility Agenda for cities

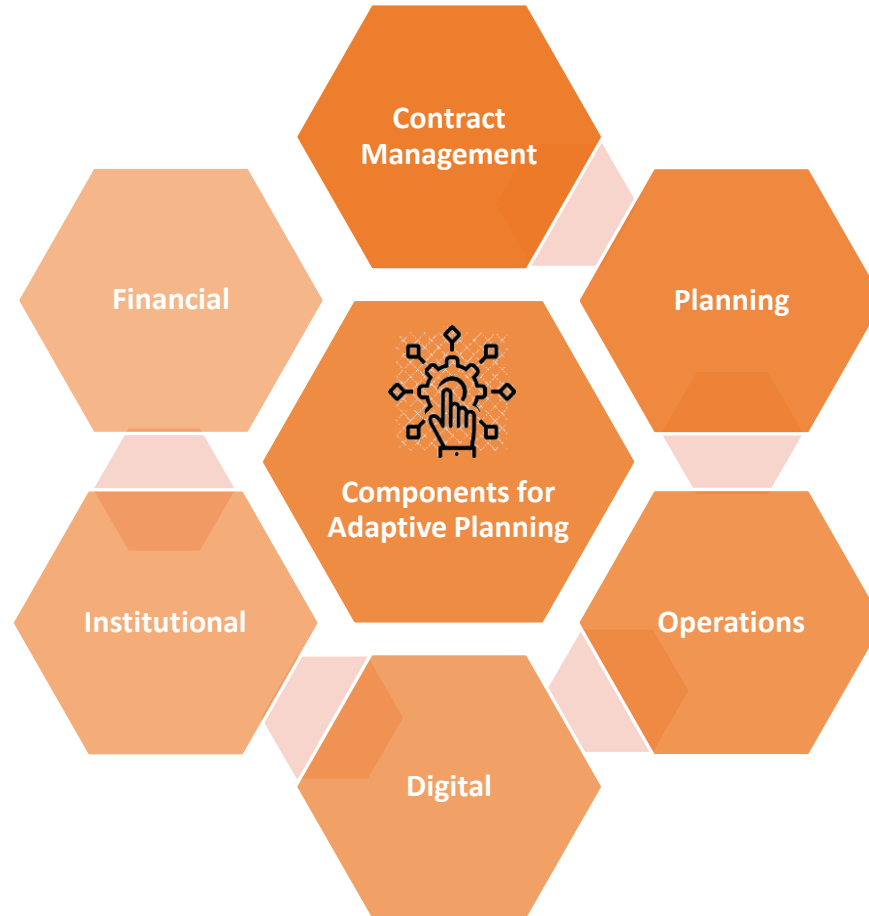
- **Avoid** – Long distance motorized trips by integrating landuse and transport
- **Shift** – Focus and investment to walking, cycling and public transport
- **Improve**– Quality and fuels, vehicles and data be using technological developments

Adaptive City Bus Eco-System

Cities need to develop an adaptive City Bus Eco-system to accommodate urban mobility dynamics and ensure sustainable bus operations.



Components of Adaptive Planning





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THANK YOU
