



WRI INDIA
—ROSS CENTER

SUSTAINABLE PPP IN BUS TRANSPORT

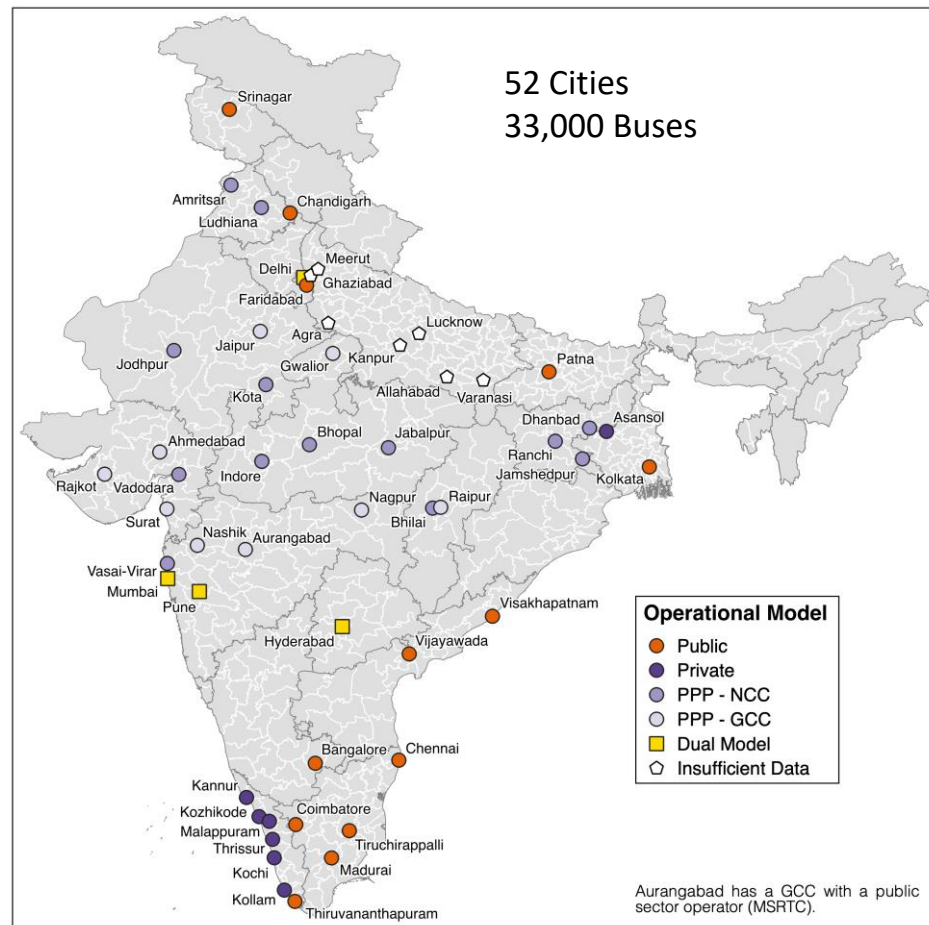
Bringing public and private interests together to improve bus-based transportation

Photo Credit: WRI India

Madhav Pai, Acting CEO, WRI India
Urban Mobility India Conference, 2022

BUS OPERATIONS IN INDIAN CITIES

Type of operations	No. of buses	No and List of cities
Public operated	~14,100	13: Bangalore, Chandigarh, Chennai, Coimbatore, Faridabad, Kolkata, Madurai, Patna, Srinagar, Tiruchirappalli, Thiruvananthapuram, Vijayawada, Vishakhapatnam
Public Private Partnerships	~4,600	22: Ahmedabad, Amritsar, Aurangabad, Bhopal, Bhubaneswar, Dhanbad, Durg-Bhilai, Gwalior, Indore, Jabalpur, Jaipur, Jamshedpur, Jodhpur, Kota, Ludhiana, Nagpur, Nashik, Raipur, Ranchi, Rajkot, Surat, Vadodara, Vasai-Virar
Private operated	N/A	7: Asansol, Kannur, Kochi, Kollam, Kozhikode, Malappuram, Thrissur
Dual (Public operated + PPP)	~14,400	4: Delhi, Pune, Hyderabad, Mumbai
Others	~960	7: Allahabad, Agra, Kanpur, Lucknow, Meerut, Varanasi, Ghaziabad



In cities with Population > 10 lakh (as per Census 2011)

This is as per the existing operational status of the bus services in these cities.

BUS TRANSPORT IN INDIA

PAST

1

- Public sector undertakings have been unable to meet public transport demand
- Estimated deficit in urban areas (2017): **1.3 lakh buses** (three times the existing bus supply)
- Private operators have filled in service gaps, but only in profitable regions or routes

2

- Financial losses faced by STUs prevent investments in improvement of the system
- Existing cost recovery for urban STUs: **47%**
- Lack of investments from National and State Governments

FUTURE

3

- **1.5 Lakhs** required in 140 cities. Investment of **₹7.5 lakh crore** required to meet the bus transport demand by 2031 (*WRI India estimate*). *Public private partnership key to unlocking finance.*

LEGACY CHALLENGES

1. **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.
2. Bus operators have **very few trained professionals**. No appointments via central exams since 1988.
3. **Quality of buses** manufactured results in life of bus that is 6-8 years. Very supplier driven market.
4. **Use of technology is limited**, mostly only use vehicle tracking and very limited use of automatic fare collection.
5. There is **very limited planning and operations** mostly continue on past history.
6. Struggle to cover the **gap between cost and revenue** is constant.
7. Buses are **stuck in traffic**





BUS BASED PUBLIC TRANSPORT STATE OF PRACTICE

1. Extensive use of technology for planning, operations and maintenance.
2. Demand driven operations design run by private operators through public private partnerships
3. Financial support to cover gap between revenue and cost and to ensure good quality of service
4. Move to Electric Vehicles

Grand Challenge (GC) & National Electric Bus Program (NEBP)

Aggregating and homogenizing India's electric bus demand at National level.

**THE GRAND CHALLENGE
TENDER CONDITIONS**
for Delhi, Bengaluru, Hyderabad,
Kolkata and Surat



Contract Period
12 years

Annual Assured Operational
70,000 kms per bus



5,450 e-buses



Charging Type
**Opportunity charging & overnight
charging at depot**

Bus Utilisation per day
225 kms + 10%

Opportunity Charging Time
60 mins at depot

Minimum Operational Kms in Single charge
200 kms



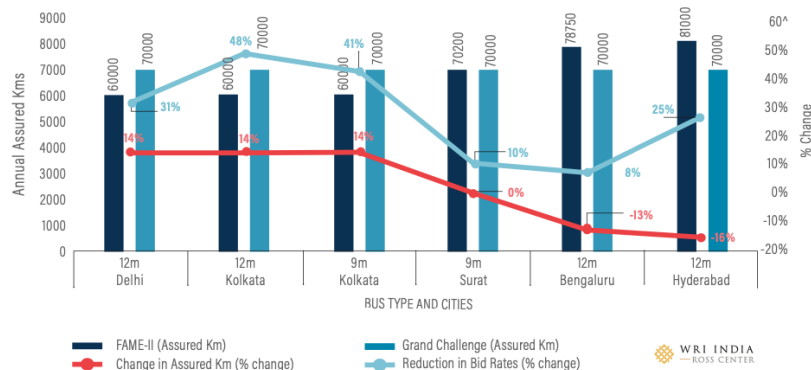
**Lowest-ever
prices
discovered**



Rs.39.21/km



Rs. 43.49/km

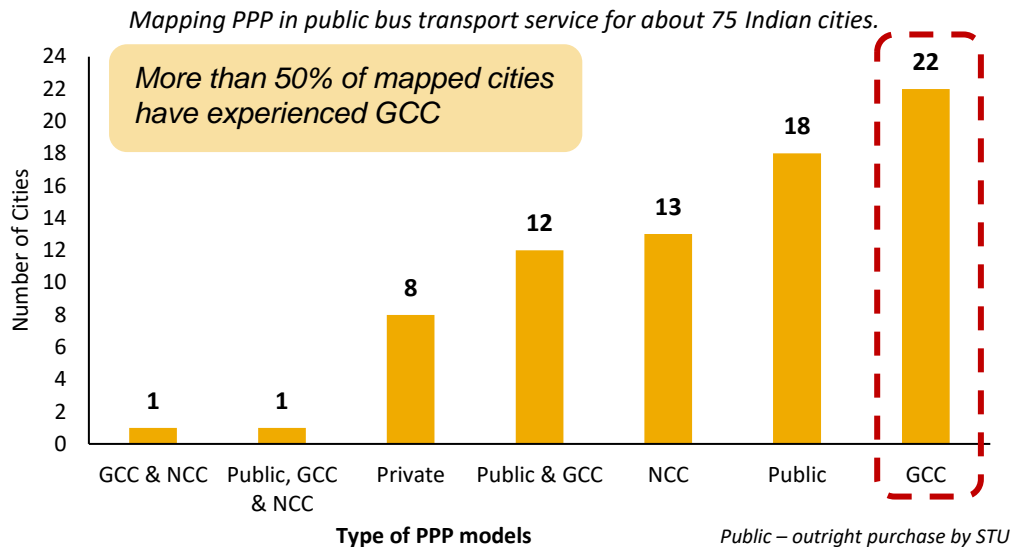


Source: Press Information Bureau, published on 26th April 2022, <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1820225>

- Demand aggregation led to 10-48% reduction in per km rate of bus operations compared to existing e-bus rates and 25% reduction from rates of ICE (CNG and Diesel) buses
- The scale-up of GC, the National E-bus Program (NEBP) will seek to operate **50,000 e-buses** across 40 Indian cities/STUs by 2030.
- Currently tender for **~6000 e-buses** is floated for 5 cities

Public - Private Partnership in India's Public Bus Service

- **GCC** is the more adopted model of PPP across Indian cities to provide public bus service
- **JNNURM** gave a boost to cities to adopt PPP Models – cities in Gujarat, MP, etc. took up GCC and NCC Models
- **FAME I** allowed both outright purchase and GCC
- **FAME II mandated the GCC model** which led to reduction in rates
- **Grand Challenge** adopted the demand aggregation GCC model which led to unprecedented low rates due to risk mitigation measures and economies of scale

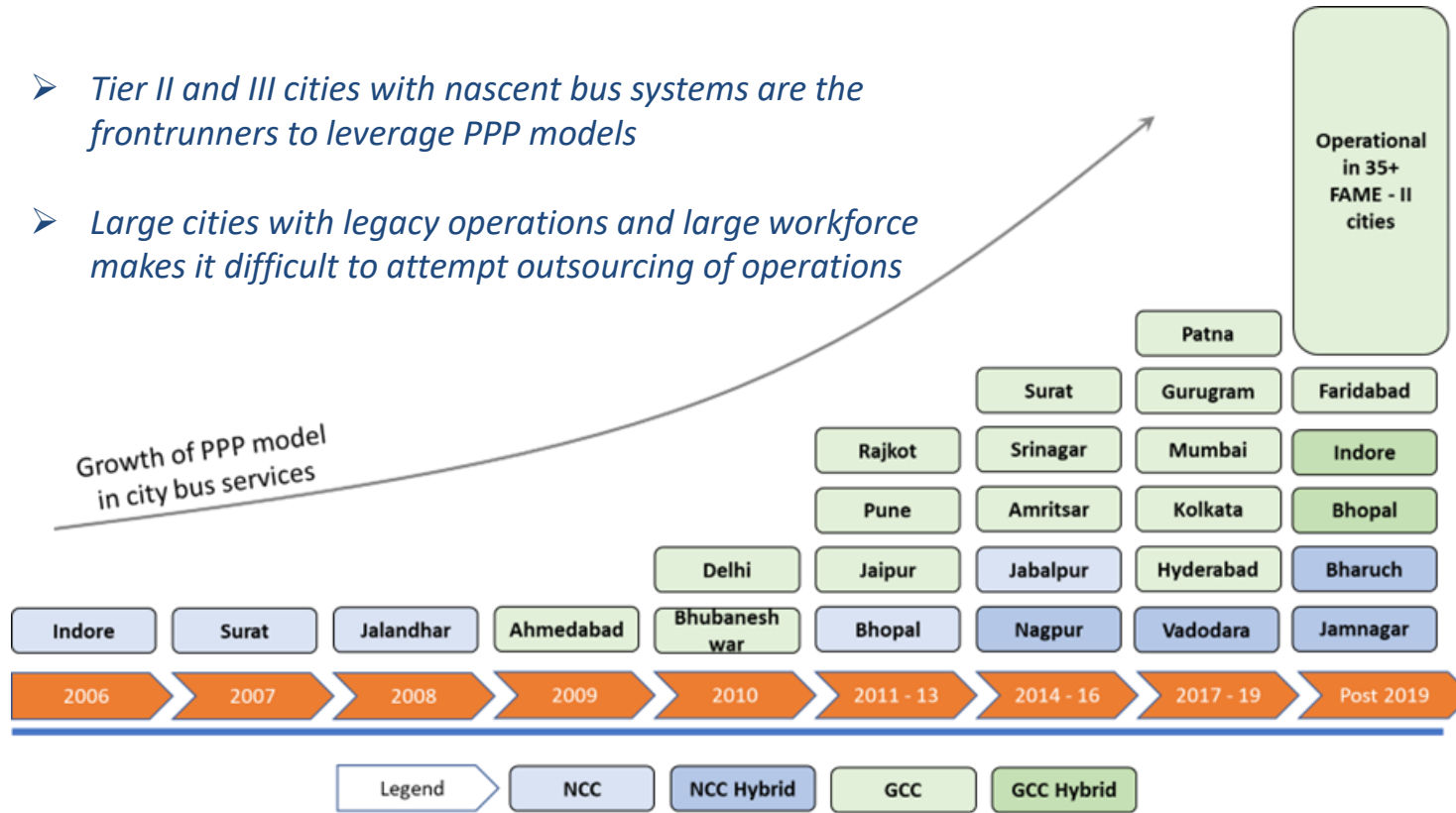


Electric Buses

- >80% of 2800 electric buses operate on GCC model
- 5450+ e-buses to be deployed on GCC model in 5 cities by 2023

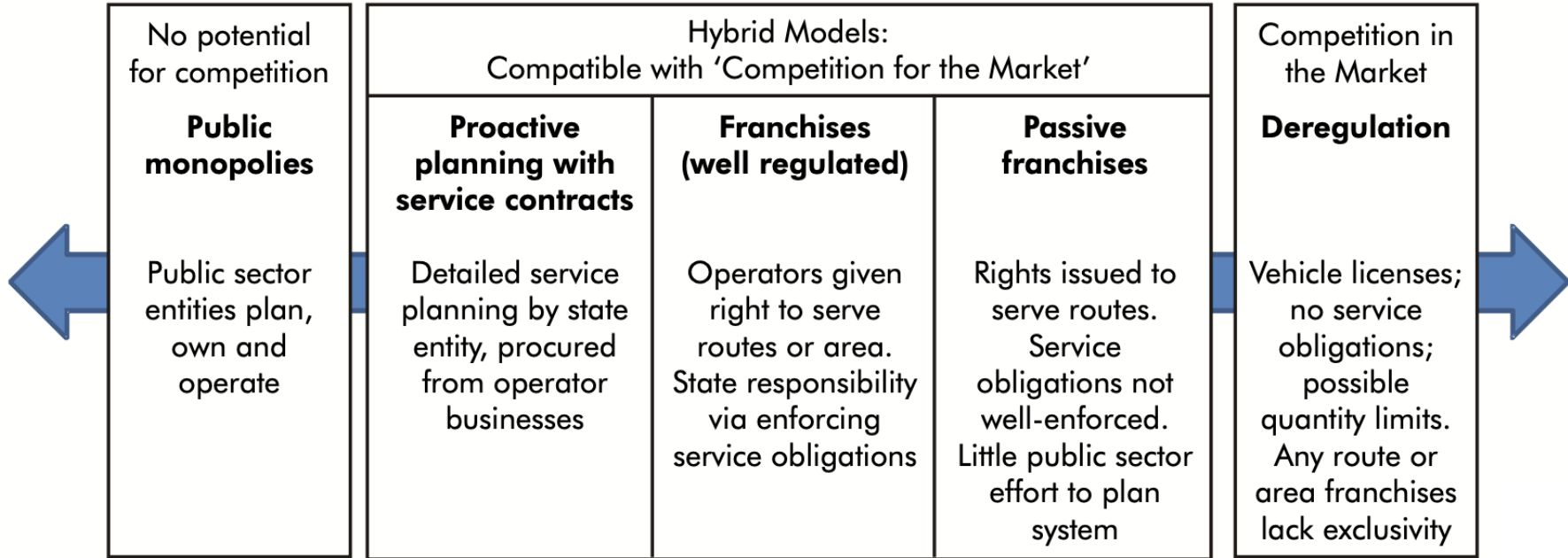
Trend of PPP Models in India

- Tier II and III cities with nascent bus systems are the frontrunners to leverage PPP models
- Large cities with legacy operations and large workforce makes it difficult to attempt outsourcing of operations



- Post 2019 Himachal, Pune, Hyderabad, Mumbai, Ahmedabad, Navi Mumbai, etc opted for GCC under FAME (~2500 – e-buses)
- Lucknow, Kolkata, Jammu, Guwahati, Himachal, Indore purchased total of 290 e-buses

TPOLOGY OF BUSINESS MODELS FOR BUS SYSTEMS



ROLES OF SYSTEM PLANNER AND SYSTEM OPERATOR

System Planner	System Operator
Develops Road infrastructure	Acquires and Maintains Buses
Manages Planning of Bus Routes	Operates Buses
Manages and Contracts Public Transport Services	Furnishes and operates fare collection systems
Oversees and Controls the system	Administers system funds (trust fund)

GROSS COST VS. NET COST

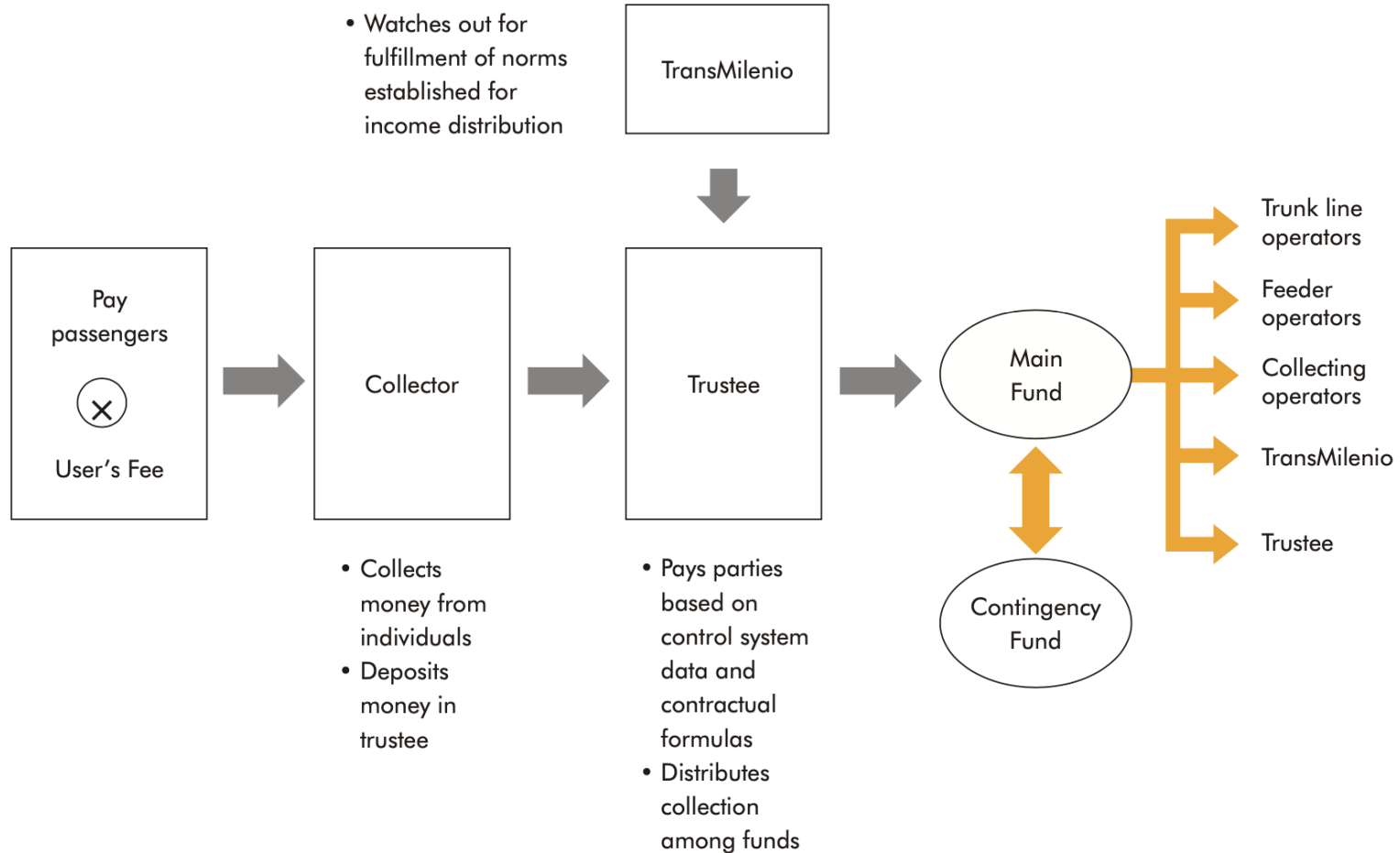
	Gross Cost	Net Cost
Pros	Lower cost per unit of service	Revenue risk is assigned to the operators
	Flexible operation (move buses from one route to another without harm to the operator)	Operators tend to maximize quality of service to increase ridership (probably in the form of oversupply of buses, then increasing the fares)
	Easy to introduce – Simple proposition to operators	Allows public agencies with limited staff and technical capacity to provide high quality bus services
Cons	Authority bears all the revenue risk	Lack of flexibility - buses are not moved among routes
	Needs a strong Authority and very good supervision	Overlapping routes compete the passengers (in the extreme buses even of the same operator compete for the passengers as the drivers are given incentives)
		Quality of service is secondary to maximizing net revenues

AREA CONTRACTS VS. ROUTE CONTRACTS

Area Contract	Route Contract
Exclusive right to operate bus services in an entire area within a city	Exclusive right to operate bus services on specified route or group of routes within a city
Suitable for cities that have a number of relatively self-contained areas	Suitable where the authority wants to distribute routes within the same area to more than one operator
Route Planning is done by the contractor. Might result in cases where high density corridors might be over-served and low density corridors ignored.	Route Planning is done by the transportation authority whose goals are to provide safe and efficient public transport. Profit is not the only goal. Authority determines routes and frequency.
One Operator is less confusing to users. The operator is viewed as the service planning authority.	More than one operator, but the planning agency is one, so routes and frequencies can be obtained from one agency.
Without competition, there is no clear incentive for the operator to over perform	Healthy competition leads to better performance of bus operations. Tenders are for a limited number of years after which they can be re-issued.

	No potential for competition	Hybrid' Models: Compatible with Competition for the Market			Competition in the Market
	Public monopolies Public sector entities plan, own and operate	Proactive planning with service contracts Detailed service planning by state entity, procured from operator businesses	Franchises (well regulated) Operators given right to serve routes or area. State responsibility via enforcing service obligations	Passive franchises Rights issued to serve routes. Service obligations- not well enforced. Little public sector effort to plan system	Deregulation Vehicle licenses; no service obligations; possible quantity limits. Any route or area franchises lack exclusivity
Aggressive network integration					
Strong integration					
Moderate integration					
Coordination mainly within each route					
Little or no coordination					

Legend:
  Seoul
  Sao Paulo
  London
  Indore
  Ahmedabad
  Mumbai
  Bangalore



CHAPTER 6: CONTRACTS AND TENDERS

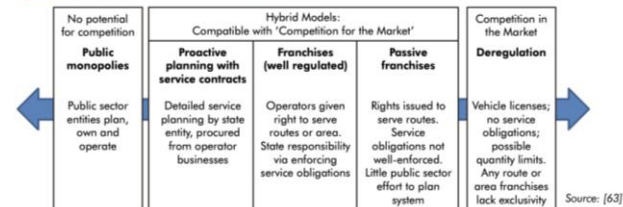
Around the world, urban bus systems display a wide variety of business models. These business models can be said to fall on a spectrum, with public monopolies at one end and complete deregulation at the other end. A public monopoly describes the situation in which all the bus services in a city or urban area are provided by a single publicly owned company. Deregulation, on the other hand, describes a situation in which a public authority (assuming one exists) allows any private company free entry into the public transport market with or without any requirements that the vehicles used meet any standards other than normal vehicle registration and approval. Both of these models exhibit some intrinsic disadvantages, which are summarised in Table 6.1. Nevertheless, there are certain, very limited, situations in which these business models for bus transport may be used. A public monopoly should only be considered if no private companies are interested in investing in the bus transport industry, franchises or rights to operate services in a given area or on a given route cannot be enforced and previous attempts to involve private companies have failed for reasons beyond the transport authority's control. Deregulation should rarely be considered unless the city or urban area has no framework or capacity to set up a more orderly system.

Table 6.1 Disadvantages of Public Monopoly and Deregulation models

Public Monopoly	Deregulation
Absence of competition often results in poor service	Service is concentrated on major route corridors causing severe congestion, and poor services on less busy routes
Conforming to government guidelines for staff terms and conditions often results in over-staffing with high salary costs	This system is usually accompanied by dangerous driving by drivers attempting to maximize passenger loads
As a government agency the operator cannot voice opposition to political edicts even where these are detrimental to bus operations	Members of the public without other means of transport have no assurance that service will be provided where and when they need it
Public monopoly operators are often unable to secure adequate fare increases, or to secure funds for investment in new buses	
There is a tendency for the operator to become more powerful than the regulatory authority	

Between the two extremes of public monopoly and deregulation lie a variety of hybrid models which can be described as utilising a "Competition for the Market" approach [63]. These models are generally defined as those in which the public authority regulates the bus transport market and is involved in system planning but procures bus services from private

Figure 6.1 Typology of Business Models for Bus Systems



BUS KARO¹

A GUIDEBOOK ON BUS PLANNING & OPERATIONS

Procurement models for e-buses

- Outright Purchase of E-Buses leads to high upfront cost of about 2-3 times more than diesel counterpart
- Extended role of OEMs in bus operators and partnership across bus life cycle
- 'Mobility-as-a-Service' is widely accepted model which reduces the financial and operational risks
- Battery-as-a-Service' an alternative model which can be explored further



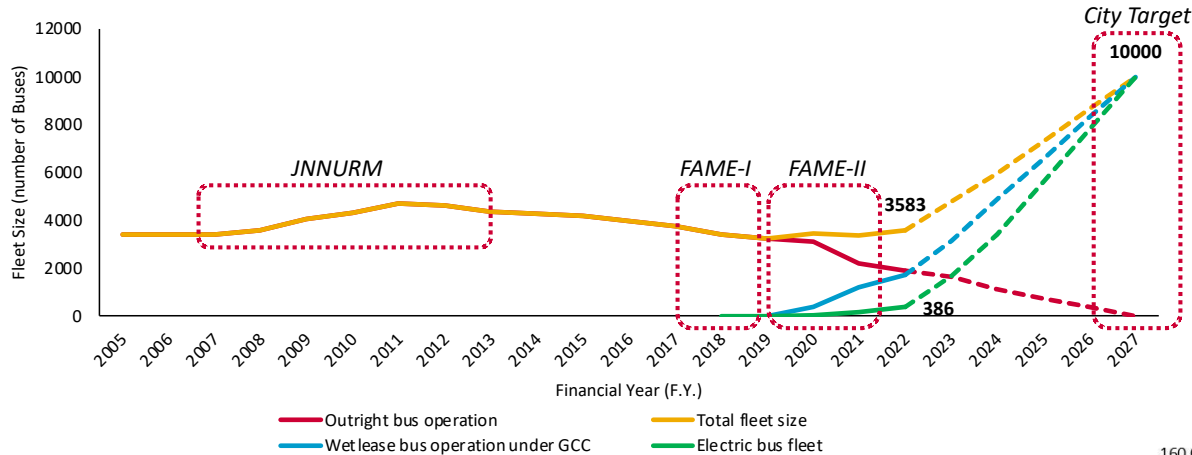


- Case Studies of alternate business models in bus services in India

- *Grand Challenge Demand Aggregation Model*
- *BEST transition from Operator to Regulator*
- *Indore – Reviving public bus operations with innovative financing*



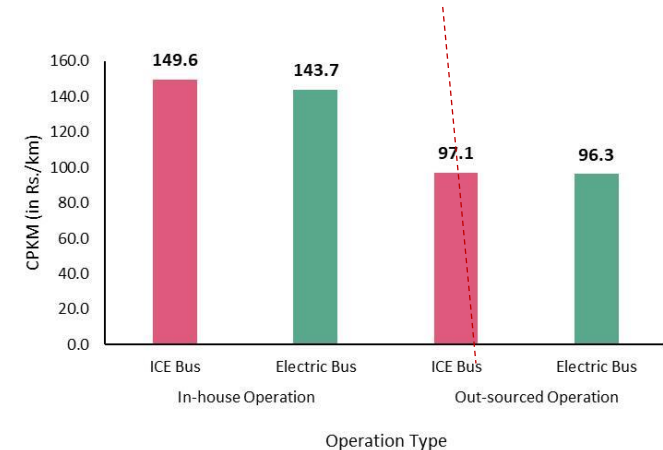
Mumbai's transition story to PPP



- **3,575 buses** operating currently
- Currently **48% buses** are operating on GCC model – majority of which are CNG (9m AC and 12m Non AC)
- **380 of 386 e-buses** are on GCC
- On transitioning to GCC model, there is a **decrease of about 30% in CPKM**

Electrification Targets:

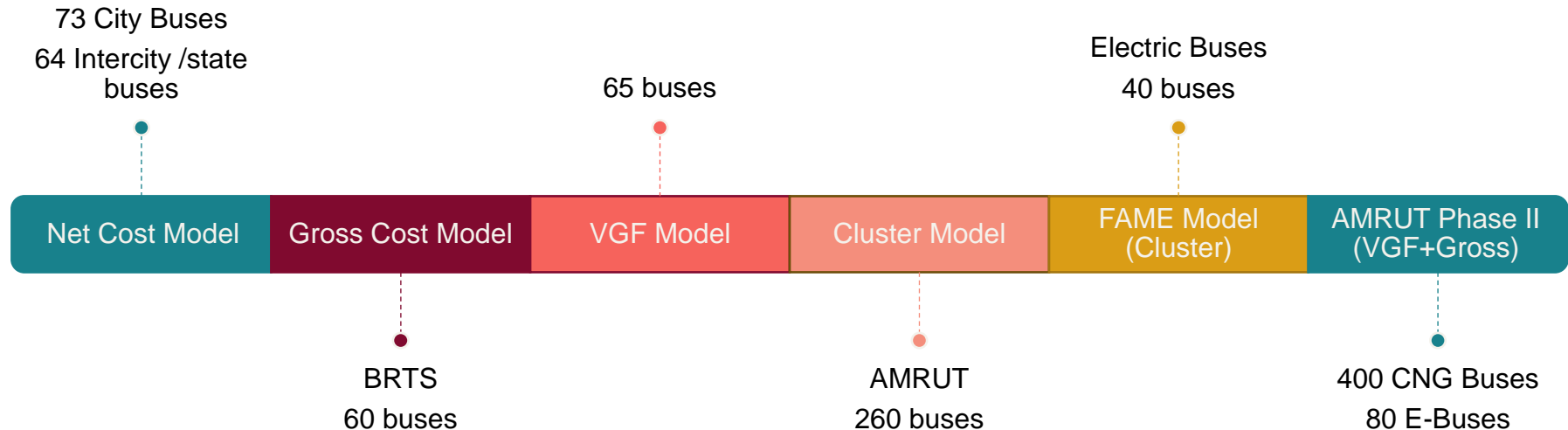
- 50% – 2023
- **100% - 2027**
- **10,000 buses by 2027**



The CPKM is estimated for the FY 2021-22 by calculating the cost for the actual fleet composition using the available data from the undertaking on staff financial burden, required staff to bus ratio, actual maintenance cost, GCC rate of the operational fleet, and annual kilometer by bus type.

Reviving bus transport in Indore – innovative financing models

- Indore City Transport Services Ltd incorporated in December 2005 to operate and manage the public transport system
- In order to improve service delivery at minimum cost, the city adopted different PPP models
- Today, 435 buses, 2.5 lakh passengers per day



Reviving bus transport in Indore – innovative financing models

Cross-subsiding to improve service delivery

- Utilizing DUTF funds.
- BRTS corridor advertisement rights allotment
- Allotment of 800 intracity bus stops to AICTSL for revenue generation
- Cross subsidizing intra-city services with intercity & interstate services through cluster model

Identifying sustainable funding for bus services



City DUTF

Parking fee collected by Indore Municipal Corporation



State DUTF

Dedicated funds from state's budget
5 Bus depots constructed using State DUTF including 1 e-Bus depot

KEY CHALLENGES FOR PPP BUS OPERATIONS

- Payment security mechanism to ensure cash flow for private operators
- Creating an ecosystem of private operators
Poor credit and repayment histories
- Capacity building of operators to ensure technology driven operations and maintenance
- Better understanding on life of bus

KEY CHALLENGES FOR PPP BUS OPERATIONS

- Low speed of buses
- Digital fare collection
- Better understanding on life of bus
- Data driven system planning – Need to build capacity of system operators



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THANK YOU
