

SUSTAINABLE BUS TRANSPORT FINANCING: INDIA

Detailed Report



2020

Janaagraha Centre for Citizenship
and Democracy



About Shakti Sustainable Energy Foundation:

Shakti Sustainable Energy Foundation works to facilitate India's transition to a cleaner energy future by aiding the design and implementation of policies that promote clean power, energy efficiency, sustainable transport, climate policy and clean energy finance.

About Janaagraha Centre of Citizenship & Democracy:

Janaagraha Centre for Citizenship and Democracy (Janaagraha) is a Bengaluru based not-for-profit institution that is a part of the Jana group. Janaagraha's mission is to transform quality of life in India's cities and towns. It defines quality of life as comprising quality of infrastructure and services and quality of citizenship. To achieve its mission, Janaagraha works with citizens to catalyse active citizenship in city neighborhoods and with governments to institute reforms to City-Systems.



Shakti Sustainable Energy Foundation (SSEF) supported Janaagraha in 2019 to design a sustainable bus transport financing mechanism for India.

Janaagraha and SSEF collaborated during the 1st phase of the project to estimate the funding gap in select states/cities and develop an institutional framework that can help sustainably finance bus operations for both capital and O&M spends.

Janaagraha immensely benefited from the continuous dialogue, brainstorming and co-creation with the SSEF team.

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LIST OF ABBREVIATIONS

Abbreviation	Full form
ADB	Asian Development Bank
AICTSL	Atal Indore City Transport Service Ltd.
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
BAU	Business As Usual
BBMP	Bruhat Bengaluru Mahanagara Palike
BCM	Bus Contracting model
BDA	Bangalore Development Authority
BMTCL	Bangalore Metropolitan Transport Corporation
BRTS	Bus Rapid Transport System
BRTS	Bus Rapid Transport System
BWSSB	Bangalore Water Supply and Sewerage Board
CAPEX	Capital Expenditure
CMA	Chennai Metropolitan Area
CMDA	Chennai Metropolitan Development Authority
CMP	Comprehensive Mobility Plan
CMRL	Chennai Metro Rail Authority
CMUBC	Chief Ministers Urban Bus service
CMWSSB	Chennai Metropolitan Water Supply and Sewerage Board
COC	Corporation of Chennai
CPKM	Cost per Kilometre
CPSE	Central Public Sector Enterprise
CRF	Central Road Fund
CRIF	Central Road and Infrastructure Fund
CTS	Comprehensive Transportation Study

Abbreviation	Full form
DMRC	Delhi Metro Rail Corporation Ltd
DULT	Development of Urban Land Transport
EPC	Engineering Procurement and Construction
EPKM	Earning per kilometre
FAME	Faster Adoption & Manufacturing of (Hybrid &) Electric Vehicles
FMD	Fund Management Division
GCC	Gross Cost Contract
GEF	Global Environment Facility
GoI	Government of India
GoK	Government of Karnataka
GoTN	Government of Tamil Nadu
GST	Goods and Service Tax
HMA	Hyderabad Metropolitan Area
HR	Human Resources
ICRA	Information and Credit Agency
IFIs	International Financial Institutions
IPT	Intermediate Public Transport
ITMS	Integrated Transport Management System
ITS	Intelligent Transport Systems
JCCD	Janaagraha Centre for Citizenship and Democracy
JICA	Japan International Cooperation Agency
JnNURM	Jawaharlal Nehru National Urban Renewal Mission
KSRTC	Karnataka State Road Transport Corporation
KUIDFC	Karnataka Urban Infrastructure Development and Finance Corporation

LIST OF ABBREVIATIONS

Abbreviation	Full form
LGFA	Local Government Funding Agency
LTAA	Land Transport Authority
MCRF	Mega City Revolving Fund
MoHUA	Ministry of Housing & Urban Affairs
MTC	Metropolitan Transport Corporation
MUDF	Municipal Urban Development Fund
MV Tax	Motor Vehicle Tax
NBFC	Non Banking Financial Company
NCC	Net Cost Contract
NHAI	National Highways Authority of India
NIF	National Investment Fund
NIIF	National Investment and Infrastructure Fund
NMT	Non-Motorised Transport
NUTP	National Urban Transport Policy
O&M	Operations and Maintenance
OEM	Original Equipments Manufacturer
OPEX	Operational Expenditure
PBT	Public bus transport
PMPML	Pune Mahanagar Parivahan Mahamandal Ltd
PPP	Public private partnership
PSCDCL	Pune Smart City Development Corporation Ltd.
SBTF	State Bus Transport Fund
SPV	Special Purpose Vehicle
SRTC	State Road Transport Corporation

Abbreviation	Full form
STF	State Transport Fund
STU	State Transport Unit
T & CP	Town and Country Planning
TDFC	Transport Development Finance Corporation
TfL	Transport for London
TNUIFSL	Tamil Nadu Urban Infrastructure Financial Services Ltd
TSRTC	Telangana State Road Transport Corporation
TSRTC GHZ	TSRTC- Greater Hyderabad city Zone
TTMC	Traffic and Transport Management Centre
TUFIDCO	Tamil Nadu Urban Finance and Infrastructure Development Corporation
UBS	Urban Bus Specifications
UDA	Urban Development Authority
UDPFI	Urban Development Plan Formulation and Implementation
UIDSSMT	Urban Infrastructure Development Scheme for Small & Medium Towns
ULB	Urban Local body
UMTA	Unified Metropolitan Transportation Authority
UTF	Urban Transport Fund
UTF	Urban Transport Fund
VAT	Value Added Tax
VGf	Viability Gap Funding
WB	World Bank
WRI	World Resources Institute

GLOSSARY

Term	Definition
Mode Share	The percentage of person trips catered to by a certain mode of transport such as private cars, buses, walking, etc., compared to the total person trips that occur in the area under consideration is called the mode-share
Motorized mode share	Mode share of an area excluding the walk trips
Vehicle Utilization	Extent to which vehicles are used kilometers per vehicle per period or operational hours/days per vehicle per period)
Fleet Utilization	The number of buses in service as a percentage of the buses available for service
Occupancy ratio	The ratio of passengers carried, versus the passenger capacity of the bus is called the occupancy ration. It is also commonly called the “load factor”
Trip lengths	The distance of movement from one point to another in a city in kms is know as trip length
Per Capita Trip Rate	Average number of trips undertaken by each person per day

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BACKGROUND



India is urbanizing rapidly; cities are likely to house 41% of India's population by 2030* from 31% in 2011 (census). This rapid urbanization has led to the growth of private-vehicle ownership, thereby creating several issues such as traffic congestion, increased road accidents, air pollution and declining share of public transport.



Public Bus Transportation is the backbone of mobility for both, urban and rural areas in India. Out of total 1.6 million buses registered in India; the public bus sector operates around 1,70,000* buses carrying 70 mn people per day. The avg. age of fleet ranges from 2 yrs to 11.8 yrs*.



As per ICRA estimates (2016), 100 of the largest Indian cities require ~ \$ 15.4 billion to procure 1,50,000 new buses and upgrade allied infrastructure. To bring in this scale of investment is a big challenge as most of the Indian State Transport Units (STUs) are financially constrained.



In this context, Shakti Sustainable Energy Foundation has appointed JCCD to undertake study on “Sustainable Financing of Public Bus Transportation in India” to assess the quantum of fund required for Public Bus Transportation for next 10 years and to recommend a funding structure or mechanism for the same.



As a part of the study, 5 selected STUs were analyzed to understand their bus procurement and financial needs in the next 10 years. Their financial health, current sources of funding, and various schemes and supporting mechanisms in place were analyzed to further come up with a sustainable funding structure.

QUESTIONS WE AIM TO ANSWER

What is the best adoptable mechanism for financing public bus transportation in India?

Demand estimation & analysis of financial performance of Five selected STUs

1. What is the financial performance/position of sample FIVE selected STUs?
2. What is the demand for regular buses and e-buses?
3. What are the financing needs for the above demand for buses in the medium term in India?



Financing – procurement models and institutionalising financing mechanism

1. What are the typical procurement models deployed for purchase and operation of buses in the past in India and peer economies?
2. What are the possible alternative financing mechanisms to upscale these models?
3. How to Institutionalise current or alternate financial structures?

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APPROACH AND METHODOLOGY

Approach

The study is undertaken in two parts -

- Demand estimation
- Assessing Financing mechanism

The study is undertaken with combination of primary and secondary research



Secondary research involved

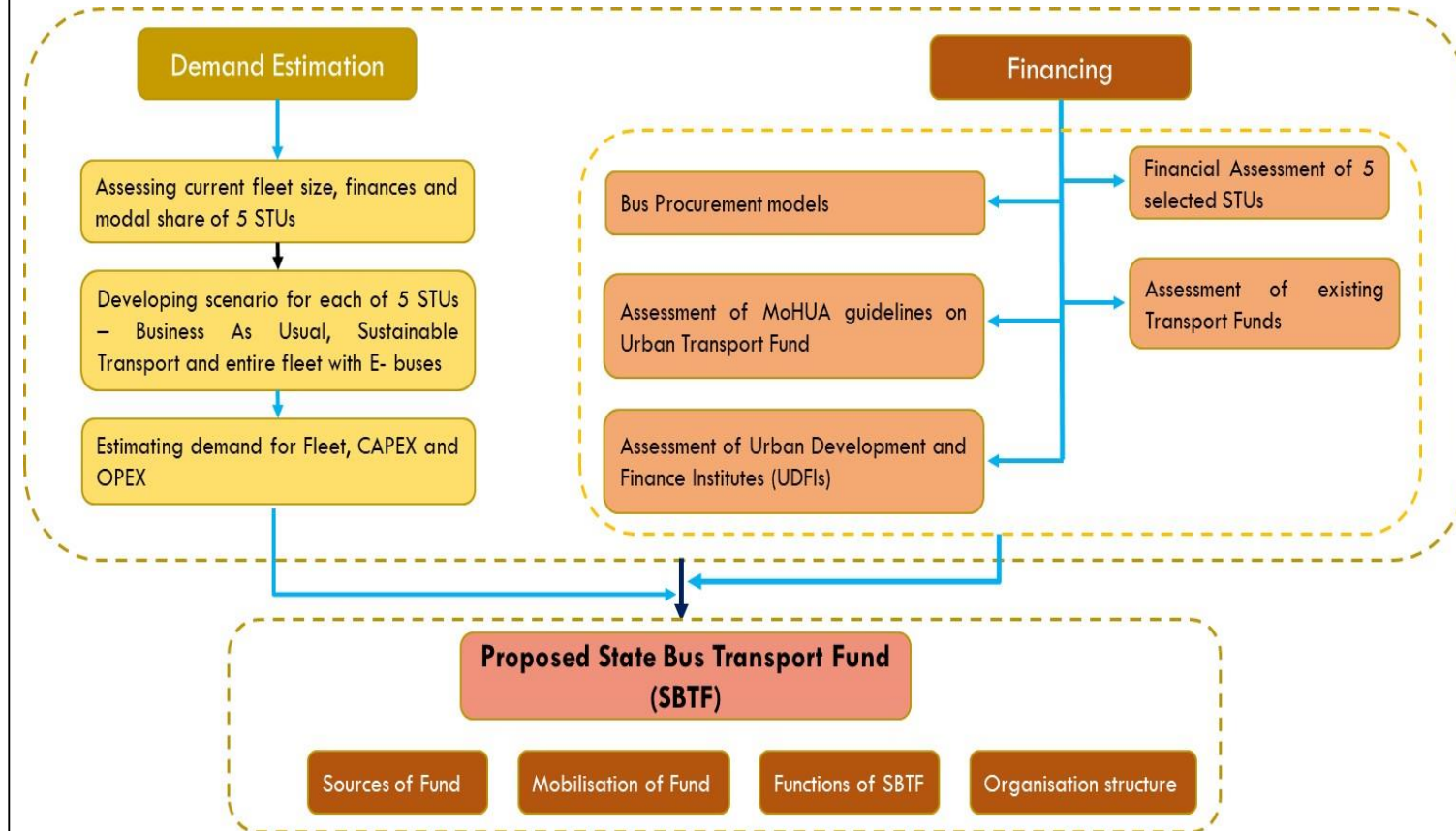
- Review of various studies, reports and documents on – public transportation, e buses, financing urban infrastructure etc.
- Review of global and Indian STUs including five selected STUs – in terms of procurement models, revenue sources, role of private players, key enablers and challenges etc.
- Analysis of unaudited finances of 5 selected STUs in terms of trends in revenue and operating costs, their interlinkages



Primary research involved

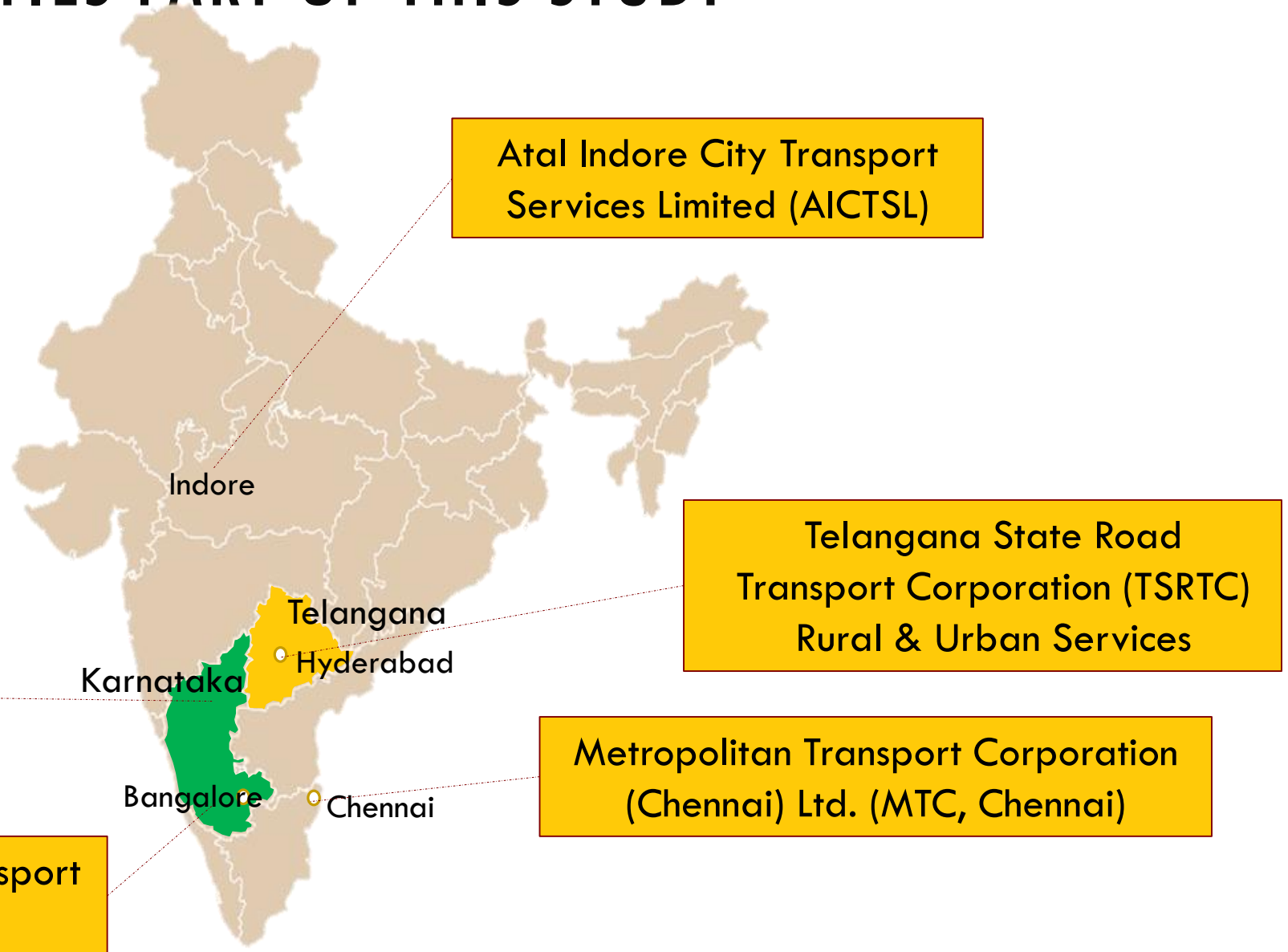
- Interaction with key experts and OEMs
- To seek insights and validate findings of secondary research
- Review meetings with Shakti Energy Foundation's team to validate and present findings

Methodology



BUS TRANSPORT ENTITIES PART OF THIS STUDY

Five chosen STUs were studied as a part of this project to first estimate their future demand for buses and quantum investment required and later assess their financial health.



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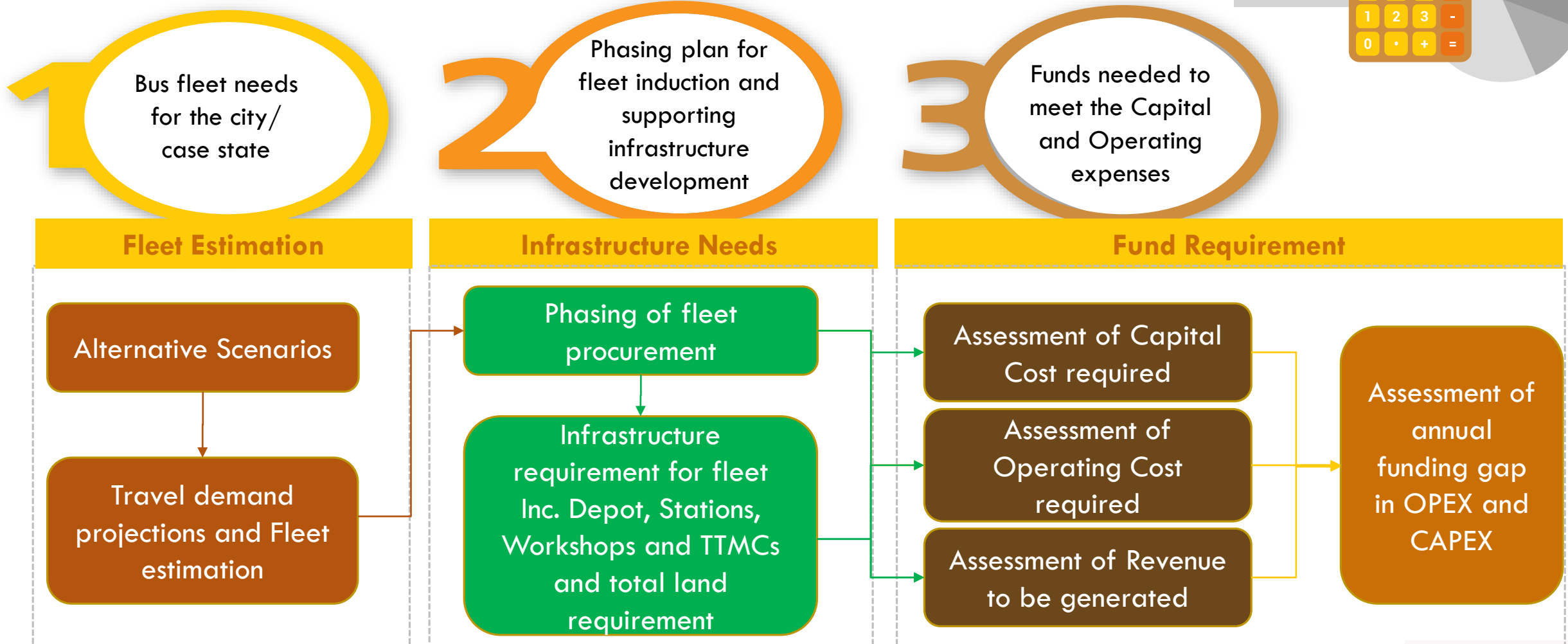
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METHODOLOGY FOR FLEET & FUNDING ASSESSMENT

Overview

The following approach was adopted to estimate:



FLEET AND FUNDING ESTIMATION SCENARIOS

Three scenarios are analysed to estimate the fleet and funding needs for five bus agencies

Scenario 1

Business as Usual (BAU) demand and supply conditions

- Fleet demand for the future is estimated based on past trends of operations (vehicle km operated per day; daily vehicle utilization, share of hired buses), assuming no change in vehicle technology
- Additionally, in the case of TSRTC, the BAU is compared with a scenario of adopting 100% hired buses instead of the current scenario of a mix of owned and hired services

Scenario 2

Increased bus demand induced by improved service levels

- For city level assessment: Bus fleet needs are estimated for the targeted mode share for buses derived from the public transport mode share targets set as a part of the sustainable mobility vision of the city's Comprehensive Mobility Plan (CMP)
- For state level assessment: Bus fleet needs are estimated for a shift of 25% of the passenger rides from auto rickshaws to public transport, along with a steady rise of bus ridership
- All buses are assumed to be BS-VI Non AC Diesel buses owned and operated in-house

Scenario 3

Scenario 2+ Electric buses

- This scenario uses the fleet estimation from scenario 2 with the additional assumption of inducting electric buses along with diesel buses to fulfill the demand
- Further, the scenario also assumes 100% electric bus procurement after 2023

FLEET AND FUNDING ESTIMATION MODEL

Assumptions

Cost assumptions

Cost of vehicle
Infrastructure cost
Land cost
Electric bus operating cost

Other Assumptions

Buses served per infrastructure unit (eg: depot, workshop)
Fleet procurement per year
Percentage of three-wheeler trips to be shifted to buses

Inputs

Population of city

Bus Operations Data

Mode share
Trip length
Per capita trip rate
Age profile of fleet
Load factor
Bus capacity
Vehicle and fleet utilisation
Vehicle kilometre
Item wise cost per km (CPKM)
Item wise earnings per km (EPKM)
Future plans for expansion

Other Transit Mode data

Mode share
Rail (metro + suburban) length
Rail daily ridership

Paratransit Data

Vehicle numbers

Outputs

Annual Estimations

(Separate for diesel and electric buses)

Fleet required
Infrastructure required (Total)
Depot
Bus station (Terminal)
Traffic management centre
Workshops
Land

Capital expenditure (CAPEX)
Operating expenditure (OPEX)
Revenue estimates
Margin over CAPEX and OPEX

DATA INPUTS AND SOURCES

Fleet and funding needs assessment modelling at state and city levels was carried out using multiple data inputs corresponding to the concerned bus agency and city/ state level mobility indicators as listed in this slide

Data Input: Operational Data for state and city level analysis

- Fleet size
- Fleet utilization
- Vehicle utilisation
- Vehicle age profile
- Existing infrastructure
- Annual vehicle km
- CPKM and EPKM split
- Hired and owned bus CPKM and EPKM

Data Source

- STU annual reports
- Profit and loss booklets
- Performance report

Additional data: City Level Analysis

Current and future mobility indicators projections

- Population
- Trip Lengths
- Mode Share
- Per Capita Trip Rate

All transit mode operating data

- Km operated, future km planned
- Ridership

Additional Data: State Level Analysis

Intermediate Public Transport (IPT) data

- Number of auto rickshaw in the state
- Number of auto rickshaw in the urban areas

Data Source

- Mobility plans or similar study
- Road transport year books

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TELANGANA STATE: BUS FLEET, SUPPORTING INFRASTRUCTURE AND FINANCIAL NEEDS

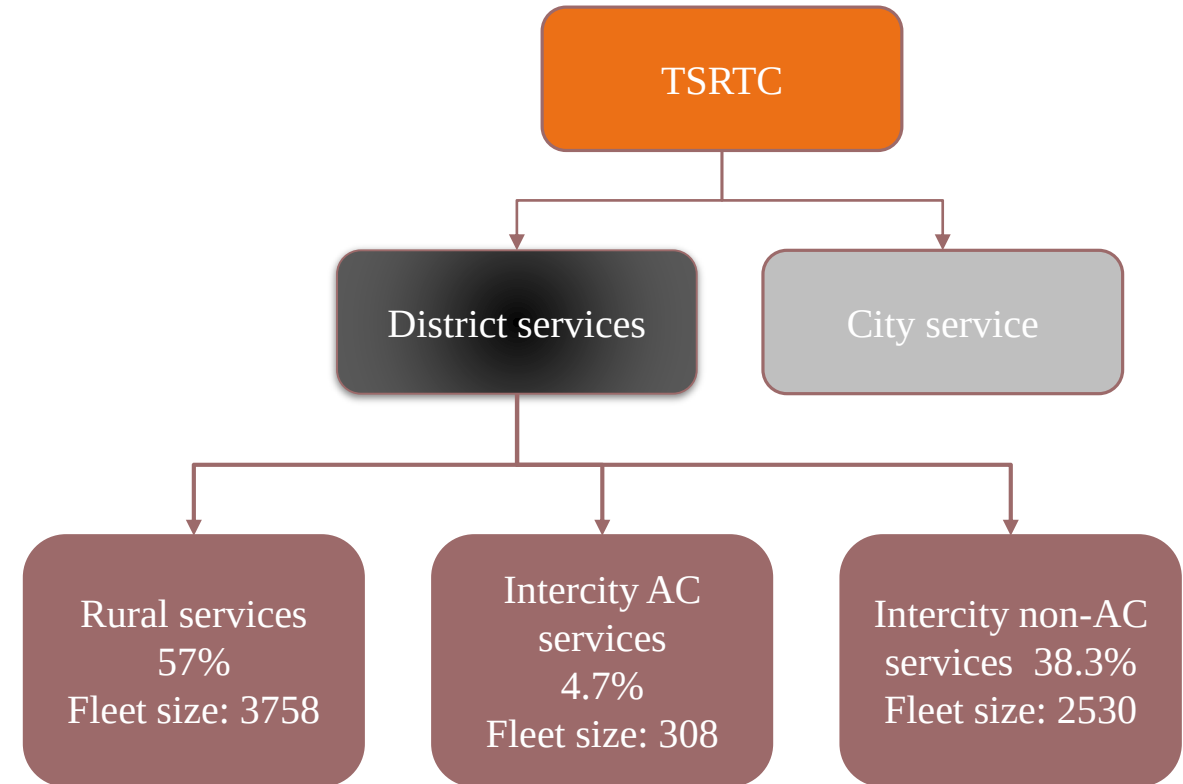
TSRTC

OVERVIEW OF TSRTC OPERATIONS



Telangana State Road Transport Corporation (TSRTC)

- TSRTC is the State Transport Undertaking (STU) for Telangana state
- TSRTC operates rural, intercity and urban services
- The operations are classified into **11 regions and 1 zone** (The Greater Hyderabad city Zone, GHZ) in the Telangana state.
- TSRTC provides rural and intercity services (district services) in all the regions except Hyderabad, (fleet size: 6596), while the urban services are restricted to GHZ (fleet size: 3771)

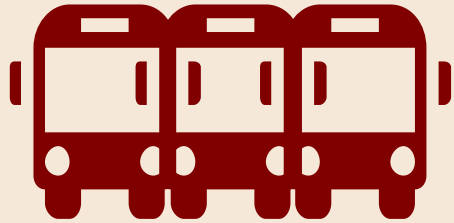


The analysis for rural and urban buses needed are presented separately in the subsequent sections

OVERVIEW OF TSRTC DISTRICT SERVICES: FY 2019-2020



Some operational indicators for TSRTC in FY 2019-20 (till January 2020) are given below



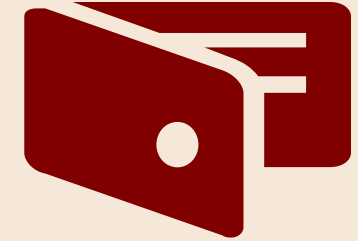
Total Bus fleet 6643

TSRTC	4481 (67.45%)
HIRED	2162 (32.55%)



Gross Earning per Km (EPKM)

38.0



Gross Cost per Km (CPKM)

40.6



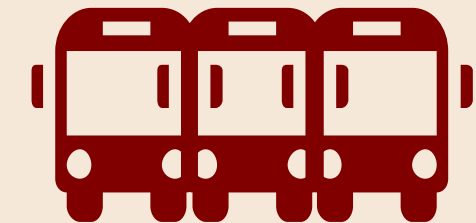
Occupancy Ratio
70.9%

Vehicle Utilization

342 Km



Fleet Utilization
99.7%



Data Sources:

- Operating Data: TSRTC [Telangana State Road Transport Corporation] Performance – Profit and Loss booklet for the year 2018, 2019 and Jan 2020
- Intermediate Public Transport (IPT) data: Road transport year book 2015-16 & year 2016-17, Transport.telangana.gov.in – vehicle statistics

<http://www.businessmodelgeneration.com>

Designed by: Business Model Foundry AG

The makers of Business Model Generation and Strategyzer

FLEET AND FUNDING ESTIMATION SCENARIOS



Three scenarios are taken up for the fleet and cost estimation for TSRTC district service.

Scenario 1

Business as Usual (BAU) demand and supply conditions

- Fleet demand for the future is estimated based on past trends of operations (vehicle km operated per day; daily vehicle utilization, share of hired buses), assuming no change in vehicle technology
- A comparison is drawn in with the scenario of adopting 100% hired buses and another of 100% inhouse operated buses instead of the current scenario of a mix of owned and hired services

Scenario 2

Increased bus demand induced by shift from Intermediate Public Transport (IPT) to public

- In this scenario fleet demand for the future is estimated based on past trends of operations (vehicle km operated per day; daily vehicle utilization, share of hired buses), assuming no change in vehicle technology
- All buses are assumed to be BS-VI Non AC Diesel buses owned and operated in-house

Scenario 3

Scenario 2+ Electric buses

- This scenario uses the fleet estimation from scenario 2 with the additional assumption of inducting electric buses along with diesel buses to fulfill the demand
- Further, the scenario also assumes 100% electric bus procurement after 2023

CONCLUSION: TSRTC (RURAL/DISTRICT) FLEET AND FUNDING NEEDS



TSRTC current fleet size for district services is 6,643.

- To fulfil the unmet demand of 2020, TSRTC requires 1,166 additional buses in case of business as usual and a total of 7,988 buses by 2031
- If, 25% of potential bus riders, i.e. IPT riders shift to PT then TSRTC would require 5,013 additional buses in 2020 and 18,645 buses by 2031

Based on Fleet and Cost estimation model, for three scenario, the key conclusions are

- In the BAU scenario, the cumulative CAPEX+OPEX is likely to be **INR 91,269 crore** between FY20-21 to FY30-31 for inhouse corporation owned buses which is more than that of hired fleet scenario (CAPEX+OPEX: **INR 88,129 crore**) by **INR 3,140 crore**.
- In the demand increase scenario, cumulative CAPEX+OPEX for diesel only buses (S-2) will be **INR 1,81,176 crore**, whereas with electric bus scenario (S-3), the same is **INR 1,68,653 crore**, which is less than diesel only scenario, by **INR 12,523 crore**. This can be attributed to low operating expenses for electric buses.

Summary: The following table summarises the likely OPEX+CAPEX, revenue and the financial deficit which are likely to be faced by TSRTC when taking up either scenario

Real Costs used in the table

TSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial needs from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1 A: BAU - Owned Fleet	6,643	7,988	4,374	3,358	(1,016)	3,125	88,143	91,269	74,459	(16,809)
Sce. 1 B: BAU - Hired Fleet	6,643	7,988	3,806	3,358	(448)	324	87,805	88,129	74,459	(13,670)
Sce. 2: Demand Increase (Diesel buses)	6,643	18,645	5,982	3,946	(2,036)	11,277	1,69,899	1,81,176	1,42,948	(38,228)
Sce. 3: Demand Increase Diesel + Electric buses	6,643	18,645	7,487	3,946	(3,540)	30,812	1,37,841	1,68,653	1,42,948	(25,705)

CONCLUSION: TSRTC (RURAL/DISTRICT) FLEET AND FUNDING NEEDS



Real Costs:

TSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
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Sce. 1B: BAU - Hired Fleet	6,643	7,988	3,806	3,358	(448)	324	87,805	88,129	74,459	(13,670)
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Sce. 3: Demand Increase Diesel + Electric buses	6,643	18,645	7,487	3,946	(3,540)	30,812	1,37,841	1,68,653	1,42,948	(25,705)

Discounted Costs:

The discounted cost with 7% inflation, give a reduction in viability gap for the project

TSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1A: BAU - Owned Fleet	6,643	7,988	4,374	3,358	(1,016)	2,438	57,657	60,095	48,983	(11,112)
Sce. 1B: BAU - Hired Fleet	6,643	7,988	3,806	3,358	(448)	295	57,330	57,624	48,983	(8,641)
Sce. 2: Demand Increase (Diesel buses)	6,643	18,645	5,982	3,946	(2,036)	8,526	1,06,861	1,15,386	90,378	(25,008)
Sce. 3: Demand Increase Diesel + Electric buses	6,643	18,645	7,487	3,946	(3,540)	22,090	88,979	1,11,069	90,378	(20,692)

Fare escalation:

The viability gap further reduces if we consider fare escalation along with discounted cost. 6% of the total revenue is taken as escalated fare annually after year 2020

TSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1A: BAU - Owned Fleet	6,643	7,988	4,374	3,358	(1,016)	2,438	57,657	60,095	50,991	(9,104)
Sce. 1B: BAU - Hired Fleet	6,643	7,988	3,806	3,358	(448)	295	57,330	57,624	50,991	(6,633)
Sce. 2: Demand Increase (Diesel buses)	6,643	18,645	5,982	3,946	(2,036)	8,526	1,06,861	1,15,386	94,151	(21,235)
Sce. 3: Demand Increase Diesel + Electric buses	6,643	18,645	7,487	3,946	(3,540)	22,090	88,979	1,11,069	94,197	(16,873)

HYDERABAD CITY: BUS FLEET, SUPPORTING INFRASTRUCTURE AND FINANCIAL NEEDS

TSRTC (GHZ)

OVERVIEW OF HYDERABAD PUBLIC TRANSPORTATION: 2020

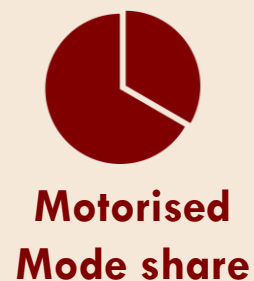


Currently, Hyderabad Metropolitan area has three Public transport Modes

- TSRTC city buses
- Hyderabad Metro
- Suburban Passenger Rail

Motorized public transport share in metropolitan area

2011	2011
45.7%	50.2%



TSRTC buses

43.1%

33 lakhs

3772 buses



Hyderabad Metro Rail

8.4%

4.75 lakhs

69.2 Km



Hyderabad Sub-Urban Rail

1.7 lakhs

97 Km in HMA

Data Sources:

- TSRTC [Telangana State Road Transport Corporation] Performance – Profit and Loss booklet for the year 2018, 2019 and Jan 2020
- Comprehensive Transportation Study (CTS) for Hyderabad Metropolitan Area (HMA)
- <https://themetrorailguy.com/hyderabad-metro-information-map-updates/>
- World Urbanization Prospects: The 2018 Revision [UN]: Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2018, by Country, 1950-2035 (thousands)

KEY ASSUMPTIONS



Assumptions made for TSRTC city services fleet and cost estimation

- The public transport share, taken from CTS for bus and metro will combine as 55.60% in 2031
- Metro network length will increase from 70 km currently to 127 km by 2031.
- Metro ridership estimated at a rate of 6,864 trips/km of network-based on the current ridership trends
- Total bus km/day will be increasing at a rate of 16% per annum, based on the current trends
- The hired buses operators are assumed to move from small operators to corporate operators with 20% rise in overhead cost. (Scenario-1 & 2)

Data Sources:

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- A comparison is drawn in with the sub-scenario of adopting 100% hired buses and another of 100% inhouse operated buses instead of the current scenario of a mix of owned and hired services

Scenario 2

Increased bus demand induced by project improved service levels

- Bus fleet needs are estimated for the targeted mode share for buses derived from the public transport mode share targets set as a part of the Comprehensive Transportation Study (CTS) for Hyderabad region.
- All buses are assumed to be BS-VI Non AC Diesel buses owned and operated in-house

Scenario 3

Scenario 2+ Electric buses

- This scenario uses the fleet estimation from scenario 2 with the additional assumption of inducting electric buses along with diesel buses to fulfill the demand
- Further, the scenario also assumes 100% electric bus procurement after 2023

CONCLUSION: TSRTC (HYDERABAD) FLEET AND FUNDING NEEDS



TSRTC current fleet size for district services is 3,772

- To fulfil the unmet demand of 2020, TSRTC requires 438 additional buses in case of business as usual and a total of 6,068 buses by 2031
- When based on CTS high public transit growth scenario, the demand for PT increases, then TSRTC would require 3,851 additional buses in 2020 and 20,926 buses by 2031

Based on Fleet and Cost estimation model, for three scenario, the key conclusions are

- In the BAU scenario, the cumulative CAPEX+OPEX is likely to be **INR 44,617 crore** between FY20-21 to FY30-31 for inhouse corporation owned buses which is more than that of hired fleet scenario (CAPEX+OPEX: **INR 34,187 crore**) by **INR 10,430 crore**.
- In the demand increase scenario, cumulative CAPEX+OPEX for diesel only buses (S-2) will be **INR 1,24,175 crore**, whereas with electric bus scenario (S-3), the same is **INR 1,32,158 crore**, which is more than diesel only scenario, by **INR 7,983 crore**. This can be attributed to high capital cost associated with electrical vehicles, as OPEX in S3 is lesser than S2

Summary: The following table summarises the likely OPEX+CAPEX, revenue and the financial deficit which are likely to be faced by TSRTC when taking up either scenario

Real Costs used in the table

TSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1A: BAU - Owned Fleet	3,772	6,068	2,262	1,501	(761)	3,581	41,036	44,617	25,402	(19,215)
Sce. 1B: BAU - Hired Fleet	3,772	6,068	1,640	1,501	(138)	340	33,847	34,187	25,402	(8,785)
Sce. 2: Demand Growth (Diesel buses)	3,772	20,926	3,785	2,057	(1,728)	11,840	1,12,335	1,24,175	67,837	(56,338)
Sce. 3: Demand Growth Diesel + Electric buses	3,772	20,926	4,522	2,057	(2,465)	33,780	98,378	1,32,158	67,837	(64,321)

CONCLUSION: TSRTC (HYDERABAD) FLEET AND FUNDING NEEDS



Real Costs:

TSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1A: BAU - Owned Fleet	3,772	6,068	2,262	1,501	(761)	3,581	41,036	44,617	25,402	(19,215)
Sce. 1B: BAU - Hired Fleet	3,772	6,068	1,640	1,501	(138)	340	33,847	34,187	25,402	(8,785)
Sce. 2: Demand Growth (Diesel buses)	3,772	20,926	3,785	2,057	(1,728)	11,840	1,12,335	1,24,175	67,837	(56,338)
Sce. 3: Demand Growth Diesel + Electric buses	3,772	20,926	4,522	2,057	(2,465)	33,780	98,378	1,32,158	67,837	(64,321)

Discounted Costs:

The discounted cost with 7% inflation, give a reduction in viability gap for the project

TSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1A: BAU - Owned Fleet	3,772	6,068	2,262	1,501	(761)	2,453	27,101	29,554	17,222	(12,332)
Sce. 1B: BAU - Hired Fleet	3,772	6,068	1,640	1,501	(138)	244	22,350	22,594	17,222	(5,372)
Sce. 2: Demand Growth (Diesel buses)	3,772	20,926	3,785	2,057	(1,728)	8,401	70,418	78,818	43,536	(35,282)
Sce. 3: Demand Growth Diesel + Electric buses	3,772	20,926	4,522	2,057	(2,465)	22,413	62,710	85,123	43,536	(41,587)

Capital cost: fleet cost + Infrastructure cost

CHENNAI CITY: BUS FLEET, SUPPORTING INFRASTRUCTURE AND FINANCIAL NEEDS

MTC

OVERVIEW OF CHENNAI PUBLIC TRANSPORTATION: 2020



Chennai Metropolitan Area (CMA) has three Public transport Modes

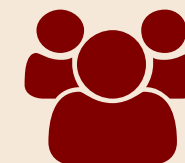
- **Metropolitan Transport Corporation (MTC) buses**
- **Chennai Metro Rail Limited (CMRL)**
- **Suburban Passenger Rail**

Motorized public transport share in metropolitan area

2018	2020
28.2%	29.5 %



Motorised Mode share



Avg Daily Ridership



Fleet size/ Operated km



MTC buses

23.7%

**35.56 lakhs
(2018-19)**

3679 buses



Chennai Metro Rail

5.8%

1.16 lakhs

45.10 Km



Chennai Sub-Urban Rail

7.65 lakhs

123 km in CMA

Data Sources:

- MTC Annual Reports [2015-16, 2016-17, 2017-18, 2018-19]
- Comprehensive Mobility Plan (CMP) for Chennai Metropolitan Area (CMA) for the year 2035 [February 2018]
- www.urbantransportnews.com/chennai-metro-information-tenders-routes-and-project-updates/
- World Urbanization Prospects: The 2018 Revision [UN]: Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2018, by Country, 1950-2035 (thousands)

KEY ASSUMPTIONS



Assumptions

- Metro network length will increase from 45 km currently to 161 km by 2031 with gradual addition of 107 km of phase-2.
- Rail ridership is estimated at a rate of 5241 trips/km of network-based on the current ridership trends
- The mode share of the Public Transport (PT), including buses and metro will increase as given by CMP based on future scenario.
- Except for electric buses, all other buses are assumed to be non AC diesel buses.

Data Sources:

- MTC Annual Reports [2015-16, 2016-17, 2017-18, 2018-19]
- Comprehensive Mobility Plan (CMP) for Chennai Metropolitan Area (CMA) for the year 2035 [February 2018]
- www.urbantransportnews.com/chennai-metro-information-tenders-routes-and-project-updates/
- World Urbanization Prospects: The 2018 Revision [UN]: Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2018, by Country, 1950-2035 (thousands)

FLEET AND FUNDING ESTIMATION SCENARIOS



Three scenarios are taken up for the fleet and cost estimation for MTC bus service.

Scenario 1

Business as Usual (BAU) demand and supply conditions

- Fleet demand for the future is estimated based on past trends of operations (vehicle km operated per day; daily vehicle utilization, share of hired buses), assuming no change in vehicle technology

Scenario 2

Increased bus demand induced by sustainable scenario

- In this scenario, the bus fleet needs are estimated for targeted mode share and trip lengths predicted from the sustainable transport vision of the city's Comprehensive Mobility Plan (CMP)
- The sustainable transport vision is based on changes in public transportation after introduction of social, economic, environmental and technological transitions in Chennai.
- All buses are assumed to be BS-VI Non AC Diesel buses owned and operated in-house

Scenario 3

Scenario 2+ Electric buses

- This scenario uses the fleet estimation from scenario 2 with the additional assumption of inducting electric buses along with diesel buses to fulfill the demand
- Further, the scenario also assumes 100% electric bus procurement after 2023

CONCLUSION: MTC CHENNAI FLEET AND FUNDING NEEDS



MTC current fleet size for district services is 3,679

- MTC has excess of 108 buses due to declining demand in 2020 in case of business as usual and would require a total of 2,544 buses by 2031
- When based on CMP Sustainable Transport scenario, the demand for PT increases, then MTC would require 3,596 additional buses in 2020 and 13,498 buses by 2031

Based on Fleet and Cost estimation model, for three scenario, the key conclusions are

- In the BAU scenario, the cumulative CAPEX+OPEX is likely to be **INR 51,378 crore** between FY20-21 to FY30-31 for inhouse corporation owned buses which is less than that of scenario 2 of demand increase (CAPEX+OPEX: **INR 1,95,254 crore**) by **INR 1,43,876 crore**. This can be attributed to the less requirement of fleet and infrastructure in scenario 1
- In the demand increase scenario, cumulative CAPEX+OPEX for diesel only buses (S-2) is more than that in electric bus scenario (S-3: **INR 1,72,686 crore**) by **INR 22,568 crore**. This is so because, the high CAPEX in S-3 is overcome by high OPEX in S-2. Based on past trends, the OPEX for diesel buses increases at an avg. rate of 15% per annum. (TSRTC OPEX increases at 5% and Hyderabad at 4% per annum)

Summary: The following table summarises the likely OPEX+CAPEX, revenue and the financial deficit which are likely to be faced by MTC when taking up either scenario

Real Costs used in the table

MTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1: BAU - Owned Fleet	3,679	2,544	2,422	1,600	(822)	687	50,691	51,378	23,285	(28,093)
Sce. 2: Sustainable Transport	3,679	13,498	4,039	2,195	(1,844)	7,429	1,87,825	1,95,254	80,395	(1,14,859)
Sce. 3: With all E-bus fleet after 2023	3,679	13,498	4,756	2,195	(2,561)	20,721	1,51,965	1,72,686	80,395	(92,291)

Capital cost: fleet cost + Infrastructure cost

CONCLUSION: MTC CHENNAI FLEET AND FUNDING NEEDS



Real Costs:

MTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1: BAU - Owned Fleet	3,679	2,544	2,422	1,600	(822)	687	50,691	51,378	23,285	(28,093)
Sce. 2: Sustainable Transport	3,679	13,498	4,039	2,195	(1,844)	7,429	1,87,825	1,95,254	80,395	(1,14,859)
Sce. 3: With all E-bus fleet after 2023	3,679	13,498	4,756	2,195	(2,561)	20,721	1,51,965	1,72,686	80,395	(92,291)

Discounted Costs:

The discounted cost with 7% inflation, give a reduction in viability gap for the project

MTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1: BAU - Owned Fleet	3,679	2,544	2,422	1,600	(822)	480	33,201	33,681	16,050	(17,631)
Sce. 2: Sustainable Transport	3,679	13,498	4,039	2,195	(1,844)	5,480	1,14,126	1,19,605	51,036	(68,569)
Sce. 3: With all E-bus fleet after 2023	3,679	13,498	4,756	2,195	(2,561)	14,370	94,425	1,08,795	51,036	(57,759)

Capital cost: fleet cost + Infrastructure cost

KARNATAKA STATE RURAL BUS SERVICES: BUS FLEET, SUPPORTING INFRASTRUCTURE AND FINANCIAL NEEDS

KSRTC

OVERVIEW OF KSRTC OPERATIONS: 2019



Karnataka State Road Transport Corporation or KSRTC is the State Transport Undertaking (STU) for Karnataka state
Some operational indicators for KSRTC are:

Assumptions

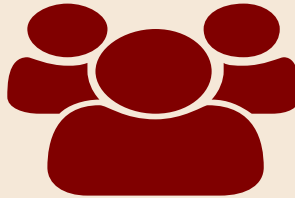
The service km in the intercity services are expected to rise at a rate of 2.63% -an extension of the past trend

All buses acquired after 2023 would be electric buses

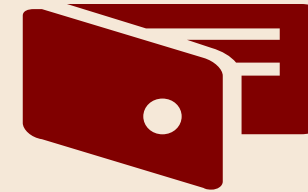
Bus Schedules
17216

Vehicle Utilization
351 Km

Number of passengers transported per day
66.1 lakhs

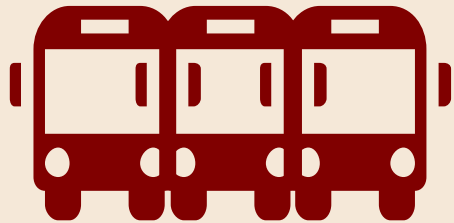


Gross Earning per Km (EPKM)
34.7 ₹



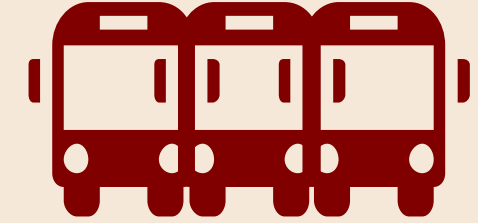
Occupancy Ratio
70%

Gross Cost per Km (CPKM)
36.2



Total Bus fleet
18543

Fleet Utilization
91%



Data Sources:

- KSRTC [Karnataka State Road Transport Corporation] Performance – Profit and Loss report for the year 2017, 2018 and 2019
- Transport Department, Annual Report of The Transport Department for the year 2018-19
- Road transport year book 2015-16 & year 2016-17

FLEET AND FUNDING ESTIMATION SCENARIOS



Three scenarios are taken up for the fleet and cost estimation for KSRTC bus service.

Scenario 1

Business as Usual (BAU) demand and supply conditions

- Fleet demand for the future is estimated based on past trends of operations (vehicle km operated per day; daily vehicle utilization, share of hired buses), assuming no change in vehicle technology

Scenario 2

Increased bus demand induced by shift from Intermediate Public Transport (IPT) to public

- In this scenario fleet demand for the future is estimated based on past trends of operations (vehicle km operated per day; daily vehicle utilization, share of hired buses), assuming no change in vehicle technology
- All buses are assumed to be BS-VI Non AC Diesel buses owned and operated in-house

Scenario 3

Scenario 2+ Electric buses

- This scenario uses the fleet estimation from scenario 2 with the additional assumption of inducting electric buses along with diesel buses to fulfill the demand
- Further, the scenario also assumes 100% electric bus procurement after 2023

CONCLUSION: KSRTC (KARNATAKA RURAL SERVICES) FLEET AND FUNDING NEEDS

A

KSRTC current fleet size for rural service is 18,543



- To fulfil the unmet demand in 2020, KSRTC would require 292 additional buses in 2020, in case of business as usual and would require a total of 24,798 buses by 2031
- If, 25% of potential bus riders, i.e. IPT riders shift to PT then KSRTC would require 3,766 additional buses in 2020 and a total of 29,958 buses by 2031

Based on Fleet and Cost estimation model, for three scenario, the key conclusions are

- In the BAU scenario, the cumulative CAPEX+OPEX is likely to be **INR 1,56,441 crore** between FY20-21 to FY30-31 for inhouse corporation owned buses which is less than that of scenario 2 of demand increase (CAPEX+OPEX: **INR 1,85,036 crore**) by **INR 28,595 crore**. This can be attributed to the less requirement of fleet and infrastructure in scenario 1
- In the demand increase scenario, cumulative CAPEX+OPEX for diesel only buses (S-2) is less than electric bus scenario (S-3: **INR 2,04,788 crore**) by **INR 19,752 crore**. This is due to the high CAPEX associated with electric buses.

Summary: The following table summarises the likely OPEX, CAPEX, revenue and the fund that are likely to be required by KSRTC when taking up either scenario

Real Costs used in the table

KSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1 BAU	18,543	24,798	8,653	7,172	(1,481)	8,392	1,48,049	1,56,441	1,25,322	(31,120)
Sce. 2: Demand Increase	18,543	29,958	9,479	7,522	(1,957)	10,884	1,74,152	1,85,036	1,47,282	(37,754)
Sce. 3: Demand Increase with all E-bus fleet after 2023	18,543	29,958	11,026	7,522	(3,505)	40,555	1,64,233	2,04,788	1,47,282	(57,506)

CONCLUSION: KSRTC (KARNATAKA RURAL SERVICES) FLEET AND FUNDING NEEDS



Real Costs:

KSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1 BAU	18,543	24,798	8,653	7,172	(1,481)	8,392	1,48,049	1,56,441	1,25,322	(31,120)
Sce. 2: Demand Increase	18,543	29,958	9,479	7,522	(1,957)	10,884	1,74,152	1,85,036	1,47,282	(37,754)
Sce. 3: Demand Increase with all E-bus fleet after 2023	18,543	29,958	11,026	7,522	(3,505)	40,555	1,64,233	2,04,788	1,47,282	(57,506)

Discounted Costs:

The discounted cost with 7% inflation, give a reduction in viability gap for the project

KSRTC-Scenarios	Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
	2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Sce. 1 BAU	18,543	24,798	8,653	7,172	(1,481)	5,886	98,776	1,04,662	84,281	(20,381)
Sce. 2: Demand Increase	18,543	29,958	9,479	7,522	(1,957)	7,853	1,15,370	1,23,223	98,337	(24,886)
Sce. 3: Demand Increase with all E-bus fleet after 2023	18,543	29,958	11,026	7,522	(3,505)	27,608	1,10,182	1,37,791	98,337	(39,454)

Capital cost: fleet cost + Infrastructure cost

BANGALORE CITY: BUS FLEET, SUPPORTING INFRASTRUCTURE AND FINANCIAL NEEDS

BMTC

OVERVIEW OF PUBLIC TRANSPORTATION BANGALORE



Bengaluru has two main Public transport Modes

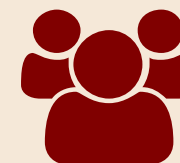
- **Bangalore Metropolitan Transport Corporation or BMTC**
- **Bangalore Metro Rail Corporation Limited (BMRCL)**

Motorized public transport share in metropolitan area

2011	2020
54%	41%



Motorised Mode share



Avg Daily Ridership



Fleet size/ Operated km



BMTC buses

37%

**35.6 lakhs
(2018-19)**

6,521 buses



**Bangalore
'Namma' Metro
Rail**

4%

4.5 lakhs

42.3 Km

Data Sources:

- BMTC Performance Indicators
- BMRCL Data
- Bangalore Revised Master Plan, 2015
- World Urbanization Prospects: The 2018 Revision [UN]: Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2018, by Country, 1950-2035 (thousands)
- CTPP, Bangalore, 2011

KEY ASSUMPTIONS

Assumptions



- The number of trips per person (motorized trip rate) will increase from 0.9 to 1.1 with increase in income and improved economy
- The average travel distance will increase owing to the spatial expansion of the city
- The public transport share will reduce to 30% in the business as usual scenario by 2030
- The metro trips will constitute 25% of the public transport trips in business as usual scenario, 2030
- Metro network length will increase to 200 km by 2030
- Metro ridership estimated at a rate of 9523 trips/km by 2030 in public transport scenario
- Bus km/day will decrease at a rate of 1% per annum in the current increasing traffic scenario
- This scenario uses the assumption of inducting electric buses along with diesel buses to fulfill the demand. Further, 100% electric bus procurement is assumed after 2023

Data Sources:

- BMTc Performance Indicators
- BMRCL Data
- Bangalore Revised Master Plan, 2015
- World Urbanization Prospects: The 2018 Revision [UN]: Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2018, by Country, 1950-2035 (thousands)
- CTP, Bangalore, 2011

CONCLUSION: BMTC (BANGALORE) FLEET AND FUNDING NEEDS



BMTC current fleet size is 6,521

- To fulfil current demand, BMTC requires 3,046 additional buses in case of improved public transport scenario in 2020 and a total 17,853 buses by 2031
- The BMTC Vision plan envisages the growth for the next 10 years. According to the plan, the viable scenario for BMTC is the improved public transport scenario with procurement of only electric buses after the year 2023
- Bangalore model is thus limited to this one scenario, as discussed with BMTC and finalised

Given below is summary tables of capital and operational cost which would be incurred by BMTC.

BMTC-Scenarios		Fleet estimates		Financial needs for FY 2020-21 (in INR Crores)			Cumulative financial need from FY 2020-21 to FY 2030-31 (in INR Crores)				
		2020	2031	CAPEX + OPEX	Revenue	Financial Deficit	CAPEX	OPEX	CAPEX + OPEX	Revenue	Financial Deficit
Improved public transport scenario + electric bus	Real Cost	6,521	17,853	5,061	2,698	(2,363)	29,546	53,539	83,085	62,223	(20,862)
	Discounted Cost	6,521	17,853	5,061	2,698	(2,363)	20,689	36,084	56,773	41,265	(15,508)

Capital cost: fleet cost + Infrastructure cost

CONTENTS

1. Background
2. Approach and Methodology
3. Part – I – Fleet & Funding Assessment
 - A. Methodology for fleet and funding assessment
 - B. Demand estimation for FIVE STUs
 - C. Key Takeaway
4. Part- II – Financing Public Bus Transport
 - A. Urban Bus Transportation in India- Changing landscape & Procurement Models
 - B. Assessment of financial health of five State Transport Undertakings
 - C. Assessment of existing guidelines, Public Bus Financing entities and Urban Infrastructure Finance Intermediaries
 - D. Proposed structure of State Bus Transport Fund (SBTF)
 - E. Summary of findings and recommendations for fund

KEY TAKEAWAY 1

The analysis supports decision makers with indicative fleet and funding needs while planning for a State level funding facility for buses.

Across STUs, the BAU trend points to stagnant service levels and increasing financial losses due to steady increase in staff and fuel costs which are not matched with commensurate increase in fare levels due to affordability considerations of bus users.

Further, the transition to electric buses would require higher investments given the higher capital needs of electric buses due to higher vehicle cost and supporting infrastructure needs such as charging and electric infrastructure

A state level facility that funds STUs for meeting the improved service and emissions performance needs to be set up as discussed in the subsequent sections

01

02

03

04

05

06

07

Alternative scenarios of fleet and funding needs were analysed for five case State Transport Undertakings (STUs) under varying travel demand conditions, operating models (owned/ hired) and vehicle technologies (diesel/electric) assuming that the current operating performance, cost and revenue trends will continue even in the future

Meeting the sustainable transport vision identified by Hyderabad, Chennai and Bangalore points to the need for a 2-4 fold increase in the bus fleet size of these cities. Even rural and intercity service providers such as TSRTC and KSRTC will require a substantial increase in fleet size to cater to the unmet latent demand for bus transport

Improving bus service levels and their transition to zero emission electric buses will require sustainable non-fare funding sources that support STUs' Capital and Operational expenditure needs.

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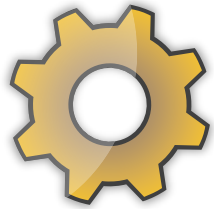
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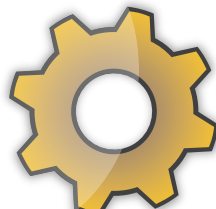
URBAN BUS TRANSPORTATION IN INDIA- CHANGING LANDSCAPE & PROCUREMENT MODELS

In the first section, we have estimated the future demand for bus fleet, allied infrastructure and associated cost for five STUs. To identify funding opportunities for this scale of demand, we need to first assess various public bus procurement models involved, analyze financial health of the chosen five STUs, identify alternative financing mechanisms and its applicability etc.

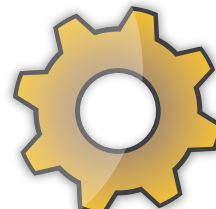
This section focuses on assessing various procurement models adopted in India and Globally, along with key enablers for the same by diving into the following key elements:



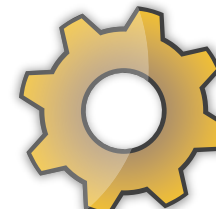
Changing
landscape of
institutes and
enablers for
adoption of models



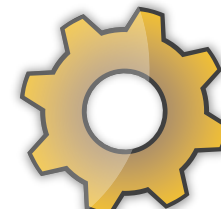
Assessment of public
bus procurement
models adopted by
global transport
authorities & Indian
STUs, with special
focus on selected 5
Indian STUs



Assessment of
global transport
authorities



Assessment of
typical
advantages and
disadvantages of
the bus
procurement
models



Assessment of
enablers for
preferring relevant
models

PUBLIC BUS TRANSPORTATION IN INDIA

INSTITUTIONS INVOLVED — CHANGING LANDSCAPE

The emergence of new forms of institutions involved in managing Public Bus Transport (PBT) and post 2005 reforms in urban transportation, have played a significant role in boosting PBT and promoting newer procurement models.

It is therefore essential to understand the changing landscape of these institutions in order to assess key enablers for adoption of different bus procurement models. And the reforms undertaken in 2005 are covered in subsequent slides.

In India, Public Bus Transport System is managed by Transport Undertakings (TUs) having its jurisdiction over urban or rural or both areas. There are FOUR key types of TUs as highlighted in the adjacent chart.

- The oldest form is State Road Transport Corporations (SRTC) formed under the Road Transport Corporations Act, 1950. The financial health of these SRTCs is significantly poor, evident from their cumulative operating losses amounting to approximately INR 16,000** crore in FY 2017.
- The Newly formed TUs are either formed under the Companies Act or act as an SPV of ULB and/or Urban Development Authority (UDA).

The large scale SRTCs with their legacy issues are reluctant to adopt newer procurement models and involving private players.

Whereas the urban TUs, especially incentivised through government schemes such as JnNURM, are more open to adoption of newer or innovative procurement models.

State / city Transport Undertakings classified based on organizational and financial set up

State Road Transport Corporations (SRTCs) formed under the Road Transport Corporations Act, 1950.

E.g. APSRTC, KSRTC, TNSRTC, MSRTC etc.

Set up as Government Department or Municipal Undertakings.

E.g. Chandigarh TU, State Transport Punjab, Mizoram ST, New Mumbai Municipal Transport etc.

Old Transport Undertakings formed under Companies Act. E.g. MTC Chennai, erstwhile Pallvaram Transport Corporation etc.

Newly formed TUs under Companies Act or as a SPV of ULB &/or UDA. Most of these are promoted under National Urban Transport Policy (2006) and JnNURM scheme (2005). E.g. Jaipur —AICTSL, Ahmedabad Janmarg, Pune-PMPML etc.

PUBLIC BUS TRANSPORTATION IN INDIA

ENABLERS

“Post 2005, six areas witnessed reforms in the urban bus industry – 1) policy-level initiatives; 2) on-the-ground pilot projects; 3) technological applications; 4) branding initiatives; 5) financing efforts; and 6) the advancement of bus-based transport to Bus Rapid Transit Systems (BRTS). At various levels and scales, these reforms are paving the way for increased modal shares of public transport in India.” - *WRI India*

In the last few years, the Indian Government, along with the support of global institutions, introduced some policy-based improvements to the transport system. These initiatives were aimed at providing technical and financial inputs.

National Urban Transport Policy 2006

Central Government's JNNURM Funding Programme

The Global Environment Facility (GEF) Funding

Urban Bus Specifications (UBS) II

On-the-ground Pilot Initiatives - Large-scale Route Rationalization by BMTC, Bangalore, Land Provisions and Financial Assistance for bus services in Mumbai, Fuel Efficiency Training in APSRTC, Innovations in Contracting Bus Services in Delhi, Public-Public Partnership Model at Jaipur

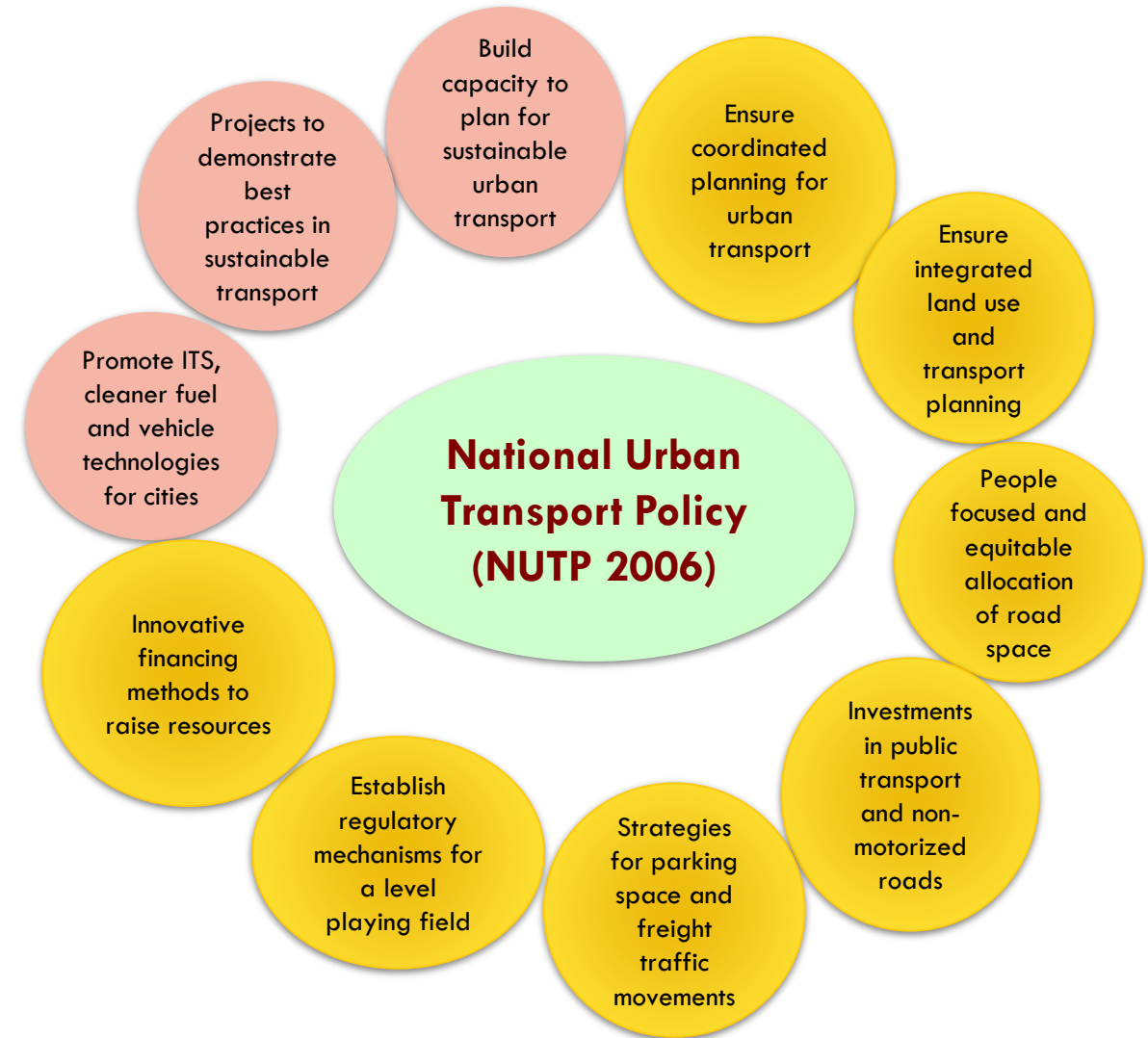
PUBLIC BUS TRANSPORTATION IN INDIA

KEY ENABLERS — NATIONAL URBAN TRANSPORT POLICY 2006

- The first major national urban transport policy to focus on strengthening the ecosystem for comprehensive improvements in urban transport services and infrastructure.
- The policy focus here is more on moving people rather than vehicles.

NUTP focuses on:

- Incorporating urban transportation as an important parameter at the urban planning stage rather than being a consequential requirement.
- Establishing effective regulatory and enforcement mechanisms that allow a level playing field for all operators of transport services and enhanced safety for the transport system users



PUBLIC BUS TRANSPORTATION IN INDIA

KEY ENABLERS — JNNURM SCHEME



- In 2009, under **JnNURM program**, **bus funding** was made available to 67 cities to boost Public Bus Transportation
 - In Phase-I 63 cities and in Phase-II 70 cities benefited, where 22,361 buses were sanctioned*
 - Total sanctioned projects worth: INR 9,327 cr*
- **Reform** requirements such as the following were focused on strengthening the ecosystem for public transportation.
 - Formation of Unified Metropolitan Transport Authority (UMTA) and Urban Transport fund (UTF) for long term sustainability of Urban Transportation
 - Formation of Special Purpose Vehicle (SPV) at ULB level
 - Fare Policy for operational sustainability
 - Operation through private sector to reduce operating cost and improve efficiency of operations
 - Parking & advertisement policy - to encourage and incentivize public transport



- Achievements under JnNU to boost public bus transportation,
 - Number of city specific transport SPVs formed: 28
 - Urban Transport Funds created: 17
 - UMTA formed: 16
 - No. of cities implemented Parking & Advertisement Policies: 8
 - Implementation of BRTS in 11 cities and Intelligent Transport System
 - Success Model of Operation on Private Operator (PPP):
 - Bhopal, Ahmedabad (AMTS → JanMarg)
 - Indore, Bhubaneswar, Puri
 - Fare Policy, eg: Ahmedabad, Karnataka

(*Source: Presentation by C K Khaitan, year 2014, MoUD, Gol)

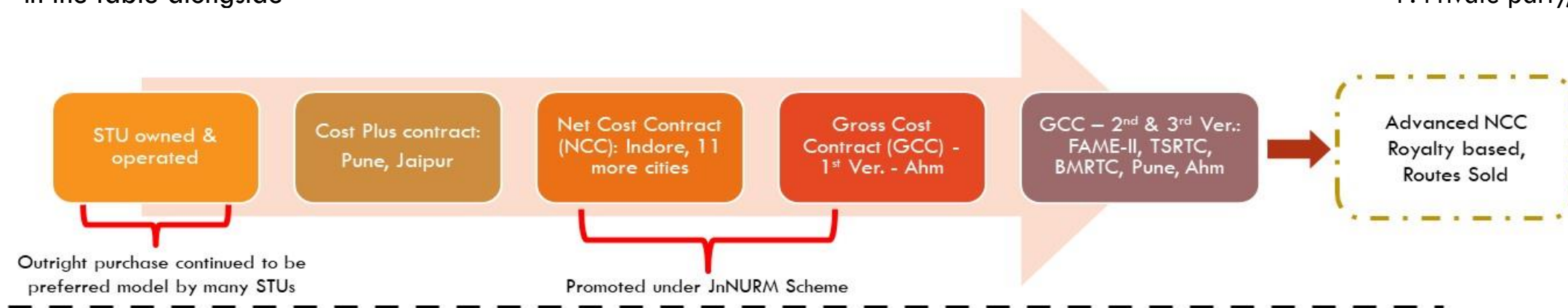
EVOLVING PROCUREMENT MODELS – JOURNEY SO FAR

- **Outright purchase** of buses continued to be priority for most of the STUs. However, policy push through NUTP-2006 and funding support under JNNURM scheme incentivized many STUs to adopt GCC and NCC kind of models, and in some cases hybrids of these models.
- **Under GCC and NCC models**, the bus is procured by either the STU or the private player, but the bus operations is with the private player
- The type of contract is decided based on key parameters – bus ownership, bus operation, responsibility for revenue collection and fare fixation
- The comparison of various models across these parameters is given in the table alongside

Comparison of various models across key parameters

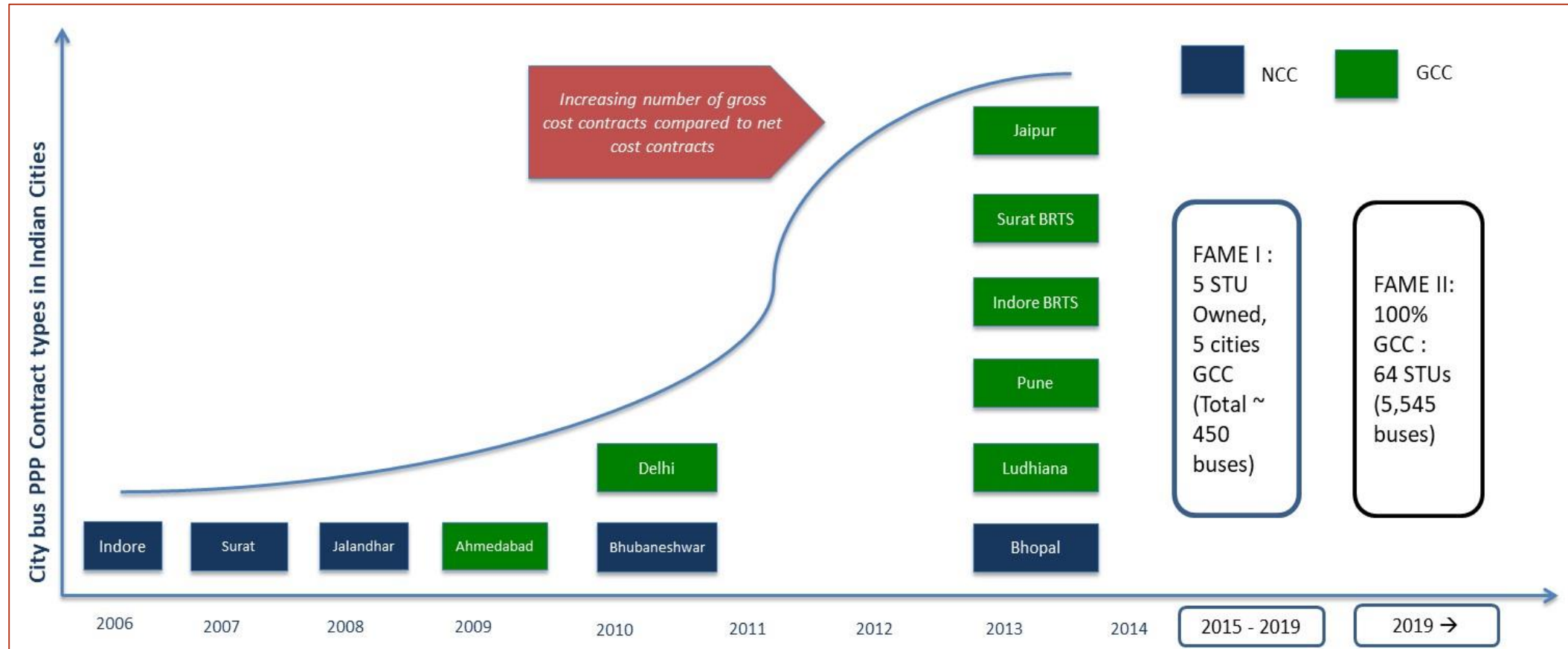
Model-> Functions	Open Market with regulations	NCC	GCC	Monopoly
Procurement of Vehicle	P	P or G	P or G	G
Bus operation	P	P	P	G
Bus maintenance	P	P	P	G
Route Planning & Sche.	P	P and G	G	G
Monitoring	-	G	G	G
Fare Collection	P	P	G	G
Fare Fixation & revision	P and G	G	G	G
Provision of Infra.	P (if required)	G	G	G

P: Private party, G: Government



GCC MODEL IS BEING INCREASINGLY ADOPTED, YET THE SCALE OF ADOPTION IS LOW

Adoption of GCC model started picking around 2011-12, while very few cities adopted NCC model due to reasons such as no periodic tariff revision, high revenue risk for pvt. player, poor baseline data etc. Further, FAME scheme promoted adoption of GCC model for procurement of e-buses. Despite these provisions favoring their adoption, the scale of adoption for GCC models remains low and further even lower for NCC models.



PROCUREMENT MODELS ADOPTED BY 5 STUs

Model/ STU →	MTC, Chennai	TSRTC	BMTC	KSRTC	AICTSL
Outright purchase	Yes	Yes	Yes	Yes	Yes
GCC or hybrid GCC	Yes GCC - bids floated for E buses under FAME-II	Yes >20% current fleet	Yes GCC - bids floated for E buses under FAME-II	Yes GCC - bids floated for E buses under FAME-II	Yes
NCC	---	---	---	---	Yes, Bus procured by AICTSL and given on VGF

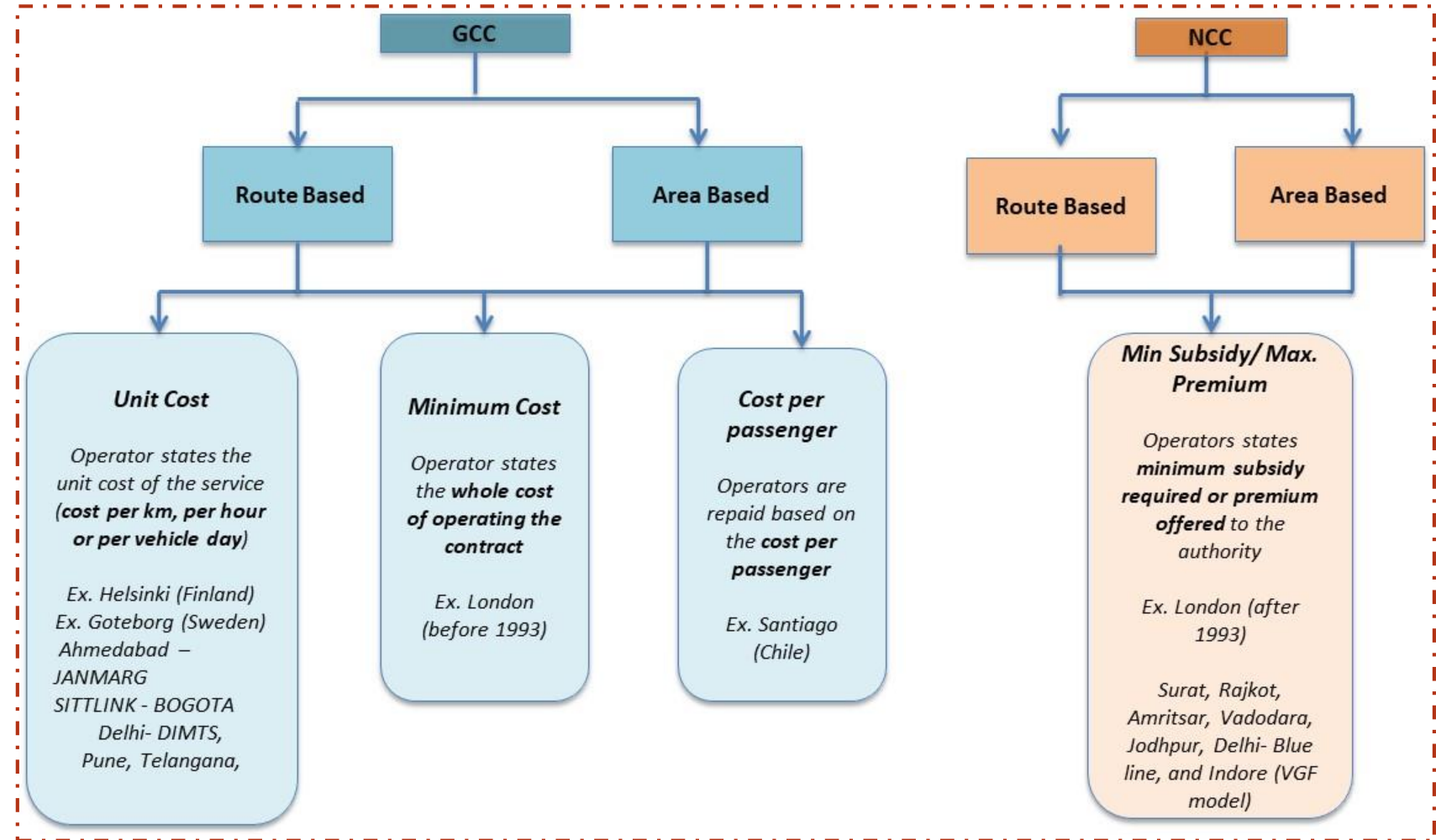
Only TSRTC shows wider adoption of GCC (>20% of fleet), whereas Indore, which has smallest fleet among these five STUs, has tried NCC model. BMTC , KSRTC and MTC Chennai, who have combined fleet of 28,743 buses are exploring GCC model for FAME-II e- buses as its mandated by Gol.

SUB TYPES OF GCC & NCC MODELS

The sub types or variants of GCC and NCC models are adopted based on payment mechanism set with the private operator.

In GCC model, revenue risk is with Government whereas in NCC model revenue risk (fully/partially) is with the private player.

Private operator is paid either through area based or route-based method.



GCC & NCC MODELS – PROS AND CONS

GCC

PROS

- Easy bid process and contract management
- Flexibility in changing schedules, fares, services
- Upfront CAPEX is reduced to certain extent
- Reduced O&M Risk of STU
- Significant bonuses or penalties linked to service targets of Pvt. Op.
- E-buses- reduced exposure to new tech
- E-buses- reduced battery risk of STU

CONS

- Risk of revenue leakage is borne by STU
- No incentive for high ridership
- Needs effective monitoring
- Financial capacity of Operator should be good
- Good OEM need not be good Operator
- If upscaled beyond certain level, existing manpower will be underutilized

NCC

PROS

- Compensation is based on operating cost less revenue earned by Pvt. Op.
- Risk of revenue leakage borne/ shared by operator
- Reduced O&M cost recovery burden on STU
- Effective incentive for high ridership
- Financial commitments of public entity are low

CONS

- Need to specify fares and other details upfront
- Proper baseline on routes, ridership is required so as to avoid risk premium
- Risk of passenger capture techniques being adopted
- Complex tendering and contracting process
- Rigidity - difficult to make changes (route, schedule, fleet size) during contract period
- Potential for disputes high

KEY REASONS FOR LESSER ADOPTION OF GCC & NCC

Although GCC and NCC models promote larger participation of private players to improve service levels and reduce operating costs, STUs have still refrained from adopting them at scale. Key reasons for lesser adoption of NCC and GCC models are as follows:



No periodic revision in legacy tariff policy

- lack of political and administrative will for periodic revision of tariff policy
- no adequate reflection of cost of inputs, service quality parameters & operational productivity
- no mechanism for calculating 'subsidy' in case of no revision



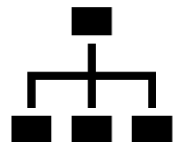
Inadequate operations planning for the system

- Poor baseline on trip data, number of trips and frequency
- Capacity to carry out route rationalization is missing
- Lack of capacity - contract management, to use Tech./ IT for operations



Absence of robust institutions

- STUs have operating losses and rely on govt. subsidy and therefore, they have limited autonomy in decision making
- Typically administrative heads have shorter stints at STUs, which leads into lack of vision in planning
- Change in management is key as strong worker unions are reluctant to adopt PPP and outsourcing models



PROCUREMENT MODELS FOR E-BUSES

Globally, electric bus is still nascent technology and involves high upfront capital cost, but low O&M cost. It requires additional investment in charging infrastructure. The cost of battery is around 50% of the bus cost hence battery efficiency and technology plays an important role.

Key models of E- bus procurement are:

- Outright purchase with subsidy by Government
- GCC model with private player bearing the capital cost with partial subsidy by government
- Battery leasing model where the battery manufacturer bears CAPEX of battery and lease it to public



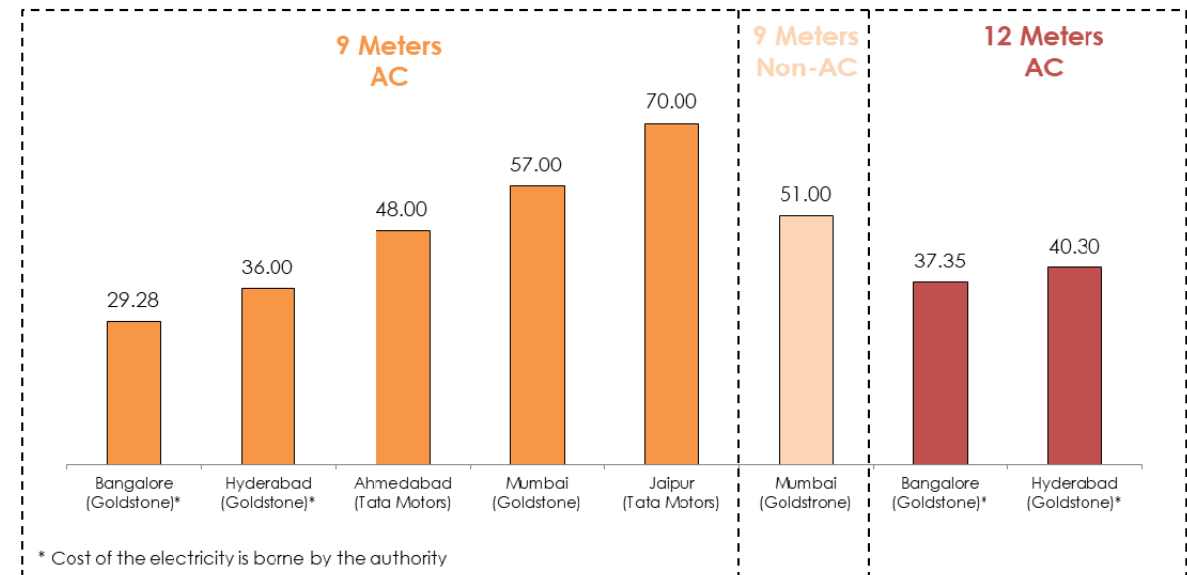
FAME-I: E-BUS PROCUREMENT: MIX OF OWN PURCHASE + GCC MODEL

- **Faster Adoption and Manufacturing of Hybrid and Electric (FAME)** Vehicles is part of the National Electricity Mobility Mission Plan (NEMMP).
- Gol launched the FAME-I program in Mar 2015 to provide a push for early adoption and market creation for both hybrids and EVs.
- Under FAME –I scheme, Gol provided subsidy to 11 cities for procuring > 450 buses
 - 12 m size bus : INR 100 Lakh subsidy
 - 9 m size bus : INR 74 Lakh subsidy
- Among them, 50% of the cities/ STUs adopted **GCC model** while remaining 50% cities adopted **Outright Purchase** model
- Length agnostic subsidy resulted in STUs preference (65% of total buses) for 9 m buses

Source: UITP Report on Electric buses procurement in India – Indian cities got the viable rates

Model	Cities	No. of Buses
GCC	Bangalore, Mumbai, Hyderabad, Ahmedabad, Jaipur	240 (mix of both 9m and 12m size; AC/ non AC)
Outright Purchase	Indore, Lucknow, Kolkata, Jammu, Guwahati	150 (mix of both 9m and 12m size; AC/ Non AC)

Bid Price in Different Cities – INR PER KM

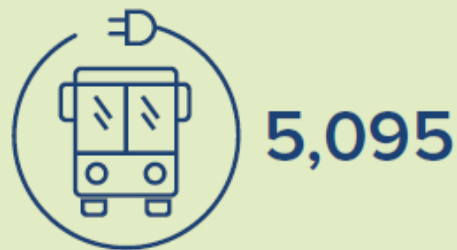


*Bangalore, Mumbai, Ahmedabad and Jaipur tenders cancelled – status as on Mar 2019

FAME-II: E-BUS PROCUREMENT: GCC MODEL RECOMMENDED BY GOI

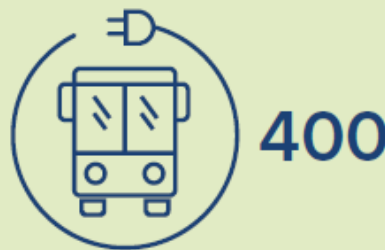
FAME - II scheme was launched in 2019, and a total of **5,545 e-buses** were sanctioned for **64 STUs** on **GCC model**.

- Electric bus is still a nascent technology with high capital cost and the STU's capacity is inadequate to manage its operations. Therefore, GoI has recommended **GCC model** to promote major role for the private players and to reduce the risk of capital and O&M cost on STUs; and at the same time improve efficiency and service levels.
- STUs will get **subsidy** of **INR 50 lakh per e-bus**. Many STUs have started bid process for selecting private party.



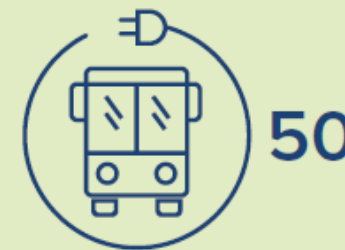
5,095

E-BUSES FOR INTRACITY ROUTES
(SUMMARIZED IN TABLE 1)



400

E-BUSES FOR INTERCITY
OPERATION



50

E-BUSES FOR LAST-MILE
CONNECTIVITY FOR DELHI
METRO RAIL CORPORATION
(DMRC)

PROCUREMENT MODELS - INSIGHTS FROM PRIVATE PLAYERS/ OEM

Insights based on interaction with OEMs -

- Pvt. Players prefer out right purchase for bulk orders and GCC for small size orders as expenditure under GCC is accounted as **capex in OEM's books**
- E-buses – since the government subsidy is available under FAME, the private players are comfortable in adopting GCC model but again there are regional disparities due to political and institutional setting
- E-buses - there are credit challenges for **Bus Operator's Co-operative** due to higher capital cost of E-buses
- **Credit challenges** for OEMs due to **lack of payment guarantee from STUs/ State**, hence State viability gap funding is necessary
- Many STUs lay stringent **penalties on OEMs** even though many times delays are beyond their control
- Needed well structured Viability Gap Funding model to support Capex and Opex of public bus transportation
- **Some pvt. players prefer NCC model**, as it ensures assured cash flows, but due to lack of route rationalization, old tariff structure with no periodic revision and absence of good baseline of data are seen as risks in adoption of NCC model

LEARNING FROM GLOBAL TRANSPORT AUTHORITIES (1/3)

TRANSMILENIO SA (TMSA) BOGOTA, COLUMBIA

Parameter	Details
Planning and coverage	• Upto 1999, there were hundreds of independently operated and uncoordinated private mini-buses • In 1999, TMSA, a public entity to manage bus system was created • Population: 5.5 mn (2018), • Avg. daily ridership 2.06 mn, • Total buses: 2054 • New Integrated Public Transportation System of Bogotá (SITP) is established to manage all Public Transport modes similar to envisioned UMTA in India
Financing	• Public sector's financial investment: fuel tax (46%), local revenues (28%), credit from World Bank (6%), and grants from the national government (20%)
Procurement models	• Advanced NCC model with private operator collecting revenue and provision for performance incentive
Private player involvement	• 10 private operator manage BRTS system under TMSA through : (i) private operator taking revenue risk, (ii) private operator paid on per km and / or also paid for passenger increase

LEARNING FROM GLOBAL TRANSPORT AUTHORITIES (2/3)

SINGAPORE LAND TRANSPORT AUTHORITY (LTA)

Parameter	Details
Background	- LTA owns assets; plan, design, build and maintain Singapore's land transport infrastructure & systems - Pop: 56,40,000 (2018), • Avg daily ridership: Buses: 40,37,000, MRT: 33,02,000, LRT: 1,99,000
Financing	Capex is govt. funded and O&M recovered through fare box, advt., land development etc.
Procurement models	Fixed Fee based Route Leasing model with performance parameters - Long term planning through Bus Contracting Model (BCM) 2016 and Land Transport Master Plan (LTMP) 2040
Private player involvement	- Four bus operators – three private and one public; manage Bus, Metro, LRT & Taxis. LTA retains fare revenue and bears demand risk and manages routes whereas operators are paid a fixed fee to run & maintain bus services

LEARNING FROM GLOBAL TRANSPORT AUTHORITIES (3/3)

TRANSPORT FOR LONDON (TFL)

Parameter	Details
Background	- TfL is a statutory body created by the Greater London Authority Act 1999. They run day-to-day operation of the Capital's public transport network and manage London's main roads. London Bus Services Ltd. (LBSL), a subsidiary company of TfL manages the operator's contracts and looks after monitoring the quality of services.
Financing	TfL is funded from 4 main sources: Fares income- largest source, Other income including commercial activity and income from congestion charge, Grants (including business rates) and Borrowing and cash reserves
Procurement models	- In 1995, London Bus Limited and its 13 subsidiaries were privatized. The Net Cost Contract was introduced. Earlier, To allow for a controlled programme of tendering, until all routes were tendered the subsidiary companies of London Bus Ltd. were funded by a "block grant" agreement to cover the net cost of those services. Eventually the Block Grant agreements converted in the Net Cost Contract. Revenue risk was transferred to the privatized subsidiaries and other private players with incentive to generate more revenue by increasing the quality of the service provided. In 2001, Quality Incentive Contracts were introduced to replace Gross Cost and Net Cost contracts as routes were tendered. These contracts are a development of previous contracts, but with direct financial incentives for operators linked to the quality of service . The new model is extension of the previous GCC Model - LBSL maintains the system's demand risk. Fare evasion risk is underwritten by LBSL, which is in charge of on-bus fare evasion enforcement.
Pvt. Player involvement	Most bus services in London are run by private operators awarded a contract by TfL. These contracts are managed by its subsidiary company London Bus Services Ltd (LBSL), which also looks after planning of routes, setting service levels and monitoring service quality. LBSL updates the operator's contract annually.

Source: TfL website and Report on Comparative Analysis of Bus Public Transport Concession Models by Global Green Growth Institute; Presentation on PPP arrangements in urban transport by Prof. Shivanand Swamy and Gautam Patel

KEY TAKEAWAY 2

REASONS FOR SPECIFIC PROCUREMENT MODELS BEING PREFERRED BY INDIAN STUS

Many STUs continue to adopt outright purchase and leasing models because of -

- Lack of willingness to change existing procurement systems, influence by automobile industries and political decision makers as auto industry in India is a major industrial investor and job creator
- Resistance to change by legacy worker unions, opposition to PPP and outsourcing contracts

However, some STUs still preferred GCC and NCC models because of -

- Push by funding and reforms under JnNURM during 2016-2014, many STUs adopted GCC and newly formed smaller STUs preferred NCC models
- In case of e – buses: the risk of high upfront cost, nascent technology and inadequate capacity of STUs to manage e buses, was transferred to private player through GCC model

01

02

03

04

Proactive STUs like Ahmedabad and Pune chose GCC for diesel and CNG buses (part of the fleet) where the local ecosystem of various stakeholders and leadership played a major role in decision making

Although OEMs prefer Outright purchase, they are adopting other models such as GCC and NCC due to upfront subsidy available from government and to withstand market competition

ESTIMATED SHARE OF KEY MODELS OVER SHORT, MEDIUM AND LONG TERM

Share of Outright purchase may go down from 90% to 65% while increase in adoption of GCC model might lead to increases in it's share from 7% to 20% in next 10 years. NCC may be adopted by more matured STUs with increase in it's share from 1% to 5% in 10 years.

Outright purchase

Short term: 92%

Medium term: 86%

Long term: 75%

GCC Model

Short term: 7%

Medium term: 12%

Long term: 20%

NCC Model

Short term: 1%

Medium term: 2%

Long term: 5%

Short: 0-3 yr

Med.: 3-6 yr

Long: > 6 to 10 yr

Source: CIRT statistics on Fleet Strength as on 31 Mar 2017, JCCD analysis and inputs from experts

TO UPSCALE THESE MODELS — WHERE & HOW DO WE GET FUNDS?



Major source of own revenue for STUs is Fare Box Revenue or traffic revenue, which is 80%-90% of their total revenue. However, most of these STUs have operating losses and the funding for buses largely comes from —

- Government grants either through budget provision or through schemes like (centrally sponsored) JnNURM, FAME etc.
- Borrowing from various entities, which are backed by state guarantees



Therefore, it is necessary to analyze finances of select Five STUs to assess their financial health and explore **alternative financing entity structure/ mechanism to fund** the CAPEX and OPEX in order to meet the future demand and upscale the procurement models.



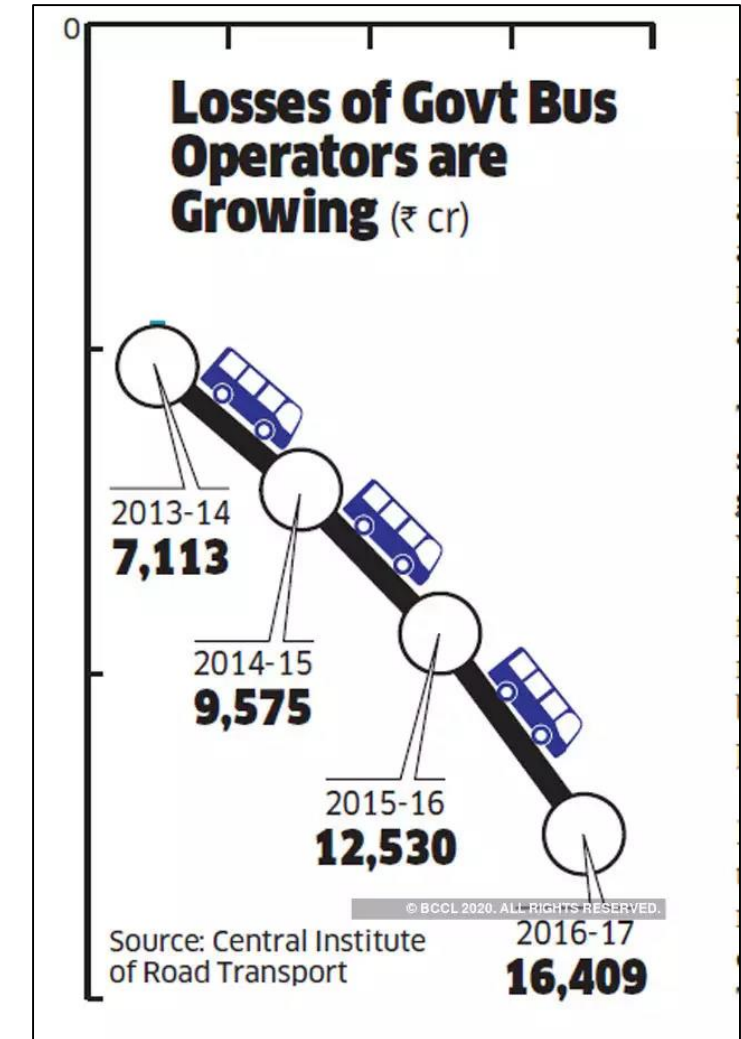
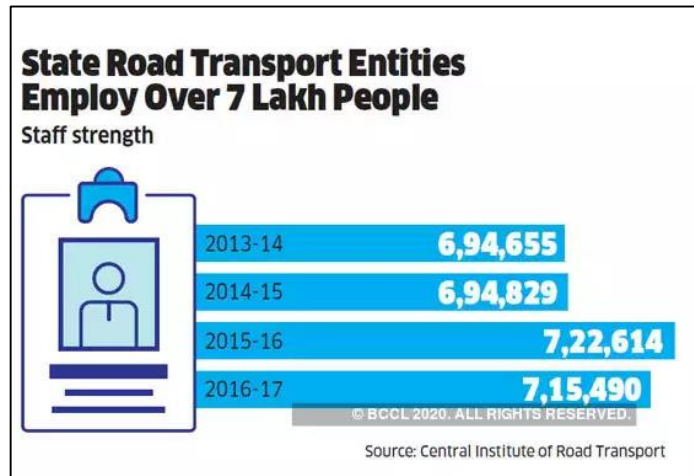
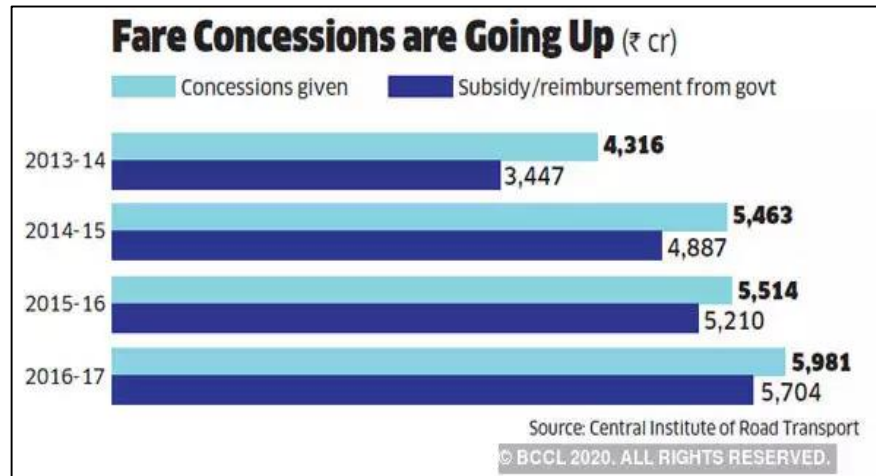
CONTENT

1. Background
2. Approach and Methodology
3. Part – I – Fleet & Funding Assessment
 - A. Methodology for fleet and funding assessment
 - B. Demand estimation for FIVE STUs
 - C. Key Takeaway
4. Part- II – Financing Public Bus Transport
 - A. Urban Bus Transportation in India- Changing landscape & Procurement Models
 - B. Assessment of financial health of five State Transport Undertakings**
 - C. Assessment of existing guidelines, Public Bus Financing entities and Urban Infrastructure Finance Intermediaries
 - D. Analysis of sources of funding
 - E. Summary of findings and recommendations for fund

IN INDIA, MOST OF THE STUS INCUR OPERATING LOSSES

To make better sense of the financial assessment of the FIVE selected STUs, it is important to take a look at financial health of STUs at national level and extra burden of taxes on them.

- There are **50+** government-run SRTC's in India
- In FY17, **combined operating losses of these STUs was INR16,400 Cr, which is >33% of what was in FY16 & 8 times of that in FY07**, highlighting that STUs face challenge in managing **OPEX**
- **Very low non-traffic receipts at 5%** of STU's revenues of INR 46,950 cr in FY17
- **Manpower cost (35% to 60%)** is major component of the operating cost

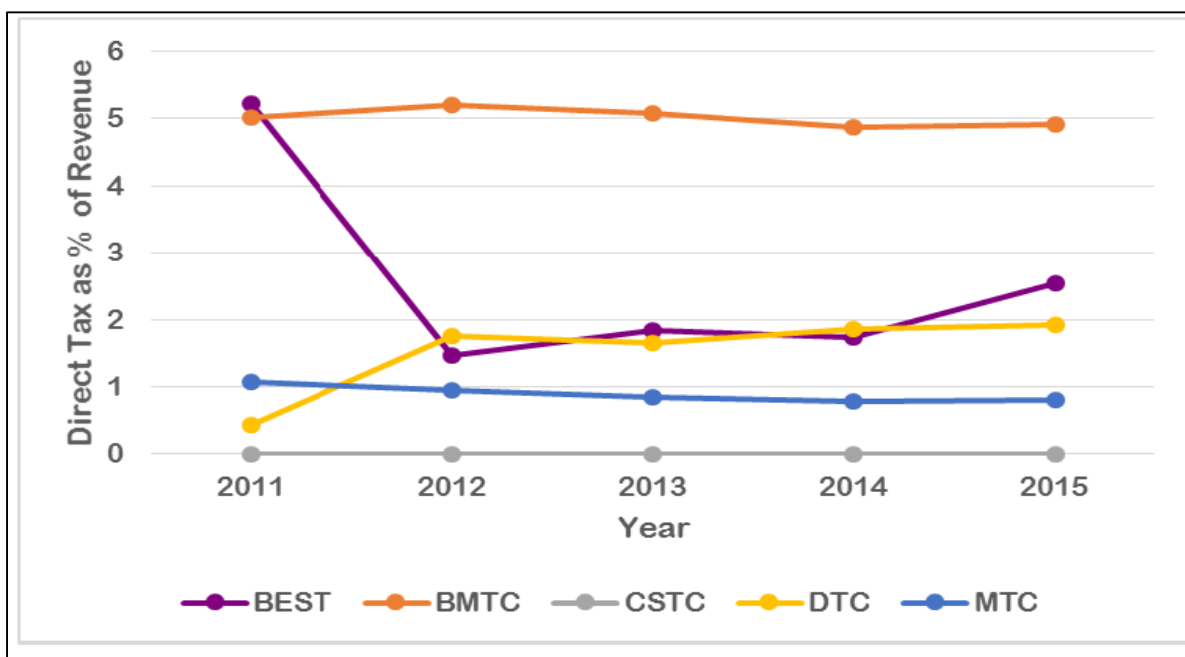
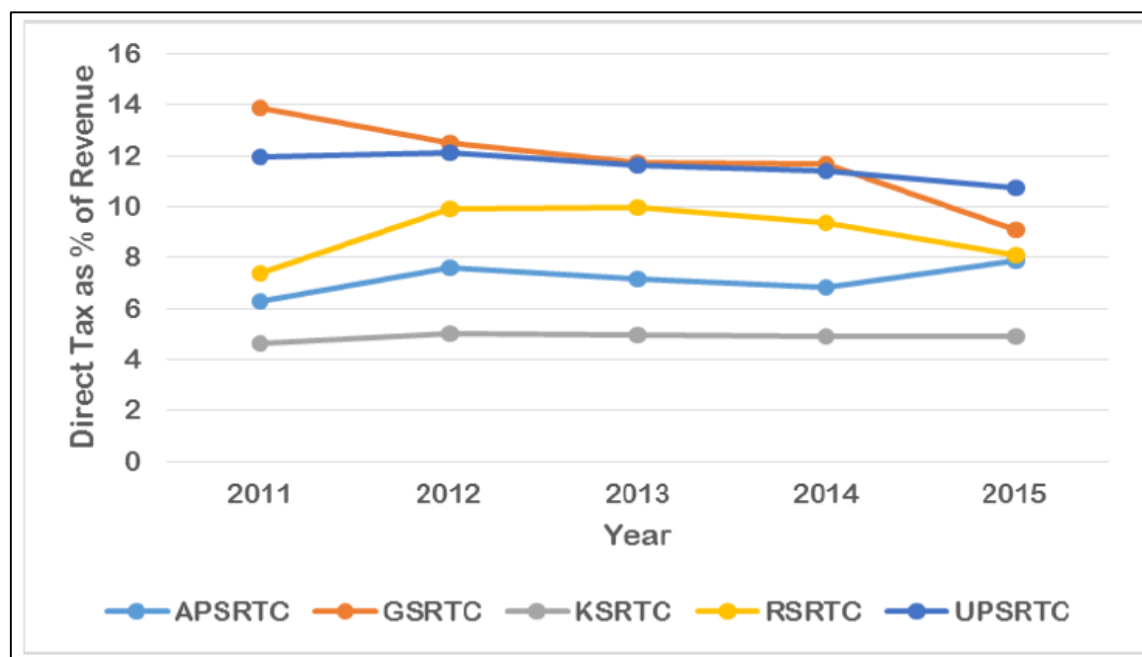


TAXES PUT EXTRA BURDEN ON FINANCIALLY CONSTRAINED STUs

STUs that are already financially constrained need to further pay taxes on a commercial basis despite their social obligations

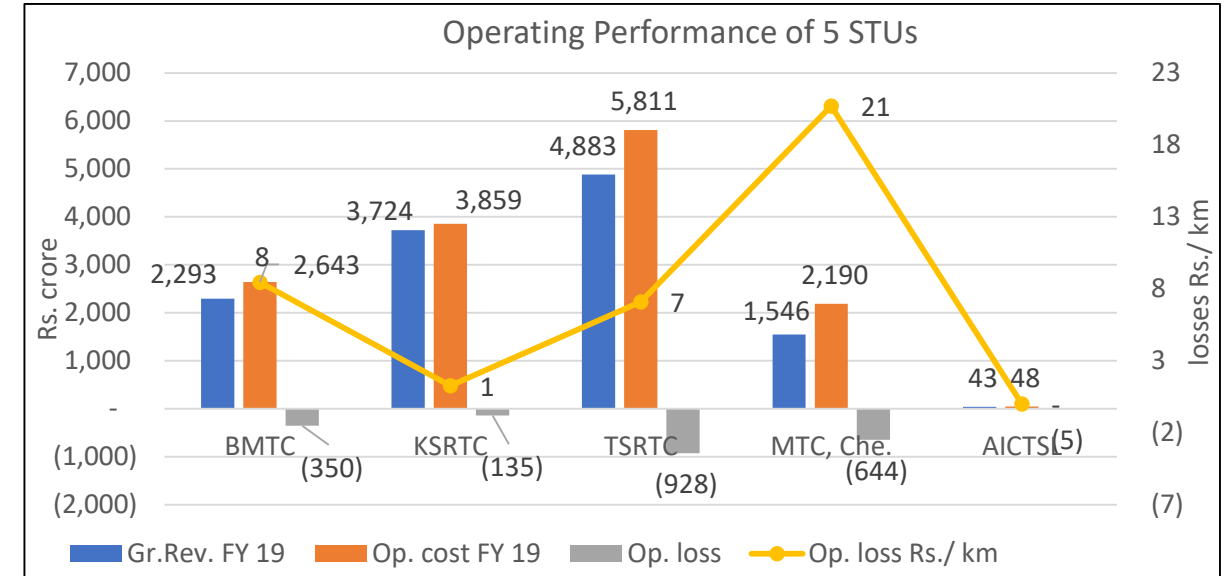
- Financially constrained Indian STUs pay **govt. taxes in the range of 1- 10 % of their revenue**, (study year 2015)
- STUs pay 13 types of taxes, out of which 3 are from center
 - State taxes: Property Tax, Stamp Duty, VAT/ GST, Passenger Tax, Advertisement Tax, Motor Vehicle Tax etc.
 - Center – Excise duty, VAT, GST, Customs
- Most significant direct taxes are **Motor Vehicle Tax & Passenger Tax**

APSRTC: Andhra Pradesh,
GSRTC: Gujarat,
KSRTC: Karnataka,
RSRTC: Rajasthan,
UPSRTC: Uttar Pradesh
BEST: Mumbai
BMTc: Bengaluru,
CSTC: Calcutta
DTC: Delhi
MTC: Chennai



ANALYSIS OF FINANCES OF 5 STUS - KEY OBSERVATIONS

- Cumulative losses of five STUs: **INR 5,442 cr (FY17-19)**
- Wide range of Operating losses/ revenue: **4% (KSRTC) to 42% (MTC)**
- Very less non- operating revenue (< 10%)
- State subsidy for concessions (8% to 13% of total Rev.)
- High HR cost; HR Cost / Op. cost: 41% (TSRTC) to 61% (MTC, Chennai)



Non-Operating to Gross Revenue %	FY17	FY18	FY19
BMTC	6%	9%	10%
KSRTC	5%	6%	5%
TSRTC	5%	5%	6%
MTC, Che.	8%	9%	6%
AICTSL	4%	14%	7%

HR cost/ Operating cost	FY17	FY18	FY19
BMTC	53%	53%	53%
KSRTC	43%	42%	41%
TSRTC	52%	50%	49%
MTC, Che.	61%	61%	61%

Source: Unaudited finances of BMTC, KSRTC, TSRTC, MTC and AICTSL

Telangana State Road Transport Corporation (TSRTC), Karnataka State Road Transport Corporation (KSRTC), Bengaluru Metropolitan Transport Corporation (BMTC), Metropolitan Transport Corporation (Chennai) Ltd. (MTC, Chennai), Atal Indore City Transport Services Limited (AICTSL)

FINANCIAL ANALYSIS OF THE 5 STUs

BORROWINGS AND INTEREST RATES

STUs heavily rely on – (i) State and central govt. grants (through schemes like JnNURM and FAME) for Capex, (ii) State grants and STU's own budget for Opex. Many of these STUs also borrow from various financing entities like commercial banks, state financial intermediaries and state govt. for their Capex and Opex requirements. Few examples -

- In Tamil Nadu, TDFC Ltd. lends to STUs for their Capex and Opex requirements through different types of loans such as hire and purchase loan, loan for MVTax payment, short term and long-term loan etc. The interest rates vary as per the type of loan.
- In Bangalore, BMTC swapped Commercial loan taken for Capex and Opex at an interest rate of 10% with KUIDFC loan @6.5% interest rate under Mega City Scheme Fund. Both KSRTC and BMTC availed loan from KUIDFC for Capex on Bus procurement, construction of bus depot/station etc.

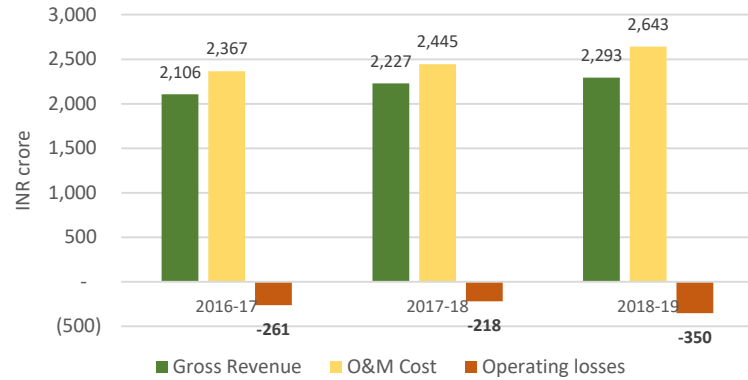
A wide range of interest rates (6.5% to 10.75%) is charged by financial institutions to these STUs, and in some cases it goes up to 14% (e.g. Delhi - DTC)

	BMTC	MTC Chennai	KSRTC	TSRTC
Int. Rate for Borrowing	6.5%	8% - 9%	8.5%-9%	10.5%-10.75%
Lending Agency	KUIDFC*	TFDC*	Banks, Fls, KUIDFC	Banks
Loan outstanding, INR Cr.	1,614	347	748	249

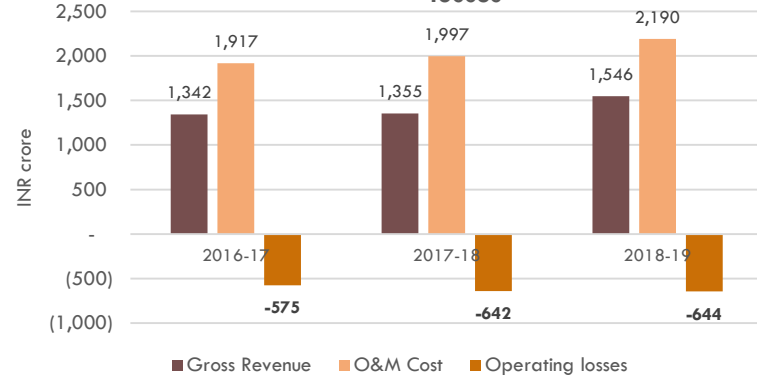
FINANCIAL ANALYSIS OF THE 5 STUS

TRAFFIC REVENUE, GROSS REVENUE, OPERATING COST & LOSSES

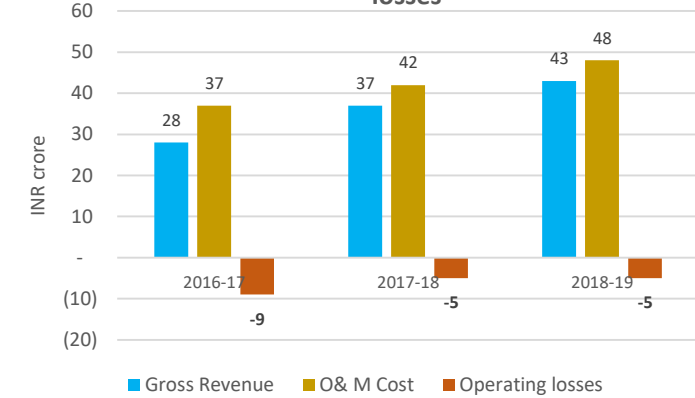
BMTC Finances - revenue, O&M cost and Op. losses



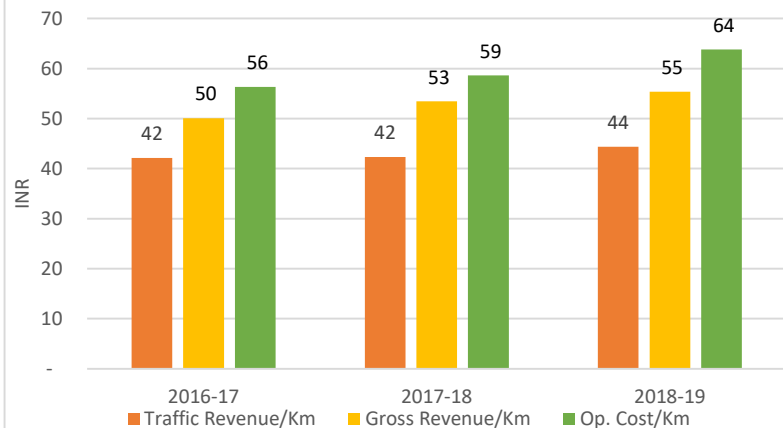
MTC Chennai Finances - revenue, O&M cost and Op. losses



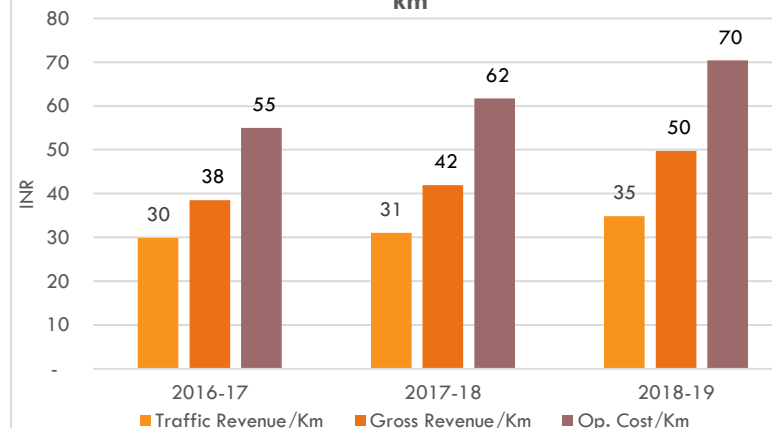
AICTSL Finances - revenue, O&M cost and Op. losses



BMTC Finances - revenue and O&M cost per km



MTC Chennai Finances - revenue and O&M cost per km

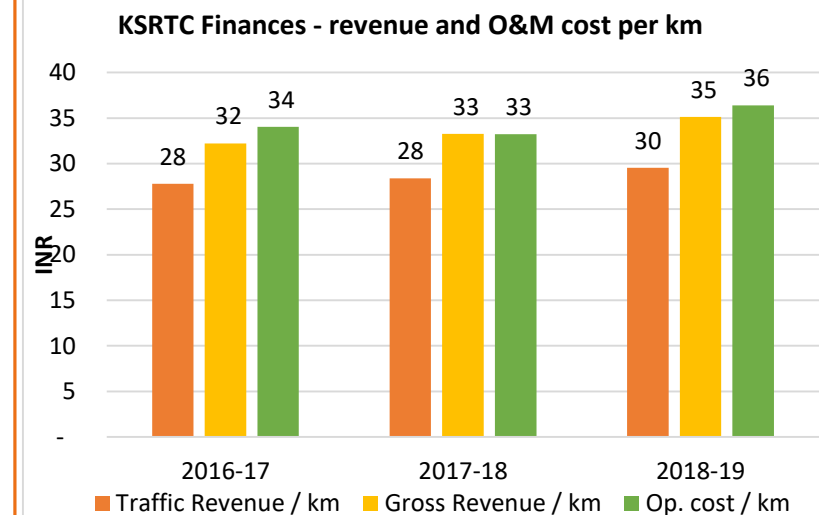
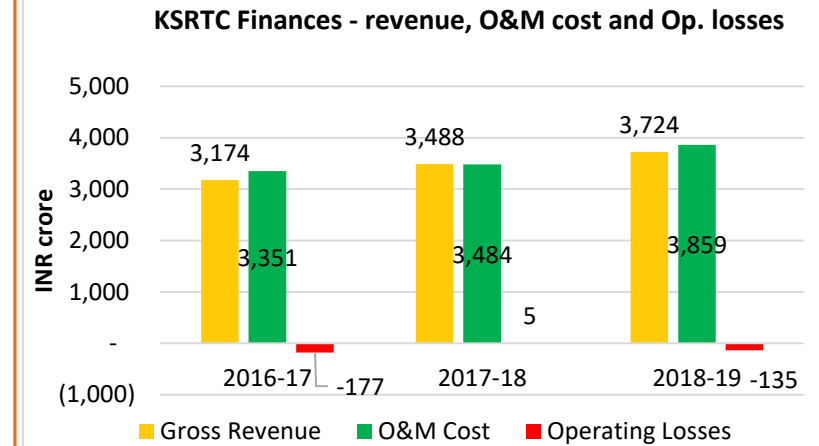
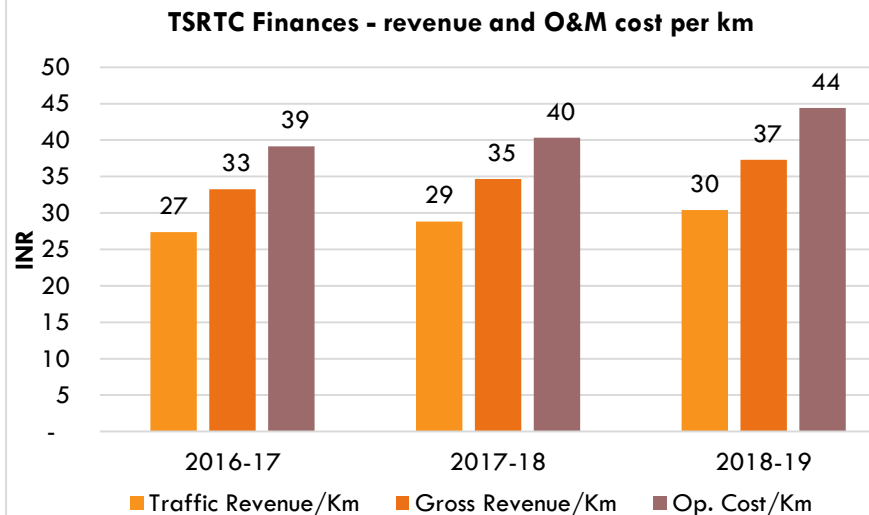
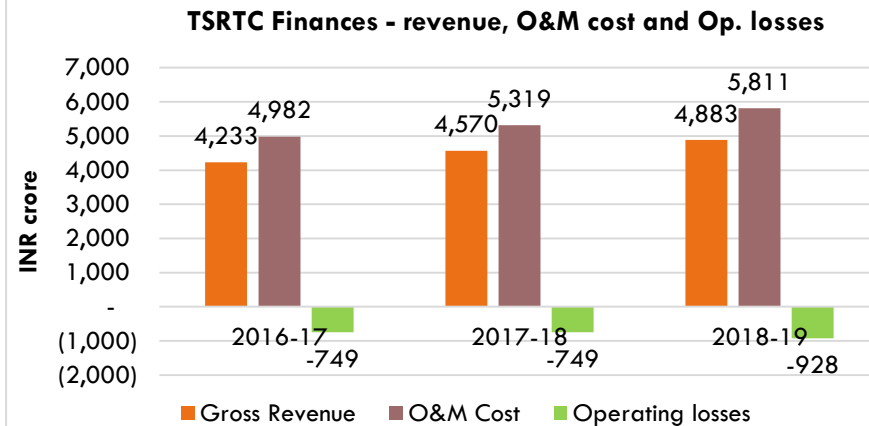


Cumulative losses of 5 STUs are INR 5,442 cr. during FY17 to FY19, again highlighting OPEX challenge.

FINANCIAL ANALYSIS OF THE 5 STUS

TRAFFIC REVENUE, GROSS REVENUE, OPERATING COST & LOSSES

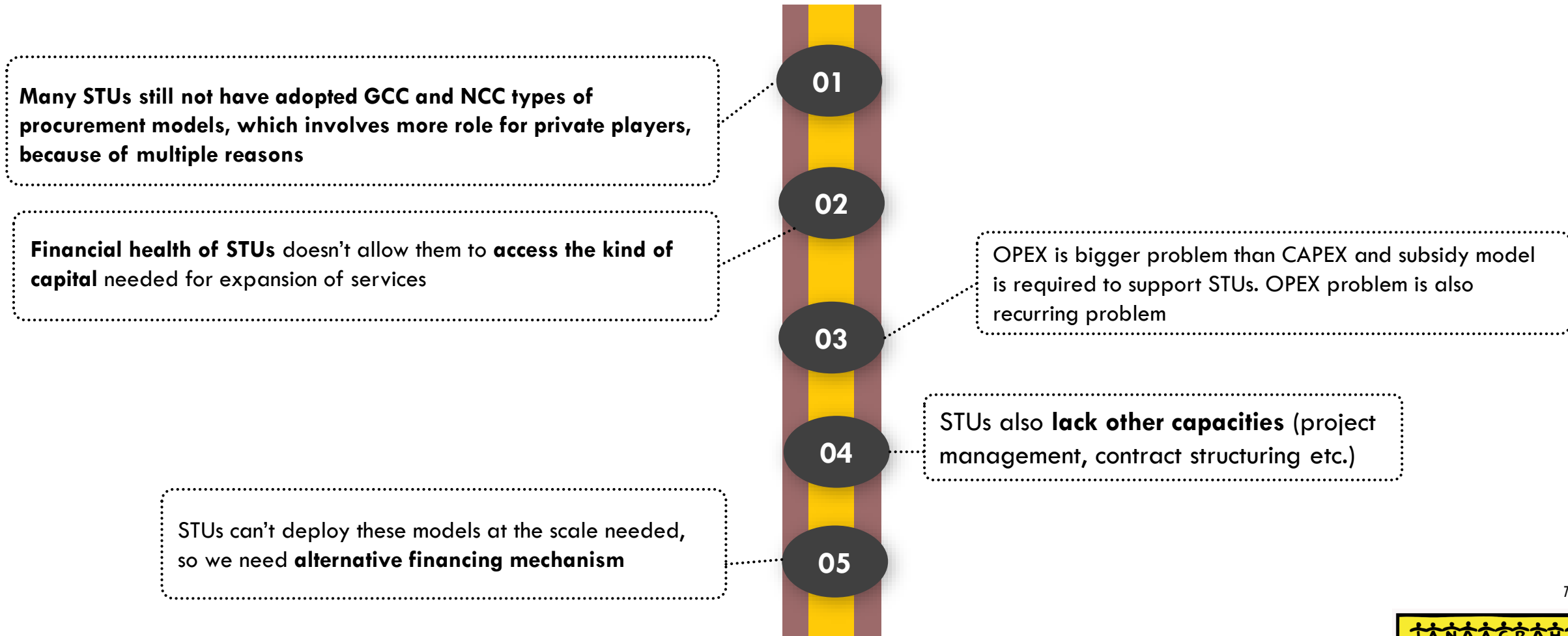
Cumulative losses of 5 STUs are INR 5,442 cr. during FY17 to FY19, again highlighting OPEX challenge



KEY TAKEAWAY 3

DEPLOYING THESE PROCUREMENT MODELS AT SCALE IS A CHALLENGE

There is a need for alternative Financing Mechanism



CONTENT

1. Background
2. Approach and Methodology
3. Part – I – Fleet & Funding Assessment
 - A. Methodology for fleet and funding assessment
 - B. Demand estimation for FIVE STUs
 - C. Key Takeaway
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 - C. Assessment of existing guidelines, Public Bus Financing entities and Urban Infrastructure Finance Intermediaries**
 - D. Analysis of sources of funding
 - E. Summary of findings and recommendations for fund

PUBLIC BUS FINANCING - AREAS OF ASSESSMENT

There is a recognised need to create or use alternate financial structures such as a State level Bus Transport Fund (SBTF) to address capital requirement and financial operating gap of STUs. To frame the structure and functions of the SBTF, there is a need to first evaluate various existing initiatives, guidelines and transport specific state funds. In this regard, we will evaluate following -

- Existing guidelines on Urban Transport Fund (UTF) by MoHUA
- Case studies on State Bus Financing intermediaries/ schemes of Karnataka, Tamil Nadu and Gujarat states

Further to frame recommendations to institutionalise the SBTF, we will evaluate existing Urban Infrastructure Development Finance Corporations

- Assessment of UIDFCs in Tamil Nadu and Karnataka to assess their strengths

This assessment will provide inputs for structuring and institutionalising proposed State level Fund.

FINANCING ENTITY - EXISTING GUIDELINES & MECHANISM

MoHUA Guidelines UTF

MoHUA Guidelines on Unified Metropolitan Transport Authority (UMTA) & **Urban Transport Fund (UTF)**, 2015

Karnataka STF

Karnataka has set up **State Transport Fund (STF)** under Dept. of Land Transport (DULT)

Tamil Nadu TDFC Ltd.

Tamil Nadu - Transport Development Finance Corporation Ltd. (TDFC Ltd.), established in 1975, with objective of **developing fund for capital and working capital requirements of STUs** in Tamil Nadu

Gujarat Viability Gap Funding

Gujarat Viability Gap Funding scheme -To support Urban Bus Services in Gujarat, Govt of Gujarat has launched a scheme to provide Viability Gap Funding (VGF) to TA & ULBs

This scheme is known as Gujarat – Chief Minister Urban Bus Service Scheme

EXISTING GUIDELINES & MECHANISM – MOHUA GUIDELINES

MoHUA's Guidelines on structuring of Unified Metropolitan Transport Authority (UMTA) & Urban Transport Fund (UTF):

- NUTP 2006 recommends creation of UMTA and Urban Transport Fund (UTF) in all million+ cities
- **15 UMTAs established in India**, which is comparably low considering the number of million-plus urban agglomerations in the country is 53
- **UMTA covers** all modes of urban transport - **Bus, Metro, water ways, NMT** etc.
- UTF Operations Document provides guidance to cities for setting up of UTF as a division within UMTA
- Function of UTF management will be through **Fund Management Division (FMD) within UMTA**

City	State	Size of city	Year	Reason for establishment	Legislative backing	Headed by
Hyderabad	Telangana	Metro	2008	NUTP	HMDA Act	Chief Secretary
Mumbai	Maharashtra	Metro	2008	NUTP	Executive Order	Chief Secretary
Delhi (UTTIPEC)	Delhi	Metro	2009	JnNURM funding policy	Delhi Development Act	Lieutenant Governor
Chennai	Tamil Nadu	Metro	2010	JnNURM funding policy	Special Enactment	Transport Minister
Bangalore	Karnataka	Metro	2007	NUTP	Executive Order	Chief Secretary
Jaipur	Rajasthan	Medium	2007	NUTP	Executive Order	Chief Secretary
Lucknow	Uttar Pradesh	Medium	2009	JnNURM funding policy	Executive Order	Chief Secretary
Bhopal	Madhya Pradesh	Small	2012	---	Executive Order	N/A
Kochi	Kerala	Small	2018	Initiated by Kochi Metro Rail Limited (KMRL)	Draft Bill	TBA

Source: Secondary Research

EXISTING GUIDELINES & MECHANISM – MOHUA GUIDELINES

Case of Chennai UMTA: Govt. of Tamil Nadu established Chennai Unified Metropolitan Transport Authority (CUMTA) under the CUMTA Act, 2010.

- CUMTA is formed to prepare comprehensive transport plan for Chennai Metropolitan Area, inter-agency co-ordination, integration of all mass transport modes, last mile connectivity and common ticketing etc.
- **Members of CUMTA** - State Transport Minister, representation from transport, finance, housing and urban development, highways, home, municipal administration and water supply departments and from the Chennai city police, Greater Chennai Corporation, Chennai Metropolitan Development Authority (CMDA), Southern Railway, Metropolitan Transport Corporation (MTC) and Chennai Metro Rail Limited (CMRL)
- **State minister for transport** will be the **Chairman of CUMTA** while the Chief Urban Planner of CMDA will be the Member Secretary of the Authority, but there are views that an officer of the rank of IAS should head it for effectively planning and implementation given the hierarchy of various institutes involved within CMA
- World Bank under its 'Chennai City Partnership' project, has mandated to create UTF within CUMTA to route its funds for transport sector

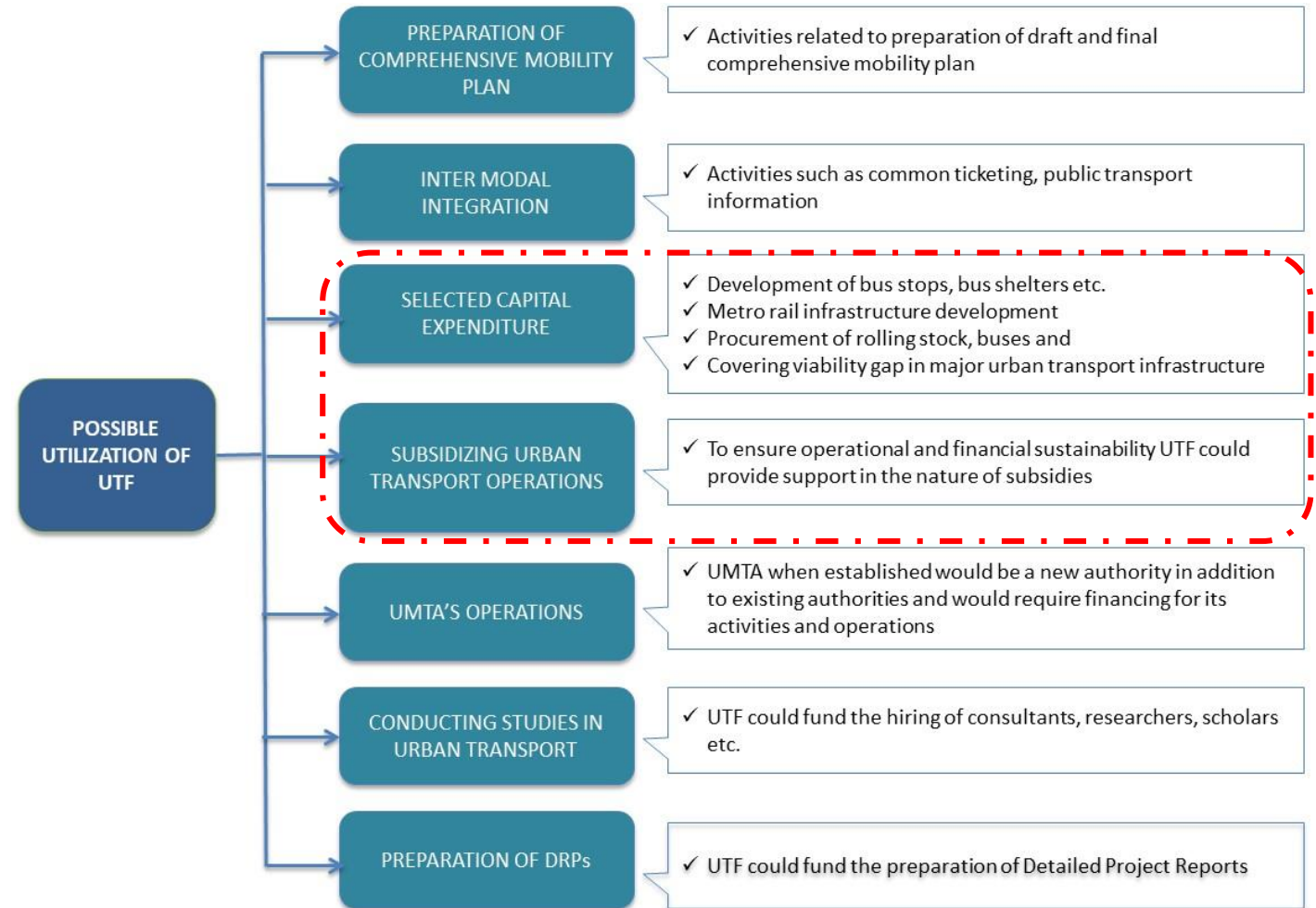


EXISTING GUIDELINES & MECHANISM – MOHUA GUIDELINES

As per MoHUA Guidelines on UTF:

Funds to be utilized for CAPEX & OPEX of urban transport modes including Bus transportation system -

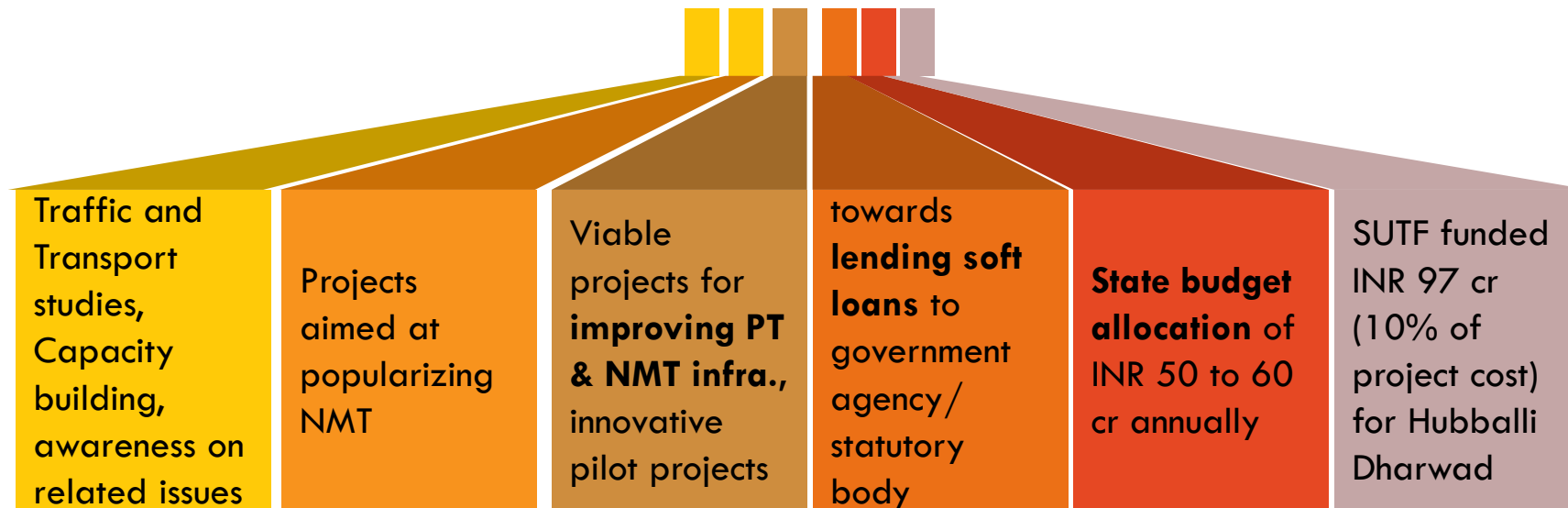
- Buses and allied infra.
- BRTS
- Metro Rail infra.
- Waterways
- NMT
- Parking
- New technologies such as energy efficient vehicles
- Intelligent Transport Systems (ITS)



STATE SPECIFIC TRANSPORT FUND/SCHEME- 1

KARNATAKA STATE URBAN TRANSPORT FUND

Karnataka State Urban Transport Fund (SUTF) is set up under Department of Urban Land Transport (ULT) to fund following activities:



- Limited funding for Procurement of Buses or supporting its O&M
- Dependent of state budget for fund mobilization
- Every year, DULT invites proposals from govt. agencies/statutory bodies for funding support for admissible sectors as mentioned above.

STATE SPECIFIC TRANSPORT FUND/SCHEME- 2

TAMIL NADU TRANSPORT DEVELOPMENT FINANCE CORP. LTD

TDFC Ltd. was established in 1975 as NBFC, with an objective of sourcing funds for capital & working capital requirements of STUs in Tamil Nadu

- A** Providing Capital and Term Loan facilities to STUs for operations, replacement of buses, capital works etc.
- B** Funding through Deposit Schemes, Total Deposits: INR 5,462 Cr, in 2019
- C** Interest paid to depositors at 7.8% to 9.1%, public deposits, GoTN schemes, GoTN owned/controlled entities including educational institutions and temples etc.

TDFC Ltd. lends to STUs through different types of loans

- 01** Hire Purchase Loans - for the purchase of chassis and bus body constructions
- 02** Short Term loans like MV Tax Loans - To meet the half yearly MV Tax commitments of STU
- 03** Bonus Loan - To meet the yearly bonus commitments and Working Capital Requirements
- 04** Long Term Loans - To meet capital expenditure programs other than chassis & bus body, e.g. construction of a depot

STATE SPECIFIC TRANSPORT FUND/SCHEME- 2

TAMIL NADU TRANSPORT DEVELOPMENT FINANCE CORP. LTD

TDFC Ltd. lends to all 6 STUs within Tamil Nadu -

- Lending rate for MTC is 8% for Hire & Purchase and 9% for Term Loan
- TDFC received interest-free loan of INR 713 cr from GoTN, later it converted into equity in 2019
- Defaulted loans by STUs are repaid by GoTN
- GoTN has provided guarantee for INR 900 crore bank facilities

TDFC finances (INR cr.)	FY 2018	FY 2019
Total Income	384	471
Profit after Tax	6.7	7.8
Net Worth	188	195.5
Total Managed Portfolio	5,221	5,444
Total Managed Assets	5,889	6,402
Return on Managed Assets (%)	0.20%	0.20%

TDFC's lending rates for STUs

Group	STU	HP Loan		Term Loan	
		Interest Rate	Period in Months	Interest Rate	Period in Months
I	Salem Kumbakonam	10.00%	50	11.50%	40
II	Villupuram Coimbatore	9.00%	60	10.50%	50
III	MTC Ltd.	8.00%	80	9.00%	60
IV	Madurai SETC Ltd.	7.00%	100	8.00%	75

Source: ICRA rating rationale and annual report of TDFC Ltd.

STATE SPECIFIC TRANSPORT FUND/SCHEME- 3

GUJARAT VIABILITY GAP FUNDING SCHEME FOR BUS SERVICE

Gujarat Viability Gap Funding Scheme is known as Gujarat - Chief Minister Urban Bus Service (CMUBS) Scheme

- The Scheme covers 8 Municipal Corporations and 22 Class A-Municipalities with population of more than one lakh
- **Only operations cost with PPP mode** will be part funded for a period of **7 years**
 - VGF of 50% or Rs.12.50 per km will be given to ULBs: remaining must be contributed by ULBs
 - **Only for running / adding new buses** i.e. it does not allow to get fund for existing buses
 - No. of buses and kms are calculated based on a set formula
 - This will result in deployment of **total 2,864 new buses** with **2240 buses in Municipal Corporations and 624 buses in municipalities**
 - **Total financial allocation for this is INR 225 cr/ year for Municipal Corporations and INR 65 cr/ year for Municipalities**
- **Inadmissible components under CMUBS scheme** - Purchase of buses, Bus operation by own, Other than PT buses, Staff recruitments / Salaries, Payment of electricity & telephone bills, Development of bus shelters/ bus station/ bus depots civil, mechanical , electric & IT work etc.
- VGF will be given in 4 advance equal instalments each of 25% to ULBs

KEY TAKEAWAY-4: UTF GUIDELINES AND EXISTING TRANSPORT FUNDS

MoHUA guidelines on UTF are very comprehensive for setting up the Fund Division within UMTA. However, most of the UMTAs are not fully functional, and in many cases UTF is not formed.

In case of **Tamil Nadu - TDFC**, key challenges are concentrated deposit profile, weak profitability, modest risk profile given TDFC's borrower segment i.e. STUs. It does not leverage on its large equity and deposit base to access private or IFI's capital from market thus limiting its reach.

01

02

03

04

Karnataka SUTF is set up under Department of Urban Land Transport (DULT) and functions as one of the departments of DULT. Thus, it has very limited autonomy, completely relies on state budget for funding ULBs, scale of funding is very small (upto INR 100 crore) and there is mostly none or limited access to private capital. There is a need for predictable, recurring funding.

Gujarat VGF model is unique in today's situation where part of the operating cost of STUs is funded through VGF. We have adopted this mechanism in our recommendation of State Bus Transport Fund (SBTF).

Now the question is - how to Institutionalise the SBTF ? In this context, we will assess suitability of institutionalising SBTF within following existing Urban Infrastructure Development Finance Corporations (UIDFCs) by assessing their structure, role, functions and funding mechanism.

- a) Tamil Nadu Urban Development Fund (TNUDF) and Tamil Nadu Urban Infrastructure Finance Limited (TNUIFSL)
- b) Tamil Nadu Urban Finance and Infrastructure development Corporation Ltd. (TUFIDCO)
- c) Karnataka Urban Infrastructure Development and Finance Corporation (KUIDFC)

URBAN DEVELOPMENT FUND-1

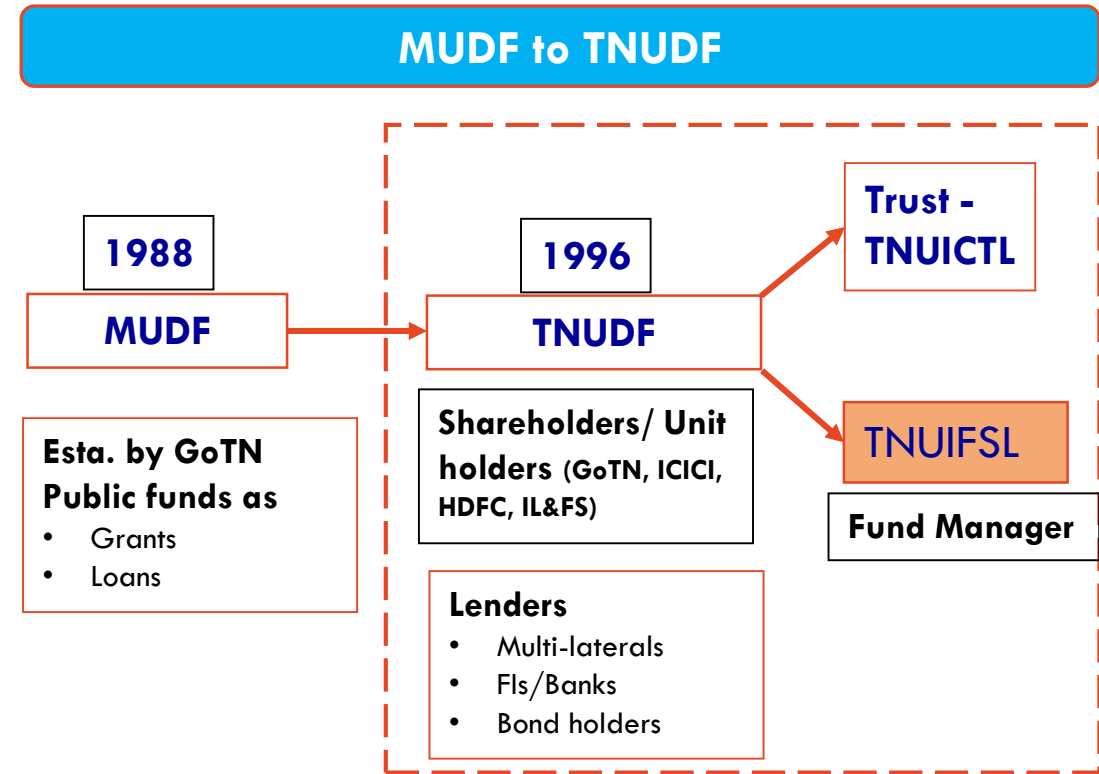
TAMIL NADU URBAN DEVELOPMENT FUND (TNUDF)

In 1996, Govt. of TN converted Municipal Urban Development Fund (MUDF) into TNUDF with equity contribution by Govt. of TN and ICICI Bank, HDFC Ltd. and ILFS. Objective of TNUDF is to fund urban infra. projects, facilitate pvt. Participation and support ULBs to access debt finance.

- It has **equity of INR 200 crore with GoTN share 72% & rest by banks/ NBFC (ICICI,HDFC Bank and ILFS)**
- TNUDF is managed by a Corporate Trustee viz., Tamil Nadu Urban Infrastructure Trustee Company Limited (TNUITCL) and TNUIFSL is the fund manager
- The Board of Directors of TNUITCL, which prescribes the policies and procedures for the operations of the TNUDF, are nominated by the four contributors of the TNUDF.

TNUDF is financing urban infra. projects by availing external funds. Details of externally aided projects are given below:

- TN Sustainable Development Project (TNSUDP) assisted by World Bank
- Sustainable Municipal Infrastructure Financing – TN (SMIF-TN) assisted by KfW
- TN Urban Flagship Investment Program (TNUFIP) -Tranche-1 assisted by ADB



Municipal Urban Development Fund (MUDF) was launched in 1988 by GoTN. It did not sufficiently resolve the urban finance shortfall through only public funds, so need of pvt. capital was recognized and TNUDF was formed with involvement of pvt. Banks & NBFC.

URBAN DEVELOPMENT FUND- 1

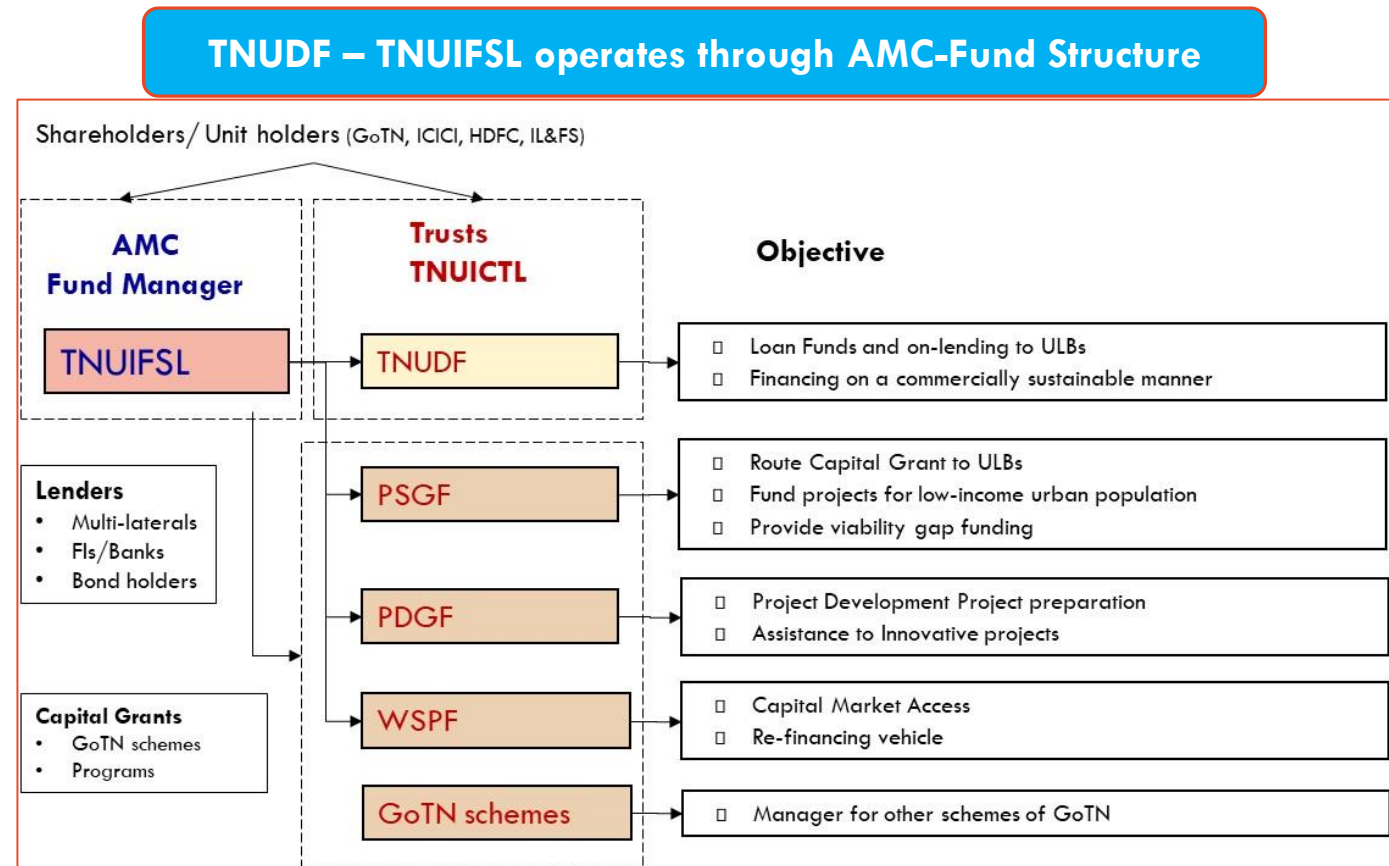
TAMIL NADU URBAN INFRASTRUCTURE FINANCIAL SERVICES LTD. (TNUIFSL)

TNUIFSL

- It is a Public Ltd. Co. formed in 1996, with equity participation by GoTN, ICICI Bank, HDFC Ltd. And IL&FS
- Autho. Paid Capital INR 2 cr & paid up capital INR 1 cr
- It is fund manager for TNUDF, PDGF, PSGF, WSPF and GoTN schemes
- PDGF and PSGF funds support in project development and preparation, provide viability grant etc.

Services offered by TNUIFSL –

- project preparation, structuring, procurement & contract management
- Loan & fund mgmt., Treasury mgmt.
- TAS, capital market access to ULBs
- Consultancy services
- PDGF and PSGF are funded through State budget and percentage of line of credit from IFIs etc.



*PROJECT DEVELOPMENT GRANT FUND (PDGF)
PROJECT SUSTAINABILITY GRANT FUND (PSGF)
WATER AND SANITATION POOLED FUND (WSPF)

URBAN DEVELOPMENT FUND- 1

TAMIL NADU URBAN INFRASTRUCTURE FINANCIAL SERVICES LTD. (TNUIFSL)

TNUIFSL as a fund manager manages sources funds in the form of loan from

- WB (50%), KfW (30%), ADB (8%), JICA (7%) and Others (5%)
- A sum of INR 3,743 cr is available, out of which INR 2,830 cr is availed
- 100% collection efficiency for past 15 yrs
- Expected margin on lending is around 1%
- **TNUIFSL successfully mobilized bonds under WSPF**

TNUIFSL's role and functioning as a fund manager is very effective in managing main fund i.e. TNUDF and other supporting funds such as PDGF and PSGF for creating investment ecosystem.

At the same time it has managed a margin of 0.5% to 1% to ensure financial sustainability of its own organisation.

TNUIFSL - Key Finances

INR crore	FY 2018	FY 2019
Total Income	222	196
Total Exp.	203	180
Net Income	11.4	9.9
Avg. Return on lending	8.83%	8.78%
Cost of funds	8.31%	8.29%
Total Assets	3,023	2,611
Net Worth	266	255

Bonds Mobilised under WSPF

SN	Particulars	PFDF- Enhanced Issue II	MFI- Tranche II
1	Amount (INR crore)	83.19	51
2	Interest rate	7.50%	8.71%
		Tax-free	Taxable
3	Rating	AA(SO)	AA(SO)
4	Tenor	10 years	10 years
5	No. of beneficiary ULBs	7	10
6	Equity (cash collateral) GoTN (INR crore)	18.5	19
7	Month and Year	Sep (2010)	May 2013

URBAN DEVELOPMENT FUND- 2

TAMIL NADU URBAN FINANCE AND INFRASTRUCTURE DEVELOPMENT CORPORATION LTD. (TUFIDCO)

- TUFIDCO was incorporated in 1990, under the Companies Act, 1956 with share capital of INR 32 crore, with GoTN contributing 97% and ULBS+ HUDCO 3%.
- Role is to provide financial assistance and guidance to Local bodies, Corporations, Boards, Authorities and parastatal agencies for their development schemes.
- It's a nodal agency to implement Government programmes/schemes in the state through Tamil Nadu Urban Infrastructure Development and Renewal Fund (TNUIDRF)
- These schemes include – JnNURM, UDISSMT, Metropolitan Infrastructure Development Scheme etc.
- Additionally it also extends financial assistance from its own source to the Local Bodies and Parastatal Agencies for various Infrastructure Development Schemes, which is extended through TUFIDCO's Infrastructure Funding Scheme (TIFS).
- The grants received by TUFIDCO from GoTN are released to ULBs as grants or loans as per respective scheme guidelines based on progress made in implementation.

TUFIDCO - Key Finances

Rs. crore.	FY 2018	FY 2019
Total Income	56.23	58.15
Total Exp.	29.34	26.34
Net Income	20.90	24.41
Net Worth	NA	239.24

Sectors covered under TIFS:

Water supply, Sewerage, drains
Road/Flyovers/ROB
Solid waste management
Heritage

Projects Covered TIFS:

Construction of Commercial/ Shopping complex,
Construction of Office Complex, Weekly Shandy,
Daily market, Bus terminals, Water Supply
Schemes, Drainage Schemes, Sites and services
schemes, Development of Truck Terminals, Street
Lighting for major roads

URBAN DEVELOPMENT FUND- 3

KARNATAKA URBAN INFRASTRUCTURE DEVELOPMENT AND FINANCE CORPORATION (KUIDFC)

KUIDFC was established in 1993, as a public ltd. Co. under Companies Act 1956. It acts as nodal agency for Govt. of Karnataka for various schemes where funds are routed through KUIDFC.

Role - support urban infrastructure development

- To prepare, formulate and implement projects, schemes and programmes
- To provide technical and financial consultancy, along with other assistance to the ULBs
- Nodal agency for implementation of Gol schemes like JNNURM, UIDSSMT and state urban infra. projects in Karnataka
- **A pass-through entity;** receives funds from GoK and Gol, World Bank, ADB and from financial markets and passes them to the ULBs including city corporations, BBMP, BDA, BWSSB as loans and grants.

Sectors supported

- Water supply, sewerage and 24X7 potable water
- Environmental sanitation, Solid waste management
- **Urban Transport**
- Municipal facilities- including strengthening financial and institutional framework for urban service delivery

SOURCES OF FUNDS

Govt. of Karnataka (GoK),
World Bank,
Asian Development Bank,
Financial Markets

FINANCIAL INTERMEDIARY

KUIDFC

IMPLEMENTING AGENCIES

Urban Local Bodies (ULBs),
Development Authorities like BDA,
Water & Sewerage Board -
BWSSB

URBAN DEVELOPMENT FUND- 4

KARNATAKA URBAN INFRASTRUCTURE DEVELOPMENT AND FINANCE CORPORATION (KUIDFC)

Karnataka – KUIDFC

- **Although KUIDFC manages funds upward of INR 5,000 Cr., it just functions as a nodal agency and does not play a role of Asset Manger like TNUISL**
- It's **major source of income** is the Management fees representing the reimbursement received from GoK for operational costs incurred
- Its total income is INR 11.8 crore in FY 2019 with no profit on books which is unlike TNUISL which has total income of INR 196 cr and profit of INR 9.9 cr
- **KSRTC and BMTC have availed loans under Mega City Scheme (till 2015), & then Mega City Revolving Fund (MCRF), apart from central schemes**
- **BMTC availed INR 1,614 cr loan from KUIDFC (FY 16-18) under Mega City Revolving Fund (MCRF) at 6.5% int. rate after swapping commercial loan which was @10%**

Key Finances of KUIDFC

INR crore	FY 2018	FY 2019
Total Income	13.8	11.8
Total Exp.	14.7	11.9
Net Income	0.36	(0.25)
Total Assets	5,900	6,315
Net Worth	66.5	66.9

GLOBAL EXPERIENCE OF URBAN DEVELOPMENT FUND



1

Scandinavian countries & Netherlands: Local Government Funding Agency (LGFA)

- It is owned by member cities, national govt
- Objective is to pool borrowing needs of local authorities and issue bonds in capital markets
- To reduce financing costs, transaction costs, and also risk exposure resulting from increased diversification

2

Munifin in Finland : created in 1990,

- It is guaranteed by Municipal Guarantee Board (MGB)
- Its a joint-stock company, majority holding by member municipalities+ local pension fund (31%) & national govt. (16%)

3

In US and Europe -

- Creditworthy ULBs, **strong municipal bond market** and developed market for pension funds are key to accessing finance

Many other countries have followed LGFA practice – Netherlands, France etc.

KEY TAKEAWAY- 5

ASSESSMENT OF EXISTING FUND IN URBAN SECTOR

Summary of assessment existing funds in urban sector:

KUIDFC

- KUIDFC manages projects worth ~ INR 8,500 Cr. including externally aided projects and government schemes.
- It's major sources of income are Management fees representing the reimbursement received from GoK for operational costs incurred
- However, it's role is limited as a nodal agency which manages the projects without any margin over borrowings unlike TNUIFSL.

TUFIDCO

- TUFIDCO was incorporated in 1990, under the Companies Act, 1956 by GoTN (97%) and ULBS+ HUDCO (3%)
- It's role is to provide financial assistance and guidance to Local bodies, Corporations, Boards, Authorities and parastatal agencies for their development schemes.
- It's a nodal agency to implement Government programmes/schemes in the state through Tamil Nadu Urban Infrastructure Development and Renewal Fund (TNUIDRF)
- It's role is limited as a nodal agency to manage government schemes such as JnNURM, UIDSSMT etc.

TNUDF and TNUIFSL

- TNUIFSL manages the main fund i.e. TNUDF plus strengthens the financing ecosystem and supports ULBs in developing financially viable projects by assisting project preparation activities and extending viability gap funding through support funds like PDGF and PSGF.
- TNUIFSL has 24+ yrs of exp. in managing Multilateral funds, floating bonds, accessing capital markets and has expertise in project development and structuring
- Therefore, existing institutional mechanism like TNUDF as a fund (registered as trust) and TNUIFSL as a fund manager (registered as public ltd. Company) is very appropriate for the proposed SBTF.

Some of the points that have to be considered while institutionalizing the fund:

- It can be housed in an existing institution with capability to act as fund manager
- It's structure should allow it to access capital in form of loan from market/ IFIs
- It should have capabilities to make professional investment decisions

PROJECT DEVELOPMENT GRANT FUND (PDGF)
PROJECT SUSTAINABILITY GRANT FUND (PSGF)

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OUTLINE OF THE PROPOSED STATE BUS TRANSPORT FUND (SBTF)

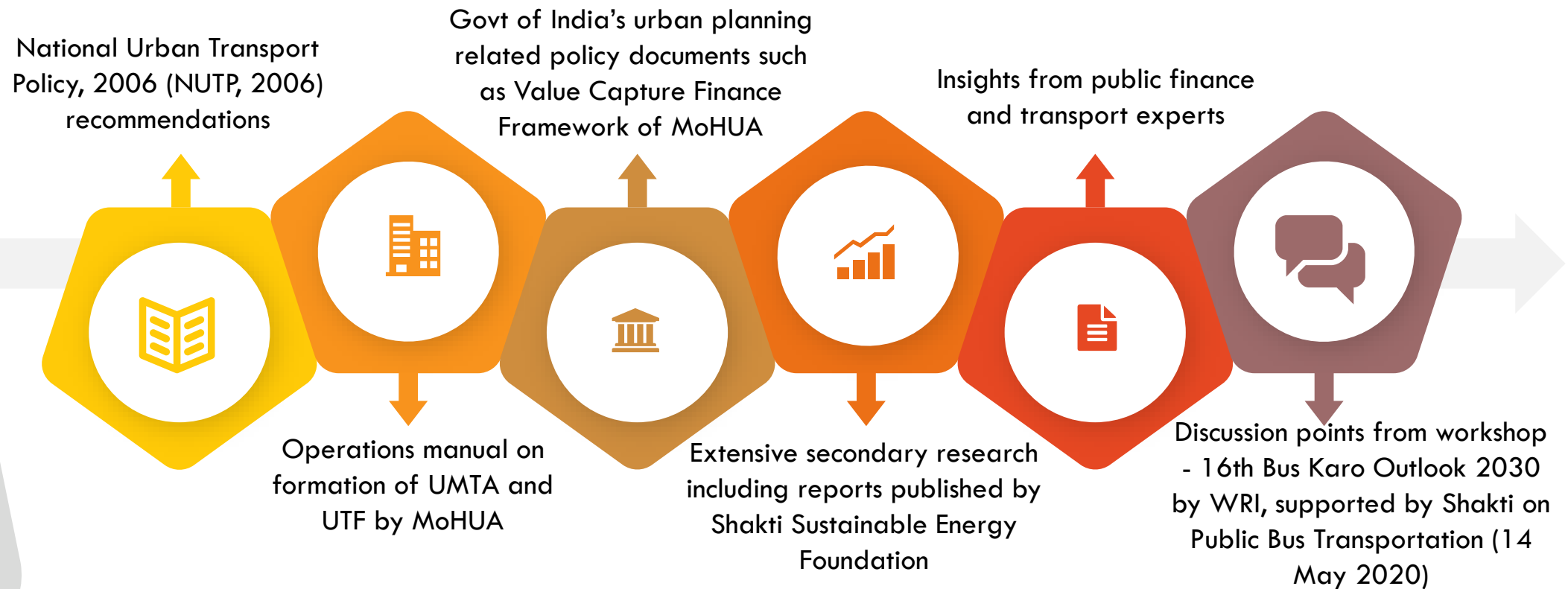
It is proposed that SBTF will be formed by equity contribution from the state Govt. and IFIs and/or commercial banks. The fund will raise grant and loan from various government sources and IFIs.

The key elements of the proposed SBTF

- 01** Sources of Fund – there are two key sources of fund – Government sources and IFIs
a) Assessed different sources of fund for the SBTF,
b) Advantages and disadvantages of each these sources
- 02** Mobilisation of fund – mechanism to mobilise the fund
- 03** Functions of SBTF
- 04** Institutional Structure of SBTF

BASIS OF IDENTIFICATION OF SOURCES OF FUND FOR SBTF

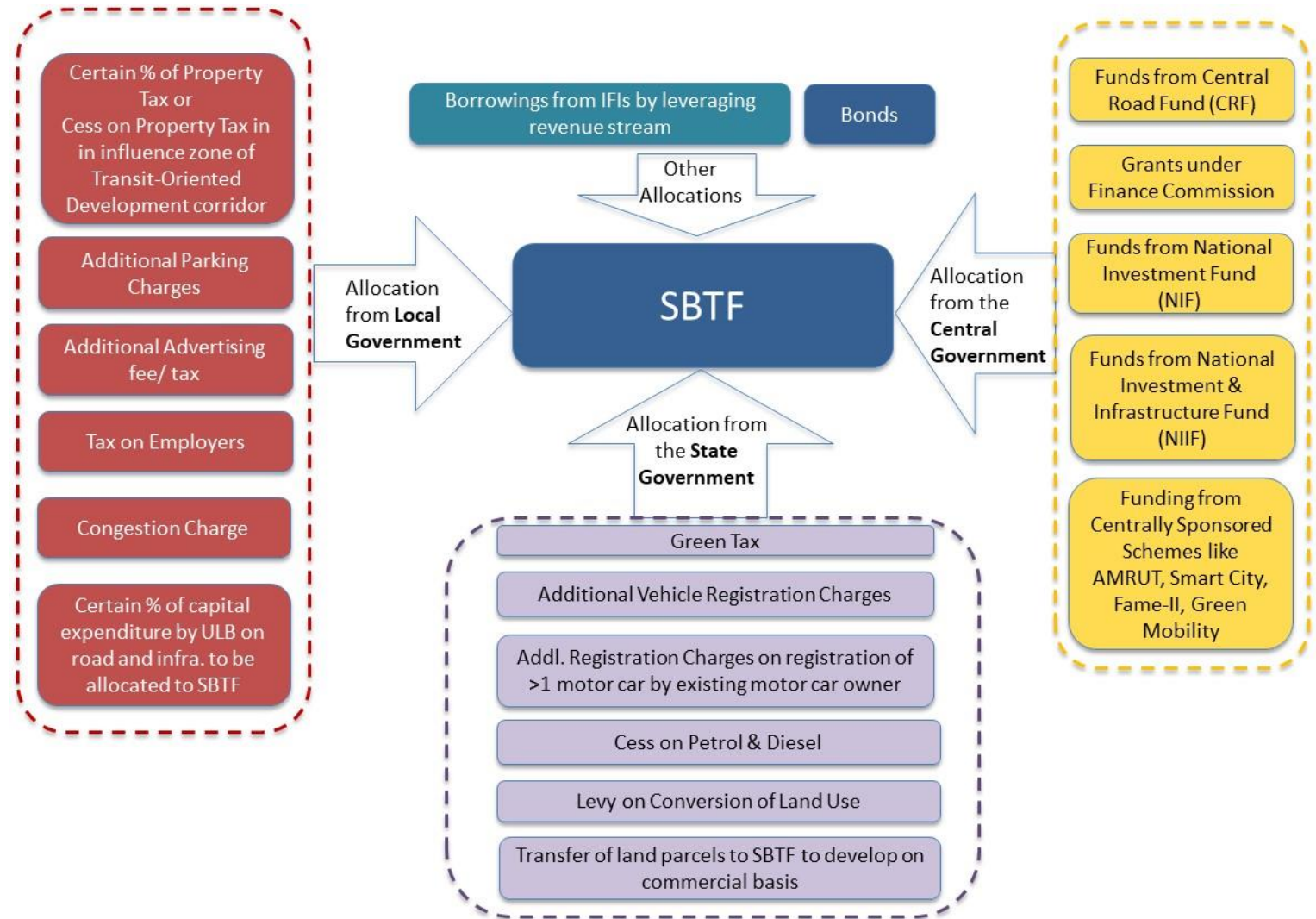
To arrive at various sources of finances which can fund the SBTF, an analysis was carried out based on the assessment of various guidelines and documents, and insights from experts.



ANALYSIS OF SOURCES OF FUND

Two major sources of fund for SBTF:

- 1. Government sources** at three levels – Central, State and ULBs or UDAs (Equity support as well as recurring)
- 2. Borrowing** from International Finance Institutes (IFIs)
 - Access low cost capital from Development Banks with government guarantee
 - Explore land monetization to ensure financial sustainability, state govt. will provide policy guidelines on this
 - Explore part of the revenue generated through Transit Oriented Development – and further develop Terminals and Stations on PPP/ commercial basis



ANALYSIS OF GOVERNMENT SOURCES OF FUND

NATIONAL LEVEL

1. Funds from Central Road & Infra. Fund (CRIF)
2. Grants under Finance Commission
3. Funds from National Investment Fund (NIF)
4. Funds from National Investment & Infrastructure Fund (NIIF)
5. Funds from centrally sponsored schemes (such as AMRUT/ Smart City/ FAME- II/ Green Mobility)

STATE LEVEL

1. Green tax
2. Additional vehicle registration charges
3. Additional charges on registration of more than one 'motor car' with an existing 'motor car' owner
4. Cess on fuel sold
5. Additional levy on conversion of land use charges
6. Transfer of land parcels to SBTF to develop on commercial basis

URBAN/RURAL LOCAL BODIES

1. Cess on property tax in influence zone of Transit-Oriented Development corridor
2. Additional parking charges
3. Additional charge on advertising fee/ tax
4. Tax on employers
5. Congestion Charge
6. % of capital expenditure by ULB on road and infra. to be allocated to SBTF

NATIONAL LEVEL: CENTRAL ROAD FUND (CRF) (1/5)

Rationale:

- Indian Central Road Fund (CRF) was established in 1930 and revitalized under the Central Road & Infrastructure Fund Act, 2000, again revised in 2017, Central Road and Infrastructure Fund (CRIF). CRF provides funds for construction and maintenance of national and State road networks and development of rural roads. Revenue for the fund is mobilized through cess, an additional duty of excise (production) and an additional duty of customs (import) on petrol and diesel. One of the sources of funds of CRF is “Additional Excise Duty” on fuel.
- Revenues collected through cess are dedicated to the CRF through the Consolidated Fund of India (CFI). CRF is managed by the Central Government’s Ministry of Finance. Receipts from the fuel cess are allocated to States on the basis of fuel consumption. CRF is distributed amongst three Ministries - Rural Development, Railways and Road Transport & Highways. As per the CRF Act, the fund allocated to a State or Union Territory remains with the Central Government until funds are actually required for expenditure.
- Certain portion of funds allocated to the State from the CRF → distributed appropriately to SBTF.** This is also prescribed under UMTA Act for funding dev. of urban transport.

Challenges/ disadvantages:

- CRF allocation is only for development and maintenance of various type of road networks. These road networks provide linkages to major market and business centers in urban areas.**
- Currently CRF is used for creating road infrastructure and in future, as the e mobility starts picking up, government may consider charging infrastructure within its scope.
- No fund allocation for development of various modes of urban transport. It is claimed that a large fraction of the fund remains unutilized, largely due to low proposals of States and slow progress of projects.
- Some portion of CRF (from diesel, consumed by most of the public transport vehicles) could be allocated to SBTF.
- The State Government could earmark []% of the funds received by it, to SBTF in the State based on a mechanism that it deems fit.

Case Studies/ examples:

Proceeds received under CRF/CRIF:
Govt. of TN received allocation of

FY20: INR 122,370 crore
INR 1,106 crore for FY18 and

FY19: INR 62,880 crore
INR 1,996 cr for FY 19 for road projects.

NATIONAL LEVEL: GRANTS UNDER FINANCE COMMISSION (2/5)

Rationale: The Fifteenth Finance Commission was constituted on Nov. 2017.

A portion of the grants received by the States under the Finance Commission (FC) could be transferred to UTFs in that State.

- Such grants are collected under the “Central Government Transfers” head in the State account.
- For example, grants under the 14th Finance Commission are deposited under “Special Grant for 14th Finance Commission”.
- Certain percentage of the proceeds accruing to the State which are allocated for ULBS and RLBs could be allocated to SBTF (as may be decided by the State Government and amended time to time) of the proceeds.

Challenges/ disadvantages:

- The State governments, ULBs and RLBs are facing fiscal challenges, fiscal deficit and have reached their borrowing limits.
- Therefore, the State Government need to decide on how judiciously it can utilize the grants received from the Finance Commission.

Case Studies/ examples: In FY 21, FCXV will provide total grants of **INR 2,01,000 cr to the states.**

- It includes: **Grants to Local bodies (45%)**, Revenue deficit grant (37%), Disaster Relief Grant (11%), Special & sector grants (7%)
- It includes **grant for ULBs (FY21) : INR 29,250 cr and for rural local bodies: INR 60,750 cr.** (Total INR 90,000 cr)
- Revenue deficit grant of INR 74,340 crore to the states in FY 21.
- The grant is allocated in certain proportion as decided by the Finance Commission to each of the states and UTs.
- For instance, in **FY 21, Tamil Nadu** has been allocated **INR 3,607 cr** for rural local bodies and **INR 1,737 cr** for urban local bodies.
- **Govt. of TN** will receive **grant of INR 233 crore for Air Quality improvement in Chennai, Madurai and Trichy cities.** Since strengthening of Public Bus system is one of the actions for reducing air pollution, a certain percentage of this grant can be allocated for SBTF.
- Similarly, under **FCXV, Bengaluru Municipal Corporation will receive INR 279 crore for air pollution management in FY 21.**

NATIONAL LEVEL: FUNDS OF NATIONAL INVESTMENT FUND (3/5)

Rationale:

- Gol constituted the National Investment Fund (NIF) in 2005, into which the proceeds from disinvestment of Central Public Sector Enterprises were to be channelized.
- NIF would be utilized for the following purposes:
 - a) Subscribing to the shares being issued by the Central Public Sector Enterprises (CPSEs) including Public Sector Banks (PSBs) and Public Sector Insurance Companies, on rights basis
 - b) Preferential allotment of shares of CPSE to promoters so that Govt. shareholding does not go down below 51% where CPSE is going to raise fresh equity to meet its Capex program.
 - c) Recapitalization of public sector banks and public sector insurance companies., Investment by Government in India Infrastructure Finance Company Limited / National Bank for Agriculture and Rural Development / Exim Bank;
 - d) **Equity infusion in various Metro projects;**
 - e) Investment in Bhartiya Nabhikiya Vidyut Nigam Limited and Uranium Corporation of India Ltd.; Investment in Indian Railways towards capital expenditure
- Utilizations as per the points “e” and “g” are related to urban transport, i.e. equity infusion in metro projects and investment in Indian Railways towards capital expenditure.
- **Certain percentage of proceeds specifically deployed for development of Urban Transport and received by the State could be allocated to SBTF**

Challenges/ disadvantages:

- Receipts from disinvestment of CPSEs → CFI → appropriated by the Department of Disinvestment to NIF → appropriated for specific purposes as per Department of Expenditure
- Gol intervention is required to tap this fund for funding Public Bus Transportation System. Currently it has provision for equity infusion in various metro rail projects. Availing this fund for SBTF will require lot of push from the state government and depends upon the political situations.

Case Studies/ examples:

- **The proceeded received in the NIF: INR 78,314 cr (FY19); INR 59,700 cr (FY20)** (Source: Ministry of Finance, Gol)
- **NIF corpus has been utilized on selected urban / social sector schemes, JnNURM, Accelerated Irrigation Benefits Programme (AIBP), Rajiv Gandhi Gramin Vidyutikaran Yojana (RGGVY), Accelerated Power Development and Reform Programme, Indira Awas Yojana and National Rural Employment Guarantee Scheme (NREGS)**
- **FY16, INR 29,438 cr utilized for CAPEX of Ministry of Railways and recapitalization of Public Sector Banks (PSBs)**

NATIONAL LEVEL: FUNDS OF NATIONAL INVESTMENT & INFRASTRUCTURE FUND (4/5)

Rationale:

- The National Investment and Infrastructure Fund (NIIF) was established in 2015 to address the long-term financing needs of the infrastructure sector in India. While the Government of India is the anchor investor in the NIIF (accounting for a 49% stake) the NIIF has been conceptualized as a platform for mobilizing both national as well as global capital, given the constraints facing the domestic banking sector (particularly public sector banks) as well as the publicly-owned vehicles.
- NIIF is **pure equity investor**, spanning three investment sub funds – Master Fund, the Fund of Funds (FoF) and the Strategic Investments Fund; managing USD 4 billion of capital commitments. The sector coverage includes **energy, transportation**, housing, water, waste management and other infrastructure-related sectors in India.
- The NIIF has a proposed corpus of USD 6 billion, and through its Funds will make **long-term equity investments in operating assets, greenfield projects and third-party managed funds in core infrastructure** and related segments, with a view to leveraging this equity manifold.
- The funds are registered as Alternative Investment Fund (AIF) with the Securities Exchange Board of India (SEBI) and are currently raising capital from domestic and international institutional investors.
- **NIIF Limited (NIIFL)** acts as the **Investment Manager of the NIIF** and is responsible for the day-to-day operations of the funds
- There are, notably, no representatives on the investment committee from either the government or investors to ensure objective decision-making in line with the global fund management industry., Project approval is typically based on commercially viable, risk-adjusted returns.

Challenges/ disadvantages:

NIIF is pure equity investor and is aimed at generating attractive long-term risk-adjusted returns for investors on a sustainable basis. Therefore, to attract equity investment from NIIF, apart from sovereign guarantee, sizeable equity contribution from other stakeholders such as government & IFIs is required. In addition, the project/ fund need to have financially sound business plan.

Case Studies/ examples:

- NIIF has made equity investment in logistics firm, inland ports, electric meter company, green fund and looking for investments in road projects.
- Asian Development Bank (ADB) will invest \$100 million into the National Investment and Infrastructure Fund (NIIF) of India Fund of Funds. With ADB's investment into the NIIF platform, the FoF has now secured \$700 million in commitments. ADB will now join the Government of India (GOI) and Asian Infrastructure Investment Bank (AIIB) as an investor in the Fund.
- NIIF has MoU with NHAI to provide innovative financial models including for the 24,000 km INR 7.5 lakh crore Bharatmala Pariyojana.

NATIONAL LEVEL: FUNDS FROM CENTRALLY SPONSORED SCHEMES (AMRUT/ SMART CITY/ FAME/ GREEN MOBILITY) (5/5)

Rationale:

- **AMRUT** - The Mission focuses on Water Supply, Sewerage, storm water drainage, NMT and green spaces. 500 cities and towns of India are covered. The total central outlay for AMRUT is Rs. 50,000 crore for five years from FY2015-16 to FY2019-20.
- **Smart City Mission primarily focus on two components** - Area based Development (ABD) and Pan City Initiative. The ABD involves urban renewal of a selected areas of 0.5- 5 sq km. as demonstration pilot project. And the Pan City Initiative involves use of IT systems and Technology at city level. In ABD components involved are – road redesign, NMT infra, river rejuvenation , garden development etc. Under Pan City – digital platform for city, Command & control center, app for citizen service, solar based Smart streetlight poles, provision of CCTV cameras etc. have very small component related to Bus Transportation unlike JnNURM. Under this, few cities among 100 Smart Cities have funded bus depot construction, procurement of E- buses, procurement of e rikshaw, adopted for technology intervention like ITMS etc.
- The **FAME-II** scheme is specifically designed to promote e mobility and 5,585 E-buses are being procured by various STUs with subsidy under this scheme.
- **Green Urban Mobility Scheme** – coverage 103 cities with total project cost INR 70,000 cr. Out of which INR 49,000 cr from central govt as grant (30%) and DFI loan (70%) and remaining INR 21,000 crore from State and ULBs in 2:1 proportion. It covers many components including funding of buses, depot and O&M cost.
- **There is discussion that there will be version 2.0 of AMRUT and Smart City Mission with focus on Climate friendly Smart Cities and Green Mobility Scheme as new scheme.**

Challenges/ disadvantages:

- **AMRUT** - there is no major admissible component related to Public Bus transportation. It includes Footpaths/ walkways, sidewalks, foot over-bridges and facilities for non-motorised transport (e.g. bicycles) and Multi-level parking.
- **SMART City** - funding from central government is INR 500 crore per city and there are various admissible components primarily focusing on IT and technology intervention. Under this, few cities among 100 Smart Cities have funded bus depot construction, procurement of E- buses, procurement of e rikshaw, adopted for technology intervention like ITMS etc.
- **FAME- II** has already selected STUs and procurement is in progress
- **Green Mobility:** the scheme is not declared yet.

Case Studies/ examples:

- PSCDCL is a SPV formed under the Smart City Mission for Pune Smart City project. PSCDCL has developed Smart Electric Bus Project for Pune under the Smart City Plan. Under this, it has funded 75 e buses and handed over to Pune's PMPML, a transport SPV of Pune.
- Gwalior - appointment of private operator on NCC
- Similarly under Smart City Mission funding few other cities - Patna & Dehradun cities 30 e buses, Faridabad Bus Depot construction, Trivendrum Bus shelter & 15 E- rikshaw

STATE LEVEL: PROPORTION OF VEHICLE REGISTRATION CHARGES (1/6)

Rationale:

- A host of taxes are applicable on new vehicles such as road tax, motor vehicle tax and registration duty,. These are collected by State Govt. under Indian Motor Vehicle Act & State Motor Vehicles Taxation Act.
- Either **additional cess can be imposed on the Vehicle Registration tax or a certain percentage of the 'Tax on Vehicles'** can be allocated to SBTF.
- Annual **Vehicles & Service tax for Karnataka (2017-18): INR 3,177 Crores** (~ 53% of total taxes on vehicles)
- Total tax from **Vehicles for Tamil Nadu (2019-20): INR 6,019 Crore** (Under Indian Motor Vehicle Act & State Motor Vehicles Taxation Act)

Challenges/ disadvantages:

- Levying additional cess is generally opposed by the related industry and target population. The major challenge is public acceptability and political willingness. And for allocating certain portion of existing revenue, the state need to take policy decision as its finances are already constrained.
- Vehicle registration charges vary from state to state. Moreover, each state has a different formula for calculating the tax rate, which leads to anomaly in the final amount. For instance, for some states, the road tax is calculated based on the make, model, engine and seating capacity of a vehicle while for many it's on the sales price.
- However, A group of ministers on transport set up by the roads ministry in 2018 had recommended a uniform road tax structure for vehicles across states and that the tax be charged based on the invoice price of a vehicle. For all personal vehicles, the tax should be 8% for a vehicle costing under ₹10 lakh, 10% for a vehicle costing between ₹10 lakh and ₹20 lakh and 12% for a vehicle costing more over ₹20 lakh.

Case Studies/ examples: Philippines has earmarked the amount collected from motor vehicle user charges for following purposes:

- Maintenance of National primary and secondary roads, drainage system: 80%
- Maintenance of local roads, traffic and road safety devices: 5%
- Installation of road safety devices throughout the country: 7.5%
- Programs for prevention, control and management of air pollution from mobile sources: 7.5%

STATE LEVEL: CESS/ SURCHARGE ON FUEL SOLD AS CARBON SURCHARGE (2/6)

Rationale:

- A fuel cess/surcharge may be levied to capture the externality cost of use of private transport as carbon surcharge. A fuel tax changes the relative price between private vehicle use and public transport and has the potential to incentivize inter-modal shift.
- Fuel cess/surcharge is relatively simple and reliable way of charging and enforcement and administration is fairly simple and less problematic than other alternate revenue sources.
- A fuel cess will be a recurring source of fund and would guarantee would help in raising additional funds from multilateral/bilateral funds as this cess can be linked to repayment.

Challenges/ disadvantages:

- The efficiency of using this tool should be examined in the context of distortions that exist in fuel pricing. I
- In India, a substantial portion of the fuel price consists of taxes. Imposing an additional tax may only lead to further distortions without necessarily sending out the suitable price signals.
- Moreover, STUs would also be paying this cess on their fuel consumption, putting them under financial duress.

Case Studies/ examples:

- Central government charges a Road and Infrastructure Cess. The proceeds go to Central Road and Infrastructure fund. As of 12 May 2020, central government charges Rs. 10 per litre for Petrol and diesel as Road and Infrastructure cess.
- In Colombian cities, a 20% surcharge is collected on all gasoline sales. Half of the resources generated are used for the construction of the infrastructure required of Bogota's TransMilenio system. In this way, private vehicle owners (19% of the population) finance about one third of the infrastructure of the public transportation system.

STATE LEVEL: ADDITIONAL CHARGES ON REGISTRATION OF MORE THAN ONE 'MOTOR CAR' WITH AN EXISTING 'MOTOR CAR' OWNER (3/6)

Rationale:

- Additional charges can be levied as punitive fine for purchase of 2nd personalised car by existing vehicle owners. This is a penalty to discourage people for buying second car and penalizing them for choosing to buy 2nd car instead of using public transport.

Challenges/ disadvantages:

- Robust system is required to capture details of vehicle ownership and tracking it effectively.
- Resistance from industry bodies as it will hamper their business.
- The revenue potential is also very low.
- Vehicle owners can do away with this additional charge by registering in the name of other family members.

Case Studies/ examples:

- Telangana government used to 2% additional tax on the 2nd vehicle registered on an individual's name. However, state decided to do away with this as it was too cumbersome for transport department to implement it and revenue generated through it was not substantial.
- There were instances where vehicle owner's name and that of the father are the same and addresses different. The owner's also used to claim that they have sold their first vehicle and that those who purchased their vehicle have not transferred it on to their name.
- Telangana transport department earned mere 2 to 3 crore from 2nd vehicle registration out of total revenue of 2700 crore from all taxes and services.

STATE LEVEL: GREEN TAX (3/6)

Rationale:

- Green tax has been used traditionally to tax on the vehicles/ plants etc. on the basis of the negative externalities they produce. The tax rate can be charges in proportion to the negative effect the vehicle has on the environment.
- Under the State Motor Vehicle Tax Act, state levy Green Tax on old vehicles - transport vehicles completing their 7 years of age and non - transport vehicles completing 15 yrs.
- Part of the Green Tax so collected and new tax levied on new vehicles can be sourced to SBTF. For Instance, in Case of TN total proceeds towards SBTF = 50% of Green Tax + 10% on MV Act Revenue. The total comes out to be INR 65 cr/ annum

Challenges/ disadvantages:

- The major challenges under this taxation will come from vehicle manufacturer. Auto manufacturer are already under pressure lately due to economic recession. Effective utilization of proceeds from this source is also a major challenge. It has been observed that proceeds from this type of sources are still lying unutilized by governments.

Case Studies/ examples:

- Delhi govt. collected INR 700 crore as Green Cess (1% of the ex-showroom price) for bringing to Delhi cars of 2,000cc or larger engine capacity. Supreme Court has also introduced an 'environment compensation charge (ECC)' for the largely diesel-powered commercial goods vehicles that pass-through Delhi on their way across the country. Proceeds from this fund are being utilized by Delhi govt. for procurement of CNG, Electric Buses and creating charging infrastructure.
- Tamil Nadu Govt. levied it since 2007 on old vehicles and collected INR 136 crore during FY07-17. Proceeds were to be used for subsidizing (INR 3000/ case) conversion of petrol autorickshaw to LPG. GOTN received INR 31 crore in FY18 which is part of receipts under the State Motor Vehicle Tax Act.
- Telangana levies INR 200 to 500 depending for transport vehicles completing their 7 years of age and non –transport vehicles completing 15 yrs.

STATE LEVEL: ADDITIONAL LEVY OF CONVERSION OF LAND USE CHARGES (4/6)

Rationale:

- The State T&CP Act, 1961 provides that where permission for change of land use or development of land or building is granted and such change of land use or development is capable of yielding a better income to the owner, the Planning Authority may levy a prescribed fee not exceeding one-third of the estimated increase in the value of land or building in the prescribed manner for permitting such change of land use or development of land or building.
- State govt. already charges for conversion of land in the influence zone of the corridor. It can levy an additional charge on conversion of land calculated as a % of existing land use conversion charges. This amount can then be allocated to the SBTF.

Challenges/ disadvantages:

Land conversion fees goes to the ULBS/UDA or the revenue department under state government. These departments are reluctant to share part of their revenues. If Land conversion is within the TOD kind of corridor or within transport corridor -

- Lack of a robust system for measuring the increase in prices due to associated benefit will be the biggest challenge here.
- Lack of transparency in the absence of a robust system.
- In the initial phases, cost of implementation of the charge might be much higher than the actual revenue generated from the same.
- It will yield high return when charged based on land value and not area, which is currently in practice in India.

Case Studies/ examples:

- In practice however, the rate of fees are linked to area of development and varied according to population size of city and land use. The rates are prescribed by Karnataka Planning Authority Rules 1965. These rates have not been revised since 1993.
- Bangalore Development Authority's revenue under this source has been around Rs. 10-12 Crores. During 2005-07 when real estate market was more active, it was even more.

STATE LEVEL: DEVELOPMENT OF LAND PARCEL ON COMMERCIAL BASIS (5/6)

TRANSFER OF LAND PARCELS TO SBTF TO DEVELOP ON COMMERCIAL BASIS

Rationale:

- Land monetization is an effective way for financing urban infrastructure projects including transport. It has been used by transit agencies for development of transport infrastructure such as bus depot/ terminals. It involves disposal of excess vacant land vested with ULB/ other govt. agencies. The proceeds from such monetization should be utilized as non- operating revenue of STUs.
- **A part of land bank with ULBs or UDAs or State Government can be transferred to the SBTF to develop on commercial basis or on PPP model where SBTF will get upfront premium or annual rental income.**
- **The cost of land transferred by the state to SBTF will be equity of the state in the SBTF.**

Challenges/ disadvantages:

- ULBs in India can fund only a small portion of their expenditure from their own sources. Although, ULBs have land banks and commercial properties but commercial utilization has not been optimal. Major challenges are - lack of asset management capability, lack of willingness on part of ULBs/ governments to earmark the land parcels to STUs. Moreover, most of the ULBs lack capabilities for monetization of land.
- In many cities there are multiple organisations like in Bengaluru, there is BDA, BMDA and BMC. There is always reluctance to share land parcels due to opposition from political bodies. Even if the land parcel is allocated, additional development rights are rarely provided to the STUs. e.g. in case of Pune, PMC has provided land to PMPML for development of Depot while they have not allowed it to use additional FSI to develop it commercially.
- Generally, land ownership is with State or ULB or UDA. State Govt. can provide a policy directive so that prominent land parcels can be allocated to SBTF to be developed on commercial basis. Higher FSI can be provided to maximise commercial potential.

Case Studies/ examples:

- BMTC developed 10 no. of Traffic and Transit Management Centers (TTMCs) along with commercial real state development at INR 460 cr for which it received funding under JnNURM. Now it earns rental income of INR 15 crore/ annum from commercial properties.
- BMTC - owns over 1,065 acres of land in over 200 places in and around the city. The corporation owns over 25 acres in Shantinagar, and almost half of it is vacant. The depot occupies about six acres
- DMRC, Indian Railways, Hyderabad Metro have used land monetization for funding a part of infrastructure development cost.

ULB LEVEL: SHARE IN PROPERTY TAX OR CESS ON PROPERTY TAX IN INFLUENCE ZONE OF TRANSIT-ORIENTED DEVELOPMENT CORRIDOR (1/6)

Rationale:

- Property Tax is major source of own revenue of ULBs in India, which is levied in lieu of the infra. facilities and services provided by the ULBs/ agencies. The good Public transport system provides better access to the citizens.
- Additional charge on property tax in localities that will benefit from infrastructure development for public transport. This benefit is based on proximity to the metro stations, bus depots, etc. and ease of access, as such factors are responsibly for increase in value of property and thus lead to a huge benefit to the property owner. **Therefore, certain percentage of the of the property tax or total municipal revenue can be assigned to the SBTF or a cess is levied on the properties within the vicinity (500m) of the public transport corridor.**
- Annual property tax rev. by cities:

Bengaluru :	FY18: INR 1,589 cr	FY19: INR 1,819 cr	FY20: INR 2,100 cr (budget)
Chennai :	FY18: INR 750 cr	FY19: INR 835 cr	FY20: INR 930 cr
			Tamil Nadu: FY20: INR 5,802 cr (estimated)
Hyderabad:	FY18: INR 1,393 cr	FY19 INR 1,47 cr	FY20: INR 1,571 cr

Challenges/ disadvantages:

- Indian cities lack a good property valuation system, even the property data is not updated on a regular basis
- Lack of digitization through GIS mapping and database, the tracking properties becomes difficult
- Interagency coordination is another major challenge to capture true value
- Opposition from citizens residing along corridor for payment of differential taxes.

Case Studies/ examples:

- The Medellin model for betterment levy in Colombia relies on pre-assessment and post-assessment values to determine the value capture increment. However, reliance on the instrument in Colombia has declined since 1990s. In some cases it even became an insignificant contributor to municipal revenue. Between 1980 and 1990 the municipal revenue from betterment levy fell from 15% of total municipal revenue to just 5%.
- Major reasons for this fall are implementation delays and lack of transparency in increasing prices.

ULB LEVEL: ADVERTISEMENT TAX (2/6)

Rationale:

- **Advertisement:** Advertising revenue is generated by various agencies like municipal corp. and certain other public sector agencies like Indian Railway, Airport Authority of India, Metro corp., STUs, etc. These authorities get revenue from advertisements through public hoardings, digital displays and billboards on various infra facilities like bus stops, buses, bridges, railway stations etc.
- **This tax is submerged into GST, hence ULBs in Tamil Nadu do not collect it further. However, cities in Maharashtra continue to collect the Advertisement Tax and there is litigation in the court regarding the same.**
- Certain share of Advertisement tax so collected by local agencies can be diverted to SBTF. All STUs need to be given rights to collect revenue from hoarding and billboards on buses, bus stops and allied transport infra. This revenue shall go into STUs kitty or to the State Bus Transport Fund (SBTF).

Challenges/ disadvantages:

- ULBs, UDAs may not be willing to have addition charge on advertisement tax and may not share part of it with STUs or the SBTF.
- There need to be policy intervention by the State Government directing ULBs and UDAs to charge additional cess on advertisement tax and sharing of part of the advertisement revenue with STUs and SBTF.
- Larger ULBs will have sizeable advertisement revenue but the smaller ULBs may not.
- ULBs incur administrative and operating expenses in levy and collection of revenue so there might be reluctance to share revenue with other agencies.

Case Studies/ examples:

- Tfl generates some revenue from commercial activities, which include rental incomes, income from commercial advertising etc. For FY 2018-19, Tfl's revenue through commercial advertising (156 £m) accounted for 2.76% of the total income of 5656.20 £m.
- BMC in 2017-18 generated an advertising income of Rs. 20.8 Crores as against a total income of Rs. 2,227 Crores, making it a mere 1% contribution.
- Chennai Corporation received revenue of INR 1.8 crore from advertisement tax. For ULBs in Tamil Nadu the projected advertising revenue for FY 2019-20 is Rs. 3 Crores. This tax is submerged into GST, hence ULBs in Tamil Nadu do not collect it further.
- Pune Corporation collects around INR 25 crore as advertisement tax per annum.

ULB LEVEL: ADDITIONAL PARKING CHARGES (3/6)

Rationale:

- **Parking:** In Indian cities, parking charges are levied in urban areas by various agencies such as municipal corp., metro corp., city bus SPVs, Indian Railway, Airport Authority of India and STUs.
- The local agency may decide to levy additional parking charge as a % of existing parking fee collected for the purpose of SBTF. The high prices of parking or scarce parking slots can push the owners of vehicles to substitute to public transport.
- For Tamil Nadu ULBs, revenue from parking fees for FY 2019-10 was less than INR 1 cr.

Challenges/ disadvantages:

- Very few cities have Parking Policy in place which divides city area in different zones and do not have tariff structures.
- Parking charges in Indian cities are the lowest in the world as per international studies.
- Since the parking fee collection mechanism is very poor and unorganised, a sophisticated parking system is needed, which requires investment in IT infrastructure for real time information on congestion and related dynamic pricing as per areas and hours of the day.
- There is no official estimate available on the annual parking revenue for a city.

Case Studies/ examples:

- Brigade Shops Establishments Association (BSEA) Bangalore. This was formed by shopkeepers in Bangalore's Brigade road to deal with the heavy parking and congestion in its streets. The pay and park scheme on Brigade road was started through an MoU between BSEA and BMC.
- The system is monitored from a control room. Approximately INR 1.5 lakh per month revenue is generated of which 50% goes to the BMC and remaining to the BSEA for maintenance of parking meters and pavements & salary for the guards.
- Broad estimates suggest that annual parking revenue for Chennai Corporation is around **INR 3 crore in FY 20.**

ULB LEVEL: TAX ON EMPLOYERS (4/6)

Rationale:

- For economic activity in a city, transport is vital in providing employees with daily access to their workplace, helping clients access to sales outlets and facilitating the delivery of goods. Additionally if more number of employees are using public transport, the employer might not even need to provide parking spaces in its property. It only seems logical and equitable that companies and business activities should contribute to funding public transport by way of paying tax per employee.
- This is similar to Profession Tax is levied by States on the income earned by way of profession, trade, calling or employment. The Constitution (Sixtieth Amendment) Act of 1988 revised the ceiling for Profession Tax from Rs 250 per annum to Rs 2500.
- In TN, all ULBs collected around INR 433 cr in FY 2015 towards Professional Tax which is projected to be INR 800 cr in FY 2020, while Chennai Corporation revenue is INR 400 cr in FY20

Challenges/ disadvantages:

- Instead of introducing new tax, Professional tax revenue can be used.
- There might be a counter argument depending on where the employees reside. If the place of residence for employees does not have ease of access to public transport.

Case Studies/ examples:

- One of the most successful cases of employer tax in recent history has been in France where the Versement Tax (Transport tax) has been implemented and has funded approximately 35-40% of total expenditure on urban transport. It was introduced in 1971 for public and private companies with more than 9 salaried employees. Initially implement in Ile-de-France region, its purpose was to provide necessary funding to extend and improve public transport services in Paris area. It was gradually extended to all metropolitan areas with a transit authority. The tax is collected by social security and transferred to the transit authority.
- % rate of tax is determined by local authorities but a ceiling is imposed by the state.

ULB LEVEL: CONGESTION CHARGE (5/6)

Rationale:

- Road users, especially those with private vehicles, increase congestion on the road during peak hours
- Congestion pricing should reflect the short-run marginal cost of using private vehicles and is typically imposed for entry into downtown and business districts or based on the time of the day. Congestion pricing is an excellent tool as compared to administrative procedures for traffic management as it alters the relative prices between use of private vehicles and public transport and thus provides the appropriate incentive for behavior change.
- Furthermore, it charges a price for each trip that contributes to the congestion and thus is a better tool as compared to a licensing scheme under which the vehicle user may buy a license for entry into the congested parts of the city.
- A charge on vehicles entering busy lanes or crowded areas. It is specifically to reduce congestion by discouraging the public from using private vehicles in the said areas. The expected revenue will be very less.

Challenges/ disadvantages:

- Like the case of parking charges, it will need a new technology-based system for identifying congestion areas and charging accordingly.
- Lot of political opposition as there is mixed traffic and public transportation is weak in Indian cities.

Case Studies/ examples:

London

- Congestion charging- London. It accounted for 5% of revenue in 2012-13. This revenue is collected from transport users using private vehicle in defined areas planned to be experienced reduced congestion levels. A charge per entry and exit is levied from private vehicle users.
- In FY 2019, TfL earned a congestion charge (230 £m) equivalent to 4% of its total operating revenue (5656.2 £m).

Congestion pricing in Singapore

- In 1975, Singapore introduced an Area Licensing Scheme for charging drivers who enter downtown Singapore. In 1998 the scheme was changed to an Electronic Road Pricing (ERP) system involving toll for each trip to certain parts of the city. Each vehicle is fitted with an In-Vehicle Unit (IU) with a cash card fitting in the IU. The appropriate toll is deducted from the cash card when the vehicle passes through the ERP zone in the city.

ULB LEVEL: % OF CAPITAL EXPENDITURE BY ULBs ON ROAD AND INFRA. TO BE ALLOCATED TO SBTF (6/6)

Rationale:

- ULBs spend 10 - 30% of their total Capex on roads, bridges, flyovers and allied infra. For instance, Chennai Corp. spent INR 22% of their total Capex (INR 2,170 cr) on Road and allied infra in FY 2019.
- At least 10% of this can be spent/ routed to sustainable transport including SBTF

Challenges/ disadvantages:

- Many roads are of less than 15 m where major public transit can not be provided hence the argument put is this fund is required for road widening.
- Some cities like Chennai have road network of <10% of total areas which is much lesser than the UDPFI norm of 15%.
- Political preference towards creation of tangible assets like road infra.
- Therefore, State need to make policy decision to allow allocation of at least 10% of the Capex for SBTF.
- Chennai has multiple organisations like CMWSSB, CMDA, CoC etc. which have their own revenue sources and hence CoC's sources remain limited. In addition, CoC's property tax revenue is much lesser compared to peer cities. Hence it has financial constraints in terms of prioritising projects.

Case Studies/ examples:

- Many Indian cities are now allocating budget for sustainable transport such as public bus transportation, BRTS, ITMS, NMT etc.
- Pune has spent over INR 1,000 crore over a 13 years period on setting up BRTS system. Pune and Pimpri city corporations also provide operational subsidy to PMPML (Pune Bus SPV) to the tune of INR 250 cr/ year in the proportion of 60:40 respectively.
- Pune Municipal Corporation allocate 20% of its budget for sustainable transport projects such as procurement of buses, BRTS, conversion of autoriskshaw to CNG, NMT etc.

KEY TAKEAWAY-6: SUMMARY OF ASSESSMENT OF SOURCES

WHAT GOES INTO POTENTIAL SBTF FROM GOVERNMENT SOURCES

Sources		Source can be tapped in the - Short or long term	Source can be used as -	
			Grant	Debt
Central Govt. level sources				
1. CRIF		LT	✓	✓
2. Finance Commission grant		ST	✓	
3. Current Central schemes (AMRUT/ Smart City/ Green Mobility Scheme)		ST	✓	✓
4. Funds from National Investment Fund (NIF)		LT		
5. Funds from National Investment & Infrastructure Fund (NIIF)		LT		
State Govt. level sources				
1. Green Tax		ST	✓	
2. Additional Vehicle Registration Charges		LT	✓	
3. Surcharge on owning > 1 motor vehicle		LT	✓	
4. Cess on fuel sold		ST	✓	
5. Additional levy on conversion of land use charges		LT	✓	✓
6. In lieu of above, certain % on revenue under State MV Act and MV tax Act		ST	✓	
7. Premium on development of land parcel by SBTF on commercial basis		LT	✓	✓
Short Term	ST			
Long Term	LT			

- Initial equity capital can be provided through State budget and /or Central Govt contribution + equity capital from IFIs and/or Commercial Banks + equity contribution from NIF and NIIF can be explored
- E.g. TNUDF has total equity of INR 200 cr with contribution from GoTN (72%) and Banks/ NBFC (28%)
- Enhancing equity by infusing more capital in future
- Cost of Land parcel allocated by State govt. can go as equity of State Govt.

Sources	Source can be tapped in the - Short or long term	Source can be used as -	
		Grant	Debt
ULB level sources			
1. Cess on property tax in influence zone of Transit-Oriented Development corridor	ST	✓	
2. Additional parking charges	LT	✓	
3. Additional charge on advertising fee/ tax	LT	✓	
4. Tax on employers	LT	✓	
5. Congestion Charge	LT	✓	
6. % of capital expenditure by ULB on road and infra. to be allocated to SBTF	ST	✓	✓
7. In lieu of above, % of total annual revenue of all ULBs in the state	ST	✓	✓

POTENTIAL SBTF FUND SIZE — CASE STUDY OF TN

THROUGH CENTRAL, STATE AND ULB SOURCES

This is illustration for estimating the potential size of the SBTF in case of Tamil Nadu state.

1. The contribution from Govt. sources -

- Thus, in case of **TN**, tapping **govt. sources** would contribute around **INR 1,450 crore/ annum** to the SBTF
- This includes both grant and debt contribution
- **Initial equity capital** can be provided through
 - State budget and /or Central Govt contribution + equity capital from IFIs and/or Commercial Banks + equity contribution from NIF and NIIF can be explored
 - Enhancing equity by infusing more capital in future
 - Cost of Land parcel allocated by State govt. can go as equity of State Govt.
 - E.g. TNUDF has total equity of INR 200 cr with contribution from GoTN (72%) and Banks/ NBFC (28%)

Sources (Amount in INR cr)	Feasibility	Esti. Annual Amount
Central Govt.		
1. Central Road Fund (CRF)	At 5% of annual state allocation	100
2. FC XV devolution It includes devolution to ULBs and RLBs + devolution to improve air quality in 3 ULBs.	At 2% of annual state allocation i.e. 2 % of INR 8,420 cr.	168
3. Funds from NIF This can be tapped in long term in the form of equity separately.	---	---
4. Funds from central schemes (such as AMRUT/ Smart City/ Green Mobility) Funds can be tapped from proposed Green Mobility Scheme & from 2.0 version of other 2 schemes	Expected INR 7,000 cr allocation for TN; 10% of INR 7,000 cr as loan & grant: (it's divided into 5 yrs)	140
State Govt.		
1. State MV Act and MV tax Act Addl. vehicle registration charges, Cess on fuel sold, Green tax and additional charges on > one 'motor car' are part of State MV Act and MV tax Act .	5 % of total annual receipts under State MV Act and MV tax Act For TN: 5% of INR 6,019 cr in FY 21	300
2. Development of land parcels on commercial basis	State can develop land parcels on commercial basis on long term lease with upfront premium or PPP	100
ULB sources		
1. Share of ULB revenue Except Property Tax and Professional tax, all other sources of revenue generate very small amount of revenue. Capturing, tracking and sourcing these annually for all ULBs across the state is a tedious process. Hence, State can allocate 2% of total annual revenue of ULBs to the SBTF.	In case of TN, 2% of ULBs' estimated annual revenue of INR 32,231 cr. can be allocated to SBTF	645
TOTAL		1,453

FUNDING FROM INTERNATIONAL FINANCE INSTITUTIONS (IFIs)

POTENTIAL BORROWING FROM IFIs — CASE STUDY OF TN

2. The contribution from IFIs as Loan + grant:

Rationale:

- DFIs play important role in lending to the financially constrained State and Local Bodies
- Provide cheaper finance (Int. 1-3% excl. hedging cost) with longer tenure (10-30 yrs) & moratorium (3-7 yrs)

Challenge/ disadvantage:

- Approval is to routed through Department of Economic Affairs (DEA) and other relevant ministries of Gol, which is very cumbersome process
- State borrowing is reaching threshold for fiscal deficit to GSDP norms. E.g. TN's Fiscal Deficit to GSDP will be 2.84% in FY21, against the norm of 3%.

Case study:

- TN has secured loan commitment of around INR 47,000 cr from DFIs during 3-4 yrs.
- This amount will be disbursed over a period of 7-8 yrs, which translates to:
- **Total annual commitment : INR 6,700 cr &**
- **Allocation for transport sector: INR 3,300 cr/yr**

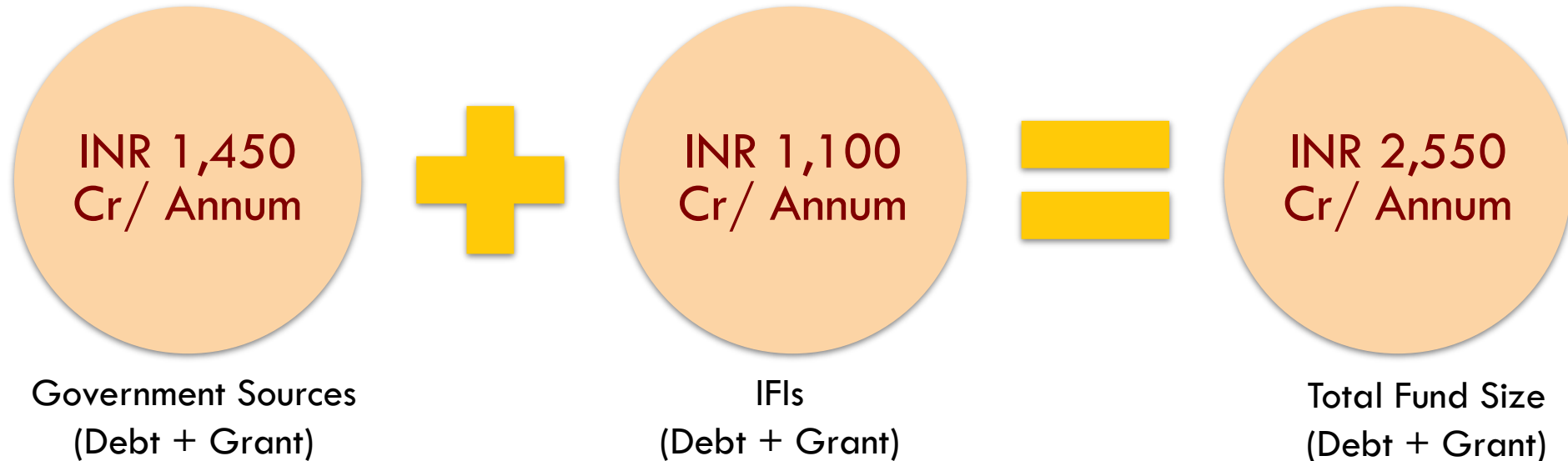
DFIs, (amount in INR crore)	Loans/ fund committed, Last 3 - 4 yrs	Allocation for Transport	Transport allocation Details
JICA	20,626	8,715	Metro, Peripheral Ring Road, Intelligent Transport systems, Port dredging
ADB	6,623	800	TN Industrial road connectivity project
World Bank	8,463	2,271	Rural roads
KfW, Germany	1,575	1,575	Bus procurement - to procure 2,213 new buses under BSVI norms and 500 electric buses worth Rs 1,580 crore
Asian Infrastructure Investment Bank (AIIB)	10,000	10,000	Chennai Metro Rail, Ring Road
Total	47,287	23,361	

- In future, TN can secure 1/3rd of total transport commitment of around INR 1,100 crore/ yr for SBTf
- As mix of loan + grant. The grant component will be very less (around 5-10%) which can be used for project preparation support and VGF for project CAPEX.

POTENTIAL FUND SIZE

CASE STUDY OF TAMIL NADU

Illustration for estimating the potential size of the SBTF in case of Tamil Nadu state.



- Initial equity capital can be provided through State budget and /or Central Govt contribution + equity capital from IFIs and/or Commercial Banks + equity contribution from NIF and NIIF can be explored
- E.g. TNUDF has total equity of INR 200 cr with contribution from GoTN (72%) and Banks/ NBFC (28%)
- Further, fund just as in case of TNUDF, SBTF can mobilize equity support from private party and funds from bond market as well

CONTENT

1. Background
2. Approach and Methodology
3. Part – I – Fleet & Funding Assessment
 - A. Methodology for fleet and funding assessment
 - B. Demand estimation for FIVE STUs
 - C. Key Takeaway
4. Part- II – Financing Public Bus Transport
 - A. Urban Bus Transportation in India- Changing landscape & Procurement Models
 - B. Assessment of financial health of five State Transport Undertakings
 - C. Assessment of existing guidelines, Public Bus Financing entities and Urban Infrastructure Finance Intermediaries
 - D. Analysis of sources of funding
 - E. Summary of findings and recommendations for fund**

DEMAND AND FUNDING NEEDS FOR SAMPLE 5 STUS

Meeting the sustainable transport vision identified by Hyderabad, Chennai and Bangalore points to the need for a 2-4-fold increase in the bus fleet size of these cities. As per our analysis, even rural and intercity service providers such as TSRTC and KSRTC will need to procure up to 18,645 and 29,958 in fleet size to cater the estimated demand for bus transport in the next 10 years.

1

Improving bus service levels and their transition to zero emission electric buses requires sustainable non-fare funding sources that support STUs' Capital and Operational expenditure needs.

3

A state level facility that funds STUs in-lieu of meeting the improved service and emissions performance needs to be set up. As discussed in the subsequent sections, this fund is designed after careful analysis of bus procurement trends, sources of funds, financial health of the STUs, and the existing guidelines and mechanism in place.

5

2

Across STUs, the BAU trend points at stagnant service levels and increasing financial losses due to steady increase in staff and fuel costs. These costs are not matched with commensurate increase in fare levels due to affordability considerations of bus users.
MTC Chennai and KSRTC, under BAU trend, incur losses worth Rs. 28,093 Cr. and Rs. 31,119 Cr. Respectively in next 10 years.

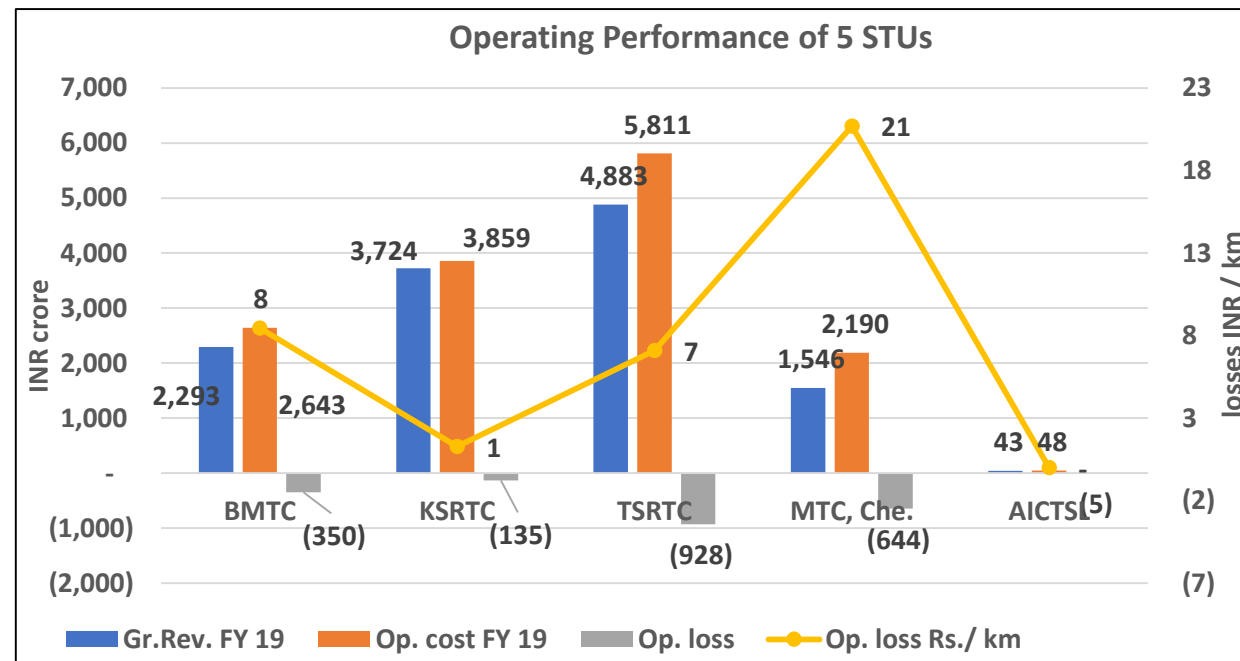
4

Further, the transition to electric buses would require higher investments given the higher capital needs of electric buses due to higher vehicle cost and supporting infrastructure needs such as charging and electric infrastructure.

For example, in the case of KSRTC, Capex required for the e-bus scenario (ambitious) is Rs. 40,555 Cr as against Rs. 10,884 Cr. otherwise. Similarly Opex for e-bus scenario for KSRTC reduces to Rs. 1,64,233 Cr from Rs. 1,74,152 Cr otherwise. This trend is constant across STUs.

FINANCIAL POSITION OF SAMPLE 5 STUS

- Cumulative losses of five STUs is **INR 5,442 cr (FY17-19)**
- Wide range of operating losses to gross revenue: **4% (KSRTC) to 42% (MTC)**
- Very less non- operating revenue (< 10%)
- State subsidy for concessions (8% to 13% of total Rev.)
- Manpower cost is a major component of the operating cost : manpower cost to Op. cost is 41% (TSRTC) to 61% (MTC, Chennai)



Non-Operating to Gross Revenue %	FY17	FY18	FY19
BMTC	6%	9%	10%
KSRTC	5%	6%	5%
TSRTC	5%	5%	6%
MTC, Che.	8%	9%	6%
AICTSL	4%	14%	7%

HR cost/ Operating cost	FY17	FY18	FY19
BMTC	53%	53%	53%
KSRTC	43%	42%	41%
TSRTC	52%	50%	49%
MTC, Che.	61%	61%	61%

Telangana State Road Transport Corporation (TSRTC), Karnataka State Road Transport Corporation (KSRTC), Bengaluru Metropolitan Transport Corporation (BMTC), Metropolitan Transport Corporation (Chennai) Ltd. (MTC, Chennai), Atal Indore City Transport Services Limited (AICTSL)

Source: Unaudited finances of BMTC, KSRTC, TSRTS, MTC and AICTSL

PROCUREMENT MODELS PREFERRED BY STUS

Many STUs continue to adopt **outright purchase and leasing models** because of –

- Lack of willingness to change existing procurement systems, influence by automobile industries and political decision makers as auto industry in India is a major industrial investor and job creator
- Resistance to change by legacy worker unions, opposition to PPP and outsourcing contracts

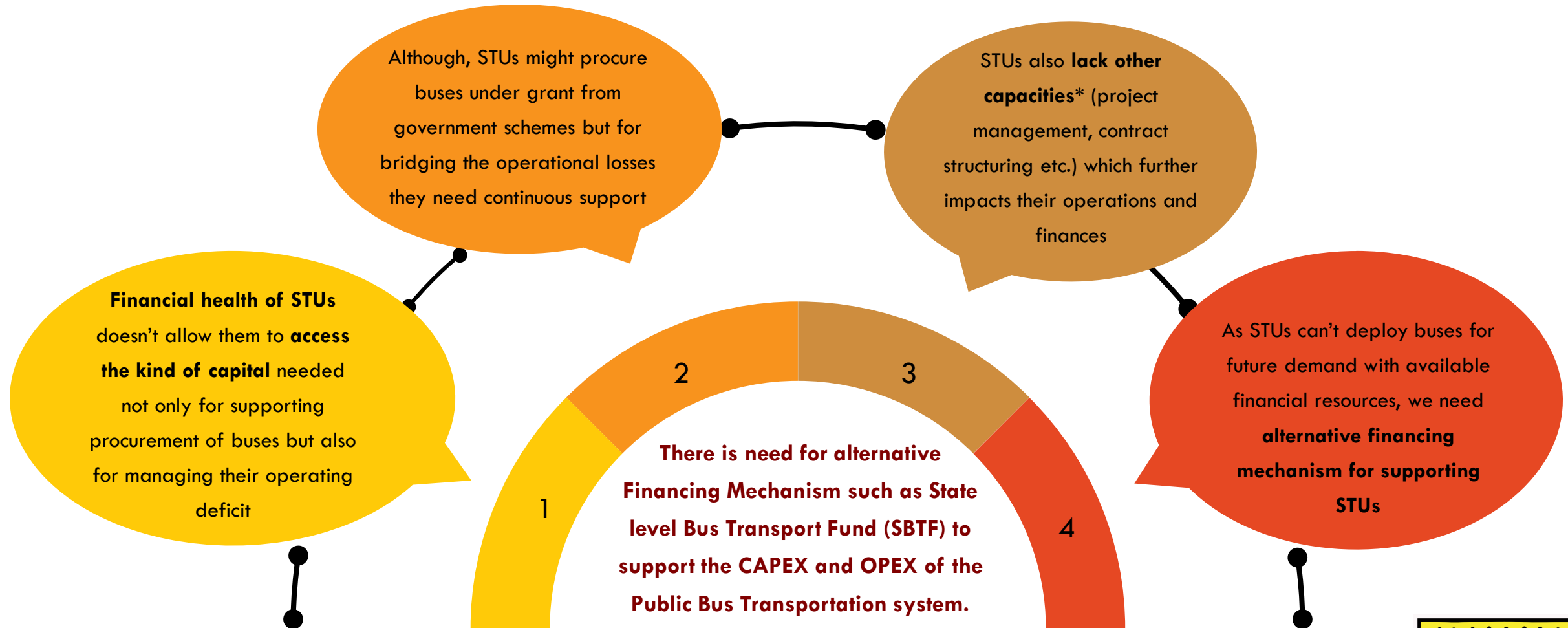
However, some STUs preferred **GCC and NCC models** because of -

- Push by funding and reforms under JnNURM during 2016-2014, many STUs adopted GCC and newly formed smaller STUs preferred NCC models
- In case of e – buses: the risk of high upfront cost, nascent technology and inadequate capacity of STUs to manage e buses, was transferred to private player through GCC model

Proactive STUs like Ahmedabad and Pune chose GCC model for diesel and CNG buses (part of the fleet) where the local ecosystem of various stakeholders and leadership played a major role in decision making

Although **OEMs** prefer Outright purchase, they are adopting other models such as GCC and NCC due to upfront subsidy available from government and to withstand market competition

FINANCIAL POSITIONS OF STUS A CHALLENGE FOR FULFILLING THE INCREASE IN DEMAND



<https://shaktifoundation.in/wp-content/uploads/2017/06/Roadmap-for-City-Bus-Systems-in-India.pdf>

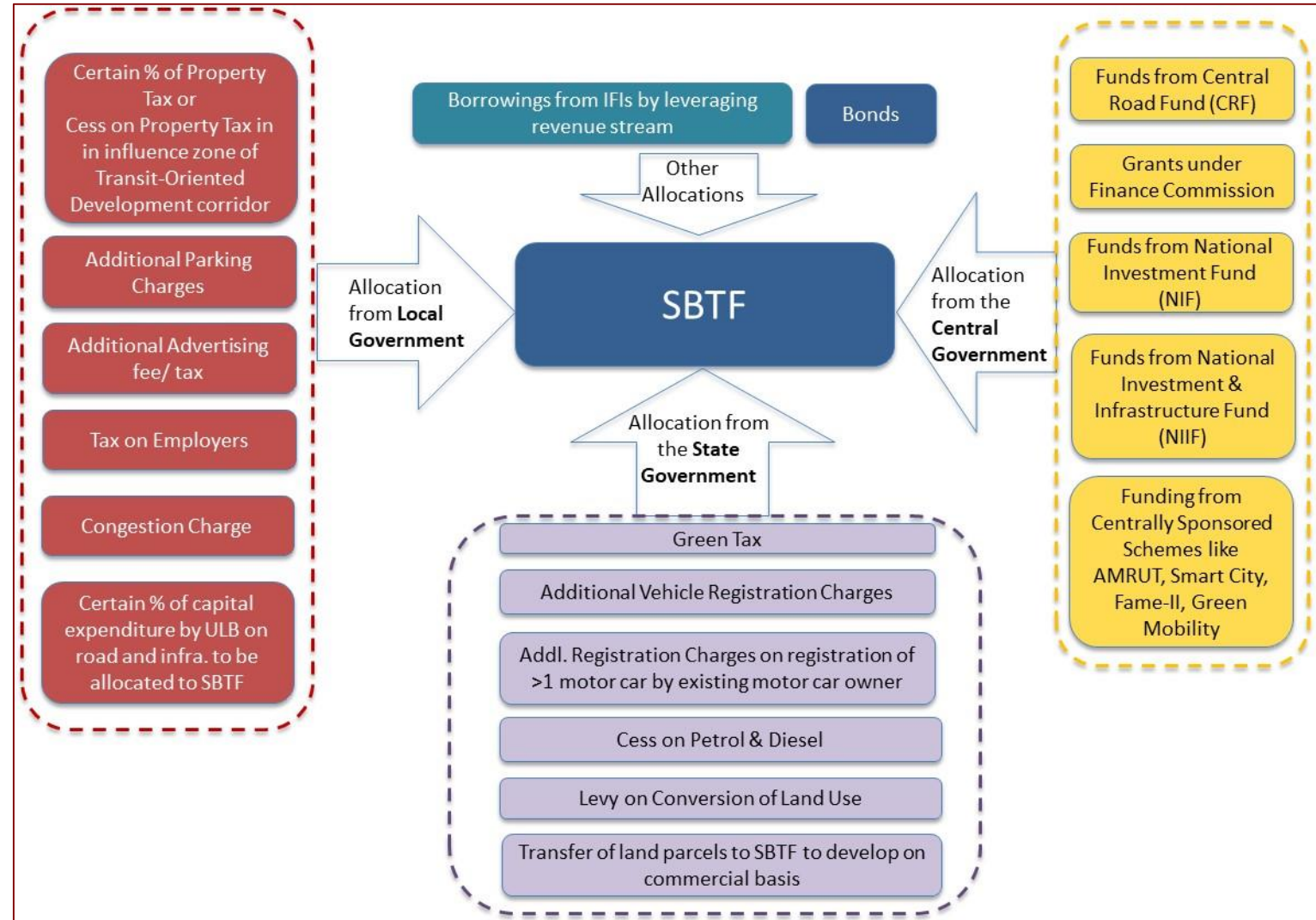
PROPOSED SBTF -SOURCES OF FUND

Two major sources of fund for SBTF:

1. **Government sources** at three levels – Central, State and ULBs or UDAs
2. **Borrowing** from International Finance Institutes (IFIs)
 - Access low cost capital from Development Banks with government guarantee

EXPLORE:

- Land monetization to ensure financial sustainability, state govt. will provide policy guidelines on this
- Part of the revenue generated through Transit Oriented Development – and further develop Terminals and Stations on PPP/ commercial basis



PROPOSED SBTF — FUNCTIONS OF FUND

UTILISATION OF FUNDS FOR CAPEX AND OPEX & PROJECT PREPARATION ECOSYSTEM

SBTF can be utilized for thrust sectors for supporting their Capex and Opex requirements. It can also help in creating/strengthening the project preparation ecosystem whereby project development grant can be provided.

Thrust sectors

- Buses and allied infrastructure
- BRTS
- Last mile connectivity
- E buses and allied infra. (charging infra., solar system)
- Intelligent Transport Systems (ITS) and other IT and technology interventions
- Training and capacity building

Capex support - grant & loan for procurement of buses & allied infra., VGF for STUs.

Opex subsidy for STUs as VGF grant for operational losses, debt servicing

Conducting studies/ DPRs - appoint consultants for preparation of CMP, Business Plan of STUs, route rationalization, capacity building etc.

Intermodal integration - common ticketing, public information

Financial support to take up initiatives to increase Non op. income - land monetization, TOD, Advt. revenue etc.

Others - project preparation, structuring, procurement & contract mgmt., Transaction Advisory, support in capital market access to STUs

PROPOSED SBTF – MOBILIZATION OF FUNDS

SBTF can be utilized for thrust sectors for supporting their Capex and Opex requirements, and for project development activities through various ways, which are explained below:

Utilisation mechanism	Activities/ Components	Sources to be tapped / Contribution
Loan	Debt can be used for creating assets, e.g. Purchasing buses, developing - Bus Depot, BRTS system, ITMS system etc.	Govt. sources, IFIs or Commercial Banks
Capital grant	- Capital grant for procurement of buses under various models - Viability Gap Funding (VGF) for developing other TDF Ltd. Provides allied infrastructure such as bus depot/ terminal, bus stops, ITMS system etc. which can be developed on EPC or PPP model - E.g. VGF grant upto 25% of the total project cost for allied infrastructure projects	- Govt. sources, IFIs or Commercial Banks - E.g. TDFC Ltd. provides loan to STUs in TN, Mega City Revolving Fund provides loans to Bangalore and Chennai metropolitan areas
VGF – Operations	- As a subsidy for covering annual operating deficit of STUs either fully or partially - In case STUs opt for PPP models for bus procurement like GCC or NCC models, then for the new procurement, the VGF can be provided as a grant (upto 50% of project cost) to support the operating cost for 5-7 years. This is to promote PPP (GCC and NCC) models.	- Govt. sources, IFIs or Commercial Banks - E.g. Project Sustainability Grant Fund (PSGF) managed by TNUIFSL, through which GoTN provides VGF for Urban Infra. projects of ULBs as in Gujarat
Project Preparation Grant (PPG)	- Conducting studies/ DPRs - appointing consultants for preparation of CMP, Business Plan of STUs, route rationalization, technical studies and bid processes, capacity building etc. - To take up initiatives to increase Non operating income of STUs. e.g. for land monetization – grant support for preparation of policy, carrying out Transaction Advisory Services etc. - E.g. Developing action plan for exploring newer sources or strengthening existing sources of revenues of STUs	- Govt. sources, - IFIs or Commercial Banks contribute 5-10% of their overall financing commitment - E.g. Project Development Grant Fund (PDGF) managed by TNUIFSL
Other partnerships	Leveraging on other partnerships such as Technical support available for capacity Building and training from various organisations	E.g. GIZ provides technical assistance for e mobility and Urban Transportation in select Smart Cities in India

PROPOSED SBTF – INSTITUTIONAL STRUCTURE

The proposed SBTF is a state level entity and can be an independent fund.

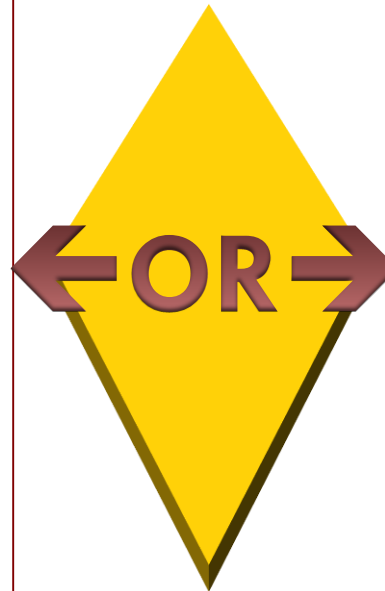
While a detailed organisation structure and nature of legal status of the SBTF depends on many factors which need to be evaluated, broadly two suggestions can be made for the institutional structure.

Option 1

SBTF can be registered as a **new Trust and a separate trustee company to be created to manage the trust.** An existing UIDFC in the state can act as a **Fund Manager or a separate entity** can be formed for the same.

Eg:

- Karnataka - KUIDFC acts as a fund manager for Karnataka Water and Sanitation Pooled Fund Trust (KWSPF Trust) and Megacity Revolving Fund (MCRF)
- Tamil Nadu - TNUIFSL acts as a Fund Manager for Tamil Nadu Urban Development Fund (TNUDF) and other supporting funds such as PDGF and PSGF



Option 2

SBTF can be a part of **existing government department, like Department of Land Transport (DULT).** The Functions of SBTF can be managed by a **fund management division under the department.** The FMD is envisaged to manage all matters pertaining to SBTF, including collection and disbursement of funds.

Eg.

As per MoHUA guidelines, UTF acts as a fund division within UMTA, which is set up at metropolitan level. Additionally UMTA looks after all modes of urban transportation including bus, metro rail, monorail, NMT etc.

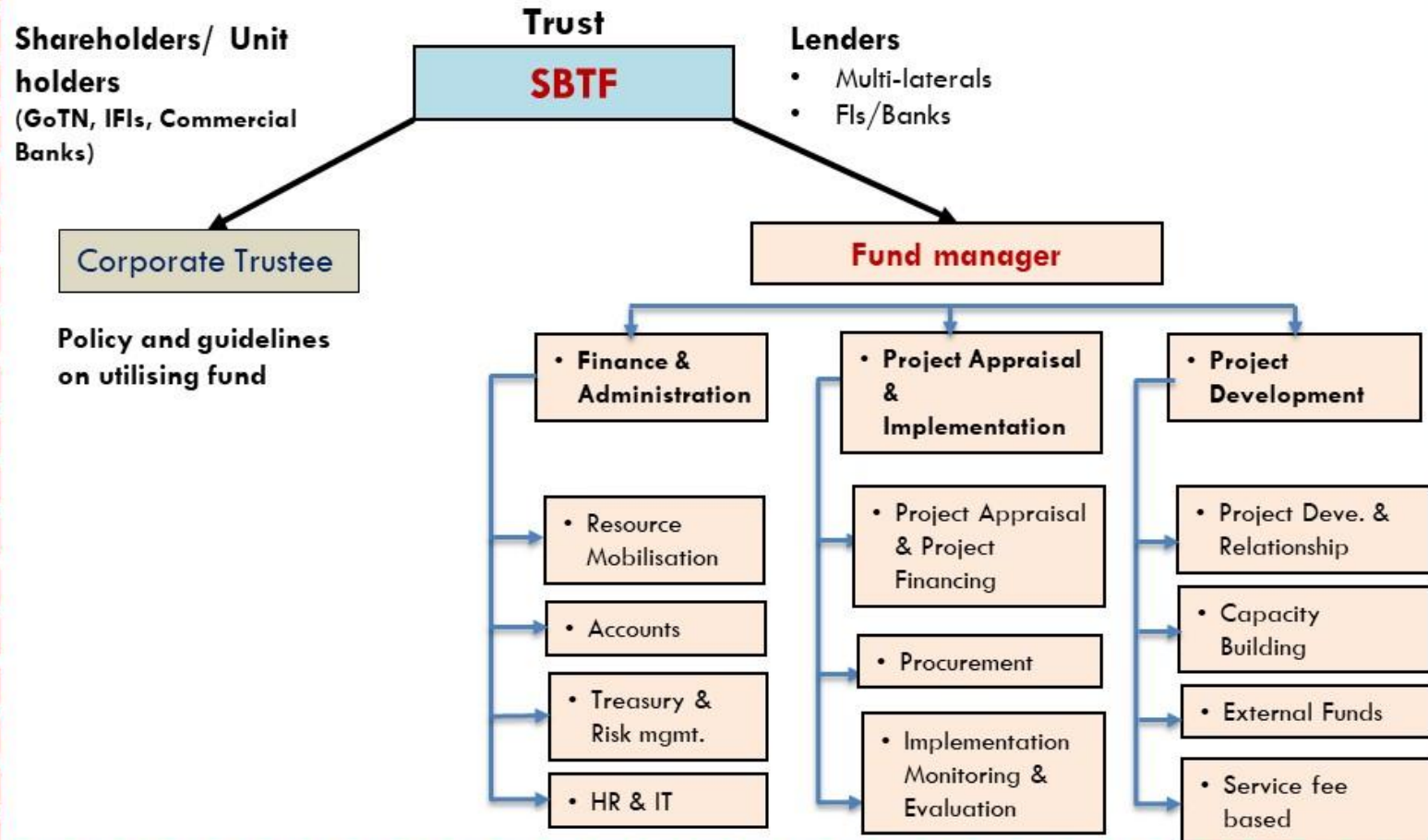
In case, a metropolitan city forms UMTA, the SBTF can lend it to the UMTA instead of the respective STU based on a certain guideline to solely use that allocation for supporting Public Bus Transportation.

EXAMPLE FOR INSTITUTIONALIZING SBTF AS SEPARATE TRUST

SBTF as a Trust with a separate Corporate Trustee managing it.

A separate existing or new entity can act as a fund manager for the SBTF.

- For instance, in case of Tamil Nadu - TNUIFSL act as a fund manager for TNUDF, similarly, it can act as a Fund Manager for SBTF
- TNUIFSL manages other supporting funds such as PDGF for project development support and PSGF for viability grant funding. These funds can act as supporting funds for SBTF.



EXAMPLE FOR INSTITUTIONALIZING SBTF UNDER GOVT. DEPARTMENT

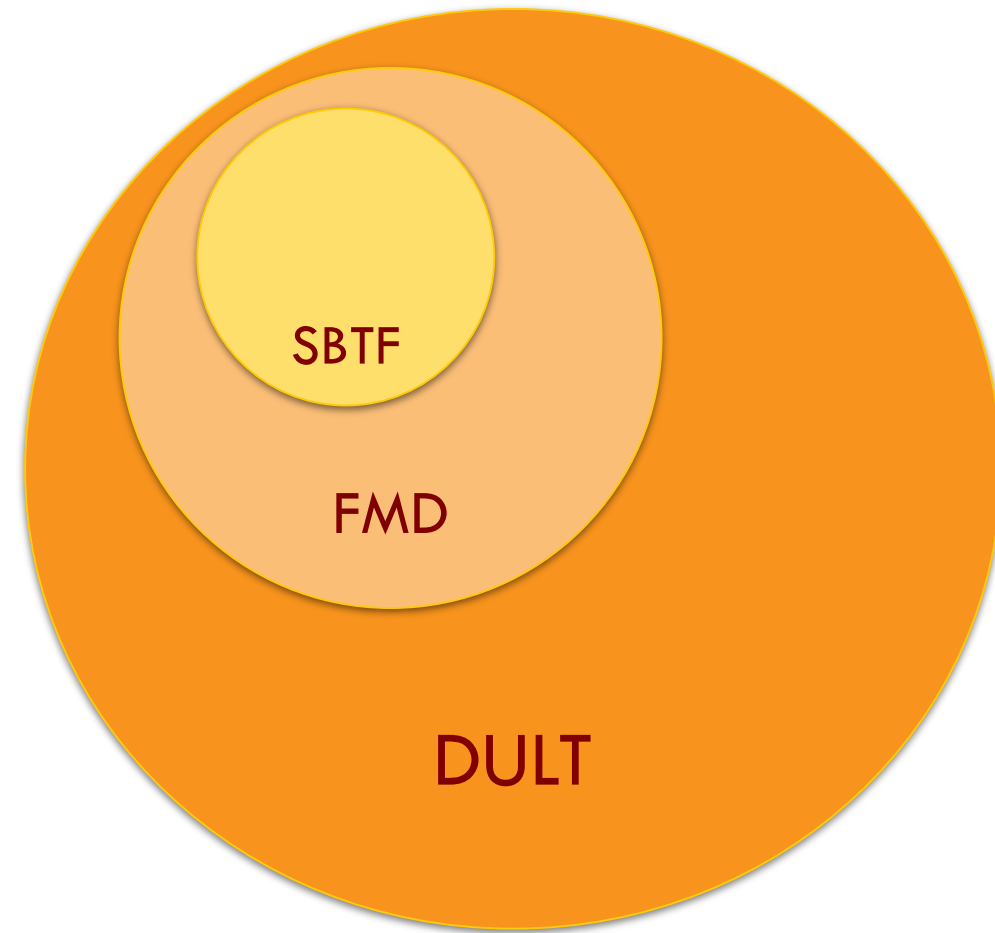
SBTF as a part of the existing state level entity/authority on land transportation,

e.g. DULT in Karnataka

which will be responsible to managing SBTF.

A department within the chosen entity/authority, e.g. A Fund Management Division (FMD) can act as a fund manager for the SBTF.

- Urban Transport Fund (UTF) acts as a fund division within UMTA and it's Fund Management Division (FMD) acts as the fund manager for UTF.



ENABLING CONDITIONS FOR INSTITUTIONAL STRUCTURE

These two options are feasible under different enabling conditions as mentioned below:

- **For Option 1- SBTF as a separate Trust** requires Presence of active UIDFC like entity with previous experience of
 - managing sizeable funds/ projects, e.g. above INR 1,000 crore
 - raising funds from commercial lenders and external financing institutions
 - project development activity
- **For Option 2- SBTF as a Division/ Department within govt.** requires presence of existing department/ agency or potential for creating such department/division with
 - political buy in
 - making budget provision for creating a fund
 - potential for creating ecosystem for project development activity

THANK YOU



ANNEXURES

ANNEXURE: E BUS PROCUREMENT MODEL



FAME I- E-BUS PROCUREMENT: MIX OF OWN PURCHASE + GCC MODEL

City	No. of Buses	Type	STU	Procurement Model	Bidder
Bangalore	60 AC	12 m	Bengaluru Metropolitan Transport Corporation	Gross Cost Contract	Goldstone- BYD
Bangalore	20 Non AC	9 m	Bengaluru Metropolitan Transport Corporation		Goldstone- BYD
Mumbai	20 AC	12 m	BEST Undertakings		Goldstone- BYD
Mumbai	20 Non AC	9 m	BEST Undertakings		Goldstone- BYD
Hyderabad	40 AC	12m	Telangana State Road Transport Corporation		Goldstone- BYD
Ahmedabad	40 non-AC	9m	Ahmedabad Janmarg Limited (AJL)		Ashok Leyland Limited
Jaipur	40 AC	9m	Jaipur City Transport Services Limited		Tata Motors Limited
Indore	40 AC	9m	Atal Indore City Transport Service Limited	Outright Purchase	Tata Motors Limited
Lucknow	40 AC	9m	Lucknow City Transport Services Limited		Tata Motors Limited
Kolkata	20 AC	9m	West Bengal Transport Corporation Limited		Tata Motors Limited
Kolkata	20 AC	12m	West Bengal Transport Corporation Limited		Tata Motors Limited
Jammu	15 AC	9m	Jammu and Kashmir State Road Corporation		Tata Motors Limited
Guwahati	15 AC	9m	Assam State Transport Corporation		Tata Motors Limited

ANNEXURE: STU FINANCES

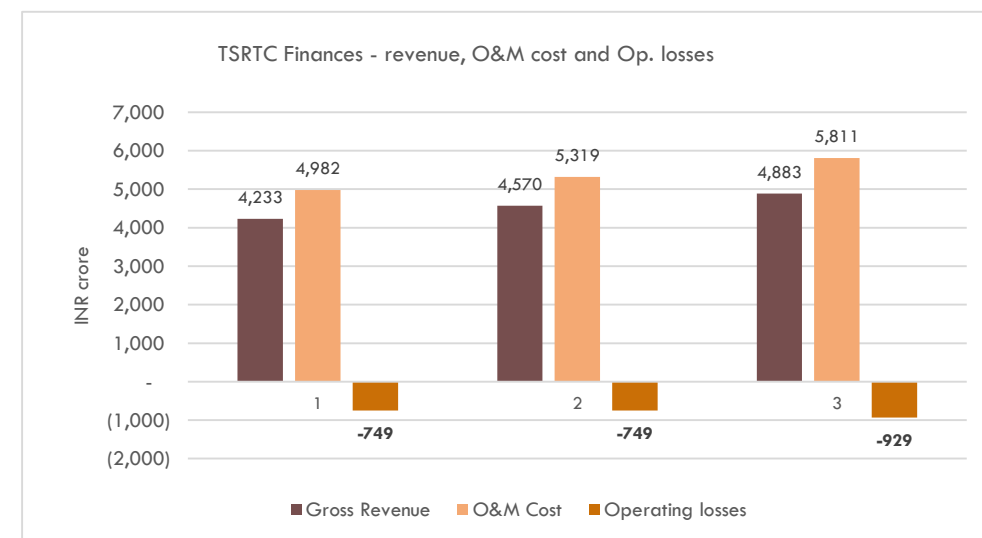
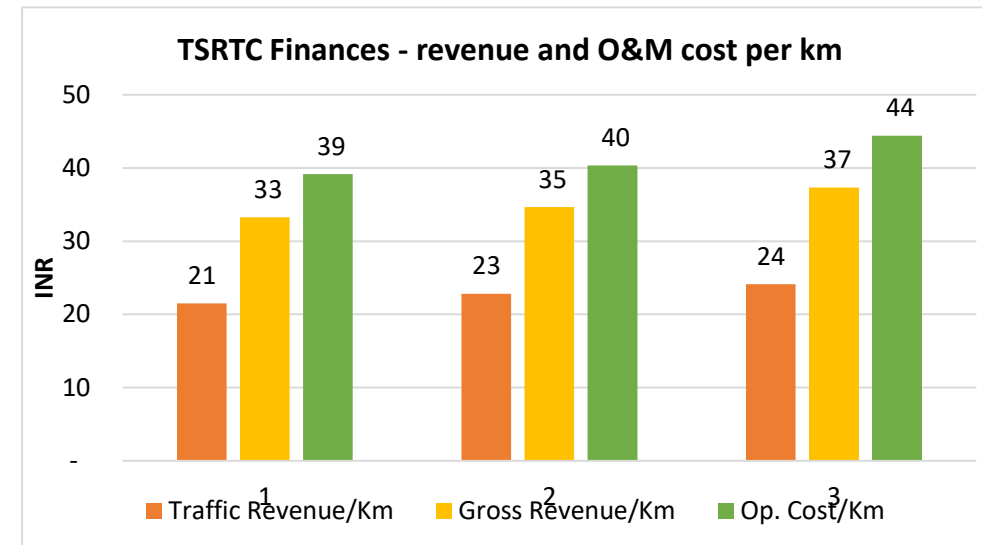


FINANCING - B. ASSESSMENT OF STU FINANCES

ANALYSIS OF TSRTC FINANCES

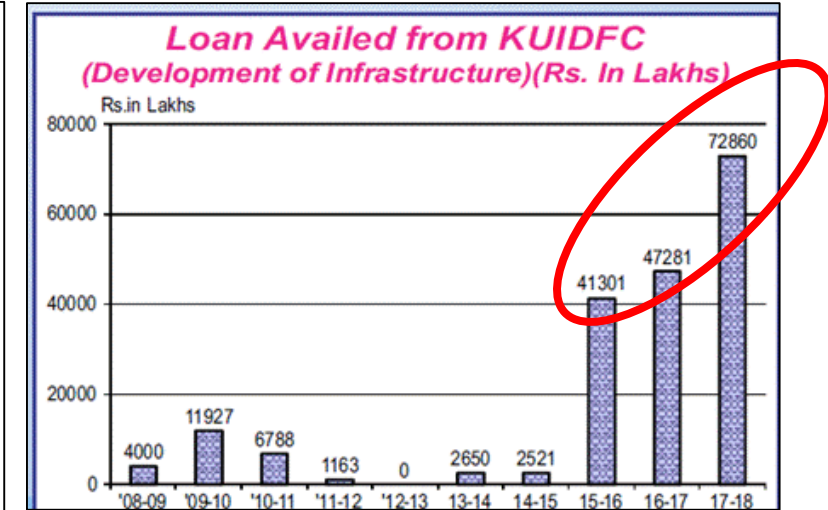
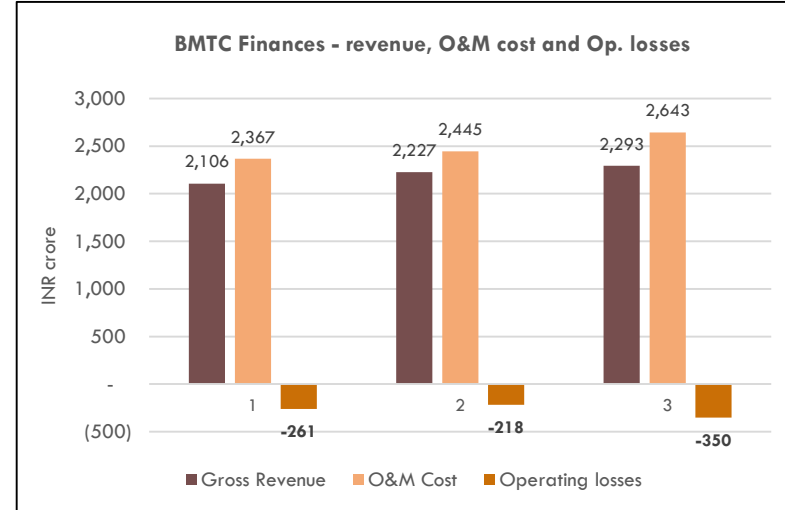
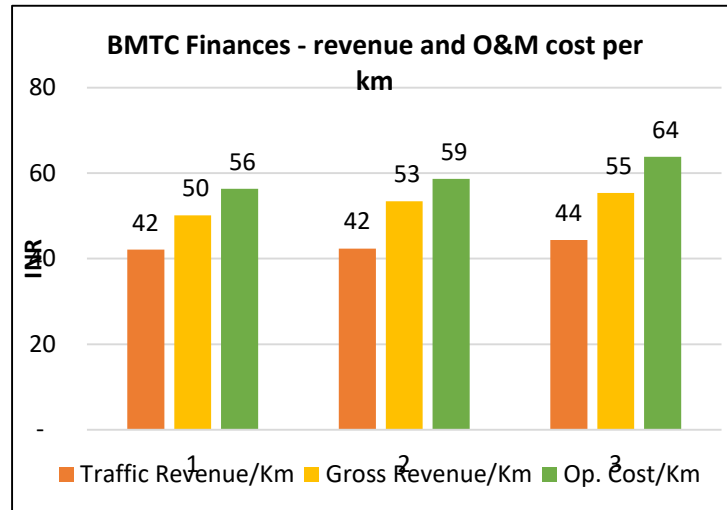
TSRTC Finances – key observations (FY 2019)

- Operates 15 types of buses, total fleet of 10,424 where **20% are hired buses**
- **Total loss per km is Rs. 7.8**
- **Hired vehicles have much lesser losses Rs. 3.8/ km against Rs.8/ km by owned vehicles**
- **Int. on loan is Rs. 181 cr**
- **Outstanding loan of Rs. 2,000 cr**
- **Operating Deficit is Rs. 929 cr in FY 2019**
- **MV Tax arrears: Rs. 452 cr due for 3 yrs, its tax on gross earnings of TSRTC**
- **Advt fees due to GHC not paid since 2014 : Rs. 50 cr**



FINANCING - B. ASSESSMENT OF STU FINANCES

ANALYSIS OF BMTC FINANCES



BMTC Finances – key observations (FY 2019)

- BMTC availed Rs. 1,614 cr loan from KUIDFC (FY 16-18) UNDER Mega City Revolving Fund (MCRF) at 6.5% int. rate after swapping commercial loan which was @10%
- BMTC defaulted : Rs. 160 cr and Rs. 175 cr. Loans in FY20
- BMTC has substantial **annual debt repayments amounting to Rs. 224.42 crore, during FY2020 and FY2021**
- Liquidity position remains poor as reflected in its delays in the repayment of long-term loans during the current fiscal
- **Op. loss increased form Rs. 6/ km (FY17) to Rs. 9/ km (FY2019)**
- **Operating Ratio ranges between 110% to 115%**

ANNEXURE: FUND



FINANCING - PROPOSED SBTF — GOVERNMENT SOURCES

SUMMARY OF ASSESSMENT - WHAT GOES INTO POTENTIAL SBTF

Central Sources

- **CRIF:** Certain 5% of allocation to a State can be further allocated for SBTF
- **Finance Commission grant** to states in the form of devolution to ULBs and RLBs
 - This also includes grant for air pollution management for few cities within that state
 - Since, Bus transport serves both rural and urban areas, 2% of FC grant to state can be allocated to the SBTF
- **Funds from NIF** are primarily used for central schemes and capitalization of public banks and difficult to access independently by states, hence not considered
- **Current schemes** - AMRUT, Smart city & FAME have allocated their funds, so it is proposed that their 2.0 or 3.0 version + Green Mobility shall include allocation of INR 7,000 cr to a state and further 10% of that can be allocated to SBTF

State Sources

- Under **State MV Act and MV tax Act**, Vehicle related revenues such as registration tax, surcharge on motor vehicle, green tax etc. are collected. So, it is prudent to allocate 5% of revenue from MV ACT & MV Tax to SBTF.
- **Transfer of at least 20 land parcels** spread across major cities, to SBTF to develop on commercial basis - it will further develop either on upfront premium basis, PPP or on lease - rental basis.
- State can provide **additional development rights** in the form of additional FSI to the SBTF so as to maximize the revenue potential of these plots.

ULB Sources

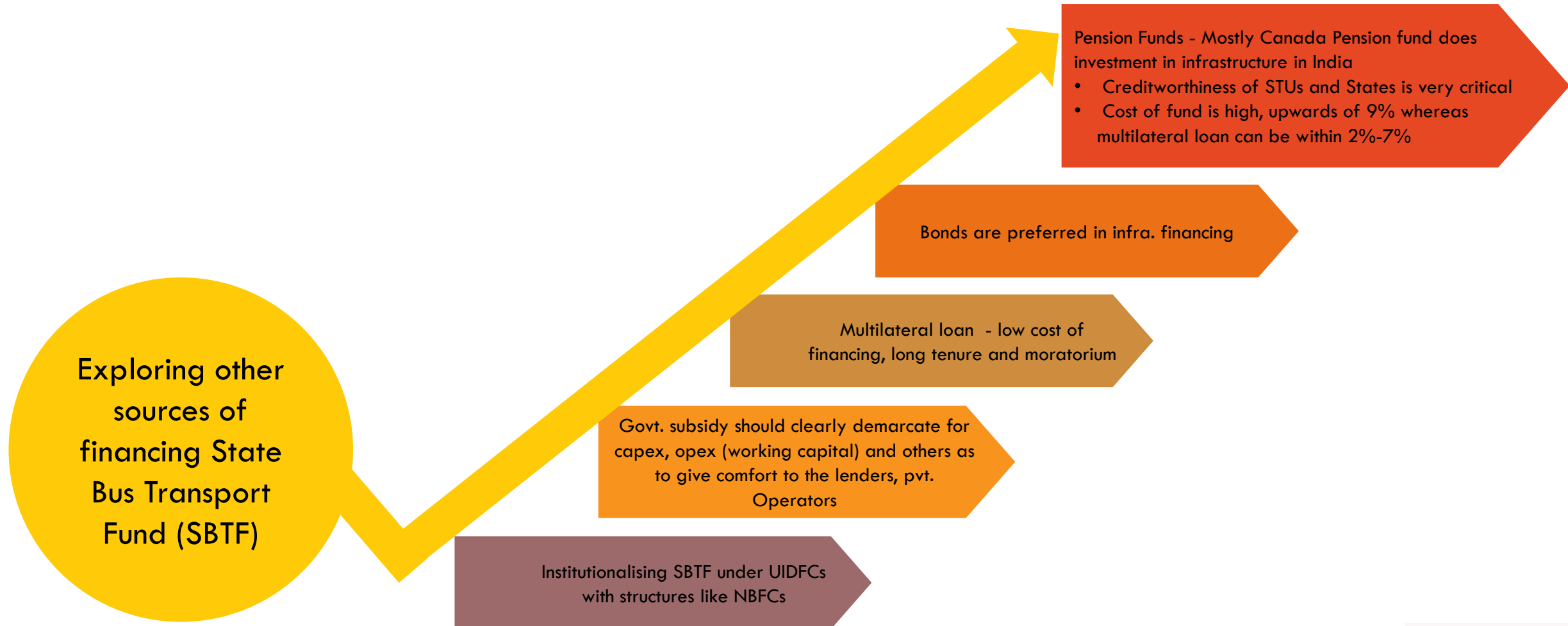
- **ULBs' major sources** of funds are own sources (30-50%) and grants & compensations (32%).
- **Property Tax** is major source (15% -30%) among them..
- Except Property Tax and Professional tax, other sources of revenue (parking charges, congestion & land conversion charges) are very small. Capturing, tracking & sourcing these smaller sources annually for all ULBs across the state is a tedious process.
- ULBs CAPEX on transport sector varies year on year and prioritisation decision is always driven politically
- Hence, **State can allocate 2% of total revenue of ULBs to the SBTF.**

TAMIL NADU URBAN ROAD INFRASTRUCTURE PROJECT (TURIP)

- With a view to upgrading the urban roads in the State to International standards, a massive scheme called “Tamil Nadu Urban Roads Development Project (TURIP)” in 2009.
- This Scheme will be implemented at an estimated cost of Rs.1,000 crores per annum and it will have multiple sources of financing which includes Rs.147 crores of arrears of devolution from the State Government, a portion from the assigned revenue payable to Municipal Corporations and Municipalities on account of surcharge on stamp duty and bonds which will be issued by the Tamil Nadu Urban Road Infrastructure Fund (TURIF)”
- GCMC received INR 75 cr and INR 120 cr during FY18 & FY19
- GCMC received INR 36 cr in FY19

FINANCING - C. OUTLINE OF THE FINANCING STRUCTURE/ENTITY

SBTF — EXPLORING OTHER SOURCES FOR MOBILIZING SBTF



ANNEXURE: DETAILED METHODOLOGY FOR FLEET & FUNDING ESTIMATION



DATA INPUTS AND SOURCES

Fleet and funding needs assessment modelling at state and city levels was carried out using multiple data inputs corresponding to the concerned bus agency and city/ state level mobility indicators as listed in this slide

Data Input: Operational Data for state and city level analysis

- Fleet size
- Fleet utilization
- Vehicle utilisation
- Vehicle age profile
- Existing infrastructure
- Annual vehicle km
- CPKM and EPKM split
- Hired and owned bus CPKM and EPKM

Data Source

- STU Annual reports
- Profit and loss booklets
- Performance report

Additional data: City Level Analysis

Current and future mobility indicator projections

- Population
- Trip lengths
- Mode share
- Per Capita Trip Rate (PCTR)

All transit mode operation data

- Km operated, future km planned
- Ridership

Additional Data: State Level Analysis

Intermediate Public Transport (IPT) data

- Number of auto rickshaw in the state
- Number of auto rickshaw in the urban areas

Data Source

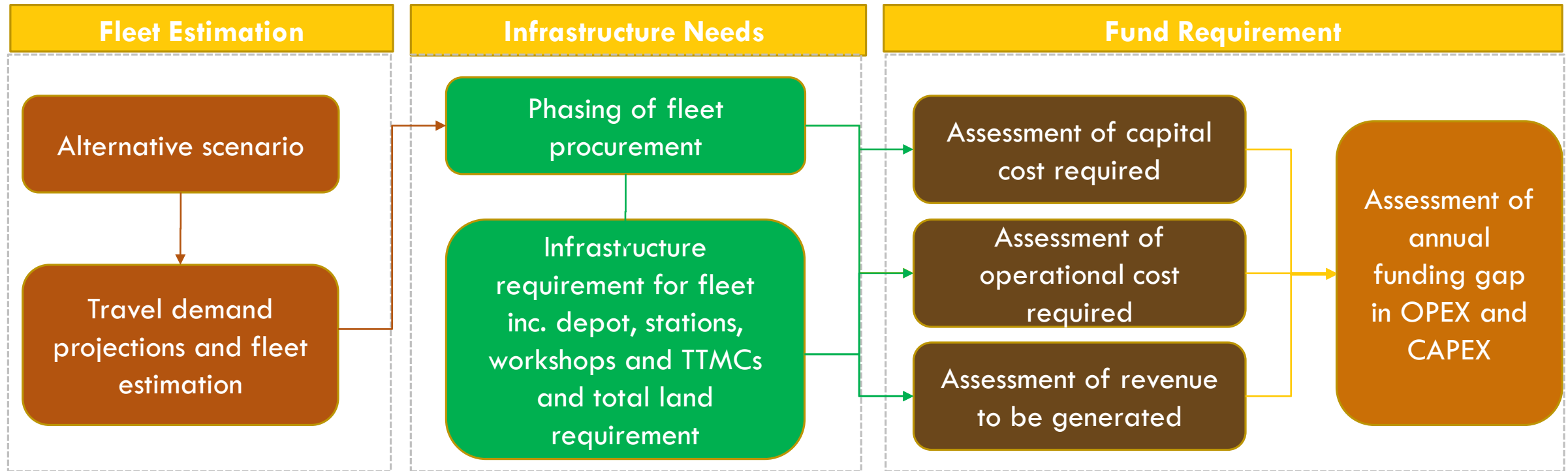
- Mobility plans or similar study
- Road transport year books

METHODOLOGY

Overview

The following approach was adopted to estimate

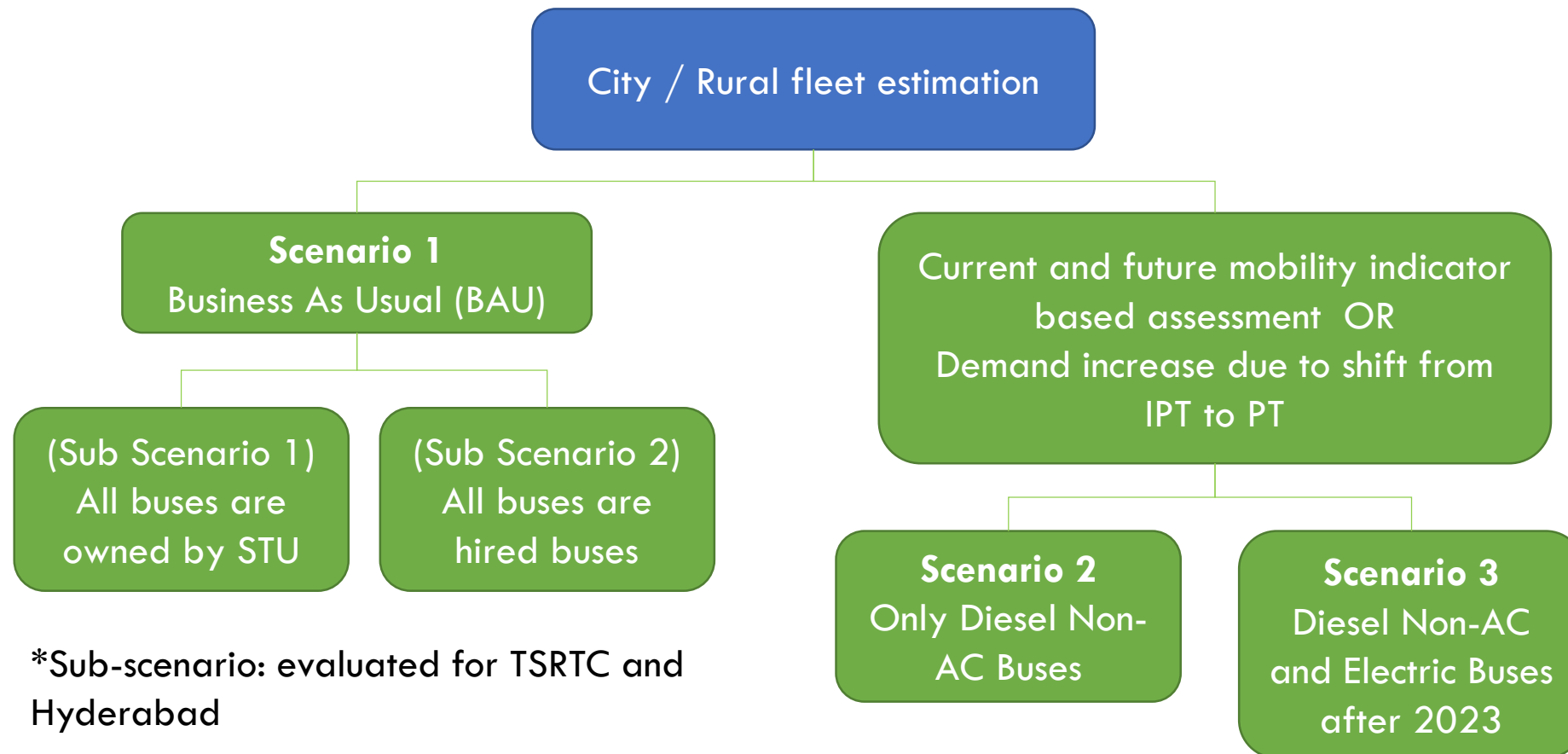
- 1) bus fleet needs for the case city/ state
- 2) phasing plan for fleet induction and supporting infrastructure development
- 3) funds needed to meet the capital and operational expenses



METHODOLOGY: FLEET ESTIMATION

1. Alternative Scenario

In the first stage of fleet estimations, alternative scenarios are built in order to evaluate fleet and cost estimates based on future public transportation strategy. For each case of city or state, a similar method of scenario development is used as given below.



METHODOLOGY: FLEET ESTIMATION (RURAL BUSES)

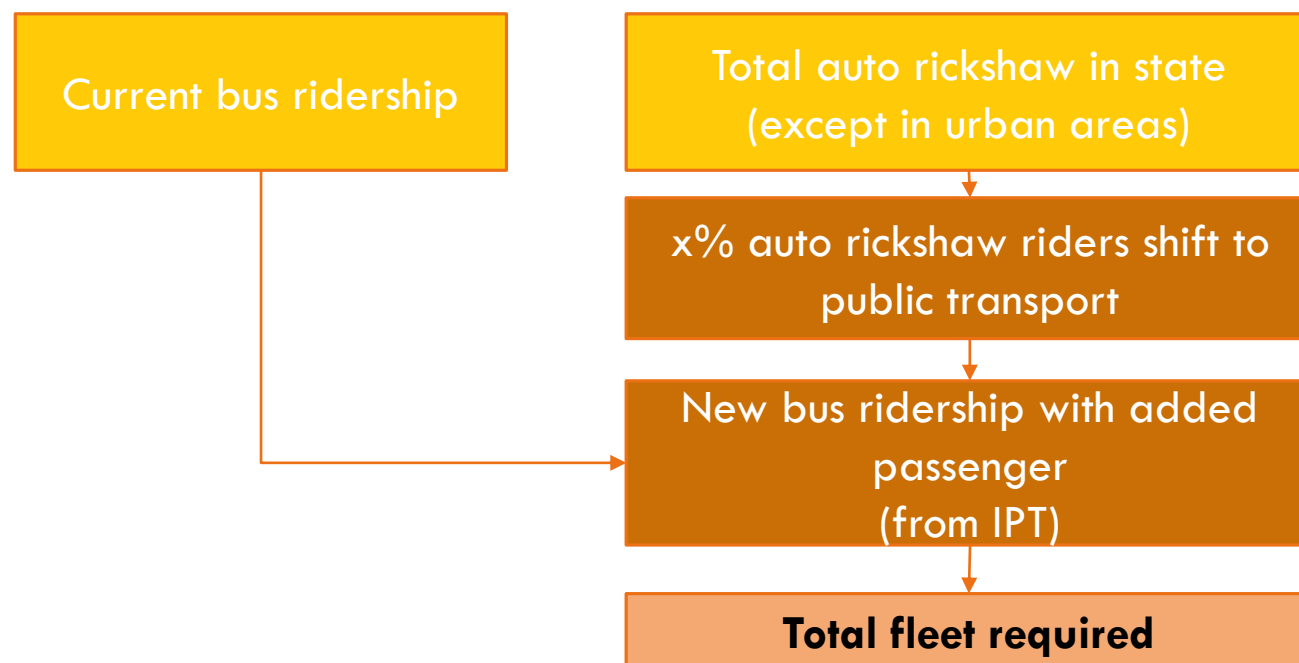
2. Travel demand projections and fleet estimation: After the alternative scenario building, the following methodology is carried up for the fleet estimation

I) BUSINESS AS USUAL (BAU)

The fleet estimation is carried out using the past trend of vehicle km operated per day and the daily vehicle utilisation, thus estimating the fleet required for the operation.

II) DEMAND INCREASE DUE TO SHIFT FROM PARATRANSIT/ INTERMEDIATE PUBLIC TRANSPORT (IPT) TO PUBLIC TRANSPORT (FOR RURAL BUS SERVICES)

Here, some percentage of the passengers using IPT or autorickshaws for rural/ intercity travel are assumed to shift to public transport, thereby resulting in the need to increase bus fleet size to cater to this demand



METHODOLOGY: FLEET ESTIMATION (URBAN BUSES)

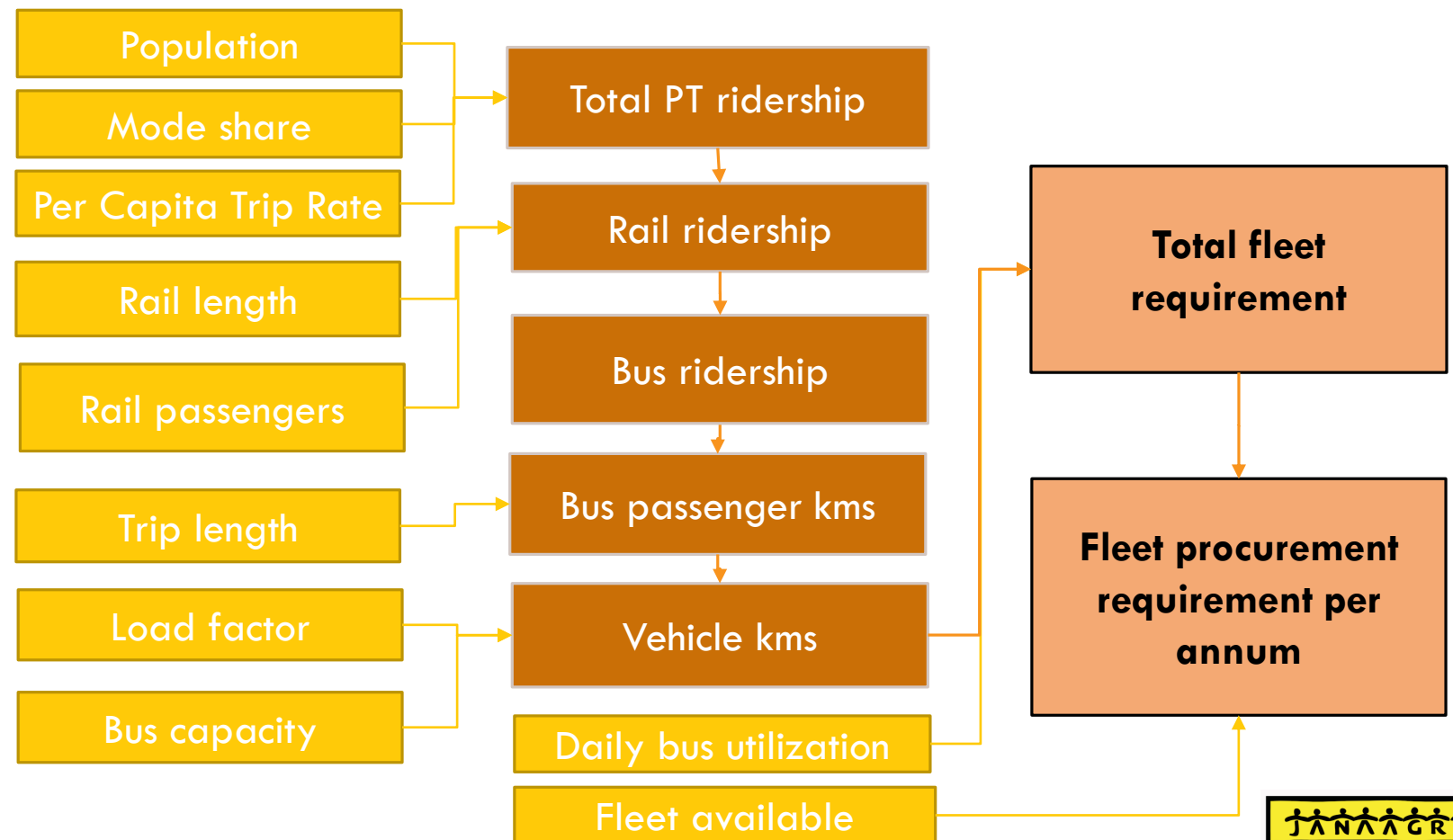
2. Travel demand projections and Fleet estimation: After the alternative scenario building, the following methodology is carried up for the fleet estimation

I) BUSINESS AS USUAL (BAU)

The fleet estimation is carried out using the past trend of vehicle km operated per day and the daily vehicle utilisation, thus estimating the fleet required for the operation.

III) CURRENT AND FUTURE MOBILITY INDICATOR BASED ASSESSMENT (URBAN BUS SERVICE)

Here, the passengers using IPT or autorickshaws for intercity travel are expected to shift to public transport. This shift is expected to cause an increase in the demand for buses.

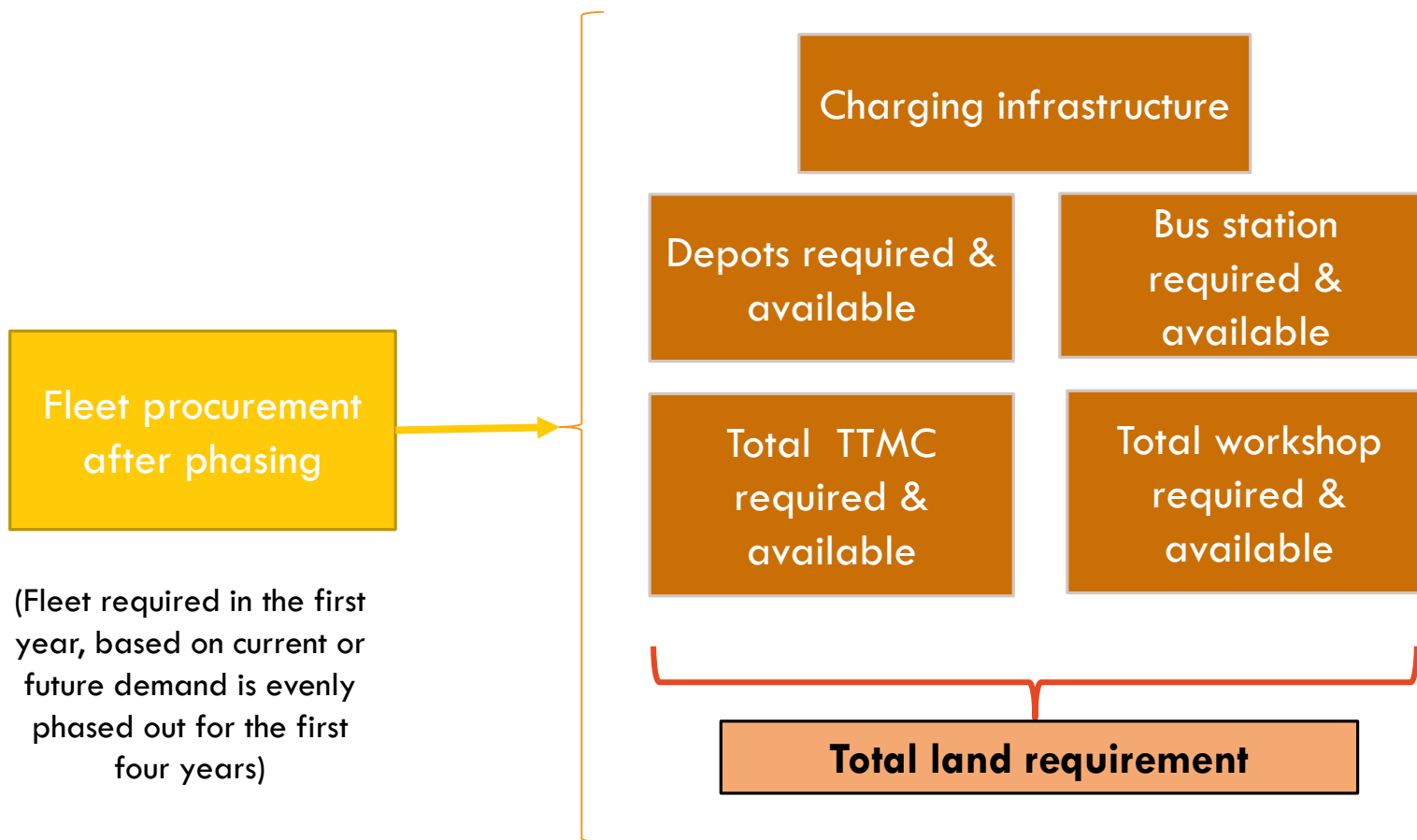


METHODOLOGY: PHASING

3. Fleet deployment phasing and infrastructure needs:

After the fleet estimation, the phasing of fleet procurement is done, based on which the infrastructure required is calculated which includes

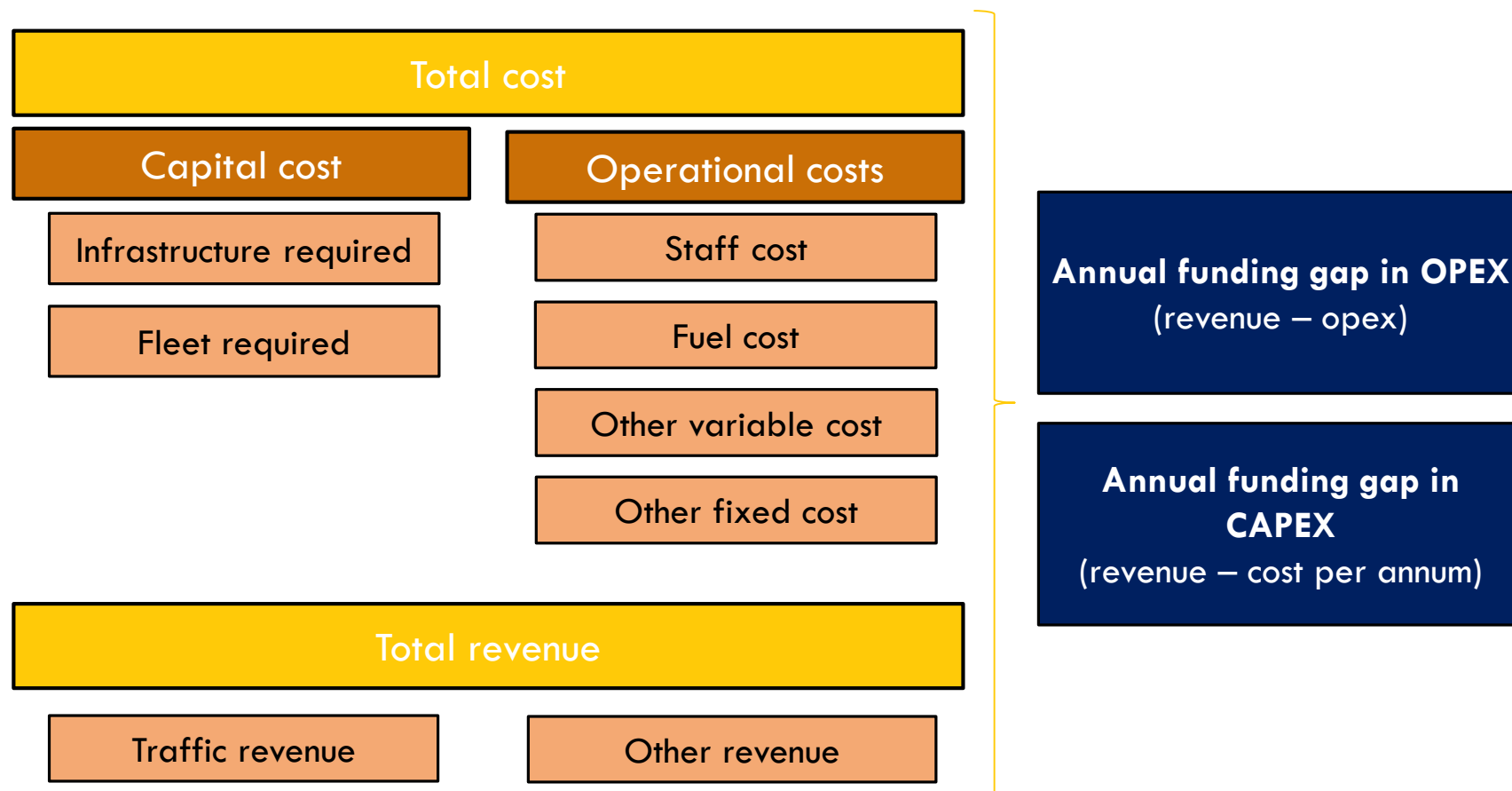
- Bus stations
- Depots
- Workshops
- Traffic management centers



METHODOLOGY: FUNDING REQUIREMENT

4. Funds required :

Based on the absolute costs of fleet and infrastructure and the past trends of CPKM and EPKM, the funds required for the future years are projected, as well as the annual funding gap present.



ASSUMPTIONS

Costs: Capital cost for fleet and infrastructure operation cost for electric buses (based on cost in 2020)

Cost assumption for infrastructure development

Component	Cost
Cost of electric bus	Rs 1.2 crore per bus
Cost of BS VI non AC bus	Rs 0.38 crore per bus
Cost of charging infrastructure	Rs 0.15 crore per bus
Cost of depot development	Rs 10 crore per depot
Cost of TTMC	Rs 40 crore per TTMC
Cost of multimodal terminal	Rs 20 crore per terminal
Cost of bus only terminal	Rs 30 crore per workshop
Land cost	Rs 1 crore per acre

Cost assumption for operation of electric buses

Component	Cost
Energy consumption	1.3 kwh/km
Cost of energy	Rs 6 per kwh
Fuel Cost	Rs 7.8 per km
Other variable cost	Rs 10 per km
Other fixed cost	Rs 6.12 per km

ASSUMPTIONS

Other Assumptions

- For demand increase scenario (state level fleet estimation), 25% shift to public transport (PT) from IPT is assumed
- The extra fleet required in the first year, based on current or future demand is evenly phased out for the first four years
- In electric bus scenario, all buses procured after 2023 are assumed to be electric buses.
- In hired vs inhouse scenario, the hired buses operators are assumed to move from small operators to corporate operators with 20% rise in overhead cost.

ANNEXURE: TSRTC FLEET & FUNDING ESTIMATION



KEY DATA SOURCES AND ASSUMPTIONS

Data Sources

The data sources for fleet and cost estimation model are listed in the table:

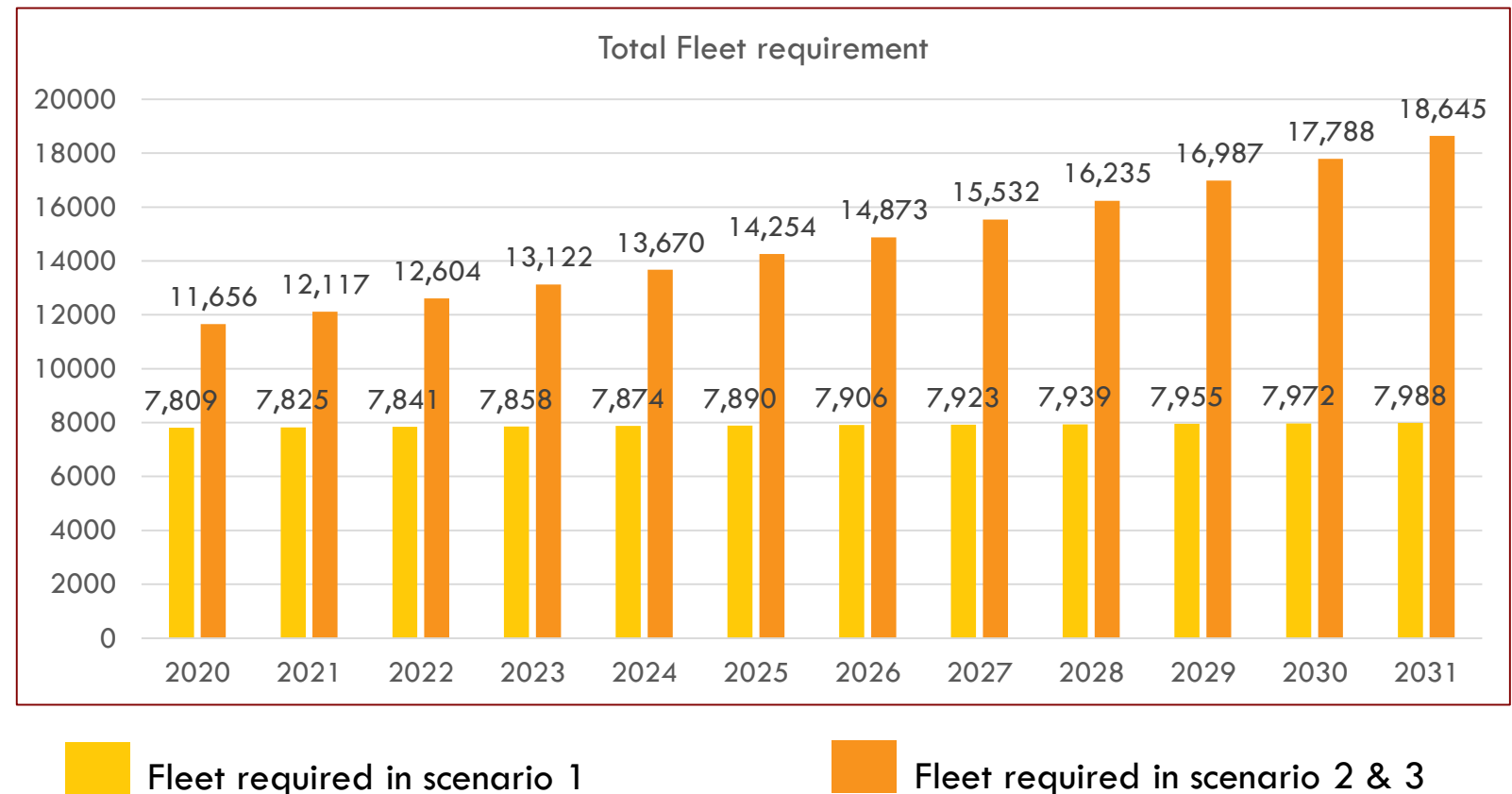
Data	Source
Operation Data	TSRTC [Telangana State Road Transport Corporation] Performance – Profit and Loss booklet for the year 2018, 2019 and Jan 2020
Other transit mode data (PT)	-NA
Mobility plans or similar study	-NA
Intermediate Public Transport (IPT) data	Road transport year book 2015-16 & year 2016-17
	Transport.telangana.gov.in – vehicle statistics
Other data sources	-NA

Assumptions

- The service km in the district services are expected to rise at a rate of 1.25%-an extension of the past trend
- All buses acquired after 2023 would be electric buses
- The hired buses operators are assumed to move from small operators to corporate operators with 20% rise in overhead cost.

FLEET REQUIRED

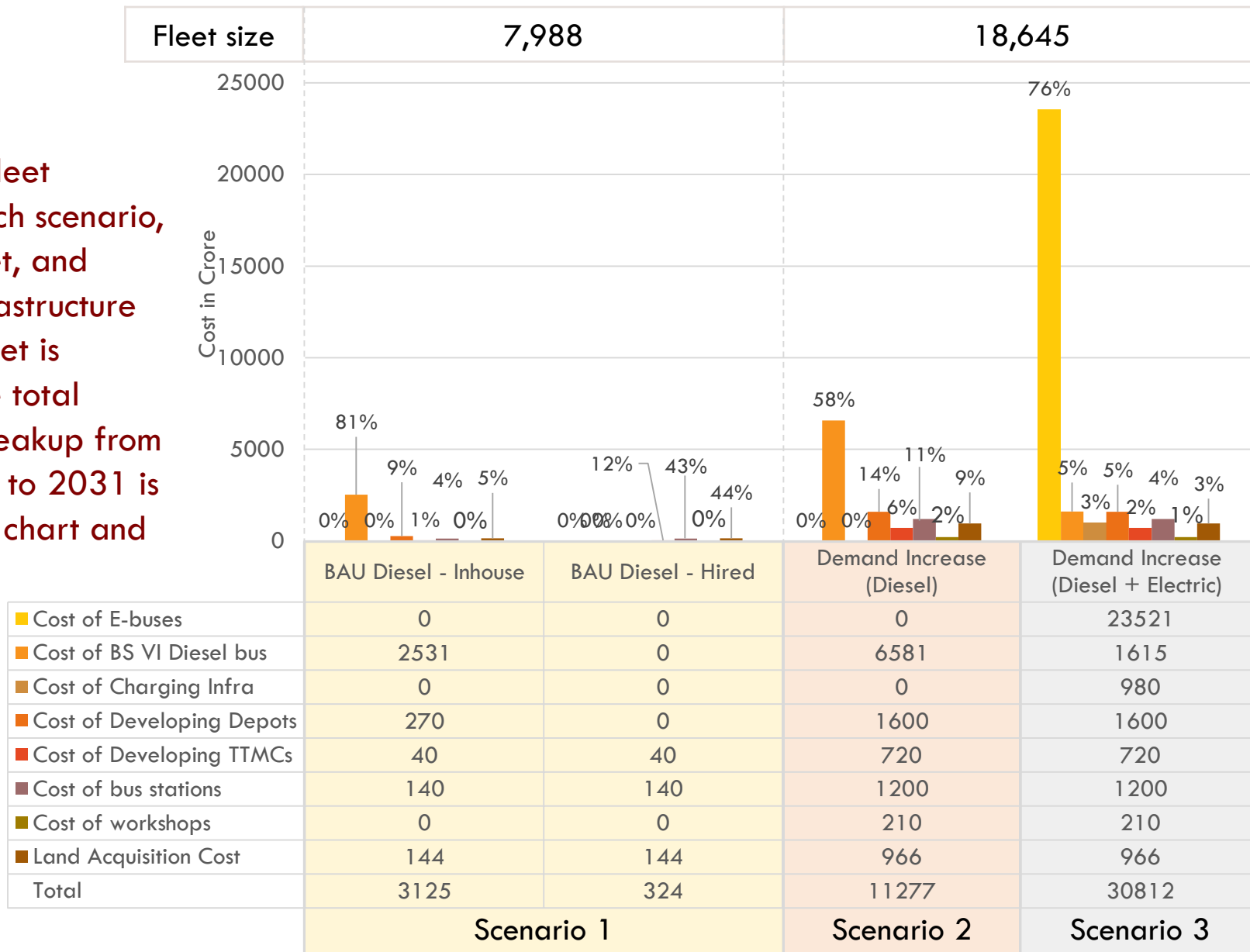
- Fleet estimation for all scenarios was carried out for next 11 years. The fleet required is thus represented in the chart.
- Total fleet required to maintain the service growth is same for both TSRTC in-house operation and hired operation
- Scenario 2 and 3, the fleet is calculated after shift of 25% of IPT users or the auto rickshaw rides to PT



- TSRTC district services bus fleet in 2020 stands at **6643**. To meet the unmet demand, TSRTC would require 1,166 more buses in 2020 for scenario 1 and a total of 7988 buses in 2031.
- TSRTC would require 5013 additional buses for scenario 2 & 3 in 2020 to meet unmet existing demand and a total 18,645 buses in 2031.

CUMULATIVE CAPITAL EXPENDITURE NEEDS UNTIL 2031

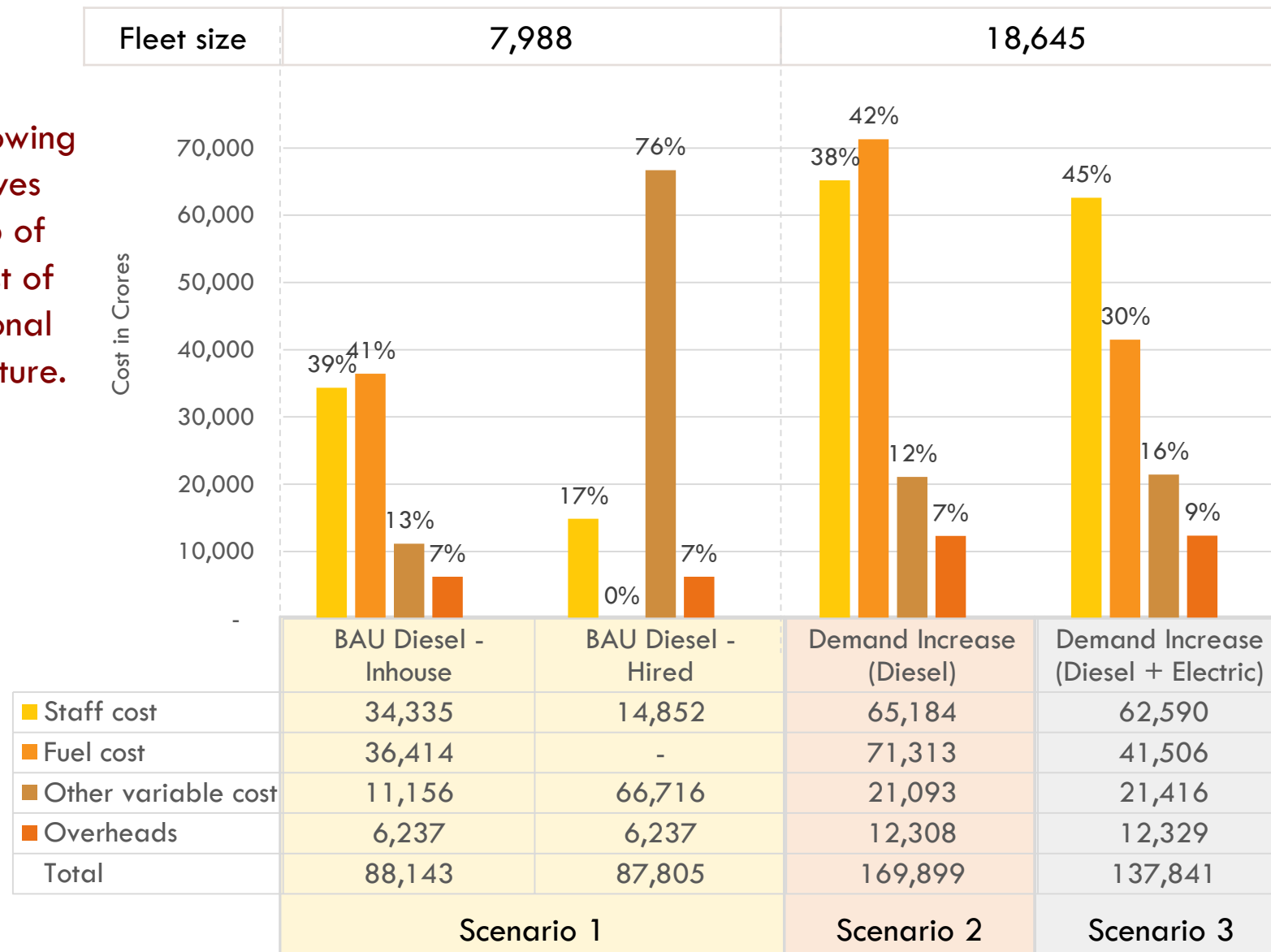
Based on the fleet required in each scenario, the cost of fleet, and respecting infrastructure for the said fleet is calculated. The total capital cost breakup from the year 2020 to 2031 is as given in the chart and table.



- The hired buses in S1 requires minimum capital cost as the buses are bought and maintained by private operators
- S2 CAPEX is 3.6 times that of S1 (Diesel, inhouse), due to larger fleet size.
- The CAPEX is highest in S3 due to electric bus fleet and charging infrastructure cost, though all other infrastructure cost is same as S2

CUMULATIVE OPERATIONAL EXPENDITURE NEEDS UNTIL 2031

The following chart gives breakup of total cost of operational expenditure.



- The total operation costs are the least in S1 due to smaller fleet size
- The hired buses expenditure for STU is majorly the overhead charges or the per km payment to private operator and tax charges.
- The diesel only buses (S-1, S-2, inhouse op) were seen to have higher percentage of fuel cost as compared to the scenario with introduction of electric buses. Hence, S3 has lesser OPEX than S2
- Electric bus fuel cost : Rs. 7.8 per km diesel bus fuel cost: Rs 12.7 per km (2020)
- The operation cost was highest for S2 due to bigger fleet size and all diesel bus operation

COSTS COMPARISON:

BAU-Diesel Buses [in-house Vs hired OPERATIONS]

	S-1 A BAU Diesel – Inhouse			S-1 B BAU Diesel – Hired		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	582	3,791	4,374	117	3,689	3,806
2021	432	4,367	4,799	67	4,274	4,341
2022	474	5,020	5,495	109	4,940	5,049
2023	189	5,529	5,718	0	5,466	5,466
2024	174	6,065	6,239	0	6,020	6,020
2025	189	6,659	6,849	5	6,632	6,637
2026	195	7,319	7,515	21	7,308	7,329
2027	175	8,053	8,228	0	8,057	8,057
2028	174	8,868	9,042	0	8,883	8,883
2029	174	9,775	9,949	0	9,797	9,797
2030	190	10,786	10,976	5	10,810	10,815
2031	174	11,912	12,086	0	11,930	11,930
Total	3,125	88,143	91,269	324	87,805	88,129

Revenue	
S-1 A (Crores)	S-1 B (Crores)
3,358	3,358
3,842	3,842
4,387	4,387
4,797	4,797
5,225	5,225
5,696	5,696
6,214	6,214
6,786	6,786
7,417	7,417
8,113	8,113
8,886	8,886
9,740	9,740
74,459	74,459

Financial Deficit	
S-1 A (Crores)	S-1 B (Crores)
(1,016)	(448)
(957)	(499)
(1,108)	(662)
(920)	(668)
(1,014)	(795)
(1,153)	(941)
(1,301)	(1,115)
(1,442)	(1,271)
(1,626)	(1,467)
(1,836)	(1,684)
(2,090)	(1,930)
(2,346)	(2,190)
(16,809)	(13,670)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS



CAPEX for S1-A include costs of buses and corresponding supporting infrastructure requirement; CAPEX for S1-B include cost of multimodal terminal and stations

COSTS COMPARISON

S1-a (BAU-In-HOUSE) Vs S2 (demand increase IN-HOUSE)

	S-1A BAU Diesel - Inhouse			S-2 Demand Increase (Diesel		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	582	3,791	4,374	1,526	4,456	5,982
2021	432	4,367	4,799	1,391	5,818	7,209
2022	474	5,020	5,495	1,439	7,399	8,838
2023	189	5,529	5,718	1,376	9,233	10,608
2024	174	6,065	6,239	566	10,529	11,095
2025	189	6,659	6,849	640	12,031	12,671
2026	195	7,319	7,515	629	13,769	14,398
2027	175	8,053	8,228	665	15,787	16,452
2028	174	8,868	9,042	715	18,134	18,850
2029	174	9,775	9,949	715	20,872	21,588
2030	190	10,786	10,976	789	24,066	24,855
2031	174	11,912	12,086	827	27,803	28,630
Total	3,125	88,143	91,269	11,277	1,69,899	1,81,176

Revenue	
S-1 A (Crores)	S-2 (Crores)
3,358	3,946
3,842	5,119
4,387	6,466
4,797	8,011
5,225	9,071
5,696	10,289
6,214	11,689
6,786	13,303
7,417	15,167
8,113	17,325
8,886	19,827
9,740	22,735
74,459	1,42,948

Financial Deficit	
S-1 A (Crores)	S-2 (Crores)
(1,016)	(2,036)
(957)	(2,090)
(1,108)	(2,373)
(920)	(2,597)
(1,014)	(2,024)
(1,153)	(2,382)
(1,301)	(2,708)
(1,442)	(3,149)
(1,626)	(3,683)
(1,836)	(4,262)
(2,090)	(5,028)
(2,346)	(5,895)
(16,809)	(38,228)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS

💡 The total fleet of S2 by 2031 is two times that of S1-A, thus requiring more infrastructure to support it. Hence the CAPEX for S2 is 3.6 times that of S1

💡 The CAPEX in first four years of S2 is higher in order to acquire the buses for unmet demand of 2020 in phases

💡 The gap in revenue recovery in S2 is more than twice of that in S1

COSTS COMPARISON

S2 (demand increase) Vs S3 (demand increase+ electric bus)

	S-2 Demand Increase (Diesel)			S-3 Demand Increase (Electric)		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	1,526	4,456	5,982	3,021	4,466	7,487
2021	1,391	5,818	7,209	2,886	5,671	8,557
2022	1,439	7,399	8,838	2,934	7,106	10,040
2023	1,376	9,233	10,608	2,871	8,705	11,576
2024	566	10,529	11,095	2,047	9,678	11,726
2025	640	12,031	12,671	2,176	10,729	12,904
2026	629	13,769	14,398	2,216	11,859	14,075
2027	665	15,787	16,452	2,312	13,078	15,390
2028	715	18,134	18,850	2,429	14,393	16,822
2029	715	20,872	21,588	2,502	15,814	18,315
2030	789	24,066	24,855	2,649	17,344	19,993
2031	827	27,803	28,630	2,771	18,997	21,768
Total	11,277	1,69,899	1,81,176	27,791	1,33,375	1,61,166

Revenue	
S-2 (Crores)	S-3 (Crores)
3,946	3,946
5,119	5,119
6,466	6,466
8,011	8,011
9,071	9,071
10,289	10,289
11,689	11,689
13,303	13,303
15,167	15,167
17,325	17,325
19,827	19,827
22,735	22,735
1,42,948	1,42,948

Financial Deficit	
S-2 (Crores)	S-3 (Crores)
(2,036)	(3,540)
(2,090)	(3,438)
(2,373)	(3,574)
(2,597)	(3,565)
(2,024)	(2,654)
(2,382)	(2,615)
(2,708)	(2,386)
(3,149)	(2,088)
(3,683)	(1,656)
(4,262)	(990)
(5,028)	(166)
(5,895)	967
(38,228)	(25,705)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS

💡 The fleet size by 2031 in both scenario is same. Yet the CAPEX for S3 is 2.5 times that of S2 due to acquiring of electric buses and charging infrastructure in S3

💡 The total OPEX of S3 is 24% lesser than that of S2 due to lower operating cost associated with electric buses

💡 With higher CAPEX and lower OPEX in S3 as compared to S2, it's total financial deficit is lower than S2 by INR 12,523 crore.

ANNEXURE: TSRTC GHZ FLEET & FUNDING ESTIMATION



KEY DATA SOURCES

Data Source

The data source for fleet and cost estimation model are the following.

Data	Source
Operation data	TSRTC [Telangana State Road Transport Corporation] Performance – Profit and Loss booklet for the year 2018, 2019 and Jan 2020
Mobility plans or similar study	Comprehensive Transportation Study (CTS) for Hyderabad Metropolitan Area (HMA)
Other transit mode data (PT)	-Comprehensive Transportation Study (CTS) for Hyderabad Metropolitan Area (HMA)
	https://themetrorailguy.com/hyderabad-metro-information-map-updates/
Intermediate public transport (IPT) data	-NA
Other data sources	World Urbanization Prospects: The 2018 Revision [UN]: Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2018, by Country, 1950-2035 (thousands)

KEY DATA: FLEET PROJECTIONS

The following are the key data inputs used for the fleet and cost estimation model

Year	2020	2031
Population	1,00 Crore	1,29 Crore
Trip lengths	16.41 km	17.10 km
Public transport mode share	51.5%	58.6% *
Per capita trip rate (PCTR)	1.02	2
Vehicle utilisation	226 km	193 km
Load factor	70.49	70.49
Average bus capacity	50	50
Bus fleet on road	99.72%	99.72%
Rail transport	166 km	344 km

* Mode share increase scenario

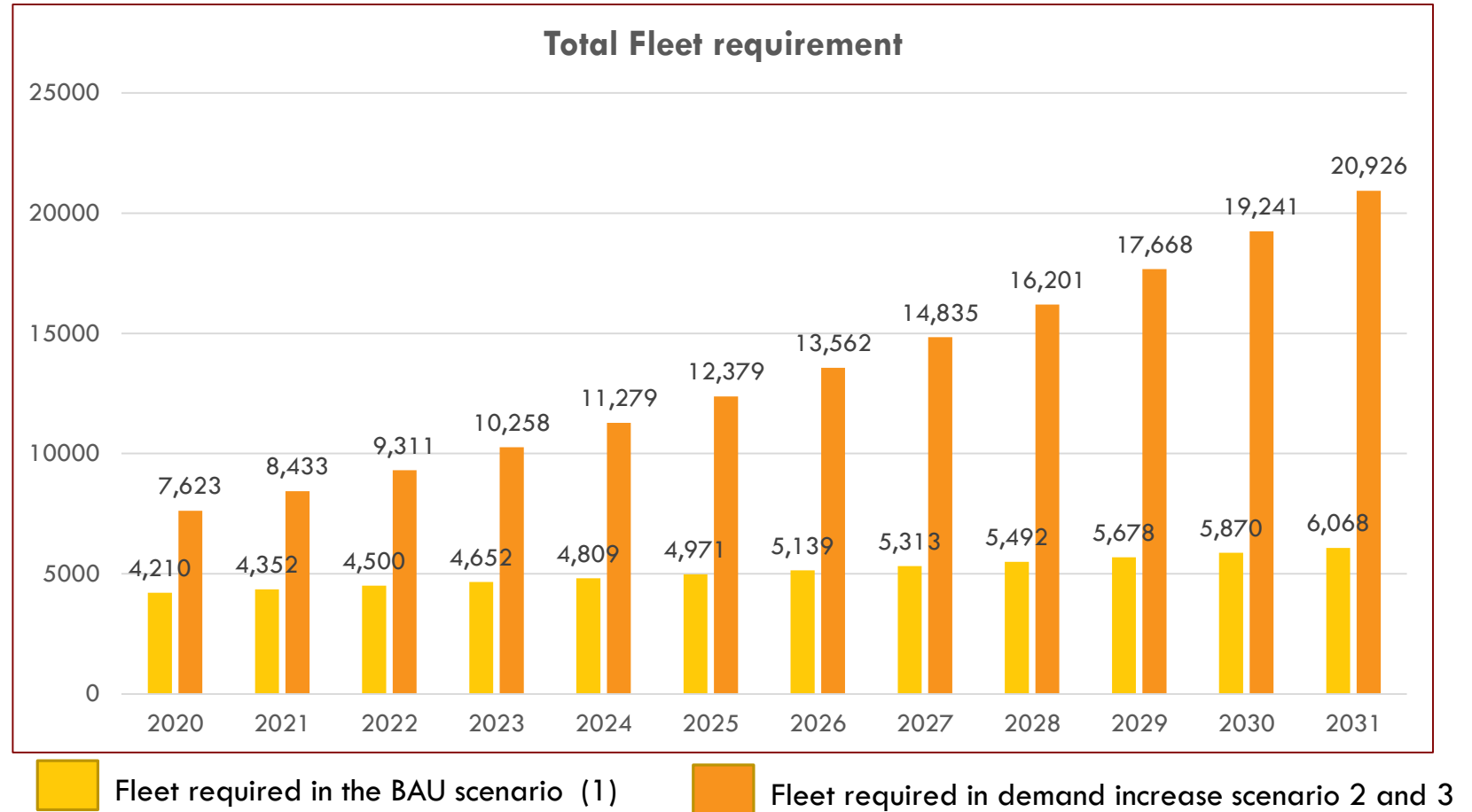
FLEET REQUIRED

Fleet estimation for all scenarios was carried out for year wise.

Total fleet required in the BAU scenario(1), and scenario 2 and 3 are as shown in charts.

Fleet required is same for inhouse and hired alternatives in scenario 1.

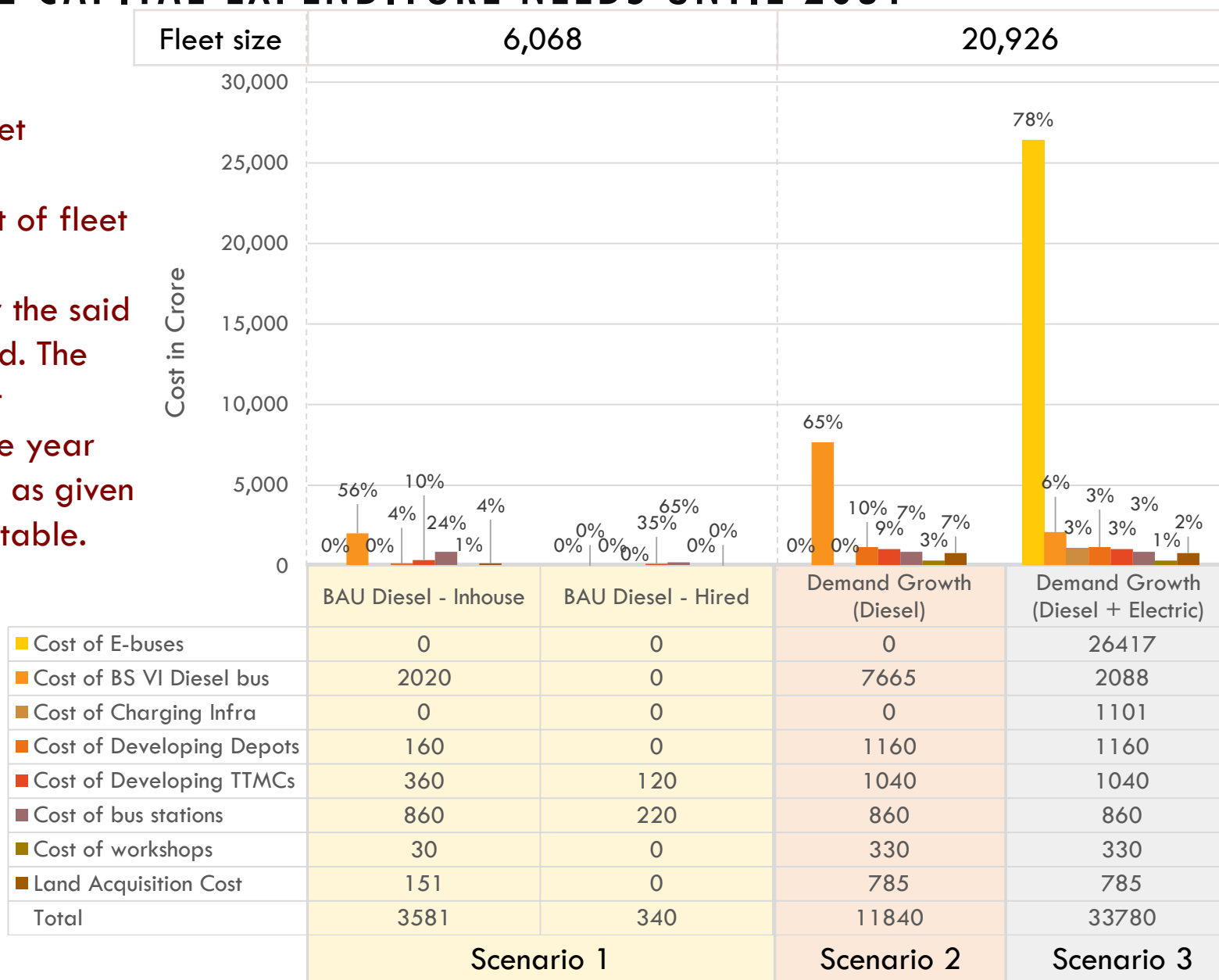
It is also same for scenario 2 and 3



- TSRTC urban services bus fleet in 2020 stands at 3,772. To meet the unmet demand, TSRTC would require 438 more buses in 2020 for scenario 1 and a total of 6,068 buses by 2031.
- TSRTC would require 3,851 more buses for scenario 2 & 3 in 2020 and a total 20,926 buses by 2031.

CUMULATIVE CAPITAL EXPENDITURE NEEDS UNTIL 2031

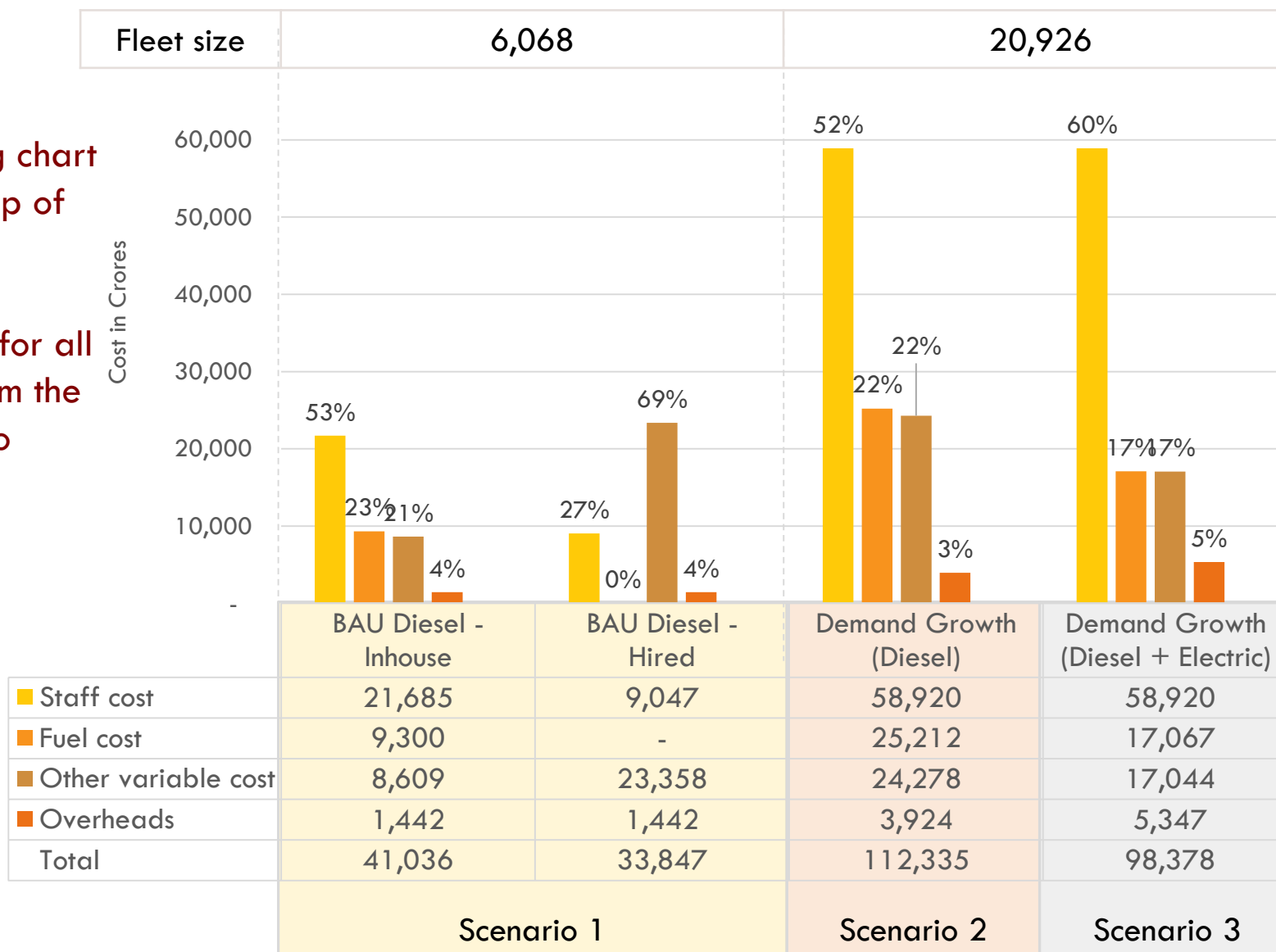
Based on the fleet required in each scenario, the cost of fleet and respective infrastructure for the said fleet is calculated. The total capital cost breakup from the year 2020 to 2031 is as given in the chart and table.



- The hired bus S-1 requires minimum capital cost as the buses are bought and maintained by private operators
- S-2 CAPEX is 3.3 times that of S-1 (Diesel, inhouse), due to larger fleet size
- The CAPEX is highest in S-3 due to Electric bus fleet and charging infrastructure cost, though all other infrastructure cost is same as S-2

CUMULATIVE OPERATIONAL EXPENDITURE NEEDS UNTIL 2031

The following chart gives breakup of total cost of operational expenditure for all scenarios from the year 2020 to 2031.



- The total operation costs are the least in S-1 due to smaller fleet size
- The hired buses expenditure for STU is majorly the overhead charges or the per km payment to private operator and tax charges.
- The diesel only buses (S-1, S-2, inhouse op) were seen to have higher percentage of fuel cost as compared to the scenario with introduction of electric buses.
- Electric bus fuel cost : Rs. 7.8 per km Diesel bus fuel cost: Rs 14.8 per km (2020)
- The OPEX was highest for S2 due to bigger fleet size and all diesel bus operation

COSTS COMPARISON

BAU-Diesel Buses [inhouse VS hired]

	S-1 A BAU Diesel – Inhouse			S-1 B BAU Diesel – Hired		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	287	1,975	2,262	20	1,620	1,640
2021	257	2,188	2,445	20	1,798	1,818
2022	272	2,418	2,690	60	1,992	2,052
2023	257	2,667	2,924	20	2,200	2,220
2024	233	2,899	3,132	20	2,394	2,414
2025	235	3,152	3,387	60	2,605	2,665
2026	259	3,428	3,687	20	2,835	2,855
2027	301	3,732	4,033	20	3,085	3,105
2028	278	4,063	4,341	0	3,357	3,357
2029	391	4,427	4,818	60	3,654	3,714
2030	394	4,826	5,219	20	3,978	3,998
2031	417	5,263	5,680	20	4,329	4,349
Total	3,581	41,036	44,617	340	33,847	34,187

Revenue	
S-1 A (Crores)	S-1 B (Crores)
1,501	1,501
1,612	1,612
1,727	1,727
1,846	1,846
1,943	1,943
2,044	2,044
2,152	2,152
2,265	2,265
2,384	2,384
2,509	2,509
2,641	2,641
2,779	2,779
25,402	25,402

Financial Deficit	
S-1 A (Crores)	S-1 B (Crores)
(761)	(138)
(832)	(206)
(963)	(324)
(1,078)	(374)
(1,189)	(471)
(1,343)	(620)
(1,535)	(703)
(1,768)	(840)
(1,957)	(974)
(2,309)	(1,206)
(2,579)	(1,357)
(2,900)	(1,570)
(19,215)	(8,785)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS



CAPEX for S1-A include costs of buses and subsequent infrastructure requirement; CAPEX for S1-B include cost of multimodal terminal and stations



The net financial deficit in S1-A is more than double of S1-B due to cost of fleet and infrastructure

COSTS COMPARISON

S1-a (all inhouse) Vs S2 (demand Growth+ InHOUSE)

	S-1A BAU Diesel - Inhouse			S-2 Demand Increase (Diesel)		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	287	1,975	2,262	1,079	2,706	3,785
2021	257	2,188	2,445	1,106	3,696	4,802
2022	272	2,418	2,690	1,064	4,780	5,844
2023	257	2,667	2,924	1,091	5,966	7,057
2024	233	2,899	3,132	733	6,896	7,630
2025	235	3,152	3,387	780	7,961	8,741
2026	259	3,428	3,687	858	9,178	10,035
2027	301	3,732	4,033	922	10,569	11,491
2028	278	4,063	4,341	957	12,158	13,115
2029	391	4,427	4,818	1,011	13,973	14,983
2030	394	4,826	5,219	1,093	16,045	17,138
2031	417	5,263	5,680	1,145	18,409	19,554
Total	3,581	41,036	44,617	11,840	1,12,335	1,24,175

Revenue	
S-1 A (Crores)	S-2 (Crores)
1,501	2,057
1,612	2,724
1,727	3,414
1,846	4,129
1,943	4,622
2,044	5,164
2,152	5,760
2,265	6,415
2,384	7,132
2,509	7,919
2,641	8,780
2,779	9,722
25,402	67,837

Financial Deficit	
S-1 A (Crores)	S-2 (Crores)
(761)	(1,728)
(832)	(2,078)
(963)	(2,429)
(1,078)	(2,928)
(1,189)	(3,008)
(1,343)	(3,577)
(1,535)	(4,276)
(1,768)	(5,077)
(1,957)	(5,983)
(2,309)	(7,065)
(2,579)	(8,358)
(2,900)	(9,832)
(19,215)	(56,338)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS

💡 The total fleet of S2 by 2031 is 3.4 times that of S1-A, thus requiring more infrastructure to support it. Hence the CAPEX for S2 is 3.3 times that of S1

💡 The CAPEX in first four years of S2 is higher in order to acquire the buses for unmet demand of 2020 in phases

💡 The gap in revenue recovery of S2 is approximately 2.9 times of S1

COSTS COMPARISON

S2 (demand increase) Vs S3 (demand increase+ electric bus)

	S-2 Demand Increase (Diesel)			S-3 Demand Increase (Electric)		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	1,079	2,706	3,785	3,040	3,914	6,954
2021	1,106	3,696	4,802	2,905	4,908	7,813
2022	1,064	4,780	5,844	2,953	5,962	8,915
2023	1,091	5,966	7,057	2,890	7,082	9,972
2024	733	6,896	7,630	2,066	7,652	9,719
2025	780	7,961	8,741	2,196	8,250	10,446
2026	858	9,178	10,035	2,237	8,876	11,113
2027	922	10,569	11,491	2,334	9,530	11,864
2028	957	12,158	13,115	2,451	10,217	12,668
2029	1,011	13,973	14,983	2,525	10,937	13,462
2030	1,093	16,045	17,138	2,673	11,691	14,364
2031	1,145	18,409	19,554	2,796	12,482	15,278
Total	11,840	1,12,335	1,24,175	28,027	97,588	1,25,614

Revenue	
S-2 (Crores)	S-3 (Crores)
2,057	2,057
2,724	2,724
3,414	3,414
4,129	4,129
4,622	4,622
5,164	5,164
5,760	5,760
6,415	6,415
7,132	7,132
7,919	7,919
8,780	8,780
9,722	9,722
67,837	67,837

Financial Deficit	
S-2 (Crores)	S-3 (Crores)
(1,728)	(2,465)
(2,078)	(2,789)
(2,429)	(3,096)
(2,928)	(3,532)
(3,008)	(4,612)
(3,577)	(5,081)
(4,276)	(5,612)
(5,077)	(6,167)
(5,983)	(6,731)
(7,065)	(7,361)
(8,358)	(8,070)
(9,832)	(8,805)
(56,338)	(64,321)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS

💡 The fleet size by 2031 in both scenario is same. Yet the CAPEX for S3 is more than twice of S2 due to acquiring of electric buses in S3

💡 The total OPEX of S3 is 16% lesser than that of S2 due to lower cost of operation associated with electric buses

💡 The total cost of S3 is just INR 1,439 crore more than S2 due to lower OPEX

ANNEXURE: MTC FLEET & FUNDING ESTIMATION



KEY DATA: FLEET PROJECTIONS

The following are the key data used for the fleet and cost estimation model

	2020	2031
Population	1,09 Crore	1,41 Crore
Trip lengths	13.6 km	15.5 km
Public transport mode share	29.70%	38.20%
Per capita trip rate (PCTR)	1.62	1.62
Vehicle utilisation	284 km	248 km
Load factor	62.15	62.15
Average bus capacity	60	60
Bus fleet on road	89.23%	89.23%
Rail transport	168 km	393 km

FLEET REQUIRED

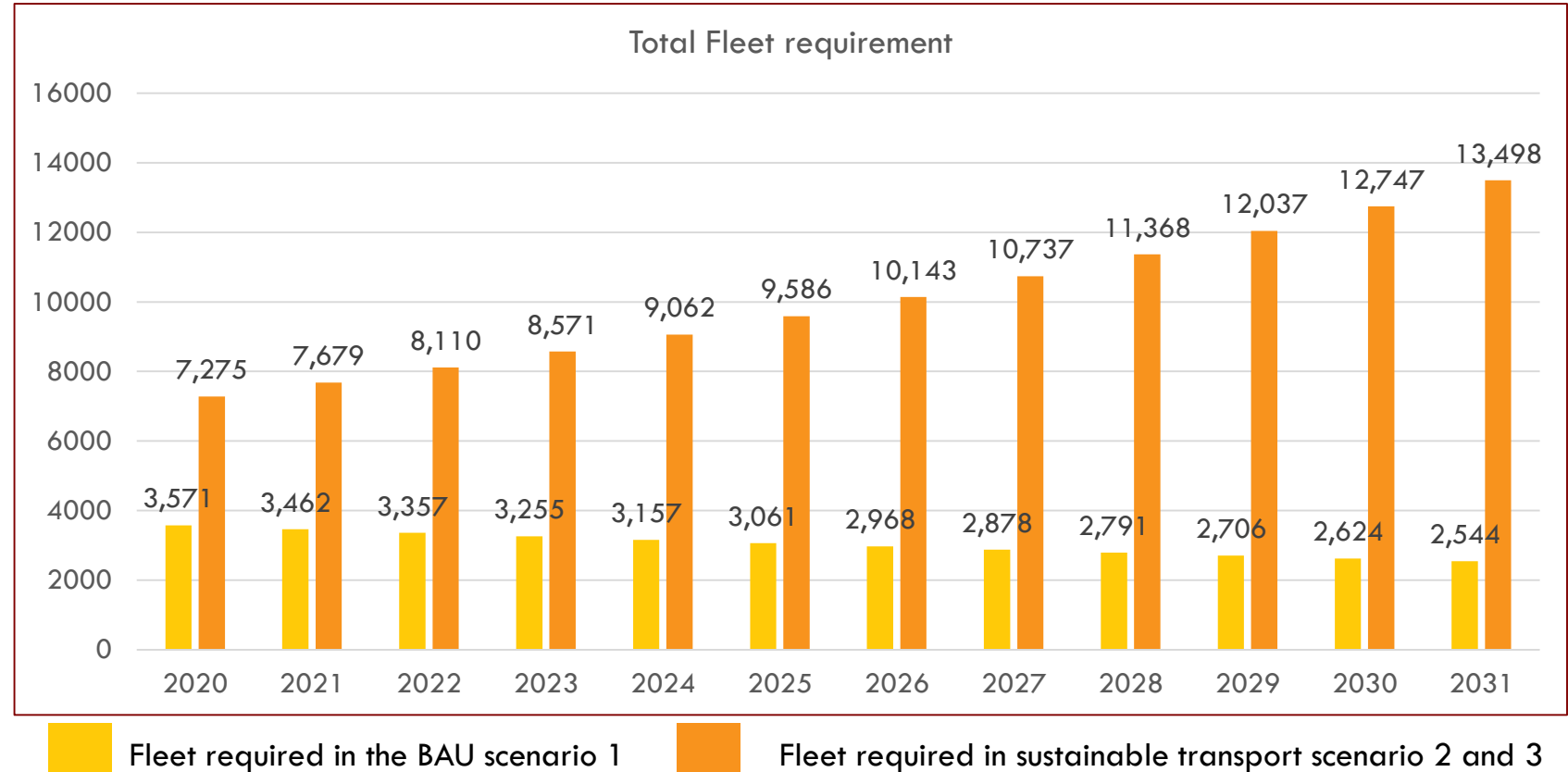
Fleet Augmentation needs to be done in scenario 2 & 3

Fleet estimation for all scenarios was carried out for next 11 years.

Total fleet required in the BAU scenario(1), and scenario 2 and 3 are as shown in charts.

Fleet required is same for scenario 2 and 3

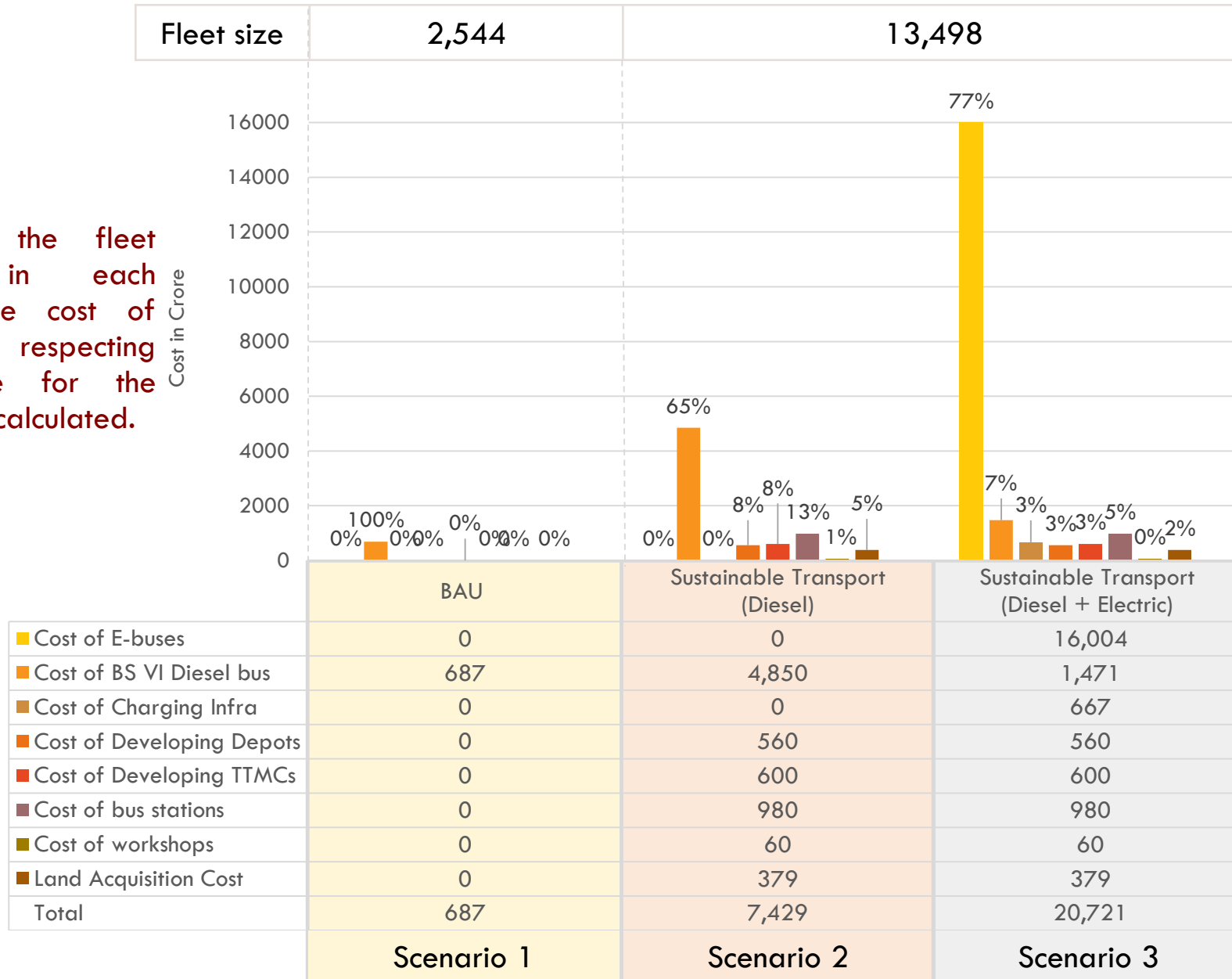
MTC has seen decline in trend of service, hence based on the trend, the fleet required in BAU also lessens over the years



MTC bus fleet in 2020 stands at 3,679. Based on model for fleet assessment, based on demand in 2020, MTC has an excess 108 buses for scenario 1. However in subsequent years, due to depletion of buses newer buses need to be acquired. For scenario 2 & 3, in year 2020, MTC must require 3,596 more buses to meet the unmet demand in 2020 and a total 13,498 buses by 2031.

CUMULATIVE CAPITAL EXPENDITURE NEEDS UNTIL 2031

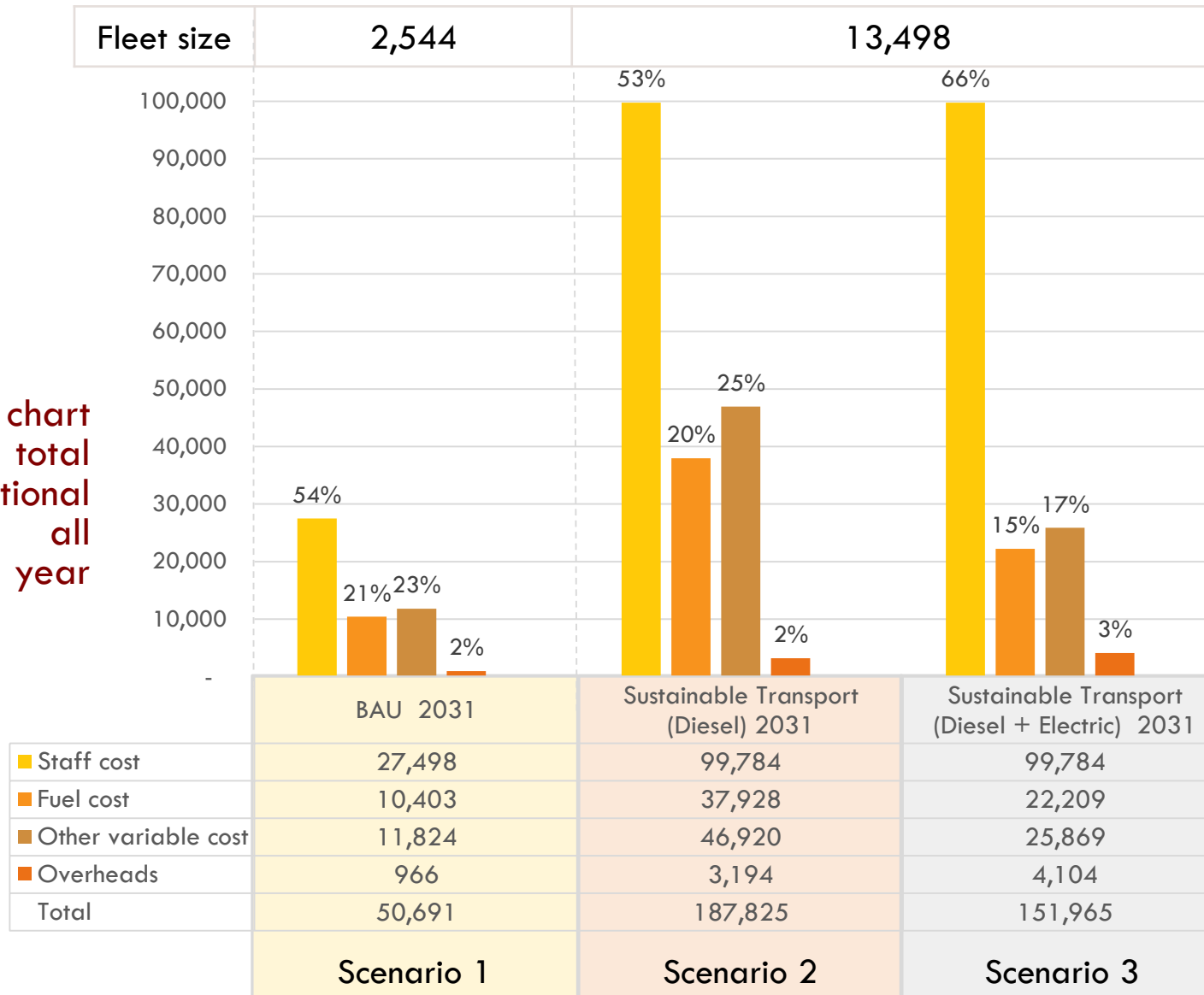
Based on the fleet required in each scenario, the cost of fleet, and respecting infrastructure for the said fleet is calculated.



- The total capital cost breakup from the year 2020 to 2031 is as given in the chart
- The number of buses required in Chennai based on past trends is less and hence no new infrastructure is required in S-1
- For S-2, adopted from CMP Chennai 2018, the fleet required would increase to 13,498 buses and hence high capital cost for fleet and infrastructure is required
- The capital cost of S-3, is 2.8 times higher than that of S-2 (diesel buses) due to higher cost of electric buses and charging infrastructure, even though the fleet size and other infrastructure required is the same

CUMULATIVE OPERATIONAL EXPENDITURE NEEDS UNTIL 2031

The following chart gives breakup of total cost of operational expenditure for all scenarios for the year 2020 and 2031



- The total operation costs are the least in S-1 due to smaller fleet size
- The diesel only buses (S-1, S-2, inhouse op) were seen to have higher percentage of fuel cost as compared to the scenario with introduction of electric buses.
- Electric bus fuel cost : Rs. 7.8 per km Diesel bus fuel cost: Rs 15.6 per km (2020)
- The OPEX was highest for S2 due to bigger fleet size and all diesel bus operation

COSTS COMPARISON

S1 (BAU) VS S2 (Sustainable transport)

	S-1 BAU Diesel			S-2 Sustainable Transport (Diesel)		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	53	2,369	2,422	789	3,251	4,039
2021	53	2,594	2,647	831	4,583	5,414
2022	53	2,842	2,895	888	6,213	7,101
2023	53	3,114	3,167	888	8,201	9,088
2024	56	3,423	3,479	409	9,825	10,234
2025	57	3,767	3,823	457	11,796	12,253
2026	58	4,151	4,209	470	14,187	14,657
2027	59	4,583	4,642	484	17,099	17,583
2028	60	5,069	5,130	496	20,648	21,144
2029	61	5,615	5,677	555	24,979	25,534
2030	62	6,233	6,295	564	30,277	30,842
2031	63	6,929	6,993	599	36,766	37,365
Total	687	50,691	51,378	7429	1,87,825	1,95,254

Revenue	
S-1 (Crores)	S-2 (Crores)
1,600	2,195
1,656	2,926
1,713	3,745
1,770	4,660
1,831	5,257
1,894	5,933
1,960	6,697
2,027	7,564
2,098	8,544
2,170	9,651
2,245	10,904
2,322	12,319
23,285	80,395

Financial Deficit	
S-1 (Crores)	S-2 (Crores)
(822)	(1,844)
(991)	(2,488)
(1,182)	(3,356)
(1,397)	(4,428)
(1,647)	(4,977)
(1,929)	(6,320)
(2,249)	(7,960)
(2,615)	(10,019)
(3,032)	(12,601)
(3,507)	(15,882)
(4,050)	(19,937)
(4,671)	(25,046)
(28,093)	(1,14,859)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS

💡 The sustainable transport scenario (S2), modelled a large fleet size i.e. 13498 by 2031, as compared to 2,544 by 2031 for S1

💡 Hence, it is seen that the CAPEX and OPEX for S2 is higher.

COSTS COMPARISON

S2 (Sustainable transport) VS S3 (Sustainable transport+electric)

	S-2 Sustainable Transport (Diesel)			S-3 Sustainable Transport (Electric)		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	789	3,251	4,039	1,536	3,220	4,756
2021	831	4,583	5,414	1,578	4,480	6,059
2022	888	6,213	7,101	1,635	5,987	7,622
2023	888	8,201	9,088	1,635	7,787	9,423
2024	409	9,825	10,234	1,509	9,081	10,590
2025	457	11,796	12,253	1,607	10,574	12,180
2026	470	14,187	14,657	1,669	12,296	13,965
2027	484	17,099	17,583	1,738	14,291	16,029
2028	496	20,648	21,144	1,807	16,601	18,408
2029	555	24,979	25,534	1,923	19,277	21,200
2030	564	30,277	30,842	1,994	22,383	24,377
2031	599	36,766	37,365	2,089	25,987	28,077
Total	7429	1,87,825	1,95,254	20,721	1,51,965	1,72,686

Revenue	
S-2 (Crores)	S-3 (Crores)
2,195	2,195
2,926	2,926
3,745	3,745
4,660	4,660
5,257	5,257
5,933	5,933
6,697	6,697
7,564	7,564
8,544	8,544
9,651	9,651
10,904	10,904
12,319	12,319
80,395	80,395

Financial Deficit	
S-2 (Crores)	S-3 (Crores)
(1,844)	(2,561)
(2,488)	(3,133)
(3,356)	(3,877)
(4,428)	(4,762)
(4,977)	(5,333)
(6,320)	(6,248)
(7,960)	(7,268)
(10,019)	(8,466)
(12,601)	(9,864)
(15,882)	(11,548)
(19,937)	(13,473)
(25,046)	(15,758)
(1,14,859)	(92,291)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS

💡 The fleet size by 2031 in both scenario is same. Yet the CAPEX for S3 is approximately twice of S2 due to acquiring of electric buses in S3

💡 The total OPEX of S3 is 21% lesser than that of S2 due to lower cost of operation associated with electric buses

💡 Since, the fuel cost is lesser with the electric vehicle, the recovery revenue for S3 is lesser than S2

ANNEXURE: KSRTC STATE SERVICES FLEET & FUNDING ESTIMATION



KEY DATA: FLEET PROJECTIONS

The following are the key data used for the fleet and cost estimation model

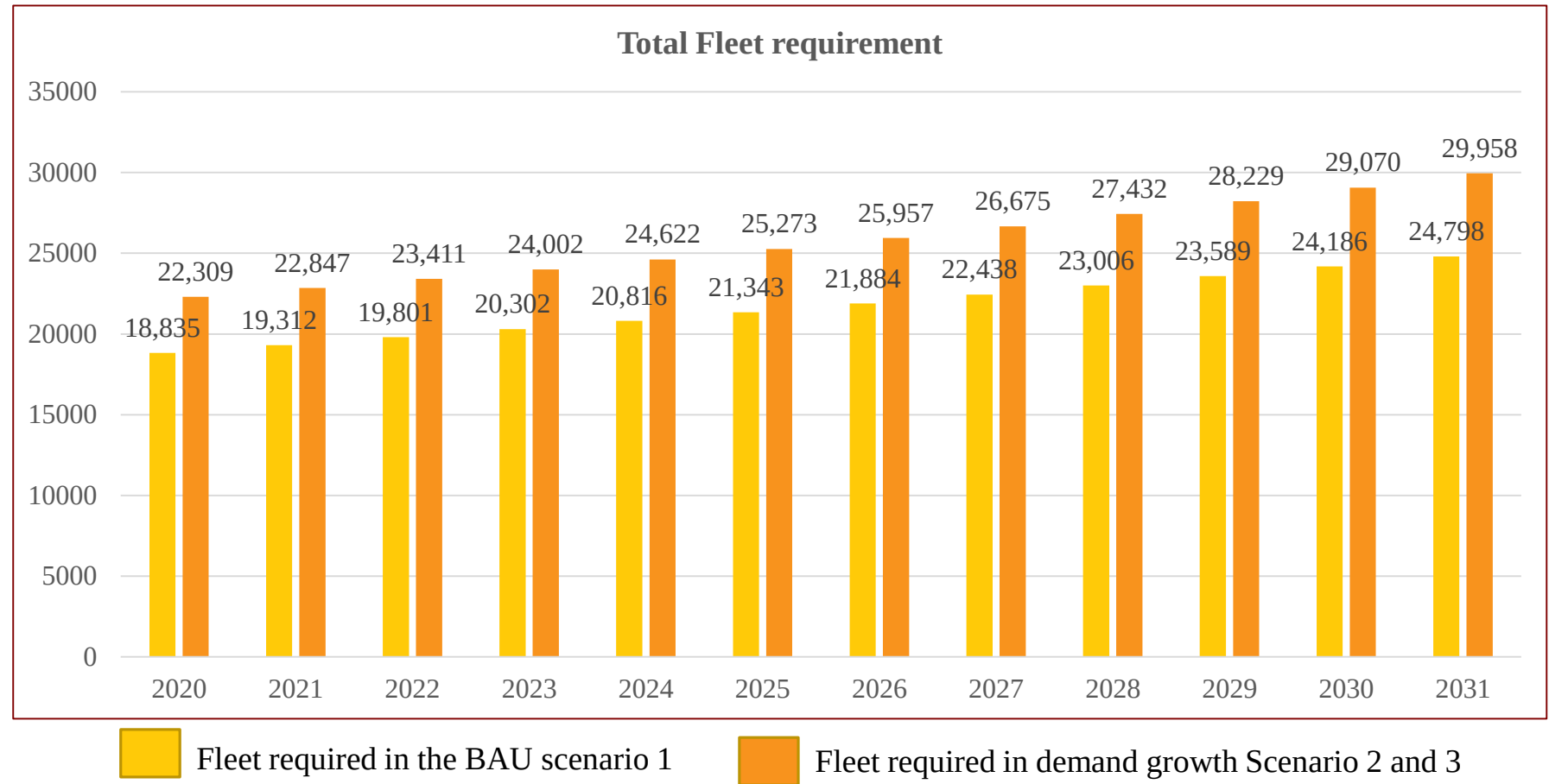
	2020	2031
Vehicle km	60,87,940	80,99,013
Vehicle utilisation	351 km	355 km
Load factor	69.51	69.51
Average bus capacity	60	60
Bus fleet on road	92%	92%
Auto rickshaws (doing intercity trips)	99,671	2,27,869

FLEET REQUIRED

Fleet estimation for all scenarios was carried out for next 11 years.

Total Fleet required in the BAU scenario(1), and scenario 2 and 3 are as shown in charts.

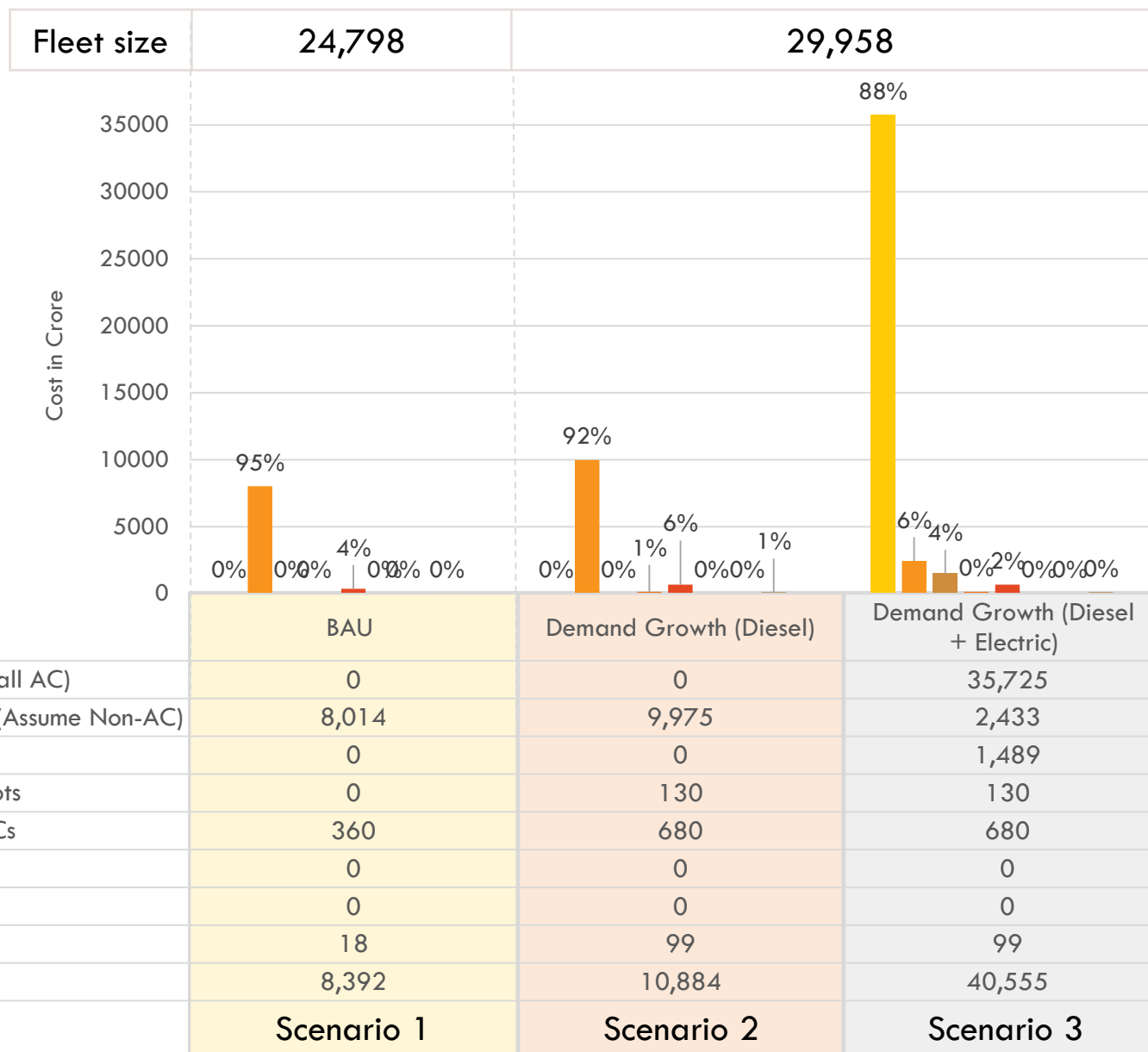
Fleet required is same for scenario 2 and 3



- KSRTC bus fleet in 2020 stands at 18,543. Based on model for fleet assessment, to meet the unmet demand, it needs extra 292 buses in 2020 for scenario 1 and a total 24,798 buses in 2031.
- For scenario 2 & 3, in year 2020, KSRTC must acquire 3,766 more buses to meet the demand and a total 29,958 buses in 2031.

CUMULATIVE CAPITAL EXPENDITURE NEEDS UNTIL 2031

Based on the fleet required in each scenario, the cost of fleet, and respecting infrastructure for the said fleet is calculated.

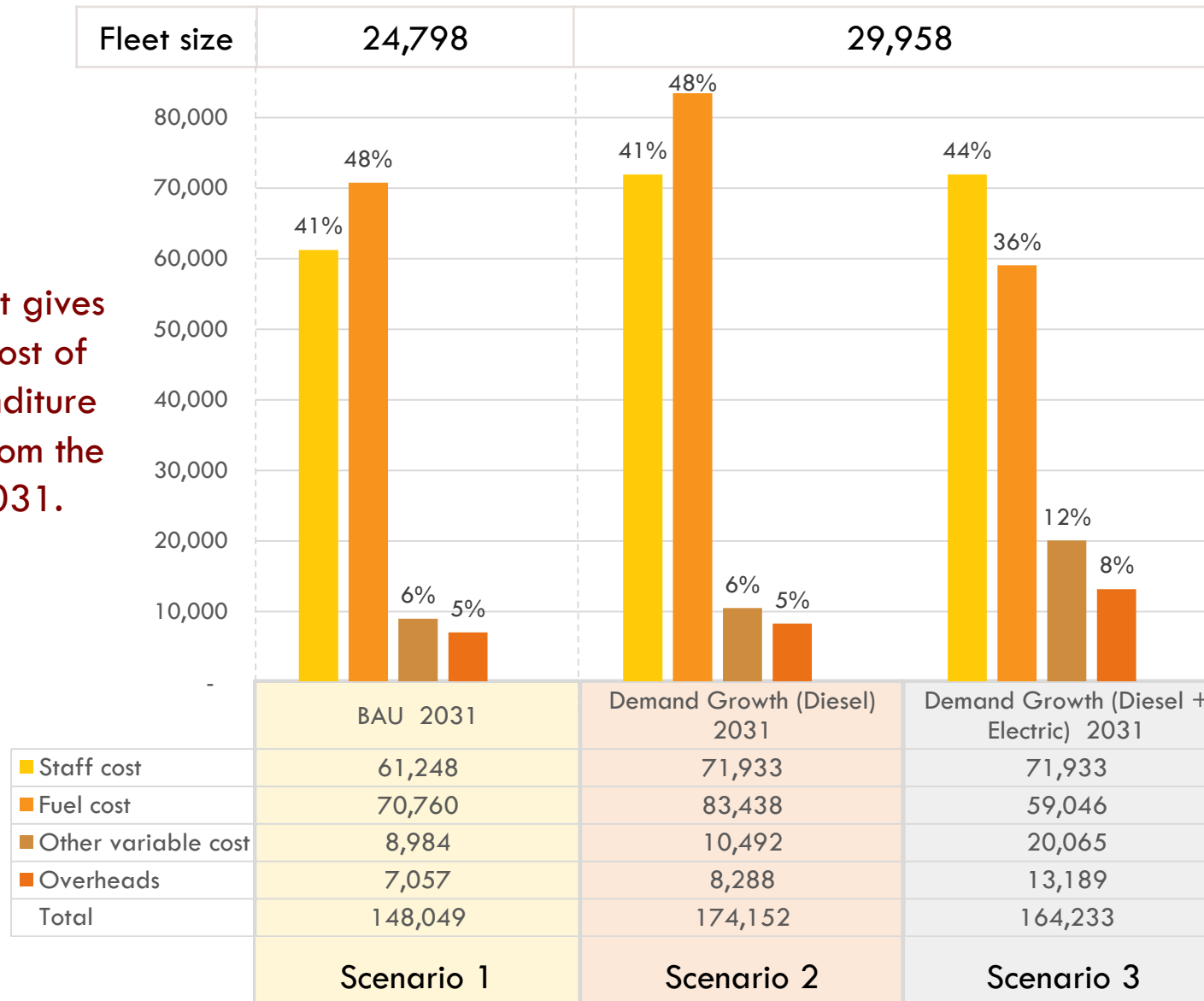


- The total capital cost breakup from the year 2020 to 2031 is as given in the chart.
- For S2, based on envisaging the shift of passengers from IPT to PT, the demand would increase to 29,958 buses and hence high capital cost for fleet and infrastructure is required.
- The capital cost of S3, is 3.7 times higher than that of S2 (diesel buses) due to higher cost of electric buses and charging infrastructure, even though the fleet size and other infrastructure required is the same

Cost of E-buses (Assume all AC)	0	0	35,725
Cost of BS VI Diesel bus (Assume Non-AC)	8,014	9,975	2,433
Cost of Charging Infra	0	0	1,489
Cost of Developing Depots	0	130	130
Cost of Developing TTMCs	360	680	680
Cost of bus stations	0	0	0
Cost of workshops	0	0	0
Land Acquisition Cost	18	99	99
Total	8,392	10,884	40,555

CUMULATIVE OPERATIONAL EXPENDITURE NEEDS UNTIL 2031

The following chart gives breakup of total cost of operational expenditure for all scenarios from the year 2020 and 2031.



- The total operation costs are the least in S-1 due to smaller fleet size
- The diesel only buses (S-1, S-2, inhouse op) were seen to have higher percentage of fuel cost as compared to the scenario with introduction of electric buses.
- Electric bus fuel cost : Rs. 7.8 per km Diesel bus fuel cost: Rs 14.35 per km (2020)
- S1 and S2 (all inhouse diesel buses) have same proportion of expenditure split over the years even though the fleet size is higher in S-2

COSTS COMPARISON

S1 (BAU) VS S2 (Sustainable transport)

	S-1 BAU Diesel			S-2 Demand Growth(Diesel)		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	637	8,016	8,653	1,072	8,407	9,479
2021	679	8,588	9,267	1,072	9,406	10,478
2022	679	9,203	9,882	1,072	10,489	11,562
2023	637	9,865	10,502	1,072	11,663	12,735
2024	707	10,617	11,324	747	12,558	13,305
2025	712	11,434	12,146	759	13,539	14,298
2026	717	12,324	13,041	772	14,617	15,389
2027	722	13,292	14,014	785	15,802	16,586
2028	686	14,347	15,032	799	17,107	17,906
2029	734	15,497	16,230	830	18,545	19,375
2030	739	16,750	17,489	964	20,132	21,096
2031	745	18,117	18,861	940	21,886	22,826
Total	8,392	1,48,049	1,56,441	10,884	1,74,152	1,85,036

Revenue	
S-1 (Crores)	S-2 (Crores)
7,172	7,522
7,638	8,365
8,129	9,265
8,648	10,224
9,229	10,916
9,849	11,662
10,511	12,467
11,217	13,335
11,970	14,273
12,775	15,288
13,633	16,386
14,550	17,577
1,25,322	1,47,282

Financial Deficit	
S-1 (Crores)	S-2 (Crores)
(1,481)	(1,957)
(1,629)	(2,113)
(1,753)	(2,296)
(1,854)	(2,511)
(2,095)	(2,389)
(2,297)	(2,636)
(2,530)	(2,922)
(2,797)	(3,252)
(3,062)	(3,633)
(3,455)	(4,087)
(3,855)	(4,709)
(4,312)	(5,249)
(31,120)	(37,754)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS

💡 The sustainable transport scenario (S2), modelled a large fleet size i.e. 24,798 by 2031, as compared to 29,958 by 2031 for S1

💡 The CAPEX in first four years of S2 is higher in order to acquire the buses for unmet demand of 2020 in phases

COSTS COMPARISON

S2 (Sustainable transport) VS S3 (Sustainable transport+ electric)

	S-2			S-3		
	Demand Growth(Diesel)			Demand Growth(Diesel+Electric)		
	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)	CAPEX (Crores)	OPEX (Crores)	Total Cost (Crores)
2020	1,072	8,407	9,479	2,567	8,459	11,026
2021	1,072	9,406	10,478	2,567	9,484	12,052
2022	1,072	10,489	11,562	2,567	10,564	13,132
2023	1,072	11,663	12,735	2,567	11,702	14,269
2024	747	12,558	13,305	3,522	12,518	16,040
2025	759	13,539	14,298	3,580	13,347	16,927
2026	772	14,617	15,389	3,642	14,190	17,832
2027	785	15,802	16,586	3,706	15,044	18,750
2028	799	17,107	17,906	3,779	15,910	19,689
2029	830	18,545	19,375	3,871	16,785	20,656
2030	964	20,132	21,096	4,070	17,669	21,739
2031	940	21,886	22,826	4,116	18,560	22,676
Total	10,884	1,74,152	1,85,036	40,555	1,64,233	2,04,788

Revenue	
S-2 (Crores)	S-3 (Crores)
7,522	7,522
8,365	8,365
9,265	9,265
10,224	10,224
10,916	10,916
11,662	11,662
12,467	12,467
13,335	13,335
14,273	14,273
15,288	15,288
16,386	16,386
17,577	17,577
1,47,282	1,47,282

Financial Deficit	
S-2 (Crores)	S-3 (Crores)
(1,957)	(3,505)
(2,113)	(3,687)
(2,296)	(3,867)
(2,511)	(4,045)
(2,389)	(5,123)
(2,636)	(5,265)
(2,922)	(5,365)
(3,252)	(5,415)
(3,633)	(5,415)
(4,087)	(5,368)
(4,709)	(5,353)
(5,249)	(5,099)
(37,754)	(57,506)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)

KEY FINDINGS



The fleet size by 2031 in both scenario is same. Yet the CAPEX for S3 is approximately 3.7 times that of S2 due to acquiring of electric buses in S3



The total OPEX of S3 is 6% lesser than that of S2 due to lower cost of operation associated with electric buses

ANNEXURE: BMTC FLEET & FUNDING ESTIMATION



KEY DATA SOURCES

The data source for Fleet and Cost estimation model are the following

Data	Source
Operation data	BMTC Performance Indicators
Other transit mode data (PT)	BMRCL Data
Mobility plans or similar study	Bangalore Revised Master Plan, 2015
Intermediate public transport (IPT) data	-NA
Other data sources	World Urbanization Prospects: The 2018 Revision [UN]: Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2018, by Country, 1950-2035 (thousands)
	CTTP, Bangalore, 2011

KEY DATA: FLEET PROJECTION

The following are the key data used for the fleet and cost estimation model

	2020	2031
Trip length	13.11	16.73
Vehicle km	5,38,02,461	9,03,88,692
Vehicle utilisation	200 km	200 km
Load factor	66.8%	66.8%
Average bus capacity	45	45
Bus fleet on road	89%	89%

FLEET REQUIRED

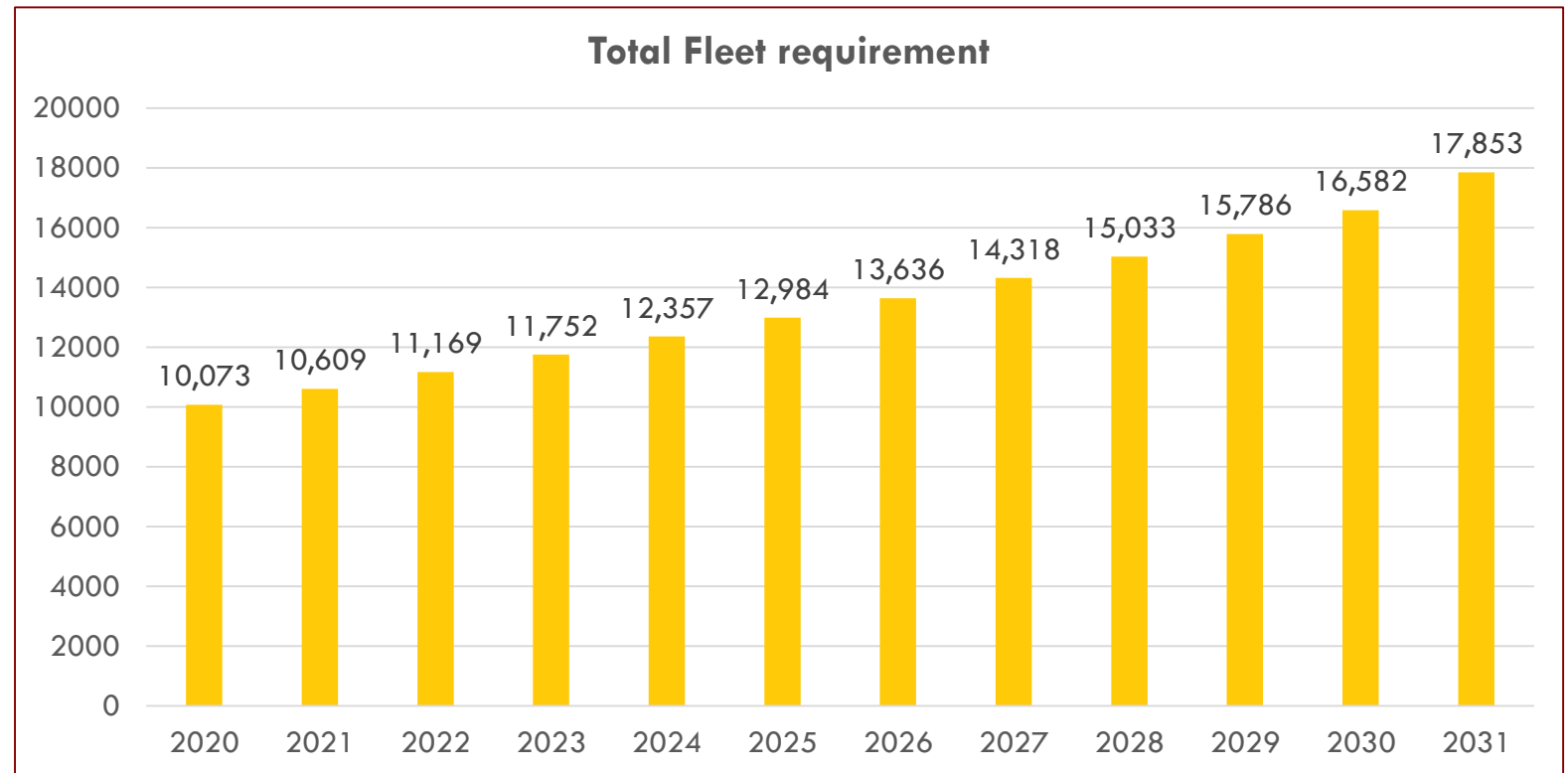
One scenarios is taken up for the fleet and cost estimation for BMTC bus service.

Based on existing trends of public transport operations and Bangalore revised master plan

All buses are assumed to be owned by MTC and are BS-VI Non AC Diesel buses.

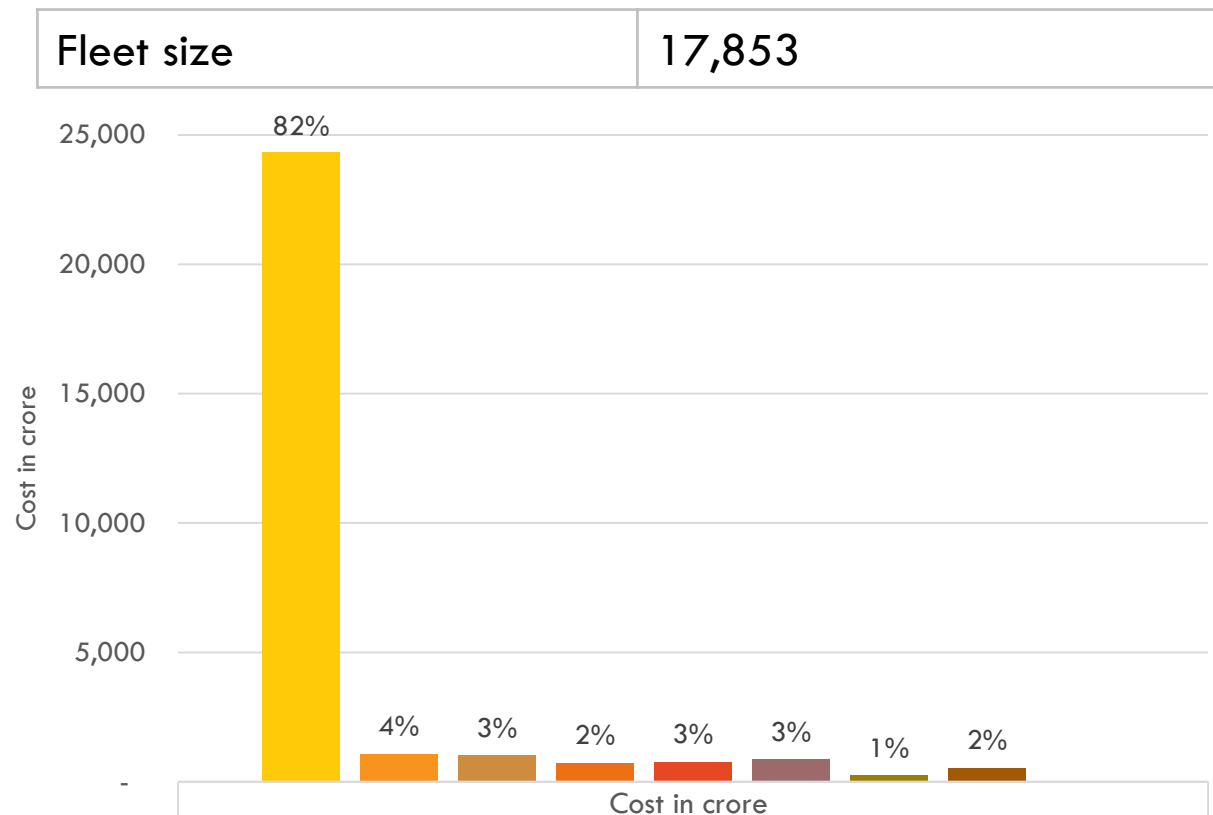
In year 2020, BMTC must require 3,552 more buses to meet the demand and a total 17,853 buses in 2031.

Scenario 1: Improved Public Transport Scenario + Electric Bus



CUMULATIVE CAPITAL EXPENDITURE NEEDS UNTIL 2031

Based on the fleet required in each scenario, the cost of fleet, and respecting infrastructure for the said fleet is calculated.

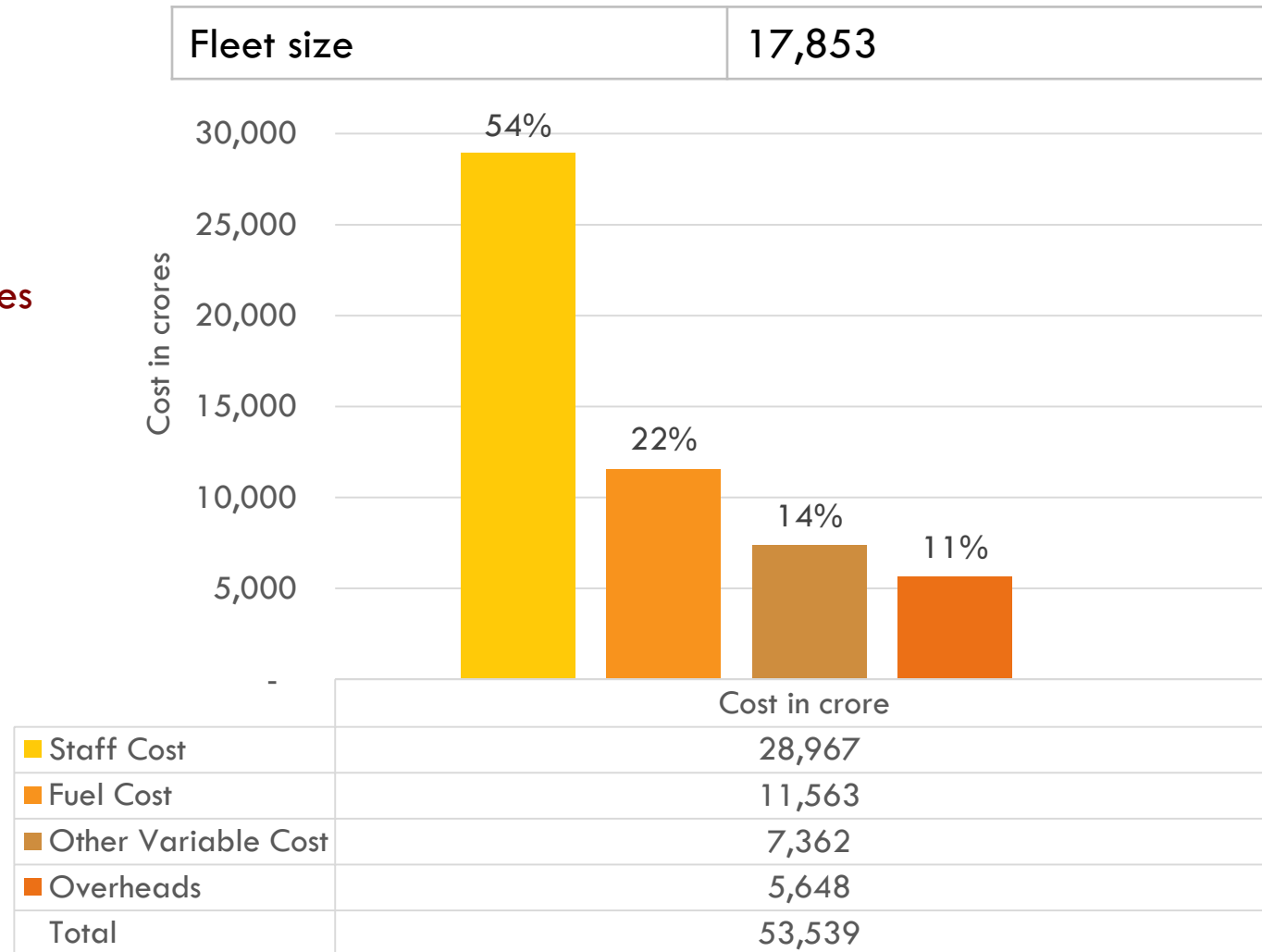


The total capital cost breakup from the year 2020 to 2031 is as given in the chart.

■ Cost of E-buses (Assume all AC)	24,344
■ Cost of BS VI Diesel bus (Assume Non-AC)	1,072
■ Cost of Charging Infra	1,014
■ Cost of Developing Depots	730
■ Cost of Developing TTMCs	760
■ Cost of bus stations	860
■ Cost of workshops	240
■ Land Acquisition Cost	526
Total	29,546

CUMULATIVE OPERATIONAL EXPENDITURE NEED TILL 2031

The chart gives breakup of cumulative operational expenditure



- The operation expenditure breakup shows that the staff cost, variable cost and overhead costs, all increased at an average rate of 10% till year 2031, however fuel cost increased at just 3% per annum.
- The fuel costs are low due to shift to electric vehicles after the year 2023.

COSTS REQUIRED

The BMTC fleet estimation model gets a positive margin over operating expenses after the year 2021

Improved Public Transport Scenario + Electric Bus				
	Capital Cost requirement (Crores)	OPEX (Crores)	Total Cost per annum (Crores)	Financial Deficit
2020	2,350	2,711	5,061	(2,363)
2021	2,420	3,071	5,491	(2,314)
2022	2,460	3,786	6,246	(2,261)
2023	2,202	4,000	6,202	(1,873)
2024	2,456	4,195	6,651	(1,969)
2025	2,907	4,394	7,301	(2,227)
2026	1,982	4,608	6,590	(1,188)
2027	1,575	4,835	6,411	(699)
2028	1,744	5,073	6,816	(772)
2029	4,380	5,307	9,687	(3,107)
2030	2,312	5,568	7,880	(898)
2031	2,758	5,991	8,750	(1,192)
Total	29,546	53,539	83,085	(20,862)

Financial deficit: Total Revenue – Total Expenses (i.e. CAPEX+OPEX)