



# Funding Public Transport in Urban areas: Bangalore, Mumbai , Ahmedabad

**ISHITA**

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**AHMEDABAD , GUJARAT**

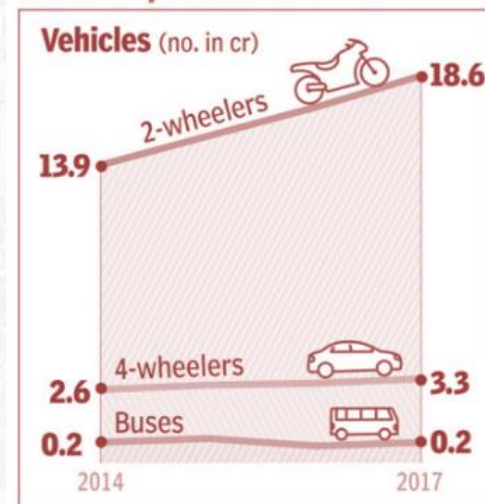


**RAPID URBANISATION**  
**350 MILLION << BILLION**

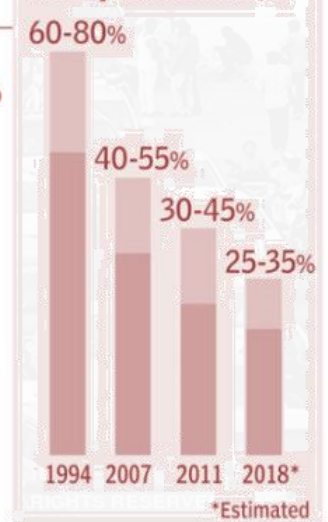
**MOTORIZATION**  
**LEVELS VS**  
**PT SHARE**  
**60-80% to 35%**



### CAR, 2-WHEELER SALES SURGE, BUSES FLAT



### Share Of Public Transport (Urban Trips)



Source : TOI 8 September, 2018: A study by global consulting firm AT Kearney  
Booming sale of cars, bikes slams brake on public transport.



# WHAT ARE THE CURRENT ISSUES IN FINANCING BUS TRANSPORT?



State transport corporations of Bengaluru, Mumbai, Hyderabad, Kolkata and Manali have already introduced electric vehicles into their fleets.

NEW DELHI: The government may soon start operating electric buses in partnership with private players as it looks to improve public transport and reduce pollution.

Niti Aayog, the government's premier think tank, has sought comments from stakeholders on a draft model concession agreement for introducing electric-bus fleets in cities for public transportation in public-private partnership or PPP mode on operational expenditure (per km per bus per year).

FINANCIAL CRISIS

SHORTAGE OF FUNDS

ABORT THE SERVICE

NO DEDICATED FUNDS

City Delhi Mumbai Bengaluru Hyderabad Kolkata Chennai Agartala Aizawl Amritsar

## Metro Phase-IV work may not start before six months

Dipak K Dash | TNN | Updated: Jan 22, 2019, 00:40 IST



Representative image

NEW DELHI: Starting the construction of Delhi Metro Phase-IV will take at least six months, Union housing and urban affairs ministry officials said on Monday, blaming it on fresh hurdles put up by Delhi government.

The next phase of expansion has already been delayed by more than two years, primarily on account of the ongoing tussle between the Centre and Delhi government over the sharing of the project cost or operational losses.

Sources said after Delhi government sent its revised proposal saying it would not bear equal sharing of operational losses that the new line might incur and that the city government wouldn't bear any liability of the loan to be taken from Japan International Cooperation Agency (JICA), the ministry has forwarded the proposal for third party appraisal by Institute for Urban Transport (IUT).

TNN | Jan 20, 2019, 04:25 IST



AHMEDABAD: For the next seven years the Gujarat government will bear almost half of the losses made by municipal authorities in running public transport. This strategy is aimed at making public transport the mainstream option said Mukesh Puri, principal secretary, urban development department. Puri was speaking at a seminar on 'mobility led

## Mumbai: BEST seeks money from MMRDA for operating hybrid buses

If the service runs into losses, the MMRDA was required to bear the losses.



At a committee meeting on Friday, BEST member Sunil Ganacharya raised the issue of pending payments from the MMRDA. (Source: File Photo)

THE LOSS-MAKING Brihanmumbai Electric Supply and Transport (BEST)

## Unions did not pay heed to BEST's poor finances: panel



Sharad Vyas

MUMBAI, JANUARY 18, 2019 00:57 IST  
UPDATED: JANUARY 18, 2019 00:57 IST

## BMTC hopes to get NGT nod to add 1,200 buses

Chiranjeevi Kulkarni, DH News Service, Bengaluru, JAN 22 2019, 00:04 IST | UPDATED: JAN 22 2019, 01:41 AM IST



In 2018, Bangalore Metropolitan Transport Corporation (BMTC) has to scrap about 400 buses that have run 8.50 lakh bus kilometres or buses as old as 11 years, BMTC Managing Director N V Prasad said.

## BEST under Threat of Privatisation

The BEST bus strike in Mumbai and its underlying issues exemplify the lacunas in India's public transport.

For nine days—from 8 to 17 January 2019—Mumbai's roads were bereft of one of its most iconic markers, the Brihanmumbai Electric Supply and Transport (BEST) buses. These buses are the backbone of daily commute for lakhs of people, who were put through immense inconvenience and even trauma during this period. Those who live in areas that are not serviced by other modes of public transport were particularly affected with students even unable to travel to their examinations. However, there are two aspects that stand out about this strike by Brihanmumbai Electricity Supply and Transport Undertaking Workers' Union. One, even though was the longest such agitation in recent times, public and commuter sympathy was with workers. Despite the divisive tactics of the Shiv Sena-affiliated unions, workers remained united under the leadership of the joint action committee. Along with the fairness of their demands, drew public sympathy for the strike was the perception that they were also fighting in the interest of public transport. Two, despite the buses being back on the roads after the Bombay Court intervened, the general feeling is that the BEST will either be in private hands soon or it is deliberately neglected to benefit other modes of private transport. Neither of these scenarios are well for the future of public transport generally and for the inhabitants of Mumbai.

# Need of Funding Public Transport

**SOCIAL GOOD,**  
Benefits large mass



Urban transport is a challenge, the only way forward for sustainable mobility would be to focus on public transport. And financing public transport being one of the major problem cities need to investigate, for the better functioning.

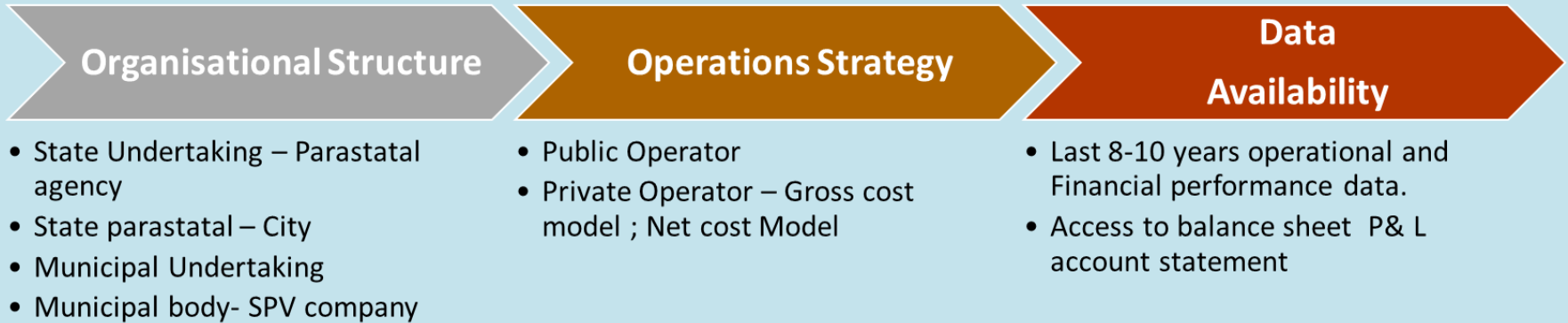
## **AIM**

“This study is an attempt to understand various funding mechanisms that are being utilized by the Public Transport Agencies in different cities and how effective are they in utilizing the same”

# Research Questions and Objectives

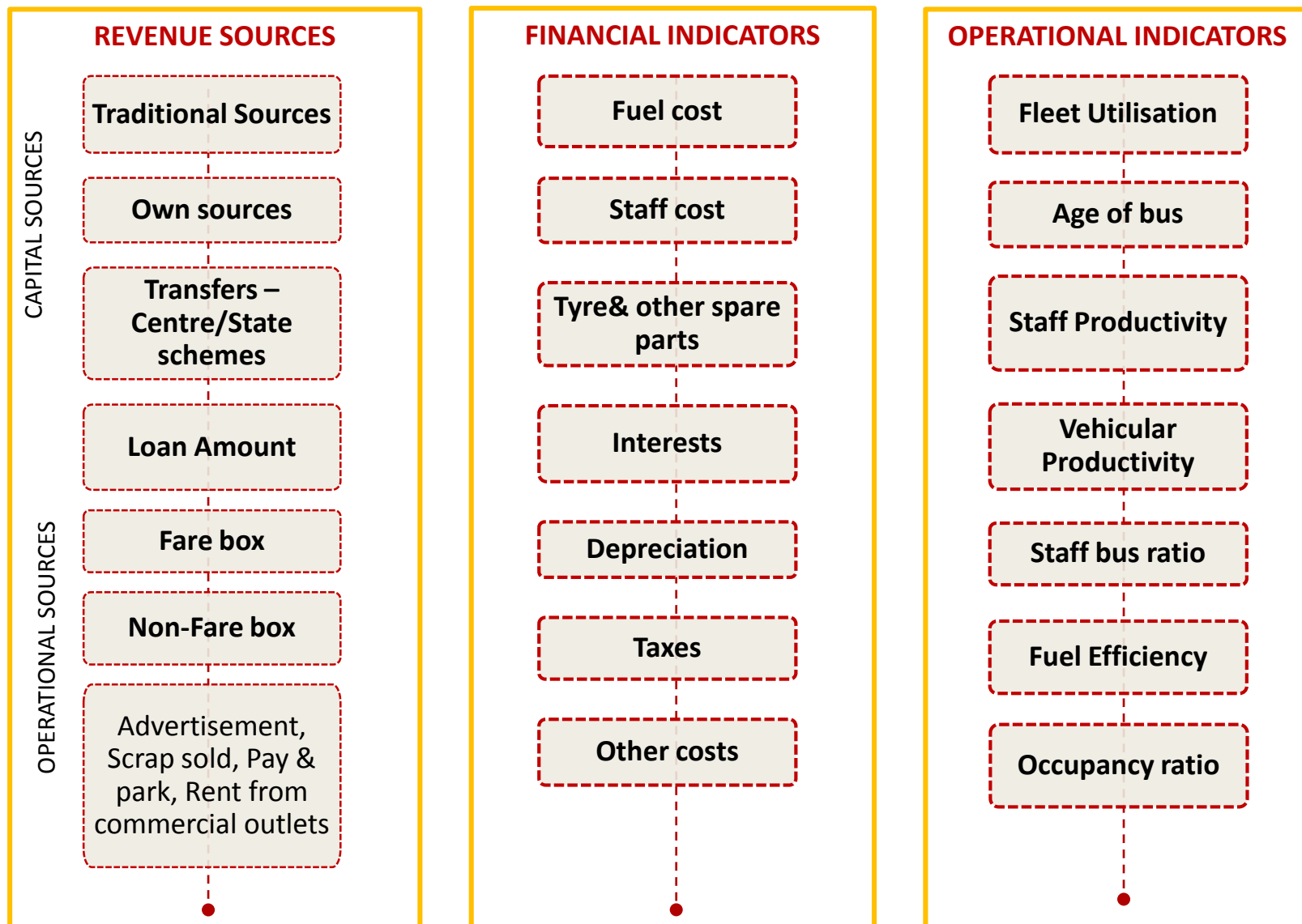
- Which are the sources of funding the city has utilized for developing and operating bus services?
- To what extent are these sources of funding are exploited by different cities?
- How is the performance of bus systems contributing to maintaining financial sustainability?
- To assess the operational and financial performance of bus systems over the recent past (last 8-10 years) in 3 cities.
- To assess how PTA's are meeting their operating expenses and to what level do they recover from fare-box and non-fare box. If there is a Viability gap, how are they filling it?
- To explore if there are any concessions provided to different groups of the society (culture, income) and how is the revenue shortfall met due to these.

## CITY SELECTION CRITERIA



Cities	Bangalore- BMTC	Mumbai- BEST	Ahmedabad-AMTS
Established under	State	Municipal	Municipal
Contracting Model	State – Parastatal	Municipal	Municipal-Gross cost

# Indicators





# 1 BANGALORE

WHAT'S YOUR IDEA  
FOR BANGALURU?  
TYPE THEM IN A  
NEXTBANGALURU

ST. JOSEPH'S  
COLLEGE

SWATI ROAD

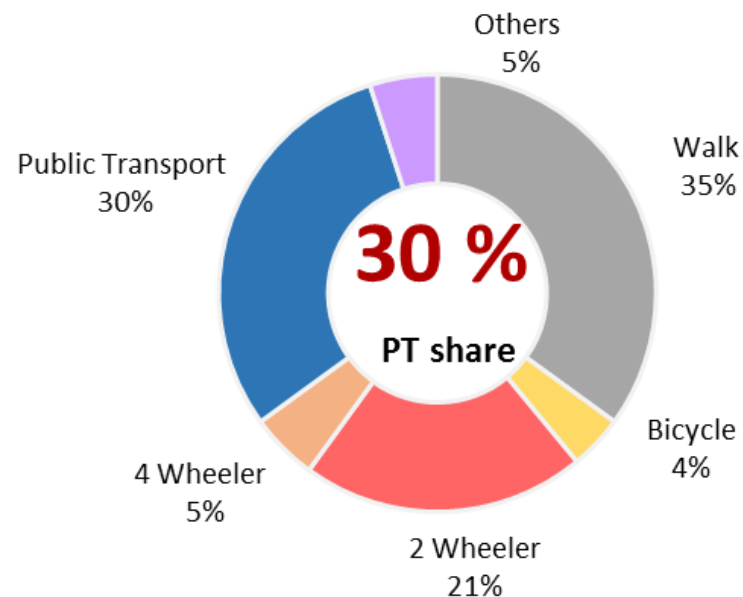
SHANTHINAGAR

LAKSHMI ROAD

DID YOU KNOW THE GUTTER  
IN DOUBLE ROAD WAS THE  
SHANTINAGAR RIVER?  
WE CAN CHANGE IT IF WE TRY

AREA (km. sq.)	800
POPULATION (2011)	96 lakhs
POPULATION DENSITY-2011	4381 (p/km. sq.)
PT SERVICES	BMTC city bus, METRO RAIL
BMTC Network coverage(km)	11.96 lakh km
Metro Network Length (km, 2018)	42 kms (operational) , 72 km proposed

Source: Census 2011, CTTS 2011

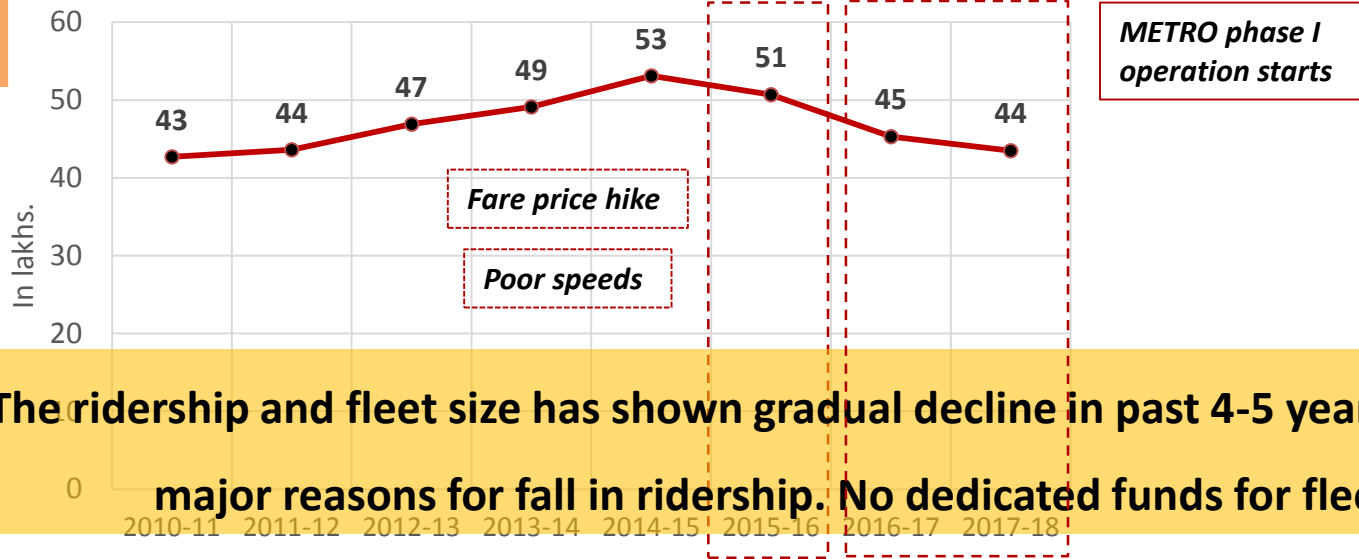


**State** undertakes major PT operations and its's finances in Bangalore. **BMTC** undertakes bus services- capital and operational



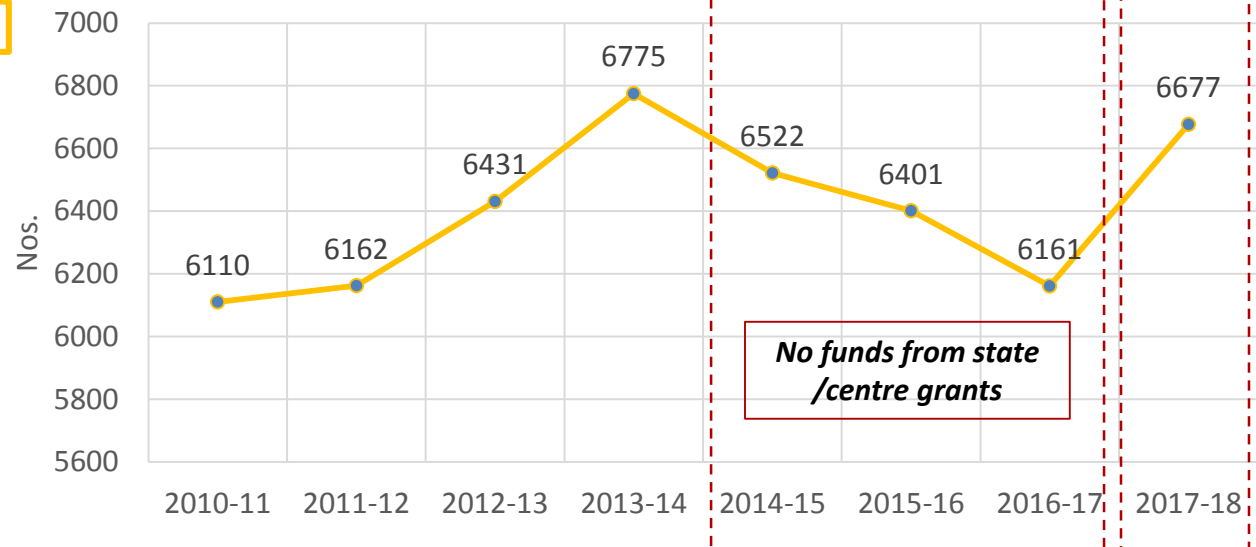
# Trends in Public Transport system: BMTC

Ridership / day



The ridership and fleet size has shown gradual decline in past 4-5 years. Speed , price hike major reasons for fall in ridership. No dedicated funds for fleet purchase.

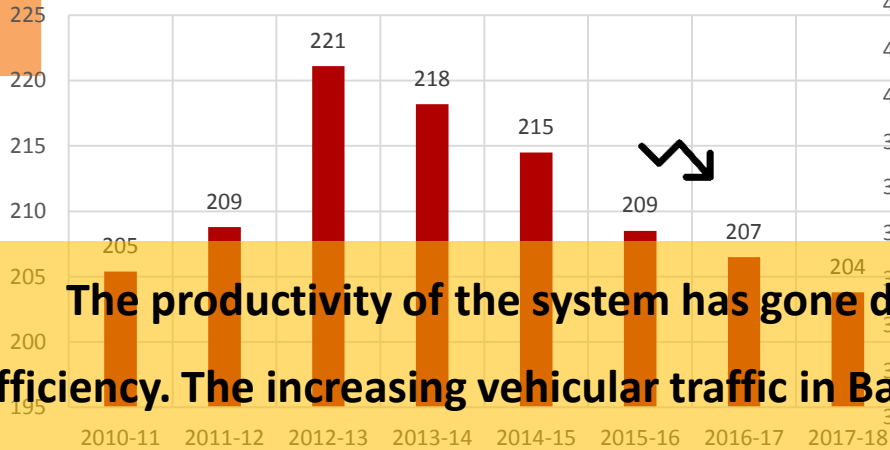
Fleet Size



# Growth and Productivity of the bus system

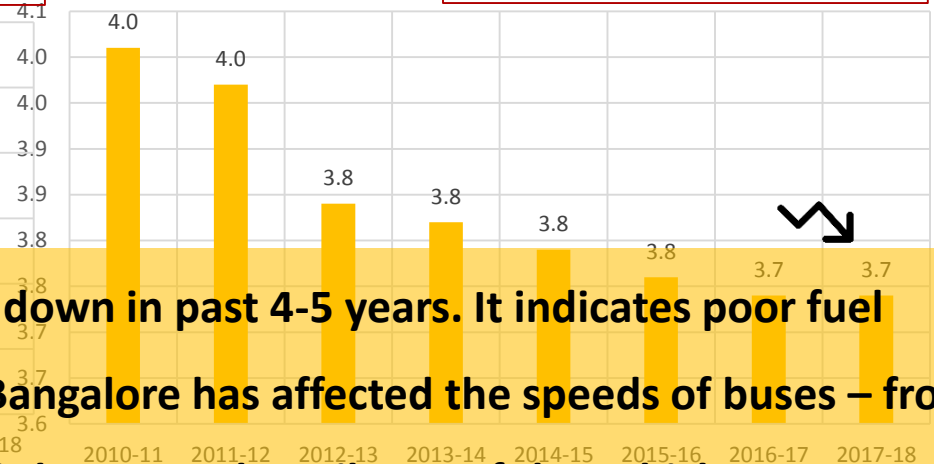
## Vehicle productivity

*Trodden speeds 20kmph to 10 kmph in peak hours due to congestion.*



## Fuel Efficiency

*Trodden speeds 20kmph to 10 kmph ; more fuel consumption;*



The productivity of the system has gone down in past 4-5 years. It indicates poor fuel

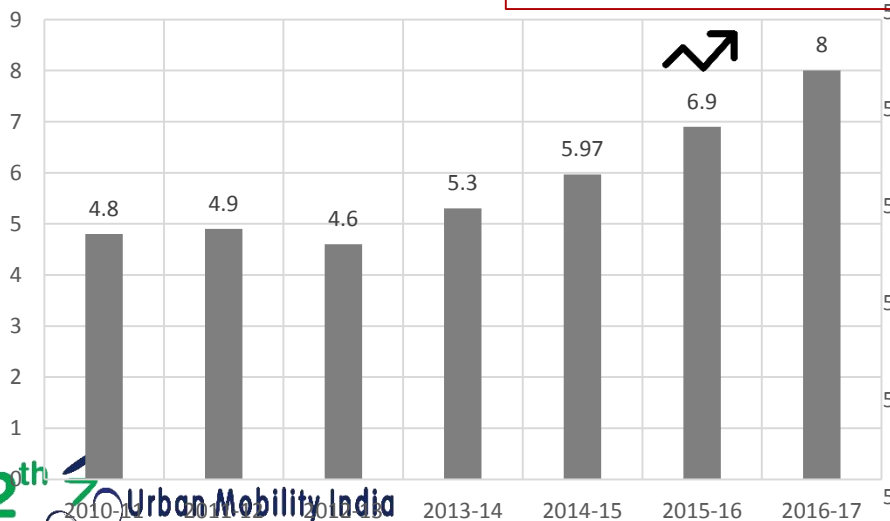
efficiency. The increasing vehicular traffic in Bangalore has affected the speeds of buses – from

20km/hr it has come down to 10km/hr. This hampers the mileage of the vehicles, systems

efficiency and increases the cost of operations.

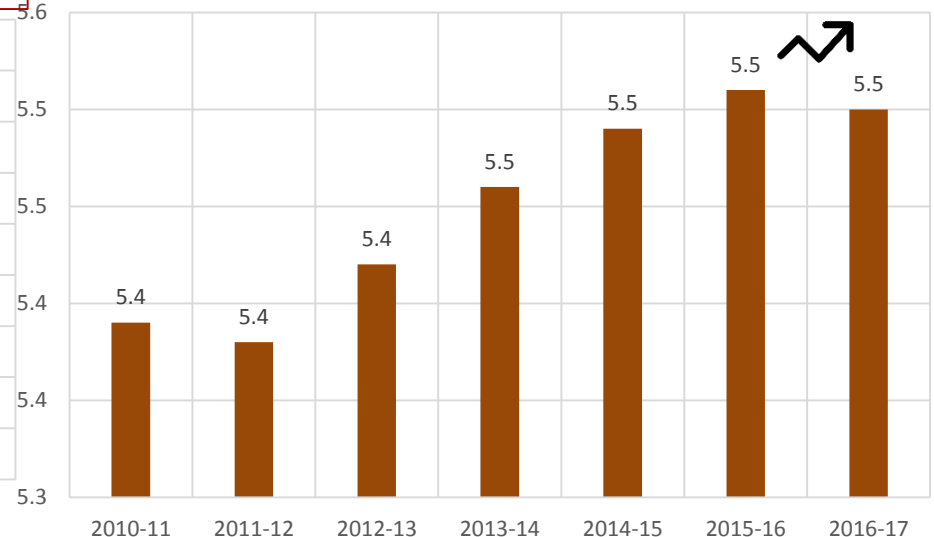
## Age of the bus

*new production of bus inc in existing maintenance*



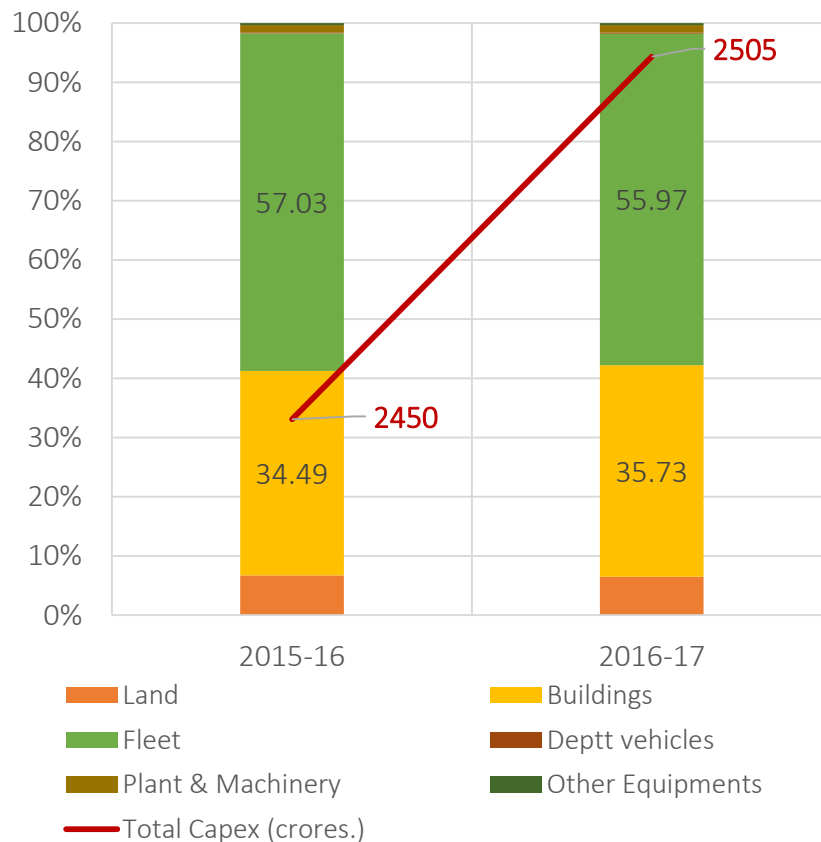
## Staff-bus ratio

*Up to the level of service*

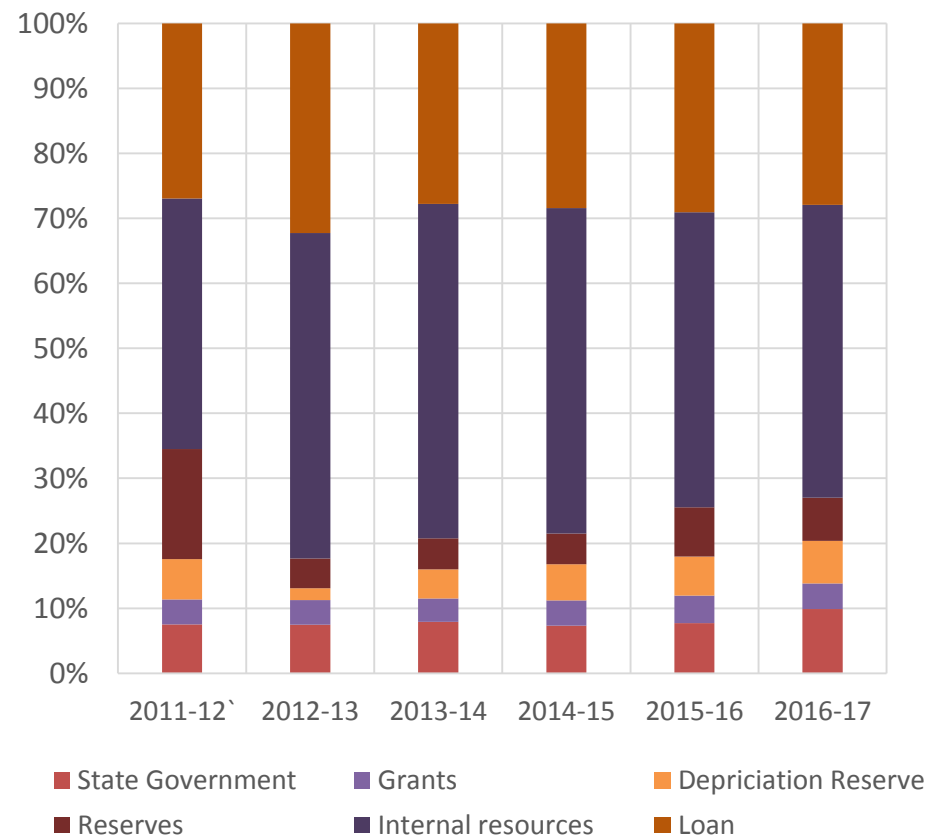


# Capital Investment & Sources

## Total Capital Investment and its components



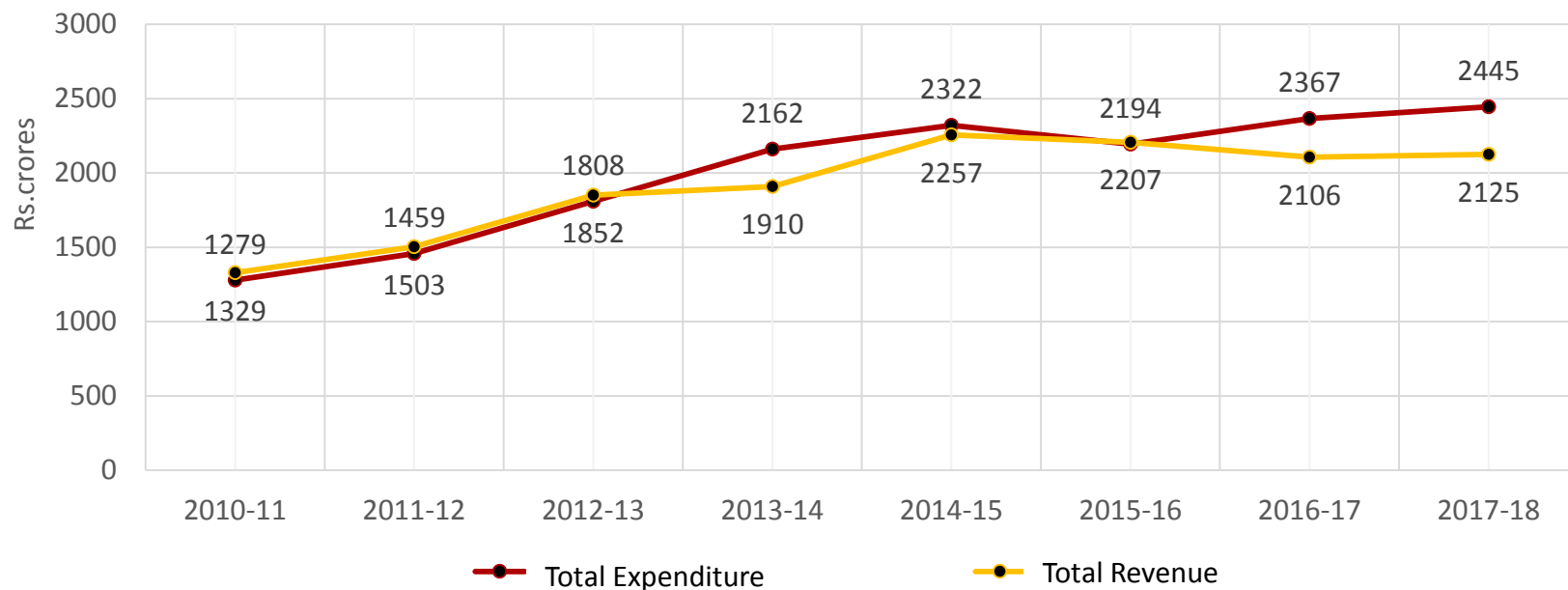
## Sources of Funds



- With the increasing investment, fleet purchase is decreasing. Only because no addition in fleet nos. after 2013-14

- For fleet augmentation and capital infrastructure it is dependant on government grants/schemes. They are neither rule based nor predictable.
- From all the sources majorly **Reserves** are changing each year based on the recovery for revenue deficit operations.

# Operational Expenditure & Revenue



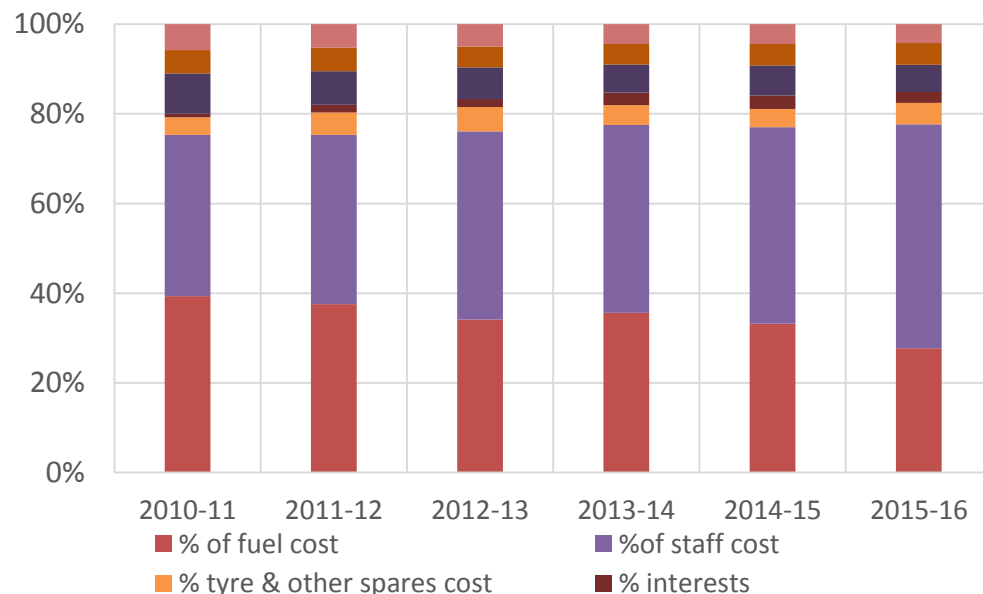
## Opex Components share in %

**50%**  
**30%**

### Staff wages and fuel cost.

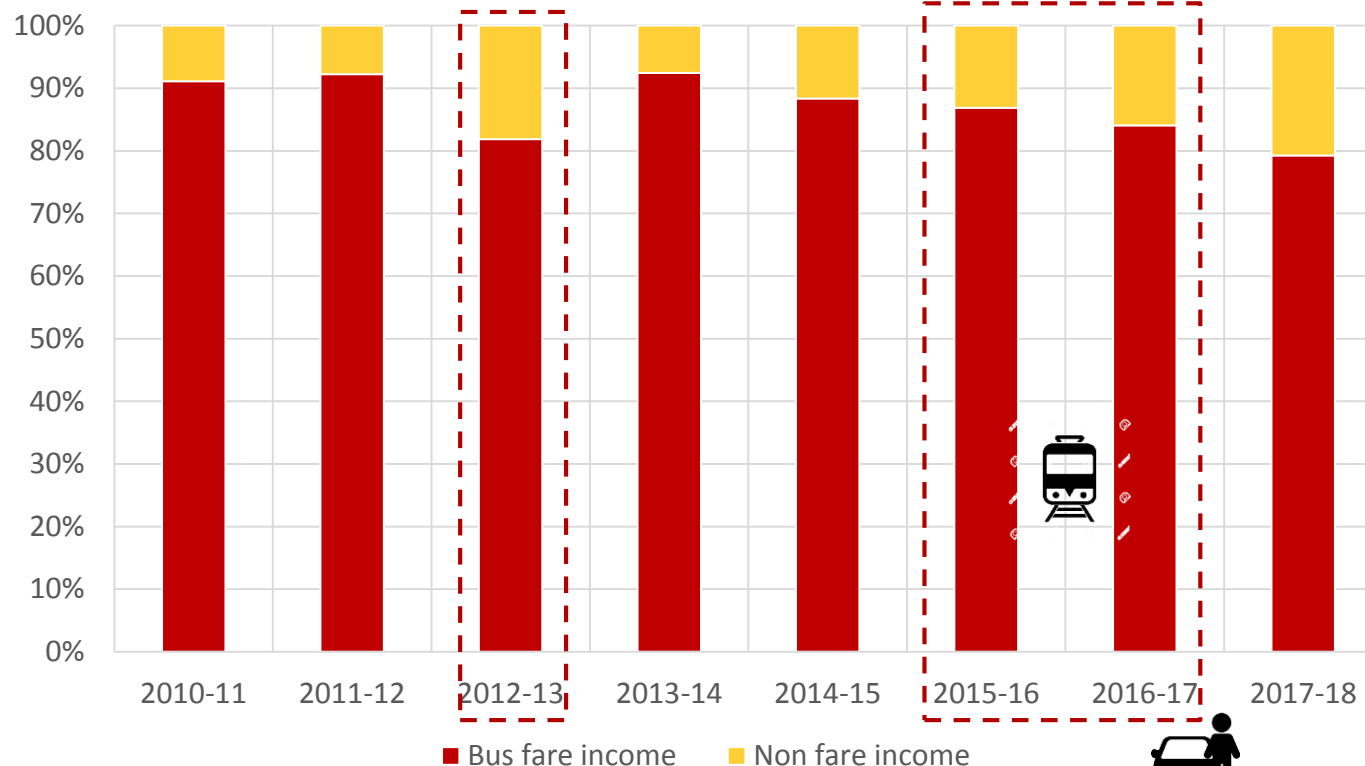
Staff salary as per the DA from government.

With increasing fuel price, cost of maintaining other spare parts also increases, has led to fare price increase (AC buses, monthly passes)





# Operating Revenue : FARE & NON-FARE BOX



**85% Fare box**  
**12% Non-fare box**



**Hike in fare prices ~ Fall in ridership ~ Revenue declined**  
Stage distance < 2 km – charging higher ticket fare

**15%**

**Drop in Speeds ~ 22kmph to 10kmph**

**Metro, Shared taxi in demand ~ high price for bus riders ~ led to decrease in bus ridership**

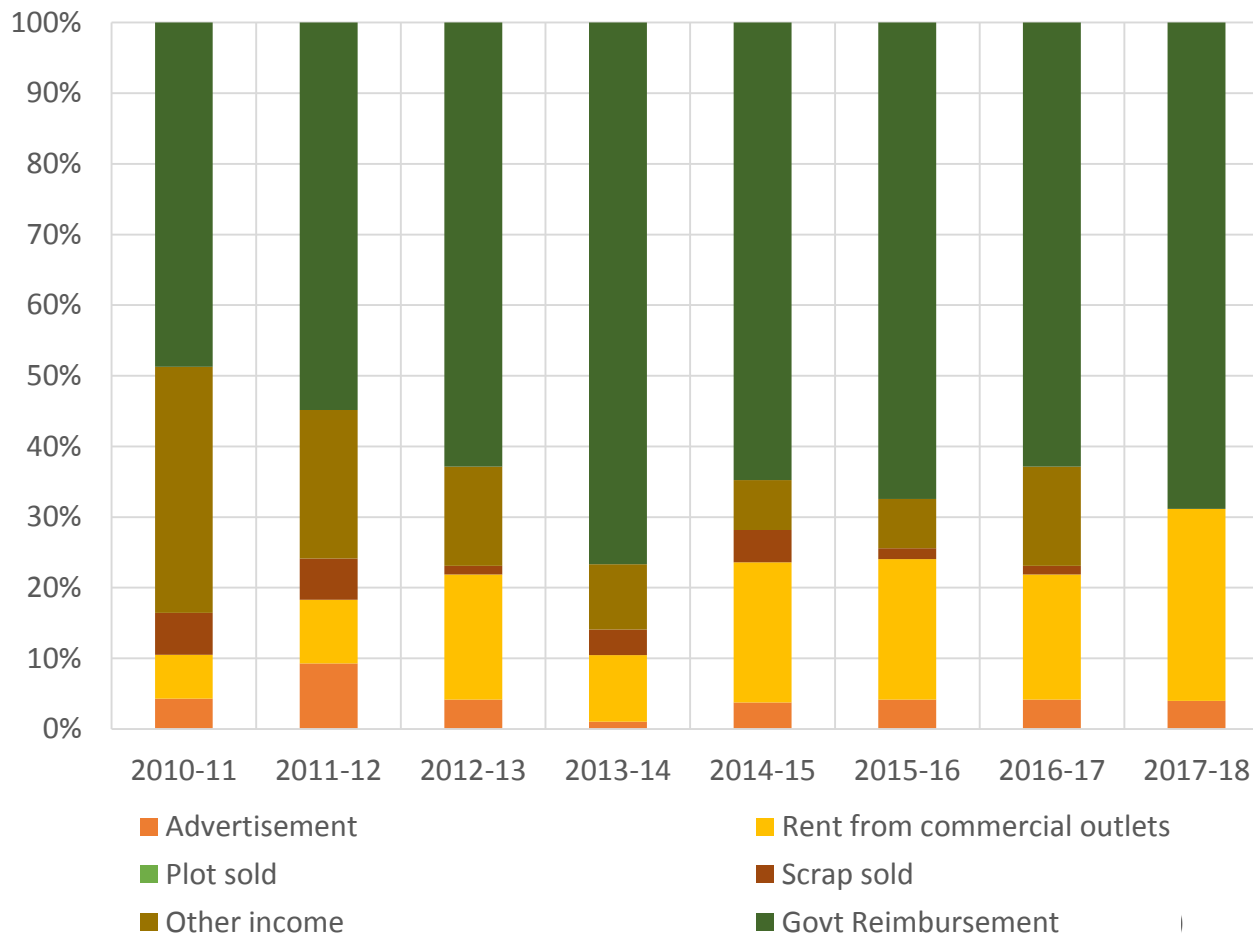
**18%**



**2018 proposal**

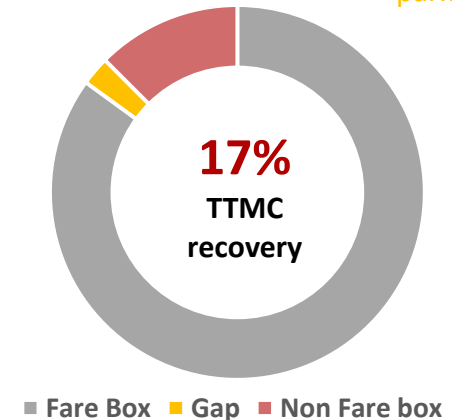


# NON FARE BOX : Components



10  
TTMC

All user groups , mixed use development, office space, pay & park

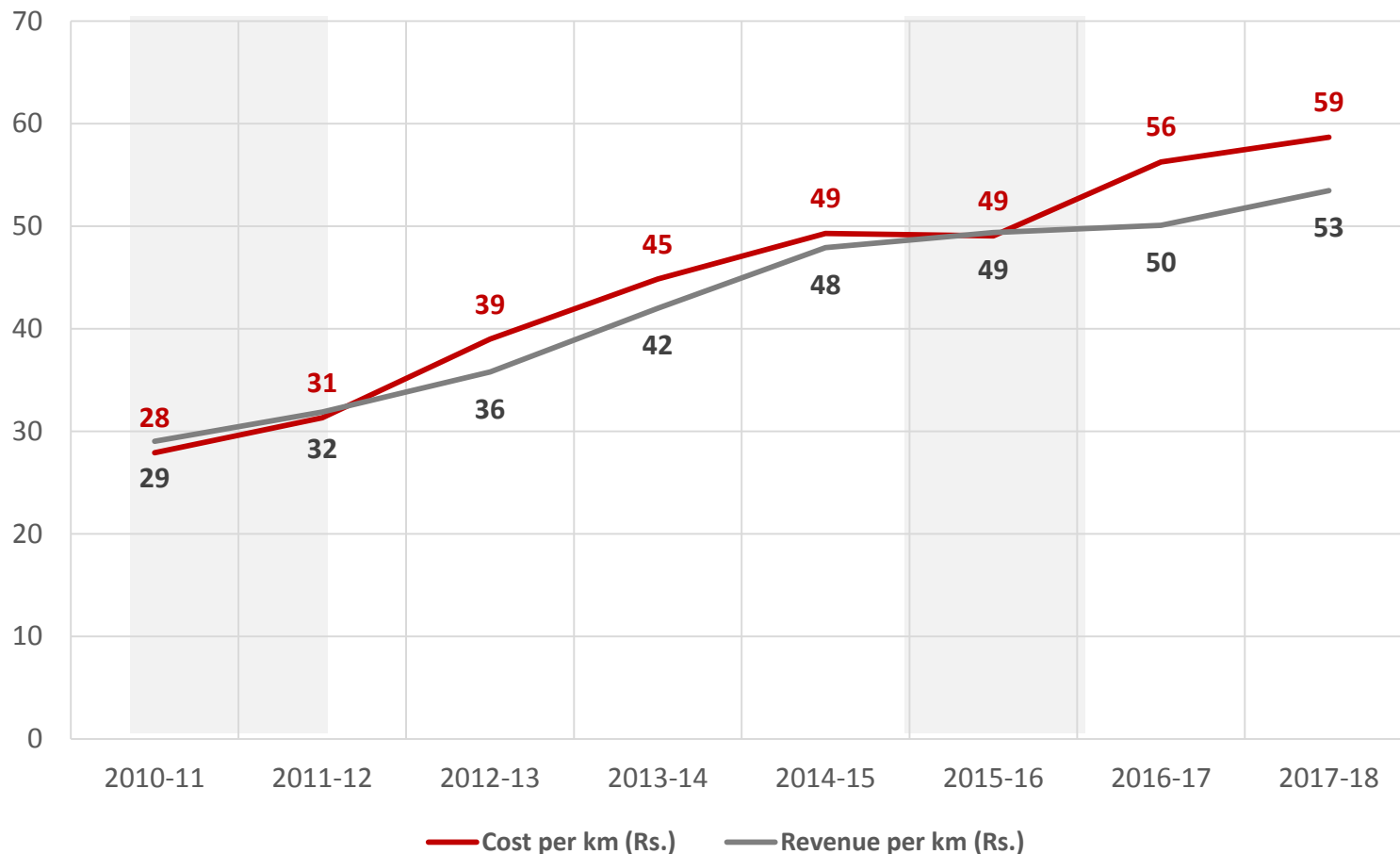


**Increase in sale of CONCESSION PASS**

Sale of these passes increased from 1.5 to 2.9 lakhs pa. Therefore, contributes 35% revenue from the non-fare box.

# Operating Ratio

## Per km Cost & Revenue

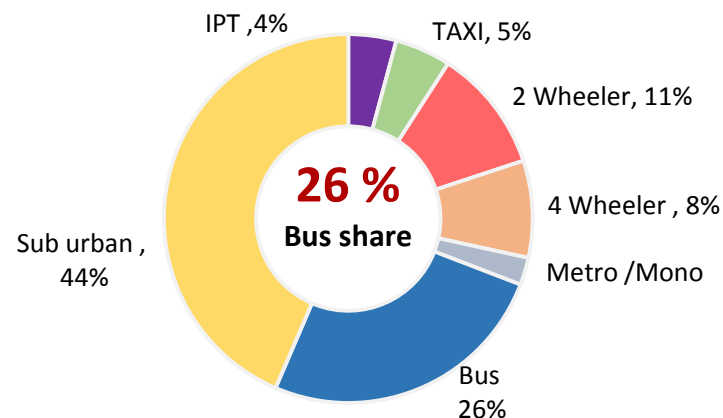


**BREAKEVEN** after running 3 years in loss: purchased bulk diesel at cheap rates, swapped loans for lower interest, cancelled unproductive routes, improved maintenance of buses (with no more breakdowns)

# 2 MUMBAI

AREA (km. sq.)	4354
POPULATION (2011)	228.04 lakhs
POPULATION DENSITY-2011	19652 (p/km. sq.)
PT SERVICES	City Bus (BEST) , Sub urban rail , Metro, Mono Rail
BEST Network coverage	215 kms
Metro Network Length	11.6 kms
Suburban rail	376 route kms

*Source: Census 2011 ,BEST official (CY. Traffic Eng.P.Shetty), MMRDA officials*



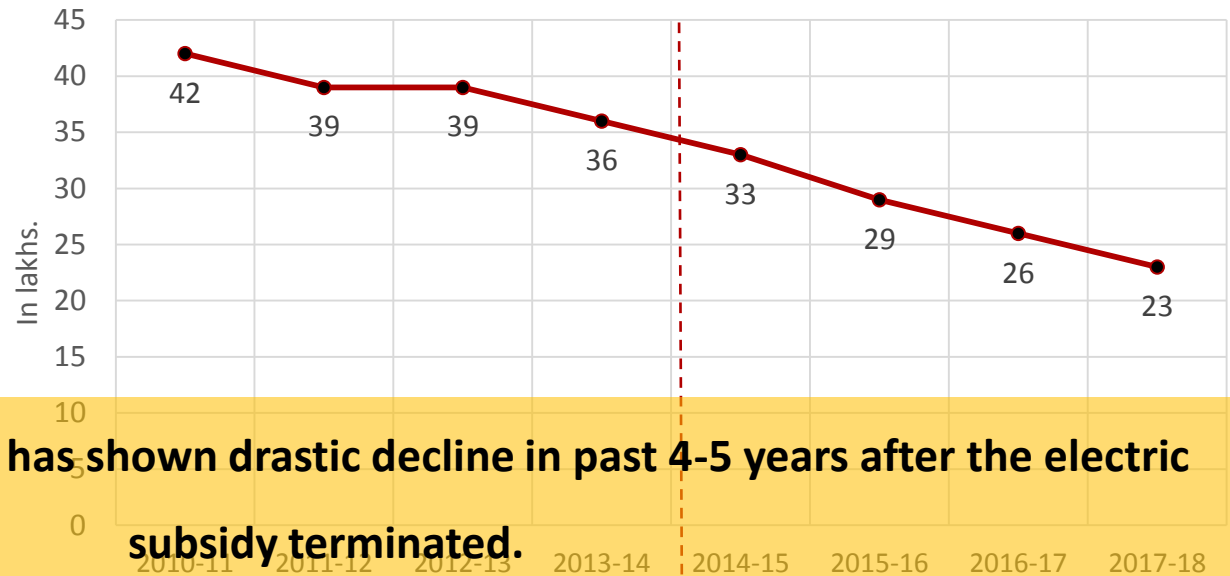
*Source: 2014 share , CMP , 2016.*

Various stakeholders play their role in dealing with Public transport. In the city limits **BMC undertakes** services of city bus service- with parastatal agency (**BEST**)

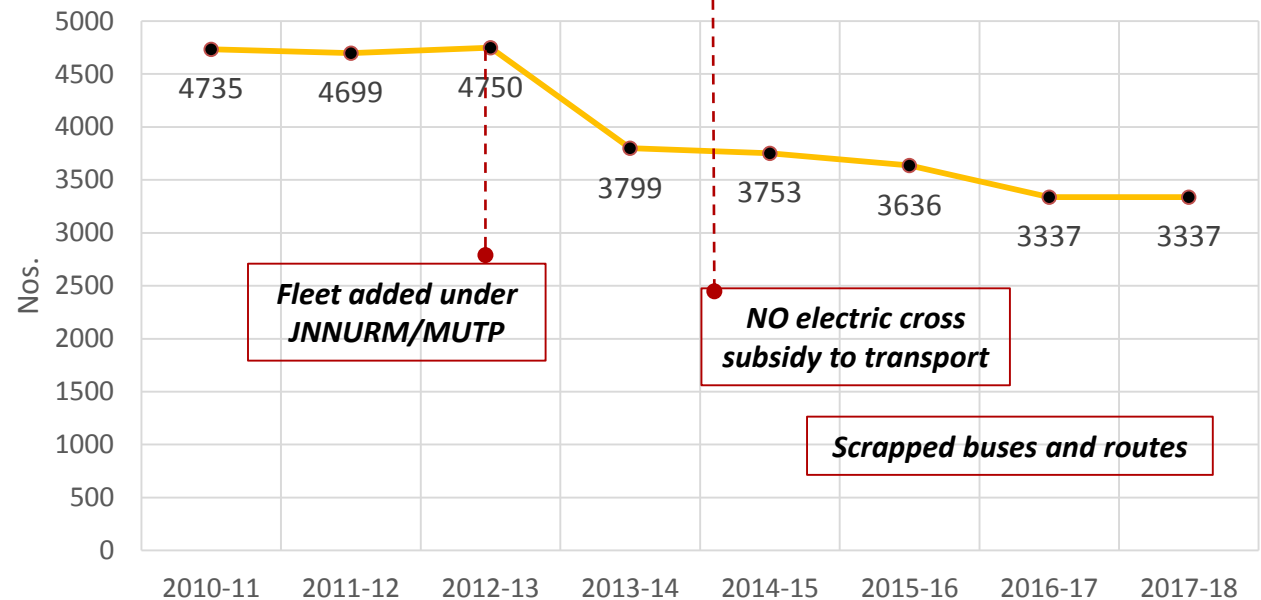


# Trends in Public Transport system: BEST

Ridership/ day



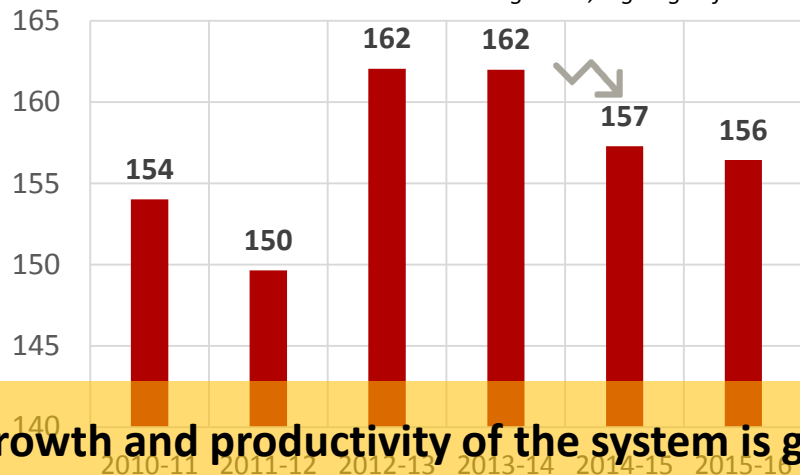
Fleet Size



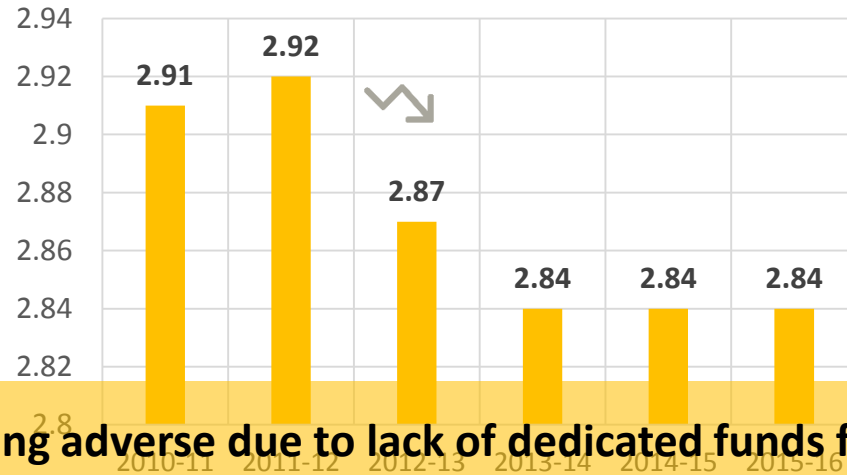
# Growth and Productivity of the bus system

## Vehicle productivity

*Trodden speeds 20kmph to 8 kmph in peak hours due to congestion, high age of buses*



## Fuel Efficiency



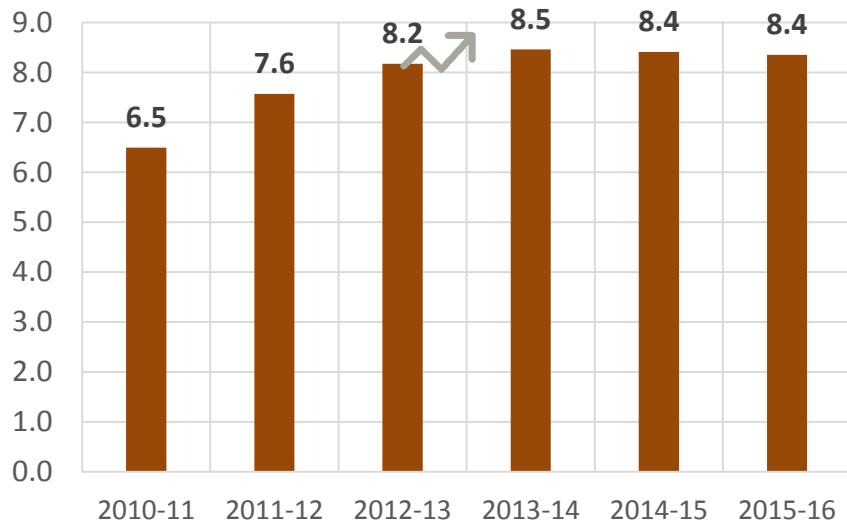
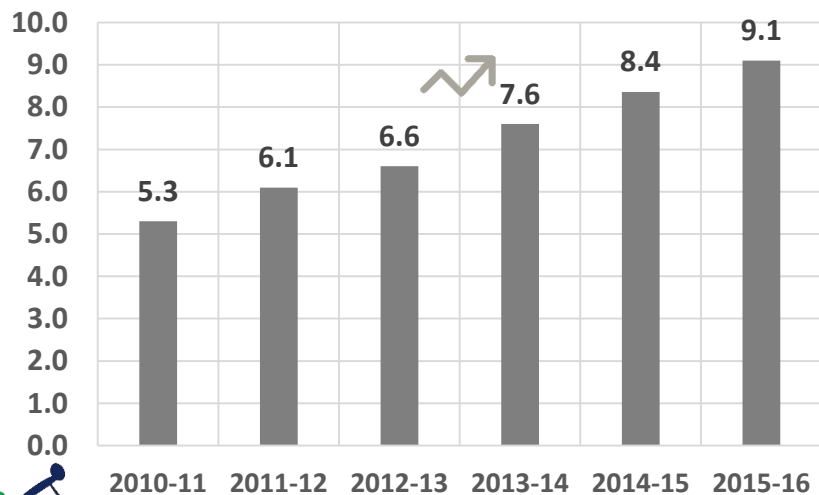
Growth and productivity of the system is going adverse due to lack of dedicated funds for

## Age of the bus

operating PT after the electric subsidy got terminated.

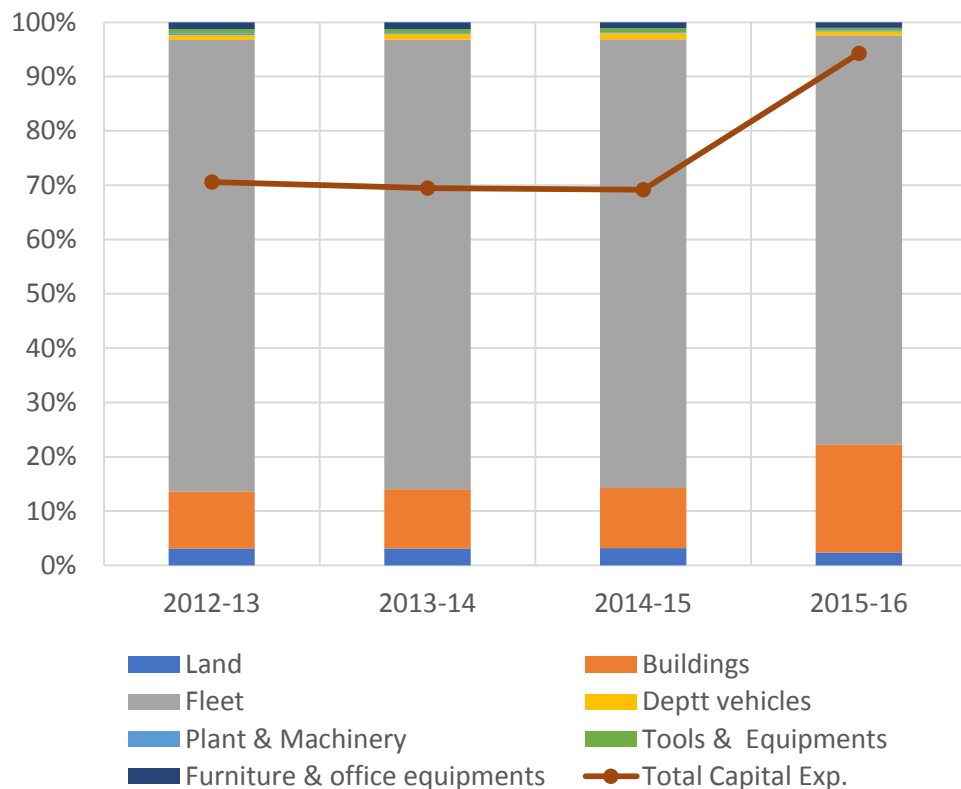
*new waste for more no of buses scrapped*

*long hours of shifts, typology of bus- double decker*

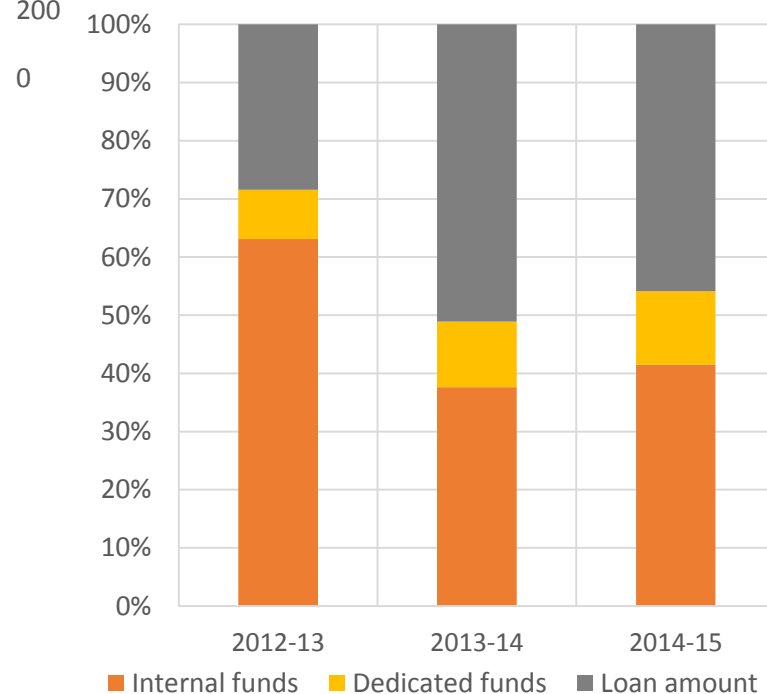


# Capital Investment & Sources

## Investment



- Sudden peak in investment is due to the increase in building works – depot repair, techno facilities for staff.
- Major capital works includes : maintenance and repair works, workshop repair works , fleet repair.
- Till 2013-14 BEST relied on their own sources, grants, MUDP scheme for capital investment.
- After Electricity subsidy got terminated , no significant investments done by BEST.



## Sources of funds

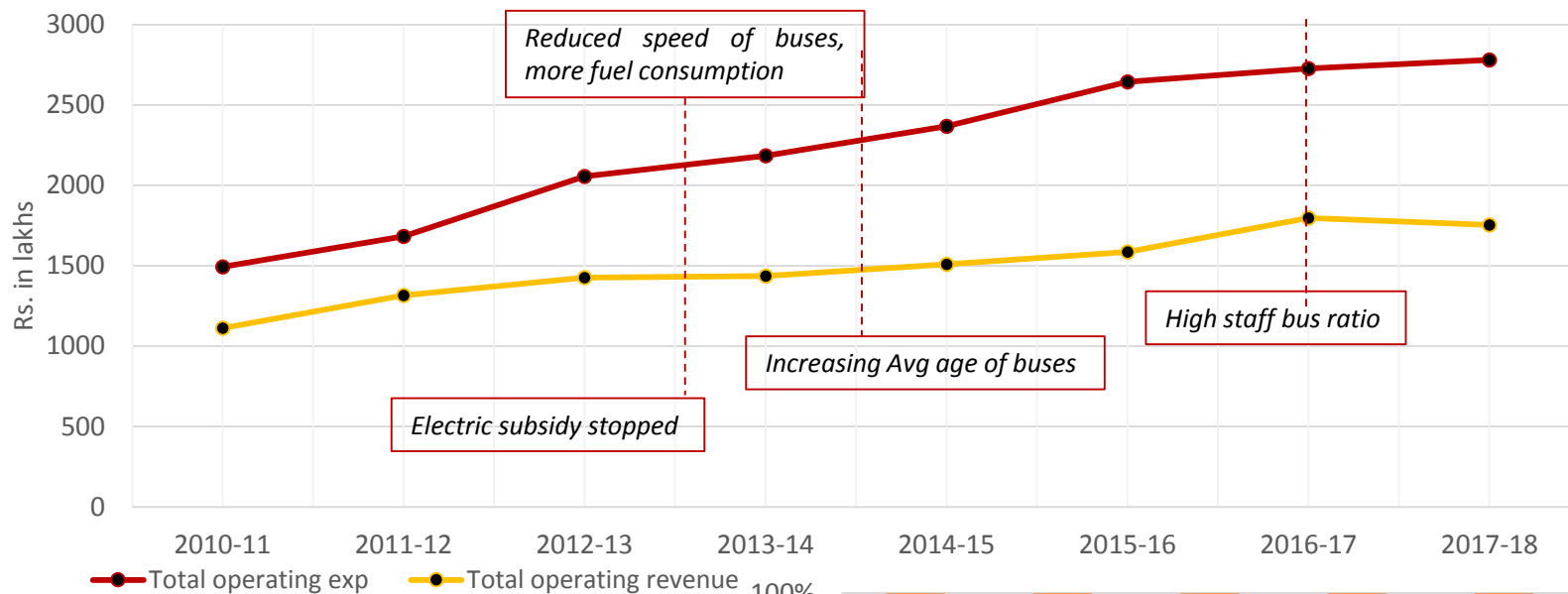
### Internal Resources

- Property insurance fund
- Passenger insurance,
- Financial assistance form State/Central gov

### Dedicated funds

- Electric supply reserve funds, staff benefit fund,
- BEST group insurance fund

# Operational Expenditure & Revenue



## Opex Components share in %

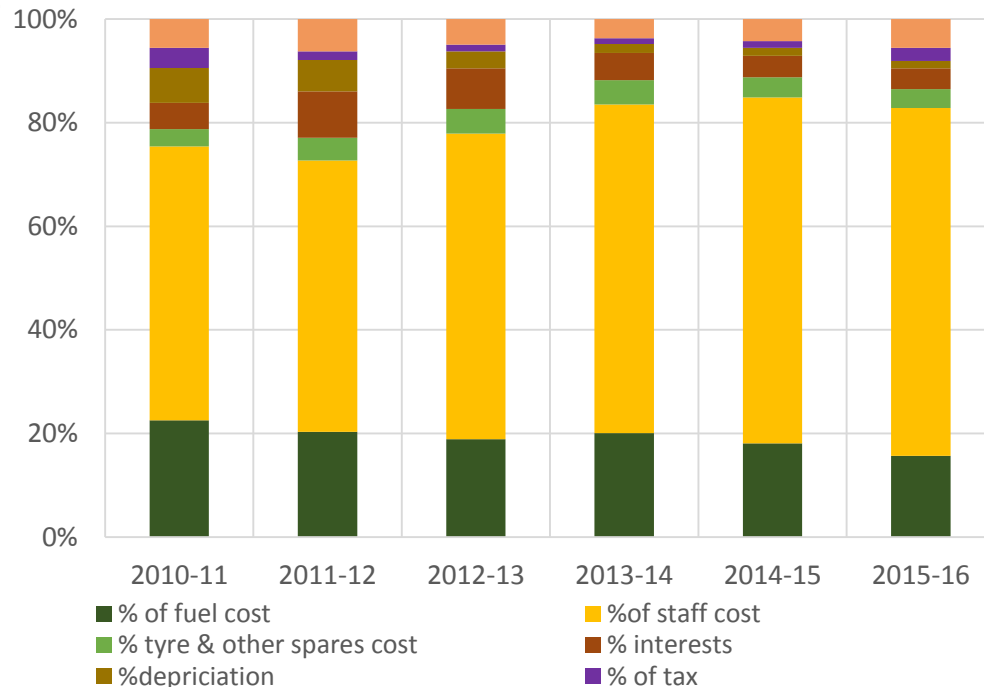
**60%**

**20%**

### Staff wages and fuel cost.

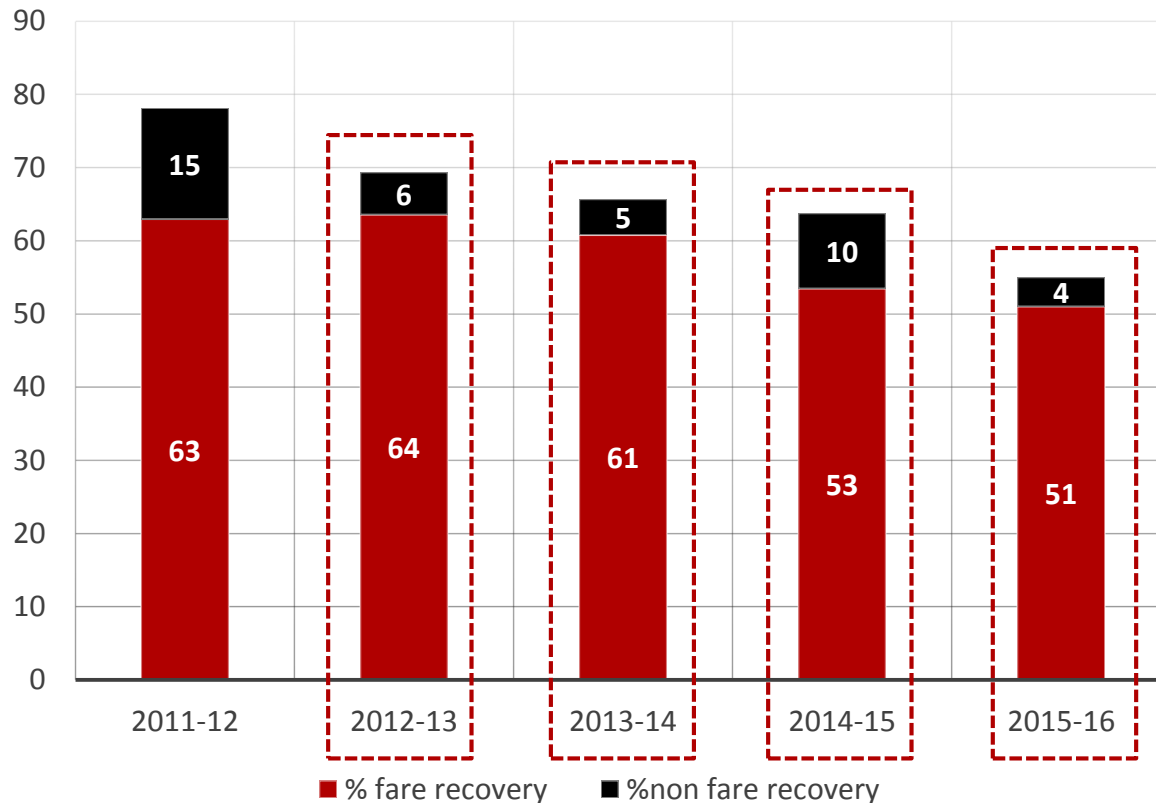
Staff salary as per the DA from government.

With increasing fuel price, cost of maintaining other spare parts also increases, has led to fare price increase



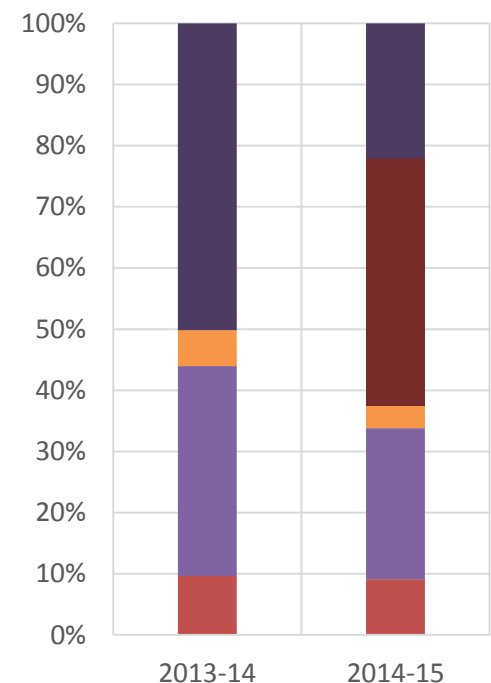


# Operating Revenue : FARE & NON-FARE BOX



**58% Fare box**  
**8% Non-fare box**

## Non-fare components share in %



Continuous Hikes in fare prices to recover the operational loss

**25%**

**20%**

**16%**

**33 %**

Metro in demand ~ low speed for bus riders ~ led to decrease in bus ridership

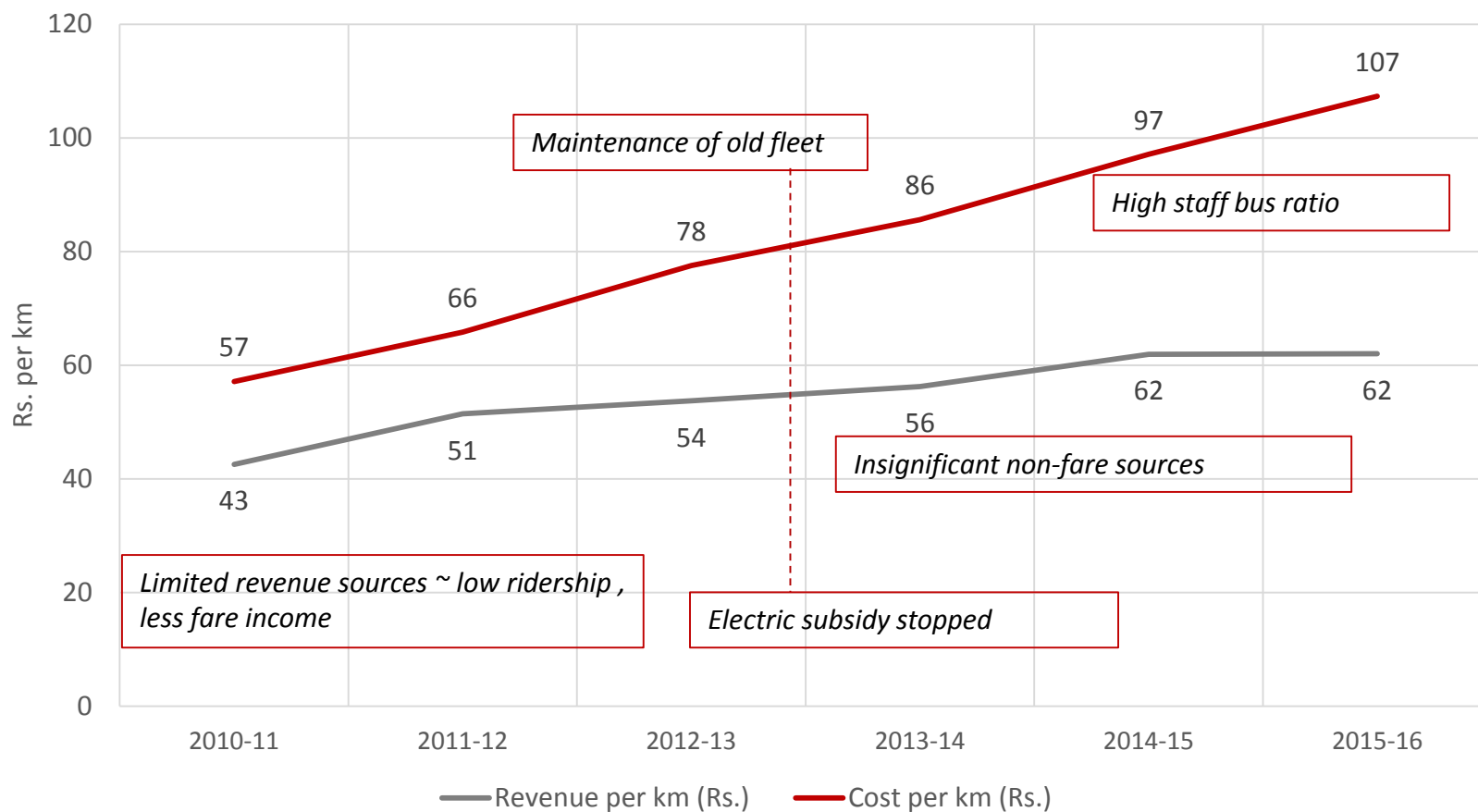
Twice in same year February to April 2015

**2017 Proposed Drop in fare prices ~ 50% drop in AC buses**

■ General Admin  
■ Grant from MCGM  
■ Other income  
■ Scrap sold  
■ Rent from commercial outlets

# Operating Ratio

## Per km Cost & Revenue

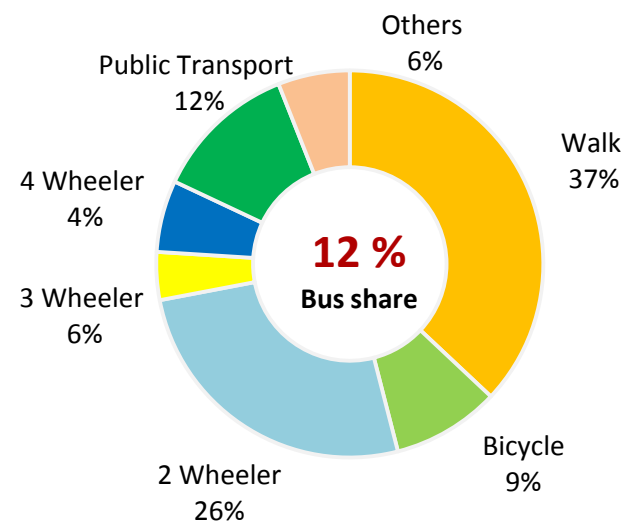


# 3 AHMEDABAD



<b>AREA (km. sq.)</b>	466
<b>POPULATION (2011)</b>	55.7 lakhs
<b>POPULATION DENSITY-2011</b>	890 (p/km. sq.)
<b>PT SERVICES</b>	City Bus (AMTS), Bus Rapid transit system (BRTS)
<b>AMTS Network coverage</b>	549 kms
<b>BRTS Network Length</b>	120 kms
<b>METRO (proposed phase)</b>	40 kms

Source: Census 2011

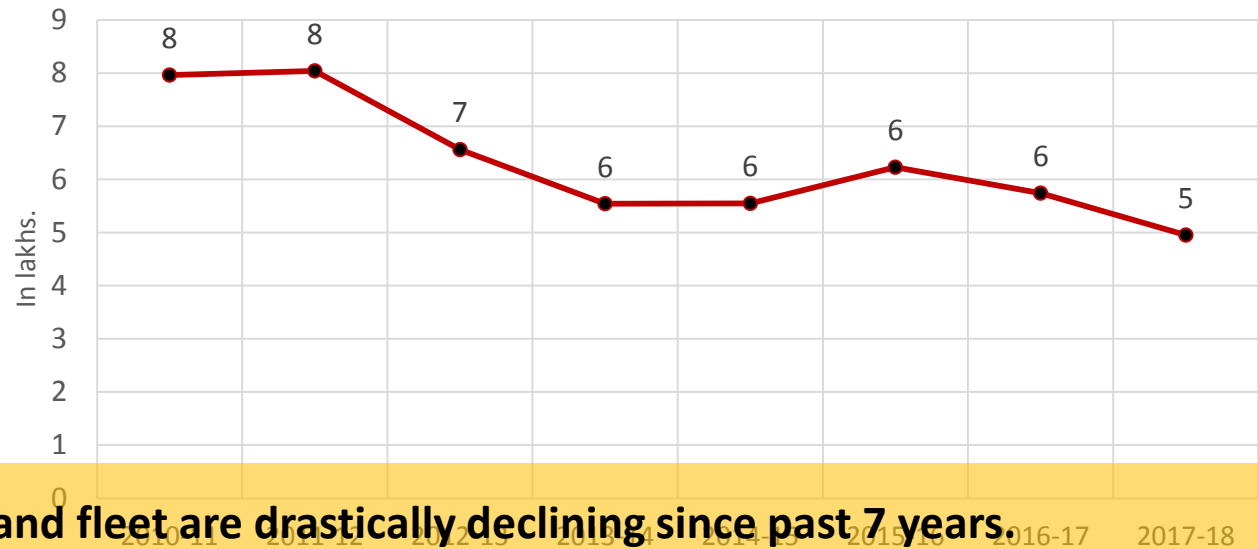


Source: mode share %, IMP 2011

**Ahmedabad Municipal Corporation** undertakes major financing for public transportation operational services. Bus services run by AMTS on gross cost model.

## Trends in Public Transport system: AMTS

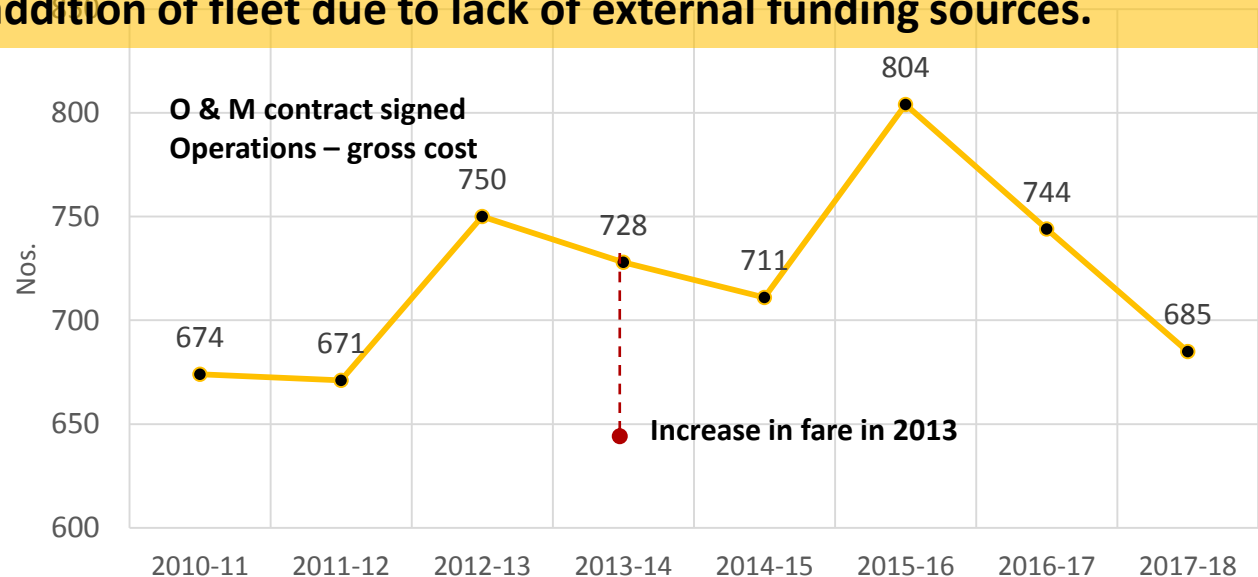
Ridership/ day



Ridership and fleet are drastically declining since past 7 years.

Insignificant addition of fleet due to lack of external funding sources.

Fleet Size

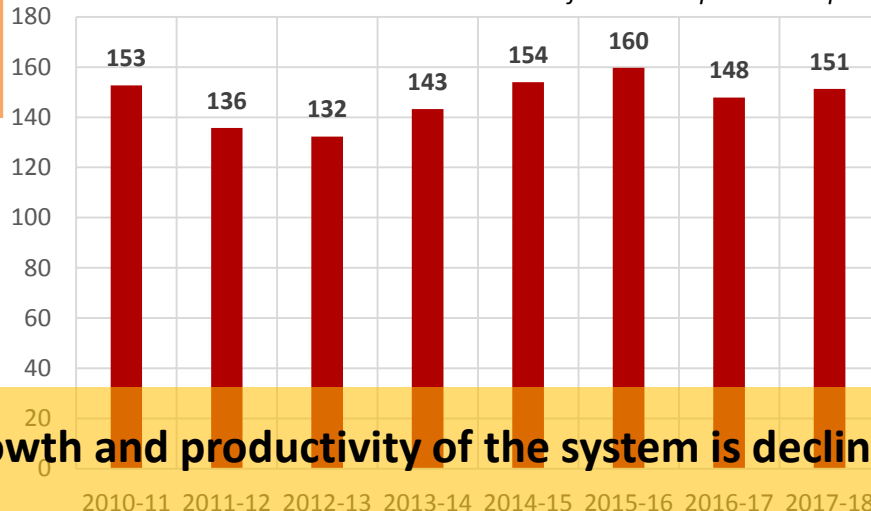




# Growth and Productivity of the bus system

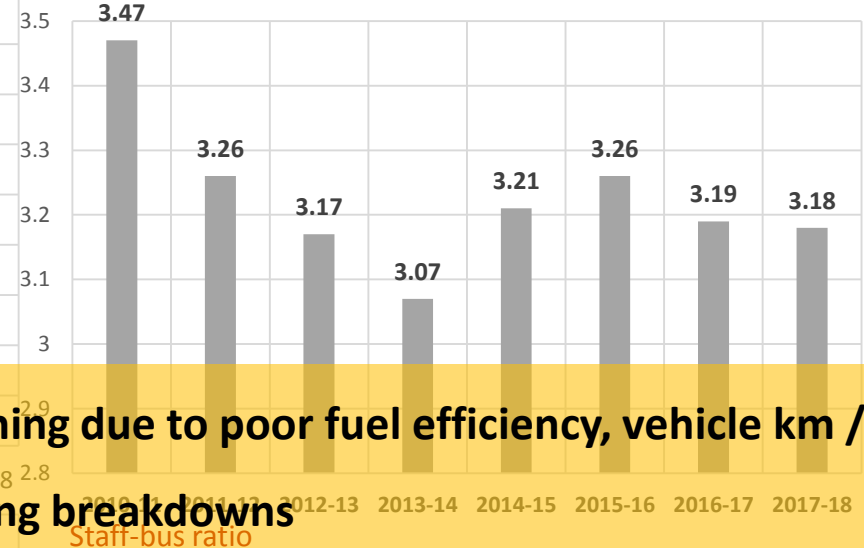
## Vehicle productivity

Increasing breakdowns, speeds decreased from 21 kmph to 18kmph

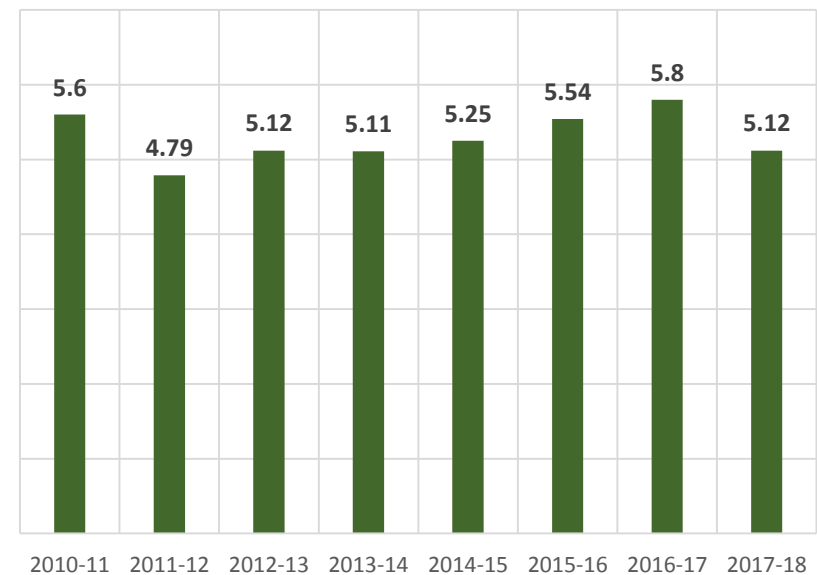
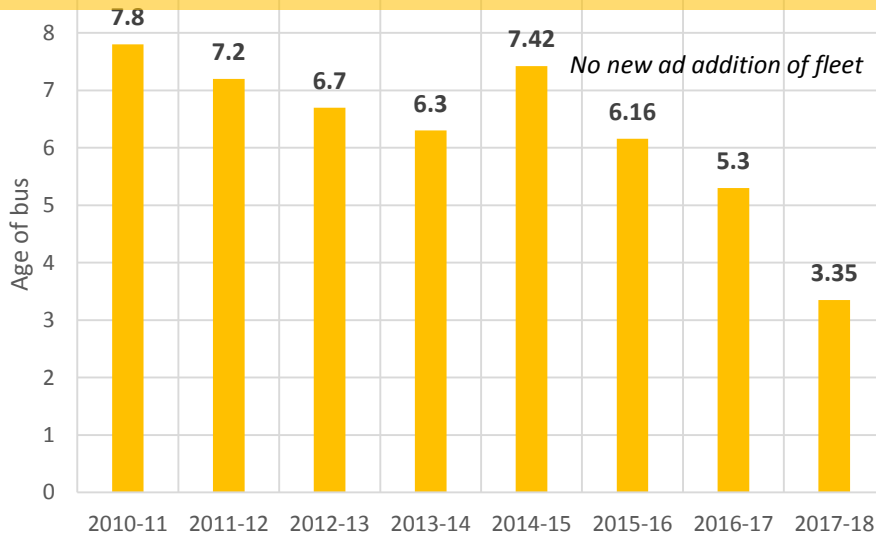


## Fuel Efficiency

Average age of buses ranging from 7.8 years to 6 years

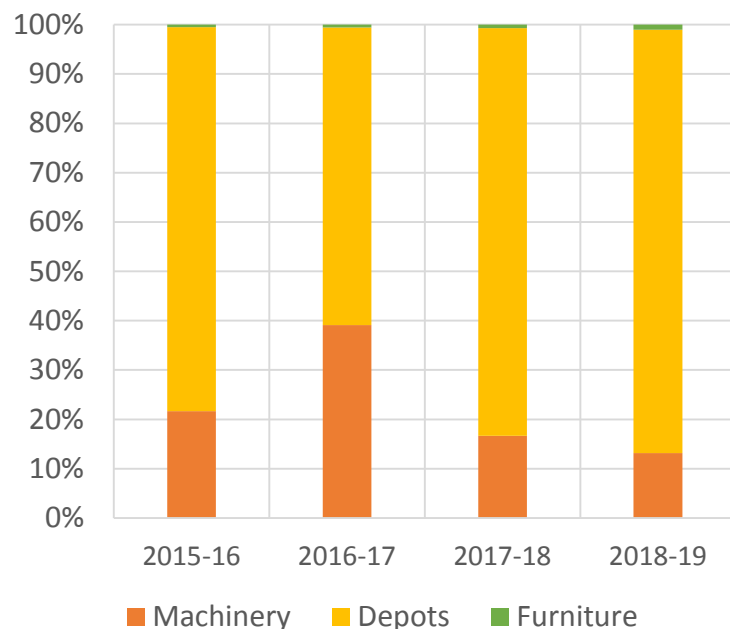


Growth and productivity of the system is declining due to poor fuel efficiency, vehicle km /day /bus , increasing breakdowns



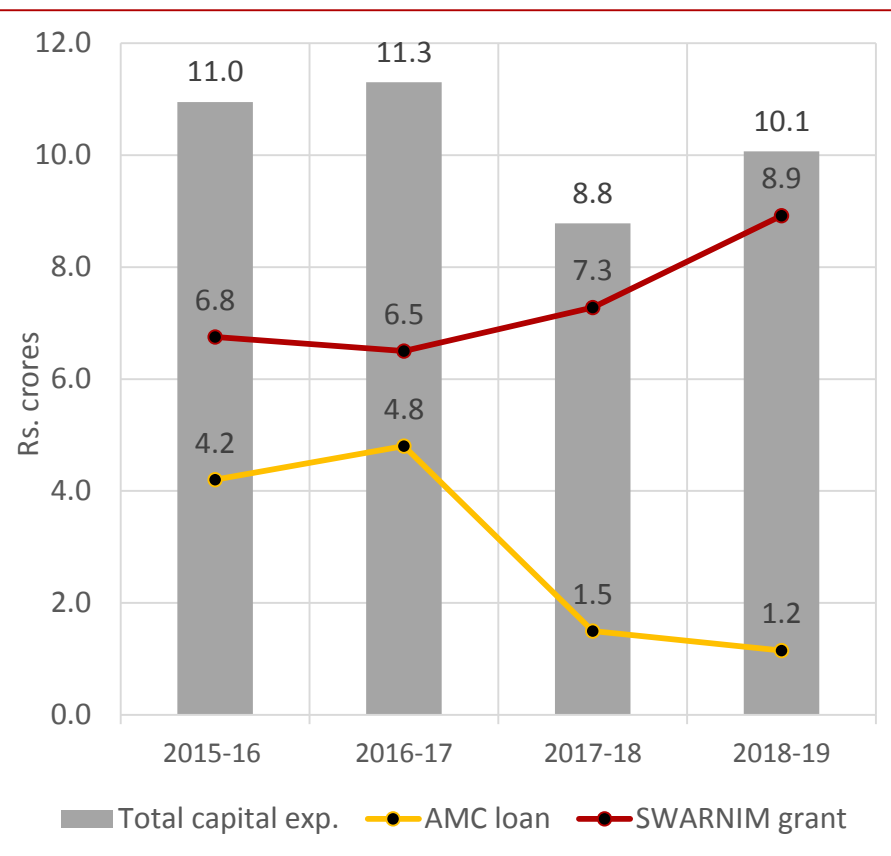
# Capital Investment and Sources

## Investment



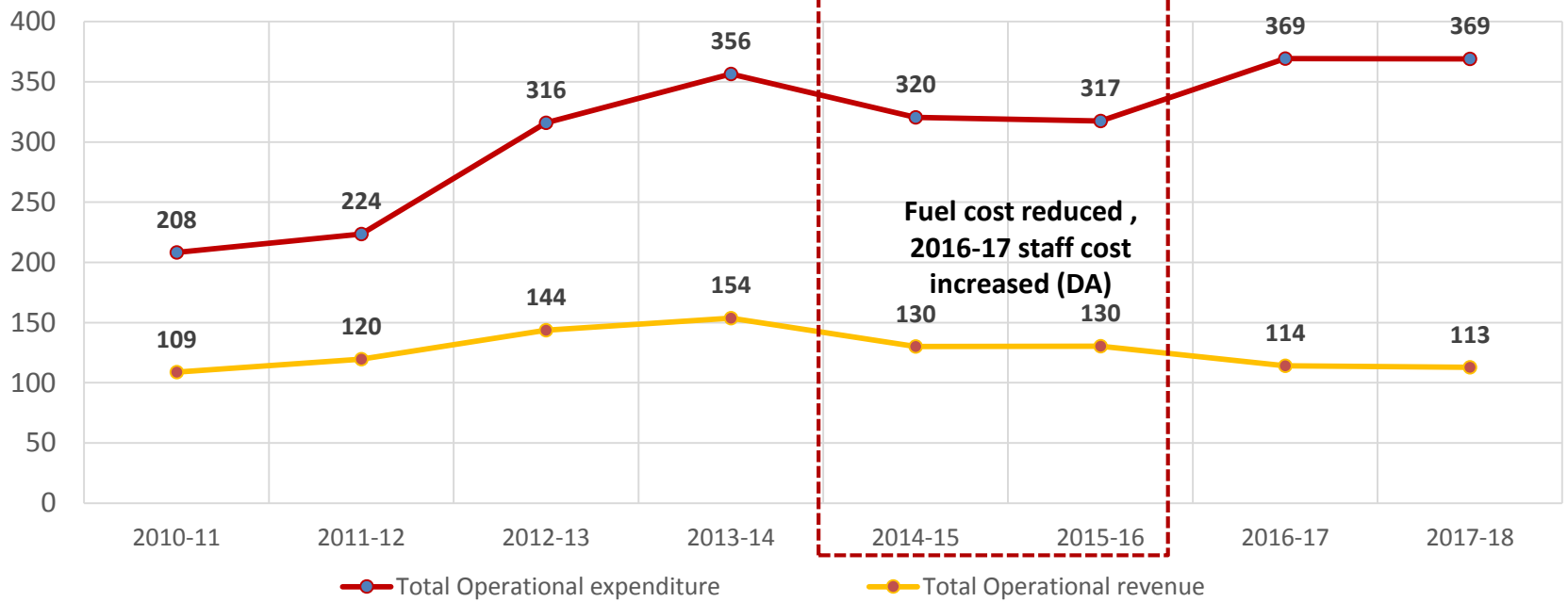
**70%** investment in building works – depots, workshops

- For capital works AMTS rely on external funding grants – SWARNIM and AMC loan
- Only includes maintenance works under capital expenditure- road improvement, depot and workshop maintenance



Sources	Assured	Unassured
AMC loan	✓	
SWARNIM grant		✓

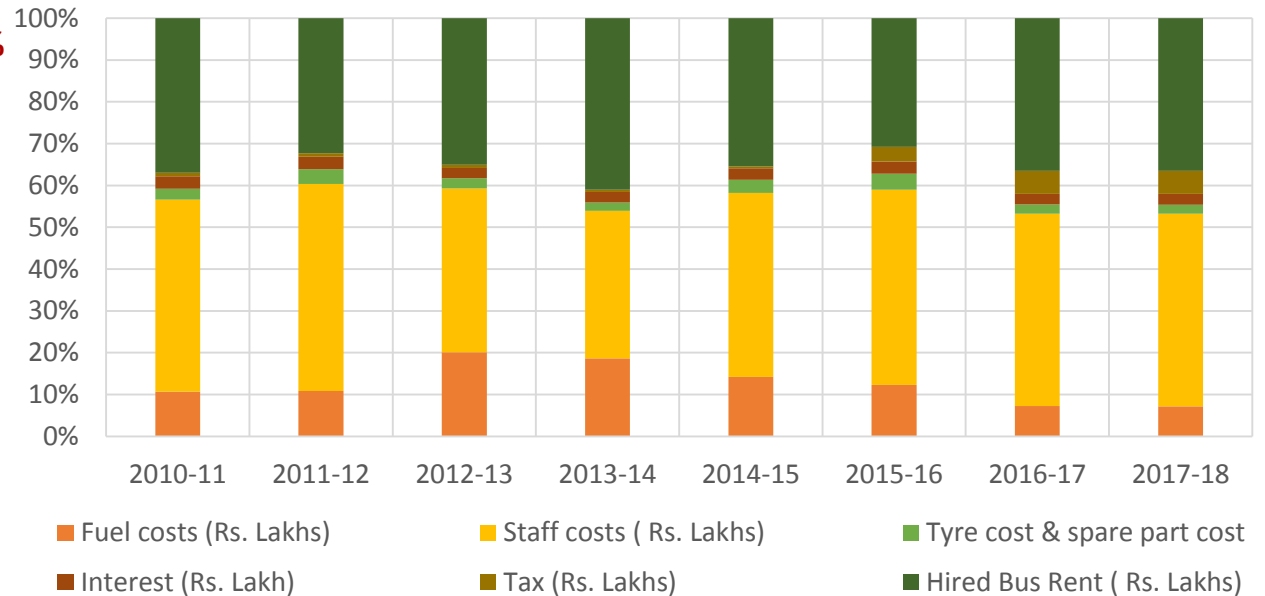
# Operational Expenditure & Revenue



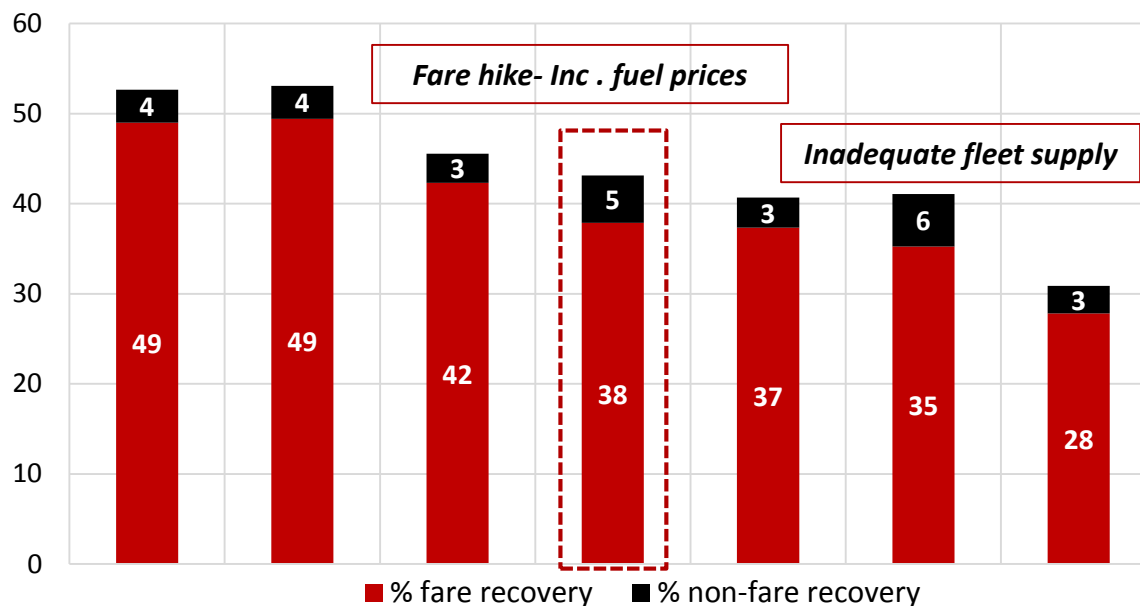
## Opex Components share in %

**50%**

High Salary cost and hired bus rent cost



# Operating Revenue : FARE & NON-FARE BOX



**40% Fare box**

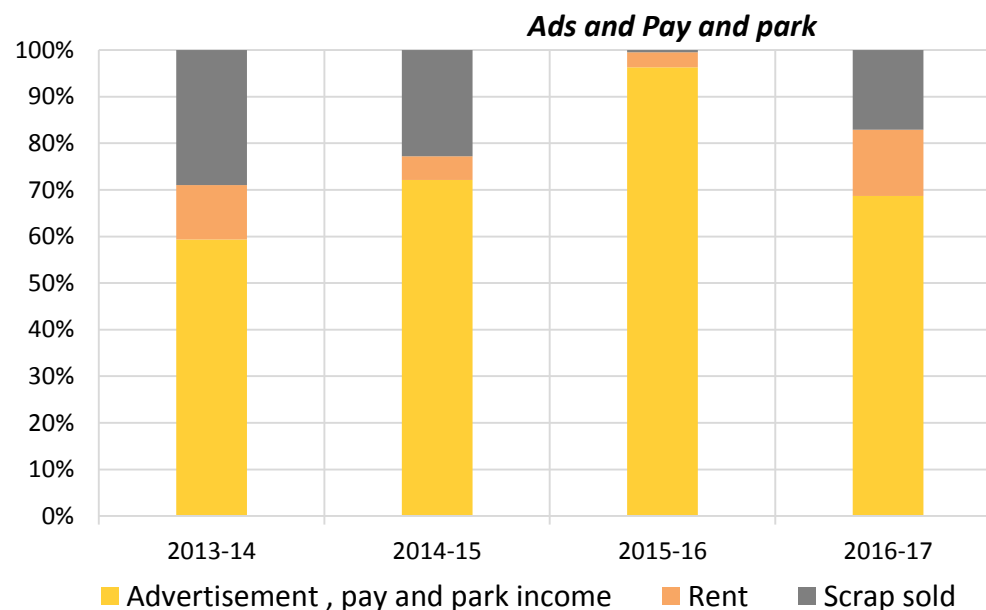
**4% Non-fare box**

Fare box recovery ~ gradual decline in ridership levels

Too many concessions given (Students, Senior citizen, differently able people, freedom fighter etc. But these are not recovered by the government/ULB

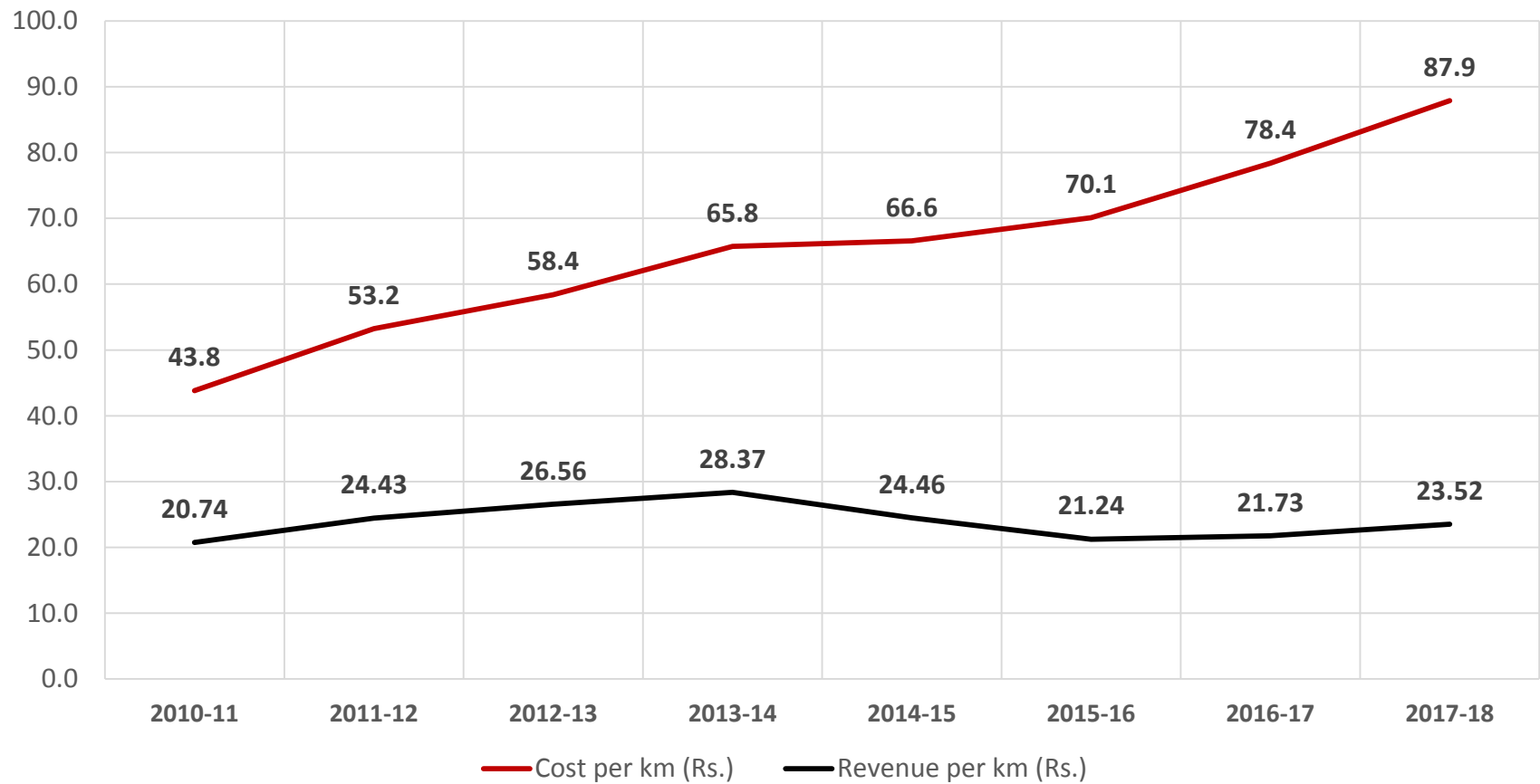
## NON-FARE: Components

Components share in %



# Operating Ratio

## Per km Cost & Revenue



## Summary : PT Performance

Year (2010-2018)	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	
<b>Fleet Utilization</b>									<b>Remarks</b>
Bangalore	92	93	91	91	91	91	89	88	Low
Mumbai	88	84	85	87	86	85	84	83	Low
Ahmedabad	71.5	68.1	67	70.3	82.77	81.01	78.3	79.04	Low
<b>Vehicle Productivity</b>									
Bangalore	205	200	221	218	215	200	207	204	Gradual decrease
Mumbai	153	136	132	143	154	160	148	151	Low
Ahmedabad	153	136	132	143	154	160	148	151	Low
<b>Occupancy ratio</b>									
Bangalore	88.3	76.9	70.9	65.5	74.3	74.98	75.8	76.1	Moderate to low
Mumbai	69.9	72.4	65.4	58.5	56.4	47.9	46.2	45.2	Low
Ahmedabad	66.3	74.4	62.1	51.8	56.5	63.3	66.09	70.66	Low
<b>Fuel Efficiency</b>									
Bangalore	4.01	3.97	3.84	3.82	3.79	3.76	3.74	3.74	Moderate to low
Mumbai	2.91	2.92	2.87	2.84	2.84	2.84	2.7	2.7	Very low
Ahmedabad	3.47	3.26	3.17	3.07	3.21	3.26	3.19	3.18	Low
<b>Staff-bus ratio</b>									
Bangalore	5.39	5.31	5.42	5.46	5.49	5.51	5.5	5.4	Moderate
Mumbai	6.5	7.6	8.2	8.5	8.4	8.4	8.9	9.1	High

All 3 cities are performing less than the desired level of service.

Thus, questions the sustainability of the PT System: financial and operational

Low Moderate High



## Summary : PT Performance

Year (2010-2018)	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	
<b>Earnings per km (EPKM)</b>									Remarks
Bangalore	29	32	36	42	48	49	50	53	Increasing
Mumbai	43	51	54	56	62	60	59	55	Decreasing
<b>Cost per km (CPKM)</b>									
Bangalore	28	31	39	45	49	49	56	59	Increasing
Mumbai	57	66	78	86	97	107	102	103	Increasing
Ahmedabad	43.8	53.2	58.4	65.8	66.6	70.1	78.4	87.9	Increasing
<b>Gap (net profit)</b>									
Bangalore	+1	+2	-3	-3	-1	0	-6	-6	Increasing
Mumbai	-14	-15	-24	-30	-35	-47	-43	-48	Increasing
Ahmedabad	-23.1	-28.8	-31.8	-37.4	-42.1	-48.9	-56.7	-64.4	Increasing

Trends show that the cost of expenditure is increasing rapidly in all cities , with an imbalance in the revenue sources. Therefore, the operating gap is increasing each year and there are no assured sources to fill these gaps.

*Need to strengthen our revenue sources to reduce costs of operations and run the PT system sustainably.*

## Summary : Funding Sources

Revenue sources	Robust	Regular	Sustainability User & Operator		Remarks
			Affordability	Adequacy	
State transfers	✓	×		×	% Of the total capital income
Grants /Schemes	×	×		×	Majorly capital exp rely on grants; Not an assured source
Depreciation reserve	×	×		×	Majorly capital exp rely on grants; Not an assured source
Reserves and Surplus	×	×		×	Diminishes over a period of time
Internal sources	✓	✓		×	Get utilised for covering the operational costs
<b>These Cities rely on their own sources for funding capital and fare box for operational expenditure.</b> <b>The state/ centre schemes are not consistent and therefore, cities lack in investing for capital.</b> <b>Non-fare revenue sources are insignificant and irregular in all the cities</b>					
Loan amount	✓	×		×	Inclusion of taxes, Congestion pricing
Fare box revenue	✓	✓	×	×	Bangalore & Mumbai fares are unaffordable
Advertisement – NFB	×	✓		×	Insignificant source
Govt. Reimbursement / Grant – NFB	×	✓		×	Insignificant source
Land value capture –NGB	✓	✓		×	Developing TTMCs; Bus depot and workshops; ATMs rent; Transit oriented development
Scrap sold-NFB	×	×		×	Insignificant source
Pay and Park	✓	×		×	Insignificant source

# Way Forward

Cities	Revenue Gap %	Funding source	Remarks
Bangalore -BMTC	4%	Dependent on Government funds, operating sources	These are not reliable sources, no dedicated fund to meet the gaps
Mumbai –BEST	34 %	At present no funding for gaps, provision for funding from the corporation	At Present no supporting funds- waiting for approval for clarity in operations or run under PPP model
Ahmedabad-AMTS	56 %	Corporation “as loan”	No time duration to return the loan amount. SWARNIM grant for capital works

- **Earmarking Local charges to fund Public transport :** local taxes , charges from urban tolls, congestion pricing , parking charges, fuel taxes
- **Building New Partnerships with private investors –** To reduce the burden of operating and capital costs
- **Introduction of Grants and schemes** like – JnNURM, SWARNIM, Smart cities to initiate investment in PT infrastructure and fleet
- **Strengthening non fare revenue strategies-** Advertisement; Pay and park; Land value capture; Concession subsidy from government authority
- **Fare box revision** should not exceed the affordability price index . E.g. In Bangalore, too many revisions have affected the ridership in last 4-5 years.
- **Reducing the cost components-** like the maintenance cost; discarding the old buses to maintain the financial sustainability.

**THANK YOU**