



Government of India  
Ministry of Housing and Urban Affairs



The World Bank



**Energy Sector**  
**Management Assistance Program**  
**Implementation in ZONE-2**  
**Karnataka, Tamilnadu, Andhra Pradesh & Puducherry**

**Joint Workshop**  
**17<sup>th</sup> Nov 2019, New Delhi**

# Content

1

- **About JV Consortium**

2

- **Round 1 Implementation & Results**

3

- **Round 2 Implementation & Results**

4

- **Monetary & Fuel Saving in 16 depots**

5

- **Challenges**

6

- **Lesson Learned**

7

- **Reward & Recognition**

8

- **Challenges**

9

- **Details of Identification of Depot Personnel**

# About JV Consortium

## CENTUM LEARNING LTD

- *Leading organization in global skills development and vocational training landscape*

**15 Countries**

**21 Sectors**

**33+ Languages**

**90+ Indian Cities**

**40+ Awards and Accolades**

**350+ Global firms impacted**

**100 Learning centers in rural & urban India**

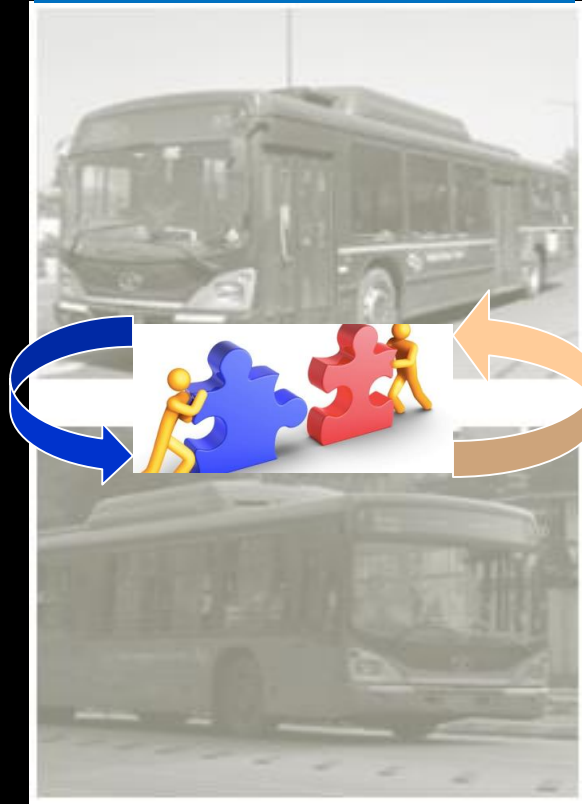
**1300+ schools where we offer vocational education**

**400,000 Job opportunities created**

**3,040,000 Youth mobilized in India**

**1,200,000+ Skilled people**

## ESCBS



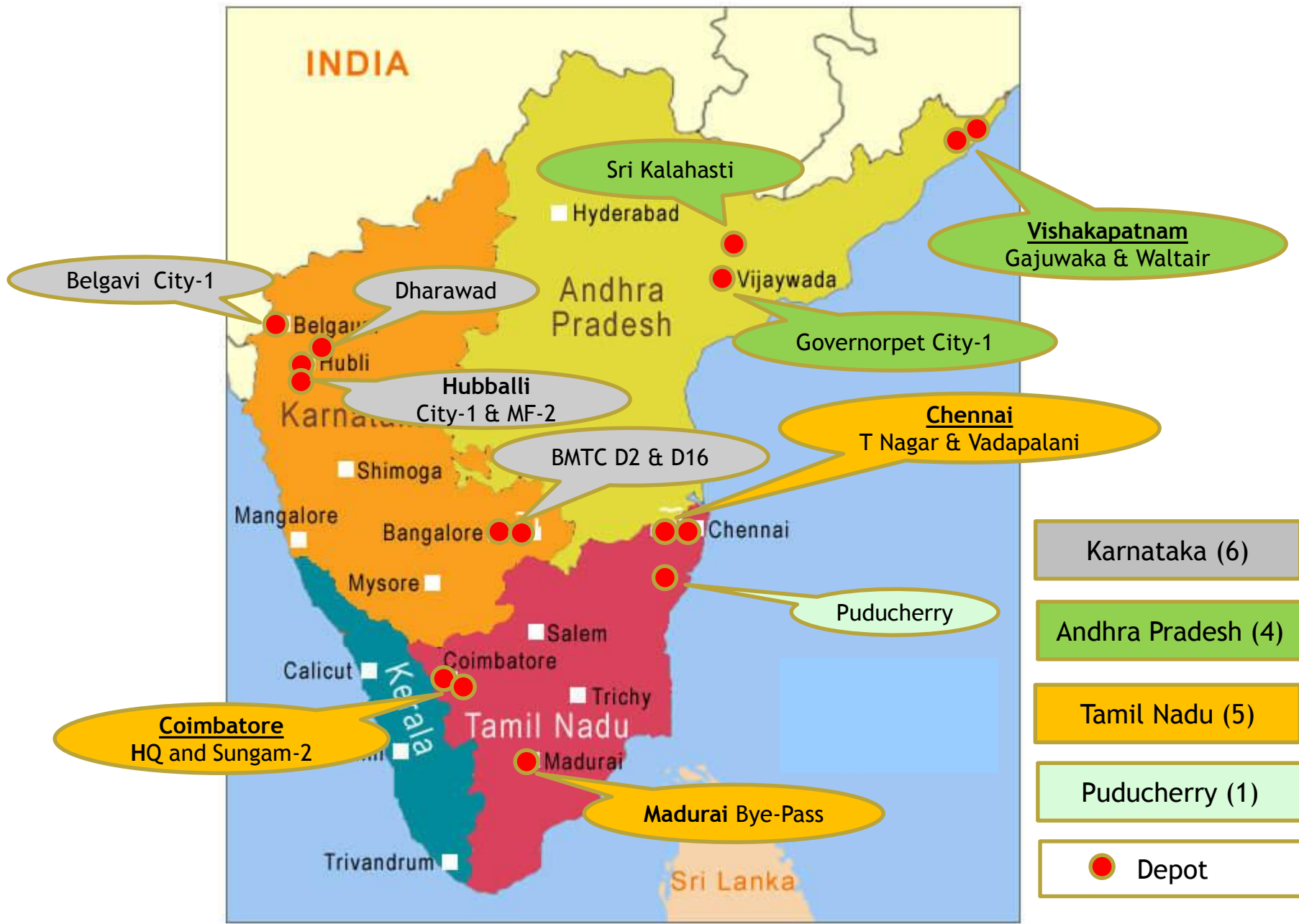
## CIRT (GOI Undertaking)

- *Joint initiative of the Ministry of Shipping & Transport & the Association of State Road Transport Undertakings*
- *Committed to improve the efficiency & productivity of transport sector, with particular emphasis on the STUs*
- *Institute for Driving Training and Research [ITDR] Pune is a joint venture between CIRT & Tata Motors established by MoRTH in 2014.*

# Manpower Deployed



# ESMAP Zone 2 : 3 States, 1 UT (16 Depots)



# **Round 1 Implementation**

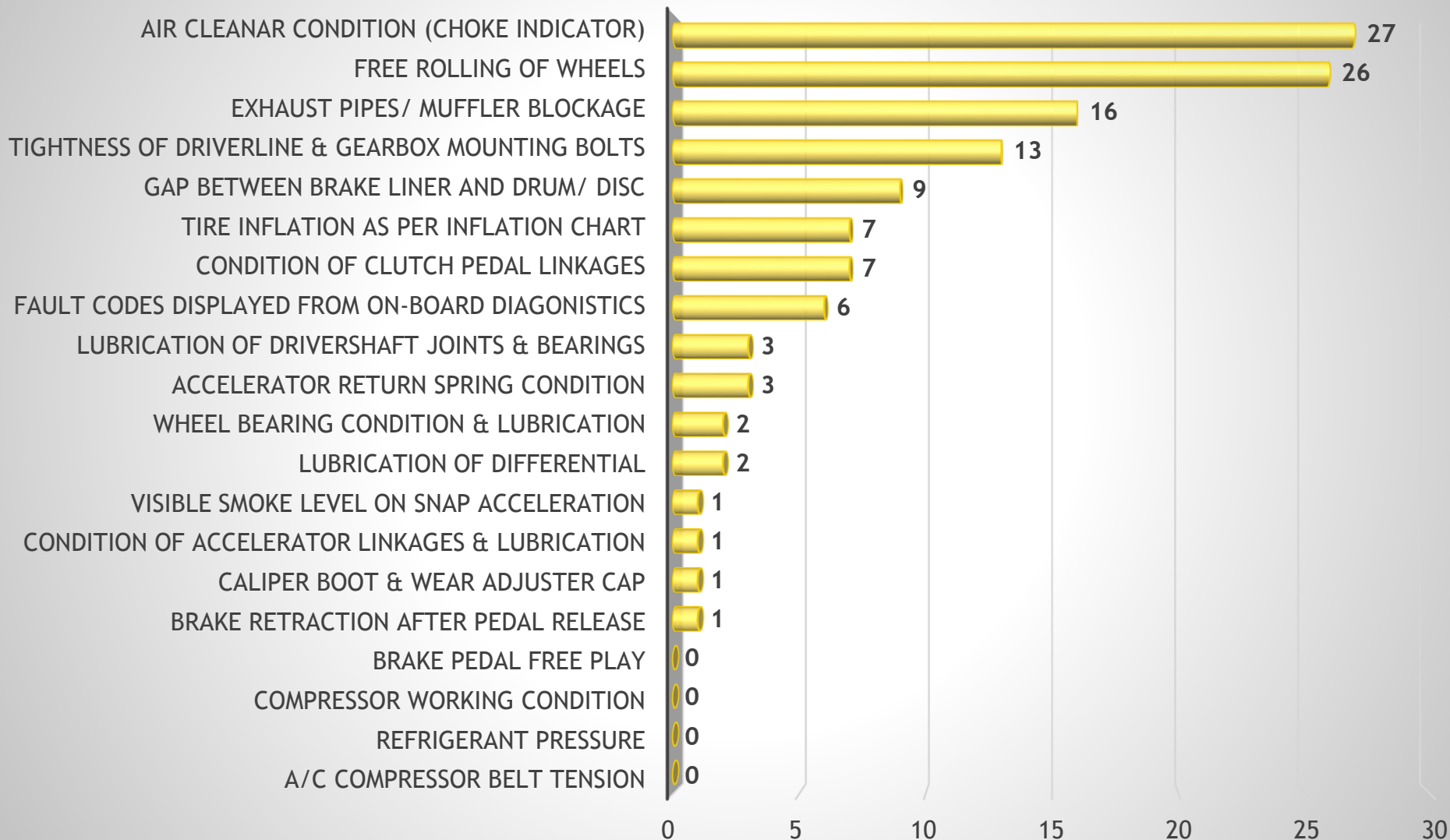
- **Created the Basic Database of**
  - Bus Inventory**
  - Route Inventory**
  - Route Grouping**
  - Route Splitting**
  - Fuel consumptions**
- **Performed cleaning of Database.**
- **Operated FEAT Software for generating Ranking of Vehicles and Drivers.**

# ESMAP Implementation Round-1

			No. of Buses	Buses attended for T-1	Buses advanced to T-2	Maintenance Staff Trained	No. of drivers	Drivers Trained
Sl. No.	Depots	Dates of Training						
1	2	3	4	5	6	7	8	9
<b>1</b>	<b>Karnataka</b>							
1	BMTC Depot-2	21-22, Dec 2018	160	12	1	20	370	16
2	BMTC Depot-16	19-20, Dec 2018	163	16	1	21	342	9
3	Hubballi City-1	28-29, Dec 2018	176	17	1	20	377	16
4	Hubballi MF-2	22-24, Mar 2019	147	15	-	20	275	14
5	Dharawad	21-23, May2019	215	22	-	9	450	17
6	Belgavi City-2	25-27, Mar 2019	137	15	9	18	239	11
<b>2</b>	<b>Tamil Nadu</b>							
7	T-Nagar	4-5, Jan 2019	72	7	-	18	158	8
8	Vadapalani	19-20, Feb 2019	186	19	1	15	494	16
9	Coimbatore-HQ	7-9, Mar2019	72	8	-	14	178	4
10	Coimbatore-Sungam-2	7-9, Mar 2019	82	8	-	16	205	4
11	Madurai	11-12, Feb 2019	97	9	2	16	240	11
<b>3</b>	<b>Puducherry</b>							
12	Puducherry	8-9, Feb 2019	104	8	1	17	309	9
<b>4</b>	<b>Andhra Pradesh</b>							
13	Governorpet-1	24-25, Jan 2019	91	9	1	12	200	10
14	Sri Kalahasti	29-30, Jan 2019	108	10	-	25	263	10
15	Gajuwaka	1-2, Feb 2019	108	10	4	20	220	10
16	Waltair	3-5, Feb 2019	122	12	4	19	250	12
	<b>Total</b>		<b>2040</b> <b>(10% = 204)</b>	<b>197</b>	<b>25</b>	<b>280</b>	<b>4570</b> <b>(5% = 229)</b>	<b>177</b>

# Composition of 100 buses per defects during Tier-1 Process in Round 1

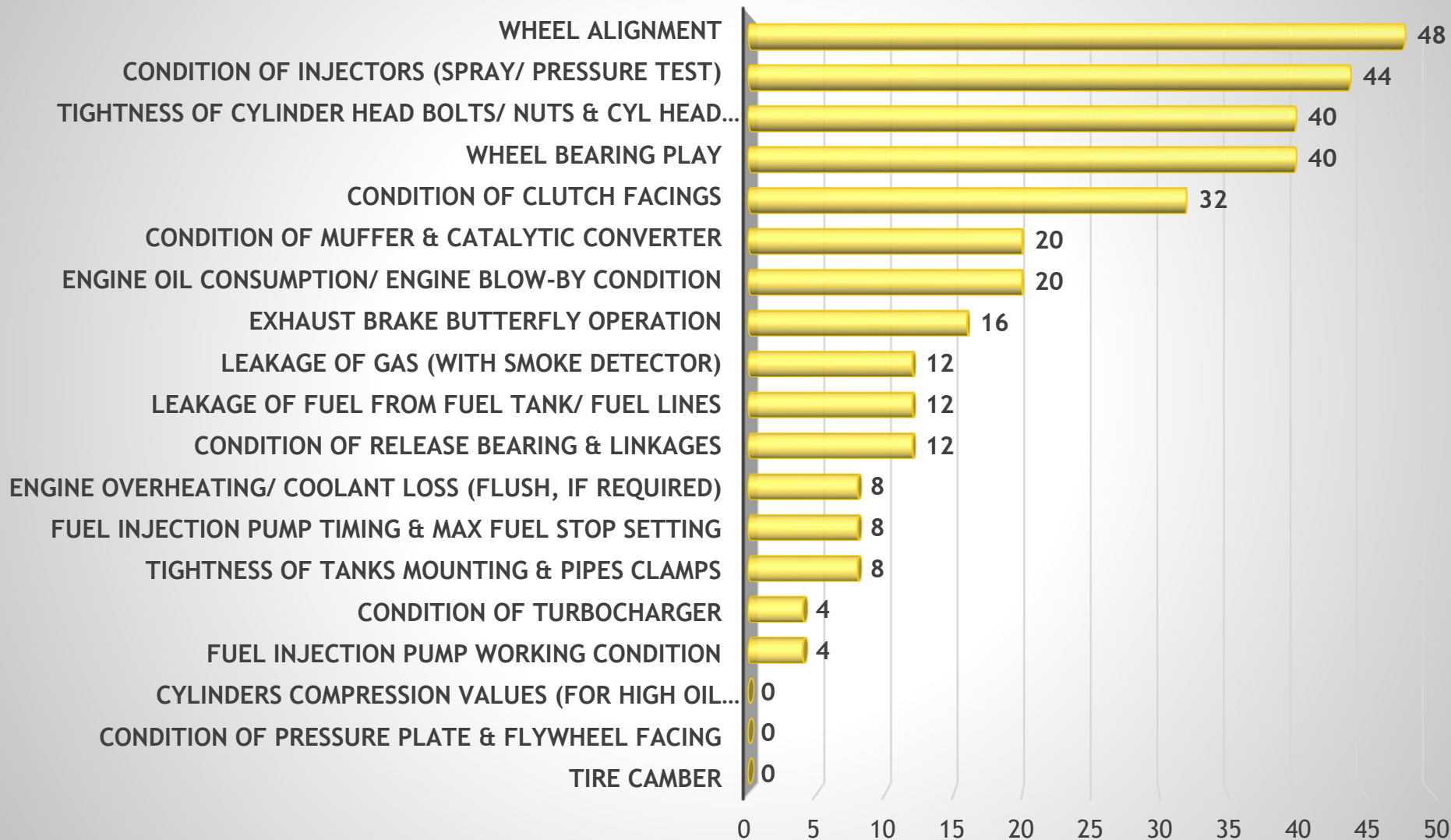
Total No.of Buses Attended in Round 1 Tier-1 was 197



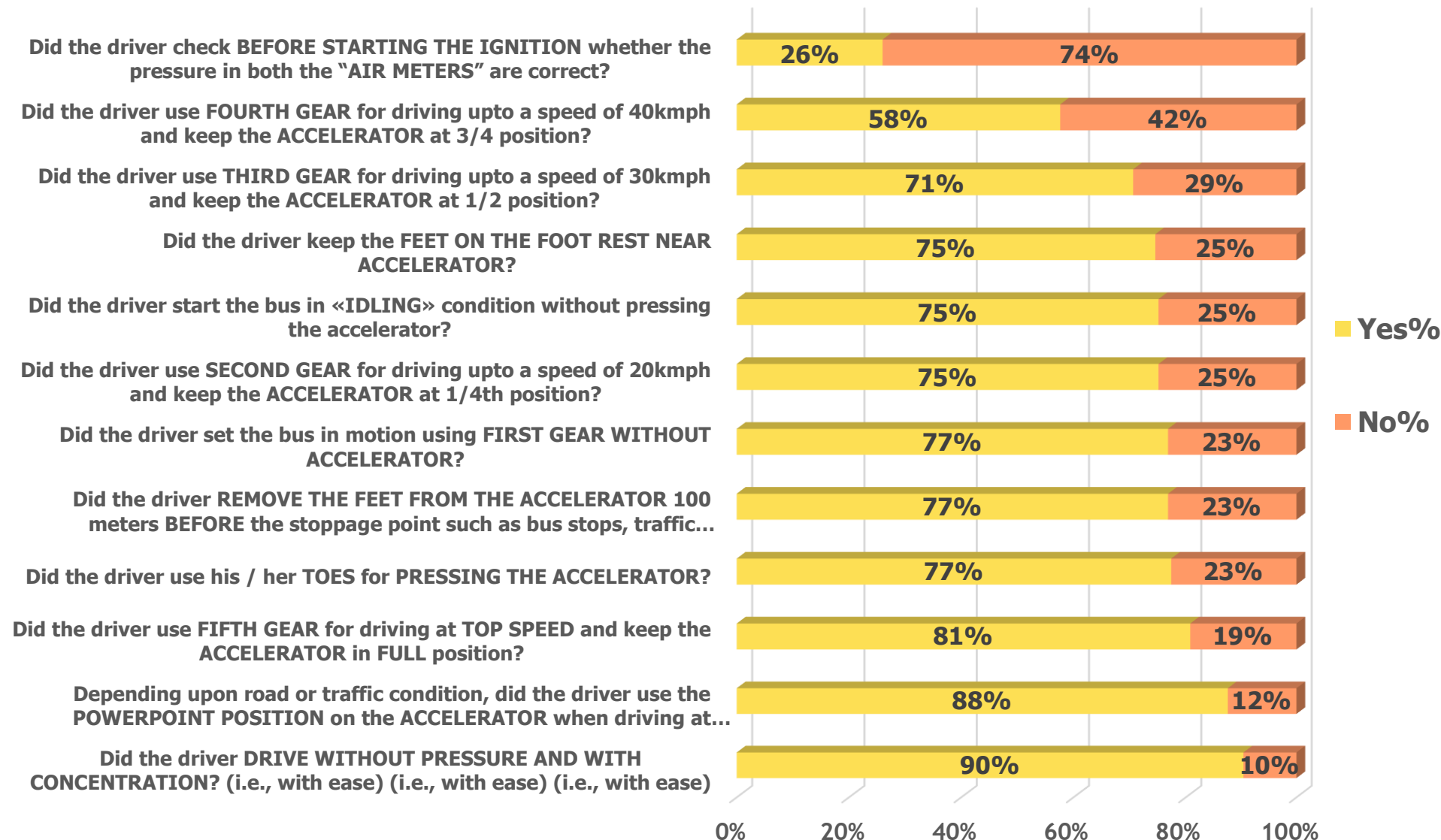


# Composition of 100 buses per defects during Tier-2 Process in Round 1

Total No. of Buses attended in Round 1 Tier-2 was 25



# Driver's Driving Habit Evaluation Analysis of Round 1



**Total Drivers Trained in Round 1 was 177**

# Savings in HSD per month by the vehicles improved after Round 1 over Baseline KMPL

Depots Name/City	Pre Activity Month	Pre Activity Depot KMPL (A)	Post Activity Month	Post Activity Month KMPL (D)	Round 1 Growth % (KMPL) ((D-A)/A)
BMTC 2 Depot/ Shanthinagar Bangalore	Nov.18	4.16	Jan.19	4.161	0%
BMTC 16 Depot/Deepanjali Nagar	Nov.18	3.82	Jan.19	3.80	-1%
Huballi City 1 Depot/Hubballi	Nov.18	5.23	Jan.19	5.22	0%
Hubballi Mof. 2 Depot/Hubballi	Feb.19	4.99	Apr.19	4.97	0%
Dharwad Depot/ Dharwad	Feb.19	5.06	Apr.19	5.10	1%
Belagavi City 2 Depot / Belagavi	Feb.19	4.87	Apr.19	4.97	2%
T Nagar Depot / Chennai	Nov.18	3.64	Jan.19	3.87	6%
Vadapalani Depot / Chennai	Dec.18	4.51	Mar.19	4.65	3%
Coimbatore HO Depot/ Head Office Branch,Coimbatore	Jan.19	4.70	Mar.19	4.75	1%
Coimbatore Sungam Depot/Coimbatore	Jan.19	4.82	Mar.19	4.85	1%
Madurai Depot/Bye Pass Madurai	Dec.18	4.76	Feb.19	4.97	4%
Puducherry City Depot / Puducherry	Jan.19	4.09	Feb.19	4.22	3%
Governorpet Depot / Vijayawada	Nov.18	4.96	Feb.19	5.02	1%
Srikalahasti Depot / Srikalahasti	Dec.18	5.04	Feb.19	5.03	0%
Gajuwaka Depot / Visakhapatnam	Dec.18	5.14	Feb.19	4.97	-3%
Waltair Depot / Visakhapatnam	Dec.18	5.06	Feb.19	4.90	-3%
Average Fuel Saved 1400 Litres/Month/Depot					1%

# Average CO<sub>2</sub> Emission & Cost Saved in Round 1

**The Average monthly savings across the sixteen depots were more than 1400 litres per month.**

$$\begin{aligned}\text{Average CO}_2 \text{ Emission Saved} &= 2.94\text{kg per litre of diesel} * \\ &\quad \text{Average Saved diesel (lit/month/depot)} \\ &= 2.94\text{kg per litre of diesel} * \\ &\quad 1400 \text{ litres/month/depot}\end{aligned}$$

$$\text{Average CO}_2 \text{ Emission Saved} = 4116 \text{ kg/month/depot}$$

$$\begin{aligned}\text{Average Cost Saved} &= 70\text{Rs/Litre of Diesel} * \text{Average} \\ &\quad \text{diesel saved(lit/month)} \\ &= 70\text{Rs/Litre of Diesel} * 1400 \\ &\quad \text{litres/Month/Depot}\end{aligned}$$

$$\text{Average Cost Saved} = 98,000 \text{ Rs/Month/Depot}$$

# ESMAP Implementation Round-2

Sl. No.	Depots	Dates of Training	No. of Buses	Buses attended for T-1	Buses advanced to T-2	Maintenance Staff Trained	No. of drivers	Drivers Trained
1	2	3	4	6	7	8	9	11
<b>1</b>	<b>Karnataka</b>							
1	BMTC Depot-2	14-16,Mar'19	160	16	3	20	370	17
2	BMTC Depot-16	07-09,Mar'19	163	15	5	21	342	15
3	Hubballi City-1	22-26,Mar'19	176	16	10	20	377	9
4	Hubballi MF-2	06-07,May'19	147	15	10	20	275	16
5	Dharawad	07-09,May'19	215	23		9	450	23
6	Belgavi City-2	09-10,May'19	137	13	7	18	239	12
<b>2</b>	<b>Tamil Nadu</b>							
7	T-Nagar	19-21,Feb'19	72	11	3	18	158	9
8	Vadapalani	15-16,Mar'19	186	14		15	494	15
9	Coimbatore-HQ	02-03,Apr'19	72	7	1	14	178	4
10	Coimbatore-Sungam-2	02-04,Apr'19	82	8	1	16	205	4
11	Madurai	26-27,Mar'19	97	10		16	240	9
<b>3</b>	<b>Puducherry</b>							
12	Puducherry	13-14,Mar'19	104	11		17	309	8
<b>4</b>	<b>Andhra Pradesh</b>							
13	Governorpet-1	09-10,Mar'19	91	8	4	12	200	10
14	Sri Kalahasti	18-01,Mar'19	108	10	6	25	263	10
15	Gajuwaka	28-29,Mar'19	108	10	2	20	220	11
16	Waltair	26-27,Mar'19	122	12	2	19	250	11
<b>Total</b>			<b>2040</b>	<b>199</b>	<b>54</b>	<b>280</b>	<b>4570</b>	<b>183</b>

# Round 2 Implementation

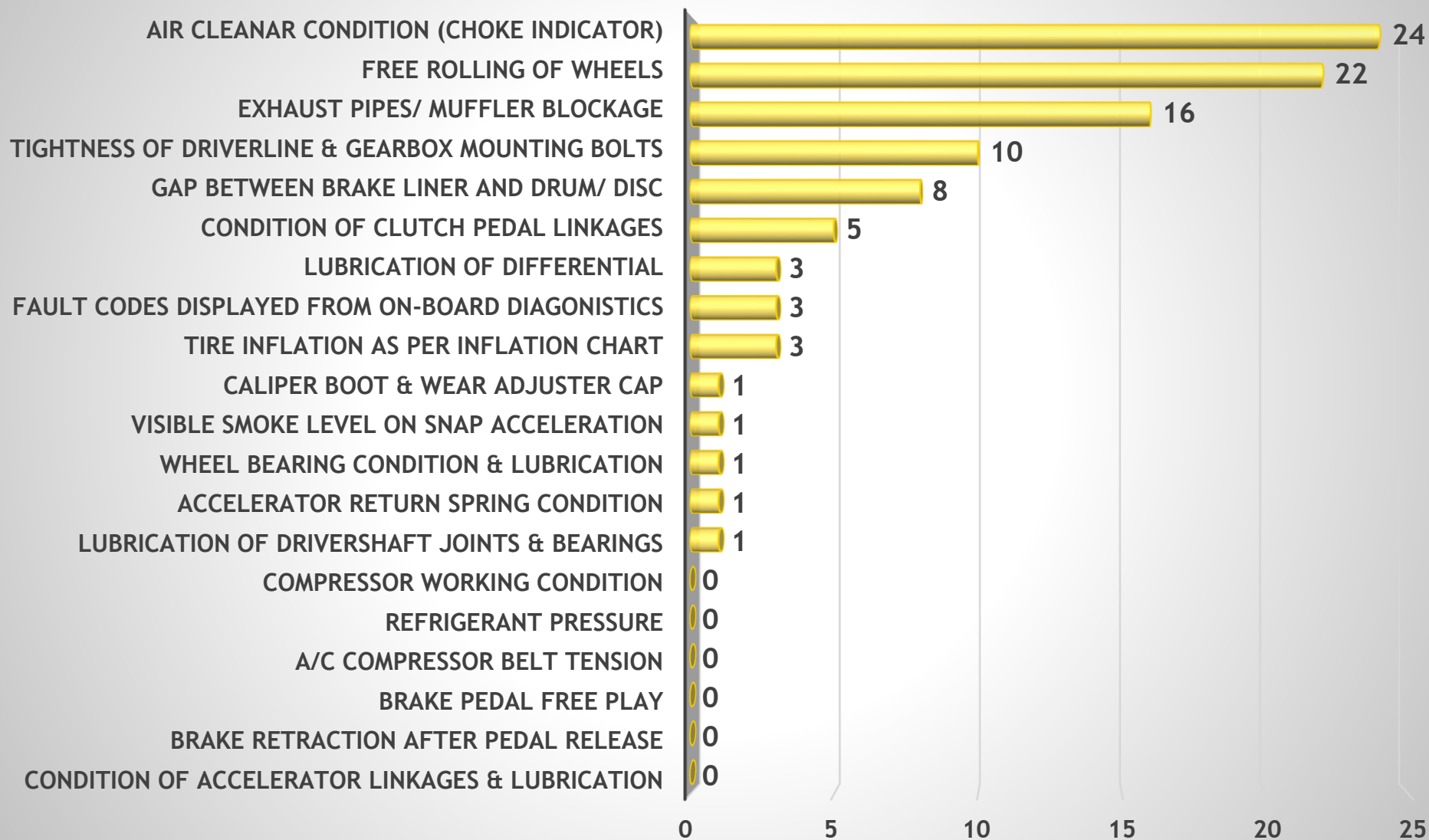


- **Generated the ranking improvement of Round 1 attended Buses & Drivers and Round 2 Ranking through FEAT software.**
- **5% Drivers and 10% Buses of Round 2 were different from Round 1 Drivers & Buses.**
- **Monitored KMPL performance of trained drivers for 4 weeks and analyzed.**
- **Identified the Driver Trainer & Maintenance Trainer at depot level.**



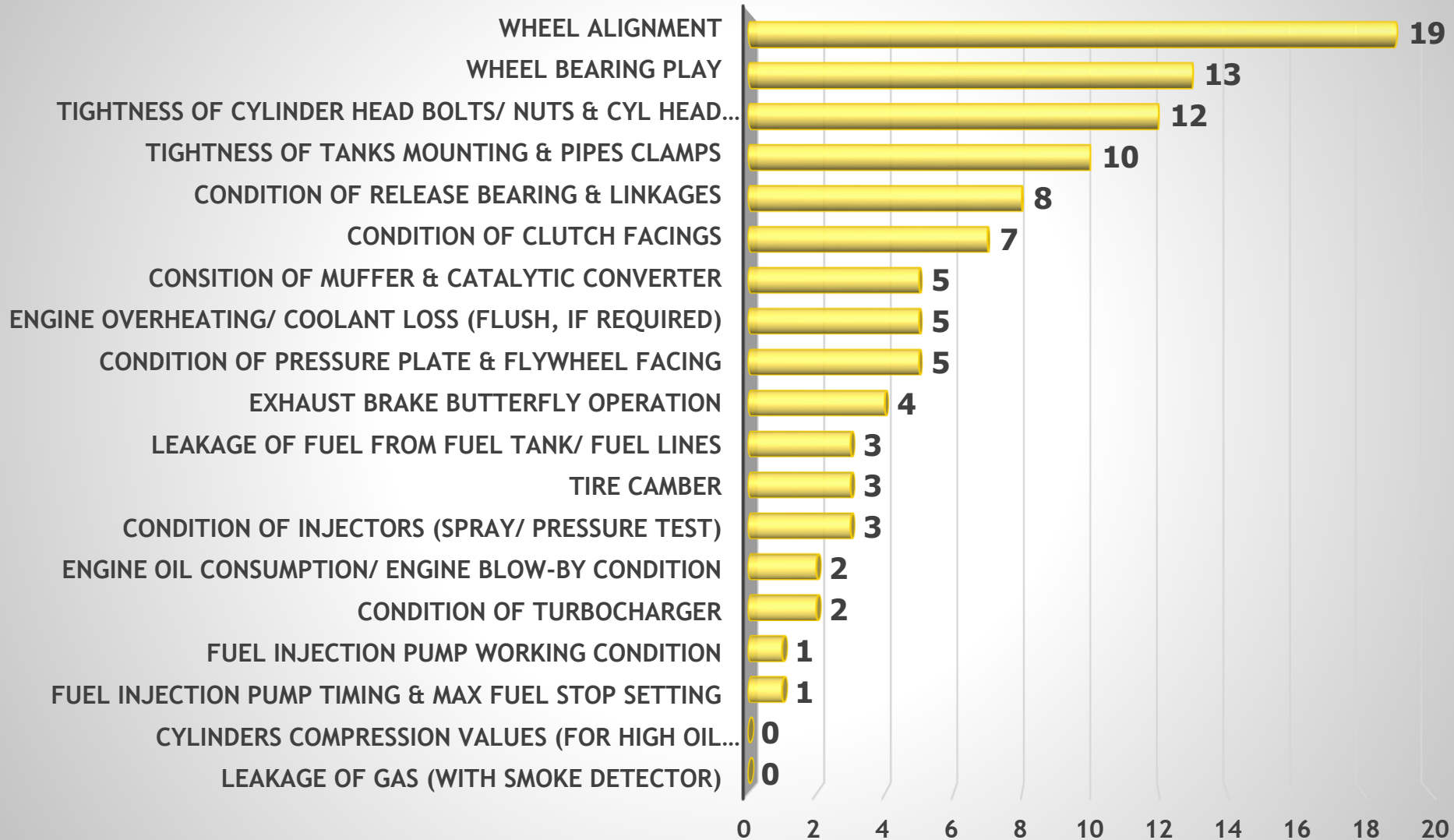
# Composition of 100 buses per defects during Tier-1 Process in Round 2

Total No.of Buses attended in Round 2 Tier-1 was 199



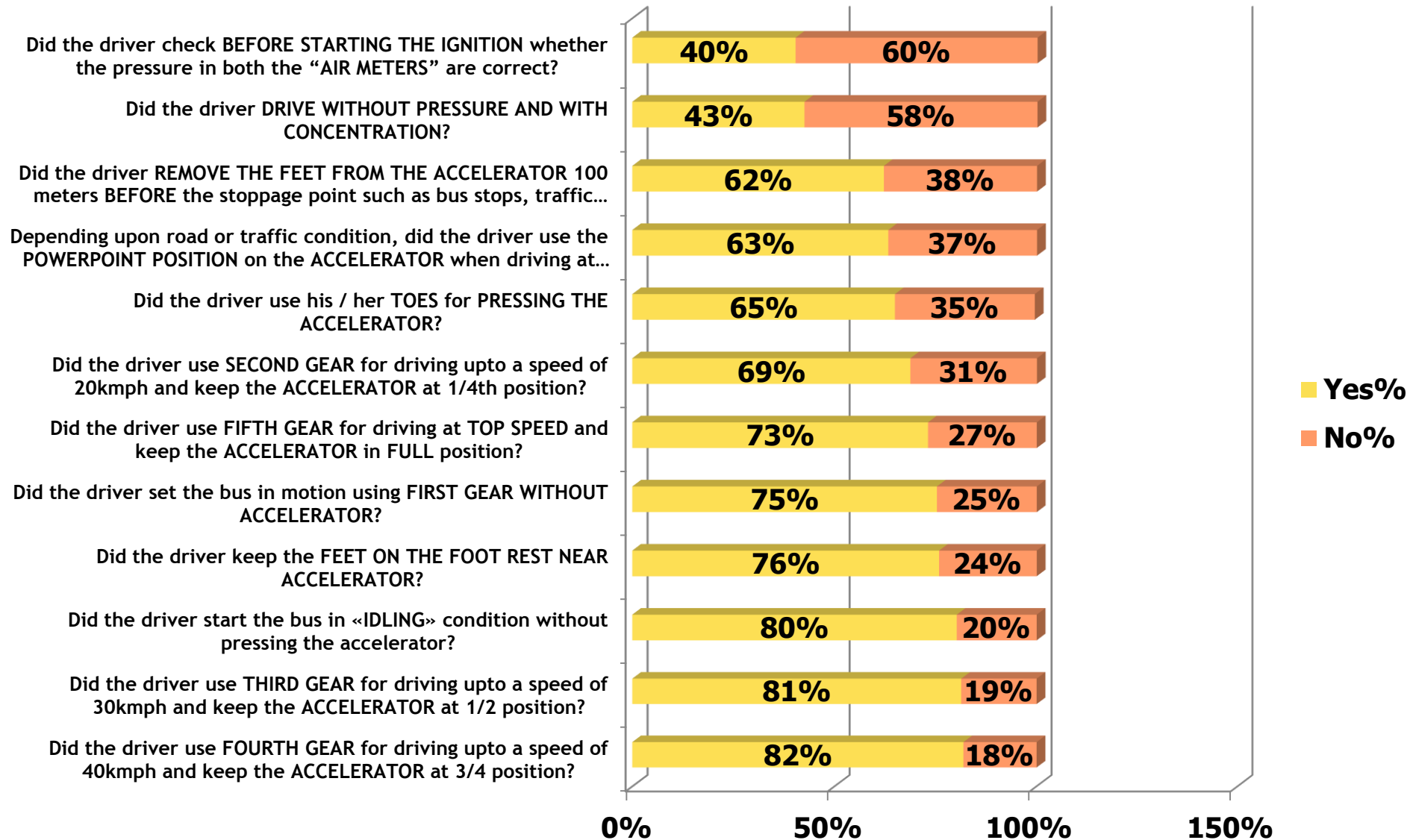
# Composition of 100 buses per defects during Tier-1 Process in Round 2

Total No.of Buses attended in Round 2 Tier-2 was 54





# Driver's Driving Habit Evaluation Analysis of Round 2



**Total Drivers Trained in Round 2 was 183**

Savings in HSD per month by the vehicles improved after Tier-1 over Baseline KMPL in Round 2					
Depots Name/City	Pre Activity Month	Pre Activity Depot KMPL (A)	Post Activity Month	Post Activity Month KMPL (D)	Round 2 Growth % (KMPL) ((D-A)/A)
BMTC 2 Depot/Shanthinagar Bangalore	Jan.19	4.16	Apr.19	4.164	0%
BMTC 16 Depot/Deepanjali Nagar	Feb.19	3.79	Apr.19	3.88	2%
Hubballi City 1 Depot/Hubballi	Feb.19	5.29	Apr.19	5.04	-5%
Hubballi Mof. 2 Depot/Hubballi	Mar.19	5.03	Jun.19	4.89	-3%
Dharwad Depot/ Dharwad	Mar.19	5.10	May.19	5.15	1%
Belagavi City 2 Depot / Belagavi	Mar.19	4.92	May.19	4.95	1%
T Nagar Depot / Chennai	Jan.19	3.87	Mar.19	4.11	6%
Vadapalani Depot / Chennai	Feb.19	4.51	Mar.19	4.65	3%
Coimbatore HO Depot/ Head Office Branch, Coimbatore	Feb.19	4.72	Apr.19	4.58	-3%
Coimbatore Sungam Depot	Feb.19	4.87	Apr.19	4.76	-2%
Madurai Bye Pass Depot	Feb.19	4.97	Apr.19	5.08	2%
Puducherry City Depot / Puducherry	Feb.19	4.22	Apr.19	4.68	11%
Governorpet Depot / Vijayawada	Feb.19	5.02	Apr.19	4.92	-2%
Srikalahasti Depot / Srikalahasti	Jan.19	5.09	Mar.19	5.01	0%
Gajuwaka Depot / Visakhapatnam	Feb.19	4.97	Apr.19	5.04	1%
Waltair Depot / Visakhapatnam	Feb.19	4.89	Mar.19	4.97	2%
Average Fuel Saved 1650 Lit/Mon/Depot					1%

# Average CO<sub>2</sub> Emission & Cost Saved in Round 2

- The Average monthly savings across the sixteen depots were more than 1600 litres per month.

**Average CO<sub>2</sub> Emission Saved = 2.94kg per litre of diesel \*  
Saved diesel (lit/month)**

**= 2.94kg per litre of diesel \*  
1600 litres/month/depot**

**Average CO<sub>2</sub> Emission Saved = 4704 kg/month/depot**

**Average Cost Saved = 70Rs/Litre of Diesel \*  
Average diesel saved(lit/month)**

**= 70Rs/Litre of Diesel \*  
1600 litres/Month/Depot**

**Average Cost Saved = 1,12,000 Rs/Month/Depot**



**Fuel & Monetary Saving of 16 Depots**

# 2018 vs 2019: Total Fuel & Cost Saved

States	Depots	Total Fuel Consumed (in Jan'18-Sep'18 )	Total fuel Consumed (in Jan'19-Sep'19)
Karnataka	BMTC 2	18.64446	17.86608
	BMTC 16	20.32235	19.28578
	Hubballi Depot 1	24.15201	21.97144
	Hubballi Depot 2	31.52924	27.49229
	Dharwad Depot	34.12799	31.12693
	Belagavi Depot 2	19.05359	18.22238
Total		1,47,82,964 Litres	1,35,96,491 Litres

Total KMs (2018)	Total KMs (2019)	Total Fuel Saved (2019)	Total Cost Saved (Diesel price ₹ 65/-)
5,84,33,354 KM	6,05,32,900 KM	11,86,473 Litre	₹ 7,71,20,715 /-

Overall KMPL of 6 depots (2018)	Overall KMPL of 6 depots (2019)	Growth% in 2019
3.953	4.452	12.6%

# 2018 vs 2019: Total Fuel & Cost Saved

States	Depots	Total Fuel Consumed (in Jan'18-Sep'18 )	Total fuel Consumed (in Jan'19-Sep'19)
Tamil Nadu	T-Nagar Depot	1054898	1025994
	Vadapalani Depot	2490607	2272760
	Coimbatore Hq Depot	1257680	1238624
	Coimbatore Sungam Depot	1708811	1580477
	Madurai Depot	1957703	1753372
Puducherry	Puducherry Depot	1949786	1797549
Total		1,04,19,485 Litres	96,68,776 Litres

Total KMs (2018)	Total KMs (2019)	Total Fuel Saved (2019)	Total Cost Saved (Diesel price ₹ 70/-)
4,47,95,975 KM	4,46,13,562 KM	7,50,709 Litre	₹ 4,87,96,084 /-

Overall KMPL of 6 depots (2018)	Overall KMPL of 6 depots (2019)	Growth% in 2019
4.29	4.64	7.5%

# 2018 vs 2019: Total Fuel & Cost Saved

States	Depots	Total Fuel Consumed (in Jan'18-Sep'18 )	Total fuel Consumed (in Jan'19-Sep'19)
Andhra Pradesh	Governorpet-Vijayawada	1422714	1446043
	Srikalahasthi	1974933	1965870
	Gajuwaka-Visakhapatnam	1389879	1627663
	Waltair-Visakhapatnam	1789640	1945383
Total		65,77,166 Litres	69,84,959 Litres

Total KMs (2018)	Total KMs (2019)	Total Fuel Saved (2019)	Total Cost Saved (Diesel price ₹ 70/-)
3,32,95,876 KM	3,46,66,068 KM	-4,07,793 Litre	₹ -2,65,06,514 /-

Overall KMPL of 4 depots (2018)	Overall KMPL of 4 depots (2019)	Declined% in 2019
5.06	4.96	-1.9%

**\* Red Highlighted depots were declined in KMPL**

# Reason for Declined KMPL in Andhra Pradesh

## **1. Less No. of drivers are available than required**

- a) The shortage of drivers results in non-operating of all buses and they are sent on only important needed routes and it is difficult to expect the kmpl in all the routes.
- b) The drivers are not given a fixed route every day. They are being changed to different buses and routes. This results on non-achieving of kmpl.

**2. Less No. of Conductors are available than required** - Due to shortage of conductors, the drivers are used to do both conductor and driver job in the bus causing lot of stops and idle running of buses.

**3. Most of the old vehicles (i.e., 12-13years old or BS-3 vehicles ) are running in daily operations in Governorpet, Gajuwaka & Waltair depots.**

**4. Absence of driver motivation**



# Challenges

SI. No	Challenge	How did we Overcome ?
1	Depot MIS were not aware for excel data entry at Hubballi Mof.2, Belagavi Depot 2, Dharwad,Coimbatore Sungam leading to delayed Implementation.	Centum aligned the MIS executive to provide training on excel data entry & FEAT Analysis to Depot MIS.
2	Non-Availability of Buses during Round 1 & Round 2 due to compulsion of Route Operations.	<ul style="list-style-type: none"><li>i. Requested support from DM for conducting checks during non operating shifts/hours.</li><li>ii. Attended Tier-1 checks in some depots at mid night.</li><li>iii. During subsequent round we increased the numbers of buses through ranking.</li></ul>
3	Non-Availability of drivers as per the ranking list due to absenteeism and transfers.	During subsequent round we increased the numbers of drivers through ranking.

# Lessons Learned

- **Depots are very much occupied with their day to day operation and they don't consider this project as a part of their job, hence more commitment is required from the depot management.**
- **It was realised that modifying preventive maintenance schedules as per Tier-I & Tier-II observations specific to the depots can bring significant savings.**
- **Depots need to be very particular in having proper real time record of bus operating data for analysis and carrying out recommended checks for improved KMPL/KMPKG.**
- **Need for sharper focus on monitoring by depot management**
- **Bus operating company should consider moving towards computerized recording of fuel data**

## **REWARDS & RECOGNITION**

- **Proposed the Depot Manager to consider to encourage Drivers who have improved KMPL after training in Round-1 and Round-2.**
- **Maintenance staff who are responsible for fuel efficiency in Vehicles through Tier-1 and Tier-2 checks in Round-1 and Round-2 through**
  - 1. Displaying their names in the Depot Notice Board ✓**
  - 2. Issuing appreciation letters to them ✓**
  - 3. Consider to give monetary incentives to the Maintenance staff and Drivers as a token of encouragement**
  - 4. Recommend to the Higher Authorities at the Division and Corporate level to consider for suitable recognition as Gold, Silver & Bronze Performer.**

# WAY FORWARD

- Learning on the “GO” – Smart learning experience with micro learning nuggets
- Continuous Engagement
- Building a sense of competitive spirit to learn

# Trainers Identified – Karnataka Depots

SI. No	State/ City	Depot	Maintenance Personnel Identified / Trained	Driver Personnel Identified / Trained
	Karnataka			
1	Bangalore	BMTC:Depot-2, Shanthinagar	4	4
2	Bangalore	BMTC: Depot-16, Deepanjali Nagar	4	3
3	Hubballi	Hubli City -1 Depot	4	4
4	Hubballi	Hubli MoF. Depot 2	4	4
5	Dharawad	Dharwad Depot	4	4
6	Belgavi	Belagavi Depot 2	4	4

# Trainers Identified – Tamilnadu Depots

<b>SI. No</b>	<b>State/ City</b>	<b>Depot</b>	<b>Maintenance Personnel Identified / Trained</b>	<b>Driver Personnel Identified / Trained</b>
	<b>Tamil Nadu</b>			
<b>7</b>	<b>Chennai</b>	<b>T.Nagar Depot</b>	<b>4</b>	<b>4</b>
<b>8</b>	<b>Chennai</b>	<b>Vadapalani Depot</b>	<b>4</b>	<b>4</b>
<b>9</b>	<b>Coimbatore</b>	<b>Coimbatore HQ Depot</b>	<b>4</b>	<b>4</b>
<b>10</b>	<b>Coimbatore</b>	<b>Coimbatore Sungam Depot</b>	<b>4</b>	<b>4</b>
<b>11</b>	<b>Madurai</b>	<b>Madurai Depot</b>	<b>4</b>	<b>4</b>

# Trainers Identified – Puducherry & Andhra Pradesh Depots

<b>SI. No</b>	<b>State/ City</b>	<b>Depot</b>	<b>Maintenance Personnel Identified / Trained</b>	<b>Driver Personnel Identified / Trained</b>
	<b>Puducherry</b>			
<b>12</b>	<b>Puducherry</b>	<b>Puducherry Depot</b>	<b>4</b>	<b>4</b>
	<b>Andhra Pradesh</b>			
<b>13</b>	<b>Vijayawada</b>	<b>Governorpet Depot</b>	<b>4</b>	<b>4</b>
<b>14</b>	<b>Sri Kalahasti</b>	<b>Srikalahasthi Depot</b>	<b>4</b>	<b>4</b>
<b>15</b>	<b>Vishakapatnam</b>	<b>Gajuwaka Depot</b>	<b>4</b>	<b>4</b>
<b>16</b>	<b>Vishakapatnam</b>	<b>Waltair Depot</b>	<b>4</b>	<b>4</b>

# IT / MIS Analysts Identified at depots

SI.No	State/ City	Depot	MIS Identified / Trained
	<b>Karnataka</b>		
1	Bangalore	BMTC: Depot-2, Shanthinagar	1
2	Bangalore	BMTC: Depot-16, Deepanjali Nagar	2
3	Hubballi	Hubli City -1 Depot	1
4	Hubballi	Hubli MoF. Depot 2	2
5	Dharawad	Dharwad Depot	1
6	Belgavi	Belagavi Depot 2	2
	<b>Tamil Nadu</b>		
7	Chennai	T.Nagar Depot	2
8	Chennai	Vadapalani Depot	1
9	Coimbatore	Coimbatore HQ Depot	1
10	Coimbatore	Coimbatore Sungam Depot	1
11	Madurai	Madurai Depot	2
	Puducherry		
12	Puducherry	Puducherry Depot	2
	<b>Andhra Pradesh</b>		
13	Vijayawada	Governorpet Depot	2
14	Sri Kalahasti	Srikalahasthi Depot	1
15	Vishakapatnam	Gajuwaka Depot	2
16	Vishakapatnam	Waltair Depot	1





# THANK YOU

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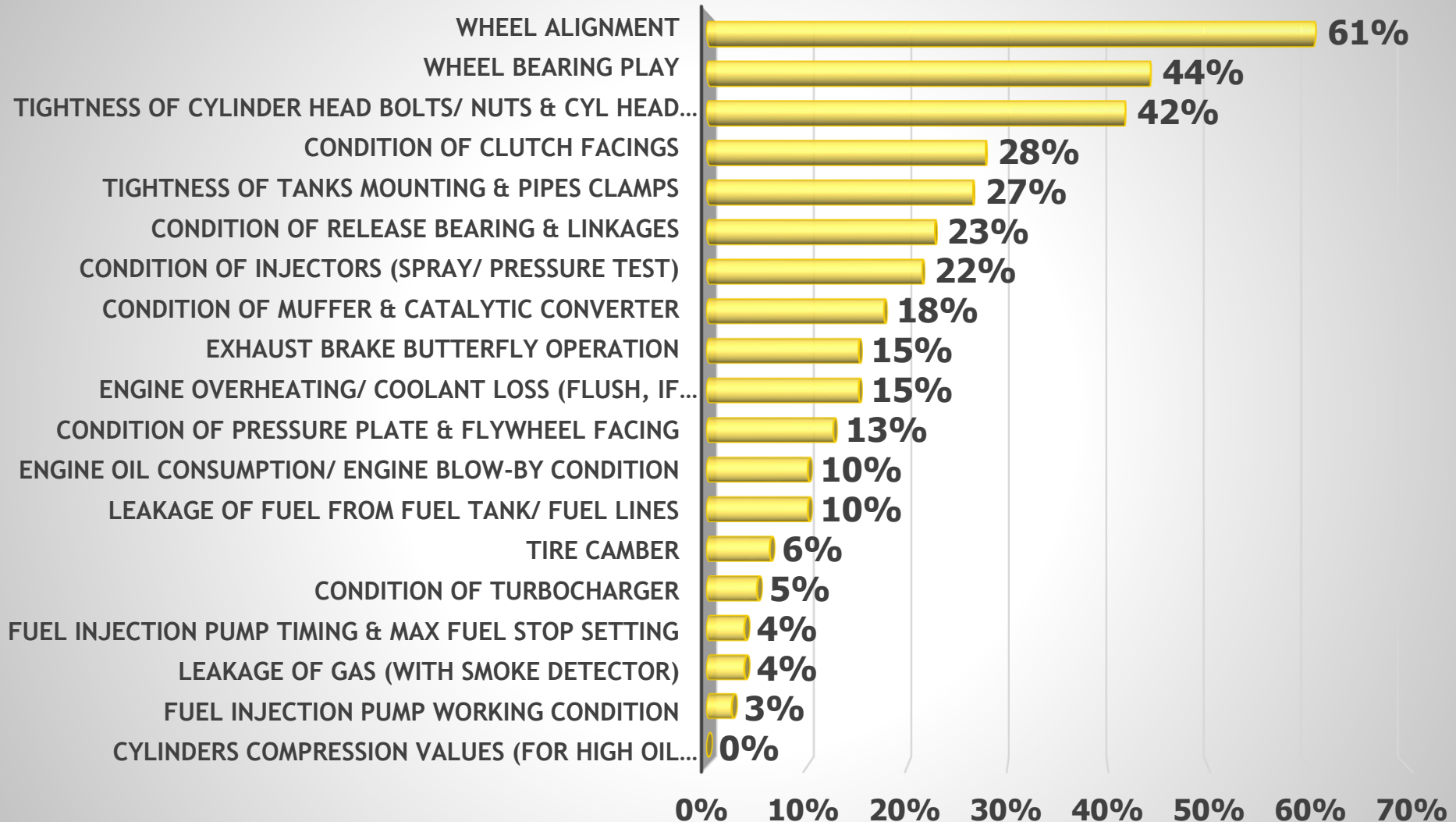


[youtube.com/user/centummarketing](https://www.youtube.com/user/centummarketing)



[worldskillsforum.com](http://worldskillsforum.com)

# Composition of 100 buses per defects during Tier-1 Process in Round 1 & Round 2



Total No. of Buses attended in Round 1 Tier 2 was 25

# Driver's Driving Habit Evaluation Analysis of Round 1 & Round 2

DID THE DRIVER CHECK BEFORE STARTING THE IGNITION WHETHER THE PRESSURE IN BOTH THE "AIR METERS" ARE...

33%

67%

DID THE DRIVER DRIVE WITHOUT PRESSURE AND WITH CONCENTRATION?

50%

50%

DID THE DRIVER REMOVE THE FEET FROM THE ACCELERATOR 100 METERS BEFORE THE STOPPAGE POINT SUCH AS BUS STOPS,...

66%

34%

DEPENDING UPON ROAD OR TRAFFIC CONDITION, DID THE DRIVER USE THE POWERPOINT POSITION ON THE ACCELERATOR WHEN...

69%

31%

DID THE DRIVER USE HIS / HER TOES FOR PRESSING THE ACCELERATOR?

70%

30%

DID THE DRIVER USE SECOND GEAR FOR DRIVING UPTO A SPEED OF 20KMPH AND KEEP THE ACCELERATOR AT 1/4TH POSITION?

73%

27%

DID THE DRIVER USE FIFTH GEAR FOR DRIVING AT TOP SPEED AND KEEP THE ACCELERATOR IN FULL POSITION?

75%

25%

DID THE DRIVER USE THIRD GEAR FOR DRIVING UPTO A SPEED OF 30KMPH AND KEEP THE ACCELERATOR AT 1/2 POSITION?

78%

22%

DID THE DRIVER START THE BUS IN «IDLING» CONDITION WITHOUT PRESSING THE ACCELERATOR?

79%

21%

DID THE DRIVER USE FOURTH GEAR FOR DRIVING UPTO A SPEED OF 40KMPH AND KEEP THE ACCELERATOR AT 3/4 POSITION?

81%

19%

DID THE DRIVER SET THE BUS IN MOTION USING FIRST GEAR WITHOUT ACCELERATOR?

81%

19%

DID THE DRIVER KEEP THE FEET ON THE FOOT REST NEAR ACCELERATOR?

83%

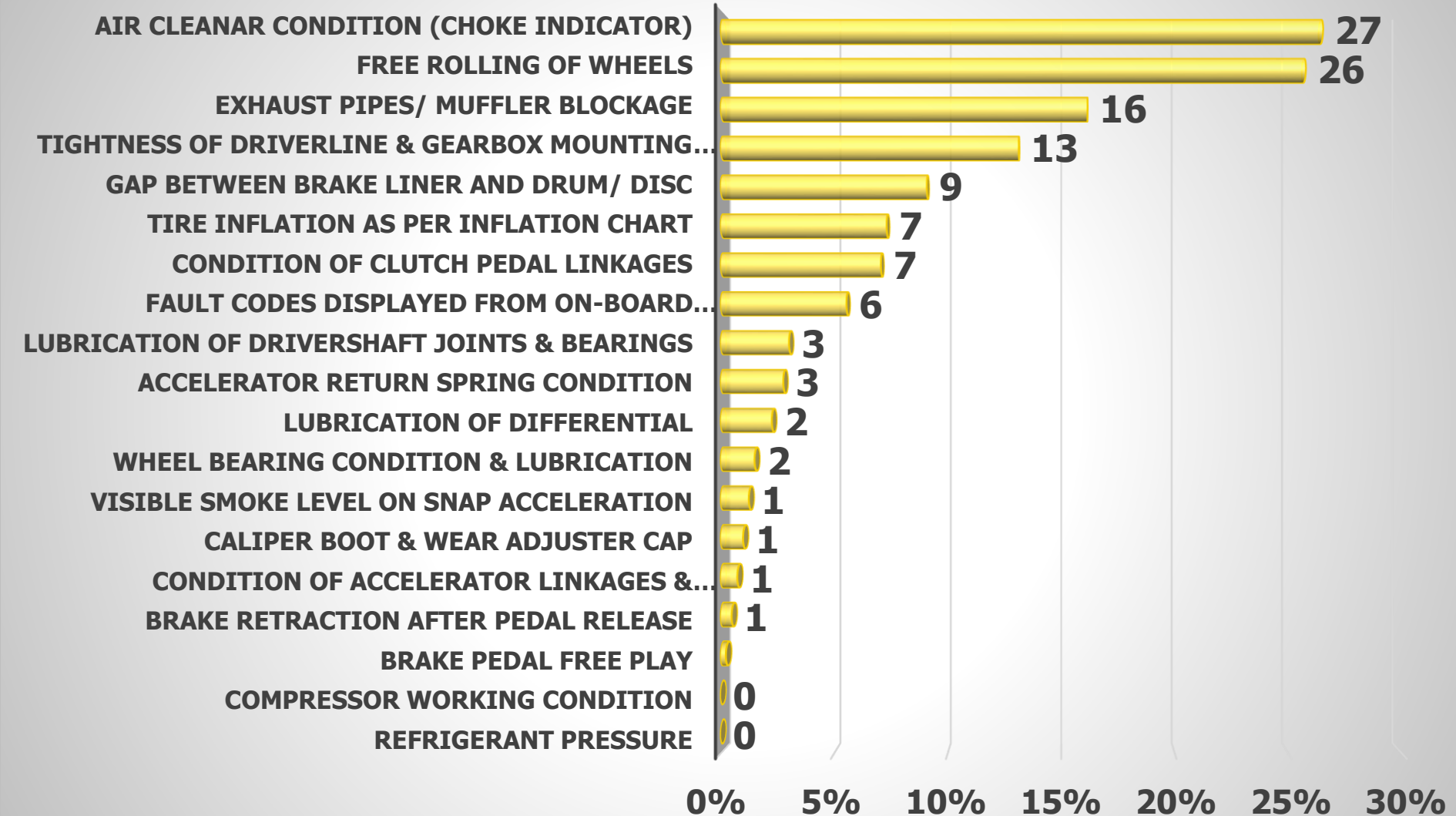
17%

■ Yes% ■ No%

Total Drivers Trained in Round 1 was 177

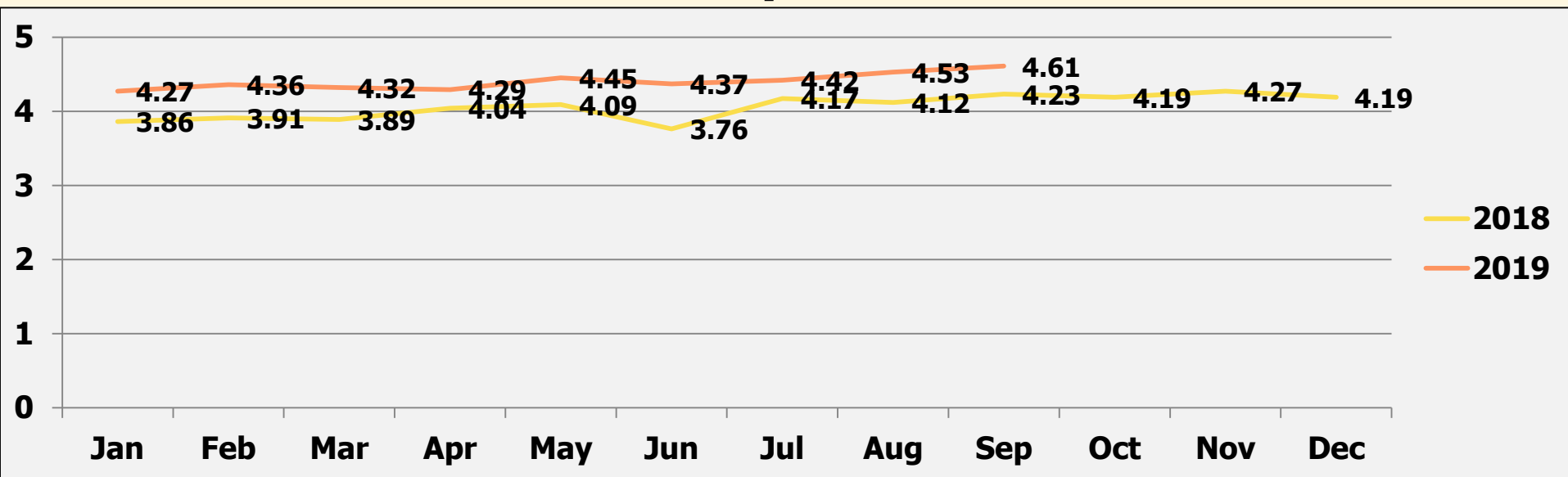
Total Drivers Trained in Round 2 was 183

# Composition of 100 buses per defects during Tier-1 Process in Round 1 & Round 2



# Sample of Calculation Process of Total Fuel & Cost Saving

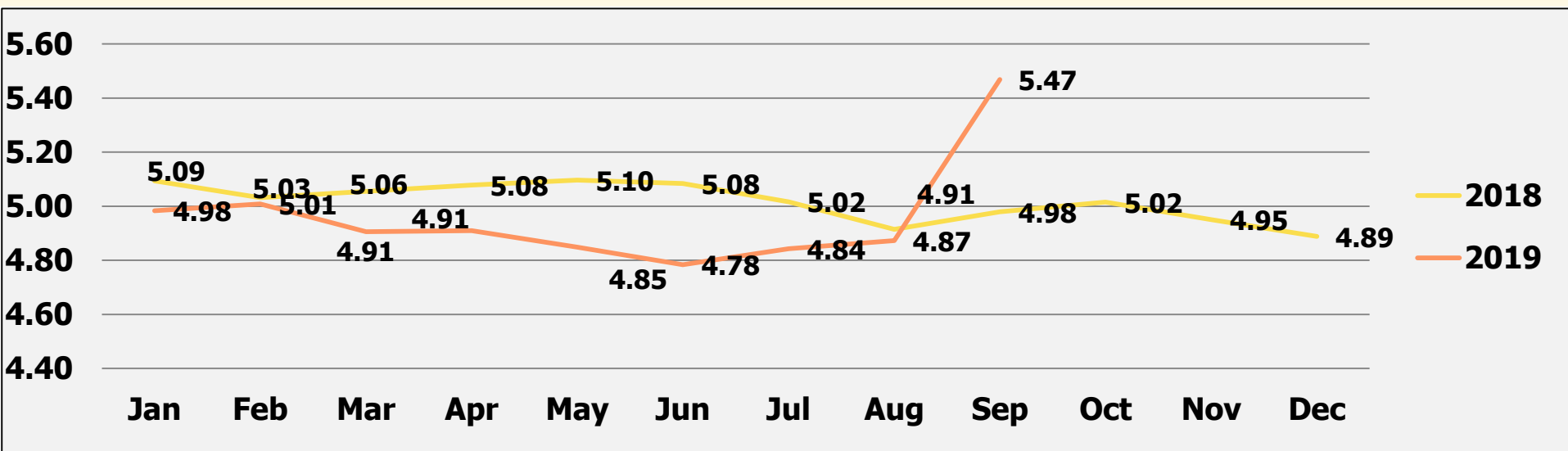
## Hubballi Depot 1,Hubbali



Month	2018	2019	Fuel Saved(Lit)	Cost Saved(Rupees(Lakh))
Jan	3.86	4.27	25963	1817403
Feb	3.91	4.36	27936	1955537
Mar	3.89	4.32	29319	2052346
Apr	4.04	4.29	15383	1076840
May	4.09	4.45	21694	1518549
Jun	3.76	4.37	39051	2733546
Jul	4.17	4.42	14586	1021039
Aug	4.12	4.53	23546	1648228
Sep	4.23	4.61	20578	1440474
Total			218057	15263963

# Sample of Calculation Process of Total Fuel & Cost Saving

## Governorpet, Vijayawada



Month	2018	2019	Fuel Saved(Lit)	Cost Saved(Rupees(Lakh))
Jan	5.09	4.98	-3547	-248295
Feb	5.03	5.01	-686	-48015
Mar	5.06	4.91	-4726	-330844
Apr	5.08	4.91	-5057	-353987
May	5.10	4.85	-8034	-562386
Jun	5.08	4.78	-9646	-675200
Jul	5.02	4.84	-5755	-402867
Aug	4.91	4.87	-1394	-97552
Sep	4.98	5.47	15516	1086147
Total			-23329	-1632998

# Observation of Major Faults Noticed in per 100 Buses during Tier-1 Check in Round 1 & Round 2

Observation of Major Faults Noticed in Buses during Tier-1	Round 1	Round 2
Free Rolling of Wheels	20	22
Air Cleaner Condition (Choke Indicator)	20	24
Tightness of driveline & Gearbox Mounting Bolts	12	10
Exhaust Pipes/ Muffler Blockage	10	16
Tire Inflation as per Inflation Chart	8	3
Gap between brake liner and drum/ disc	7	8
Fault Codes Displayed from On-board Diagonistics	6	3
Condition of Clutch Pedal Linkages	6	5