BEST PRACTICE Catalogue
PREFACE

Efficient mobility of people is one of the key factors for the progress and prosperity of a society and a nation. The State Road Transport Undertakings (SRTUs) are playing a major role in this endeavour. The SRTUs have been providing the economical, efficient and sustainable road transport services for covering short as well as medium distance passenger mobility in rural, urban and hilly areas of the country.

Due to a variety of reasons, most of the STUs have not been able to meet their operational cost and maintain a reasonable margin, to upgrade systems at various levels of operations. But, at the same time, some of the SRTUs have adopted several cost cutting measures and formulated strategies for improvement in operations; bring down the operational cost and maintaining quality services.

ASRTU, in its endeavour, to support its members by exchanging of good practices and knowledge sharing, has been organizing National Best Practices Workshops & Seminars regularly.

A need was felt to compile the best practices of SRTUs in print and audio visuals so as to use the facility by anyone, as and when required. Thus, the idea of “Best Practices Manual” in print and audio visuals emerged. This manual is a compendium of best practices’ models evolved, implemented in public transport with best results to the SRTUs in terms of operational efficiency.

This manual is the collective efforts of the professionals of SRTUs at all levels who willingly donated their time, expertise, insight and support in preparing and presenting the case studies of Best practices.

I take the opportunity to thank one and all who are involved in bringing out the manual and I hope that the other members will make use of the proven best practices for the improvement of their operations.

I also recognize the efforts of the officials from ASRTU and the Co-ordinating Officer of Karnataka State Road Transport Corporation who have helped in bringing out the edition in a short framework of time.

(P. S. Ananda Rao)
Executive Director
ASRTU, New Delhi
Message

I am delighted to know that the Association of State Road Transport Undertakings (ASRTU) is bringing out the “Best Practices Manual of State Road Transport Undertakings”. ASRTU is the Apex body on various issues of SRTUs and has the responsibility to promote and contribute to the growth of member SRTUs.

This Best Practice Manual being published by ASRTU is a compilation of such vital information which provides insights of the major successful programmes of SRTUs and depicts how SRTUs have been able to make their operation viable.

I congratulate the team of officials involved in this initiative. I am sure that the publication would be of great interest not only to the officials of SRTUs but to other stakeholders also.

I hope that users shall continue providing valuable feedback and suggestions so that the publication can be suitably updated in the upcoming versions.

[Yudhvir Singh Malik, I.A.S.]
Secretary, RTH &
President, ASRTU
Message

I am happy that ASRTU is bringing out "Best Practices Manual of State Road Transport Undertakings".

ASRTU being the Apex Body of STUs for carrying out various issues concerning STUs, it has the responsibility to promote efficiency by sharing Best Practices.

STUs are facing several problems which require sharing of Knowledge, Skills and Guidance.

STUs are also in the process of using IT in a big way to improve efficiency, productivity, quality of service and safety.

I hope that this Manual of "Best Practices" would be of use to all the STUs.

[Dr. M. Malakondaiah, IPS]
VC & MD, APSRTC &
Vice-President, ASRTU
## Index

| 1. Andhra Pradesh State Road Transport Corporation | Introduction of New Brand Ultra Deluxe | 11 |
| 2. Bengaluru Metropolitan Transport Corporation | Safety First | 17 |
| | Intelligent Transport System (ITS) | 22 |
| | Smart Phone Application | 26 |
| 3. Chandigarh Transport Undertaking | SMS-based Crew Management System | 31 |
| | SMS-based Roster Management System | 33 |
| 4. Delhi Integrated Multi-Model Transit System Ltd., | Corporatization of Private Stage Carriage Services in Delhi | 37 |
| 5. Gujarat State Road Transport Corporation | Environment, Health and Safety Policy | 41 |
| 6. Kadamba Transport Corporation Limited | Computerized Monthly concessional RFID pass System | 47 |
| 7. Karnataka State Road Transport Corporation | AWATAR | 51 |
| | (Any Where Any Time Advance Reservation System) with Mobile Booking | 58 |
| | MITRA- Nation’s First Intelligent Transport System with Mobile App | 65 |
| | Marketing Initiatives | 70 |
| | Staff Duty Rota and Leave Management System | 74 |
| | Vehicle Tracking & Monitoring System | 74 |
| | City Bus Service at Medium and Small towns & cities | 86 |
| 8. Maharashtra State Road Transport Corporation | Geographical Information Technology-based Statistical Information System Website | 93 |
| 9. North Eastern Karnataka Road Transport Corporation | City/Town Provided with City Services | 97 |
| 10. North Western Karnataka Road Transport Corporation | Softwares Implemented | 101 |
| | Safety Measures | 103 |
| | Cleanliness at Workplace | 107 |
| 11. Navi Mumbai Municipal Transport | Commuter-friendly Initiatives | 111 |
| 11. Uttar Pradesh State Road Transport Corporation | Initiatives of UPSRTC | 119 |
| 12. Uttarakhand Transport Corporation | Commuter-friendly Initiatives : Cashless Ticketing on Board | 125 |
| 13. Telangana State Road Transport Corporation | Excellence in bus transport | 129 |
Andhra Pradesh State Road Transport Corporation
BEST PRACTICE Catalogue
Name of the Initiative: Introduction of New Brand ULTRA DELUXE

Year of Implementation: 2015-16
Year of Completion: 2016-17

1. Organisation’s Detail: A.P.S.R.T.C
   a. Head of the Organisation with their complete contact details
      EXECUTIVE DIRECTOR (O)
      edonmis@apsrtc.ap.gov.in
      9959224599 / ctmapsrtc@gmail.com / 9959224666
   b. Type of Organisation: State Road Transport Corporation
   c. Details of office which implements this initiative
      ED(O), Operations Department
      A.P.S.R.T.C. / VIJAYAWADA, A.P.

2. Situation before Initiative & Implementation Strategy
   a. EPK Before: 27.30
      EPK After: 29.18
   a. Briefly describe the conditions in the area before implementation of the initiative with photographs.

3. Description of Initiative & Implementation Strategy
   a. Describe in detail the processes adopted in implementation of the initiative
   b. What are the activities taken up to implement the initiative?

   Initiative is taken to provide a better comfort to passengers. All the supervisors, mechanical staff who have to take initiative are given all the theoretical inputs. The details of recline mechanism is explained & kits are supplied to convert the seats. In order to implement in all units during the same period, at few units the activity is outsourced.

4. Briefly describe the benefits derived from implementing the initiative: Increased EPK, Increased passenger comfort with change of fixed seats by reclining seats.

5. Partners’ information (if any): Mechanical Engineering Department of A.P.S.R.T.C

6. Innovative Characteristics about the initiative: Change of type of seat from fixed to reclining and providing new brand by modifying brand name from DELUXE to ULTRA DELUXE showing the upgradation of service.

7. Problems faced:
   a) Describe the problems faced in implementing the initiative & how were they overcome?
      1. Allotment of vehicles to services which is overcome by internal pooling and spare vehicles.
      2. Supply of kits to all units which is overcome by continuously monitoring the supplier and out-sourcing the activity in few depots.

8. Sustainability:
   How is the sustainability achieved in this initiative? Continuous monitoring

9. Recognition / Awards:
   Has this initiative been awarded / recognized any where? No
Name of the Initiative: Standardization of 10.00R20, 16PR Radial Tyres

Year of Implementation: 2015-16
Year of Completion: 2016-17

Situation before the initiative:
a. Briefly describe the conditions in the area before the implementation of the initiative with photographs

<table>
<thead>
<tr>
<th>Year</th>
<th>New Tyres Consumed</th>
<th>RC Tyres Consumed</th>
<th>New Tyre Life</th>
<th>RC Tyre Life</th>
<th>Total Tyre Life</th>
<th>Tyres CPK in Ps</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>42203</td>
<td>95673</td>
<td>74268</td>
<td>48734</td>
<td>175568</td>
<td>72</td>
</tr>
<tr>
<td>2015-16</td>
<td>38149</td>
<td>85433</td>
<td>80500</td>
<td>51971</td>
<td>183540</td>
<td>67</td>
</tr>
<tr>
<td>2016-17</td>
<td>29033</td>
<td>64526</td>
<td>88856</td>
<td>57807</td>
<td>198536</td>
<td>56</td>
</tr>
</tbody>
</table>

Due to using 9.00R20 14PR Radial Tyres on all wheels, Cost per KM, Tyre damages and Tyre punctures were on higher side. Buses were failing online due to Tyre failures in good number.

Description of the Initiative & Implementation Strategy:
In place of the scrapped 9.00R20 14PR Radial Tyres 10.00R20 16PR were fitted in phased manner on all special type buses, though initial cost of 10.00R20 is more by Rs. 3000/- per tyre.
a. Describe in detail the processes adopted in implementation of the initiative: 2015-16 - All Super Luxury & Deluxe services were implemented. During 2016-17 - all Express Services were implemented.
b. What were the activities taken up to implement the initiative? Training programmes were conducted to Mechanics and Supervisors at all depots on Tyre preparation, Inflation standards, Rotation systems etc. to keep all the tyre care systems in place to achieve optimum performance from 10.00R20 Tyres.

Briefly describe the benefits derived from implementing the initiative:

Considerable reduction in consumption of New & RC Tyres achieved. New and RC life of Tyres increased by 14,588 & 9,073 kms respectively. Expenditure on Tyres reduced significantly from 72 to 56 Ps per km. Gross reduction in cost to the tune of Rs. 27 Crores in 2 years

Partners’ Information (if any):
The decision was taken by MED APSRTC having conducted field trials at depots during 2013-14 & 2014-15. For conducting Special trainings on Tyre care the services of Engineers of M/s JK Tyres & M/s Michilin Tyres are availed.

Innovative characteristics about this initiative:
During field trial it was assessed that 10.00R20 16PR are able to withstand road shocks, impact brakes and Tread chipping damages when compared to 9.00R20 Radial Tyres. After converting 9.00R20 into 10.00R20 Tyre, punctures also reduced drastically. A few supervisors having good aptitude and skills were involved during the initial study. The study was conducted initially at depots where the special type bus content is more to achieve the benefits and to conclude the study quickly.
Problems faced:

a. Describe the problems faced in implementing the initiative & how were they overcome?

1) 10.00R20 16PR RC tyres are not available in sufficient numbers initially for rear wheel fitment. Therefore on Super Luxury buses new tyres were fitted on all wheels for about one year till RC tyres of 10.00R20 size are generated to take the project forward.

2) It took nearly 6 months time to impart necessary training to the Mechanics and Tyre technicians on different inflation pressures, ill effects of mismatching of tyres of two sizes and new & RC tyres etc. to achieve optimum performance from 10.00R20.

3) It was very difficult initially to convince the Finance Managers for spending Rs.3000/- per Tyre additionally over 9.00R20.

Sustainability:

How is the sustainability achieved in this initiative?

1) By monitoring and ensuring proper switching over from 9.00R20 to 10.00R20 in phased manner performance improvement was achieved in every quarter.

2) Depots were selected in a systematic order in all the regions simultaneously so that the cost benefit of conversion of 10.00R20 is achieved by all the regions.

3) Having seen the fruits of conversion into 10.00R20 all the Regions / Depots volunteered for conversion of Express buses also in the second year.

4) The significant reduction in CPK on Tyres from 72 Ps of 2013-14 to 56 Ps in 2016-17 benefited all the regions of APSRTC financially.

Transferability:

a. What can others learn from this initiative?

b. Has initiative been replicated/ adopted elsewhere? Where? By Whom?

Systematic implementation of the thoroughly tested experimentations will certainly help the organizations both in terms of Physical and Financial parameters. In the process, Managers, Supervisors and Staff get motivated.

Recognition / Awards:

Has this initiative has been awarded / recognized any where?

This was not presented before any forum earlier.
Bengaluru Metropolitan Transport Corporation
The accident data from 2012-15, causing 327 fatalities on 306 accidents also revealed that over 42% of the drivers involved in fatal accidents were in the age group of 31 to 40 years. In addition, over 65% of these drivers involved in fatal accidents had less than 10 years of driving experience with BMTC. Thus, accident analysis has helped in profiling of drivers involved in accidents for BMTC to concentrate their efforts in training and monitoring the young drivers with less than 10 years of experience and in the sub 40 year age group.

1. Details of the Initiative:

BMTC is operating 6158 buses as on date covering 1.3 million daily bus km by serving 5.2 million passenger trips constituting roughly 40% of the mode share in Bangalore. Increasing vehicle ownership in the city has led to increase in congestion and number of accidents.

As accidents are random, multi-factor event, in which one or more road users would have failed to cope with the road environment, the organizations can only work towards mitigating it from their end. Since last few years BMTC has been working on improving various aspects of road safety i.e. infrastructure, bus specifications & driver behaviour etc.

a. Organisational Detail : BMTC
b. Head of the organization with their complete contact details : Dr. Ekroop Caur, The Managing Director, BMTC, caurekroop@gmail.com.

2. Situation before the initiative

a. Briefly describe the conditions in the area before implementation of the initiative with photographs:

Open doors when the bus is in movement: High passenger fatalities due to the doors remaining open when the bus is in movement.

Blind Zones due to use of substandard rear view mirrors: Use of substandard rear view mirrors causes a blind zones on the left side resulting in the driver not being able to see vehicle / people up to 3mtr distance from back portion of the bus.

Weaving and lack of lane discipline especially amongst two wheeler riders: There is no lane discipline amongst the riders. The riders often try to overtake from the left and over-speed causing accident.

Jaywalking and inadequate pedestrian infrastructure: Pedestrians often cross the road from the front of a bus, assuming that the driver is able to see them. They are at higher risk as the oncoming traffic in the adjoining lane may not be able to see them. Since there are inadequate pedestrian infrastructure especially to cross roads – at grade crossing, pedestrians often tend to jaywalk.

Reckless driving by BMTC drivers: The drivers are often stressed to complete their trips on time due to which they tend to over-speed and drive recklessly.

Parked vehicles at bus stops and location of bus stops: The bus stops are often located just before/after a signal or a busy junction causing traffic to stop behind. In many areas the vehicles are parked at the bus stops causing the bus to halt on the carriageway blocking the lane behind.

Inadequate safety infrastructure at bus terminals: Busy terminals have constant flow of buses which require segregation of pedestrian traffic. There have been at least 2-3 fatal incidents annually at the Majestic bus terminus where the pedestrians were run over or crushed between two buses.

Poorly maintained buses: There have been many complaints on the brake light of buses not working. The breakdowns have also caused traffic snarls in the city. Although on most occasions the repair vans resolve the issues within a few hours, it causes blockage of the roads and have caused accidents in the past.
3. ECONOMIC AND OTHER IMPACTS DUE TO ACCIDENTS

In addition to the loss of life and public inconvenience due to these accidents, it also tarnishes the image of the bus agency. To understand the overall implication of the issue, BMTC also studied the economic impact of these accidents. Since BMTC had taken an exemption from paying vehicle insurance, they have to bear the costs of compensation payouts from their financial reserves. Following were the estimated costs that BMTC has to bear annually in addition to the compensations paid to the victims.

Average Vehicle damage losses from 2012-2016 is approximately INR 1.81 crores per year.
Average Man hour losses from 2012-2016 is approximately INR 12 lakhs per year.
Average other legal fees and compensations paid from 2012-2016 is approximately INR 9 crores annually.

To mitigate and reduce such incidents BMTC has set a budget of INR 1.4 Crore per year to train their drivers on a regular basis and has also invested in building a state-of-the-art training centre.

4. Description of the Initiative & Implementation strategy:

Accident data from 2012-15, causing 327 fatalities on 306 accidents also revealed that over 42% of the drivers involved in fatal accidents were in the age group of 31 and 40 years. In addition, over 65% of these drivers involved in fatal accidents had less than 10 years of driving experience with BMTC. Thus accident analysis has helped in profiling of drivers involved in accidents for BMTC to concentrate their efforts in training and monitoring the young drivers with less than 10 years of experience and in the sub 40 year age group.

To summarize, following points were identified based on the data:

- Open doors when the bus is in movement: High passenger fatalities due to the doors remaining open when the bus is in movement.
- Blind Zones due to use of substandard rear view mirrors: Use of substandard rear view mirrors causes a blind zone on the left side resulting in the driver not being able to see vehicle / people up to 3m from the front of the bus.
- Weaving and lack of lane discipline especially amongst two wheeler riders: There is no lane discipline amongst the riders. The riders often try to overtake from the left and over-speed causing accident.
- Jaywalking and inadequate pedestrian infrastructure: Pedestrians often cross the road from the front of a bus, assuming that the driver is able to see them. They are at higher risk as the oncoming traffic in the adjoining lane may not be able to see them. Since there are inadequate pedestrian infrastructure especially to cross roads – at grade crossing, pedestrians often tend to jaywalk.
- Reckless driving by BMTC drivers: The drivers are often stressed to complete their trips on time due to which they tend to over-speed and drive recklessly.
- Parked vehicles at bus stops and location of bus stops: The bus stops are often located just before/after a signal or a busy junction causing traffic to stop behind. In many areas the vehicles are parked at the bus stops causing the bus to halt on the carriageway blocking the lane behind.
- Inadequate safety infrastructure at bus terminals: Busy terminals have constant flow of buses which require segregation of pedestrian traffic. There have been at least 2-3 fatal incidents annually at the Majestic bus terminus where the pedestrians were run over or crushed between two buses.
- Poorly maintained buses: There have been many complaints on the brake light of buses not working. The breakdowns have also caused traffic snarls in the city. Although on most occasions the repair vans resolve the issues within a few hours, it causes blockage of the roads and have caused accidents in the past.

5. Briefly describe the benefits derived from implementation of the initiative

To begin with, most safety initiatives that are not cost-intensive are already being done. BMTC has also written a road safety grant proposal for an assistance of INR 1,00,18,000 from the Government
of India for installing standard mirrors on all their buses, improving their training programme and improving vigilance for safety.

Constant effort and active implementation of ideas have helped BMTC to reduce their fatalities and number of accidents. The ITS system has enabled BMTC to track vehicle and driver performance and has cautioned the drivers about them being monitored at every step. BMTC has been working with their drivers to reduce the human error and are also improving on the upkeep of their buses to reduce breakdowns. This has also resulted in reducing their compensation pay-outs and improve efficiency amongst their staff.

BMTC has also begun use of a more comprehensive accident data collection form prepared by JP Research and WRI, being used by the BMTC officials. The officials were trained to collect crash data that can be used to do scientific analysis.

Accident-free drivers are encouraged by providing special allowance, awards and medals (drivers who render accident-free service for 3 years will be awarded with Silver medal of 30 grams and Rs. 2000/- cash prize and for 7 years, will be awarded with Gold medal of 8 grams and Rs. 5000/- cash prize).

Hence BMTC took following initiatives:
Improving safe and convenient access for commuters travelling on foot into the terminal.
Ensuring safe and cautious access of buses to the terminal from adjoining roads by constructing traffic calmer and sign boards.
Seamless multi-modal integration with other mass transit modes of transport like the metro and suburban train stations, airport etc. to reduce conflict of access.
Redesigning the terminal structure to provide adequate resting facilities for drivers, conductors, etc. The resting facilities have helped the drivers to take breaks and remain relaxed.
In all the big bus terminals pedestrian guard rails have been mounted to prevent pedestrians for straying on to the bus bay area.

6. Partners’ information (if any) : WRI and Media Partners

7. Innovative characteristics about this initiative :
   a. Guard rails Kempegowda Bus Station, BMTC, at Majestic.
   b. Sky Walks Kempegowda Bus Station, BMTC, at Majestic.
   c. Lane Discipline for Buses at K.R.Puram Junction Bangalore.
   d. Lane Discipline for Buses at Nayandahalli Junction Bangalore.
   e. Ensuring Lane Discipline for Buses at Hebbala Junction.
   f. Bus Specifications and Retrofitment: The accident study revealed that crashes in the left side were primarily due to the blind spots. To prove this a blind zone experiment was conducted and it was identified that the field of vision of the bus drivers with the existing mirror being used was skewed. Hence BMTC has ordered and retrofitted mirrors as per the AIS (Automotive Industry Standard) on 75 buses on the most accident-prone route. Based on the driver feedback, the corporation intends to procure and install these mirrors on all the buses subsequently.
g. BMTC has installed speed governing device in all buses and speed limit is fixed at 60 KMPH. BMTC is the only STU in India which has fitted speed governing device in all its fleet.

h. In addition to this, BMTC has invested in the Intelligent Transport Management System (ITMS), which monitors driver performance using criteria such as harsh braking, sudden acceleration, over speeding, skipping bus stops and stopping vehicle at an unauthorized location. They have installed a two-way voice communication system to communicate with the driver in case of emergency.

i. **Changing Driver Driving Behaviour and other initiatives:** Finally, as the drivers are often blamed for traffic incidents, it is necessary to improve driving behaviour and incentivize / reward them for safety. The process of changes is slow but can contribute immensely to improve road safety. Following are the initiatives that are being implemented by BMTC.

- BMTC has initiated regular training, counseling, and monitoring of drivers at the depot levels. ITS data is being used to identify drivers that are involved in recurring faults and are given strict warnings.

- **“Committee to Review fatal accidents”** has been formed under the chairmanship of the Managing Director, BMTC to review fatal accidents. Wherein the Managing Director in person counsels the drivers involved in the fatal accidents and provide necessary instructions/suggestions. This to imply that such incidents are taken seriously and drivers are answerable for their conduct to the highest authorities.

- BMTC collaborated with WRI India to have 2 training sessions for the corporation’s trainers and depot managers. This has been conducted in order to provide necessary training for the trainers in each depot regarding improving safety measures.

Road Safety Week is observed every year and during this period, the Police department and Transport Department officers give necessary suggestions/guidelines to drivers about safe driving.

8. **Problems faced**

   a) **Describe the problems faced in implementing the initiative and how were they overcome?**

   Although the motive of the Corporation has been to provide safe and convenient travel there are several challenges they encounter in their daily operations. Following are the challenges:

   **Operation of buses in highly congested area:** The increase in vehicular traffic has led to buses getting delayed, hampering the people’s perception on the cause of delay being routed to buses.

   Thus a dedicated bus lane will reduce the time lag for buses and establish it as a mass carrier.

   **Traffic violation by other vehicles:** Increase in vehicular ownership results in higher number of drivers driving. In 2016, the number of traffic incidents in Bengaluru city increased by 55% from its lows and the fatality also increased by 8%, while BMTC incidents has been steadily declining. This indicates that traffic violation by other vehicles will increase.

   **Untrained drivers and safety awareness as a continuous exercise:** The reason for high number of road incidents has been due to high number of untrained drivers driving private vehicles. To reduce traffic violations, safety awareness needs to increase and it needs to be a continuous exercise. BMTC realizes this and is doing it with their drivers but for the masses, the RTO/ Transport department and the implementation agency traffic police need to work together and have safety campaigns on a regular basis throughout the year.

9. **Problems faced**

   a) **Describe the problems faced in implementing the initiative & how were they overcome?**

   To begin with, most safety initiatives that are not cost-intensive are already being done. BMTC has also written a road safety grant proposal for an assistance of INR 1,00,18,000 from the Government of India for installing standard mirrors on all their buses, improving their training programme and improving vigilance for safety.
10. Sustainability

How is the sustainability achieved in this initiative?

Bangalore has experienced rapid demographic growth and urbanization, unprecedented sprawl, increasing private motor vehicle ownership with differentiated mobility needs of the commuters which leads public transport to compete with personalized/private Modes of Transport, Bangalore is the city with highest growth of private vehicles, especially two wheelers. In order to address this and to enhance its revenue, BMTC has taken initiative in the following parameters with its existing fleet.

11. Transferability

a. What can others learn from this initiative?
b. Has initiative been replicated / adopted elsewhere? Where? By Whom?

BMTC with a good cause of reducing the accident BMTC has given first priority to safety. The main objective of the project is to create awareness about the violation of traffic rules and lane discipline among the drivers. organizing training programme to the drivers in collaboration with the private about the safe driving, refresher training, traffic lane discipline etc., is indeed a unique initiative carried out by BMTC.

12. Recognition / Awards

Has this initiative been awarded / recognized anywhere?

BMTC has bagged safety award for registering lowest accident rate.

**BMTC HAS WON AWARDS AT NATIONAL AND INTERNATIONAL LEVELS:**

BMTC secured third place in Best Practices Award 2014-15 for its initiative on Cleanliness at work place from ASRTU.
Name of the initiative: Intelligent Transport System (ITS)

Year of implementation: 2016
Year of completion: 2021

1. Situation before the initiative

Briefly describe the conditions in the area before the implementation of the initiative with photographs.

Bengaluru Metropolitan Transport Corporation (BMTC) is the backbone of the city’s public transport network. It plays a major role in meeting the urban transportation needs of the residents of Bengaluru. With ever increasing traffic, BMTC is part of the larger strategy of the state Government in decongesting the city by encouraging commuters to adopt public transport.

BMTC, currently operates around 6,404 buses, operates 6,217 schedules and carries 52 lacs passenger daily. It plies 75,993 trips contained within 2,400 routes with the passage of time, it has scaled up its operations to around 12.9 lacs service kilometers daily.

With such large operations to manage, BMTC faced its own share of challenges, which primarily impacted its –

1. Operational Discipline, caused by irrational and unmonitored staff behaviour, resulting in unpredictable operations and unreliable services, demonstrated by reduced growth of EPKM, a significant fall from a rate of 14.1% to 0.9% in the last FY.

2. Efficiency, caused by non-optimized operations, leading to growing losses, exemplified by fall of 3.9% in revenue resulting in losses of approximately 195 crores in the last FY.

Staff morale, because of complicated & tedious processes and large paper work.

With such large operational challenges and the pressing need to strengthen the transportation backbone of Bengaluru so as to decongest its roads, BMTC had to find a solution which could help it scale its services while curtailing its operational losses. The focus was on finding mechanisms which could help it monitor operations and financial health in real-time or near real-time manner.

To achieve its objectives BMTC embarked on an ambitious effort to bring in technology interventions in its day-to-day operations. The proposed interventions ensured real-time information on buses which would capture late departures from depots, commuter wait times, route deviations, bus-stop skips, over-speeding, harsh acceleration & deceleration, early arrivals at depots, among other parameters which were required to improve operational efficiency. The interventions also captured financial intelligence by monitoring in near real-time and in a granular manner the tickets being sold across all buses.

Intelligent Transport System, popularly referred to as ITS, fundamentally, comprises of 3 main elements of Vehicle Tracking System (VTS), Passenger Information System (PIS) and Electronic Ticketing System (ETS). A detailed schematic representation of the elements of the ITS is depicted below:
Also project like Intelligent Transport System involved significant challenges when it comes to addressing the transition requirements from the current AS IS state to the post ITS state. Since there were changes in the following areas, major challenges were faced,

- Organizational Culture and Structure
- Physical Environment
- Process and work-flow
- Job Design and Responsibilities
- Skills and other Knowledge requirements
- Policies and Procedures

2. Description of the initiative/implementation strategy

Describe in detail the processes adopted in implementation of the initiative:

- The agency for the project was selected through tender process as per KTPP Act. The ITS project involves very complex technology and huge cost and the BMTC being a transport organization may not have technical expertise required for such projects. Hence to aid BMTC to professionally & effectively monitor the development and implementation of the project, Project Management Consultancy (PMC) for ITS project was appointed through tender procedures.
- PMC helps BMTC in testing Hardware and Software deliverables of the project. Field testing was conducted to test the device and software with the help of PMC.

What were the activities taken up to implement the initiative?

- A pilot depot was selected to implement the solution
- Training to all the crew was given on a continuous basis both at field level and depot level so as make them thorough and to be in tune with the system
- Continuous Training activity was carried out to all the staff of different categories using the system
- Continuous development was carried out to address the issues faced by crew in field situation
- Roll out was done in a phase-wise manner so as to implement the system without any hassle

3. Briefly describe the benefits derived from implementing the initiative

Citizen surveys conducted by an independent third party showed a 41% increase in overall commuter satisfaction levels from pre-ITS to post-ITS phase.

a. Operational Discipline

Late Departure
- Monitoring late departures helped identify erring crew and correct them.

Early Arrival
- Early arrivals, on account of trip skipping, are tracked and the erring crew are reproached.

Stationary Vehicles
- Identification of stationary vehicles helped reduce idling time.

Online ticketing
- Online availability of ticketing data helped optimize routes & schedule plans and launch incentives to pull riders during lean hours.

Route Deviation
- Curtailing route deviation, on account of trip skipping, led to improved revenue realization per schedule.
b. Operational Efficiency

Bus Bunching
- The identification and subsequent correction of bus bunching led to an even distribution of available buses.

Online Collection
- Online reporting of cash collections ensured that ticket data was available with audit section beforehand thus ensuring faster and paperless ticket audits.

Depot Automation
- Automation of duty rotation and waybills helped save a lot of time & effort wasted in manual operations. It also reduced discretion at depot manager level thereby bringing transparency and higher crew satisfaction.

c. Commuter Benefit

ETA / ETD
- Availability of real time information about buses and their ETA helped increase service reliability and ridership.

Bus Stop Skipping
- Monitoring of bus stop skipping helped enhance trust in system.

d. Driving Habits

Harsh Acceleration and Deceleration and Over-speeding
- Recording of harsh acceleration, deceleration and over-speeding & subsequent actions helped improve driving habits, reduced losses due to traffic penalties and accidents, and reduced wear and tear.

4. Partners’ information (if any)

M/s Trimax IT Infrastructure & Services Ltd.
2nd Floor, Universal Mill Building,
Mehra Estate, AshaUsha Compound,
L.B.S. Road, Vikhroli(W),
Mumbai-400 079

5. Innovative characteristic about this initiative

- First of its kind in India. Integrated ITS implementation by an STU for Urban Public Transportation System in the country
- Large scale deployment of ITS in the country in terms of infrastructure with 10,000+ online Electronic Ticketing Machines (ETM) and 6,400+ Vehicle Tracking Units (VTU) i.e. every single bus has the vehicle tracking unit
- Largest impact to citizens as BMTC has a ridership of approximately 5.2 million per day
- The project also supports introduction of Smartcard-based Fare Collection System which enables introduction of Common Mobility Card
- The project provides essential data feed for Mobile Application and Planning & Scheduling application

6. Problems faced

- Change management with a work force of around 36,000
- Synchronizing operations of BMTC in tune with ITS
- High dependence of day-to-day operations on network and IT infrastructure
- Ensuring mapping of correct vehicles to allotted schedules
- A project like implementation of Intelligent Transport System will involve significant challenges when it comes to addressing the transition requirements from the current AS IS state to the post ITS state. In order to ensure the transition is smooth, it is essential to look at all the aspects that will or likely affect the transition. A smooth transition is possible if all the critical factors are acknowledged and addressed adequately.
The solution implemented for the above hurdles is as below:

- Continuous training was imparted to crew
- Continuous development activity as and when the issues were raised has been carried out
- Phase-wise roll out was carried out so as to address all the issues faced during initial implementation
- Advantages of the system was made known to the staff so as to avoid resistance from the staff
- Training by means of video was given to the crew
- Also training manual and pamphlets were distributed to the staff

7. Sustainability

How is the sustainability achieved in this initiative?

- BMTC’s Intelligent Transport Systems initiative has enabled monitoring the day-to-day operations and addressing any anomaly or deviation in real time at the Depots as well as BMTC’s central Office. This has enabled BMTC to establish and maintain tight control over operations resulting in improvement in key Performance Indicators such as increase in total effective kilometers covered on a day-to-day basis, increase in overall earnings per kilometer, increase in overall schedules operated on daily basis and decrease in total kilometers cancelled per day. This has made a positive impact on the overall financial position.

- BMTC’s mobile app is one of the first apps in the country through which commuters can access the ETA (estimated time of arrival) of buses in real time for more than 6,000 buses on any given day. The mobile app also provides a platform for the commuters to raise any concerns they have W.R.T. to BMTC’s service delivery and all such grievances are looked into and resolved proactively. In addition to the mobile app, social media platforms such as Facebook and Twitter are also being used to solicit commuters’ views on BMTC’s service delivery and any other such views.

- BMTC’s ITS initiative is vast in its scope of implementation in Urban Public Transport domain. Implementation of such scale has been attempted for the first time in Urban Public Transport domain and the same has been completed successfully. Hence the scope for replicating the same in other Urban Public Transport sector undertakings is substantial.

8. Transferability

What can others learn from your initiative?

BMTC’s ITS initiative has a high degree of replicability in other Urban Public Transport sectors across the country. This is due to the fact that the learning and operational complexities encountered while implementing such a system across a fleet strength of over 6,000 buses and a workforce of over 35,000 would also be present in other Urban Public Transport undertakings across the country albeit may be a bit less complicated as compared to BMTC. Hence, the potential for transferability of the ITS of BMTC across other Urban Public Transport Undertakings is very high

- Has your initiative been replicated/ adopted elsewhere? Where? By whom?
  No.

9. Recognition/Awards

- Has your initiative been Awarded/Recognized anywhere?
  Yes.
**Name of the initiative**  
Smart Phone Application

**Year of implementation**  
2016

**Year of completion**  
2021

1. **Situation before the initiative**

   Briefly describe the conditions in the area before the implementation of the initiative with photographs

   Before introduction of Smart phone application, commuters could get information about bus services only through website and help desk. Some of the features like Real time information, obtaining information about nearest Bus stop and points of Interest were not available.

2. **Description of the initiative/implementation strategy**

   Describe in detail the processes adopted in implementation of the initiative

   The agency for the project was selected through tender process as per KTPP act. The Solution includes Design and Development of the Smart Phone Application for the benefit of BMTC commuters on two environment - namely, Android and iPhone OS (IOS) and maintenance. This application has been integrated with ITS to get real time information.

   BMTC mobile application has been downloaded by around 1,50,000 passengers.

   BMTC mobile application is hosted in Play store & Apple store servers.

   What were the activities taken up to implement the initiative?

   - Detail requirement of the system was analyzed by the vendor.
   - System was developed to help commuters to locate the nearest bus stop from their current location.
   - System was also developed to know the real time information of the buses they wish to travel [Location and Estimated Time of Arrival (ETA)].
   - System was also developed to help commuters to know the timetable, fare, route information for the buses they wish to travel.

3. **Briefly describe the benefits derived from implementing the initiative**

   - Simple and intuitive user interface with dual language, English and Kannada options.
   - IT helps in Locating buses on the map along with Estimated Time of Arrival (ETA).
   - Commuters can know the Real time information of the buses and can get the Estimated Time of Arrival and know the present location of the bus on Google map which helps to plan their travel.
   - Commuters will get the Route and ETA information on all buses approaching a bus stop and hence helps commuters to plan their trip.
   - Mobile App helps to access to PIS display installed at airport and major bus stations
   - Trip Planner feature helps new commuters to reach their destination.
   - Commuters can see the bus information displayed in Passenger Information System at major Bus Stands and Airport.

4. **Partners’ information (if any)**

   M/s Globals ITES Private Limited.
   #10, 2nd Floor, RMV 2nd Stage,
   Off’New BEL Road, Next to ISRO HQ, Bangalore 560094

5. **Innovative characteristic about this initiative**

   - Will provide the real time information of the buses to commuters.
   - Will give the location of the buses to the nearest bus stop commuter wish to travel.
   - Commuters can see the bus information displayed in Passenger Information System at major Bus Stands and Airport.
6. Problems faced

The buses will be displayed properly in the mobile application only if it is rightly mapped with schedules and operated as per schedule. The application should be designed both in English and local language.

These challenges were taken care as below:
- Action has been taken to properly map the vehicles before they leave.
- Action has been taken to develop the application in local language i.e. in Kannada.

7. Sustainability

How is the sustainability achieved in this initiative?
- BMTC’s mobile application has helped commuters to get the real time information of the buses and also to plan their travel. This has made people to shift from their private mode of travel to BMTC thus having a positive impact on the overall financial position.
- BMTC’s mobile app is one of the first apps in the country through which commuters can access the ETA (estimated time of arrival) of buses in real time for more than 6,000 buses on any given day. The mobile app also provides a platform for the commuters to raise any concerns they have w.r.t to BMTC’s service delivery and all such grievances are looked into and resolved proactively. In addition to the mobile app, social media platforms such as Facebook and Twitter are also being used to solicit commuters’ views on BMTC’s service delivery and any other such views.
- Due to model shift of passengers from private transport to public transport, the environmental pollution may be reduced. Also, the reduced congestion on the road helps in boosting a better environment.

8. Transferability

What can others learn from your initiative?

BMTC’s mobile application has a high degree of replicability in other Urban Public Transport sectors across the country. The data for the mobile application is taken from ITS. Thus, if there are any chances of getting real time information, replication by means of sharing the APIs can be done. Alternatively, if GPS is installed in the buses, the data can be taken and the mobile application similar to BMTC can be developed with some logics incorporated. Hence the potential for transferability of the Mobile application of BMTC across other Urban Public Transport Undertakings is very high.

- Has your initiative been replicated/adopted elsewhere? Where? By whom?
  No.

9. Recognition/Awards

- Has your initiative been Awarded/Recognized anywhere?
  Yes.
Chandigarh Transport Undertaking
**Name of the Initiative**  
**SMS-based Crew Management for City Bus Operations**

Year of Implementation : 2017  
Year of Completion : 2017

**1. Organizational Detail**

a. Head of the organization : Mr. Amit Talwar, PCS  
   with their complete contact details (name, designation, phone, email Ids)  
   Director Transport-cum-Chief Executive Officer  
   Chandigarh City Bus Services Society  
   Tel: 0172-2679002/2679003  
   Email ID: directorctuchd@gmail.com

b. Type of organization : SPV under the aegis of Chandigarh Transport Undertaking

c. Details of the officer who implements this initiative  
   Mr. Yashjeet Gupta  
   General Manager  
   Chandigarh City Bus Services Society, Chandigarh

**2. Situation before the initiative**

Briefly describe the conditions in the area before the implementation of the initiative with photographs  
Low Fleet Utilization  
Absenteeism  
Indiscipline in terms of unplanned leaves  
Missed KMs, hence revenue loss

**3. Description of the initiative & implementation strategy**

a. Describe in detail the processes adopted in implementation of the initiative.  
   SMS-based Roster Management System at Annexure ‘A’

b. What were the activities taken up to implement the initiative?  
   Consolidation of a data base with the updated contact numbers of the crew members.  
   Design of an application “SMS-based Crew Management System (CMS)” which is further integrated with other application “Bus Monitoring System (BMS)” which depicts the scheduling of the buses and crew members i.e. Drivers & Conductors.  
   Procurement of low cost Bulk SMS.  
   Reorganization of Depot’s Duty Section with Computer Literate employees to handles these applications.  
   Training of the respective Duty Section employees for real time updation of the BMS and flashing the SMS to crew as per defined time.  
   Pilot run/Soft launch of the application and hand holding of the team members during pilot launch.  
   Implementation on ground.

**4. Briefly describe the benefits derived from implementing the initiative**

Higher Fleet Utilization  
More passenger kilometres  
Less absenteeism  
Control on overtime
5. Innovative characteristics about this initiative:

- Increase the quality, punctuality, accuracy for the duty allocation exercise
- Flawless communication to the respective crew members for their duty (Day & Time)
- Information available pre-hand (one day prior with Duty Section regarding the Duty Roster and Fleet available)

6. Problems faced

Describe the problems faced in implementing the initiative & how were they overcome?

- Resistance to change due to automation from duty section as well as the drivers and conductors
- It was overcome by counseling & mentoring the crew/duty official, time to time

7. Sustainability

How is the sustainability achieved in this initiative?

Sustainability achieved by engaging the drivers and conductors by educating them regarding benefits of this system. Also disciplinary proceeding initiated against the crew members who neither report for duty as per the allocated day & time, nor contacted duty section for duty change by the stipulated time frame as per Annexure ‘B’.

8. Transferability

a. What can other learn from this initiative?

Others can streamline their roster management by implementation of this initiative.

b. Has initiative been replicated/adopted elsewhere? Where? By Whom?

No knowledge

9. Recognition/Awards:

a. Has this initiative been awarded/recognized anywhere?

Not till now, as it has been recently implemented.
Name of the Initiative: SMS - based Roster Management System

- The Duty Section prepares the Duty Roster of the depot for the next day duties up to 12:30 PM
- Duty Section sends the first message to the crew members for their duties, immediately after preparing the duty roster maximum by 1:00 PM

SMS Template Example:

“Harinder Singh (D-404) your duty is on Bus No. 7094 (R.No.26) at 5:10 AM to 12:30 PM in M shift on dated 08.06.2017. Call before 3:00 PM on 0172-2679255, 94175-96979, if problem”

- The crew members respond to the Duty Clerk in case of any problem before 3:00 PM and Duty Section/Yard Section maintains Duty Verify Proforma on daily basis.
- Revised updation of the duties flashes at 5:00 PM on daily basis to the crew members who have declined the duty and to the new assigned crew member.

SMS Template Example:

“Rohtash (C-388) your duty is on Bus No. 5344 (R.No.212) at 6:50 AM to 2:30 PM in M shift on dated 08.06.2017 has cancelled”

- The final message flashed by the Duty Section/Yard Section at 11:00 PM if there is any change/detention of bus in the roster.

SMS Template Example:

“Nirmal Singh (D-554) now your duty is on Bus No. 5348 instead of 7019 (R.No.10) at 5:50 AM to 1:10 PM in M shift on dated 08.06.2017”

- Before flashed the final message at 11:00 PM, Works Manager provides the list of the vehicles which are unfit/detained for next day maximum by 10:15 PM to the Duty Section.
- The final message flashed to the conductor and the conductor is responsible for changing his/her ETM machine if the bus has changed.

(Note) : All the above three (3) messages are also confirmed to the respective Duty In-charge (DI) & General Manager (GM) in parallel in the following format:

First Message:
Duty Messages were sent successfully for Depot-II by Contact person XYZ

Revised Message:
Revised Messages were sent successfully for Depot-II by Contact person XYZ

Final Message:
Final Messages were sent successfully for Depot-II by Contact person XYZ
BEST PRACTICE

Delhi Integrated Multi-Modal Transit System Ltd.
Name of the Initiative  
**Corporatization of Private Stage Carriage Services in Delhi**

**Year of Implementation**: 2011  
**Year of Completion**: Ongoing

1. **Organizational Details:**
   a. **Head of the organization**: Shri M. Ramsekhar  
      with their complete contact details (name, designation, phone, email)  
      ED & Joint CEO  
      011-43090118  
      m.ramsekhar@dimts.in

   b. **Type of organization**: Consulting agency

   c. **Details of the officer who implements this initiative**: Shri Manpreet Singh, Chief (Road Transport)  
      011-43090222 / manpreet.singh@dimts.in

2. **Situation before the initiative**
   Briefly describe the conditions in the area before the implementation of the initiative.
   Prior to implementation of this initiative, privately owned Blueline buses were operational in Delhi.
   Two major drawbacks of this scheme were (i) the bus owners were dependent on the ticket revenue for their earnings and (ii) ownership of the Blueline fleet was fragmented to the extent that the number of owners was close to the number of buses. Dependence on ticket revenue for earning unleashed on-road competition for passengers, neglect of unprofitable routes or route-segments and lean-hour service and of course a spate of accidents as well.

3. **Description of the initiative & implementation strategy**
   a. Describe in detail the processes adopted in implementation of the initiative.

   b. **What were the activities taken up to implement the initiative?**
      Under this scheme, 657 stage carriage bus routes of Delhi have been grouped into 17 (seventeen) distinct route clusters. Any two routes with a common path of around 10 (ten) kilometres become part of the same cluster. Each route-cluster is to be served by buses of DTC (Delhi Transport Corporation) and those owned by corporate entities — the latter being selected by a process of competitive bidding — in a 50:50 ratio. Both sets of fleets are to operate every route under a unified time table (UTT) mandated by the STA (State Transport Authority). This makes for optimal utilization and integration of capacity and assets.

4. **Briefly describe the benefits derived from implementing the initiative**
   There has been significant improvement in reliability of services, which has made the bus service popular. The previous system did not have IT in use applications either for monitoring of operations and ticketing. This has been effectively introduced under the new system. The buses are monitored through Automatic Vehicle Location System. This enables the commuter who has real time information available at his fingertips.
   He may plan his journey, know the expected time of arrival of a bus on a particular route at a specific bus stop, register his feedback online, etc.

5. **Innovative characteristics about this initiative**:
   - Automatic Vehicle Location System
   - Automatic Fare Collection System with Electronic Ticketing Machines and Real Time Data Availability
   - Bus Management System
6. Problems faced
Describe the problems faced in implementation of the initiative & how were they overcome?
Challenges in provision of better reliability of bus-based public transport system were overcome by
- Deployment of technology to optimize resources
- Real time information availability for passengers
- Proactive action on commuter feedback and suggestions

7. Sustainability
How is the sustainability achieved in the initiative?
The Gross Cost Model which has been commended by the erstwhile Planning Commission of India,
has been adopted by Nagpur city, and many other Indian cities are considering adoption of the same
model. This business model is replicable in other Indian Cities and Cities in the Sub-Continents.

8. Transferability
a. What can others learn from this initiative?
Many key aspects of the scheme can be adopted in other city public transport systems, such as use
of technology to optimize bus operations and monitoring of route performance.
b. Has initiative been replicated / adopted elsewhere? Where? By Whom?
The scheme has been replicated in Nagpur city by Nagpur Municipal Corporation.

9. Recognition / Awards:
Has this initiative been awarded / recognized anywhere?
Recognition/ Awards received
- Award for Excellence in Urban Transport for the year 2011 as a Commendable Emerging Initiative
  in the category of Best PPP initiative in Urban Transport Towards Improvement in Public Transport
  in the City of Delhi through Scheme of Corporatization of Private Stage Carriage Service, 2011
- UITP Asia Pacific Regional Award in the category of Service Improvement for Restructuring of
  Private Stage Carriage Buses, 2011
- UITP Award - Grow Innovative with Public Transport Business Model Award for Corporatization of Private Stage
  Carriage Services in Delhi, 2013
- UITP Award in the category of Smart Financing and Business Model for Reform of Bus Transport System in India
  (Delhi) – Pt X 2 Strategy (Nominated), 2015
- Skoch Mobility Awards, December 2016 for Corporatization of Private Stage Carriage Services in Delhi, 2016

Inauguration of 100 cluster buses by Hon’ble
Minister of Transport and Speaker
1. Name of the organization: Gujarat State Road Transport Corporation
   ST Central Office, Central Workshop Compound, Naroda, Ahmedabad-382346.
   Phone: 079-22831601, Fax: 079-22803065
   Email: vcmd@gsrtc.in / Website: www.gsrtc.in

2. The following details to be furnished in the table

<table>
<thead>
<tr>
<th>No. of Central Workshops</th>
<th>No. of Divisions / Regional Workshops</th>
<th>No. of Depot Workshops</th>
<th>Total No. of Workshop employees (both regular &amp; contractual if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16</td>
<td>125</td>
<td>5668</td>
</tr>
</tbody>
</table>

3. Other parameters for evaluation

<table>
<thead>
<tr>
<th>Description</th>
<th>2011-12</th>
<th>2012-13</th>
<th>2013-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of injuries</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>No. of fatalities</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Loss of man days</td>
<td>10</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Compensation paid in Rs.</td>
<td>14266.00</td>
<td>2400.00</td>
<td>41696.00</td>
</tr>
<tr>
<td>Expenditure made under the head for implementation of safety regulation</td>
<td>5,79,439.00</td>
<td>4,53,021.00</td>
<td>10,23,737.00</td>
</tr>
<tr>
<td>Expenditure incurred safety awareness programs</td>
<td>60,700.00</td>
<td>1,06,820.00</td>
<td>2,18,709.00</td>
</tr>
<tr>
<td>Grade and ranking for the following points</td>
<td>9.5</td>
<td>9.7</td>
<td>9.6</td>
</tr>
<tr>
<td>1. Work-related injury</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2. Work-related fatalities</td>
<td>9.7</td>
<td>9.8</td>
<td>9.7</td>
</tr>
<tr>
<td>3. Loss of man days</td>
<td>9.5</td>
<td>9.6</td>
<td>9.5</td>
</tr>
<tr>
<td>4. Compensation paid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Implementation of safety Regulations</td>
<td>9.8</td>
<td>9.9</td>
<td>9.9</td>
</tr>
<tr>
<td>6. Creating awareness for safety</td>
<td>9.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand Total out of 60</td>
<td>58.4</td>
<td>58.9</td>
<td>58.5</td>
</tr>
</tbody>
</table>

4. Details in brief:

ENVIRONMENT, HEALTH & SAFETY POLICY

Gujarat State Road Transport Corporation shall aspire to be a committed and responsible corporate citizen. We shall always strive to accord highest importance for protection of environment, prevention of accidents and containment of health hazards.

This shall be demonstrated by:

1) Complying with all relevant Environments, Health & Safety (EHS) legislations, regulations and other requirements.

2) Proactively develop and implement EHS systems for identifying, monitoring and periodically reviewing EHS practices in order to minimize its impact on our business activities.

3) Conferring highest importance to continual improvement in all business process to prevent pollution, reduce wastage, conserve energy, identify and reduce risk as well as health hazard.
4) Facilitating knowledge up-gradation for all members of the Gujarat State Road Transport Corporation family as well as stakeholders, enabling them to understand and perform their roles and responsibilities towards improvement of EHS practices.

5) Encouraging all members of the Gujarat State Road Transport Corporation family to actively participate in EHS practices, by including individual EHS performance as one of the criteria in the evaluation process for career advancement.

6) Importance of EHS is reviewed at the highest level & the performance is highlighted in GSRTC’s Annual Report.

This policy shall provide meaningful direction to the efforts of entire Gujarat State Road Transport Corporation team towards improving EHS performance and invoke awareness in all concerned.

1. Occupational Safety & Health Policy : Available and displayed at all locations

2. OS&H Organizational Set-up : Safety, Emergency Response & Clinic set-ups exist

3. Education & Training:
   - Full-fledged training centre exists. Training schedule includes safety training also.
   - Activities covered in PTW
     - Vehicle movement
     - Maintenance I construction activity within restricted area
     - Construction work in the administration building and other area
     - Cleaning of equipment in the workshop
     - Maintenance of fire water network system that requires shut-down
     - Maintenance work at GSRTC Depot
     - Any other non-routine work

4. Employees Participation in OS&H Management
   - Central and department safety committees exists. Safety suggestions are invited. Safety competitions are organized and records maintained

5. Motivational & promotional measures for OS&H
   - Such measures are carried out

   - Prepared, followed and implemented

7. Compliance with Statutory Requirements
   - Remarks of Factory Inspectors and other legal compliance complied with

8. New Equipment Review/Inspection
   - Details procedure exist

9. Accident Reporting, Analysis, Investigation & Implementation of Recommendation
   - Accident analysis and investigation reports are available

10. Risk Assessment Including Hazard Identification :
    - The main hazards identified on the facilities are listed below :
      1. Earthquake activity in the vicinity
      2. Leakage on the process facilities
1. CNG leaks
3. Fires - electrical fires
4. Environmental pollution
   (a) Following spills during tank filling operations
   (b) Oily water
5. Dropped objects
6. During loading / unloading

11. Safety Inspections :
   Safety Department carried out such inspection. Report is maintained

12. Health & Safety Improvement Plan/Targets :
   Five-year HSE plan & target exist Five-year HSE plan & target exist

13. First Aid Facilities- Occupational Health Centre :
   1. Part Time Qualified Doctor available at all Depot and divisional offices also
   2. Medical Centre and First Aid Boxes are provided at various places
   3. First AidERS have been trained at site conducted by EHS Training Institute, approved by Govt. of Gujarat

14. Personal Protective Equipment :
   Provided to all the employees & contractors including security staff & visitors

15. Good Housekeeping :
   Housekeeping, inspection and follow-up are carried out. Housekeeping is good. Employees feel it is part of duty

16. Machine & General Area Guarding :
   It is provided

17. Material Handling Equipment :
   Chain pulley blocks, Cranes & All lifting tackles etc. are maintained in good condition and it is certified by competent authority

18. Electrical & Personal Safeguarding :
   Electrical safety procedure exists and followed strictly

19. Ventilation, illumination & Noise :
   1. Measures have been taken for natural ventilation of areas where combustible gas may accumulate, and to vent explosion over pressures as safely as possible. It is particularly important to protect critical safety systems.
   2. Noise level Monitoring carried out and complied by GPCB norms and in respect of controlling control noise, wherever required ear plug and ear muffles are provided at each entry of noise area.

20. Work Environment Monitoring system :
   Record for environmental parameters is maintained as per GPCB norms and complied

21. Prevention of Occupational Diseases Including Periodic Medical Examination :
   Depot regularly do pre-employment medical check-up and periodical check-up subsequently

22. Safe Operating System :
   Written SOP are prepared and followed
23. Work Permit System:
   Activities covered in PTW
   [PERMIT TO WORK SYSTEM]
   1. Vehicle movement
   2. Maintenance / construction activity within restricted area
   3. Concurrent activities in restricted area
      (e.g. construction and operation)
   4. Construction work in the administration building
   5. Cleaning of equipment in the workshop
   6. Maintenance of fire water network system that requires shut-down
   7. Maintenance work on GSRTC all machineries
   8. Any other non-routine work

24. Fire Prevention, Protection & Fighting Systems:
   The following fire protective equipment:
   1. Fire hydrant, monitor, remote operated monitor
   2. Two-way fire hydrant monitor
   3. Portable fire extinguishers are provided
   4. Carbon-di-oxide extinguisher
   5. Gas, Smoke detector have been fixed in all the depots

25. Emergency Preparedness Plans (on-site/off-site):
   Emergency response plan prepared that includes on-site emergency plan

26. Process/Plant Modification Procedure:
   Procedure available

27. Transportation of Hazardous Substances:
   CNG, Diesel and other hazardous product MSDS available and followed strictly

28. Hazardous Waste Treatment & Disposal:
   Disposed at GPCB approved at site, as per GPCB norms

29. Safety in Storage & Warehousing:
   Safety in Storage & Warehousing provided with required fire protective equipment

30. Contractor Safety:
   Contractor employees are given training & PPE provided before mobilization including sub-contractor

31. Safety for Customers:
   Safety induction training given to all
BEST PRACTICE Catalogue
Name of the Initiative: Computerized monthly concessional RFID pass system

Year of Implementation: Jan 2013 (Pass system software) Sep 2016 (RFID system)
Year of Completion: Dec 2016 (with RFID implementation)

1. Organizational Details:
   Name of the organization: Kadamba Transport Corporation Ltd.
   a. Head of the organization: Shri Derrick Pereira Neto
      with their complete contact details (name, designation, phone, email Ids)
      Managing Director 0832-2415606 kadambapo@yahoo.com
   b. Type of organization: Public Sector Undertaking
   c. Details of the officer who implements this initiative:
      Shri Sanjay L. Ghate General Manager
      9422441041 / kadambapo@yahoo.com

2. Situation before the initiative:
   Briefly describe the conditions in the area before the implementation of the initiative.
   - Before implementing pass system software, clerks were maintaining all the records manually.
   - Passes were given manually using MS paper.
   - The concession which was given for pass by Government of Goa for various commuters’ categories was calculated manually thus it was hectic process for them.
   - Various reports like Taluk-wise report, Trip-wise report, and MIS report were difficult to generate and taking more time hence subsidy was getting delayed.
   - After implementation of Concessional Pass system software, the passes were started to print through software application.

3. Description of the initiative & implementation strategy:
   a. Describe in detail the processes adopted in implementation of the initiative.
      - In order to make manual process computerized, KTCL contacted Goa Electronics Limited (Govt. of Goa) who converts manual processes into an automated process by developing suitable software.
      - Training was given to clerks to use the software (e.g. registering passes, generating reports, renewal processes, etc.)
      - In 2016, KTCL moved towards RFID implementation - a step towards implementing RFID cards to make the renewal of passes more effective.
   b. What were the activities taken up to implement the initiative?
      - In order to implement RFID system, integration of RFID by third party (MicroFx) was implemented in the software which was developed by Goa Electronics Limited.
      - Rigorous testing was carried out to check for presence of bugs wherever printers which print RFID cards were purchased.
4. Briefly describe the benefits derived from implementing the initiative:
   - All the manual records got computerized hence we can get all the required reports on-time.
   - Earlier, pass renewal was a tedious process, now it became a simpler one since searching commuter’s data in software became easy.
   - Commuters’ waiting time for renewal of passes was reduced drastically.
   - Card can be blocked in lost-found situation, thus it solved the pass misuse problem.

5. Partner’s information (if any): Goa Electronics Limited, Panaji-Goa

6. Innovative characteristics about this initiative:
   - Commuter can renew the pass on the go with the help of conductor.
   - No need to visit pass counters thus reduces precious time of commuters.
   - Transparency - Before RFID implementation we were getting data regionally like taluk-wise, city-wise and route-wise. Now we get trip-wise data of passenger travellers so we get correct trip-wise load factor and define if any additional services required during particular time.

7. Problems faced:
   Describe the problems faced in implementing the initiative & how were they overcome?
   - Sorting of technical-related problems was challenging one since RFID software was related to ETM machines and to integrate that software with web-based was complicated process. To solve the problem, web services solution was implemented to fetch data from Goa Electronics Limited to RFID software.
   - Some conductors did not know about the RFID cards and how to use them in case renewal process occurs.
   - Rigorous training was provided to them so that they can handle it smoothly.

8. Sustainability:
   How is the sustainability achieved in this initiative?
   - Concessional pass is a scheme which was introduced by Govt of Goa hence KTCL receives subsidy quarterly. Also after introducing this scheme more number of commuters who travels in private buses and uses personal transport migrated to KTCL buses. Hence there was 7% increase in load factor.

9. Transferability:
   a. What can others learn from this initiative?
      - KTCL is transferring from manual tasks to automated ones and this is one of the tasks which have been successfully implemented towards betterment of staffs as well as commuters.
      - Implementing innovative ideas into a reality is a challenging task which KTCL is trying to do in serious mode.
   b. Has initiative been replicated/adopted elsewhere? Where? By Whom?
      - RFID is an innovative process which was successfully implemented by KTCL and till date, no other STUs has implemented this especially renewal of passes by conductors.

10. Recognition/Awards:
    Has this initiative Been awarded/recognized anywhere?
    - Not Yet -
Karnataka State Road Transport Corporation
Name of the Initiative  AWATAR (Any Where Any Time Advance Reservation System) with Mobile Booking:

Start date : 29th April, 2006 and 15th October, 2009 (mobile booking)
Purpose : Passengers to reserve seats in advance in KSRTC services from any part of the world through mobile
Purpose : Passengers to reserve seats in advance in KSRTC services from any part of the world
Cost : 50 lakhs per annum mobile booking Cost: 5.00 lakhs

The web-based Passenger Advance Reservation system AWATAR (Any Where Any Time Advance Reservation) developed by KSRTC is operational since 29th April, 2006. The KSRTC is the first STU in India to implement the web based passenger reservation system. Web-based Reservation system is one of the several technology-driven initiatives taken up by the KSRTC in recent years. This system has enabled the passengers to reserve seats in advance in KSRTC services from any part of the world. This system has gained very good response from the traveling public and the franchisees.

KSRTC has launched E-booking and Mobile ticket booking features in AWATAR system. E-booking was launched on 12th March, 2007 and Mobile ticket booking was launched on 15th October, 2009. E-booking enables the passengers to book seats sitting at home and even from places where KSRTC or franchisee counters are not available. Similarly, mobile booking enables the passengers to book seats using their Mobile phones through a user-friendly software. With this service of ‘Tickets on the GO’, KSRTC has added another feature wherein commuters can book tickets for all bus services by using mobile application. This feature provides immense convenience to the commuter in accessing KSRTC services.

The authorities of several STUs of the country have visited KSRTC to study the system. Some of the STUs (Andhra Pradesh, Tamilnadu and Maharashtra) have already implemented this system in their States. The Passenger Advance Reservation system AWATAR of KSRTC has been recognized as a major IT initiative and bagged following Awards for successful implementation and exemplary use of IT among Public Sector Undertakings.

1. National award for “Exemplary implementation of E-Governance initiatives” in the 13th National Conference on E-Governance from Govt. of India. AWATAR project was adjudged as the Best in the category of ‘Exemplary Use of IT among PSUs’.
2. KSRTC has won the Prestigious “Golden Peacock Innovative Product/Service Award-2010.” instituted by Institute of Directors, New Delhi.
AWATAR system is catering to the needs of three Corporations (KSRTC, NWKRTC and NEKRTC). Presently, 3024 services (188 Airavat Multiaxle SSL, 464 Airavat (Volvo), 18 Mercedes Benz, 6 Ambari A/C, 733 Rajahamsa, 84 Carona AC sleeper (Ambari), 13 Sheetal A/C, 13 Semide luxe, 101 Non A/C Sleeper, 12 Meghadoota, 8 Jumbo (Mayura), 73 Karnataka Vaibhav and 1311 Karnataka Sarige (Express) are available for booking.

To ensure that the booking counters are easily accessible and are located at convenient places, the number of counters has been increased from time to time. Franchisees have been appointed not only in Bangalore but also at various places within the State and in neighbouring States of Andhra Pradesh, Tamilnadu, Kerala, Maharashtra and Goa. The AWATAR system which, initially started with 121 counters, has 743 counters at present. The details are as under.

<table>
<thead>
<tr>
<th>Place</th>
<th>No. of Corporation Counters</th>
<th>No. of Franchisees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangalore City</td>
<td>20</td>
<td>128</td>
</tr>
<tr>
<td>Within KSRTC</td>
<td>30</td>
<td>171</td>
</tr>
<tr>
<td>NWKRTC Jurisdiction</td>
<td>47</td>
<td>52</td>
</tr>
<tr>
<td>NEKRTC Jurisdiction</td>
<td>14</td>
<td>85</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>2</td>
<td>32</td>
</tr>
<tr>
<td>Goa</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Kerala</td>
<td>3</td>
<td>43</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>2</td>
<td>37</td>
</tr>
<tr>
<td>Pondicherry</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Tamil Nadu</td>
<td>4</td>
<td>44</td>
</tr>
<tr>
<td>Bangalore-one</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Master Franchisee</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>123</td>
<td>620</td>
</tr>
<tr>
<td>Grand Total</td>
<td>743</td>
<td></td>
</tr>
</tbody>
</table>

The number of seats booked and the revenue realized from AWATAR bookings has increased every year. During the year 2011-12, 73,60,312 seats have been booked and the STUs (KSRTC, NWKRTC and NEKRTC) have realized revenue of Rs.326.30 Crores. The details of total seats booked and revenue realized is as follows.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of seats</th>
<th>% age growth</th>
<th>Revenue (in Rs. Crores)</th>
<th>% age growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-07</td>
<td>3210692</td>
<td>NA</td>
<td>92.66</td>
<td>NA</td>
</tr>
<tr>
<td>2007-08</td>
<td>5138891</td>
<td>60 %</td>
<td>154.88</td>
<td>40 %</td>
</tr>
<tr>
<td>2008-09</td>
<td>5466636</td>
<td>6 %</td>
<td>184.36</td>
<td>15 %</td>
</tr>
<tr>
<td>2009-10</td>
<td>5732681</td>
<td>5 %</td>
<td>207.59</td>
<td>11 %</td>
</tr>
<tr>
<td>2010-11</td>
<td>6610891</td>
<td>15%</td>
<td>265.37</td>
<td>28%</td>
</tr>
<tr>
<td>2011-12</td>
<td>7360312</td>
<td>11%</td>
<td>326.30</td>
<td>23%</td>
</tr>
<tr>
<td>2012-13</td>
<td>7965740</td>
<td>8%</td>
<td>394.95</td>
<td>21%</td>
</tr>
<tr>
<td>2013-14</td>
<td>7751263</td>
<td>-3%</td>
<td>432.76</td>
<td>10%</td>
</tr>
<tr>
<td>2014-15</td>
<td>7953084</td>
<td>3%</td>
<td>472.43</td>
<td>9%</td>
</tr>
<tr>
<td>2015-16</td>
<td>7953037</td>
<td>0%</td>
<td>479.68</td>
<td>1.5%</td>
</tr>
<tr>
<td>2016-17(Oct-16)</td>
<td>4485431</td>
<td>-6.6%</td>
<td>272.31</td>
<td>-7.0%</td>
</tr>
</tbody>
</table>
No. of seats booked and revenue realized through E-booking:

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of seats</th>
<th>% age growth</th>
<th>Revenue (Rs. in Crores)</th>
<th>% age growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006-07 (For March’07)</td>
<td>5717</td>
<td>NA</td>
<td>0.21</td>
<td>NA</td>
</tr>
<tr>
<td>2007-08</td>
<td>215193</td>
<td>NA</td>
<td>8.10</td>
<td>NA</td>
</tr>
<tr>
<td>2008-09</td>
<td>428453</td>
<td>99%</td>
<td>18.75</td>
<td>131%</td>
</tr>
<tr>
<td>2009-10</td>
<td>819920</td>
<td>91%</td>
<td>37.44</td>
<td>100%</td>
</tr>
<tr>
<td>2010-11</td>
<td>1232527</td>
<td>50%</td>
<td>62.72</td>
<td>68%</td>
</tr>
<tr>
<td>2011-12</td>
<td>1968715</td>
<td>60%</td>
<td>109.23</td>
<td>74%</td>
</tr>
<tr>
<td>2012-13</td>
<td>2622070</td>
<td>33%</td>
<td>157.69</td>
<td>44%</td>
</tr>
<tr>
<td>2013-14</td>
<td>2818000</td>
<td>7%</td>
<td>183.14</td>
<td>16%</td>
</tr>
<tr>
<td>2014-15</td>
<td>3413040</td>
<td>21%</td>
<td>234.90</td>
<td>28%</td>
</tr>
<tr>
<td>2015-16</td>
<td>3797125</td>
<td>11%</td>
<td>259.99</td>
<td>11%</td>
</tr>
<tr>
<td>2016-17 (Oct-16)</td>
<td>2324881</td>
<td>4.5%</td>
<td>158.83</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

The average seats booked and revenue realized per day from AWATAR advance reservation system during the period 01.04.2016 to 31.10.2016 is as under. (advance booking reduced to 15 days)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Average number of seats booked per day</th>
<th>Average revenue realized per day (lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total book</td>
<td>20960</td>
<td>127.25</td>
</tr>
<tr>
<td>Online</td>
<td>10864</td>
<td>74.22</td>
</tr>
</tbody>
</table>

With a view to increase the bookings of seats for KSRTC services to effectively compete with private operators, attract more number of franchisees, to ensure that franchisees attract passengers from private services towards KSRTC services and increase the bookings for KSRTC services various measures/initiatives as under have been taken by KSRTC.

1. The advance booking days have been increased to 30 days from 10 days. Similarly provision has been made for booking of tickets round the clock.
2. To encourage advance reservations, the reservation fee is reduced from Rs.15/- to Rs.5/- for fare upto Rs.200/- and from Rs.15 to Rs.10/- for fare > Rs.200/-.
3. To encourage e-bookings, the convenience fee (payment gateway charge) is being reduced from 2.5% of the fare to Rs.10/- per seat.
4. Action has been initiated to communicate ticket booking confirmation, cancellation and service cancellation information through SMS for passengers.
5. Telephone numbers of the advance ticket booking passengers are being printed in the trip sheets. This would help KSRTC to contact passengers where needed.
6. Arrangements have been made for booking of tickets in Bangalore through “Bangalore-One” centres (e-governance project of Government of Karnataka). Presently, Bangalore-One is booking tickets at 60 of their centres in Bangalore city.
7. To further expand the franchisee network and to attract more number of applicants, the minimum educational qualification is relaxed from Degree to SSLC.
8. The minimum educational qualification criterion for places outside the State is removed.
9. Two Seats earmarked for Lady Passengers (travelling single) in all Semi Deluxe and higher class of services having advance reservation facility.
10. Avatar Passengers are allowed to travel free in city service (except AC) to reach pick-up points during before two hours of departure time and up to departure time of the service.

11. Pick-up points have been provided under AWATAR system at various places in Bangalore, Mangalore, Mysore, Chikkaballapur, and Bidadi and at various Inter-state places such as Mumbai, Pune, Shirdi, Hyderabad, Panaji, Madagao, Puducherry, Coimbatore, Aleppy, etc.

12. To provide front-end support to the franchisees, redressal of passenger grievances regarding bookings, e-booking transactions, enquiries about mobile bookings, etc, a cell has been established at KSRTC Central Office (under the Traffic department) which works between 07:00 hrs to 22:00 hrs on all days.

Benefits:

- Enquiry
- Dynamic service search on homepage
- Link service booking
- Pre-pone / Post-pone booking
- Duplicate ticket printing
- Modification of boarding points
- Cancellation of seats - Full Cancellation/Partial Cancellation
- Discount, Concessions & loyalty Scheme- Group discount, return journey discount, senior citizen concessions, Prayanothsava loyalty scheme, etc.
- Schedule management
- Fare management
- Service management
- Users and Roles and Privileges management
- Ticket Inventory management
- Franchisee management
- Payment Gateway management
- General Masters
- General Reports
- Complaint / Grievance / Suggestion / Feedback
- Content management
- Security & Logs management
- Manual reservations
- Casual contract booking
- Loyalty programs
- **SMS Alert:** KSRTC also facilitated sending SMS for the confirmation of seat booked through e-booking, counters and mobile device. The SMS will contain all the journey details

- **Capturing mobile numbers on Trip-sheet:** Mobile numbers of the passengers captured during booking is printed on Trip-sheet given to the conductor. If there is a delay in the bus arrival or if the reserved passenger does not turn up, the conductor can call up the passenger about their arrival and can wait up to 5 minutes / depending on the circumstances of the passenger, which is a great advantage to the passenger

- **Paperless ticketing:** Passenger can travel in the bus by showing SMS delivered to them on confirmation of the tickets booked, contributing for green revolution

Results Achieved

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Status at the time of launch</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. seats booked per day</td>
<td>10000</td>
<td>23000</td>
</tr>
<tr>
<td>Avg. Revenue per day (Rs.)</td>
<td>22 lakhs</td>
<td>137 lakhs</td>
</tr>
<tr>
<td>e-booking: Seats/day</td>
<td>0</td>
<td>13000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>----------</td>
<td>--------------</td>
</tr>
<tr>
<td>e-booking: Revenue/day (Rs.)</td>
<td>0</td>
<td>86 lakhs</td>
</tr>
<tr>
<td>No. of registered users</td>
<td>0</td>
<td>35 lakhs plus</td>
</tr>
<tr>
<td>Users covered</td>
<td>Karnataka</td>
<td>Worldwide</td>
</tr>
<tr>
<td>Seat Booking Counters</td>
<td>125</td>
<td>726+</td>
</tr>
</tbody>
</table>

**AWATAR mobile booking:**

KSRTC, India implemented a mobile-based ticketing application that enables commuters to enquire about bus routes, bus schedules and book advance travel tickets through mobile internet from anywhere to anywhere. AWATAR provides a host functionalities and features bringing more convenience and value-added services to commuters.

Now, KSRTC has become the first STU to introduce URL-based mobile booking application, tickets can be booked in a single hand, by enjoying a cup of tea in other hand.

No need to download or request any additional application to book the tickets on your Mobile. Just...
access the URL “ksrtc.in/mobile” from GPRS enabled mobile and book your ticket within 2 minutes. Enjoy
the best and user-friendly GUI developed only for Mobile booking-savvy users.
One time registration for both e-booking and mobile user i.e. any e-booking user needn’t register once again
to book or cancel the ticket through mobile.
Now, you can check/view of your e-tickets booked status on your mobile. Passengers can now cancel their
e-tickets from mobile and vice-versa.
KSRTC, one of India’s foremost public transport corporations, introduced mobile ticket booking service,
which brings immense convenience to the commuters in accessing KSRTC and availing its services.

**KSRTC also sends SMS for the confirmation of seat booked.**

**3 Ways of ticket booking through mobile device:**

- URL-based application
- Android application
- Windows application

The mobile booking application will provide the following services through mobile devices:

- Availability
- Booking
- Cancellation

**Benefits:**

- Enquiry
- Dynamic Service search on homepage
- Modification of boarding points
- Cancellation of seats - Full Cancellation / Partial Cancellation
- Discount, Concessions & loyalty Scheme - group discount, return journey discount, senior citizen
  concessions, Prayanothsava loyalty scheme, etc.,
- **SMS Alert** : KSRTC also facilitated sending SMS for the confirmation of seat booked through
e-booking, counters and mobile device. The SMS will contain all the journey details.
- **Capturing mobile numbers on trip-sheet** : Mobile numbers of the passengers captured during
  booking is printed on trip-sheet given to the conductor. If there is a delay in the bus arrival or
  if the reserved passenger does not turn up, the conductor can call up the passenger about their
  arrival and can wait up to 5 minutes / depending on the circumstances for the passenger, which
  is a great advantage to the passenger.
- **Paperless ticketing** : Passenger can travel in the bus by showing SMS delivered to them on
  confirmation of the tickets booked, contributing for green revolution.

**Recognitions:**

- ASRTU National Transport Excellence Award for IT initiatives-2015
- IIMM – SCM Best Innovation Award-2013
- International Public Transport Award (UITP) – Innovation Award-2013
- Apollo CV Award for Public sector bus fleet operator of the year-2014
- Golden Peacock Innovative Product/Service Award -2013
- D.M.A.I Synergy Award-2012
- Digiratti Award-2012 for Effective social media management
- National 1st FIEO - Telecom Technology Award -2011 by Ministry of Commerce and Industry , Govt. of India
- IBM Great Mind Challenger for Business Award -2010
- m-Billionth South Asia Award-2010
- Manthan South Asia Award-2012
- National e-Governance Award-2009 for Exemplary Usage of ICT among PSUs by Ministry Personnel & Administrative Reforms, Govt. of India
1. Objective of the Innovative best practice:

- To establish an intelligent system to improve quality & convenience of public transport system in Mysore city and ensure the delivery of safe, fair, reliable and environment-friendly transport system
- To promote use of sustainable transport modes and enable commuters to make informed choices on travel modes by developing an integrated network in an effort to reduce passenger wait times
- To optimize operations, improve fleet utilization, schedules, and vehicle availability with accurate information

2. Details in brief:

**MYSORE CITY TRANSPORT DIVISION, KSRTC**

India needs to focus on curtailing growth of private vehicles. KSRTC along with Ministry of Urban Development, Government of Karnataka, World Bank and UNDP is focusing on sustainable transport solutions in Mysore. In a plan of action, KSRTC wanted one city to serve as an example for sustainable transport solution of Intelligent Transport Systems (ITS) that is expected to be replicated across India. Public transport should always be the hallmark of a good transportation system for a city, especially for a city like Mysore, which is earmarked as:

- City of palaces & major tourist destination
- City of Heritage famous for silk, ivory & sandal wood, developing as a IT hub
- City growing as satellite city of Bangalore and IT activities, commercial, industrial & educational institutes shifting to Mysore.

**Following are the status / situation prior to introduction of initiative in Mysore:**

- Inadequate Infrastructure
- Very rapid increase in motorization
- Substantial increase in traffic congestion
- Relative decline of public transport usage and services
- Increased Waiting Time, Unpredictability & Uncertainty
- Risk to Safety of Road Users
- Increased Fuel Consumption and Emission
- Increased Operational Costs
- Decreased Traffic Efficiency
- Higher Traffic Congestion
- Decline in Economic Productivity
- Non-availability of Real Time Information for passengers about bus arrival and departure
- Lack of decision enabling MIS Reports
- No monitoring system of bus operations, control room was not there
- Absence of two-way communication between bus driver and control room
- No system to inform commuters about the bus routes and arrival timings of buses at the bus stops/terminals and notify commuters about schedule changes through appropriate display systems; Expected Time of Arrival (ETA) and Expected Time of Departure (ETD) information to passengers in real time was not available for passengers to plan their trips and reduce the waiting time
- Manual dispatch of buses
- Bunching of buses, no system to cross check the public grievances/complaints
- No tools for schedule rationalization available
- Digitization of transport operational records not available
No system to track the dynamic status of bus operations nor on GIS map

Absence of Mobile App with value-added feature to aid commuters for trip planning

**Previous method followed:**

**Manual dispatch of buses:**
Previously dispatch of buses were done manually. Traffic controllers use to stand at bus bay and used to make drivers to depart with the bus at right time. But there were no tools for tracking and recording the same. All works related to dispatch were done manually.

**Manual control over bus operation:**
There was no control over bus operation. There was chance of non-stopping of buses at bus stops, early departure, early arrival, late departure etc. Traffic inspectors and Traffic controllers were manually monitoring these. Sometimes driver may take the bus at right time but may stop the bus in the middle and come back without reaching destination. KSRTC needed to depute traffic controllers to the destination to check whether drivers are taking the buses to destination at right time or not. This was extra manpower burden on KSRTC.

**Manual assessment of rationalization of schedule / bunching of buses etc..**
Traffic controller and traffic inspectors used to roam in the city and access the rationalization of schedule / bunching of buses. Based on their assessment they would submit the report to higher officials to take necessary action so as to avoid bunching of buses.

**Absence of two-way communication between crew on duty and the control room:**
If there was any problem (Breakdown / Accident) and driver wants to communicate the same to the Depot / Division, driver must rely on the public telephone booths or any other bus crew who is returning from that route and inform the same to concerned at Depot / Division.

**Manual data collection and preparation of report:**
Data related to operation is collected manually, by using the same reports were prepared. Based on these reports, management used to take the required decisions. Manual collection of data may lead to erroneous reports.

**No real time information about the buses to commuters as well as KSRTC officials :**
Data collection and other works related to schedule (bus departure details from Depot and arrival of bus back to depot) were done manually. Extra manpower was utilized for these types of works.

**New technology introduced**

The City of Mysore needed to achieve a model shift towards public transportation. The ITS project aimed at offering - Real-time monitoring and tracking of buses and help reduce road congestion and other transport issues; Dynamic Passenger Information System (PIS) based on Geographical Positioning System (GPS); advanced display and communication technologies, Central Control Station (CCS) and intelligent display boards. Overall, the ITS project improved passenger safety, fleet efficiency, services and traffic situation through transmission of real time information.

Intelligent Transport System has been implemented in all buses of Mysore City Transport Division. The project scope includes 500 buses, 105 bus shelters and 45 platforms. ITS provides bus arrival and departure timings in real time to commuters through MITRA website, SMS, IVRS, PIS boards and Mobile App. The System also generates MIS reports. The Mobile Application ‘MITRA-KSRTC Mysuru’ for the ITS, Mysore has been launched with the features of searching available buses, tracking bus, route map, women safety and tourist places etc., to enable commuters to use the system easily. The app has been ranked high by the commuters.

**Following are the features implemented in the project:**

**Project Components :**

The ITS project is popularly branded as MITRA (Mysore Intelligent TRAnsport); indeed an opt name for this commuter friendly initiative. (MITRA name was selected through online campaign on KSRTC Facebook page, with participation of more than 5000 entries)

To enhance KSRTC’s efficient functioning, ITS project is implemented with the following sub-systems:
A. Real Time Passenger Information System - The Unique Selling Proposition (USP) of the project is to provide Expected Time of Arrival (ETA) and Expected Time of Departure (ETD) of buses in real time. Currently, this information is provided through:

(a) SMS – The SMS system will provide real-time bus arrival information and scheduled bus availability for the convenience of customers. In this way, customers shall be able to plan their trip according to real-time information.
[Visit http://mitra.ksrtc.in/MysoreMBus/sms.jsp for details].

(b) IVRS - The Interactive Voice Response System (IVRS) will provide responses to the KSRTC bus customer queries through pre-recorded messages / operator in Kannada and English specific to Mysore bus operations and is accessible from mobile or land line phones. Currently, Commuters are calling toll free No.1800-425-5220 and 0821-2520070.
[Visit http://mitra.ksrtc.in/MysoreMBus/ivrs.jsp for details].

(c) Passenger Information System Display Boards - KSRTC has commissioned 193 Nos. of Passenger Information Display Boards at 111 locations including bus shelters, bus stations, tourist places, prominent places like Railway Station, Hospital, Infosys campus etc. The LED/LCD Boards with different sizes & dimensions accommodating 2 lines, 4 lines, 8 lines, 10 lines and 16 lines of information in both Kannada and English are commissioned at various places of city based on bus traffic generating potential.

(d) Commuter Portal - mitra.ksrtc.in/ is the bilingual commuter portal providing host of information to commuters which include information on usage of various sub components of ITS, track the bus on GIS map, time table, route details, fare, KSRTC bus services etc.
[Visit http://mitra.ksrtc.in/MysoreMBus/index_e.jsp for details].

(e) Mobile Application - (MITRA-KSRTC-Official APP): The App developed by five students of SJCEE, Mysore has the following features:
- Journey Planner between any Origin-Destination pair, giving best routing including transfers
- ETA at any given stop, which can be searched by route or by stop
- Facility to track a bus
- Map facility, showing the area around any stop. This can be layered in the style of (e.g.) Google Maps to show available amenities
- Tourist information, giving information about any tourist amenity itself, the bus routes to reach it and the applicable fare
- Women’s safety feature, in which two numbers can be stored. When activated, a pre-configured text alert is sent to the two numbers along with the location
- Alert facility for commuters, for example if there is a schedule change on any route or on their preferred route(s)

B. In-Vehicle Display System & Automated Voice Announcement System: Passengers will be ready to alight the bus when bus is nearing the stop and is especially helpful to senior citizens, children and tourists.

C. Central Control Station (CCS) - is the State-of-the-art Command Centre established for monitoring and regulating the bus operations equipped with High-end video wall and advanced applications helping dispatchers to monitor the bus movements.

D. MIS Reports - KSRTC has designed and deployed customized MIS Reports capturing bus operations. Based on bus operations, ITS application generates 13 value-added reports which are being used by depot managers and traffic operations team for analysis and continuous improvements. The list includes – bunching of buses, schedule adherence, bus breakdown, route deviation, missed trips, daily schedule departure and arrival, punctuality of arrival and departure, schedule performance, operational summary and control chart.

With implementation of ITS enabled bus operations, average waiting time of passengers reduced from 20 minutes to 12 minutes. About 3 lakh passengers daily are benefitted with the system.
E. Date of implementation: 17-November-2012
F. Duration of implementation: 18 months

G. Purpose and priority of the initiative:
- To establish an intelligent system to improve quality & convenience of public transport system in Mysore city and ensure the delivery of safe, fair, reliable and environment-friendly transport system
- To promote use of sustainable transport modes and enable commuters to make informed choices on travel modes by developing an integrated network in an effort to reduce passenger wait times
- To optimize operations, improve fleet utilization, schedules, and vehicle availability with accurate information

H. Strategies adapted for implementation:
Major strategies planned and implemented are as follows:
- Building Knowledge Base - In-depth study, threadbare discussions, consultations
- Multi-lateral Co-ordination - City Administration, PMU, WB, Consultants, State Govt. etc.
- Acquaintance with Procedures - Finance, Procurement
- Team Work - KSRTC, Vendor, Consultants etc
- Detailed Project Planning and Documentation
- Sound Management Review Techniques - Weekly Meetings, Monthly Steering Committee Meetings, Field visits, Adhoc Meetings, consultations with PMC etc.
- Comprehensive Training Program
- Practical approach to problem solving

I. Outcome including exceptional achievements, impact and sustainability:
Exceptional Achievements with actual figures:
- Reduction in Bunching of buses - From 346 before project implementation to 8
- Reduction in Cancellation kms due to early arrivals - 24331 to 4877 kms over the two years
- Reduction in Cancellation kms due to late departures - 42238 kms to 16948 kms over the two years
- Improvement in depot departure punctuality - 9% to 91%
- Reduction in passenger waiting time reduced from 20 minutes to 12 minutes
- Reduction in rate of accidents - 0.15 to 0.09 per lakh kms
- Substantial decline in % of dead kms - 6.5% to 4.3%
- Considerable improvements in driving behaviour
- Increase in modal share from 39.8 to 42.2%
- SMS - 24197, IVRS - 29027 and Commuter Portal - 187074
- Schedule optimization - Reduction of 2314 kms daily; 844610 kms annually resulting in Savings of Rs. 160.05 lakhs
- Reduction in Staff Ratio - 5.2 to 4.9
- Reduction in Crew Ratio - 3.88 to 3.63
- Reduction in Buses - Same effective kms performed using 8 less nos. of buses - Savings Rs. 264 lakhs
- Preventive Maintenance - Savings on lubricants & filters Rs. 2.19 lakhs
- Staff Reduction - Savings of Rs. 35 lakhs
- Reduction in Overtime of 62475 Hrs - Savings of Rs. 124 lakhs
- MITRA - KSRTC Mobile App is popular with the user rating 4.6 out of 5.

Impact of the innovation can be identified with three perspectives:
a) Commuters’ Perspective :
- Real Time Information on bus arrival and departure
- Real Time Tracking
- Next stop bus announcement and display within the bus
- Reduced waiting time at bus shelters
- Comfortable Trip planning
- Value-added SMS and IVRS Services
- Exclusive Commuter Portal - mitra.ksrtc.in/
- Mobile app

b) Management Perspective :
- Real Time Tracking of Buses
- Control room monitoring
- Dynamic scheduling of Buses
- Schedule rationalization and Overtime reduction
- Digitalization of operations
- Driving behavior analysis
- Tool to address Motor Vehicle Claim Cases
- Cost reduction benefits

c) Society’s perspective:
- Promotes Public Transport usage
- Environment-friendly initiative with reduction in carbon foot prints
- Immediate access to accident/incident information
- Brings down traffic congestion
- Safety of commuters & pedestrians
- Involvement of all stakeholders

Sustainability :
- Organized Knowledge Exchange Workshops at Mysore
- More than 200 transport officials visited workshops
- National Media Meet Organized in Feb - 2017
- Implemented VTMS in 2000 buses
- ITS introduction in 1739 buses across 37 cities in Karnataka
- Rolling out VTMS in 16000 buses - KSRTC, NWKRTC and NEKRTC
- Launching Public Outreach & Communications program
- SUTP Newsletter - March 2016 edition “Dr. Humera Aiman shifted to Public transport because SMS Services instilled confidence”
- Mysore ITS project featured in “What Makes a Sustainable City?” - A sampling of Global Case Studies highlighting Innovative Approaches to Sustainability in Urban Areas published by World Bank Group
- KSRTC implementing ‘Data Sharing Policy’ and will soon share real time data with third-party developers

5. Implementation highlights (preferably in bullet points):
KSRTC had overcome many challenges faced at the time of implementation of the project. Following are the major challenges faced by KSRTC:

Planning
- Implementing the project for the first time in KSRTC
- Lack of subject knowledge
- Requirements study and analysis
- Conceptualization of ITS & control room-driven bus operations
- Utility analysis of each component of ITS project
- RFP Preparation with Technical and Functional Specifications
- Understanding of the Technology & Solutions
- Budget estimates and financial viability
- Multi-Agency Co-ordination

**Procurement**
- International Competitive Bidding (WB Guidelines), new to KSRTC
- Manual Tendering v/s e-tendering
- Finalizing the Contract Terms and Special Conditions of Contract
- Setting up Minimum Qualification Criteria - Financial & Technical
- Setting up Bid Evaluation Methodology - Financial, Technical & Project Management
- Evaluation of the documents supporting bidders’ qualifications
- Multi-Agency Co-ordination

**Deployment**
- Unavailability of historical project data (lessons learnt from previous ITS implementations in Indian conditions of this scale)
- Non-availability of best practices & guidelines
- Time to map / adapt technologies vs. existing business processes
- Additional rework to meet ITS solution requirements - (routes redefined)
- Stabilize solution while continuously optimize business process
- Synchronizing massive daily operational changes to system requirements
- Delayed stakeholder engagement (PMC, M&E)
- Recurring requirement changes
- Project Implementation Plan
- Excessive rework during Geo-fencing
- Multiple trips to capture, validate, and test physically
- Buses available only at night (for installations)
- Non-standard “in-bus” environment - different bus types / designs
- Impractical to standardize procedures
- Non-standard cabling needs
- Continuous VMU issues and bus power supply issues
- Availability of same voice-over (recording) for implementing changes
- Longer time to freeze PIS (passenger information system) format requirements
- Display multi-language formats as per specifications
- Non-availability of a single font (for Kannada + English)
- Unable to perform Over The Air (OTA) activity for operational changes
- Non-standard bus shelters, Unplanned effort & cost - additional concrete shelter reinforcement and Non-availability of power supply at bus-shelters (Corporation, Ad agencies)
- Excessive vibrations in rural routes - affecting in-bus equipment performance
- Security of ITS equipment in public places
- Availability and applicability of local insurance policies for ITS projects
- Availability of 100% GPRS signal
- Lack of flexibility (in contract) to deal with field realities and changes
- Residual ambiguity in RFP - Technical vs. Functional requirement conflicts
- Geo-fencing shelter-less bus stops
- Missing requirements in the beginning (dead KM)
● Building competency within available time constraints
● Ensuring effective promotions & communications (ITS and its benefits)
● Initial resistance to change by crew - fear of scrutiny
● Adherence to Geo-fence routes by crew
● Adherence to schedules and trips by crew
● Ensuring multi-lingual trainings to crew
● Ensuring continuous and refresher training
● Getting timely approvals and support from various local authorities like hospitals, tourist spots, railways, for deploying the PIS display boards

6. Output / Outcome:
Following are the major outcomes of the project implemented in Mysore city:
● Average waiting time for commuters at bus stops reduced from 20 minutes to 12 minutes.
● Surveys indicated higher user-satisfaction levels over benchmarks even without any Public Outreach Programme.
● Bus operations purely as per ITS requirements ensuring disciplined, controlled and systematic traffic operations;
● Notable improvements in late or early arrival and departure timings of buses. For example, bunching of buses at bus stops. Similar results were recorded in case of no. of bus stops skipped, speed violations, improper stoppages, driving attributes etc.
● KSRTC has been effectively using the ITS data to reap the full benefits that has helped in reducing the staff ratio.
● Rationalization of schedules using ITS data (Operating same kms minus 8 schedules over previous year - 422 Vs 430), optimization of all schedules, Real Time provision for trip timings, reduction in cancellation due to late/early departures, improvement in load factor, considerable reduction in accident rates etc. have been the results of analyzing ITS data and executing the action plans.
● From the cost savings perspective, Overtime given during 2015-16 is less than in 2014-15, resulting in savings of Overtime hours and corresponding payment.
● Reduction of staff in central bus station, preventive maintenance based on ITS kms etc. have also resulted in considerable reduction in costs.

7. Recognitions / Awards received:
● National e-Governance Gold Award
● Award of Excellence by Ministry of Urban Development, Govt. of India
● HUDCO Award
● CMAK Best Practices Award
● Best ICT enabled Urban Governance Initiative
● Apollo- CV Award
● Golden Peacock Award
● UITP (International Association of Public Transport) Regional Information Technology Award and Many More...
Name of the Initiative | Marketing Initiatives
---|---
Bio Bus | KSRTC is for the first time, launched 10 BIO-DIESEL buses, called BIO-BUS, as a pilot project. This will be followed with the fleet of 107 of an entire depot. In the ratio of B20 (20% bio-diesel) and 80% petrol diesel will be used for this process. KSRTC currently is operating around 8200 buses, if replaced with bio-diesel, there may be a saving of Rs 5 per litre. KSRTC has been successfully using a combination of bio-fuel with diesel and ethanol-blended diesel for some of its buses, resulting with significant reduction in fuel emission.

ALL ABOUT BIO-DIESEL

Bio-diesel is a clean burning renewable fuel made using natural vegetables oils and fats. It is made through a chemical process which converts oils and fats of natural origin into fatty acid methyl esters (FAME). It can be used as a replacement for petroleum diesel fuel, or can be blended with petroleum diesel fuel in any proportion.

Methodology used for fuel blending: The Fuel grade anhydrous denatured Ethanol stored in the Underground tanks is drawn accurately through electronic metering systems and using High pressure pumps injected to the fuel (HSD) while the solubilizer is pumped in to create a Homogeneous mixture comprising of 91.8% HSD+7/7% of Ethanol+0.5% of solubilizer to create a stable fuel of Ethanol blended Diesel. The fuel so produced has all the qualities of HSD and even better in terms of lubrication, Cetane no etc.

We envision the “Karnataka State Road transport”, to be the best state transport in the country. It is our endeavour to place ‘Karnataka State Road Transport’ at the helm of the public transport by dispelling the common notion of transport system to be a drain on the exchequer. As a responsible Public Undertaking, KSRTC believe that sustainable growth is possible only when we take all our stakeholders with us in our journey of growth.

The Airavat Progression

When KSRTC’s Airavat services first hit the road, it was acknowledged as a game-changer in the medium-to-long-haul category, and it still is. With the subsequent introduction of Airvat Club Class, Airavat Superia and Airvat Bliss, we continuously upgraded the Airavat experience.

Now, with the launch of the Diamond Class, KSRTC sets benchmarks for the Airavat lineage, with greatly enhanced standards of passengers comfort and safety. To experience this Airavat avatar, read on. Or hop on…

Marketing and Branding, Fleet Modernization like Airavat, Airavat Club Class, Airavat Superia, Airavat Bliss, Airavat Diamond Class, Fly Bus- First Intercity Airport connecting service. Cost minimization measures, Strengthening of Infrastructure, Revenue mobilization measures,

Airavat Diamond Class
KSRTC, one of the largest bus networks in India, is committed to bring-in innovation to continue to provide excellent service. To accomplish this one of the priorities was to minimize the impact of pollution on nature. KSRTC strives to achieve a better environment management system. As a part of Social Responsibility, and to maintain environmental standards of vehicular emission KSRTC introduces a novel concepts called “PRAKRUTHI- For a clean environment”, which means Nature in Sanskrit.

PRAKRUTHI is the First-of-its-kind initiative by any Road Transport Organizations in India. The project is implemented through the introduction of Emission Testing Shuttles, which commute across its network, to check the emission and noise levels of the buses. PRAKRUTHI is equipped with the advanced technology Smoke Meter and Sound Level Meter. They examine the carbon footprint levels, and also address the standards to control air and noise pollution. These shuttles are also the brand ambassadors spreading the message of environmental conscience.

KSRTC’s efforts in Environmental Protection:
KSRTC always strives to achieve a better environmental management like water conservation measures, usage of alternative fuel, solar energy, rain water harvesting. Latest addition is ‘PRAKRUTHI’- Green Squad which reaches out to its workforce to educate the importance of nature care, equipped with the advanced technology smoke meter and sound level meter. They examine the carbon footprint levels, and also address the standards to control air and noise pollution. Adding to this another initiative is “Bio-Bus”- using Bio-diesel in its buses to protect and promote clean fuel, clean air, clean environment and clean India.

GREEN SQUAD
A green squad reaches out to its workforce to educate the importance of nature care, stands as a testimony to the efforts made by KSRTC in creating awareness in environmental protection.

FLY BUS
KSRTC is proud to introduce Flybus - a luxury inter-city airport coach. Joining forces with Bengaluru International Airport, Flybus aims to make your pre departure travels less burdensome, quicker and economical. Passengers travelling in and out of the airport can benefit from this service. Coaches will ply from destinations and back, twice a day. Flybus will ensure a luxurious, reliable and affordable experiences to all passengers.
Project: flybus - Switch to flight mode even before take-off

flybus – India’s first intercity airport bus service introduced by Karnataka State Road Transport Corporation (KSRTC) between Bengaluru city and Mysore city.

Bengaluru the capital city of Karnataka State, one of the largest cities in India and ranked among top ten entrepreneurial locations in the world by The Economic Times. In 2012 Lonely Planet ranked it 3rd among world’s top ten cities to visit. Bangalore serves as an important airport hub city in South India for a number of other smaller cities like Mysore, Hubli, Hassan, Shimoga, Tirupathi and Calicut which sees a large influx of passengers using the airport. The perennial problem of the big-city traffic loomed the largest for flight passengers who were commuting from these cities to the KIA.

A recent gap identification study conducted by a globally reputed research agency, Lead Cap Ventures found that almost 10% of passengers to BIA come from upcountry locations. Most of the time, they are left with no choice as far as transportation is concerned. When it comes to women travelling alone and aged travellers, taxis are seen as the only safe option left. But under the current circumstances, even taxies are highly unaffordable. The research indicated that more than one third of the travellers prefer luxury AC buses compared to all the other modes of transportation.

Mysore has inter-city and intra-city suburban public transport bus system albeit not very robust. Mysore is the third largest city in the state of Karnataka, India which served as the capital of Mysore Princely Kingdom (Kingdom of Mysore) for nearly six centuries, from 1399 until 1974. Tourism is the major industry in Mysore. The city attracted about 3.15 million tourists in 2010. The growth of the information technology industry in the first decade of the 21st century has resulted in the city emerging as the second largest software exported in Karnataka, next to Bengaluru. In 2011, Mysore city had population of 0.9 million, spanning an area of 128 sq km. flybus service is helping to boost tourism, economic growth and an alternative sustainable mobility to an important historical, cultural and tourist centre of the state.

No public transport system connecting the neighbouring cities directly to the airport was in place. These passengers had to reach the airport via Bangalore, adding wastefully to their time and cost. The other alternative of hiring a taxi to the airport is expensive for most. To overcome, KSRTC launched flybus an ambitious and innovative project, placed with customer at the heart of the public transport system.

Place the customer at the heart of the Public Transport System: KSRTC has always treasured the traveller’s choice. A recent study conducted by a Lead Cap Ventures found that almost 10% of passengers to KIA come from upcountry locations. flybus is a boon addressing exactly the travellers’ needs.

Provide an integrated and first class offer of mobility service: flybus on Volvo multi-axle, uninterrupted WI-FI connectivity, in-bus pantry & chemical toilet, In-bus entertainment with 70+ personalised live TV channels to each passenger, seats with increased leg room, display of flight timings & related information, GPS enabled tracking.
Deliver alternative sustainable mobility: Based on the gaps identified in providing direct connectivity between Mysore & KIA flybus was introduced which proved to be a successful alternative mobility. Research indicates 1/3 of travellers prefer buses compared to other modes. KSRTC is providing more than just a transport service from point A to point B but also minimizing hassle-free travel between airport and their respective outlying cities. This not only reduces cost & time, but also diminishes the inconveniences on the move.

Features:
- In-Bus entertainment 70+Live channels to each seat
- Live display of flight timings
- GPS enabled
- Dedicated departure bay at Mysore Bus Station to Bengaluru International Airport and Kundapura to Bengaluru International Airport
- In the earlier KSRTC Pantry & Chemical Toilet buses, toilet was fitted in the middle of the bus, resulting in many passengers showing reluctance to sit near the toilet. The flybus has toilet which was fitted in the back side of the bus providing more comfort
- Bus travels directly from Airport-to-Mysore, by passing the Bengaluru avoiding city congestion, saves lot of time
- Bookings at www.ksrtc.in & 900 booking counters
- Enquiry & spot ticket booking counter
- Flybus on Volvo multi-Axle Chassis
- Artificial leather seats with increased legroom

It’s My Bus:
KSRTC’s ITS project is a demonstrative project and the first of its kind in India for the complete implementation of the system for city bus services. The system addresses the critical issue of road congestion by offering state-of-art technologies and attractive, convenient, comfortable, value-added services to encourage the usage of bus services against individual personal vehicles.

Implementation of ITS at Mysore City (MITRA) is a pioneering effort by Karnataka State Road Transport Corporation (KSRTC) to accelerate modal shift from personal use of vehicles to public transport system and lowering pollution levels, by offering high-class services through state-of-the-art technologies. Working towards this goal on high priority, KSRTC has implemented Intelligent Transport System (ITS) project at Mysore City covering 500 buses, 2400 bus stops, 6 bus terminals, 45 platforms.

Key Objectives that addressed the business needs through this system are:

- Establishment of an intelligent system to improve quality & convenience of public transport system in Mysore city
- ITS has ensured the delivery of safe, fair, reliable and environment-friendly transport system
- Promoted the use of sustainable transport modes and enabled commuters to make informed choices on travel modes by developing an integrated network in an effort to reduce passenger wait times
- ITS has helped Mysore City Transport Division of KSRTC to optimize bus operations, improved fleet utilization, schedules, and vehicle availability with accurate information

KSRTC introduced the Mobile Application for Intelligent Transport System Project at Mysore City conforming to Standard Practices addressing commuter requirements related to bus services.

Limca Book of Records
Name of the Initiative: Staff Duty Rota & Leave Management Kiosk System

a) Objectives

KSRTC is one of the largest employed organizations having staff strength of 37831. Allocation of duty and managing leave is very critical & is a sensitive issue that needs to be handled carefully in road transport industry. Employee satisfaction is essential to the success of any business; high rate of employee contentment is directly related to a lower turnover rate. Satisfied employee - healthier Organization- Satisfied Commuters is the key for success.

Staff Duty Rota System and Leave Management Kiosk System is first of its kind initiative in road transport industry in India introduced by Karnataka State Road Transport Corporation (KSRTC). Staff Duty Rota and Leave Management System address the issue of allocating duty and sanctioning of leave to crew and mechanics working in depots. Application has been scientifically designed based on functional level requirements. KSRTC has implemented Staff Duty Rota and Leave Management System at all depots of KSRTC.

Implementing Staff Duty Rota and Leave Management System by Karnataka State Road Transport Corporation is an effort to bring transparency and increase labour satisfaction by eradicating favouritism and corruption.

Key Objectives are:

- Minimizes disturbance and disruption
- Eradication of favouritism / corruption
- Removal of manual process
- Decreased complaint regarding delay of sanctioning leave
- Bringing transparency
- Increased labour satisfaction
- Increased optimum utilization of crews
- Improved operational efficiency
- Saving cost
- Ensuring proper accounting of leave

Duty Rota System:

The system is completely automated and enables the employee to select their preferred route or their preferred weekly off day-based on their seniority. After generating the seniority list, Counselling will be conducted for employees. A Duty chart will be created accordingly. Based on this Rota, operation will be carried out for next one month.

Counselling will be conducted every month so that the employees can change their preferred duty or weekly off day, if required or can extend the existing roaster for next month. If any new schedules are introduced then Duty Rota counselling will be conducted for those routes without disturbing the existing Rota.

This system facilitates optimum utilization of staff and reduces favouritism/ nepotism and route cancellation which in turn increases the productivity and provide efficient service to the commuters.

Operating Procedures are as follows:
Separate blocks will be created for schedules considering:

- One man operation (Conductor-less service) - 131
- One Driver and one Driver-cum-Conductor - 345
- Two Drivers and one Driver-cum-Conductor - 24
- Lady Conductors - 531
- City Schedules- 469
- One Driver + One Conductor – 6089
- Total - 7589

Crew ineligible to continue duty on route opted due to:

- Bringing low revenues
- Low KMPL
- Involvement in pilferage cases
- Major / Fatal Accident history
- Misbehaviour
- Habitual Absenteeism

**Leave Management Kiosk System:**

This system enables the employee to avail their leave themselves 30 days in advance through 24x7 working user friendly touch screen based kiosk system without waiting for approval of Depot Manager or other higher authorities. The system has biometric authentication ensuring the security. Regional language interface has been provided for employees to avail leave. SMS will be sent to employees mobile regarding leave approval / rejection along with generation of acknowledgement receipt in the kiosk. One week duty allocation information can be known through Kiosk and SMS of the same can also be obtained. Employees can know their leave balance through Leave Kiosk system. During any exigency, the Depot Manager has privilege to sanction leave to employees. Only 2% discretionary power has been given to Manager to sanction leave in case of exigencies to avoid favouritism, delay, harassment and corruption. The Depot Manager can set the threshold limit (i.e., number of employees who can avail leave) 31 days in advance depending on the crew required for depot operation. Leave account maintenance has become easier now. This initiative promotes transparency, discipline and avoids undue delay in granting leave/ favouritism. Through system generated leave reports, the Manager can decide the operation schedule and provide efficient service to the commuter.

**Operating Procedures are as follows:**
b) Estimated Cost – Rs.96,075/- per Kiosk

c) Benefits of the project

Duty Rota System ensures punctuality and minimizes operational failure which brings higher customer satisfaction. Availability of staff can be managed by setting the leave quota, restricting the staff to avail mass leave to ensure flow of operation. Since the depot is managed by few individuals with huge number of labour force, high job satisfaction of staff is the key for maintaining operational efficiency to provide better service to the commuters.

1. Eradication of favouritism / corruption: Earlier duty had been allotted to the employees as per the discretion of the depot officials. Employees had to get prior approval from the higher authorities to obtain leave. Duty rota and leave management system eliminates the scope for subjectivity or partiality in leave management and duty allocation which improves industrial relations.


3. Decreased complaint regarding delay of sanctioning leave: Employees can avail leave through 24x7 working touch screen based user friendly kiosk systems without waiting for approval of higher authorities. Leaves are sanctioned immediately to the eligible employees based on leave quota of the day. Hence there is no delay in sanctioning of leaves. It reduces scope for grievances, thereby increased harmony in the organization prevails.

4. Increased labour satisfaction: Employees are happy as they can avail their leave without waiting for approval from Depot Manager / Traffic Inspector and can select their preferred duty through counselling based on their seniority. It reduces crew complaints, absenteeism, disciplinary cases/ enquiry and employee turnover to below 0.25% and improves punctuality and regularity in operation. The system has successfully met the long term demand of the trade unions to bring transparent system in leave management and duty allocation.

5. Increased optimum utilization of crews: Depot managers can plan staff requirement for operation and set threshold limit to achieve operational efficiency. Threshold limit will be set based on the requirement of crew for operation for a particular day.

6. Cost efficiency: Staff requirement is reduced and employee turnover is very minimal which saved an enormous amount of money in recruiting new employees, hiring process, training new employees.

7. Safety: Proper planning of duty allocation avoids repeated duties for crew. System ensures non-violations of extra duty allocation. Uniformity, transparent allocation of duty brings ownership about vehicle. Rate of accidents is coming down because of reduced stress and satisfied staff as they perform their preferred route which makes driving safe.

d) Use of e-Governance Initiatives

Employee-friendly initiative:

Crew and mechanics were facing the problem in availing their leave or duty. In earlier system, employee had to submit their leave application in physical format to the competent authority for approval of leave which was consuming more time. Labour had complaints on the leave management since the same attracts disciplinary action against them, if prior approvals were not taken for the leave by the competent authority. Hence in order to avoid undue complaints / corruption and favouritism, Kiosk-based leave management system was introduced.
Automated Crew Management

Before implementing duty rota application, duty allocation to the drivers and conductors was being done manually by depot officials. There was a scope for favouritism and corruption in duty allocation. Drivers and conductors had no choice in selecting their preferred route. In order to eradicate favouritism and to bring transparency in allocation of duty, KSRTC has implemented Duty rota system. Various MIS reports generated through Kiosk are helping the management in taking timely decisions.

Some of the MIS reports available in Kiosk

1. Employee attendance summary report
2. Employee attendance report
3. Casual leave report
4. Employee approved leave month
5. Employee approved leave day
6. Employees leave request report
7. Mechanic approved month summary
8. Employee registered report
9. Leave balance summary
10. Approved day summary

The initiative and its contribution to improved operational parameters are:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Avg. off-road vehicles</td>
<td>362.5</td>
<td>353.1</td>
</tr>
<tr>
<td>2</td>
<td>% off-road vehicles</td>
<td>4.4</td>
<td>4.3</td>
</tr>
<tr>
<td>3</td>
<td>No. of breakdowns</td>
<td>3777</td>
<td>3477</td>
</tr>
<tr>
<td>4</td>
<td>No. of Accidents</td>
<td>1266</td>
<td>1207</td>
</tr>
<tr>
<td>5</td>
<td>Rate of Accident/100000 KM</td>
<td>0.13</td>
<td>0.12</td>
</tr>
<tr>
<td>6</td>
<td>Traffic Revenue (Rs. In lakhs)</td>
<td>260835.40</td>
<td>284056.62</td>
</tr>
<tr>
<td>7</td>
<td>EPKM on traffic revenue (in Paisa)</td>
<td>2639.4</td>
<td>2874.9</td>
</tr>
<tr>
<td>8</td>
<td>EPKM % variation over PYR</td>
<td>7.3</td>
<td>8.9</td>
</tr>
<tr>
<td>9</td>
<td>Disciplinary cases</td>
<td>7918</td>
<td>2829</td>
</tr>
<tr>
<td>10</td>
<td>Absenteeism cases</td>
<td>2988</td>
<td>1279</td>
</tr>
</tbody>
</table>

Sky blue colour chosen for the kiosk- symbolizes trust, loyalty, confidence, faith about the system

India Pride Award
Vehicle Tracking & Monitoring System

1.1 Project Overview

Karnataka State Road Transport Corporation (KSRTC) is the largest public transport provider for travelling Commuters in South India. KSRTC covers City, Sub-urban, Rural areas and Long distance routes across the Six States and one Union Territory. Every day covers 27 lakh kms and carries 25 lakh passengers per day. KSRTC’s main motto is to provide safe and secure service to the commuter.

The vision of KSRTC to introduce the Vehicle Tracking & Monitoring System (VTMS) & Passenger Information System (PIS) project is to provide safe and secure services to commuter and to improve its capability in managing the public transport system more efficiently, safely with a commuter-friendly approach. VTMS Project aims to improve the reliability of KSRTC services through effective Operations, Travel Time Management, Incident Management and reduction in the waiting time of the passengers at bus stations. In the same way, monitoring operational activities and analysis of the driving behaviour of the crew is done. VTMS is an integrated system for automatic vehicle location and monitoring from central control station. Core technologies include GPS receiver located in VMU which determines the Vehicle location, position reporting implemented through a GSM Network and supporting information and communication technology infrastructure in terms of hardware and monitoring equipment. VTMS project provides real-time locations of the vehicle through GPS device (Vehicle Mounted Unit - VMU), ETA, ETD, number of seats available in vehicles at the source bus station that allows commuters to plan their trips better, complete picture operations and utilization of existing infrastructure for running advertisement campaigns.

In this behalf, KSRTC has implemented Vehicle Tracking and Monitoring System (VTMS) in 2000 buses, and Passenger Information System in 27 major bus stations that helps better management of operations, and travelling passengers’ satisfaction at large, under Government of India – Ministry of Road Transport and Highways (MoRTH) “Central Assistance for Strengthening Public Transport System” scheme.

Overall Scope of Service, Plan and Status:

The overall scope of the implementation will consist of design, development, testing, installation, commissioning, training, hand-holding operations and management of facilities for a period of three years by the Systems Integrator. To achieve this, the Functional and Technical requirements are formulated for design, development of the project.

Functional Requirements - a set of functions which the module must meet in realizing the objectives of the stakeholders. This part meets the “What” is required of the solution. As a part of this, 125 functional requirements have been evolved for a solution in the project.

Technical Requirements - a minimum set of features that will help in realizing the functionality of the system. This part meets the guidelines of “How” the solution is conceptualized. As a part of this, 91 technical requirements have been evolved for a solution in the project.

The details of the same are enclosed in a separate MS Word document. Currently, the System Integrator has provided solutions and completed all the Functional and Technical requirements (excepting for some reports, which will be designed during operations and maintenance, based on the operational requirements).
2.0 RESULT INDICATORS

Key Outcomes / Indicators of the Project can broadly classified in two groups - To Commuters & KSRTC:

i. Effective Crew, Fleet Planning, Tracking and Monitoring which is currently not available in any system while the bus is on road:

- With VTMS, the staff at various levels at KSRTC shall be able to plan the schedules, allocate personnel, track the compliance through a monitoring system and then initiate corrective action where desired. For this, a mechanism of Scheduling and Re-scheduling is evolved.
- Scheduling - one time activity to be effected in the application duly allocating bus and crew to a schedule. This will run automatically till such time changes are made in bus or crew.
- Re-scheduling - whenever there is change in bus or crew, than the planned or scheduled activity is redone for the required temporary period only.
- With the above activities, we can see the below details by a click on a bus in GIS map/application, real time.
- Screen Shot attached below;

ii. Increase in Productivity to Commuters;

With intelligent passenger information system units at bus stands providing information on bus trips, schedules and estimated time of arrival / departure, commuters enhance their productive time without idling time at bus stands.

Screen Shot attached below – PIS Display Board;  
Screen Shot attached below – Central Control Station, Bengaluru;
iii. Reduction in Travel Time:
With well-established communication lines between vehicle, control station, bus stands, ability to manage operations will be enhanced in the event of any emergencies en-route saving property of KSRTC (in such events such as riots en-route) and help to reach the destination in pre-determined time.

iv. Patronage of Public Transport System:
With the introduction of this, VTMS system is resulting in more efficient transport management, real-time dissemination of information to passengers regarding bus services at bus stands. This will enhance reliability of public transport services and encourage people using personal transport to use public transport system.

v. Reduction in Accidents / Incidents Management / Breakdowns:
With VTMS improving the monitoring, tracking and increased efficiency and management of fleet, it is expected to reduce incidents. In case of eventualities, use of incident management facility in VTMS, will ensure quick relief in incidents such as hold-ups, accidents, breakdowns and diversions etc.

2.1 Key Performance - Services Type, Benefits and Volumes:

Benefits:
Vehicle Tracking System (VTMS, PIS & GIS application) to Commuters:
1) Real time Vehicle location - On time, Early, Late, location, Time.
2) Deviation - Route violation.
Severe violations noticed in cases and 6 crew have been suspended by initiating disciplinary action in Bengaluru Central division.
3) Distance Travelled.
4) Two-way communication between vehicle and control room. This is being used in times of emergency.

Driver Behaviour & Fuel Management:
1) Speed Violation.
Replay option is used to show the speed violation of crew and are being ducted for KMPL. As compared to 2013-14 & 14-15 there is increase of 0.05 KMPL points in 2015-16 over a period of two years.
2) Harsh Braking: This is also being shown to crew in replay option of GIS application.
3) Harsh Acceleration: This is also being shown to crew in replay option of GIS application by giving counts in their duties.
4) By-pass operations, skipped stops & bus stands: This check has been done extensively by the users at depots to ensure optimum revenue realization. In other words, buses that operate through byepass without passing through the respective bus stands are dealt severely by initiating disciplinary action.

Vehicle Management / Health Monitoring & Preventive Maintenance Alerts:
1) Allocation of buses on weekly / monthly etc. by way of Scheduling concept.
2) Provision for recording daily docking, workshop, RTO - passing buses in a separate maintenance menu.
3) Alerts (SMS/E-mail) for Vehicle Maintenance, RTO renewals.
4) Alerts to DM/DME for maintenance, RTO passing.

Alerts:
1) Accident and Breakdown. Crew can use SOS button in the VMU. A pop up will come in the application, it will get cleared only on acknowledgement of SOS alert for accident & breakdown in the application screen and so also need to initiate action to support for the same from Central Control Station.
2) Available for speed / harsh braking / harsh acceleration. A small beep sound emits for any violation beyond limits specified for the same.
3) VMU tampering for any physical damage etc.
4) Late Departures from Depot beyond scheduled timings.

MIS Reports :
1) Various Operational reports.
2) Distance travelled.

Operational Transactions / Management (Depot/Division/Corporate):
1) Non-performed Trips.
2) Skipped Bus stands, stops, pickup points.
3) Regularity, unauthorized stops, stopped duration.
4) Display and playback of a vehicle on Digital Map (history).
5) ETA / ETD of a vehicle.
6) Line Diagram indicates buses passing in a route facilitates to arrange relief vehicle (accident/BD).
7) Duty Rota allocation of crew on weekly/monthly etc.
8) Bunching of Services, Scheduling of services.
9) Historical Data for analysis and improvement.
10) Analytical data for top management.
11) Resolving Public complaints.
12) False Hit and Run case can be avoided to a greater extent.
13) Increase in Revenue due to passenger loyalty.
14) Increase in Revenue due to Avatar / ETM integration.
15) Competitive services as against other STUs / Pvt. operators.
16) Alerts for crew license expiry, Inter-State permits, insurance.
17) Running Time between Routes / Stops.

Passenger Information System / Commuter Portal:
1) The ‘Status’ of a service with real time and ‘Expected Time of Arrival’ / ‘Expected Time of Departure’ is available at any point of time,
2) Enquiry of Real Time information by passengers through Web Portal / SMS / PNR No / Trip Code / Vehicle No.
3) Time Table - Schedule details for 2000 services (Express & above) of Bengaluru Central, Ramanagara, Mysore Rural, Mangaluru & Puttur divisions are available in portal for the benefit of commuters. They can plan their trips and reserve to it, as a link is given to www.ksrtc.in (for booking tickets)
4) Increase in commuter satisfaction due to reduction in uncertainty. However, we are awaiting commuter responses through part of ‘on-line survey’ & ‘feed-back’ system given in the portal.
5) A link is given in www.ksrtc.in to ‘Track Your Bus’. We can also access the Commuter Portal in http://vtms.ksrtc.in/KSRTC-VTMS_new/.

The Key performance parameters of the Project is as under;
- Vehicle Mounted Unit (VMU) installed 1972 nos
- Spare VMUs 28 nos.
- Tracking Percentage 88% to 93%
- Execution of Schedule mapping at depots 75% to 83%
- Passenger Information System Boards 87% to 93%
- Expected Time of Arrival / Departure 83% to 89%
2.2 Implementation coverage

Glimpse of Implementation of the Project:

- System Integrator initially conducted Business Process Study (BPS) for 3 months (Jan., 2013 to Mar., 2013), RFP requirements till July 2013 and then finalized System Requirements Specifications and design documents.

- Phase I (pilot) was conducted in 50 buses in one depot from Jun., 2013 to Jan., 2014 and 220 buses in two depots from Jan., 2014 to July 2014 and continued roll-out for 2000 buses. UAT/RFP completed by July 2014 along with PMC consultants.

- Phase II continued for fine tuning process from August 2014 to March 2015, April 2015 to August 2016 for fine tuning and stabilization process. The system started stabilizing/delivering since March 2015 and is being utilized for operational purposes from the said month. During this period several improvements, change requests, modifications have been made and the connected MS Excel document is attached.

- Operations and Maintenance from September 2016 for next three years.

i. Description of the new services / scope enhancements planned delivered through ICT and other interventions during the year preceding the date of EOI submission along with reasons for implementing the same.

- Installation of 1972 (28 spare units) Vehicle Monitoring Units in 27 depots
- Evaluating the tracking system, functionality / operational transaction tests
- Installation of 14 PIS boards completed in below bus stations viz.
  - Kempegowda Bus Station - Terminal 1 (3 Nos.)
  - Shanthinagar Bus Station (3 Nos.)
  - Mysore Road Bus Station at Bangalore (3 Nos.)
  - Channapatna (1 No.)
  - Mandya (1 No.), Mysore (1 No.), Kanakapura (1 No.), Harohally (1 No.)
- Testing of PIS Boards (2 Nos.) at CCS
- Differential Global Positioning System (DGPS) survey at Kempegowda Bus Station (3 terminals), Shanthinagar Bus Station, Mysore Road Bus Station at Bangalore, Thrissur Bus Station, Mangaluru / Puttur division. Totally, 20 bus stations covered
- Plotting of GIS (Geographical Information System) information to GIS maps
- Training documentation
- User Acceptance Tests, fine tuning process and stabilization
- GIS survey for 63,000 Kms and 8,000 bus stops across 7 States, Karnataka, Maharashtra, Goa, Andhra Pradesh, Telangana, Tamilnadu, Kerala and 1 Union Territory - Puducherry
- Currently covered in 5 Divisions of South / West Karnataka for 2000 buses, 27 Bus stations, 39 Display Boards
- Bengaluru Central, Ramanagara, Mysore Rural, Mangalore and Puttur Divisions consisting of 27 Depots:-
  - Bengaluru Central - 6 Depots
  - Ramanagara - 6 Depots
  - Mysore Rural - 6 Depots
  - Mangalore - 5 Depots
  - Puttur - 4 Depots
- Around 25% of 26 lakh customers will be benefited from this initiative.

Key Project features:

- Tracking the Buses, Domestic Vehicles on Real time and history
- Calculating Expected Time of Arrival / Departure of buses
- Automated Fleet Scheduling & Daily Rescheduling
• Calculation of Revenue kms and Dead kms based on requirement
• Displaying Bunching of buses
• Two-way communication between Central control station to the buses
• Running Campaigns in display board
• Tracking the driver behaviour on Real time and history, driver behaviour capturing & alerts
• Replaying the actual travel path of the bus
• Various MIS Reports to assist with KSRTC Operations
• SMS & Email Alerts on Accident, Break downs, Late Departure, Crew License expiry, FC Renewal, Vehicle Insurance.
• Dynamic Status Report
• Recording Bus Maintenance activities
• Master Data for crew, buses, schedules, Form-4, etc
• Live Information to Commuters using Commuter Portal, SMS and PIS Display boards
• Integration with AWATAR through Vacant Seat Information, ETM for real time seat availability, Displaying the vacant seats in Display Boards
• Crew / Vehicle license Expiry monitoring
• Vehicle Performance dashboard

Stakeholders of the project:

2.3 Outcomes in terms of Efficiency, Improvements and Integration

Outcome/Utilities Derived from this VTMS System for the last 18 months from March 2015 to August 2016:

<table>
<thead>
<tr>
<th>Details</th>
<th>In Nos.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Accident and Breakdown Analysis</td>
<td>104</td>
</tr>
<tr>
<td>2) Educating Over-speeding Drivers (Dr. Behaviour)</td>
<td>1445</td>
</tr>
<tr>
<td>3) KMPL Tackling - Mileage</td>
<td>341</td>
</tr>
<tr>
<td>4) Schedule Operations Analysis</td>
<td>564</td>
</tr>
<tr>
<td>5) Real Time Location for various reasons</td>
<td>109</td>
</tr>
<tr>
<td>6) Kms comparison including CC kms</td>
<td>47</td>
</tr>
<tr>
<td>7) Running Time Analysis</td>
<td>12</td>
</tr>
<tr>
<td>8) Irregular Operations</td>
<td>6</td>
</tr>
<tr>
<td>9) Information used for Intelligence / complaints resolving</td>
<td>48</td>
</tr>
</tbody>
</table>
10) Resolving AWATAR and Public complaints 59
11) Disciplinary action against erring crew 109
12) Others – crew license and FC expiry 29

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total</strong></td>
<td><strong>2873</strong></td>
</tr>
</tbody>
</table>

A few detailed qualitative analysis of the above is narrated below:

1) Accident and Breakdown Analysis - 104 Nos:
   An SOS button is provided in VMU to send emergency messages to Central Control Station. In case of Accident or Breakdown, the driver or conductor can use this button. On pressing this button, VMU displays the pre-configured SOS messages, Sl. No. 1, is indicated for Accident and Sl. No. 2 for Breakdown. Then, press the corresponding number to send SOS message. On pressing the number, a pop up will come in the application, it will get clear only on acknowledgement of SOS alert for accident & breakdown in the application screen and so also need to initiate action to support for the same from Central Control Station.

After analysing the details in replay option, all the details will be sent to all the concerned, through which they will use the details as document to file complaint with police for accidents and arrange alternatives to passengers (including for breakdown) to continue their journey.

Accidents - A case study is being undertaken in Bengaluru Central Division having average fleet strength of 735+ buses for accidents and breakdowns, wherein 135 (30 fatal, 50 major & 55 minor) accidents in 2014-15 have been reduced to 111 accidents (27 fatal, 29 major and 55 minor) in 2015-16. There has been reduction in accidents by 18%. This we could able to do it with the help of REPLAY option in GIS application, wherein drivers are being shown their driving behaviour right from the starting point to ending point with respect to their speed, harsh acceleration and harsh braking, any deviations to scheduled route etc.

Breakdowns - During 2014 there were 386 breakdowns and in 2015, 371 nos., there is reduction of 4%.

2) Educating over-speeding, harsh acceleration, harsh braking Drivers (Dr. Behaviour), KMPL Tackling - Mileage:
   Crew are being educated by showing REPLAY option in GIS application. Likewise, a small beep sound is given in VMU to indicate this on violation of the above 3. KMPL improvement - As compared to 2013-14 & 14-15 there is increase of 0.06 KMPL points in 2015-16 over a period of two years, resulting in savings of Rs.1.90 crores.

3) Schedule Operational Analysis:
   Schedule adherence with reference to departure time, arrival time, stops skipped, travel time taken etc. With this, we could be able to guide on the lacunas at the depots / operational level.

4) Running Time Analysis:
   Running Time reports have been provided in the application. This indicates travel time taken between two points in a route. This historical data is being used to analyse the travel time and effect suitably any increase or decrease in travel time (including over time applicable)

   A detailed running time analysis has been made for 272 routes. Revision of increase in time (OT given) effected in 3 routes (97 schedules), 6 routes (26 schedules) travel time has been reduced and effected in our AWATAR (On line Passenger Reservation System) application, 89 routes are under review by our Traffic dept.

5) Disciplinary action against erring crew for violations, deviations etc:
   All these benefits are being derived with the engineering process of showing REPLAY option available in the GIS application, wherein replay of the bus travelled path right from depot to end point and vice-versa is shown to crew with their speed, acceleration, braking, deviations, non-stoppages, skipped stoppages etc. This tool is most educative and is resulting in increase in revenue and decrease in cost. With the use of REPLAY option, we could be able to resolve complaints against crew like too over-speeding, harsh braking, deviations, by-pass operations without passing through scheduled bus stands etc. For serious deviations noticed and with public complaints lodged, 6 crew have been suspended pending enquiry.
3.0 ENABLER INDICATORS

The Enabler Indicators are primarily the processes that are implemented to achieve the above mentioned results. For the purpose of these Awards, the enablers are being evaluated on selected attributes listed below. Nominations should address the required information as per attributes below, and if desired, important additional information may also be provided in brief.

3.1 Process re-engineering

a. Description

b. Major ICT and Non-ICT process

Plan:

**Functional Requirements** - a set of functions which the module must meet in realizing the objectives of the stakeholders. This part meets the “What” is required of the solution. As a part of this, 125 functional requirements have been evolved for a solution in the project.

**Technical Requirements** - a minimum set of features that will help in realizing the functionality of the system. This part meets the guidelines of “How” the solution is conceptualized. As a part of this, 91 technical requirements have been evolved for a solution in the project.

The details of the same are enclosed in a separate MS Word document. Currently, the System Integrator has provided solutions and completed all the Functional and Technical requirements (excepting for some reports, which will be designed during operations and maintenance based on the operational requirements).

Likewise, the changes effected to the system by additional or new / change requests are documented suitably. A separate MS excel sheet is enclosed for perusal.

Challenges faced in implementing Process changes

**Challenges faced before deployment of the project:**

- GIS Survey of 63000 kms across 7 States of South India with required landmarks
- Geo-fencing particular stops, bus stands, landmarks
- Creation and validation of routes, schedule data, etc.
- Scheduling and Rescheduling (dispatch mechanism) by depots
- Trip Recognition of a Schedule in the beginning
- Connectivity issue in ghat / remote areas in some depots
- Place of fixing and power drawal to VMU. A comprehensive study of type of buses were made to under the physical structure of the bus to fix VMU, so also power drawal before cut-off switch or after this switch

**Challenges faced in Implementing Process Changes:**

- Proper adherence by drivers to Geo-fenced stops, bus stands, landmarks by the crew resulting in non-recognition of trips, schedule or impact of skipped stops in reports,
- Scheduling and Rescheduling (dispatch mechanism) by depots at the field level. This is one of the biggest challenges faced in the implementation process, as the depot officials took almost 8 months under the mapping mechanism of a bus to a schedule appropriately by following scheduling or re-scheduling process.
- Trip Recognition of a Schedule in the beginning. Scheduling needs to be effected before departure of a bus at least by minimum of 2 hours. Whenever there is such lacuna at the depot level in deploying a bus on time, due to change process in the back-end, trip recognizes properly after reaching or hitting next stop Geo-fence to the source bus station. Any bus that passes through a Geo-fence area of a parent depot from the source bus station, there used to be closure of trip. This was overcome by defining time constraint considering schedule timings.
- Connectivity issue in ghat / remote areas. To handle non-availability of GSM network, it has been designed in the VMU to store 5000 positional packets and on availability, these packets will flow to data centre.
- VMU sustains 9 to 36 V threshold. However, there was power surge beyond 36 V resulting in power fuse failure in VMU. This took much time to analyze the reasons for frequent PF failure. Later, system integrator installed surge protector in all the 2000 buses. With this, we would be able to avoid this power surge issue.
• Usage of VMU / SOS by Drivers (Accident / BD). Drivers, initially were reluctant to use SOS buttons. However, after educating them of the utilities and training 8000 crew, now they are using this facility.

• Damages to VMUs / accessories by crew - about 2% to 5%. A few crew damaged antenna and VMU display screen intentionally, for which disciplinary action has been initiated to recover the cost of damages.

• Operational discipline by depot team - ensuring timely updates in the system on all operational information - Schedule changes, Cancellation, Required Route changes etc.

• Safe upkeep of VMU / in Bus equipment by crew. - Cable cut, Antenna issues, Keypad damages, Removing the power cable etc.

• Antenna, power cable disconnection related issues - disconnections, and continuous tracking and communication gaps.

• Additional Surge protectors were to be designed and installed. To address Bus battery-related voltage issues - 50+ Buses are having Surge affecting VMU.

• Unplanned Stoppage of buses in the Trip affecting ETA.

• Crew adhering to Schedules and Trips.

• Buses availability for any ITS-related maintenance requirements - Stoppage in depots for few hours for many buses.

• Power quality for the display boards in Bus Stops, Terminals - Kanakapura, Channapatna, Harohalli locations.

• Synchronizing the Form IV data with system’s Actual Schedules, Routes, kms information.

• Updates on the movement of buses, Scrapped bus, New bus induction etc in the system real-time.

The Lessons learnt from the Process re-engineering exercise Key learnings to Transport Sector (all STUs) as a whole:

• Designing Standard Prototype Optimum level Vehicle Monitoring Unit. STUs are handling complex bus types in terms of BS-II, III, IV, CAN bus etc, operational features, whereas in the Telematics Field a lot number of VMUs/OBD/ITS kits are readily available. This creates selection difficulty among STUs to opt a particular type of VMU. Therefore, there is need to design for an optimum level VMU that can give minimum VTS features as default and the other features like CAN, Security camera, VHMD, etc as optional.

• Campaign Management activities to earn revenue by using PIS display boards at bus stands.

• Inclusion of all independent Depot System for integration. Currently, all STUs are planning for Vehicle Tracking System (VTS) spending huge budget and without any centralized solution for capturing revenue parameters also. Therefore, it is high time for STUs to go for comprehensive ITOMS (Integrated Transport Operations and Management System) inclusive of VTS.

• Better Technical solutions to connectivity like analyzing the GPS, Glonass, Gagan etc and recommend for the best one by an appropriate authority duly guiding STUs.

• Actual Travel Time (Running Time) Analysis for differential Form IV (indicating schedule timings). Currently, Form IV is common to a particular schedule that will be operated at any point of time, say peak or slack, either day or night. With the availability of travel time between two points for a given time like peak or slack, either day or night facilitates management to think new concept of flexi Form IV for a route or schedule.

• The entire VTS + systems shall cover both physical & financial transactions (ticket revenue, other revenue accounting, all types of expenditure), instead multiple solutions. Currently, STUs are having multiple systems to capture physical parameters or financial parameters by spending huge budgets. In the absence of one unified system, STUs are depending on multiple systems say 50+ or so to get their required results. Therefore, this is high time for STUs to think for one unified system, may be ITOMS which covers both physical and financial transactions under one system.

• Providing emergency Panic Button near to the seats of commuters to raise alerts to central control station to ensure safety and security of women and children.

• Comprehensive ITS solutions beyond tracking focus towards ITOMS.

• Provision for Multi-Modal Integration options along with city and metro transport.
• Preparation of ITS / VTMS Tool Kits by Government Agencies and provide it to STUs. Since STUs are new to ITOMS and VTS technology, standard ITS and VTMS tool kits may be designed by Government of India or its agencies or by private agencies, so that STUs can follow accordingly for smooth implementation.

Best practices adopted from the industry / other State implementations
• Currently, the RFP prepared for this project is based on the benefits that could be derived and delivered to commuters at large and also as per the standard internal operational transactions in KSRTC.
• KSRTC is in lead role in the implementation of ITS solutions for better operations management and to provide better, safe services to commuters from time to time.

3.2 Leadership, Change Management, Capacity Building during transition
  a. Description
    i. Leadership support for the initiative, visibility of actions with current status
       A Project Management Committee headed by the Managing Director and Director (Security and Vigilance) as member, a few Heads of Departments form Traffic, Mechanical, Stores etc. will lead the initiatives, guide, monitor actions from time to time.

    ii. Change management and Capacity building strategy defined and status thereof
       As of now, Systems Integrator (SI) will monitor the overall implementation, operations and maintenance of project for a period of next three years. Change management is defined at the time of end of completion of operations and maintenance after three years. Exit management is well defined. Initial Capacity Building of about 8000+ crew and 89 workshops for 1100+ office staff has already been completed for effective implementation of the project by System Integrator / KSRTC from time to time. Technical capacity building is scheduled in next 6 months’ time.

    iii. Project management & Monitoring adopted
       a. Project Implementation Unit headed by Chief Mechanical Engineer (Production) and a few other Heads of Departments from Traffic, Mechanical and Stores will monitor the overall implementation of the project duly guiding the depots and divisions from time to time.
       Similarly, a Project Implementation Unit at the Divisional Level headed by Divisional Controller and a few other Sectional Heads from Traffic, Mechanical, civil and Stores will monitor the overall implementation of the project duly guiding the depots and bus stands from time to time.

       b. Financial model adopted [Source of funds, description of PPP if any, Total cost of ownership etc].
       Sources of funds 50% by MoRTH, Government of India and 50% by KSRTC. Total Cost of the Project comes to 12.90 Crores.

       c. Special efforts to ensure sustainability of the e-Governance initiative[s] [including but not limited to carrying out of third-party assessment[s] and implementation of their recommendations where feasible etc].

       d. Challenges faced in transition mainly from Change Management & Capacity Building perspective.
       As of now, there are no hurdles from change management perspective. However, while capacity building to crew (conductors and drivers) was challenging in the initial stage of explaining them of the initiative and its benefits to all the stakeholders. Now, crew are comfortable with the benefits derived out of the project.

       e. The Lessons learnt from Change Management and Capacity Building exercise[s].
       While conducting 89 capacity building workshops, SI team & VTMS Cell team travelled across 27 depots 4 times and could complete the task. Such workshops are in progress across all depots of KSRTC. This process is a parallel activity. As on date, 8000+ crew and 1100 staff are being trained in the Project.

3.3 Technology
  a. Description
    i. Technological solution adopted [including the maintenance model]
       Reliance GPS, GSM and MPLS cloud technology have been adopted for tracking and transfer of data
to the data center. Hardware environment consists of HP tower server models with suselinux 11sp3, Windows Server 2008 R2 Standard and Cent OS release 5.4.

ii. Compliance of the Technology adopted with e-Government standards notified / recommended by the GOI [Please refer to https://egovstandards.gov.in/] including security and confidentiality.

This system is designed with usage of defined company standards, Application is designed based on Oracle 11g, Java 7, hibernate and spring framework with Apache tomcat runtime environment.

iii. Strategy for Disaster Recovery and service continuity

Clustering of servers is used for handling all possible failure and increase reliability. Also regular backups are taken. Every server is provided with backup servers which will increase the efficiency of handling the failures. Zenoss tool is adopted for the monitoring servers and network related components.

iv. Briefly describe the impact and value-addition through adaption of social media platforms for the project.

a. PIS display boards and commuter portal plays a major role in providing required information to the end users. Also Add-manager tool is used to keep track of the advertisements.

b. Technology-related challenges faced.

Main challenges faced were GPS satellite availability and GSM coverage not available for some areas (Specially in Ghat sections).

c. The Lessons learnt from Technology choices and implementation strategy adopted.

In order to overcome loss of data in above mentioned cases Post-processing had been employed. Data related to packets are stored in SD card present in VMU, on availability of network these data is fed into system and processing is done accordingly and reflected in application.

4.0 VALUE INDICATORS

The Value Indicators are high level goals and objectives which are used as guiding philosophies for defining visionary scenarios within which the e-Governance projects.

KSRTC has been leading the state of art technology initiatives covering the reservations system-AWATAR, Intelligent Transport System in Mysore, electronic ticketing machines, Leave KIOSK management system, duty rota system and many others. The National Urban Transport Policy as laid out by the Ministry of Urban development “is to ensure safe, affordable, quick, comfortable, reliable and sustainable access for the growing number of city residents to jobs, education, recreation and such other needs with our cities”.

KSRTC is building intelligence in to the transport system and brings in the convergence of technologies providing a synergetic transformation in the commuter experience. This projects aims at establishing sustainable transport which is not just a case of increasing the infrastructure available, but also question of maximizing the use of existing infrastructure and of maximizing the efficiency and interoperability of all transport assets. Upon implementing this project with VTMS solution gets more and more complex based on the size of the transport network to be addressed and intricacies of traffic conditions. Changing the traditional ground transportation scheme to a fully automated and intelligent transport network is a substantial upgrade of the scheme. Apparently the main problems that are hampering to materialize are not just technological limits, but cultural, conceptual, social emotional, political and economic hurdles. The bigger the geographical area of operation the more complex this becomes.

VTMS Project has met the following high level goals and objectives;

1) Social Impacts:

- Delay reduction, travel time savings
- Increased accessibility to the system
- Increased safety of users
- Reducing traffic congestion
- Greater commuter satisfaction
- Use of public transport rather than private vehicles

2) Socio Economic Impacts:

- Increase in productivity of time due to intelligent display units at bus stands
- Reduction in travel time in case of emergencies like accidents, breakdowns, incidents
- Patronage of Public Transport System
- Reduction in congestion
- Reduction in Accidents
- Reduction in emission levels as citizens shift to public transport from own vehicles

3) Financial Impact:
- Increase in revenue due to Modal Shift over from personalized to public transport
- Increase in revenue due to real time punctuality, reliability and timely operations
- Decrease in cost due to effective management of incidents, accidents, breakdowns
- Increase in revenue due to advertisement campaigns
- Intangible benefits due to effective crew/Fleet Management
- Decrease in cost due to increased driver behaviour (KMPL growth)

4.0 Digital Inclusion

Language, demographic and Cultural differences may result in certain types of stakeholders not getting fully benefitted from e-Governance initiatives. Currently, all the stakeholders of the project come under digital inclusion. However, under travellers / commuters category, illiterate / rural passengers may not easily access the VTMS project and its technology buildings into the system.

To overcome this, KSRTC, currently using a separate Passenger Announcement System at Bus stands duly announcing the bus no, platform no, departure time in local language to benefit the passengers instantly. This separate system is under consideration for integration with VTMS in Phase II. Likewise, mobile application is under development in English and Kannada version for benefit the passengers.

Further, it is also pertinent to mention here that the passenger / travellers who lack on-line activities mentioned below;
- Access - the ability to actually go Online and connect to the Internet
- Skills - to be able to use the Internet
- Motivation - knowing the reasons why using the Internet is a good thing
- Trust - the risk of crime, or not knowing where to start to go Online

To make the above into positive, the role of Society/Government at large is also important to include ourselves to Digital Inclusion to reap the benefits of VTMS.

4.2 Green e-Governance

Green e-Governance is about application of Green computing practices to the domain of e-Governance. It involves adoption of environment-friendly practices with respect to creation, use, and disposal of ICT gadgets / infrastructure. There are several dimensions to green e-Governance and prominent among these relate to Power and Paper consumption, and disposal of e-Waste.

- Currently, in VTMS project reports are designed in such a way that the reports or master data could be exported or imported at any point of time. This initiative is more towards aiming at paperless office. This data can be exported to MS Excel and required data or summary can be printed. This is user-friendly system developed in VTMS. It is also instructed to keep the reports in electronic form than in paper form, so as to conserve environment, rather to curb the usage of paper.
- All correspondence pertaining to VTMS project is paperless (unless it is used in local Kannada Language) and majority of it happens in electronic form (e-mails) including reports generation, analysis etc. across 27 depots. It happens through vtms@ksrtc.org and vtmsksrtc@gmail.com.
- Likewise, in KSRTC, currently, the life of Computers and its accessories (as an Asset) is 5 years. Once these reach end of life new procurments are made and the scrap / e-waste will be disposed of by way auction, as per our IT Department process.

Recognition:
SKOCH Smart Governance Award-2016
CMO Asia Award-2016
SKOCH Order of Merit -2016
Name of the Initiative  Organised City Bus Service at Medium and Small towns and cities

Public transport is a vital ingredient in the solution to various problems afflicting our cities and communities. The contribution of Public Transport is very significant to our economies, it provides affordable mobility to millions of our people, it is source of varied jobs for many, and more importantly, it plays a role of social cohesion and inclusion.

Mobility is very essential to small cities’ life, so how can we make getting around easier, better and more convenient for our small cities? How equitable and sustainable each option, in terms of accessibility, public health and environment? Considering this issue, KSRTC has taken up the challenge to provide sustainable public transport in smaller cities.

Public transport always is the hallmark of urban bus system and effective operation is vital for the development of city or towns. In most Indian cities, there is an ever increasing preference for use of personal vehicles for commuting due to the absence of robust public transport service which in turn leading to the problems of road congestion, pollution, lack of safety in most of the small towns. Cities with a poor public transportation system and unorganized & dysfunctional bus system lead to a higher availability of para-transit, private and other intermediate modes.

The NUTP lays the basic principles of urban transport - strengthening of Public Transport System, reduction of personalized vehicles, emphasis on non-motorised transit like cycling and walking, and also lists several other policy issues.

In major metropolises having population more than 20 lakh, Mass Rapid Transit Systems (MRTS) like Metro and BRTS have been initiated. These are already under different stages of progress. However, for small metropolises and particularly Tier-II cities having population between 3 to 10 lakh, effective city bus operations would be the only mainstay for Public Transport System.

Considering the need, necessity and demand for public transport, KSRTC took up the visionary & strategic initiative of introducing organized public transport buses in medium and small towns and cities, which is affordable, accessible, and efficient and offers a choice of transport mode.

Challenges faced before deployment of the project

- Whether sustained city bus operation can be introduced in the cities having population of 3 or below lakh?
- If so, can the city operations be viable and can they generate sufficient revenue to take care of operation, maintenance and depreciation costs?
- Considering the constraints on capital expenditure which has to be borne by the operator (KSRTC) itself, what minimum configuration of components in the city buses can be put together, so as to optimize capital costs?
- Whether add-ons like Destination sign boards and next stop announcement systems, which lead to additional costs, would be good value for money and would promote and encourage modal shift to public transport?
- To what extent the provisions of Urban Bus Body Code can be incorporated in such city buses required for Tier-II cities?
- If City Buses can be taken only for few high density routes in these cities. What should be the methodology of route identification?
- What should be the frequency of the city bus operations and how the bus scheduling should be taken up?
- What is the extent of need and necessity to which infrastructure from the local municipal corporation would be necessary, particularly in setting up the bus shelters and bus stop signages?
- Estimating the number of city buses that may be required for city bus operations - number of city buses less than the optimum would be insufficient for modal shift to public transport, and number more than optimum may lead to increased cost of operations, making the project unviable.
- Need for consultation and end-user involvement so as to have “commuter buy-in” and to make people develop a sense of ownership towards the city bus operations.
The objectives of the project:
KSRTC Bus Service for Small Towns and Cities' - Doubling Public Transport Share in the State of Karnataka by introducing public transport in smaller towns & cities to bring smart transportation with enhanced mobility, enhanced sustainability, and enhanced public transport market share.

With the above objective, KSRTC launched its City Bus Service in the state of Karnataka during February 2011 with 9 buses at Tumkur City. This initiative has proved that, Public transport services is the mobility of the future and is the only viable option that can ensure sustainable, equitable and uncongested mobility in liveable cities and smaller towns.

The governance practice involved:
KSRTC Management & Staff: Prior introducing, extensive field surveys were taken up, to assess requirements, deployment, route selection - periphery to periphery through city centre, frequency & timings.

Vehicle manufacturers: Procurement of buses required for city buses in Indian road conditions.

Local city administration: Successful implementation of the services (Auto Rickshaw strike opposing bus services commissioning and local police helped in maintaining law and order), Municipal Authorities (Bus shelter construction, maintenance)

Monitoring & Evaluation consultants: Surveying customer satisfaction level & analysing bus operations for further deployment of services

Media: extensive public outreach programme.

Public: Both commuters and non-commuters were involved for assessment to implementation and for business re-engineering. Public contact meetings for identifying their needs & feedback, local government agencies like, local police department. Since the buses were seen as a threat to Para-transit modes, auto-rickshaw unions went on strike in the cities demanding to withdraw city buses from the cities. KSRTC, with the assistance of the local police, streamlined the operations. The city buses have now become the lifeline of the people in these towns.

Details of coverage of the targeted population
As towns grow, their ecological impact increases and despite the flexibility and apparent freedom a personal vehicle might bring, a town or city cannot function without a sustainable public transport network which allows their citizens to move. Karnataka is one of the fifth most urbanized states in the country and it is estimated that 50% of the population of the State would be living in its urban areas by 2030. Urbanization brings many challenges with it and a significant one of them is that of ensuring sustainable mobility options for the urban populace.

As per 2011 Census, the number of inhabitants of the city / region Chikkaballapura-191122, Chikkmagaluru-118496, Hassan-133723, Tumkur-305821, KGF-162230, Davangere-435128, Kolar-138553, Mandya-137735, Mangaluru-484785, Mysore -887446

Comparison of the pre-development scenario and post-deployment benefits:
Situation before City Bus Service:
- Unorganized & dysfunctional city transport system
- Dependency on autos including shared autos, tum-tums, maxi-cabs
- Lack of effective public transport resulting in usage of two-wheelers & other personalized modes
Situation after the implementation:

Every once in a while, a revolutionary idea changes the way we see the world. Migration from villages to cities has led to the phenomena of an unorganised, expandable growth for most of the cities in India. The quality of public transport in any city serves as a formative index of development, being the fulcrum of the functional efficiency for businesses and non businesses alike.

Most of the cities where KSRTC introduced city bus service are smaller towns. First mile connectivity to last mile connectivity has ensured for seamless travel by providing inter-connectivity between moffussil and city bus services. Provision has been made to operate both kinds of bus operations from same city bus stations. Wherever there are different bus stations connectivity services have been provided with more number of frequency. At Mysore City, Passenger Information boards for real time information are deployed at City Railway Station etc.

KSRTC new city bus service

KSRTC has always been treasured as the travellers’ choice. Reliability of service, time of schedule, safety, customized city buses with unique design, wide doors, sufficient standing space, LED boards, GPS-based next stop announcement system, with adequate frequency are the hallmark of the initiative. Even drivers and conductors have been identified from KSRTC pool and imparted proper training and orientation for city bus services, where operating to fixed time schedule is critical.

City Bus Operational Details

<table>
<thead>
<tr>
<th>City</th>
<th>Current Schedule</th>
<th>Trips</th>
<th>Schedule Kms</th>
<th>Initial Ridership</th>
<th>Current Ridership</th>
<th>Population (in lakhs)</th>
<th>Passenger per Bus (Initial)</th>
<th>Passenger per Bus (Present)</th>
<th>KMs / Bus/ Day</th>
<th>Population served within 400mts from Bus stop</th>
<th>Bus Route length/ Sq Km area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ramanagara</td>
<td>20</td>
<td>206</td>
<td>5701</td>
<td>3166</td>
<td>10220</td>
<td>1.66</td>
<td>317</td>
<td>511</td>
<td>285.1</td>
<td>2200</td>
<td>31.6</td>
</tr>
<tr>
<td>Tumakuru</td>
<td>50</td>
<td>1102</td>
<td>9641</td>
<td>8934</td>
<td>39487</td>
<td>3.06</td>
<td>993</td>
<td>790</td>
<td>192.8</td>
<td>37500</td>
<td>11.9</td>
</tr>
<tr>
<td>Kolar</td>
<td>15</td>
<td>226</td>
<td>3157</td>
<td>3263</td>
<td>4362</td>
<td>1.39</td>
<td>326</td>
<td>291</td>
<td>210.5</td>
<td>3489</td>
<td>17.6</td>
</tr>
<tr>
<td>KGF</td>
<td>10</td>
<td>151</td>
<td>2347</td>
<td>3571</td>
<td>5048</td>
<td>1.43</td>
<td>595</td>
<td>505</td>
<td>234.7</td>
<td>4038</td>
<td>16.4</td>
</tr>
<tr>
<td>Mysuru</td>
<td>423</td>
<td>6383</td>
<td>98385</td>
<td>138699</td>
<td>234128</td>
<td>15.0</td>
<td>525</td>
<td>553</td>
<td>232.6</td>
<td>203662</td>
<td>15.5</td>
</tr>
<tr>
<td>Mandya</td>
<td>21</td>
<td>221</td>
<td>5264</td>
<td>3947</td>
<td>13991</td>
<td>1.38</td>
<td>359</td>
<td>666</td>
<td>250.7</td>
<td>6193</td>
<td>21.0</td>
</tr>
<tr>
<td>Hassan</td>
<td>28</td>
<td>488</td>
<td>4719</td>
<td>5524</td>
<td>18000</td>
<td>1.55</td>
<td>921</td>
<td>643</td>
<td>168.5</td>
<td>15000</td>
<td>14.0</td>
</tr>
<tr>
<td>Chikkmagalu</td>
<td>10</td>
<td>146</td>
<td>2744</td>
<td>2134</td>
<td>5683</td>
<td>1.18</td>
<td>427</td>
<td>568</td>
<td>274.4</td>
<td>3592</td>
<td>5.3</td>
</tr>
<tr>
<td>Mangaluru</td>
<td>30</td>
<td>332</td>
<td>6173</td>
<td>2539</td>
<td>12756</td>
<td>4.99</td>
<td>363</td>
<td>425</td>
<td>205.8</td>
<td>10603</td>
<td>19.6</td>
</tr>
<tr>
<td>Udupi</td>
<td>12</td>
<td>156</td>
<td>2244</td>
<td>2643</td>
<td>4400</td>
<td>1.25</td>
<td>220</td>
<td>367</td>
<td>187.0</td>
<td>1962</td>
<td>15.8</td>
</tr>
</tbody>
</table>
The present City bus operation in tier II and III cities

<table>
<thead>
<tr>
<th>City</th>
<th>No of Buses</th>
<th>Passengers</th>
<th>Fare</th>
<th>Revenue</th>
<th>Distance</th>
<th>Frequency</th>
<th>perforance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davangere</td>
<td>20</td>
<td>296</td>
<td>3552</td>
<td>8306</td>
<td>19500</td>
<td>4.35</td>
<td>378</td>
</tr>
<tr>
<td>Chitradurga</td>
<td>9</td>
<td>197</td>
<td>1198</td>
<td>1151</td>
<td>4435</td>
<td>1.4</td>
<td>555</td>
</tr>
<tr>
<td>Shimoga</td>
<td>20</td>
<td>226</td>
<td>3943</td>
<td>322</td>
<td>7473</td>
<td>3.22</td>
<td>579</td>
</tr>
<tr>
<td>Bhadravathi</td>
<td>10</td>
<td>96</td>
<td>2154</td>
<td>1005</td>
<td>4419</td>
<td>1.51</td>
<td>436</td>
</tr>
</tbody>
</table>

Key learning from the project

Efficient public transport system is the sine qua non for a modern city. Karnataka has already had a popular bus-based transit system evolved over the years that has been refined recently. Need for an efficient public transport system in growing medium size cities has not been successfully met so far. Spatial growth in the city – growth impulses and growth axes, existing transport infrastructure caused dysfunctional city transport system.

Initiatives and the methodology of introduction of city services and learnings accrued there from can be replicated for taking up similar organized city bus services in other Indian cities. What needs to be done is proper project preparation in terms of route planning, bus design, participatory processes, fare fixation and revenue model and best practices in operation and maintenance. Success of this, has led to plan bus services in other 30 cities of Karnataka.

Note on the cost effectiveness of the project

The very fact of improvisation in load factor and sustainable city bus operations implies acceptance to the services by the citizen in respective towns. KSRTC has been using the MIS reports in respect of bus operations in these cities and analysing the ticket sales growth. Based on demand, KSRTC has deployed more services / trips with convenient frequency.

Example - Customer Satisfaction levels in Mysore city: KSRTC Customer Satisfaction Rate as captured by Monitoring and Evaluation Consultants during September-October 2014 corresponding to 1150 KSRTC regular commuters on KSRTC bus services in Mysore City is depicted below:
Current Status of City Buses in KSRTC:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trips/day</td>
<td>10335</td>
</tr>
<tr>
<td>No.of Vehicles</td>
<td>718</td>
</tr>
<tr>
<td>Ridership/day</td>
<td>3.69 lakhs</td>
</tr>
<tr>
<td>Avg. passenger/bus/day</td>
<td>674</td>
</tr>
<tr>
<td>Avg.km/bus/day</td>
<td>208</td>
</tr>
<tr>
<td>Effective Kms(in lakhs/day)</td>
<td>1.55</td>
</tr>
</tbody>
</table>

- Operated in 14 cities
- Planned for another - 4 cities
- Karnataka has 31 cities with city buses.

Future Road map of the project

The frequency of the buses, unique bus branding, trip performance as per public demand, Intelligent Transport System enabled bus services, SMS, IVRS, call centre, control room monitoring, public interaction programmes at regular intervals, conducting dissemination workshop etc. The semi-floor bus design engineered and deployed by KSRTC has been recognized by Ministry of Urban Development, Government of India, as model for other cities to replicate.

Based on the success, Karnataka State has taken up city bus operation in 30 cities spanning 2104 buses. This initiative has helped to double the market share of public transport in the city and region.

In the city of Mysore alone 0.3 million people depend on KSRTC city buses daily.

MoUD appreciated the in-house built KSRTC city bus design and circulated this as a model for other cities in India to replicate.

International Public Transport Award
BEST PRACTICE

Maharashtra State Road Transport Corporation
BEST PRACTICE
Catalogue
1. Organizational Details
   Name of the organization: Maharashtra State Road Transport Corporation
   a. Head of the organization: Shri. Ranjeet Singh Deol, IAS, with their complete contact details
      (name, designation, phone, email IDs)
      022-23085979, mdmsrtc@rediffmail.com
   b. Type of organization: State Transport Organization
   c. Details of the officer who implements this initiative: Shri S.K. Ganjave, Chief Statistical Officer,
      022-23085965, chiefstat_msrtc@rediffmail.com

2. Situation before the initiative
   Briefly describe the conditions in the area before the implementation of the initiative.
   • Before the implementation of GIS based MIS system in MSRTC, Statistical data was received
     from divisional office to region office in the physical format. At Regional office, consolidation of
     data of all divisions under them was done & then sent to Central office by mail. At central level,
     consolidation of region-wise data was done in MS-Excel. After data consolidation, analyzed data
     used to be circulated by way of hard copies to concerned Managers.
   • The old system was time consuming & MIS data was not made available at all levels.

3. Description of the Initiative & Implementation strategy
   a. Describe in detail the processes adopted in implementation of the initiative.
      • In order to provide fast, up-to-date paperless MIS data at every level, we started GIS-based MIS
        system.
      • GIS is a computer system that allows to map, model, query, and analyze large quantities of data
      • We had to encourage & train field officers / clerical staff for collection of latitude & longitude of
        1073 establishments of MSRTC.
      • With the use of latitude, longitude & software, borders of regions & divisions are fixed in the map
        of Maharashtra State.
   b. What were the activities taken up to implement the initiative?
      • To minimize the time between the data capture & data delivery, the system is developed wherein
        data is captured from division level directly bypassing regional level & consolidation, analysis
        part is done Online.

4. Briefly describe the benefits derived from implementing the initiative.
   • Geographical Information Technology-based Statistical Information system website is the part of
     Management Information System for effective monitoring of performance at every level.
   • Prompt decision making by field officers.
   • Uploading of data by the divisions in the stipulated time, quick, fast and accurate transmission at
     every level helps in taking corrective actions by field officers without loss of time.
   • Presentation of the data through maps is more effective than the traditional tabular format.
   • GIS technology allows MSRTC officials to access information anytime and anywhere. An official
     can point to a spot on a map to find information stored in the GIS about that location. There is no
     limit to the kind of information that can be analyzed using GIS technology.
The Chief Executive, General Managers and Regional Managers can directly access the data of each depot in the Corporation and this helps in taking corrective measures at respective level.

5. Partner’s Information (if any) : Website was developed by M/s. Ridhi Management Services, Kolkata free of cost.

6. Innovative characteristics about the initiative :
   - GIS technology allows digital or computerized data in the form of information, no matter what the source or original format; to be overlaid on top of one another on a single map.
   - Data in many different forms can be entered into GIS and can also include data in tabular form.

7. Problems Faced
   a. Describe the problems faced in implementing the initiative & how were they overcome?
   - Training to all officers & supervisors of Statistical branch were given at every level of implementation.
   - Further, demonstrations for Managers at Regional or Divisional level were arranged to acclimatize to the system & for access of data for timely decision making.

8. Sustainability
   How is the sustainability achieved in the initiative?
   Fast availability of data at every level facilitated quicker decision making, resulting into positive impact. Sustainability of this system is long term.

9. Transferability
   a. What can other learn from this initiative?
   - Access to data to anyone, anytime & anywhere.
   - Paperless availability of data : environment-friendly initiative.
   b. Has the initiative been replicated / adopted elsewhere? Where? By whom?
      No idea

10. Recognition / Awards : - NIL

Website Address : www.msrtc.indiagis.org
Username - Msrtc
Password - Admin
NEKRTC has done an exemplary work in providing Sustainable Urban Transport Solution to all small and middle-sized cities. In all, 479 city buses are in operation in 11 cities of the Corporation courtesy DULT (GoK) and JnNURM (GoI).

### Sl. No. | City/Town  | No of buses | No.of Trips |
---|---|---|---|
1 | Kalaburagi | 88 | 976 |
2 | Bidar | 33 | 326 |
3 | Yadgiri | 24 | 180 |
4 | Raichuru | 55 | 525 |
5 | Koppala | 28 | 280 |
6 | Ballari | 63 | 555 |
7 | Hosapete | 48 | 480 |
8 | Vijayapura | 89 | 980 |
9 | Gangavati | 25 | 275 |
10 | Sindhinur | 20 | 176 |
11 | Sedam | 06 | 48 |
**TOTAL** | **479** | **4801** |

**Employees welfare measures:**

**Leave Management System:**

1. Web-based Leave Management System in 47 Depots which facilitate the Leave granting without Human interference to Crew and Mechanical Staff. This is the first STU to implement this system in country.
Infrastructures provided to the Commuters

All necessary infrastructures have been provided to the commuters at all the Bus stations in NEKRTC, under Special Development Scheme by the Government of Karnataka to redress the regional imbalances.

Computerised Driving Module:

- The Drivers Training Institute @ Hnumabad in Bidar Dist. in constructed during 1988, with broader thought to improve efficiency of the in service Drivers, to avoid the accidents, to cultivate the perfect Driving systems, to increase fuel efficiency of the Vehicles. The periodical Training is being given to selected needy crews.
- The Institute has systematic Driving Tracks of Different Curves, Up-Gradients, Down-Gradients, Reverse Parking, Hillock Riding, Hairpin bends, Different type of roads like 6 lanes, 4 lanes, 2 lanes, single lane, Mettled, Asphalted, Concreted Roads along with Accommodation & Boarding facilities.
- The Institute is headed by Principal with Training Faculties.
- By virtue of above, the NEKRTC is continuously receiving “BEST FUEL EFFICIENCY AWARDS” from IOC since 5 years.
- For fair & Transparent selection Drivers, the Drivers Training Institute has now developed Fully Comprised Test Tracks by which the Corporation is selecting quality Drivers.
BEST PRACTICE

North Western Karnataka Road Transport Corporation
Name of the Initiative | Softwares Implemented
--- | ---
1. | The project on “EMPLOYEE GUARANTEE SERVICE” was undertaken in the brand of “SEVA SPANDANA” to address the employee grievances, proactively and timely. It is working successfully. IT department has successfully developed and installed SEVASPANDANA software at all the units of NWKRTC.
2. | **Less Paper Office:** Implementation of less paper office for tracking of files and letters in Central Offices and all Division offices.
3. | **Biometric Attendance Monitoring System:** Installed the biometric Aadhar Card-based attendance monitoring system in Central Offices.
4. | **Newly recruited crew posting Counselling software:** IT department has successfully developed and implemented Newly recruited crew posting counselling software to facilitate the posting of drivers, conductors and driver-cum-conductors in a very short time. This software provides transparent way of filling up of vacancies according the merit list.
5. | **Smart Leave Application Management System:** The crew leave application receipt system was developed to process leave application online via web application. IT department has successfully developed and implemented application at 21 depots of NWKRTC. The software application is indigenously built by NWKRTC in-house software development team.
6. | **Development of Form-IV software application** for traffic / operations management: application avoids parallel and overlapping schedules while creating new schedules.

II. Awards and Recognition:

1. | “Abhi Bus Award” for Excellence in Bus Transport in the year-2015
2. | “Urban Mobility India award - 2016” - Award of Excellence: - The Ministry of Urban Development, GoI had invited the nominations for Urban Mobility India award in the various categories. In response to it, NWKRTC filed nominations in three categories. Among the nominations filed, “BEST CITY BUS SERVICE PROJECT” category was short-listed for final presentation, topic entitled “Best City Bus services-Dharwad”. Eighteen Road Transport Corporation made presentation before the jury. The jury members considering the achievements in the field, selected NWKRTC project “Best City Bus Services - Dharwad” for Excellence in Public Transport.
3. | Skoch Mobility Award-2016: Skoch groups Services invited nominations for Skoch Mobility Award-2016. There were 17 categories to be applied by various Government and Non Governmental agencies. NWKRTC filed two nominations 1. “Seva-Spandana - Employee Grievance Management System”. 2. “Transport Hubs in Rural areas - Up-gradation of Bus station Infrastructure”. Both the nominations are short-listed for the presentation before

The award was received by the Managing Director of NWKRTC on 11-Nov-2016 at Gandhi Nagar, Gujarat state.
evaluation committee on 24-Nov-2016. Considering the nomination, presentation and factual details the evaluation committee recommended for “Skoch Order of Merit Award-2016” for both the nominations.

4. **Elets PSU Award - 2016:** NWKRTC was practicing manual system for sanctioning of leave to the crew at depots due to which lot of problems were faced in sanctioning of leave to the employee. In order to bring transparency in administration and to provide better approaches and ambience to employees, Systems Department under the guidance of Managing Director developed “Smart Leave Application Management System” application software.

This software was inaugurated by the Honourable Transport Minister during Corporation Day celebration. The Elets Techno-media in coordination with Government of India New Delhi, invited application for PSU Special Award-2017. NWKRTC, was short-listed and won the award. Award was distributed on 31.01.2017 in the 3rd PSU summit 2017.

5. **Greentech Award:**
Considering the remarkable contribution of NWKRTC in environment protection and conservation like, regular smoke emission tests, disposal of automobile wastes, celebrating Vanamahotsava, celebration of Ozone Day and World Environment Day. NWKRTC, is awarded with “silver medal” in the “17th Annual Greentech Environment Award-2016” organised by Greentech Foundation New Delhi.

Award distribution ceremony was organised in Hotel Taj, Bangalore on 02-02-2017 and the award was given away by Shri. R.K Dubey, Chairman, Disaster Management Institute and Shri. Kalmeshwar Sharan, Chairman, Greentech Foundation.

6. **1st Annual Exceed Award 2017:**
Ek Kaam Desh Ke Naam, an organisation involved in recognizing the exemplary work done by Corporates by organising Exceed Award. NWKRTC has been awarded in recognition of IT applications in Human resource development and management. The award function was arranged in Joseph Stein auditorium on 17-03-2017 New Delhi and the award was given away by Shri. Deepak Mishra, IPS (Addl. DG CRPF) and Smt Kiran, Director, Punjab Kesari.
Name of the Initiative: Safety Measures

1. The following details to be furnished in the table

<table>
<thead>
<tr>
<th>No. of Central Workshops</th>
<th>No. of Divisions / Regional workshops</th>
<th>No. of Depot workshops</th>
<th>Total no. of workshop employees (both regular &amp; contractual if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>48</td>
<td>3377 (Mechanical Staff)</td>
</tr>
</tbody>
</table>

2. Other parameters for evaluation

<table>
<thead>
<tr>
<th>Description</th>
<th>2011-12</th>
<th>2012-13</th>
<th>2013-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of injuries</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>No. of fatalities</td>
<td>Nil</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Loss of Man days (in hrs)</td>
<td>90</td>
<td>210</td>
<td>35</td>
</tr>
<tr>
<td>Compensation paid (in Rs.)</td>
<td>Nil (Medical bills are reimbursed as per applicable law)</td>
<td>Nil (Medical bills are reimbursed as per applicable law)</td>
<td>Nil (Medical bills are reimbursed as per applicable law)</td>
</tr>
<tr>
<td>Expenditure made under the head for implementation of safety regulation (Rs. in Lacs)**</td>
<td>425.00</td>
<td>445.00</td>
<td>453.00</td>
</tr>
<tr>
<td>Expenditure incurred safety awareness programs (Rs. in Lacs)</td>
<td>45.00</td>
<td>47.00</td>
<td>41.00</td>
</tr>
</tbody>
</table>

** The required expenditure on safety equipments was made before 2011-12 which is one time Capital expenditure and the proportionate expenditure being made based on the depreciation of the safety equipments provided at various workshops. These accounts represent equipments, safety measures which includes infrastructure-related expenditure to meet the safety norms.

3. Details in brief:

a. Safety measures followed in Workshops:

As per the applicable Acts, Laws and Industrial Regulations the employees are provided with the safety equipments / facilities and list of such equipments provided are listed and shown at Annexure-A. To ensure the optimum safety of working staff at various production and maintenance units of NWKRTC the following variety of safety equipments are provided.

1. Safety equipments for routine works ex., hand gloves & safety goggles, helmet, hum shoes, masks etc.

2. Trained personnel in First Aid, First Aid box & Doctor facility at each depot

3. Fire Extinguishers
4. Alerting equipments and trained security personnel.
5. Signage boards and safety slogans / instructions.
6. Hand gloves & Black goggles are provided to the mechanics for making the welding process.
7. Various Women’s safety measures like providing separate crew resting room, urinals/toilets and avoiding crew booking for night duty.
8. Hoists, lifting tackles are being maintained properly and being examined once in every 6 months.
9. Air compressors and grinding wheels are fenced with safeguards and periodic all maintenance being done and examined by competent person.
10. Some mechanical officers are recognized as “competent person” by director of factories, Bangalore, for the purposes of carrying out tests, examinations and inspections of machineries like air compressors and lifting tackles.
11. Effective arrangements being taken for treatment of wastes and effluents and their disposals.
   (Effluent Treatment Plant (ETP) is constructed at regional workshops, Hubli, as per the norms and specifications of Karnataka State Pollution Control Board (KSPCB)).
12. Periodical maintenance of Workshop buildings being done to meet the various safety norms.

The Workshop infrastructures are also designed considering various safety measures which includes avoiding conflicts between vehicles and labours, maintenance area and materials storage; earmarked a specific area for storage of oils, waste oils, cotton waste; provided emergency exit, speed limits etc.,

b. Personal protection equipment (PPE) available:

As per the applicable Acts, Laws and Industrial Regulations the employees are provided with PPE equipments as stated in the Annexure-A and same are being replaced considering depreciation/wear & tear on periodical basis.

c. Monitoring / Enforcing Methods:

The safety measures are being monitored by the stipulated authority at each workshops wherein three-layer monitoring / enforcement system is adopted apart from external independent agencies like Directorate of Factories, Labour & Welfare, Pollution Control Board appointed by the State Government etc. NWKRTC is also using standard formats to evaluate the available safety measures on periodical basis which is mandatory for all the workshop in-charges to furnish and enforce the safety norms.

d. Safety awareness programs conducted:

- Every year in the month of January 1st to 15th, the Corporation is celebrating Road Safety week. During this period mechanical staffs have been educated regarding safety programs.
- Every year on 4th March, National Safety Day is being celebrated, on that day oath will be administered to all the employees of workshops.
- Conducting safety awareness and cleanliness day at each units to ensure the availability of safety environment at each unit. This programme is being conducted on every 3rd Wednesday of the month.
- Series of training and awareness camps are being conducted at each unit and also at Regional Training Institute, NWKRTC, Hubli.
- The Security & Vigilance wing of NWKRTC is also monitoring, evaluating and conducting demo test of various emergency safety equipments at every unit of NWKRTC.
- The external Government agencies like fire brigade, police, labour department, health department etc., are also conducting various training / awareness programmes about enforcement of safety measures.
AWARENESS PROGRAM TO THE SECURITY GUARDS

e. Method adopted to improve the safety at workplace / health of the workplace

- The units are strictly adhere to the various cleanliness norms which includes
- Segregation of waste, oil, spares, grease etc., to avoid any security threat to the working force.
- The workshop areas are bifurcated with various zones wherein specific section of the unit is earmarked for the specific activities which is mandatory for every workforce of the unit to follow and work in the similar lines. This exercise is tremendously helped the NWKRTC to reduce the accidents / safety-related challenges at workplace.
- A separate labour and welfare department is established in the Corporation to ensure the safety at every workplace and also up keeping the various security equipments to avoid any threat to the routine production activities. Under this department, three layer monitoring system is adopted to oversee the said activities.

f. Health check-up programs:

- NWKRTC is following the Karnataka Government servants (Medical Attendance) Rules-1963. Accordingly Employees are entitled for reimbursement of medical expenditure as per Medical Attendance regulations on par with the govt.
- In addition to this, the employees and their family members who are undergoing surgery for serious diseases, the medical advance up to 1 lakh would be sanctioned.
- The de-addiction program of NWKRTC, Titled “WAPPA” (Workplace Alcohol Prevention Program & Activity) is successfully implemented under anti-alcohol policy.

Alcohol addicted employees counselling along with their dependants

Periodically various kind of Health check-up camps are being conducted for all the employees and their dependants.

Eye check-up camps are conducted especially for the Mechanical staff who are above 40 years.
Eye check up programs

- During the period of 2012-13, 27 Eye check-up camps and 17 health check-up camps are conducted, during 2013-14, 22 Eye check-up camps and 25 health check-up camps are conducted.

g. Lighting in Work place:
At Every workshop sufficient illumination of lighting is provided under 24 x 7 concept.

h. First Aid Kit:
First Aid Boxes with sufficient equipment and medicines are also provided at every workplace and minimum two mechanical personnel are also trained to facilitate first aid treatment in case of emergency. Every workshop is also provided with honorary medical consultants who will ensure the various kind of health issues on day to day basis.

i. Other safety markings & informative instructions for awareness:
The various signage boards like speed limit, parking, emergency contact details, storage, instructions, manuals etc., are displayed at every work place to create the awareness among the staff.

4. Recognitions / Awards received:
NWKRTC’s various achievements / works / performances / best practices have been recognized by various agencies and awarded following trophies etc.,
1. Road Safety Award for the year 1998-99.
3. Road Safety Award for the year 2001-02.
4. Runner-up Award for improvement in KMPL for the year 2002-03.
5. Tyre performance Award for maximum improvement (Mofussil services) for the year 2003-04.
6. Award for improvement in KMPL for the period 2003-04.
7. Runner-up Fuel efficiency Award for maximum improvement in KMPL (Mofussil services) 2004-05.
8. Award for Excellence in Bus Transport- Contribution to the Bus Travel Industry: Presented by India Bus Award-2015 on 03-07-2015. Additional information about NWKRTC may please be seen at www.nwkrtc.in
1. The required details are furnished in the table below:

<table>
<thead>
<tr>
<th>Central Office</th>
<th>No of Divisions/ Regional office &amp; Workshop</th>
<th>No of Depots</th>
<th>No of bus station</th>
</tr>
</thead>
<tbody>
<tr>
<td>One (HQ at Hubli)</td>
<td>08 Divisions and one Regional Workshop</td>
<td>48 Depots</td>
<td>128</td>
</tr>
</tbody>
</table>

2. Other Parameters for Evaluation:

Name of the Central office / Divisional offices / Regional offices / Depots / Bus station;

i) Bus station waiting area:

<table>
<thead>
<tr>
<th>SL. No</th>
<th>Description</th>
<th>Yes/No</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dust bins with segregation of waste</td>
<td>Yes</td>
<td>Segregation is being done on day-to-day basis at all major bus terminals and dustbins are provided at all other minor bus terminals.</td>
</tr>
<tr>
<td>2</td>
<td>Fans, lights, and seating area</td>
<td>Yes</td>
<td>All major bus terminals are provided with proper lighting, sitting and ventilation facilities.</td>
</tr>
<tr>
<td>3</td>
<td>Walls, roofs, whether painted or not</td>
<td>Yes</td>
<td>Painted</td>
</tr>
<tr>
<td>4</td>
<td>Frequency of cleaning in a day</td>
<td>Yes</td>
<td>Frequency is between two to six times in a day depending upon the size of the terminal and movement of passengers, for which all terminals are allocated with a specific cleaning staffs/contractors for cleaning purpose.</td>
</tr>
<tr>
<td>5</td>
<td>Overall appearance</td>
<td>Yes</td>
<td>Good</td>
</tr>
<tr>
<td>6</td>
<td>Public conveniences and feedback of commuters</td>
<td>Yes</td>
<td>Good, and each terminal is equipped with public grievance system in the form of online and offline. Public can file complaints using online public grievance which is provided at <a href="http://www.nwkrtc.in">www.nwkrtc.in</a></td>
</tr>
<tr>
<td>7</td>
<td>Drinking water facilities</td>
<td>Yes</td>
<td>Provided at all units of NWKRTC</td>
</tr>
</tbody>
</table>

ii) Bus station waiting area:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Parking facilities</td>
<td>Provided</td>
</tr>
<tr>
<td>2</td>
<td>Disposal waste as per waste deposal norms</td>
<td>Followed</td>
</tr>
<tr>
<td>3</td>
<td>Driver/conductor restrooms</td>
<td>Provided</td>
</tr>
<tr>
<td>4</td>
<td>Canteen facilities</td>
<td>Provided /Repast allowance is being paid</td>
</tr>
<tr>
<td>5</td>
<td>Sanitation facilities</td>
<td>Provided</td>
</tr>
<tr>
<td>6</td>
<td>Landscaping</td>
<td>Available with limited units based on the space</td>
</tr>
<tr>
<td>7</td>
<td>Lighting</td>
<td>Provided</td>
</tr>
<tr>
<td>8</td>
<td>General appearance of the Building and offices</td>
<td>Maintained in Good condition</td>
</tr>
<tr>
<td>9</td>
<td>Cleanliness of other work places</td>
<td>Maintained in Good condition</td>
</tr>
<tr>
<td>10</td>
<td>Bus cleanliness &amp; feedback of commuters</td>
<td>Before starting the schedule all Buses are washed and sent online</td>
</tr>
<tr>
<td>11</td>
<td>Officers and staff working area</td>
<td>Good condition</td>
</tr>
<tr>
<td>12</td>
<td>Surrounding open area</td>
<td>Good condition</td>
</tr>
</tbody>
</table>

3. Details in brief (Not exceeding ten one side A4 Size pages)

a) Method adopted to maintain the cleanliness

- The all units are assigned with a regular cleaning contractor/staff who will take care of cleanliness of the site and in addition to this NWKRTC is being provided various cleaning equipments and consumables.
- The units are strictly adhered to the various cleanliness norms which include segregation of waste, oil, spares, grease etc., to avoid any security threat to the working force.
b) Monitoring / enforcing methods
The cleanliness measures are being monitored by the stipulated authority at each unit wherein three layer monitoring / enforcement system is adopted apart from external independent agencies. NWKRTC is also using standard evaluation formats to ensure cleanliness at every units.

c) Lighting in work place
At every unit including Bus terminals sufficient illumination facilities are provided with, based on the set of norms specified by the enforcement authority. The illumination is available under 24x7 basis.

d) Awareness programs conducted to improve cleanliness
Periodical programmes are being conducted for cleaning of depot / workshop premises. The various programmes conducted during the period is represented in the form of photographs at Annexure-B.

4. Recognition / Awards received.
NWKRTC’s various achievements / works / performances / best practices have been recognized by various agencies and awarded following trophies etc.,
1. Road Safety Award for the year 1998-99.
3. Road Safety Award for the year 2001-02.
4. Runner-up Award for improvement in KMPL for the year 2002-03.
5. Tyre performance Award for maximum improvement (Mofussil services) for the year 2003-04.
6. Award for improvement in KMPL for the period 2003-04.
7. Runner-up Fuel efficiency Award for maximum improvement in KMPL (Mofussil services) 2004-05.

Additional information about NWKRTC may please be seen at www.nwkrtc.in
Name of the Initiative  Commuter-friendly Initiatives - Integrated Intelligent Transport System (IITS) in Navi Mumbai

1. Name of the organization : Navi Mumbai Municipal Transport (NMMT), Navi Mumbai

2. Objective of the Innovative best practice :
   NMMT envisages implementing IITS for its city bus operations to bring in world class operational efficiency and automation for its transit operations. With a Vision of giving a safe, secure, economical, intelligent and interactive public transport to common citizen, NMMT decided to implement the IITS project with the following objective.
   - To provide hassle-free transport services with technology interventions - Sustainable Urban Mobility focusing on Demand side.
   - Route rationalization and citizen participation in planning and improvement in NMMT services.

3. Details in brief
   a. Title of the initiative
      Integrated Intelligent Transport System (IITS) in Navi Mumbai
   b. Depot / Division / Centre where the initiative was implemented
      The operations of NMMT is handled from 3 depots which are Turbhe Depot, Asudgaon Depot and Ghansoli depot. The Integrated Intelligent Transport System (IITS) has been implemented over complete NMMT operations. It covers all the depots and all buses that NMMT operates.
   c. Background of the initiative
      Navi Mumbai Municipal Transport (NMMT) is the transport wing of Navi Mumbai Municipal Corporation, which operates bus services in Navi Mumbai. NMMT buses serve the entire Navi Mumbai city as well as to certain parts of Mumbai, Thane, Kalyan, Dombivali, Badlapur, Taloja, Panvel and Uran. NMMT operates more than 450 buses within Navi Mumbai, as well as into Mumbai, Thane, Kalyan-Dombivali, Uran and Panvel from three bus depots, Turbhe, Ghansoli and Asudgaon.
   d. Previous method followed
      1. Previously following processes were manually operated
         a) Bus assignment
         b) Crew assignment
         c) Route rationalization
         d) Scheduling and planning
         e) Incident reports generation
         f) Fare collection
         g) Grievances Handling
      2. There were no system where commuter can see upcoming and schedule buses and plan the journey
      3. There was no provision to track vehicles
      4. Inefficient utilization of assets
      5. Passengers were not able to able to book tickets online. Also there was no system for ticket payment through Credit / Debit Cards
   e. New technology introduced
      IITS project is being implemented in NMMT with an investment of approx. 10 Cr. rupees across the period of 5 years. The key technology components (Hardware) used in the project for implementation of all software modules are shown in the figure below.
f. Date of implementation
11 June 2015

g. Duration of implementation
2 Years

h. Purpose and priority of the initiative
The objective of IITS is to provide a safe, secure, economical, intelligent and interactive public transport promoting NMT (Non-motorized Transport). For this initiative, the priority is always “Commuter”. The commuter should be able to feel satisfied with the services offered by NMMT.

i. Strategies adopted for implementation
In order to make this initiative a great success, a consultants are hired for Project Management purpose. A tender “Supply, Design, Development, Implementation, Hosting & Maintenance of Intelligent Transportation System (ITS) for NMMT” was floated to select the vendor for development and implementation of ITS solution. In order to get the global best practices and technology, NMMT officials also visited advanced country where ITS solution is already operational.

j. Outcome including exceptional achievements impact and sustainability
i) Automatic Vehicle Location System
The Automated Vehicle Locator System (AVLS) is the heart of the fleet monitoring system and primarily use GPS devices or On-Bus Intelligent Transportation System (OBITS) mounted on the vehicle as primary source of data for tracking purposes. The AVLS system enable NMMT operations team to monitor vehicle movement in real time and synthesize the AVL field data to deliver the same on the public information system devices installed on Bus stops, Terminals, Buses, NMMT portal and mobile information delivery system. AVLS system includes the key facilities as follows

- Show Operation of entire Bus fleet of NMMT and its status
- Depot-wise Bus Operation Statistics
- Real Time Trip progress showing distance travelled by Bus and travelling time.

Figure 1 : Entire fleet on Map | Figure 2 Depot Wise Fleet Statistic | Figure 3 Line Tracker showing real time location of vehicles on routes

ii) Mobile Application
NMMT has released the Mobile Application (NMMT Tracker) on Android and iOS platform with below mentioned functionalities.

- Showing nearby bus-stops
- Navigation option to direct to the bus stop
• Bus details for selected bus stop showing all running buses
• Showing real time position of buses
• Create reminder for arrival of the user’s stop
• Share travelling details through WhatsApp or SMS
• Online booking of tickets and pass issuance and renewal

With the help of this application, journey planning has become very convenient and friendly to commuter.

![Bus Stops Near by Location](image1)
![Landing page of Mobile App](image2)

**iii) Passenger Information System**

- Facilitates Commuter by providing updates of Expected Arrival and Departure time of buses at NMMT Bus Terminals and Bus Stations.
- Displays Real time information of routes and estimated time of arrival bus.
- Automatic internal voice and visual announcements of next stop locations
- Automatic external voice announcements of route name, direction and destination

![LED Displayed based PIS](image3)
![LED TV Based PIS](image4)

**iv) Command and Control Centre**

One of the keys to smart system is information. More available data means better solutions. Combining databases will therefore help to create better understanding of situation at a given moment. Hence, all the data gets captured at Control Command Centre.

- All time connected to depots and terminals
- Central Monitoring & Control of all 450 buses and crew
- Generates necessary management reports
- Manages, updates and uploads all configuration data and fare tables
- Collates all transaction data and authenticate security features of transaction data to provide secure and accurate traffic statistics for the Buses / Routes of the depot

**v) Toll free Helpline**

- We have provided eight (8) toll free numbers where commuters can call and get the required information
- They can also file their grievances on these toll free numbers where our ITS team tries to resolve it at earliest
vi) Automatic Fare Collection System (AFCS)
- It includes hand-held device for dispensing bus tickets to commuters
- Commuters can purchase tickets with the help of their Debit / Credit cards so that it will be complete cashless experience for them. We received enormous response for this initiative to tackle demonetization and we are in the middle of launching this system on more routes
- A System support NMMT’s Fare Collection Rules and work as an automatic fare collection system having centralized data source and which offers paper and cash-less ticketing

vii) Scheduling and Planning system
- The solution offers the following integrated vehicle timetable, driver scheduling and crew rostering tools:
  - Network Plan
  - Fleet
  - Crew
  - Roster
- The module provides fully automatic solutions with an option for manual fine-tuning. Mathematical algorithms calculate the most economic use of fleet vehicles and staff in accordance with timetables, labour agreements and driver preferences.
- With the help of economical use of fleet vehicles, we can provide better service to our commuters.

viii) Inventory and Maintenance Management System
- Integrated stores management to monitor the inflow, outflow and maintenance of stock along with its link to stock position, sales and revenue figures etc
- Stock checking, replenishment and identification of stock thresholds linked with auto-mailers/ SMS alerts to the concerned officer for replenishment of stock
- With proper inventory management, we are keeping our buses in good running condition. This gives commuters a sense of safety and punctuality of our service

ix) Financial Management System
This system takes care of all accounting functions of NMMT including,
- Asset Management
- Management of payments to vendors
- Fare accounting
- Profit and Loss calculation
Daily Receipts and Payments Cross-tally • Disbursal to operations

x) Business Intelligence System
- Management Information System is a single window dashboard for higher management. The dashboard is designed considering typical requirement of Decision Support Tool for Higher Management. It is being used as navigation to various reports and other functionalities as well.
- The dashboard is used as one of the best tools available to authorities of Public Transit System for various comparison and Decision Analysis.
  - Trip Overview Analytics
  - Terminal Performance Overview
  - Passenger Profile Analytics
  - Inventory Analytics
  - Violation Overview Analytics
  - Bus Operation Analytics
  - Revenue & Expenditure Analytics
With the help of ITS solution, our internal processes and efficiency have also improved due to which we can focus more on providing friendly services to our commuters.

4. Implementation Highlights
- Automatic Vehicle Location System
- Mobile application for Citizen
- Passenger Information System
- Command & Control Center and incident management system
- Automatic Fare Collection System
5. Output / Outcome

Benefits for Citizens

- Informed and intelligent travel to commuters
- Safe and secure travel
- Hassle free travel
- Public Information System & Mobile application
- Support for Multi-Modal Transport Services to plan Journey
- Digital ticketing & cash-less ticketing options

Benefits for Administration

- Efficient Operations
- Systematic Operational Management
- Better Fare collection and Management
- Transparency
- Proactive Load Management
- Prompt & Effective Incident Management

6. Recognition / Awards received

1. ASRTU Highest performance in vehicle productivity and tire utilization 2013-14.
3. ASRTU Highest performance in vehicle productivity 2015-16.
BEST PRACTICE
Catalogue
Initiatives of UPSRTC

UPSRTC, a passenger road transport corporation of UP, operates in UP & neighbouring states (now including Kathmandu & Pokhara in Nepal) with a fleet of over 11000 buses. We currently operate 4 categories of services apart from ordinary Non-Ac buses:

1. Gramin Service - around 1500 buses
   - Rural areas connectivity
   - UPSRTC buses connect to 70% villages out of 97000 villages in UP
   - Reduced fare public transport services - Discounted Fare @ 75% of normal

2. JanRath / Shatabdi - around 900 buses
   - Affordable AC Buses
   - 2 x 2 - Fare @ 1.5 times of normal
   - 3 x 2 – Fare @ 1.1 times of normal
   - Connectivity between major towns / districts

3. Pink Service
   - AC Buses - exclusively for women
   - Lady conductors, security & CCTV
   - Tickets - only to Women or Male companion

4. Maitri Services
   - Luxury AC buses - International tourism
   - Varanasi & Kathmandu

Our services connect to major destinations in neighbouring states. On an average, our services cover around 40 lakh kms providing services to over 16 lakh passengers and earning around Rs. 13 crores every day.

Initiatives

1. Intelligent Transport Management System

The corporation embarked on a scheme for passenger centric Intelligent Transport Management System (ITMS) in 2013-14. UPSRTC is the pioneer State Transport Corporation, which has undertaken a comprehensive project of this nature. The project is on BOOT model with no expenditure burden on the corporation revenue.
2. Digital India Initiative
   a. E-Ticketing-use of Smart Cards-cash less travel, no change problem, advance revenue

   Cards as per RBI Guidelines under PPI License
   - Combo cards by leading banks - Travel wallet in RFiD & Shopping wallet in Magstrip VISA powered – Semi-closed loop
     “यात्रा भी खरीददारी भी करारी भी कहीं भी”
   - Over the Counter Prepaid Preloaded cards by leading banks – closed loop
     “तरंग आओ, तरंग पाओ”
   - Contributes advance payment, committed passenger, registration charges @ Rs. 50/- per card
   - Integration of mWallets is in progress - Mobile current booking app, wi-fi enabled, choice of mWallet to passenger

b. IRCTC JV

   c. Cashless Transactions - Fas-Tag Cards on buses for payment of Toll Tax
   d. Digitisation of Fuel Pump, Storage & Dispensation for consumption control resulting in conservation of fossil fuel and reduction in pollution

   e. Other Initiatives
   - Water ATM & Neer
   - Yatra Darpan
   - Wi-fi Hotspots
• Computerised Inventory Management - to reduce inventory carrying cost and stock outs
• Use of LED & power saving devices at Bus Stations & Offices - reduce cost, carbon footprint & carbon credits
• Create Modern Bus Stations - model created at Kaiserbagh, Lucknow
• Solar Power Generation - Panels on Roof Top
• AC Passenger Waiting Area
• Anti Collusion Device - safer travel & lower impact of accidents - trial being conducted
• E-Auction introduced through MSTC (Metal Scrap Trading Corporation)
• Automatic bus washing at various locations
• Yatri Rahat Yojana - For Relief to passengers and their kin involved in accidents.

Awards:
1. Department of IT & Electronics, GoUP
   Digital transactions and cash-less initiatives - 2017
2. ASRTU
   • Maximum profit making STU in 2015-16 & 2014-15
   • Minimum cost of operations per km. - 2016
   • Excellence Award for Commuter-friendly Initiatives - Use of Multi-Purpose Smart Cards -2015
   • Best Practices Award - 2014
3. Skoch Consultancy Services
   • Transformative Governance Award - - 2015
   • Skoch Mobility Award 2016 - Excellence Gold Award in 5 categories – ITMS Project, Multipurpose Smart Cards, VTS & Road Safety, IVRS Dial 149 Helpline, Water ATM & Parivahan Neer
   • Store Inventory Management System - Order-of- Merit & Silver Award - 2016
   • Passenger Relief Scheme - Yatri Rahat Yojana- Order-of- Merit Award - 2016
4. KIGA (Kalam Innovative Governance Award) - bestowed by Dr APJ Abdul Kalam Foundation in 2016 at Vigyan Bhawan, Delhi for Use of Innovative IT Tools in Public Interface of Road Transport (ITMS)
   • Elets Award - Elets Award - Smart City - Smart Card Initiatives
   • Elets Award - IT on fast wheels - 2016
   • Elets Smart City Summit Award Lucknow, e-Initiatives : Cashless Transactions - Multi Purpose Smart Cards for Bus Travel & Shopping
Uttarakhand Transport Corporation
Name of the Initiative: Commuter-friendly initiatives: Cashless Ticketing On Board

1. Name of the Organisation: Uttarakhand Transport Corporation

2. Objective of the innovative best practice
   a. To make cashless payment to conductor in a running bus.
   b. To provide passengers free from keeping small denomination currency.
   c. To avoid complaints of conductor regarding not refunding money to passengers.

3. Details in brief
   a. Depot / Division / Centre where the initiative was implemented
      - All 21 depots of Uttarakhand Transport Corporation
   b. Background of the initiative
      - After the demonetization of 1000 and 500 Rs notes, a need of cashless solution for payment to conductors was felt. Also a solution for avoiding complaints of conductor regarding not refunding money to passengers and for keeping passengers free from keeping small denomination currency a solution was needed.
   c. Previous method followed
      - After getting payment from passengers the conductors used to write balance amount on the back of the ticket and asks to wait till the small notes come. This leaves a lot of complaints for not refunding money as there was no proper system for arranging small notes for conductors.
   d. New technology introduced
      - UTC has integrated its existing EBTMs with PayTm.
      - Passenger has to download PayTm App to his smart phone.
      - Passenger has to scan a QR code pasted on UTCs EBTM.
      - Enter the Ticket amount for his journey in screen.
      - The passenger will get a 6 digit code on his mobile screen as well as through SMS within seconds.
      - Passenger has to tell this code to Conductor.
      - The Conductor will enter this code in his EBTM and the Ticket will be printed giving all the journey details like From and To and Fare etc at once.
      - The payment made through this system will come directly to UTCs central bank account and in conductor EBTM summary report this amount shall be shown separately which he has not deposited in Depot.
      - The main feature of this system is that UTCs EBTMs are non GPRS and without any Internet connectivity.
   e. Date of implementation
      - 1 April 2017
   f. Duration of implementation
      - From 1st April to 30th June 2017
   g. Purpose and priority of the initiative
      a. Provide cashless payment to conductor of a bus.
      b. To provide passengers free from keeping small denomination currency.
      c. To avoid complaints about conductor regarding not refunding money to passengers.
h. Strategies adopted for implementation

UTC has adopted this system to integrate with its existing EBTMs which are non GPRS.

i. Outcome including exceptional achievements

- Passengers are happy as they do not have to keep small denomination currency and request to conductor for refund of money
- Short distance Passengers and Daily passengers are showing more interest in this
- UTC has advantage of reducing pilferage in small distance tickets.
- Helping increasing revenue of the corporation
- Conductors has to carry less cash hence cash security.

4. Implementation Highlight

1. Integration of PayTm with existing EBTMS
2. Development of software for EBTMs
3. Pasting QR codes on EBTMs
4. Training to conductors
5. Instructions for passengers

5. Output / Outcome

1. Daily commuters and others passengers are very happy to make payment through this system.
2. There is a clear increase of collection up to 3 percent as there is no scope of corruption in this system.
3. Conductors has to carry less cash hence cash security.

6. Recognition / Awards Received

- Ticketing cashless on board of a bus is first time in India
- This is one step forward in Prime Minister’s dream of cashless India
**Name of the Initiative**  Excellence in Bus Transport - Call Centre for obtaining Passenger Feedback

1. **Organization Information**: Telangana State Road Transport Corporation

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years of operation</td>
<td>86 Years (TSRTC -3 Years)</td>
</tr>
<tr>
<td>Head office location</td>
<td>Bus Bhavan, RTC X Roads, Musheerabad, Hyderabad, Telangana</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameters</th>
<th>2016-17</th>
<th>2015-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fleet Size (count)</td>
<td>10451</td>
<td>10391</td>
</tr>
<tr>
<td>No. of services (count)</td>
<td>9891</td>
<td>9817</td>
</tr>
<tr>
<td>Customer Base (count)</td>
<td>348.79 Crores per annum Avg. 95.96 lakhs per day</td>
<td>329.35 Crores per annum Avg. 89.99 lakhs per day</td>
</tr>
<tr>
<td>Employee Base on payroll (count)</td>
<td>54117</td>
<td>55993</td>
</tr>
<tr>
<td>Employee Base on contract (count)</td>
<td>687</td>
<td>583</td>
</tr>
<tr>
<td>Cities/Segment/Regions covered (count)</td>
<td>Entire state of Telangana comprising 31 Districts</td>
<td></td>
</tr>
<tr>
<td>Company revenue growth (%)</td>
<td>6.00%</td>
<td>0.23%</td>
</tr>
<tr>
<td>Turnover (INR Lacs)</td>
<td>Rs.4239.93 Crores</td>
<td>Rs.3999.90 Crores</td>
</tr>
</tbody>
</table>

Private and Confidential

2. **OBJECTIVES**

- To obtain the feedback from the passengers - their experiences, right from booking to completion of journey so as to improve the quality of services
- A Call Centre with 5 operators has been established in the Corporate Office
- An amount of Rs. 8.87 lakh is incurred towards establishment of call center infrastructure
- A running cost of Rs.14.70 lakh per annum
- March, 2017

3. **Details of the Project**:

- The contact numbers of the passengers who have travelled are distributed to the operators by the system itself without giving scope for any discretion in choosing the phone numbers
- The passengers are called over phone by trained female operators and feedback on the quality of service and the problems faced by them are obtained
- The feedback obtained is recorded in the system. Voice recording of the conversation is also maintained
- The feedback obtained from the passengers is entered into the system by the operators and reports (service-wise, Depot-wise, date-wise, region-wise etc.) are generated
- The negative feedback given by the passengers is communicated to the respective Depot Managers for improvement
- Compliance from the Depot Managers is obtained
- The trend in number of complaints received is monitored to gauge the efficiency levels
- Improved passenger satisfaction
4. Passenger Feedback Rating:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Initial 10 days of Implementation</th>
<th>First 10 days in June'2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>0-1</td>
<td>1</td>
<td>0.03</td>
</tr>
<tr>
<td>1-2</td>
<td>3</td>
<td>0.10</td>
</tr>
<tr>
<td>2-3</td>
<td>9</td>
<td>0.30</td>
</tr>
<tr>
<td>3-4</td>
<td>23</td>
<td>0.76</td>
</tr>
<tr>
<td>4-5</td>
<td>107</td>
<td>3.51</td>
</tr>
<tr>
<td>5-6</td>
<td>223</td>
<td>7.32</td>
</tr>
<tr>
<td>6-7</td>
<td>334</td>
<td>10.97</td>
</tr>
<tr>
<td>7-8</td>
<td>1382</td>
<td>45.39</td>
</tr>
<tr>
<td>8-9</td>
<td>963</td>
<td>31.63</td>
</tr>
<tr>
<td>Total</td>
<td>3045</td>
<td>100.00</td>
</tr>
</tbody>
</table>

5. Impact and sustainability:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pre-launch</th>
<th>Post-launch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer base number</td>
<td>32.86 lakhs per annum</td>
<td>As per the monthly trend it is expected that the passengers would increase to 35.00 lakhs per annum.</td>
</tr>
<tr>
<td>Fleet size</td>
<td>1111 services</td>
<td>1111 services</td>
</tr>
<tr>
<td>Routes / Services taken</td>
<td>101 routes</td>
<td>101 routes</td>
</tr>
<tr>
<td>Revenue in Cr. per annum</td>
<td>Rs. 151.19 Cr. per annum</td>
<td>Rs. 200.00 Cr. Per annum</td>
</tr>
<tr>
<td>Market Growth (%)</td>
<td>15%</td>
<td>18%</td>
</tr>
</tbody>
</table>

6. Innovation:

- Instead of passengers complaining on the deficiency in services, taking feedback from the passengers by contacting them is better
  This is unique in public transportation
- Initiative of taking feedback is innovative and first time in the country among public transport undertakings
- Quality of services rendered by the organization is known
- An opportunity to take immediate action by field managers to redress the deficiencies reported by passengers
- Passenger feels important and cared for when he is called for giving his observations

The first of its kind initiative is an STU wherein the passengers are called after their journey to record their observations.
Name of the Initiative  “VAJRA” - SERVICE AT DOOR STEP

1. AT A GLANCE:

<table>
<thead>
<tr>
<th>Number of Depots</th>
<th>No. of Divisions / Regions</th>
<th>Number of Buses Held</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>RTC</td>
<td>HIRE</td>
</tr>
<tr>
<td>96</td>
<td>24/11</td>
<td>8435</td>
<td>2184</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10619</td>
</tr>
</tbody>
</table>

2. FLEET:

<table>
<thead>
<tr>
<th>A/C</th>
<th>Non A/C</th>
<th>Rural Transport</th>
<th>Urban Transport (A/C-161)</th>
</tr>
</thead>
<tbody>
<tr>
<td>250 (2.35%)</td>
<td>2640(24.86%)</td>
<td>3802(35.80%)</td>
<td>3941(37.11%)</td>
</tr>
</tbody>
</table>

3. Operational Key Indicators:

<table>
<thead>
<tr>
<th>Avg. Daily Earnings (Rs in Lakhs)</th>
<th>Avg. Daily Operation (Kms in Lakhs)</th>
<th>Occupancy Ratio (%)</th>
<th>E.P.K. (In Paise)</th>
<th>A.V.U (Kms/Bus/day)</th>
<th>E.P.B. (Earnings/Bus/Day)</th>
<th>No. of Passengers Transported: Lk/day</th>
<th>Rate of Accidents per 1.0 Lk Kms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1059.28</td>
<td>35.73</td>
<td>72</td>
<td>2965</td>
<td>342</td>
<td>10138</td>
<td>103.47</td>
<td>0.07</td>
</tr>
</tbody>
</table>

4. Major Cities & Towns in Telangana

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>City/town</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hyderabad</td>
<td>7749334</td>
</tr>
<tr>
<td>2</td>
<td>Warangal</td>
<td>759594</td>
</tr>
<tr>
<td>3</td>
<td>Nizamabad</td>
<td>310467</td>
</tr>
<tr>
<td>4</td>
<td>Karimnagar</td>
<td>299660</td>
</tr>
<tr>
<td>5</td>
<td>Khammam</td>
<td>262309</td>
</tr>
<tr>
<td>6</td>
<td>Ramagundam</td>
<td>252261</td>
</tr>
<tr>
<td>7</td>
<td>Mahabubnagar</td>
<td>210143</td>
</tr>
<tr>
<td>8</td>
<td>Nalgonda</td>
<td>153736</td>
</tr>
<tr>
<td>9</td>
<td>Adilabad</td>
<td>139103</td>
</tr>
<tr>
<td>10</td>
<td>Suryapet</td>
<td>106524</td>
</tr>
</tbody>
</table>

5. Situation before the Initiative:
- Passengers have to travel long distances to Bus Stations
- Involved time and money in their transfer to Bus Stations
- Ticket purchase at booking counters at Bus stations or in-bus from the conductor / driver after boarding bus
- Passengers did not know the location of their bus before arrival at the platform in the Bus Stations

6. Objectives of Service at Door Step:
- To provide hassle-free journey experience
- To reduce burden of travel within City and to provide bus facility to their residence in various colonies in the cities
- Mini AC Buses are planned for easily maneuverability and low capacity

In the first phase:
- Hyderabad to Warangal
- Hyderabad to Nizamabad

7. Features of the Project:
- “Service at door step” is the first step towards new generation inter-city travel
- Embodying the new concepts
- Service at door step boarding location nearest to residence
**8. Activities taken up to implement the initiative:**

**Passenger surveys:**
- To know their actual places / colonies of origin before boarding
- To know the destination and after alighting the intercity buses
- The passengers are spending considerable time & money on intra city travel to Bus station
- Identification of potential points which are surrounded by several nearby residential colonies

**9. Summary of Passengers going to WL from different places in Hyderabad:**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Place</th>
<th>% of Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Uppal</td>
<td>20.91</td>
</tr>
<tr>
<td>2</td>
<td>MGBS</td>
<td>9.47</td>
</tr>
<tr>
<td>3</td>
<td>DSNR</td>
<td>9.07</td>
</tr>
<tr>
<td>4</td>
<td>JBS</td>
<td>9.07</td>
</tr>
<tr>
<td>5</td>
<td>OTHERS</td>
<td>6.71</td>
</tr>
<tr>
<td>6</td>
<td>KPHB</td>
<td>5.92</td>
</tr>
<tr>
<td>7</td>
<td>AMBERPET</td>
<td>3.16</td>
</tr>
<tr>
<td>8</td>
<td>GACHIBOWLI</td>
<td>2.96</td>
</tr>
<tr>
<td>9</td>
<td>MEHDIPATNAM</td>
<td>2.76</td>
</tr>
<tr>
<td>10</td>
<td>HITECH CITY</td>
<td>2.37</td>
</tr>
<tr>
<td>11</td>
<td>TARNAKA</td>
<td>2.37</td>
</tr>
<tr>
<td>12</td>
<td>MADHAPUR</td>
<td>2.17</td>
</tr>
<tr>
<td>13</td>
<td>ECIL</td>
<td>1.97</td>
</tr>
<tr>
<td>14</td>
<td>LBNAGAR</td>
<td>1.97</td>
</tr>
</tbody>
</table>

- Pick-up routes are formed within the cities connecting the potential boarding points and connecting to the arrival points in the city other side.
- Buses are planned for deployment on these routes with reasonable frequency under this Service at Door Step concept.

**10. KPHB List of Colonies in Hyderabad city accessible to various boarding points for Vajra buses**

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Stages</th>
<th>Accessibility to Colonies</th>
<th>No of Colonies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Uppal Depot</td>
<td>Boduppal, Udaya Nagar, Sri Sai Nagar, Sai Nagar, Prashant Nagar, Ashok Nagar Colony, Parvathi Nagar, Manikanta Nagar, Bheemreddy Nagar, Canara nagar, Buddha Nagar and NIN colony.</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Big Bazar / Venkateshwar Temple road</td>
<td>Ragavendra Nagar colony, Mallikarjuna Nagar, Shanti Nagar, Kesava Nagar, Chenna Reddy Enclave, Hanuman Nagar.</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Uppal Bus station</td>
<td>Berrappagadda, Vijayapuri Colony, Laxma Reddy Colony, Sathya Nagar, Gandhi Nagar</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Uppal X road</td>
<td>Surya Nagar, IDA Uppal, Kalyan Nagar, Raghavendra Nagar.</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Ramanthapur Church</td>
<td>Maheshwari Nagar, Indira Nagar, Rahat Nagar, Ganesh Nagar, Nehru Nagar, Sai Chitra Nagar.</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Street No.8, Habsiguda ISI bus stop, Opp. South Indian Bank</td>
<td>Ravindra Nagar, Habsiguda, VV Nagar, SS Nagar</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Habsiguda X road</td>
<td>SS Nagar, Kakateeya Nagar, Snehapuri Colony, Professors Quarters, Nacharam.</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Tarnaka - RTC Hospital</td>
<td>Tarnaka, Vijay puri Colony, South lalaguda, Lalapet, NIN Quarters, Ravinder Nagar, Manikeswari Nagar.</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>Seethapal Mandi -Bata, MORE Super Market</td>
<td>Seetaphal Mandi, Warasigudda, Namalgundu, Boudha Nagar.</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Gandhi Statue</td>
<td>Mylargadda, Scandagiri, Parsigutta, Padmarao Nagar.</td>
<td>4</td>
</tr>
</tbody>
</table>
11. Summary of Route Wise Colonies in Hyderabad city accessible to various boarding points for Vajra buses towards WARANGAL (WL) and NIZAMABAD (NZB)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Route</th>
<th>No. of Additional Boarding Points</th>
<th>No. of Colonies Accessible to Boarding points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SAROORNAGAR - WL</td>
<td>24</td>
<td>95</td>
</tr>
<tr>
<td>2</td>
<td>MEHDIPATNAM - WL</td>
<td>24</td>
<td>110</td>
</tr>
<tr>
<td>3</td>
<td>KPHB - WL</td>
<td>24</td>
<td>133</td>
</tr>
<tr>
<td>4</td>
<td>A.S.RAO NAGAR - WL</td>
<td>24</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td><strong>Total WL Route</strong></td>
<td><strong>96</strong></td>
<td><strong>415</strong></td>
</tr>
<tr>
<td>1</td>
<td>LBNAGAR - NZB</td>
<td>23</td>
<td>91</td>
</tr>
<tr>
<td>2</td>
<td>KPHB - NZB</td>
<td>10</td>
<td>64</td>
</tr>
<tr>
<td>3</td>
<td>MEHDIPATNAM - NZB</td>
<td>15</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td><strong>Total NZB Route</strong></td>
<td><strong>48</strong></td>
<td><strong>224</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Grand total</strong></td>
<td><strong>144</strong></td>
<td><strong>639</strong></td>
</tr>
</tbody>
</table>

- Online ticketing system and mobile app is developed on the existing OPRS platform
- Tickets can also be booked through
  - Mobile App
  - Online E-ticketing
  - Authorized Ticket Booking agents numbering around 400 spread over Hyderabad and other cities
  - Mobile APP is available on Play store & App Store
  - In Mobile App, the intending passenger will be shown the nearest boarding points with departures of the available services so that he / she can select the nearest boarding point for booking
  - Similarly the choices of arrival points in the destination city will be shown
  - Payment can be done through net banking, credit / debit card
  - SMS alert with the service driver no will be sent to the reserved passenger phone once the bus starts from the first pick up point on the route
  - Tickets not issued in the bus either by driver or any conductor is provided for the service

12. Driver App

- To know the no of passengers booked before start of the service
- To know the passenger wise boarding point so that he can plan for stopping the bus and pick him up
- To know the details of passengers booking the tickets for boarding at the on-coming points ahead so that he can plan for picking them also without leaving behind
Contact details of passengers
- To know the summary of Dropping points information
- Route map and Navigation Facility
- Way bill showing the number of passengers carried and earnings realized
- Driver App is loaded mobile TAB fitted in the Bus

13. Characteristics of Vajra Bus
- Low capacity (21 seats) Mini buses are chosen in view of their easy maneuverability through the colonies and faster travel
  a) Comfortable luxury seats with push back facility
  b) Mobile charging facility
  c) Air Suspension system in the rear facilitating comfortable journey
  d) A state-of-art LCD TV with high class audio system
  e) Drinking water bottles and individual AC adjustment knobs
- These buses are fitted with a mobile device (TAB) with GPS

14. Strategies adopted for implementation
- The Vajra bus drivers were given in-house training on the new concept of service at door step
- They were given practical training in Vajra buses on how to use the Tab along with familiarization of new routes connecting the colonies, locations from where they have to pick-up / drop the passengers
- Wide publicity was given to popularize the new product in Electronic Media, Print Media and thousands of Pamphlets were distributed in Govt Offices, Engineering colleges, Educational institutions, Commercial establishments

15. Challenges faced in implementing
- Finding the drivers with minimum educational qualification who can use app in mobile TAB while driving the bus
- With lot of efforts the drivers were trained on the know how of TAB operations
- Practical training duly conducting dry runs/ mock service were given to the drivers along with route familiarization
- Online booking: Majority of the travelers in the cities are not having habit of advance booking nor Online booking
- Widespread publicity and marketing activities are undertaken to motivate the passengers use Online booking and App-booking facility

16. Sustainability
- Service at door step is launched for the first time in the country in Public Transportation sector.
- It is a new generation inter-city travel embodying the concept of Service at Door Step, Online and MobileApp based booking and digital transactions
- Convenience to the inter-city passengers enhanced
- Buses are picking them very near to their places of residences and dropping near to their final destination
- This has eliminated their time and money in reaching to bus stations hitherto they used to spend on
- Customer satisfaction increased
- Have become popular in Telangana
- Planning to introduce for other cities like Karimnagar, Ramagundam & Khammam

17. Transferability
- The project can be implemented at other STUs: advantages are:
  - Elimination of time consuming in-bus Ticket issuing process conductor or driver
  - Conductor is eliminated - cost of operation drastically reduced
  - In case of one man i.e. driver TIM cost is reduced besides saving the ticket issue time
  - Conductor-passengers tussles on change-coins issue are avoided
  - Possibility of giving a tough competition to aggregators like OLA, UBER etc, who are entering in to inter-city rent-a-cab service
The responsibility for the content, language, correctness of information and portrayal of people and corporations featured therein, along with due acknowledgements, rests with the publishers of this Best Practice Catalog.

The publishers are not liable for any errors, omissions, accuracy, completeness or quality of the information provided (the options and views contained in the publications of the corporations). Readers are advised to seek specialists’ advice before acting on information contained in this publication which was provided for general use and may not be appropriate for the readers’ particular circumstances. Any content-related claims against the publisher in respect of damage caused by the use of information provided, including any kind of information which is incorrect or incomplete, are therefore excluded. The ownership of trademarks is acknowledged. No part of this publication or any part of the contents thereof may be reproduced, stored in a retrieval system, or translated in any form without the permission of the publishers.