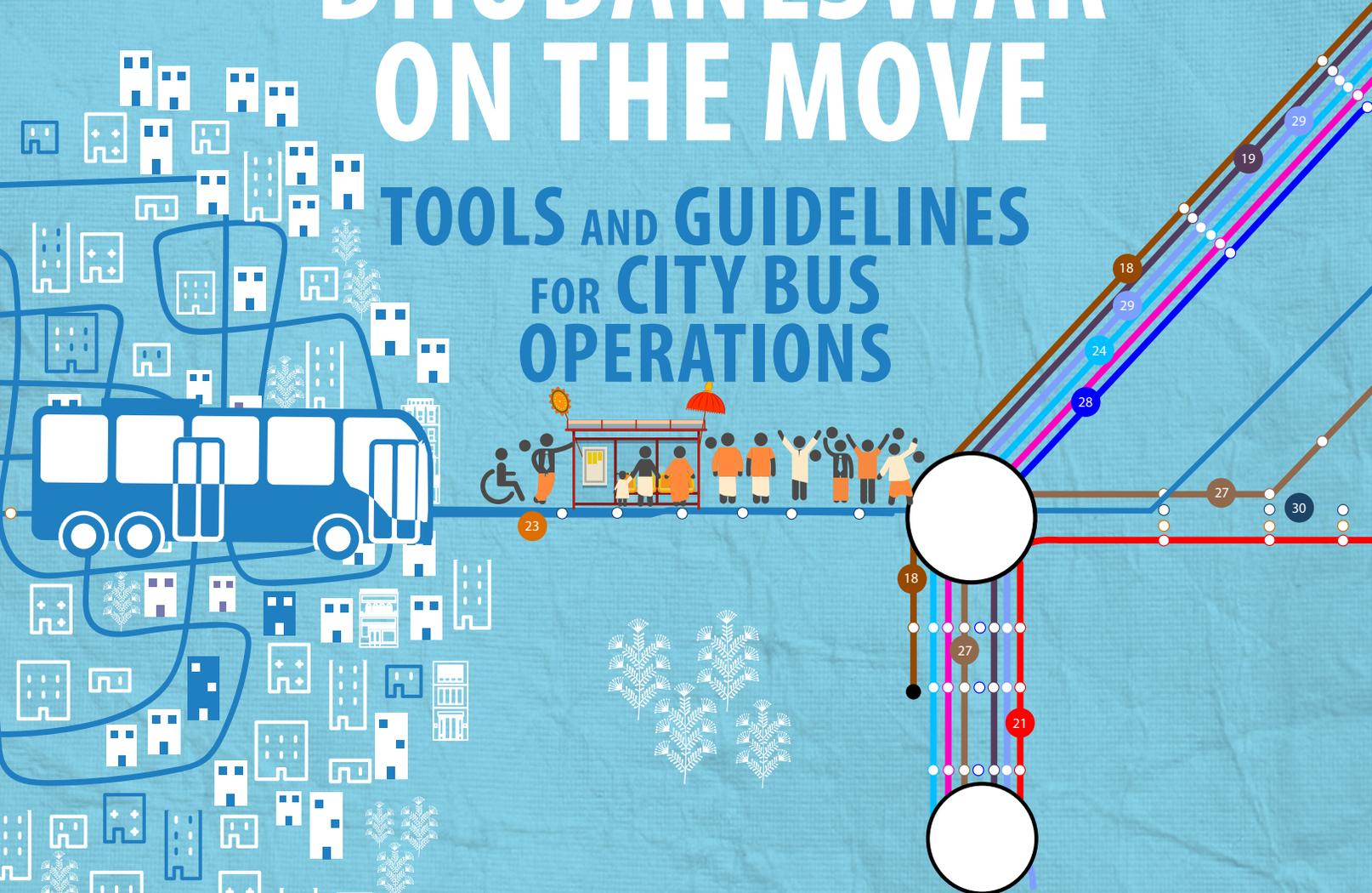


BHUBANESWAR ON THE MOVE

TOOLS AND GUIDELINES FOR CITY BUS OPERATIONS



Recommended
organisational
structure for city bus
agencies operating on
gross cost basis

Job descriptions for
key categories of
bus operations staff

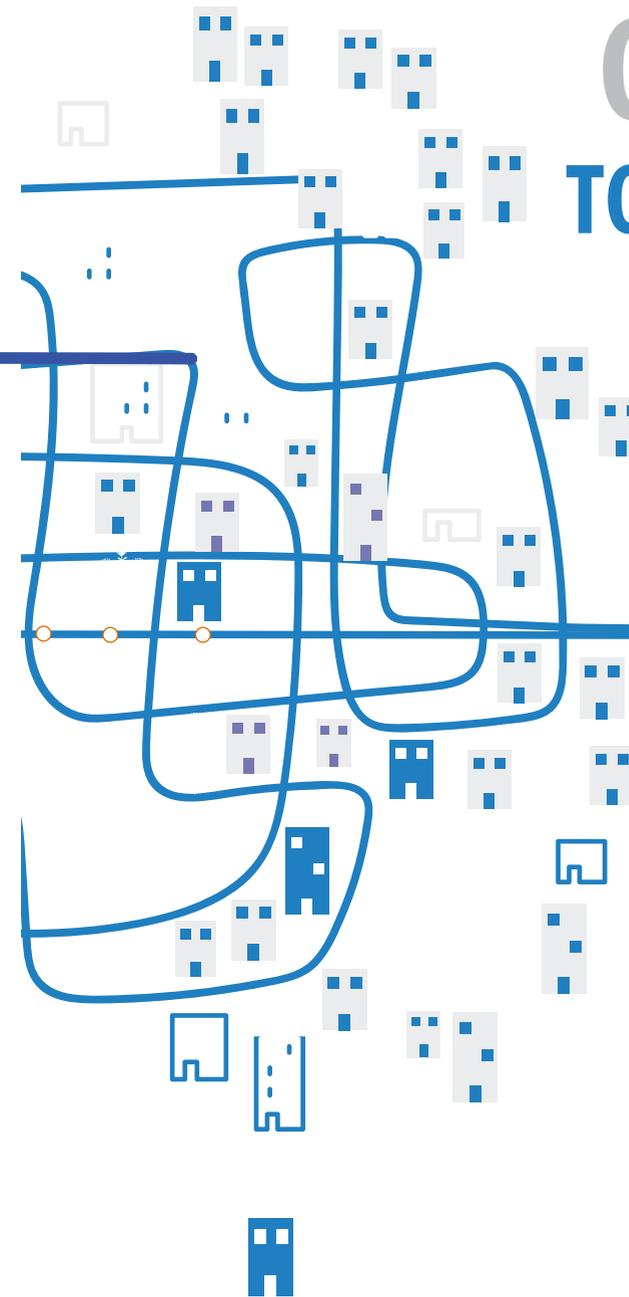
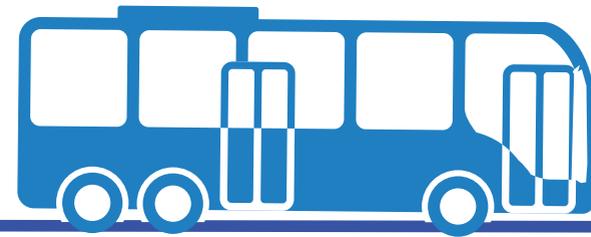
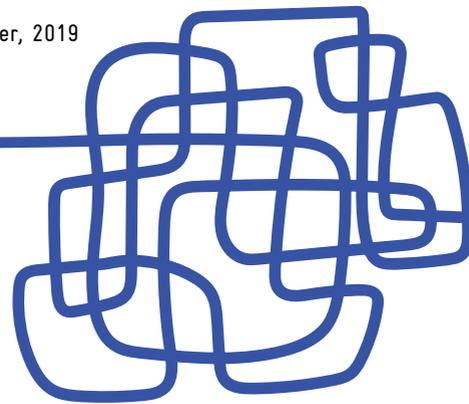
Standard Operating Procedures
(SOPs) for planning depot
operations, maintenance
management, revenue collection,
bus captains and guides

List of reporting
formats for recording
and monitoring
bus operations and
maintenance

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BHUBANESWAR ON THE MOVE

TOOLS AND GUIDELINES FOR CITY BUS OPERATIONS



PART ONE

ORGANISATIONAL STRUCTURE AND PROCESSES

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(BMZ)

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ABBREVIATIONS

AM: Assistant Manager	PCV: Passenger Carrying Vehicle
BPTS: Bhubaneswar-Puri Transport Service	PUC: Pollution Under Control
CRUT: Capital Region Urban Transport	RAT: Revenue Assurance team
DM: Depot Manager	RCA: Revenue Collection Agency
DMS: Depot Management System	RFID: Radio-Frequency Identification
ETM: Electronic Ticketing machine	RTO: Regional Transport Office
FC: Fitness Certificate	SLA: Service Level Agreement
GCC: Gross-Cost Contract	SPV: Special Purpose Vehicle
GM: General Manager	SOP: Standard Operating Procedure
ITS: Intelligent Transportation System	TMC: Traffic Management Centre, also commonly referred to as “Command Control Centre” or the CCC
JD: Job Description	TMS: Traffic Management Services
KMPL: Kilometres Per Litre	
MIS: Management Information System	





FOREWORD



Government of Odisha
Department of Housing & Urban Development



G. Mathi Vathanan, IAS
Principal Secretary
Department of Housing & Urban Development (HUDD)
Government of Odisha

With a vision to create more liveable and sustainable urban centres in the state, and with the objective of providing a comfortable, affordable and environmentally friendly mode of mobility for the people of Bhubaneswar (and Odisha at large), the State launched the “Mo Bus Service” on 6th November 2018. The Capital Region Urban Transport (CRUT), a Special Purpose Vehicle (SPV), was created by the Department of Housing & Urban Development (HUDD) to manage the operations of city bus services (Mo Bus Service) in Bhubaneswar, Cuttack and Puri-Konark urban areas.

In the one year that has passed since its inception, CRUT has taken many initiatives to build infrastructure, streamline its organisational processes, and invest in the skill development and capacity building of its staff. On an average,

Mo Buses undertake around 1800 trips each day, serving about 85,000 passengers across 21 routes. I hope that this trend continues in the same direction, and that the people of Odisha increasingly choose public transport as their preferred mode of daily commute, especially over their private vehicles, thereby creating a sustainable mobility culture in the capital region.

I compliment the Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT) project, implemented jointly by the Housing & Urban Development Department (Government of Odisha), the Bhubaneswar Development Authority (BDA), and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, for its efforts towards improving mobility planning in Bhubaneswar.

(G. Mathi Vathanan)

FOREWORD



Arun Bothra, IPS
Managing Director
Capital Region Urban Transport (CRUT)
Bhubaneswar

Just like most other Indian cities, the capital region of Odisha (comprising Bhubaneswar, Cuttack, Khurda and Puri) is also witnessing high levels of economic growth, resulting in increased travel demands. This requirement is largely being met by private motor vehicles, especially two-wheelers. Alarmingly, more than 80 per cent of commuters in Bhubaneswar are dependent on private vehicles. Also, the total number of registered vehicles in the city, pegged at 14 lakhs by the Regional Transport Office, exceeds the city's total population, which was estimated as 10 lakhs in 2019!

Till date, our standard response to increasing traffic problems has been to make new roads, and/or widen the existing roads. With the city's population expected to double in the next 20 years, we need to pause and think whether this is the course of development we would want to take. Should we keep providing for more and more vehicles, or could we consider disincentivising the use of private vehicles and at the same time, incentivise the use of cleaner modes of travel? Do we want Bhubaneswar to be a healthy, beautiful, thriving, and liveable place for all, or a city choked with polluting and noisy vehicles, with no safe places to walk and play?

The answer lies in providing the city's residents with a reliable, fast-moving and high-quality public transport system, which is low-carbon,

more energy and space-efficient, and safer than private vehicles. An alternative that does not pose the challenge of finding parking on a daily basis, one that does not eat up public spaces meant for people. Experiences worldwide have demonstrated that cities having high-quality public transit services (buses, metros, etc.) are also the most "liveable". These are cities where it is not just the poor who use public transport out of compulsion, but the well-off also *choose* to use the same for convenience and comfort. In such cities, driving personal vehicles is perceived as a luxury that comes at a very hefty price. Investing in creating a high-quality and cost-efficient public transportation system and developing strategies for increasing its ridership and appeal (so as to move people away from personal modes of travel) needs to take centre stage in the debate on mobility choices today.

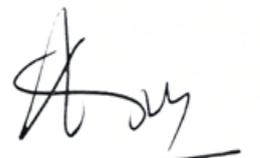
The Capital Region Urban Transport (CRUT), which was known as the Bhubaneswar-Puri Transport Services (BPTS) in its earlier avatar, is operating 200 buses (with 100 more to be added) and 2000 cycles (under its public bicycle-sharing programme) in the capital region. CRUT has been improving its services through building transit infrastructure (in terms of new fleets, depots, terminals, bus queue shelters, etc.), adoption of the gross-cost contract (GCC) model of operations, and the installation

of Intelligent Public Transportation Systems (IPTS). CRUT is also undergoing institutional strengthening through the enhancement of individual capacities and the development and streamlining of its organisational processes.

The Mo Bus service was launched by Shri Naveen Patnaik, Hon'ble Chief Minister of Odisha, on November 6, 2018. Since then, our focus at CRUT has been on customer service, employee development and the use of technology to bring precision to our work. We have aimed to provide the *best* public transportation possible to our commuters and enhance the quality of life in our cities. We are in the process of evolving and learning from our past and peers, and it gives me immense pride and joy to inform you that ahead of its first anniversary, Mo Bus has already touched a daily ridership mark of 1 lakh! I would like to take this opportunity to congratulate

all individuals and teams who made this possible through sheer perseverance and hard work.

On behalf of CRUT, I would also like to warmly acknowledge and compliment the efforts made by the Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT) project. Implemented jointly by the Housing & Urban Development Department (Government of Odisha), the Bhubaneswar Development Authority and the GIZ as a part of the Indo-German technical cooperation, its goal is to make sustainable mobility a reality in our capital region. I especially want to thank all the collaborators for their wholehearted support, expertise and contribution in preparing this document. My hope is that the tools and guidelines shared here serve as a helpful reference for other cities undertaking similar operations.



1719114
(Arun Bothra)



PREFACE



Dipti Mahapatro, OAS
General Manager (P & A)
Capital Region Urban Transport (CRUT)
Bhubaneswar

In 2010, the Bhubaneswar-Puri Transport Services was created with a mandate to manage and operate bus services on intra-city as well as inter-city routes within the capital city of Bhubaneswar, and between Bhubaneswar, Puri, Cuttack and Khurda. On May 4, 2018, the BPTS evolved into the Capital Region Urban Transport, more commonly known as CRUT, with the vision to reorganise public transit services in the city.

As part of their efforts to offer technical and capacity-building support to sustainable mobility projects in Bhubaneswar, Integrated Sustainable Urban Transport Systems for Smart Cities (SMART-SUT), in partnership with the Capital Region Urban Transport (CRUT), Bhubaneswar, have prepared a guidebook called *Bhubaneswar on the Move: Tools and Guidelines for City Bus Operations*. This guidebook documents the tools and practices that Bhubaneswar has adopted over the last one year (since the launch of the Mo Bus services on 6th November, 2018) with the support of SMART-SUT, and with the goal of streamlining its city bus operations. It collates useful information on addressing issues faced during bus operations running on PPP models, specifically the Gross-Cost Contract (GCC) model, and provides detailed insights on a variety of relevant topics, such as the organisational structure of an SPV, job descriptions, the standard operating procedures, processes for the planning and monitoring of

bus services, training and capacity building of the organisation's staff, etc.

This guidebook is intended to act as a ready reference for other Indian cities (especially those focussing on gross-cost contract models for their buses) to adapt and use. It does not claim to substitute any existing comprehensive manuals on bus operations planning, management or capacity building. Some aspects in the document are technical in nature, while others can serve as a tactical guide for practitioners on operations planning and as a ready reckoner for understanding the roles, responsibilities and training needs within a city bus agency.

As bus operations is a dynamic field, this guide is expected to be updated regularly to include technological advancements. Bhubaneswar's bus modernisation strategy includes the introduction of e-buses in the coming years, and at that point, the organisational structure proposed here will be modified to include this. This will also lead to the inclusion of new processes, especially those related to bus maintenance, training and capacity building, etc.

I hope this guidebook adds to the existing knowledge on the subject, and that cities find it a useful tool for planning and managing their bus operations.

Dipti
Dipti Mahapatro

BHUBANESWAR ON THE MOVE: TOOLS AND GUIDELINES FOR CITY BUS OPERATIONS

SUMMARY

Context

As cities become the engines of economic growth, effective mobility becomes more and more of a central requirement. In this context, a decided preference for personal automobiles makes cities major contributors to GHG emissions, air pollution, noise pollution, congestion – not to mention increasing incidences of road accidents, all of which negatively impact the health and productivity of the citizens.

The most common and widespread response of the governments has been to expand the existing road spaces and create flyovers and similar road-based infrastructure, with the hope of accommodating the exponential growth of vehicles. Another response has been to increase the sanctions for rail-based mass-transit projects (like the metro). However, owing to their high costs and limited coverage, these have had low user-appeal, and have not yet succeeded in getting anywhere near their expected ridership targets.

Given that a major share of urbanisation in India is expected to take place in her small and medium-sized towns and cities (which typically

have low densities and trip lengths averaging between 4-8km), and given that the road infrastructure capacities in these cities is limited, there is an urgent need to place a road-based, more ubiquitous, and low-cost public transport system (like the bus) at the heart of our plans and policies. This could be a safe, cleaner (less emitting), more space-efficient alternative, and if prioritised, has the ability to perform at par with high-speed rail systems.

The introduction of public-private partnership (PPP) models in urban bus operations in India over the last few years has thrown up a number of challenges as well as opportunities for re-looking at how bus operations can be managed and monitored in cities. An increasing number of cities are procuring fleets (under the aegis of various government schemes), and forming Special Purpose Vehicles (SPVs) for running bus operations. However, due to the absence of suitable guidelines, many of them still follow the practices of State Transport Undertakings (STUs), which may not be an optimal approach for addressing the nuances of city bus operations running on PPP models. These agencies often have limited in-house capacity for estimating



infrastructure requirements, service planning, and setting up of key performance indicators; regular capacity building, though extremely important, is often overlooked, and needs to be institutionalised. This guidebook attempts to address all these aspects of city bus operations.

About CRUT and the Guidebook

Capital Region Urban Transport (CRUT), Bhubaneswar, is a young organisation currently operating 200 buses on 21 routes across

Bhubaneswar, Puri, Cuttack and Khurda, using the gross-cost contract (GCC) model. It has successfully recorded a daily ridership of 1 lakh commuters in October 2019. As part of its ongoing efforts to offer technical and capacity-building support to sustainable urban mobility projects in Odisha, SMART-SUT, in partnership with CRUT, has prepared this guidebook, entitled *Bhubaneswar on the Move: Tools and Guidelines for City Bus Operations*. It documents the tools and practices that have helped CRUT set up its



91%

Mo Bus users rated behaviour of on-board staff as very good*



76%

Mo Bus users rated comfort on the bus as high



75%

Mo Bus users rated services as punctual



32%

MoBus users used to be private vehicles users



85%

women Mo Bus users rated availability of priority seats as very good



98%

elderly Mo Bus users rated ease of boarding and alighting as very good

efficiency of its buses in Bhubaneswar and the capital region over the last one year (since the launch of the Mo Bus services in November 2018).

The guidebook collates useful information on various aspects of city bus operations (especially those operating on the gross-cost contract model). The topics covered range from organisational structure and job descriptions to standard operating procedures, reporting formats, methods to be adopted for service planning, setting up of key performance indicators, and a list of recommended training modules and curricula, all of which can act as a ready reference and offer guidelines for other Indian cities implementing bus operations on similar models.

The guidebook consists of three parts, each focusing on a different aspect of city bus operations.

Part 1: Organisational Structure and Processes

Part 1 of the guidebook proposes a compre-

hensive organisational structure that can be helpful in managing the large amounts of manpower that GCC operations typically require. Under this model, services need to be procured from multiple private partners, and the city bus agency is required to closely monitor the roles and performances to ensure quality and avoid the duplication of responsibilities. To help with this, a list of Standard Operating Procedures (SOPs) for various functions within a bus organisation has been provided, along with an exhaustive list of job descriptions for all employees. The SOPs have been prepared after extensive and critical study of the practices followed by STUs, bus companies, and bus operators. These generally exist only in memos and internal circulars, and are not readily available in the public domain.

Part 2: Planning, Scheduling and Monitoring

The prime objective of transit agencies is the provision of efficient and cost-effective services, and service planning and monitoring form

the key components in achieving this. Besides sharing some key technical terms (related to bus-operations planning) and their meanings, Part 2 also provides step-by-step guidance on subjects like planning bus infrastructure (fleets, depots, terminals and bus stops) and services (networks, bus stops, bus routes, schedules and fares). It also shares guidelines for performance monitoring of technology, demand, supply and fleet-based indicators. This section can serve as a practical reference for any city, for planning, scheduling and monitoring its bus operations.

Part 3: Training and Capacity Building

Organisations investing in and committed to meticulous and consistently high-quality training

programmes are known to have better operational efficiency and performance levels. Part 3 of the guidebook talks of the training and capacity-building needs of city bus agencies; it provides detailed guidelines on the categories of staff to be trained, proposes training modules with their ideal durations, class sizes, and the topics to be taught, suggests the frequency of conducting trainings, and lists the expected outcomes. It also includes a list of topics for induction and re-orientation training. These trainings attempt to cover the needs of the various categories of staff ,and can be adapted by a city bus agency based on the staff and resources available to them. The schedules proposed have been designed to ensure that each employee gets the opportunity to undergo training at least once a year.

* Surveys conducted by GIZ (2019)



1 Background

The introduction of public-private partnership (PPP) models in urban bus operations has thrown up a number of challenges as well as opportunities for relooking at how bus operations can best be managed and monitored in cities. An increasing number of cities -- small and medium -- are procuring fleets of buses (under the aegis of various government schemes), and forming Special Purpose Vehicles (SPVs) for running bus operations. However, due to the absence of suitable guidelines, many of them still follow the practices of State Transport Undertakings (STUs), which in reality may not be the optimal way to address the nuances of city bus operations running on PPP models.

Any organisation overseeing the planning and provision of bus services in a city needs to undertake the following tasks on a daily basis to ensure efficient operations. These are also indicative of the division of work and

the requirement of personnel within different departments of the agency.

- Infrastructure planning (bus depots, terminals, bus shelters)
- Bus-operations planning & scheduling
- Bus operations and maintenance
- Contract management, including security-related contracts, and those with entities such as the RCA (Revenue Collection Agency) and the RAT (Revenue Assurance Team)
- Data collection and monitoring
- Analysis and evaluation
- Financing and sustainability
- Legal compliance, including factory inspection, safety compliance, etc.
- Communication and branding
- Personnel management and training

2 Organisational Structure for City Bus Agencies

Supported by GIZ, the SMART-SUT project has been working with CRUT to re-imagine its organisational structure. This was necessary because, from its earlier role as Bhubaneswar-Puri Transport Services (BPTS), responsible for

providing bus-based public transport for the cities of Bhubaneswar & Puri, CRUT recently assumed the new and bigger role of a Special Purpose Vehicle (SPV), responsible for providing public transport services (city bus services [Mo

Bus] and public bicycle sharing [Mo Cycle]) in the areas of Bhubaneswar, Cuttack and Puri delineated in the master plan. The positions and manpower requirements proposed were based on careful evaluations of the existing organisational structure, on-site requirements for bus operations, and other internal requirements of CRUT.

2.1 Organisational Structure for Bus Operations under a Gross-Cost Contract (GCC) Model

In gross-cost contract models, the operating agency is merely a supplier of the service, and is insulated from revenue and ridership risks. The risk of revenue rests with the city agency/SPV; the private partner is only responsible for bus operations and maintenance. The city agency pays a fixed pre-agreed fee to the operator (irrespective of occupancy or ridership) for providing transit services as per a contract and schedules defined by the former. This ensures a certain level of availability and quality of service to the passengers, and profit-making manifests as cost minimisation on the part of the city agency.

In a net-cost contract (NCC), the operator receives the revenue from ticket sales (as opposed to the fixed payment that happens in the gross-cost approach), thus bearing any financial risks that might occur during the contract period. Increasing ticket sales thus becomes their primary aim, which is often done by causing inconvenience to

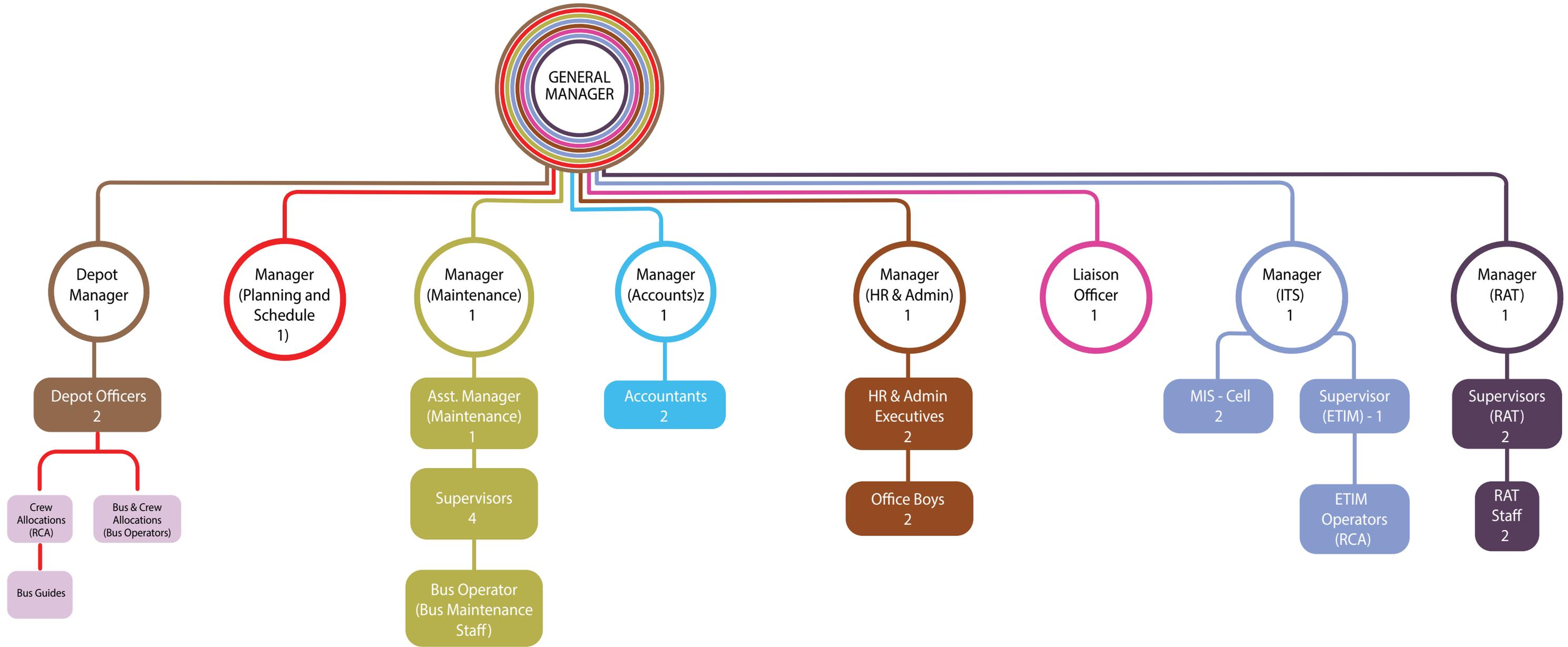
riders through long stoppages en route to fill up the bus, poor maintenance, not operating during off-peak hours or on low ridership routes, etc.

The organisational chart of a city bus agency needs to reflect the many sub-agencies required under a GCC model, for instance, bus operators, revenue-collection agencies, ticket-checking agencies, ITS agencies, security agencies, etc. (see Figure 1). Adequate manpower is needed to monitor the functioning of all these sub-agencies, and facilitate the effective delivery of services.

The proposed organisational and reporting structure for CRUT is presented in Figure 2. To help CRUT handle its additional functions and activities like managing public bicycle-system contracts, bus depot construction, etc., certain new roles have been proposed as part of CRUT's organisational structure. The different layers of management have been clearly indicated here.

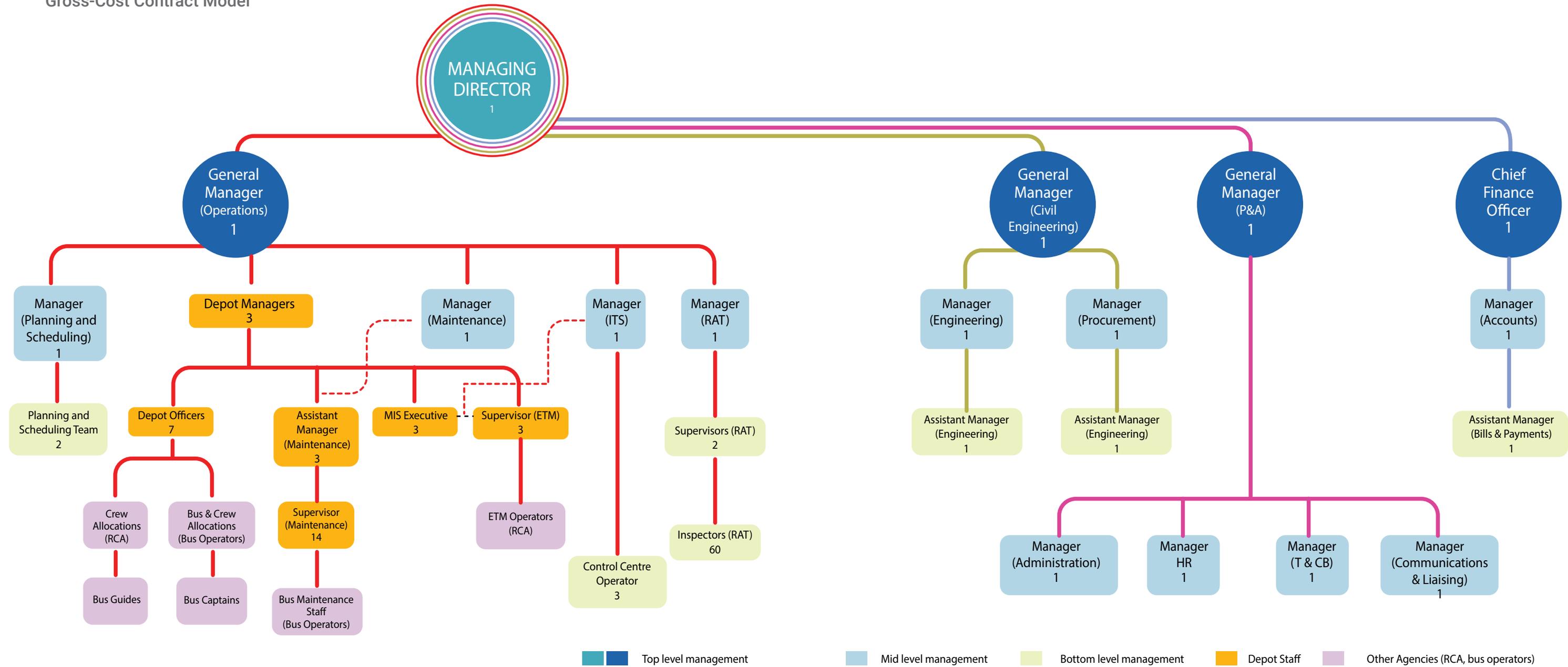
CRUT has transformed from a small organisation (BPTS) into its present form. The formation of the RAT within a couple of weeks of its establishment has helped CRUT record revenue leakage and take necessary actions. However, in order to achieve its envisaged aim of becoming an "integrated mobility service provider" in the three cities of Bhubaneswar, Cuttack and Puri, the core of the organisation needs to be strengthened. In addition to a sound top and mid-level management, CRUT needs to develop a strong lower-level management and dependable on-field staff as well.

Figure 1: Organisational Chart for Bus Operations based on a Gross-Cost Contract Model¹



¹ Per depot, for a fleet of 100 - 120 buses.

Figure 2: Proposed Organisational Structure for CRUT to Support Operations on a Gross-Cost Contract Model



1. A **GM (Operations)** responsible for planning and scheduling, maintenance, monitoring depot management, ITS and RAT.
 - One Manager (Planning and Scheduling), with a team of two people, responsible for the planning and scheduling of existing and new routes, and monitoring adherence to schedules.
 - One Manager (Maintenance) to act as a link between the GM (Operations) and the bus maintenance activities conducted at the depots.
 - One Manager (ITS), supported by four Control Centre operators, to ensure data flow between on-ground operations and the Operations Centre at Bhubaneswar.
 - One Manager (RAT), supported by two supervisors and 40 inspectors, for reporting on-ground revenue leakages. More inspectors may be inducted in the beginning, but, with the stabilisation of operations and minimisation of revenue leakage, 40 inspectors were identified as sufficient for overlooking the operations of 300 CRUT buses.

The staff at the depots are required to report to the GM (Operations), except the supervisors and the inspectors of RAT, who report to the Manager (RAT).

- Each depot is to be managed by one Depot Manager, supported by two depot officers, the Assistant Manager (Maintenance), an MIS

executive and an ETM (Electronic Ticketing Machine) supervisor.

- The allocation of bus guides by the RCA and that of the bus and bus captains is to be monitored by two depot officers – one for each shift.
 - Each depot to have an assistant manager, who reports to the Depot Manager for all daily activities and to the Manager (Maintenance) for all maintenance-related activities.
 - Three supervisors (two for the night shift and one for the day shift) to monitor the bus maintenance staff provided by the bus operators.
 - One MIS executive for recording all data at the depot-level and generating MIS reports. This executive is to report to the Depot Manager for all day-to-day activities, and to the Manager (ITS) for all IT-related activities.
 - Each depot to have one Supervisor (ETM) to monitor the ETMs provided by the RCA. This supervisor is to report to the Manager (ITS) for all IT-related activities.
2. A **GM (Civil Engineering)** responsible for engineering and procurement work for the buses, cycles and e-autos under the purview of CRUT. This GM will be supported by a Manager (Civil Engineering) and a Manager (Procurement), who are further assisted by an Assistant Manager (Civil Engineering) and a Legal Advisor, respectively.

3. A **GM (Personnel and Administration)** responsible for administration, human resources, training and capacity building, communications and liaising. This GM is to be supported by a manager for each of the above functions.
4. A **Chief Finance Officer** for looking after all finance-related matters for the organisation. This officer will be assisted by a Manager (Accounts) and an Assistant Manager (Bills and Payments).

3 Job descriptions

Job descriptions of the key positions in an organisation provide insights into its functioning, and map the relationships between the various positions. Agencies operating on the GCC model usually draw up JDs from time to time internally as per requirement, but generally (as this model demands a lot of detailing and accountability), it is hard to come by any standardised job descriptions for GCC operations.

The JDs below have been scrupulously prepared to address this perceived gap, and to add value by clearly defining the roles and responsibilities. Efforts have been made to cover ground such that all the tasks of daily bus operations can be effectively monitored, and that there is no unnecessary duplication or overlapping of roles. This constitutes one of the few first formal attempts to standardise the JDs for the various positions under the Operations Division of CRUT.

Table 1: Job Descriptions

Job Title	Main responsibilities
General Manager (Operations)	Responsible for monitoring bus operations <ul style="list-style-type: none"> • Planning and scheduling • Maintenance • ITS • Revenue assurance • Depot management

Job Title	Main responsibilities
Manager (Planning and Scheduling)	Responsible for <ul style="list-style-type: none"> Monitoring the day-to-day operations, route planning and scheduling Preparing new schedules
Manager (Maintenance)	Responsible for <ul style="list-style-type: none"> Daily bus maintenance Preventive maintenance activities
Manager (RAT)	Responsible for <ul style="list-style-type: none"> Revenue assurance Checking revenue leakages in bus operations
Supervisor (RAT)	Responsible for conducting and supervising RAT checks
Inspectors (RAT)	Field duty for RAT, including checking
Depot Manager	Responsible for: <ul style="list-style-type: none"> Ensuring a direct link between the CRUT and on-ground operations Monitoring bus operators and the RCA on ground, and reporting to the Depot Manager
Depot Officer/Traffic Officer	Responsible for monitoring the bus operators and the RCA on ground. To report to the Depot Manager.
Assistant Manager (Maintenance)	<ul style="list-style-type: none"> Acting as a link between on-ground maintenance activities and the head office Responsible for following up on maintenance activities
Supervisor (Maintenance)	Responsible for ensuring that maintenance activities, such as those listed below, are executed: <ul style="list-style-type: none"> Random Inspection of buses before out-shedding, as per SLA guidelines Ensure out-shedding of buses as per the given schedules Checking the availability of adequate technical manpower, etc.
Supervisor (ETM)	Representative from CRUT's side to monitor ETM-related operations at the depots

3.1. General Manager (Operations)

The GM (Operations) is responsible for monitoring bus operations (planning and scheduling, maintenance, ITS, revenue assurance and depot management), as well as liaising with other government departments and media.

The responsibilities are as follows:

- i. Ensure compliance with all statutory requirements.
- ii. Ensure compliance from the bus operators and the RCA on the "terms and conditions" detailed in the agreement in accordance with the SLA.
- iii. Create a conducive working environment for the employees to optimise their productivity, formulate productivity goals for all the departments, and review those periodically.
- iv. Analyse the daily/monthly MIS, and take corrective measures to improve services and maximise revenues.
- v. Review accident data periodically and implement preventive steps.
- vi. Conduct review meetings for all the concerned departments in the first week of each month.
- vii. Verify the bills submitted by the bus operators, the RCA and other agencies for certification, and release payments in compliance with the SLAs.

- viii. Verify the levy of penalties on the bus operators, the RCA and other agencies.
- ix. Liaison with external stakeholders/public representatives/RTO/Traffic Police/Civil Police/NGOs, etc., and address their concerns and queries.
- x. Interact and provide information to the media and other stakeholders about the organisation's initiatives towards improving bus services.
- xi. Initiate employee-welfare schemes such as incentives, performance awards, etc.
- xii. Conduct regular training programs to enhance the productivity of all employees.
- xiii. Handle grievances, both of the staff and the public; understand the causes and resolve them accordingly.
- xiv. Review all contracts and other documentation where the organisation is involved, and keep the executive management informed about the legal implications.
- xv. Understand the requirements of customers and deliver the best possible service.
- xvi. Follow up with advertising agencies for advertising on CRUT buses, payments, contents of the advertisements, etc.
- xvii. Follow up on clandestine vehicle operations affecting the organisation's revenues, and take effective measures to stop such operations.

xviii. Any other task assigned by the management.

3.2. Manager (Planning and Scheduling)

The Manager (P&S) is responsible for monitoring the day-to-day operations and route planning and scheduling. He/she also needs to coordinate with the Depot Manager for monitoring the depot operations, and reports to the GM (Operations).

- i. Responsibilities of the Manager (P&S) are as follows:
 - ii. Monitor the process of preparation of bus and crew schedules.
 - iii. Prepare schedules for special trips (such as school trips, factory trips, etc.), monitor their performance, and prepare weekly reports on their earnings, the number of passengers, load factors, etc.
 - iv. Analyse the existing bus and crew schedules based on the feedback received from various sources, and take necessary actions for improvement after due approval from the GM (Operations).
 - v. Conduct surveys as per the schedule below:
 - Schedule adherence survey – Once a week
 - Running time survey – Once a week
 - Waiting time survey – Once a week
 - vi. Prepare special schedules during festivals, fairs, railway board examinations, etc. for generating additional revenue.

vii. Prepare curtailment plans for summer vacations, Sundays, and other holidays.

viii. Conduct feasibility studies to start new routes and take necessary action after due approval from the GM (Operations).

- ix. Report routes that are not feasible, citing the reasons for these considerations.
- x. Monitor the performances of new routes and prepare weekly reports.
- xi. Any other task as per the directives of the management.

3.3. Manager (Maintenance)

The Manager (Maintenance) is responsible for daily bus maintenance and preventive maintenance activities, with responsibilities as listed below:

- i. Minimise bus breakdowns by implementing the schedules prepared for preventive maintenance.
- ii. Investigate and analyse bus breakdowns system-wise, and implement corrective steps to avoid recurrences of such breakdowns.
- iii. Take corrective actions to prevent premature failure of bus aggregate units (engine, gear box, etc.). This activity is to be conducted by the operator, and CRUT will monitor the activity.
- iv. For various units, monitor the monthly MIS reports pertaining to the stipulated life as per

the manufacturer.

- v. Arrange regular trainings to improve the skills of workshop and maintenance staff.
- vi. Regularly conduct safety audits of the depot premises to ensure that all maintenance activities are being carried out with the necessary precautions.
- vii. Investigate accidents that have injured employees on the job, and take precautionary measures to prevent recurrences.
- viii. Ensure that the “Factory Inspector’s Register” and other legal documents are properly maintained, and that the demands of the factory inspector submitted in writing are complied with promptly.
- ix. Ensure cleanliness within the depot premises through good housekeeping.
- x. Rotate all the supervisors and associated staff on a monthly basis.
- xi. Prepare reports on the productivity of the supervisors.
- xii. Review the MIS reports and check the accuracy of the data.
- xiii. Ensure the optimisation of resources – manpower, buses, fuel, etc. CRUT will review the availability of sufficient manpower for bus maintenance across shifts, and will track the fuel-efficiency parameters.
- xiv. Monitor performance bus-wise and route-wise, on parameters such as economy,

maintenance, manpower, etc.

- xv. Implement internal policies and procedures.
- xvi. Monitor operations to ensure that the employees are complying with the administrative policies and procedures, safety guidelines and government regulations.
- xvii. Track the placement and removal of advertisements pasted on the buses, and ensure that these do not negatively affect the external appearance of the bus.
- xviii. Any other task as per the directives of the management.

3.4. Manager (RAT)

The Manager (RAT) is responsible for managing one of the biggest teams in the organisation – the one that monitors revenue leakages in bus operations. His/her responsibilities are listed below:

- I. Prepare duty lists for each RAT zone, and enforce the ticket-checking methods specified by RAT.
- II. Analyse the daily reports received from the RAT inspectors, and take necessary actions against the reported leakages.
- III. Conduct monthly meetings with the zonal teams to assess their performance.
- IV. Plan incognito-checking programmes and prepare strategies based on the feedback.



- V. Prepare programmes for general checking, such as revenue-boost checking, combing operation checking, etc.
- VI. Analyse the daily revenue reports day-wise, zone wise, route-wise, time-wise, bus guide-wise, etc.
- VII. Prepare plans for checking during fairs, festivals and other times when high ridership is generated.
- VIII. Conduct regular checks with the zonal RAT teams.
- IX. Investigate crew/passenger complaints against the RAT and take suitable action.

3.5 Supervisor (RAT)

The Supervisor (RAT) is responsible for operating and supervising the RAT checks. His/her main responsibilities are:

- i. Take measures to reduce revenue leakage through surprise bus inspections, and ensure that the RAT is performing according to the duties assigned to them.
- ii. Enforce various checking methods as per the instructions of the senior management.
- iii. Verify the daily checking formats submitted by the RAT, and ensure that checking is done as per the guidelines.
- iv. Check the revenue leakage cases submitted by the RAT, and ensure that the submissions happen as per the management guidelines.

- v. Conduct weekly reviews to assess the targets of the RAT, and prepare reports for the management.
- vi. Conduct surprise inspections of the performance of RAT teams and their reporting times, and ensure that the duties are being carried out as per the duty charts and allocated timings.
- vii. Monitor the attendance of the RAT team and ensure adequate staff availability.
- viii. Monitor the proper utilisation of the vehicles given to RAT, and prepare reports on non-availability/misutilisation of vehicles, etc.
- ix. Liaison with other government departments such as the Traffic Police, Civil Police, etc. to resolve cases of ticketless travel, nuisance created by passengers, etc.
- x. Conduct daily random checks in buses to keep revenue leakages to a minimum.

3.6. Inspector (RAT)

Inspectors operate in a team of 3-4, and each group is assigned to one zone for operations. They are the field staff for the RAT, and operate in two shifts. Their responsibilities include:

- i. Perform their duties, as assigned in the duty list.
- ii. Plug the leakages in revenue through surprise checks in buses.
- iii. Supervise the work of the end-point

- controllers -- the bus guides and bus captains.
- iv. Towards identifying ticketless passengers, check the tickets of passengers alighting from the bus and of those sitting in the bus. The inspectors also randomly ask the passengers about their boarding points.
- v. Levy penalties on ticketless travellers as per the directives of the management.
- vi. Report money misappropriation cases to the management as per the guidelines.
- vii. During the checks, also pay attention to the bunching of buses, accuracy of display of destination boards, late arrivals of buses, etc. Since the duties are supervisory in nature, inspectors need to take steps to ensure that the services run as per schedule, and that the passengers are not inconvenienced in any way.
- viii. Help the passengers to board/alight from the buses, especially during the heavy rush of the peak hours. Inspectors should ensure that everyone boards the bus; if any passenger is left behind, this must be noted on the checking sheet, so that more buses can be provided.
- ix. Liaison between the management, crew (bus guides and bus captains), and the passengers.
- x. Maintain courteous behavior with the staff and the passengers, and uphold a good image of the organisation.
- xi. Check the imprest cash with the bus guides

and the captains, tally with the amount recorded in the waybill, and prepare reports as per format.

- xii. Provide support to the passengers, bus captains, bus guides, etc. during accidents and bus breakdowns.
- xiii. Make a note of heavy traffic movement in their beats, and suggest changes (of the schedules/routes) in their reports.

3.7. Depot Manager

The Depot Manager acts as a link between the CRUT office and on-site operations. He/she monitors the bus operators and the RCA, and reports to the Manager (Operations). The responsibilities of a depot manager are listed below:

- i. Ensure out-shedding of buses from the depot as per the timetable.
- ii. Analyse the MIS reports every day, and prepare weekly reports on the actions taken to overcome service-level deficiencies related to break downs, trip losses, etc.
- iii. Review the deployment of manpower – overtime work hours, double duties, and absentees.
- iv. Counsel the bus guides on challenging low earnings, and suggest behavioural guidelines with passengers.
- v. Counsel the bus captains towards improving

- efficiency, on aspects such as adherence to timetables (punctuality), challenging low earnings, dealing with accidents/breakdowns, trip cancellations, etc.
- vi. Coordinate the conducting of enquires on the revenue pilferage reports submitted by the RAT.
- vii. Conduct checks on the route to ensure adherence to timetables by bus captains.
- viii. Check the driving licenses, PCV badges and identity cards of bus captains and bus guides.
- ix. Investigate the loss of trips and take corrective steps to reduce such losses.
- x. Prepare checking programmes, and follow up on operational performance using the feedback reports.
- xi. Analyse the performance of routes and suggest measures for improvement.
- xii. Suggest necessary modifications in the monthly MIS report formats in consultation with the ITS/MIS Team.
- xiii. Examine the suggestions and demands received from the public via letters/helpline numbers (for starting new routes, for the diversion of existing routes, introduction of new bus stops, etc.) and prepare proposals with the help of the Planning and Scheduling team.
- xiv. Respond to the letters received from passengers and other stakeholders.

- xv. Suggest cost-cutting measures to minimise losses incurred during bus operations.
- xvi. Conduct monthly meetings of the staff to review their performance.
- xvii. Monitor FC planner/insurance of the buses.
- xviii. Implement policies and procedures relating to route deviation, shifting of stops, etc.
- xix. Monitor operations to ensure that employees are complying with the administrative policies and procedures, safety rules, union contracts and government regulations.
- xx. Follow and promote safe practices and implement safety audits.
- xxi. Monitor the preventive maintenance and daily maintenance of the buses.
- xxii. Check at least ten buses per day for cleanliness, body damages, seat conditions, stanchion bars, the condition of the glass and the flooring, electrical fitments, and the ITS.
- xxiii. Manage lost property accounts and settlements.
- xxiv. Any other task as per the directives of the management.

3.8. Depot Officer/Traffic Officer

The Depot Officer or Traffic Officer works in shifts, and is responsible for monitoring of bus operators and the RCA. He/she reports to the Depot Manager, and responsibilities include:

- i. Ensure out-shedding of buses in the morning

- and the evening shifts.
- ii. Ensure that the bus and crew allocation sheet is received one day in advance from the bus operator.
- iii. Undertake various measures to improve the revenue, such as:
 - Post ground-booking conductors at heavy loading points
 - Plan for peak-hours and off-peak hours
 - Set up public enquiry counters with PA systems
 - Display timetables at important terminals
 - Identify locations for setting up POS (point of sale) counters for promoting bus passes.
 - Incidental planning
 - Route-wise analysis (ABC analysis)
 - Conductor-wise analysis (ABC class)²
 - Coordinate with the RAT for revenue improvement and revenue leakage issues
- iv. Check for deviations in the allocation of bus and crew on a daily basis, and posting of indoor and outdoor staff by the bus operator.
- v. Analyse the daily MIS reports, and assist the planning and scheduling department in preparing bus schedules.

- vii. Check on the bus Captains en route and keep the bus operator informed in case there are any issues.
- viii. Ensure the proper working of signboards/public address systems on buses.
- ix. Investigate the loss of trips and take corrective steps to reduce such losses.
- ix. Investigate and address passenger complaints received through the helpline numbers and submit a detailed weekly report to the Depot Manager.
- x. Track the renewal of driving licenses and bus guide badges every week, and conduct sample checks of the licenses of a few randomly chosen bus captains.
- xi. Check the night parking of the buses at various locations. Buses scheduled to depart early in the morning are parked near the depot exit gate
- xii. Conduct the following surveys to understand the ground realities as per the schedule mentioned below:
 - Schedule adherence survey – Once a week
 - Running time survey – Once a week
 - Waiting time survey – Once a week
- xiii. Any other task as per the directives of the management.

²Conductors categorised as “A” class are those who are fast in ticketing, “B” somewhat slower, and “C” the slowest. The idea is to allocate routes according to the speed of the conductor in terms of using tickets. For instance, “A” class conductors are generally assigned high ridership routes, and so on.



3.9. Assistant Manager (Maintenance)

The Assistant Manager (Maintenance) is stationed at the depot, and reports to the Depot Manager, and to Manager (Maintenance) specifically for maintenance-related activities. He/she acts as a link between on-site operations and the head office, and job responsibilities include:

- i. Ensure follow-up actions on preventive maintenance schedules - major dock buses, staff utilisation, work done, quality checks, change of units as per schedule, maintenance of various records, etc.
- ii. Ensure the out-shedding of buses on a daily basis, so that the maximum number of buses are made available for revenue services.
- iii. Check buses to ensure that they have undergone the preventive maintenance schedule, and address complaints from the bus captains.
- iv. Liaison with the traffic department to ensure that the complaints of the traffic staff regarding defects in the buses, fitments, etc. are addressed.
- v. Monitor the FC planner and ensure that these buses are promptly attended to.
- vi. Ensure that all the buses have valid Pollution Under Control (PUC) certificates.
- vii. Investigate bus breakdowns on a daily basis and ensure that corrective measures are taken to reduce such breakdowns.

- viii. Conduct systematic breakdown analyses, and accordingly update the preventive maintenance schedules in consultation with the bus operator for corrective measures.
- ix. Study trip losses on a daily basis and take corrective actions to minimise such losses. Analysis is to be carried out by CRUT and the bus operator will be instructed to take the necessary corrective actions.
- x. Check buses daily as per the log-sheet complaints by the bus captain.
- xi. Ensure adequate deployment of manpower by the bus operator in each shift (in all categories).
- xii. Conduct safety audits of the depot premises and ensure that all the safety protocols are followed.
- xiii. Inspect the workshop diary, preventive-maintenance schedule, register, and all the control charts every day.
- xiv. Analyse bus breakdowns reported at the call centre, and ensure that corrective measures are taken on a daily basis.
- xv. Conduct periodic checks to assess the condition of the tyres on all the buses, and attend to the mechanical defects that may be causing untimely wear and tear.
- xvi. Ensure that the buses are being cleaned and washed as per schedule.

- xvii. Check the inventory for fast-moving/essential spares available with the bus operator on a daily basis, and issue reminders to replenish the same at regular intervals.
- xviii. Any other job as per the directives of the management.

3.10. Supervisor (Maintenance)

The job responsibilities of the Supervisor (Maintenance) include:

- i. Ensure the inspection of buses before out-shedding as per the SLA guidelines.
- ii. Ensure that the preventive maintenance and daily maintenance schedules are carried out by the bus operator and the staff respectively.
- iii. Address the complaints of the bus captains and carry out preventive maintenance procedures in a timely manner.
- iv. Check whether or not adequate technical manpower is being provided by the bus operators.
- v. Randomly inspect the buses, and check if they have been attended to for breakdowns, undergone the periodic maintenance schedules, docking schedules and FC renewals.
- vi. Investigate bus breakdowns system-wise, and take corrective actions.
- vii. Investigate cases of trip loss and initiate steps to minimise such losses.

- viii. Check buses for the condition of tyres, batteries, the body of the bus, etc.
- ix. To avoid accidents, ensure that worn, smooth or recapped tyres are not used in the front.
- x. Ensure that the buses are cleaned and washed as per schedule.
- xi. Any other job as per the directives of the management.

3.11. Supervisor (ETM)

The Supervisor (ETM) is a CRUT representative who monitors ETM-related operations at the depots. His/her responsibilities are as follows:

- i. Monitor the functioning of the ETMs at the depot.
- ii. Ensure the availability of an adequate number of ETMs, ETM chargers and ticket rolls at the depot. Randomly check if the ETMs are fully charged before issuing them to the bus guides.
- iii. Ensure that an adequate number of ticket blocks of all denominations (for future reference only) are available in the depot.
- iv. Ensure the presence of the operators in each shift to issue and receive the ETMs, and monitor the reporting times of the operators.
- v. Investigate the failure of ETMs during trips, and initiate corrective measures.
- vi. Maintain a log of ETMs that are scrapped.
- vii. Investigate damaging/mishandling/tampering of ETMs and initiate disciplinary action against

the concerned staff.

- viii. Ensure that the service providers conduct regular trainings for bus guides on the subject of the proper maintenance of ETMs. Test new bus guides on their ability to issue tickets, and provide necessary guidance.

- ix. Investigate the cases brought forward by the RAT regarding defects in ETMs, and take corrective actions.
- x. Check ETMs en route during peak hours to monitor their performance.

4. Standard Operating Procedures

Standard Operating Procedures (SOPs) help to streamline and embed certain essential processes in an organisation. There is hardly any material presently available which comprehensively lists out all the processes involved in carrying out bus operations, and one of the most important features of this manual is the inclusion of such SOPs. Prepared after a critical study of the operational practices of various State Transport Undertakings (STUs), bus companies and bus operators, these minutely detail out the standard processes involved in bus operations, from out-shedding to in-shedding, revenue collection, and maintenance.

For the purposes of CRUT, SOPs have been classified into eight categories:

- Planning of bus operations
- Bus operations at depots
- Bus maintenance at depots
- ETM-related functions at the depots (undertaken by the RCA)

- Ticket stock-related functions at the depots (undertaken by the RCA)
- Bus captains
- Bus guides
- Inspection of depot infrastructure

4.1. SOP for the Planning of Bus Operations

The Planning and Scheduling Department is a part of the Operations Division, and is entrusted with the responsibility of preparing bus and crew schedules, while maintaining the minimum staff requirement and keeping an eye on staff costs. The bus and crew requirements developed by them are then allocated for depot operations by the bus operator/RCA. The utilisation of bus and the crew capacities needs to be meticulously planned to ensure optimum operational efficiency of traffic and the overall productivity of the organisation.

Box 1: ABC Analysis of Routes

Class A routes cover all costs³;

Class B routes cover only the variable costs;

Class C routes are loss-making

The Planning and Scheduling Department conducts quarterly review meetings with the depots to discuss the performance of the routes within their purview. Performance is reviewed using the 'ABC analysis' tool (explained in box 1), generated through the Depot Management System (DMS).

During these review meetings, proposals for starting new routes and revising the existing routes are discussed. The department also prepares action plans to meet the increased transport demand during the festival periods. Reviewing the performance of plans prepared earlier for similar circumstances helps the team to ensure the optimal utilisation of staff and buses during these periods.

With schools and colleges closing for vacations, the department also prepares "summer curtailment plans" to adjust to the reduced travel demand by reducing the number of operational buses.

The department also conducts periodic route and traffic analyses using historical ticket data and boarding/alighting (at bus stops) data. The information collected by CRUT could be stored centrally to facilitate the use of data-modelling tools for route design.

³All costs include both the variable costs (of fuel, maintenance, incentives, etc.), and the fixed costs (e.g. manpower, which is a fixed cost, irrespective of bus operations, EMI, FC renewal, etc.).

4.1.1. The process for bus scheduling

The preparation of suitable bus and crew schedules requires careful planning, and helps in organising the supply of transport services as per the demand. Both the criticism and praise received by transport undertakings for their services can be attributed to the inefficiency or efficacy respectively of their bus and crew scheduling procedures.

While the Planning and Scheduling Department prepares the bus schedules, the depots follow a centralised planning schedule, implementing operational changes every four months, along with changes in the duties of the bus captains and guides.

- A Bus Route Schedule is a timetable specifying the expected arrival and departure times of buses at fixed intervals at various bus stops. In other words, it refers to the trips assigned to a vehicle through its working hours.

- A Crew Schedule means the duties assigned to the bus captains (bus drivers) and the bus guides (conductors) through the working hours.
- Schedules are prepared and revised under the following circumstances:
 - Introduction of new routes
 - Augmentation or curtailment of existing services
 - Changes in trip timings
 - Changes in route itineraries - extensions or diversions
 - Changes in the parameters involved in the preparation of schedules, such as running time, headway, first or last bus timings, the number of buses, changes in relief points, depot locations, the patterns of operation, types of buses, etc.
 - Integration with other modes of transport, viz., train and flight timings, etc.
 - Requests from passengers and the people's representatives
- Bus schedules are prepared based on the "London pattern", wherein buses at the end of their routes keep moving, and are met by a fresh set of crew at predetermined spots where the changeover happens (instead of changeovers at the depot).
- Assessing the demand for buses is a key prerequisite for bus scheduling, and is done by conducting origin-destination surveys. In

order to decide upon the route pattern, the frequency of operations, time schedules, origins, destinations, the number of trips, etc., the entire area of operations needs to be studied carefully.

4.1.2. The process for introducing a new route or extending an existing route

The Planning and Scheduling Department follows a login and logout procedure in their scheduling system.

The requests received from the public and their representatives (through letters or customer portals) for starting new routes or for the extension of existing routes are critically examined by the department. Inspectors from the RAT and staff from traffic planning conduct a route survey (strictly using a bus) to assess the feasibility of operations on the requested route, by assessing the following parameters:

- Potential ridership
- Road conditions
- Bus maneuverability
- Availability of street lighting
- Overhead clearance
- Feasibility of installing bus stop shelters along the route
- Bus reversing facility at the terminals
- Amenities for staff at both ends of the route

The department also conducts detailed surveys to calculate bus running times, bus stop names, the scheduled time at each stop, and the termination points. The data collected is fed into the DMS, which is then analysed by the software to generate a report assessing the feasibility of bus operations on the route. The report also suggests bus timetables, bus frequencies and the number of buses to be operated on the proposed route. These are then sent to the Managing Director for approval.

Once the approval comes through, the planning department uses bus and crew scheduling software to prepare schedules, and instructs

the concerned depots to start operating buses on the new routes. These new routes are kept under observation for two weeks, and commuter feedback is taken into account to further enhance the operations. A similar process is followed for the extension of existing routes.

4.1.3. Key responsibilities for the introduction of a new route or the extension of an existing route

Most of these activities are undertaken by the bus operators, while the city authorities are involved in the monitoring of these activities.



Manager
(Planning and Scheduling)

- Preparing bus and crew schedules
- Assigning routes to buses.
- Modifying the routes in case of emergency



Depot
Manager

- Ensuring adherence to the schedule – both for the bus and the crew
- Conveying the schedule to the crew



Manager
(Maintenance)

- Planning the mid-day maintenance requirements
- Providing feedback to the captains and guides
- Providing feedback about routes, traffic conditions, etc.

4.2. SOP for Bus Operations at Depots

4.2.1. Process for bus and crew scheduling

- The bus operator will hand over information on the allocation of buses and bus captains one day in advance to the Depot Manager.
- The revenue collection agency will hand over information on the allocation of bus guides to the Depot Manager, one day in advance.
- The Depot Manager will compare the planned staff allocation with the actual number of staff who served on the buses to detect any variations. Variations of more than 5 percent indicate faulty planning.
- Bus captains are to be allocated to a fixed bus and a fixed route. Bus guides, on the other hand, should be rotated every month on various routes as per requirement.
- Bus operators and the Revenue Collection Agency (RCA) should ensure that the bus captains and bus guides are informed about the duties assigned to them, one day in advance, via SMS.
- The depot officers should ensure the out-shedding of buses as per the timetable and check whether the crew is in uniform before leaving the depot.
- The depot officers should also ensure proper crew changeovers during the mid-ways, as

per the allocation sheet provided by the bus operator and the RCA.

- The depot officer should ensure that timely replacements are provided for buses that break down during the trip, and have to be recalled to the depot for repair.
- For bus breakdowns on high-ridership routes, the depot officer should out-shed the replacement bus and crew from the depot as per availability, after making the necessary entries in the system. In the absence of spare buses at the depot, services on a low-ridership route can be temporarily suspended and deployed on the high-ridership route. The DMS data can help in identifying such low-ridership routes.
- In case of crew shortage, the crew will be preferentially assigned to the high-ridership routes. Again, the DMS data can help in identifying such routes.

4.2.2. Process for night parking

- The bus operator will post an officer at the in-gate. This officer will guide the bus captains to the designated locations for night parking. Buses scheduled for out-shedding early in the morning should be parked near the out-gates.
- As far as possible, to enable the timely out-shedding of buses, the parking locations should be fixed. Bus captains reporting in the early mornings should not need to waste time in

locating the buses assigned to them.

- Bus captains should be instructed to park the buses using the parking brakes only, and not keep the gears engaged. This will help prevent accidents and damage to the buses.
- During in-shedding, the security personnel posted at the gates should thoroughly check all the buses for suspicious objects.

4.2.3. Process for handling untoward incidents en route

Bus captains and bus guides should immediately report any untoward incidents en route (such as those listed below) to the call centre. The call centre will pass on instructions to the concerned depot managers/depot officers for prompt action.

- The bus catching fire
- The bus getting trapped in floods
- The bus caught in riots
- Traffic jam diversions

- Accidents involving the bus
- Any suspicious object found in the bus

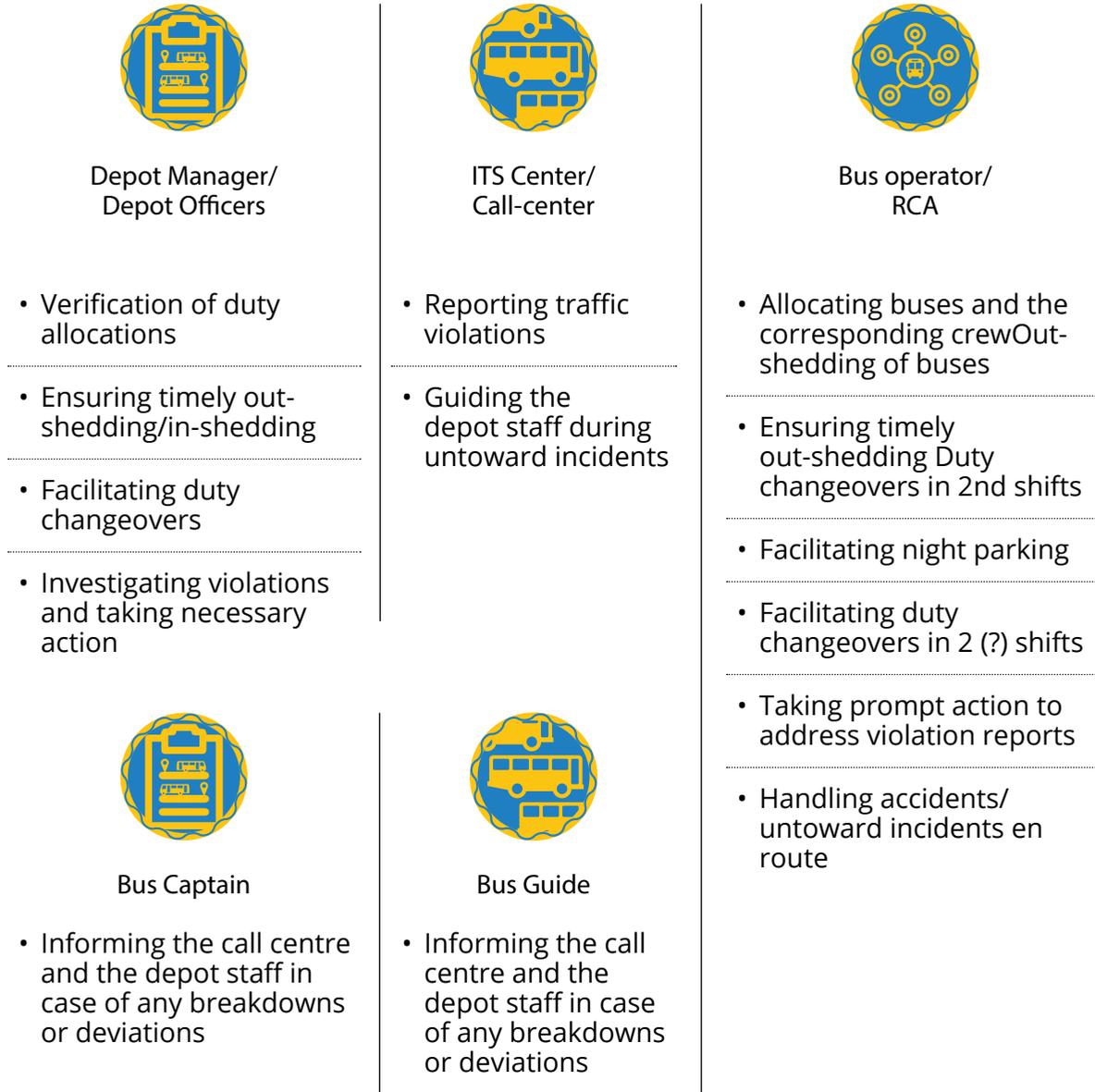
4.2.4. Process for handling violation reports

On receipt of violation reports from the ITS command centre, the depot managers/depot officers will apprise the bus operators and seek rectification. Repeated and serious offences by the bus operator will be reported to the central office by the depot managers, and appropriate penalties will be levied as per their agreement. Violation reports could be formulated for:

- Skipped stops
- Overspeeding
- Route deviations
- Unauthorised halts
- Bus bunching
- Abnormal delays in arrival and departure times
- Passenger complaints against the crew to the TMC

4.2.5. Key responsibilities for bus operations at depots

Along with the operators, the involvement of CRUT officials is required in all depot activities.



4.3. SOP for Bus Maintenance at Depots

4.3.1. Process for posting of technical staff

- The Manager (Maintenance), along with an Assistant Manager (Maintenance), are responsible for all maintenance-related activities at the depots.
- Each depot will have four technical supervisors, three of whom will report for the night shift and one for the day shift. The postings can vary, based on the depot requirements.

4.3.2. Process for bus maintenance

Bus maintenance activities will be conducted by the bus operator, under the supervision of CRUT's technical supervisors. The latter will ensure that the operator adheres to the Standard Maintenance Practices and Recommendations by the bus manufacturers, conducting checks for adherence to the 33 existing Performance Appraisal System (PAS) parameters. The operators will be responsible for the following maintenance activities:

- Daily maintenance
- Periodic maintenance
- Major docking maintenance
- Unit replacement as per shelf lives
- Seasonal Preventive Maintenance
- Predictive maintenance
- Fitness Certificate (FC) renewal

- En route breakdown maintenance
- Repair of damages caused by accidents
- Overhauling and replacement of major units
- Maintenance to address exhaust-related issues and low efficiency (KMPL) of buses

Daily maintenance

The following tasks need to be incorporated in the DMS module, and conducted by the inspection mechanics during the daily maintenance schedule:

- Attending to the complaints reported by the bus captains
- Checking the air pressure in the tyres as per schedule
- Ensuring that the buses are clean and washed, and passenger seats dry-cleaned as per schedule
- Checking the brake and clutch fluid levels, battery connectors, fan belt tension, sedimentary drains, the free play of brake and clutch pedals, etc.
- Checking on oil and air-pressure leakages, propeller shaft bolts, electrical fittings, destination boards and body fitments
- Ensuring that engine oil and coolant toppings in the yard are stable

The technical supervisor should check on a few buses at random that are brought in for daily maintenance operations by the bus operator. He should then record the observed malfunctions

and maintenance requirements, as well as log the corrective measures (to be taken by the operator) on his handheld device. The requirements which are not immediately attended to due to the unavailability of spares, manpower, etc. will also need to be recorded, and the details emailed to the bus operators. The supervisor will now need to follow up with the operator till the rectification measures are complete.

Periodic maintenance

The following tasks need to be incorporated in the DMS module, and carried out by the inspection mechanics during the periodic maintenance schedule:

- Inspecting the oil level in all the units, including the brake and clutch, the coolants and the fuel pipes
- Checking the functioning of the hub bearing, the steering linkages, P/shaft joints, the clutch and brake pedals, and the electrical fitments
- Cleaning the radiator using air or water, and lubricating all the grease points
- Tightening all the suspension bolts, the rear axle bolts, and the body bolts
- Checking the tyres for pressure, wear patterns and tread depth
- Cleaning and topping the batteries
- Inspecting and rectifying any defects in the body, the passenger seats, and the ITS units
- Maintaining the air-conditioning as per the

manufacturer's recommendations

The technical supervisor should check the buses taken for periodic maintenance by the bus operator. He should record the observed malfunctions and maintenance requirements, as well as log the corrective measures (to be taken by the operator) on his handheld device. The requirements which are not immediately attended to due to the unavailability of spares, manpower, etc. will also need to be recorded, and the details emailed to the bus operators. The supervisor will now need to follow up with the operator till the rectification measures are complete.

Major Docking Maintenance

As per the practices followed by the STUs, as well as the recommendations of the bus manufacturers, docking maintenance needs to be conducted after the completion of every 36,000 km by the bus. At this time, tasks such as unit replacements, oil and filter changes, etc. should be attended to. As far as possible, docking maintenance should be scheduled during the day shifts. All tasks which are a part of the 10-day periodic maintenance schedule are to be carried out during docking maintenance as well, including the following:

- As per the programme generated by the DMS:
 - Changing oil in the gearbox, the differentials, steering, clutch and coolant
 - Brake-lining replacement and overhauling of all the brakes and wheels

- Brake unit and brake hose replacement
- Washing and painting the chassis
- Hub greasing of all the wheels
- Setting the tappet clearance
- Tightening the cylinder head nuts as per the sequence specified by the bus manufacturer
- Inspection and replacement of defective propeller shafts
- Inspection and replacement of defective clutch assemblies
- Maintaining the air-conditioning as per the manufacturer's recommendations

The technical supervisor should check the buses taken for docking schedule maintenance by the bus operator. He should record the observed malfunctions and maintenance requirements, as well as log the corrective measures (to be taken by the operator) on his handheld device. The requirements which are not immediately attended to due to the unavailability of spares, manpower, etc. will also need to be recorded, and the details emailed to the bus operators. The supervisor will now need to follow up with the operator till the rectification measures are complete.

Seasonal Preventive Maintenance of buses

To protect the buses from adverse seasonal effects, preventive maintenance activities as detailed below should be conducted before the onset of summer and monsoon.

Summer Maintenance:

To minimise bus breakdowns due to high temperatures, the inspection mechanics need to:

- Check for and address any issues in the water circulation system. The fan belts and radiator hoses should be replaced wherever necessary. The working of the NRV (Non-Return Valves) should also be checked.
- Check the working of the viscous fans, radiator/intercooler fins, etc.
- Check for proper circulation of the coolant, and ensure that its correct specific gravity is being maintained.
- Ensure that correct procedures are being followed for coolant changing, the flushing of engine blocks, and the pressure rating of the radiator caps.
- Ensure that the radiator cores in all the buses are cleaned with water, after duly removing the intercoolers.
- Buses that consume excess engine oil/have blowing engines should be thoroughly checked and attended to at the depots/workshops.
- All the buses need to be checked for proper fitments of engine bonnet covers and gear box covers to prevent the entry of hot gases.

Monsoon Maintenance:

The inspection mechanics need to:

- Check for and repair broken/missing wiper blades, movable (window)/fixed glasses and leaky roofs.
- Check for and repair fuel tank caps and ensure that the rubber seals are in good condition.
- During every maintenance schedule, check and attend to the grease in the front wheels to prevent water contamination.
- Check the mud flaps for all the wheels and replace if found to be torn/missing.
- Check and attend to (if necessary) the felting/canvas cover of the engine bonnet.
- Whenever there is flooding or heavy rains, the following instructions should be followed:
 - Buses should be checked and attended to for water ingress in the HSD tank and engine oil on the next day.
 - Buses should be checked and attended to for water ingress in the hub grease, starter, gear oil, differential oil and any other damages, on a special maintenance programme every 4-5 days.
 - The details of the defects, units damaged, and actions taken for rectification should be maintained in the DMS.
- Buses are to be washed thoroughly on a daily basis.
- The incidence of tyre punctures should be recorded and analysed route-wise/location-

wise. Routes/locations with high incidences of tyre puncture, where road repairs may be necessary, need to be brought to the notice of the control centre.

4.3.3. Process for buses undergoing major unit replacements

Buses which are taken for replacements of major units such as engines, gear boxes, clutch assemblies, and steering boxes/pumps/linkages should be checked by the technical supervisors or the Assistant Manager (Maintenance) for proper fitments. Information about any existing malfunctions should be emailed to the bus operators.

4.3.4. Process for buses repaired for body damages and RTO fitness jobs

The buses taken in for repair of body damages due to accidents and for Regional Transport Office (RTO) fitness jobs should be thoroughly inspected by the technical supervisor and the Assistant Manager (Maintenance). The process for such daily inspections should comply with the SLAs.

The technical supervisor and the Assistant Manager (Maintenance) should check the buses daily before out-shedding, to ensure compliance with the SLAs. The findings are to be recorded on the handheld device that is provided to the supervisors.

4.3.5. Key responsibilities for the inspection of buses



Assistant Manager (Maintenance)/
Supervisor (Technical)

- Monitoring bus maintenance activities
- Random inspection of vehicles



Bus Operator

- as per the standard maintenance practices, and the recommendations of the bus manufacturers

4.4. SOP for ETM-Related Functions at the Depots (Undertaken by the RCA)

4.4.1. Process for the issuance and submission of ETMs

As laid down by the CRUT and followed by the RCA, the employees of the ETM department of the RCA have a login and logout procedure in the Waybill module of the DMS.

Issuance of the ETM

The ETM department operator will:

- Upload the configuration data (crew information, details of routes, stages, fare, etc.) into the ETM and issue it to the bus guide, when he/she visits the ETM department to collect the ETM, the paper ticket box and the waybill. The waybill issued should have the details of the arrival and departure times of each trip printed

on it through the DMS module.

- Enter the waybill number and the imprest cash amount with the bus guides into the ETM
- Verify the machine time and set it correctly.
- Ensure that the ETM is fully charged.
- Verify whether the concessions are getting reflected in the ETM.

Submission of the ETM at the end of the shift

- The bus guide will submit his/her ETM, the cash, the paper ticket box and the waybill to the ETM operator, and inform them about the number of paper tickets sold (if any).
- The ETM operator will:
 - Receive the cash and feed the amount (of cash collected) into the DMS.
 - Connect the ETM to the DMS, and download the data from the ETM.

- After feeding the cash amount into the system, the ETM operator will receive a number which, when inputted in the system, will exhibit the cash amount in the ETM.
- Note the excess/shortage of cash amount received.
- After downloading the service and trip details into the ETM, the operator will ensure that the service details are properly loaded, and that the required service is opened.
- The ETM should not be on charging mode when it is linked to the computer for uploading or downloading data, as this will damage the COM ports on the motherboard.
- On completion of data download, the ETM should be connected to the charging unit, with the power socket switch on, so that it can be charged.
- The details of bus guides who do not deposit the ETMS even after three continuous shifts should be sent to the Manager (ITS) and the Depot Manager for appropriate action.

4.4.2. Process for replacement of ETMs

In case of Configuration Errors: All previous data in the ETM will be erased, and the configuration data (crew information, details of routes, stages, fares, etc.) will be re-uploaded by the ETM operator and issued to the bus guide.

In case of Hardware and Software issues:

A new ETM will be issued by the branch operator. All the previous data in the ETM will be erased, and the configuration data (crew information, details of routes, stages, fares, etc.) will be uploaded to the new ETM.

4.4.3. Process for maintaining ETM records

The ETM department will:

- Maintain the history of all the ETMs in the DMS module, from the inception of the unit till it is scrapped.
- Maintain daily records of all the defective ETMs in the DMS.
- Maintain the utilisation records of all the units in the DMS. No unit should be kept idle for long.
- Rotate the ETMs route-wise to prevent the overutilisation of a few units, and maintain the rotation records in the DMS. As per standard practice, 20 percent of the ETM units are to be kept as reserve, and a record of the same will be maintained in the DMS module. Records for failing ETMs (but still within the warranty period) are also to be maintained in the DMS module.

4.4.4. Process for the issuance of ticket rolls

The ETM department will:

- Collect the reusable paper roll cores (plastic pipes) from the bus guide before issuing fresh

paper rolls, to prevent wastage. A record of the paper roll cores received from each bus guide will be maintained in the DMS.

- Records for the number of ticket rolls issued to the bus guides should be maintained in the DMS and on the waybill.
- Sufficient stock of rolls should be maintained, as per the inventory levels mentioned in the DMS module.

4.4.5. Process in case of thefts/damage to ETMs

- In case of thefts/damage to ETMs, the person to whom the ETM was issued will be responsible. The ETM department will maintain records in the DMS module, and block the stolen machine immediately through appropriate software to prevent misuse. When data is not retrievable from the stolen ETMs, the department shall decide on the amount to be remitted by considering the highest earnings realised by the service on the route in the last one month. The ETM department will obtain this data from the DMS module.
- Information about the ETM theft needs to be immediately conveyed to the Manager (ITS)/call centre for necessary directives.
- As per standard practice, the theft should be

immediately reported at the nearest police station with the help of the depot officers.

- The ETM department will prepare and submit detailed reports on the damages to the ETM to the concerned officials for disciplinary action, the records of which will be maintained in the DMS module.
- Any wilful/negligent damage or sabotage caused to the ETM should be reported for disciplinary action, and the cost of the ETM should be collected from those responsible.

4.4.6. Process for issuance, submission and accounting of paper tickets

- Paper tickets of appropriate denominations are issued to the bus guides along with the ETM. A record of ticket numbers is to be maintained.
- Paper tickets are to be received by the bus guide along with the ETM. Before receiving back the tickets from the bus guide, the ETM department should verify the ticket sales and the unsold block of tickets received.
- At the end of every week, a physical verification of each ticket against the sale of tickets as recorded in the DMS should be conducted. Misreporting should be investigated and reported to the Manager (ITS) for appropriate action.

4.4.7. Key responsibilities for ETMs at the depot

	ETM department Operator	<ul style="list-style-type: none"> Issuing of ETMs, paper tickets & waybills to the bus guides Replacement of the ETMs
	Bus guide	<ul style="list-style-type: none"> Collecting the ETM, paper tickets and the waybill from the box branch station
	Manager (ITS)	<p>Interventions/necessary action in cases of</p> <ul style="list-style-type: none"> Bus guides not depositing the cash in more than 3 shifts Discrepancies in block tickets
	Depot Officer	<p>Interventions in cases of</p> <ul style="list-style-type: none"> Damage to or loss of ETMs
	Depot Manager	<p>Interventions/necessary action in cases of</p> <ul style="list-style-type: none"> Bus guides not depositing the cash in more than 3 shifts

4.5. SOP for Ticket Stock-Related Functions at Depots (undertaken by the RCA)

4.5.1. Process for indenting paper tickets, ETM printing rolls, smart cards, etc.

Issuance of Paper Tickets, ETM printing rolls, etc.

- The ticket stock-in charge should receive a

sufficient monthly quota of paper tickets from the ETM department through the DMS module.

- An inventory for a minimum of two months should be maintained in stock.
- The ticket stock-in charge should enter the new stock in his inventory module.
- Printed paper tickets and ETM rolls should be

sent to the box/waybill branches upon request.

Indenting Paper Tickets, ETM printing rolls, etc.

- The ticket stock-in charge should receive a sufficient monthly quota of paper tickets from the box section through the DMS module.
- The ticket stock-in charge should analyse the

monthly requirements of paper ticket stock, ETM rolls, etc., and communicate with the accounts officer for requisitioning the same.

- The accounts officer needs to assess and approve the request.

4.5.2. Key responsibilities for ticket stock-related functions



Ticket stock- in charge

- Issuing (and maintenance of) paper tickets, ETM printing rolls and daily/monthly passes to the Box branch.
- Requesting the accounts officer to approve the purchase of the same



ETM Department

- Requisitioning ETM printing rolls, paper tickets and daily/monthly passes from the Ticket Store Branch.



Accounts Officer

- Assessing and approving requests for the purchase of paper tickets, ETM printing rolls and daily/monthly passes.

4.6. SOP for Bus Captains

4.6.1. Process for taking charge and out-shedding of buses

- The bus captain should arrive at the designated

bus depot on time, and mark their attendance in the biometric machine.

- The captain should collect the bus keys and log sheet of the allocated bus from the operations office.

- The captain should login to the Bus Driver Console (BDC), and back up the automatic selection of the designated route by a manual selection on their part.
- The captain should ensure the availability of the following items while taking charge of the bus:
 - Driving license
 - Passenger Carrying Vehicle (PCV) licence/ badge
 - CRUT identity card
 - Schedule chart
 - Emergency numbers
 - Pen

The depot officers should do random checks to ensure the availability of the above-mentioned items with the captain.
- The captain, who has already been intimated about the details of their bus and their job schedule through an automated SMS a day prior to their duty, is obligated to check the fitness of the bus as per the predefined Daily Inspection Checklist. If found unfit for operations, they need to log out from the BDC and report the issues to the maintenance staff for necessary action, following which the duty in charge allocates an alternate bus.
- The security staff needs to check the bus prior to out-shedding, to ensure any missing/damaged items such as passenger seat cushions, back rests, leftover tools, spares, etc.

4.6.2. Process for conducting checks on buses

After taking charge of the bus, the captain should check the bus for:

- Engine oil – Oil levels should be maintained between the maximum and minimum levels on the dipstick
- Coolant – Coolant levels should be maintained below the filler neck level of the coolant tank
- Clutch oil and Brake oil – Oil levels should be maintained between minimum and maximum levels of the oil container
- Tyres: The tyres should be checked for external cuts, uneven wear, and tyre pressure
- The condition of the fuel tank cap
- The working status/availability of the destination boards (PIS boards)
- Battery lug condition of fastening
- The proper working of the main switch
- The clutch play of the hydraulic clutch should be nil, and that of the mechanical clutch should be 3.5 inches
- The up/down play of the brake pedal, adjustable up to 12mm
- The proper working of the hand-brake valve and the low-pressure warning buzzer
- The air pressure should be more than 6.5kg/cm²
- The working status of the wiper and the lights

- The inside of the bus should be checked for cleanliness, wet seats, broken seats, broken window glasses, etc.
- The bus should never be started with all the lights in the “On” mode.
- After switching on the bus, it is to be kept in idling mode for a minimum of 3 minutes to prevent damage to the turbocharger.
- Any other instructions specific to a particular make/model.

4.6.3. Process for conducting en route duties

- The bus captain should follow the running time as per schedule. At the end of every trip, an entry is to be made on the log sheet, recording the actual arrival and departure times of the bus, which is to be countersigned by the station supervisor.
- The captain should not allow passengers to board from the front, and should ensure that boarding and alighting is complete before closing the front and rear doors and moving the bus.
- The captain should drive the bus only on the left side of the road, follow all traffic rules and regulations, refrain from smoking and using mobile phones and/or earphones while driving.
- The captain is required to halt the bus on all the scheduled stops, irrespective of the availability of passengers waiting to alight or deboard.

- The captain needs to coordinate with the bus guide to adjust the bus speed for ensuring complete ticketing, especially during the peak hours.

4.6.4. Process during en route breakdowns

In case of an en route breakdown, the captain should follow the following process:

- Stop the bus on the left side of the road, and switch on the parking lights/flashers to indicate the breakdown of the bus. The bus should not be left unmanned at any time.
- For buses stuck and immovable in the middle of the road, the captain should stand behind the bus and divert the traffic.
- Inform the call centre and the workshop regarding the breakdown and, if possible, obtain directions for the repairs.
- In case of a delay exceeding 30 minutes in the arrival of the technical staff, the bus captain should follow up with the workshop section.
- Record the defect on the log-sheet. If the bus needs to be brought back to the depot, the captain should also ensure that the bus-operations section makes the necessary entries, following which they should provide a replacement as quickly as possible to prevent loss of km.



4.6.5. Process in case of accidents and other adverse situations

The process to be followed in case of accidents, and situations such as fires, floods, riots, bomb scares, etc.:

Accidents

- Switch off the engine and activate the battery cut-off switch immediately
- Apply handbrakes
- Dial the number 100 as soon as possible and inform the police
- Call the ambulance immediately
- Inform the call centre and the concerned depot officer or bus operator immediately
- Assist the injured passengers

Riots

- Drive the vehicle to the nearest police station, if possible
- Convince the rioters to calm down, if possible
- Dial the number 100 and call the police immediately
- Inform the call centre and the concerned depot officer or bus operator immediately
- If it is necessary to leave the bus, switch off the engine, activate the battery cut-off switch and the handbrakes

Water-logging

- The bus should not be driven if the water level rises above the bottom of the wheel hubcap
- Evacuate the passengers
- Stay near the bus
- If the engine stops because of the water, don't restart it
- The brakes will be weakened while the vehicle runs in water, so they will need to be pumped continuously
- If the vehicle needs to be stopped in water, switch off the engine, activate the battery cut-off switch, and apply handbrakes to stop the vehicle
- Inform the call centre and the concerned depot officer or the bus operator immediately

Noticing suspicious objects in the bus (Bomb scare)

- Immediately stop the vehicle on the roadside, switch off the engine, and apply handbrakes
- Switch on all the parking lights
- Vacate the bus immediately
- Don't touch the suspicious object
- Don't direct a flashlight directly on the suspicious object
- Don't use mobile phones within a radius of 100 ft from the suspicious object

- Dial the number 100 and inform the police
- Inform the call centre and the concerned depot officer or the bus operator immediately

4.6.6. Process for in-shedding of buses

- The log sheet is to be deposited with the bus operations section
- The bus is to be taken to the fuel station for fuelling, and then to the designated point for inspection
- The captain should park the vehicle at the allotted parking slot and logout from the on-board BDC (Bus Driver Console).
- The captain will also need to deposit the bus keys in the yard section.

4.7. SOP for Bus Guides

4.7.1. Process for starting the shift

- Receive an automated SMS with information on the bus and the route assigned to him/her, a day prior to duty.
- Arrive at the depot on time and mark attendance in the biometric machine. In cases where the bus guide boards the bus en route, their attendance will be marked from the ETM login time, with respect to the location of the bus.
- Proceed to the ETM Branch to collect the ETM, waybill, paper tickets and paper rolls. The ETM operators will log details (such as the number

of ticket rolls issued to the bus guide) on the waybill and in the DMS.

- Record the imprest cash amount on the waybill and in the ETM.
- Login to the ETM and check the route code, schedules, fares, etc. If the ETM is malfunctioning, he/she should inform the ETM department and request a replacement.
- Check to see if they have their PCV badge.

4.7.2. Process for conducting en route duties

Bus guides should:

- Ask the passengers boarding the bus for their destination, and input the origin and destination stops in the ETM. He/she should start the ticketing from the rear end of the bus.
- Issue tickets to all the passengers at the origin point before the bus starts (issue and start).
- Ensure that he/she is always located at the rear gate on standard buses, and the front gate on midibuses. The location of the bus guide is randomly tracked through CCTV cameras installed in the bus.
- There are no seats allocated for the bus guides, so they should not occupy a seat if there are standing passengers.
- Coordinate with the bus captain to adjust the speed of the bus to ensure complete ticketing, especially during the peak hours. The number of tickets issued by the bus guides and the

- speed of the bus during peak hours will be tracked through the ITS.
- Ensure that the reserved seats are not occupied by unauthorised passengers.
- If the Passenger Information System (PIS) is not working, inform the passengers about the arrival of the next stop.
- Till the time that RFID (Radio-Frequency Identification) cards are implemented, it is necessary to physically verify the validity of the passes. Bus guides should issue tickets to all the pass-holders after the implementation of the same.
- In case of serious disputes with passengers, bus guides should contact the depot manger or the Manager (RAT) immediately, and/or request the bus captain to drive the bus to the nearest police station so that the issues can be sorted out.
- In case of regular offenders, bus guides should keep the Depot Manager or the Manager (RAT) informed, so that surprise checks by ticket-checking staff can be organised.
- Allow the passengers to travel only with valid tickets, passes and/or their CRUT identity cards.
- In case of failure of the ETM machine, the bus guide should immediately inform the callcentre with the details of the problem, and use box tickets till the completion of the trip.
- In case of bus breakdowns, the bus guide will shift the on-board passengers to the next bus

- scheduled to reach that point on the route or to the bus provided as replacement. The bus guide should make travel arrangements for all the passengers before leaving the spot.
- In case of accidents and/or any other adverse situations, the bus guide should assist the bus captain in evacuating the passengers. They should contact the Bhubaneswar Operation Centre and/or ask authorities such as the police station, fire brigade, etc. for immediate help.
- Bus guides should also take care of any other activity that needs to be conducted from time to time, or any other task as per the regulations.

4.7.3. Process for ending the shift

On returning to the depot/ISBT after the trip, the bus guide should:

- Check the bus thoroughly for any items left behind, and deposit the same in the lost property section.
- Close all the windows before the bus is taken away for parking inside the depot.
- Report to the ETM department at the depots.
- Logout from the ETM and submit the machine, balance paper tickets and empty roll tubes to the operators. If paper tickets have been issued, the ETM Branch Operator staff will analyse data from the ETM, calculate the amount collected through the sale of paper tickets, and generate an end-of-shift report for the bus guide.
- Following the generation of this report, the bus guide will deposit the amount collected with

- the cashier, who will, post verification, deposit it in the bank.
- Mark his/her duty-out time in the biometric machine.
- Ensure that he/she has not exceeded two continuous shifts without depositing the cash.

4.8. SOP for Depot Infrastructure Inspection

4.8.1. Process for inspection of depot infrastructure

- On every alternate Saturday, a team comprising the following officials will conduct a thorough inspection of the depot premises:
 - General Manager (Operations)
 - Depot Manager (CRUT or city bus agency)
 - Maintenance Manager (CRUT or city bus agency)
 - Manager (Civil Engineering, CRUT, or city bus agency)
 - AM (Maintenance), CRUT, or city bus agency
 - Depot Manager (of the Bus Operator)
- During the inspection, the following points are to be assessed, and observations recorded:
 - Cleanliness of the depot yard
 - Disposal of scrap material
 - Spillage of oil, grease, etc.
 - Proper stacking of all the spares
 - Cleanliness of inspection pits

- Cleanliness of bus washing bays
- Cleanliness of fuel shed
- Condition of the buildings
- Loose hanging wires, damaged sockets
- Condition of fire-fighting equipment
- Condition of the yard lights, quality of illumination in the depot
- Any working conditions that can be considered unsafe

The team will now prepare a detailed report with proposed action items to correct the issues identified, and submit it to the MD (CRUT).

4.8.2. Process for reporting damage to the depot structure due to the negligence of the bus operator

- Any damage to the depot structure caused due to the negligence of the bus operators (or their staff) will be repaired by the bus operator at their own cost.
- The Depot Manager and Manager (Civil Engineering) will oversee the repairs, and take necessary actions for incorrect or incomplete work.

¹ All costs include both variable costs (of fuel, maintenance, incentives, etc.), and fixed costs (e.g. manpower, which is a fixed cost, irrespective of bus operations, EMI, FC renewal, etc.).

5. Reporting formats

As a part of this guidebook, certain reporting formats have also been prepared to complement the SOPs. These have been designed to ensure compliance to the service level indicators as mentioned in the bus operators' agreement. The formats also incorporate the daily checks carried out by the RAT. These formats are not

system-generated; they need to be filled in manually or on handheld devices. The following table lists all the reporting formats for the recording and monitoring of bus operations, along with details of the personnel responsible for taking decisions on these tasks.

Table 2: List of Reporting Formats for Recording and Monitoring Bus Operations and Maintenance

S. No	Checklist	Frequency of updating	Filled by	Checked by	Submitted to
1	Checking of buses (as per the SLAs in the tender)	Daily	Technical supervisor	AM (Maintenance)	Manager (Maintenance)
2	Weekly checks on buses (as per the SLAs in the tender)	Weekly (for a batch of buses)	Technical supervisor	AM (Maintenance)	Manager (Maintenance)
3	RAT duty schedule	Monthly	Supervisor (RAT)	Manager (RAT)	General Manager
4	RAT daily checking format	Daily	Zonal RAT team	Supervisor (RAT)	Manager (RAT)
5	Money misappropriation report	Daily	Zonal RAT team	Supervisor (RAT)	Manager (RAT)
6	Bus-guide cash checking report	Daily	Zonal RAT team	Supervisor (RAT)	Manager (RAT)
7	Housekeeping inspection	Weekly	Depot officer	Depot Manager	General Manger

S. No	Checklist	Frequency of updating	Filled by	Checked by	Submitted to
8	Night inspection report (Inspection of bus maintenance activities carried out in the night shift)	Monthly	Night inspection officers (AM)	Maintenance manager	General Manager
9	Inspection of buses attended to for preventive maintenance schedules	Daily	Supervisors	AM (Maintenance)	Manager (Maintenance)
10	Breakdown investigation report	Daily	AM (Maintenance)	Manager (Maintenance)	General Manager
11	Terminal visit report (Visit to the terminals to record the issues observed)	Weekly	Depot managers & Depot officers		Depot Managers/ General Manager
12	Passenger loading surveys (surveys carried out on the heavy-loading bus stops to check the number of passengers unable to board the bus due to lack of bus capacity)	Weekly	Depot officers	Depot Managers	General Managers

6. MIS Reports

MIS reports are vital tools for monitoring bus operations. During the daily operations of the buses, a huge amount of data is generated through the ITS & the DMS. This data has to be represented in simple formats to facilitate their analysis by the managers and the supervisors.

The MIS reports play a vital role in establishing the accountability of each and every individual working in the organisation. A list of MIS reports beneficial for effective monitoring of bus operations have been indicated in the table below. These are system-generated reports.

Table 3: MIS Reports

S. No	MIS reports	Frequency
1	Daily bus operation report	Daily and monthly
2	All routes performance report	Daily and monthly
3	Individual route performance report	Daily and monthly
4	Trip loss and km loss report	Daily and monthly
5	Conductor-wise revenue reports	Daily and monthly
6	Driver-wise trip loss report	Daily and monthly
7	Driver complaints and breakdowns control chart	Daily and monthly
8	Bus-wise attention to preventive maintenance schedule	Daily and monthly
9	Status of attending to the preventive maintenance schedule	Daily and monthly
10	Day-wise & bus-wise fuel efficiency report	Daily and monthly
11	Daily breakdown investigation report	Daily and monthly
12	Repeated defects report	Daily and monthly
13	Group-wise breakdowns and driver complaint report	Daily and monthly
14	Summary of bus maintenance activities	Daily and monthly
15	Daily bus washing report	Daily
16	Control charts: engine oil topping, coolant topping, tyre pressure checking, bus washing	Daily
17	Accident and incident report	Daily
18	PUC check report	Monthly
19	Fitness renewal (MVI) report	Daily & monthly
20	Passenger complaint report	Daily & monthly

The key positions of responsibility and the important SOPs have been defined in Part 1. Part 2 will elaborate on the principles of transit system planning, with examples from city bus operations in Bhubaneswar.



About the GIZ supported SMART-SUT Project

The Integrated Sustainable Urban Transport Systems for Smart Cities (Smart-SUT) project (August 2017 - July 2021) is jointly implemented by the Ministry of Housing and Urban Affairs (MoHUA) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. The project works with the three Smart Cities - Bhubaneswar, Coimbatore, and Kochi, and their respective state governments, to promote low-carbon mobility, and to plan and implement sustainable urban transport projects in the fields of public transport, non-motorised transport and modal integration. It also supports urban transport agencies to set up the required institutional structures and processes, and enhance their capacities for efficient delivery of services. A consortium comprising GFA, WRI India and the Wuppertal Institute is supporting GIZ in the implementation of this project.



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