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(Partnering for Accelerated Climate Transitions)

National Dissemination Workshop on

Electrification of Public Transport and Intermediate Public Transport in Indian Cities

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Session 1: PT Electrification Strategy for Ahmedabad

Contracting Strategy

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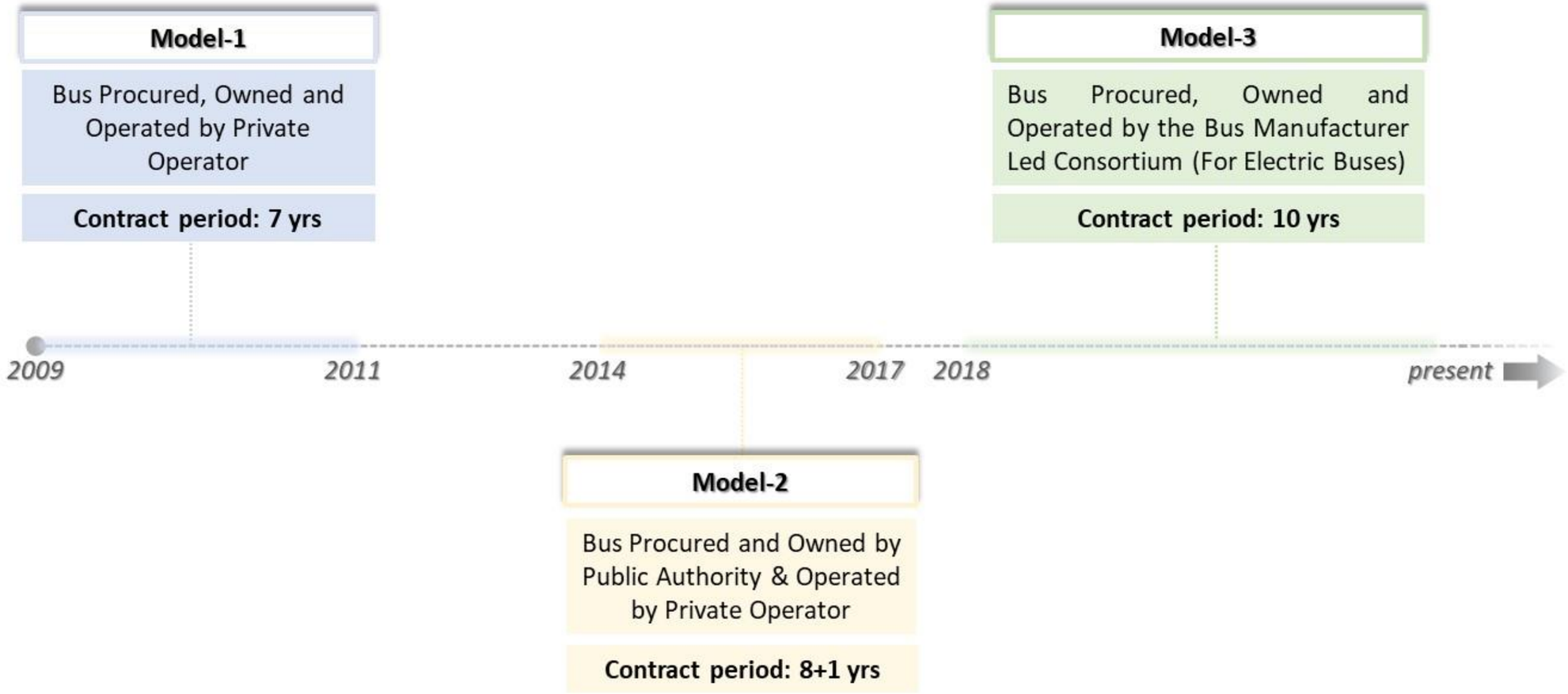
AJL's E-Bus Contract

Evolution of Contracting Models in AJL

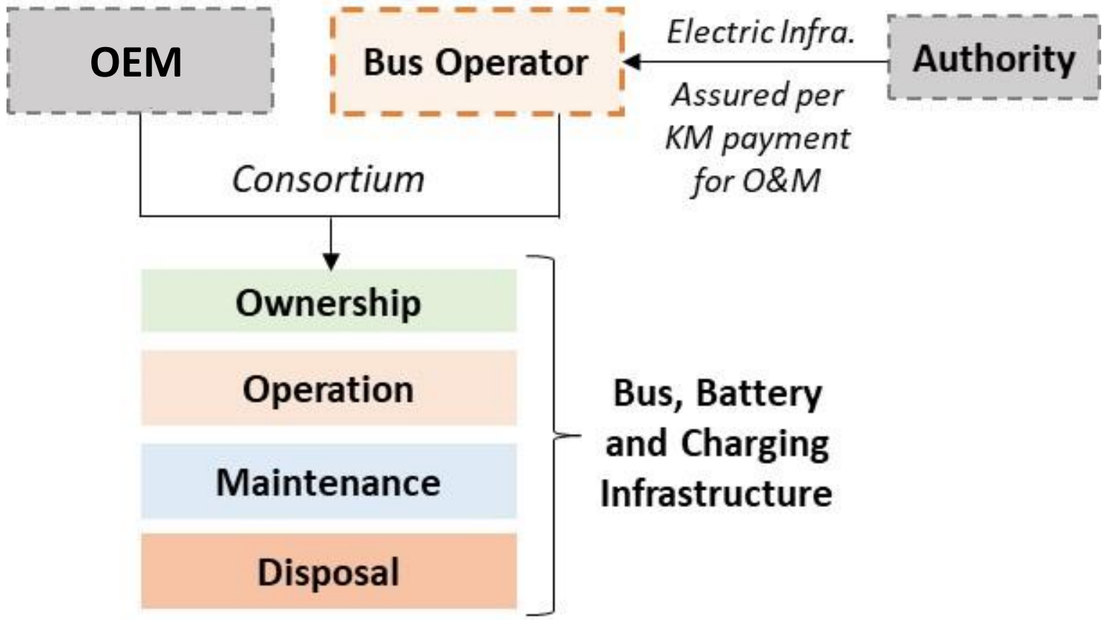


Ahmedabad has always preferred the GCC model over NCC due to following advantages :

- Revenue risk not loaded on the Operator
- Greater assurance of planned supply
- Authority's full control over selection of routes and bus frequency
- Easier to enforce compliance due to performance based payments

AJL's E-Bus Contract

Project Structure of Gross Cost Contract for E-bus



Vehicle manufacturer/ operator owns, operates and maintains the buses, batteries and charging infrastructure and gets a fixed remuneration from the Authority based on assured km.

Key Features of the E-bus Contract

Model	Procure, Operate and Maintain	
Contract Period	10 years	
Payment	Per KM basis	
Bus Types	Midi AC E-Buses	
Annual Assured KM	70,000 per bus	
Maintenance Depot	**Authority** Provide civil infra	**Operator** Maintain depot
Electric Infra. (Upstream)	Authority	
Electric Infra. (Downstream)	Operator	
Charging Infrastructure	Operator	
Electricity consumption cost for bus charging	Operator	
Time for Opportunity Charging	90 mins	

AJL's E-Bus Contract

Key Characteristics of the Bus Operator Contract

- Investment risk on Operator
- Revenue Risk – Authority
- Technology and Performance Risk on Operator

- Force Majeure
- Change in Law
- Dispute resolution mechanism

- Bus Specification guidelines
- Inspection and Acceptance Processes

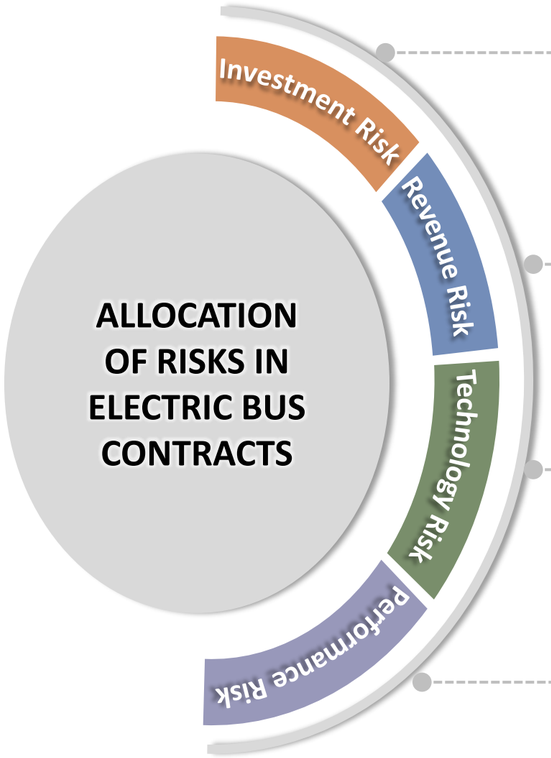
- Assuring business through kms
- Assuring availability of Buses
- Vehicle utilization through route planning
- Time based Payment for service provided

- Performance Parameters
- Performance Evaluation Process
- Liquidated Damages

- Escrow
- Assured debt payment during termination
- Substitution

AJL's E-Bus Contract

Allocation of risks in contract



Assigned to	Risk Mitigation Measures defined in the Contract
Operator	• *Bus Ownership with Operator* • *Time based payment of service fees to recover the investment made in buses* • *Escrow Mechanism for payment.* • *Termination Payment of debt due and equity.* • *Upfront milestone based payment for depot development.*
Authority	• *Operator is immune through service based payment.* • *Authorities are mostly dependent on the Parent Organization for Viability Gap Funding.*
Operator	• *Operator is required to make available buses as per the stipulated specifications.* • *Buses will be inspected by authority for final acceptance.*
Operator	• *Operator is required to meet assured availability of Buses and other performance parameters.* • *Liquidated damages in case of non adherence to the performance obligations.*

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AJL's E-Bus Contract

Performance Monitoring

- Well defined Operation and Maintenance Standards and expectations from the Operator in the contract
- Performance standards are designed to ensure uniform customer service levels and safety
- Monitoring done through ITS devices fitted on the buses linked to Control Centre
- Penalties delinked from actual amount and expressed in Km, based on severity.

1. Vehicle – Fine per deficiency per bus

Sr. No.	Deficiencies	Fine Km
1	Modification of the design or paintwork of the exterior or interior of the bus without the authorization of Authority	50
2	Missing bus body panels on the exterior/interior of the bus	50
3	Defective or malfunctioning headlights, rear lights, brake light, turning indicators and parking lights, broken mirrors at the time of Bus Operations	50
4	Dirty vehicle(i.e. dusty handrails, chairs and floor, litter of any kind on floor, foul odour; dirty windows and glass panels, Spots) inside or outside, at the time of start of first shift in the morning	50
5	Broken/damaged windows, fixed glass, front windshield or rear windshield	25
6	Fire Extinguisher missing or beyond expiry date	25
7	Malfunctioning passenger door	50
8	Broken/Loose/Missing Passenger Seat	25
9	Loose or missing handrails, roof grab rails and/or with Sharp edges	25

27. OPERATION AND MAINTENANCE STANDARDS

27.1. The Operator shall observe the minimum service standards for operations and maintenance of Contracted Buses as provided in the Agreement.

27.2. The Operator shall operate and maintain the Contracted Buses in accordance with the Fleet Deployment Plan, and shall at all times ensure that the frequency is maintained as specified under the Fleet Deployment Plan or as per the instructions of the Authority from time to time.

27.3. The Operator shall ensure that the following activities are undertaken as part of the maintenance activity of the Contracted Buses without causing any disruption to the frequency or the availability of the Contracted Buses in accordance with the terms contained herein:

a. Charging of Bus Batteries.

b. Checking and maintaining Charging Infrastructure.

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AJL's E-Bus Contract – Wider Benefits

City's Contracting Methods have led to other benefits

City's Gross Cost Contract Template of Ahmedabad has been adopted by many cities

Jaipur Bus

Indore City Bus
Atal Indore City Transport Service Co. Ltd

Amritsar Metrobus

The city has spawned a host of operators and strengthened the bus operator industry

Chartered

Aadinath
Driving miles, Gifting Smiles

Jay Maruti Dada
Shree Maruti Travels

Daga Group

MUT
Connecting City Life

CRUT
Capital Region Urban Transport
Bhubaneswar • Cuttack • Puri

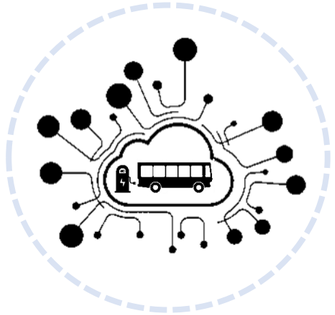
Manufacturers encouraged to enter bus services business through Electric Bus

Ashok Leyland

TATA
TATA MOTORS

JBM Group
Our milestones are touchstones

Best Practices for E-bus Procurement & Contracting



Adopting a 'Technology Agnostic' Contract

- Several competing technology options
- Flexibility to select E bus technology left to the Operator based on functional requirements specified in the RFP
- Reduces the technology risk as bidders propose based on the best-fit requirements.

- New E-bus technology involves technology risks which need guidance of an OEM.
- Since the performance risk is loaded on the OEM, OEM presence provides strong risk mitigation

Mandatory participation of OEM

Depot Infra. Development shared between Authority and Operator

- Loading the depot on the operator leads to capability issues and improper price discovery
- AJL provided bulk power access and civil infrastructure at depot, whereas, the operator was obliged to provide downstream electric infrastructure and charging infrastructure.

- Existing E-buses provides a range of 130-180 km in single charge, over the requirement of 220 km/day.
- Flexible scheduling adopted which allows the buses to top up through flexibility of curtail scheduled routes & reduced dead KMs.

Flexible Scheduling for Efficient Operations

AJL's E-Bus Contract - Strategies going forward

Contract Period

- ✓ Could be based on Km rather than time period.
- ✓ Buses could be retired lot wise based on contracted km completed.

Common Charging Infrastructure Standards

- ✓ Common charging standards to ensure interoperability and compatibility among different operators.
- ✓ Provides flexibility to use centrally distributed charging infrastructure and inventory, resulting to reduction in Dead KMs. Thus achieve route optimization.

Financial Planning

- ✓ Current practice does not include explicit investment and finance planning in terms of capex and opex requirements and providing for them
- ✓ Adoption of the practice of Transport Funds for long term sustainability

Opportunity Charging Time

- ✓ Higher opportunity charging time reduces service reliability and increase optimization problem
- ✓ Higher capacity batteries will imply higher cost, reduction in carrying capacity and energy efficiency.
- ✓ Adoption of new top up locations on route and technologies like Pantograph flash charging.

Electricity Consumption Cost For Bus Charging

- ✓ The electricity consumption cost for bus charging should be loaded on the Operator to incentivise energy efficiency with provision for a bonus.

Integration of Intelligent Transit Systems

- ✓ ITMS currently in scope of Operator leading to integration challenges with ITS Operator
- ✓ Cost of integration should be included as a line item in cost

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Goal	Strategies	Instruments for implementing the strategy	Stakeholder wise role							
			Cen/State Govts.	Transport Agency	Bus Manuff.	Bus Operator	Finance Provider	ITS Provider	Energy Provider	Power Utility
Promotion of E Bus use in Public Transport	Contracting for long term Scale	• Long term fleet electrification planning • Standard models incentivizing scale • Manuf capacities/supply	S	S	S	S	S	L	S	S
	Improve E Bus procurement processes	• Pre bid stakeholder consultation • Standardized terms of bidding • National Pool of Pre-qualified bidders • Leveraging online e-procurement	S	S	S	S	S	L	S	L
	Introduce new business models	• Learn from International Experiences • Unbundling bus, battery, and charging • TCO and revenue modelling	S	S	S	S	S	P	S	L
	Effective Govt. incentive schemes	• Efficacy of schemes, gaps • New schemes, international experience	S	S	S	S	S	L	S	L
Improve Access to Finance	Improve institutional (STU/OEM/Operator) bankability	• Broader STU policy issues • Cash flow related issues (eg fares) • Asset monetization / non fare strategies • OEM and operator financial health	S	S	S	S	S	L	P	L
	Improve contractual bankability	• Commercial Gaps in contracts • Termination, liability caps, damages • Risk allocations framework	P	S	S	S	S	L	S	L
	Guarantee and support structures	• Pooled guarantees and escrows • Priority Sector Lending • Alternatives to sovereign guarantees.	S	S	S	S	S	L	P	P
	New business models	• Ensuring bankability of new models • Subsidy / incentives required ?	S	S	S	S	S	L	P	P
Standards and Contract Mangt	Establish technical standards	• Standard Specifications for E Bus, Battery, Chargers and Charging infra • O&M standards embedded in contracts • Safety Audits and SOPs • Battery disposal protocols	S	S	S	S	P	P	S	P
	Strengthening Operations	• Optimized scheduling and routing tools • End of contract life issues • Reduce/ rationalize import tariff barriers	L	S	P	S	L	S	S	P
	Institutional Capacity	• Long term plans with commitment • Training, and capacity building in PTAs	S	S	S	S	S	P	S	P
Implementation	Identifying suitable cities for rollout	• Identifying criteria for selection • Ensuring higher degree of success • State level Funding Schemes	S	S	S	S	S	L	S	P

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