

Operation of Electrified Public Transport

Ram Chandra Poudel
Director (Technical)
Department of Transport Management
Minbhawan, Kathmandu, Nepal
e-mail: ramchandra.poudel@dotm.gov.np

National Consultative Workshop on Strategy for
Electrification of Public Transport
Kathmandu, Nepal
18-19 May 2022

National Transport Policy, 2001

Objective: to make the transport sector environment friendly.

Activities related to e-mobility:

- (i) expansion of **solar powered and electricity-driven transport** means throughout the country
- (ii) special attention to improving 'the comfort, reliability, safety, frequency, availability and affordability of public transport' to **reduce the harmful emissions from mobility sources**
- (iii) provision of **economic instruments in the form of custom and tax incentives** to promote private sector involvement in the construction, maintenance and rehabilitation of transport infrastructure and to encourage non-polluting vehicles



Environment Friendly Vehicles and Transport Policy 2014

Goals

- Promoting the national production
- **Infrastructure for such vehicles and services**
- Promoting the industry, trade and technology
- **Converting the fossil fuel vehicles to environment friendly vehicles**
- Emission reduction and environment protection



Environment Friendly Vehicles and Transport Policy 2014



Strategic Programs

- Encouraging, enabling and promoting national industry in this field
- Government or government owned entities to buy such vehicles giving priority to national product , making at least 20% of all vehicles to be environment friendly by 2020
- Provision of exemptions on Finance Act. Income Tax, Custom, VAT, Excise Duty, rebates
- **Separate facilitated regulation, test, registration and operation**
- Priority sector for bank credit
- Promoting use of such vehicles in Tourist areas

Environment Friendly Vehicles and Transport Policy 2014



Strategic Programs (contd..)

- **Cooperation between Public, private and cooperatives for building**
 - **Green mode of transport like Rope-Ways**
 - **Charging Stations for Electric Vehicles**
 - **Parking lots with solar powered charging facilities for electric vehicles**

- **Promotion of Battery recycling industry**

- **Separate lanes for cycles**

- **Conversion old vehicles into to electric vehicles before they are auctioned**

- **Separate route and identity for such vehicles used in public transportation**

Motor Vehicles and Transport Management Act 1993 (MVTMA 1993): Major Provisions relating to Public Transport

- ✓ Public Transport Vehicles shall not operate service without obtaining **Route Permit** in designated routes. (Section 75)
- ✓ Route Permit shall have a **validity** period up to **4 months** from the date of issue. (Section 77. Sub-Section 2)
- ✓ **Fitness Test** Certificate (Road Test Certificate) is an essential document for granting Route Permit (Section 78, part (b)).
- ✓ A public transport vehicle may get **multiple Route Permits** (Section 80).
- ✓ A vehicle found to be in proper mechanical and structural conditions, upon test, shall be awarded a Fitness Test (Road-Test) Certificate with a **validity period of 6 months** (Section 91)



Motor Vehicles and Transport Management Act 1993 (MVTMA 1993): Major Provisions relating to Public Transport

- ✓ Registration as Service Provider and **Permit to Operate**: (Section 93)
- ✓ A vehicle owner or Proprietor (**A Company/co-operative**) shall not operate public transport service without **registering the name of the service provider** at the Department (or Transport Management Offices)
- ✓ A permit to operate public transport service, upon registration, shall have a validity period of **5 years**.
- ✓ **Fare** for public transport (passengers and cargo) shall be as **specified** (by the Department) (Section 96)



Permission for Conversion of Fossil Fuelled Vehicles into Electric Vehicles: Gazette Notification: March 28, 2022 (Chaitra 14, 2078 BS)

Motor vehicles subjected to Environment friendly and energy efficiency oriented modifications shall be exempted for three years from the Provisio under sub-section (2) of section 39 of Motor Vehicle and Transport Management Act 2049 (1993).



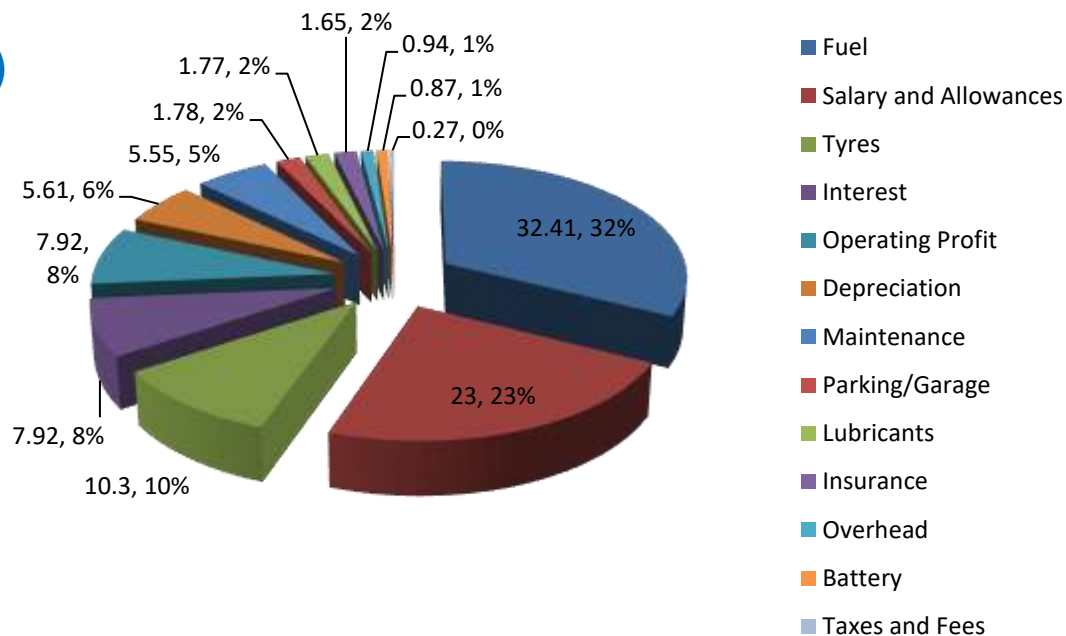
The provisio :

“No permission, however, shall be granted to alter the detailed specifications regarding the structure of the motor vehicle provided by the manufacturer.”



Breakdown of Operating Cost of Diesel Buses:

1. Fuel Cost (32.41%)
2. Salary and allowance of workers (23%)
3. Tyres (10.3%)
4. Interest on Loan (7.92%)
5. Operating Profit (7.92%)
6. Depreciation (5.61%)
7. Maintenance Cost (5.55%)
8. Parking/garage charges (1.78%)
9. Lubricants (1.77%)
10. Insurance Premium (1.65%)
11. Overhead Expenses (0.94%)
12. Battery (0.87%)
13. Taxes and Fees (0.27%)



Effects on Cost Factors in Electric Bus Operation:

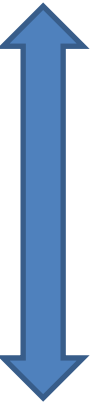
INCREASE

- Interest on Loan
- Depreciation
- Insurance Premium
- Overhead Expenses
- Battery



FAIRLY CONSTANT

- Salary and allowance of workers
- Tyres
- Operating Profit
- Parking & Garage Charges



DECREASE

- Fuel Cost
- Maintenance Cost
- Lubricants
- Taxes and Fees



Major Constraints in Operation of Electric Vehicles in Public Transport:

- **Grossly informal transport business** dominated by the private sector with individual vehicle owners affiliated to 'companies'
- **Low fare** and less **profitability**
- **Huge capital Investment required** for acquisition of electric Vehicles (Buses) and for changing the battery
- **Inadequate charging infrastructure**
- **Shortage of well trained human resource** and well equipped **facilities** for maintenance and repair works
- **Difficult terrain**, Poor road infrastructure, traffic **congestion**, frequent stoppage

Steps being Taken to Facilitate the Operation of Electric Vehicles in Public Transport:

1. Formulation of **Standards** for Electric Vehicles to be Imported into Nepal and for **Conversion** of fossil fuelled vehicles into EVs.

Major Criteria to be Considered:

- ✓ Safety
- ✓ Energy Efficiency
- ✓ Gradeability
- ✓ Suitability for the geographical terrain
- ✓ Comfort

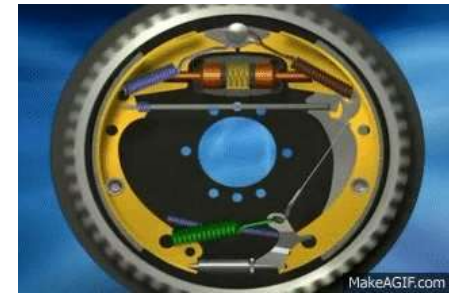
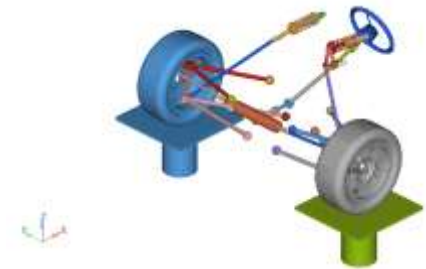


Steps being Taken to Facilitate the Operation of Electric Vehicles in Public Transport: (Contd..)

2. Formulation of **Test Standards** for Electric Vehicles Imported into or assembled or manufactured in Nepal

Major Criteria to be Considered:

- ✓ Safety
- ✓ Structural Soundness
- ✓ Performance (peak power, torque, speed)
- ✓ Gradeability
- ✓ Brake Performance
- ✓ Suspension System
- ✓ Dynamic Stability
- ✓ Lights



Steps being Taken to Facilitate the Operation of Electric Vehicles in Public Transport: (Contd..)

3. Cooperation between government entities and private sector for establishment of a **network of Charging Stations**, suitable for multiple types of electric vehicles across the country .

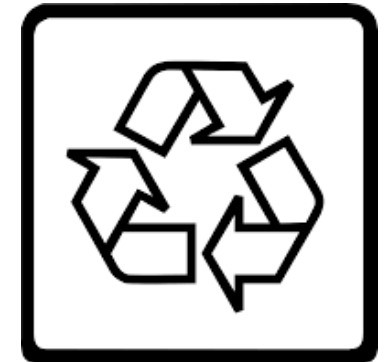
- ✓ Land Availability
- ✓ Uninterrupted power supply
- ✓ Investment in Infrastructure
- ✓ Flexible, competitive and profitable tariff



Steps being Taken to Facilitate the Operation of Electric Vehicles in Public Transport: (Contd..)

4. Formulation/revision of **Battery Recycling/Management Policy** for safe and productive management of different types of batteries used in electric vehicles

- ✓ Returning of the used batteries to the manufacturers
- ✓ Promotion of battery recycling plants
- ✓ Maximum recovery of useful components from the used batteries



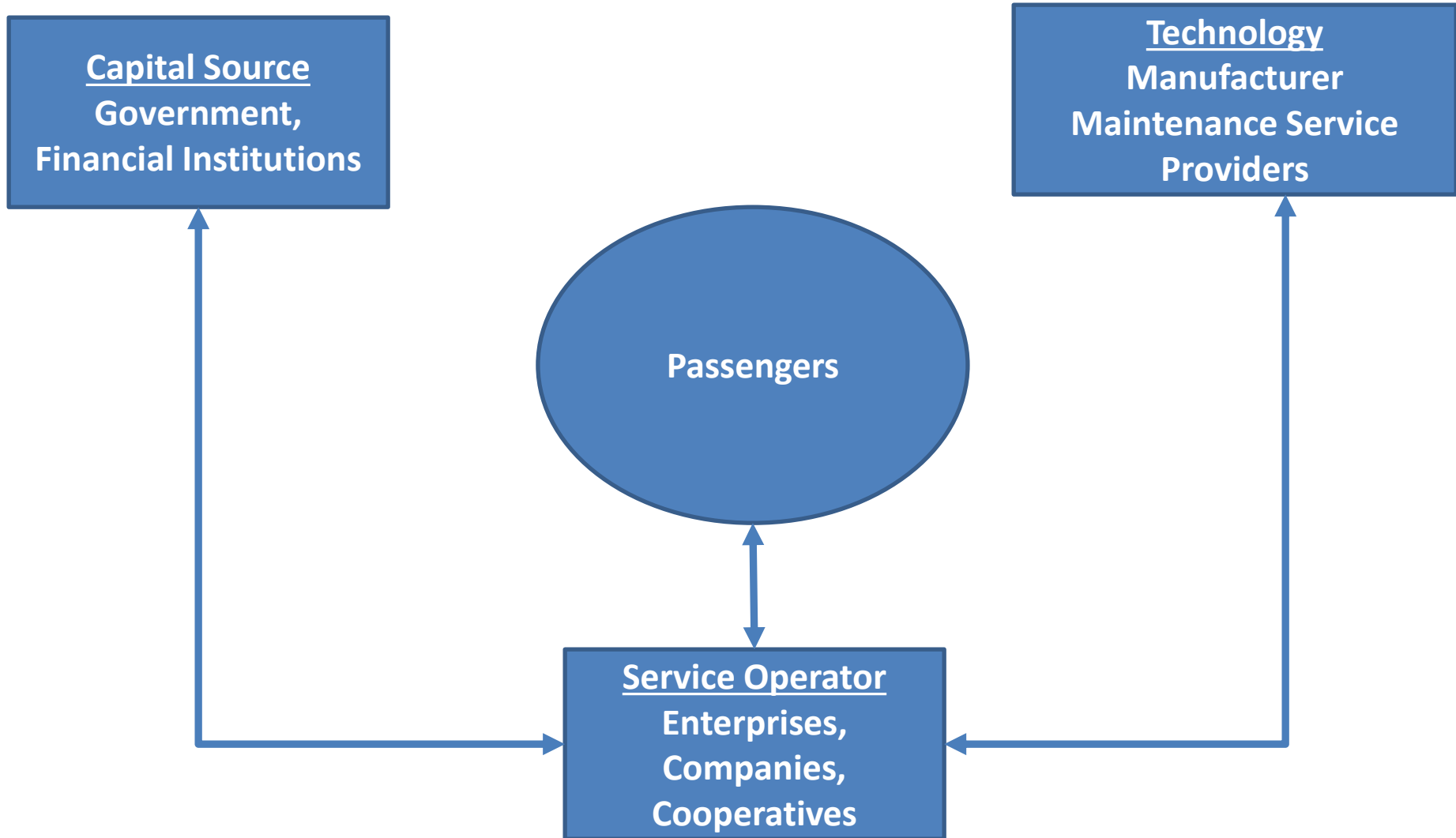
Li-ion

Steps being Taken to Facilitate the Operation of Electric Vehicles in Public Transport: (Contd..)

5. Partnership between federal government, provincial governments, local governments and private sector for promotion of electric vehicles in **public transport**

- ✓ **Strengthening Government's Presence in Public Transport: establishment of government owned enterprises to operate EV based public transport in sub urban areas.**
- ✓ **Partnership with Private Sector:**
 - **Gross Cost Contract: Payment of fixed unit charge for service provided by private operator selected through competitive bidding.**
 - **Net Cost Contract: providing fixed subsidy or collecting fixed fee from private operator selected through competitive bidding.**
- ✓ **Encouraging Private Sector Participation: in urban areas where private sector will be more effective and competitive.**

Most Feasible Partnership Modality for Operation of EVs in Public Transport:



Most Feasible Partnership Modality for Operation of EVs in Public Transport (Contd..)

Each party performing the tasks best suited for itself.

- **Capital Provider**: Government or financial institutions to provide capital at affordable cost through loan or leasing mechanism. This will ease the service operator in acquiring EVs.
- **Service Operator**: shall concentrate on providing quality service in competitive manner. Operator will not have to bother about maintenance related issues which shall be handled by the manufacturer under life cycle warranty scheme.
- **Technical Support Provider**: the manufacturer or competent service provider shall provide continued technical support in operation and maintenance of the EVs.

THANK YOU