



ADVANCING
PUBLIC
TRANSPORT

ASHOK LEYLAND'S ELECTRIC BUSES: SOLUTIONS FOR INDIA- SPECIFIC NEEDS

Supported by



Local Host



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UITP – DIMTS Bus Seminar
11-12 May 2018, Delhi

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CONTENTS

- Electric Vehicle Energy Accounting
- Factors Influencing Vehicle Efficiency
- Other Considerations
- India Specific Solutions



ELECTRIC VEHICLE ENERGY ACCOUNTING

Power Flow and Energy Usage



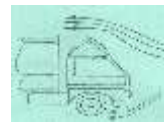
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ARTICLE: POWER



CONVENTIONAL BUS: ENERGY ACCOUNT



0

0

340

30-

20-

10-

230

50

670

Wh/km

ELECTRIC BUS: ENERGY ACCOUNT



0

0

340

30-

20-

7-

230

50

310

Wh/km

FACTORS INFLUENCING VEHICLE EFFICIENCY

How do we get more out?

FACTORS INFLUENCING VEHICLE EFFICIENCY

If Vehicle Mass is Reduced by 1 Ton

0

0

340
310

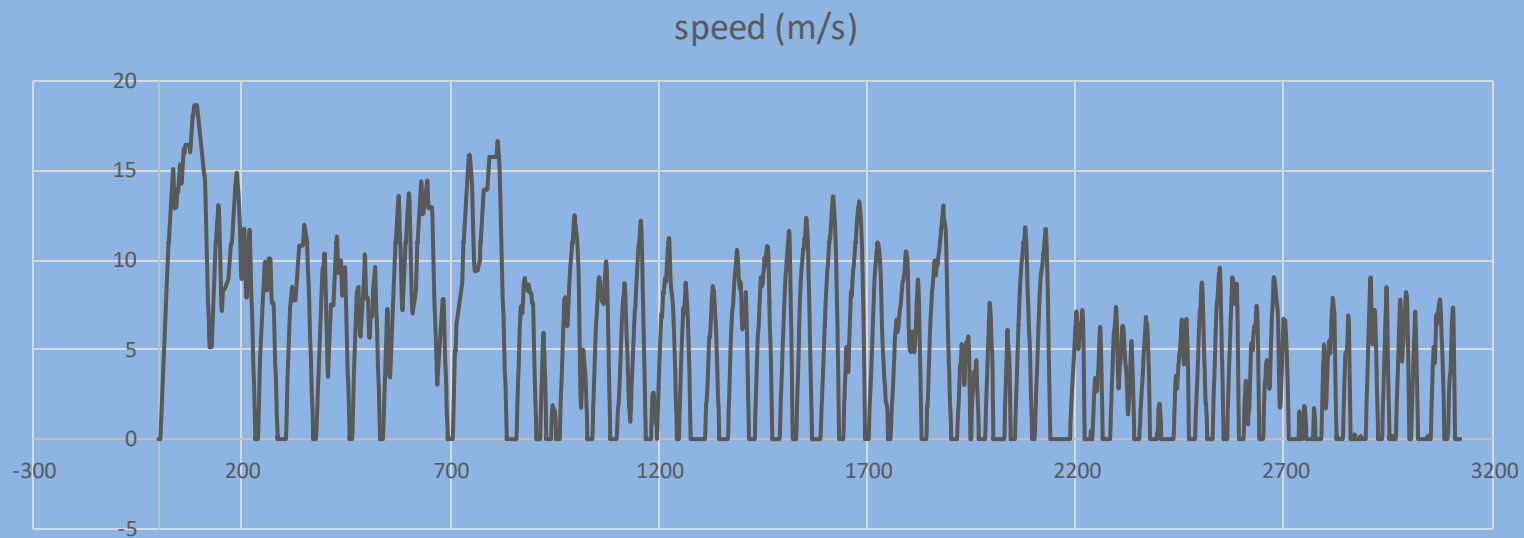
30-

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6-

Energy Efficiency Goes Up by 8%

FACTORS INFLUENCING VEHICLE EFFICIENCY



OTHER CONSIDERATIONS

What else needs to be done to make EVs successful?

OTHER CONSIDERATIONS

- **Viability – the more the assets are used, the quicker Electric Buses become viable**
- **Managing charging of batteries makes a difference**
 - Asset Utilization
 - distance run by the bus per day
 - hours charged per charging station
 - Real Estate Requirements
 - Availability of parking spots with charging facility
 - Moving buses in and out before and after charging

INDIA SPECIFIC SOLUTIONS

Make in India – Design in India

INDIA SPECIFIC SOLUTIONS



China's Shenzhen becomes world's first city to electrify entire 16,359-strong bus fleet

replaced with electric cabs and be allowed to operate citywide.

501 bus charging stations

For powering the needs of its public transport model, the city has built 501 bus charging stations that is equipped with 8,000 charging poles.

"A bus can be fully charged within two hours and the charging poles can serve 300 buses a day. Since the replacement, the bus terminal has

Move People – Not Batteries
Be flexible in managing charging
Improve regeneration

MIX OF CHARGING STRATEGIES

Slow Charging – charging at 0.1C to 0.2C

Fast Charging – charging at 0.5C to 1C

Opportunity Charging - at 0.5C to 1C

Battery Swap – takes less than 3 minutes

Ultra Fast Charging – charging at 5C

IMPROVE REGENERATION

Intelligent deceleration management:
Comfort vs. efficiency

Hardware designed to absorb more of
vehicle kinetic energy

THANK YOU!!

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INDIA



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