



Sustainable Urban  
**Freight Coalition**

Workshop Proceedings on Sustainable Urban Freight  
for Bengaluru

17<sup>th</sup> April 2021

**SUSTAINABLE URBAN FREIGHT INITIATIVE  
A COLLABORATIVE APPROACH**



*shaping the way cities move*

**© THE ENERGY AND RESOURCES INSTITUTE, 2021**

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without prior permission in writing to The Energy and Resources Institute, New Delhi, India, or as expressly permitted by law, or under terms agreed with the appropriate organizations. Enquiries concerning reproduction should be sent to the address:

**PUBLISHED BY**

The Energy and Resources Institute (TERI)

**FOR MORE INFORMATION**

Project Monitoring Cell, TERI, Darbari Seth Block, IHC Complex, Lodhi Road, New Delhi 110 003, India

Tel.: +91 11 2468 2100 or 2468 2111 | Fax: +91 11 2468 2144 or 2468 2145

Email: [pmc@teri.res.in](mailto:pmc@teri.res.in) | Web: [www.teriin.org](http://www.teriin.org)

## TABLE OF CONTENTS

<b>BACKGROUND</b> .....	4
SUSTAINABLE URBAN FREIGHT INITIATIVE.....	4
WORKSHOP OBJECTIVES .....	5
<b>AGENDA AND PARTICIPANTS</b> .....	6
AGENDA .....	6
PARTICIPANTS .....	6
<b>PROCEEDINGS</b> .....	7
WELCOME REMARKS AND KEYNOTE SPEECH .....	7
OPENING REMARKS .....	7
NEED AND SCOPE OF ELECTRIFICATION FOR BENGALURU .....	8
EXPERIENCE SHARING OF REDUCING COST AND EMISSIONS FROM URBAN FREIGHT .....	9
PATHWAYS FOR REDUCING COST AND EMISSIONS FROM URBAN FREIGHT IN BENGALURU .....	10
QUESTION AND ANSWER SESSION .....	11
<b>WAY FORWARD</b> .....	12
<b>ANNEXURE-I</b> .....	12
<b>ANNEXURE-II</b> .....	12
<b>ANNEXURE-III</b> .....	12

# INTRODUCTION

## BACKGROUND

### SUSTAINABLE URBAN FREIGHT INITIATIVE

This Workshop is a part of TERI's *Sustainable Urban Freight Initiative Coalition* aimed at creating local and national support structures for cost and emission reduction from Urban Freight in India. With this aim, TERI is establishing a consortium of all public and private stakeholders of urban freight including Urban Local Bodies, Vehicle Manufacturers and Civil Society members. This *Sustainable Urban Freight (SUF) Coalition* aims to share, create and disseminate knowledge to facilitate interventions to reduce emissions and costs from urban freight activities in India. The SUF Coalition will facilitate continuous initiatives through both policy and practice. One of the major objectives of this working group is to facilitate clean technology pilots in various applications of urban freight in Indian cities.

Urban Freight broadly includes all movement of goods within urban areas. This includes a wide range of commodities with varied transportation requirements. Effectively reducing cost and emissions from urban freight, especially through technological transitions like EVs, cannot have a blanket approach for all. Each type of urban freight will have its own mobility pattern with specific load and range requirements. In many cases, the need may even differ based on location.

The city of Bengaluru is one of the fastest growing cities of the India with estimated GDP growth of 8.5% by 2035. The city has been the epi-center of many start-ups and e-commerce businesses. Being the largest FMCG market of India, Bengaluru has experienced a sudden growth in Urban Freight activities of the city resulting into increased congestion and pollution issues. Keeping in view all these aspects, Bengaluru is selected for the pilot studies for sustainable urban freight practices.

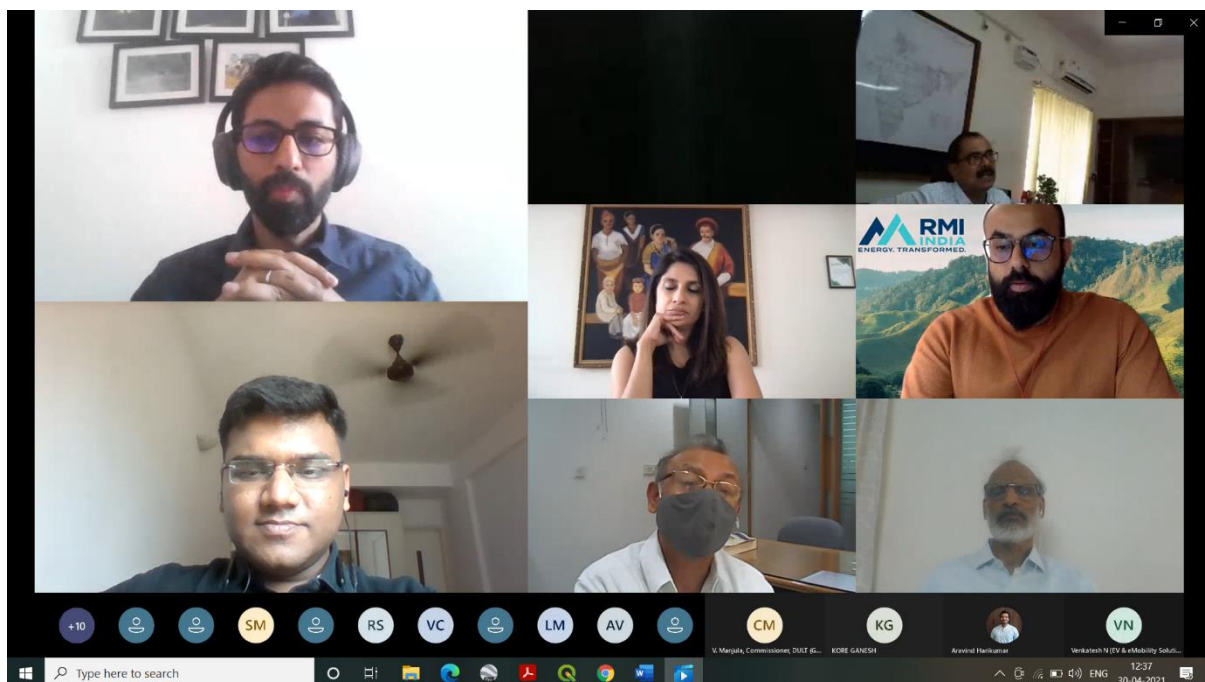
## WORKSHOP OBJECTIVES

The workshop was jointly organized by TERI and Directorate of Urban and Land Transport (DULT) on 27<sup>th</sup> of April with the specific objective to

- ❖ *Discuss solutions for sustainable urban freight in Bengaluru*

The workshop was aimed at bringing all the city stakeholders on the one platform and discuss the potential of sustainability in Urban Freight of the city. The sub-objectives of the workshop were:

- ❖ To identify the current status of urban freight and discuss the scope of sustainability with key stakeholders of the city of Bengaluru
- ❖ To understand the roadblocks in the application of green technologies
- ❖ To identify and discuss the pathway for implementing the sustainable urban freight



**Image 1: Workshop on Sustainable Urban Freight for Bengaluru**

# AGENDA AND PARTICIPANTS

## AGENDA

The virtual workshop was held on 27<sup>th</sup> April, 2021 from 1130 to 1330 hours. Broadly, the agenda constituted of discussions on the following sections:

- ❖ Current status of Urban Freight in Bengaluru
- ❖ Experience of application of Electric Vehicles in Solid Waste Management
- ❖ Experience of Electrification of last mile delivery
- ❖ Pathways for electrification of Urban Freight in Bengaluru
- ❖ The detailed agenda of the workshop is included in the annexure.

## PARTICIPANTS

The workshop involved stakeholders from different areas concerning the urban freight in Bengaluru. The detailed list of participants is attached in the annexure.

- ❖ Public Services
  - Directorate of Urban and Land Transport
  - The Rail Infrastructure Development (Karnataka) Ltd
  - PIU Bengaluru
  - Traffic Planning Department
  - All India Federation of Motor Vehicle Department
  - NHAI
- ❖ Private Companies, OEMs and Industry Bodies
  - Lets Transport
  - Kinetic Engineering
  - Mahindra and Mahindra
  - Ashok Layland
  - Society of Indian Automobile Manufacturers (SIAM)
- ❖ Research Organizations
  - Indian Institute of Science (IISc)
  - Rocky Mountain Institute (RMI)
  - Environment Defense Fund (EDF)
  - Shakti Sustainable Energy Foundation
  - Indian Institute Technology – Dhanbad (IITD)
  - The Energy and Resource Institute (TERI)

# PROCEEDINGS

## WELCOME REMARKS AND KEYNOTE SPEECH

(By Mr Narsimha Raju, Director, TERI SRC)

Highlighting growing e-commerce activities, Mr Raju said that urban freight activities are yet not given enough attention while planning the city transportation. Talking about the recent growth in Bengaluru, he expressed the need of efficient traffic planning as raising freight activities in the city have led to issues like congestion, pollution, noise pollution and parking demands. As EVs have started occupying substantial share in the freight vehicles, it is crucial to provide efficient charging infrastructure. He emphasized on adopting new technologies and planning measures to plan better and efficient systems for urban freight.

## OPENING REMARKS

(By Ms. V Manjula, Commissioner (IAS), DULT)

Looking at the current trends of E-commerce and retail, Ms Manjula mentioned that in near future 20% of all the retail sells will be online resulting into hike in urban freight activities. It also contributes to 6% of total GHG emissions and a better system must be developed to make urban freight trips more efficient and sustainable.

Majority of comprehensive mobility plans (CMP) and master plans pay a little or no attention to urban freight due to lack of data and awareness. She mentioned that last mile deliveries contribute significantly to the congestion and road safety issues. As the trips made are of higher frequency with lesser pay load, it signifies the underutilization of the vehicle while exploiting the same number of resources. Expressing keen interest in planning better system Ms. Manjula highlighted the major focus areas for DULT to plan urban freight: Data collection, Stakeholder Consultation, Integration of Public Transport and Innovation.

# NEED AND SCOPE OF ELECTRIFICATION FOR BENGALURU

(Presentation by TERI)

Based on the previous study of TERI, need of sustainability and the scope of electrification for the urban freight in Bengaluru were presented. It was highlighted that the majority of freight vehicles in Bengaluru are light commercial vehicles (LCV) and their number is increasing at the CAGR of 6.5%. The case study of Let's Transport logistic company also suggested the last mile deliveries for E-commerce have range of 71km and weigh about 702kg on average, EVs can be the more efficient mode of transport for such use cases. As the parking time for the vehicle is around 30 minutes, EVs charging solutions may be appropriately planned at those locations.

## Key inferences from EV driver survey

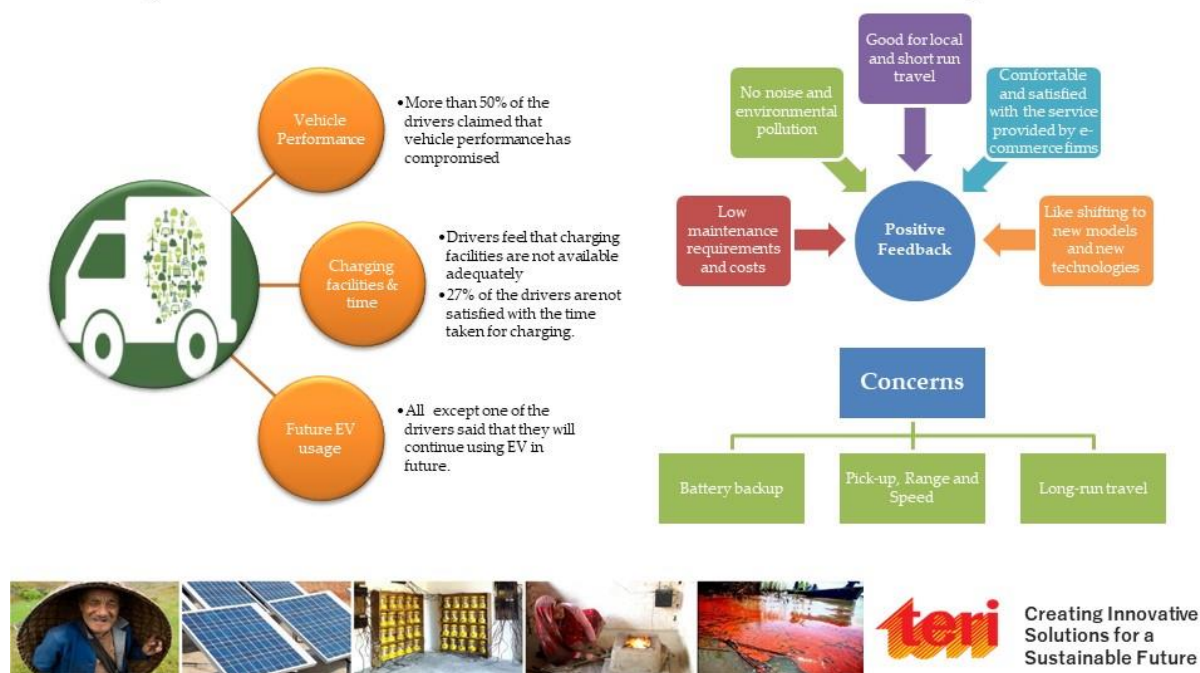


Image 2: Inferences from EV driver survey  
(Source: TERI Presentation)



## EXPERIENCE SHARING OF REDUCING COST AND EMISSIONS FROM URBAN FREIGHT

(By Ms. Sulajja Motwani, Vice Chairperson, Kinetic Engineering and Mr. Yash Kariwal, Senior Manager, Lets Transport)

The major agenda of this session was to discuss the experience of procuring, adopting and promoting electric vehicles. **Ms. Motwani** mentioned that e-commerce should lead the way of electrification as better alternative EVs are available, as well as they have capacity to switch.

The experience of deploying EVs of Kinetic Greens for Solid Waste Collection in different cities and the experience of Lets Transport in using EVs for last mile deliveries was discussed.

The major push factors derived from their experience are:

- ❖ Amazing cost benefits in terms of operation and maintenance cost as well as total cost of ownership.
- ❖ Government incentives.
- ❖ Zero air and noise pollution.
- ❖ Smaller vehicles with lesser loading capacity are better fit for e-commerce deliveries.

**Mr. Kariwal** mentioned that for any new purchase EVs are better and cheaper option as their cost is lesser than BS6 vehicles available in the market. The operational cost of EV also goes down as electricity needed is cheaper than BS6 diesel.

The major bottlenecks experienced/expected for the wider adoption of EVs:

- ❖ Reliability of technology: Range and Charging time and capacity are not much reliable and there is a wide scope of improvement. Lack of charging infrastructure is also an issue; government shall take necessary steps to incorporate charging stations at public and market places to push wider adoption
- ❖ Finances: EMI cost of EV is higher as compared to IC engines; Residual value of EV is counted as zero by financing institutions. Mass adoption of EVs can solve this issue.
- ❖ Availability of Infrastructure: Adequate charging infrastructure and parking spaces shall be available at important places.

Talking about the issue of financing, Ms. Motwani suggested that SC/ST Development Cells, Self Help Groups and other welfare schemes can help the marginalized community to buy EVs and they can be given opportunity to work in urban freight sector. Both the panelist also agreed on the fact that better incentives like subsidies and access to infrastructure and services will push more towards adoption of EVs.

## PATHWAYS FOR REDUCING COST AND EMISSIONS FROM URBAN FREIGHT IN BENGALURU

The panel discussion included key stakeholders from Karnataka as well as representatives from research and knowledge institutions. The detailed list of panelists is attached in the annexure.

**Mr. Shivaraj Patil**, Additional Commissioner of State Transport Department mentioned that Karnataka is working on the State Action Plan to reduce the vehicular emissions as directed by National Green Tribunal (NGT) and the strategies are focused on polluters pay principal, establishment of emission testing centers and promoting EVs.

Talking about the focus on urban freight, **Ms. V Manjula**, Commissioner of DULT mentioned that current CMPs and Master Plans lack the focus on urban freight and DULT is aiming to engage with different stakeholders to plan for sustainable urban freight. Currently DULT is focusing upon the provision of charging and parking infrastructure on Public Private Partnership bases.

Another major issue with planning of urban freight discussed was Lack of Availability of Data. **Prof. Ashish Verma** from IISC said that urban freight has a more complex system as e-commerce, online food delivery etc are increasing at a greater pace. And due to such reasons, it is difficult to generate the data regarding origin and destination along with their daily run etc. Lack of authentic data is one of the major reasons behind the absence of urban freight in most of the CMPs. Given the data regarding the spread of origin and destination (OD) points, their routes and frequencies is available, efficient models can be developed to manage the urban freight sustainably. The availability of data will not only help to form the policies, but will also help to forecast and understand the impact of the policy.

**Mr. Dimpy Suneja** from RMI mentioned that EVs are better option from the economic point of view as the total cost of ownership as well as operation and maintenance cost of EVs are lesser than that of IC engines. The sales of electric 2-wheelers are increasing in past some years and many start-ups are working on better and efficient designs of EVs. **Mr. Saurav Rohilla**, Assistant Director of SIAM also added that EV market in India is now established as a proper commercial market and EVs are now not only environmentally sustainable but are also economically viable.

Other important points mentioned during the discussion are:

- ❖ The focus should be on making the whole system sustainable, instead of focusing only on the vehicle technology.
- ❖ CNG vehicles are still a better option to achieve sustainability if EVs don't fit in some systems.
- ❖ Along with promoting EVs, it is important to focus on the traffic congestion and road safety as well.

- ❖ EVs have better scope for improvement and various designs and technologies can be explored to generate more sustainable and feasible vehicle.
- ❖ Scope of NMT can be explored for last mile deliveries.
- ❖ Logistic companies and e-commerce companies can also think of implementing electric bicycles and bikes for last mile delivery of lighter goods.
- ❖ The pilots can be run with Postal services also, as they have short distances for last mile delivery and different vehicles can be experimented.

## QUESTION AND ANSWER SESSION

- ❖ Can First Loss Default Guaranty (FLDG) be a good option to avail easy finances for EVs?
  - FLDG is definitely a better way to avail finances, but it is difficult for a start-up to provide this guaranty. For a mass scale solution, it is only possible after 2-3 years when sufficient data and evidence is available that EVs are successful. (Mr. Yash Kariwal)
  
- ❖ What is the scope of application of EVs in Municipal Solid Waste Collection? Is Kinetic Greens associated with SWM collection?
  - Yes, EVs perfectly meet the loading capacity required for daily MSW collection. Also, as the trip length is limited and daily hours of working are fixed, charging of EVs can also be taken care of easily. As EVs do not have extensive fuel demand, they can be deployed in villages also easily.
  - Recently Kinetic Greens has supplied 1000 EVs for the SWM collection in Chennai and 5000 EVs for Andhra Pradesh. Almost 20 municipal corporations are currently using EVs from Kinetic Greens for the mentioned use. (Ms Sulajja Motwani)
  
- ❖ Thoughts on recycling batteries and reducing environmental risks.
  - Government has issued the draft notification for the guidelines on recycling of used batteries focusing on how the lithium and other metals can be extracted from used batteries. It is still in a draft stage but it will soon be mandatory to process the batteries for the interest of environment and public health. (Mr I V Rao)

## WAY FORWARD

This workshop aimed at bringing all the stakeholders on one platform and discuss the potential of sustainability for the city of Bengaluru. It was concluded that the along with the data collection for freight behavior, sensitizing the stakeholders about the available alternate technology and their benefits will help to switch to sustainable freight activities. The following tasks can be taken up:

- ❖ **The Partnerships with Knowledge and Research Institutes:** It will help to collect the data regarding urban freight activities and need of infrastructure. These partnerships can help to deliver detailed action plan for Urban Freight for the city of Bengaluru.
- ❖ **Capacity Building Workshops:** These workshops can be a platform to sensitize the FMCG groups, Logistic companies, SWM and Postal and Courier Services about the potential of EVs to achieve environmental and economic sustainability. OEMs can also be invited to such workshops to suggest the best fit EV for given service.
- ❖ **Partnership with Infrastructure Companies:** Public Private Partnership based models can be developed to facilitate the charging infrastructure in the city.

TERI is looking forward to long partnership with DULT to take forward this discussion and develop the action plans for mentioned activities.

# ANNEXURE-I

## List of Participants

Public Services		
Sr No	Organisation	Participant
1	DULT	Ms V Manjula (IAS), Commissioner
2	DULT	Ms Bhavana Nadagoudar
3	KRIDE	
4	PIU Bengaluru	
5	All India Federation of Motor Vehicle Department	Mr Ashfaq Ahamed, President, Regional Transport Office
6		Ms Rajashree M S
7	ACP Traffic Planning	
8		Mr Umashankar B P
9	NHAI	
Private and OEMs		
10	Lets Transport	Mr Yash Kariwal, Senior Manager
11	Kinetic Engineering	Ms Sulajja Motwani, Vice Chairperson
12	Kinetic Engineering	Mr Rushabh Sanghvi
13	SIAM	Mr Saurabh Rohilla, Associate Director
14		Ms Ula
15	Mahindra and Mahindra	Mr Ganesh Kore
16	Ashol Leyland	Mr Venktesh
17		Mr Rishabh Singh
18		Mr Shamanth

Research Institutes		
Sr No	Organisation	Participant
19	IISc	Prof Ashish Verma
20	IITD	Dr Nilanjana De Bakshi
21	EDF	Mr Kaushik
22	EDF	Ms Lavanya
23	Shankti Sustainable Energy Foundation	Mr Vivek Chandran
24	RMI	Mr Dimpy Suneja
25	IIT Dhanbad	Ms Leeza Malik, Assistant Professor
26		Ms Saima
27	TERI	Mr IV Rao, Senior Visiting Fellow
28	TERI	Mr Narsimha Raju, Director, TERI SRC
29	TERI	Mr Shri Prakash, Distinguish Fellow
30	TERI	Mr Sharif Qamar, Associate Fellow and Area Convener
31	TERI	Mr Aravind Harikumar, Research Associate
32	TERI	Mr Promit Mukherjee, Research Associate
33	TERI	Ms Palak Passi, Research Associate
34	TERI	Ms Shivangi Kumar, Research Associate
35	TERI	Mr Santosh Kumar
36	TERI	Ms Viral Joshi, Research Intern

# ANNEXURE-II



## AGENDA 11:30-13:15, April 27<sup>th</sup>, 2021 [Click Here to Join Meeting](#)

### WORKSHOP | Sustainable Urban Freight In Bengaluru

11:30 – 11:40 Hrs.	<b>Welcome Address and Keynote Speaker</b> Mr. Narasimha Raju D N Director, South Regional Centre, TERI
11:40 – 11:50 Hrs.	<b>Opening Remarks</b> Ms. V Manjula, IAS E/o Additional Chief Secretary to Government, Commissioner Directorate of Urban Land and Transport (DULT), GoK
11:50 – 12:00 Hrs.	<b>Presentation on urban freight case studies in Bengaluru</b> TERI
12:00 – 12:20 Hrs.	<b>Experience sharing of reducing cost and emissions from Urban Freight</b> <ol style="list-style-type: none"><li>1. <b>Solid Waste Management:</b> Ms. Sulajja Motwani, Vice Chairperson, Kinetic Engineering</li><li>2. <b>E- Commerce Logistics:</b> Mr. Yash Kariwal, Senior Manager – Corporate Development, Lets Transport</li></ol>
12:20 – 12:50 Hrs.	<b>Panel Discussion: Pathways for reducing cost &amp; emissions from Urban freight in Bengaluru moderated by Mr I V Rao, Senior Visiting Fellow, TERI</b> <ol style="list-style-type: none"><li>1. Ms. V Manjula, IAS (DULT)</li><li>2. Mr. Shivaraj B Patil, Additional Commissioner for Transport, State Transport Department, Karnataka</li><li>3. Mr. Abhishek Saxena, Public Policy Expert, Niti Aayog</li><li>4. Prof. Ashish Verma, IISc</li><li>5. Ms. Akshima Ghate, RMI</li><li>6. Mr. Saurabh Rohilla, Associate Director, SIAM</li></ol>
12:50 – 13:10 Hrs.	<b>Open Q&amp;A Session</b>
13:10 – 13:15 Hrs.	<b>Thank You Remarks</b> Mr. Sharif Qamar, Fellow and Area Convenor, TERI

# ANNEXURE-III

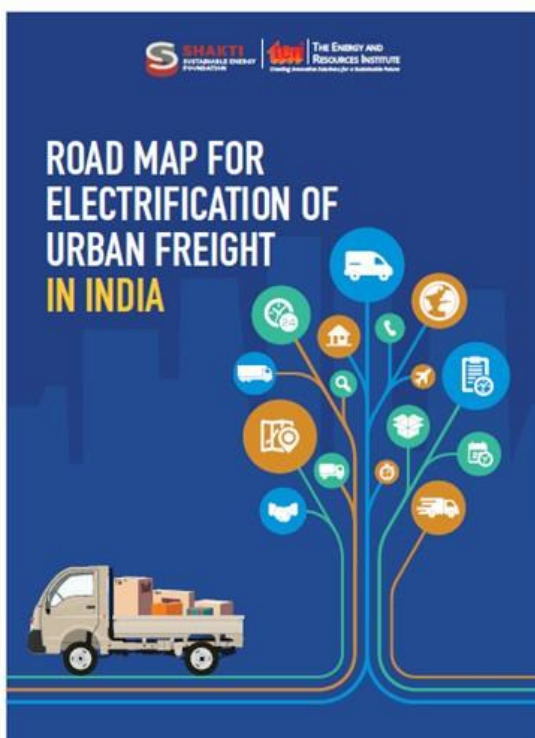
## TERI's Sustainable Urban Freight Initiative



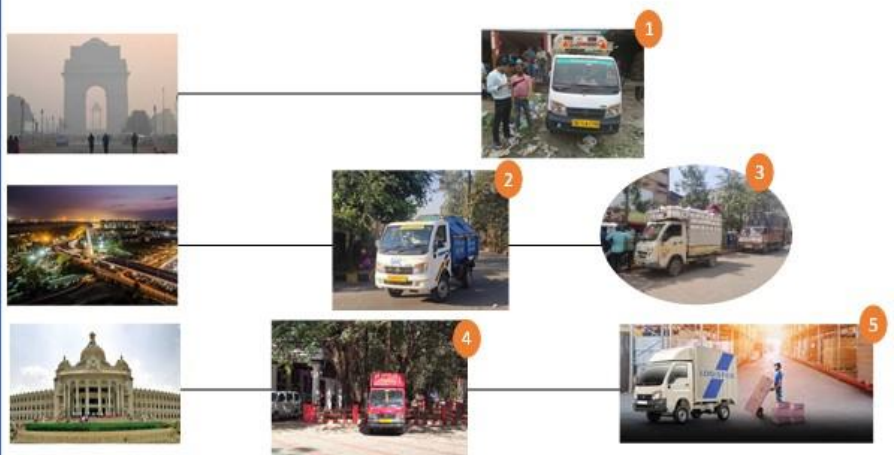
Creating Innovative Solutions for a Sustainable Future

April 2021

## E-Urban Freight Study

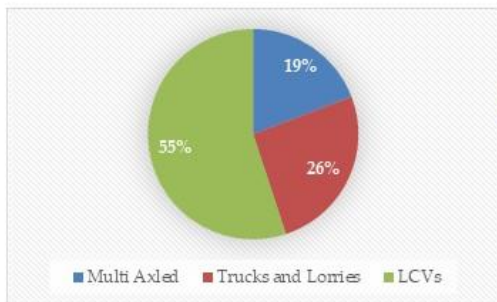


*Aim: Techno-economic potential of EVs in various urban freight applications*



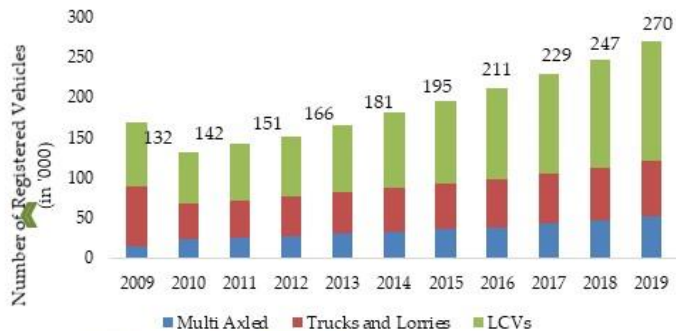
Creating Innovative Solutions for a Sustainable Future

## Overview of growth of freight vehicles in Bengaluru



- Freight vehicles account for 34% of total CVs in the city
- Amongst the freight vehicles, LCVs have a share of 55%

- The total registered freight vehicles grew at a CAGR of 4.8% between 2009 and 2019
- The LCV grew at a CAGR of 6.5%.

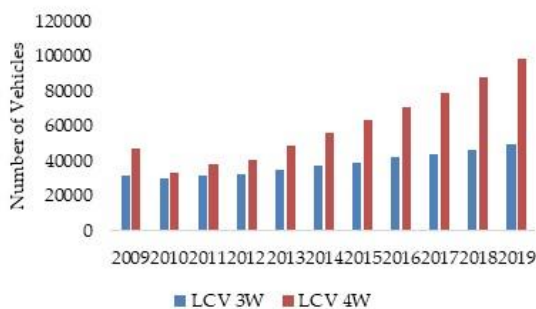


Source: Data from Govt of Karnataka and Road Transport Year Book, MoRTH TERI Analysis (2019)



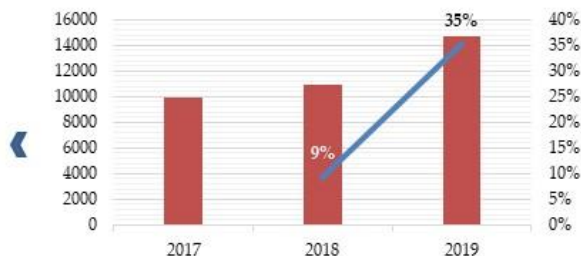
Creating Innovative Solutions for a Sustainable Future

## Overview of growth of freight vehicles in Bengaluru



- Within the LCV segment in Bengaluru the share of 4W is higher than 3W
- The share of 4W increased from 62% in 2015 to 66% in 2019.

- Newly registered LCV increased by 35% from 2018 to 2019 as compared to 9% in previous year.
- Key reasons for this surge: Change in tax regime (GST), increased demand for LCVs/SCVs by the e-commerce segment, and increase in discretionary consumption



Creating Innovative Solutions for a Sustainable Future



# Case Study- Organised Freight movement in Bengaluru

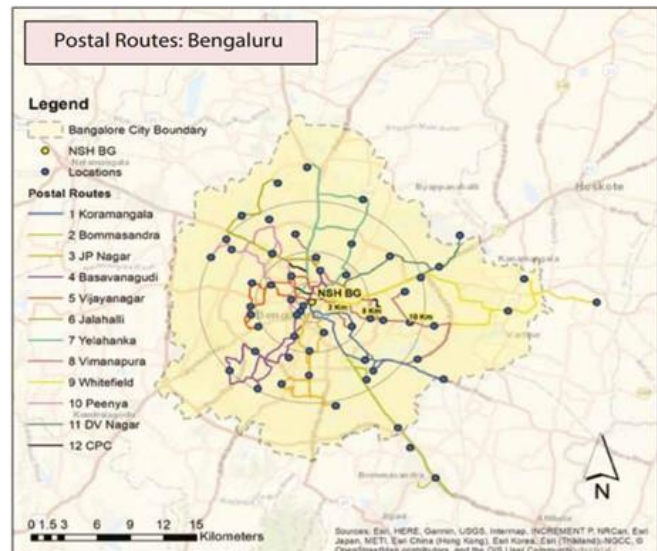
Company	Udaan	LetsTransport	India Post	Porter
Fleet size operational in Bengaluru (<3.5 tonnes)	1,000+	2,900	70	-
Commodity Type	Groceries, FMCG	E-commerce, Groceries, FMCG	Parcels	All types of commercial operations
Clientele	B2B	B2B	B2B	B2B and B2C
Vehicle Types	Tata Ace, Tata 407 and Bolero	TATA Ace, TATA 407, Xenon Yodha	Mini Trucks	Tata Ace, Tata 407 and pick-up truck
Outsourced Component	Vehicle and drivers (on contract)	3PL	Vehicle and drivers (on contract)	-
Fuel Type	Diesel and CNG	Diesel and CNG	Diesel and Petrol	-
Electric Vehicles (Pilot)	Electric Rickshaws	Pilot with retrofitted vehicle	Not Done	Not Done
Willingness to Switch	Not very keen	Keen to use	Keen to use	Keen to use



**teri** Creating Innovative Solutions for a Sustainable Future

## Key inferences from India Post case Study

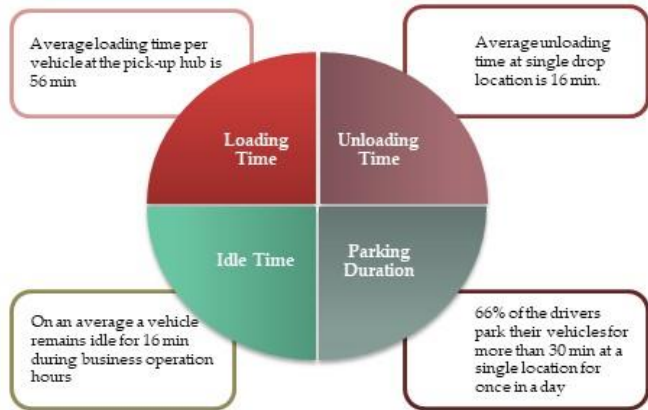
Parameter	Details	Postal Services
<b>Bengaluru</b>		
Ownership	% of vehicles owned by drivers themselves	0%
Vehicle Type	3w	-
	4w	100%
Energy	Major fuel used	Diesel
Fleet Emission Characteristics	% of BS-IV vehicles	NA
Utilisation	Average distance per day (km)	68-136
	Average payload carried (kg)	500



**teri** Creating Innovative Solutions for a Sustainable Future

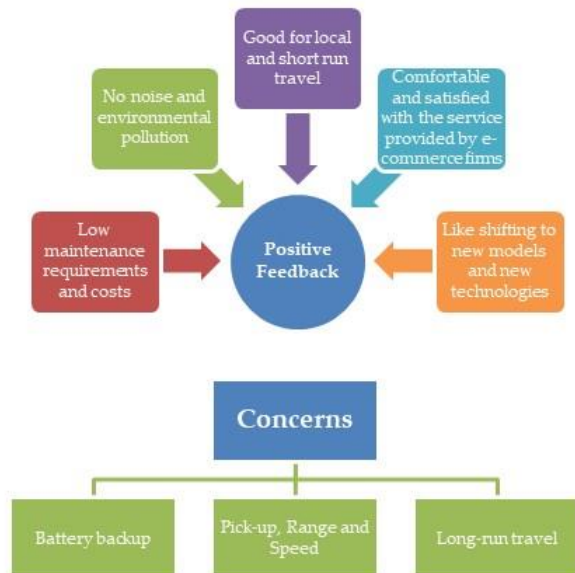
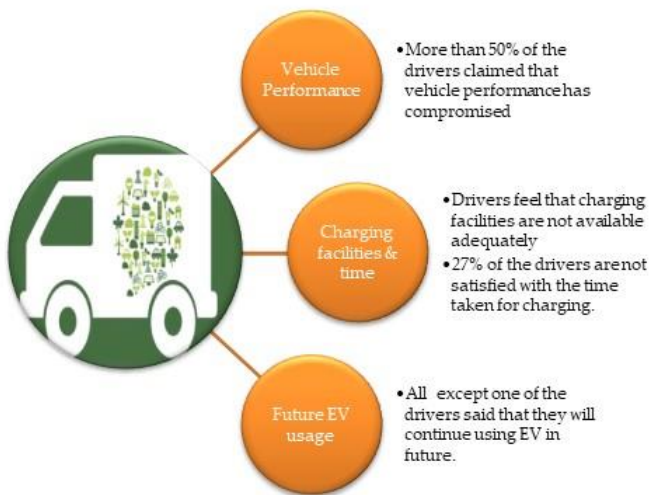
# Key inferences from *Lets Transport* Case Study

Parameter	Details	E-Commerce, Groceries, FMCG
<b>Bengaluru</b>		
Ownership	% of vehicles owned by drivers themselves	74%
Vehicle Type	3w	10%
	4w	90%
Energy	Major fuel used	Diesel
Fleet Emission Characteristics	% of BS-IV vehicles	39%
Utilisation	Average distance per day (km)	71
	Average payload carried (kg)	702



Creating Innovative Solutions for a Sustainable Future

# Key inferences from EV driver survey



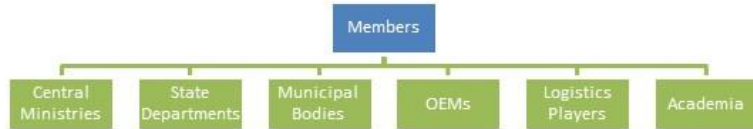
Creating Innovative Solutions for a Sustainable Future

# Sustainable Urban Freight Coalition

Aim: A guidance facility for **Cost and Emission Reduction** from Urban Freight in India



Sustainable Urban  
Freight Coalition



## Activities in Phase-I



Creating Innovative  
Solutions for a  
Sustainable Future

## Thank you



Creating Innovative  
Solutions for a  
Sustainable Future