SUSTAINABLE URBAN FREIGHT INITIATIVE
A COLLABORATIVE APPROACH
Decarbonizing Urban Freight in Surat and Bengaluru
Annexures
Sustainable Urban Freight Initiative: A Collaborative Approach

Decarbonizing Urban Freight in Surat and Bengaluru

Annexures
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ANNEXURE

Annexure-I Letter from SMC to TERI for sourcing tentative EV quotations

E. H. PATHAN
Executive Engineer (Solid Waste Management)
Surat Municipal Corporation

To,
Mr. Sanjay Seth,
Senior Director,
The Energy and Resources Institute
Darbari Seth Block, IHC Complex, Lodhi Road,
New Delhi, Delhi 110003

Subject: Request to source quotation from Electric Vehicle Manufacturers

Dear Sir,

Surat Municipal Corporation envisions to transition its fleet of over 800 vehicles deployed in Solid Waste Collection into electric. As the first step towards this transition, the Solid Waste Department intends to initiate a EV pilot in one zone to replace collection of waste from street sweeping and litter bins currently undertaken by various type of vehicles. Presently, they carry around 800-1500 kgs of street sweeping and litter bin waste per trip and cover a total distance 20-25 km in a day.

We understand that these operations can be replaced by different types of Electric Vehicles. For the same, before coming out with a tender in due procedure, we request TERI to source quotations from maximum number of Electric Vehicle manufacturers across three-wheeler, four-wheeler, as well as medium/heavy vehicle segments. The manufacturers must give quotations for electric vehicles required to replace current operations of vehicles deployed for collecting waste from street sweeping and litter bins. The vehicles must have closed body but do not need separate compartments for dry and wet waste. The basic requirements for this application are enclosed.

Based on this information, we request TERI to prepare adequate Terms of Reference and source quotations from electric vehicle manufacturers for replacing the specific waste collection operation discussed here. Subsequently, SMC will prepare official tender document and publish the same for competitive bidding after approval of competent authority of SMC.

Thank you,

Executive Engineer
Solid Waste Department
Surat Municipal Corporation
Annexure-II Workshop Proceedings

Workshop on Electrification of Solid Waste Collection in Surat

Workshop Proceedings on electrification of Solid Waste Collection in Surat
25th November 2020

SUSTAINABLE URBAN FREIGHT INITIATIVE
A COLLABORATIVE APPROACH
INTRODUCTION

BACKGROUND

SUSTAINABLE URBAN FREIGHT INITIATIVE

This Workshop is a part of TERI’s Sustainable Urban Freight Initiative aimed at creating local and national support structures for cost and emission reduction from Urban Freight in India. With this aim, TERI is forming 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) Group aims to share, create and disseminate knowledge to facilitate interventions to reduce emissions and costs from urban freight activities in India. The SUF Group 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.

One of the first targets of the SUF Group is to facilitate EV pilots in Surat city. For the same, Surat Municipal Corporation and TERI are organising a series of workshops focussed on electrifying specific use-cases of urban freight in Surat. The first targeted use-case is Municipal Solid Waste Collection.

WORKSHOP OBJECTIVES

This workshop was organised by TERI and Surat Municipal Corporation on 25th November, 2020 with a specific objective to

❖ Facilitate Electrification of Municipal Solid Waste Collection in Surat

The workshop aimed to bring together private and public stakeholders of solid waste collection in Surat and manufacturers of EVs to discuss introduction of Electric vehicles in Solid Waste Management (SWM). The sub-objectives of the workshop were:

❖ Discuss potential of EVs in Surat SWM
❖ Understand requirement of SMC for EV pilot in SWM
❖ Understand OEMs feedback on availability and ability of EVs for SWM in Surat City
Sustainable Urban Freight Initiative: A Collaborative Approach

AGENDA AND PARTICIPANTS

AGENDA

The workshop was held on 25th November 2020 from 1130 to 1330 hours using Google Meet Platform. Broadly, the agenda constituted of discussions on the following sections:

- Current SWM operations in Surat and EV potential of the same
- Availability and ability of EVs to be applied in Solid Waste Collection
- Experience of applying EVs in SWM activities elsewhere in India
- SMCs vision of de-carbonising solid waste collection in Surat
- Way forward for EV pilot in Surat’s SWM

PARTICIPANTS

The workshop involved participants representing Surat Municipal Corporation, various Original Equipment Manufacturers (OEMs) and TERI.

- Surat Municipal Corporation
  - Mr. Ellyashkan Pathan, Executive Director, SWM Department
  - Mr. Jwalant Naik, Solid Waste Manager
  - Mr. Harshul Parekh, SWM Policy Consultant
  - Mr. Kamlesh Vagnik, Chief Resilience Officer

- Original Equipment Manufacturers (OEMs)
  - Ashok Leyland Ltd.
  - Tata Motors Ltd.
  - Volvo Eicher Commercial Vehicles Ltd.
  - Kalinga Ventures Private Ltd. (Vidhyut EVs)
  - Mahindra and Mahindra Ltd.
  - Piaggio Vehicles Private Ltd.
  - Gayam Motor Works

- TERI
  - JV Rao, Senior Visiting Fellow
  - Sharif Qamar, Associate Fellow and Area Convenor
  - Aravind Harikumar, Research Associate
WELCOME REMARKS AND SETTING THE CONTEXT
(By Mr. Kamlesh Yagnik, Climate Action Expert, IUC India & Chief Resilience Officer, Surat)

As a long-standing advocate of climate action in Surat, Mr. Kamlesh Yagnik emphasised the need for technological transition in Surat’s transportation sector. He assured the eagerness of Surat’s Government, Industry and Civil Society for interventions for sustainable growth. While looking forward to EV pilots in various vehicle applications and a subsequent EV policy for Surat, Mr. Yagnik highlighted the essential five factors to be considered for clean transport technology transition: costs, necessary infrastructure, performance of EVs (range and payload), wider choice of EVs and policy support.

EV POTENTIAL OF SWM IN SURAT
(Presentation by TERI based on past research)

Based on TERI’s previous research study, State of SWM in Surat and EV potential of the same were presented. With the presentation (attached in the Annexure-II), TERI highlighted the potential in electrifying the primary door-to-door waste collection in Surat. This is being carried out currently with about 490 Small Commercial Vehicles (SCVs). These vehicles on average cover 39-53 kms per day in about 3 trips on fixed/planned routes. Almost all the vehicles operate on diesel carry about 800 kgs on a typical trip. The low fuel efficiency of these vehicles, their fixed/planned routes, ease of setting up charging solutions and the influence of SMC in the same were cited as the reasons for high potential of EV application in this segment.

Why Electrify Solid Waste Collection?

- **High Emissions**
  - Mostly Diesel Vehicles
  - Low Fuel Efficiency
  - Increasing waste generation

- **High Costs**
  - High Fuel Costs
  - High Maintenance Costs
  - Low vehicle life

- **High Potential for EV application**
  - Fixed Routes
  - Fixed Origins and Destinations
  - Fleet level ownership
  - Scalable pan-india
  - ULB is a stakeholder
SMC’s Vision for Electrifying SwM in Surat

SMC expressed clear intent in transitioning their existing municipal waste collection to electric. The Solid Waste Management department at SMC would lead this with both investment and policy regulation. SMC expressed interest for an initial pilot of 70-80 electric vehicles with an average payload of 800-1000 kgs. Based on successful pilot study, SMC envisions to deploy 800-1000 vehicles by 2022. Initially, the vehicles for street sweeping and litter bins can be converted to EVs. For the door to door collection vehicles, three aspects need to be considered

- slow speed,
- frequent stops and
- tipping arrangement

The representatives from SMC expressed concerns regarding payload of EVs, the effect of overloading on their performance and also ability of loaded EVs to operate in gradient at the waste transfer stations. The transfer station is 6 meters above the ground with a 7% slope. Therefore, the vehicle should be able to travel at said inclination carrying a load of 1000 kgs. Also, the vehicle for primary door to door collection should be able to manoeuvre through small streets. SMC requested OEMs present in the workshop to clearly express their interest in such in EV pilot deployment, availability of the EVs and their ability to effectively reduce economic costs of municipal solid waste management in Surat.

SMC indicated that the method of procurement is not finalised. However, it can be done in 3 ways:

- SMC will purchase the vehicles and hand over the vehicles to operators under a contract
- Contractor will purchase, operate and maintain the vehicles under contract with SMC
- SMC and operator will purchase the vehicles together under a contract

OEM’s Feedback for Electrifying SwM in Surat

(Presentation by respective OEMs)

The OEMs were invited one by one to introduce / share updates on their products and to inform the group on their preparedness towards SwM and deployment of EVs in the SwM sector.

Ashok Leyland Limited (ALL)

Ashok Leyland expressed their experience in electric bus segment and indicated that new vehicle models may need to be developed for SwM application. ALL requested exact design requirements for the application and suggested planning of a pilot project in a specific zone with fixed routes and distances. During the discussion round, ALL indicated a timeline of 9-12 months for deploying EVs after receiving requirements from SMC.

Tata Motors Limited (TML)

TML clearly expressed their keen interest in EV pilot deployment in Surat SwM. TML indicated their pioneering work in India’s EV segment and market leadership in commercial segment (including SwM applications). TML indicated the potential of integrating the current market leader TATA Ace’s electric version into SwM applications. TML also requested some more inputs from SMC like range, payload, overload margin, type of charger, type of application etc. Regarding EV product they are in the preliminary stage and need inputs from SMC but their product platform is completely ready. They are willing to work on priority basis for EV where they need to focus on fine tuning of certain aspects. However, TML would like to know what the future roadmap is and highlight the need to focus on the
ecosystem being developed around the vehicles which includes the type of charging, parking lots, depots, time schedule, etc.

**Volvo Eicher Commercial Vehicles Limited (VECV)**

VECV expressed that their product will need customization based on application. Indicating their upcoming 2 Tonne load EV, VECV sought clarity on potential need for higher load vehicles for EV pilot. Also, VECV requested clarity on what the limitations are, the mode of communication with the SMC, the timeline we are looking at, procedure for buying process. VECV commented that we should not try to fit an EV in the current operation to replace current ICE vehicle. Instead, we should alter the current operation based on the type of EV and its specifications. That is, to focus on optimising transportation with EVs rather than replacing ICE vehicles with EVs.

**Mahindra and Mahindra Limited (M&M)**

M&M clearly expressed their interest for EV pilot in Surat’s SWM application. M&M presented the potential of their newly launched electric TREO-Zor (three-wheeler cargo) Model in the same application. While describing the potential of the new EV, M&M highlighted the environmental and economic benefits from applying Treo Zor in freight applications.

**Vidhnyt EVs**

Vidhnyt EVs clearly expressed their interest in EV pilot in Surat SWM. Based in Rourkela, functioning since 2013 Vidhnyt EVs has a focus on electrical cargo. They have been working with the Municipal Corporations of Chhattisgarh, West Bengal and Jharkhand for various public utility applications. While presenting the potential of their current vehicles in Surat’s SWM application, they also indicated that they can help deploy charging infrastructure although they are not currently doing so.

**Piaggio Vehicles Private Limited**

Piaggio clearly expressed their interest in EV pilot deployment in Surat’s SWM application. Piaggio expressed the potential of their upcoming cargo three wheeler’s potential for the same. During the discussion round, Piaggio requested SMC to keep the tender open to proposals from both three wheeler and four wheeler EVs.

**Experience Sharing of EVs in SWM Applications**

**Presentation by Gayam Motor Works (GMW)**

GMW’s Chief Operating Officer presented their experience in deploying EVs for SWM for multiple Municipal Corporations in Telangana and Andhra Pradesh. These also include deployment in capital cities of Hyderabad and Vijayawada. Vehicles with a payload of 600 kgs were deployed in Hyderabad. Based on their experience, certain challenges were highlighted by GMW.

**Challenges indicated in SWM applications:**

- **Overloading:** Vehicle capacity in 600 kg but were always overloaded to up to 1100 to 1200 kg. Although the vehicle could bear the heavy load, load sensors were included to avoid overloading (Municipal Corporation of Vijayawada)
- **Tracking Usage:** There was no control over accessibility or no track of inventory of these vehicles. To overcome this, an integrated dashboard to track vehicles was suggested. The
dashboard includes enabling immobilizations and dealing with rough handling, over speeding, etc. Each vehicle could be tracked.

- **Gradient:** In cities like Tirupati and Vishakhapatnam, a lot of streets going uphill (terrain) was a challenge.

- **Training Drivers:** Training of drivers is very important for successful operations of EVs in SWM application. Technology interventions can take care of mishandling. GMW has developed a mobile app for the same.

This section of the workshop was intended to improve capacity of SMC as well as the OEMs in deploying EVs in Solid Waste Applications. Even though EVs are being deployed in cargo segments, there are many challenges which are specific to the application.
The workshop aimed at forming partnerships between private and public stakeholders for reducing cost and emissions from Municipal Solid Waste Management. The OEMs were exposed to a potential buyer of their new technology vehicles (SMC), and SMC was exposed to a wide range on EV manufacturers in India. SMC clearly expressed their interest in EV pilot of 70-80 vehicles for SWM in Surat.

Based on inputs received from OEMs and with TERI’s assistance, SMC will release a Request for Proposal (RFP) for pilot deployment of 80 Vehicles in the Central Zone of Surat.

**Pilot Deployment Timeline**

- Dec’20: RFP/Tender by SMC
- Jan’21: Proposal Selection
- March’21: Pilot Deployment

SMC envisions pilot deployment in March 2021. Hence, OEMs will have 1.5 to 2 months to deploy once their proposal is selected and order is placed by SMC. Subsequently, SMC and TERI will monitor and study the deployment. Based on observation of successful economic benefits from deploying EVs, adequate provisions will be made in SMC’s SWM policy to plan transition of entire fleet (800-1000 vehicles) into electric. The provisions in SWM policy will nudge the third-party contractors through incentives and mandates to transition entire waste collection in Surat by 2022.

TERI’s Sustainable Urban Freight Group envisions to use this experience to guide all Urban Local Bodies in India to transition waste collection to electric.
Workshop on Electrification of Textile Supply Chain in Surat

Workshop Proceedings on Electrification of Textile Supply Chain
27th December 2020

SUSTAINABLE URBAN FREIGHT INITIATIVE
A COLLABORATIVE APPROACH
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 forming 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 Coalition aims to share, create and disseminate knowledge to facilitate interventions to reduce emissions and costs from urban freight activities in India. The SUF Group 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.

After the successful workshops with solid waste management department, TERI has chosen Textile Freight operations to work upon as it has the highest share in the urban freight movement of the city.
WORKSHOP OBJECTIVES

The workshop was organized by TERI with the support of Tempo Owner’s Association of Surat on 27th December, 2020 on a virtual platform.

- Facilitate the Electrification of Textile Supply Chain and OWC Companies in Surat

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 discuss the potential of electrification in the identified areas
- To understand the technological requirement of target groups
- To understand the OEM feedback on availability of EVs for specific operation
AGENDA
The workshop was held on 27th December, 2020 from 10:00 to 12:30 hours using the Microsoft Teams platform. Broadly, the agenda constituted of discussions on the following sections:
- Current operations of Textile Supply Chain and their requirements
- Availability of electric vehicles for specific uses by target groups
- Scope of electrification of supply chains of mentioned groups

The agenda of the workshop is attached in the annexure.

PARTICIPANTS
The workshop involved member of Tempo Owners’ Association along with representatives of Textile companies. Representatives from Ashok Leyland, TATA Motors, Volvo Eicher, Mahindra and Piaggio were present to discuss the vehicle availability. Officials from Resilient Surat and TERI’s research team had also joined the discussion.
WELCOME REMARKS
(Mr. Kamlesh Yagnik, CRO)

Mr. Kamlesh Yagnik, Chief Resilience Officer congratulated TERI for initiating transition towards sustainable urban freight systems and also appreciated the decision of Surat Municipal Corporation to switch the government vehicles to cleaner fuels. He appreciated the keen interest Tempo Owners has shown for the electrification of their freight activities.

Mr. Kamlesh showed his positive approach towards electrification and mentioned that the electric vehicles have long life span along with less maintenance; and this initiative by TERI will accelerate the adoption of Electric Vehicle in Surat and lead to a positive change in the society.

PRESENTATION ON POTENTIAL OF EV IN SURAT TEXTILE FREIGHT
(Mr. Aravind Harikumar)

Mr. Aravind Harikumar, research associate from TERI discussed about the nature of Textile fleet in Surat. He showed the potential of electrification of 3W goods vehicles with respect to loading requirement and distance travelled.

TEMPO OWNER’S PERSPECTIVE ON ELECTRIFICATION OF TEXTILE FREIGHT IN SURAT
(Mr Shravan Singh Thakur, President, Small Tempo Owners Association & Mr Sanjay Patil, President, Big Tempo Owners Association)

Giving an overview about the freight operations of Small Tempos in Textile sector, Mr Shravan Thakur mentioned that the small tempos generally carry the wight of around
900-1000 kgs and run the distance of 50-55 km in one trip. The major concern regarding the freight activities is the over-loading issues at times. He also mentioned that the high fuel costs affect their operation adversely.

**Mr Sanjay Patil** shared his concerns about higher loading and longer range of operation. He mentioned that the major concern with adopting EV is the short range of EV and availability of the charging infrastructure.

Both the presidents expressed their positive interest in EV and said that the tempo owners are happy to switch to more sustainable mode of transport if given better range and loading capacity.

Other issues during the discussion session were based on the charging requirement of the vehicle, battery life and issues of breakdown of vehicle.

**RESPONSES OF OEMs FOR EV DEMAND**

- Representatives from Ashok Layland, TATA Motors, Volvo Eicher, Mahindra & Mahindra and Piaggio were present in the workshop to give detailed overview about the electric vehicles and technologies available with them. The OEMs also showed their interest in customizing the EV to meet the specific demands related to loading cart.
- The OEMs also offered the special digital dashboard to track the remaining battery percentage and kilometers associated with them. This feature was largely appreciated by the tempo owners as it would help to deal with the issues related to range anxiety.
- Talking about the issue of over-loading, OEM representative mentioned that the overloading might reduce the range of the vehicle, but they will try to accommodate the loading demand in their existing vehicle models available.
- OEMs also mentioned the fiscal benefits available with respective EV model. They mentioned that along with the lower cost of operation, additional fiscal benefits will significantly lower down the costs related to EV ownership.
WAY FORWARD

The Tempo Owners Associations were positive about the adoption of electric vehicles and asked to arrange the demo and test drive of the mentioned electric vehicles. TERI has asked the OEMs to arrange mentioned vehicles in Surat and will organize the demo and test drive for Bakery owners as well as other interested stakeholders.
Workshop on Electrification of Bakery Supply Chain and OWC Companies in Surat

Workshop Proceedings March, 2021

Workshop Proceedings on Electrification of Bakery Supply-Chain and OWC Companies and Surat

7th March 2021

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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 forming 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 Coalition aims to share, create and disseminate knowledge to facilitate interventions to reduce emissions and costs from urban freight activities in India. The SUF Group 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.

After the successful workshops with solid waste management department and textile industry, the other major potential areas for electrification are Bakery Supply Chain and Organic Waste Management Companies.
WORKSHOP OBJECTIVES

The workshop was organized by TERI with the support of Bakers’ Association of Surat on 7th March, 2021 on a virtual platform.

- Facilitate the Electrification of Bakery Supply Chain and OWC Companies in Surat

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 discuss the potential of electrification in the identified areas
- To understand the technological requirement of target groups
- To understand the OEM feedback on availability of EVs for specific operation
AGENDA AND PARTICIPANTS

AGENDA
The workshop was held on 7th March, 2021 from 10:00 to 12:30 hours using the Microsoft Teams platform. Broadly, the agenda constituted of discussions on the following sections:

- Current operations of Bakery Supply Chain and OWC Companies and their requirements
- Availability of electric vehicles for specific uses by target groups
- Scope of electrification of supply chains of mentioned groups

The agenda of the workshop is attached in the annexure.

PARTICIPANTS
The workshop involved member of Bakers’ Association along with some individual bakers and OWC companies. Representatives from Mahindra, Piaggio and Kinetic Greens were present to discuss the vehicle availability. Officials from Resilient Surat and TERI’s research team had also joined the discussion.
WELCOME REMARKS
(Mr. Kamlesh Yagnik, CRO)

Mr. Kamlesh Yagnik, Chief Resilience Officer congratulated TERI for initiating transition towards sustainable urban freight systems and also appreciated the decision of Surat Municipal Corporation to switch the government vehicles to cleaner fuels. He appreciated the Bakery Association of Surat for always leading the way for social work, awareness and betterment of lives in Surat. He also added that bakery holds a very important position in the society and has a wide spread network, hence electrification of Bakery supply chain will significantly improve the air quality of Surat in upcoming years.

Mr. Kamlesh showed his positive approach towards electrification and mentioned that the electric vehicles have long life span along with less maintenance; and this initiative by TERI will accelerate the adoption of Electric Vehicle in Surat and lead to a positive change in the society.

REMARKS ON LOGISTICS IN SURAT BAKERY INDUSTRY
(Mr Chandresh Patel, Chairman, Surat Bakers’ Association)

Stating their issues with current supply vehicles Mr. Chandresh Patel – Chairman of Bakery Association Surat said that, the pay load of bakery industry is very less and the current available vehicles in the market has higher loading capacity. This leads to higher consumption of fuel and results into high operational cost. Hence, vehicle with less payload capacity will help to save the increased fuel cost. Mr. Chandresh also mentioned the need of refrigerated container for the movement of fresh bakery products. He mentioned that a vehicle runs for around 100 km in a day and takes 10-12 breaks in between.
REMARKS ON LOGISTICS IN SURAT ORGANIC WASTE MANAGEMENT COMPANIES
(Mr Nishak Shah, Owner, Dura Green)

Mr. Nishank Shah from OWC company said that the operating cost of diesel vehicle is 1-1.5 rs/km which is bit high, so they are looking for a vehicle with better fuel efficiency.

Other issues during the discussion session were based on the charging requirement of the vehicle, battery life and issues of breakdown of vehicle.

RESPONSES OF OEMs FOR EV DEMAND

- **Response of OEM: Mahindra**

  Mr. Ganesh Kore from Mahindra talked about the successful journey of 10 years of Electric Vehicles in India, where around 35,000 of electric vehicle units are sold till the date. He introduced the electric 3W TERO Zor with 120 cubic feet capacity as a suitable option for bakery supply chain with running cost of 50 paisa/km. The standard Lithium-Ion battery is used for the vehicle.
  
  Talking about the technical specifications he said that TERO Zor gives the range of 80-85 km on road and takes 3 hours to full charge. In case of higher runs, vehicle can be charged for 1 hour to get additional battery life. The vehicle is fully automated with regenerative breaking.
  
  Mahindra provides the extended warranty upto 5 years. Surat has fully equipped service center to help the maintain and repair the vehicle at the earliest. Mentioning the additional benefits of the vehicle Mr. Ganesh said that the buyer is eligible for the subsidy of 48,000 from Government of Gujarat for buying electric vehicle from Mahindra.
  
  Mr. Ganesh also offered the special NEMO platform for the owners of 3-4 vehicles, where they can track the vehicles, their battery charging, idle time, performance etc. to plan better and more efficient vehicle trips.

- **Response of OEM: Piaggio**

  Mr. Saket Jain from the Piaggio introduced the recently launched most powerful
electric cargo 3Wheeler Ape. He mentioned that the body built is same as the
diesel/CNG cargo and vehicle can be customized to provided insulated container
for bakery products.
The vehicle comes with the 17% gradeability and boost mode to run smoothly on
slopes. The vehicle has the running cost of 49 paisa/km.
Piaggio offers 3 years of warranty of battery with 3 years of free maintenance for
the vehicle. Mr. Saket mentioned Piaggio has applied to subsidize the Ape with
GEDA subsidy from upcoming financial year.

- **Response of OEM: Kinetic**

Mr. Mehboob Ali from Kinetic Green Vehicles introduced the Kinetic Jumbo for
the Bakery supply chain with the capacity of 70 cubic feet. The most unique feature
in this vehicle is the swappable batteries. The driver can change the drained battery
with the charged one while on the fleet to go extra miles.
Mr. Mehboob mentioned that the Kinetic Jumbo is one of the best suitable vehicles
for last mile connectivity and it has provided the services to the government of UP,
Andhra Pradesh and Chennai to fulfill the needs of last mile connectivity with
electric vehicle.

The vehicle is eligible for FAME2 subsidy and Kinetic has applied to
avail GEDA subsidy from Government of Gujarat.

**QUESTION ANSWER SESSION**

The major points discussed in the Q&A session are:
- All the vehicles have electric displays to show the battery percentage, which
  will help to alert the driver to find the charging point before the vehicle
  completely shuts down.
- All the vehicles use normal chargers, which can be plugged at any shop/place
  and charging of 30 minutes provides 25% of battery which would be sufficient
to reach the designated place. They also mentioned that drivers can charge their
vehicles during the lunch time to avail extra run.
- Mr. Saket from Piaggio mentioned that Ape runs 3 km after complete discharge
  and that distance is sufficient to find a charging place. He added that after the
  battery reached 10%, it limits the vehicle speed to 25 km/h to maximize the run.
WAY FORWARD

The Bakery Association was positive about the adoption of electric vehicles and asked to arrange the demo and test drive of the mentioned electric vehicles. TERI has asked the OEMs to arrange mentioned vehicles in Surat and will organize the demo and test drive for Bakery owners as well as other interested stakeholders.
Workshop on Sustainable Urban Freight for Bengaluru

Workshop Proceedings | April, 2021

Sustainable Urban Freight Coalition

Workshop Proceedings on Sustainable Urban Freight for Bengaluru

17th April 2021

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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 27th 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

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*Image 1: Workshop on Sustainable Urban Freight for Bengaluru*
AGENDA
The virtual workshop was held on 27th 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)
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 polices, but will also help to forecast and understand the impact of the policy.

Mr. Dimple 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-wheers 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?
  o 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?
  o 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.
  o 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.
  o 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)
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 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-III Feedback collected from stakeholders who procured EVs

Developing ecosystem of E-vehicle in the Surat city focusing on Urban Freight

<table>
<thead>
<tr>
<th>Name of the Respondent:</th>
<th>Manish Gadhani</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Number:</td>
<td>9166231552</td>
</tr>
<tr>
<td>Bakery Name:</td>
<td>Textile</td>
</tr>
</tbody>
</table>

1. How many EVs were purchased? Mention vehicle model
   Ans: 10

2. How many ICE vehicles did these replace?
   Ans: 0

3. What were the vehicle models?
   Ans: City life Heavy capacity

4. What is a typical trip for the vehicle? (For example, factory to shop, or shop to distribution, etc.)
   Ans: Shop to distribution

5. What is the average load carried per trip? (In Kgs)
   Ans: 500 kg

6. How many trips are made in a day?
   Ans: 6 to 7

7. What is the total distance travelled per day per vehicle?
   Ans: 80 km

8. Where will you charge the new electric vehicles?
   Ans: At shop or At home

9. What is the max load capacity of the electric vehicle?
   Ans: 1000 Kg or 550 Kg

10. Will the electric vehicle be used for any other purposes?
    Ans: No

11. Are you aware of the effects of overloading on EV performance?
    Ans: Yes

12. Why did you not purchase higher-performing EVs like Piaggio, Mahindra, etc.?
    Ans: Best performance veh. City life
Developing ecosystem of E-vehicle in the Surat city focusing on Urban Freight

Name of the Respondent: Jaysukhbhai
Contact Number: 99099-22840
Bakery Name: Vapiya - Rasuam - lace (Textile Market)

1. How many EVs were purchased? Mention vehicle model
   Ans: 2

2. How many ICE vehicles did these replace?
   Ans: 8

3. What were the vehicle models?
   Ans: City Life High Capacity

4. What is a typical trip for the vehicle? (For example, factory to shop, or shop to distribution, etc.)
   Ans: Shop to distribution.

5. What is the average load carried per trip? (in Kgs)
   Ans: 60-80 Kgs.

6. How many trips are made in a day?
   Ans: 4 to 5 trips

7. What is the total distance travelled per day per vehicle?
   Ans: 90 to 100 km by scooter vehicle / 120-130 km by heavy vehicle

8. Where will you charge the new electric vehicles?
   Ans: At shop

9. What is the max load capacity of the electric vehicle?
   Ans: 1050 Kg

10. Will the electric vehicle be used for any other purposes?
    Ans: Bins transport, cartoon delivery

11. Are you aware of the effects of overloading on EV performance?
    Ans: Yes

12. Why did you not purchase higher-performing EVs like Piaggio, Mahindra, etc.?
    Ans: City Life vehicle is used for delivery so Scion to maintain
Developing ecosystem of E-vehicle in the Surat city focusing on Urban Freight

<table>
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<tr>
<th>Name of the Respondent:</th>
<th>Chand bhai</th>
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<tbody>
<tr>
<td>Contact Number:</td>
<td>9998334271</td>
</tr>
<tr>
<td>Bakery Name:</td>
<td>National sales</td>
</tr>
</tbody>
</table>

1. How many EVs were purchased? Mention vehicle model
   Ans: 1 city life

2. How many ICE vehicles did these replace?
   Ans: New vehicle, 1st vehicle

3. What were the vehicle models?
   Ans: EV, comm. rickshaw

4. What is a typical trip for the vehicle? (For example, factory to shop, or shop to distribution, etc.)
   Ans: Coldown to shop

5. What is the average load carried per trip? (in Kgs)
   Ans: 600 kg

6. How many trips are made in a day?
   Ans: 2

7. What is the total distance travelled per day per vehicle?
   Ans: 60 to 70 km

8. Where will you charge the new electric vehicles?
   Ans: At godown or home

9. What is the max load capacity of the electric vehicle?
   Ans: 850 kg

10. Will the electric vehicle be used for any other purposes?
    Ans: No

11. Are you aware of the effects of overloading on EV performance?
    Ans: Yes

12. Why did you not purchase higher-performing EVs like Piaggio, Mahindra, etc.?
    Ans: Not suitable for our business (specification to quality issue)
Developing ecosystem of E-vehicle in the Surat city focusing on Urban Freight

<table>
<thead>
<tr>
<th>Name of the Respondent:</th>
<th>Kamal Bhai</th>
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<tr>
<td>Contact Number:</td>
<td>90331538315</td>
</tr>
<tr>
<td>Bakery Name:</td>
<td>Royal Timber</td>
</tr>
</tbody>
</table>

1. How many EVs were purchased? Mention vehicle model
   Ans: 2 - City life (Heavy Capacity)

2. How many ICE vehicles did these replace?
   Ans: 2

3. What were the vehicle models?
   Ans: City life - Heavy capacity

4. What is a typical trip for the vehicle? (For example, factory to shop, or shop to distribution, etc.)
   Ans: Shop to distribution

5. What is the average load carried per trip? (in Kgs)
   Ans: 600 kg to 700 Kgs

6. How many trips are made in a day?
   Ans: Max. 3

7. What is the total distance travelled per day per vehicle?
   Ans: 90 to 100 Kms

8. Where will you charge the new electric vehicles?
   Ans: At shop or at home

9. What is the max load capacity of the electric vehicle?
   Ans: 550 Kgs

10. Will the electric vehicle be used for any other purposes?
    Ans: No

11. Are you aware of the effects of overloading on EV performance?
    Ans: Yes

12. Why did you not purchase higher-performing EVs like Piaggio, Mahindra, etc.?
    Ans: Quality of city life vehicle is better than Piaggio and Mahindra.
Developing ecosystem of E-vehicle in the Surat city focusing on Urban Freight

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<th>Name of the Respondent:</th>
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<tr>
<td>Contact Number:</td>
<td>9033850761</td>
</tr>
<tr>
<td>Bakery Name:</td>
<td>Mode Bakery</td>
</tr>
</tbody>
</table>

1. How many EVs were purchased? Mention vehicle model
   Ans: City Line - heavy capacity - 2 Nos.

2. How many ICE vehicles did these replace?
   Ans: 2

3. What were the vehicle models?
   Ans: City Line - Heavy Capacity

4. What is a typical trip for the vehicle? (For example, factory to shop, or shop to distribution, etc.)
   Ans: Factory to shop to shop to distribution

5. What is the average load carried per trip? (in Kgs)
   Ans: 200 Kgs

6. How many trips are made in a day?
   Ans: 2 to 5 trips

7. What is the total distance travelled per day per vehicle?
   Ans: 80 to 90 km

8. Where will you charge the new electric vehicles?
   Ans: At shop only

9. What is the max load capacity of the electric vehicle?
   Ans: 852 Kgs

10. Will the electric vehicle be used for any other purposes?
    Ans: No

11. Are you aware of the effects of overloading on EV performance?
    Ans: Yes

12. Why did you not purchase higher-performing EVs like Faggio, Mahindra, etc.?
    Ans: City Line vehicle is user friendly
Memorandum of Understanding (MoU)

BETWEEN

“The Energy and Resources Institute (TERI)”

and

“The Directorate of Urban Land Transport (DULT)”

This Memorandum of Understanding hereinafter referred to as MoU is made and entered into at Bengaluru on the 30th day of June 2021.

BETWEEN

The Energy and Resources Institute (TERI), headquartered in Darbari Seth Block, IHC Complex, Lodi Road, New Delhi 110003 (hereinafter called “TERI” which expression shall where the context so admits include its successors and permitted assigns) of one part.

AND

The Directorate of Urban Land Transport (DULT), having its registered office at BMTC TTMC ‘B’ Block (above bus stand), 4th Floor, Shanthinagar, KH Road, Bengaluru, Karnataka 560027 (hereinafter called “DULT” which expression shall where the context so admits includes its successors and permitted assigns) of the other part.

Whereby TERI and DULT shall hereafter be referred to jointly as the “Parties”

(A) INTRODUCTION:

1. DULT was set up in 2007 by the Government of Karnataka (GoK) under the Urban Development Department (UDD) with the objective to coordinate planning and implementation of Urban Transport projects and programs. The Directorate is in general responsible for overseeing all the urban land transport initiatives in Urban/ Local Planning Areas of Karnataka and administers the State Urban Transport Fund (SUTF). Since its inception, DULT’s focus has been on promoting sustainable mobility in urban areas in the State. DULT has played a seminal role in the preparation of mobility plans for key cities in the State; planning, financing and facilitating the first BRTS in Karnataka in Hubballi-Dharwad; introduction and/or augmentation of organised city transport in more than twenty cities in the State; first Public bicycle sharing system in Karnataka etc.

2. TERI is a leading think tank dedicated to conducting research for sustainable development of India and abroad. TERI was established in 1974 as an information centre on energy issues and over the years it has evolved into a research institute, whose policy and technology solutions have transformed people’s lives and the environment. TERI’s key focus lies in promoting...
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Clean energy, Environment management, Water management, Sustainable agriculture, Climate resilience, Sustainable habitat, Resource efficiency and Outreach and advocacy.

3. DULT and TERI have entered into a MoU on 19th January 2021 for the purpose of jointly conducting workshops on sustainable urban freight to disseminate best practices and learnings in Urban Freight Management among relevant stakeholders. Accordingly, a workshop was held on 27th April 2021 in Bengaluru. The intent is to expand the scope of cooperation between the two organizations as outlined in the ensuing paragraphs to beyond the scope outlined in the MoU referred to above.

4. TERI is working towards building a Sustainable Urban Freight Coalition (SFC) with the following objectives:
   - Create, compile and disseminate sustainable urban freight related knowledge;
   - Regulate inefficient freight vehicles and encourage clean technology transitions of urban freight;
   - Build capacity of government and private stakeholders for interventions to reduce costs and emissions from urban freight;
   - Facilitate sharing of sustainable urban freight related experiential knowledge to identify, replicate and scale best practices;
   - Facilitate clean technology pilots in varied urban freight applications and facilitate regional and national scaling of successful pilots;
   - Test, promote and scale innovative solutions for decarbonizing urban freight in India; and
   - Facilitate sustainable urban freight policies at local, state and national levels.

5. DULT is a partner organization in the SFC. Both the organizations are interested in collaborating together to further the objectives mentioned above, and to the extent possible, use their individual resources, strengths and capabilities to work in tandem towards creating a robust urban freight ecosystem in Karnataka.

(B) SCOPE OF THE MOU

Now, therefore, in consideration of the premise and mutual covenants hereinafter contained, the parties hereto agree to enter into an overarching Memorandum of Understanding (MoU) with the following broad scope of work:

1. To devise and conduct relevant studies and/or surveys for data acquisition to understand the urban freight landscape in Urban Karnataka, and to put in place a robust model for estimating demand on a periodic basis.
2. To formulate an urban freight policy framework for Karnataka consisting of network strategies, loading or parking strategies, land use zoning, licensing regulations etc. with a focus on use of sustainable systems so as to reduce the impact in terms of congestion or emissions due to urban freight.

3. To develop Comprehensive Urban Freight plans for few important cities in Karnataka based on the policy framework developed as above.

4. To devise and implement clean technology pilots to gather policy, regulatory or implementation insights.

5. To plan and organize capacity building workshops and outreach and awareness activities for promoting sustainable urban freight.

6. Any other activity aligned with the overall objective of achieving sustainable urban freight, as mutually agreed to.

(C) ROLES AND RESPONSIBILITIES

1. DULT and TERI will agree to a project-related distribution of roles and responsibilities.

2. Both the organisations agree to share the primary data collected in the process of implementing activities taken up jointly under this MoU.

3. DULT will facilitate participation of relevant government stakeholders in workshops, activities etc. that require their participation. DULT will also coordinate collection of data from the stakeholders.

4. TERI will bring on board its expertise in conducting clean technology pilots in urban freight, and will also coordinate with relevant experts in the field as and when their advice or guidance is deemed necessary in planning, implementing and monitoring the activities jointly undertaken.

5. All media releases, papers published or digital outputs/releases brought out in connection with activities taken up jointly under this MoU by any of the partners to this MOU, will acknowledge the role of both the organisations, and would carry both logos.

6. A joint working committee will be set up with representation from both the organisations to meet periodically and chalk out a detailed work plan for execution.

7. Both the Parties agree to collaborate and work closely for fulfilment of objectives set in the MoU. The parties will regularly review the progress and commit to put best efforts to achieve the objectives of the MoU.

(D) FINANCIAL ARRANGEMENTS:

1. No financial arrangement is envisaged between the two signing parties at this juncture.

2. As far as it’s feasible, each party may bear the necessary expenditure as required for carrying out its part in activities planned jointly.
3. Any reimbursement or payment of costs of goods or services procured for a jointly executed activity or project, by one party to the other, will be governed by their respective financial rules and regulations and the mutual agreement between the parties prior to procurement of such goods or services.

(F) DURATION: The MoU will be valid for a period of two years from the date of signing of this MoU. It can be extended by mutual consent in writing for two more years or by such period as mutually agreed to.

(F) DISPUTE RESOLUTION: In the likelihood of any dispute arising between the parties in the course of the implementation of the MoU, the matter will be referred for resolution to the Additional Chief Secretary to the Government, Urban Development Department and Director General, TERI (or his/her nominee), and their decision in this regard would be final and binding on both the parties.

IN WITNESS WHEREOF, the parties hereto have executed this MoU on the 30th day of June 2021.

FOR TERI
(Signature and Date)

Senior Director, Sustainable Habitat Division
The Energy and Resources Institute

For DULT
(Signature and Date)

Commissioner and E/o Additional Chief Secretary to the Government
Directorate of Urban Land Transport

V. Manjula, IAS
Commissioner
E/o Additional Chief Secretary to Govt,
Directorate of Urban Land Transport
Urban Development Department