



Ahmedabad
University

Dissemination and Sensitisation Workshop An Inclusive Net-Zero Approach in the Urban Transportation Sector



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Abbreviations

ASI	Avoid-Shift-Improve
BAU	Business as Usual
BRT	Bus Rapid Transit
CCAT	City Climate Transparency Tool
CDRI	Coalition for Disaster Resilient Infrastructure
CMP	Comprehensive Mobility Plan
ERASIE	Enhance-Retain-Avoid-Shift-Improve-Eliminate
GHG	Greenhouse Gas
IITD	Indian Institute of Technology Delhi
IPCC	Intergovernmental Panel on Climate Change
IPT	Intermediate Public Transport
IRC	Indian Road Congress
LCMP	Low Carbon Mobility Plan
LEAP	Low Emission Analysis Platform
MoHUA	Ministry of Housing and Urban Affairs
MTW	Motorised Two-Wheeler
NDC	Nationally Determined Contributions
NIUA	National Institute of Urban Affairs
NMT	Non-Motorised Transport
NZT	Net-Zero Transport
PM E-bus	Pradhan Mantri Electric-Bus Sewa
PPP	Public Private Partnership
ROW	Right of Way
SDGs	Sustainable Development Goals
TAZ	Traffic Analysis Zone
TRIP Centre	Transportation Research and Injury Prevention Centre
UMTA	Unified Metropolitan Transport Authority
UNEP-CCC	United Nations Environment Programme - Copenhagen Climate Centre
UPI	Unified Payment Interface

Inclusive Net-Zero Transport in Cities of Gujarat

The project ‘Inclusive Net-Zero Transport in Cities of Gujarat’ emphasises an inclusive approach for achieving net-zero emissions within the transport sector. The project is a collaborative effort between Ahmedabad University, Indian Institute of Technology (IIT), Delhi, and UNEP Climate Centre Copenhagen (UNEP CCC). The project is funded and supported by UNEP CCC. The project objectives include developing a detailed approach and methodology, studying the existing transport scenario, and proposing a scenario-based net-zero plan for the case city of Rajkot.

The transport sector is a major contributor (15%) (in 2019) of greenhouse gas (GHG) emissions, with road transport alone accounting for 70% of total urban transport emissions. A sustainable and net-zero transport scenario in Indian cities requires a paradigm of enhance-retain-avoid-shift-improve-eliminate framework; that is, enhance mobility of those not experiencing one now, retain current low trip lengths, avoid motorised trips for all, shift to public transport and non-motorised transport, improve technology of motorised vehicles and eliminate the emissions. Additionally, net-zero transport needs to interface with Sustainable Development Goals (SDGs) as highlighted in various Intergovernmental Panel on Climate Change (IPCC) reports. The 1.5 °C Report and Assessment Report Six of the Working Group III indicates that climate change mitigation efforts must aim to achieve the SDGs. Hence, the former must be assessed for their synergies and conflicts with the latter.

The project approach and methodology aim to achieve net-zero urban transport in Indian cities, in the context of mobility-poverty, through a low-carbon transportation system that improves access for underserved populations. The project outlines three scenarios for 2030, 2040, and 2050: Business as Usual (BAU), a Technology Scenario for Net-Zero Emissions, and an Inclusive Net-Zero Emissions Scenario. The 2050 scenario is expected to link with the ‘Viksit Gujarat 2047’ vision, whereas India’s commitment is to achieve net-zero by 2070. Effective implementation of this plan requires the definition of net zero and net-zero transport within the Indian context, developing pathways for inclusive transport solutions, and creating indicators to track progress.

Project Partners:

- School of Arts and Sciences, Ahmedabad University
- Transportation Research and Injury Prevention (TRIP) Centre, Indian Institute of Technology (IIT), Delhi
- United Nations Environment Programme Copenhagen Climate Centre (UNEP CCC)

Professor Darshini Mahadevia (Project Lead), Professor Geetam Tiwari (IIT Delhi), Dr Deepty Jain (Project Coordinator, IIT Delhi), and Ms Saumya Lathia form the core project team placed at Ahmedabad University and IIT Delhi, India. Dr. Talat Munshi and Dr. Subash Dhar are part of the team from UNEP Copenhagen Climate Centre (UNEP CCC), which supports and funds the project. The project is grounded in the city of Rajkot in Gujarat, and is conducted in coordination with Rajkot Municipal Corporation officials.

Day 1



Inaugural session

The inaugural session was joined by Prof. Arvind K. Nema, Deputy Director, IIT Delhi, Prof. Girish Agrawal, Head of TRIP Centre, IIT Delhi, Ms Isha Kalia, Joint Secretary & Mission Director, Ministry of Housing and Urban Affairs (MoHUA), and Dr Debolina Kundu, Director, National Institute of Urban Affaris (NIUA), along with project team members. Welcoming all the participants to the dissemination and sensitisation workshop, Prof. Agrawal presented the TRIP Centre’s vision of reducing the adverse effects of the transport sector. Prof. Arvind K. Nema, Deputy Director, IIT Delhi, emphasised how the project “Inclusive net-zero transport plan for Rajkot” addresses “inclusivity” as the keyword and its alignment with the sustainable development goals and the ‘Viksit Gujarat’ vision.

Professor Tiwari introduced the keynote speakers of the day and reflected on how the methods developed as part of the project can be applied to other Indian cities. She also discussed the shift in focus from low-carbon mobility plans to net-zero goals and how an inclusive net-zero transport plan can help achieve the country's nationally determined contributions (NDCs).

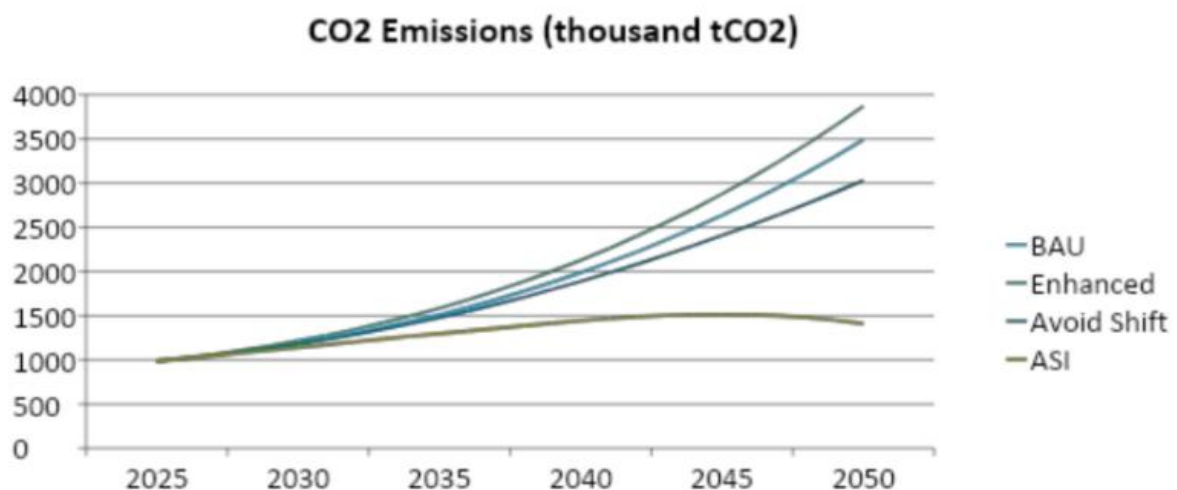


Dr Kundu highlighted how the rapid urbanisation and motorisation are resulting in an increasing contribution of Indian cities to emissions. She noted that the limited public transport systems and unsafe and insufficient non-motorised transport infrastructure in Indian cities



contribute to the increasing GHG emissions. Indian cities need to align climate action plans with strategies such as accessible footpaths and better public transport infrastructure to achieve net-zero targets. She further discussed the ongoing efforts led by NIUA on climate change mitigation and adaptation at the city level, which include developing climate action plans for small-sized Indian cities and the development of the National Urban Learning

Platform used for training over 5,000 Indian cities. She noted the need to reconsider institutional mechanisms for translating national and state-level policies to the city level through training and capacity building. Additionally, she also discussed the need to incorporate urban freight into emissions estimation for preparing comprehensive city-level net-zero transport plans.



In 2019, GHG emissions from the transport sector accounted for 15% of global energy-related CO₂ emissions, with 70% attributed to road transport. The transport emissions in the cities of Gujarat are also gradually increasing. Dr Subhash Dhar discussed how travel demand management and modal shift at the city level can reduce transport-related energy demand by 25% while also helping to achieve co-benefits such as improved health, equity, and



environmental outcomes. He also discussed other allied projects being pursued with funds from the Danish Ministry of Foreign Affairs, such as the Net-zero project for Gujarat, assessing and managing loss and damage in Ahmedabad and Surat, and a project on Nature-Based Solutions (NBS) to mitigate extreme heat and local area flooding in Ahmedabad. With this, he emphasised the need to consider an integrated approach for preparing climate-responsive and net-zero transport plans, which are supported by data and evidence. Dr Dhar presented the results from the LEAP model applied to Rajkot shows that CO₂ emissions can be stabilised at the 2024 level by 2050 through the adoption of the Enhance, Retain, Avoid, Shift, and Improve framework. The remaining CO₂ need to be eliminated from 2050 to 2070 by various sequestration methods.



Professor Darshini Mahadevia, Ahmedabad University, highlighted that the current project builds on a long-standing partnership and advances the Low Carbon Mobility Plan developed for Rajkot a decade ago. She outlined the concept of net-zero transport and its alignment with multiple Sustainable Development Goals (SDGs). The project translates the Gujarat government's initiative "Viksit Gujarat" to the city level. She emphasised that the national-level

net-zero commitment can be achieved by operationalising it at the local level.

Ms Isha Kalia leads the climate vertical at the Ministry of Housing and Urban Affairs (MoHUA). Addressing the workshop, she emphasised the urgent need to scale up efforts to create inclusive, low-carbon, and equitable urban environments. She noted that carbon crediting mechanisms need to be utilised. Projects like e-waste remediation and carbon sequestration can help mobilise climate finance. Many city and state-level pilots are underway, but they must be systematically expanded to generate meaningful impact.

She highlighted key government initiatives, including the PM e-Bus Sewa programme, stressing that scaling up requires not only procurement but also investment in depot systems and charging infrastructure. While a few cities in Punjab have prepared comprehensive mobility plans (CMPs), translating these plans into implementation remains a major gap. She also discussed the role of the 15-minute city, which would need to integrate



land use and transport planning to achieve the objectives of the national urban transport policy. She noted that the current planning approach, which involves fragmented and isolated projects, is insufficient to improve accessibility, safety, and climate resilience.

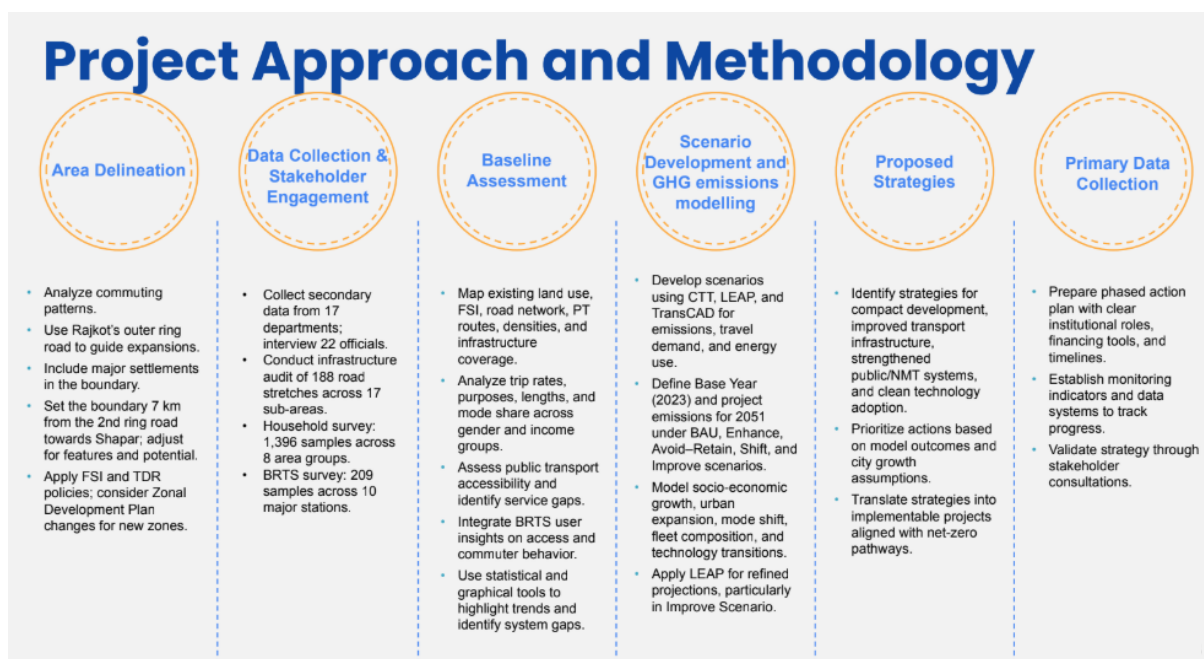
Ms Kalia further emphasised the importance of cohesive, inter-sectoral strategies that improve overall quality of life rather than addressing climate concerns in isolation. Many cities have already developed baseline climate assessments under programmes such as the Smart Cities initiative, offering a foundation for future implementation.

She concluded by acknowledging the ongoing challenges of financing and capacity building, suggesting that private investment, as well as stronger networks among experts, city administrators, and citizens, will be essential. The ministry remains open to collaboration and welcomes actionable insights that can inform and strengthen future national programmes.

Session 1: Need for Net-Zero Transport in Indian cities



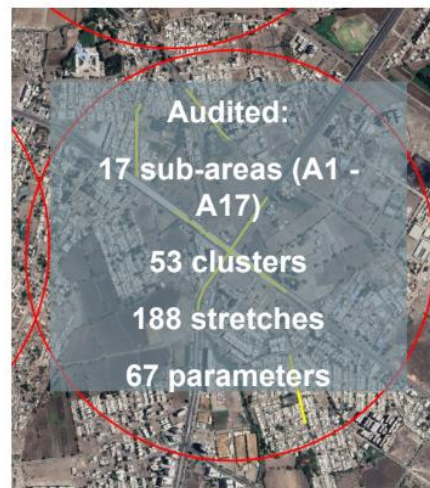
Dr Mahadevia presented India's commitment to achieve Net-Zero by 2070, emphasising that net-zero considers emissions reduction and removal. Discussing the rationale behind selecting Rajkot as the study area for this project, she discussed the existing "Low Carbon Mobility Plan for Rajkot 2040" and the availability of baseline data.



She discussed the methodology used for preparing the net-zero transport plan for Rajkot. This includes developing a comprehensive database using both primary and secondary data sources,

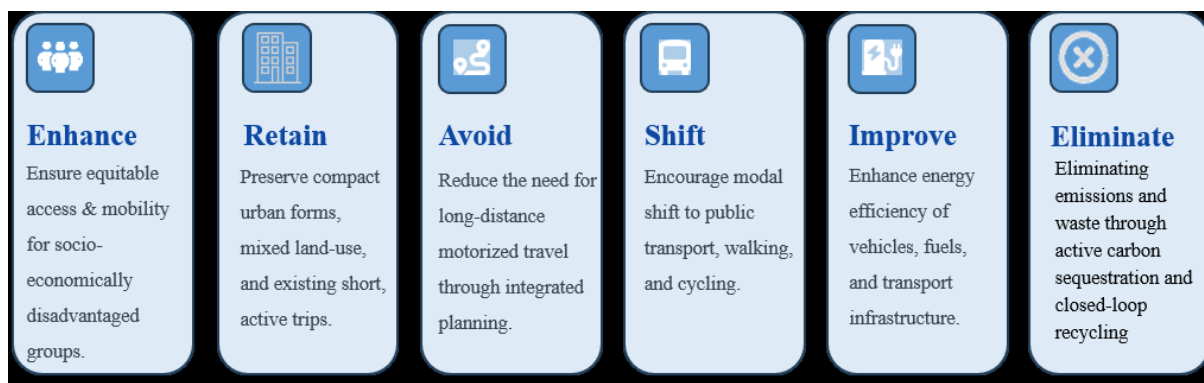
conducting baseline assessments with the data, developing alternative scenarios, estimating emissions, and proposing evidence-based strategies. This project demonstrates a replicable approach for other Indian cities, based on existing models and tools. She emphasised that the proposed modelling framework offers flexibility in policy choices and parameter adjustment, thereby acknowledging the role of local expertise. She concluded by stating that the project has endeavoured to enable cities to prepare net-zero plans for transport in the city and take ownership while reducing reliance on external experts to prepare plans.

Infrastructure Audit | Output



- Cleaned data from spreadsheets and digitized physical forms.
- Corrected errors, including missing or incorrect ward numbers.
- Assigned unique IDs to each audited stretch and mapped data in GIS software.

The project approach consists of six primary steps, including area delineation, data collection, stakeholder engagement, baseline assessment, scenario development and analysis (including GHG emissions modelling), and strategy identification. She further explained the new proposed framework of Enhance-Retain-Avoid-Shift-Improve-Eliminate (ERASIE), which is an advancement over the existing Avoid-Shift-Improve approach, helping to explicitly consider inclusivity and the elimination of leftover emissions to achieve inclusive net-zero targets.



Panel discussion 1

The panel discussion emphasised the importance of integrating gender representation and broader inclusion within transport planning frameworks. It highlighted the increasing participation of women in the workforce and the significant mobility constraints, including those related to safety and access. Safe and reliable mobility has a direct impact on women's choices related to education and employment, often leading them to select opportunities based on safer or shorter travel rather than merit alone. The conversation highlighted how class, gender, and the nature of work intersect in shaping mobility experiences, especially for part-time and care-sector workers whose mobility depends on accessible public spaces and affordable transport. Examples from India's census data were drawn, which show a high share of women relying on walking and public transportation, as well as the control men have over household vehicles. The rising aspirations toward two-wheelers and cars often work against equitable mobility, acting as a barrier.

The panel emphasised that traditional Avoid – Shift – Improve (ASI) strategies are not sufficient, highlighting the need to incorporate Enhance and Retain approaches to protect existing walkable urban forms, strengthen neighbourhood-level public spaces, and sustain socially supportive environments. Despite the policy discourse around net-zero, actual urban decisions still prioritise road expansions and flyovers, which ultimately reproduce congestion and emissions. The discussion highlighted the need to incorporate socio-economic segmentation, recognising that different income groups utilise the city in distinct ways. A few questions were raised related to the project methodology and data collection process. The challenges faced in selecting the size of traffic analysis zones (TAZs) and the type of trips to be considered for data collection were also discussed. It was emphasised that conventional transport modelling exercises generally ignore intra-zonal trips, and using larger-sized TAZs results in high under-reporting of data, particularly for walk trips. Therefore, the data should be collected in accordance with the study's objective and purpose. The session concluded that robust regulatory frameworks and evidence-based mobility data are crucial for building more inclusive and sustainable cities.

Session 2: Understanding the status and challenges in Indian cities: Case study of Rajkot



Prof. Deepty Jain, TRIP Centre, IIT Delhi, presented the proposed net-zero transport indicators for Indian cities, which are based on the existing low-carbon mobility indicators referred to in the Revised Comprehensive Mobility Planning Toolkit adopted by the Ministry of Housing and Urban Affairs. She began the discussion by briefly defining the net-zero transport for Indian cities as –

“A system that encourages low-carbon modes of transport providing safe mobility and accessibility for all, reduces the carbon intensity of the motorised modes and integrates nature-based solutions and circular economy concept to offset waste generation and emissions.”

She further elaborated on the ERASIE framework, the strategies needed to achieve it, and the indicators required to assess the existing status, progress, and evaluate the impact of alternative scenarios. The criteria used for selecting the indicators are relevant to the net-zero target, the transport sector and the city level, are measurable, and data is available or is easy to collect. A list of proposed indicators, along with data sources, was discussed. These indicators were classified into primary, secondary, and tertiary based on what needs to be measured immediately and the indicators that need to evaluate strategies and progress.

Panel discussion 2

The panellists discussed that the measured parameters should be relevant to the study's objectives. Concerns were raised regarding the safety and security indicators, particularly how these dimensions can be measured in a meaningful way. The discussion also highlighted broader challenges related to implementing strategies and user acceptance. Insights from the case study of Panaji illustrated these issues, which is one of the first Indian cities to introduce an automated fare collection system for intra-city buses, offering smart transit cards and UPI-based digital payments. However, nearly 80% of fare revenue continues to be collected in cash, highlighting the persistent gap between technological interventions and actual user acceptance.



Ms Sonal Shah, Urban Catalyst, shared her insights from earlier work in Bihar (Patna, Gaya, and Muzaffarpur), where household travel surveys and mapping of informal public transport (IPT) networks were used to develop plans to improve women's mobility and access. The discussion highlighted the growing international emphasis on the "Enable" component that complements the traditional Avoid – Shift – Improve (ASI) framework. She further emphasised that women's per capita trip rates in Bihar were found to be 30–35% lower than those of men, driven largely by lower workforce participation. When only work trips are considered, women's mobility is significantly underrepresented. Instead, "mobility of care", including for shopping, escorting children, and completing household errands, accounts for 30–45% of women's trips. Women also make up the majority of walk trips and a substantial share of shared IPT trips. These patterns underline the importance of integrating gender perspectives into net-zero transport planning. One of the suggestions was monitoring gender-responsive budgeting by public transport agencies to make the policy inclusive. Participants also recommended clearly distinguishing output indicators from the outcome indicators and emphasised the need for more consistent monitoring of outcomes.

Some of the concerns were related to specific indicators; for example, officials from Chennai highlighted that simply establishing bus stops within 500 meters does not fully capture accessibility, as the frequency of buses also affects accessibility. The recommendations included considering factors like barrier-free footpaths and continuity of walking networks.



Ms Rokovono from UDD, Nagaland, highlighted the challenges of applying standard indicators in hill cities and regions, noting that benchmarks such as minimum footpath widths or the presence of bus stops within 500 meters may not be suitable for such contexts. The team clarified that while the 500-meter distance is a globally accepted indicator, its implementation must take into account terrain, street gradients, and local travel patterns. They noted that indicators need to be adapted to better reflect the unique conditions of hilly and mountainous areas.

Towards the end of the session, it was highlighted that the focus is on inclusive net-zero transport and that technology or emissions alone cannot achieve inclusivity. Public transport does not automatically guarantee lower emissions unless operated efficiently and used at adequate occupancy levels.

How to measure the progress?

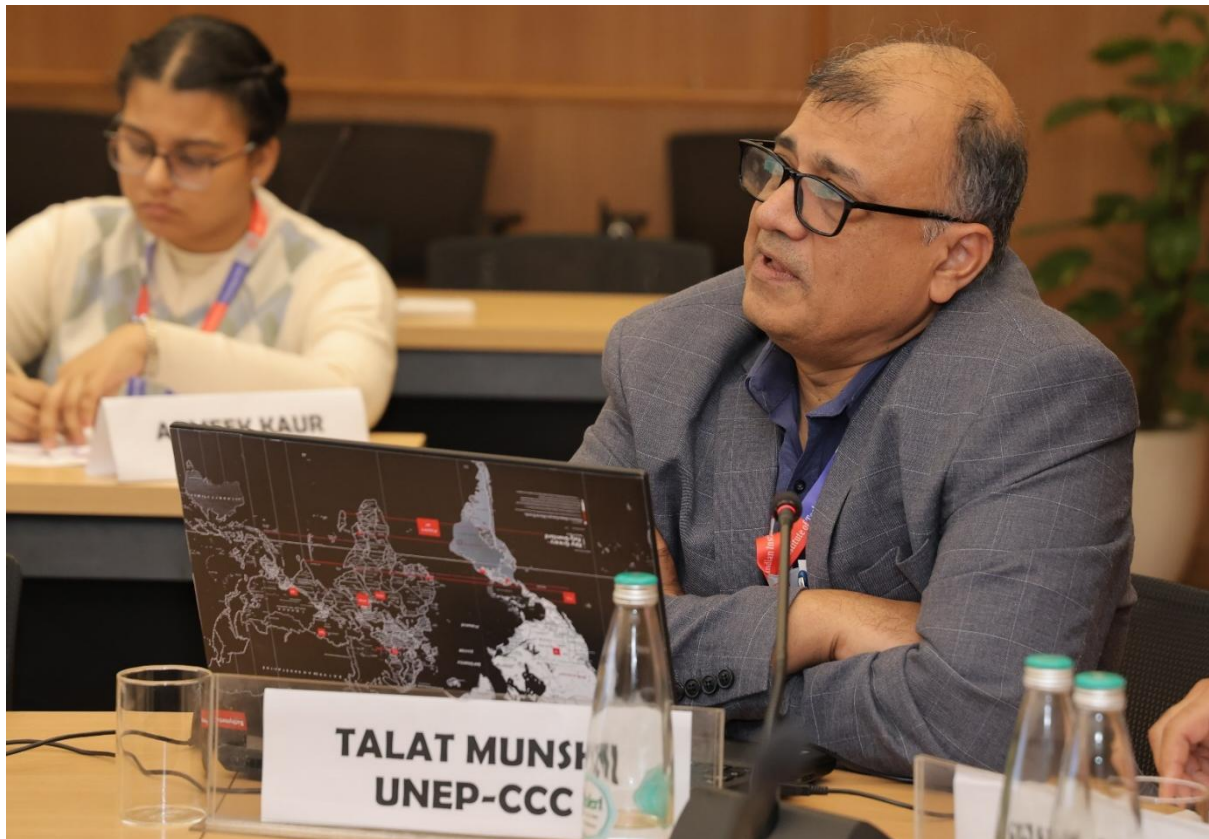
Need to assess both existing status, progress and evaluate impact of alternate scenarios

Indicators are measuring the contents of objectives in terms of:

Quantity	how much?
Quality	how well?
Time	when?
Location	where?

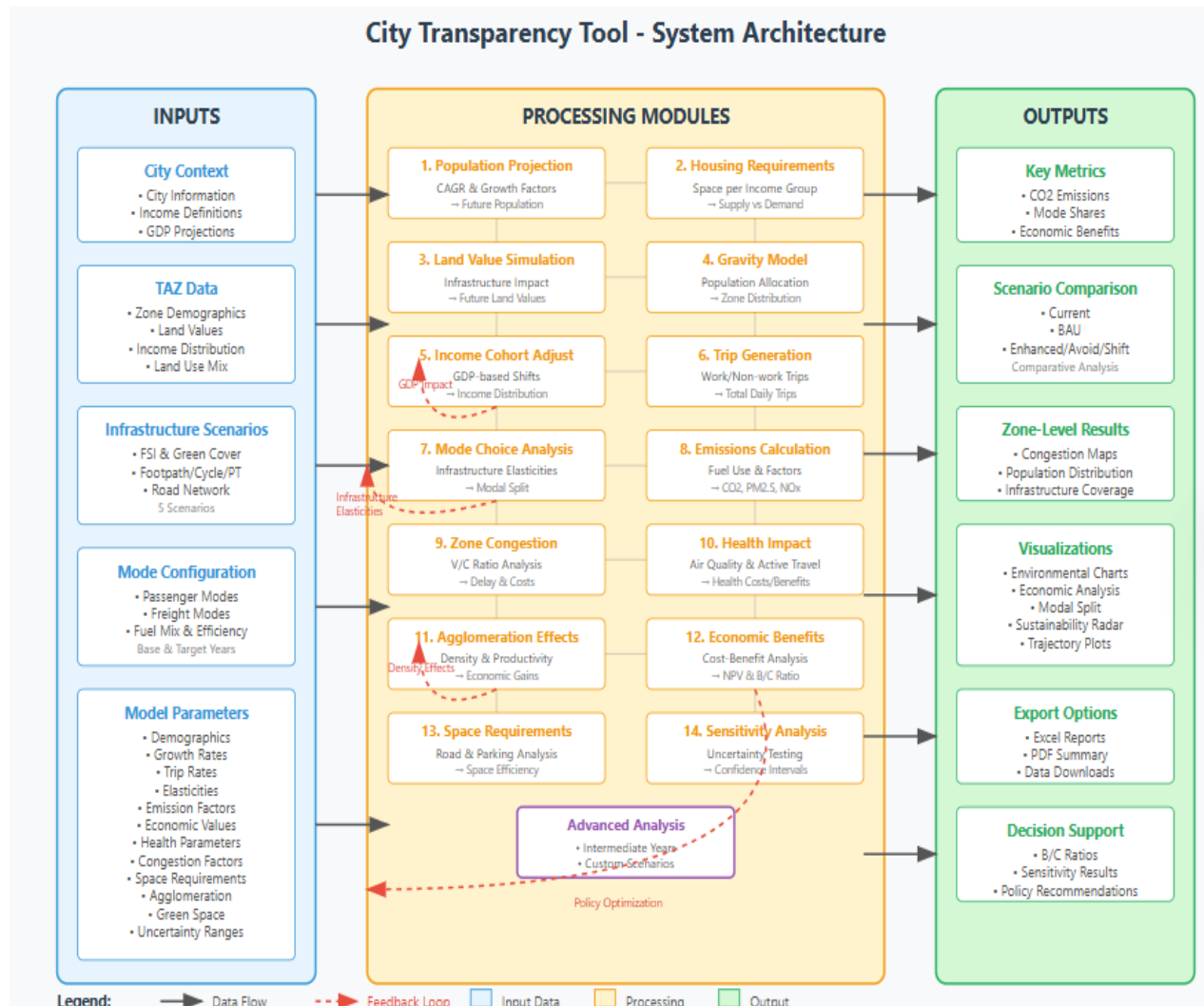
- Indicators tell if an objective is achieved.
- Indicators provide a basis for monitoring and evaluation
- Indicators are used to assess policy options, actions and inactions

Session 3: Potential Strategies to achieve NZ: Learning from Rajkot



Dr Talat Munshi, UNEP-CCC, presented the CCAT (City Climate Transparency Tool) model, which enables local authorities to understand the impact of alternative strategies and identify potential pathways. The CCAT is a UNEP CCC in-house web-based platform. The model integrates an urban development model (handling population, housing, and land-use dynamics) with transport emissions analysis to facilitate evidence-based climate planning. The CCAT model has been applied to Rajkot to identify potential net-zero transport strategies and measure their impact. For this purpose, the Transport Analysis Module used outputs from TransCAD model and related data for infrastructure and mode-choice elasticities. These sensitivities were applied to determine potential mode shifts. The resulting CCAT outputs are subsequently fed as input into the LEAP energy system model to quantify energy demand and emissions (CO₂, NO_x and PM_{2.5}) for various scenarios.

The architecture of the CCAT model is explained in



Dr Talat Munshi discussed the core strategies considered in this project that focused on six pillars representing the key objective of the study. These include – strategies that Enhance mobility, ensuring equitable, safe mobility for underserved and socio-economically disadvantaged groups; Retain includes provisioning infrastructure and ensuring safety to pedestrians, bicycles and public transport users; Avoid includes strategies related to mixed-use development therefore encouraging shorter trip lengths and reducing the travel demand; Shift to public transport, walking and cycling will require incentives, infrastructure development and vehicle restrictions; Improve to bring in technological improvements; and Eliminate the waste and emissions.

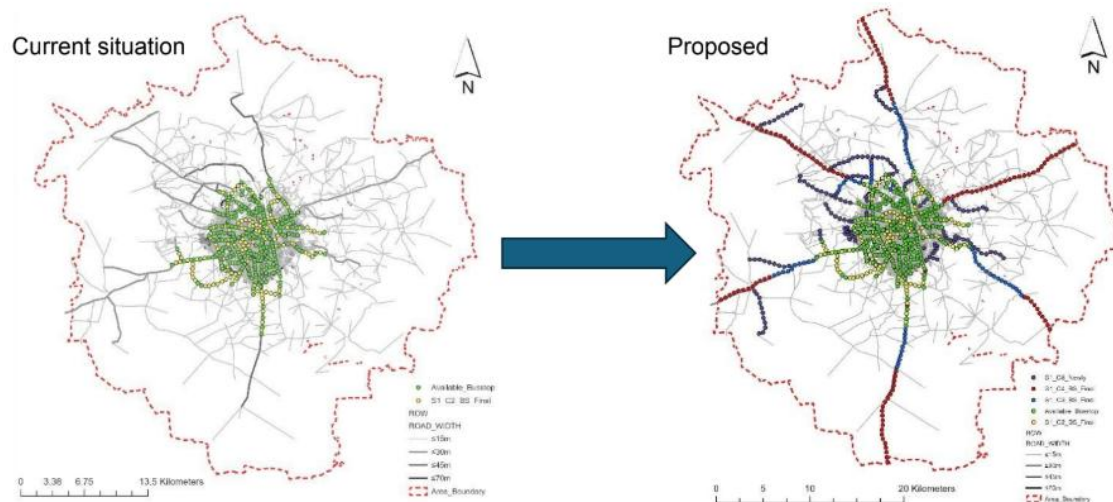


Dr Subhash Dhar discussed outputs from the LEAP (Low Emissions Analysis Platform) model for Rajkot. These estimates are based on the outputs from the CCAT tool that accounts for passenger trips and respective travel behaviour data. The models show a 13% reduction in emissions in the Avoid-Shift scenario and a 60% reduction in the ASI (Avoid-Shift-Improve) scenario. Additionally, the analysis reveals the potential for tree-based carbon sequestration in Rajkot.

Prof. Deepty Jain from the TRIP Centre, IIT Delhi, discussed potential strategies for achieving net-zero transport within the ERASIE framework. She emphasised the key transport-related issues in Rajkot. In the current scenario, the share of bicycles and buses was low, with buses operating at lower frequencies and bus stops being spaced far apart, resulting in longer access and egress times, as well as increased waiting times. She discussed five major alternative scenarios based on walkable infrastructure, bicycle infrastructure, public transport improvement, and integration. Within public improvement, five sub-scenarios were discussed, ranging from reducing bus stop spacing to expanding bus routes and reducing waiting time.

The impact of public transport improvement scenarios was estimated using Transcad. She discussed how expanding public transport routes to all roads with a right-of-way above 18 m and increasing bus frequency shall result in a 27% increase in bus share. Impact of provisioning walk and bicycle infrastructure was estimated using worksheet-based models that account for trip length distributions and modal split in the city. Providing safe and continuous bicycle infrastructure is expected to increase the bicycle share from 4% to 14%. She concluded by stating the need for an integrated approach that can help encourage walking, bicycling, and the use of bus services.

Public transport expansion scenario - Rajkot



Panel discussion 3

The discussion started with the need to break down city-level strategies into area-based development strategies. Such strategies are easier to implement and monitor while resonating with the needs of the users and providing them with direct benefits. Therefore, quantitative data should be collected and observed to understand the change in individual behaviour as per weather conditions, comfort, safety, accessibility and reliability, and further evaluation of the data should be done at the city level.

There is also a need to consider the impact of last-mile services on the share of walking, time, and cost of local services in different areas. The role of three-wheelers and e-rickshaws for elderly and pregnant women should also be examined. Also, implementing the identified strategies and policies, there is a need to establish coordination between different agencies.

Discussion further highlighted the importance of micro-journey details. Critical segments, such as the first 100–500 metres, the quality of waiting areas, the interchange experience, and the reliability of services, strongly influence whether a person shifts to public transport. Comfort, thermal conditions, affordability, and ease of access significantly influence user decisions, more than the infrastructure provision alone. Even where footpaths are shown on maps, many are unusable due to design issues or encroachments, resulting in actual accessibility being far lower than theoretical estimates.

Cities like Chennai also reflected on modelling challenges. Traditional transportation models often underrepresent walk trips. Strategies such as active mobility scenarios require richer datasets to estimate realistic shifts. Freight modelling remains even more complex, requiring simplified yet context-appropriate estimation methods. Standardised, regularly updated data across departments was identified as critical for monitoring indicators and making evidence-based decisions.

Towards the end, a concern was raised that pedestrian trips may actually decline due to rising vehicle ownership, worsening traffic, and inadequate walking environments. Even when

footpaths exist, their usage may be low due to safety issues, encroachment, or general preference for motorised options, suggesting that walking share may shrink rather than grow without major structural reforms. The project team concluded that we need to focus on enhancing the mobility of the underserved community and retaining the existing walk shares to achieve an inclusive net-zero future.

Session 4: Upscaling the NZT approach in Indian cities and cities' role



This session explored challenges and methods needed to scale up the net-zero transport planning to other Indian cities. Officials from Vishakhapatnam highlighted that pollution in the city is driven by transport, industrial, and port activities. To address rising pollution in cities, coordination among planning authorities, municipal bodies, transportation corporations, and law enforcement agencies is necessary. This would also require establishing an agency to centralise the data from multiple sources.

Panellists also discussed the need to build the capacity of existing engineers and planners. The need was also identified to include stakeholder consultations involving citizen groups and the public, and such an approach should involve citizens more than the respondents to the surveys. The public opinion and objections received on the master plans should be treated as valuable feedback rather than hurdles.

The panellists also discussed the co-benefits of well-designed streets. In Gurgaon, a redesigned 1 km stretch now sees over 30,000 daily walking trips, connecting an urban village to an industrial area. Streets with bioswales, shaded walkways, accessibility features, and designated vending zones address issues such as waterlogging, urban heat, and women's safety, while also providing opportunities for livelihoods. State officials are increasingly seeking dust-free, climate-resilient street designs, and many corporations are willing to support these efforts through public-private partnerships. However, in the existing situation, the city engineers lack the capacity to design streets and are often assigned tasks to repair potholes. Scaling requires cohorts of design and planning experts at the state level to support cities in implementing complete street principles.

Concerns related to capacity were also raised for hill cities and regions, where implementing agencies are often understaffed and have limited technical and financial capacity, imposing significant constraints for scaling successful solutions. Capacity building and user awareness across all levels of governance are essential for projects to be understood and accepted.

The state of Gujarat has a dedicated Urban Development Institute that trains government staff at all levels. Trainings are based on real needs and integrated with performance appraisal systems. The state recently converted eight municipalities into municipal corporations, requiring significant training of the existing staff. Gujarat's efforts include a state-level transportation cell that supports cities in preparing proposals for procuring buses under the PM e-bus scheme and planning depots. Workshops, sharing best practices, and viability gap funding help smaller cities adopt and sustain bus services. There is a need for a national-level, multi-departmental data cell and improved dissemination of central government schemes, as many cities remain unaware of the available funding.

The sessions for the first day of the workshop were concluded, and all the participants were thanked for their engagement. The discussions throughout the day covered modelling approaches, data needs, city-specific concerns, the importance of strengthening governance structures and developing measurable indicators to assess enabling conditions for net-zero transport implementation.

Day 2



The second day of the workshop began with a welcome address from Prof. Deepty Jain. Ms Saumya Lathia from the Chief Minister's Fellow in Gujarat introduced the project objectives, approach and methods. She discussed the issues related to urbanisation and the need for climate action plans at the city level, along with the existing policies and strategies that are currently shaping the urban climate action plan in India.

Ms Nandini Sharma and Mr Devender Kumar, TRIPC, IIT Delhi, discussed the key takeaways from Day 1 of the workshop. The recap included the proposed framework and developed tools for preparing a net-zero transport plan, along with key findings from the case study of Rajkot. The presentation also summarised the key points discussed by panellists across various sessions. Key highlights include the need for context-specific, measurable indicators, particularly for hill cities; the requirement for capacity building to scale up the net-zero transport planning approach; and the necessity of integrating last-mile deliveries and freight modelling, as well as expanding the definition of vulnerable groups to include elderly and pregnant commuters.

This day, two roundtable discussions were held focusing on the needed governance model and financial mechanism to support the net-zero transition in the Indian cities.

Round table discussion 1: Need for governance model



The discussion was opened with three core questions-

- What multi-scalar approaches can be implemented to upscale NZT at the urban level?
- What policy reforms are needed to enable net-zero transport in Indian cities?
- What accountability frameworks are needed to ensure progress on cities' net-zero transport commitments?

The official from Visakhapatnam emphasised that cities already have many institutions, and instead of creating new ones, there is a need to establish a city-level task force that meets monthly, similar to council meetings. This task force can be chaired by the District Collector or Commissioner and should include representatives from police, transport, electricity, and energy departments. He also proposed incentivising cities that meet performance parameters and called for a centralised agency for maintaining a data repository. Additionally, he also suggested integrating transport-related data to be collected within the upcoming census.

Ms Poonam Sabikhi from Chennai Urban Metropolitan Authority (CUMTA) explained that although Unified Metropolitan Transport Authorities are proposed, their effectiveness depends on being formed as independent statutory authorities rather than being housed under transport or development departments. By giving the example of Chennai's UMTA, she discussed the role of experts and deputed officers in strengthening coordination between agencies. Further, there is a need to empower UMTAs financially, with project appraisals and budget allocations routed through them to ensure alignment with CMPs and long-term mobility visions. The amended CUMTA act explicitly positions the authority for implementing CMP, coordinating with multiple agencies, facilitating common ticketing, and planning and regulate fundings. Various departments collect data but have limited use cases. A central authority for managing

a common data repository was identified, along with the need to build capacity within government organisations for effective monitoring and planning.



Ms Ruchi Varma, Humanqind, highlighted that committees like district road safety committees often focus narrowly on crashes involving vehicles, not broader mobility or environmental outcomes. Even when action plans are there, they are not implemented. This gap is largely due to a lack of clarity of agency roles, fragmented responsibility, and the absence of service-delivery workflows. In Delhi, school-zone projects showed that community-led, hyper-local models could scale up effectively once proof of concept existed, but this required strong engagement processes and capacity building for decision-makers.

Participants also discussed the challenges associated with heritage cities, where standardised road guidelines cannot be uniformly applied without large-scale demolition. Examples like Chandni Chowk's pedestrianisation project demonstrate that community engagement, particularly with shopkeepers, is essential for successful interventions in congested historic areas requiring context-sensitive approaches rather than implementing rigid standards.

A recurring concern raised during the discussion was the lack of coordination across departments. Even when funding exists in different schemes (e.g., safety, air quality, transport), decision-makers rarely align them. The discussion stressed the need for stronger top-down and bottom-up mechanisms. One of the suggestions was establishing city-level climate cells, headed by municipal leaders with representatives from all relevant departments, including buildings, industries, transportation, waste, water, air quality, and education. This structure would enable strategic thinking and coordinated planning with clear role assignments and interdepartmental communication channels.

Round table discussion 2: Financing mechanism for net zero transport planning and implementation



This discussion primarily focused on the needed financing mechanism for preparing and implementing net-zero transport plans in Indian cities. The panel discussion centred on three critical questions:

- What financing models can incentivise cross-sectoral projects?
- How can existing city and state governments streamline financial mechanisms to support inclusive net-zero transport?
- And how can non-motorised transport infrastructure, such as footpaths and cycling lanes, be adequately funded?

It is known that the cities' financial base is very poor, and they depend on grant funding from the central and state governments for project implementation. Besides, the individual components of each of the large transport project gets funded and hence, the funding that comes through is fragmented, which makes cross-sectoral project funding difficult. Further, there is no specific funding available for Non-Motorised Transport (NMT), and there is a need to think of a mechanism, such as bundling of NMT funding with the funding of mega transport projects, such as metro rail, etc. The discussion further highlighted the need for a structured framework to understand financing needs across different system elements and the categorisation of these requirements into policy and planning preparation, regulatory and enforcement implementation, infrastructure development, and technology deployment.



Dr Abhijit Datey commented on the absence of a standardised definition of what should be considered as a road in the urban context. There is a lack of a universally accepted definition of what constitutes a complete road, leading to situations where roads are constructed without footpaths or cycling infrastructure and still deemed complete. While Indian Roads Congress (IRC) guidelines exist covering various aspects regarding footpaths and bicycles, these are not consistently mandated or implemented. Without standardised definitions enforced through contracts and monitoring, cities repeatedly invest in incomplete infrastructure. He cited the example from Japan where national-level standardisation of street infrastructure helps in creating an industrial ecosystem around common specifications, reducing costs and improving quality.

A recurring theme of severe coordination failures between various government departments was highlighted, with examples from different construction projects cited where repairs were not completed on time. This reflects deeper systemic issues existing in the current governance. Additionally, there is a lack of integrated planning and a failure to view infrastructure holistically.

Community-based financing models were proposed as a mechanism to improve monitoring and implementation quality. Community contributions, even in small percentages towards infrastructure development costs, can ensure rigorous oversight, promoting contractor accountability. This approach has proven effective globally for neighbourhood-level road project development, where community investment dramatically improves implementation quality through community-led monitoring.

The Comprehensive Mobility Plans (CMPs) in India typically include cost estimates but never specify funding sources or funding mechanisms. Without financial backing, plans remain aspirational documents disconnected from the reality of implementation. However, it was noted that master plans serve different functions as long-term vision exercises spanning twenty years, making detailed financial specifications impractical given dynamic conditions. The existing financial capacity of municipal corporations proved to be a critical constraint. Most municipal corporations lack adequate income, with property tax revenues primarily used to cover employee salaries. The remaining funds barely cover the operations and maintenance of existing infrastructure, leaving no capital for new projects. The official from Surat Municipal Corporation highlighted concerns related to the awareness level of different municipal corporations regarding available schemes. Smaller cities often lack information about available funding sources, despite allocated funds being unspent due to implementation requirements not being met.

One of the suggestions by participants was to make non-motorised infrastructure a mandatory component of all capital-intensive projects, including flyovers, road widening, and metro construction, ensuring basic accessibility requirements are met. Area-based contracting approaches, rather than linear road-based projects, were also discussed as a potential solution. Here, contractors are responsible for developing a five-kilometre zone, including street design that conforms to standards, while gaining commercial rights to generate revenue from street assets.

The discussion concluded by recognising extensive new research directions, including transport planning in heritage cities, detailed analysis of procurement and budget approval processes, community financing models, and the fundamental question of project selection criteria.

Annexure

List of participants

S.No	Name	Institutional Affiliation
1.	Abhijit Datey	CDRI
2.	Akanksha Bhardwaj	TRIP Centre, IIT Delhi
3.	Amit Bhatt	International Council on Clean Transportation (ICCT)
4.	Ananya Sinha	National Institute of Urban Affairs (NIUA)
5.	Armeek Kaur	Council on Energy, Environment and Water (CEEW)
6.	C.N. Bodh	UTTIPEC, DDA
7.	Darshini Mahadevia	Ahmedabad University
8.	Debolina Kundu	National Institute of Urban Affairs (NIUA)
9.	Deepty Jain	TRIP Centre, IIT Delhi
10.	Depinder Kapur	National Institute of Urban Affairs (NIUA)
11.	Devender Kumar	TRIP Centre, IIT Delhi
12.	Dharshan Siddharth	Council on Energy, Environment and Water (CEEW)
13.	Dunu Roy	Hazard Centre
14.	Geetam Tiwari	TRIP Centre, IIT Delhi
15.	Girish Agrawal	TRIP Centre, IIT Delhi
16.	Ishika Verma	TRIP Centre, IIT Delhi
17.	Jayesh Solanki	Ahmedabad University
18.	Juuhi Rajput	IIT Delhi
19.	K. Ramesh	VMRDA, Andhra Pradesh
20.	Kalpna Viswanath	Safetipin
21.	Kushagra Sinha	Delhi Integrated Multi-Modal Transit System (DIMTS)
22.	I.Rokovono	UDD Nagaland
23.	M. N. Chaudhari	Surat Municipal Corporation
24.	Megha Kumar	International Council on Clean Transportation (ICCT)
25.	Nandini Sharma	TRIP Centre, IIT Delhi
26.	Poonam Sabikhi	Chennai Unified Metropolitan Transport Authority (CUMTA)
27.	Priti Shukla	Shakti Foundation
28.	Rajshree Swaminarayan	Gujarat Urban Development Institute (GUDI)
29.	Ruchi Varma	Humanqind
30.	Sahadeva Singh	APMRCL, Andhra Pradesh
31.	Sanjeev Nikore	Strategies2Scale
32.	Saumya Lathia	Ahmedabad University
33.	Shabnam Khan	TRIP Centre, IIT Delhi
34.	Sharif Qamar	The Energy and Resources Institute (TERI)
35.	Shashank Shekhar	Delhi Integrated Multi-Modal Transit System (DIMTS)
36.	Sherebanu Frosh	Raahgiri Foundation
37.	Shreya Gupta	The Energy and Resources Institute (TERI)
38.	Sonal Shah	The Urban Catalyst
39.	Sonal Singh	The Energy and Resources Institute (TERI)
40.	Srishti	TRIP Centre, IIT Delhi
41.	Subhash Dhar	UNEP CCC
42.	Shweta Pal	Ahmedabad University

43.	Swati	IIT Delhi
44.	Talat Munshi	UNEP CCC
45.	Tanya Singh	National Institute of Urban Affairs (NIUA)
46.	Umang Jain	Delhi Integrated Multi-Modal Transit System (DIMTS)
47.	Varsha	National Institute of Urban Affairs (NIUA)
48.	Vasudha	TRIP Centre, IIT Delhi
49.	Vigneshvar J	National Institute of Urban Affairs (NIUA)
50.	Vikash Nimesh	School of Public Policy, IIT Delhi
51.	Vinay Kumar	EPIC- India
52.	Viplav Prakash	IIT Delhi
53.	Vishal Dhakrey	Delhi Metro Rail Corporation (DMRC)
54.	Yatharth	IIT Delhi

Workshop agenda

Venue- Senate Room, 1st Floor, Main Building, IIT Delhi Day 1 (21st November 2025)	
Sessions	Time
Registration	9:00
Welcome – Girish Agrawal, TRIP Centre, IIT Delhi Opening remark – Arvind K. Nema, Deputy Director, IIT Delhi Welcome address – Geetam Tiwari, TRIP Centre, IIT Delhi Inaugural and keynote speech – Debolina Kundu, Director, NIUA Net-Zero Transport for Indian Cities – Subhash Dhar/ Talat Munshi, UNEP Copenhagen Climate Centre Project Introduction – Darshini Mahadevia, Ahmedabad University Keynote Speaker – Isha Kalia, Joint Secretary and Mission Director, MoHUA	9:30
Tea break	11:00
Session 1- Need for Net-Zero Transport in Indian cities - Introducing project and project methodology - Darshini Mahadevia & Saumya Lathia, Ahmedabad University. Chair – Debolina Kundu, Director, NIUA Moderator- Geetam Tiwari, TRIP Centre, IIT Delhi Panel Discussion – 1 - Is net zero an important guiding principle at present? If not, what would it take? - What is the current mechanism in your city? - What is the vision of the mobility plan for your city? - Who is guiding the development of CMP? Panelists - Kalpna Viswanath, CEO, Safetipin - Vikas Nimesh, Assistant Professor, IIT Delhi Q&A session	11:30
Session 2- Understanding the status and challenges in Indian cities: Case study of Rajkot Presentation - Indicators and findings – Deepty Jain & Nandini Sharma, TRIP Centre, IIT Delhi Chair – Girish Agrawal, Head of TRIP Centre, IIT Delhi Moderator- Talat Munshi, UNEP Copenhagen Climate Centre Panel Discussion – 2 - Which of the presented indicators are most relevant? - Is their data available for these indicators? - What are the data sources for your city? - Do you have smart city data and what is the potential for using this data? Panelists - Amit Bhatt, India Managing Director, ICCT - Sharif Qamar, Associate Director, TERI	12:30

• Sonal Shah, Founder, The Urban Catalysts Q&A session	
Lunch	13:30
Session 3- Potential Strategies to achieve NZ: Learning from Rajkot Presentation • Strategies based on emission models – Talat Munshi/ Subhash Dhar, Darshini Mahadevia, Jayesh Solanki, Ahmedabad University • Strategies from transport models – Deepty Jain & Devender Kumar, TRIP Centre, IIT Delhi Chair – K. Babu, Commissioner, CRDA, Andhra Pradesh Moderator – Subhash Dhar, UNEP Copenhagen Climate Centre Panel Discussion – 3 • Which of the listed strategies are more relevant for your city and why? • What barriers and challenges are faced during the implementation of strategies? • What is the potential for multi-sectoral strategies (circular economy, power generation, nature-based solutions)? • What can be the cities’ role in achieving net-zero transport emissions? Panelists • Poonam Sabikhi, Senior Transport Planner, Chennai Urban Metropolitan Transport Authority • Sahadeva Singh, Director, APMRCL, Andhra Pradesh • Dunu Roy, Social Activist and Political Ecologist • Vinay Kumar, Program Manager, EPIC-India • Kushagra Sinha, Deputy Manager, DIMTS, Delhi • Sahadeva Singh, Director, APMRCL, Andhra Pradesh Q&A session	14:30
Tea break	16:00
Session 4- Upscaling the NZT approach in Indian cities and cities’ role Panel Discussion – 4 • What can be the multi-scalar responsibilities, and what can cities and states do? • What capacity-building initiatives can be undertaken by states? • What technical and financial assistance can be provided by the state to the cities? • What can be the data sharing mechanism between ministries and industries for transparent climate action? Chair- Dunu Roy, Social Activist and Political Ecologist Moderator- Geetam Tiwari, Emeritus Professor, TRIP Centre, IIT Delhi Panelists • Tej Bharath, Metropolitan Commissioner, VMRDA, Andhra Pradesh • Sherebanu Frosh, Programme Manager, Raahgiri Foundation • L. Rokovono, Assistant Director, UDD Nagaland	16:30

Rajshree Swaminarayan, General Manager, Gujarat Urban Development Institute	
Q&A session	
Closing remarks and vote of thanks - Deepty Jain, TRIP Centre, IIT Delhi	17:30
Day 2 (22nd November 2025)	
Sessions	Time
Welcome address – Deepty Jain, TRIP Centre, IIT Delhi Chair: Girish Agrawal, Head of TRIP Centre, IIT Delhi - Introducing Net-Zero Transport approach for Indian cities – Saumya Lathia - Key takeaways from Day 1 – Nandini Sharma & Devender Kumar, TRIP Centre, IIT Delhi Round table discussion 1 – Need for governance model Moderator: Geetam Tiwari, Emeritus Professor, TRIP Centre, IIT Delhi - What multi-scalar approaches can be implemented to upscale NZT at the urban level? - What policy reforms are needed to enable net-zero transport in Indian cities? - What accountability frameworks are needed to ensure progress on cities' net-zero transport commitments? Panelist: - Sri Kanna Babu, Commissioner, CRDA, Andhra Pradesh - Poonam Sabikhi, Senior Transport Planner, Chennai Urban Metropolitan Transport Authority - Jagan Shah, CEO, The Infravision Foundation - Ruchi Varma, CEO, HumanQind Round table discussion 2 – Financing mechanism for net zero transport planning and implementation Moderator: Darshini Mahadevia, Professor, Ahmedabad University - What can be the financing models that can incentivise cross-sectoral projects? - How can city and state governments streamline financial mechanisms to support inclusive net-zero transport? - What should be the mechanism for financing NMT infrastructure and public transport projects other than the mega projects? Panelist: - Subhash Dhar, UNEP-CCC - Abhijit Datey, Lead Specialist, CDRI - Megha Kumar, Senior Researcher, ICCT (TBC) - M N Chaudhari, Surat Bus Rapid Transit System (BRTS) Closing remarks and vote of thanks - Deepty Jain, TRIP Centre, IIT Delhi	11:00
Lunch	13:00