

The MInT Collaborative

Mobility Dreams For A Billion





The **M**obility and **I**ntelligent **T**ransportation
Collaborative

ABOUT

Mobility, ubiquitous and essential for the movement of people and goods, forms the backbone of the modern economy. The future of mobility is transforming rapidly due to remarkable advances in technology.

Digital infrastructure complements and helps optimize the physical infrastructure and will be the innovation engine to advance future mobility. It connects all aspects of the mobility ecosystem: data, payment mechanisms, vehicle technology stacks, multi-modal passenger and freight networks, and digital twins. This framework is critical for mobility growth in a safe, sustainable and equitable manner, and should be a digital public good.

The MINT Collaborative facilitates “collaborate and compete”, bringing industry, government and academia together to co-create the mobility digital infrastructure (Bharat Multi-Modal Mobility Stack, BM³S) and enable holistic system solutions that foster synergies through knowledge sharing.

This white paper synthesizes the key concepts crystallized from the collaborative’s Inaugural Mobility Summit held April 4-5, 2024: the critical challenges ahead on the mobility landscape, new opportunities with AI and Big Data, exciting directions for impactful and responsible exploration, and promising avenues for collaborative advancements. We hope you enjoy these insights!

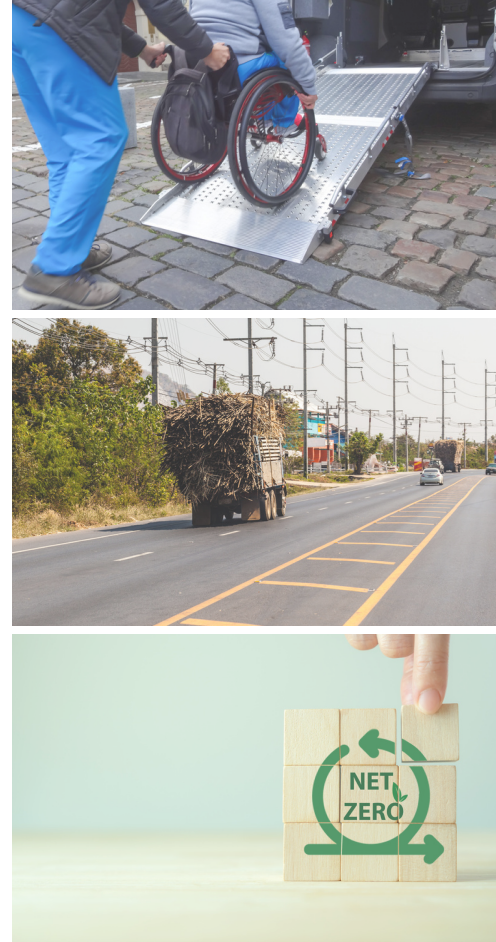
MOBILITY AND SDG GOALS

The Mobility Summit addressed India's mobility challenges in the context of Sustainable Development Goals (SDGs), focusing on sustainable city planning, equitable transportation, technology integration, and automotive lifecycle sustainability.

Key discussions on city planning included integrating land use and transport to reduce congestion and promote the 20–40-minute city concept. Efforts like procuring electric buses highlighted urban mobility improvements. Emphasizing equity, the summit called for inclusive solutions for rural and disabled populations.

Technology integration through digital public infrastructure (DPI) aimed to unify mobility and support sustainability goals. The automotive industry was urged to reduce carbon emissions throughout vehicle lifecycles, from material sourcing to disposal, with collaboration across the ecosystem essential for sustainability.

The summit stressed a holistic approach to mobility, advocating for public-private collaboration to drive innovation, inclusivity, and sustainability in urban mobility and the automotive sector.



Key Takeaways

Sustainable Town Planning to design

**15 Minutes
Cities**

**Unified
Transport
Authorities**

Lower Carbon Emissions through

**Public - Private
Research**

Remanufacturing

**Lifecycle
Approach**

Equity and Inclusivity that addresses

**Rural
Populations**

**Disabled &
Elderly
Populations**

DPI should be designed to use

**Tech to unify
varied
solutions**



Dr. Subramani Ailoor
Vice President, Renault
Nissan Technology



Mr. I. Jeyakumar
Member Secretary, Chennai Unified
Metropolitan Transport Authority



Dr. Pawan Mulukutla
Executive Program Director,
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Moderator

**Mr. Surendra Kumar
Ahirwar**
Joint Secretary, DPIIT



Prof. Satyanarayanan R Chakravarthi
Professor, IIT Madras



Dr. Venkatesh Prasad
VP Innovation, Center for Automotive
Research, MI, USA

FIRESIDE CHAT

Mobility is about quality of life: reduced congestion, equitable accessibility, enhanced safety, and environmental sustainability.

Technology and policy must nudge human behaviour toward sustainable and optimal choices.

Investments should accelerate mobility technologies via granular data collection at scale, edge AI, and human-computer interactions. A better understanding of perceptions and adoption of technology can help minimize unintended consequences.

Responsible AI should tackle both data and software. Realistic and empirical test situations will reveal the limitations to be addressed. Understanding causality is particularly challenging with Big Data and AI.

India presents a challenging frontier for stress-testing new technology before global deployment.

Key Takeaways

- ◆ *Behaviour Modeling should be a key research area for MInT and should focus on*

Consumer
Choices

Understand
unintended
consequences

**Perception &
Adoption**
of Technologies

- ◆ *Research Focus from a Data Science aspect should be on*

Granular
Data Collection

**Human -
Computer**
Interactions



“

***Understanding and mimicking
human behaviour is all about AI.***

”



“

***Empirical approaches are critical
to developing responsible AI.***

”



Prof. Chandra Bhat

Chair Professor in Engineering
University of Texas at Austin



Prof. Hari Balakrishnan

Massachusetts Institute of
Technology

Moderator



Prof. Gitakrishnan Ramadurai

Faculty In Charge, MInT Collaborative

TECHNICAL CHALLENGES AND SOLUTIONS FOR BM³S (UMI)

We had a robust discussion on many topics from data privacy, truck driver safety, information and skill gaps that need to be addressed through a holistic systems approach.

There's been a surge in data collection due to advancements in computing, storage, cloud technology, and sensing, but data is silo'ed, partly due to privacy concerns. An open source framework that allows collaboration without sharing the data itself, protecting privacy was proposed. Lack of behavioral context (trip purpose, mobility dynamics) makes historical data, ineffective in predicting future needs. Understanding the "why" behind data is crucial for building accurate models.

This would be a unified platform integrating multi-modal mobility options. It is important to build this layer-by-layer, focusing on critical needs like safety first. This needs to have a real-time data element to optimize traffic flow. Collaboration between public and private sectors with well aligned incentives, is essential for its success.

Also discussed was the need for skilled professionals who can span across data science and behavioral modeling.



Key Takeaways

◆ *Data and AI should help in developing*

Open Source Framework

Model for Privacy & Security

Understanding the "Why" behind behaviour

◆ *UMI should*

Be built Layer by Layer

Have Real-time Data Integration

Be built with Public-Private Partnerships

Be built by experts with AI/DS skills and Domain Knowledge



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AI / ML Expert



Mr. Rajeev Chanan
CEO, UmeandUS



Moderator

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Mr. Ravi Bulusu
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Dr. Ramachandran Balakrishna
Principal Transportation Scientist,
Caliper Corporation

FOUNDING MEMBERS ROUNDTABLE

“

“This is an opportunity to participate in the India Story”

“Collaboration with Government and Academics”

“Think beyond Traditional Mobility - Waterways and Fisheries, Drones etc..”

“Excited to be part of this initiative and collaborative”

“The Collaborative should be focused on being PEOPLE-CENTRIC”



Mr. Ganesamoorthy Arumugam
Head Engineering, ZF



Dr. Jennifer Duthie
Head of Innovation, Cintra



Mr. R Madhavan
Chief Executive, Interise



Mr. Mohan Ethirajulu
CEO, Xera Robotics



Mr. Rajeev Chanan
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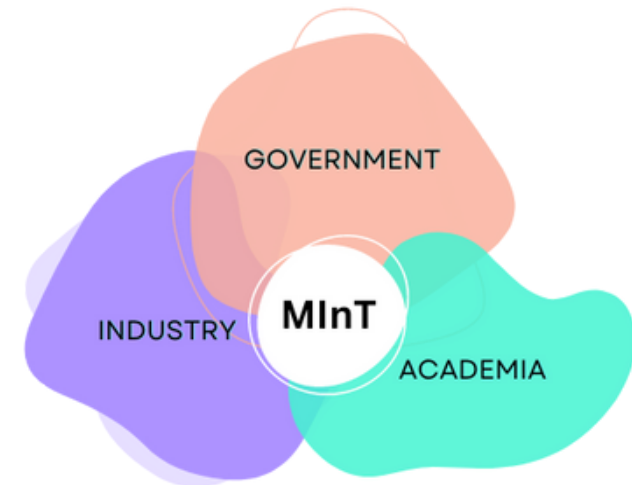


Mr. S. Santhanakrishnan
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PKF Sridhar and Santhanam LLP



Mr. Ravichandran Srinivasan
Start-up Advisor

Moderator



THE FUTURE



The Inaugural MInT Mobility Summit provided valuable guidance on what should be the imperative for the Mint Collaborative as it gears up to create digital public infrastructure and goods to make the **“Mobility Dreams of a Billion”** come true!

The core team of MInT has listened carefully to the global experts in terms of how myriad interlinked issues drive the challenges facing in delivering mobility in a region with an extraordinarily high density of population and vehicles.

The Collaborative intends to start the journey with a mindset of “build, test and deliver” small but contained digital mobility infrastructure solutions that can progressively grow in scope and complexity.

The MInT Collaborative will focus the next twelve months on a quarterly agile delivery schedule. Some of the key goals envisioned are outlined below:

Unified Mobility Interface (UMI):

- Design and develop the “Alpha prototype” of UMI, with a scalable architecture to handle big data.
- Create a UMI protocol to an accepted operational standard to enable secure, fast and real-time interchange of data and operation of approved digital twins to enable problem solving.
- Test the UMI prototype with one simple use case to bring out the power of using Digital Public Infrastructure in solving real life problems.



Big Data Research Portfolio (R&D):

- Cybersecurity: Research and recommend standards for handling “high volume” datasets sourced real-time from multiple national data sets without compromising security.
- Creation and curation of real time mobility data sets: Analyse and recommend approaches for successful scalable real time mobility big data handling.

Applied Research (R&D):

- Safety: Work with an industry partner to analyse commercial truck safety with onboard connected roll over and stability control systems. Develop specific algorithms to understand interface of geo spatial data to provide early warning to drivers to improve safety.
- Driver Behaviour: Collect, collate and analyse driver behaviour to a variety of use cases that allow for safe handling of vehicles.

The MInT Collaborative hopes to share progress and ideas at semi-annual and annual summits to get the broader digital mobility community including academia, industry and government. These summits should provide continuous feedback on the progress of development and R&D activities of the Collaborative.



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