Smart Mobility Living Lab London

Insights from the Innovation Community

Introduction

James Long, Head of Technical Consulting at the Smart Mobility Living Lab opened the proceedings by saying: "Mobility is a key contributor to a higher quality of life. However, our demand for mobility has brought road fatalities, poor air quality, lost time in congestion and leaving the road surface transport sector as the highest contributor to carbon emissions in the UK. The SMLL Community event, on 14th July 2022, brought together members and experts from across the mobility ecosystem to discuss and create insights on how to ensure the future transport system is safe, clean, efficient and equitable".

Q What are the ways in which the UK can deliver safe, clean, equitable, and ethical mobility for all?

Q What are the key challenges your organisation faces today?

Delivering clean transport by promoting alternative transport modes

Q How can the UK deliver clean transport?

Question to the audience: By how much do you think the number of car kilometres travelled in the UK will actually change by 2030?

0 % (no change)	50% agreed
Reduced by 10%	19% agreed
Reduced by 20%	27% agreed
Reduced by 30%	4% agreed
Reduced by >30%	0% agreed

> “Interesting response in comparison with Scotland’s aim to reduce car km travelled by 20% by 2030

A common theme across the discussion tables was the need to promote mode shift to alternative and cleaner transport modes. Alternative modes highlighted include public transport, sea transport, micromobility, multimodality and shared mobility. Influencing transport behaviour was underlined as a key challenge in enabling this mode shift, made worse by varying road user behaviour across the UK. In overcoming this challenge, two suggestions were raised by the delegates.

The first entailed providing incentives. Ensuring the effectiveness of these incentives was particularly emphasised. Two highlighted ways to achieve this include understanding the needs and behaviours of different sections of society and storytelling. Citizen assemblies could play a role in driving behavioural changes. It was argued that bottom-up approaches were likely to improve acceptability of policies driving the uptake of more environmentally friendly transport modes. Policy makers have a important role to play in storytelling creating narratives that can be easily understood by the public.

The second involved taking a more stringent approach to force a rethink towards these alternative transport modes. Care must be taken when penalising less sustainable modes to ensure equitable outcomes; we can look to London’s congestion charge and ULEZ zones as examples where this approach has been applied successfully.

> “Clean mobility (i.e., UV/ zero emissions) and technology to provide safety to more shared mobility users protecting vulnerable road users are high on the agenda — Balazs Berki, Streamax

Shared mobility and sea transport

One of the delegates highlighted how enhancing the safety and cost-effectiveness of shared mobility will attract more users. At the same time, other delegates indicated that increasing sea transport (using the canals and coastline) usage would reduce the focus on surface transport, as the latter accounts for a more significant share of transport emissions.

Multimodality

Improving transport multimodality was also highlighted as key to enhancing sustainability because it enables seamless interaction between low carbon transport modes such as public transport and micromobility.

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Q How can the UK deliver clean transport?

...Delivering clean transport by promoting alternative transport modes

Public transport

Public perception, rising fares and bus driver shortages were highlighted as key challenges facing the public transport sector. Coventry University, represented by Kevin Vincent, mentioned the existence of a stigma associated with taking the bus, as it is perceived as a lower-income mode of transport. Identified solutions to improving public transport perception include enhancing its convenience and overall journey experience. Providing financial incentives was also indicated as a means to improve public transport use as rising fares have made rail travel unattractive for business use. Comparison was made with Germany where rail fares have been subsidised to promote the use of public transport and improve energy security.

Bus driver shortages could also directly affect the number of incidents and fatalities as the remaining crew members may be less experienced, under extra strain and subsequently become fatigued. Technical solutions like Driver Monitoring Systems could tackle driver fatigue by detecting real-time driving conditions and issuing timely alerts. Other mentioned ways to increase public transport use include:

- enhancing its connectivity;
- employers providing subsidised employee transport;
- best practices being shared across the UK; and
- reducing traffic congestion.

A delegate also highlighted the lack of ultra-low emission buses within the UK public transport sector, indicating that more could be done to enhance the sustainability of public transport.

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Less wealthy areas tend to have fewer tube and train links and more bus links. Also tend to have worse transport connectivity in general.

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Bus journey times are unpredictable due to traffic levels. Train journey times are highly predictable. With private car usage you control your own route.

TRL

Should we be concerned about wasted energy from running buses empty, by providing the correct size vehicle for the job, by stopping only on demand?

> “The issue with taking the bus is the stigma, a problem of image, they need to be classless, but they are seen as lower income modes of transport – Kevin Vincent, Coventry University

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Q How can the UK deliver clean transport?

...Delivering clean transport by promoting alternative transport modes

Question to the audience:
*In cities, what do you think would deliver the *LEAST* value in achieving equitable mobility?*

Make EVs cheaper and improve charging infrastructure	29% agreed
Improve the frequency, quality and price of public transport	4% agreed
Improve infrastructure for and availability of active travel modes	8% agreed
Implementing clean air zones	58% agreed

Micromobility

Micromobility has emerged as one of the innovative transport modes in the shift towards cleaner transportation; appropriate and safe infrastructure would have to be provided to encourage its use. However, some parts of the UK, such as Stevenage, with fantastic and segregated cycle routes, have low cycle usage, indicating that infrastructure alone is insufficient to enable a mode shift.

> "Better active micromobility for the last mile is a solution, the legislation is coming, but it is a challenge for people to cope with the random nature of it – Kevin Vincent, Coventry University

Delegates made four recommendations to improve micromobility usage.

1. Structured training and support could be provided to improve public perception and drive cultural change

2. There could be an increased focus on enhancing the safety of micromobility. The current licence requirement for e-scooters is a good step in enabling this, as some riders would have that road driver perspective. That said, a key discussion point focused on how that requirement might potentially lead to more driving.

3. Micromobility could be equally prioritised with cars and included in technological considerations on the road network, in the same way that cyclists can be managed at traffic lights. Key points for making this work may require a lot of trialling and willingness to be accountable if the trials go wrong.

4. Policymaking should be based on evidence and not perception. A delegate highlighted the possibility for the UK to develop better policies to integrate new forms of mobility into the transport network. A delegate from TfL pointed out how the organisation would like new forms of mobility, such as e-scooters, integrated into the transport network in the right way alongside other travel modes. Furthermore, it was mentioned that as the London underground currently exclude e-bikes this might limit the growth of micromobility and multimodality?

Q What role does data play?

The role of data in delivering safe and equitable transport

Data

Insights from data analysis are key to the UK delivering safe and equitable mobility for all. Delegates discussed data's role in delivering safe and equitable transport, and the role of connected infrastructure was highlighted. Such infrastructure could provide real-time information on the transport network, ultimately leading to the development of strategies or schemes tailored to the needs of a community. That said, risks surrounding data have to be taken into consideration. The role of policies in enhancing data quality was also highlighted. Effective policymaking will lead to enhanced data quality. Better data quality will provide adequate information, leading to better decision-making, incentives, effective schemes and product roll-out by transport authorities.

Q Where are we with vehicle safety?

Vehicle safety contribution to the accessibility and sustainability of transport

Vehicle safety

Safety is improving for vehicle passengers and vulnerable pedestrians. Primary concerns that will influence CAV uptake are views on safety and security. It was identified that there is a public perception that is fixated on the safety of the vehicles. Relevant organisations must move the public discourse beyond the point of feeling concerned about the safety of the vehicles.

OEMs have designed ways to help reduce the impact force if a vehicle collides with a pedestrian. Furthermore, V2X (vehicle to everything) connectivity development allows users/vehicles to receive more information, therefore predicting and potentially avoiding a collision in the first place. A technological challenge with automated driver assistance systems was also highlighted as they drive down the wrong side of the road when there are many cycle lanes. Also, a discussion table raised questions on the ethics and effectiveness of highways controlling vehicle speed limits through a mandatory speed limit control system.

Regarding policies, there is a new regulation in London (DVS & Vision zero) aimed at enhancing the protection of road users around vehicles. More predominantly, this regulation will address lorries above 12 tonnes (i.e., LGVs and HGVs rather than regular passenger cars).

A new BSIS (blind spot information system) will be mandated in the EU on new vehicles from 2024. While the current BSIS system only detects objects, this new system will be able to differentiate between different types of VRUs (vulnerable road users) (i.e., to tell if the object is a pedestrian or a cyclist), and this will achieve a greater degree of safety.

A bottom-up approach is required in policymaking aimed at ensuring safety.

Developing a policy aggregate is important; different facets, such as EV charging and vehicle parking, must be developed in tandem towards enhancing overall safety. Effective leadership is required to ensure that all aspects work towards ensuring safe systems.

TRL

Public engagement and eduction is key. ADAS technology is out there now assisting people in driving their vehicles. It's not as big a jump to fully automated vehicles as people might think.

It is important that this movement of public discourse should be based on research to understand the nuances of public perception, so that the public can contribute to the journey towards full automation.

Q Where do you stand on the kerbside?

Kerbside management for safe, clean, equitable and ethical mobility for all

Kerbside

The importance of the kerbside was highlighted. Delegates identified two key drivers for change in managing the kerbside.

1. There is a need to improve accessibility for individuals with poor mobility.

2. The kerbside is predominantly used for private vehicle parking but faces new demands to be accessible for new mobility and active forms of travel while maintaining the ability for freight and deliveries.

In managing the kerbside, flexibility is key as each borough, city, council, town, and county has different terrains and requirements for their residents.

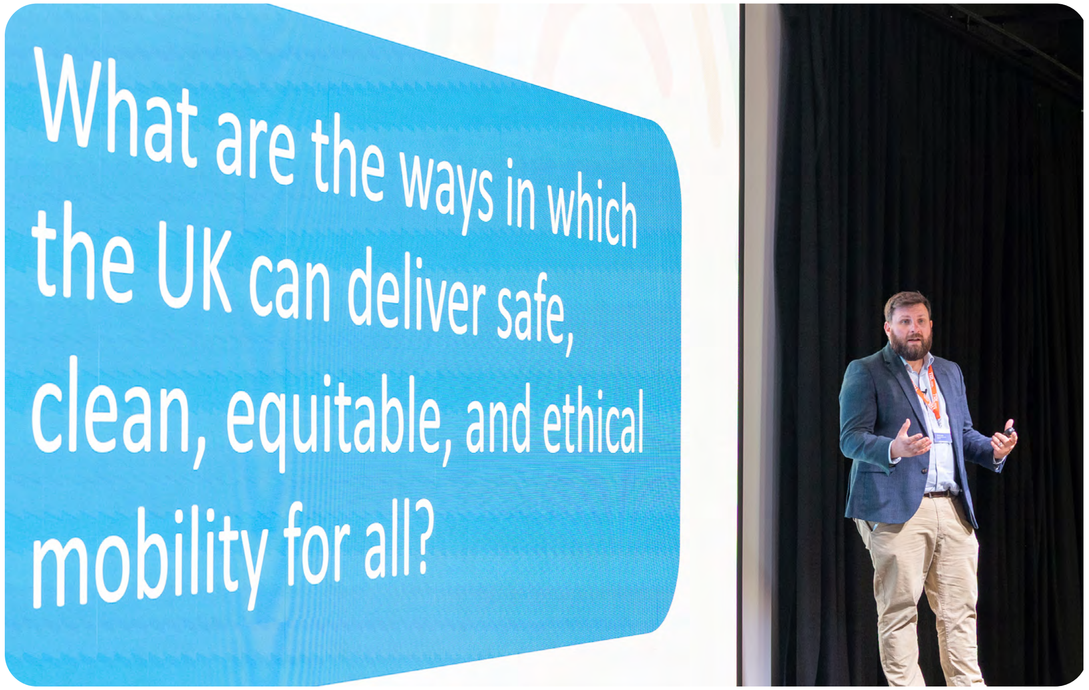
A flexible kerbside management programme would ensure that individual location goals are being met according to their budgets, resources, and timeframes.

Provisions could be made for better use of the kerbside, such as booking it for a specific time. A delegate also pointed out how policy change is key to ensuring good kerbside management.

TRL

How are new forms of mobility managed at the kerbside?

'Good' kerbside management might also encourage private car usage as it becomes easier to park & pay.



Q What challenges are organisations facing?

Barriers to the growth of the CAM eco-system

Uncertainty

Trends such as the decarbonisation agenda and technological advances such as electrification, digitalisation, and automation underpin change occurring across the transport sector. This brings several opportunities for innovation and radical new approaches, as significant changes, such as extensive infrastructural changes, will potentially occur. However, these changes also increase the complexity involved in organisations adapting and developing strategies for the future of transport.

Delegates pointed out how organisations are willing to invest but are wary of how long a specific technology will remain relevant. There is a need for a structure and a framework to guide investment decisions. Also, only so much can be done without the availability of appropriate infrastructure.

Acquiring funding

Organisations require financing to drive innovation. Because of uncertainty in the transport sector, a discussion table pointed out how organisations are unclear on where to invest to be well placed for long-term grant funding (grant funding in many years). Also, a start-up can secure funding in an area that is not as innovative or impactful, which can be detrimental.

There are many innovative areas, but different political agenda by various councils within London is a challenge for SMEs as it acts as a barrier to getting to the last stage of the government funding process. A delegate highlighted the need for SMEs to be given more opportunities to do things innovatively and TfL's role in helping achieve that.

Also, developing a business case remains key to obtaining funding, and while various tools such as simulations could highlight the benefits of digitisation and digitalisation use cases, funding availability remains an issue.

TRL

When to invest and what to invest in is the difficult question to ask in a fast paced industry without a clear roadmap.

Q What challenges are organisations facing?

Barriers to the growth of the CAM eco-system

London's transport policies and strategy

A delegate pointed out how a lot of geopolitics is leading to different transport policies within London, making it difficult for SMEs to operate. London's regulations and legislation were also termed outdated.

Transport for London's current structure, framework and collaboration with the local authorities was identified as too political, and the need for relevant stakeholders to take action was raised. Various issues were raised regarding London's transport strategy. A delegate pointed out how Transport for London's current strategy does not effectively consider marginalised groups such as the disabled and low-income earners. Another delegate highlighted the need for effective strategies and schemes by transport authorities to improve air quality and achieve decarbonisation objectives.

A delegate from Transport for London indicated that in the innovation sector, the organisation faces the challenge of aligning policies with DfT's transport strategy to ensure innovation is by the rules and the objective of achieving cleaner air.

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As the usage of electric vehicles increases, charging will inevitably become an increasing problem. The sustainability of electrification of vehicles is also coming under greater scrutiny.

Viability of fleet electrification

The UK government's transition to zero-emission road transport includes the introduction of Clean Air Zones. For SMEs there is a fear that running a sustainable fleet could translate into higher costs. Range anxiety and current range capabilities for delivery vehicles such as vans were also highlighted as factors limiting the viability of fleet electrification. Regarding range anxiety, a delegate indicated how data analytics could provide insights enabling the installation of EV chargepoints where they are most needed.

It was also highlighted how choice is limited as there isn't a broad spectrum of electric vehicles capable of being used in fleets.

Q What challenges are organisations facing?

Barriers to the growth of the CAM eco-system

Delivering inclusive and accessible transport

Public transport improves the quality of life by providing access to schools, work and social connections. However, residents in rural areas are disadvantaged as they tend to have limited access to public transport. Establishing on-demand, in-person, and subsidised transport in such areas is crucial as it will ensure equal opportunities for all. A discussion table pointed out that vehicle manufacturers face a key challenge in enhancing transport accessibility. There are issues in ensuring that innovative transport technologies such as electrification technology and infrastructure is affordable for all.

To overcome these challenges, the development of new technologies must consider different communities, such as age groups. Engaging with potentially excluded groups, such as older persons, early in the development phase is important. It is crucial to understand how technology and the elderly interact and how technology could be designed for them across the ecosystem. A verbal interface could be more suited to the elderly accessing digital technologies such as apps. The UK must work to increase the trust and confidence of the elderly in technology and decouple the value one creates as an individual from transport priority. Legislation is key to achieving this.

Excluding a community increases the gap as digital and technology-led solutions improve, and this can leave some groups excluded or negatively impact their well-being. The reliance on apps could lock people out of getting around. Digital inclusion is essential to future mobility. A delegate suggested involving accessibility representative organisations in discussions, workshops, conferences, events, updates etc., to ensure they are on board with processes. Also, efficient monitoring of the usage of different modes of mobility and how they interact will help provide insights into enabling equitable mobility for all.

In terms of inclusion, Nissan is looking at developing Autonomous Vehicle (AV) technology, and the project (ServCity) engaged with different partners (e.g., Nottingham university) to enhance the inclusivity of the technology. For OEMs, a key challenge is to enhance transport accessibility.

Q What challenges are organisations facing?

Barriers to the growth of the CAM eco-system

Public perception

Public perception is key to successfully deploying transport technologies such as Connected and Autonomous Vehicles (CAV). Technology developers such as autonomous vehicle manufacturers must be technologically and people-focused. How the public thinks and feels about changes within the transport sector is a key challenge.

A discussion about overcoming this challenge highlighted the importance of engaging with the public to improve their knowledge of changes and developments. That said, uncertainty remains in identifying an effective means of carrying out this engagement to ensure the public is well informed. A discussion table identified the marketing team of technology developers as having a key role in communicating with the public to get them on board with various emerging technologies.

One delegate mentioned that Norway has not received as much public backlash and negative media press for new technology in the transport sector because there was more education around what changes would take place, enabling the public to feel a part of the process.

Highway authorities, government organisations and technology developers could lean more towards storytelling and away from statistics to create a communal feel and improve public perception of innovative technologies in the transport sector. Data about incidents could be made more openly available. Researching people's aspirations may be a way to enhance public trust in technologies.

Also, the different market needs and behaviours must be well understood. Evaluating the interactions between transport technologies and human behaviour is important to manage potential adverse outcomes effectively. One risk of delegating everything to automation is that everything could be directed towards a mapping tool such as google maps.

> "How can we engage with the user and the public to bring them on the process to find a solution – Shayan Afshar, Navtech Radar

Q What challenges are organisations facing?

Barriers to the growth of the CAM eco-system

Forming long-term partnerships

Collaboration is essential between OEMs, tech partners, government agencies and the wider transport sector. The transport sector's increased complexity and uncertainty have adverse effects on collaboration. A delegate pointed out the difficulty in forming long-term partnerships in innovation with Transport for London due to the uncertainty about where long-term goals are aligned.

Building partnerships with the right partners to discuss and overcome challenges is crucial in attaining safe, clean, equitable and ethical mobility for all. Different industry sectors have different roles but could have the same goal. For instance, OEMs require guidance from government or local councils for effective technology deployment as from an OEM's perspective, automated driver assistance systems could interact with the local infrastructure, which Highway Authorities manage.

Organisational challenges

Delegates also highlighted organisational issues such as limited employees hired to make required changes due to increasing competitiveness in the job market.

Exporting

Another challenge identified by attendees was exporting issues. The licensing behind exporting technology abroad is challenging and slow because of Brexit. This makes it difficult for organisations to rely on exports to get to manufacturers on time.

Summary

Sustainable transport is an invaluable aspect of life. This is made up from many aspects such as reducing car travel, micromobility, multimodal transport, the EV charging infrastructures, making transport inclusive and accessible to all, kerbside management, how various organisations face and deal with their own challenges and the public perception.

To reduce car travel, shared mobility such as car sharing has to be made available, safe and cost effective in order to attract users. Canals also could be utilised to reduce surface transport. Active travel and micromobility have to be prioritised as equally as car travel.

For micromobility, infrastructure availability alone is insufficient to enable a mode shift. There is also a need for structured training and support to improve the public's perception to drive culture change.

Improving transport multimodality enhances sustainability as it enables a smooth transition between low carbon transport modes such as public transport and micromobility. Providing the right incentives will promote travel using low carbon transport modes. It is also important to ensure that this will be accessible for all to use.

The UK has committed to phasing out the sale of new petrol and diesel cars/vans by 2030. An appropriate number of EV chargepoints would have to be provided to support the uptake of EVs. Data analysis tools could be used to provide insights for installation sites where they are needed the most due to the high costs of EV charging infrastructures.

Insights from data analysis are key to the UK delivering safe and equitable mobility for all. Effective policy making leads to enhanced data quality. Better data quality will provide better information which leads to better decision making, incentives, more effective schemes and better product roll out by the transport authorities.

Vehicle safety is improving by design although KSIs and fatalities remain unacceptably high. V2X connectivity development allows users/vehicles to receive more information, which leads to the potential of predicting and avoiding a collision in the first place. BSIS will eventually be able to differentiate between different types of vulnerable road users which will achieve a greater degree of safety.

Residents in rural areas face the problem of limited access to public transport. Establishing on demand, in person and subsidised transport in such areas is crucial to ensure equal opportunities for all. During the development of new technologies, it is important to consider the needs of many different communities and engage early in the development phase with marginalised groups. Digital inclusion must be essential to the future of mobility.

Flexibility is key in kerbside management. Each borough, city, council, town, and county have different terrains and requirements for their residents. A flexible kerbside management program would ensure that individual location goals are being met according to their budgets, resource, and timeframes. Collaboration is also vital. Car charging facilities rather than car parking space is a key area which has to be assigned increased importance by the local authorities.

Various organisations face the challenge of collaboration as its difficult forming long term partnerships in innovation with the local authorities. This is due to the uncertainty of where long-term goals are aligned across authorities. Long term grant funding is unclear. Collaboration is also essential between OEMs, tech partners, government agencies and the wider transport sector. The continuous change between civil servants and the lack of communication enhances the difficulty of managing change. Different industry sectors have distinct roles and could all be heading towards the same goal.

Public perception is vital for the successful launch of transport technologies such as CAV. The primary concerns which will influence CAV uptakes are views on safety and security. How the public think and feel about changes within the transport sector is a key challenge. It is crucial to engage with the public to improve on their knowledge of the changes and developments. Highway authorities, government organisations and technology developers could lean more towards a story telling approach and away from statistics to create a communal feel and improve public perception. Incidents, not stats could be marketed. Different market needs and behaviours must also be well understood.

TRL and SMLL: the Journeymakers

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