

Innovation Showcase

Arup

Framework for Change

Arup have established the 'Avoid, Shift, Improve' framework is a useful tool to prioritise attention and investment in future mobility.

Whilst measures to reduce demand for travel and shift to more sustainable transport modes can have the most impact in delivering sustainable outcomes, we must consider measures to address all three areas to decarbonise transport and address the climate emergency.

Applying an inclusion lens is equally important. A transition to a net zero, enabled by future mobility, must be done in a way which addresses all aspects of sustainability rather than a narrow focus on decarbonisation. The UN Sustainable Development Goals (SDGs) recognise that measures to decarbonise must go hand-in-hand with strategies that reduce inequality and social exclusion. A just transition will focus on delivering the transport needs of everyone, particularly those who are already marginalised



Avoid

Incentivising changes in behaviour, improving land use planning & digital connectivity to reduce the need to travel



Shift

Shift journeys to more sustainable journeys and low carbon forms of transport: walking, cycling, wheeling and public transport



Improve

Use technology improvements to improve vehicle efficiency and reduce emissions per kilometre

Focus Areas:

Behaviour Change

Living Neighbourhoods

Mobility Pricing

Active Travel

Freight & Logistics

Public & Shared Transport

Micromobility

Data & Digital

Low Emission Mobility

Systems & Operations

CAVs



Travel Demand Management

Behavioural Change Toolkit, SEStran



This Travel Behavioural Change Toolkit has been prepared by Arup on behalf of the South East of Scotland Transport Partnership SEStran. The aim of this toolkit is to provide a practical guide for local authorities, community groups and third sector organisations within the SEStran region working to encourage a positive shift in travel behaviour with individual groups, and throughout communities.

This toolkit supports national measures on active and sustainable travel choices and placemaking principles. The toolkit puts the National Transport Strategy (NTS2) at the forefront by prioritising active and sustainable transport as per the Sustainable Travel Hierarchy, and equally supports the Sustainable Investment Hierarchy by looking to reduce the need to travel unsustainably. It also supports the NTS2's four priorities to: 1) **Reduce inequality**; 2) **take climate action**; 3) **help deliver inclusive economic growth**; and 4) **improve our health and wellbeing**.

Travel Demand Management, National Highways



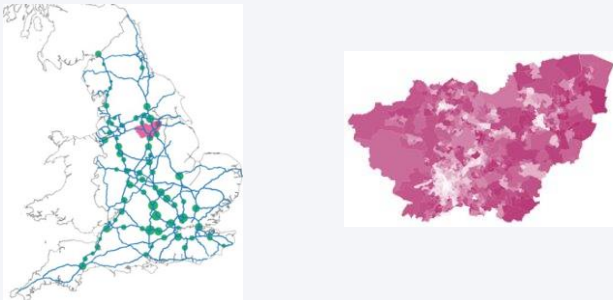
Arup have worked with National Highways and partner authorities over a number of years to develop TDM policies for the Strategic Road Network (SRN).

The work has developed interventions, supported the operation of pilot studies and looked to map the benefits of implementation of TDM interventions.

A TDM Toolkit has been developed to disseminate material, and made available to National Highways staff and partner authorities involved in the development of TDM interventions on the SRN and KRN. **The TDMT will be launched in summer 2022.**

Low Emission Mobility

EV Charging Infrastructure Modelling

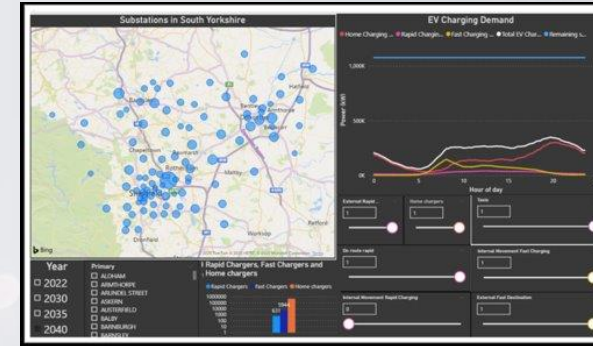


The LEM domain experts within Arup have developed modelling capabilities to support local authorities and partners to answer key questions:

- How many EV chargers are required in the area between now and 2050, and where?
- What type of EV charging (Fast or Rapid) do they need to be?
- How does this change with Policy, Behaviours, EV and charging technology improvements?
- Where should the public sector intervene and where should the private sector come in?

Arup have two industry leading models to address the challenges: on-route (for interurban charging) and a regional model (for urban). Modelling techniques developed have been successfully rolled out on projects nationally and across Europe.

EV Charging Strategy, Sheffield City Region



For Sheffield City Region Mayoral Combined Authority, we developed an EV charging infrastructure strategy. This used an EV forecasting model based on transport movements, socio-economic data and EV charging user groups (e.g. commuter, leisure travel, business travel) to build an understanding of the level of infrastructure needed to support the region's transition to zero carbon mobility.

The project also assessed different funding options for installing chargers, key challenges that SYMCA would come across and recommendations for how they should intervene in the quickly evolving charging environment. The result was an evidence-based strategy which the city region could implement to support the move to battery electric cars.

Hydrogen Bus

HyBus - MerseyTravel HyBus Trial Technical Advisors and Future Roadmap to Zero-emission Buses

The Liverpool City Region (LCR) Metro Mayor has set a target for the Liverpool City Region to become a net-zero carbon economy by 2040. Given the potential for Hydrogen production across the city region, both Grey, Blue and Green, LCR see the bus network as a key tool in demonstrating the commercial viability of hydrogen and act as a catalyst to develop a future network of hydrogen refuelling stations for use by both public and private vehicles.

- Arup have been commissioned as Technical Advisors to support the procurement of 20-40 hydrogen buses, to enter operation by 2022. Working as part of integrated team with Merseytravel HyBus colleagues, we have specifically:
- supported the development of the Outline and Full Business cases to unlock funding;
- undertook significant background research and knowledge share sessions with other authorities such as TfL, Aberdeen, Translink, Birmingham City Council and Brighton and Hove and Metrobus – to build best practice into the programme;
- led the specification of the commercial leasing contracts through negotiations with operators;
- developed a fuel supply contract heads of terms and cost model – via engagement with multiple potential fuel suppliers; and
- engaged operators and bus manufacturers to develop technical specification of the buses, in a format to be released for tender.

A specific focus of our work has been on the development of contracts that navigate the complex interaction between diesel parity, to ensure the trial is affordable for operators, whilst balancing state aid considerations. Through extensive stakeholder, LCR and legal engagement, we have developed a diesel parity rebalancing benchmark tool, to benchmark diesel and hydrogen prices and therefore maintain diesel parity for the trial, whilst avoiding any distortion of the fuel supply market or competition in favour of the provider or the operators

Our work is putting Merseyside at the forefront of a transformational technology, developing new skills, jobs, and business export



Arup's City Modelling Lab - Agent Based Simulation

Decision makers need support to address a new range of strategic policy questions around **decarbonisation, equity, and multimodality**.

In support of this, we build cutting edge Agent Based Simulations up to national scale, and can build an initial model in as little as 12 weeks.

The simulations contain millions of agents, each with their own plans and activities, and a full set of multimodal trip options.

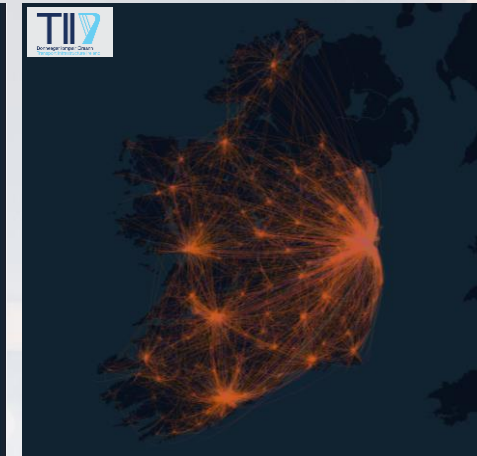
Our approach is built around **open source** tools and components, academic and industrial **partnerships**, and **collaboration** with clients.



New Zealand Ministry of Transport

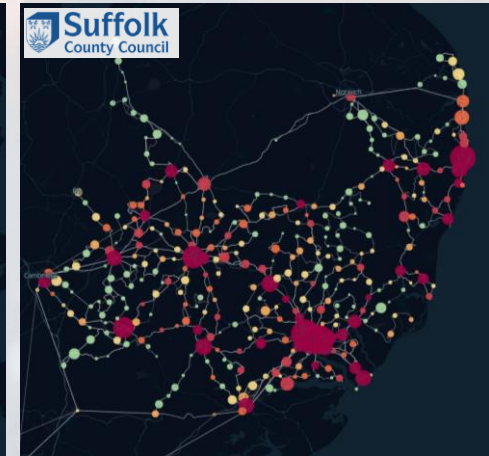
Embedding **simulation capabilities** within the Ministry.

National scale, including domestic aviation. Currently understanding congestion mitigation scenarios.



Transport Infrastructure Ireland

Built a simulation model to investigate the social equity impacts of road pricing scenarios for future infrastructure.



Suffolk County Council

An Alpha model for the Suffolk county, and ran scenarios to inform their **bus strategy**. Carried out a **carbon assessment** and investigated the potential for modal shift from cars.

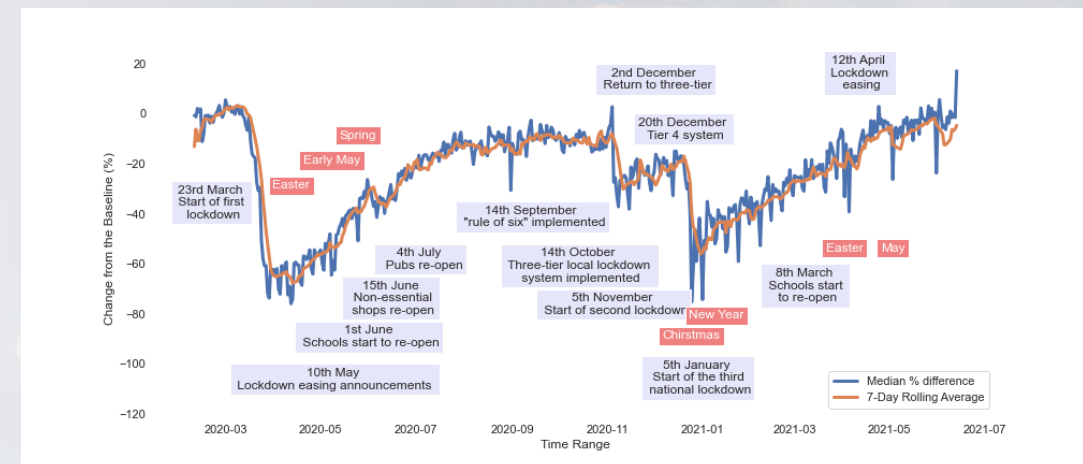
Local Authority Data Reporting Pipeline

Transport Technology Forum, Department for Transport

When the COVID-19 pandemic hit in early 2020, the DfT identified a need to develop a more holistic understanding of the entire road network in England to support decision making around the pandemic. Through the TTF, Arup were asked to support an urgent 'call to arms' requesting Local Authorities and private companies to share their data.

Within three months, Arup had led the production of a **data pipeline** and web based analytical tools to enable the DfT to access the **latest traffic, cycling, parking and freight data** from a variety of sources. The outputs were published to the transport community via the 'TTF Weekly Digests', and shared with the DfT statistics team. This enabled the DfT to understand how travel patterns and behaviour had been changed due to the Government's decision to impose and relax the lockdown restrictions.

To achieve a national perspective, a wide range of data sources and standards were ingested from private and public sector. Differences existed across datasets due to different detection method, modal classification, frequency and method of data sharing and commercial sensitivities. To enable analysis, modes were assessed independently with key metadata identified for each modal dataset.



High Level Statistics

- Over 100+ authorities and private data providers approached
- Data integrated from 4x modes of transit
- 24+ months of historic data previous not captured by the DfT
- 50million + journeys process
- 2020 ITS-UK Project of the Year Winner

Thank you.

For more information contact:

Martyn.minear@arup.com OR Yousef.Majeed@arup.com

Presentations will be uploaded onto TTF Conference Website within the next 7-10 days

