Showcasing the importance of data integrity: Insights from Cycling Scotland's National Data Integration and uMove Fusion

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Synopsis:

This paper underscores the importance of integrating future technologies, data, and active travel planning to enhance transport networks and promote sustainable modes. It emphasises the need for a holistic approach, utilising open data and enhancing data integrity to inform decision-making and encourage a shift towards sustainable travel choices.

The case study in Scotland showcases how Cycling Scotland used national open data to build an active travel framework. The collaboration between UrbanTide and Cycling Scotland resulted in an open data portal, providing a comprehensive view of active travel at national scale. The portal uses automated data integration and validation to enhance data maturity and quality, identify data errors and standardise formats from multiple data feeds into one centralised system.

Furthermore, uMove fusion integrated Appyway's kerbside data and digital TROs to more holistically map transport networks for comprehensive understanding.

The paper will showcase the importance of data readiness, quality, maturity and access, stressing the value of integrating cycling data, pedestrian data, multi-modal surveys and kerbside data into traffic models, traffic management and promoting modal shifts. Overall, it advocates for innovative approaches and data sharing to create effective solutions for sustainable transport networks. This paper supports the initiative for cross-sector data integration and the importance of contextual data in planning effective traffic management and sustainable transport networks. It explores the importance of combining siloed data, standardising travel data and utilising integrated data solutions for a more holistic approach.

![UrbanTide]

uMove: Open and Integrated traffic data

JCT Traffic Signals Symposium 2024
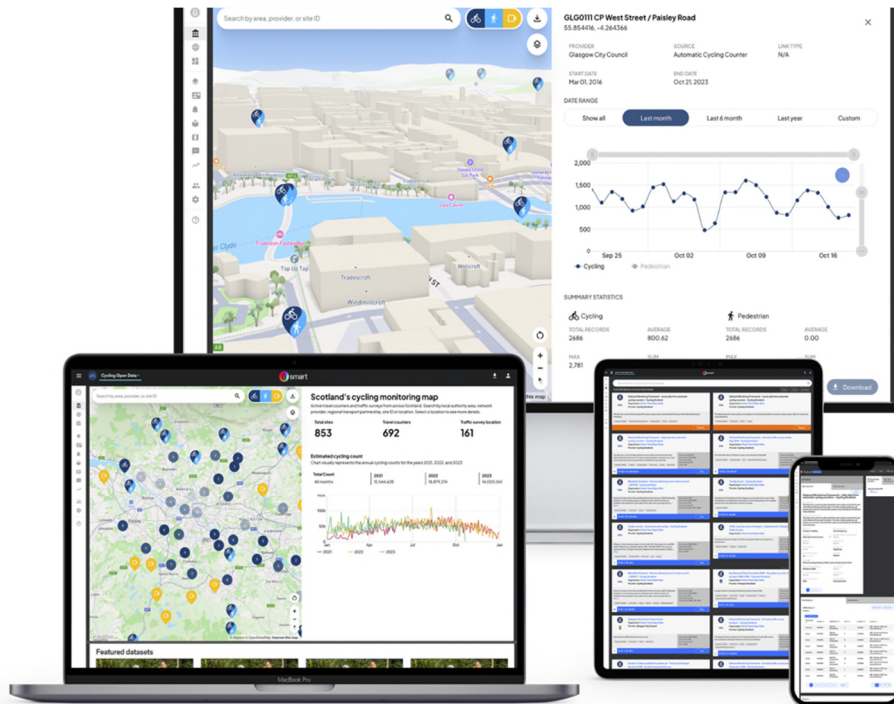
Introduction

To improve our transport networks it is key to consider the role of future technologies, data and active travel planning to create more reliable journeys. The transport industry strives to reconfigure our networks in such a way that prioritises and promotes more sustainable modes of travel over the reliance on motorised vehicles, providing the public with more information to make more informed choices on modes of transport they use.

In response to the global imperative for sustainability and the ambitious pursuit of net-zero targets, there is a collective drive to reshape behaviours and make sustainable travel choices the standard within our evolving transport networks. Local councils and transportation authorities are exploring innovative solutions to enhance travel experiences, encourage active commuting, and prepare for the future. Their goal is to promote changes in behaviour and establish a holistic approach that ensures the safe and efficient coexistence of both non-motorised and motorised

travel modes, benefiting all users of the transportation network.

The new Government are targeting 50% of short trips (1-2miles) to be conducted by Active Travel Modes and Public Transport by 2030.

Core to developing how we manage and improve our networks and operations within them is data. Traffic signal systems, monitoring & evaluation and transport planning data are often siloed for individual purposes. However, integration in hosted systems can provide a centralised evidence base to collect, store and analyse data together. A more holistic view helps us to better understand how the public use our networks to see where we should focus improvements and investment. Understanding the context of people's journeys is key to decision-making for interventions to encourage the take-up of sustainable modes. Monitoring and evaluation are also crucial to understanding the benefits of these programmes and how journeys are improving. These insights can feed into wider strategies and enable them to scale deployment across authorities, including at regional or national levels. The Transport industry is one of several that are gradually embracing the open data journey. To facilitate a systems approach and create integrated data hubs, collaboration and open data are required. Open APIs integrate different data sets into one place and are becoming increasingly standardised to gain broader context and streamline efficiencies, often removing the need for so much hardware at the roadside. Technologies and evaluation methods have developed quickly in recent years, including, as highlighted by the Department of Transport, cooperative Intelligent Transport Systems, systems that allow users to collaborate and exchange information between roads and road users. As we continue to develop towards fully connected services, data availability, exchange, and re-use becomes increasingly crucial.

With innovation and funding providing opportunities in 2024, we aim to utilise the power of data integration and collaboration to help authorities create safer, more reliable, more active journeys to enable a more sustainable future.

As authorities move towards new monitoring, evaluation and connection methods, they also require updated technical architecture and working methods to gain the time and resources needed. Open data plays a crucial role in traffic management, transport planning, and Active Travel by fostering collaboration among various authorities and partners, thereby maximising its utility beyond its initial purpose. As the demand and urgency brought about by climate change continue to rise, the imperative for infrastructure and innovation grows in tandem. To address these mounting challenges effectively, the foundation of reliable, open data becomes increasingly indispensable. A concept that Cycling Scotland has adopted in it's deployment of the Cycling Open Data portal as showcased below.

There is a need for innovative approaches in data sharing, adopting a systems-oriented framework that integrates information from multiple sources and ensures accessibility across interconnected systems. This approach is essential to gurantee that the resulting solutions are designed effectively.

Cycling Scotland National Data Integration
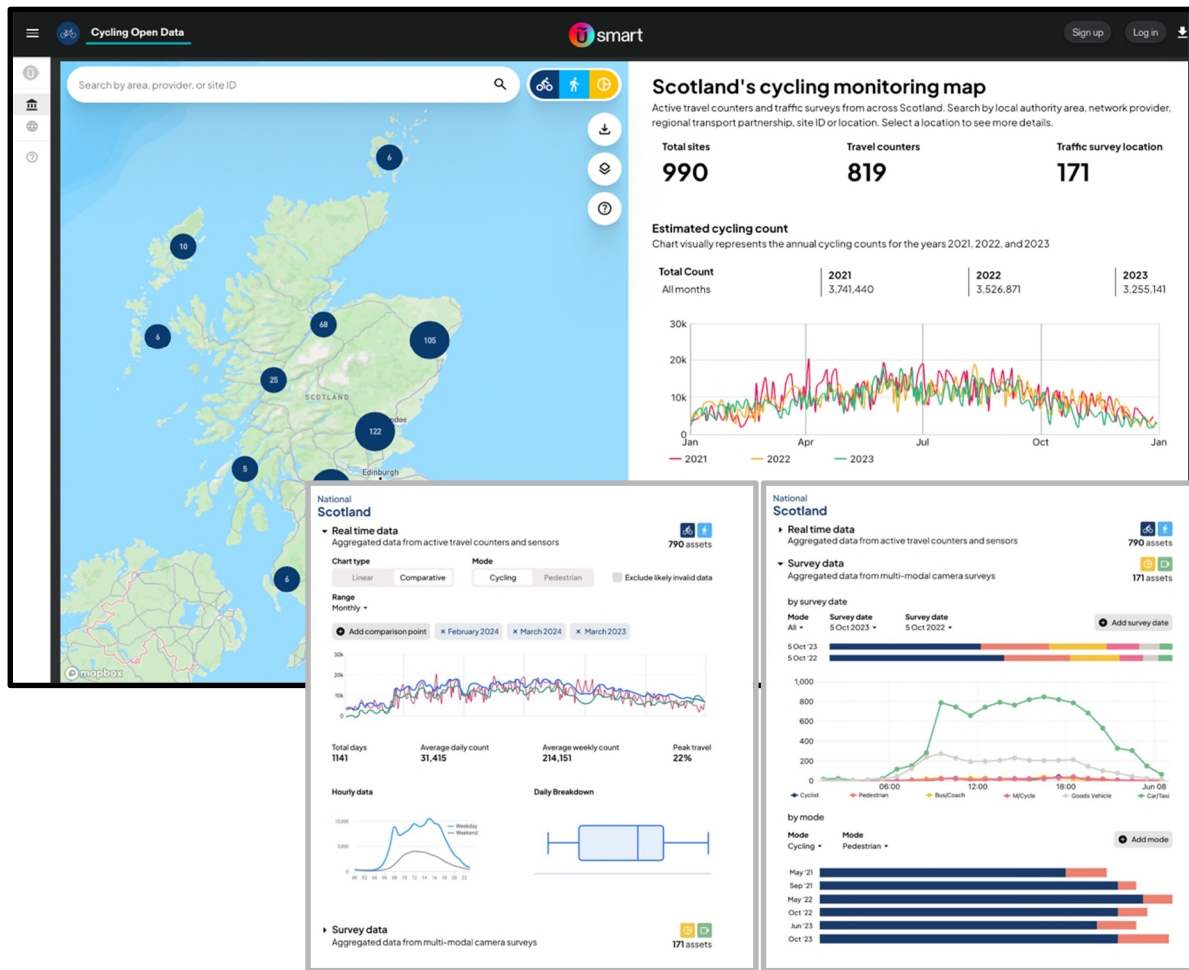
Cycling Scotland is Scotland's national cycling organisation. Working in partnership with others - and with funding from Transport Scotland - they help create an environment for anyone in Scotland to cycle easily and safely. They promote a sustainable, inclusive and healthy Scotland by establishing cycling as an accessible and practical travel option for everyone.

UrbanTide collaborated with Cycling Scotland to develop an open data portal. Combining over 900 sites worth of data, with 100,000+ records per day, from over 20 collaborating partners and over 30 local authorities, we created a collaborative data source for all active travel data across Scotland and centralised an extensive network of automatic cycling and pedestrian counters to track cycling and walking activity and modal share and inform active travel planning across Scotland.
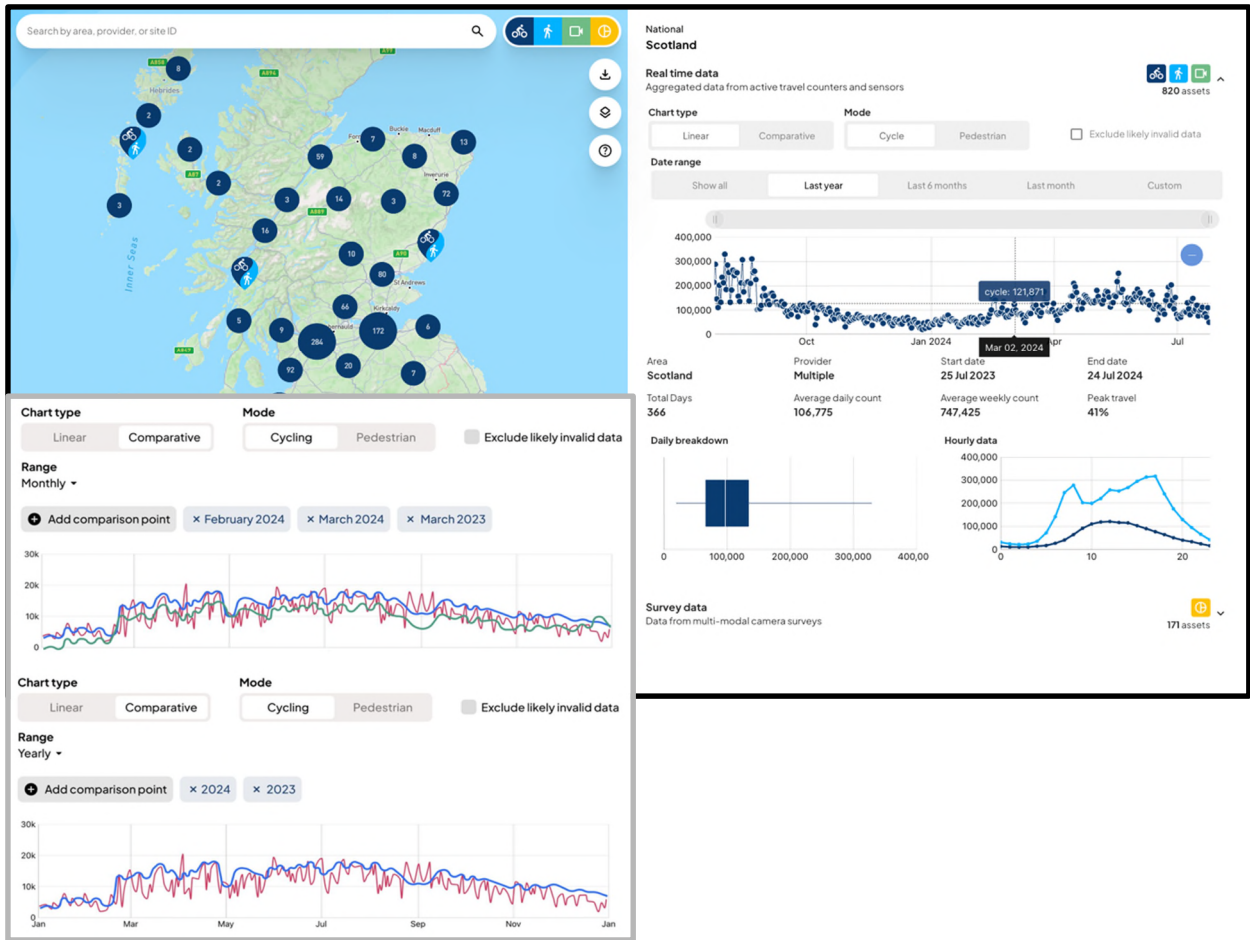
The data within this open platform provides an evidence base for anyone to access, supporting consultants in project planning, authorities in investment decisions and providing evidence to justify decisions. Access to, and application of data can be used to support everything from local community groups campaigning for quieter streets to urban planners looking at the effectiveness of existing cycle infrastructure.

Having this data together, in an easily accessible platform helps drive more effective, purpose-driven decision making, leading to delivery of well-designed sustainable spaces which ultimately means people enjoy using the spaces they live and work in.

Aggregated and Comparative data allows any user to query trends at a national, regional and local authority level or road and counter level. Comparisons year on year, month to month or even day by day allow flexible analysis to understand usage at specific times.
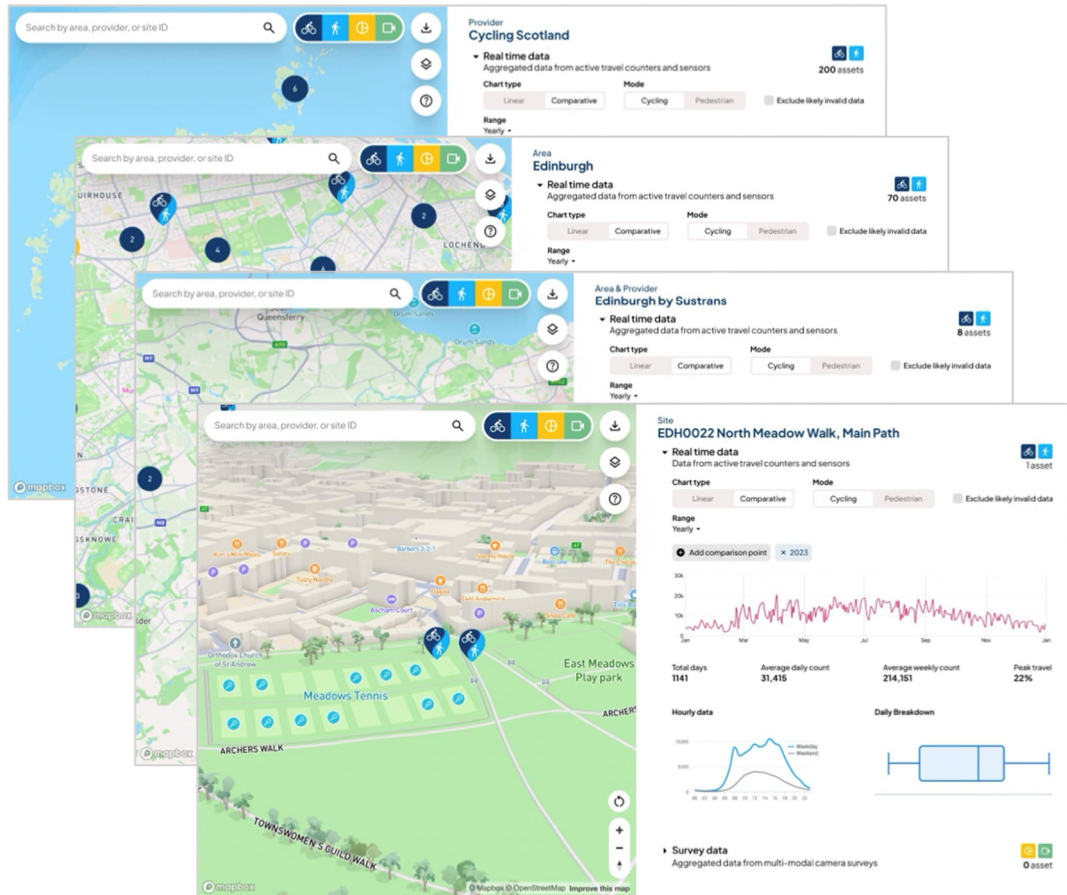
Authorities often have considerable amounts of data on the movement of vehicles through their networks and develop models to optimise traffic movement. However, more often than not, traffic models do not contain data on walking or cycling so these vital modes of transport cannot be considered correctly in transport planning or traffic management schemes.

Traffic management tools can now take advantage of active travel users through modern sensors, so the need for data flows and modes is ever more important to be used to set up in base timings and configuration.

Treating all modes in line with today's sustainable transport policies through the use of clear evidence based data allows us to better understand how people move through the networks with targeted interventions, including active travel, to encourage a modal shift from cars to more sustainable modes.
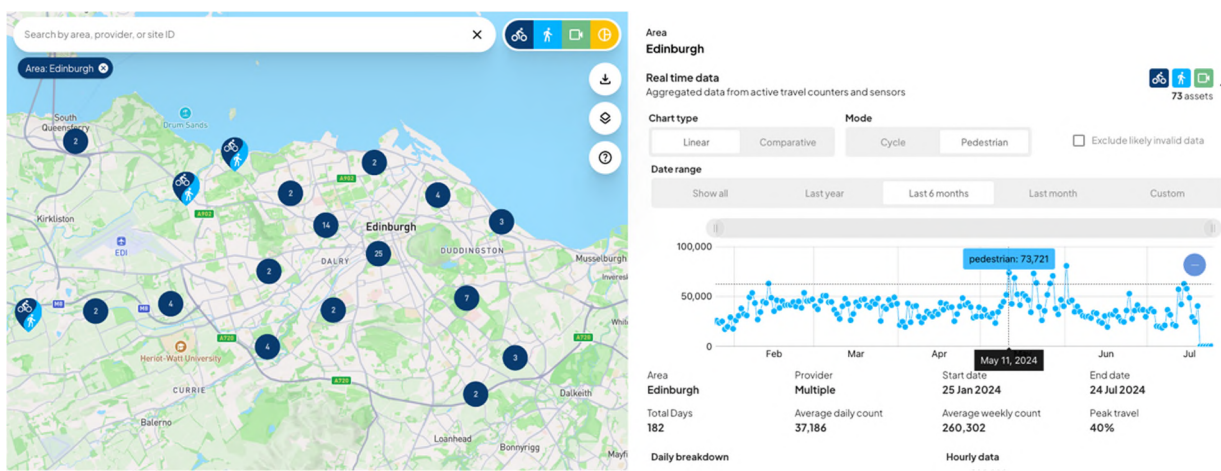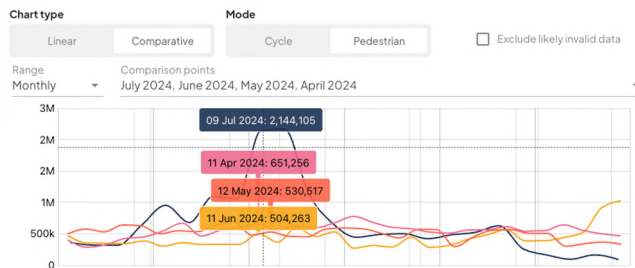
Modal shift is a challenge within the industry as encouraging people to change their habitual behaviour requires a psychological shift. Even when presented with clear benefits, such as reduced journey time, reduced cost, improved health, etc., people are still reluctant to change their rationale as they see the 'car as king'. With most active journeys being multi-modal, Active Travel modes and public transport need to become more attractive and convenient to the public than the car for people to consider changing habits.

Combining cycling, pedestrian and multi-modal data brings great value when planning and evidencing success of traffic management and active travel projects, as illustrated by use of Cycling Scotland's portal by Glasgow City Council and Sustrans to evidence the effectiveness of the South City Way cycling route.

How the Cycling Open Data Portal provided evidence for South City Way Glasgow

Traffic survey data shared on the Cycling Open Data Portal recently attracted national press attention when it was used to evidence high cycling rates along Glasgow's South City Way cycling route.

2.5km two-way on-street cycle path

The South City Way is one of the most ambitious urban cycle routes in the country, and showcases how cycling infrastructure is being recognised as a national priority and kickstarts the transformation for cycling in Scotland. The route was developed by Glasgow City Council and Sustrans, with funding from the Scottish Government.

12.75% of people cycled their journey

Traffic surveys recorded 3,739 bikes travelling along Victoria Road in the South of Glasgow, out of a total of 29,318 travel methods recorded.
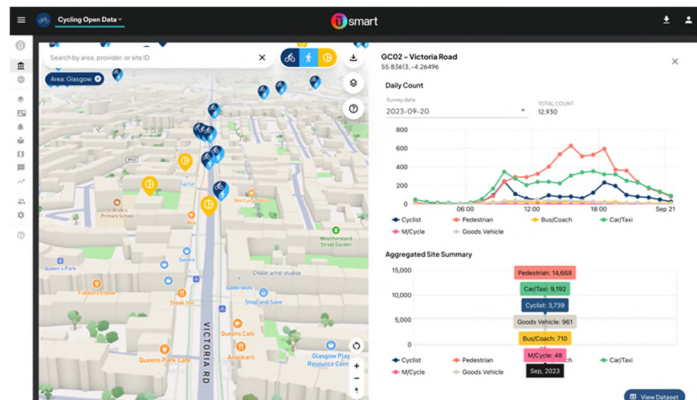
1.69% typically cycle

Comparing this result to a street without safe cycle lanes, Cathedral Street in Glasgow showed just 1.69% of people cycling their journey.

"These new figures from Cycling Scotland continue to prove that where we invest in high-quality cycling lanes, we make it easier for more people to choose cycling for everyday journeys."

- Patrick Harvie, Minister for Active Travel

uMove Fusion: Integrating Appyway's Kerbside data

Active travel programmes aren't just about demand for active travel infrastructure but also about other users of the road and perhaps more importantly what's happening by the kerbside which is why we are now building a pipeline to ingest digital Traffic Regulation Orders into our uMove platform too. By adding the legal restrictions by the kerbside such as parking bays and bus restrictions with active travel and public transport data, in our Appyway project called uMove Fusion, we're more holistically mapping the network. Which is key to understanding, for example, how non-cycling infrastructure restrictions affect proposed
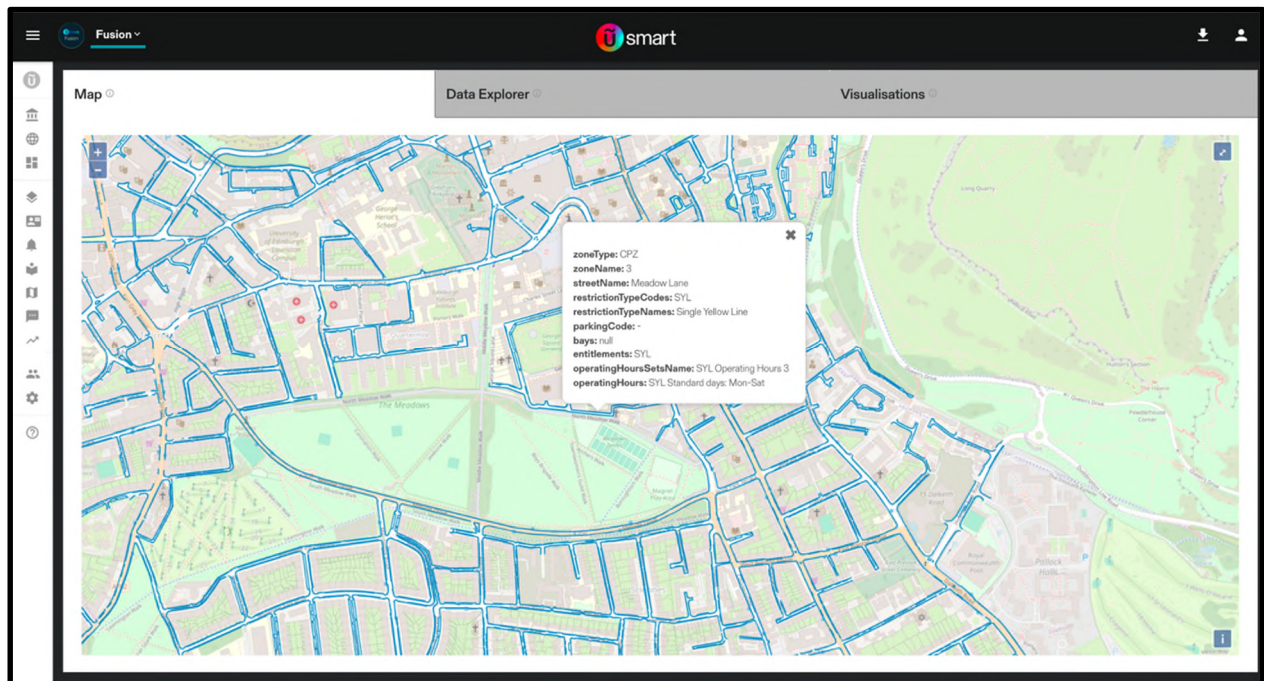
cycling infrastructure.

We aim to address and resolve the challenges in sharing and exchanging mode-specific road data, concentrating on critical kerbside usage (active travel, buses, parking), which has historically been segregated into purpose-specific silos. Our goal is to enable data sharing and refine this data into easily accessible and actionable formats, thus breaking down a major barrier in data utilisation.

The current uMove platform, embraced by Cycling Scotland, serves as the backbone for their national monitoring framework. uMove fusion expands on this, adding data on broader road usage, particularly kerbside activities crucial for advancing Active Travel initiatives in communities. Appyway's kerbside TRO system holds detailed insights on parking infrastructure along kerbsides. By combining forces, both systems will evolve to interchange and integrate diverse data sets, fostering a more cohesive and user-friendly approach to mobility data.

This amalgamation streamlines access to comprehensive road network information, saving valuable time and resources. This efficiency not only aids users in decision-making but also reallocates more funds towards active travel and decarbonisation initiatives.
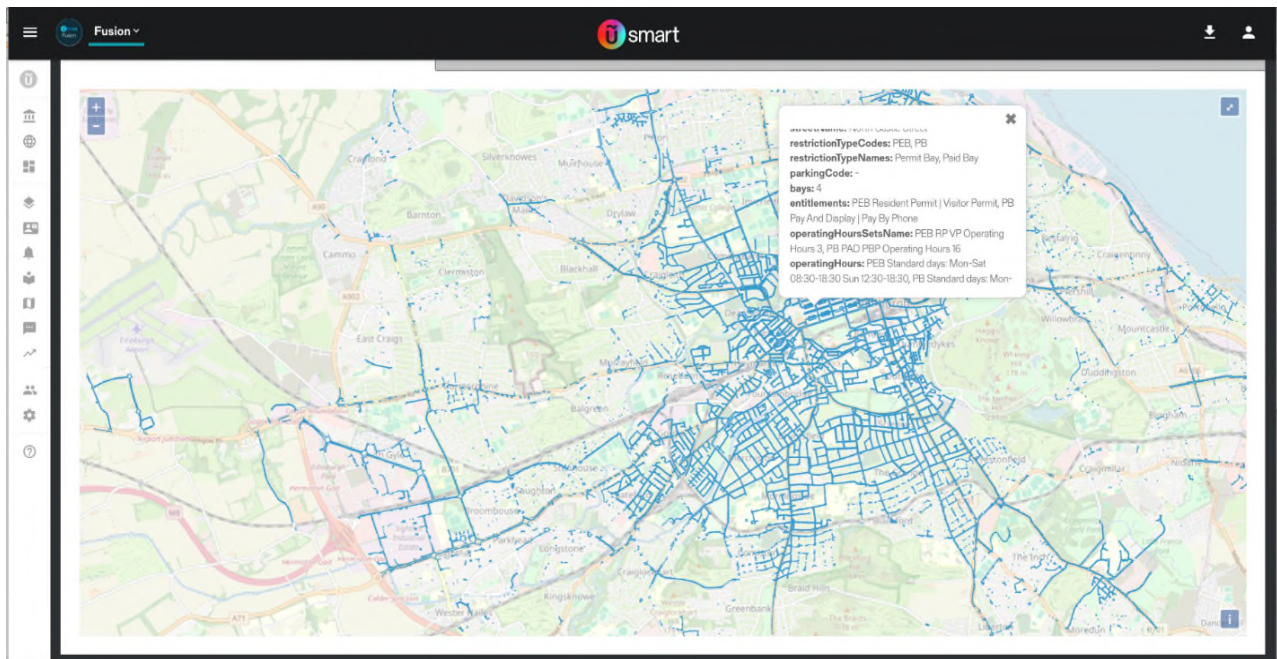
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