

Review of Future Mobility Services Across the SCR

Executive Summary

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Future mobility is a broad and rapidly evolving area. Technology is constantly advancing, and this is driving an unprecedented pace of change that will impact our cities, environment and way of life. This report considers these changes by analysing global transport trends and emerging technologies (grouped into key themes), interpreting the principles set out in the DfT's Future Mobility: Urban Strategy (2019) report and benchmarking where the SCR is now in relation to these principles, and providing a set of recommendations and actions which the SCR should seek to implement to help propel the City Region to the forefront of future mobility. A summary of the report findings is presented below.

Key Themes

- Data and Digital Lifestyles** - The ubiquity of the Internet and smart phones have changed the way we go about our lives and will continue to do so. This has led to the rise of on-demand mobility services including, for example, Uber, Lyft, Deliveroo and Ofo which, in turn, has resulted in a trend towards people increasingly viewing mobility as a service rather than an asset to be owned.
- Integrated Ticketing and MaaS** - a high quality and seamless integrated ticketing system which enables seamless travel across different modes and simple payments is increasingly what customers expect. London and TfL have been successful in this regard, underpinned by the fact that they control three modes of travel. With the onset of new disruptive technologies (bike share, ride share, demand-responsive transport) controlled by private operators, the challenge is now how these new mobility models can be integrated into a more holistic offering. There are significant challenges to the implementation of MaaS as it requires data sharing and transparency between the users, public and private operators. Transport Authorities have an important role to play in setting open data policies and frameworks and creating the right ecosystem and conditions to attract business and users to use and share data.
- Active Travel and Micromobility** – Trends indicate that there will be an increase in sustainable transport usage over time, with an increasing number of people opting to travel via public transport and active modes. A number of factors are driving this change, including environmental concerns, and an increased awareness of health issues and the benefits that cycling and walking can bring in addressing these problems. E-bike sales are increasing year on year, offering particular advantages in areas with hilly terrain and for those with limited mobility. E-scooters are the latest entrants to the micromobility sector, gaining massive popularity in many European and American cities because of inexpensive costs, however their use remains illegal in the UK to date.
- The Future of the Bus** – Trends show that bus passenger numbers are decreasing. It is likely that many factors are accounting for this change – reductions in Government subsidy have resulted in a reduced network, and smart phones have been a game-changer in terms of on-demand mobility and travel choice. These trends have altered people's expectations regarding travel meaning, over time, traditional bus services are becoming less attractive. However, ride-hailing services do not address wider issues, such as congestion and air quality, and while these issues remain, a public transport system involving the bus will always be needed, but perhaps in a different form such as demand-responsive transit.
- Mass Transit** - Despite rapid technological developments in mobility and changing consumer behaviours, the role of mass transit in future mobility is unlikely to diminish. In urban areas where population density is high, moving large numbers of people will be vital to success. Furthermore, mass transit is key to addressing wider issues such as congestion, air quality, carbon and parking, particularly in mitigating against the risks of increased vehicle trips posed by autonomous vehicles and new mobility models.
- Low Emission Vehicles** - Reducing carbon emissions from transport is a key part of the UK's strategy to reduce overall CO₂ emissions. Finding ways to reduce the car mode share, and to encourage use of low and ultra-low emission vehicles, is important. Trends suggest that electric vehicle uptake is set to increase

significantly over the coming years, whilst taxi fleets are increasingly decarbonising and electric buses are starting to gather pace. The use of hydrogen as an energy vector has also been increasingly viewed as a credible option for decarbonisation, and cities including London, Liverpool, Belfast, Brighton, Aberdeen and Birmingham currently have hydrogen bus projects underway or in the planning phase.

- **Connected & Autonomous Vehicles** - CAVs refers to a wide range of vehicle types including cars, public transport, autonomous trucks, and autonomous aerial ridesharing vehicles (air taxis). Whilst still in their infancy, CAVs are due to increase significantly, with forecasts suggesting that all vehicles produced in the UK by 2027 will have at least Level 3 technologies (where drivers do not have to monitor the driving but must always be in a position to resume control), and that there will be a 25% market penetration of fully autonomous vehicles by 2030. Autonomy is also beginning to emerge in public transport, with trials of autonomous buses taking place in cities including Manchester, Edinburgh to Fife, and Singapore. In logistics, Volvo have developed and trialled the Volvo Vera - a fully autonomous truck without a passenger cabin.

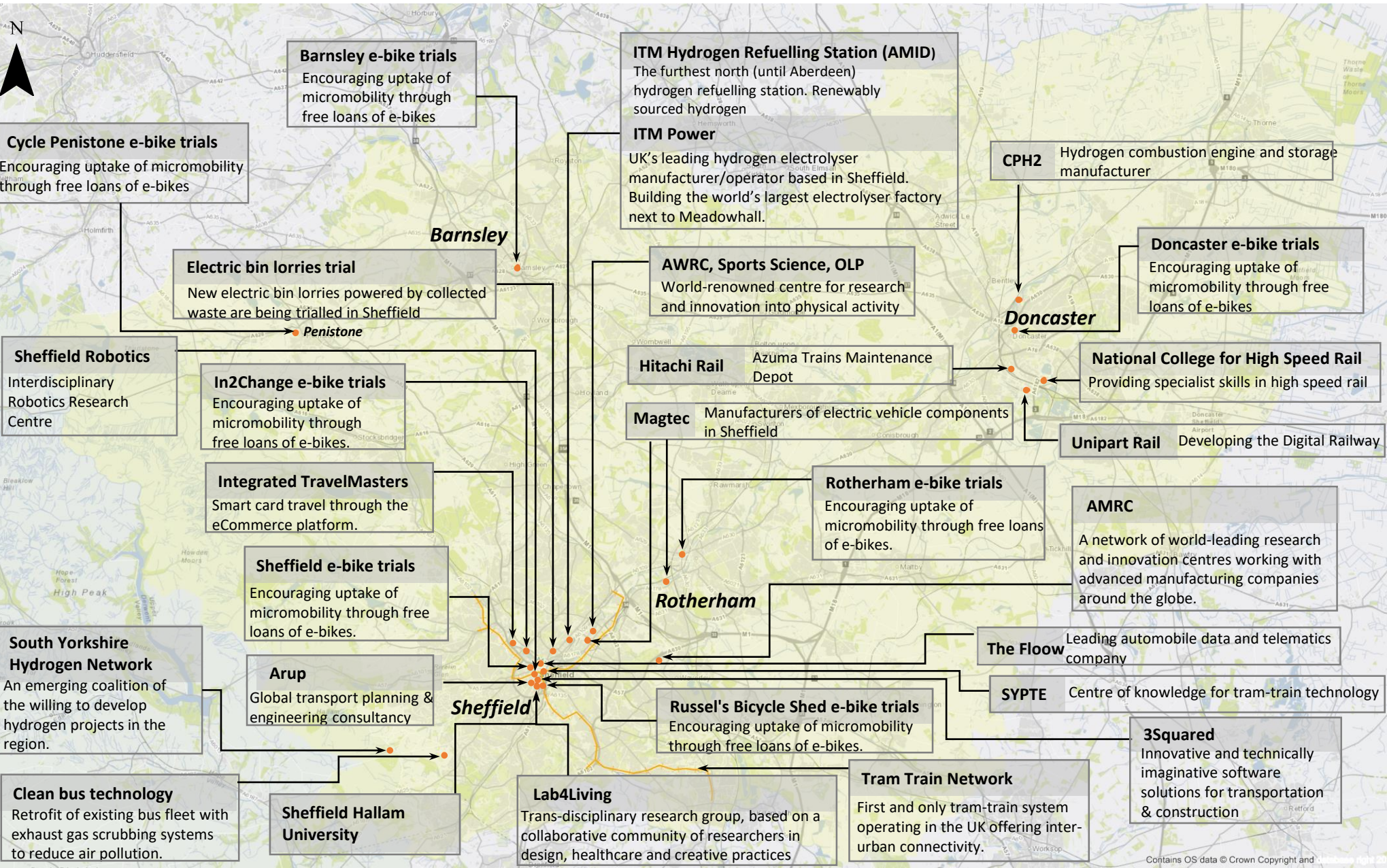
‘Air Taxis’ are also starting to gather pace, with Uber developing its aerial ridesharing capabilities through Uber Air which, by 2023, plans to give riders in Los Angeles, Dallas and Melbourne the option of an affordable shared flight in an electric vertical take-off and landing (e-VTOL). Whilst the aircraft will be manned at first, it is anticipated that these will transition to become fully autonomous over time as technologies develop.

- **Logistics** – new technologies are emerging in logistics as companies look to automate processes, increase efficiencies and reduce costs. The use of drones for deliveries is one example which could have a transformative impact on logistics operations, however, legislative changes, coupled with technological advances, will be required to permit this. Robots are also being developed to deliver goods such as groceries to customers. Another example is truck platooning, which is the linking of two or more trucks in convoy using connectivity technology and automated driving support systems.

Sheffield City Region Context

A review of the SCR Transport Strategy has been undertaken to understand existing transport priorities and travel demands within the region. A spatial portrait of existing SCR Future Mobility assets and capabilities has also been developed in collaboration with stakeholders within the region, to understand where the City Region is currently with regards to future mobility technologies and capabilities. In undertaking this future mobility review, we have engaged with the Local Enterprise Partnership to help identify the existing assets and capabilities within the SCR and to shape the recommendations set out in this report in the context of the emerging Strategic Economic Plan (SEP) and Local Industrial Strategy (LIS). Having undertaken this review, it is apparent that there is already lots going on in SCR, both in terms of physical assets and intellectual effort, which can be built upon.

Existing Assets & Capabilities in the SCR



Governance

Successful adoption of future mobility technologies and services in SCR is reliant not only on technological advancement, but also on the governance and regulatory regime within which they operate. A progressive and adaptable approach to governance and regulation is required to readily accommodate rapid and at times disruptive change.

An outcome-based approach

Unlocking competition and commercial opportunities for innovators to test and expand new services and delivery approaches is a key role for the City Region. The City Region, with its partners, should examine how their approach to procurement can evolve to focus on outcomes and not be too prescriptive by specifying how this is achieved. An important step is the trialling of an outcomes-oriented approach to procurement. This new approach can provide space for the market to dictate the most effective means of achieving the Combined Authority's desired outcomes.

SCR can further this approach of shaping the market by examining different business models. This means that the Combined Authority needs to consider opportunities to charge more for the mobility solutions that do not support their outcomes, and to subsidise the ones that do. This is not just about the frequency or service or number of vehicles, it goes beyond this to include the social and environmental outcomes which the City Region is aspiring to achieve.

Key to making this shift is the Combined Authority's role in regulation. The review of how existing services are performing against changing customer expectations will help to inform if and how the governance and delivery of public services might change to deliver an overall solution and transport mobility, social mobility and environmental improvements at the same time.

In the public interest

There is an important role for the City Region to mitigate against any risks of new mobility models. It must take this responsibility pro-actively and boldly, specifying up-front what the Combined Authority and the Local Authorities want from service providers and ensuring these parameters are operated within. This is reflected in the Government's Urban Mobility Strategy principles, for example the emphasis on safety and integration. This balance of risk and reward can be difficult to judge, which is why piloting of new mobility solutions is a key tool. These pilots should not only be about whether the solutions work for the users, but also to understand what wider impacts it might have.

Unlocking Data

The opening up of data has significant potential for the development of new services and solutions. This needs to be set against the importance of data security and privacy, but the City Region has the opportunity to explore how data can be made more open. Working with the Open Data Institute and local digital companies should be a key step in exploring the potential, learning from others and helping to ensure the opportunities are developed to comply with GDPR. The un-locking of data can also support better city planning, not just from a mobility perspective, but also to look at the whole system of planning to support better and more predictable outcomes.

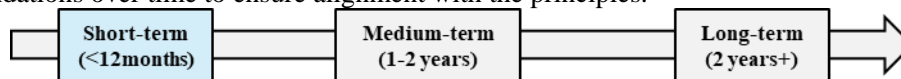
Focus Areas & Recommendations

The global future mobility trends research and SCR assets and capabilities spatial portrait has been used to assess and benchmark where the SCR is now in relation to the DfT's Future Mobility: Urban Strategy principles, which has formed the basis for the recommendations set out in this report. In addition to the recommendations, we have also identified five key moves that we think SCR could take now, to drive change and propel the City Region to the forefront of future mobility. These are summarised below:

Key Moves

1. Publicise the great work already underway in the future mobility space in Sheffield City Region.
2. Create a transport data platform for Sheffield City Region.
3. Identify and realise opportunities to test future mobility technologies.
4. Foster a network of mobility technology companies and service providers.
5. Review changes to the governance and regulation of SCR's transport system to deliver future mobility solutions.

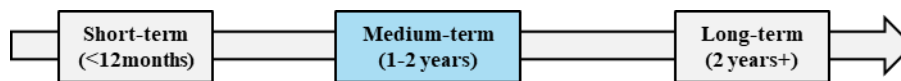
The full list of recommendations and indicative timescales is provided below. SCR should consider and progress these recommendations over time to ensure alignment with the principles.



1. **Work with experts from the digital community, for example .shf and Sheffield Digital, to engage with the issues from their perspective.***
2. Ensure the SCRCA and partners understand what industry standard specifications are for new technological/data developments and ensure they are applied in the design of physical and digital infrastructure undertaken.*
3. **Teach people digital skills, by identifying target groups and designing and implementing a programme to achieve this.**
4. Ensure designers understand cultural aspects so that our transport network is inclusive for all.*
5. Ensure all new cycle routes are designed so that they are inclusive for all, for example by ensuring they are wide enough for tricycles.*
6. Provide bicycle hubs with safe and secure cycle parking and provision for e-bikes throughout the region, which are linked in to the wider cycling and public transport network.*
7. Investigate and formulate a view on the use of e-scooters in the region.
8. Explore provision of more feeder services to public transport hubs to create a more integrated system.*
9. Improve integration of active travel modes with public transport, for example by creating cycle routes and providing safe and secure cycle parking which are well-integrated with tram and bus stops.*
10. Explore options for alternative rolling stock and infrastructure combinations to reduce renewal and maintenance activities (e.g. catenary free systems, battery and hydrogen powered trams, etc.).
11. Explore options for autonomous running of the tram network in the future.
12. **Progress further work on zero emission buses to deliver on this ambition. This should include reconfiguring the network to achieve this, if necessary. The existing network should also be reconfigured to accommodate measures including 24 hour bus lanes and bus priority***
13. **Explore and trial the use of hydrogen as an alternative fuel for freight at key regional hubs in Doncaster and Barnsley, and identify opportunities for trialling hydrogen for public transport and bin lorries.**
14. Set higher standards for vehicle engine cleanliness through bus partnerships, with Euro VI diesel as the minimum expected across South Yorkshire, until the fleet is eventually replaced by electric buses.
15. Ensure alignment between energy strategy and transport projects.
16. **Align the SCR roads Implementation Plan with RIS2 and encourage data sharing between Highways England and local authority's systems to better integrate data relating to traffic flows, congestion and collisions and provide integrated journey and routing information.***

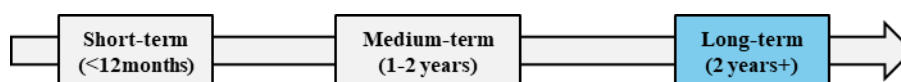
17. Investigate the use of intelligent ‘flex kerbs’, which enable dynamic uses throughout the day to prioritise space based on demand.
18. Investigate mobility pricing, with charges for vehicles based on occupancy*
19. Develop the future mobility capability of the City Region’s technology and logistics sectors by trialling drones and delivery robots.*
- 20. Trial demand-responsive transport. Possible locations include rural areas of Barnsley, an urban area, and the AMID.***
21. Consider the outcomes of the Bus Review in the context of future mobility and creation of a more open and competitive marketplace, balanced against the need to provide an integrated and efficient public transport network.
22. Host a workshop with attendees from different parts of corporate services and the private sector to understand how best to procure new mobility which can still demonstrate value for money for the public purse.
23. Identify opportunities for trialling the TfN Integrated and Smart Travel Programme in SCR.
24. Work with transport operators to make the Integrated and Smart Travel Programme happen as soon as possible.
25. Undertake an open data survey, measuring levels of integration and identifying challenges/opportunities. Involve the Open Data Institute in this process.
26. Investigate how data from the future concession of the tram can be shared.*

** To be progressed in the short-term and continue through the medium-to-long term*



27. Make public transport cheaper for those who cannot afford it (structured tariff based on means to pay).
28. Encourage greater uptake of e-bikes, for example through CycleBoost and provision for e-bike charging stations at key public transport interchanges and cycle hubs.*
29. Be proactive in trialling new technologies in public transport, such as autonomous buses.*
30. Simplify the existing ticketing and payment offer through the TfN Integrated and Smart Travel Programme. It is important that ticketing reflects current lifestyle trends, for example, prepaid tickets which can be used as and when required, to meet the needs of people who work from home or do not work fixed hours.
31. Develop a strategy for adoption of zero emissions fuels by the City Region’s logistics businesses.
32. Develop the future mobility capability of the City Region’s technology and logistics sectors by trialling autonomous goods vehicles and truck platooning on the City Region’s motorways and major road network.*
33. Structure regulation and procurement processes to gain access to data generated through contracts let by the City Region and through services using the assets owned and maintained by the City Region.
34. Establish a data platform to encourage development of new mobility services and solutions.

** To be progressed over the medium-to-long term*



35. Ensure that a mix of payment methods are maintained for all transport modes throughout the city region, and do not transition to a fully cashless system until society is ready for this change to ensure the transport system is inclusive to all members of society. Contactless is only suitable for those who have cash cards, and some people will want / need to use cash. As part of this explore the introduction of a ‘Mobility Credits’ scheme to support those who prefer to pay by cash through a ‘top-up’ system.
36. Rationalise buses and trams on arterial routes, aligned with the renewal of the Supertram concession in 2024.
37. Move to a more outcomes focused procurement process to encourage innovation and broaden the marketplace.