

Draft v3

Connected Mobility

Implementing a
connected mobility
strategy for the North

July 2023



Draft



Contents

Executive Summary	2
Background	4
Connected mobility what and why	4
Industry context	6
Passenger context	8
Local context	10
Strategic Purpose	17
Strategic Focus and Governance	20
Supporting Transport for the North's regional offer	20
Governance and RACI	21
The Future of Ticketing Systems	22
Pay as You Go	22
Multi-modal ticketing	23
Barcodes, QR and new tokens	24
Smartcards, legacy and new	24
Fares and retail reform	25
Data and Infrastructure	26
Open data and open source	26
Journey planning and disruptions	27
Data integrations across place and mode	28
Data standardisation and interoperability	28
Enabling supplier and industry innovation	29
Infrastructure and procurement	29
Future Mobility	30
Demand responsive transport	30
Micro-mobility integrations	31
EV and carclub integrations	31
Integrating active travel	32
Connecting to mobility hubs	32
Future facing and innovation	33
Measures of Success	34
Stakeholder Engagement	36
2023/2024 Activities	38
Definitions	41
Appendices	42

Executive Summary

The North's vision is for a seamlessly interconnected mobility ecosystem, where all transport modes are effortlessly accessible to passengers in networks relevant to local markets.

This will be achieved by implementing dynamic Pay-As-You-Go ticketing systems, bringing flexibility to passengers, alongside helping the region understand and adapt to evolving travel behaviours as well as delivering interventions and integrations that make public transportation more appealing, and affordable.

Across the North there are extensive plans to revolutionise mobility, addressing the challenges of reduced patronage, changing travel habits, and cost of living pressures. We will support, add value to, and help facilitate these through delivering a holistic and collaborative approach for the region.

Ultimately delivering integrations across transport modes and locations will enable improved decision making, predictability, and personalised travel experiences across and help deliver a cost effective and joined up end-to-end journey experience for passengers.

Our role:

- Establishing and facilitating collective activity across the north to include the development of standardised documentation (incl. commercial, procurement, technical)
- Identifying areas of joint interest across the North, set out and deliver a plan for each area (e.g. preparedness for multi-operator Pay as you go both at a local level and in readiness for any national initiative)
- Identifying areas where there are economies of scale (e.g. joint procurements) that indicate the benefits of joint working
- Supporting development of funding bids and supporting business case development with partners to enable draw-down of central government and other sources of funding

Our Connected Mobility Strategy sets out that we will:

- Build on existing successes and identify the medium and long-term foundations to collaboratively expedite delivery of connected mobility for passengers across the North and beyond.
- Develop a user-centric and placed-based evidence base that supports and empowers local decision-making whilst also identifying where more joined-up investment in technological delivery would benefit areas
- Develop a combination of policy position statements across thematic areas and common delivery and procurement frameworks / strategies to support greater efficiencies and economies

The Strategy is split into three thematic areas under which we should be providing support and enabling collaboration across Northern authorities.

Underlining each of these themes is our overarching aim to help expedite delivery for passengers, support the priorities of our strategic transport plan and to reduce the duplicated cost and effort required across partners in realising their connected mobility ambitions

There are also wide interfaces across other TfN workstreams (see appendix A)

We will introduce a Connected Mobility Implementation Group - designed to provide a singular point of engagement allowing the North to speak with one voice on connected Mobility - to determine the areas of focus and work programme for each financial year and ensure it provides real benefit and added value for authorities and passengers across the north

This will also see our Connected Mobility Hub concept built upon as a collaborative delivery vehicle for resources interfacing with TfN's regional centre of excellence ambitions but also national shared resources.

The three themes:

→ **The Future of Ticketing**

→ **Data and Infrastructure**

→ **Future Mobility**

Background

Transport for the North's original Strategic Transport Plan set out clear ambitions for smarter and more integrated travel across the North. This has progressed, with lessons learned from the Integrated and Smart Travel programme, to a new strategic priority in the refreshed Strategic Transport Plan highlighting...

"The importance of local connectivity and multimodal integration in providing door-to-door sustainable transport for people and goods. There is a need invest in improving local connectivity and how this helps address the extent to which our current transport system too often acts as a barrier and how this represents an opportunity to decarbonise transport."

Transport for the North is not a delivery body but has a key role in enabling and facilitating this strategic priority.

A report to our Board in September 2022, identified the following issues:

- A lack of capacity and capability to take forward initiatives at the local level
- A lack of experience developing specific proposals, including a lack of knowledge of legislative and regulatory frameworks
- A lack of capacity and experience when it comes to procurement and delivery of technical proposals

What is 'Connected Mobility'

Connected Mobility covers the delivery of smarter and more integrated transport networks, and the systems that seamlessly connect passengers to the places that matter to them across regions, modes, and technologies.

This includes payment and journey planning, integration of modes and routes across geographical and technological boundaries, and the underlying processes, data systems and structures that will enable it.

It aims to deliver:

- Seamless Payment and Retail
- Integration Across Modes
- Enhanced Journey Planning
- Integration Across Regions
- Better Journey Choices
- Passenger Focused Innovation

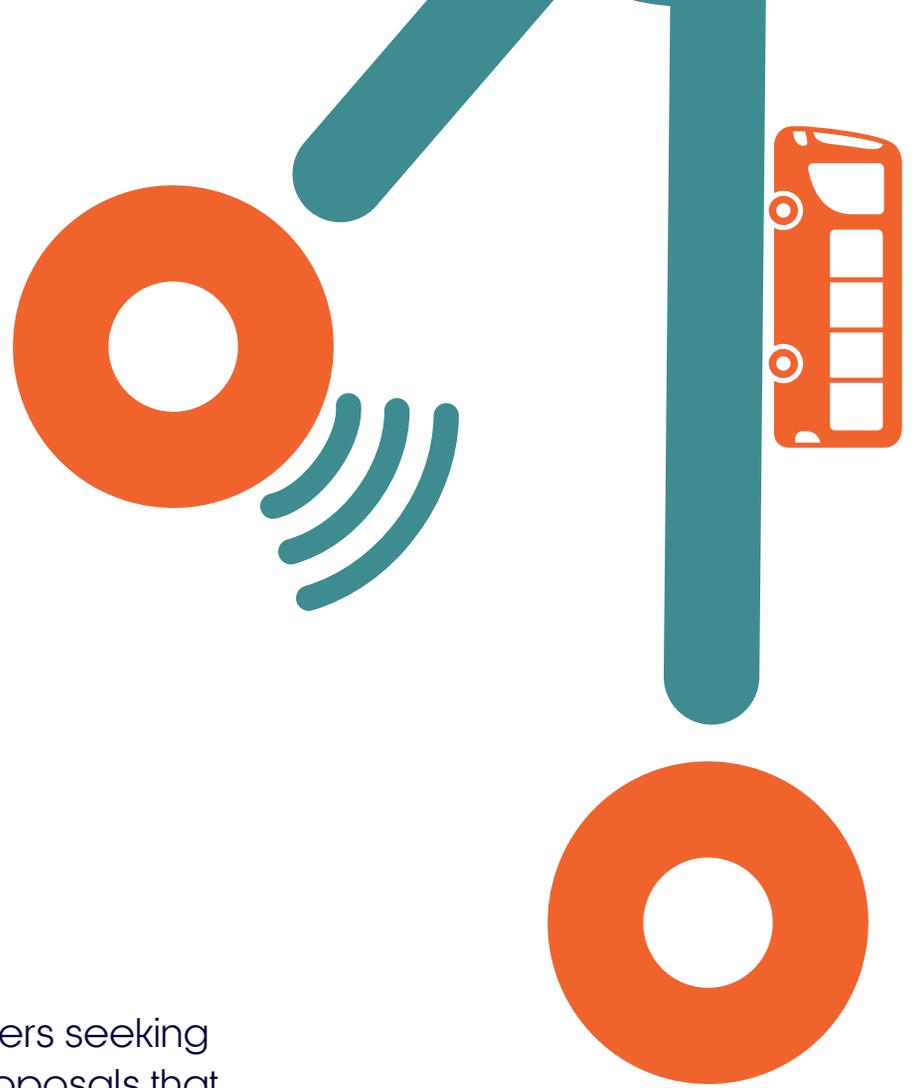
These issues do not affect all Transport for the North partners equally, with the larger Mayoral Combined Authorities better placed to take forward work to deliver connected mobility than others.

From discussions across the North, there is clear support for Transport for the North to support the region by introducing a Connected Mobility Strategy with a view to:

- Providing technical support for those partners seeking to develop and implement user-centric proposals that deliver connected mobility.
- Sharing accumulated knowledge and experience from proposals introduced in the North to the benefit of subsequent proposals.

Unlike the central delivery focus of the Integrated and smart travel programme, the approach underpinning the connected mobility strategy is to add value, capacity and support to local delivery and decision-making around digital and ticketing interventions. This role is developed further below.

Similarly the multi-modal and place-based focus of Connected Mobility means it will engage and support across a multitude of our workstreams. Ranging from supporting the priorities of Strategic Transport Plan to more detailed interfaces with programmes across rail, roads, rural mobility, international connectivity and decarbonisation.



Industry context

In addition to the above, the situation locally and nationally has changed in the two years since the end of the Integrated and Smart Travel programme.

Patronage

Clearly the pandemic has put massive pressure on public transport and most operators are struggling to regain patronage to pre-pandemic levels. This, in turn, is putting pressure on Local Authority finances. Managing these commercial realities whilst capturing the benefits of digital interventions is even more important than was the case before the pandemic.

It is worth noting that patronage across areas of the North have recovered promising rate.

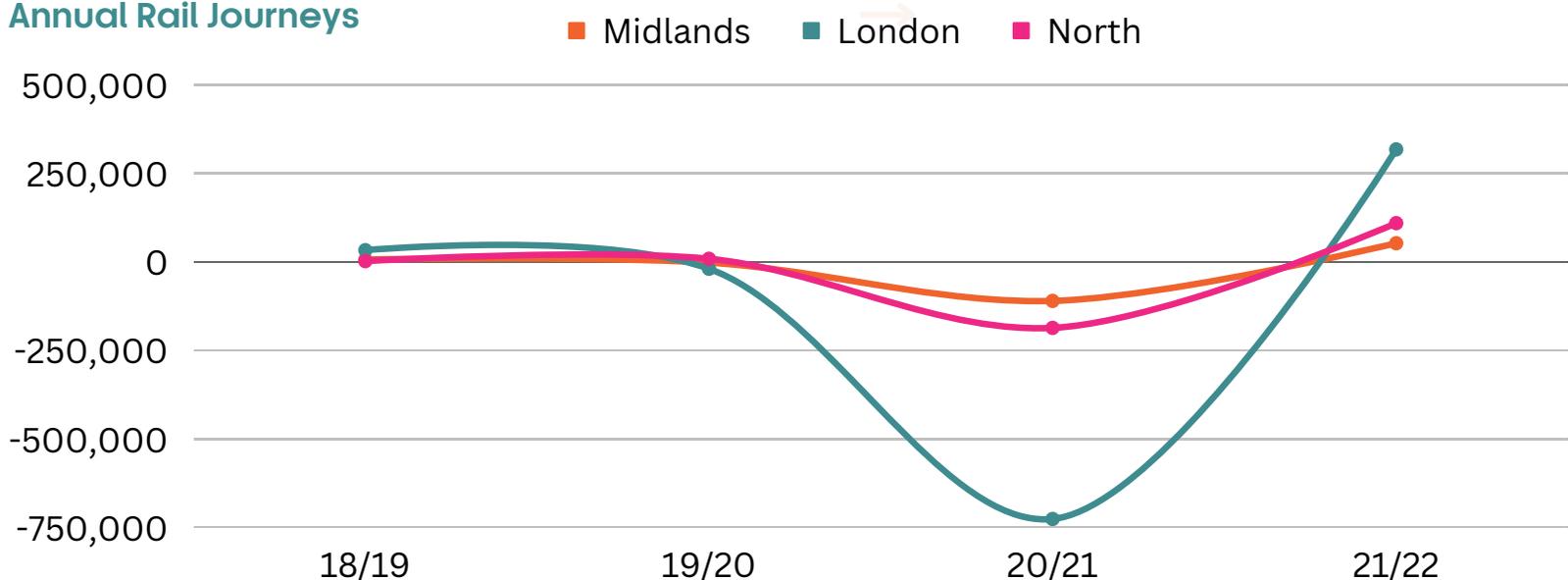
This leaves the North ideally placed to test and develop connected systems that can build on and support even further recovery and growth.

Rail / Great British Railways

The work in Rail on smart ticketing has been driven by the Plan for Rail, together with related government manifesto commitments. This work is largely being led by GBRTT (the transition team that has been formed in advance of the legal establishment of Great British Railways).

GBRTT's plans involve projects both for 'line of route' tap and cap for longer distance train operating companies and 'place-centric' projects where Authorities are well placed to deliver a multi-modal offer. These will be supported by a national account-based fares 'engine' with targets to deliver this within the spending review window to 2025.

Annual Rail Journeys



Source: Office for Road and Rail Regional Passenger Usage

NOTE: London figures inflated due to transfer of Underground patronage to NR via Elizabeth Line.

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Bus and the broker solution

Over recent years, all larger bus operators have introduced payment by contactless bank card, with some introducing tap and cap for their own products. Many have invested significantly in electronic ticket machines and back-office functionality, so interventions need to recognise the evolution of operator infrastructure. Light rail systems across the UK, largely with Authority support, are also developing tap and cap offers.

In 2020, the larger bus operators formed Project Coral which aims to deliver a 'broker' system. The broker will process 'taps' to see if a customer should have been entitled to a capped product, e.g. when they reach a multi-operator cap. Any reimbursement / reconciliation needed between operators will then be resolved at an agreed point, e.g. at the end of each week. In parallel, Transport for the West Midlands has been developing a similar approach.

Department for Transport has recently agreed that a joint Project Coral / Transport for West Midlands project is the right way forward, with some initial funding support. Midlands Connect is developing a business case for the roll-out of the solution beyond the West Midlands, which could be of great benefit to all TfN's partner Authorities - preparedness for which we are currently modelling across authorities.

Local Authorities

Our members have also been making progress, but this has been variable depending on bus service improvement plan focus for activity, operator ambitions, success or otherwise in obtaining central government funding, and access to resource and / or expertise.

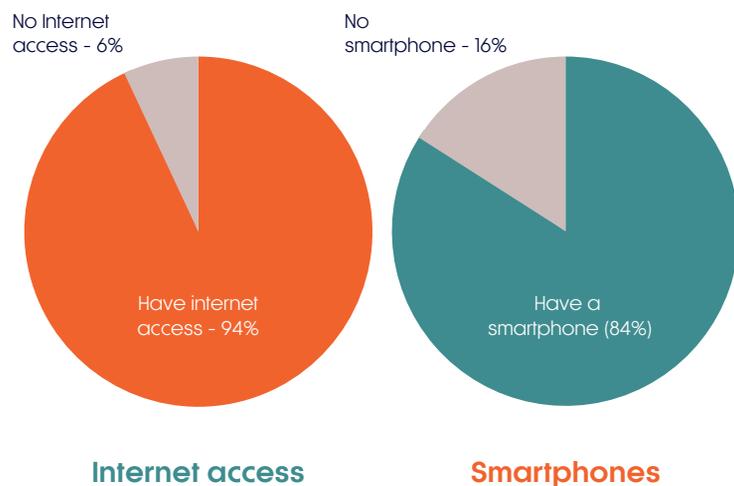
Whilst progress made is to be welcomed, Transport for the North has a role to play in ensuring that the learning from initiatives taken forward by individual partners is shared more widely.

Such a role is consistent with the desire from Department for Transport for Sub-National Transport bodies (STBs) to play an active role in reducing duplication of effort, thereby accelerating implementation of proposals and reducing the incidence of avoidable costs being incurred.



Passenger context

Technical Literacy / Digital Access



Source: <https://www.finder.com/uk/mobile-internet-statistics>

Over the past decade digital literacy and access to the internet has improved significantly, with 94% of adults being internet users in 2023, an increase from 80% in 2010. Digital systems are increasingly integrated into day to day life and educational curricula.

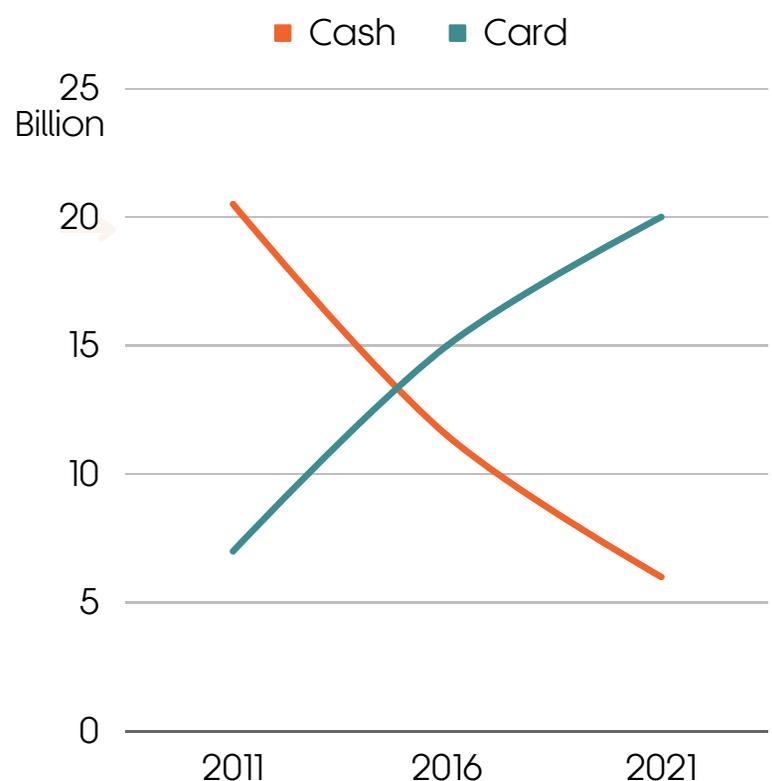
However there remains a "digital divide", affecting disadvantaged socio-economic groups, older adults and rural areas. These groups are oftentimes those most reliant on public transport to access key services and systems.

So either alternatives must be provided or infrastructure and accessibility to digital systems improved.

Attitudes to Cash

In the past decade, the UK has seen a significant move from cash to digital and contactless payments, driven by convenience, speed, and the COVID-19 pandemic. By 2019, card payments even surpassed cash as the most common payment method.

However, this shift has not been uniform, with older and rural populations often still relying on cash due to habit, limited digital literacy, or lack of access to digital options. This has raised concerns about potential exclusion of these groups, and the unbanked, and prompted discussions about maintaining cash accessibility.



Source: UKFinance

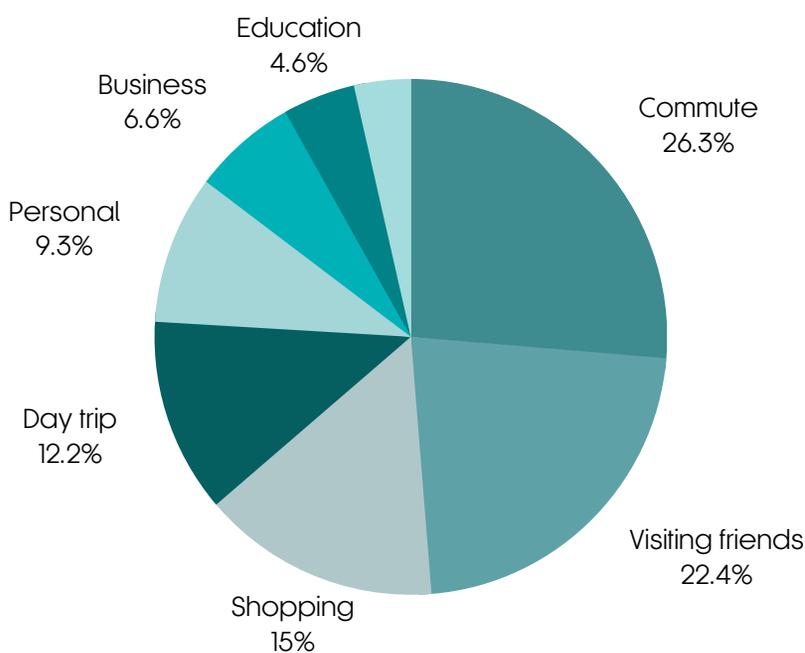
Travel Patterns

The COVID-19 Pandemic led to a sharp drop in public transport use - due to social distancing, lockdowns and increased remote working. This has resulted in challenging financial environments, and necessitated government funding, as people moved back to private car use or made more local journeys via active travel.

Likewise the rise of flexible and hybrid working has reshaped the traditional understanding of a commuter market. Demand has changed as mon-fri commutes have become less regular and instead new peaks have emerged mid-week.

These changing levels of demand have reduced peak-time congestion but have made it harder to plan networks, or for traditional ticketing products to remain relevant; with passengers preferring more flexible options.

Split of journey by purpose (all modes)



Source: National Travel Survey

Links to Social Exclusion

Our research shows that 3.3 million people in the North live in areas where there is a high risk of social exclusion because of transport issues. This risk is higher in the North than the rest of Transport and the social inclusion challenge in the North with 21% of the population of the North living in areas with a high risk, compared with 16% of those in the rest of England

Factors around rural isolation, cost or network provision can factor into this; similarly the aforementioned digital divide can exacerbate it too.

Ticketing, journey planning and data infrastructure should be prioritised around reducing this risk of exclusion and increasing accessibility to services and opportunities by public transport. Integrating products and tools across regional barriers would support this.



Places context

Commuter Towns

Commuter Towns are typically smaller towns and suburbs which neighbour Large Conurbations, with strong economic and commuting linkages to these large cities.

Requirements

Main focus is on delivering reliable multi-modal hub and spoke transport options.

This requires reliable journey planning tools, linked to viable and integrated ticketing products, that work across boundaries to support the hub and spoke model.

Timetables and ticketing should align with local services provided, including supporting the leisure and night-time economies.

Many commuter towns may be in areas which struggle to finance bus services and would benefit from funding of their Bus Service Improvement Plans and other external funding

Example: Warrington

Warrington Borough Council's Enhanced Partnership has a focus on frequency and reliability including investment in bus priority along key corridors, along with new and higher specification / zero emission buses.

Connected Mobility Plans include:

- Lower fares / simplified fare structure
- Multi-operator ticketing offer
- Enhanced options for payment (e.g. Touch-on, touch off reader equipment allowing fare capping)
- Updated multi-modal network maps
- A Warrington-based tap and cap offer initially with an aspiration to address cross-boundary services in due course.



Large conurbations

Large conurbations contain 51% of the North's population. They benefit significantly from economic agglomeration and generate greater productivity than the Northern average.

Requirements

Public transport must be integrated (ticketing, operations, infrastructure, and information) reliable, accessible, and inclusive for all users.

Bus services are the backbone of public transport networks in Large Conurbations, and franchising or Enhanced Partnerships offer the opportunity to provide affordable city-wide services and connectivity to other transport provision. Capped fares will help achieve affordability and reduce the risk of transport related social exclusion.

Large Conurbations are perfectly located to maximise the benefits of multi-modal enhanced journey planning, to enable the services to function as a single, cohesive network. Integrated digital management systems can feed into journey planning tools should be implemented for providing a more reliable information base for users to make their travel choices.

Example: Liverpool

Liverpool City Region's bus service improvement plan has five objectives:

Quick and reliable bus journeys; A comprehensive and integrated bus network; Straight forward ticketing and great value fares; An excellent passenger experience; An emission-free bus system.

Ticketing reforms include:

- To adopt a city region-wide fare zone for bus tickets
- To introduce a framework for ticketing, to support simplification
- To introduce new ticket types to suit passenger needs, such as short hop, hoppa and bundles
- To introduce account-based contactless, mobile and smart ticketing and reduce cash transactions as much as possible in order to speed up boarding times
- To improve the availability of good value multi-operator and multi-modal tickets
- To introduce fare capping, enabled by tap-and-go technology

Rural villages and dispersed

Rural Villages and Dispersed areas are rural districts geographically isolated from cities and towns. These locations are generally characterised by long distances, poor accessibility, and high levels of car dependence.

Requirements

Community based transport will play a key role for access to wider services and amenities. Policy aims should look to make private vehicle travel more sustainable, for example by switching to electric vehicles and community-led car clubs.

Digital connectivity is a foundation of delivering sustainable economic growth, reducing demand for journeys through greater opportunity for remote working and unlocking digitally connected demand responsive bus and logistics trips.

Active awareness campaigns, training, and fare incentives should be considered for car clubs, demand responsive transport, and scheduled bus services.

Example: Rural Lancashire (e.g. areas of Ribble Valley)

The enhanced partnership covers the whole of Lancashire. Specific to rural areas are:

- Work to provide affordable public transport to disadvantaged and isolated communities
- Work with the health sector to make sure that people can connect with the health provision they need
- Work with operators to introduce a new Smartcard technology covering multiple forms of transport
- Improving the range of sustainable transport options available

Lancashire County Council has an interest in demand Responsive Transport which could potentially address all the above.



Transformational

They can be characterised as particularly dynamic and successful local economies, with productivity and employment growth above the national average.

Requirements

Due to high levels of car ownership associated with workers in knowledge intensive jobs, there is a need to prioritise modal shift from private car to public transport.

Public transport must be integrated, reliable, accessible, and inclusive. Integrated ticketing with larger conurbation mass transit networks is required. For large centres of employment, such as Sellafield, timetables should be aligned with working patterns.

Ticketing must be smart and flexible, ensuring value for money for non-5-day commuters, as well as those working outside of conventional working times. Furthermore, due to high levels of flexi commuting, existing bus and rail stations should be adapted to act as integrated multi-modal hubs with inclusive design. Information and journey planning tools should complement the integrated transport system for users to make their travel choices.

Example: York

City of York Council has a comprehensive set of initiatives regarding fares and ticketing including:

- Fare reductions for young persons (a low, flat fare for young persons aged under 19; free bus travel for up to three children when accompanied by an adult; targeted fare reductions for the 19-25 age group)
- An app-based All York Ticket
- All York tickets for off-bus purchase which can be marketed through employers and to residents of new property developments
- Review the range and pricing of All York tickets, ensuring they carry no price premium over single-operator tickets
- Develop a smart All York carnet of journeys ticket, which can be used alongside fares capping
- Support and promote PlusBus and work with train operating companies to develop local rail/bus products
- Work with colleagues in adjoining areas to develop a range of add-on tickets valid for both an interurban journey and local travel in York
- Investigate opportunities for sales of bus tickets as a means to access festivals and Major Events

Visitor

The definition of Visitor Destinations is focused on rural destinations and towns that attract large numbers of seasonal tourists each year. Visitor destinations tend to experience seasonal demand which requires a careful consideration for the transport infrastructure and modal splits in these areas.

Requirements

Local authorities can work with train and bus operators to deliver a tourist-industry friendly offer and timetable, complemented with reliable information systems. Leisure cross-modal ticketing could increase public transport provision uptake.

Example: Blackpool

Blackpool Borough Council's Enhanced Bus Partnership includes:

- Lower fares: Co-ordinating young person fares, making group and corporate travel attractive. Focus on locking people in with easy to purchase and renew season products. Also do more in terms of advertising the good value bulk ticketing
- Simplify fares: Multi-operator tickets, including co-ordinating fares for all, particularly young people
- Integrate ticketing between operators and transport: Develop multi-operator ticketing offer for the Fylde coast in association with LCC

Multi-operator ticketing will enable integration with the tram and good connections to rail services bringing visitors to the town. Fares policy does, however, have a focus on jobs and regeneration.



Towns within Metropolitan Counties

They are prominent around Leeds, Manchester, and Sheffield, where they can be found intermingled with Industrial Places and adjacent to large Conurbations.

Requirements

Due to their proximity to Large Conurbations and high percentage of people commuting, there is an opportunity for connectivity to large urban centres to support labour supply effects.

This needs to be balanced with local regeneration and improvement of town centres to avoid excessive amounts of commuting in peak hours and encourage more local trips.

15/20-minute neighbourhoods should be complemented with multimodal hubs where feeder bus services that link with rail stations are provided and/or for hub and spoke services

Example: Keighley

Keighley is a key town within the West Yorkshire Combined Authority area. The West Yorkshire BSIP has objectives around connected communities and integrated travel.

One interesting initiative is around 'more 'FlexiBus' Demand Responsive Transport schemes and Mobility Hubs to give people access to integrated, sustainable travel options built round their individual needs.

Around ticketing, the combined authority aims for:

- clear and simple fares
- • a common framework for bus fares
- • use and develop the MCard branded multi operator tickets
- • reduce the maximum price for a day's bus travel to a more affordable level.
- • introduce a multi operator "tap and go" capping system
- • buy travel in advance at discounted rates using mobile phone apps.
- trial a new form of mobile phone ticket which provides for travel over the next 90 minutes which will help people making two leg journeys using different company's buses.



Industrial Places

They are areas where employment is focused around 'traditional' industries, with typically lower levels of productivity and higher levels of economic inactivity and unemployment. They are typically located surrounding Large Conurbations.

Requirements

Focus should be on creating 15/20-minute neighbourhoods by improving sustainable transport connectivity increasing spatial proximity and enhancing digital connectivity.

15/20-minute neighbourhoods should be complemented with multimodal hubs where feeder bus services that connect them to rail stations and/or hub and spoke services.

Example: Gateshead

The North East Combined Authority bus service improvement plan includes:

- Region-wide affordable fares for multi-modal travel on all bus, Metro and Ferry services across the North East, as well as on selected rail services.
- Multi-modal fares available both as a ticket purchased before travel begins (from a bus driver, at a Metro ticket machine, online, or through a new app); and as a price "cap" that is automatically calculated and applied when a customer uses a contactless bank card, mobile phone payment app, or Pay As You Go smartcard to pay for travel.
- Value for money region-wide affordable fares for under 19s.
- A trial of "kids go free" for under 12s on bus services matching the offer already in place on Metro.



Strategic Purpose

The rationale of the Strategy is based on the following premise.

Every partner has their own priorities, depending on several factors including the operators in their area, ticketing products available, levels of technological maturity and infrastructure, current travel patterns and approaches being adopted to deliver more sustainable future travel. Regardless of priorities, however, there are many commonalities of experience.

There are a small number of suppliers in many areas of digital delivery, with many transport authorities working both with the same operators and same suppliers.

Working together would support better outcomes for all.

There is also a common set of technical requirements and challenges, depending on whether, for instance, ITSO smart cards, barcode technology or contactless bank cards are chosen. It can be both resource-intensive and confusing if every local transport authority must explore these themselves alongside creating risks making it harder to integrate across modes and regions later.

Transport for the North could facilitate access to resources and expertise; artefacts (e.g. specifications, templates); shared procurements and / or shared learning (e.g. Mobility as a service, pay as you go, multi-modal ticketing, demand responsive travel, future mobility).

This collaborative, cross-border, emphasis will also support government and HM Treasury. Working together across technological delivery and development will reduce duplicated funding asks and help spread and scale public funds in delivering passenger benefits quickly; rather than funding more pilots or consultative work.

Why?

- ① To be a catalyst for the sharing of best practice and the development of common technical and strategic digital approaches
- ① To reduce the duplication of effort, cost, and resource in delivering digital innovation across areas
- ① To make the case for more joined-up investment in the collaborative delivery of connected mobility systems

Outcomes for People and Place

The strategy will support delivery of:

- Seamless Ticketing and Retail
- Integration Across All Modes
- Enhanced Journey Planning
- Integration Across Regions
- Better Journey Choices
- Passenger Focused Innovation





Alongside this, the commercial viability of many interventions is limited without the benefit of economies of scale. For example, the number of transactions that pass through a particular system might make it viable for a larger geography in a way that would not be true for a single Authority.

Several national initiatives currently in development will also work most effectively with larger geographies and / or well-resourced Authorities.

Both Project Coral / broker for bus and light rail and the future ticketing and retail programme of Great British Railways have a common business model. This model requires that partners to onboard and access centrally offered services once they have acquired the necessary capabilities e.g. infrastructure (hardware and software) in place; established commercial agreements and management of revenue and risk; product range agreed.

Objectives

Defined by the Transport for the North Board in 2022

- 1 Build on existing successes and identify the medium and long-term foundations to collaboratively expedite delivery of digital mobility for passengers
- 2 Develop an evidence base that supports and empowers local decision-making whilst also identifying where more joined-up investment in technological delivery would benefit areas
- 3 Develop a combination of policy position statements across thematic areas and common delivery and procurement frameworks / strategies to support greater efficiencies and economies

Strategic Focus and Governance

The strategic focus of the Connected Mobility Strategy is to identify implementations that add value to local offers and projects. It builds on, adds value to and facilitates local ambition, decision-making and planning.

Role of Transport for the North

- Establishing of value adding activity to include the development of standardised documentation (incl. commercial, procurement, technical)
- Identifying areas of joint interest for across the North, set out and deliver a plan for each area (e.g. preparedness for multi-operator pay as you go both at a local level and in readiness for any national initiative)
- Identifying areas where there are economies of scale (e.g. joint procurements) that indicate the benefits of joint working
- Supporting development of funding bids and supporting business case development with partners to enable draw-down of central government and other sources of funding

Supporting TfN's Regional Offer

Transport for the North has an objective to be proactive in supporting authorities across the North and as such the activity and outputs delivered under the connected mobility strategy will be targeted towards and success measured against, supporting that golden thread.

This collaborative, cross-border, emphasis will also support government and HM Treasury. Working together across technological delivery and development will reduce duplicated funding asks and help spread and scale public funds in delivering passenger benefits quickly; rather than funding more pilots or consultative work.

→ Specific areas of focus will be determined by our membership and shaped around those which add the most value to them and the whole region.

This will require clear governance and steer from members as to what activities in this space should be, what the required outputs are and what the defined measures of success will be for each financial year.

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Governance

The above needs governance and mechanisms for effective oversight and engagement. It is also recognised that there is time overhead for partners, so the work needs to be focussed on active interventions.

It is proposed that this work will be undertaken under the banner of a Connected Mobility Workstream. In practice this will be delivered by our connected mobility team, some project management resource and external advice as required), together with resource from partners as appropriate to each defined project.

Governance will be in the form of a connected mobility implementation group. Each TfN member would be entitled to sit on the implementation group with each meeting focussed on identified project areas. Members would identify or elect a Chair and Deputy Chair to work with the connected mobility team to set out a programme of work for the year and oversee meeting management.

It is important that the group is pragmatic, with success measured in outputs and resources that add value to partners and are actively used to support local delivery.

The initial meeting of the Implementation group, and at a meeting once annually thereafter, should identify key indicators of success for each financial year.

This should be supported by qualitative feedback from members and be linked to a setting of the priorities that group have set for TfN's focus in the area of connected mobility.

Governance RACI

	Strategic Development and Review	Document Development (Templates, standards and research)	Joint Activity (Procurement, business case development, Programme Delivery)
TfN Executive Board	A	C	C
Connected Mobility Implementation Group	R	A	A
Connected Mobility Team	R	A	R
Member Transport Authorities	C	R/C	R/C
External Partners (e.g DfT, STBs and GBR)	C	C	C
Transport Operators	I	C	C
Supplier Marketplace	I	C	C

R = Responsible A = Accountable
C = Consulted I = Informed



The Future of Ticketing

(media, retail, payment and fares reform)

Pay as You Go and Account Based Travel



Passengers and authorities in the North of England seek a simple and seamless payment experience for public transport. With most buses accepting contactless payments and rail infrastructure funding available under Great British Railways future ticketing programme, this should be achievable. Transport for the North aims to assist the region in achieving this goal sustainably and relevantly to their existing plans.

We recognise that planned aggregator approaches may not always be relevant or necessary in all areas, such as those moving to a franchised network, and waiting for it could create unnecessary delay in implementing pay as you go capping; those areas should be free to introduce a capping ecosystem on their franchised network, in the same vein as single operator capping currently, with later integration with a regional/national aggregator for cross border travel and multi-modal travel.

We will strive to minimise duplicated efforts in applicable areas and ensure experiential and technological interoperability with neighbouring systems through any aggregator, starting from an early stage

Transport for the North will:

- Collaborate with Transport for the West Midlands, Midlands Connect, Transport for Greater Manchester and Bus Operators to promote and facilitate a single point of engagement for introducing a 'Broker' aggregation model.
- Work with Great British Railways to as a forum for defining and delivering regional Pay as You Go on rail and define how it integrates with other modes.
- Develop and provide toolkits and models that support pay-as-you-go delivery based on the authority types in Policy and Places Framework.
- Embed common technical specifications across regions and modes to ensure interoperability by design preventing silos and reduce future integration costs

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Multi-Modal Ticketing



The National Bus Strategy and the Plan for Rail emphasize the importance of multi-modal ticketing.

The North already has established multi-modal ticketing in areas linked to former PTE areas (now MCAs) delivered through mature Ticketing Schemes.

We will promote and build upon these schemes, as well as any franchised replacements, as examples of best practice to be scaled.

We will encourage the sharing of best practices and economies of scale in administering ticketing schemes, and facilitate the introduction of new schemes in areas aspiring for multi-modal ticketing

Transport for the North will:

- Create a comprehensive set of resources and toolkits for implementing multi-modal ticketing, including documentation on standardised governance, apportionment agreements, and operating models to minimise complexity for operators and local transport authorities.
- Establish a "Ticketing Schemes" advisory group with members from existing Ticketing Schemes and Ticketing Companies, working together to share best practices and promote increased standardisation.
- Investigate the possibility of partnering across multiple local transport authorities through TfN's statutory provisions to develop a "super" ticketing scheme that enhances efficiencies of scale and simplifies administration for new schemes.

We will look to scale, support and learn from our existing schemes:





Barcodes, QR and new Tokens



In recent years, there has been an exponential increase in the use of barcode/QR tickets for both bus and rail.

Approximately a third of rail tickets are now issued as barcodes, and other token agnostic solutions are emerging.

These tickets often support mTicket solutions, but unlike the ITSO standard for smartcards, there is limited standardisation on how they work, especially on buses where operators have implemented them in isolation with success.

Transport for the North will:

- Enhance standardisation of barcode business rules across the North, especially in a multi-modal setting, by leveraging industry and supplier experience.
- Build confidence among local authority partners and operators by serving as a single source of truth and promoting engagement as more barcode and token agnostic solutions are developed.

Smartcard (New and Legacy)



In the past, integrated ticketing was achieved through ITSO smart cards, and the North has several mature smartcard schemes. The English National Concessionary Travel Scheme still requires ITSO smart cards as the primary format.

However, as new media is introduced, ITSO smart card systems may experience reduced transactions and potential cost increases for ITSO delivery or new schemes. Where smart cards are maintained or introduced for commercial or ENCTS purposes, economies of scale should be sought through more joined-up procurement and administration as a legacy solution.

Transport for the North will:

- Collaborate with partners to support aligned tendering and procurement of ITSO systems, aiming to reduce transactional costs and drive economies of scale.
- Deliver insight into migration risks as regions transition from smartcards to new ticket media and advocate with the government for future media delivery of ENCTS entitlement.



The future of ticketing across the North and in a national context depends on fares and retail reform that reduces transactional costs while ensuring fares remain relevant and sustainable for passengers and operators. Simplification or reducing perceived complexity is key to fares reform, which can be achieved through technical innovations and greater local specification of fare structures. Regions across the North have plans to simplify their fare structures, and our priority is to build on that knowledge with added capacity and capability.

Retail reform is also a core focus for both rail and bus, and ticket office closures can be contentious. We recognise the strength of local transport brands, such as the bee network, Travel South Yorkshire, Nexus, MerseyTravel, or Metro, and aims to support and refine locally derived fare structures accessible to technical innovators. Ideally, local transport authorities can procure retail systems collectively to ensure uniformity in passenger experience and achieve economies of scale.

The North of England has experienced strong patronage growth and is recovering from the pandemic, but needs to respond to emerging trends to maintain and increase ridership.

Transport for the North will:

- Build place-based fares analytical tools for local transport authorities to model and decide on appropriate fare structures and mitigate risks for their networks.
- Advocate for local decision-making in fare structures for any nationally integrated solutions based on member authority areas' experience and conditions.
- Develop a business case for collective procurement of white-labelled retail solutions to secure economies of scale and uniformity of passenger experience.
- Research and model changes in travel habits post-COVID-19 and their impacts on travel products' retail and pricing across modes, days, and times.
- Spearhead radical fare structure reform across modes and develop collaborative pilots to encourage flexibility and maximise patronage recovery in the North.

Data and Infrastructure

(Enabling connections and information confidence)

Open Data and Open Source



TfN's integrated and smart travel programme played a crucial role in the Bus Open Data Service's initial setup, emphasising the importance of open data in driving transport innovation.

Open data enables easy access to transport data for technological innovators, driving passenger-focused innovation.

Open bus fares data could support technological development similar to independent retail on rail. The government's Transport Data Strategy highlights the importance of data sharing, quality, skills, user needs, and governance.

We aim to support the north of England in realising the benefits of open data and building local capacity and capability to benefit transport users and network development.

Open data enables better passenger experience, network planning, and strategic decision-making, as already demonstrated in the strength of TfN modelling across other workstreams.

Transport for the North will:

- Advocate for increased open data and standards in transport and communicate the benefits for passengers and authorities.
- Provide practical support to local authority partners in publishing, accessing, and utilising transport data where applicable.
- Work to embed Open API as technical requirements in the specification and procurement of new systems.
- Produce guidance and clarity on local responsibility for quality assurance and publishing of Open Data and identify sustainable administrative models across partners.

Draft

Journey Planning and Disruptions



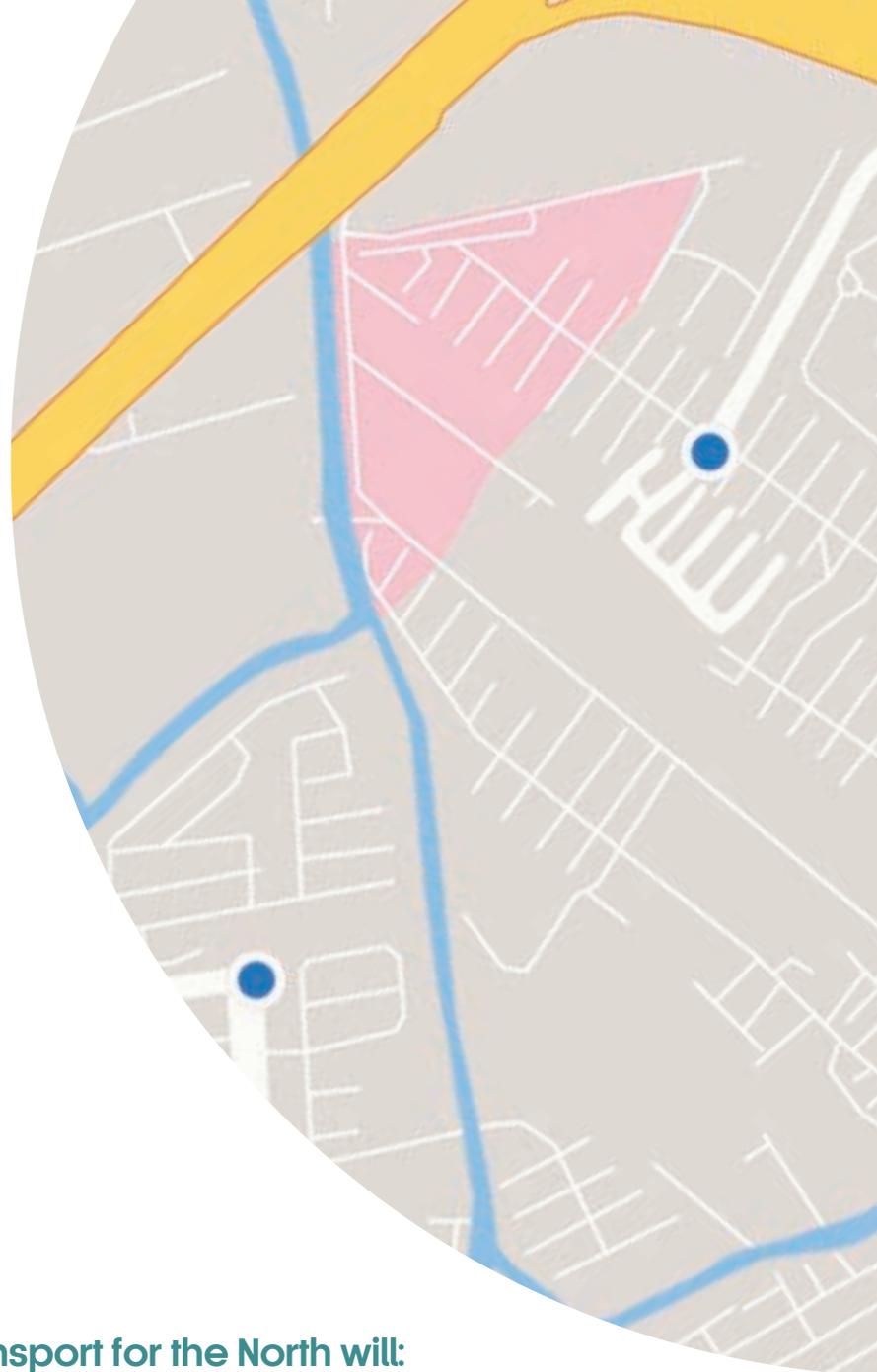
Passenger confidence in a network is reliant on the information available to them. In the North, various approaches to providing journey information exist, ranging from real-time information at stops/stations to online journey planning tools to printed timetables.

Third-party platforms like Google, Moovit, and Trainline are increasingly used to plan journeys over locally managed planners.

Decisions on the appropriate platforms should remain local, especially where strong local transport brands are in play.

However, standardisation, collective business rules, and white-label solutions may offer opportunities for economies of scale and more common user experiences.

Additionally, it is crucial to communicate effectively with passengers when something goes wrong, whether through at station systems or social media channels, and provide uniform next best action guidance across different channels to help passengers complete their journey.



Transport for the North will:

- Collaborate with authorities and industry to develop standardised approaches to journey planning and disruption messaging to promote passenger confidence.
- Develop the business case for collective procurement of white-label journey planning solutions across authorities, promoting innovation in the tech sector and integrating with online retail options.
- Define the regional journey from traditional journey planning tools to enhanced multi-modal journey planners or Mobility as a Service systems.

Draft

Data Integrations across Place and Mode



As open data becomes more prevalent across modes of travel, we are well-positioned to advocate and support its strategic integration between regions and modes.

For example, real-time information could be encouraged at stations for onward bus travel or capacity information for trains shown on journey planning apps. Alternatively, integration with the region's major road network could occur, with information provision systems providing live details of nearby station departures, parking availability, or onward bus arrival times.

Transport for the North will:

- Work with partners across all modes (not just bus, tram and train) and regions to integrate travel data intermodally and across regional borders and at varying user touchpoints.

Data Standardisation and Interoperability



Transport technological systems have often emerged organically, resulting in silos of technical standards and business rules that were adapted to meet specific needs.

This has created challenges and risks, particularly when it comes to cross-border ITSO interoperability and uniformity or later integration between systems.

With new innovations this risk of silo working needs to be avoided from the offset.

Transport for the North will:

- Engage with the government's Transport Data Strategy to promote its principles and provide guidance to our local transport authority membership.
- Collaborate with standards organisations, such as the BSI, to support more uniform standards across guidance, models, and specifications that we and our partners develop for digital mobility.



Infrastructure and Procurement



Existing approaches to procuring technically innovative mobility solutions can be front-loaded or over-specified, and authorities may be procuring the same or similar solutions as other areas, duplicating cost and energy. To address this, there is an opportunity to explore and collate best practices for how authorities are procuring innovative mobility solutions.

Similarly innovation is only possible where there is suitable infrastructure in place - many mobility innovations rely on 4G and 5G connectivity which is less likely to be in place in rural areas where transport is a key link for residents.

Transport for the North will:

- Deliver guidance, using existing experience across Authorities, of how innovative mobility systems are procured and emphasise for greater agility and collaborative tendering by default.
- Model the availability of 4G and 5G connectivity, particularly in rural areas, and assess the impact on future and current mobility.
- Work with partners to quantify the resources needed to close connectivity gaps and identify procurement routes available.

Enabling Supplier and Industry Innovation



Innovation in transport has historically taken time due to siloed development, complex regulatory environments, and bespoke procurements.

However, there is a risk that technology disruptors in the transport space will innovate in isolation. To avoid this, the industry should embrace private technological investment and create environments that allow regions and passengers to benefit from competition among innovative suppliers and disruptors.

Transport for the North will:

- Encourage supplier and technology industry involvement in intervention developments and facilitate partnerships across the whole of the North.
- Horizon scan technological developments and proactively identify areas across the North where lessons could be learned from deployment.



Future Mobility

(Integrating new modes, micro mobility and First/Last Mile)

Bus Open Data and Open Source



Demand Responsive Transport (DRT) could be an important aspect of the overall public transport network in the North of England. It is a flexible transportation system that responds to the demand of individual passengers, particularly in areas where ridership levels do not support the running of a full-time service.

Increases in flexible working and travelling patterns also mean that a demand responsive solution may have wider application as an important adjunct to the standard public transport offers as a solution is needed so that places do not become isolated for people who do not have access to private transport.

These services, typically made available through a mobile application, allow customers to book bus services, with the demand responsive solution matching available buses to waiting customers, dynamically creating best path routes between them.

Transport for the North will:

- Produce evidence to support demand responsive solutions across the North, including partnering with private operators and our authority members.
- Share lessons learned and best practices to support authorities, aligned with our rural mobility policy position, in using demand responsive transport to reduce transport related social exclusion.
- Deliver commercial and network gap analysis exploring integration of demand responsive transport with existing transport networks and ticketing systems.

Draft

Micro-Mobility Integration



The last few years have seen an increase in micro-mobility provision. - such as eBikes and eScooters - being trialled in towns and cities.

In the North York currently has a trial underway and there is extensive learning from cities like London on their experience and wider integration of these modes with the transport network.

Nonetheless these modes are contentious and partners may be hesitant to implement and integrate whilst this remains the case and there remains ambiguity around their future.

Transport for the North will:

- Maintain a watching brief on micro mobility pilots, creating an evidence base for their integration from existing pilots.
- Provide research and support on commercial modelling for micro mobility integration in fare structures or MaaS systems.

EV Payment and Car Clubs



Transport for the North has provided trailblazer support in EV charging infrastructure modelling.

As this progresses to delivery there is a window to explore how payment for EV charging, or swapping to EV vehicles, can be linked with transport payments or transport credits.

This could see EV charging costs bundled with bus or train tickets for example.

Transport for the North will:

- Research how paying for EV charging could be incorporated with transport ticketing - either in a mobility as a service setting or in a mobility credits context.



Draft

Integrating Active Travel



Active Travel, such as cycling and walking, is an important mode of transport and should be integrated into the wider transport network.

This could include options for walk breaks in journey planning or early alight, as well as converting steps/miles travelled into credit for public transit journeys.

Transport for the North will:

- Collaborate with partners and government agencies to explore ways of integrating active travel modes with transport networks through technology, such as journey planners that offer walk breaks and early alight options.
- Develop potential partnerships with fitness apps and operators to converting steps/miles travelled via active travel into credit for mass transit journeys.

Connecting to Mobility Hubs



Connecting people with places works at a local level but also between regions. This is an area where we are ideally placed to support 'islands and nations' approaches.

This would see exploration of integrating ticketing and journey planning provision with 'ports' linked with our International connectivity policy or for traditional transport hubs like rail and coach stations.

Transport for the North will:

- Engage and understand the international entry ports for the North and identify with partners ways to integrate transport payments with inbound travel.
- Progress intercity payments and ticketing integrations across rail (expanding on PlusBus as a concept) alongside intercity coach services.



Future Facing and Innovation



To foster innovation and reduce risk aversion in the transport industry, Transport for the North has a pivotal role in simplifying and expediting the delivery of innovation across the north of England.

This can be achieved by promoting collaborative development and shared standards embedded in specifications to build confidence in emerging mobility trends.

By reducing the duplication of effort, ambiguity across the sector can be reduced, and duplicate costs can be avoided, allowing more efficient investment in the systems and networks used by passengers.

Furthermore, common structures around multi-modal agreements, revenue allocation, and governance can help to support commercial operator and supplier buy-in.

These structures can help to streamline the development of new technologies, reduce costs, and provide a more integrated passenger experience. Transport for the North can also facilitate the sharing of best practices and lessons learned among its delivery partners, enabling them to benefit from one another's experiences and expertise in the field of transport innovation.

Transport for the North will:

- Identify research and future facing analysis to support partners that is used in longer-term strategic planning for connected mobility developments.
- Embrace standardisations across governance for schemes, procurements and collaboration to reduce complexity and mitigate partner fatigue in engagement.
- Act as a single source of the truth for our region on emerging trends and thought leadership. Developing evidence aligned with our Policy and Places Narratives to build local understanding and applicability.

Measures of Success

Future of Ticketing - Outcomes

Ref	Outcome	Target Date
FT.1	Passengers in the North of England are travelling across bus, tram and train with payment made via Model 2 Contactless Capping, or an equivalent account-based system.	2025/2026
FT.2	Multi-operator ticketing is available for passengers across the North and, if viable, for non-mayoral authorities this will be delivered through a collaborative region-wide scheme.	2024/2025
FT.3	The delivery of multi-modal ticketing, regardless of media, is being delivered with uniform governance, apportionment and technical standards achieving regional interoperability.	2024/2025
FT.4	Fares across the North of England will be easier to understand, commercially viable and authorities confident in their relevance to their markets - enabled by a TfN fares modelling tool.	2023/2024
FT.5	The future media requirements for ENCTS concessionary products will be known and agreed and the region will have an agreed policy on the future relevance and viability of smartcards.	2025/2026
FT.6	Transport for the North's Connected Mobility Implementation group is the recognised vehicle for engagement between local authorities and national ticketing programmes.	Ongoing
FT.7	Transport for the North, with a lead authority partner, has delivered a user-centric white-label ticket retail solution that can be accessed, and branded, by transport authorities in the North.	2024/2025
FT.8	Passengers benefit from Rail fares in the North of England that have been reformed to promote, and build on, the leisure markets and existing post-pandemic recovery for the region.	2023/2024
FT.9	Passengers have greater certainty on discretionary discount products across the North that are more uniform, such as a clear definition of a young person, with fewer regional variations.	2023/2024
FT.10	Passenger expectations on when and how they want to travel, and how they want to pay, are known through a robust placed-based evidence base for the North.	Ongoing

Data & Infrastructure - Outcomes

Ref	Outcome	Target Date
DI.1	Transport authorities across the North are using common guidance on how to produce, use and deploy transport data in an open standard - aligned with the national strategy.	2023/2024
DI.2	Passengers in the North have access to more tailored journey planning that allows them to mix modes, avoid busy periods and be presented with next best option mitigations to disruptions.	2024/2025
DI.3	The North has an agreed roadmap of regional requirements, risks and the business case, to progress from current journey planning tools to integrated planners / mobility as a service.	2024/2025

DI.4	Passengers are benefiting from the integration of open across modes and regions to support modal shift, to better nudge decarbonisation behaviours and inform choice.	2023/2024
DI.5	Non-Mayoral authorities are working together, with a core fund of money secured through a Transport for the North business case, to develop and deliver white-labelled journey planners.	2024/2025
DI.6	Passengers are benefiting from public / private sector partnerships, rewarding, and supporting transport, enabled by TfN through open data and private sector innovations.	2024/2025
DI.7	Authorities in the North are using common standards, vetted by a standards body, in the development of connected mobility specifications ensuring regional interoperability.	Ongoing
DI.8	The North of England has the connectivity infrastructure required to enable better connections in rural areas - including increased 4G & 5G coverage enabling live systems.	2025/2026
DI.9	Authorities across the North trust, and engage with, the connected mobility implementation group, to work through any data or infrastructure problem statements	Ongoing
DI.10	Authorities across the North are coordinated in the procurement of technical systems to maximise the spread and scale of funds and reduce duplicated effort in shared delivery.	2023/2024

Future Mobility - Outcomes

Ref	Outcome	Target Date
FM.1	Passengers in rural and isolated communities have access to viable demand responsive service to keep them connected to services and opportunities.	2024/2025
FM.2	Passengers traveling into a region, where viable, can choose to travel and from a mobility hub via a demand responsive solution for the first/last mile element of their journey.	2025/2026
FM.3	Transport for the North's modelling and evidence has enabled local delivery of viable demand responsive transport as part of local transport plans where this was sought.	2023/2024
FM.4	Transport users travelling via micro-mobility, where this available, use journey planners to integrate this with other modes and pay with an integrated fare.	2024/2025
FM.5	Transport users parking an electric vehicle at a charging point that is a transport hub or a park and ride site pay for their charging in with their travel ticket.	2024/2025
FM.6	Transport users access cars via car clubs as an appropriate mode of transport, that can be selected and paid for, alongside mass transit options and mobility hubs.	2025/2026
FM.7	Passengers are incorporating active travel into journeys - to avoid high occupancy, out of choice for an element of journeys or to support local policies on walking between modes of travel.	2024/2025
FM.8	Inbound transport users pay for, and access, onward travel when planning their journey - be it by car, rail, plane or sea. with ticketing integrated at regional mobility hubs	2025/2026
FM.9	Transport for the North has commissioned user-research on new questions - such as pricing car as a mode of travel - from across the region as new emerging technologies are considered.	Ongoing
FM.10	Case-studies are produced using our policy & places framework to detail how emerging technologies apply in a placed-based analysis of requirements and impact.	Ongoing

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Stakeholder Engagement

Transport for the North must own the engagement lessons learned from the former IST Programme and ensure all activities undertaken under the Connected Mobility Strategy are communicated locally, regionally and nationally concisely and clearly.

It is key that any developed business cases or delivery programmes have robustly evidenced buy-in across the full stakeholder mix prior to outline business case stage. Likewise we are clear with partners where we intend to act as a conduit for other partner engagement or as a singular source of the truth.



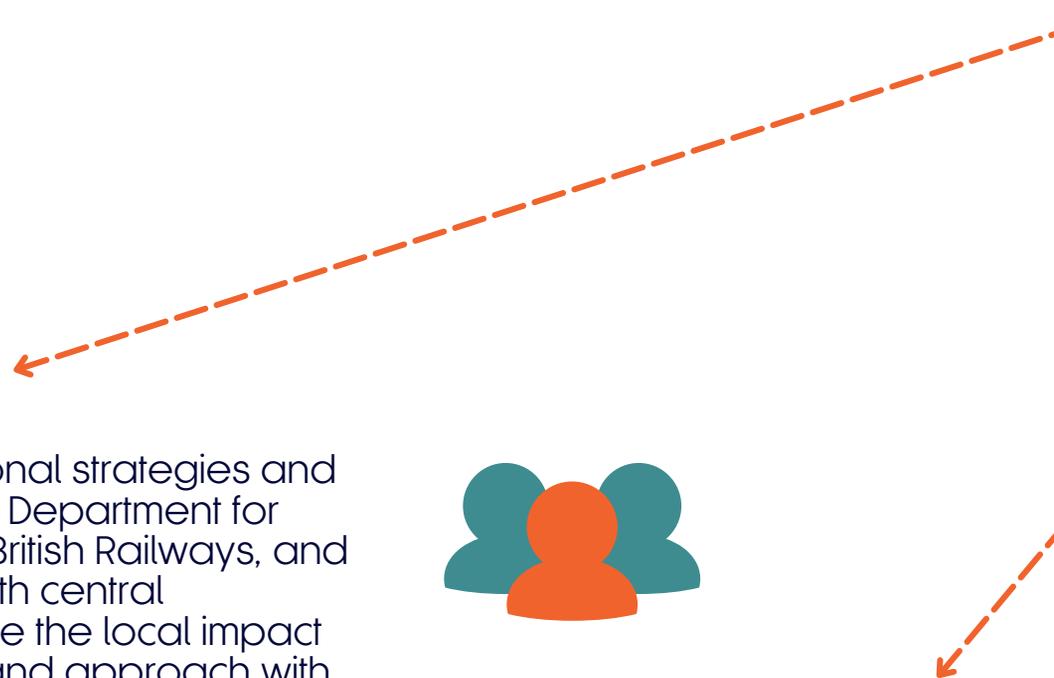
Central Government

We will align with national strategies and programmes from the Department for Transport and Great British Railways, and work in partnership with central government to explore the local impact of national initiatives and approach with members.



Passengers and End Users

We will Undertake passenger research and seek end user feedback to ensure that interventions developed and delivered across the North are informed by the needs of users and their changing behaviours.





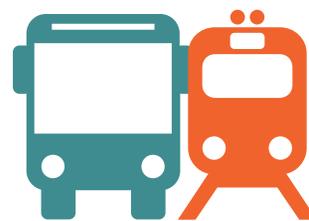
TfN Member Authorities

We will engage with its members through the CM Implementation Group, made of representatives from all TfN members, will providing a forum for collaboration, feedback and decision making.



Delivery Vehicles And Local interest

We will integrate existing local structures in engagement, such as Ticketing Companies, alongside Business Improvement Districts on connected mobility.



Industry and Operators

We recognise the importance of early buy-in from operators .This engagement will occur at the local, regional, and national and include the Confederation of Passenger Transport and the Association of Local Bus Managers



Arms-Length and Statutory Bodies

We will partner with other sub-national transport bodies and organisations where there is overlap in workstreams, e.g Active Travel England, and act as a communications and engagement conduit for their work with our members.

2023/2024 Programme

Connected Mobility Hub

During 22/23 TfN secured funding from the Department for Transport to pilot a connected mobility hub to support partners in realising their connected mobility ambitions.

This has been undertaken and during 2023 initial outputs from the hub will be published in support of TfN's regional offer but also national centre of excellence activities.

Work undertaken so far includes:

- Assisting York, Tees Valley and Lancashire to set the foundations for the rollout of contactless capping via a system compatible with operator-derived systems that will also allow for later integration with the national broker solutions. This involves working with the LTA to understand the current state of ticketing systems and identifying the changes needed to implement single operator PAYG capping schemes for those operators that do not have any contactless EMV capping schemes in place already.
- Supporting Cheshire West and Chester, Warrington and Cheshire East in navigating how to position themselves in relation to conflicting contactless capping mechanisms utilised by interconnected regions of TFW, Greater Manchester and LCR.

A guide has been developed to cover the activities needed to offer PAYG capping, this provides information and guidance for other LTAs looking to offer PAYG capping schemes

Support has been given to City of York Council in the development of an operating model (including apportionment) to support the local ticketing scheme which could be deployed elsewhere in the future. In particular, measures have been proposed to support products for young people and offers for customers coming into York City from the wider Yorkshire area.

Options are being developed around how these products could be implemented.

As part of this work a checklist for implementing multi-operator ticketing has been created, including guidance on how to undertake each of the steps, which will enable any LTA to identify potential gaps in their own provision and how to address these.

Work has been undertaken to assist Lancashire County Council with learning the lessons from live DRT projects elsewhere and assessing its suitability, with outputs suitable for use by other authorities.

This involves researching DRT implementations by other TfN LTAs as well as implementations in other parts of the UK.

Work has been undertaken to audit and support journey planning, and use of Data, in the Tees Valley to help shape how authorities provide timetable information, interchange information and disruption messaging to passengers.

This will again produce shared learning, examples of best practice and help frame ongoing development of innovative journey planning tools.

Developing a 'Super' Ticketing Scheme

During 2023/2024 Transport for the North will explore a 'super' ticketing scheme to cover the North of England in areas aiming to implement multi-modal ticketing; this will complement and be shaped by existing ticketing schemes with a focus on non-combined authority areas.

This will consider using TfN's statutory powers to create ticketing schemes in partnership with non-combined authority member authorities to help drive uniformity in governance, administration and apportionment of multi-operator ticketing revenue in areas that may not have the capacity to deliver those elements.

This will explore:

- Developing a joint venture across authorities and operators to deliver multi-operator ticketing in non-CA areas.
- Identifying a vehicle for collective procurement of systems, marketing, administration and financial processes to minimise local administrative burden and generate economies of scale.
- A governance model delivering local ticketing boards to develop, embed and promote local fare structures and own their later interaction with national schemes.

Developing an OBC for a Connected Mobility Joint Fund

During 2023/2024 Transport for the North will work to develop an outline business case, supported by statutory advice to the Secretary of State, for a devolved connected mobility funding pot designed to promote collaborative procurement of collective mobility systems.

This case will argue for a reduction in duplicated bids, a reduction on consultancy commissions and a movement towards collective procurement of white-labelled technical solutions through a singular funding mechanism across Northern authorities.

This business case will define a technological investment roadmap across authorities with common ambitions and would strive to secure reduced administrative costs, reduced duplication of systems impacting in higher cost of sale for products and greater use of open data in alignment with national data strategies.

A robust case would be made, shaped by the region's needs, to ensure all authorities across the North can progress their collective connected mobility ambitions in a way that encourages seamless passenger experiences across mode and geographical boundaries.

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Building a Fares Modelling Tool

During 2023/2024 Transport for the North will build a fares modelling tool, using experiences derived from areas with mature multi-operator products to simplify the creation of new products, or the creation of viable pay as you go caps.

This will explore:

- A fares tool that assess the level of abstraction risk created through moving from single/return product types to weekly caps and flexible products.
- The relative modal premia applicable to different modes of travel - ranging from traditional modes through to new and emerging modes
- Identifying a newer understanding of pricing elasticities at play when considering the cost of travel in a multi-modal and more flexible travelling environment.
- The tool should be created to allow for geographical variations to help maintain locally relevant structures or assess these in comparison with new proposed structures.

Delivering Passenger Behaviour Research

During 2023/2024 Transport for the North will work across our partners to identify or commission research to set out a stabilised post pandemic analysis of travel patterns and changes to travel behaviours.

This will explore:

- The changing role of cash payments in transport post-pandemic
- The preferred way of paying for and proving and authority to travel (mobile vs contactless)
- Changing definitions of peak vs off-peak within a day and for days of the week.

Definitions

BSI	British Standards Institution
cEMV	Contactless Payment Card
DFT	Department for Transport
DRT	Demand Responsive Transport
EV	Electric Vehicle
FTR	Fares, Ticketing & Retail Programme
GBR(TT)	Great British Railways (Transition Team)
ITSO	Smart Card System
LTA	Local Transport Authority
LTP	Local Transport Plan
MCA	Mayoral Combined Authority
OBC	Outline Business Case
STB	Sub-National Transport Body
STP	Strategic Transport Plan
TOC	Train Operating Company
TRSE	Transport Related Social Exclusion

Appendix A - Interfaces across other TfN Workstreams/Programmes

DECARBONISATION

Transport for the North's Decarbonisation Strategy sets out ambitious targets and areas of focus around how the organisation and region can work towards decarbonisation.

The Connected Mobility Strategy has clear interfaces with this as, through encouraging people to make smarter journeys, it will maximise capacity of vehicles and reduce single-occupancy diesel and petrol car use.

There are also opportunities for specific project interactions where the development of technical solutions, or the deployment and delivery of better data, can explicitly or passively support efforts for decarbonisation.

These could include:

- The integration of mobility credits linked to net-zero car scrappage schemes.
- Digital DRT integrated with spatial planning reform for new developments to reduce built infrastructure encouraging single occupancy vehicle use.
- Incorporation of CO2 emissions data and comparisons by mode in journey planning by default.

TRANSPORT RELATED SOCIAL EXCLUSION

Transport for the North's work on transport related social exclusion has been welcomed by our partners and wider industry and helps to highlight the varying factors that contribute to TRSE.

With the focus of the Connected Mobility Strategy being to make it easier for passengers and authorities alike to connect journeys between places and purpose this area of work needs to be embedded from as earlier stage as possible.

This interface could include:

- Incorporating new metrics like modal split vs cost into future iterations of the tool.
- Incorporating factors like connectivity (e.g 4G) in impacting on TRSE.
- Using data on TRSE to build and target interventions developed under the strategy (e.g where to focus DDRT effort for maximum benefit in reducing TRSE)

STRATEGIC RAIL / RAIL REFORM

A key element of of the Connected Mobility Strategy overlaps with ongoing reform to the railway and work underway within TfN on areas like stations and rail fares reform.

The core area of interface will be with how a station is connected for onward journeys, or journeys to them. This is alongside exploring how innovations in retail across all modes can help reframe the role and purpose of a station as retail moves increasingly off-site organically.

This interface could include:

- Integrations providing next bus real time information on board trains onboard or on rail journey planners.
- Ensuring early integration between bus and rail Pay as You Go deployments.
- Trailing new ticketing products to promote leisure travel or to integrate with through-tickets (e.g building on plusBus)
- Integrating DRT systems with rail stations as a fixed boarding or alighting point at one end.

RURAL MOBILITY AND LOCAL CONNECTIVITY

Transport for the North has published policy positions on rural mobility and local connectivity. These policy positions interface with this strategy as it intends to develop the systems and innovations needed to better connect those communities.

Work is underway in modelling network gaps where a Digital Demand Responsive travel offer could best complement rural transport networks and this strategy would see this built upon. Likewise these policy's explore how networks can be integrated with 'ports' be they air, water or rail.

This interface could include:

- The integration of onward travel via through ticketing on airline tickets or on inbound travel products.
- The deployment of jointly procured DDRT white-labelled systems across multiple rurally orientated authorities based on TfN modelling.
- Broader integration of transport data and technological innovation in spatial planning to better connect developments.

MAJOR ROADS AND BUS POLICY

The roads network across the North is the primary way that people travel and stay connected to the things that are important to them. As investment in this is explored, alongside work around supporting bus prioritisation, there is a clear interface with this strategy. This is both in terms of the modes being used on those roads, and the capacity of those roads to cater for differing vehicles - but also in smarter roads playing a role in encouraging modal shift or less urban driving.

This interface could include:

- Engaging with National Highways to link motorway signs to onward travel times for nearby park and ride systems.
- Levering shared data to support authorities in planning their transport networks to maximise the efficient use of finite road resources and better target investment in new roads construction /alterations.

ACTIVE TRAVEL

Transport for the North has published an Active Travel policy position. Active Travel remains one of the most popular way for people to get around and this has likely increased as people work more from home or engage more with their local communities.

This mode should be integrated with other network provisions so it appears in parity with the likes of bus, tram or car.

This interface could include:

- Integrating active travel in any procured white-label journey planning system.
- Exploring the ways technology can be levered to reward and encourage active travel alternatives for journeys in lieu of cars or where this high demand.

ELECTRIC VEHICLE CHARGING

Transport for the North has produced well received work on Electric Vehicle Charging Infrastructure. As this work progresses with partners to delivery there is a logical interface with connected mobility as we look at how cars can be integrated with transport networks - both in terms of mobility hubs but also in terms of payment to dissuade private ownership.

This interface could include:

- Using multi-modal hubs data to explore how EVCI deployments can link with broader transport networks like park and ride.
- Identifying how paying for EV charging at modal hubs can be seamlessly integrated with onward travel costs.
- Exploring how car clubs progression to EV fleets can be integrated to any future MaaS solutions within regions.

Transport for the North
2nd Floor
4 Piccadilly Place
Manchester
M1 3BN

0161 244 0888
info@transportforthenorth.com
