



# Developing Tram Train Solutions in Great Britain

Forum ÖV Planung, June 2024

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# Agenda...



We're talking to you about...

- Why and how Great Britain's main line railway introduced Tram Train
- Why Tram Train is a transport solution for Greater Manchester
- Future developments of Tram Train
- Sharing conclusions and success factors



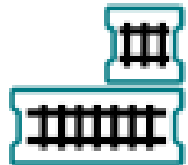
# Main Line Railways of Great Britain

Image: nationalrail.co.uk

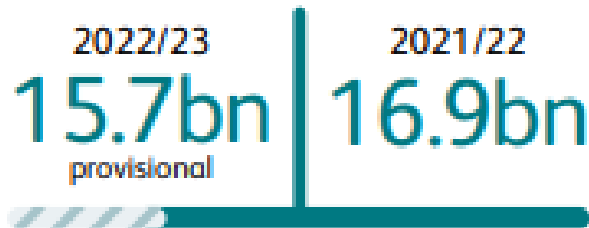




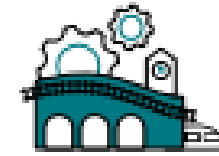
NUMBER OF  
PASSENGER  
JOURNEYS



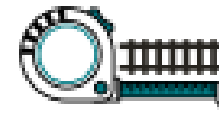
AMOUNT OF  
FREIGHT  
(bn net tonne kilometres)



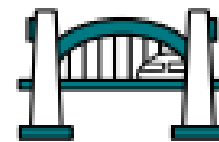
# Network Rail in a nutshell...



Over  
**2,500**  
stations, the 20  
largest are managed  
by Network Rail



**20,000**  
miles of track



**30,000**  
bridges, tunnels and  
viaducts







Kassel, DE



Karlsruhe, DE



Mulhouse, FR

**In the mid-2000s...**

**...Network Rail & UK  
Government interest in  
the “Karlsruhe” model  
of Tram Train...**

**...full inter-running  
between tramway  
and railway  
networks**





**...to replace ageing  
trains on the  
regional/rural railway**



**...to reduce  
congestion at station  
bottlenecks**



**...towards a  
greener, more  
efficient railway**



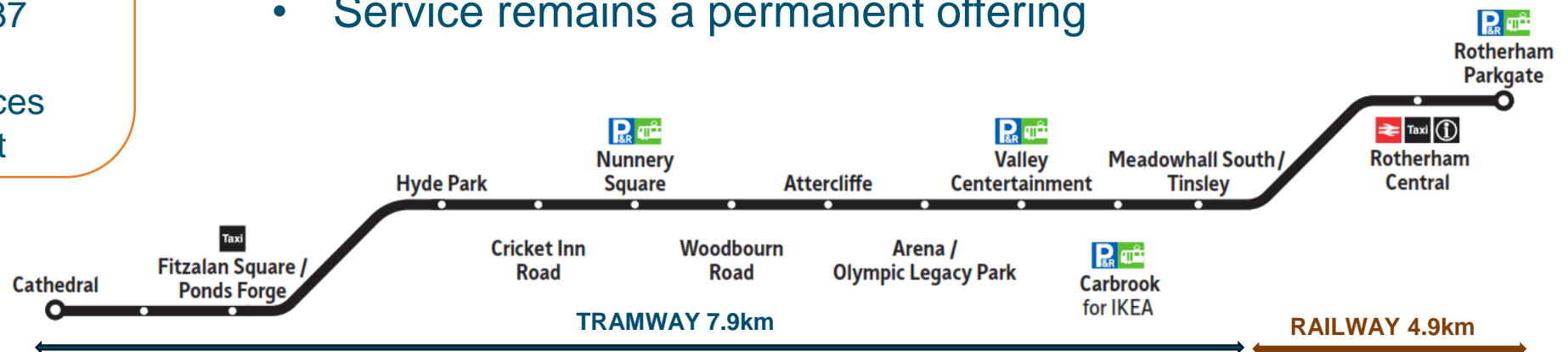
## Tram Train Pilot



### Stadler Citylink

7 vehicles  
 25kV ac / 750V dc  
 Low floor: 425mm  
 Vmax: 100 km/h  
 96 seats / 137  
 standing  
 2 x PRM spaces  
 TSI-exempt

- UK's first Tram Train operation went live October 2018
- Linking Sheffield and Rotherham, South Yorkshire, England
- Operation closely follows the “Karlsruhe Model”
- Tramway 62% / Railway 38% route kms
- A “pilot” project to establish how Tram Train can work
- Since 2018 +4 million journeys
- Service remains a permanent offering





## How was the Pilot delivered?

- Excellent collaboration between:
  - Network Rail
  - UK Government
  - Local Transport Authority
  - Tramway Operator
  - Vehicle Supplier



## What is its legacy?

- Commitment to widely share knowledge
- Free online learning resource hub
- Comprehensive information
- Widely shared across international community

### South Yorkshire Tram Train Pilot Learning Legacy

Site Navigation	<p>Welcome to the South Yorkshire Tram Train Pilot Learning Legacy Home Page. Included on the left are a series of site navigation links in dark blue tabs to other Tram Train stories in this Learning Legacy series. Click on a link to view other stories and their relevant topics/sub-topics. Links are included in light blue tabs at the top of each story page to assist with internal system navigation. Alternatively, users can view a list of individual stories at any time, by clicking on the SharpCloud icon in the top far left of the screen.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><b>SOUTH YORKSHIRE PASSENGER TRANSPORT</b> EXECUTIVE</p> </div> <div style="text-align: center;">  <p><b>Department for Transport</b></p> </div> <div style="text-align: center;">  </div> </div> <p style="font-size: small; color: red;">Terms and Conditions of use can be viewed via the Disclaimer navigation link on the bottom left of this page</p>
Project Description	
Learning Themes	
Scheme Evaluation	
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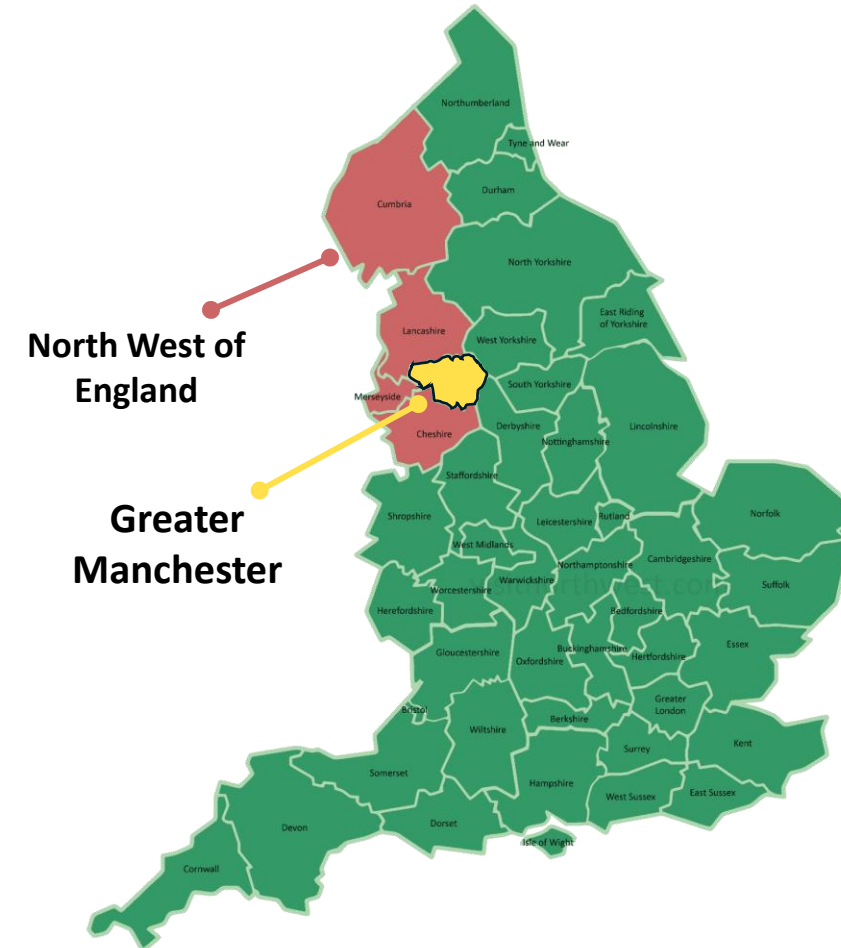
# Why Tram Train in Greater Manchester?

- To deliver our goal to have 50% of all journeys in Greater Manchester to be made sustainably by 2040 which equates to a million more sustainable journeys every day.
- The construction of new lines can help this, but a limited number of routes and notoriously long planning process in the UK mean this is not achievable in this timeframe.
- Using tram-train technology increases the pool of potential new routes substantially.
- A tram-train system could significantly increase the local rapid transit network by connecting networks and enabling better interchanges, releasing vital capacity on the heavy rail line
- The development of GM's pilot tram-train scheme is on-going and Transport for Greater Manchester is currently in the process completing single option selection with the aim to complete this phase by January 2026.



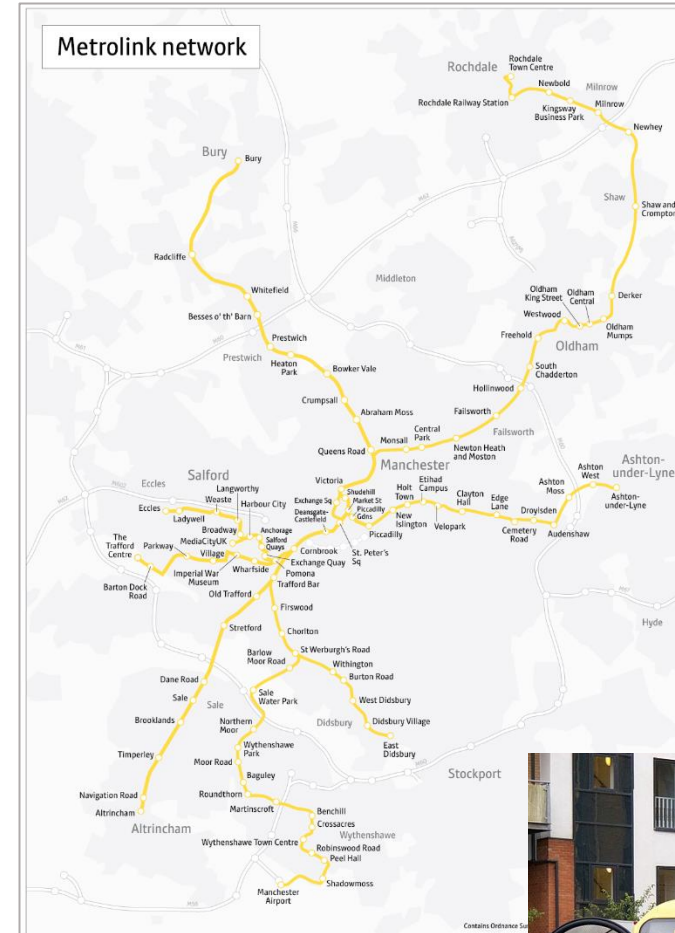
# Which differences exist between light rail and heavy rail in Greater Manchester (GM)?

	Light Rail in GM (Metrolink)	Heavy Rail in the North West
<b>Area</b>	1,276 km <sup>2</sup>	14,165 km <sup>2</sup>
<b>Population</b>	2.8m	7.3m
<b>Asset owner</b>	Infrastructure & Rolling Stock- Transport for Greater Manchester	Infrastructure - Network Rail Rolling Stock - ROSCOs
<b>Operations</b>	Keolis Amy Metrolink	Various train operators
<b>Maintenance</b>	Keolis Amy Metrolink	Infrastructure - Network Rail Rolling Stock - Various
<b>Funding of infrastructure</b>	Revenue & Public funds (central government/local contributions)	Central Government – 5-year funding cycles called Control Periods
<b>Funding of operations</b>	Revenue* & Public funds (central government/local contributions) *Pre-covid, Metrolink operations were funded entirely through revenue.	Passenger Service Contracts - built on concession model. * ** *Pre-covid – franchise model used. ** Both Northern & TPE have been bought into public ownership – Operator of Last Resort.



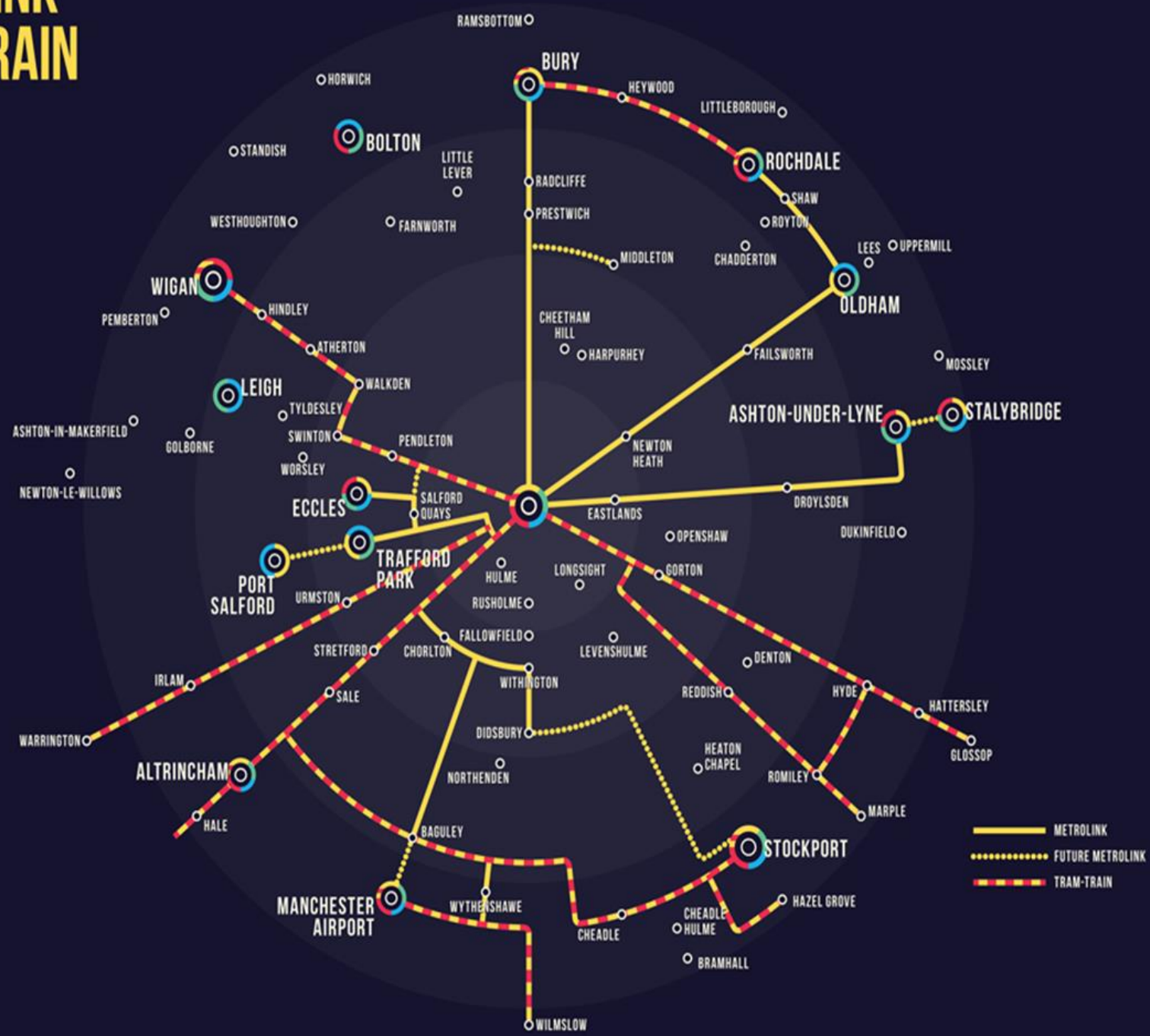
# Metrolink today

- Opened in 1992
- Currently 8 lines, 99 stops and over 100km of track and is the largest light rail network in the UK
- Entire network is electrified by 750 V DC overhead line equipment and is high-floor
- Homogenous fleet of 147 Bombardier M5000s delivered between 2009 and 2022
- Over £2bn investment in the last 30 years
- 45.6m passenger journeys a year before C19
- Most recent expansion opened in March 2020
- Metrolink is part of a multimodal integrated transport network called the 'Bee Network' (bus, tram, active travel)
- Every tram and tram stop is entirely accessible and provide level boarding to passengers





# METROLINK TRAM-TRAIN



**Metrolink  
tomorrow**





# Approach to Tram-Train Delivery in Greater Manchester



The Greater Manchester Tram-Train Pilot is known as the “**Pathfinder**” Scheme. Pathfinder will develop principals and working arrangements that can be applied to all future Tram-Train schemes.

The following operational objectives underpin the development of the scheme:

1. Deliver a tram-train vehicle.
2. Prove the delivery of tram-train in Greater Manchester.
3. Enable delivery of the future tram-train network

# Identifying the pilot scheme

Since 2001, a long list of Tram-Train schemes were put forward and developed up to the Strategic Outline Business Case stage.

Three 'Pathfinder' schemes were identified as potential pilot projects including 'North': Oldham to Heywood via Rochdale.

These Pathfinder projects were deliberately more limited in scope as follows:

- New services that do not replace any existing tram or railway services.
- No third-party land purchase outside existing railway and tramway ownership is required to implement the project
- It was believed that the existing powers allowed operation with limited planning processes

Rochdale to Bury via Heywood (4), 'Pathfinder North' was eventually selected as the pilot scheme for Tram-Train for GM.

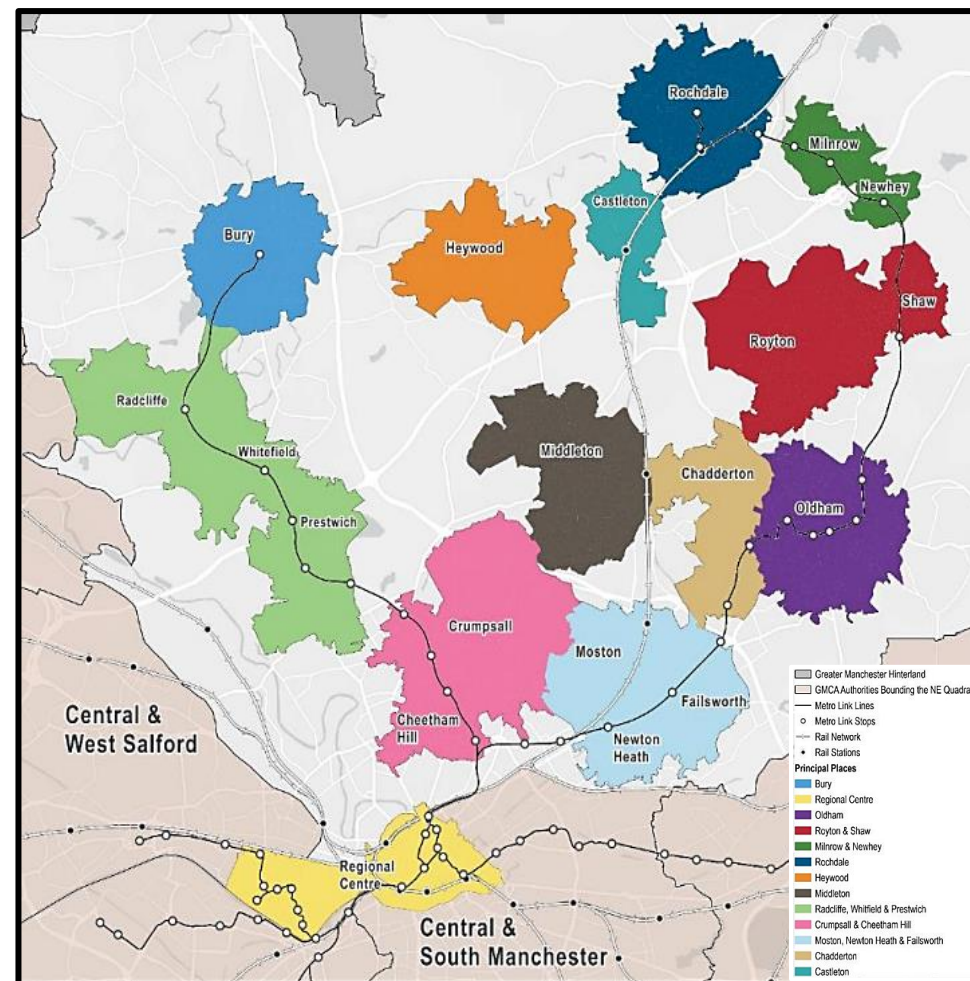


# Why Tram Train Pathfinder North

## Today - GM's North-East Quadrant

All four districts in GM's NE Quadrant (Oldham, Rochdale, Bury and Manchester) make up for 40% of GM's population. All the districts. are 'Priority One' places for levelling up under the UK Government Priority:

- 23% of the population have no qualifications.
- Over 60% of all wards are within the lowest Quintile of Health Life Expectancy at birth nationally.
- 38.1% of households have no access to a private mode of transportation
- Nearly 50% of the population within its principal places are outside the 1km catchment of a tram stop or train station – this includes some of the most deprived areas, with the lowest car ownership.



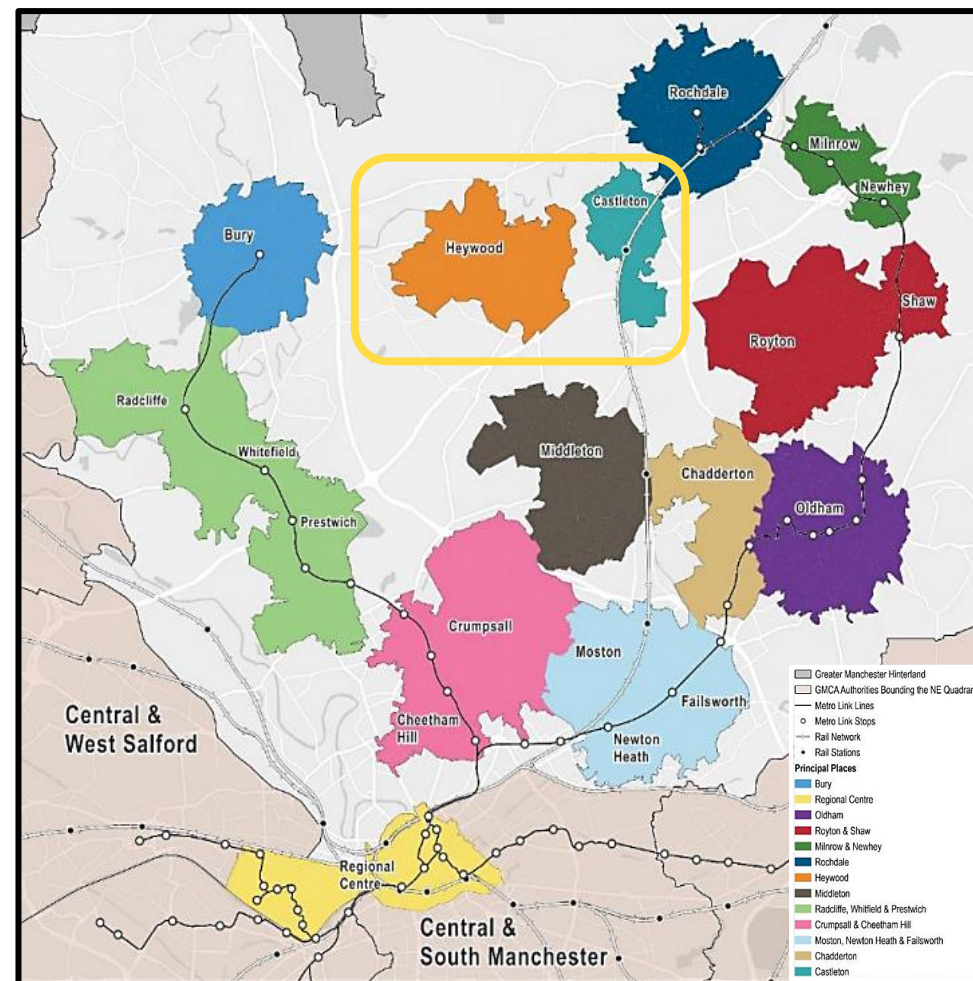


# Why Tram Train Pathfinder North

## Today - GM's North-East Quadrant

In particular, Heywood is insufficiently connected to reliable, direct, and efficient public transport. This creates issues of isolation and correspondingly issues related to access to opportunities, skills, training, and deprivation.

Principle Place	Population
Bury	30,777
Rochdale	43,699
Heywood	28,270
Castleton	10,778
Oldham	59,439
<b>North-East Quadrant</b>	<b>1,220,000</b>





# Why Tram Train Pathfinder North

“Covering sites across Bury, Oldham and Rochdale, this vast innovation mega-cluster will play a pivotal role in making Greater Manchester one of the best places in the world to grow up, get on and grow old.”

Tram-Train Pathfinder could connect the town centres and major employment sites.

These developments are complimentary to Tram-Train Pathfinder but not dependant on it.

For comparison, Trafford Park is located in South West Manchester and is the largest industrial site in Europe. It occupies an area of 12 km<sup>2</sup> and employs 35,000 people.

The three Atom Valley sites (Kingsway (1), Northern Gateway (2) and Stakehill (3)) is planning to accommodate 1,300,000 m<sup>2</sup> of commercial floorspace, 23,000 new jobs and 3,400 new homes.



Places for Everyone is a long-term plan of nine Greater Manchester districts for jobs, new homes and sustainable growth.

The 5th and 8th largest office development allocations across the nine Places for Everyone districts are situated within the NE Quadrant.

## KEY

- 1 AMPI / KINGSWAY BUSINESS PARK
- 2 NORTHERN GATEWAY
- 3 STAKEHILL

# Tram Train Pathfinder North

The scheme proposes to:

- Connect up Atom Valley's major employment sites, and the town centres of Bury, Heywood, Castleton, Rochdale and Oldham.

The scheme would could cut public transport journey times between Rochdale and Bury by 15 mins in the AM peak – a reduction of 37%, and competitive with car.

It will also provide line capacity increase to the light rail network, delivers an orbital connection and is complimentary to GM Rail proposals as set out in the GM's Mayoral manifesto.



# Tram Train Pathfinder North

## Existing Metrolink section:

- Use of existing Oldham and Rochdale Line network infrastructure.
- Options for a turnback at Freehold Metrolink stop.

## Network Rail section:

- Shared use of the network including Rochdale and Castleton Stations.
- Signalling modifications to accommodate tram-train services.
- Transfer areas to facilitate tram-train movements on and off network.

## Vehicles and depot:

- New 60m long tram-train 'Next Generation Vehicles' (NGV) – establishing the mechanism to replace the wider Metrolink fleet.
- Stabling provision for new vehicles at expanded Queens Road Depot.

## Service options:

- Range of options considered – service frequency 2 to 4 services per hour.



# Why now?

- **Delivering:** Pathfinder North has emerged from a 20-year history of strategic planning for GM's strategic public transport network. It is a key element of GMCA's approved CRSTS Delivery Plan.
- **Growing:** Invigorate connectivity between the GM North-East Quadrant's three key centres of Bury, Rochdale and Oldham; restore connectivity to the mainline railway for Heywood and for communities between Heywood and Bury (including Darnhill) and improving connectivity to the mainline railway for Bury (connections for Bradford and Leeds at Rochdale).
- **Reusing:** Maximises the use of existing rail infrastructure – cost-effective and carbon-conscious.
- **Equipping:** Delivers a Next Generation Vehicle contract, to get TfGM back to the timescales for ordering and receiving vehicles.
- **Unlocking:** A future tram-train network by providing the proof of concept in GM.



## Further Tram Train developments in GB

### South Wales Metro

Welsh Government funded, converting suburban railway to Tram Train with on-street tramway into urban development



Image: TfW



### South Yorkshire Supertram

Public transport authority funded  
Expansion of Tram Train routes including new stations and transfer of services from heavy rail to Tram Train



**The challenges for  
Network Rail to  
advance Tram Train**

Retaining specialist  
knowledge

Cultural resistance:  
it's not "heavy rail"

Balance of benefits  
leans to the light rail  
operator

Lack of standardisation

Funding routes not well  
defined





# Concluding thoughts...



## Our key learning points

- Tram Train works in the UK
- Tram Train is in the public transport toolkit
- Its benefits may be spread across agencies
- Care to understand benefits and risks and appropriate application
- Be prepared that Tram Train will challenge established processes and conventions

## Our success factors

- Sharing our learning and experience
- Early engagement across organisations especially during the definition and conception phases
- Understand the challenge and risks
- Passion to break with convention and norms







**Thank you listening,  
please ask us questions!**

