

Network North

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Network North – Part of an Integrated GB Rail Plan

Terms of Reference for Integrated Rail Plan for GB state:

- Assume HS2 Phases 1 & 2A are built
 - **BUT** *HS2 Phases 2B(West) and 2B(East) now in considerable doubt*
- The emerging NPR vision is to be integrated with HS2 as defined above

That will not deliver a practical Northern rail network

- It will not result in step change improvements in connectivity
- It will not result in significant reductions in journey times
- It will not increase passenger numbers or drive a major road to rail modal shift to reduce CO₂ emissions and damage to the environment
- It will take until 2040 to be fully completed

This will never be the Network the North requires

Network North – The Vision and Design Objectives

Vision:

To comprehensively inter-connect the major Towns and Cities of the Northern Powerhouse with a fully electrified rail network

Design Objectives

- To meet all TfN targets for journey time between primary cities
- To provide full interconnectivity between major population centres
- To achieve transformational reductions of journey times across network
- To provide through stations in all primary city centres enabling simple interchange between high speed and local services
- To design commensurate infrastructure improvements which enable step-change improvements to local services giving a 'local capacity dividend'
- To develop a matching freight network delivering TfN's ambition for a TransPennine 'freight superhighway'

Network North – Achievements to Date – 1

- Fully detailed **NN** design completed at 1:25,000 scale.
- Surveying and mapping at 1:5,000 scale as soon as mobilisation complete
- **NN** design avoids building HS2 Phase 2B (West) in Cheshire and Lancashire and Phase 2B(East) in Yorkshire saving **over £21.5 Billion**
- **NN** design provides high speed links both within the Northern Powerhouse and externally to The Midlands, London & Scotland
- **NN** has compiled a Demonstrator Timetable which shows that:
 - **NN** intercity services comply fully with specified TfN journey times/frequencies
 - 153 journeys are possible between the 18 Northern Powerhouse key centres
 - **NN** enables 140 of these journeys (91%) to be made without a change of trains
 - **NN** services reduce journey times by average of **40%** compared with today

Network North – Achievements to Date – 2

- **NN** has designed bespoke solutions for major station improvements
 - These deliver full integration & approx. double capacity for local services
 - Manchester Piccadilly & Airport stations transformed into through stations
 - Bradford's 2 terminus stations linked with a new cross city line (700m)
 - Leeds station capacity is enhanced avoiding HS2's terminus platforms
 - New hub station provided at Sheffield Victoria for all services
- **NN** design reopens the Woodhead route as a high speed passenger spine
- **NN** National Freight Network provides a parallel TransPennine freight line
 - This facilitates the provision of a TransPennine 'Roll-On / Roll-Off' lorry shuttle linking the M1 & M60 and relieving the A628 Woodhead road
- **NN** has commenced exploratory talks with a Global Japanese Bank and two International Rail Engineering Companies to gauge their interest in offering private funding and the expertise for constructing, maintaining and operating **NN**

Network North – Costs, Benefits and Programme

- **Capital Cost** (2020 prices) (Trains excluded)(**NN** intercity network fully electrified) **£39.3 Bn**
- **Benefits** (**NN** Benefits scaled from HS2 published Benefits) **£143 Bn**
- **‘Indicative’ Benefit to Cost Ratio** **3.6**
 - NB Not enough data available to undertake a formal BCR calculation, hence ‘indicative’
- **NN** does not require HS2 Phases 2B (West) and 2B (East) to be built
Saving achieved as a result £21.5 Bn
- **Programme**
 - Delivered using international best practice in 13 stages, commencing with Leeds – Hull electrification
 - High Speed spine rolled out within 10 years, with 80% of overall benefits delivered within that timescale

Network North – The Designed Network

Capital Cost
£39.3 Bn

(Fully Electrified)
(Without Trains)

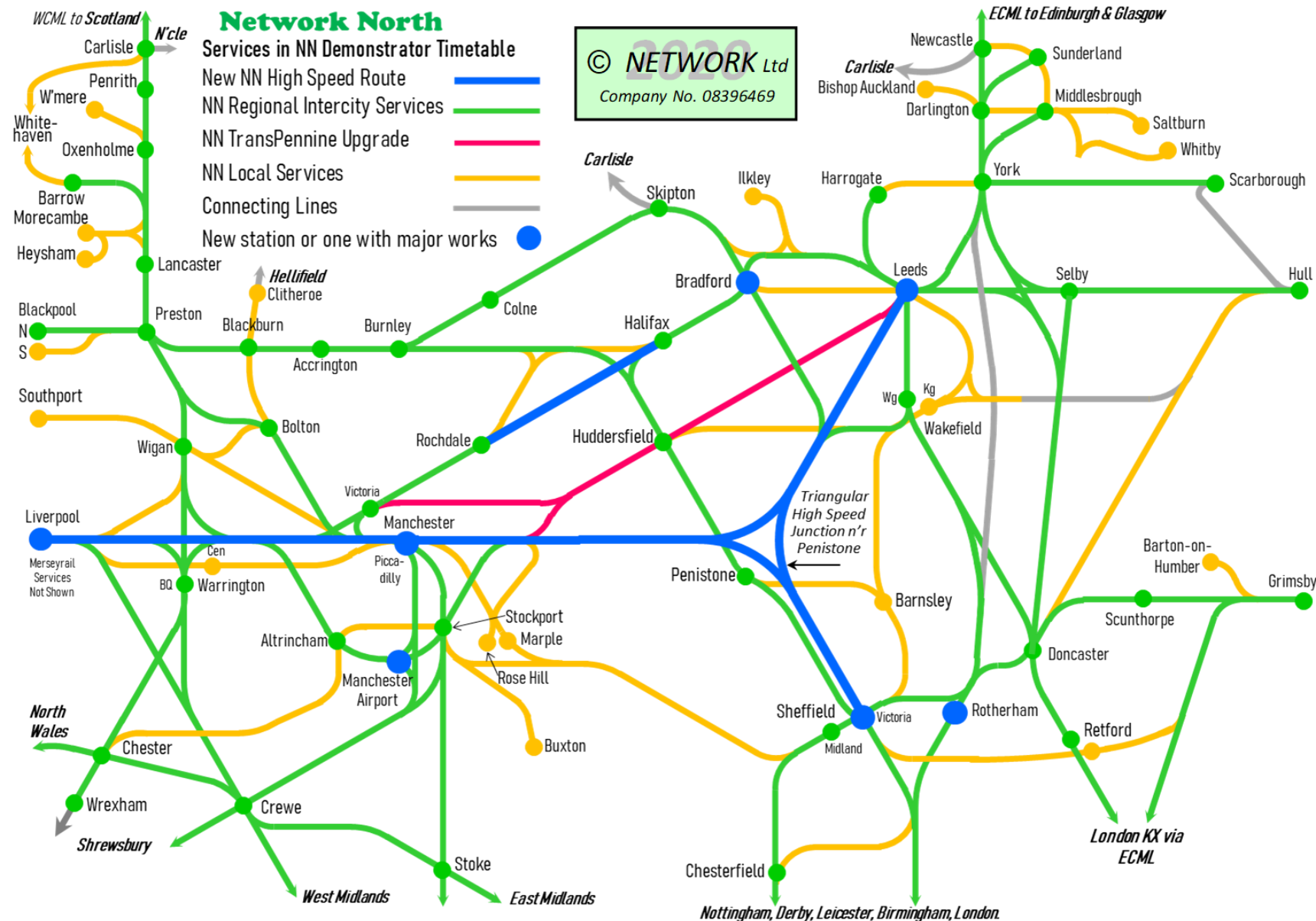
Times and Average
Speeds Compared

Today's Best, in Black
Network N in Green

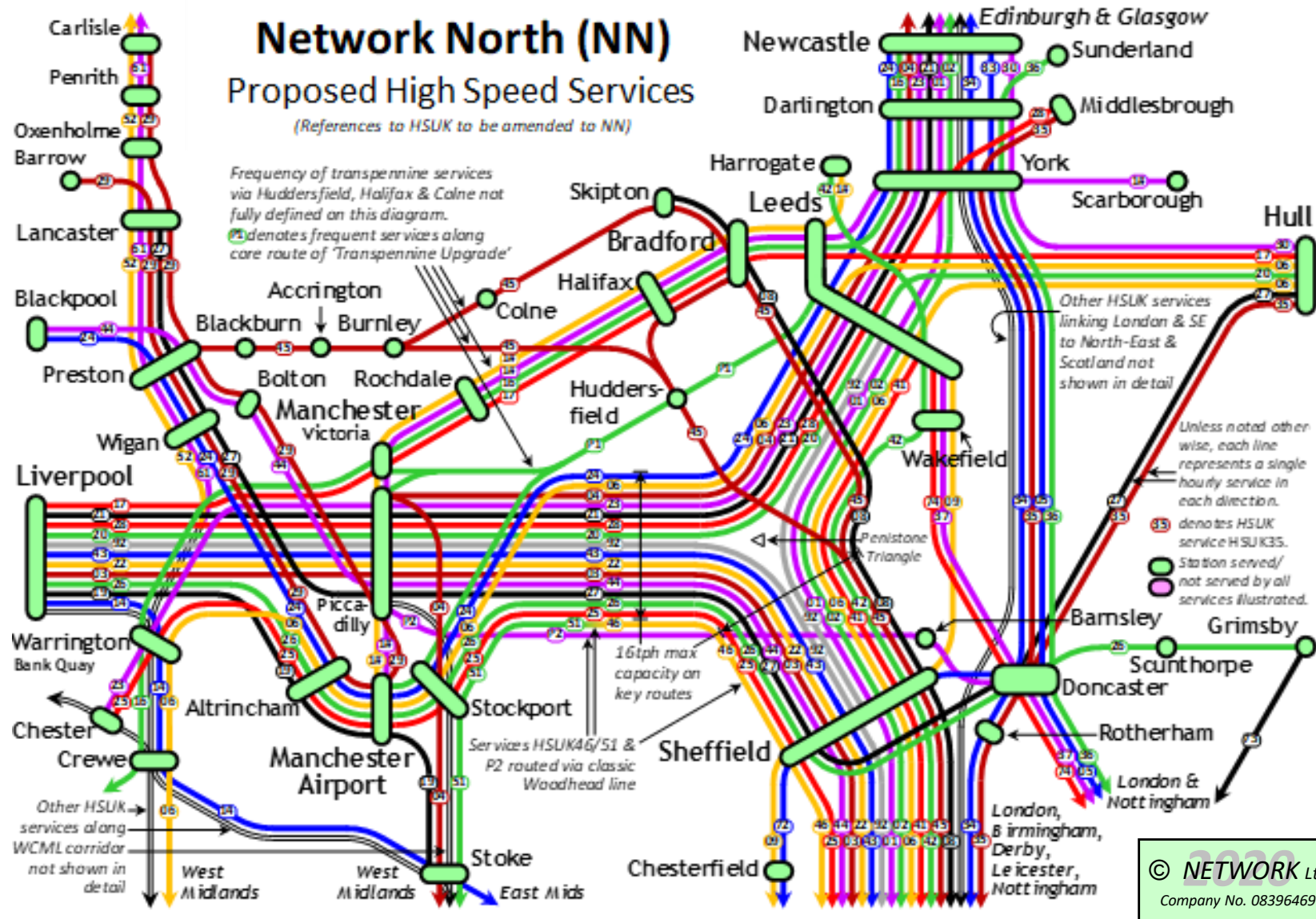
Manchester - Leeds
51 min 57.1 mph
26 min 113 mph

Manchester - Sheffield
51 min 49.8 mph
22 min 112 mph

Leeds - Sheffield
44 min 52.8 mph
19 min 104 mph



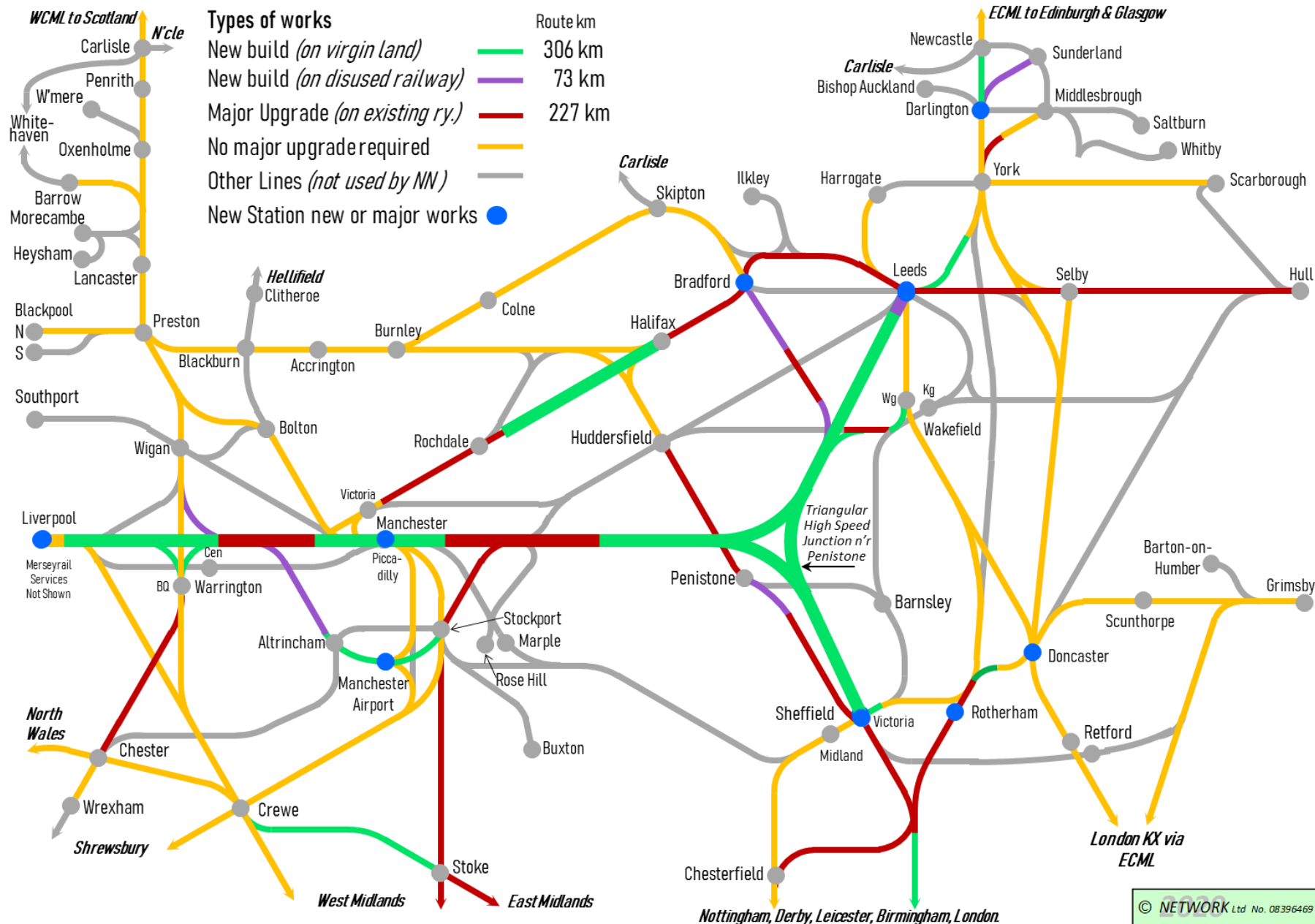
Network North – Demonstrator Timetable



Network North Demonstrator Timetable

- More than 50 hourly high speed services illustrated
- Each illustrated service is one train per hour in each direction
- Up to 13,000 seats per hour on high speed trains into both Leeds and Manchester
- Up to 14,000 seats per hour available on local services in addition to the above figure

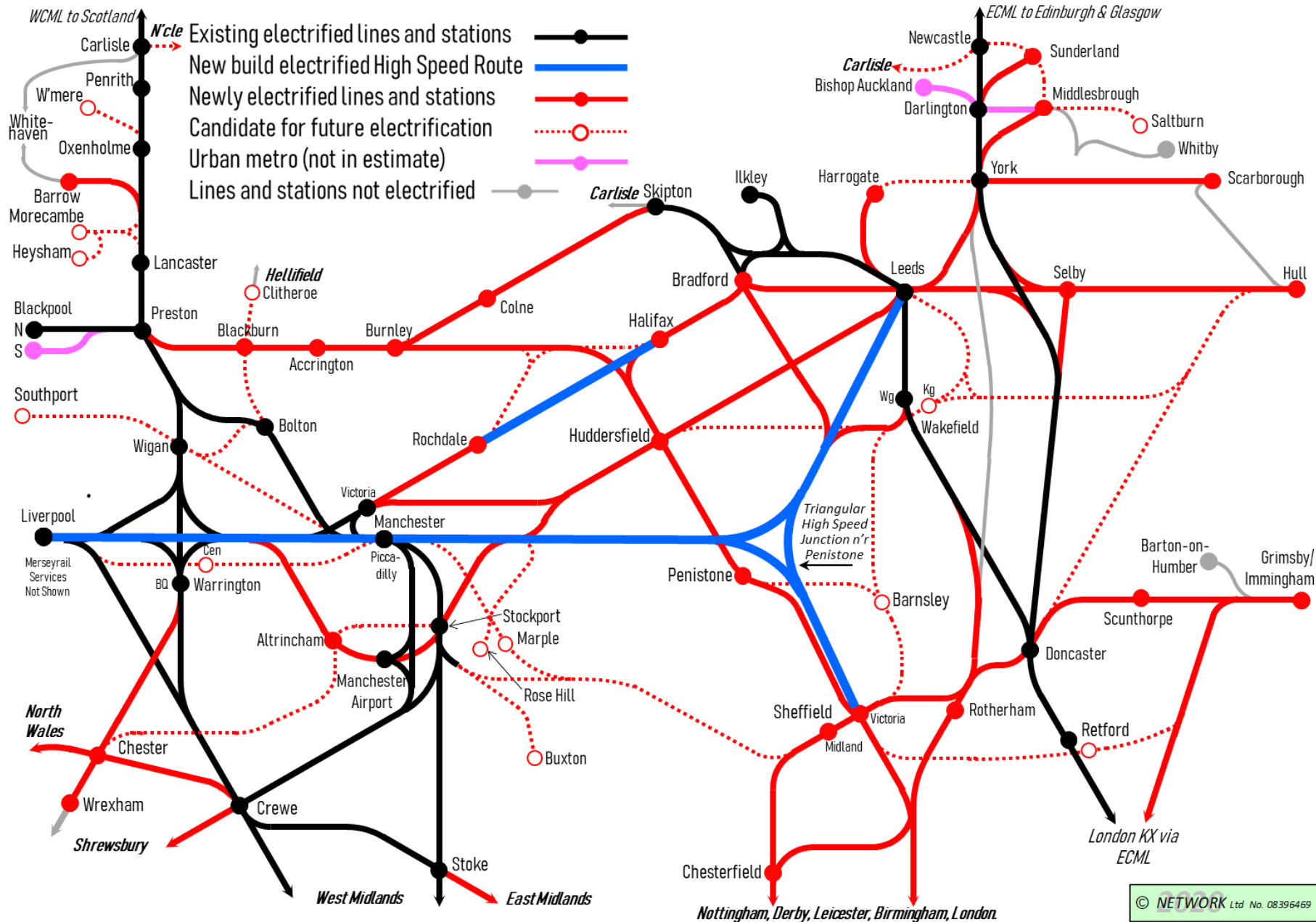
Network North – Required Works



Works Notes

- In the **NN** Demonstrator Timetable, there are no services using the grey lines.
- NN** Services use all the lines in colour.
- Some of these lines are electrified and some are not.
- The electrification proposals are shown separately on the following slide.

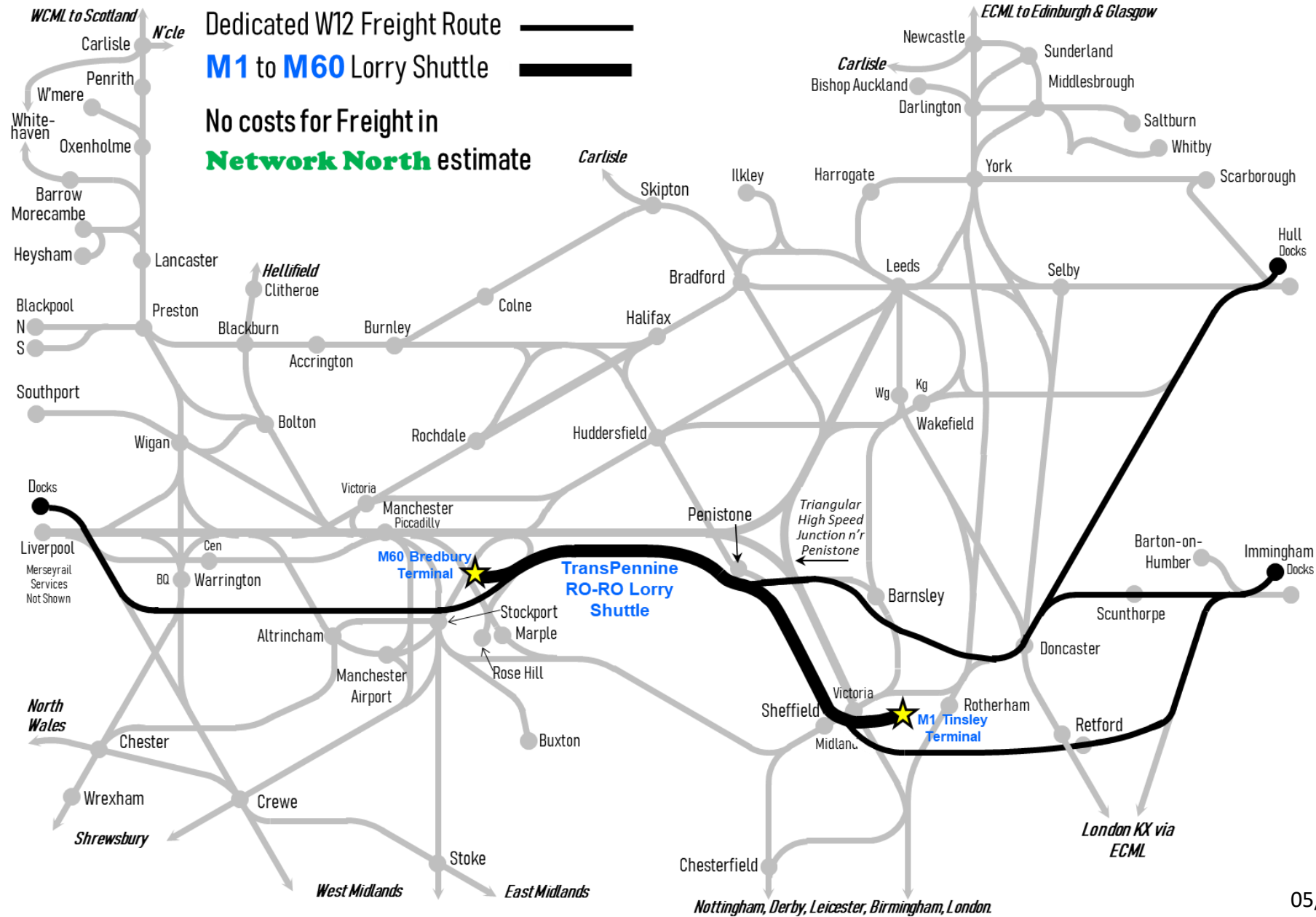
Network North – Electrification Proposals



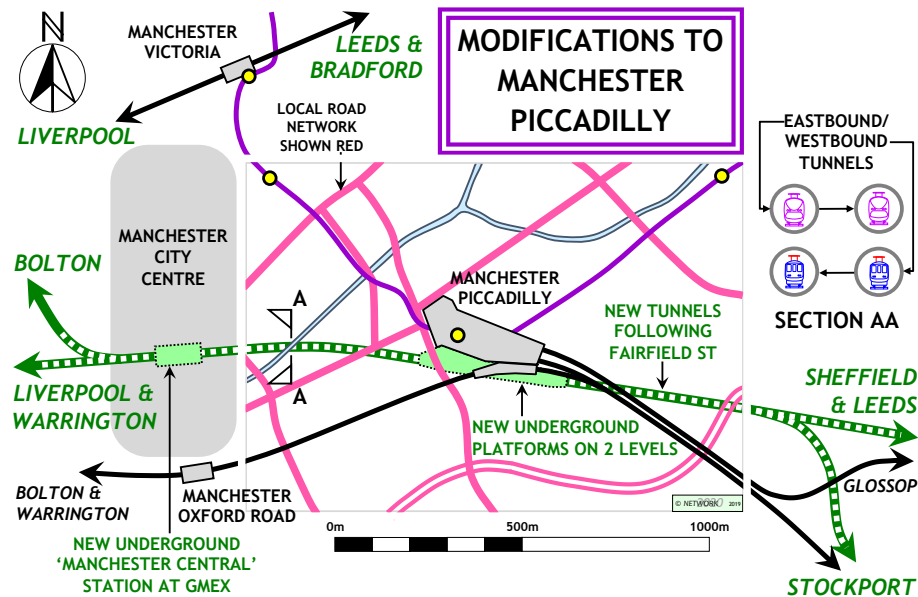
Electrification Notes

- Lines shown in blue or solid red are for 25kV AC overhead line.
- Costs are include estimate.
- Lines in dotted red are NOT in estimate.
- Lines in pink will probably use one of the light rail /tram standard voltages and are NOT in estimate

Network North – TransPennine Freight Plan



Network North – Changes to Major Stations – 1



Manchester Piccadilly

- New E/W cross city tunnel
- New underground platforms at Piccadilly
- Option for underground station at G-Mex
- Capacity for local services approx. doubled

Land Use

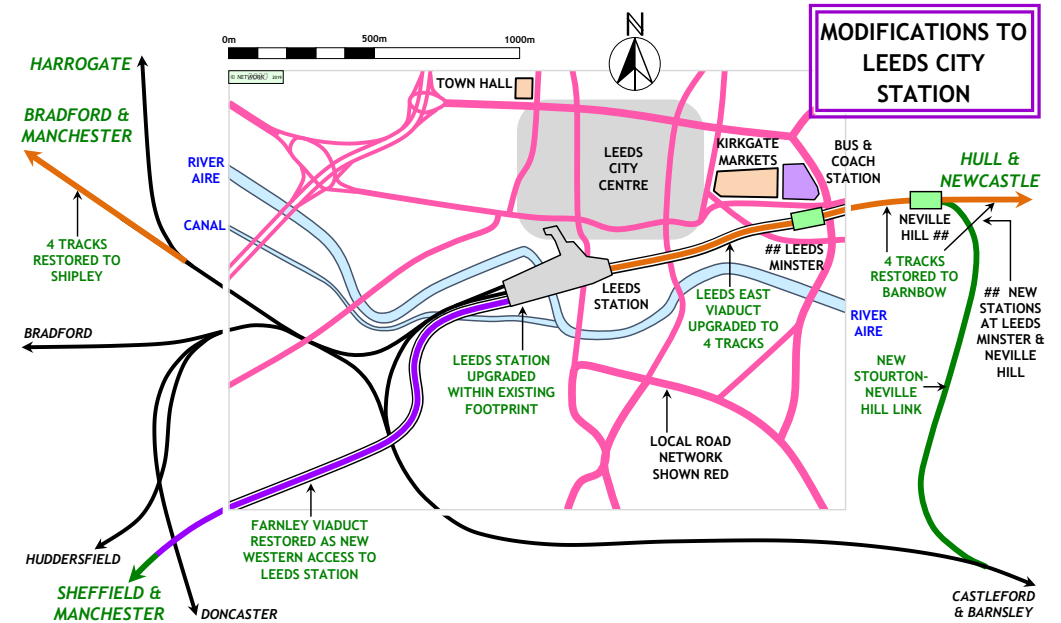
New & upgraded railway within Manchester City boundary
27.8 route km.

42% in tunnel, **56%** contained within existing railway boundaries

2% (600 metres) on viaduct over low value commercial property

0% new ground level railway on valuable commercial property

Pile-free corridor **must be reserved** to permit future tunnelling



Leeds

- 4 Tracks east of Leeds give new capacity for InterCity and Local Services
- New Neville Hill to Stourton link allowing through operation
- New station at Leeds Minster for interchange with Leeds bus station
- Capacity for local services approx. doubled

Land Use

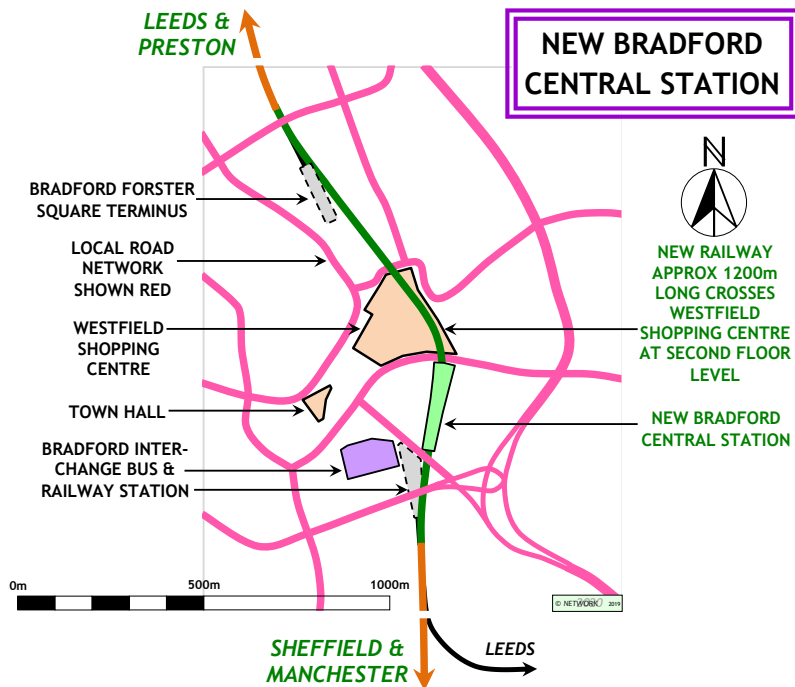
New and upgraded railway within Leeds City boundary **19.2 route km**

0% in tunnel, **74%** contained within existing railway boundaries

25% (4.8 km) on viaduct over low value commercial property

1% (100m) new ground level railway on potentially valuable commercial property

Network North – Changes to Major Stations – 2



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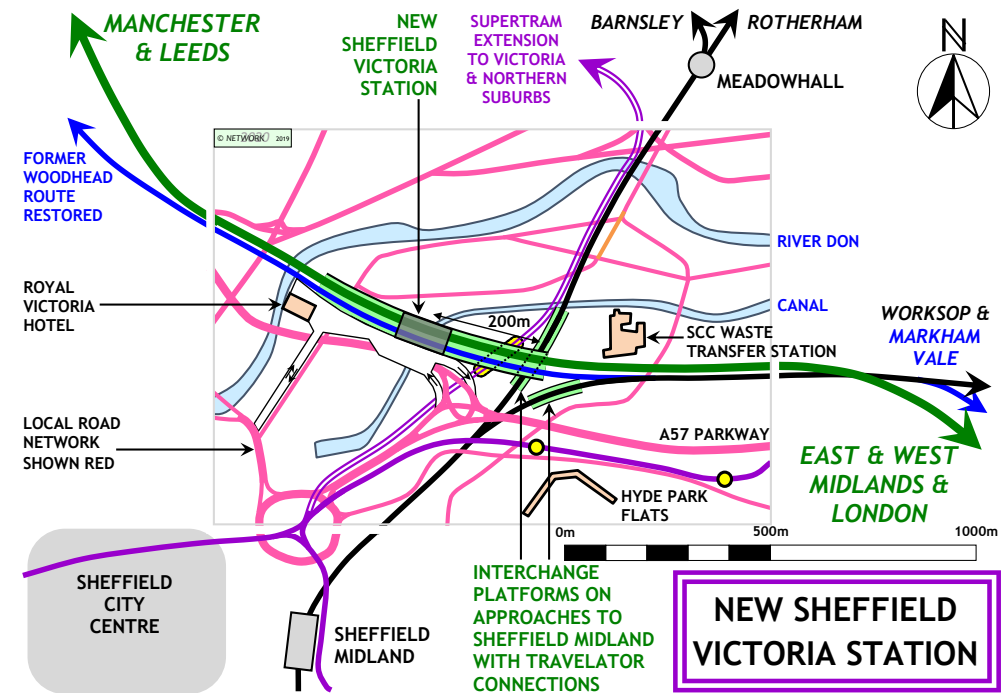
Bradford

- New cross Bradford rail link **1.2km long**. New central Bradford station
- New intercity & local services possible across Bradford for the first time

Land Use

Crosses the city centre through potentially valuable commercial property
67% (800m) on viaduct in part through commercial property

33% (400m) is new ground level railway on potentially valuable property
Masterplan required to optimise land use in city centre and to reserve the rail corridor.



Sheffield

- New Sheffield rail hub at former Victoria station for all high speed & local services via interchange platforms on routes to Sheffield Midland
- Supertram extended via Victoria to northern suburbs

Land Use

New and upgraded railway within Sheffield City boundary **28.2 route km**

24% in tunnel, **64%** contained within existing railway boundaries

12% (3.4km) on viaduct over low value commercial property

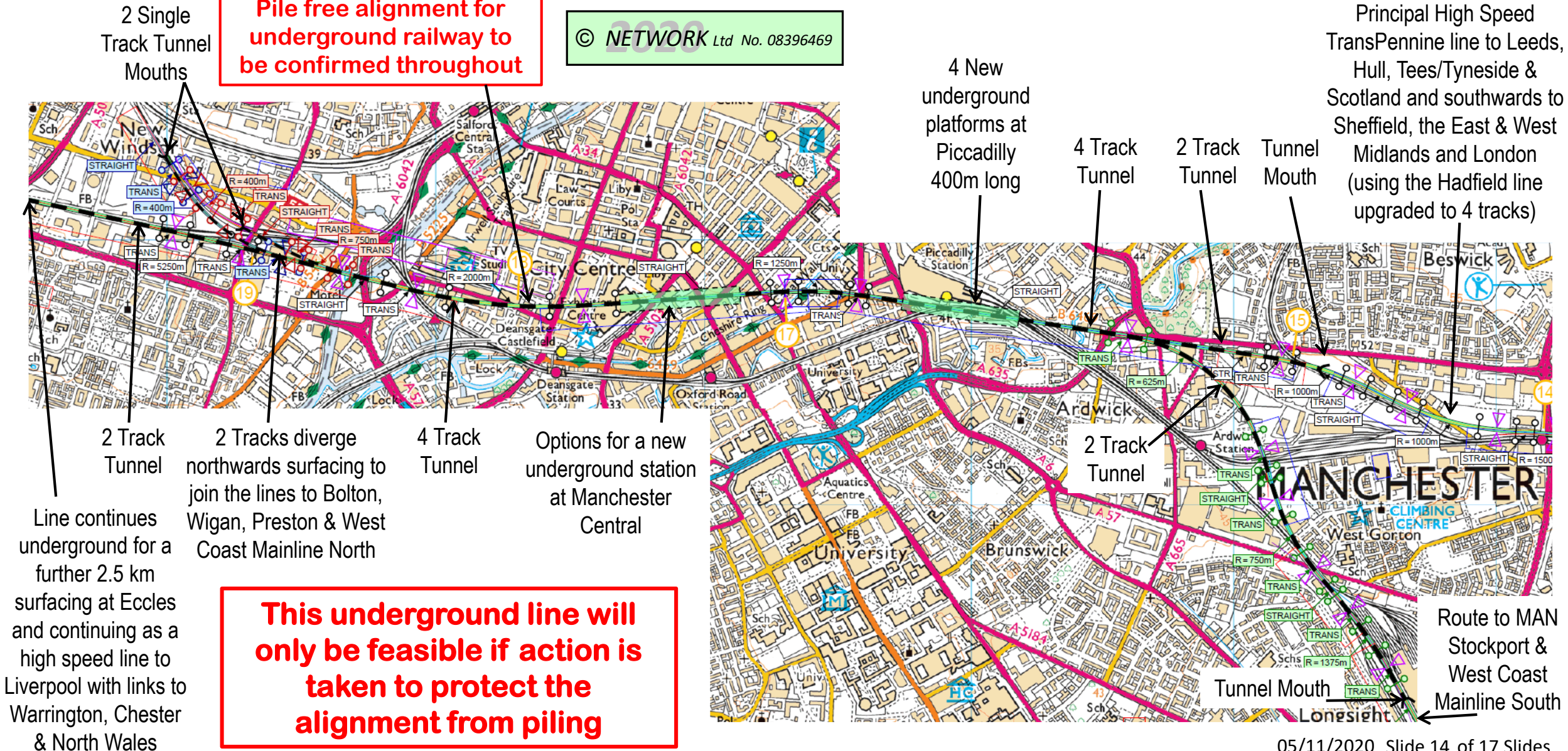
0% new ground level railway on valuable commercial property

Network North – Route through Manchester Piccadilly

Pile free alignment for underground railway to be confirmed throughout

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Principal High Speed TransPennine line to Leeds, Hull, Tees/Tyneside & Scotland and southwards to Sheffield, the East & West Midlands and London (using the Hadfield line upgraded to 4 tracks)



Network North – Design Methodology

- The **NN** design has been extracted from a complete design for a new high speed railway between London to Scotland. That overall design comprehensively covers the Northern Powerhouse
- The **NN** extract has been turned into a stand alone design which is able to deliver the TfN specifications for journey times and service frequencies between the principal cities (with Bradford added)

Network North – Detailed 5 Step Design Methodology

1. Select high speed spine routes between principal cities and add high speed links to London, the Midlands and Scotland
2. Create a strategic design at 1:200,000
3. From that create a detailed design at 1:25,000 demonstrating that the railway can be built while minimising environmental damage
4. Use Detailed Route Data to generate construction cost and to.....
5. Produce a Demonstrator Timetable to prove performance

Network North – Suggested Next Steps

- Hold a study day with a full presentation by the **NN** Team, including technical and financial Q & A sessions
- A formal proposal to be made by **NN** for undertaking a performance analysis of emerging NPR options:
 - To be performed within a few weeks. The deliverable proposed is a joint report from **NN** and TfN/NPR following a full plenary review of each other's proposals with everything 'on the table'
- In conjunction with TfN/NPR reach a joint conclusion on the best way to inform the current work on an Integrated Rail Plan for GB
- **NN** to brief TfN/NPR on potential funding mechanisms for **NN** given the current situation in the UK rail industry

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