

# HSUK assessment of Integrated Rail Plan performance in Northern Powerhouse

With no definitive design criteria for the Integrated Rail Plan established by the Government, HSUK has set 7 criteria by which schemes should be assessed:

1. Full compliance with any core specification (*note the NPR specification for journey time and service frequency between primary Northern Powerhouse cities set out in The Northern Transport Strategy: Spring 2016 Report, published March 2016 by Transport for the North*).
2. Direct links between all principal (Northern) population centres.
3. Delivery of maximised journey time reductions.
4. Full integration with local networks at city centre stations.
5. Delivery of step-change capacity gains for local services.
6. Provision of radically enhanced capacity for railfreight (*note the TfN ambition for a 'freight superhighway connecting Liverpool and the Humber' set out in Draft Strategic Transport Plan, published January 2018 by Transport for the North*).
7. Optimisation of direct links & reductions in journey time to principal population centres across national network.

The following assessment contrasts the performance of Integrated Rail Plans based on a) the official HS2 and Northern Powerhouse Rail proposals, and b) the High Speed UK exemplar alternative. The assumption is made that the Integrated Rail Plan will stipulate that HS2 and Northern Powerhouse Rail are implemented in full; any scope reductions in either scheme (for instance the widely predicted curtailment of the HS2 Phase 2b 'Eastern Arm') will further exacerbate the inadequate performance of the official proposals.

The assessment shows HSUK's comprehensive superiority over any local network based upon the official HS2 and Northern Powerhouse Rail proposals.

It should particularly be noted that predication upon the established HS2 proposals in both Greater Manchester and Yorkshire has prevented Northern Powerhouse Rail from meeting its own specification for journey time and service frequencies.

Further information on the performances of HS2 and HSUK as national propositions is given in Document A15, see Figures 4.1, 4.2, 4.3, 7.1 & 7.2.

# Northern Powerhouse Rail & HS2

Are they the network that the North needs?

Do they deliver the Integrated Rail Plan?

and... Can they meet the HSUK Challenge?

*A study by* **Colin Elliff BSc CEng MICE**

# Hold this thought...



- ➔ The HS2 project can only be justified if it results in an improved national railway network, offering step-change enhancements in capacity and connectivity.
- ➔ This improved national network is vital to deliver the HS2 promises of economic benefit, regional rebalancing and reductions in CO<sub>2</sub> emissions, and to build back better after the COVID-19 pandemic.
- ➔ HS2 cannot be an end in itself.

A.01

# Executive Summary - 1



1. The Northern Powerhouse Rail (NPR) initiative is vital to creating the enhanced transport network in the North that is necessary:
  - to spur the economic development of the Northern Powerhouse;
  - to meet the Government's 'levelling up' agenda;
  - to deliver step-change CO<sub>2</sub> reductions in line with 'net zero' commitments;
  - to 'build back better' after the COVID-19 pandemic.
2. This demands not any rail network, but the best possible railway network, delivering the greatest possible connectivity and capacity between the principal cities of the North.

# Executive Summary - 2



3. This study defines 7 core performance requirements of an enhanced rail network for the Northern Powerhouse:
  - compliance with the TfN journey time specification;
  - direct intercity links between all principal population centres;
  - step-change journey time reductions across Northern network;
  - city centre stations for full local/intercity integration;
  - step-change capacity increase for local services;
  - harmonisation with a parallel strategy for regional railfreight;
  - optimised intercity links to other major UK population centres.
4. This study reveals for the first time how a future UK rail network including Northern Powerhouse Rail & HS2 would perform against the 7 performance requirements listed above.

A.03

# Executive Summary - 3



5. This study then contrasts NPR's & HS2's combined performance against that of the High Speed UK (HSUK) Exemplar Alternative.
6. On all comparators, HSUK vastly outperforms NPR/HS2.
7. NPR's failure can be attributed to its dependency upon the established HS2 proposals. This false imperative has prevented NPR from meeting its own journey time/frequency specification.
8. By contrast HSUK's design as an integrated national intercity network, independent of HS2, gives far superior performance.
9. Northern Powerhouse Rail's & HS2's combined poor performance effectively sabotages the DfT's Integrated Rail Plan.
10. Only the fully integrated HSUK can deliver.

# Contents



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B.01	Development of NPR	J.01	Leeds & Bradford
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F.01	Comprehensive direct links?	N.01	Stoke/Potteries
G.01	Step-change journey time reductions?	P.01	Transpennine Railfreight?
H.01	NPR city proposals	Q.01	Links to other UK regions?
		R.01	Conclusions
		S.01	Integrated Rail Plan

# NPR Development

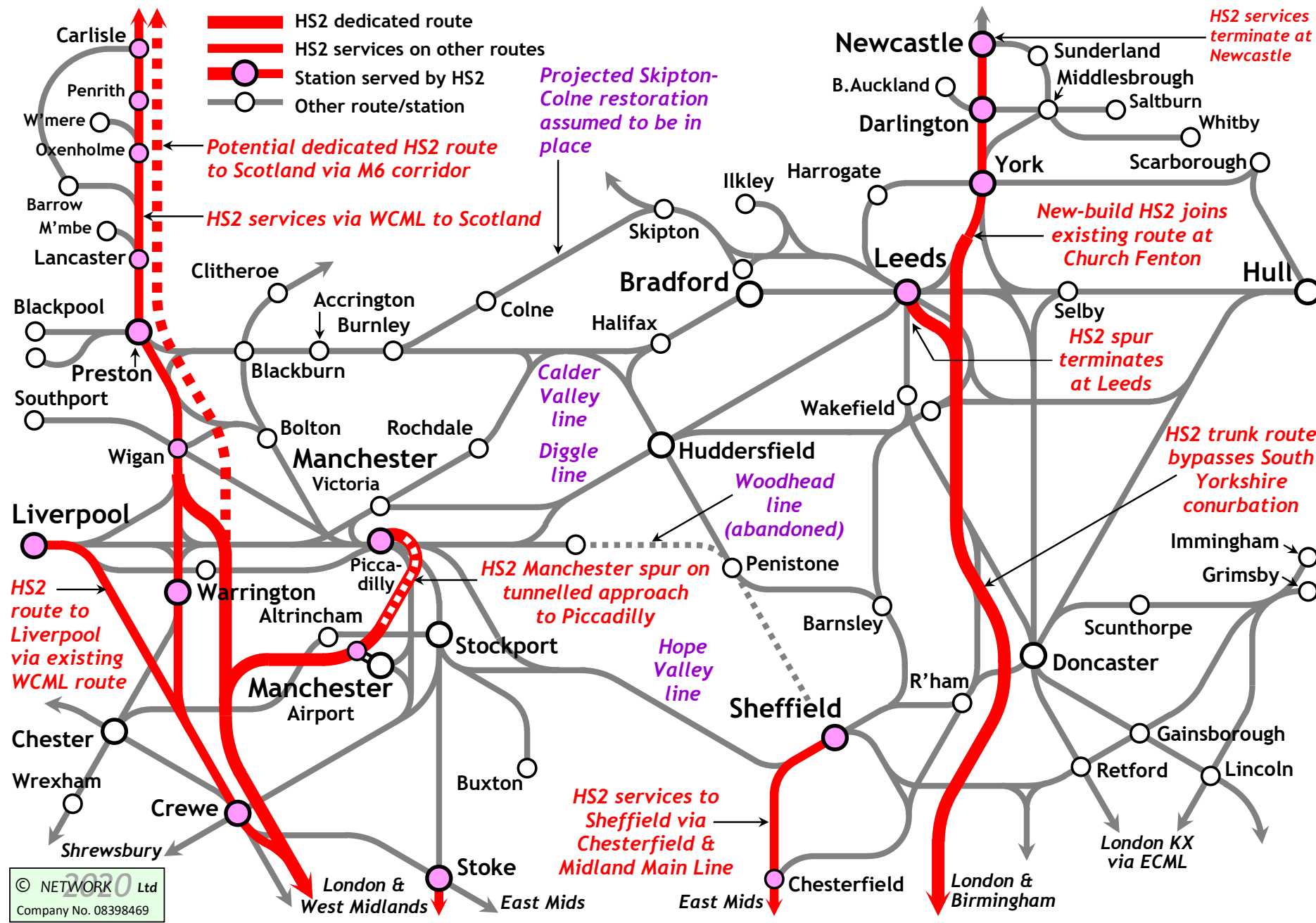


1. 2009 - HS2 project launched, with basic remit for new London - West Midlands high speed line.
2. 2010 - HS2 concept of national Y-network defined, with Ph1 London-West Mids stem splitting into Ph2a route to North-West and Ph2b route to Yorks.
3. 2012 - Ph2a and Ph2b routes confirmed. *Note no links created by HS2 between Northern cities.*

*See Slide B.02*

B.01





**HS2 Phase 2b developed with no thought for transpennine links**

# NPR Development



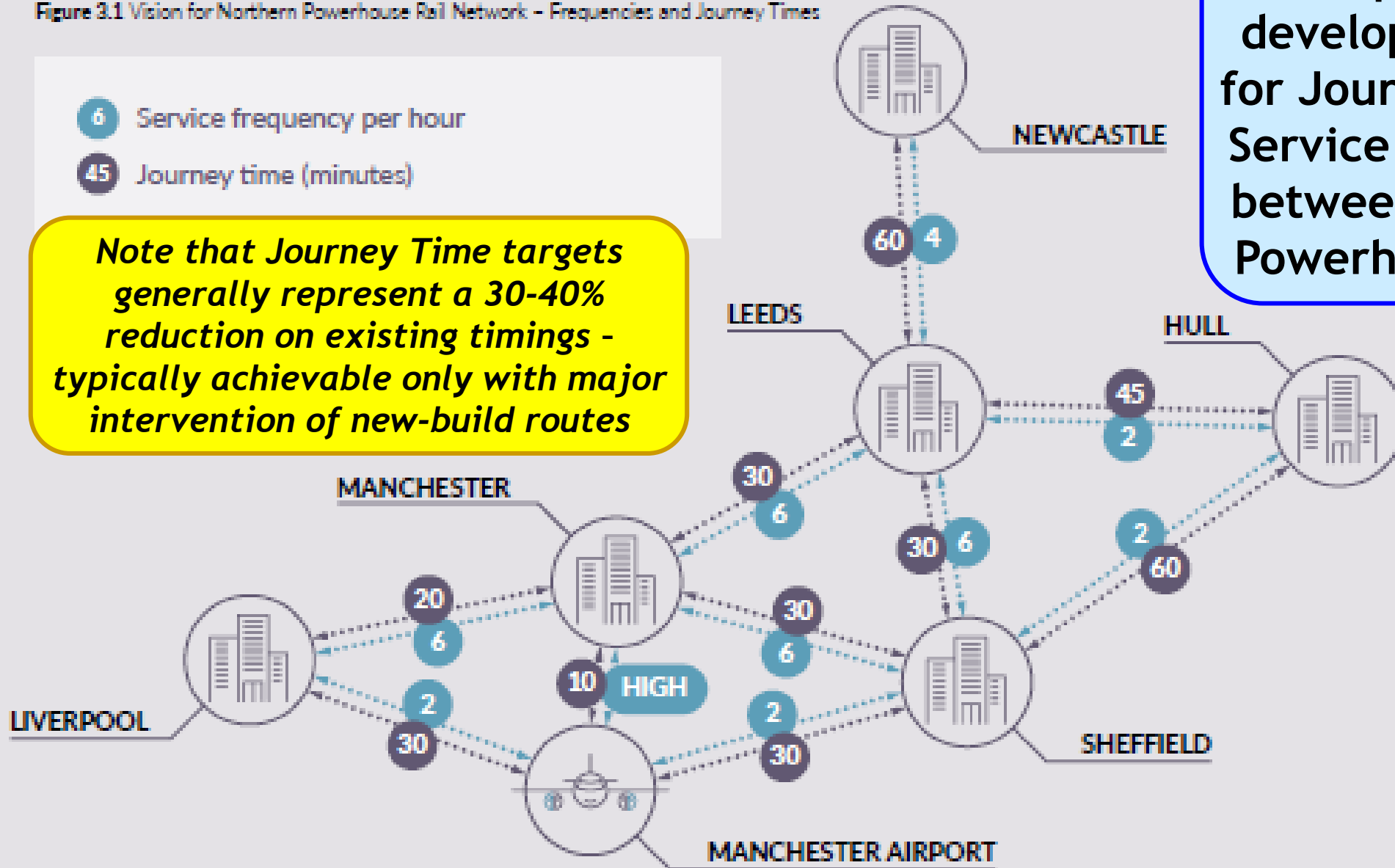
4. 2014 - Chancellor George Osborne launches Northern Powerhouse initiative. Improved transpennine rail links key to economic development of Northern Powerhouse.
5. 2015 - Transport for the North (TfN) established to develop Northern Powerhouse Rail.
6. 2016 - TfN publishes core specification for journey time & service frequency on primary routes.

B.03

Figure 3.1 Vision for Northern Powerhouse Rail Network – Frequencies and Journey Times

- 6 Service frequency per hour
- 45 Journey time (minutes)

*Note that Journey Time targets generally represent a 30-40% reduction on existing timings - typically achievable only with major intervention of new-build routes*



Core Specification developed by TfN for Journey Time & Service Frequency between Northern Powerhouse cities

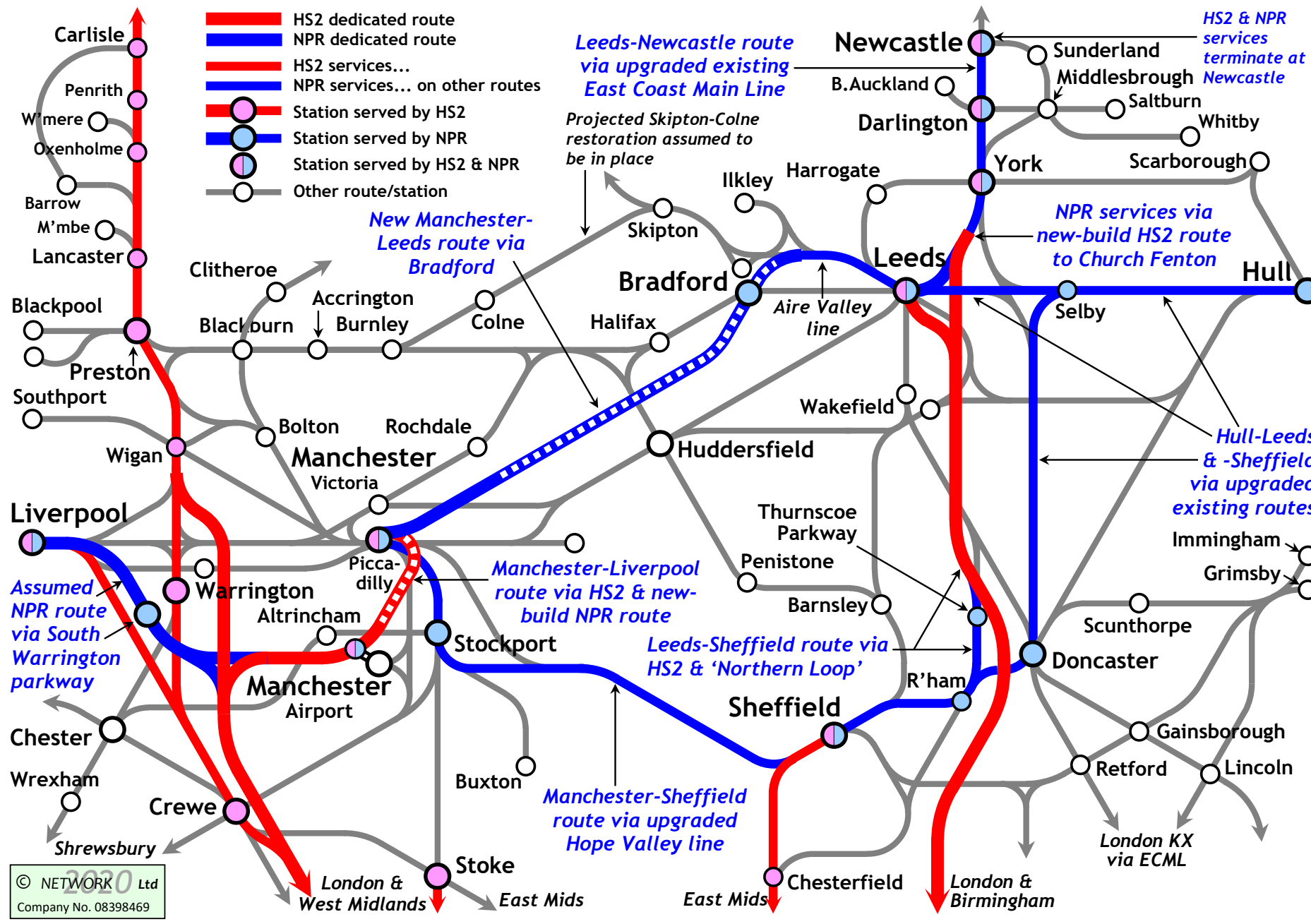
# NPR Development



7. 2016/20 - TfN develops Northern Powerhouse Rail scheme in conformance with established HS2 Ph2b proposals in Yorkshire and Greater Manchester.
8. 2018/19 - TfN's Strategic Transport Plan published, proposing new-build Manchester-Bradford-Leeds route, but no new Manchester-Sheffield route. Also Manchester-Liverpool & Sheffield-Leeds routes proposed, both dependent on sections of HS2.

*See Slide B.06*

B.05



**NPR Scheme  
based upon  
established  
HS2 Phase 2b**

# NPR - Further Steps

9. Nov 2020 - TfN issues 'Initial Preferred Way Forward' to Government - but no details of proposed routes or stations published.
10. End of 2020 - Government due to publish 'Integrated Rail Plan for whole GB network' - *a key recommendation of Oakervee Review of HS2 project.*  
NPR & HS2 key elements of Integrated Rail Plan.
11. August 2021 - So far, no Integrated Rail Plan.

# NPR: Does it Work?



Comprehensive review of TfN outputs indicates:

- No evidence of definitive technical proposals for NPR routes or stations (*compare with HS2 progress!*)
- No evidence that TfN has adopted any structured approach to developing NPR as an optimised railway network.
- Plentiful evidence that NPR will fail to meet many aspects of TfN's core specification.

C.01

# Nevertheless...



Despite lack of detailed proposals, sufficient information exists in TfN's technical outputs to:

- Assess NPR's likely improvements in intercity journey times & direct intercity links;
- Determine NPR's overall performance as a railway network interlinking the principal cities of the Northern Powerhouse.



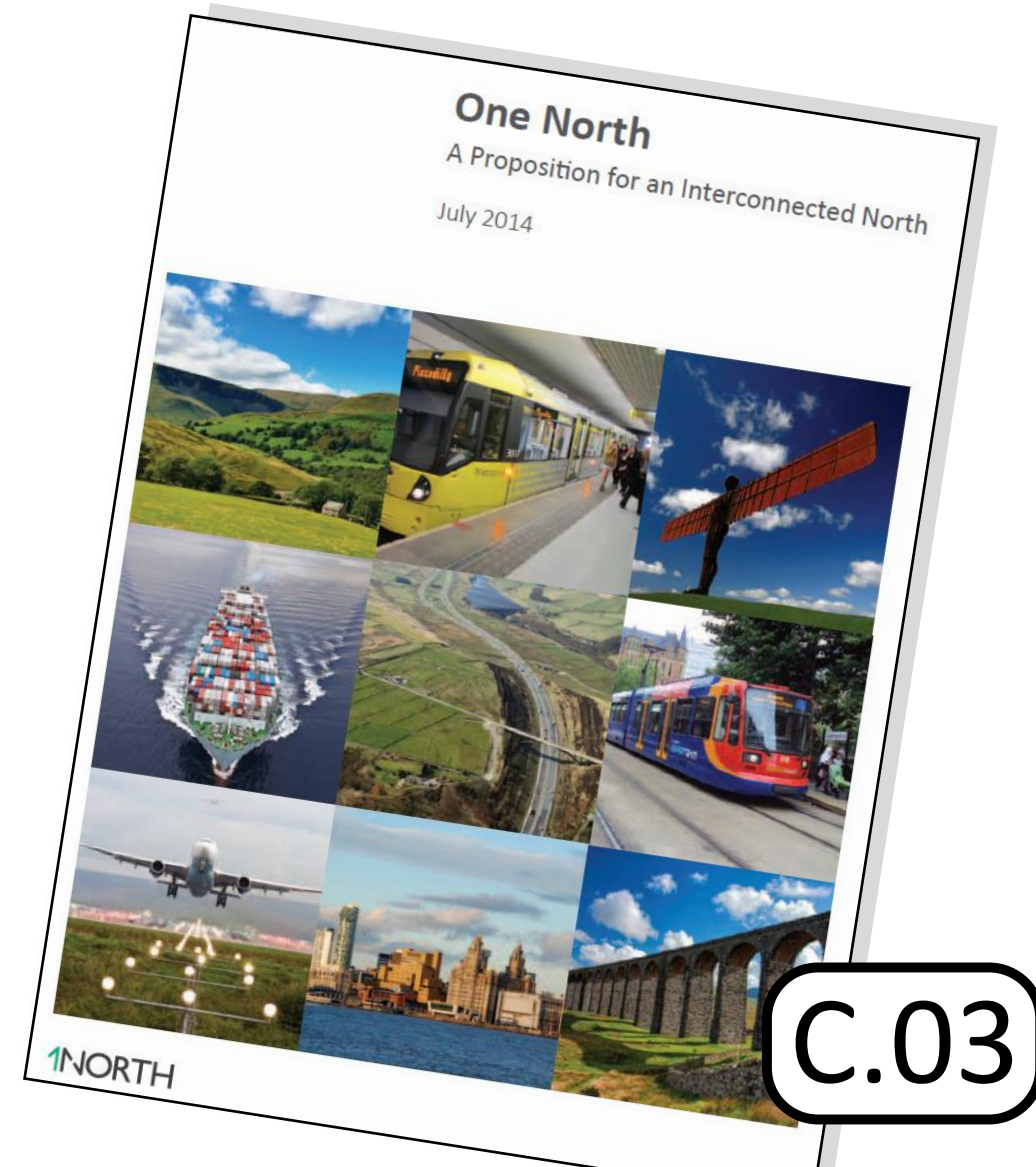
# Primary Info Source 1



## *One North: A Proposition for an Interconnected North*

‘One North’ group of Northern city  
councils (July 2014)

- ➔ This document established the core specification of intercity journey times. *See Slide B.04.*  
*Note that journey times to Hull were not included in ‘One North’.*



C.03

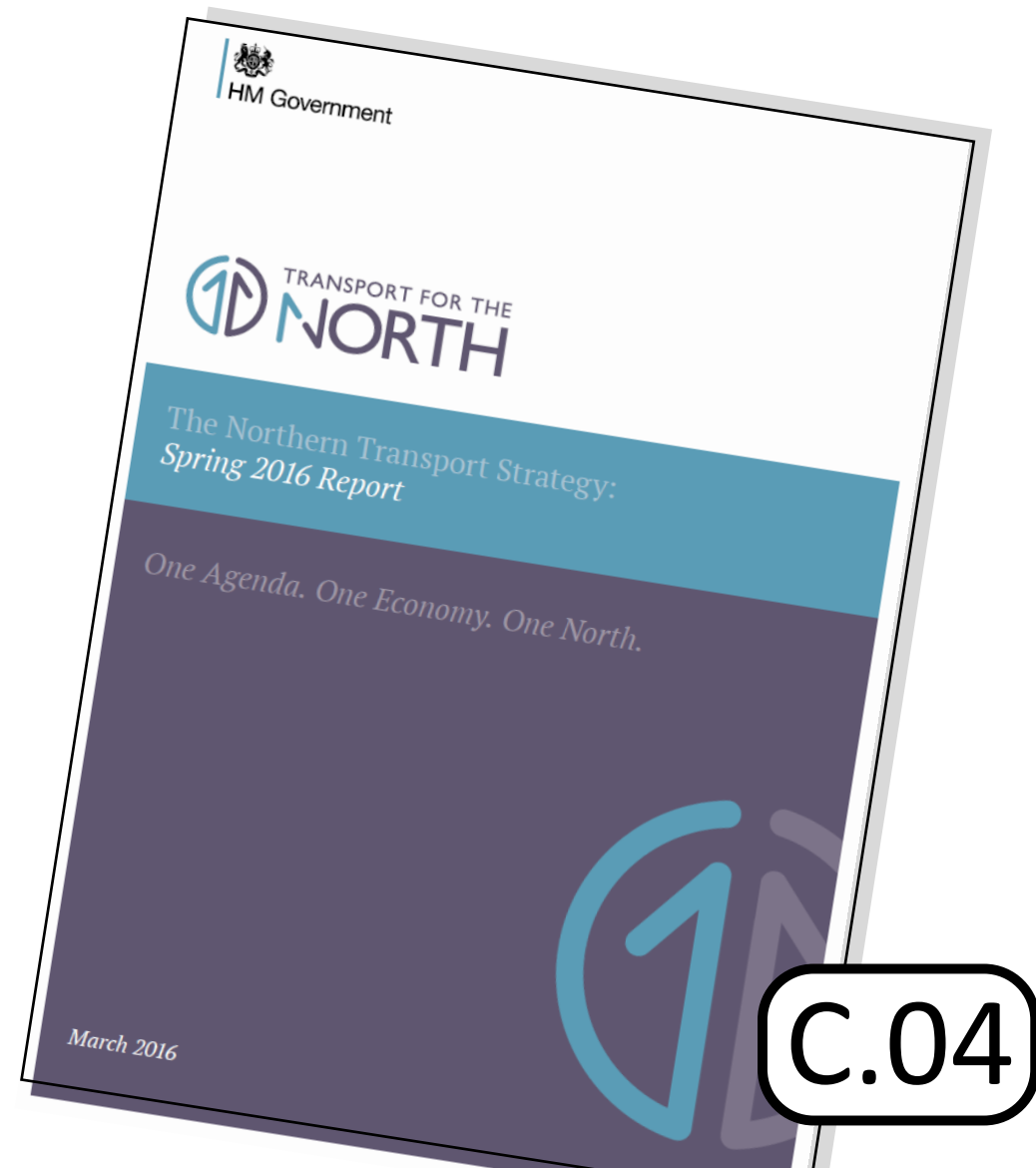
# Primary Info Source 2

## *The Northern Transport Strategy: Spring 2016 Report*

Transport for the North (March 2016)

- ➔ This document confirmed the core specification of intercity journey times (including Hull), and also set out required service frequencies.

*See Slides B.04 & E.02*



C.04

# Primary Info Source 3a

## *Strategic Transport Plan: Final Draft*

Transport for the North (January 2019)

- ➔ This document indicated proposed routes and set out journey times and service frequencies - *many in breach of core specification.*

*See Slide E.03.*



# Primary Info Source 3b

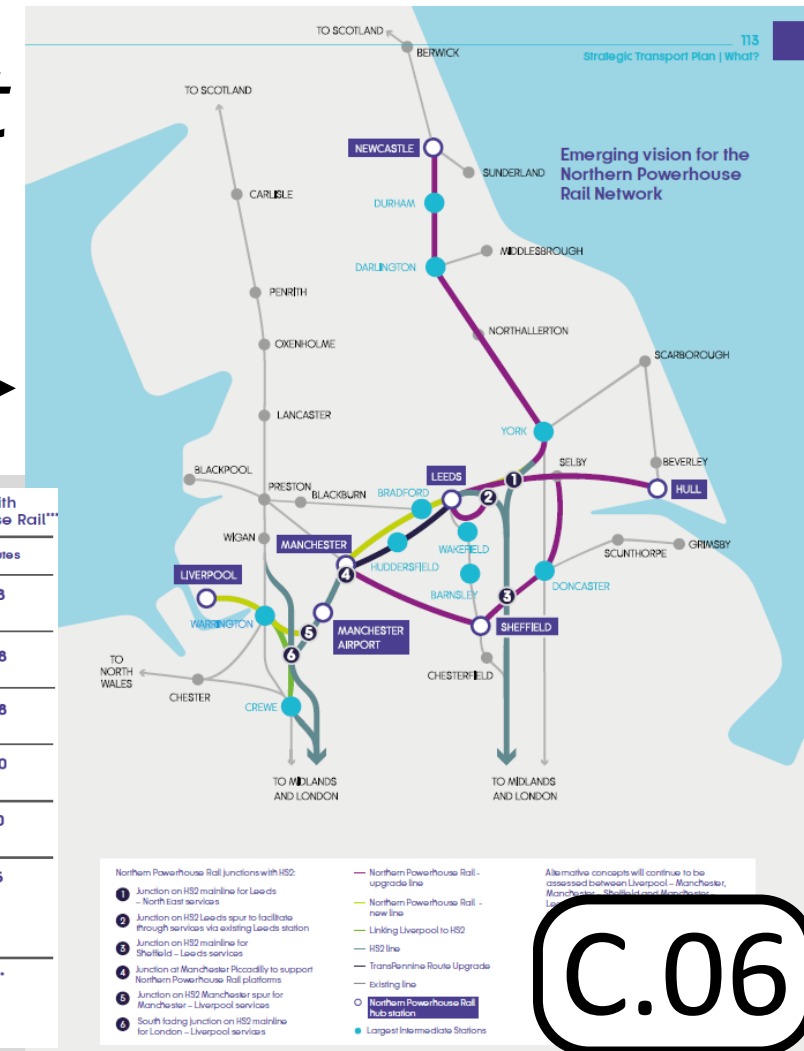


## Strategic Transport Plan: Final Draft Transport for the North (Jan 2019)

➔ Proposed routes shown on Page 113 ➔

➔ Journey times and service frequencies shown on Page 112 ➔

	Corridor concepts under consideration	Best current		Best potential with Northern Powerhouse Rail***	
		frequency	minutes	frequency	minutes
Newcastle - Leeds	Infrastructure upgrades	3	88-95'	4	58
Leeds - Hull	Infrastructure upgrades	1	57	2	38
Sheffield - Leeds	Infrastructure upgrades and use of HS2	1	39-42	4	28
Sheffield - Hull	Infrastructure upgrades	1	80-86	2	50
Manchester - Sheffield	Infrastructure upgrades	2	49-57	4	40
Leeds - Manchester	A new line serving Bradford via Parkway or Centrally Diggle Upgrades Akin to New Line	4	46-58	6	25
Liverpool - Manchester***	A new line via Warrington Southern Parkway or Centrally A Fiddlers Ferry upgrade	4	37-57	6	26'

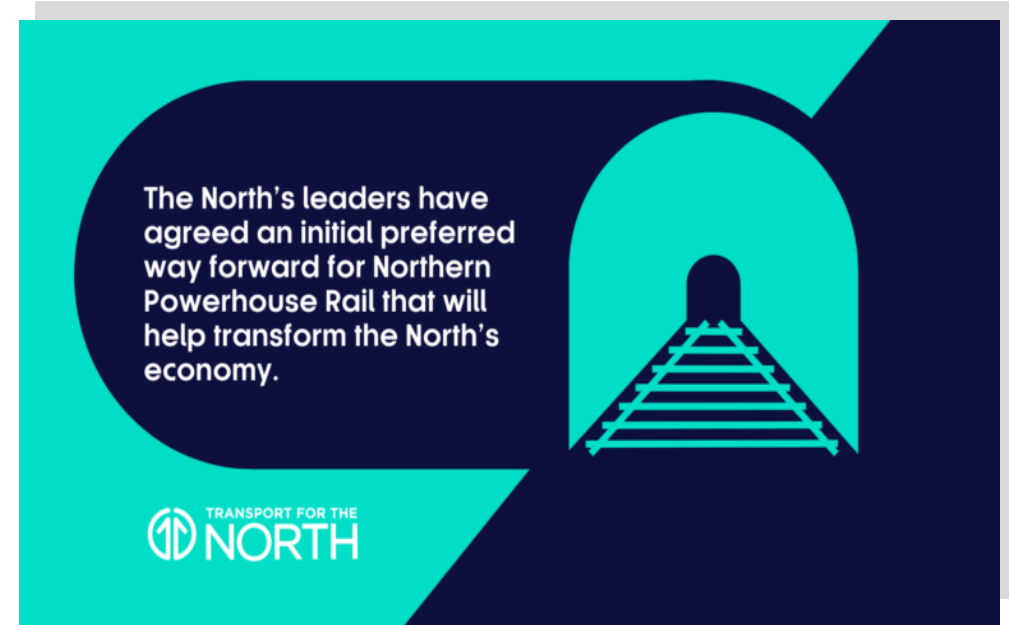


C.06

# Primary Info Source 4a

*TfN press release: 19 Nov 2020*

- ➔ It was announced that TfN had issued their 'Initial Preferred Way Forward' to Government.
- ➔ Whilst further indicative info was provided re proposed stations, no detailed information of proposed routes was given.
- ➔ The sketch shown on Slide C.06 remains the best indicator of TfN's 'Initial Preferred Way Forward'.



<https://transportforthenorth.com/press-release/gov-recommendations-northernpowerhouserail/>



# Primary Info Source 4b

*TfN press release: 19 Nov 2020*

The TfN press release confirmed:

- No proposal for a new NPR high speed line in County Durham - *hence NPR cannot achieve the 60 minute target for the Leeds-Newcastle journey time.*
- An intention for a central station in Warrington - *but no technical detail of the 8km long tunnel necessary to incorporate this station into a time-critical new route linking Manchester and Liverpool. Hence not accepted and southern parkway assumed instead.*

C.08

# Remember...



*It cannot be disputed that...*

- ➔ To deliver the greatest possible economic and environmental benefits, the Northern Powerhouse needs the best possible railway network, providing the greatest possible enhancements in connectivity and capacity.

# Remember...



*It also cannot be disputed that...*

- ➔ Any proposed 'NPR network' must be designed to deliver optimum performance as a network.
- ➔ This cannot be left to chance - it is no good simply designing new high speed lines in isolation from the existing railway system, and hoping for the best.



# Key Network Objectives

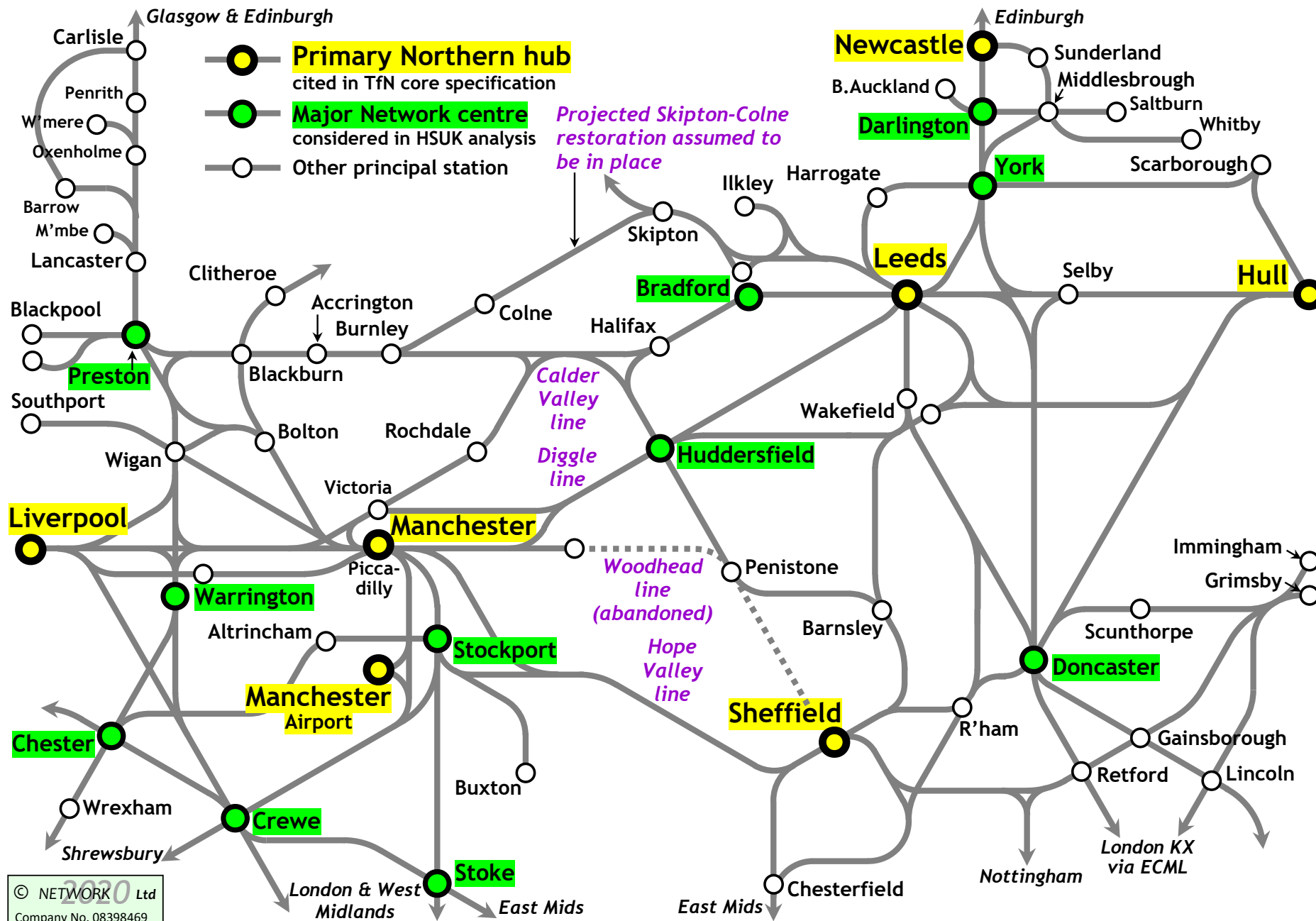
An ideal Northern Powerhouse rail network should...

1. Comply fully with TfN core specification.
2. Directly interlink all principal Northern population centres.
3. Deliver maximised journey time reductions.
4. Integrate fully with local networks at city centre stations.
5. Deliver step-change capacity gains for local services.
6. Be compatible with TfN ambition for 'freight superhighway'.
7. Optimise direct links & reductions in journey time to principal population centres across national network.

# 18 Hubs Considered in HSUK Network Analysis



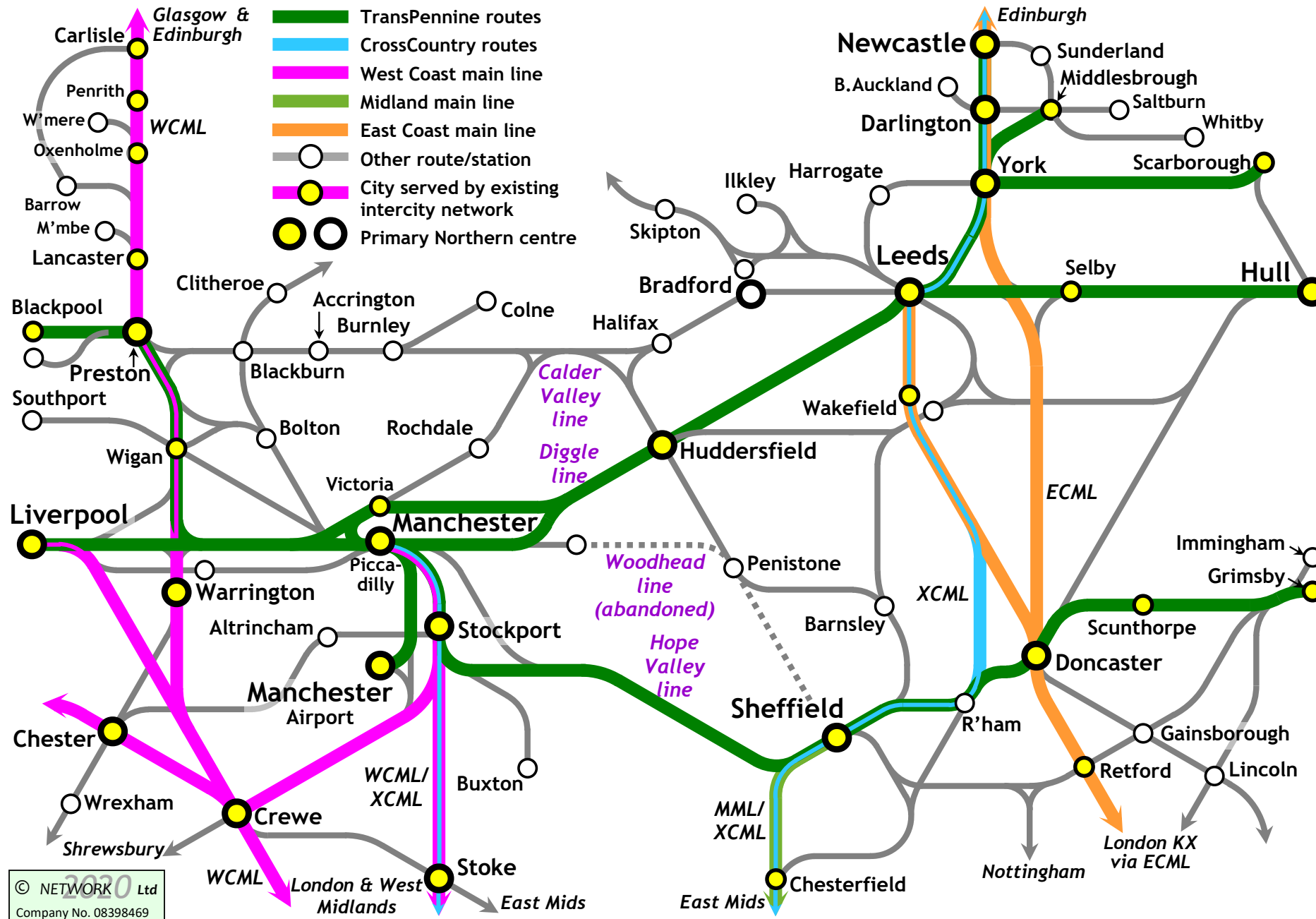
Doncaster		Stoke		 7 Primary Network Hubs
Sheffield		Crewe		
Huddersfield		Chester		 11 additional Major Network Centres
Bradford		Stockport		
Leeds		Manchester Airport		
Hull		Manchester		
York		Warrington		
Darlington		Preston		
Newcastle		Liverpool		



# Basis of Analysis



- ➔ Any judgment on network performance can only be made in the context of the performance of the existing network.
- ➔ Primary problem:
  - High quality links to London (WCML to Liverpool & Manchester, MML to Sheffield, ECML to Leeds)
  - Much poorer quality transpennine links between Liverpool, Manchester, Sheffield, Leeds



**Existing  
intercity  
network in  
Northern  
Powerhouse**

# Existing Network Links



Newcastle	NE																		
Darlington		DL																	
York			YO																
Hull				HU															
Leeds					LS														
Bradford						BD													
Huddersfield							HD												
Doncaster								DN											
Sheffield									SH										
Manchester										MA									
Stockport											SK								
MAN Airport												MAN							
Stoke													ST						
Crewe														CW					
Warrington															WA				
Chester																CH			
Liverpool																	LI		
Preston																		PR	
	NE	DL	YO	HU	LS	BD	HD	DN	SH	MA	SK	MAN	ST	CW	WA	CH	LI	PR	
No of Direct Links	9	9	12	6	14	7	10	8	13	17	8	14	3	8	10	8	13	9	

High quality	Direct hourly intercity link
Medium quality	
Low quality	
No direct intercity link	
No. of direct intercity links	88

Existing network offers **88** direct intercity links out of **153** possible.

**58%** Network efficiency

# The High Speed UK

## Exemplar Alternative

- ➔ A properly informed judgement on NPR's performance as an intercity network, and on its worth as a public infrastructure project, can only be made through rigorous comparison with an 'Exemplar Alternative'.
- ➔ High Speed UK provides this Exemplar Alternative.

# The HSUK Alternative



- ➔ Unlike NPR or HS2, HSUK has been designed from the outset as a national intercity network, with the basic aim of establishing frequent and direct intercity links between all major UK regional cities.
- ➔ The HSUK design is supported by detailed design (at 1:25,000 scale) of over 1,000km of new, upgraded and restored railway. This has in turn allowed detailed estimation of construction cost, and calculation of journey times on all intercity routes.



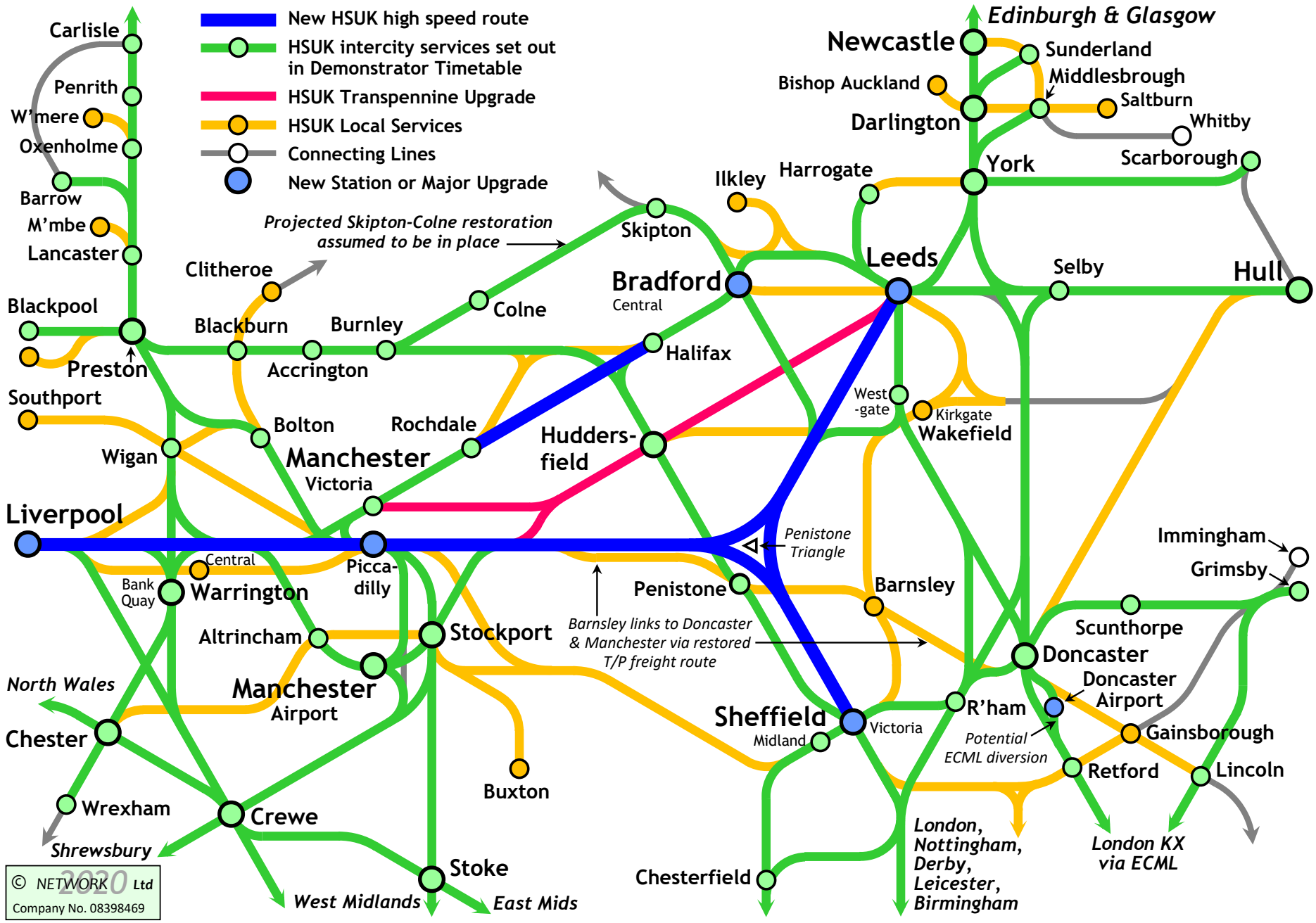
# Network North & HSUK



- ➔ The elements of High Speed UK in the Northern Powerhouse region are presented as ‘Network North’.
- ➔ Network North has the same fundamental aim as Northern Powerhouse Rail (NPR) - to interconnect the major cities of the North, and hence promote economic growth.
- ➔ The detailed design supporting Network North allows rigorous comparisons to be made with NPR on a wide range of technical criteria.

# Network North Services

- ➔ High Speed UK/Network North intercity services will extend to all major population centres in the Northern Powerhouse.
- ➔ These services will be fully integrated with a wider network of local services accessing most communities.

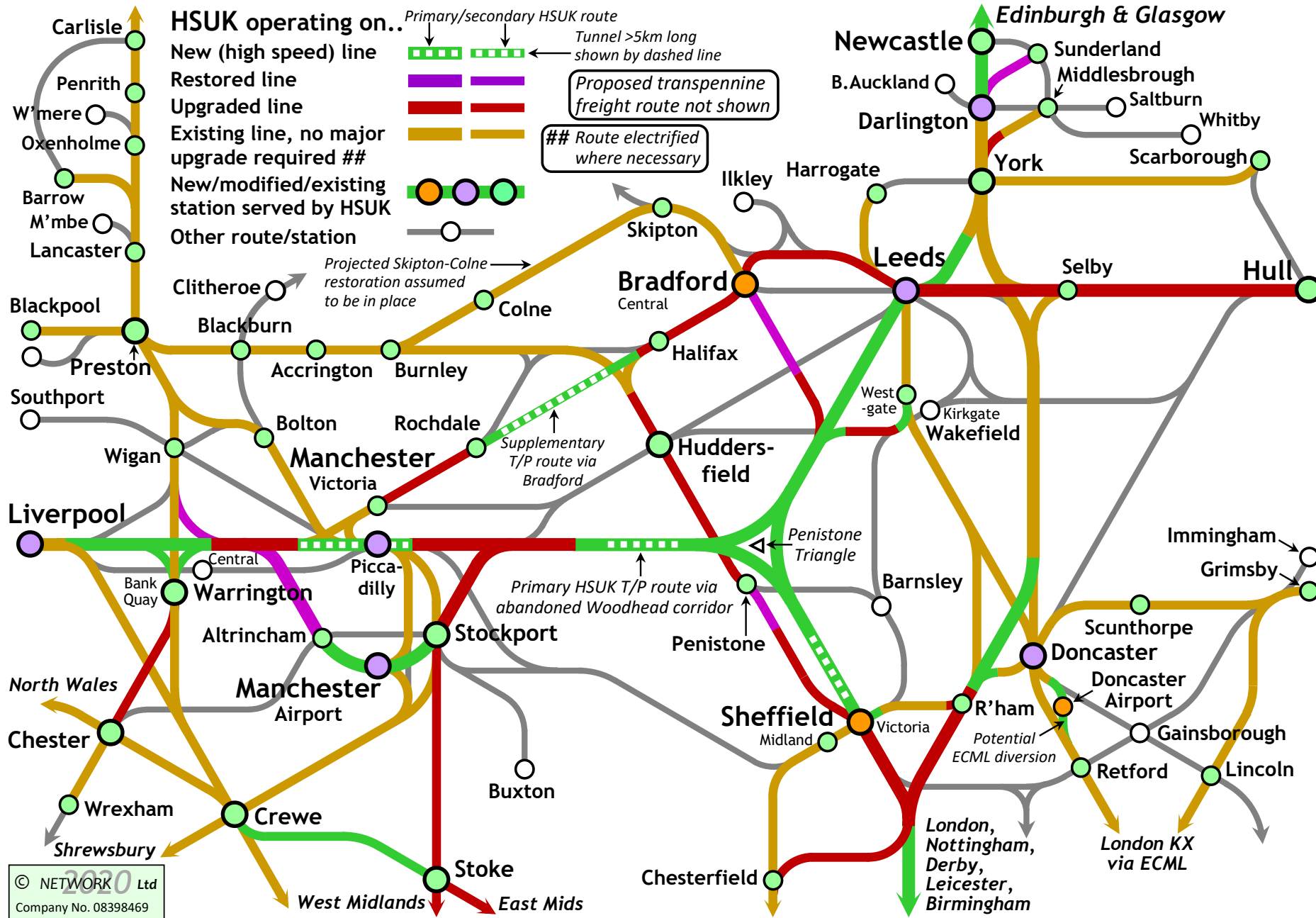


# HSUK Intercity Network in Northern Powerhouse

# Network North Routes



- ➔ High Speed UK/Network North services will operate on a blend of:
  - New-build routes;
  - Upgraded existing routes;
  - Restored abandoned routes.
- ➔ This is harmonious with wider initiatives to:
  - Create a dedicated transpennine freight route; and
  - Electrify most Northern rail routes.



**HSUK  
Proposed  
Infrastructure  
in Northern  
Powerhouse**

**Proposed  
transpennine freight  
route not shown**

**D.07**

# Network Aim 1

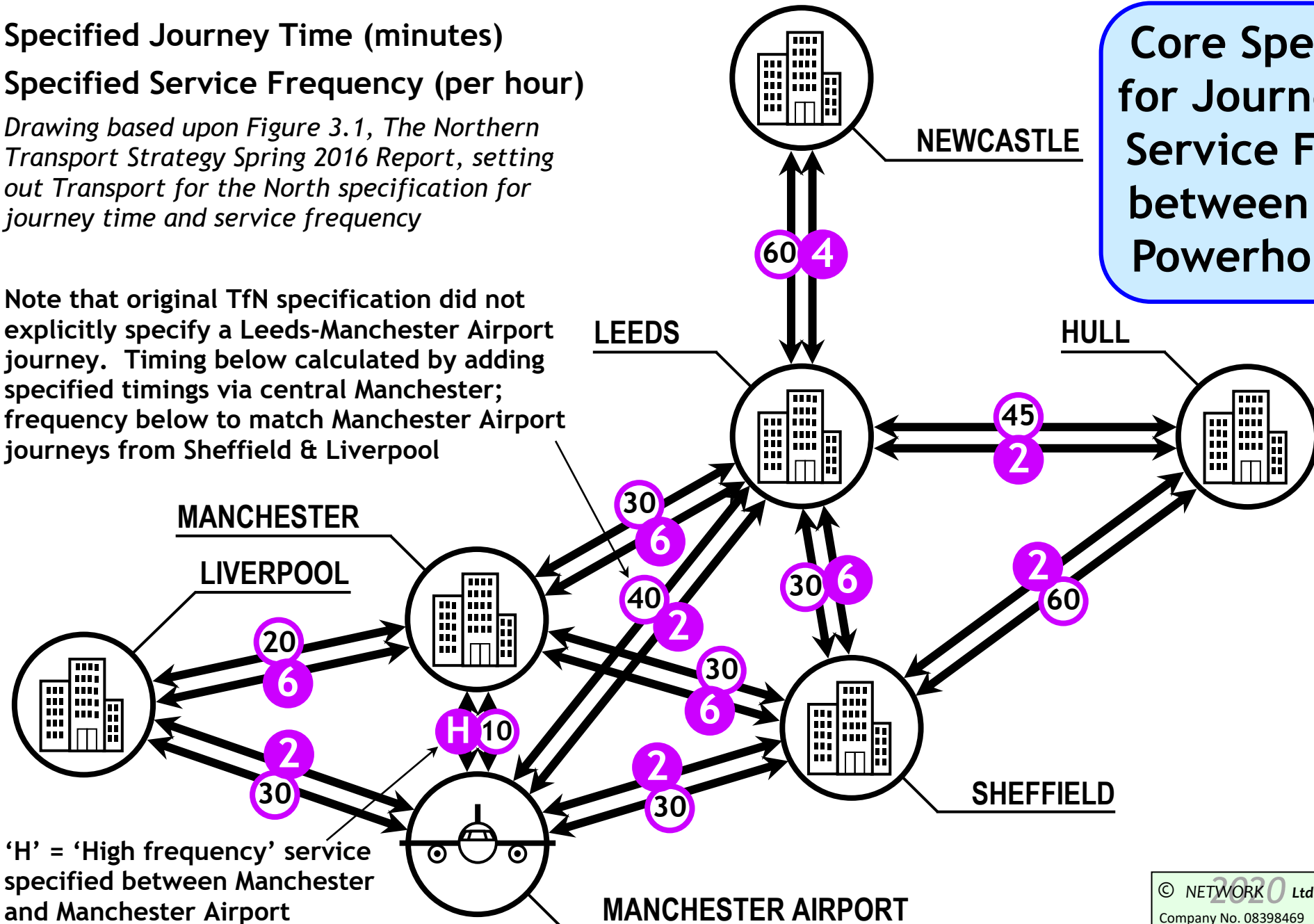


1. Full compliance with TfN core specification for journey time & service frequency

- 60 Specified Journey Time (minutes)
- 4 Specified Service Frequency (per hour)

*Drawing based upon Figure 3.1, The Northern Transport Strategy Spring 2016 Report, setting out Transport for the North specification for journey time and service frequency*

Note that original TfN specification did not explicitly specify a Leeds-Manchester Airport journey. Timing below calculated by adding specified timings via central Manchester; frequency below to match Manchester Airport journeys from Sheffield & Liverpool



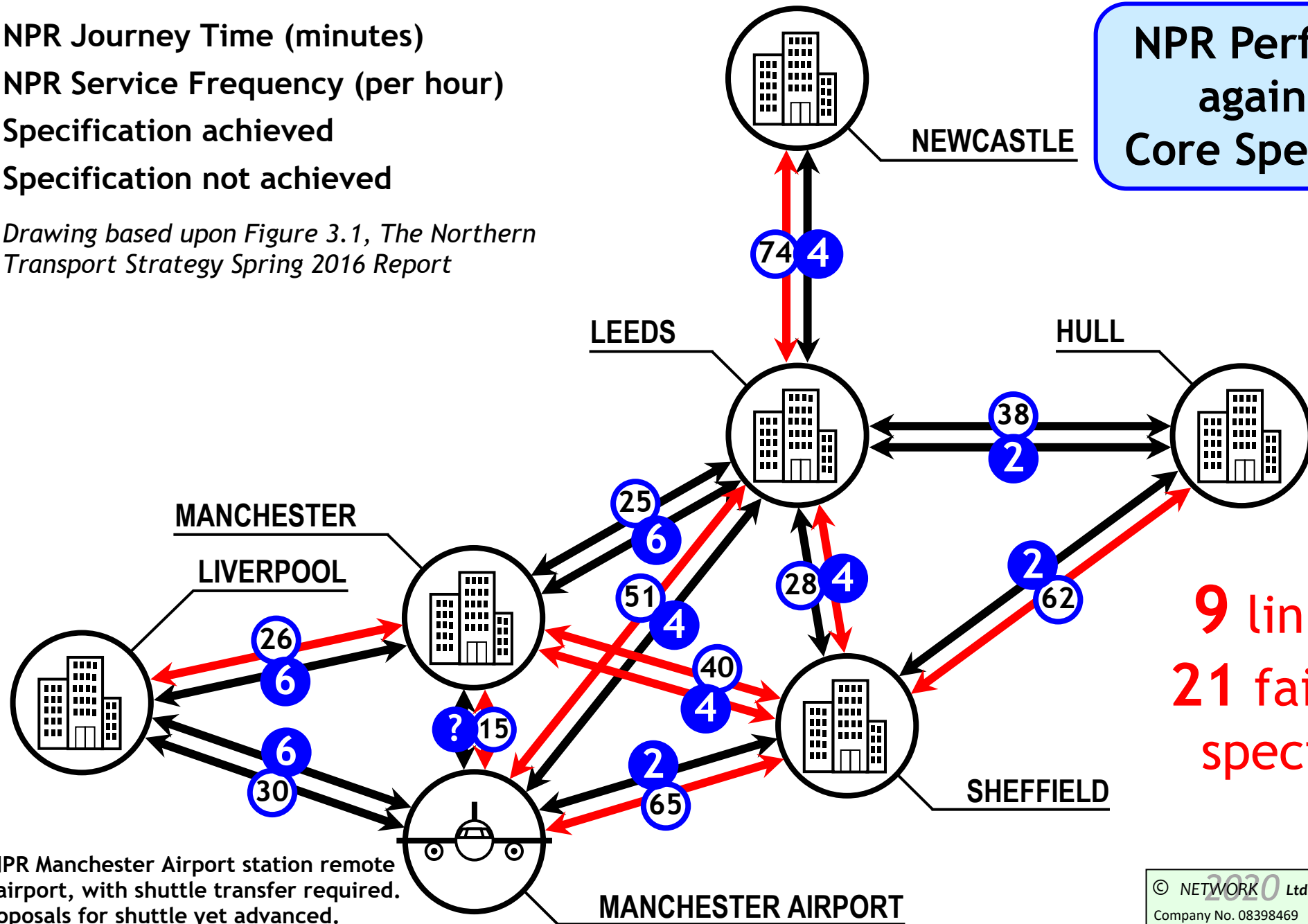
**Core Specification for Journey Time & Service Frequency between Northern Powerhouse cities**

'H' = 'High frequency' service specified between Manchester and Manchester Airport

- 60 NPR Journey Time (minutes)
- 4 NPR Service Frequency (per hour)
- Specification achieved
- Specification not achieved

Drawing based upon Figure 3.1, The Northern Transport Strategy Spring 2016 Report

## NPR Performance against TfN Core Specification



9 links out of 21 fail to meet specification

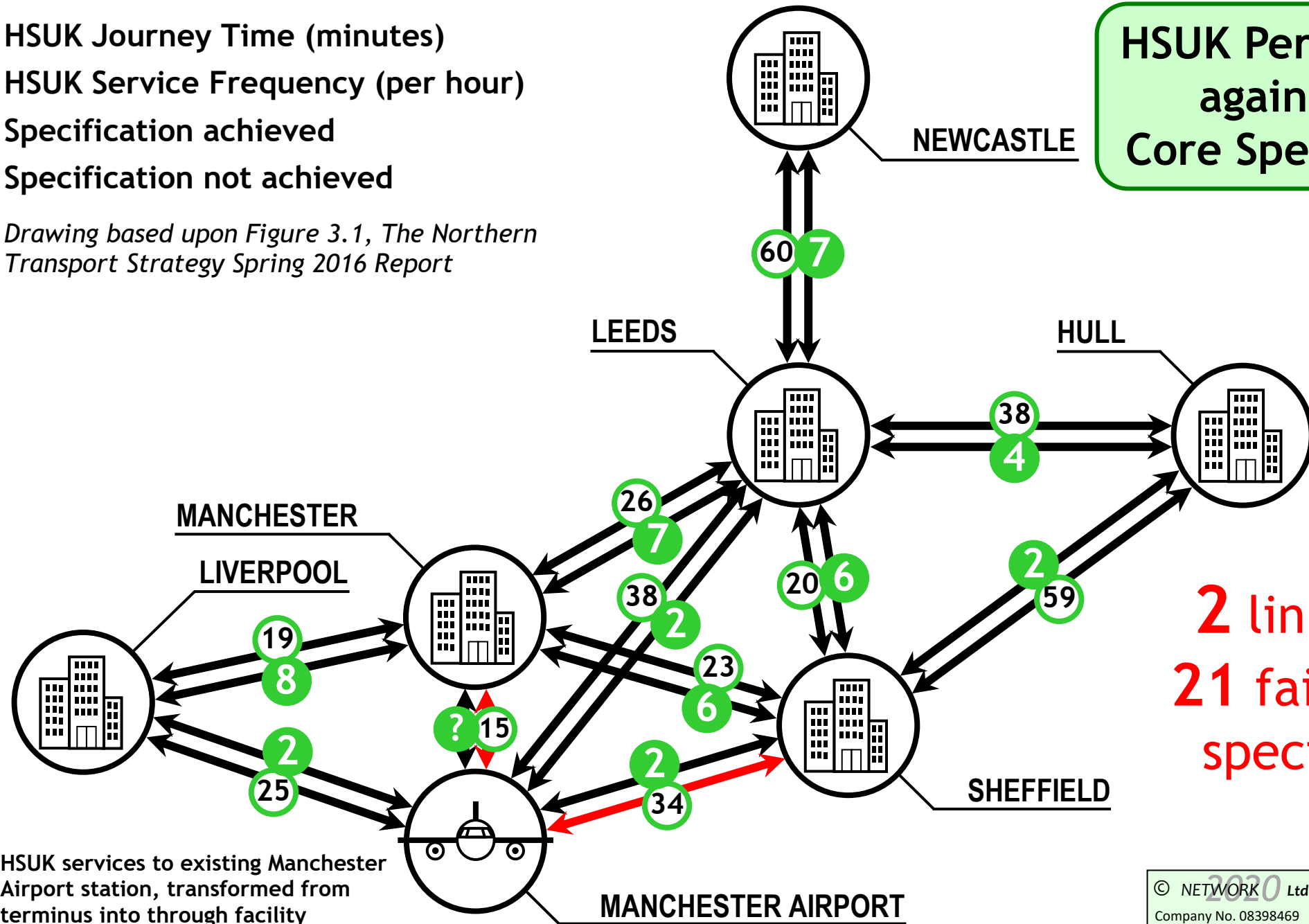
HS2/NPR Manchester Airport station remote from airport, with shuttle transfer required. No proposals for shuttle yet advanced.



- 60 HSUK Journey Time (minutes)
- 4 HSUK Service Frequency (per hour)
- Specification achieved
- Specification not achieved

Drawing based upon Figure 3.1, The Northern Transport Strategy Spring 2016 Report

## HSUK Performance against TfN Core Specification



2 links out of 21 fail to meet specification

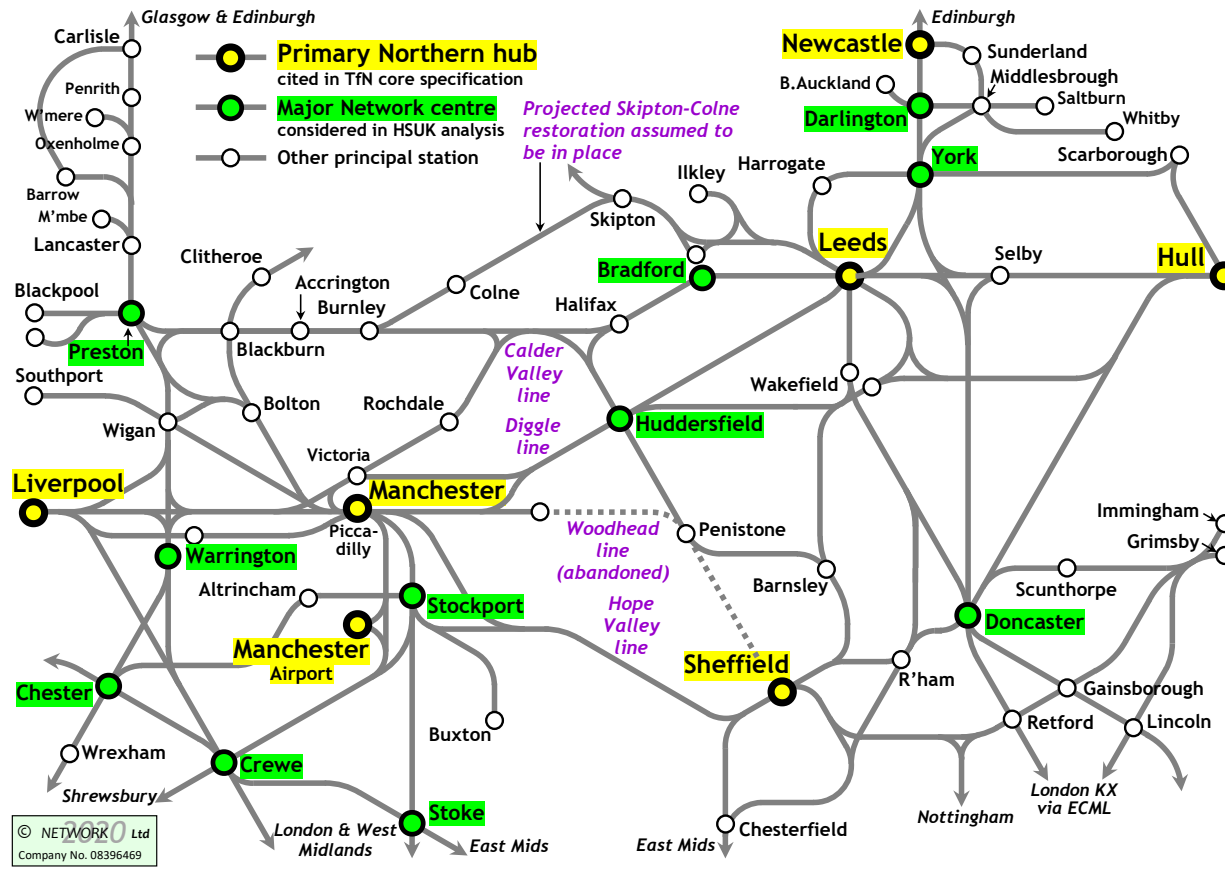
HSUK services to existing Manchester Airport station, transformed from terminus into through facility

# Network Aim 2



2. Comprehensive direct links  
between principal centres of  
Northern Powerhouse

# Direct Links??

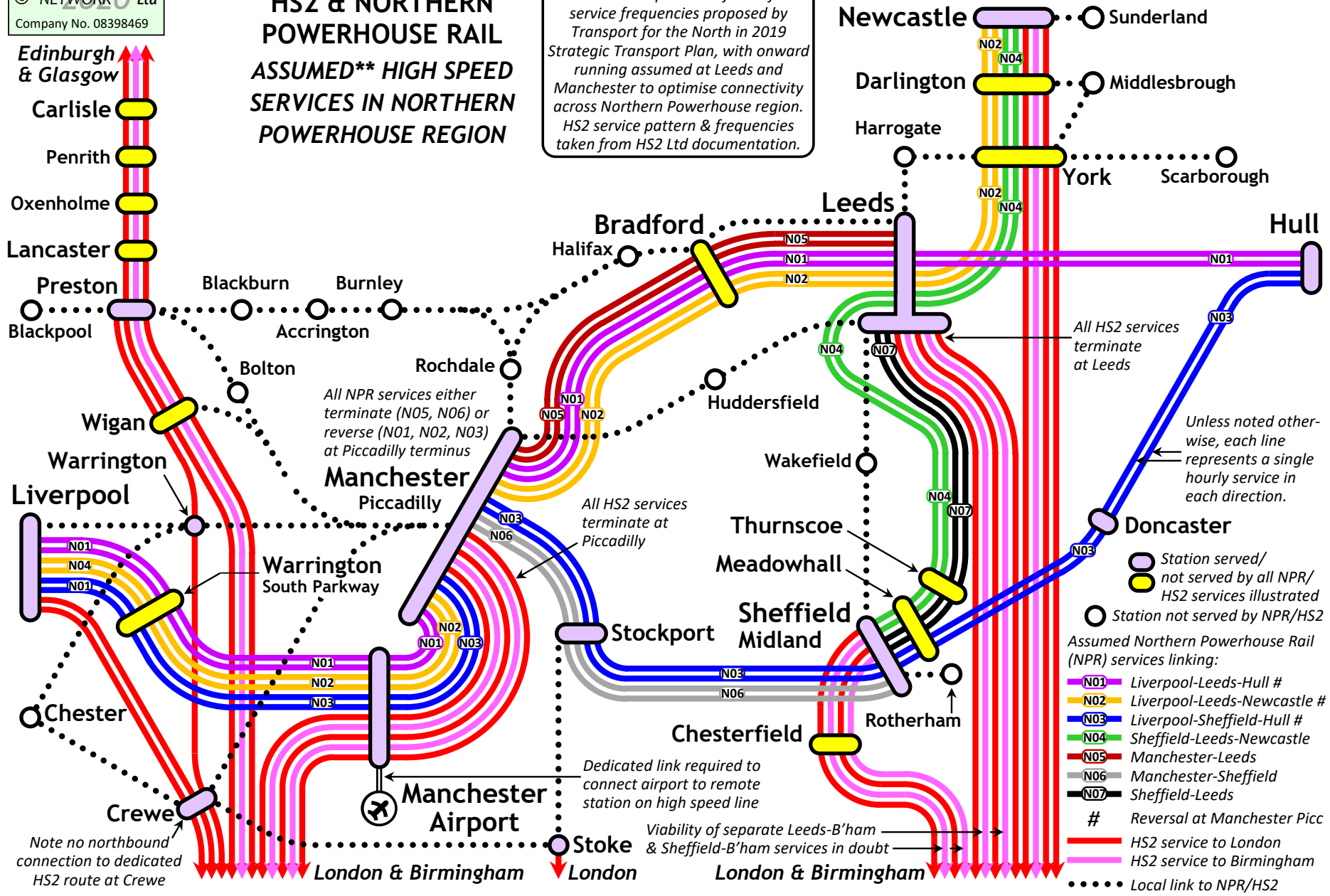


- 17 cities + 1 airport considered in connectivity analysis of rail network of the Northern Powerhouse
- 17 possible links from 18 centres
- 153 links in total

# HS2 & NORTHERN POWERHOUSE RAIL ASSUMED\*\* HIGH SPEED SERVICES IN NORTHERN POWERHOUSE REGION

\*\*NPR service pattern inferred from service frequencies proposed by Transport for the North in 2019 Strategic Transport Plan, with onward running assumed at Leeds and Manchester to optimise connectivity across Northern Powerhouse region. HS2 service pattern & frequencies taken from HS2 Ltd documentation.

## NPR/HS2 Assumed Service Pattern



# Direct Links via NPR



Newcastle	NE																		
Darlington	DL																		
York	YO																		
Hull	HU																		
Leeds	LS																		
Bradford	BD																		
Huddersfield	HD																		
Doncaster	DN																		
Sheffield	SH																		
Manchester	MA																		
Stockport	SK																		
MAN Airport	MAN																		
Stoke	ST																		
Crewe	CW																		
Warrington	WA																		
Chester	CH																		
Liverpool	LI																		
Preston	PR																		
No of Direct Links	9	9	9	9	10	8	9	6	10	12	6	12	0	3	3	0	13	2	

Including TP Upgrade  
links to Huddersfield,  
NPR/HS2 offers **64**  
direct intercity links  
out of **153** possible.

42% Network efficiency

# F.04





# Direct Links via HSUK

Newcastle	NE																		
Darlington		DL																	
York			YO																
Hull				HU															
Leeds					LS														
Bradford						BD													
Huddersfield							HD												
Doncaster								DN											
Sheffield									SH										
Manchester										MA									
Stockport											SK								
MAN Airport												MAN							
Stoke													ST						
Crewe														CW					
Warrington															WA				
Chester																CH			
Liverpool																	LI		
Preston																		PR	
	NE	DL	YO	HU	LS	BD	HD	DN	SH	MA	SK	MAN	ST	CW	WA	CH	LI	PR	
No of Direct Links	17	17	17	15	17	13	12	12	16	17	17	17	13	14	17	11	15	15	

128	HSUK direct intercity link
8	TPUG direct intercity link
17	Existing intercity link
	No direct intercity link
No. of direct intercity links	136

Including TP Upgrade links to Huddersfield, HSUK offers **136** direct intercity links out of 153 possible.

**89%** Network efficiency

F.06

# Network Aim 3



3. Step-change journey time reductions on intercity routes within Northern Powerhouse



# Journey Time Calcs



- ➔ Comprehensive route design of HSUK's new-build, upgraded and restored lines allows direct journey times to be calculated for all the proposed services illustrated in Slide F.05.
- ➔ NPR direct journey times are based on the services illustrated in Slide F.03 and journey times published by TfN.
- ➔ Times for journeys requiring a change of trains include an allowance of 20 minutes to reflect the 'deterrent effect' of changing trains.
- ➔ HSUK, NPR and existing journey times to 12 principal Northern Powerhouse centres are presented on the following slides.

# Journey Time Reductions Index to City Data

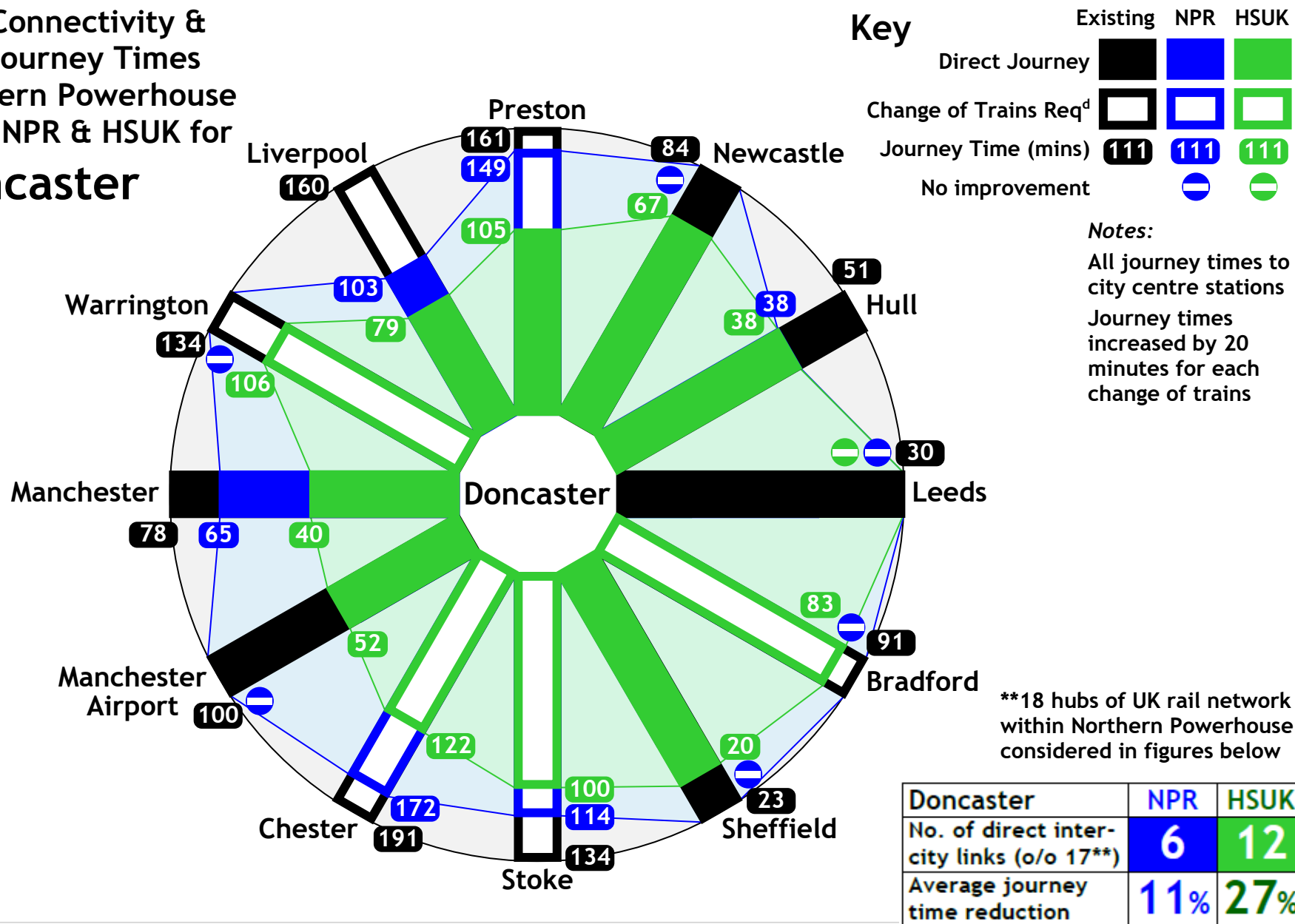


Doncaster	G.04
Sheffield	G.05
Huddersfield	G.06
Bradford	G.07
Leeds	G.08
Hull	G.09
York	G.10
Darlington	G.11
Newcastle	G.12

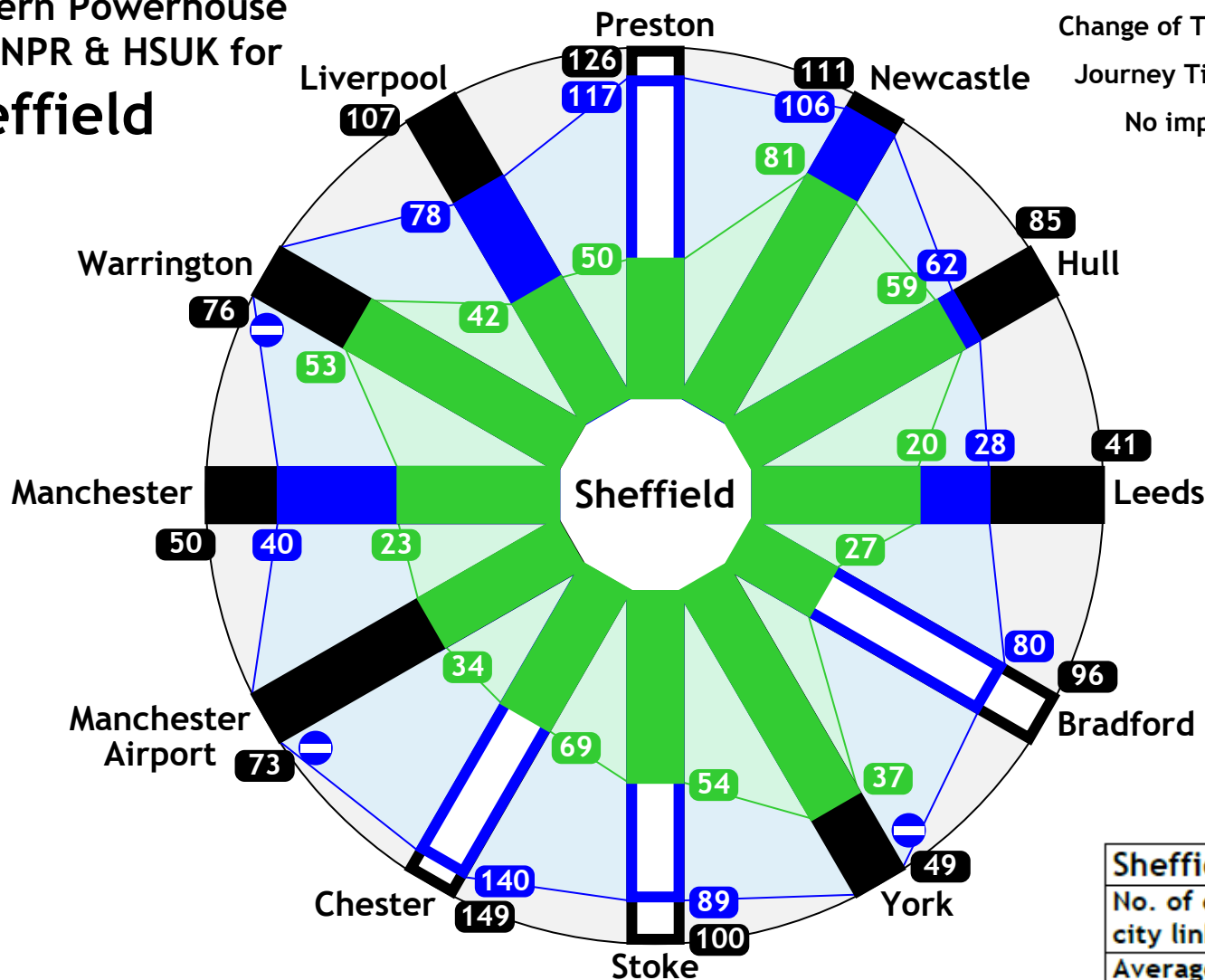
Stoke	G.13
Crewe	G.14
Chester	G.15
Stockport	G.16
Manchester Airport	G.17
Manchester	G.18
Warrington	G.19
Preston	G.20
Liverpool	G.21

G.03

# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Doncaster

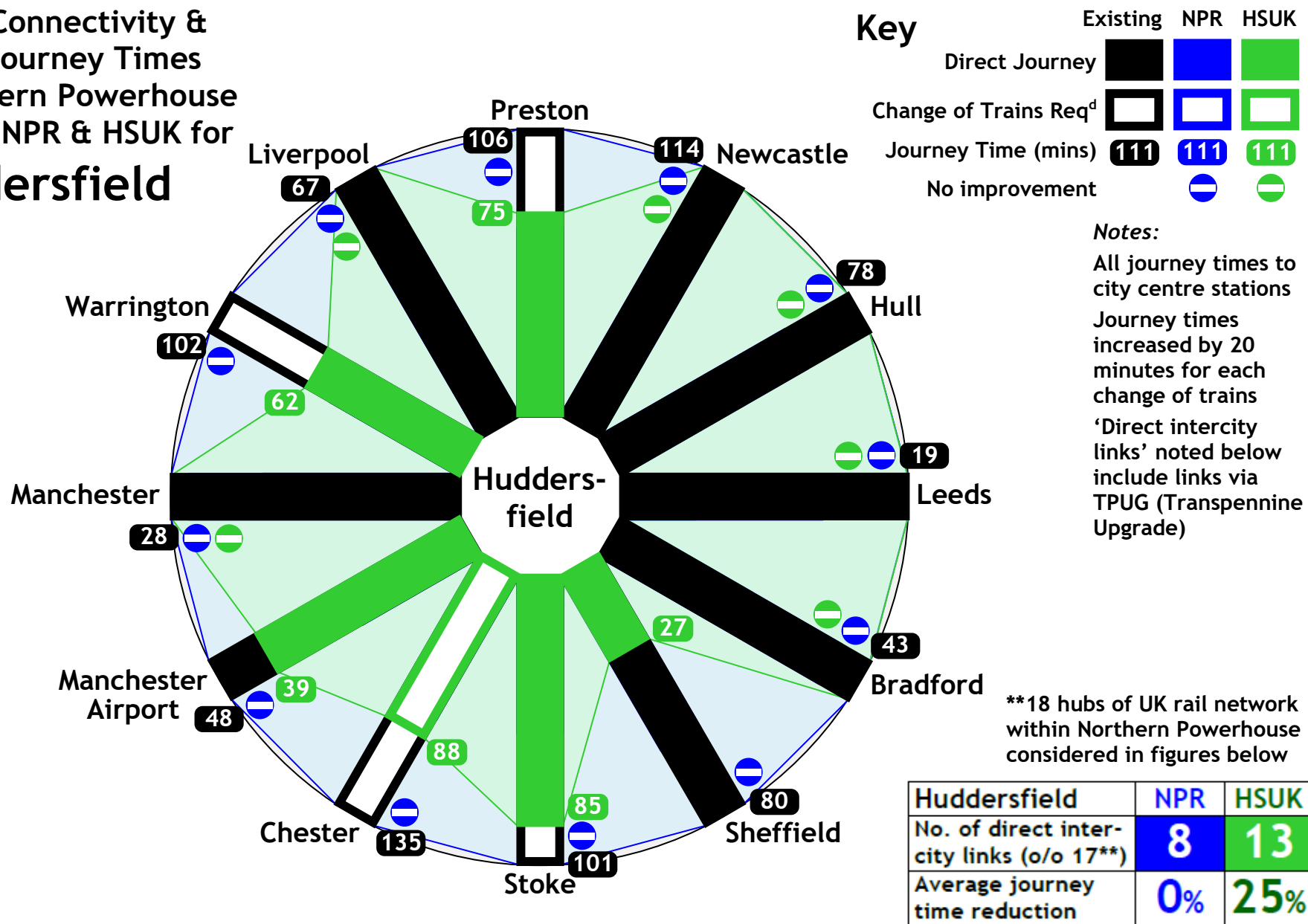


# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Sheffield

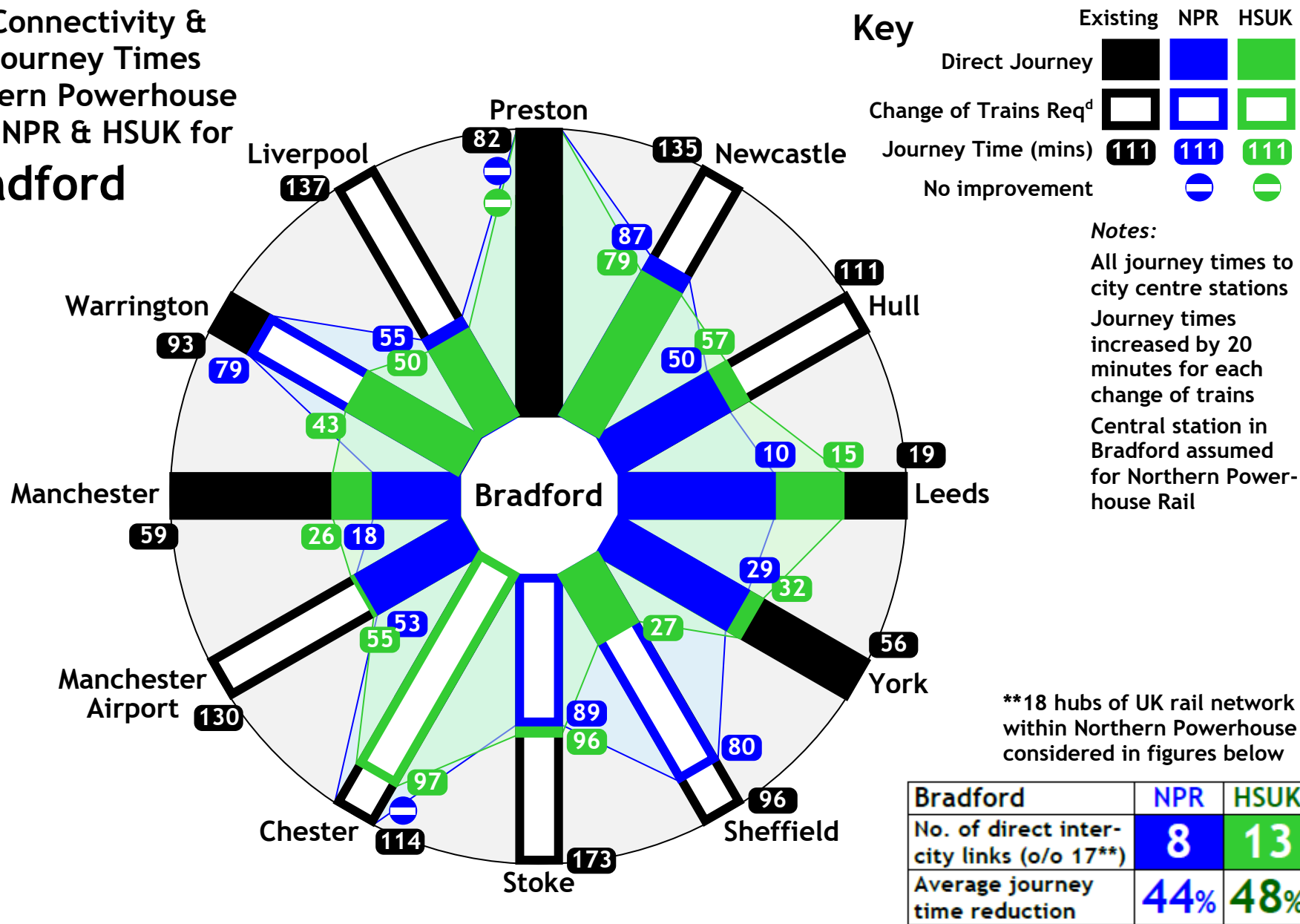


Sheffield	NPR	HSUK
No. of direct inter-city links (o/o 17**)	10	16
Average journey time reduction	13%	48%

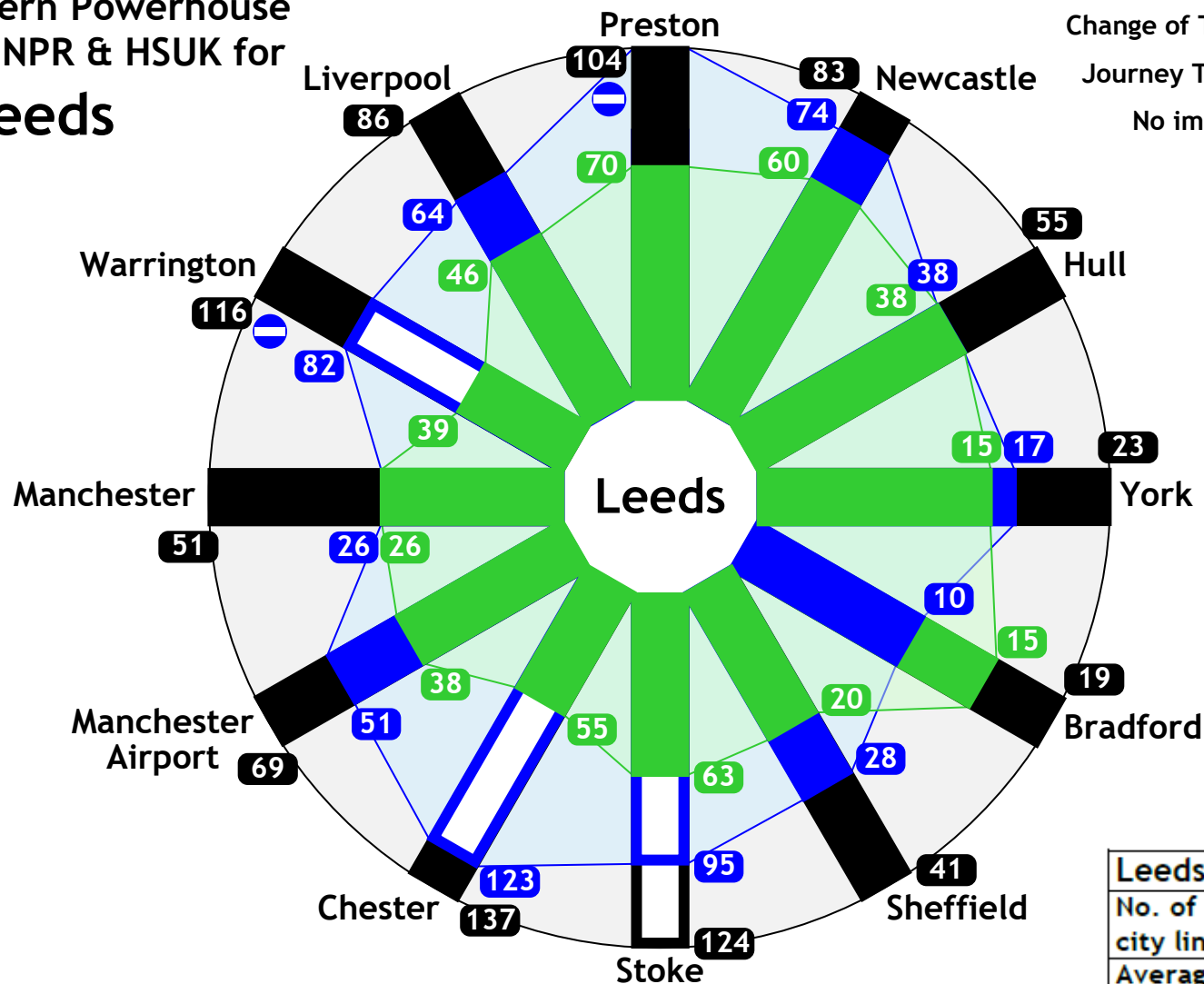
# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Huddersfield



# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Bradford



# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Leeds



## Key

	Existing	NPR	HSUK
Direct Journey			
Change of Trains Req <sup>d</sup>			
Journey Time (mins)	111	111	111
No improvement			

## Notes:

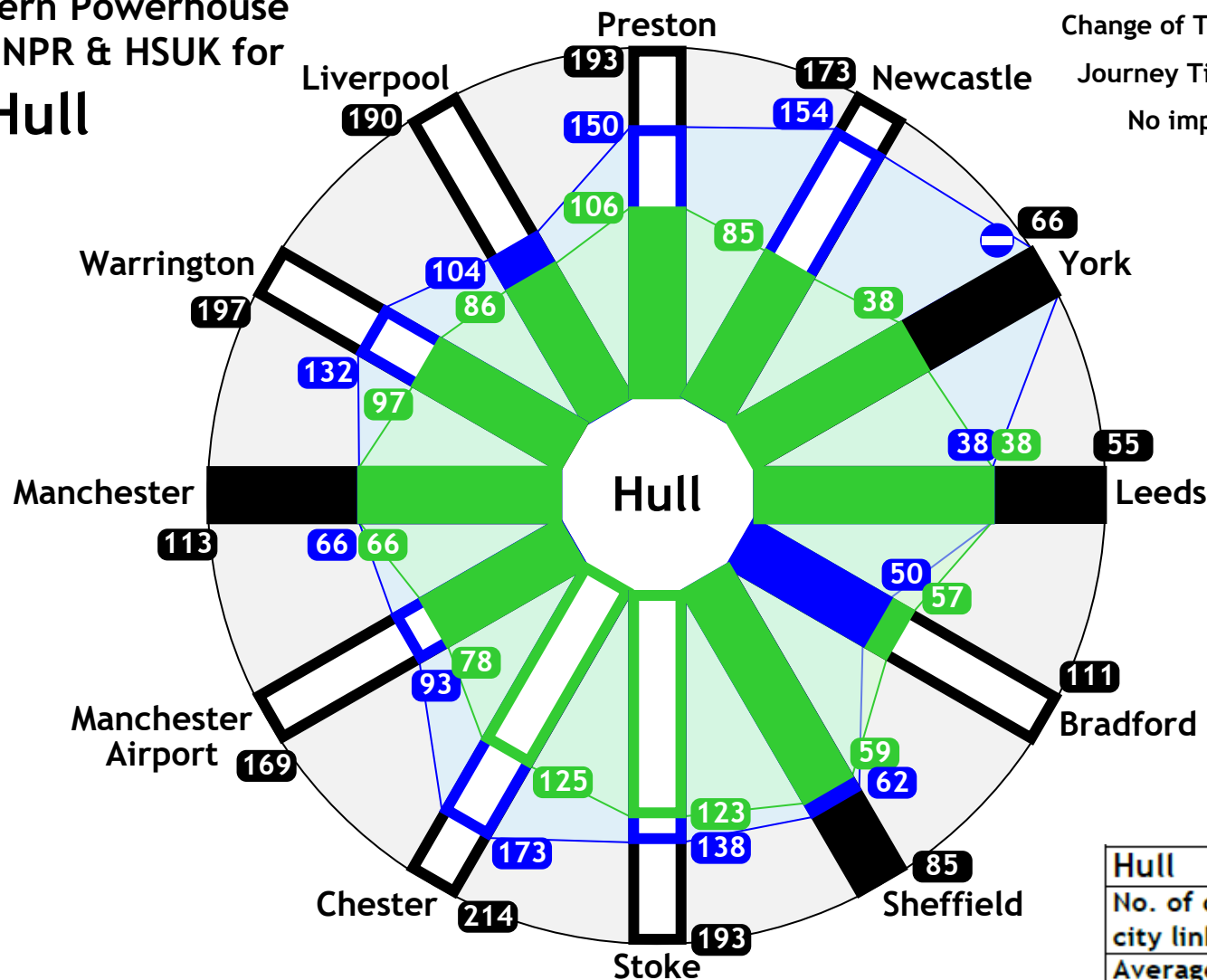
All journey times to city centre stations

Journey times increased by 20 minutes for each change of trains

\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below

Leeds	NPR	HSUK
No. of direct inter-city links (o/o 17**)	10	17
Average journey time reduction	25%	42%

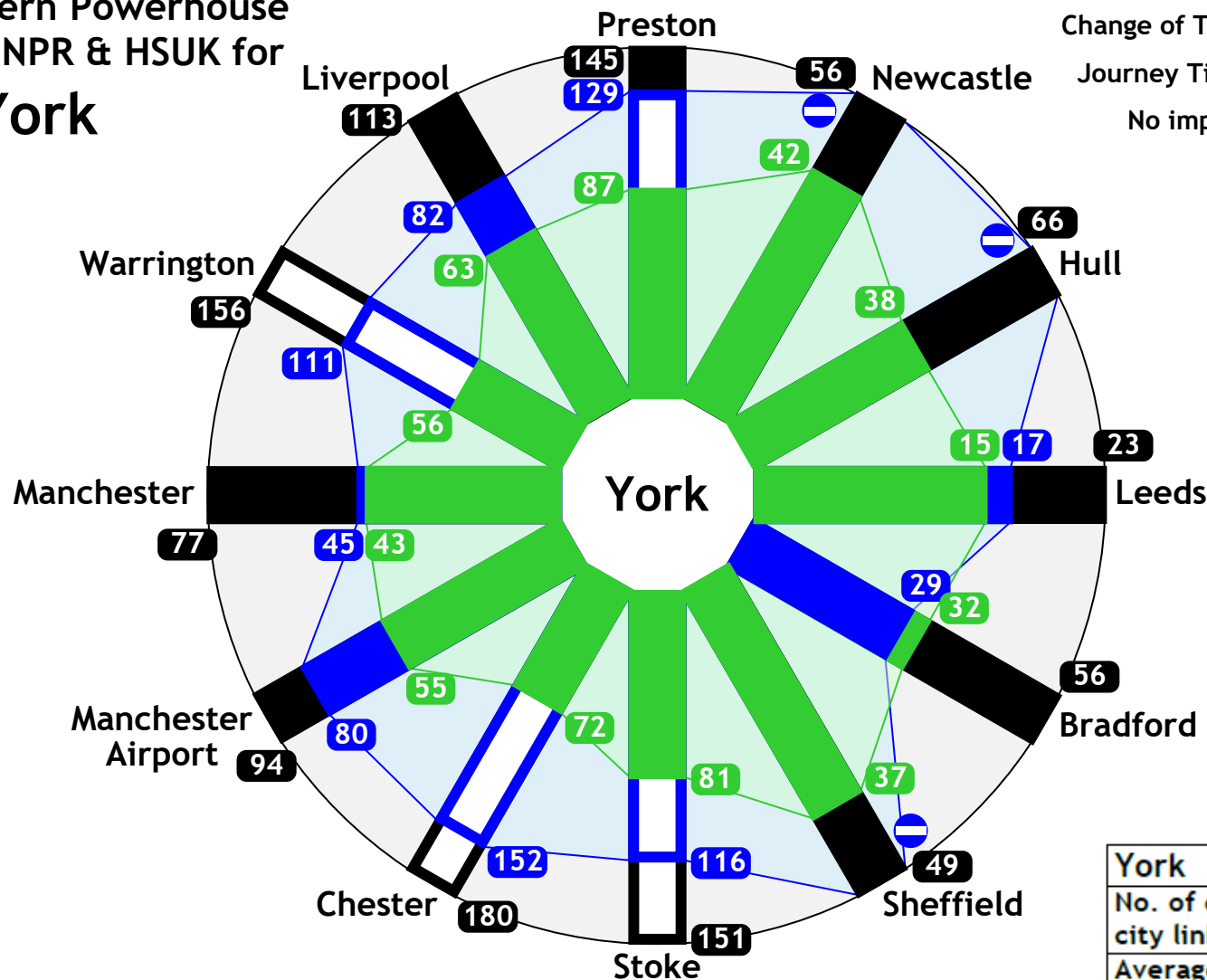
# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Hull



Hull	NPR	HSUK
No. of direct inter-city links (o/o 17**)	9	15
Average journey time reduction	31%	44%



# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for York



## Key

	Existing	NPR	HSUK
Direct Journey			
Change of Trains Req <sup>d</sup>			
Journey Time (mins)	111	111	111
No improvement			

## Notes:

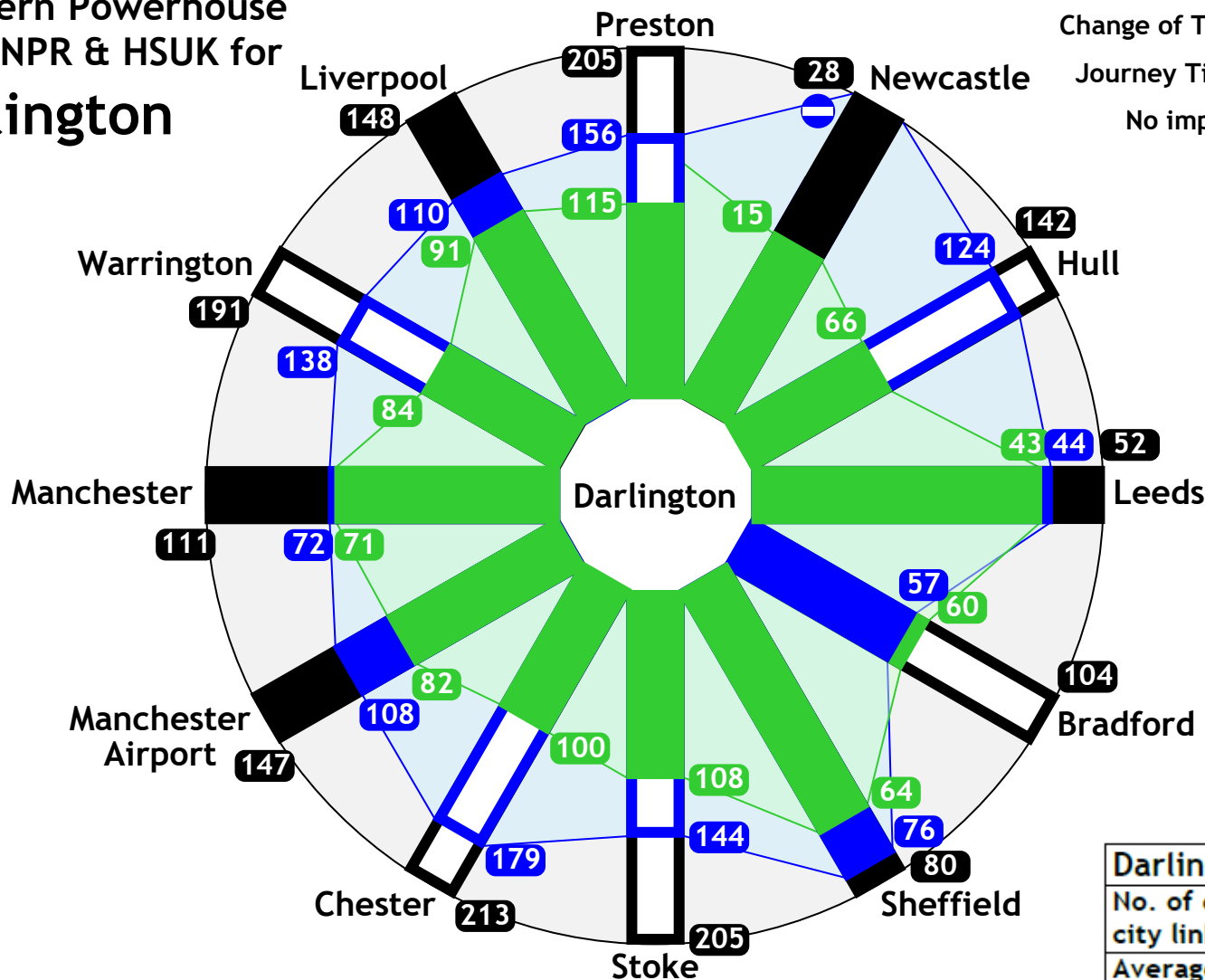
All journey times to city centre stations

Journey times increased by 20 minutes for each change of trains

\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below

York	NPR	HSUK
No. of direct inter-city links (o/o 17**)	9	17
Average journey time reduction	20%	40%

# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Darlington



## Key

	Existing	NPR	HSUK
Direct Journey			
Change of Trains Req'd			
Journey Time (mins)	111	111	111
No improvement			

## Notes:

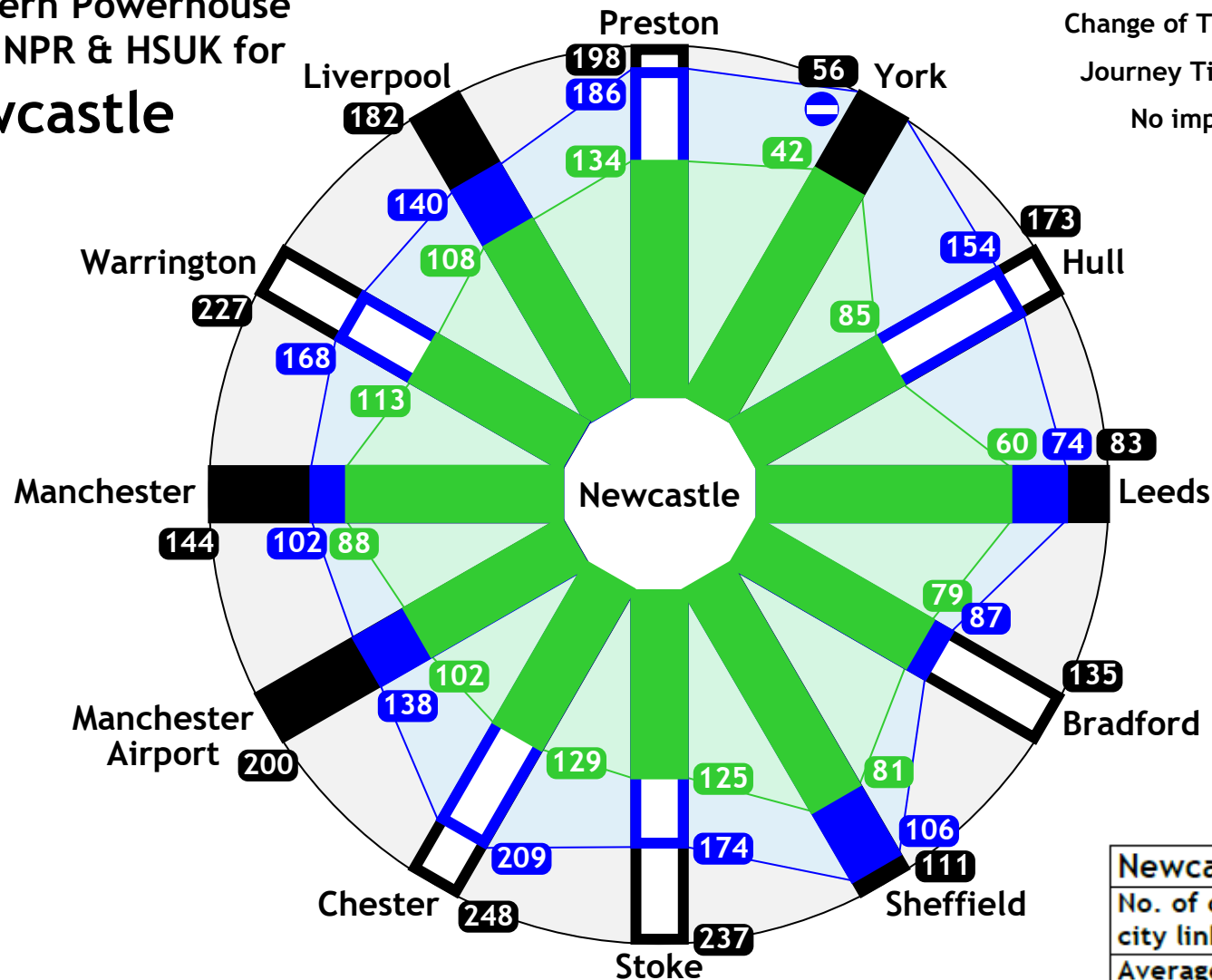
All journey times to city centre stations

Journey times increased by 20 minutes for each change of trains

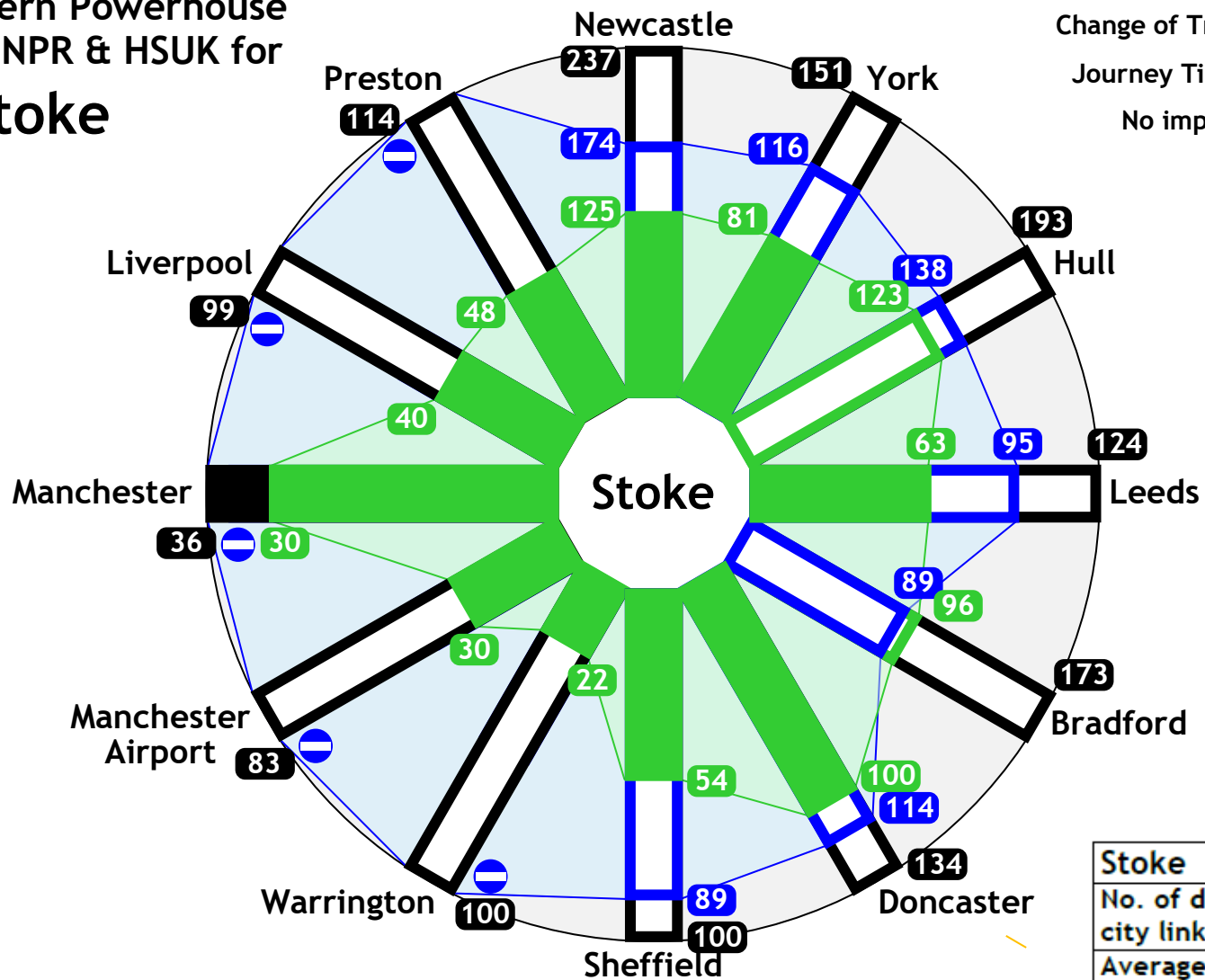
\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below

Darlington	NPR	HSUK
No. of direct inter-city links (o/o 17**)	9	17
Average journey time reduction	21%	39%

# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Newcastle



# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Stoke



## Key

	Existing	NPR	HSUK
Direct Journey			
Change of Trains Req <sup>d</sup>			
Journey Time (mins)	111	111	111
No improvement			

## Notes:

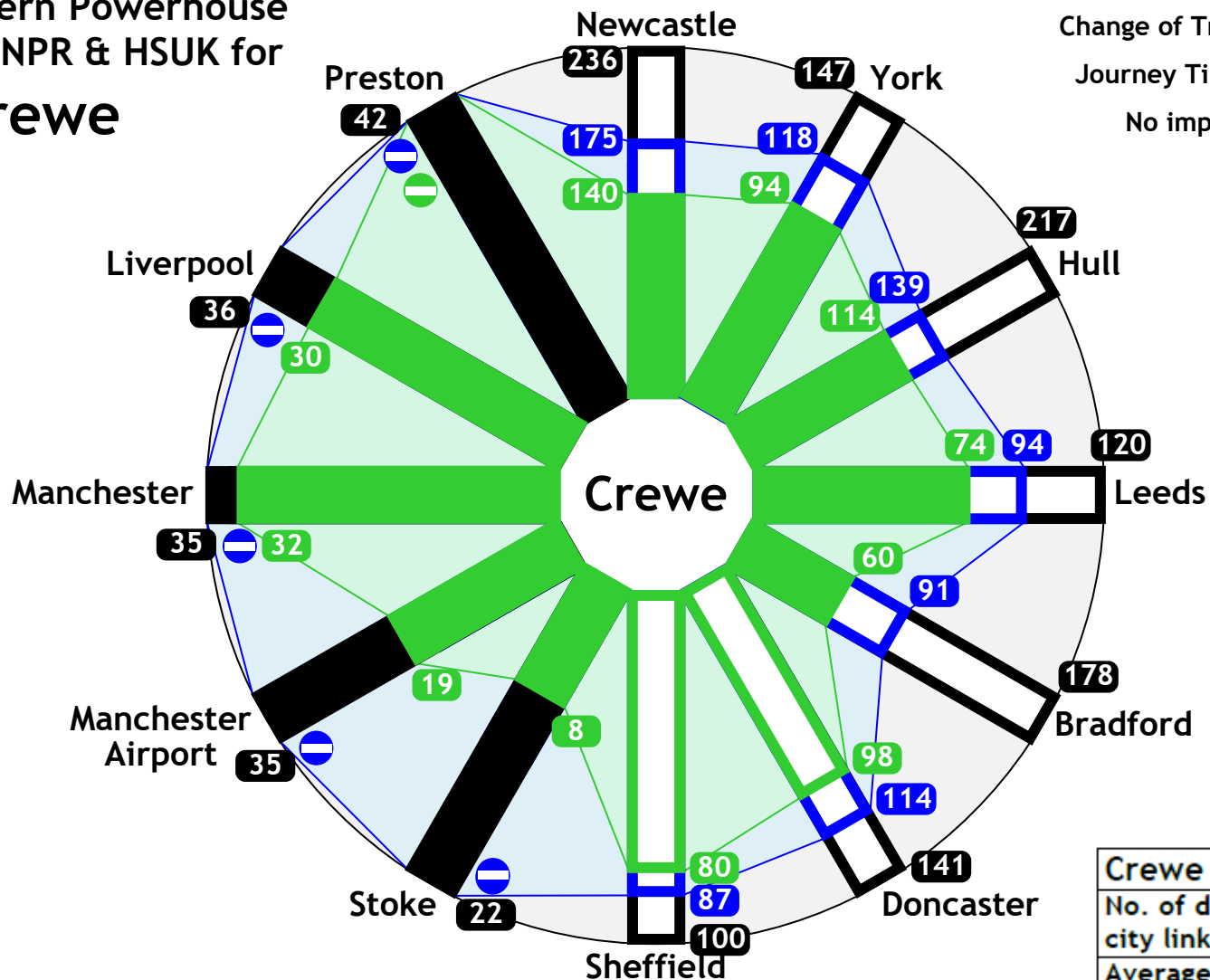
All journey times to city centre stations

Journey times increased by 20 minutes for each change of trains

\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below

Stoke	NPR	HSUK
No. of direct inter-city links (o/o 17**)	0	13
Average journey time reduction	15%	51%

# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Crewe



## Key

Existing	NPR	HSUK
----------	-----	------

## Direct Journey

### Change of Trains Req<sup>d</sup>

**Journey Time (mins)**

**No improvement**

**Notes:**

**All journey times to city centre stations**

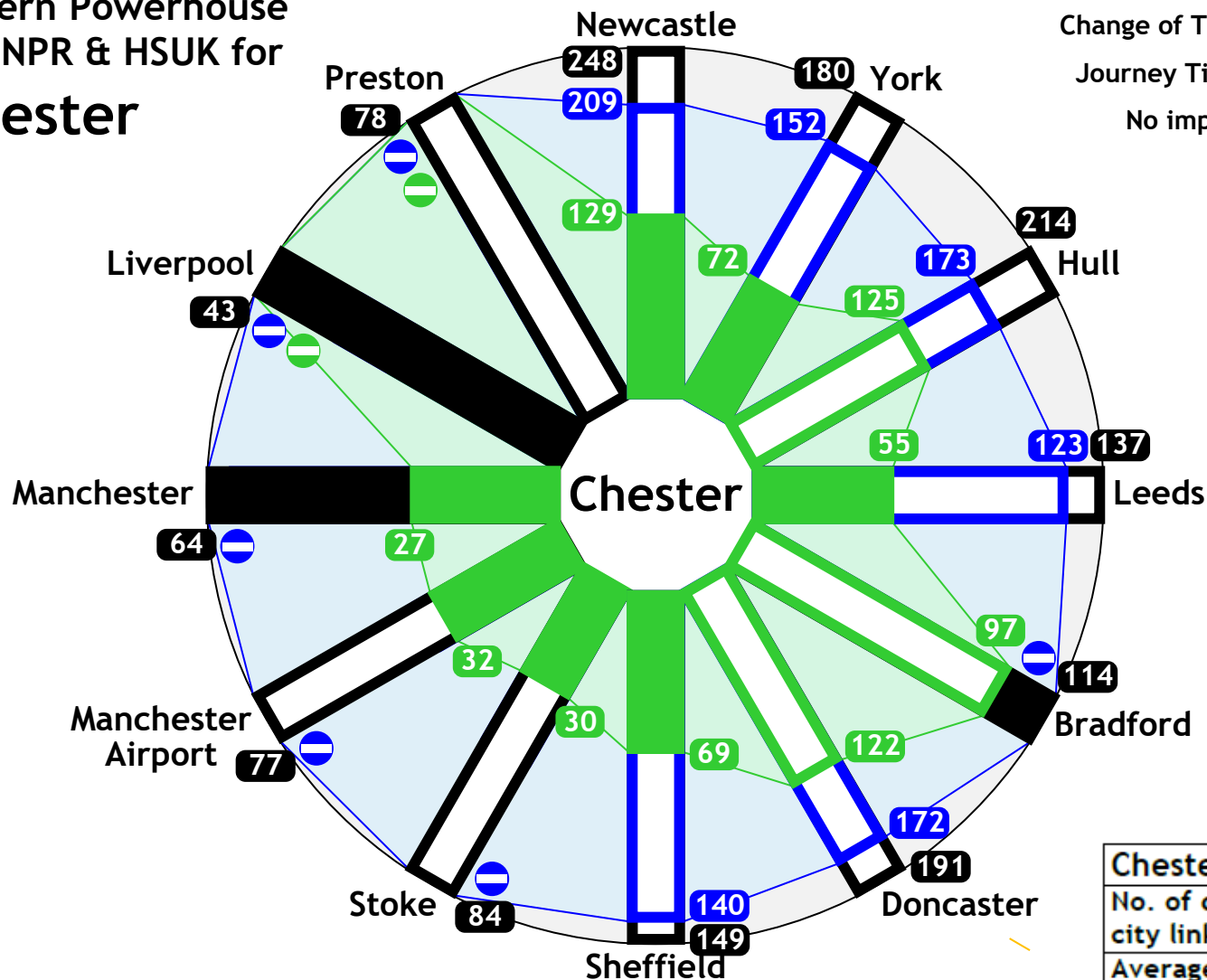
**Journey times increased by 20 minutes for each change of trains**

**NPR 'Direct inter-city links' noted below all via HS2**

**\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below**

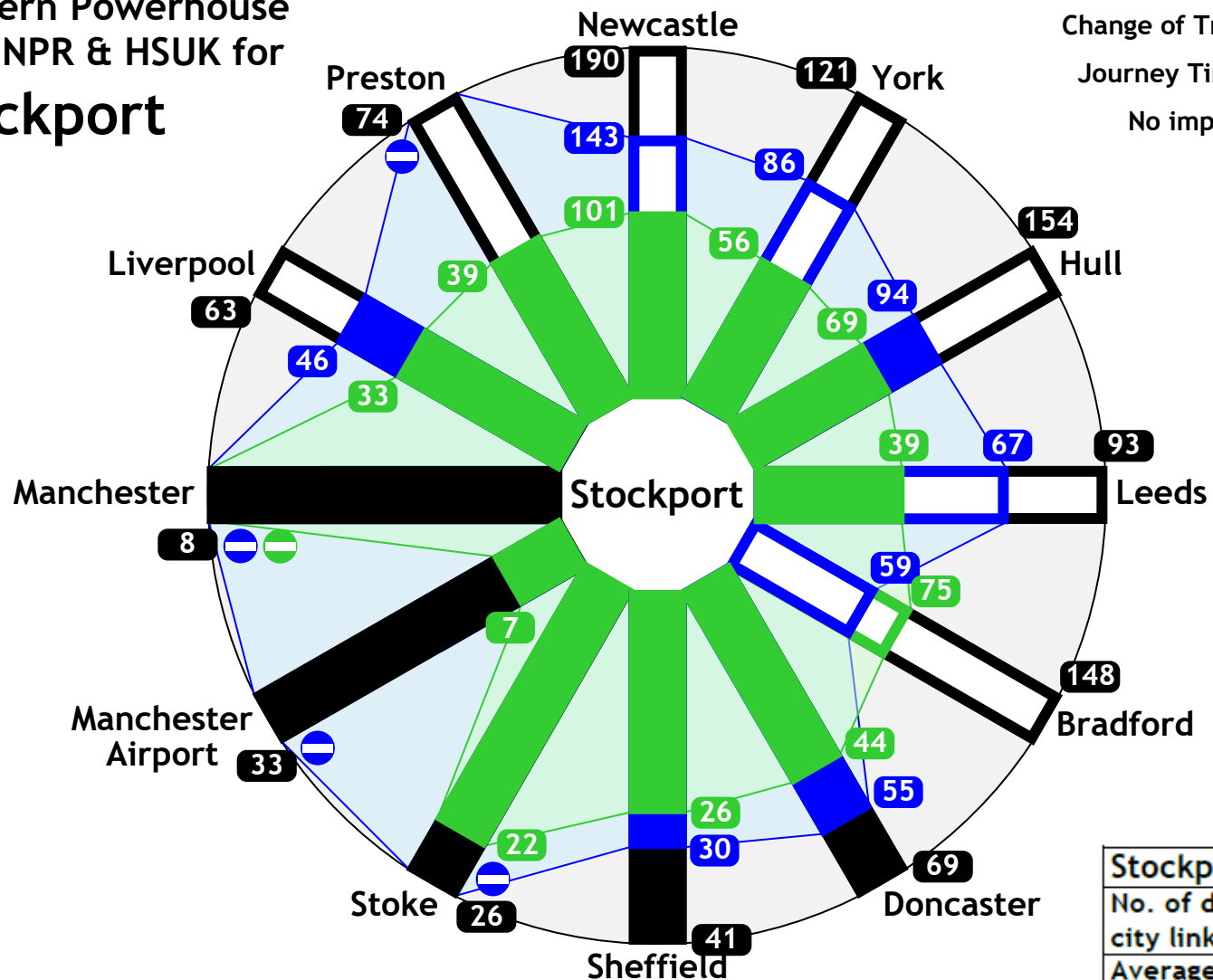
Crewe	NPR	HSUK
No. of direct inter-city links (o/o 17**)	3	11
Average journey time reduction	16%	35%

# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Chester



Chester	NPR	HSUK
No. of direct inter-city links (o/o 17**)	0	11
Average journey time reduction	6%	46%

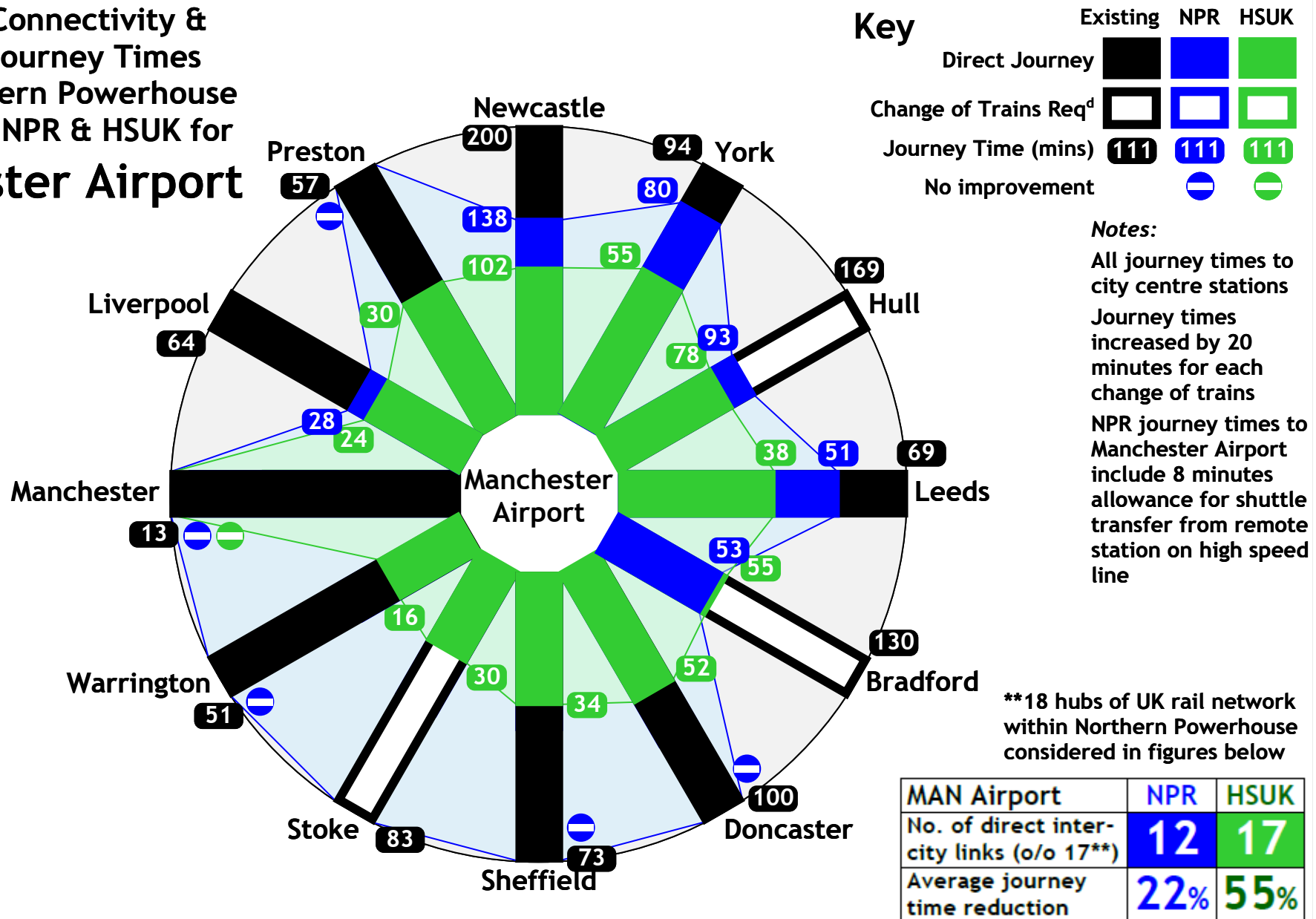
# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Stockport



\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below

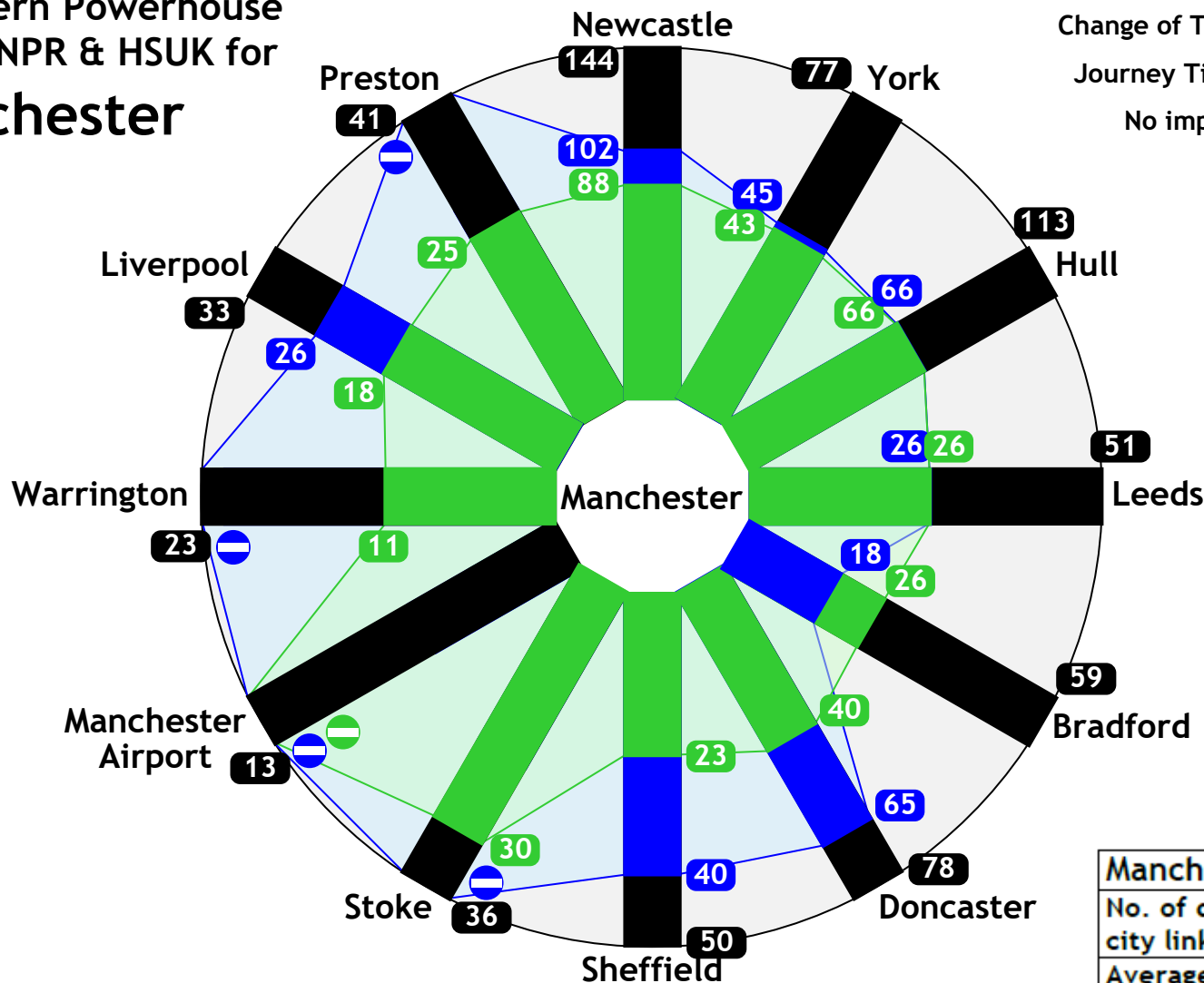
Stockport	NPR	HSUK
No. of direct inter-city links (o/o 17**)	6	17
Average journey time reduction	22%	49%

# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Manchester Airport





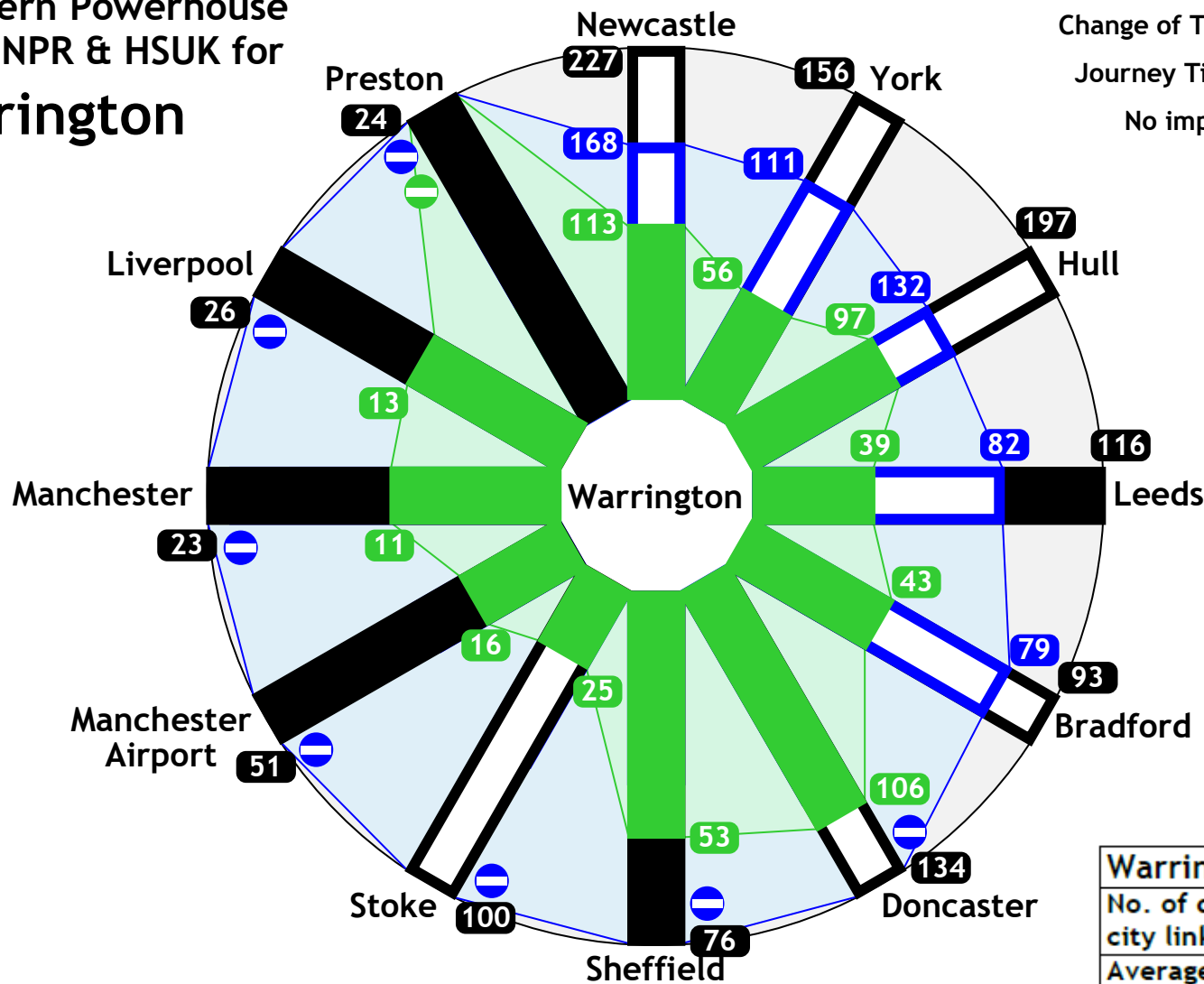
# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Manchester



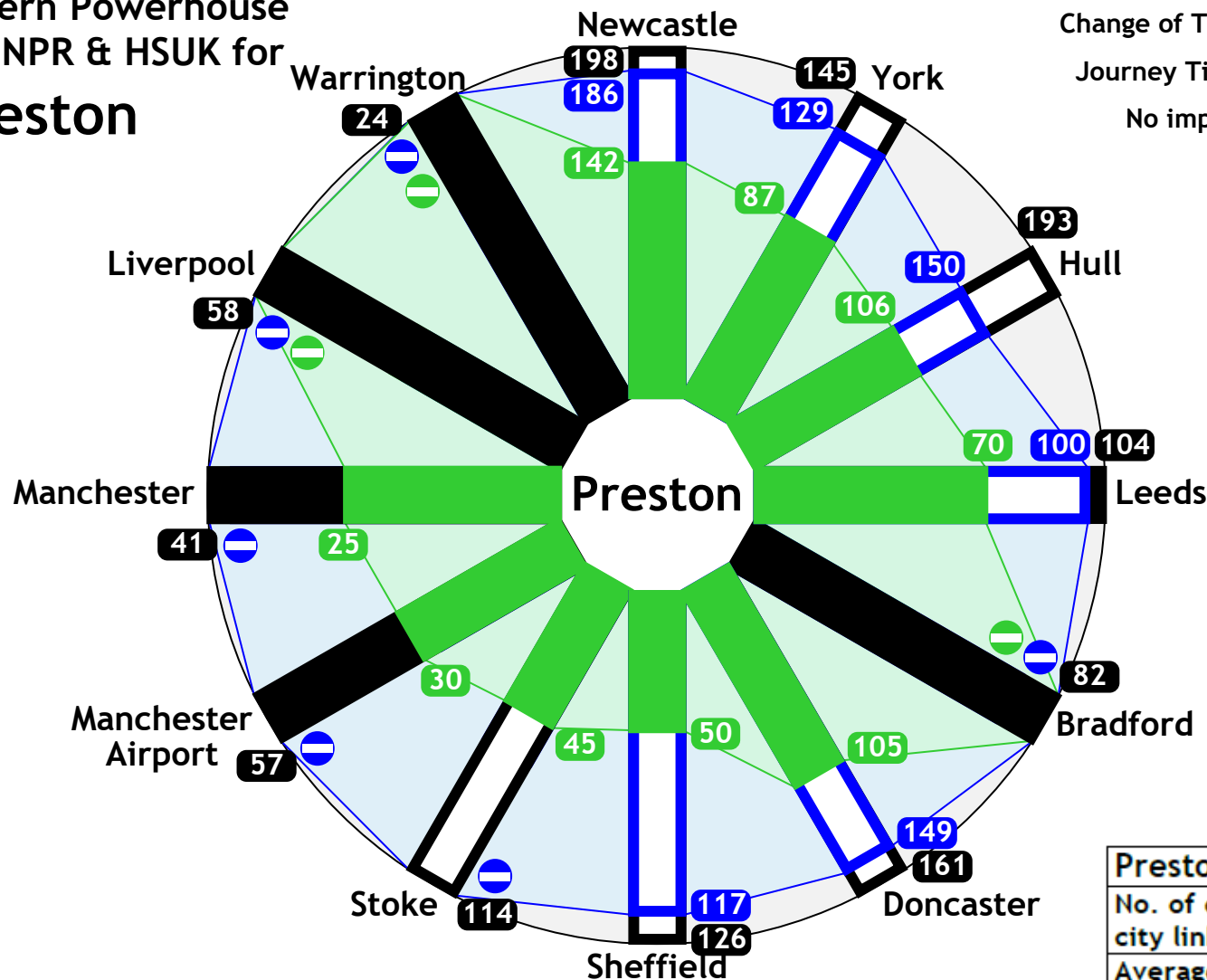
\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below

Manchester	NPR	HSUK
No. of direct inter-city links (o/o 17**)	12	17
Average journey time reduction	27%	40%

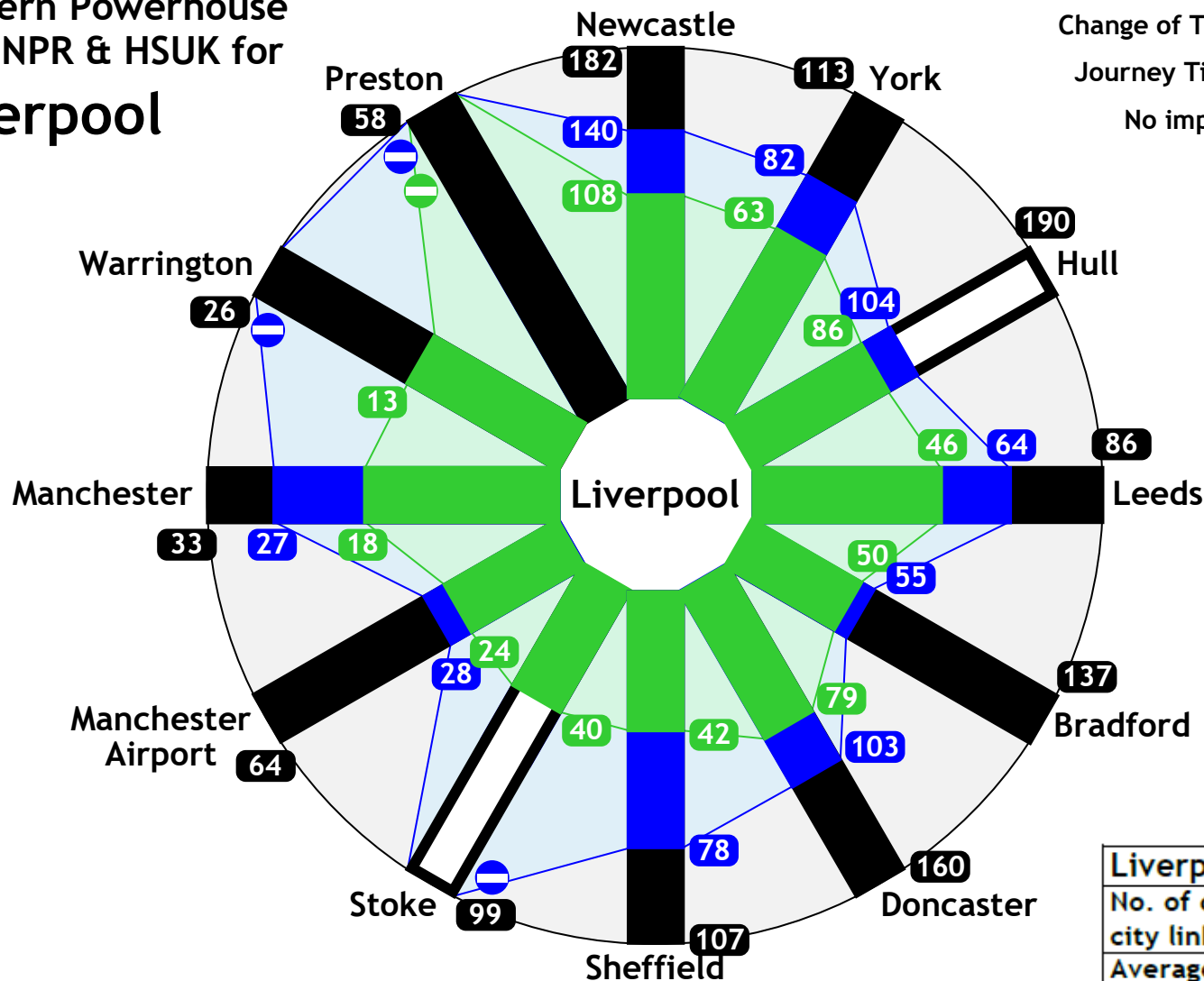
# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Warrington



# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Preston



# Improved Connectivity & Reduced Journey Times within Northern Powerhouse achieved by NPR & HSUK for Liverpool



## Key

	Existing	NPR	HSUK
Direct Journey			
Change of Trains Req <sup>d</sup>			
Journey Time (mins)	111	111	111
No improvement			

## Notes:

All journey times to city centre stations

Journey times increased by 20 minutes for each change of trains

\*\*18 hubs of UK rail network within Northern Powerhouse considered in figures below

Liverpool	NPR	HSUK
No. of direct inter-city links (o/o 17**)	13	15
Average journey time reduction	28%	46%

# Overall Journey Time Reduction Performance

Averaged across 153 journeys interlinking 18 key Northern Powerhouse centres:

- NPR achieves 20% average JT reduction
- HSUK achieves 43% average JT reduction

# Network Aims 4 & 5

4. Full integration between  
high speed & local services

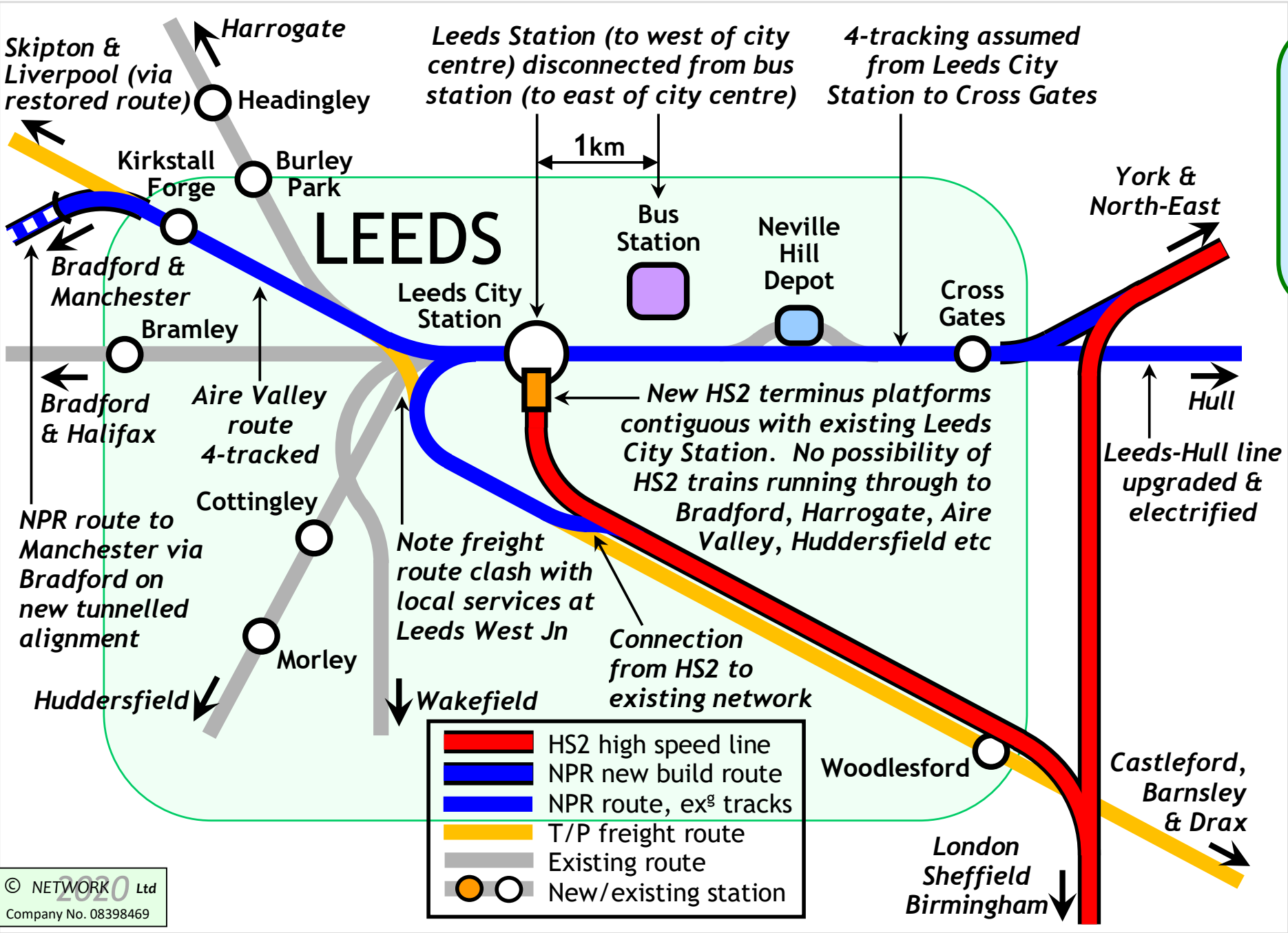
5. Step-change capacity  
increase for local services

# NPR Schemes for Northern Powerhouse Cities

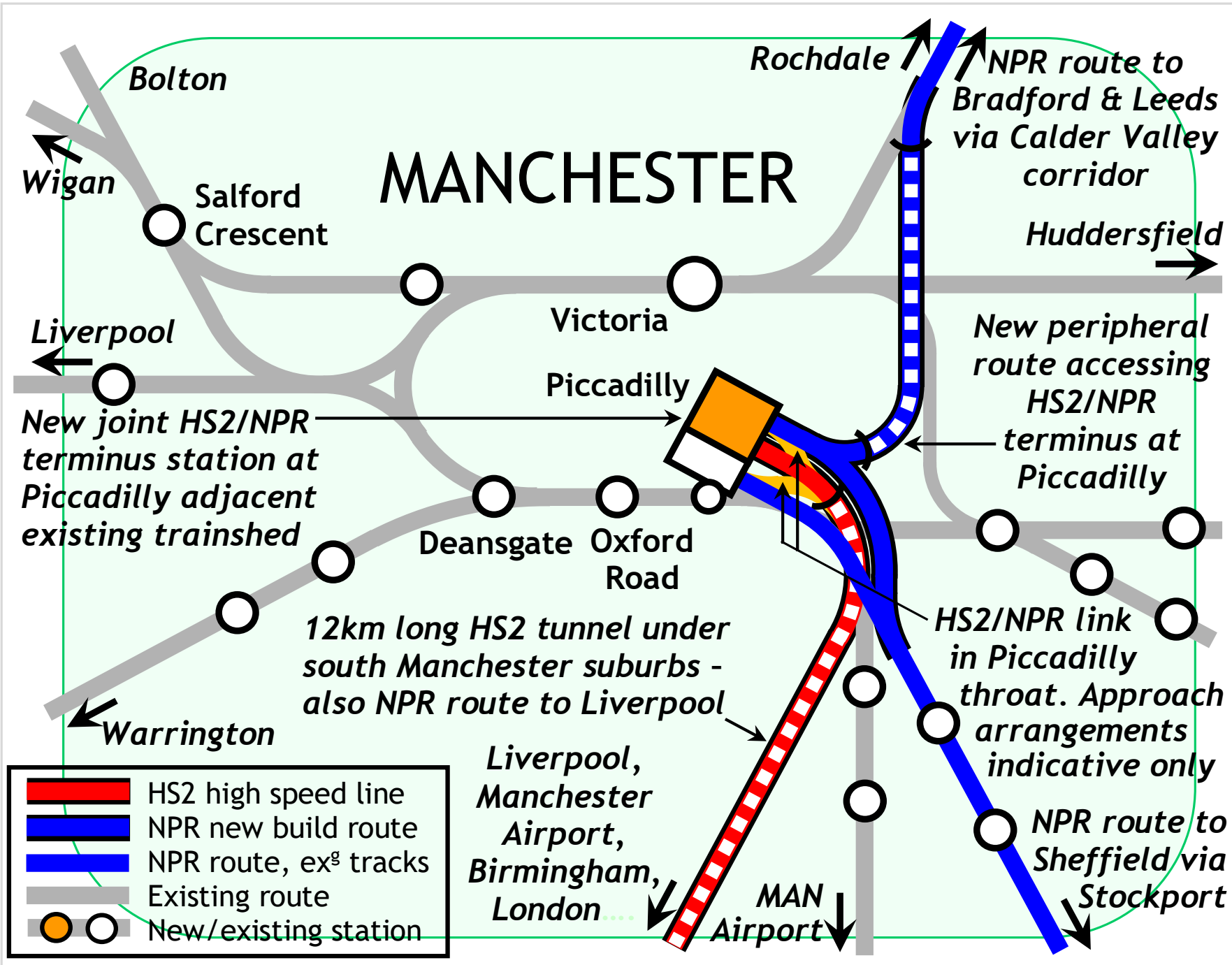
- H.03 Leeds
- H.04 Central Manchester
- H.05 Greater Manchester

All compromised by lack of integration, dependency upon HS2 and reliance upon unfit-for-purpose terminus and parkway stations in Leeds and Manchester

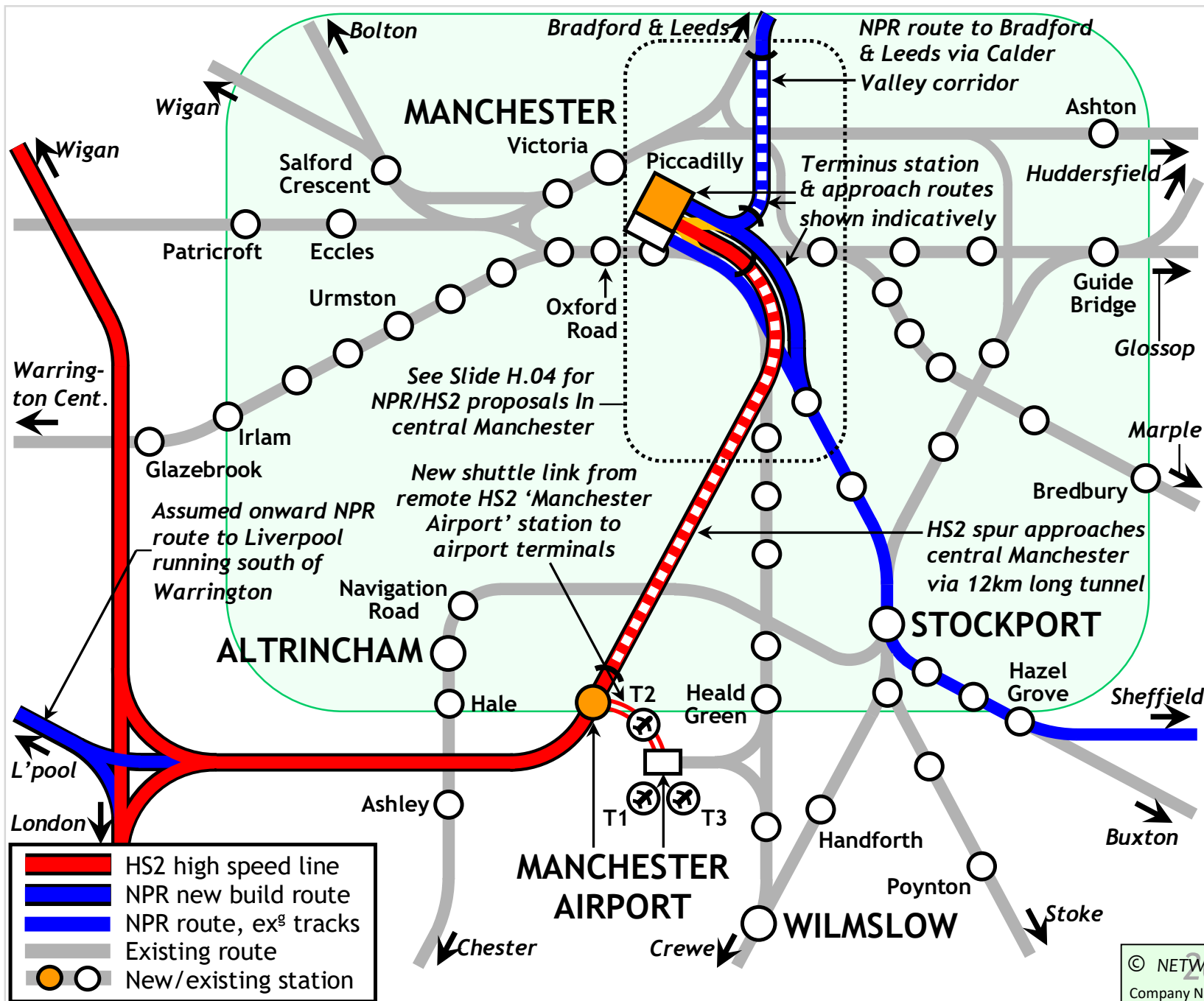
Assumed NPR Scheme for Improved Rail Infrastructure in Leeds







**Assumed NPR Scheme for Improved Rail Infrastructure in Central Manchester**



**Assumed NPR Scheme for Improved Rail Infrastructure in Greater Manchester**

# HSUK Schemes for Northern Powerhouse Cities



HSUK schemes represented as follows:

- Scale plan showing proposed HSUK city centre station in relation to other infrastructure;
- Scheme plan illustrating proposed HSUK works;
- Diagram showing potential step-change increase in local services enabled by proposed HSUK works.

# HSUK Schemes for Northern Powerhouse Cities



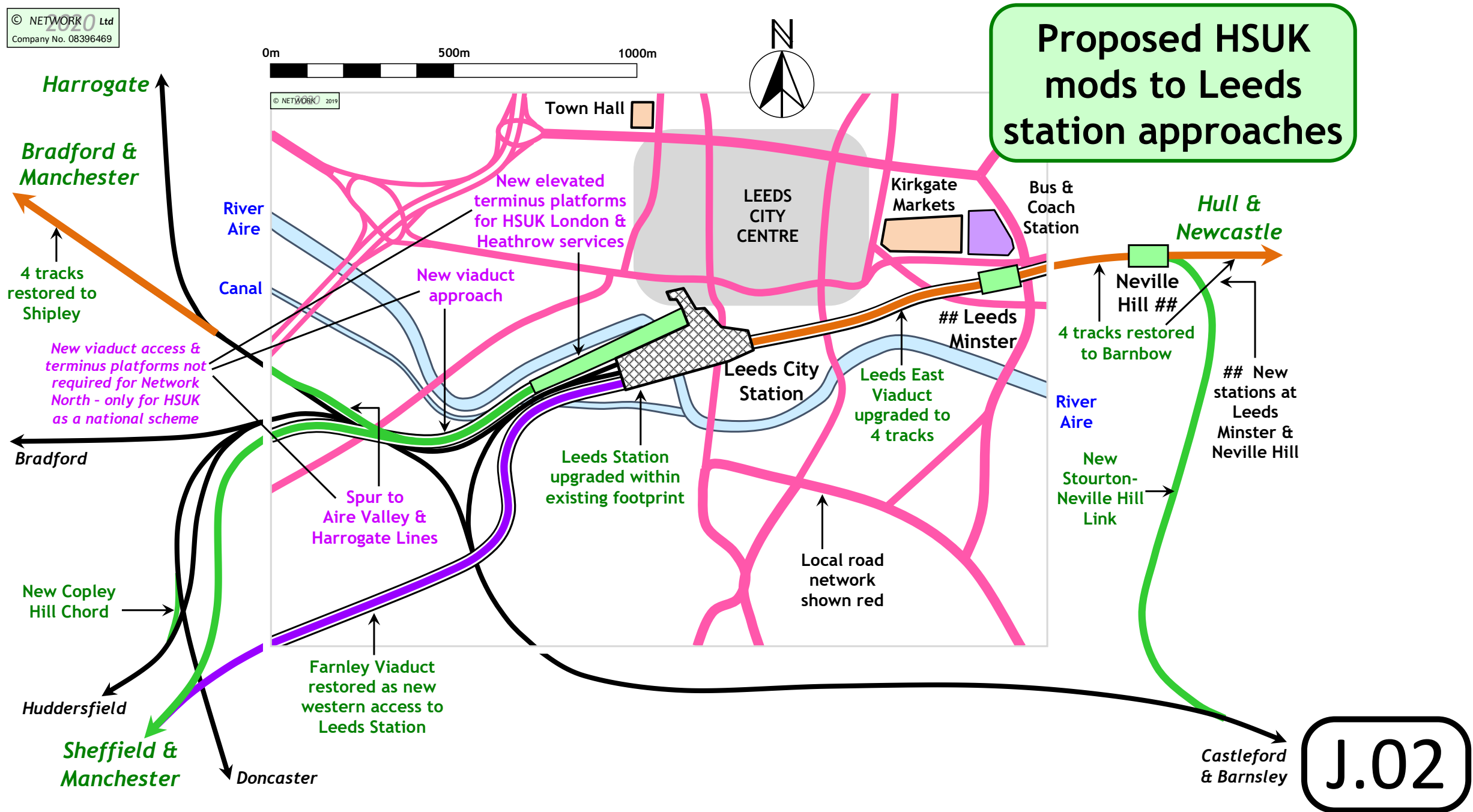
- J.01 Leeds & Bradford
- K.01 Sheffield City Region
- L.01 Manchester & Manchester Airport
- M.01 Liverpool
- N.01 Stoke/Potteries

# Leeds

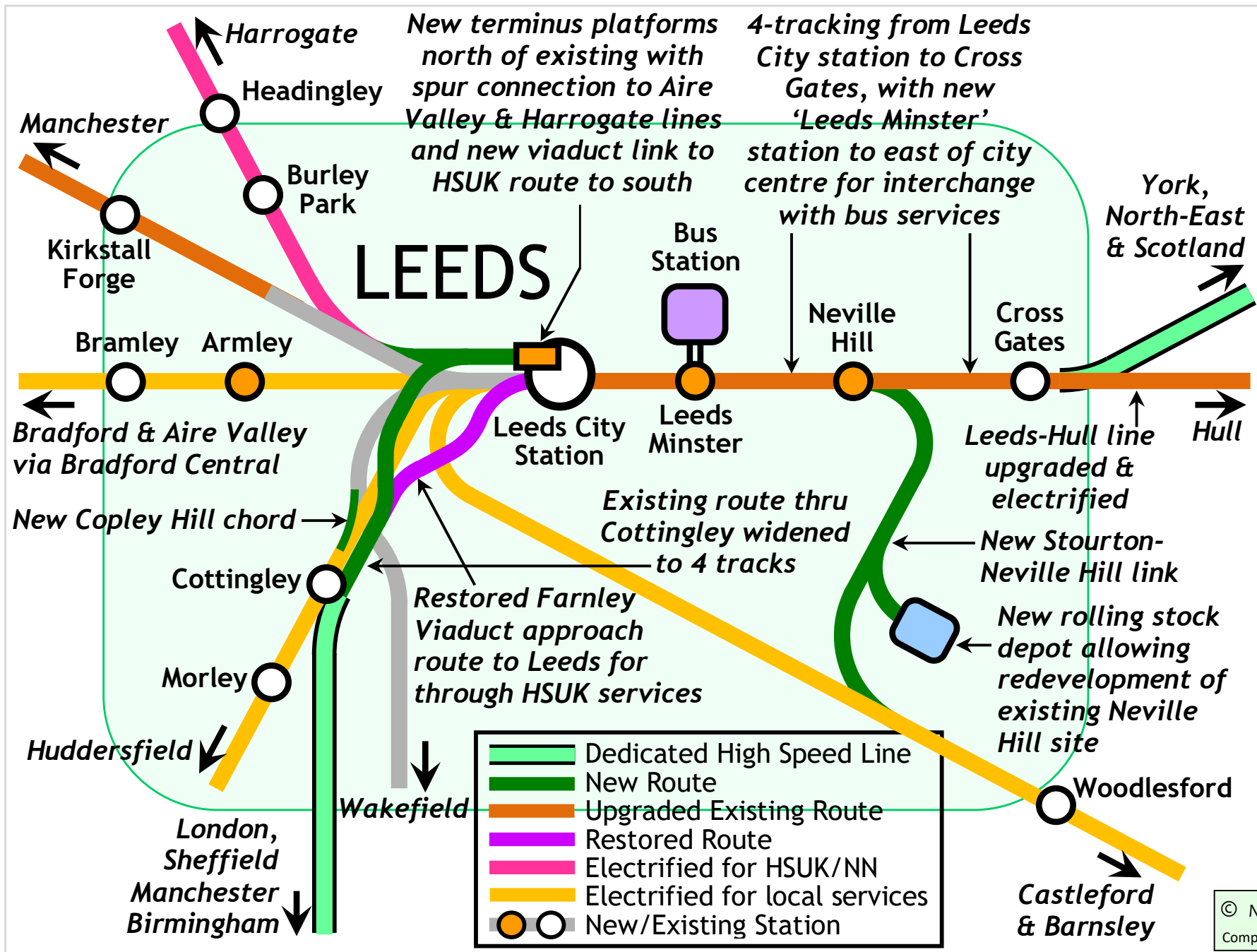


- Network North will serve Leeds at the existing Leeds City Station.
- Dedicated HS route created through Leeds, with Farnley viaduct restored & route to east 4-tracked.
- New Stourton-Neville Hill link to reduce termination at Leeds and increase capacity.
- New station at Leeds Minster for interchange with Leeds Bus/Coach station.
- Capacity for local services approx doubled.

J.01



# HSUK Scheme for Improved Rail Infrastructure in Leeds



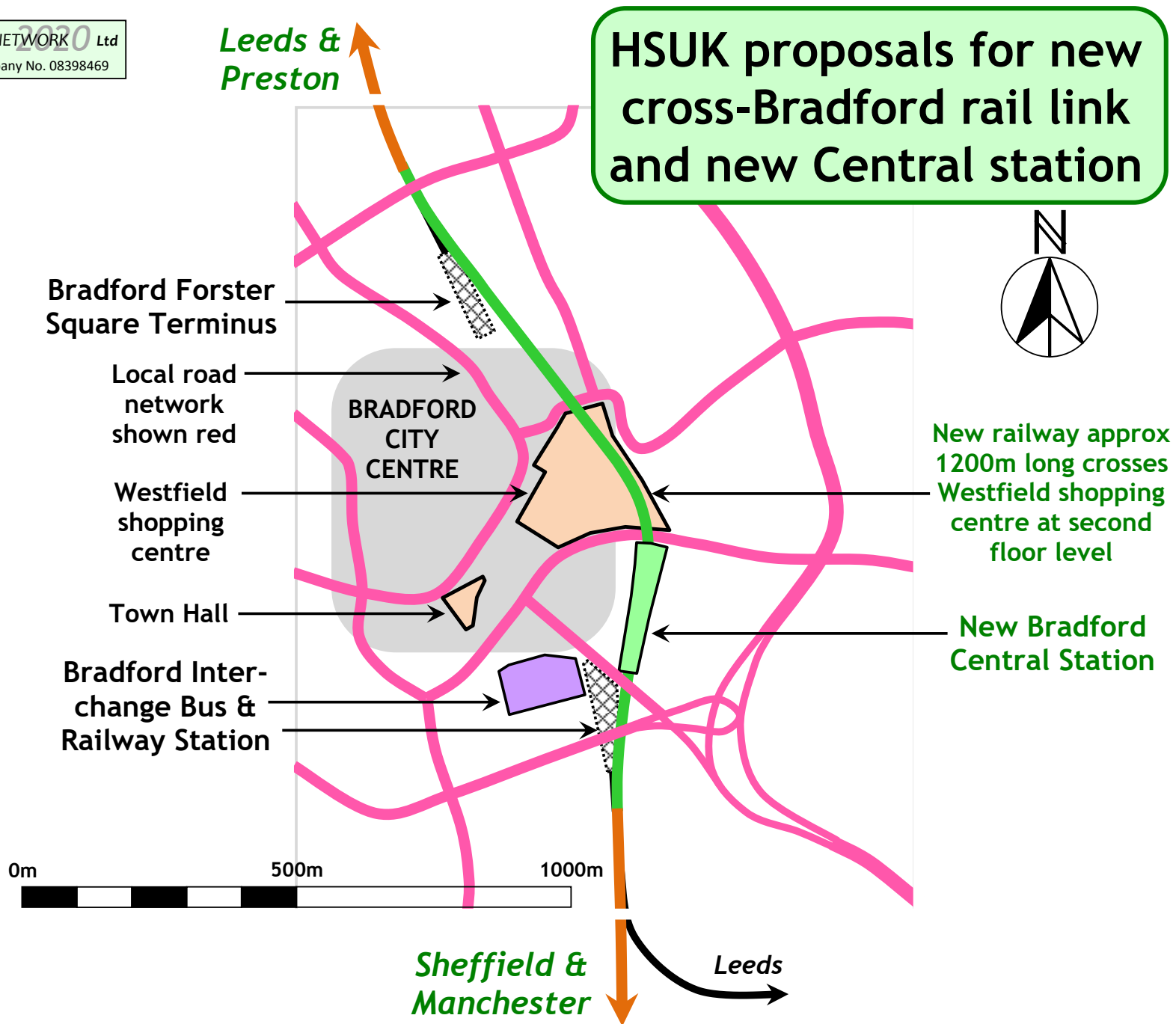
# Bradford



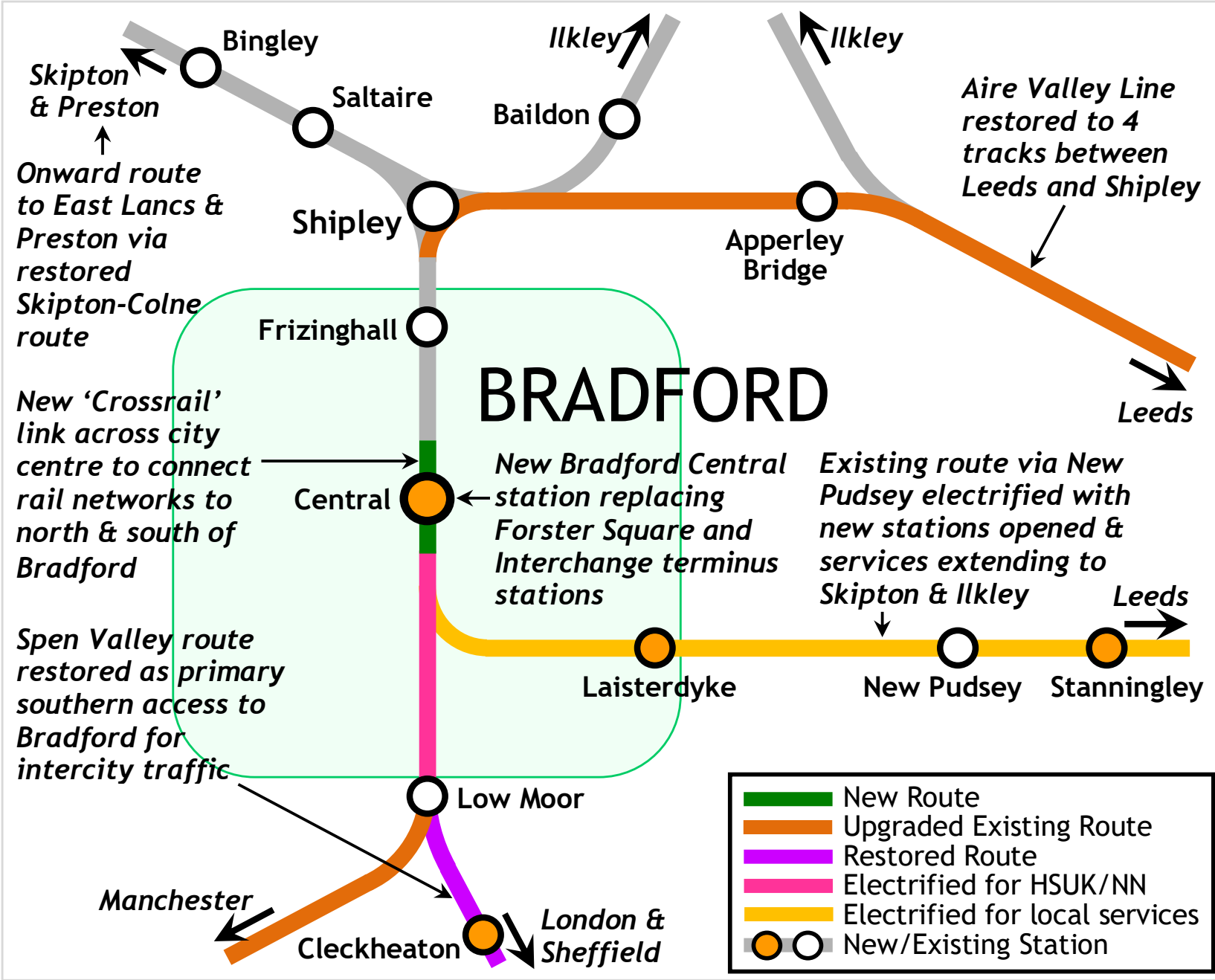
- Network North will serve Bradford at the new Bradford Central Station.
- This will be located on new 1.2km cross-city link, connecting networks to north & south of Bradford.
- With existing terminus stations eliminated, local & intercity services can cross the city e.g. London & Sheffield via Bradford to Skipton, Burnley, Preston.
- Local rail networks in Leeds, Bradford, Aire Valley & Calder Valley fully integrated.

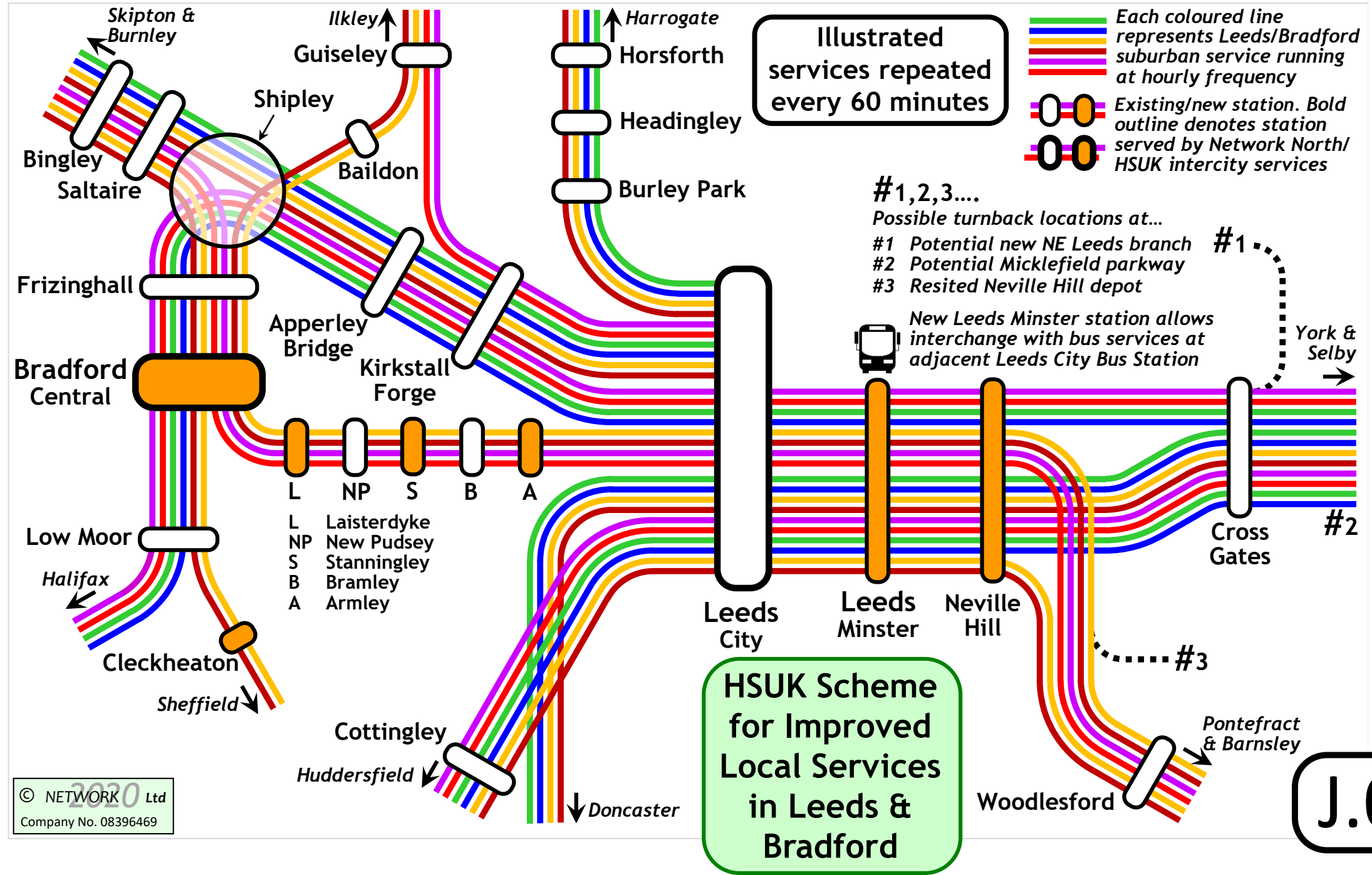
J.04





# HSUK Scheme for Improved Rail Infrastructure in Bradford



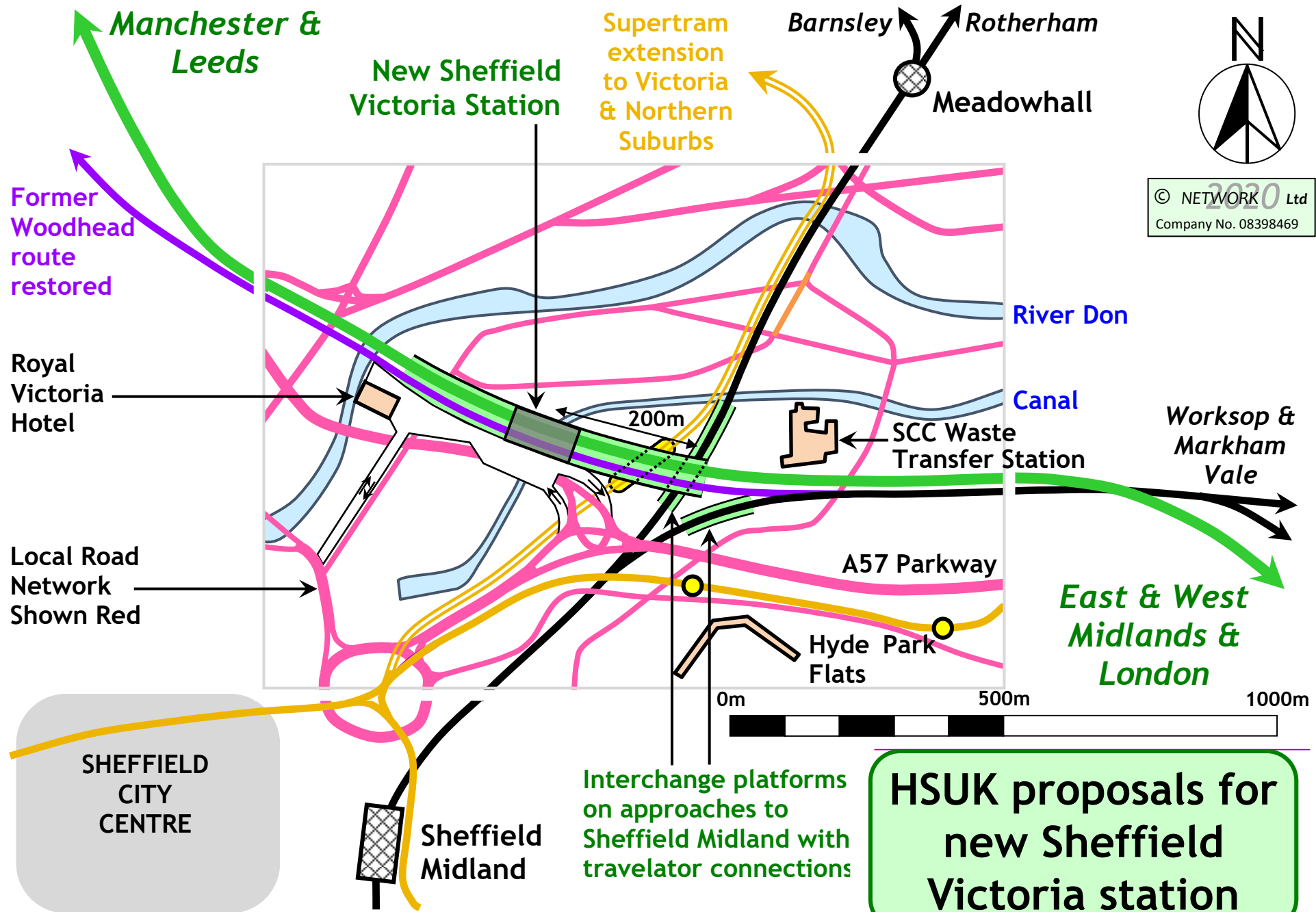


# Sheffield



- Network North will serve Sheffield at a new station on the site of the former Sheffield Victoria station.
- This will form Sheffield's new rail hub, integrating high speed intercity services at the high level platforms and local services at low level platforms on the existing approaches to Sheffield Midland.
- Proposed HSUK works will enable establishment of greatly improved local services on all radial routes into Sheffield.

K.01



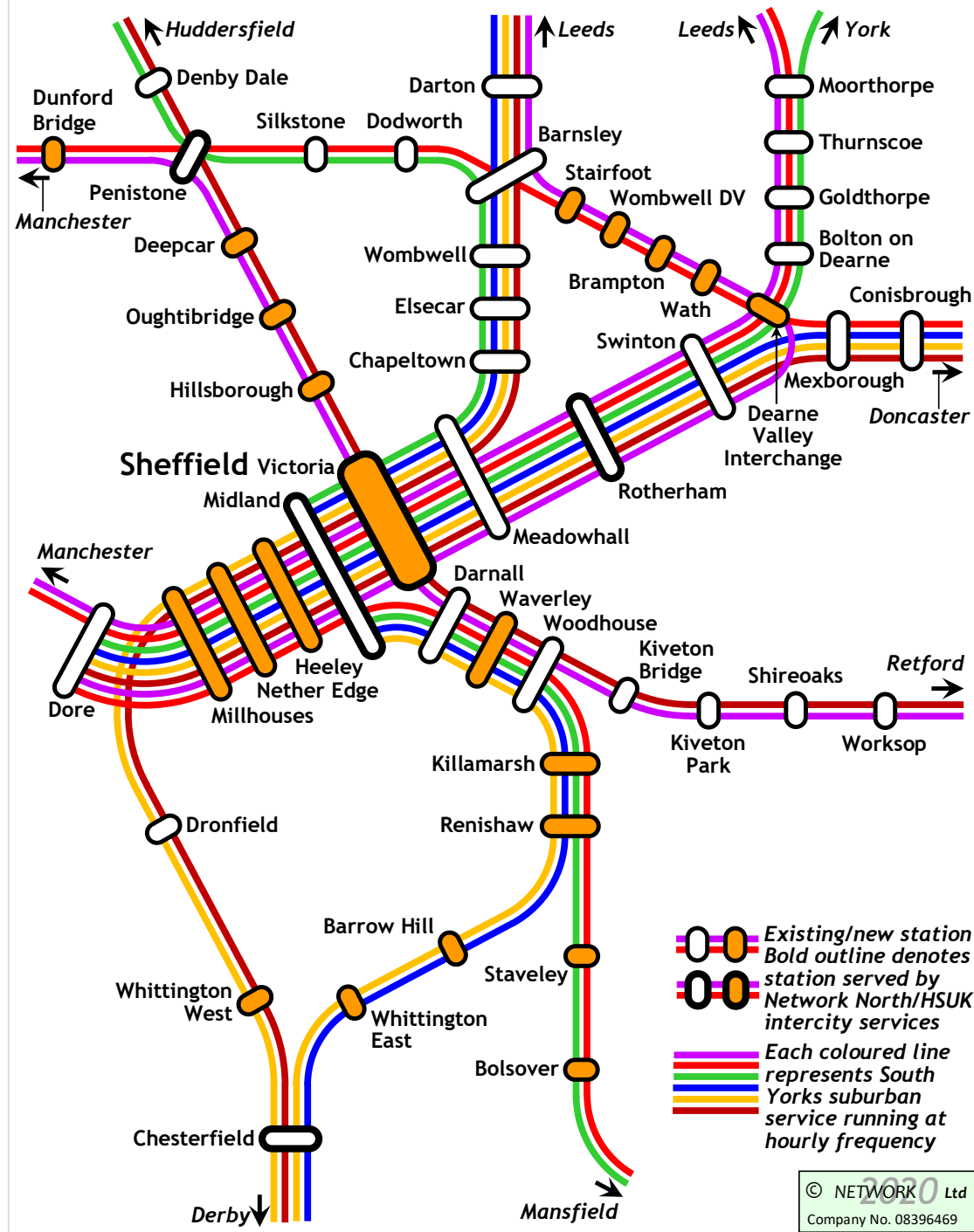
**HSUK proposals for new Sheffield Victoria station**

**K.02**

# HSUK Scheme for Improved Rail Infrastructure in Sheffield City Region



K.03



# HSUK Scheme for Improved Local Services in Sheffield City Region

Illustrated services repeated every 60 minutes

K.04

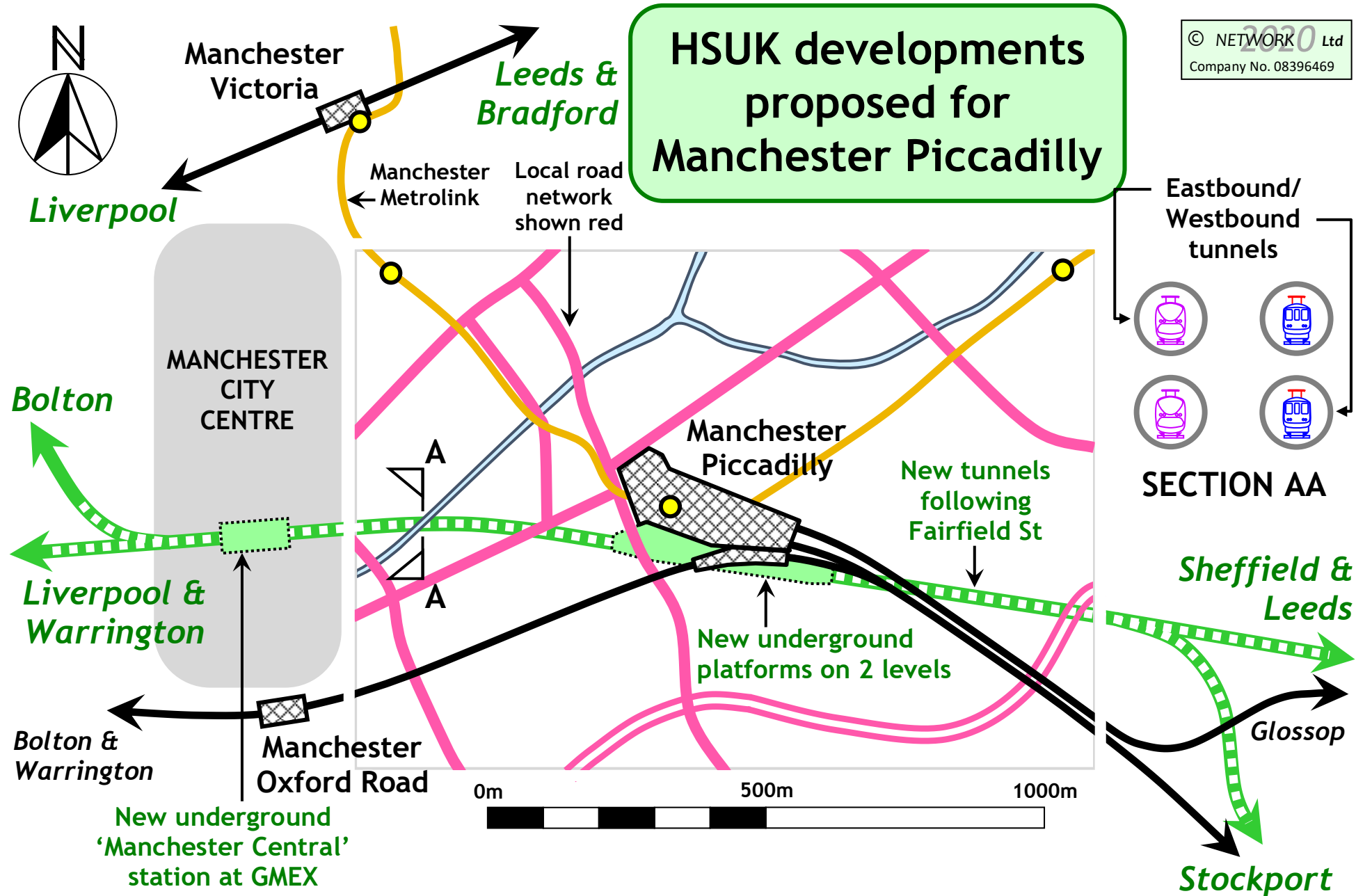


# Manchester

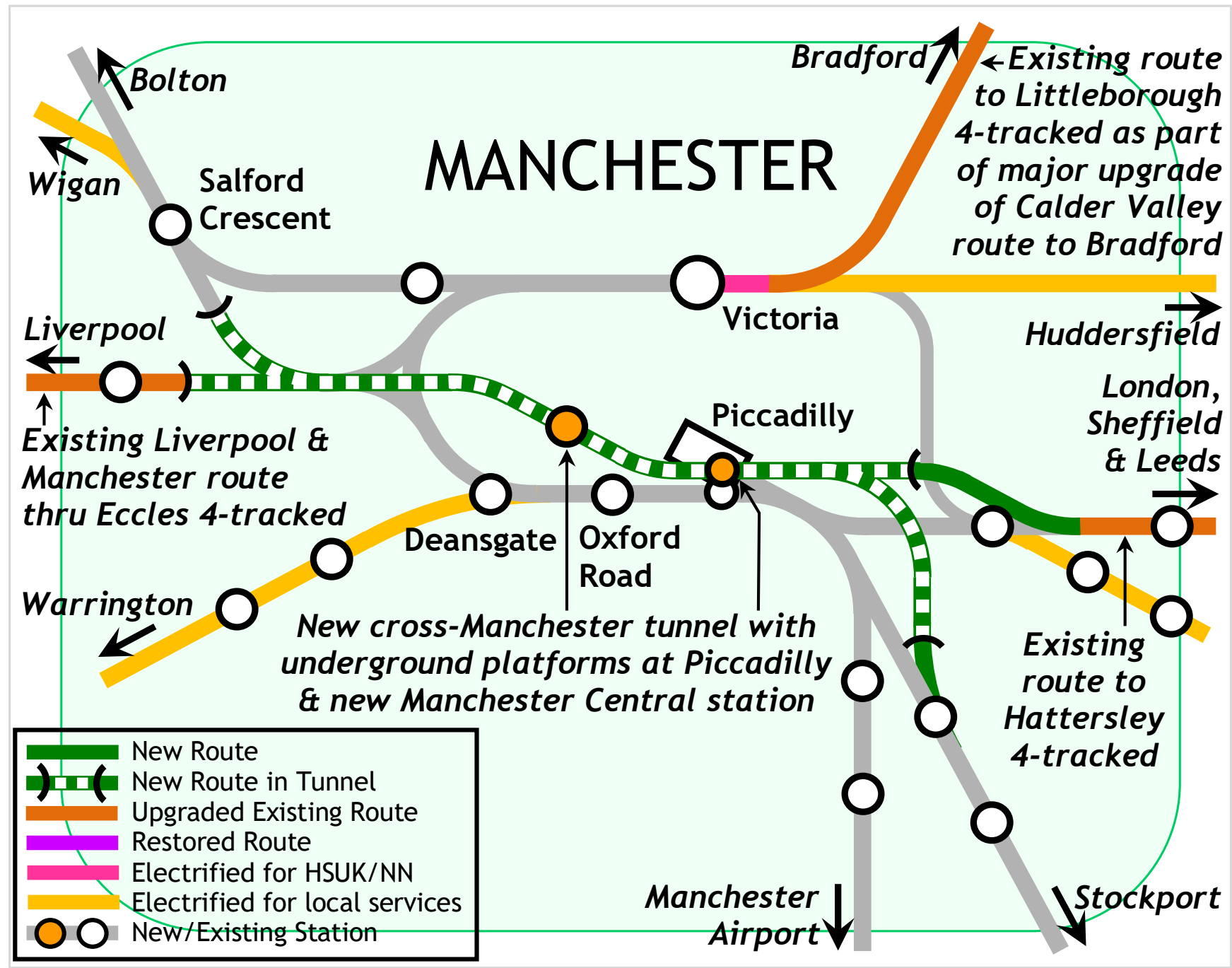


- Network North will serve Manchester at new underground platforms below Piccadilly station.
- New tunnel - comprising 4 tracks - will connect to HSUK routes to Yorkshire and Liverpool, and also to existing routes to Stockport and Bolton.
- New tunnel provides new east-west route for local services, additional to existing Castlefield Corridor.
- New underground 'Manchester Central' station for local services.





# HSUK Scheme for Improved Rail Infrastructure in Central Manchester

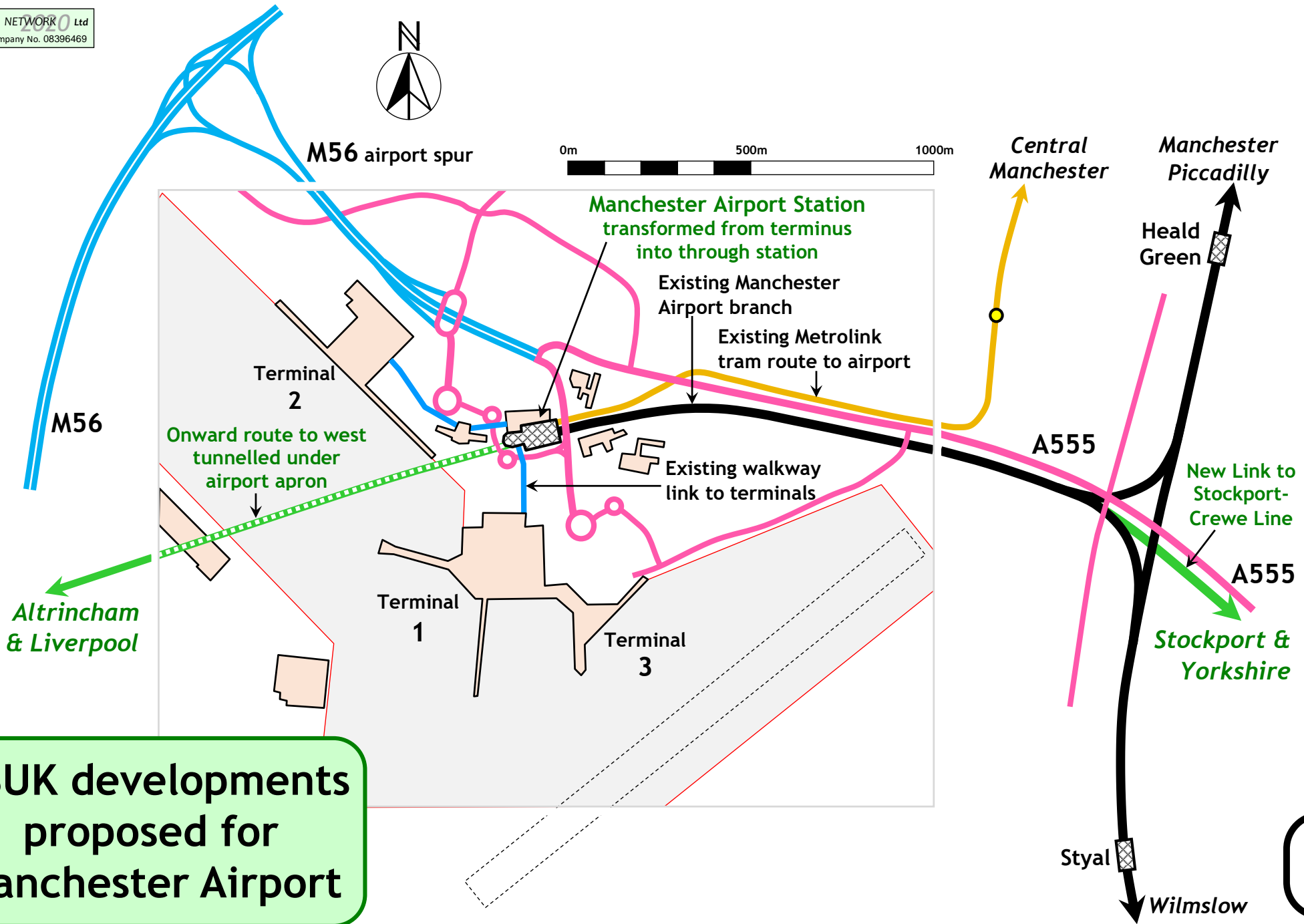


# Manchester Airport



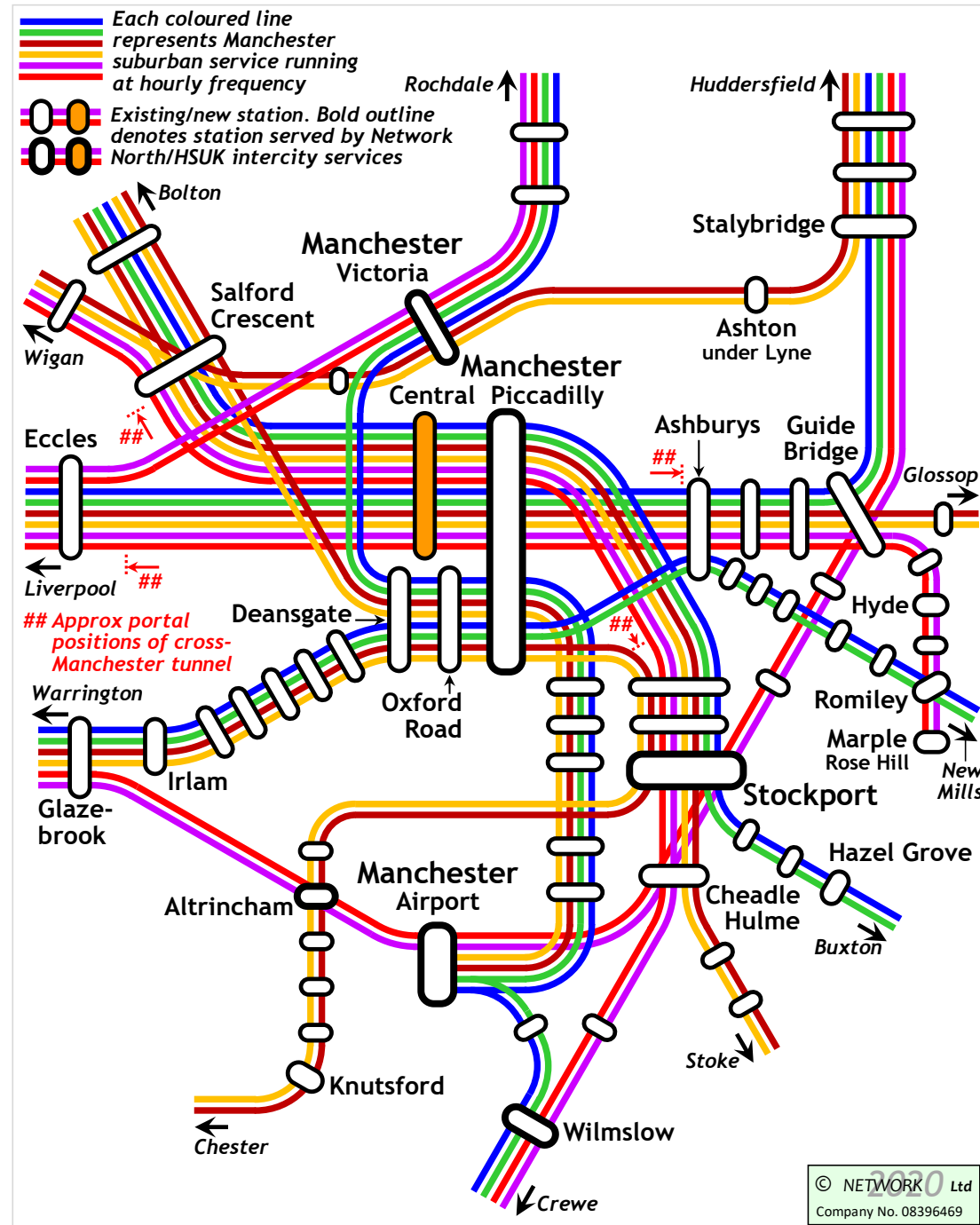
- Network North will serve Manchester Airport at its existing terminus station.
- This station will be transformed into a through station, with a new tunnelled route continuing west under the airport apron.
- This will form part of a south Manchester loop, extending west via Altrincham towards Liverpool and east via Stockport towards Yorkshire.
- Direct services to all major Northern cities.

L.04



**HSUK Scheme  
for Improved  
Rail  
Infrastructure  
in Greater  
Manchester**





# HSUK Scheme for Improved Local Services in Greater Manchester

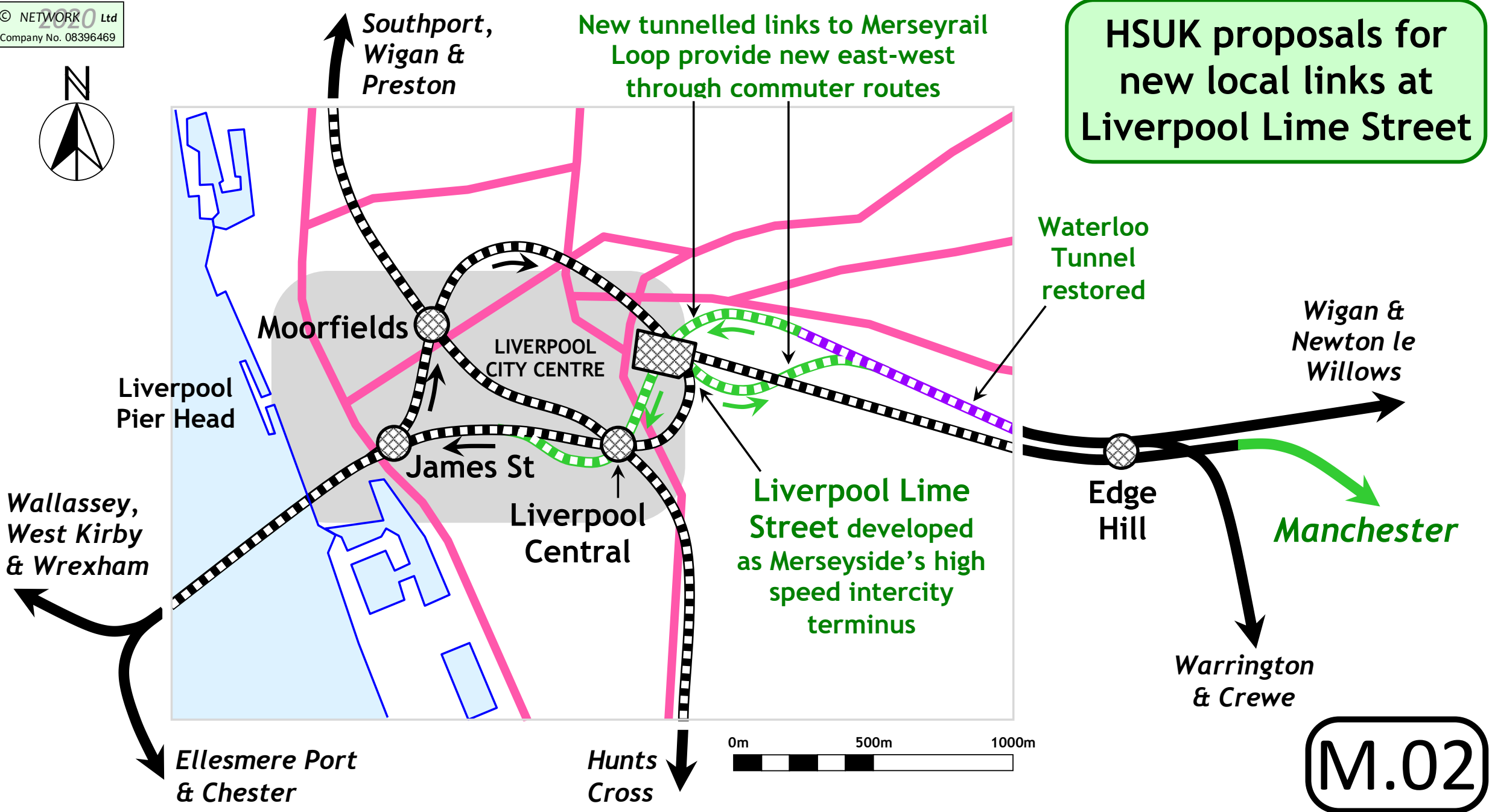
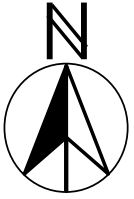
Illustrated services repeated every 60 minutes

# Liverpool

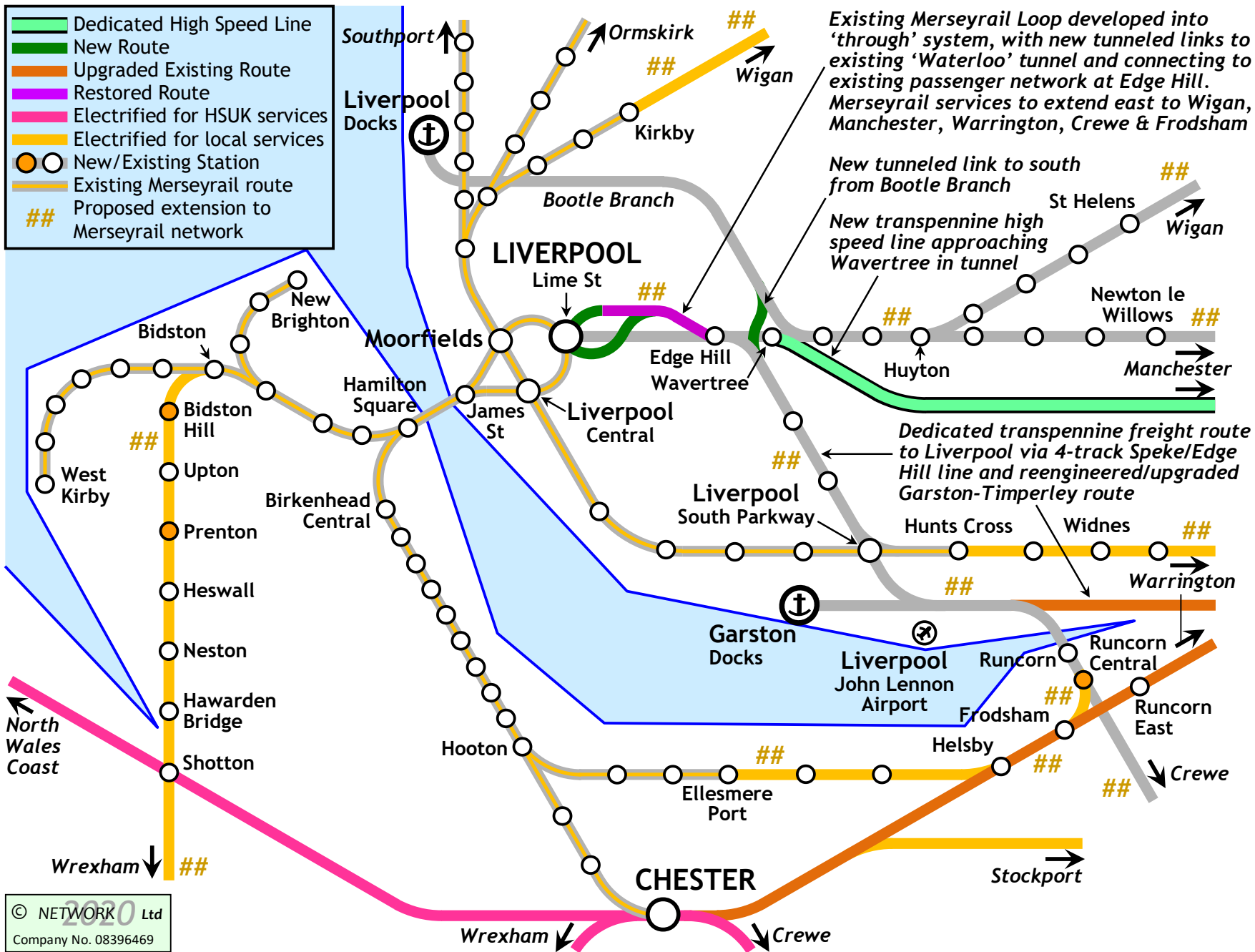
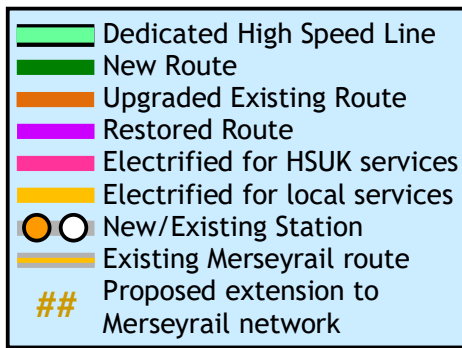


- Network North will serve Liverpool at the existing Liverpool Lime Street station.
- Greatly increased range of intercity services from Liverpool leaves no platform space for local services to Wigan, Warrington etc.
- Local services diverted via restored 'Waterloo Tunnel' & new tunnels to existing Merseyrail Loop.
- This will enable new east-west (dual voltage) services linking through to Wirral.



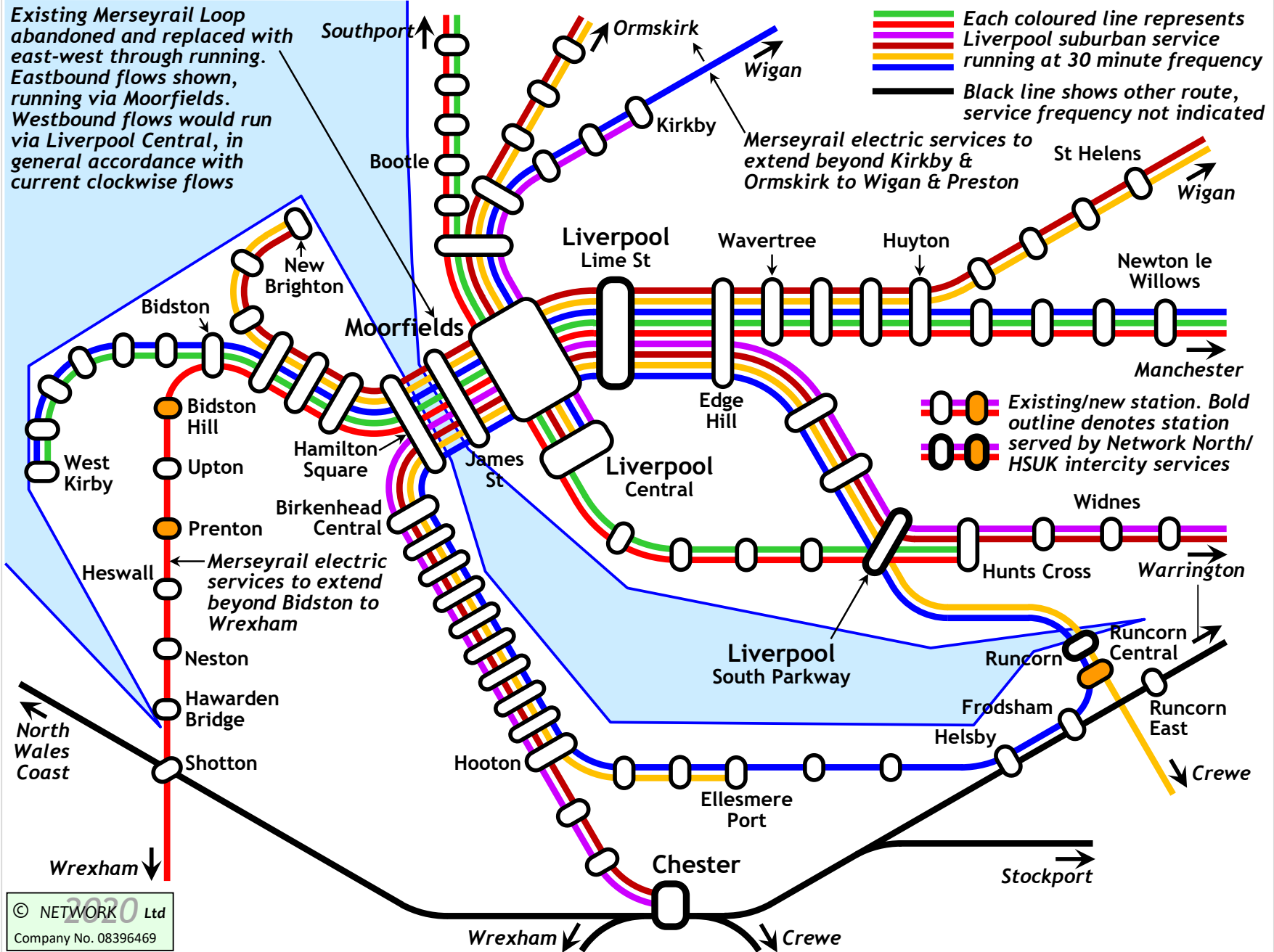






# HSUK Scheme for Improved Rail Infrastructure in Merseyside

Existing Merseyrail Loop abandoned and replaced with east-west through running. Eastbound flows shown, running via Moorfields. Westbound flows would run via Liverpool Central, in general accordance with current clockwise flows

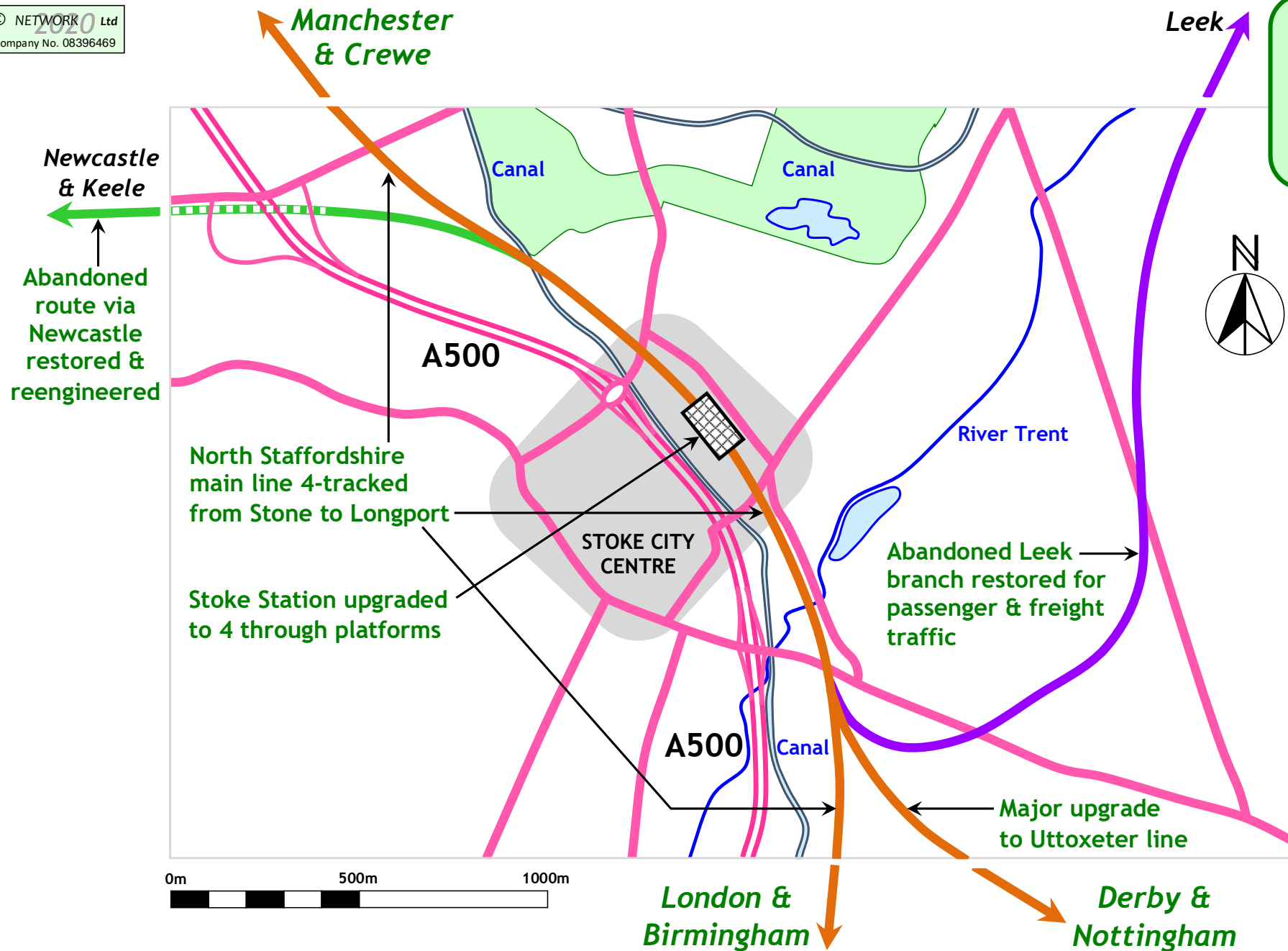


# HSUK Scheme for Improved Local Services in Merseyside

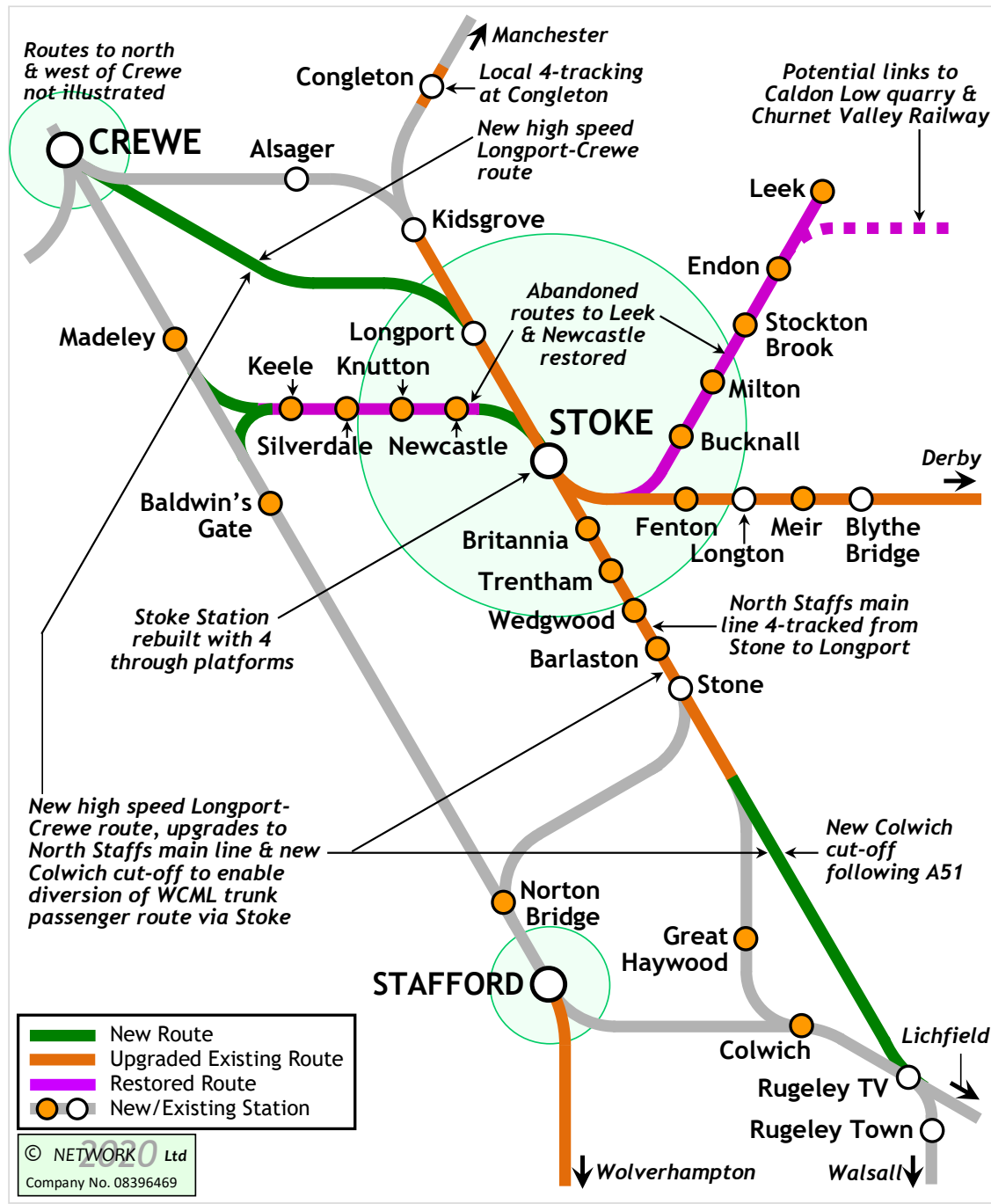
Illustrated services repeated every 30 minutes

# Stoke/Potteries

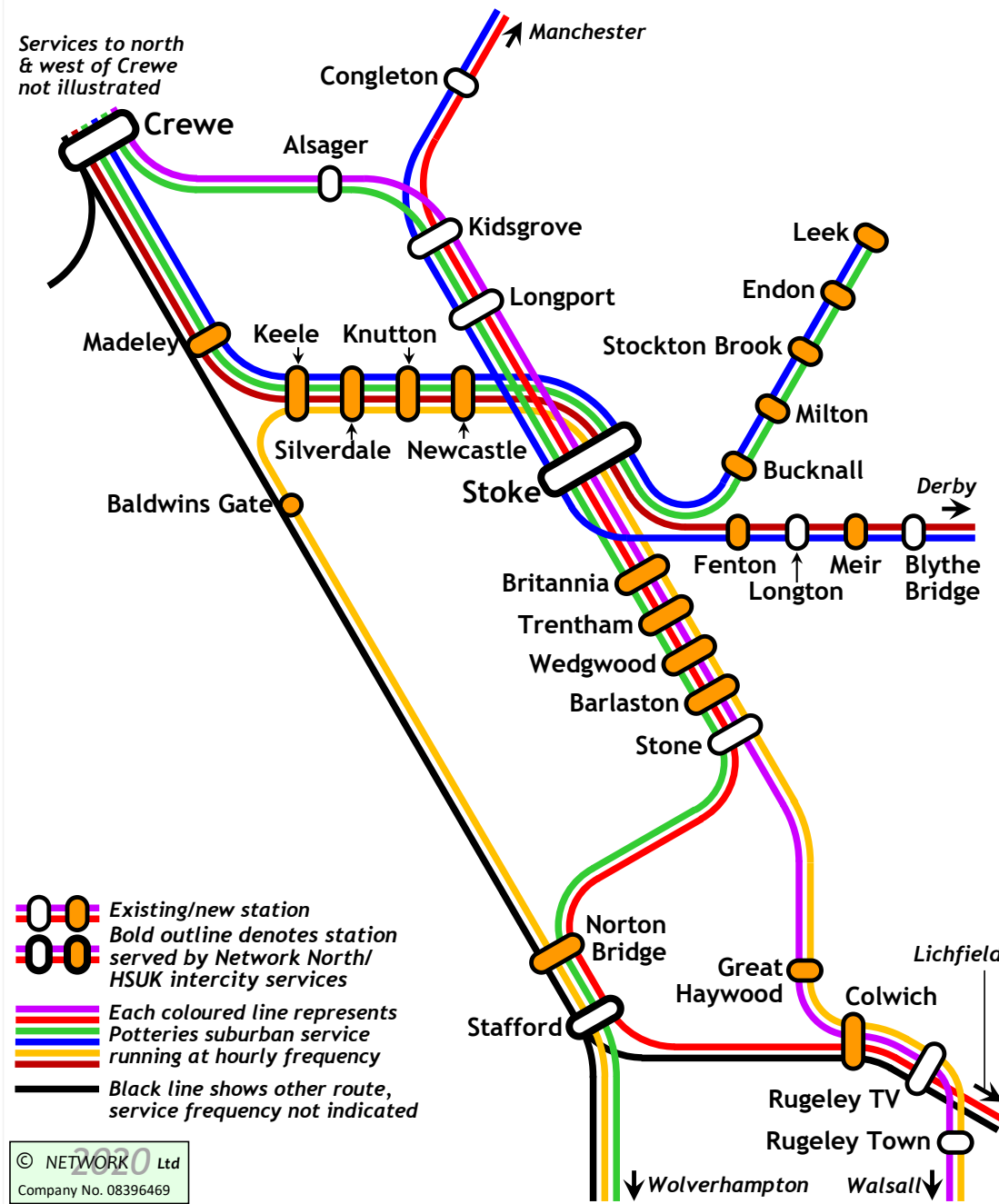
- Network North will serve Stoke at its existing station, upgraded to 4 through platforms.
- This is part of wider strategy to divert WCML passenger route to serve Potteries conurbation and vastly improve Stoke's intercity links.
- North Staffs main line 4-tracked between Stone and Longport for enhanced capacity.
- Together with restoration of key local routes, this will transform local rail network.



**HSUK proposals for  
new local links at  
Stoke on Trent**



# HSUK Scheme for Improved Rail Infrastructure in Potteries



# HSUK Scheme for Improved Local Services in Potteries

Illustrated services repeated every 60 minutes

N.04

# Network Aim 6



6. Compatibility with TfN ambition for ‘freight super-highway linking Liverpool and the Humber’.

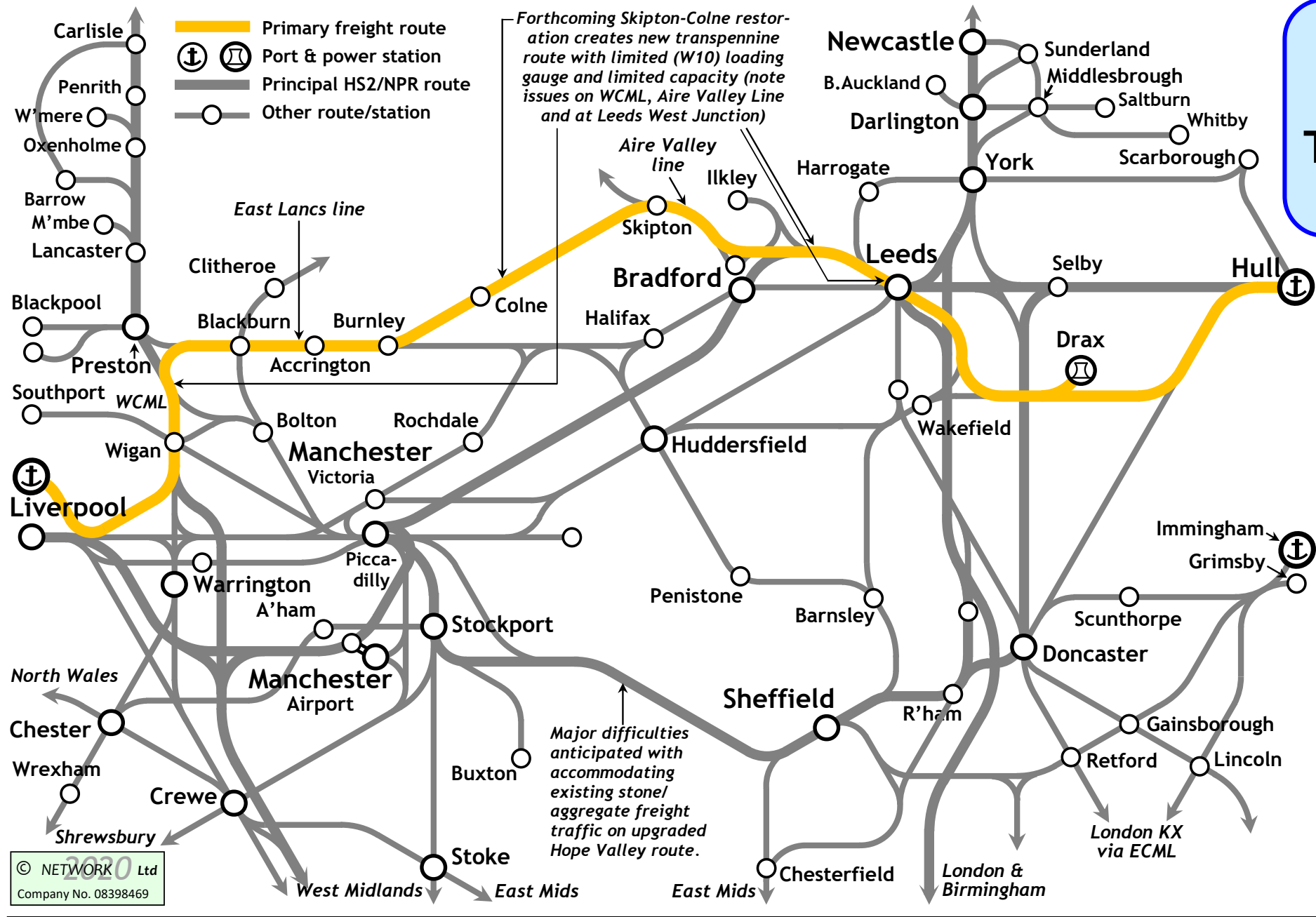
# TfN Freight Scheme



- ➔ A proposal to restore the abandoned line between Skipton and Colne represents TfN's only current initiative for a new transpennine freight route.
- ➔ This route is compromised by both its capacity (max 1 train per hour) and the limited size of wagon that it can accommodate (only W6 bulk wagons e.g. for biomass to Drax, not W12 marine containers).
- ➔ Clearly not the specified 'freight superhighway'!



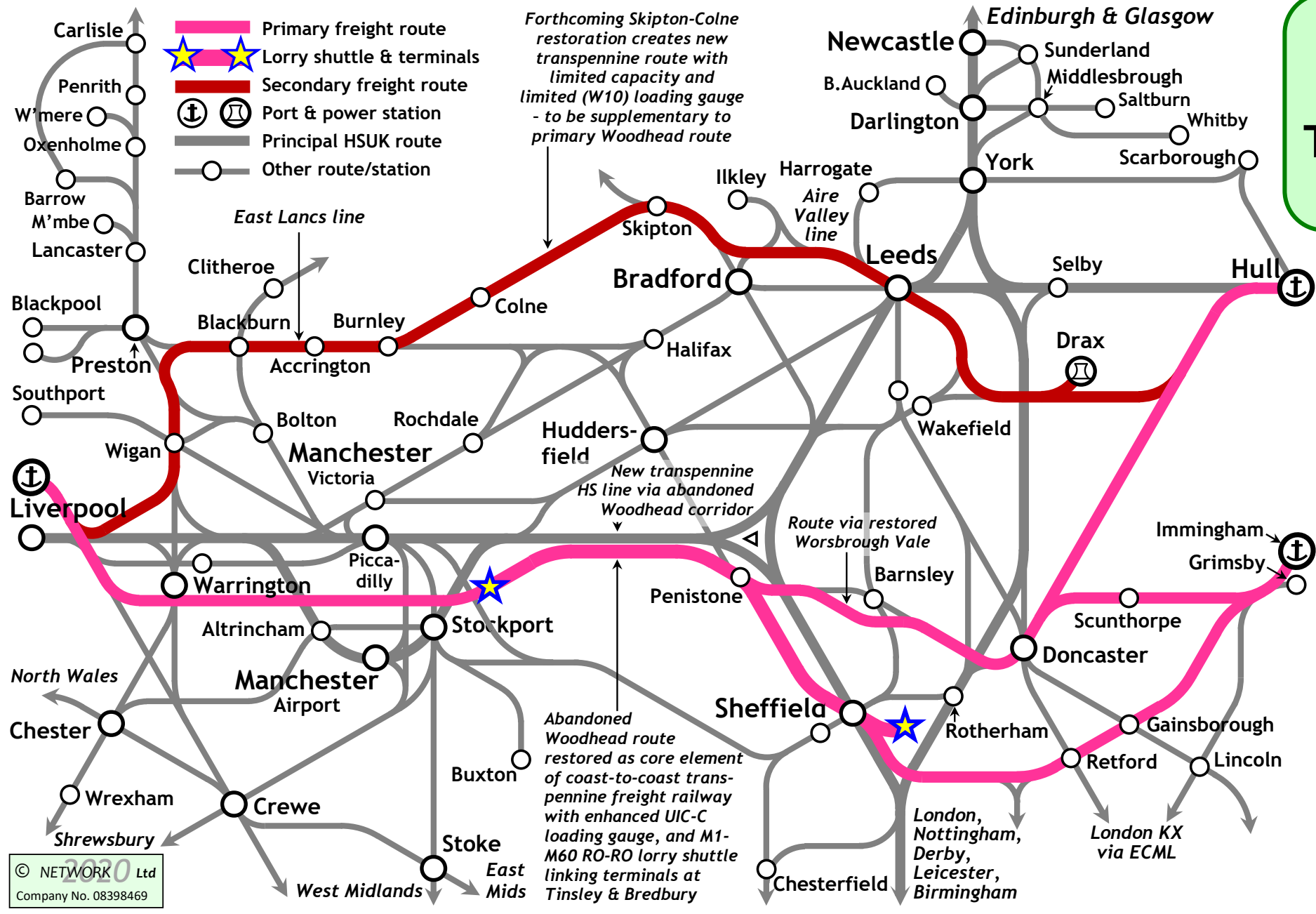
# TfN Scheme for Transpennine Freight??



# HSUK Freight Scheme

- ➔ HSUK's dedicated Eurogauge (UIC-C) freight route will take high-volume container flows from Port of Liverpool via south Manchester and restored Woodhead route to South Yorkshire.
- ➔ This route will extend via upgraded existing lines to Hull and Immingham, thus constituting TfN's specified 'freight superhighway linking Liverpool and the Humber'.
- ➔ HSUK's freight scheme also includes a roll-on roll-off lorry shuttle linking M60 in Greater Manchester and M1 in South Yorkshire. This will vastly reduce congestion on trans-pennine roads, particularly the A628T Woodhead Road.

# HSUK Scheme for Transpennine Freight

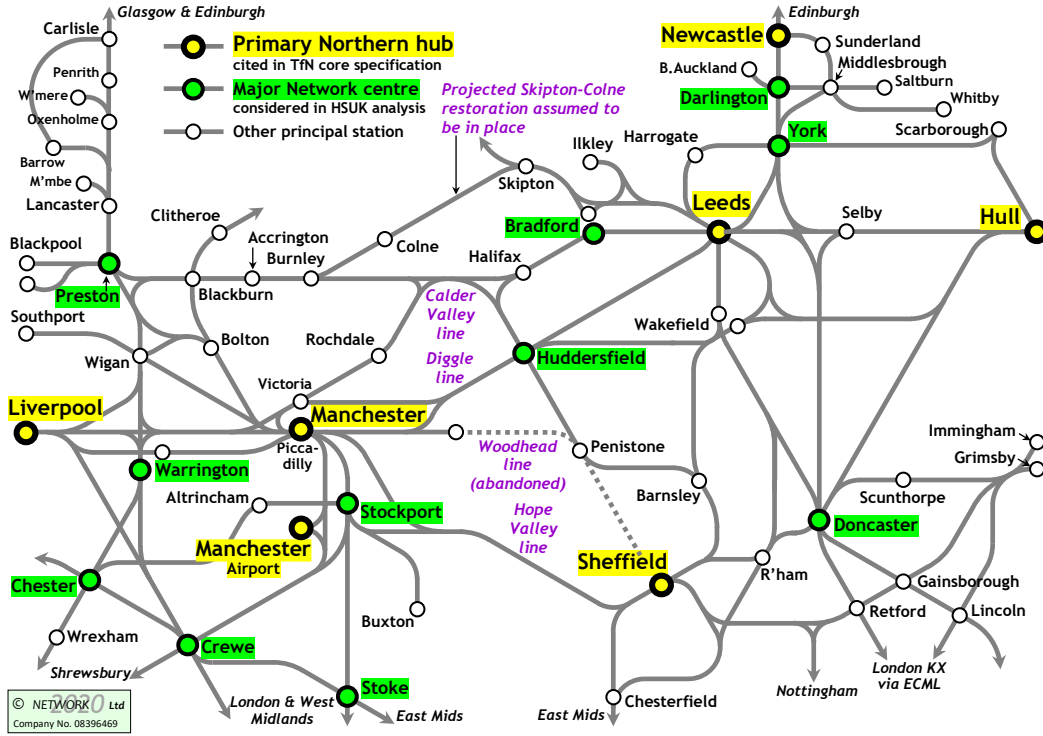


# Network Aim 7



7. Optimised direct links & journey time reductions to principal population centres in other UK regions.

# National Links??



- 17 cities + 1 airport considered in connectivity analysis of rail network of the Northern Powerhouse
- Links to 34 cities + 4 airports considered in connectivity analysis of wider national rail network
- 38 possible links from 18 centres
- 684 links in total
- Timings for HSUK & HS2 set out on following slides calculated on similar basis to methodology set out in slide G.02

Q.02

# Journey Time Reductions

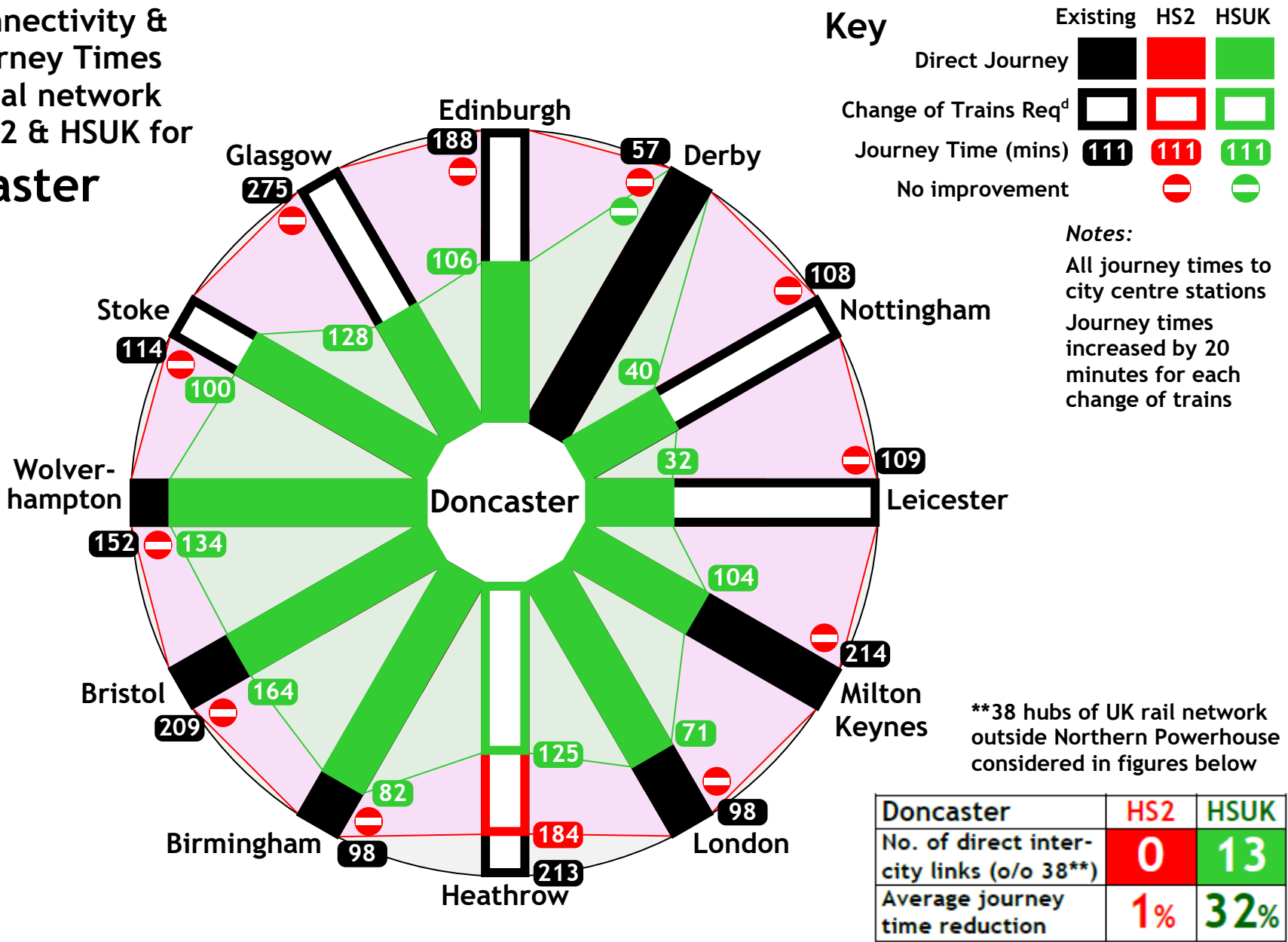
## Index to City Data



Doncaster	Q.04	Stoke	Q.13
Sheffield	Q.05	Crewe	Q.14
Huddersfield	Q.06	Chester	Q.15
Bradford	Q.07	Stockport	Q.16
Leeds	Q.08	Manchester Airport	n/a
Hull	Q.09	Manchester	Q.18
York	Q.10	Warrington	Q.19
Darlington	Q.11	Preston	Q.20
Newcastle	Q.12	Liverpool	Q.21

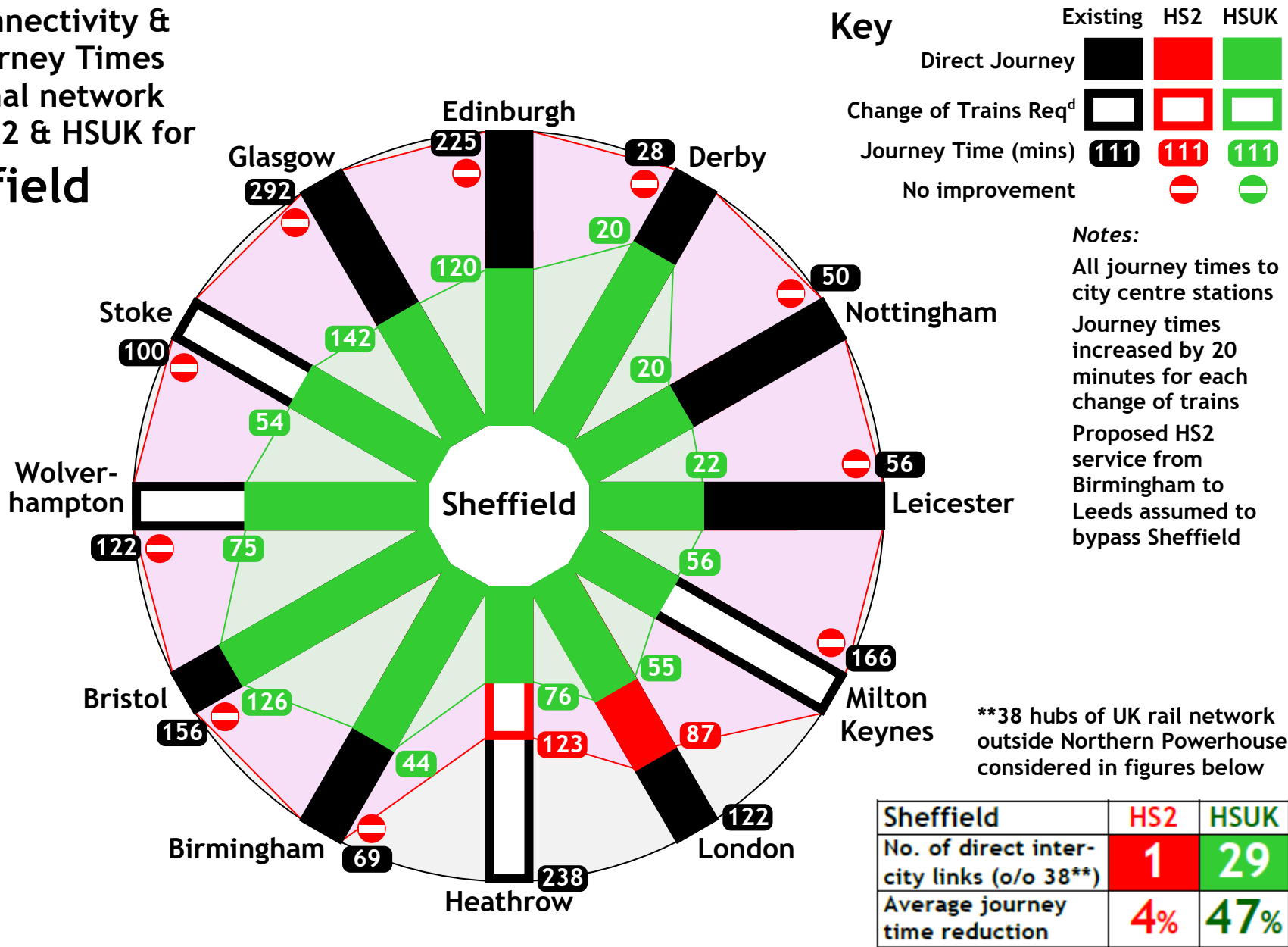
Note : HSUK journey time data assumes  
HSUK north-south trunk route from  
Glasgow to London, with southern section  
following M1 corridor

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Doncaster



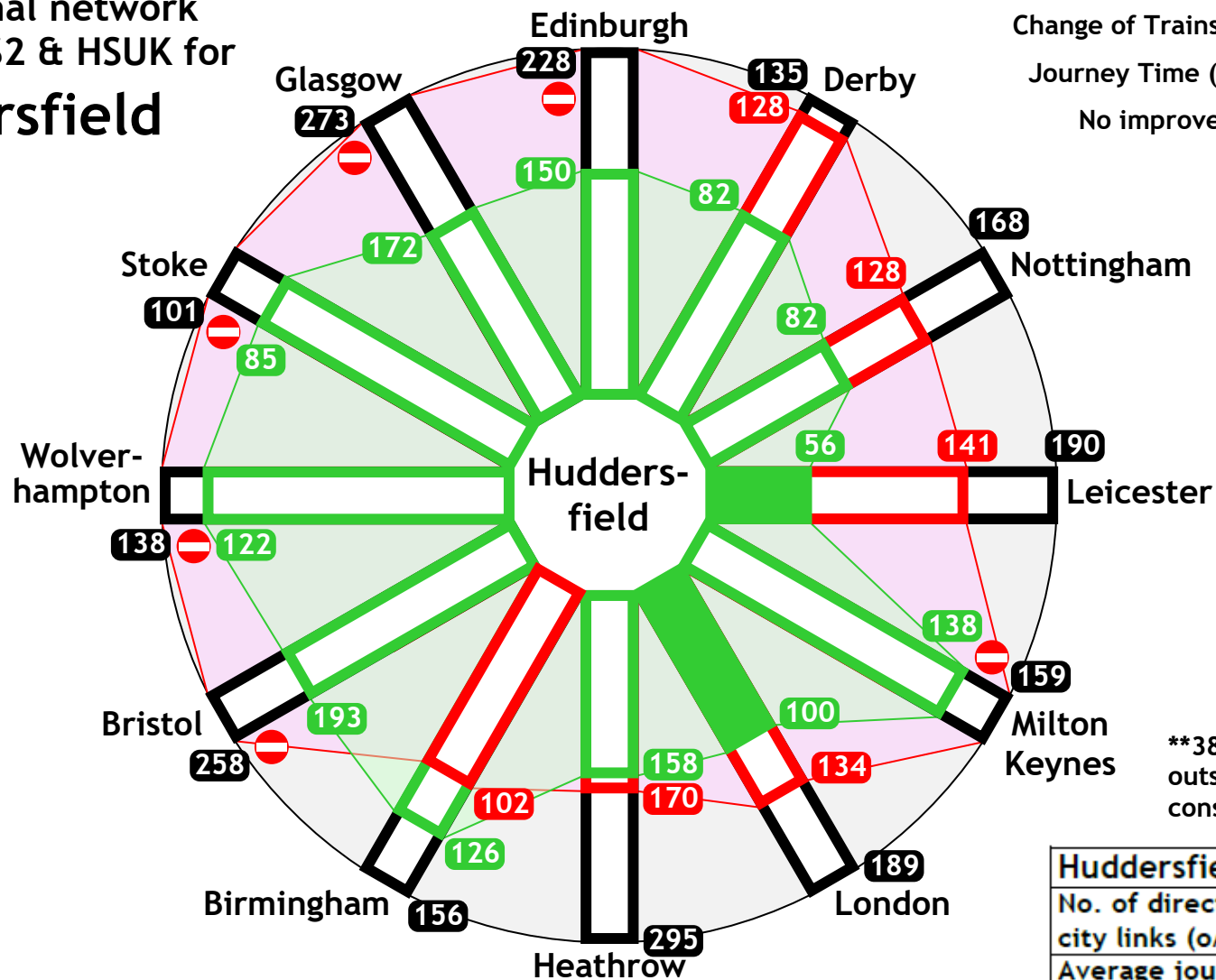


# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Sheffield





**Improved Connectivity &  
Reduced Journey Times  
across national network  
achieved by HS2 & HSUK for  
Huddersfield**



## Key

Existing	HS2	HSUK
----------	-----	------

### Direct Journey

### Change of Trains Req<sup>d</sup>

Journey Time (mins)

No improvement

**Notes:**

**All journey times to city centre stations**

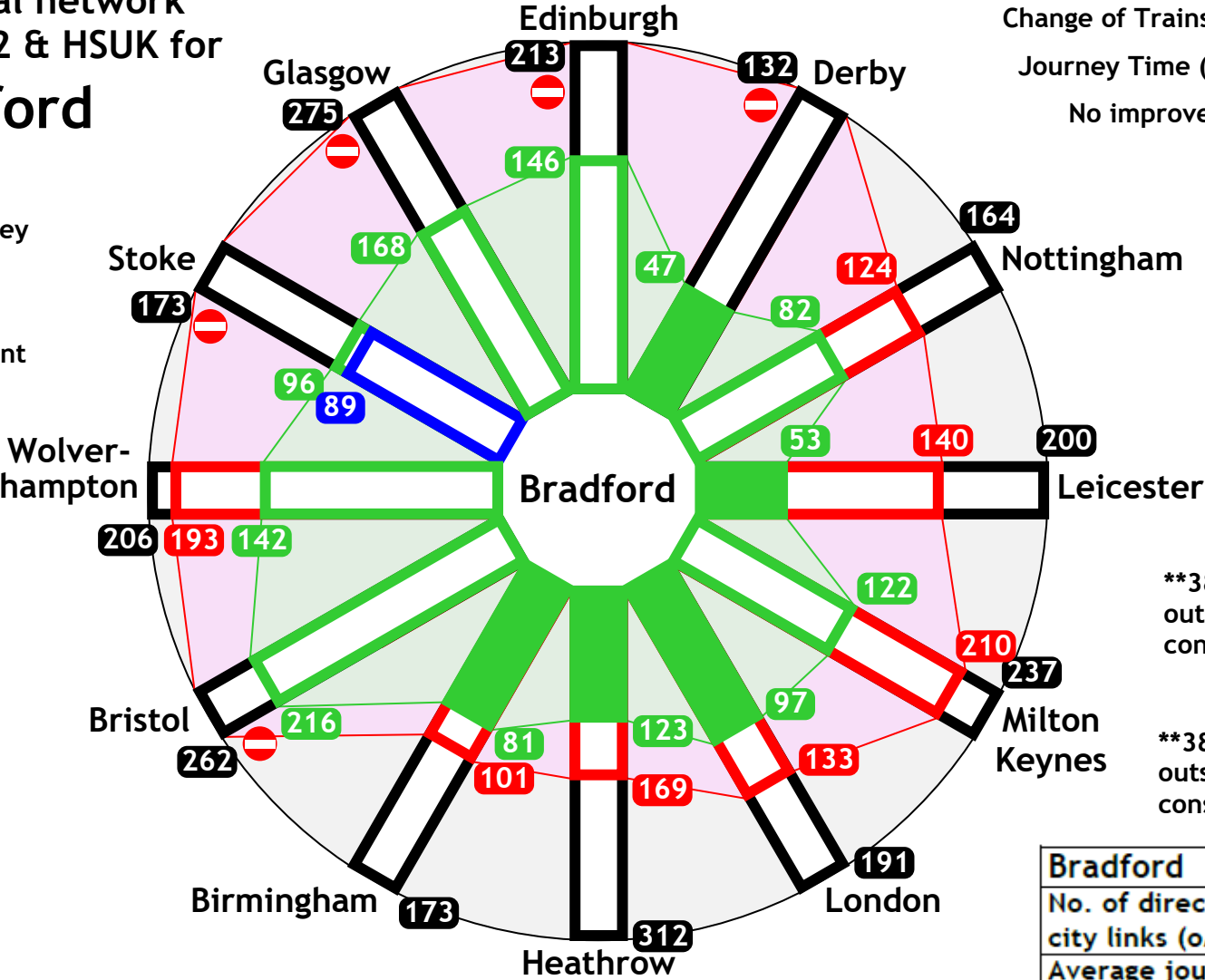
**Journey times increased by 20 minutes for each change of trains**

**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

Huddersfield	HS2	HSUK
No. of direct inter-city links (o/o 38**)	0	2
Average journey time reduction	8%	31%

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Bradford

*Note:*  
Improvements in journey times to Stoke only delivered by Northern Powerhouse Rail. HS2 delivers no improvement



Key

Existing

HS2

HSUK

Direct Journey

Change of Trains Req<sup>d</sup>

Journey Time (mins)

No improvement

111

111

111

111

111

111

*Notes:*  
All journey times to city centre stations  
Journey times increased by 20 minutes for each change of trains

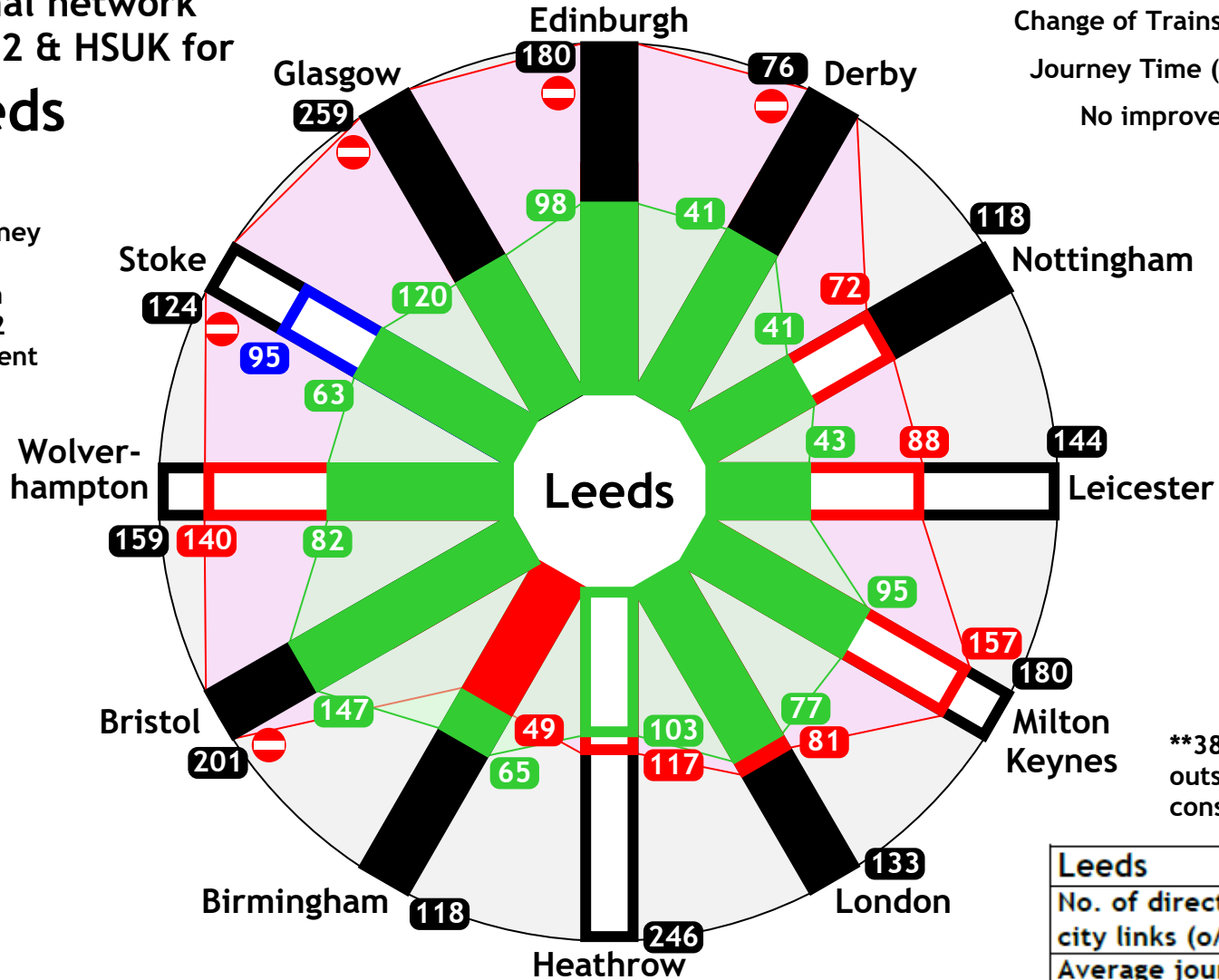
**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

Bradford	HS2	HSUK
No. of direct inter-city links (o/o 38**)	0	10
Average journey time reduction	14%	46%

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Leeds

**Note:**  
Improvements in journey times to Stoke only delivered by Northern Powerhouse Rail. HS2 delivers no improvement



## Key

	Existing	HS2	HSUK
Direct Journey			
Change of Trains Req <sup>d</sup>			
Journey Time (mins)			
No improvement			

## Notes:

All journey times to city centre stations  
Journey times increased by 20 minutes for each change of trains

**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

Leeds	HS2	HSUK
No. of direct inter-city links (o/o 38**)	3	30
Average journey time reduction	18%	44%

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Hull

*Note:*  
Improvements in journey times to Stoke only delivered by Northern Powerhouse Rail. HS2 delivers no improvement

Key

Existing

HS2

HSUK

Direct Journey

Change of Trains Req<sup>d</sup>

Journey Time (mins)

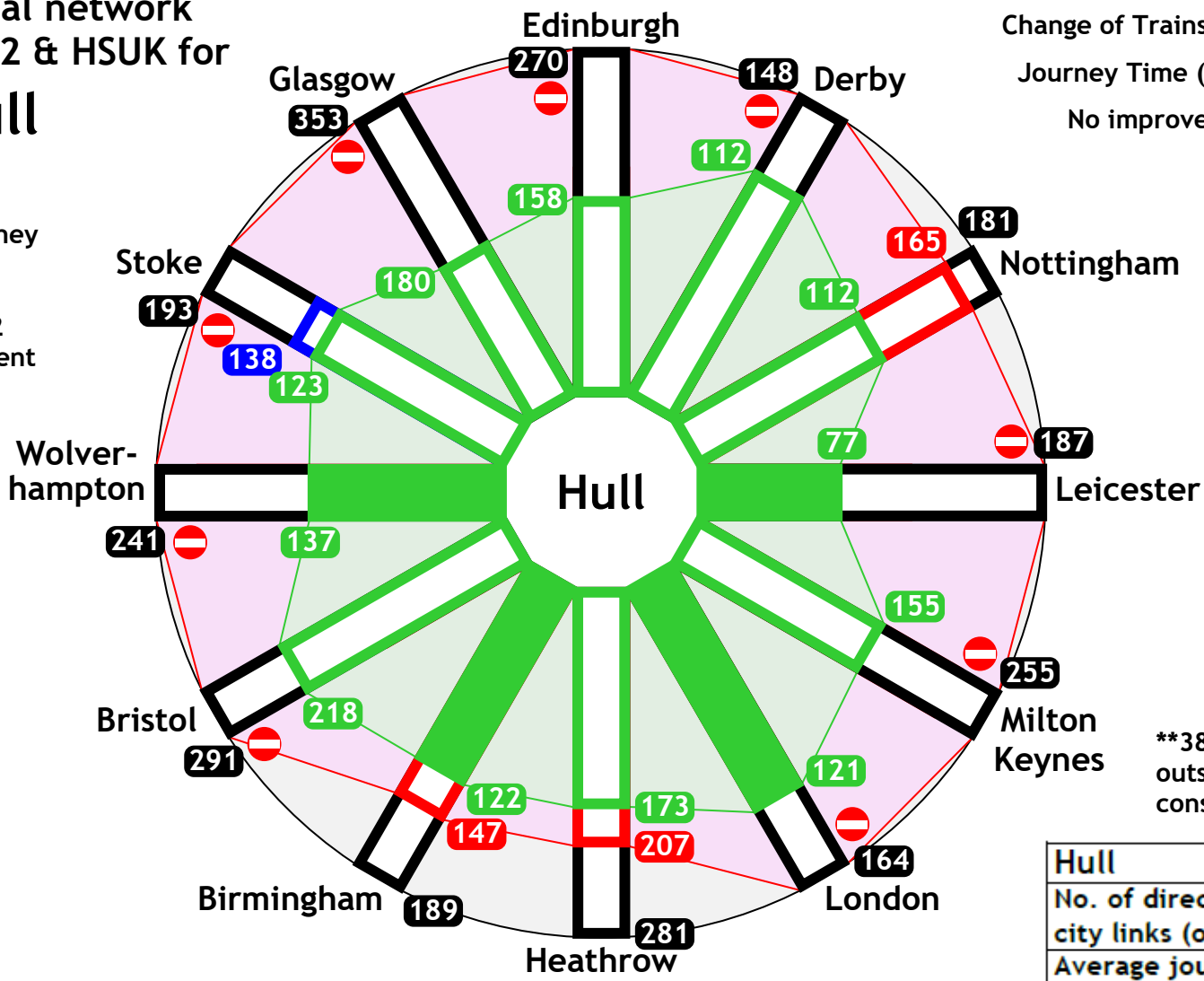
111

111

111

No improvement

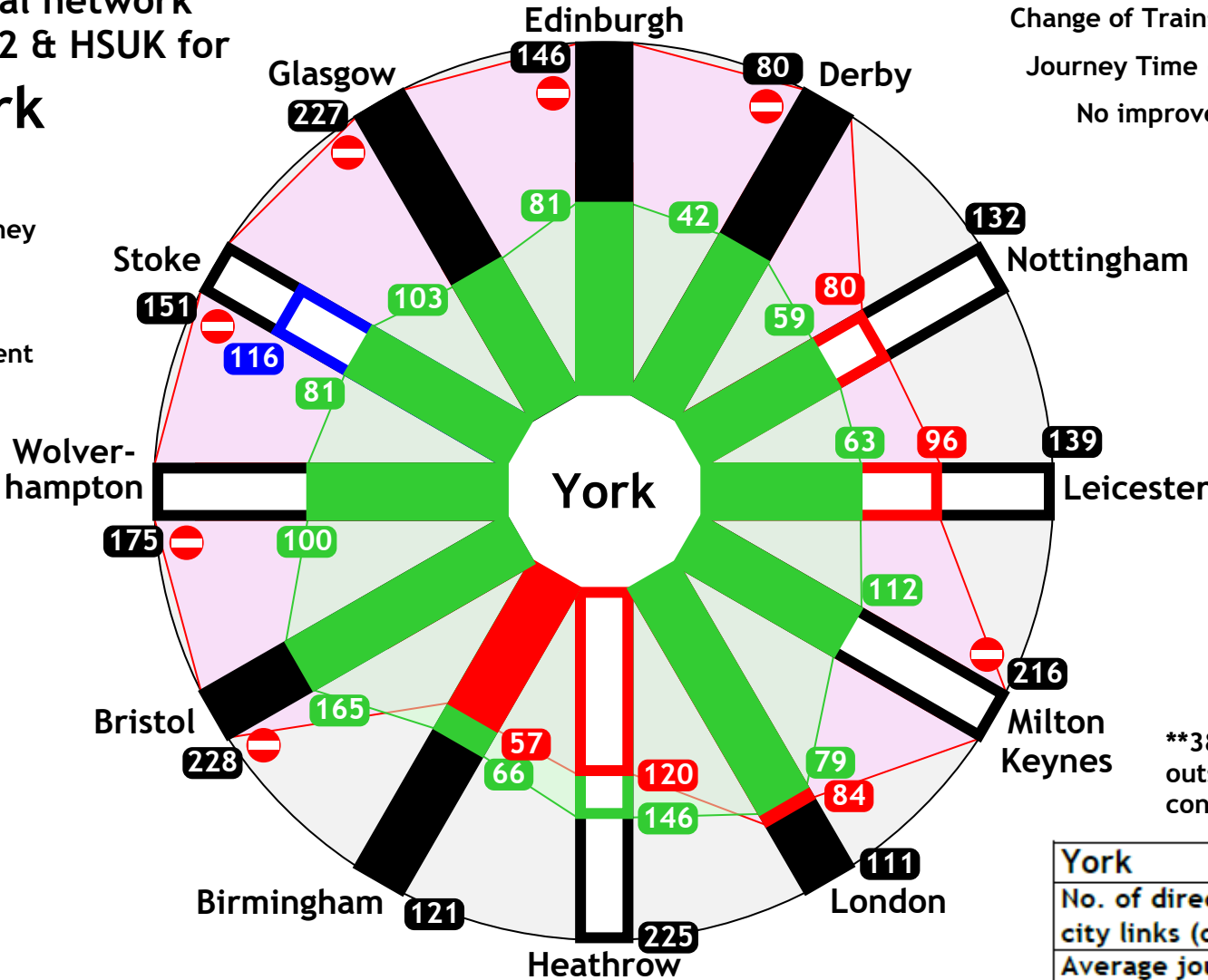
*Notes:*  
All journey times to city centre stations  
Journey times increased by 20 minutes for each change of trains



Hull	HS2	HSUK
No. of direct inter-city links (o/o 38**)	0	7
Average journey time reduction	5%	36%

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for York

*Note:*  
Improvements in journey times to Stoke only delivered by Northern Powerhouse Rail. HS2 delivers no improvement



Key

Existing

HS2

HSUK

Direct Journey

Change of Trains Req<sup>d</sup>

Journey Time (mins)

111

111

111

No improvement

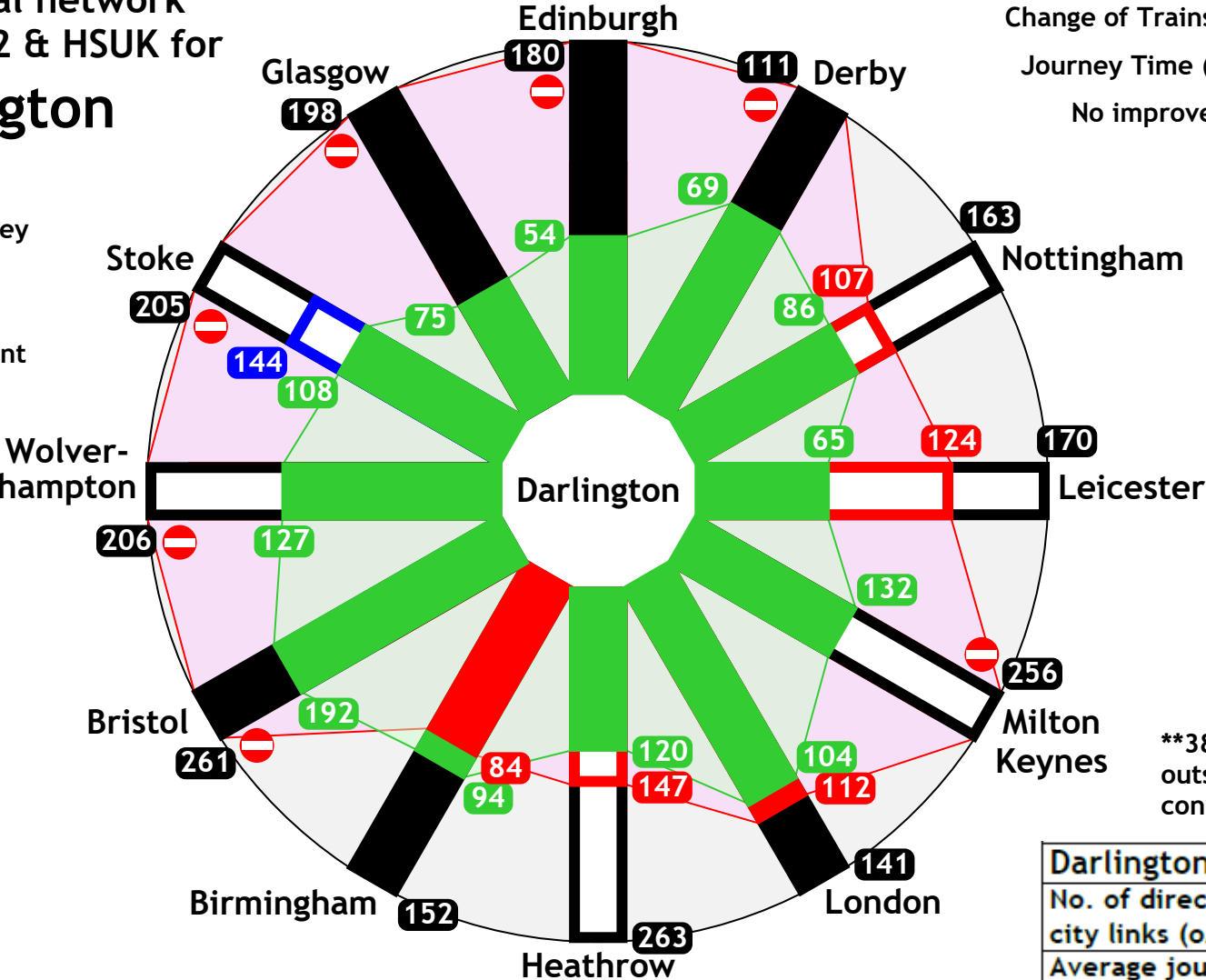
*Notes:*  
All journey times to city centre stations  
Journey times increased by 20 minutes for each change of trains

**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

York	HS2	HSUK
No. of direct inter-city links (o/o 38**)	2	24
Average journey time reduction	10%	36%

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Darlington

*Note:*  
Improvements in journey times to Stoke only delivered by Northern Powerhouse Rail. HS2 delivers no improvement



Key

Existing

HS2

HSUK

Direct Journey

Change of Trains Req<sup>d</sup>

Journey Time (mins)

No improvement

Existing

HS2

HSUK

111

111

111

No improvement

No improvement

No improvement

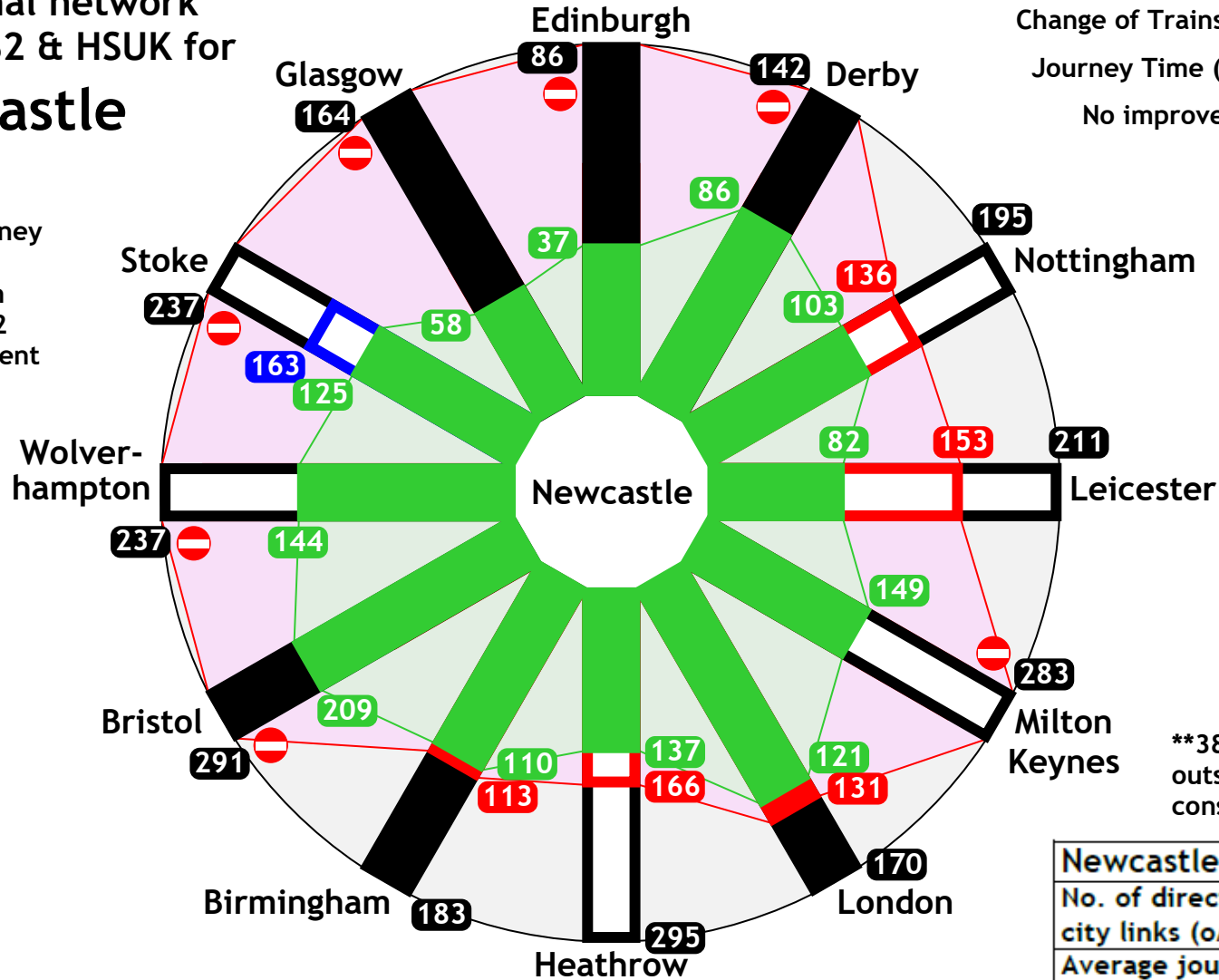
*Notes:*  
All journey times to city centre stations  
Journey times increased by 20 minutes for each change of trains

**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

Darlington	HS2	HSUK
No. of direct inter-city links (o/o 38**)	2	30
Average journey time reduction	8%	40%

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Newcastle

**Note:**  
Improvements in journey times to Stoke only delivered by Northern Powerhouse Rail. HS2 delivers no improvement



## Key

	Existing	HS2	HSUK
Direct Journey			
Change of Trains Req <sup>d</sup>			
Journey Time (mins)			
No improvement			

## Notes:

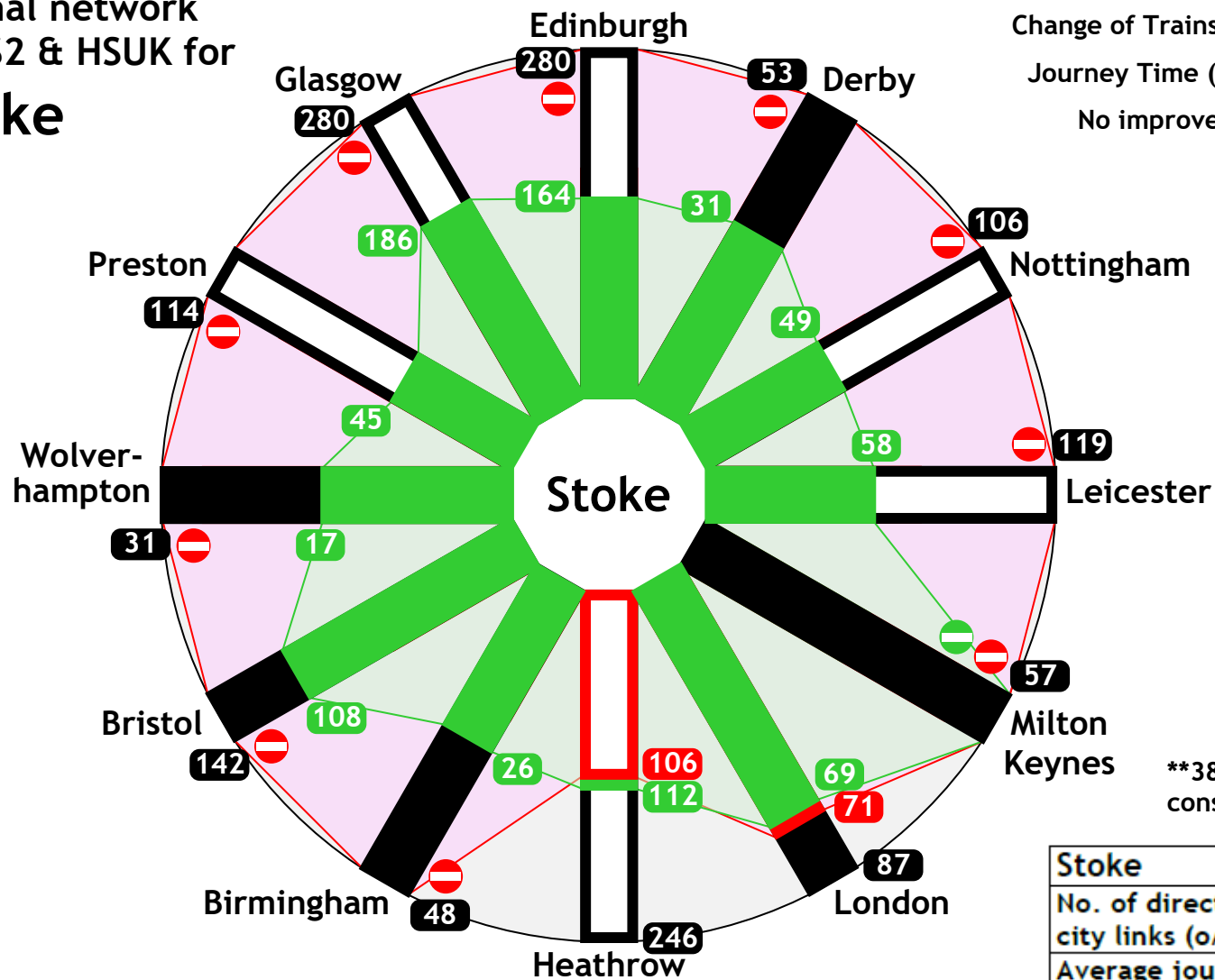
All journey times to city centre stations  
Journey times increased by 20 minutes for each change of trains

**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

Newcastle	HS2	HSUK
No. of direct inter-city links (o/o 38**)	2	30
Average journey time reduction	7%	41%



**Improved Connectivity &  
Reduced Journey Times  
across national network  
achieved by HS2 & HSUK for  
Stoke**



Stoke	HS2	HSUK
No. of direct inter-city links (o/o 38**)	1	22
Average journey time reduction	3%	35%

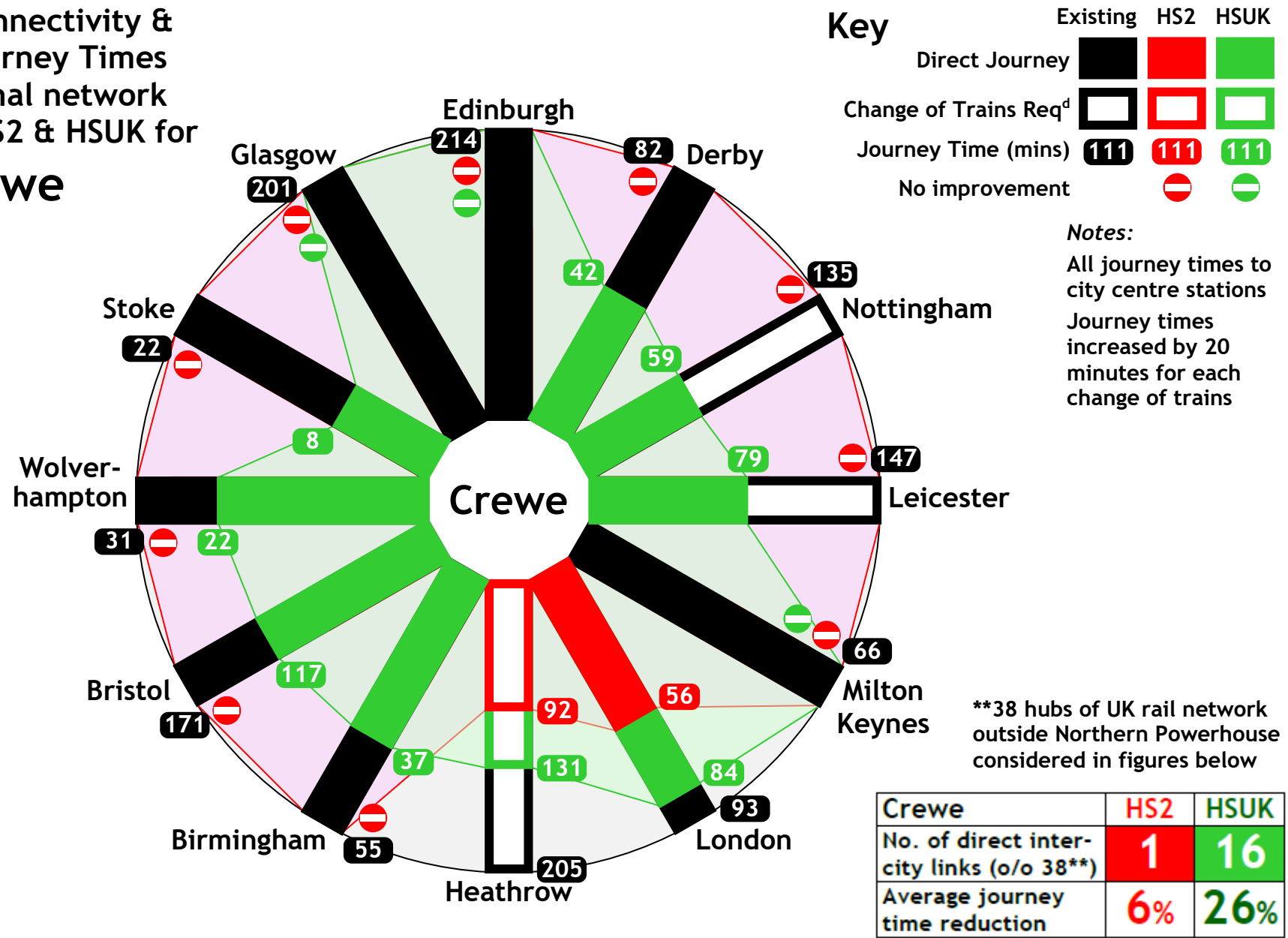
**\*\*38 hubs of UK rail network considered in figures below**

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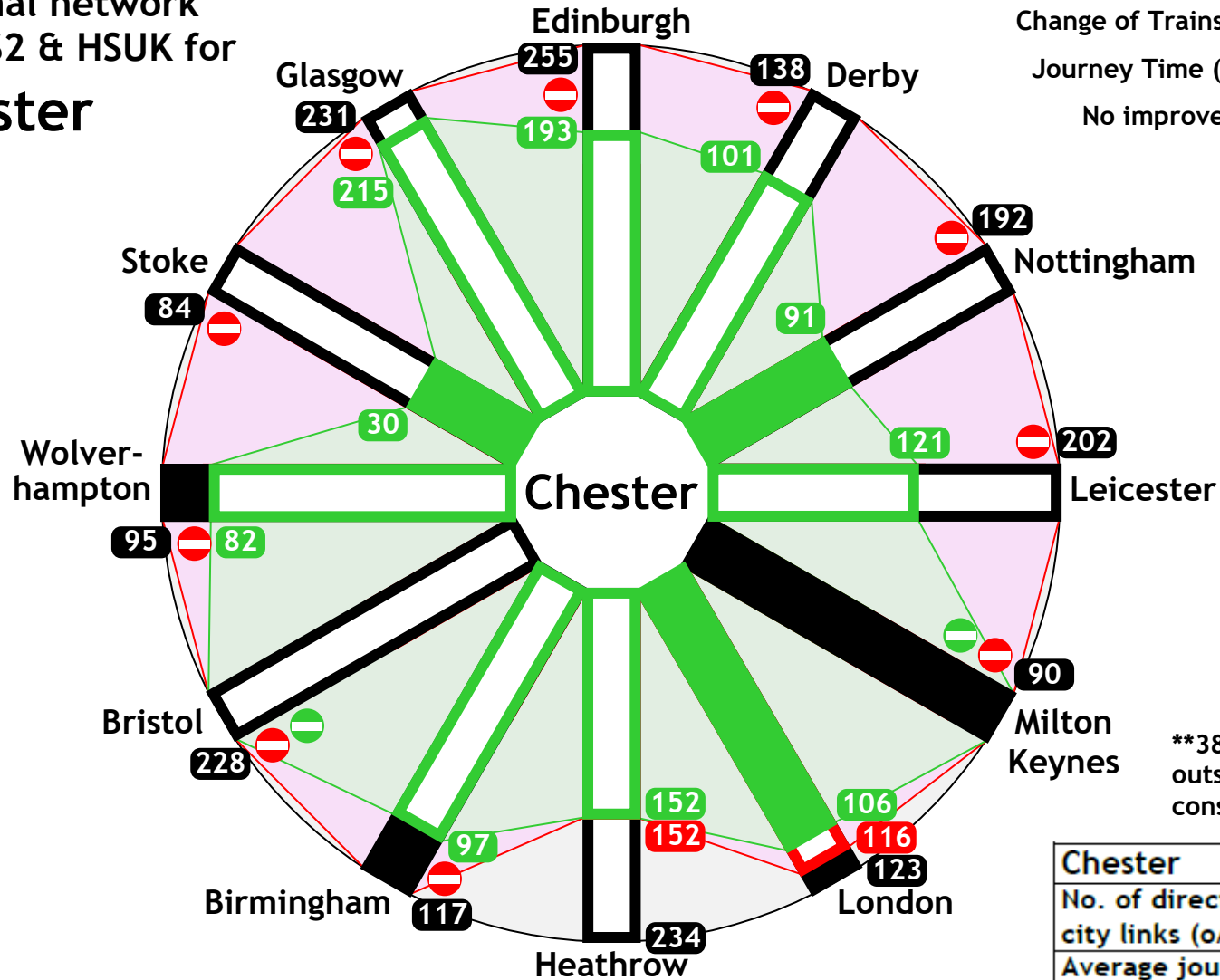
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# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Crewe



# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Chester



## Key

Existing	HS2	HSUK
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## Direct Journey

### Change of Trains Req<sup>d</sup>

Journey Time (mins)

No improvement

**Notes:**

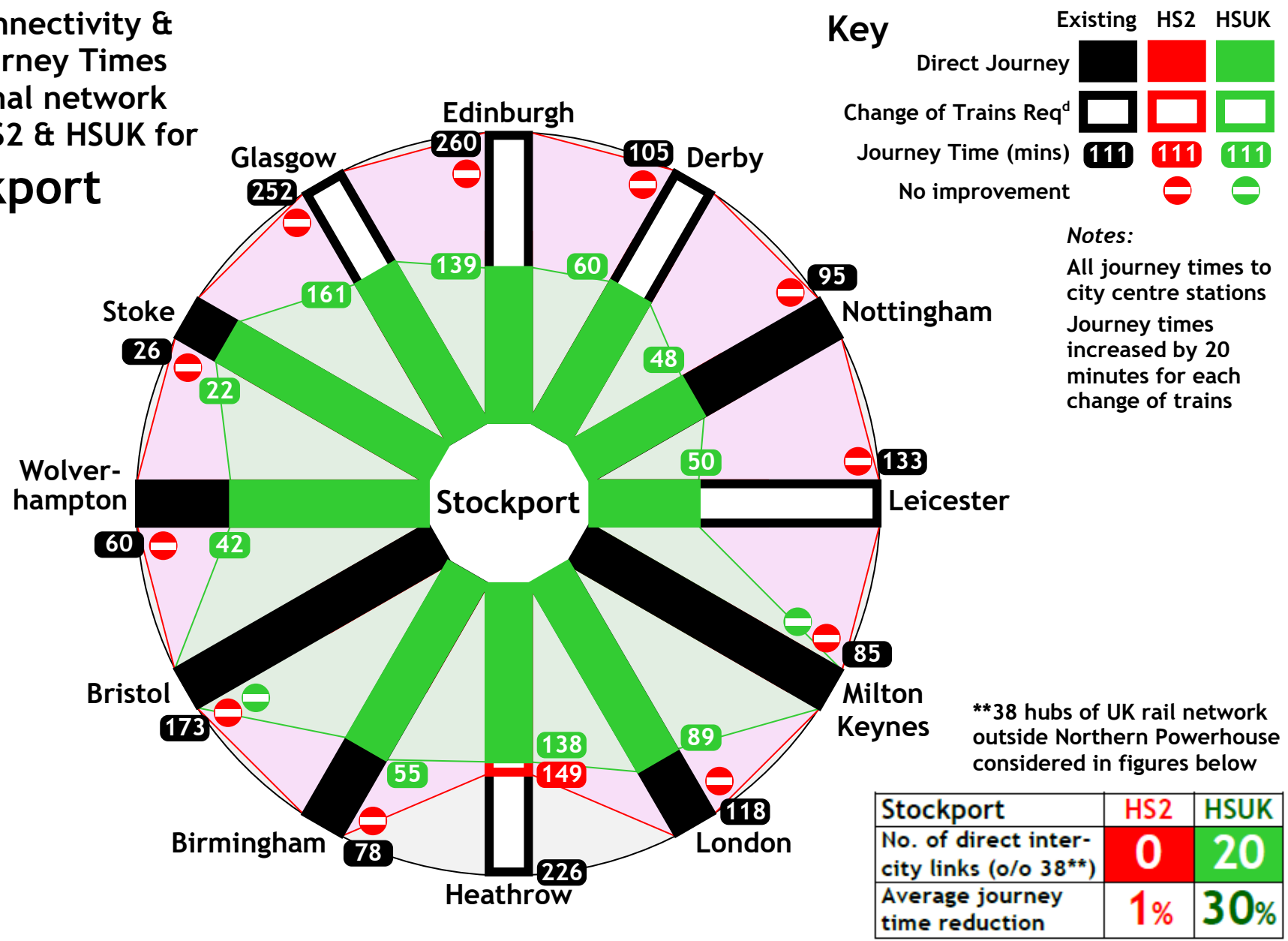
### All journey times to city centre stations

**Journey times increased by 20 minutes for each change of trains**

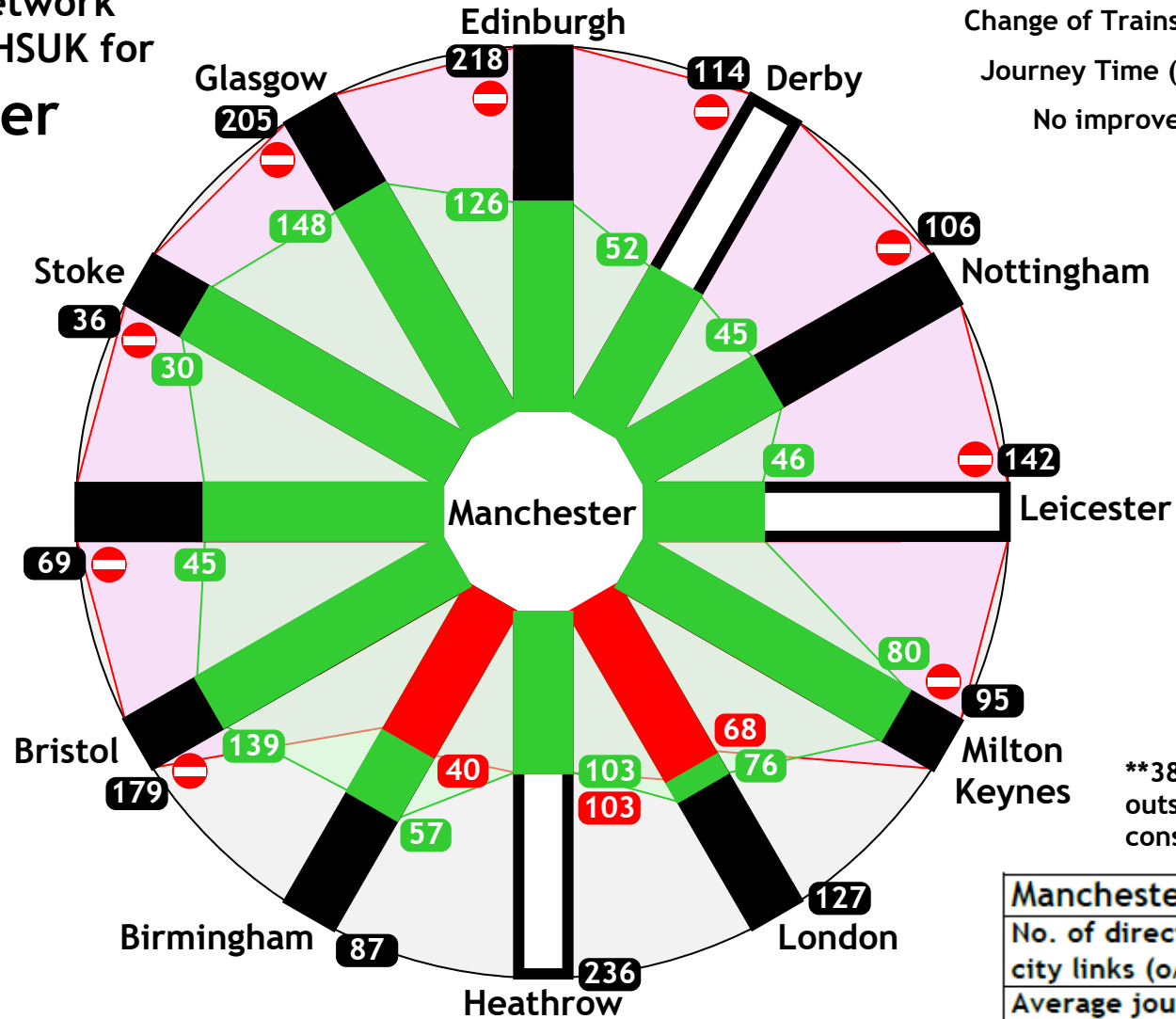
**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

Chester	HS2	HSUK
No. of direct inter-city links (o/o 38**)	0	3
Average journey time reduction	2%	27%

# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Stockport



**Improved Connectivity &  
Reduced Journey Times  
across national network  
achieved by HS2 & HSUK for  
Manchester**



## Key

Existing	HS2	HSUK
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## Direct Journey

### Change of Trains Req<sup>d</sup>

Journey Time (mins)

**No improvement**

**Notes:**

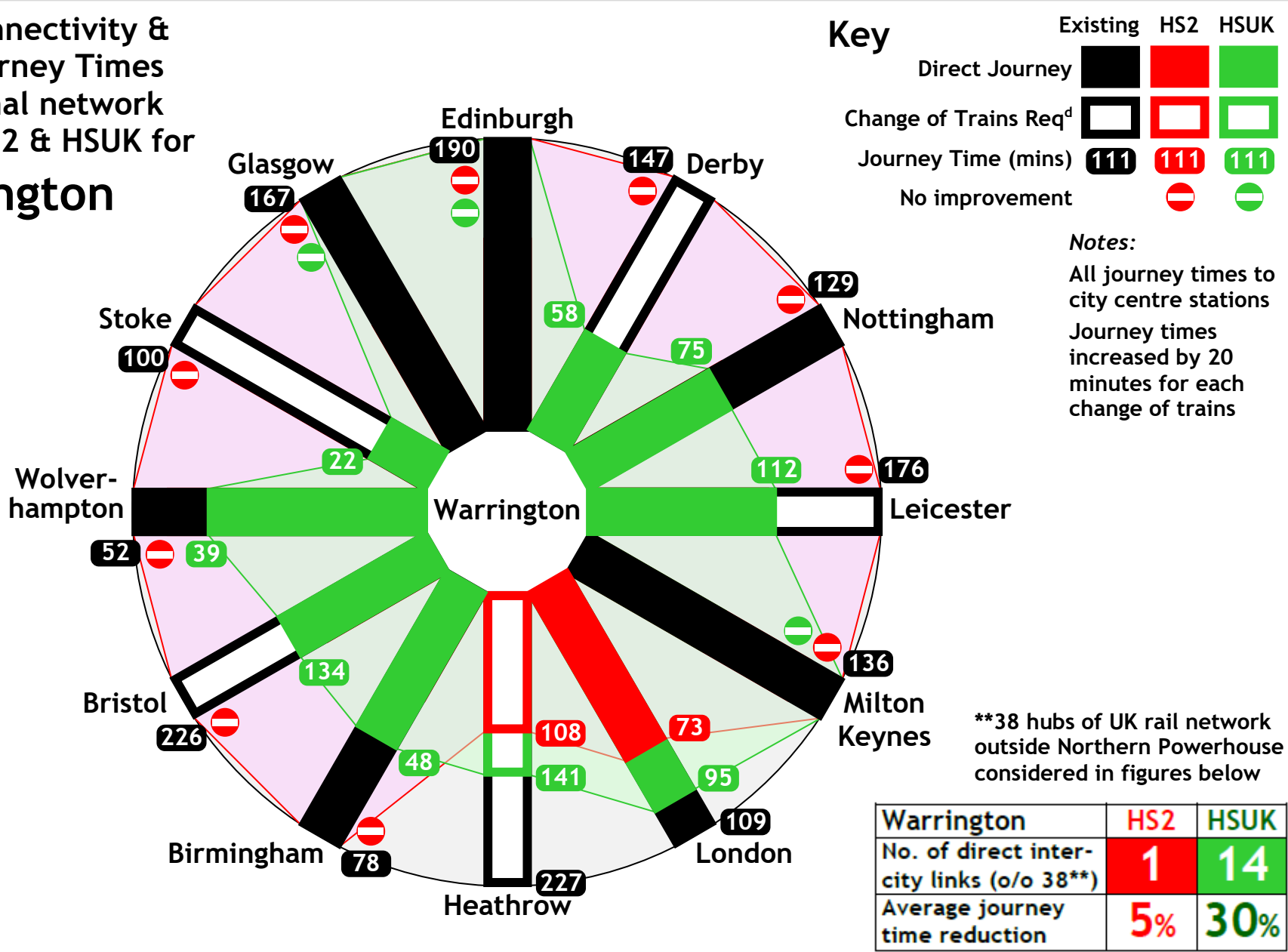
### All journey times to city centre stations

**Journey times increased by 20 minutes for each change of trains**

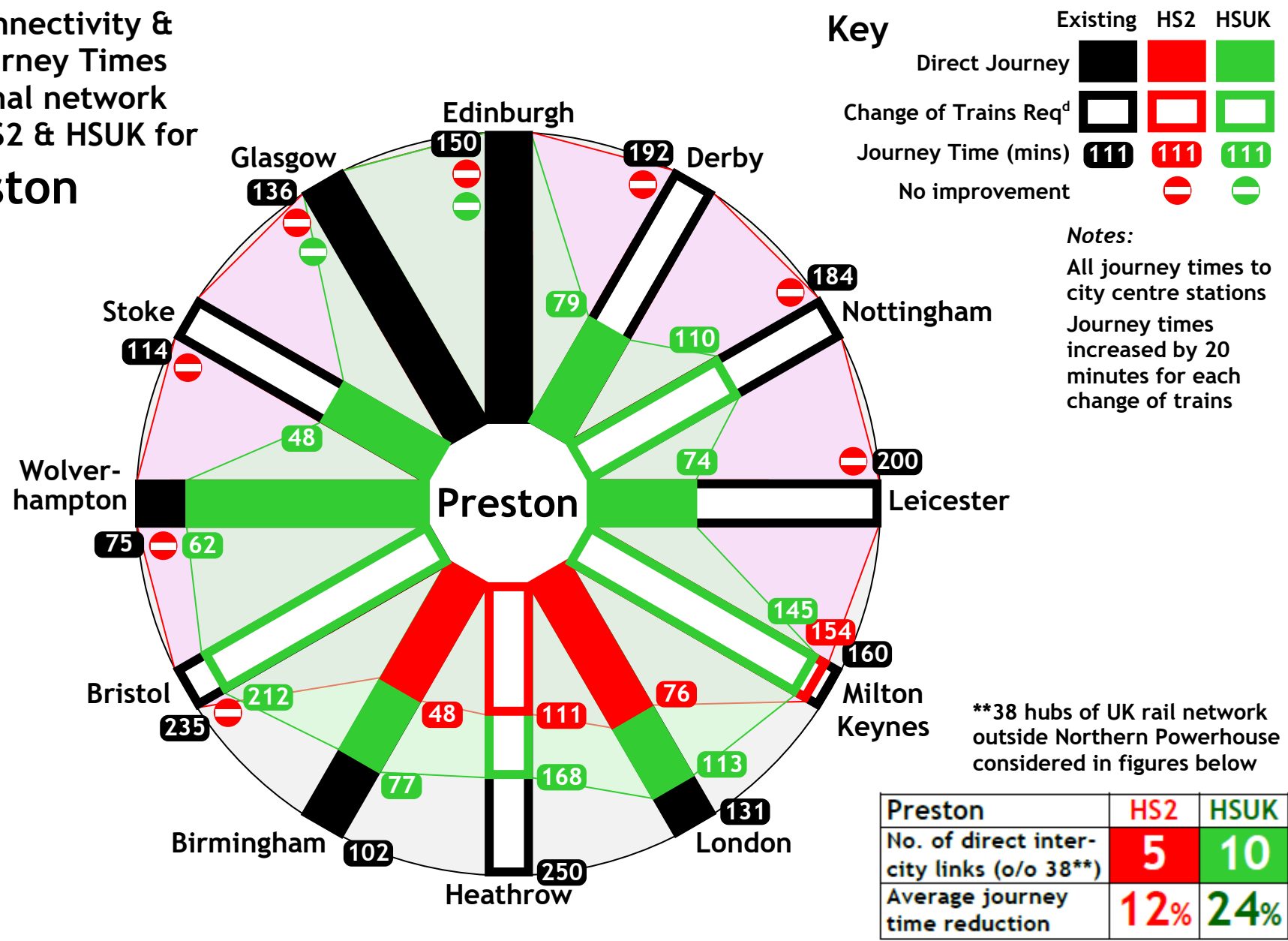
**\*\*38 hubs of UK rail network outside Northern Powerhouse considered in figures below**

Manchester	HS2	HSUK
No. of direct inter-city links (o/o 38**)	3	29
Average journey time reduction	11%	38%

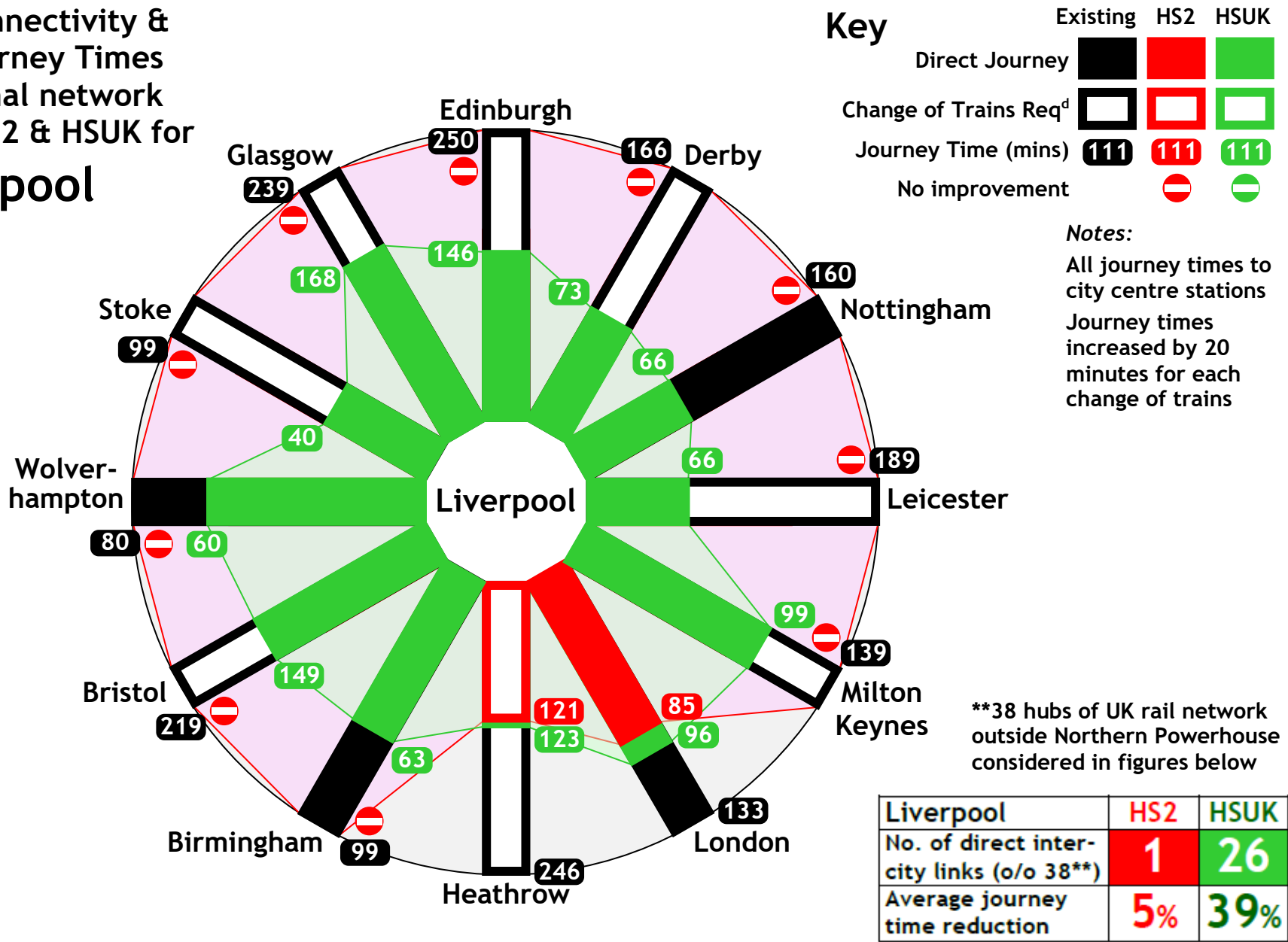
# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Warrington



# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Preston



# Improved Connectivity & Reduced Journey Times across national network achieved by HS2 & HSUK for Liverpool



# Direct Intercity Links without Change of Trains

Considering 684 journeys linking 18 key Northern Powerhouse centres to 38 other centres of UK railway network:

- HS2 offers 22 direct links - 3% efficiency
- HSUK offers 334 direct links - 49% eff<sup>cy</sup>

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# Overall Journey Time Reduction Performance

Averaged across 684 journeys linking 18 key Northern Powerhouse centres to 38 other centres of UK railway network:

- HS2 achieves 8% average JT reduction
- HSUK achieves 36% average JT red<sup>n</sup>

# Final Scorecard



	Criterion	Metric	HSUK	NPR
1a	Compliance with TfN specification?	out of 21	19	12
1b	Non-compliance with TfN specification?	out of 21	2	9
2	Direct links between key centres?	out of 153	136	64
3	Step-change journey time reductions?	%	43%	20%
4	Full integration with local services?	Y/N	Y	?
5	Step-change local capacity increase?	Y/N	Y	N
6	Compatibility with TfN freight vision?	Y/N	Y	N
7a	Direct links to other UK cities?	out of 684	334	22
7b	National journey time reductions?	%	36%	8%

} HS2

HSUK wins on every criterion



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# Simple Conclusion



- ➔ Network North outperforms the official Northern Powerhouse Rail proposals by a factor of at least 2 on all criteria.
- ➔ This should not happen on a properly-remitted and well-regulated public infrastructure project.
- ➔ It is legitimate to inquire how this has happened.

# Rationale for NPR Fail



- ➔ Success of HSUK against all 7 network criteria shows that the TfN core specification is both achievable and also the logical first step in developing an efficient railway network for the North.
- ➔ Failure of TfN's Northern Powerhouse Rail even to meet TfN's own core specification can be attributed to the false imperative for NPR to conform with the established HS2 scheme.
- ➔ This appears to have taken precedence over TfN's true priority - to develop for the people of the North the best possible railway network that will improve links between Northern communities and thus deliver the greatest prosperity.

# A Challenge to TfN



- ➔ This study has demonstrated that on the available evidence, the official Northern Powerhouse Rail proposals will fail to meet TfN's own core specification for journey times and service frequencies, and will fail to meet the needs of the people of the North for an efficient and optimised railway network.
- ➔ These assertions are justified by the vastly superior performance of the High Speed UK Exemplar Alternative.
- ➔ TfN must either:
  - refute these allegations; or...
  - provide further info to justify their own proposals; or...
  - abandon NPR and support the HSUK alternative.

# Integrated Rail Plan - 1



- ➔ In February 2020 the Oakervee Review of the HS2 project recommended the development of an ‘Integrated Rail Plan for the whole GB network’.
- ➔ This was intended to address HS2’s self-evident lack of integration, and ensure that HS2, Northern Powerhouse Rail, Midlands Rail Hub and other major Network Rail upgrades would together deliver an efficient national rail network.
- ➔ The Government adopted Oakervee’s recommendation, and is now developing the Integrated Rail Plan.

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# Integrated Rail Plan - 2

- ➔ So far, no criteria have been developed either to:
  - define the Integrated Rail Plan's technical objectives.
  - stipulate how the national railway system resulting from the 'Integrated Rail Plan for the whole GB network' should perform.
- ➔ Yet the Integrated Rail Plan can only have one basic aim - to develop for the people of the UK the best possible railway network, offering the greatest possible enhancement in connectivity and capacity, and thereby maximising both economic benefits and CO<sub>2</sub> reductions.

# Integrated Rail Plan - 3



- ➔ It is vital for the interests, of both the UK regions and of the entire UK, that the Integrated Rail Plan delivers the best possible regional and national railway network.
- ➔ The ‘Key Network Objectives’ set out in Slide C.11 are precisely aligned with this fundamental aim, and effectively establish the requirements of the Integrated Rail Plan.
- ➔ HS2 & NPR comprehensively fail to meet these objectives.
- ➔ By contrast HSUK’s success means that HSUK alone meets the fundamental aim of the Integrated Rail Plan.

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# Final thoughts...



Northern Powerhouse Rail and HS2 :

- NPR network hugely compromised by predication upon HS2; therefore...
- Hugely reduced economic benefit;
- No worthwhile regional rebalancing;
- Minimal CO<sub>2</sub> reductions;
- Little post-pandemic recovery;
- No justification whatsoever for HS2.