HSUK

HS2 : High Speed to Nowhere : Appendices

Putting HS2 Ltd's Promise of a Higher-Speed and Better-Connected Britain to the Test

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Contents *(Sections 1-6 not included)*

HS2 – High Speed to Nowhere : Appendices

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1	10/05/2017	Draft for comment
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High Speed to Nowhere – Executive Summary

The HS2 project has stood for many years as the cornerstone of successive Governments' commitment to developing the nation's infrastructure for the growing pressures of the 21st Century. Over the past 8 years a broad political consensus has grown in support of the project, and this consensus has overwhelmed the objections of protestors against HS2's excessive environmental impact and very limited economic benefits.

So far there has been no effective scrutiny of the most crucial consideration – whether HS2 will work efficiently as a railway network and deliver its core objective of multi-billion pound economic benefits based on predicted step-change improvements in capacity and connectivity. As former HS2 Ltd Technical Director Andrew McNaughton stated on 30th November 2015, in evidence to the HS2 Select Committee:

> **"The aim of the HS2 project is to deliver hugely enhanced capacity and connectivity between our major conurbations"**

With the publication in November 2016 of official proposals for Phase 2 of HS2 it has at last become possible to put this promise to the test. This study has used HS2 Ltd's published information on proposed HS2 services, journey times, stations, routes and connections to the existing network to measure its performance as a national intercity network. This has involved detailed calculation of timings for 496 separate intercity journeys between 32 key centres, extending from London and Heathrow to the principal towns, cities and airports of the Midlands and the North journey times. This is part of a wider investigation of HS2's capability to deliver its objective of **"hugely enhanced capacity and connectivity"**.

Exactly the same methodology has been applied to the High Speed UK (HSUK) proposals for an integrated national network of high speed lines. HSUK provides the necessary 'exemplar alternative' against which the performance of HS2 can be compared and evaluated, to ensure that it does deliver the greatest possible capacity, connectivity and journey time benefits for the least cost and environmental impact.

The comparisons with HSUK paint an entirely different picture to that which HS2's proponents have sought to portray. They make it utterly plain that HS2 will not bring about the better-connected, higher capacity rail network that the nation needs. They illustrate HS2's failure to perform on almost any conceivable comparator, and they reveal for the first time two highly inconvenient truths:

> **HS2 Ltd's failure to address the need for an improved national network means that HS2 can never deliver its promise of "hugely enhanced capacity and connectivity" between the UK's major conurbations, and it can never deliver the huge economic benefits that have also been promised.**

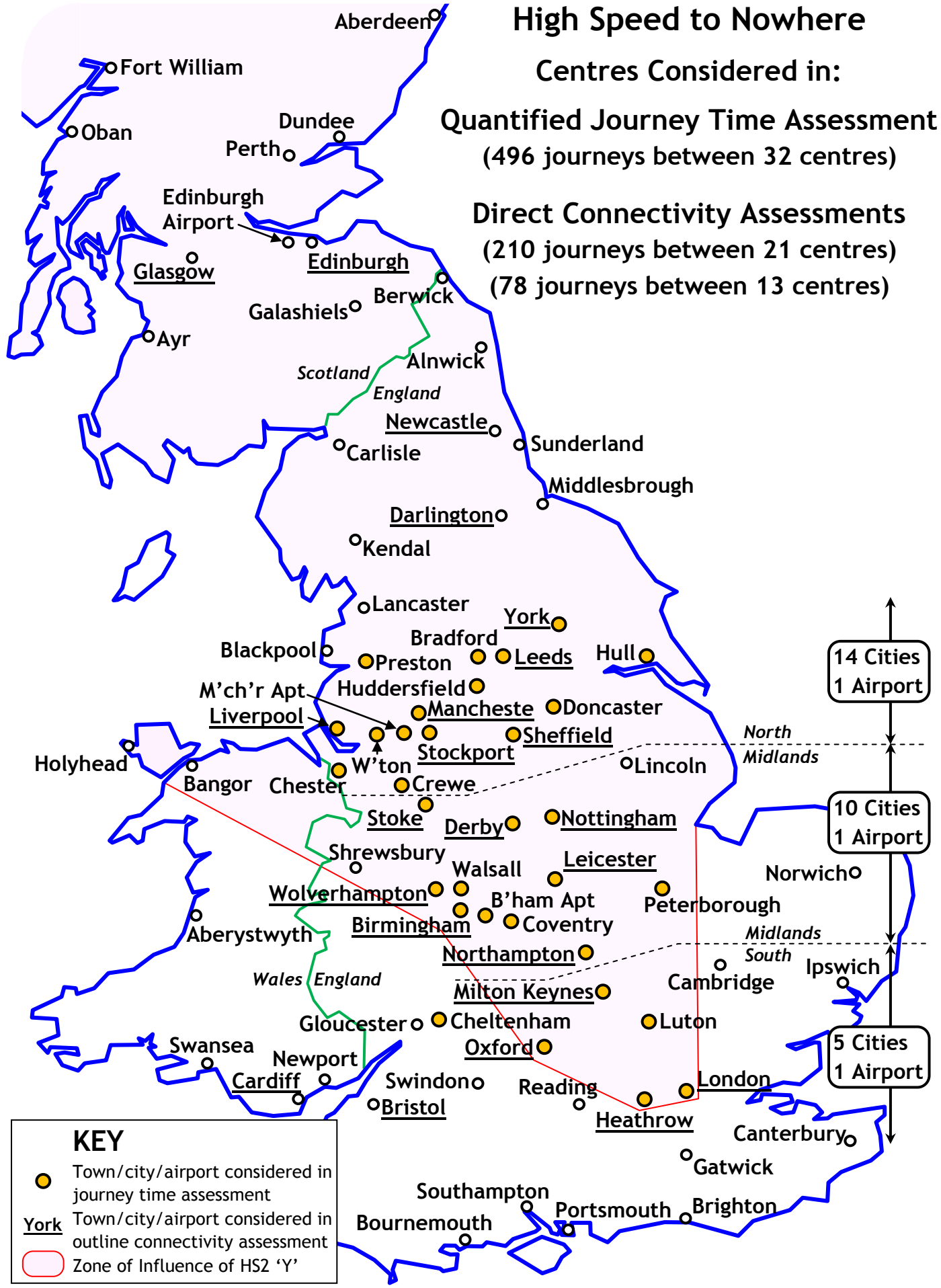


Figure ES1 : HS2 Zone of Influence and cities considered in Study

This study has identified a huge range of failures that affect every aspect of HS2's performance as a national transport system.

1. HS2 will only benefit a select group of primary cities

HS2's journey time reductions are largely restricted to the much-promoted headline journey times between the key primary cities of London, Birmingham, Manchester and Leeds; only 18% of journeys will see any improvement in journey time and a greater proportion will be made worse.

2. HS2 has insufficient capacity to serve other major cities

HS2's 2-track stem lacks both the capacity and the connections to the existing network to provide high speed services to other cities currently enjoying premium services on the existing intercity network. All of HS2's capacity will be consumed in improving just 18% of journeys – the remaining 82% will either see no improvement or will be damaged through proposed withdrawal of existing intercity services. The majority of UK cities will see a reduction in intercity services as a result of HS2's introduction.

3. HS2 fails as a high speed railway system

HS2's achievement of 9% average journey time reductions across the national network compares very poorly with HSUK's figure of 46%.

4. HS2 provides no extra capacity for local services in regional cities

HS2 generates little or no extra capacity for improved local services in regional conurbations.

5. HS2 is not 'future-proofed'

HS2's new capacity is already fully allocated before construction has even started. HS2 cannot satisfy the reasonable demand of all cities served by the existing intercity network to enjoy high speed services. There can therefore be no question of HS2 being future-proofed for anticipated increased demand for intercity rail travel.

6. HS2 has never been designed as a network

HS2's routes have been developed with no consideration of an optimised national network. All design effort has been confined to the question of how the new lines will perform, largely in isolation from the existing railway.

7. HS2 will damage the existing national rail network

No explanation has ever been provided for how the existing national rail network will operate, with HS2 in place. All the outputs of this study indicate strongly that the introduction of HS2 will have an overall negative effective upon the performance and the integrity of the network.

8. HS2 – the fastest railway in the world but the slowest network?

HS2's design for a future maximum operating speed of 400 km/h dictates intrusive and expensive rural routes and prevents effective integration with the existing network. High Speed UK has been designed for a lower maximum speed but id capable of delivering far

greater network-wide journey time reductions and far greater overall gains in connectivity and capacity. This indicates clearly that design for extreme speed is incompatible with optimised functioning of the national network.

9. HS2 will reinforce the North-South divide

HS2's greatest connectivity and capacity benefits will be concentrated in London, which already enjoys the highest per capita income and the greatest connectivity. HS2 will also damage links between the UK regions (especially Scotland) and its London-centric design will prevent efficient HS3 transpennine links. Hence HS2 seems certain to reinforce the current North-South divide and possibly even to threaten the integrity of the United Kingdom.

10. HS2 has never been technically optimised as a railway system

The vastly superior performance of High Speed UK on almost any conceivable comparator shows clearly that HS2 has never been technically optimised in a proper and professional manner to provide the greatest possible gains in capacity and connectivity for the least cost and environmental impact.

The simple statistics laid out in the diagram below, and replicated in Charts ES3-ES9 on the following pages, give a fair summary of HS2 Ltd's complete failure to design the national rail network that the nation needs.

Figure ES2 : HS2 - FAILURE BY NUMBERS

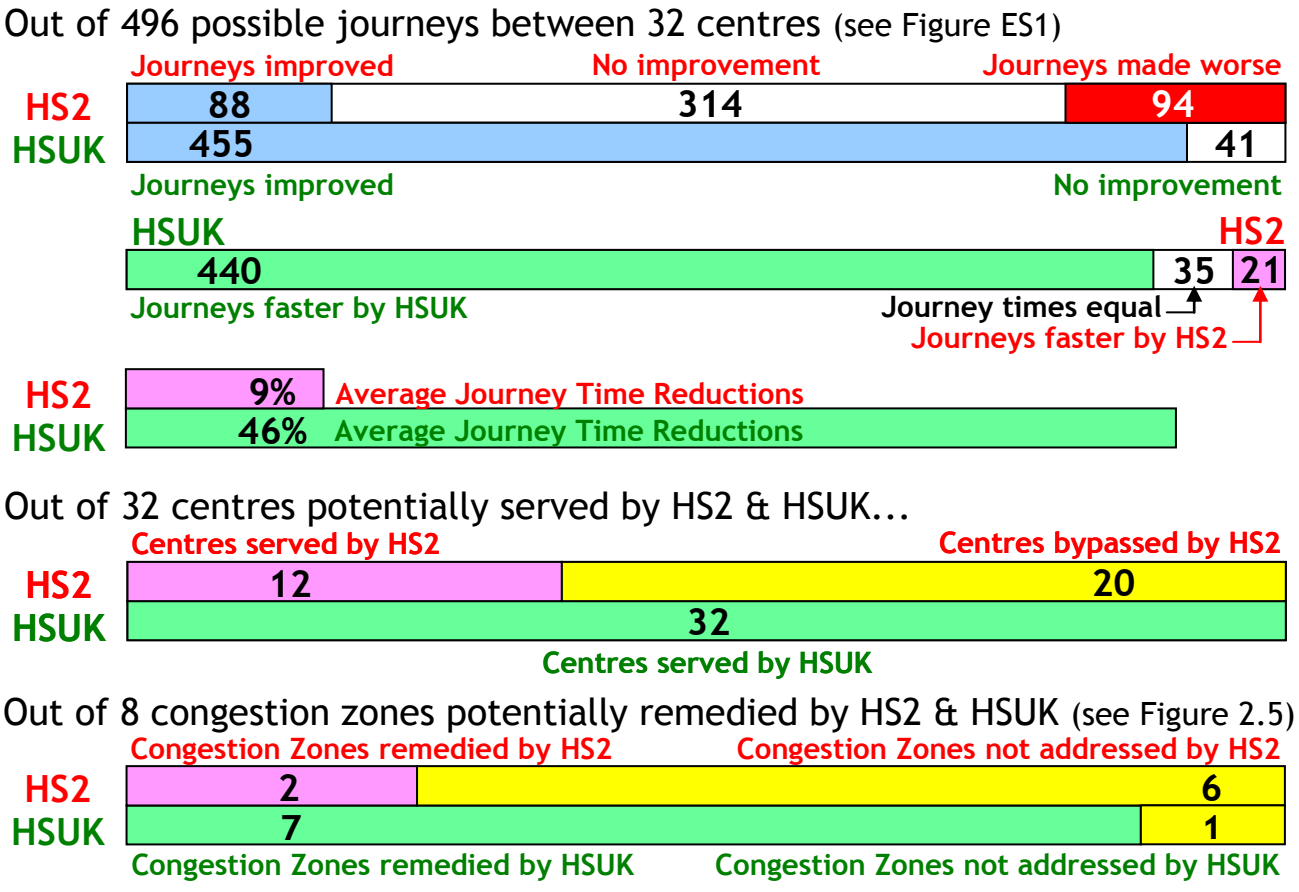


Chart ES3

HIGH SPEED UK & HS2

COMPARATIVE PERFORMANCE IN ACHIEVING JOURNEY TIME REDUCTIONS ACROSS NATIONAL NETWORK

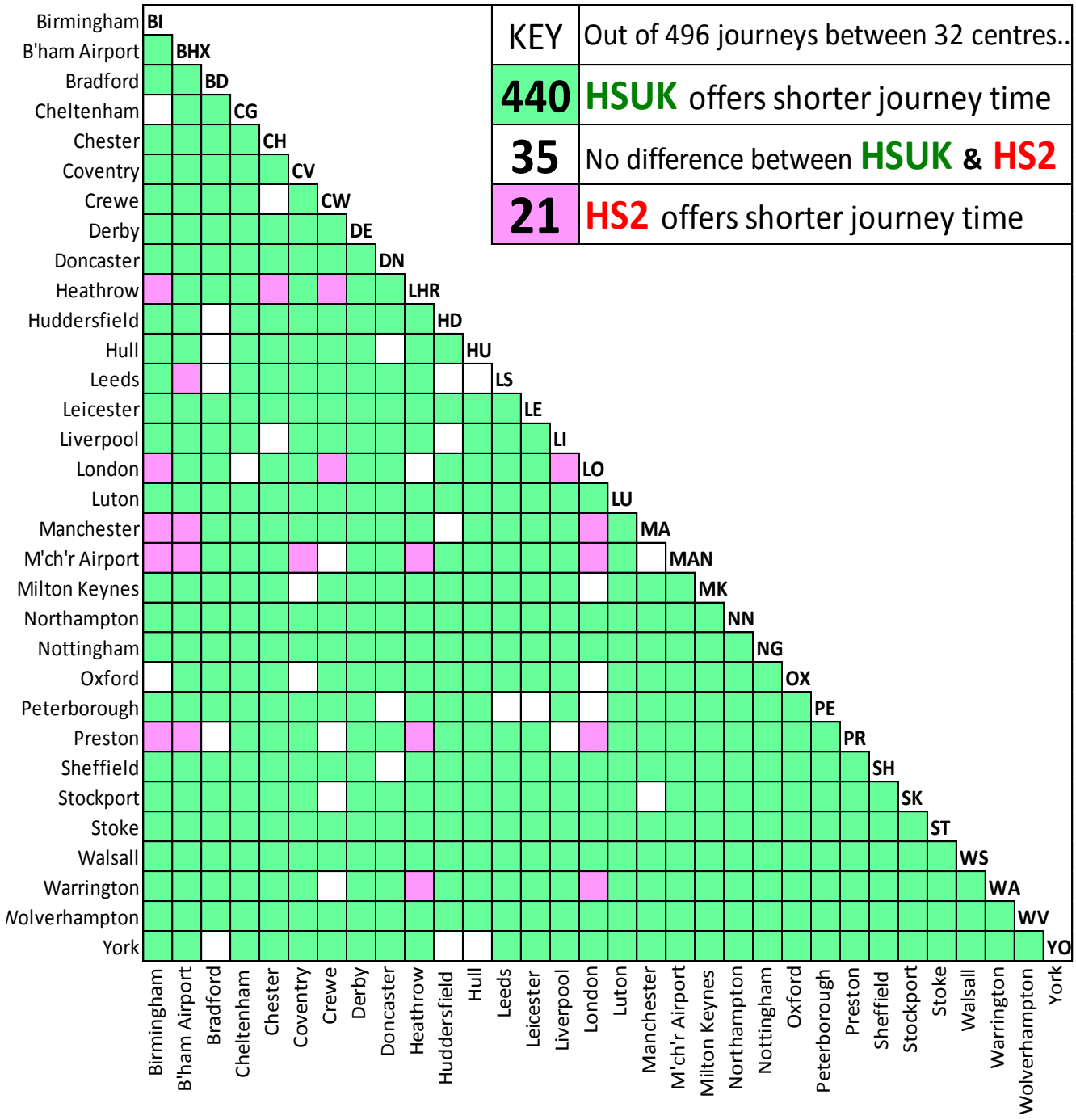


Chart ES4

HIGH SPEED 2

NETWORK PERFORMANCE :

JOURNEYS IMPROVED/MADE WORSE

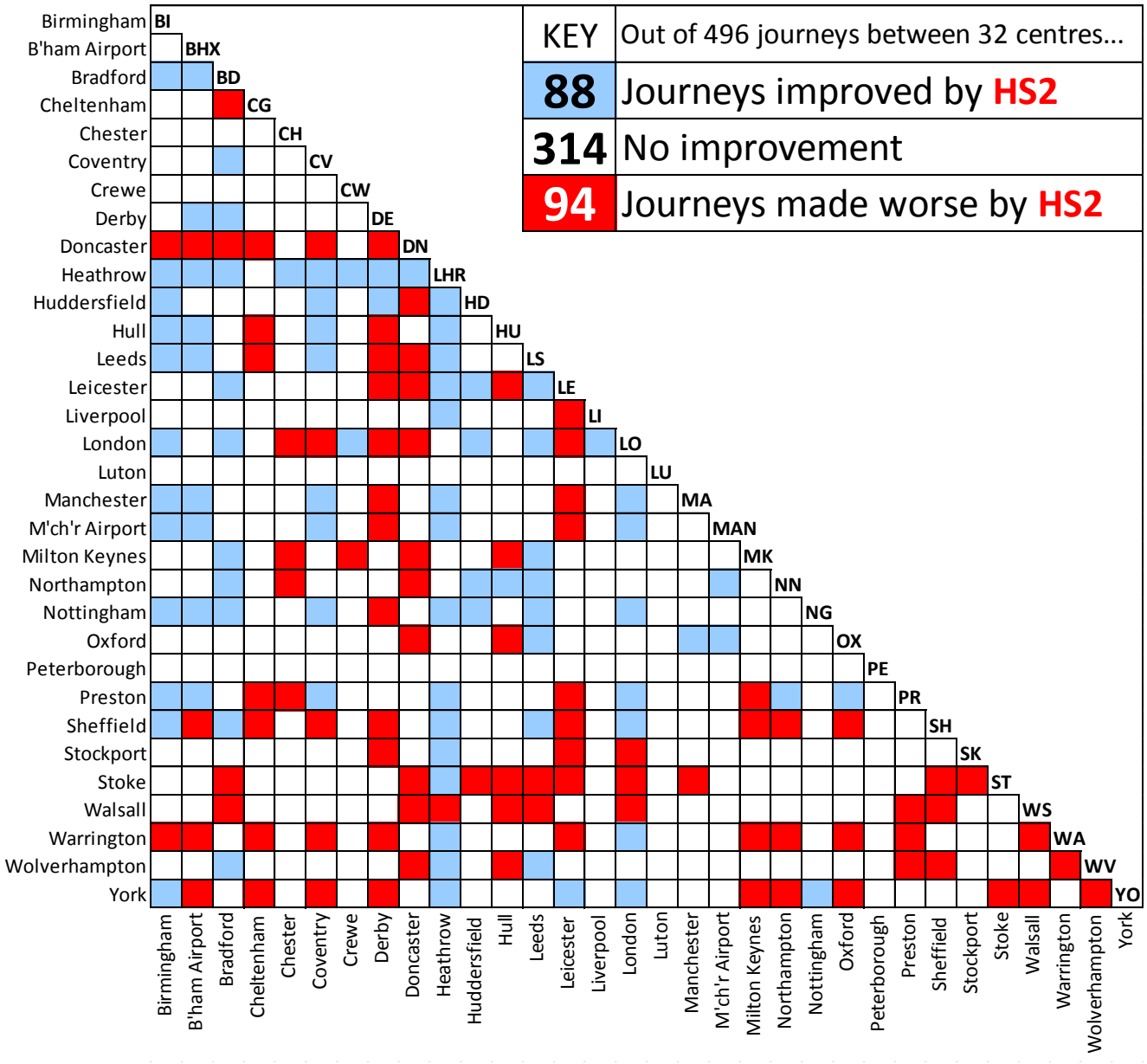


Chart ES5

HIGH SPEED UK

NETWORK PERFORMANCE :

JOURNEYS IMPROVED/MADE WORSE

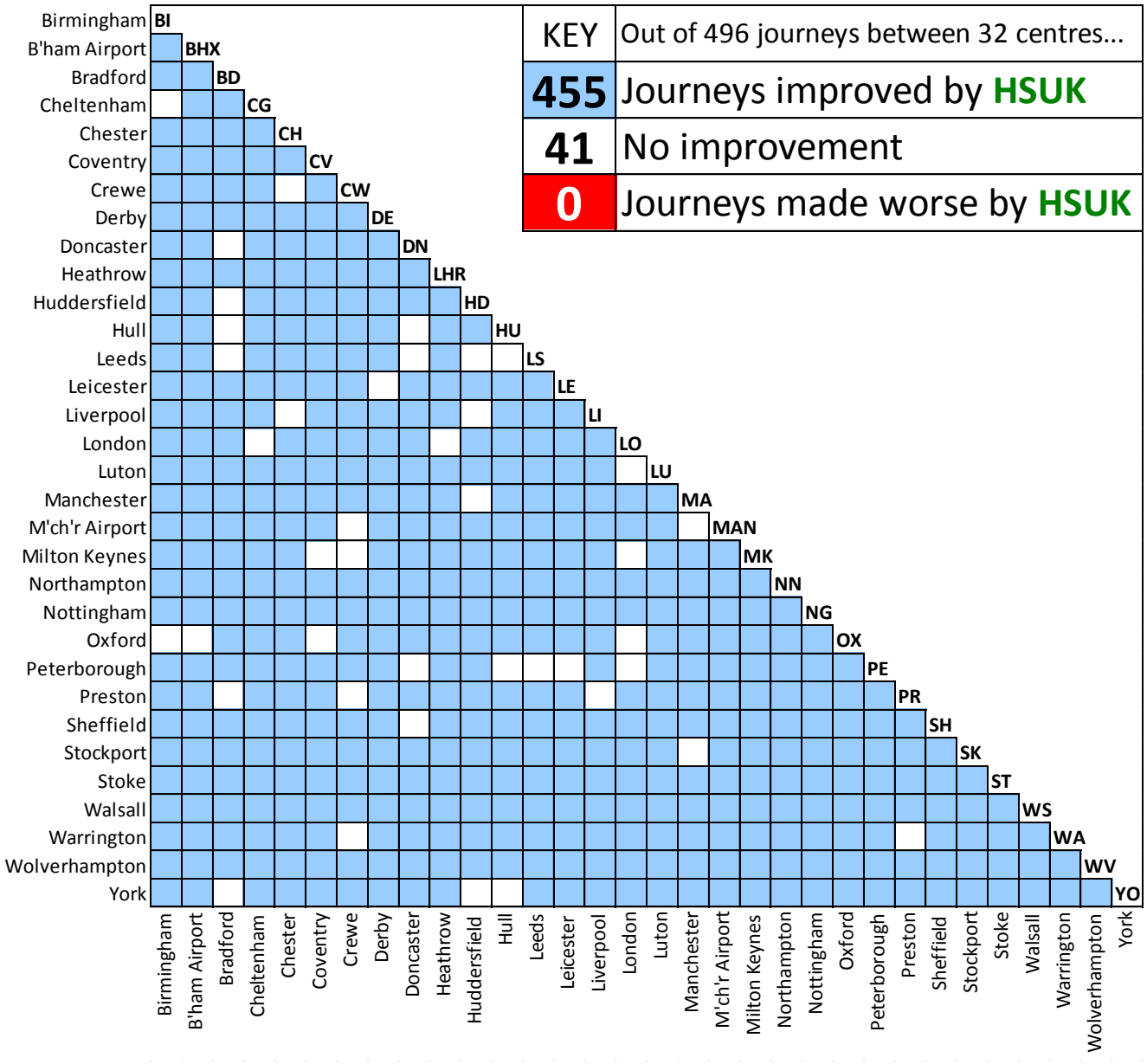


Chart ES6 : HSUK & HS2 INTERCITY LINKS
SUMMARY COMPARISON TABLE

Northern Powerhouse city/airport / Midlands Engine city/airport	HIGH SPEED UK				HS2			
	Average journey time reduction	Cities directly linked by HSUK services	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Average journey time reduction	Cities directly linked by HS2 services	Journeys made faster (out of 30)	Journeys made worse (out of 30)
Birmingham	36%	29	28	0	23%	8	12	2
B'ham Airport	43%	24	29	0	20%	6	9	4
Bradford	50%	12	25	0	13%	0	12	4
Cheltenham	28%	17	29	0	0%	0	0	8
Chester	42%	12	29	0	2%	0	1	4
Coventry	48%	24	29	0	9%	0	9	5
Crewe	32%	20	25	0	6%	4	2	1
Derby	47%	27	29	0	2%	0	4	12
Doncaster	37%	16	25	0	1%	0	1	16
Heathrow	50%	22	30	0	33%	0	23	1
Huddersfield	40%	17	26	0	8%	0	8	2
Hull	32%	16	26	0	3%	0	5	8
Leeds	50%	30	26	0	20%	4	12	5
Leicester	62%	27	29	0	6%	0	5	12
Liverpool	43%	27	28	0	4%	2	2	1
London	31%	27	25	0	19%	11	13	8
Luton	62%	17	30	0	HS2 performance not assessed for Luton			
Manchester	42%	29	28	0	13%	4	6	3
M'ch'r Airport	43%	13	29	0	18%	4	7	2
Milton Keynes	46%	22	28	0	1%	0	2	8
Northampton	60%	18	31	0	5%	0	6	5
Nottingham	56%	27	31	0	10%	0	9	1
Oxford	38%	21	27	0	2%	0	4	5
Peterborough	32%	14	26	0	0%	0	0	0
Preston	35%	19	27	0	12%	5	7	7
Sheffield	53%	31	30	0	8%	3	5	11
Stockport	45%	28	29	0	2%	0	1	4
Stoke	46%	26	31	0	1%	0	1	11
Walsall	59%	18	31	0	0%	0	0	10
Warrington	43%	23	29	0	4%	3	2	12
Wolverhampton	47%	27	31	0	2%	0	3	6
York	42%	24	28	0	9%	2	5	10
Average	46%	22	28	0	9%	1.8	5.5	5.9

Chart ES7

HIGH SPEED UK & HS2 : WINNERS AND LOSERS

Interpreting this table. The table below lists the 32 towns, cities and airports considered in this study. From each place it is possible to make a journey to each of the other places, a total of 31 journeys. Taking London as the example, HSUK offers the fastest journey to 18 destinations, HS2 is fastest to 7 destinations and journeys to 6 destinations remain the same as today. Taking Wolverhampton and 5 other cities as the examples, HSUK offers the fastest journey to all 31 destinations.

	Number of journeys (out of 31) with shortest journey time offered by:			Journeys made worse by HS2
	HIGH SPEED UK	No difference	HS2	
London	18	6	7	7
Heathrow	24	1	6	1
Birmingham	24	2	5	2
M'ch'r Airport	24	2	5	2
Preston	24	3	4	7
B'ham Airport	27		4	4
Manchester	25	3	3	3
Crewe	25	4	2	1
Warrington	28	1	2	12
Leeds	26	4	1	5
Liverpool	27	3	1	1
Chester	28	2	1	3
Coventry	28	2	1	5
Bradford	26	5		4
Huddersfield	26	5		2
Hull	27	4		8
Peterborough	27	4		0
Doncaster	28	3		16
Oxford	28	3		5
York	28	3		10
Cheltenham	29	2		8
Milton Keynes	29	2		8
Stockport	29	2		4
Leicester	30	1		12
Luton	30	1		N/A
Sheffield	30	1		11
Derby	31			12
Northampton	31			5
Nottingham	31			1
Stoke	31			11
Walsall	31			10
Wolverhampton	31			6

Chart ES8

HS2 NATIONWIDE CAPACITY ASSESSMENT

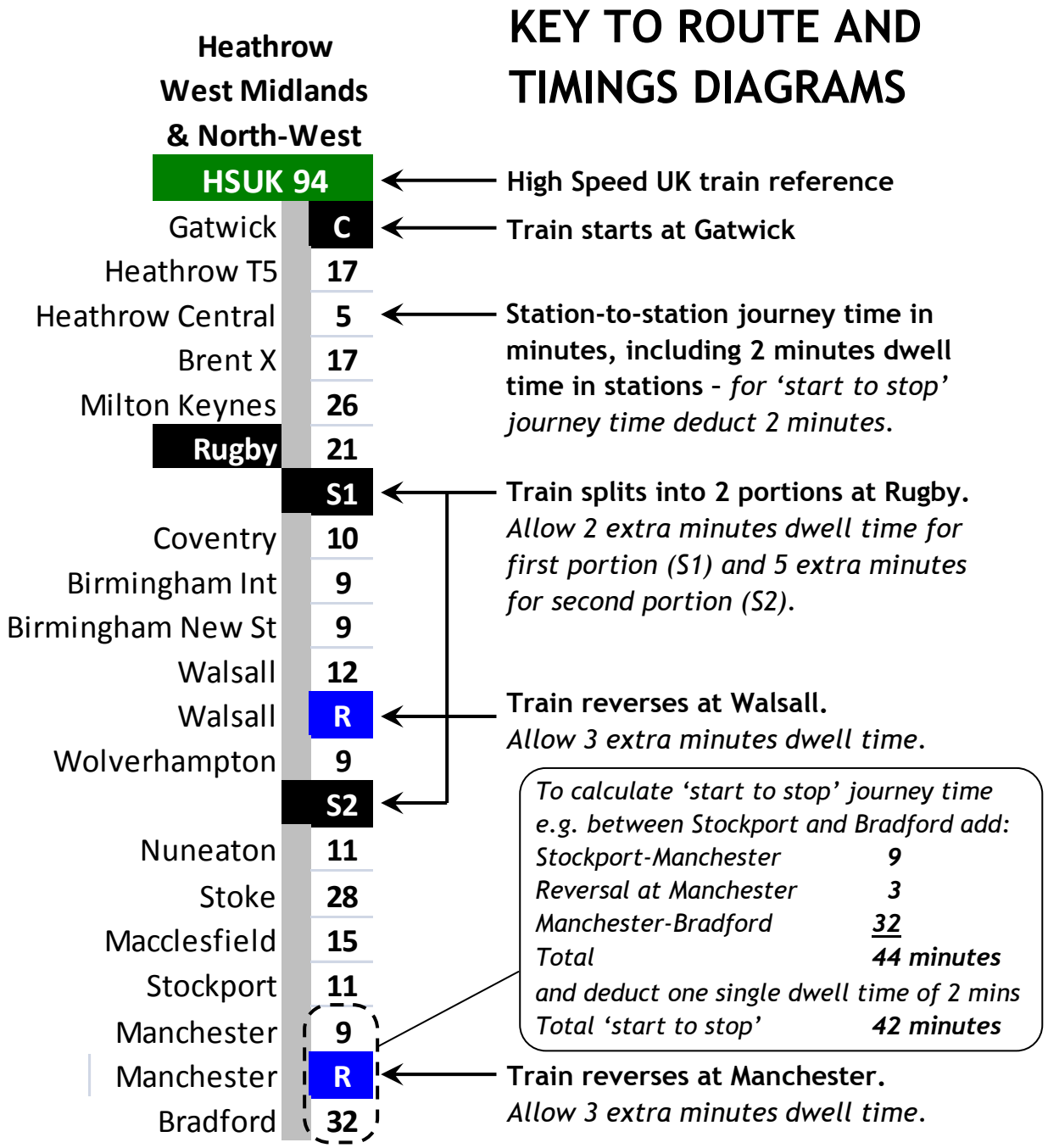
Ref	Location	Congestion relief/Capacity improvement achieved	Score
C1	**Scottish Central Belt** *between Edinburgh and Glasgow*	HS2's west-sided approach to Scotland, with separate routes to Glasgow and Edinburgh splitting at Carstairs, is poorly aligned with the Scottish aspiration for a new high speed intercity route directly linking Glasgow-Edinburgh Airport-Edinburgh. Any Glasgow-Edinburgh high speed route based on current HS2 proposals will offer poor journey times and will probably fail to include Edinburgh Airport.	1/10
C2	**West Yorkshire** *local network focussed on Leeds*	Although new terminus platforms will be built for HS2 trains at Leeds, HS2 will do nothing to relieve present congestion in the existing platforms. Instead, congestion at Leeds seems likely to increase given the inability of HS2's proposed layout to accommodate through services from London to Bradford, Harrogate and the Aire Valley.	0/10
C3	**Transpennine lines** *Manchester to Leeds & Sheffield*	HS2 does nothing to improve the capacity of any transpennine route. Instead, proposed HS2 routes to and stations in Leeds, Sheffield and Manchester, all developed to London-centric priorities, will compromise future delivery of efficient HS3 transpennine links. Hence a negative score has been awarded.	-5/10
C4	**Greater Manchester** *local network focussed on Manchester Piccadilly*	Although new terminus platforms will be built for HS2 trains at Manchester Piccadilly, HS2 will do nothing to relieve present congestion either in the station or on its primary approach route via Stockport. Current 'Northern Hub' strategies are only incremental and will not deliver the required step-change in capacity; moreover, the entire Greater Manchester network will remain critically dependent upon the existing 2-track railway from Manchester Piccadilly (Platforms 13/14) via Oxford Road to Deansgate.	0/10
C5	**West Midlands** *local network focussed on Birmingham New Street*	The selection of Curzon Street as HS2's Birmingham station will achieve only minimal congestion relief at New Street. However, any new capacity at New Street will be compromised by the disconnection between local/regional services at New Street, and high speed services at Curzon Street.	1/10
C6	**West Coast Main Line** *from Euston to Rugby*	HS2's congestion relief to the WCML is greatly compromised by its lack of interconnection with the WCML, and the political need to maintain express intercity services to bypassed cities such as Coventry and Stoke. Moreover, with only 2 tracks, it lacks the capacity to serve all major cities within its 'Zone of Influence', or to provide direct regional links to Heathrow.	8/20
C7	**Greater London** *all quadrants, NW,NE,SW,SE*	Any capacity relief that HS2 will deliver for Greater London will naturally be confined to the north-west quadrant. The extra capacity that it will bring to the WCML is compromised by the continued need for commuters to transfer to the Tube or Crossrail 2 at Euston, and by the huge disruption associated with the proposed expansion and reconstruction of Euston Station.	3/20
C8	**Great Western Main Line** *incl. Severn Tunnel*	HS2's general north-south orientation prevents it from providing significant capacity relief to the GWML. Additionally, HS2's design with a terminus station in Birmingham effectively prevents HS2 services extending to Bristol, Cardiff etc.	0/10
	Nationwide Capacity Score (out of 100)		**8**

Chart ES9

HSUK NATIONWIDE CAPACITY ASSESSMENT			
Ref	**Location**	**Congestion relief/Capacity improvement achieved**	**Score**
C1	**Scottish Central Belt** *between Edinburgh and Glasgow*	HSUK's east-sided approach to Scotland creates a unified high speed route to Edinburgh and Glasgow. This allows direct high speed services from Edinburgh and Glasgow to most principal UK cities. HSUK's proposals also align with Scottish aspirations for a new high speed intercity route directly linking Glasgow-Edinburgh Airport-Edinburgh, and provide 2 new tracks between the 2 cities.	10/10
C2	**West Yorkshire** *local network focussed on Leeds*	HSUK's strategy to create a dedicated route for high speed services through Leeds, achieved through 4-tracking of approach routes, will greatly increase capacity for local services. Construction of a new Stourton-Neville Hill link will allow many terminating services to be converted to through services. Together these 2 measures will allow capacity for local services to be approximately doubled.	10/10
C3	**Transpennine lines** *Manchester to Leeds & Sheffield*	HSUK's 'spine & spur' configuration incorporates a transpennine link (via the restored Woodhead corridor) as an integral part of network development. This will relieve congestion on all existing transpennine routes, and also creates the opportunity for a new transpennine freight route and a Sheffield-Manchester lorry shuttle	10/10
C4	**Greater Manchester** *local network focussed on Manchester Piccadilly*	HSUK's transpennine spur, serving both Manchester and Liverpool, demands a new east-west cross-Manchester tunnel with underground platforms at Manchester Piccadilly. This new facility – linking to Huddersfield, Sheffield and Stockport in the south and east, and to Liverpool and Bolton in the north and west, will also provide major new capacity for local services. This will greatly augment and reinforce current 'Northern Hub' strategies, and also offer a much more resilient local network.	10/10
C5	**West Midlands** *local network focussed on Birmingham New Street*	HSUK's strategy of 4-tracking key approach routes into Birmingham New Street (from Coventry, Derby and Wolverhampton/Walsall) enables local services to be segregated from express intercity services. This creates a step-change in capacity, and with the additional benefit of new routeing options created by HSUK, it is no longer necessary to terminate or reverse services at New Street; comprehensive 'through' operation will hugely increase platform capacity and allow much more frequent local services.	10/10
C6	**West Coast Main Line** *from Euston to Rugby*	HSUK's 4 tracks and its frequent interconnection with the WCML will deliver much greater congestion relief and resilience than HS2. With 4 tracks, HSUK has sufficient capacity to serve all major cities within its 'Zone of Influence', including Coventry and Stoke.	20/20
C7	**Greater London** *all quadrants, NW,NE,SW,SE*	HSUK will deliver capacity relief for Greater London in both the north-west quadrant and – on account of its transformation of Heathrow's rail links – in the south-west quadrant also. Unlike HS2, its strategy to transfer commuter flows to Crossrail, or to a future 'Westlink' tunnelled route linking Euston and Charing Cross, will have massive beneficial effects upon current WCML commuter flows, eliminating the need to transfer to Tube lines at Euston.	10/20
C8	**Great Western Main Line** *incl. Severn Tunnel*	HSUK's general north-south orientation prevents it from providing significant capacity relief to the GWML. A complementary 'High Speed West' scheme is currently under development. Proposed HSUK services via Birmingham New Street will ensure full connection of Cardiff, South Wales, Bristol & West Country to national network.	2/10
	Nationwide Capacity Score (out of 100)		**82**

APPENDIX A1

HIGH SPEED UK SERVICES: ROUTES & TIMINGS



Plymouth
Glasgow

HSUK 01	
Plymouth	C
Exeter	55
Bristol	64
Cheltenham	52
Birmingham New St	40
Derby	24
Sheffield Victoria	23
Leeds	19
York	17
Darlington	21
Newcastle	15
Edinburgh	38
Glasgow Central	22

Cardiff
Glasgow

HSUK 04	
Cardiff	C
Cheltenham	80
Birmingham New St	40
Wolverhampton	14
Stoke	19
Stockport	25
Manchester P	10
Manchester P	R
Leeds	28
York	17
Darlington	20
Newcastle	16
Edinburgh	39
Glasgow Central	22

West Midlands
East Anglia

HSUK 07	
Wolverhampton	C
Birmingham New St	14
Derby	24
Nottingham	18
Grantham	20
Peterborough	22
Cambridge	38

Cardiff
Bradford

HSUK 08	
Cardiff	C
Cheltenham	80
Birmingham New St	40
Walsall	12
Derby	23
Sheffield Victoria	22
Kirklees Int	17
Bradford	11

Bournemouth
Glasgow

HSUK 02	
Bournemouth	C
Southampton	38
Reading	43
Oxford	32
Milton Keynes	29
Northampton	14
Leicester	20
Nottingham	16
Nottingham	R
Sheffield Victoria	23
Leeds	21
York	17
Darlington	20
Newcastle	16
Edinburgh	39
Glasgow Central	22

Cardiff/Bristol
Newcastle

HSUK 05	
Cardiff	C
Bristol	49
Cheltenham	52
Birmingham New St	40
Derby	24
Nottingham	17
Newark Northgate	19
Doncaster	23
York	18
Darlington	20
Durham	15
Newcastle	12

Reading
York

HSUK 09	
Reading	C
Oxford	32
Birmingham New St	47
Walsall	12
Derby	23
Chesterfield	18
Sheffield Mid	13
Sheffield Int	3
Wakefield W	25
Leeds	12
York	17

Humberside
Ringby

HSUK 06	
Hull	C
Leeds	55
Huddersfield	18
Manchester P	28
Warrington BQ	13
Crewe	17
Stafford	17
Wolverhampton	11
Birmingham New St	14
Birmingham Int	9
Coventry	9
Leicester	21
Sheffield Victoria	25
Leeds	21
Hull	55

Bournemouth
Liverpool

HSUK 03	
Bournemouth	C
Southampton	38
Reading	43
Oxford	32
Milton Keynes	29
Northampton	14
Leicester	20
Sheffield Victoria	25
Manchester	25
Liverpool	20

Birmingham
Glasgow

HSUK 10	
Birmingham New St	C
Derby	24
York	35
Darlington	20
Newcastle	16
Edinburgh	39
Glasgow Central	22

Figure A1.1 : High Speed UK NESW Crosscountry services

Southampton
Birmingham
Manchester

HSUK 11	
Southampton	C
Reading	43
Oxford	32
Coventry	47
Birmingham Int	9
Birmingham New St	9
Wolverhampton	14
Stoke	21
Stockport	25
Manchester P	10

Nottingham
Stoke
Liverpool

HSUK 14	
Nottingham	C
Derby	17
Stoke	33
Crewe	10
Warrington BQ	17
Liverpool	16

Bristol
Birmingham
Manchester

HSUK 12	
Bristol	C
Cheltenham	52
Birmingham New St	40
Stoke	27
Manchester P	32

Birmingham
Walsall
Manchester

HSUK 15	
Birmingham New St	C
Hawthorns	7
Walsall	7
Cannock	11
Rugeley	8
Rugeley TV	4
Gt Haywood	8
Stone	9
Stoke	8
Congleton	10
Macclesfield	8
Stockport	12
Manchester P	10

Cardiff/Bristol
Birmingham
Liverpool

HSUK 13	
Cardiff	C
Bristol	49
Cheltenham	52
Birmingham New St	40
Stafford	20
Crewe	17
Warrington BQ	17
Liverpool	16

Figure A1.2 : High Speed UK Grand Junction Crosscountry services

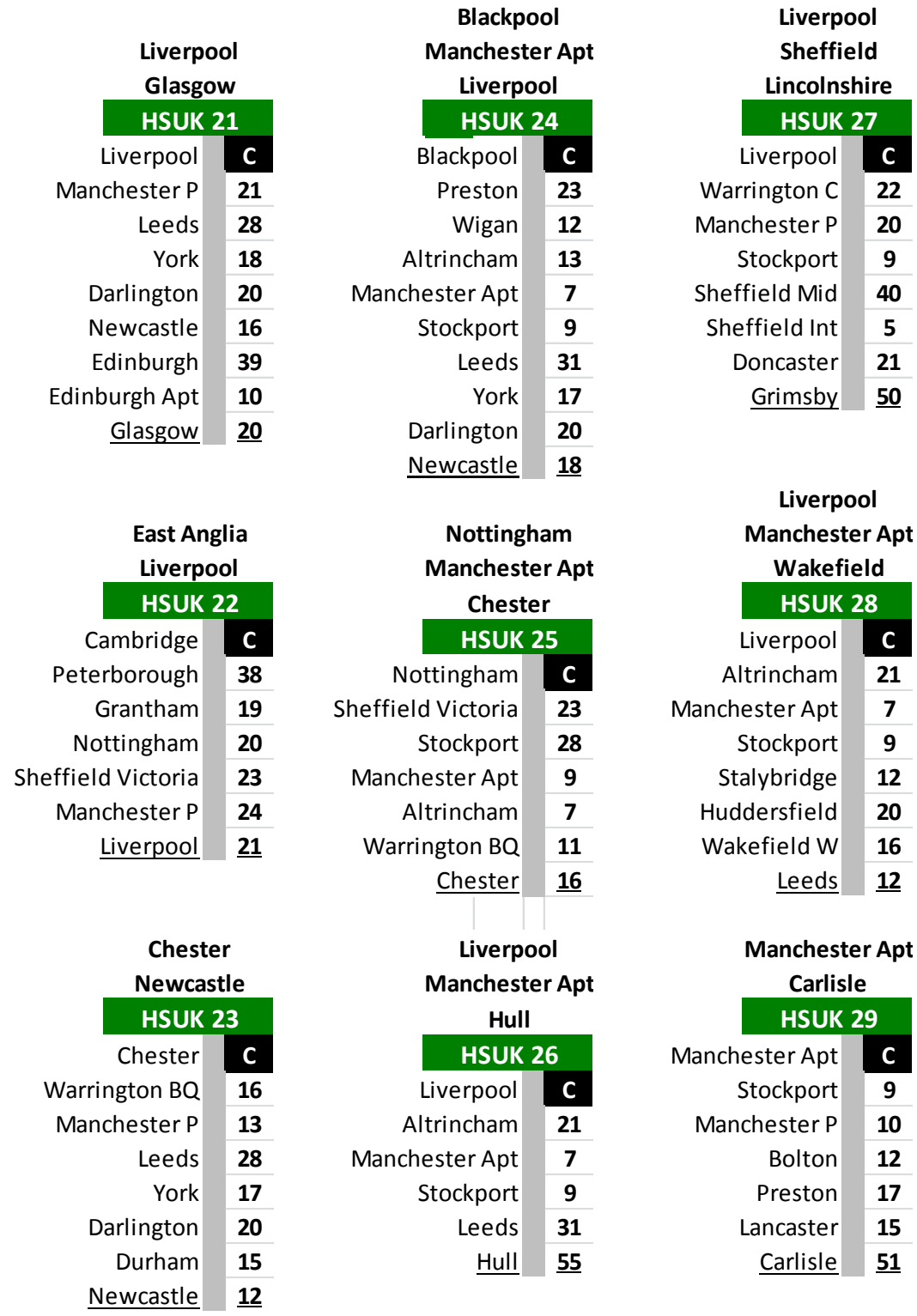


Figure A1.3 : High Speed UK Transpennine services

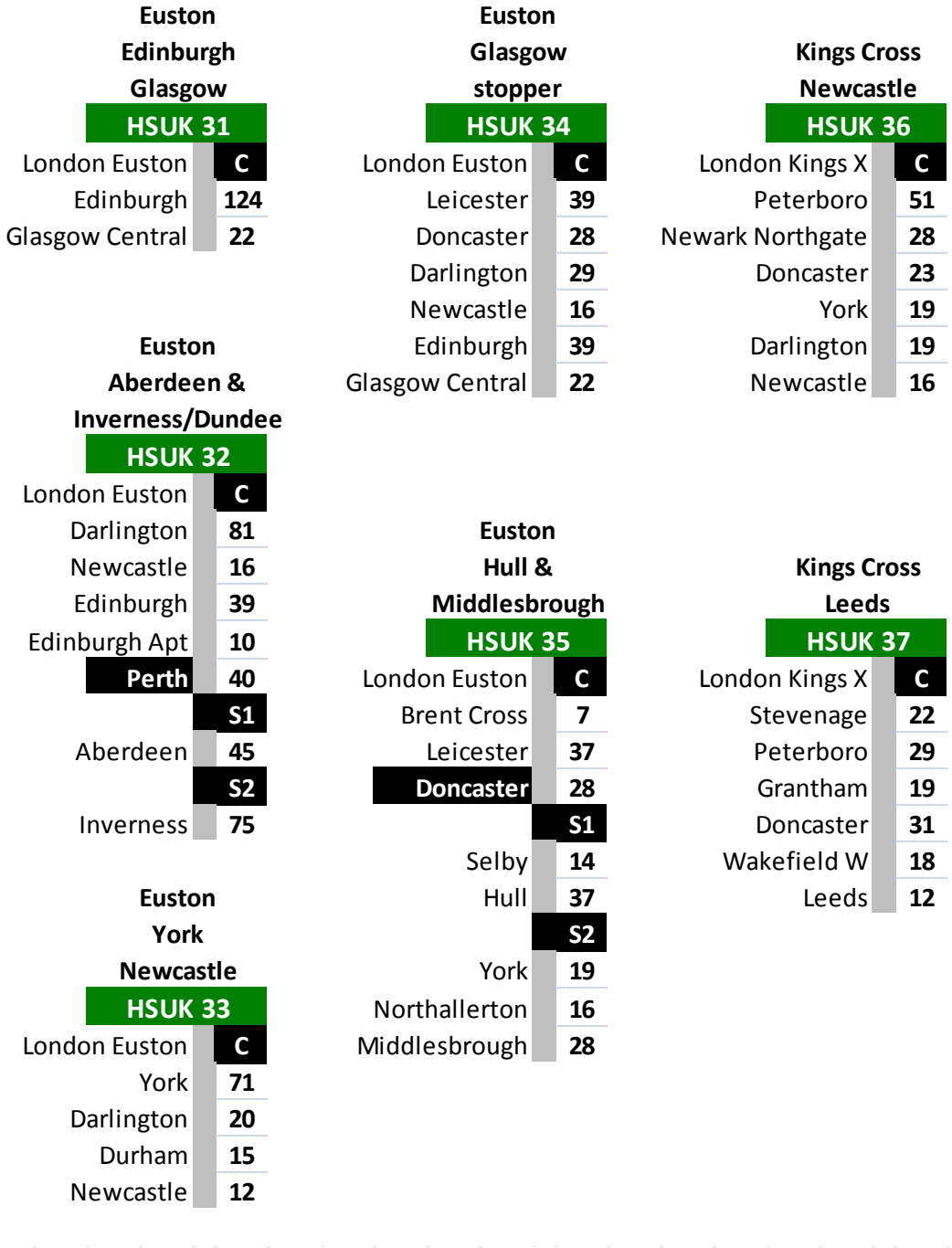


Figure A1.4 : High Speed UK North-East & Scottish services

Euston Sheffield Leeds

HSUK 41	
London Euston	C
Sheffield Victoria	58
Leeds	21

Euston Bradford & Huddersfield

HSUK 45	
London Euston	C
Brent Cross	7
Leicester	37
Sheffield Victoria	22
	S1
Kirklees Int	17
Bradford	11
Skipton	31
	S2
Penistone	12
Huddersfield	16
Hebden Br	19
Burnley	21
Blackburn	20
Preston	14

Euston Wakefield Leeds

HSUK 42	
London Euston	C
Leicester	39
Sheffield Victoria	24
Wakefield W	18
Leeds	12

Euston Manchester Liverpool

HSUK 43	
London Euston	C
Manchester P	79
Liverpool	21

Stockport Loop Anticlockwise

HSUK 46	
London Euston	C
Leicester	39
Sheffield Victoria	25
Stockport	28
Macclesfield	13
Stoke	15
Rugby	35
Milton Keynes	21
London Euston	30

Euston Manchester Blackpool

HSUK 44	
London Euston	C
Leicester	39
Sheffield Victoria	25
Manchester P	25
Wigan	14
Preston	12
Blackpool	23

Figure A1.5 : High Speed UK Northern Cities services

Stockport Loop Clockwise

HSUK 51	
London Euston	C
Milton Keynes	30
Rugby	21
Stoke	35
Macclesfield	15
Stockport	13
Sheffield Victoria	28
Leicester	25
London Euston	39

Euston Stoke Liverpool

HSUK 54	
London Euston	C
Nuneaton	42
Stoke	28
Runcorn	24
Liverpool SP	9
Liverpool	12

Euston Birmingham Liverpool

HSUK 62	
London Euston	C
Northampton	30
Coventry	21
Birmingham Int	9
Birmingham New St	9
Wolverhampton	14
Crewe	24
Runcorn	16
Liverpool SP	9
Liverpool	12

Euston Milton Keynes Chester

HSUK 55	
London Euston	C
Milton Keynes	30
Rugby	21
Stoke	35
Crewe	10
Chester	21

Euston Glasgow & Holyhead

HSUK 52	
London Euston	C
Brent Cross	7
Stoke	65
	S1
Warrington BQ	24
Wigan	11
Preston	12
Lancaster	15
Carlisle	51
Glasgow Central	68
	S2
Crewe	10
Chester	21
Bangor	60
Holyhead	27

Euston Birmingham Walsall

HSUK 63	
London Euston	C
Coventry	40
Birmingham Int	9
Birmingham New St	9
Walsall	12

Euston Birmingham Edinburgh

HSUK 61	
London Euston	C
Brent Cross	7
Luton	18
Milton Keynes	16
Coventry	27
Birmingham Int	9
Birmingham New St	9
Wolverhampton	14
Crewe	24
Warrington BQ	17
Wigan	11
Preston	12
Lancaster	15
Carlisle	51
Edinburgh	75

Euston Birmingham Manchester

HSUK 64	
London Euston	C
Rugby	34
Coventry	10
Birmingham Int	9
Birmingham New St	9
Wolverhampton	14
Manchester P	47

Euston Crewe Manchester

HSUK 53	
London Euston	C
Brent Cross	7
Stafford	61
Crewe	17
Wilmslow	14
Stockport	8
Manchester P	10

Figure A1.6 : High Speed UK North-West Corridor services

Euston
Derby
Manchester

HSUK 71	
London Euston	C
Derby	55
Chesterfield	19
Sheffield Victoria	11
Manchester P	25
Wigan	14
Preston	12
Lancaster	15

Euston
Luton
Leeds

HSUK 74	
London Euston	C
Brent Cross	7
Luton Apt	17
Luton	5
Leicester	27
Loughborough	11
Nottingham	12
Newark Northgate	18
Retford	14
Doncaster	13
Wakefield W	18
Leeds	12

Wolverhampton
Walsall
Nottingham

HSUK 77	
Wolverhampton	C
Walsall	9
Lichfield	10
Burton	11
Derby	10
Nottingham	17

Euston
Luton
Sheffield

HSUK 72	
London Euston	C
Brent Cross	7
Luton Apt	17
Luton	5
Leicester	27
Loughborough	11
East Mids Pway	8
Long Eaton	5
Derby	10
Chesterfield	19
Sheffield Mid	13
Sheffield Int	3
Doncaster	22

St Pancras
Milton Keynes
Oxford

HSUK 75	
London St P	C
Luton Apt	20
Luton	5
Milton Keynes	16
Milton Keynes	R
Bicester	21
Oxford	11

Wolverhampton
& Midlands
Ring

HSUK 78	
Wolverhampton	C
Hawthorns	7
Birmingham New St	8
Birmingham Int	9
Coventry	9
Rugby	10
Leicester	14
Loughborough	11
East Mids Pway	8
Long Eaton	5
Derby	10
Burton	10
Lichfield	11
Walsall	10
Wolverhampton	9

Euston
Nottingham
Lincolnshire

HSUK 73	
London Euston	C
Nottingham	49
Newark Northgate	19
Lincoln	27
Grimsby	54

Nottingham
& Midlands
Ring

HSUK 76	
Nottingham	C
Long Eaton	11
Derby	10
Burton	10
Lichfield	11
Walsall	10
Hawthorns	7
Birmingham New St	8
Birmingham Int	9
Coventry	9
Rugby	10
Leicester	14
Loughborough	11
Nottingham	12

Euston
Derby, Stoke
Manchester

HSUK 79	
London Euston	C
Milton Keynes	30
Northampton	14
Leicester	20
Derby	24
Uttoxeter	17
Stoke	19
Macclesfield	15
Stockport	11
Manchester P	10

Figure A1.7 : High Speed UK M1 Corridor & Midlands Ring services

Gatwick
Heathrow
Scotland

HSUK 91	
Brighton	C
Gatwick	24
Heathrow T5	17
Heathrow Central	5
Brent Cross	17
Darlington	80
Newcastle	16
Edinburgh	39
	S1
Glasgow Central	22
	S2
Edinburgh Apt	9
Perth	40
Aberdeen	45

Gatwick
Heathrow
Northern Cities

HSUK 92	
Brighton	C
Gatwick	24
Heathrow T5	17
Heathrow Central	5
Brent Cross	17
Sheffield Victoria	56
	S1
Manchester P	25
Liverpool	20
	S2
Leeds	21
York	17

Gatwick
Heathrow
East Midlands

HSUK 94	
Gatwick	C
Heathrow T5	17
Heathrow Central	5
Brent Cross	17
Luton Apt	17
Luton	5
Northampton	19
Leicester	20
Loughborough	11
	S1
Nottingham	12
	S2
Derby	16

Gatwick
Heathrow
West Midlands
& North-West

HSUK 94	
Gatwick	C
Heathrow T5	17
Heathrow Central	5
Brent Cross	17
Milton Keynes	26
Rugby	21
	S1
Coventry	10
Birmingham Int	9
Birmingham New St	9
Walsall	12
Walsall	R
Wolverhampton	9
	S2
Nuneaton	11
Stoke	28
Macclesfield	15
Stockport	11
Manchester	9
Manchester	R
Bradford	32

Cambridge
Heathrow
West Country &
South Wales

HSUK 95	
Cambridge	C
Stevenage	38
Brent Cross	25
Heathrow Central	22
Heathrow T5	5
Slough	9
Reading	15
Bristol	68
	S1
Exeter	64
Plymouth	55
	S2
Cardiff	49

Oxford
Heathrow
Peterborough

HSUK 96	
Oxford	C
Reading	32
Slough	15
Heathrow T5	9
Heathrow Central	5
Wembley	13
Brent Cross	7
Hatfield	17
Stevenage	10
Huntingdon	21
Peterborough	15

Portsmouth
Heathrow
Milton Keynes

HSUK 97	
Portsmouth	C
Woking	70
Walton	9
Heathrow T5	11
Heathrow Central	5
West Ruislip	13
Gerrards Cross	7
Beaconsfield	6
High Wycombe	7
Aylesbury	23
Aylesbury Vale P	6
Winslow	15
Bletchley	7
Milton Keynes	7

Southampton
Heathrow
East Anglia

HSUK 98	
Southampton	C
Woking	49
Walton	9
Heathrow T5	11
Heathrow Central	5
Wembley	14
Brent Cross	7
Radlett	10
Hatfield	9
Welwyn GC	5
Stevenage	8
Cambridge	38

Figure A1.8 : High Speed UK Heathrow services

APPENDIX A2

PREDICTED HS2 SERVICES

PREDICTED HS2 'CAPTIVE' SERVICES, HS2 'CLASSIC COMPATIBLE' SERVICES, AND RESIDUAL INTERCITY SERVICES ON EXISTING MAIN LINE NETWORK

Taken from:

Table 23, pp91-92,
***HS2 Regional Economic Impacts*,**
HS2 Ltd, September 2013

Annex B : Modelled train service spec,
High Speed Two Phase 2b Strategic Outline Business Case
HMG, October 2016

Table 23: HS2 services pattern and re-deployment of classic network capacity assumed in the August 2012 economic case

HS2 Captive Services	HS2 Classic-Compatible Services	Classic Network
3tph Euston-Manchester, calling at Old Oak Common and 1tph at Birmingham Interchange.	2tph Euston-Liverpool calling at Old Oak Common and Runcorn, one of which splits/joins a Euston-Birmingham service at Birmingham Interchange, also calling at Stafford. Second also calls at Crewe.	LM WCML services south of Birmingham - net 59 more per day, inc. 26 more Wolverhampton-Euston stopping services (via Birmingham, Coventry, Milton Keynes and other stations), between Milton Keynes/Rugby and Euston and within West Midlands (New Street to Coventry and New Street to Birmingham International).
3tph Euston-Birmingham, calling at Old Oak Common and 2tph at Birmingham Interchange.	2tph Euston-Edinburgh/Glasgow, calling at Old Oak Common and splitting/joining at Carstairs. 1tph calls additionally at Birmingham Interchange and Preston.	ICWC services/LM north of Birmingham - net 87 fewer per day, including merging ICWC Liverpool and Wolverhampton services by diverting Liverpool trains via West Midlands and adding station calls, 19 new Crewe-Euston trains and reduction from 50 to 11 ICWC Manchester-Euston services, excl. three peak services and eight extended

HS2 Captive Services	HS2 Classic-Compatible Services	Classic Network
		to/from Edinburgh. (NB overall Manchester-Euston frequency increased.)
3tph Euston-Leeds, calling at Old Oak Common and two at Toton, two at Sheffield and one at Birmingham Interchange.	1tph provides second hourly service to/from Preston, also calling at Old Oak Common, Crewe, Warrington and Wigan.	MML/Thameslink via MML - net 4 more services per day, including new 16-train Bedford-St Pancras service and a reduction in longer distance MML services between Sheffield, Derby and Nottingham from 60 to 48.
2tph Birmingham-Manchester.	2tph to/from Newcastle, also calling at Old Oak Common and either York or Darlington.	ICEC, Great Northern and TransPennine - net 11 fewer services per day, new 16-train Peterborough-King's Cross service, from 1 to 16 Lincoln-King's Cross trains, reduction from 45 to 16 ICEC Leeds-London services (NB overall Leeds-Euston frequency increased) and 10 fewer ICEC Edinburgh-London services (note ICWC services via Manchester described above).
2tph Birmingham-Leeds, calling at Toton and Sheffield.	1tph providing a second hourly service to/from York, also calling at Old Oak Common and Toton.	CrossCountry services to North East and North West - no change in frequency, additional stops at Birmingham International, Coventry, Sheffield HS, Toton, Alfreton, Macclesfield and Congleton, and some services shortened from Edinburgh/Newcastle to Newcastle/York.
1tph Heathrow-Manchester, calling at Birmingham Interchange.	1tph Birmingham-Edinburgh or Glasgow (in alternate hours), calling at Wigan, Preston, Carlisle and Lockerbie, plus either Lancaster and Penrith, or Oxenholme.	East Midlands local services - no frequency changes, additional stops at Toton, some services to/from Nottingham extended to/from Leicester.
1tph Heathrow-Leeds, calling at Birmingham Interchange, Toton and Sheffield	1tph Birmingham-Newcastle, calling at Toton, Sheffield, York, Darlington and Durham.	Northern England local services - 64 new semi-fast local services per day including 32 Leeds-Doncaster trains, 16 Manchester-Crewe services and 16 Manchester-Stoke trains.

Figure A2.1 : Predicted Services on HS2 and Existing Network (HS2 Ltd, 2013)

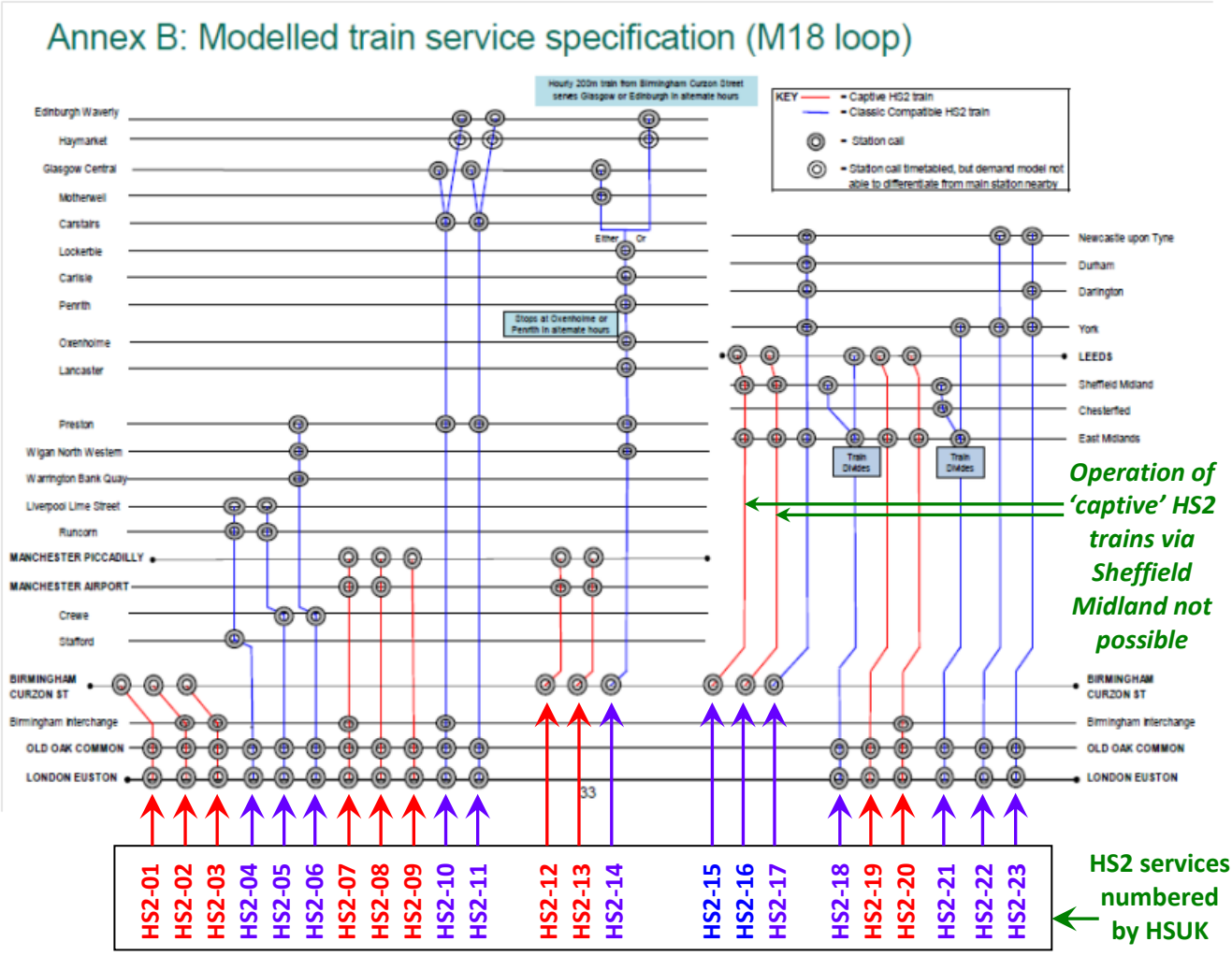


Figure A2.2 : Predicted HS2 Services (HS2 Ltd, 2016)

Numbering of Proposed HS2 Services for Detailed Journey Time Review by HSUK

APPENDIX A3

PREDICTED HS2 JOURNEY TIMES

Unless noted otherwise, taken from:

COMMAND PAPER Cm9355

High Speed Two: From Crewe to Manchester, the West Midlands to Leeds and beyond

HMG, November 2016

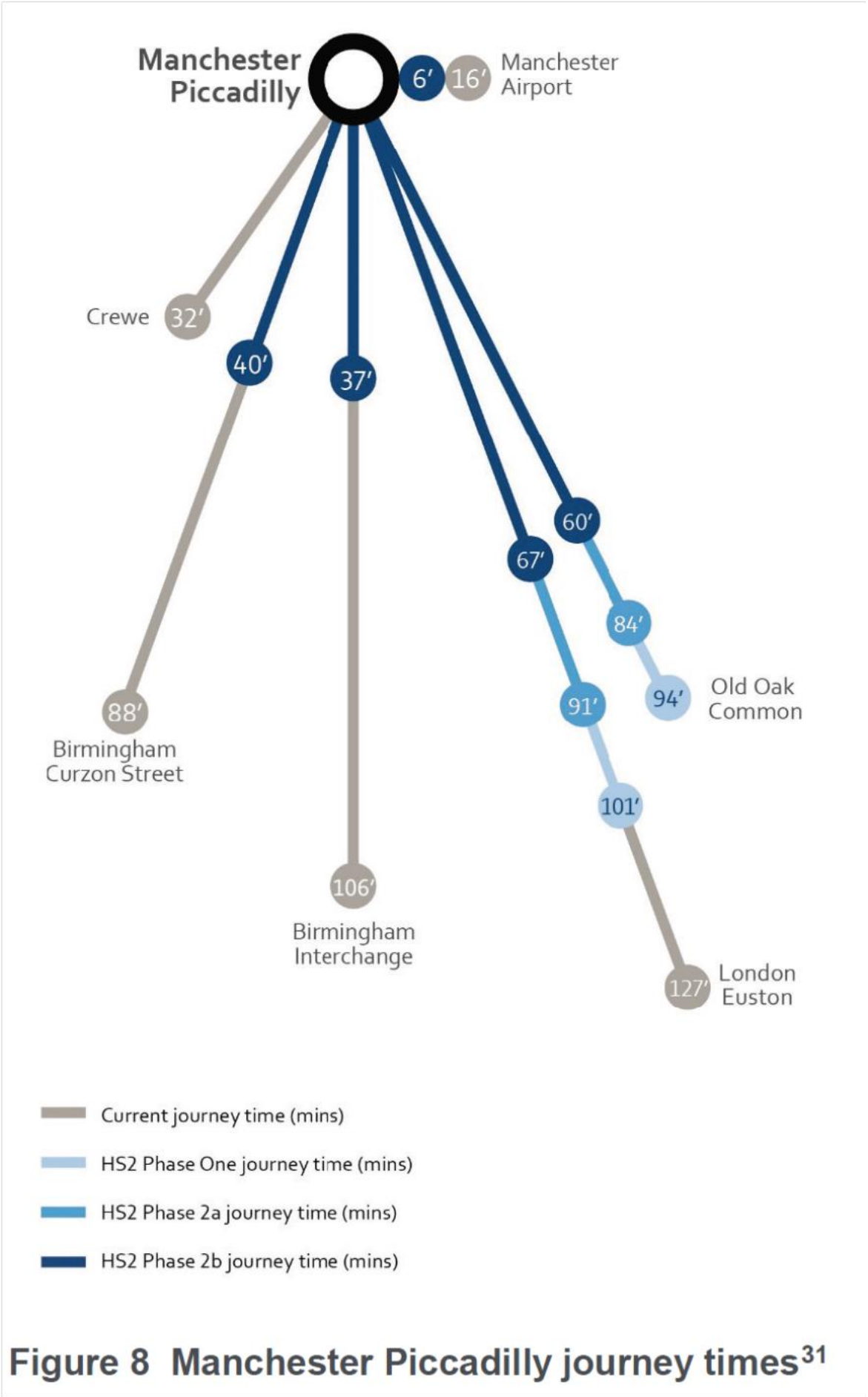


Figure 8 Manchester Piccadilly journey times[31]

Figure A3.1 : HS2 Services and Journey Times from Manchester Piccadilly

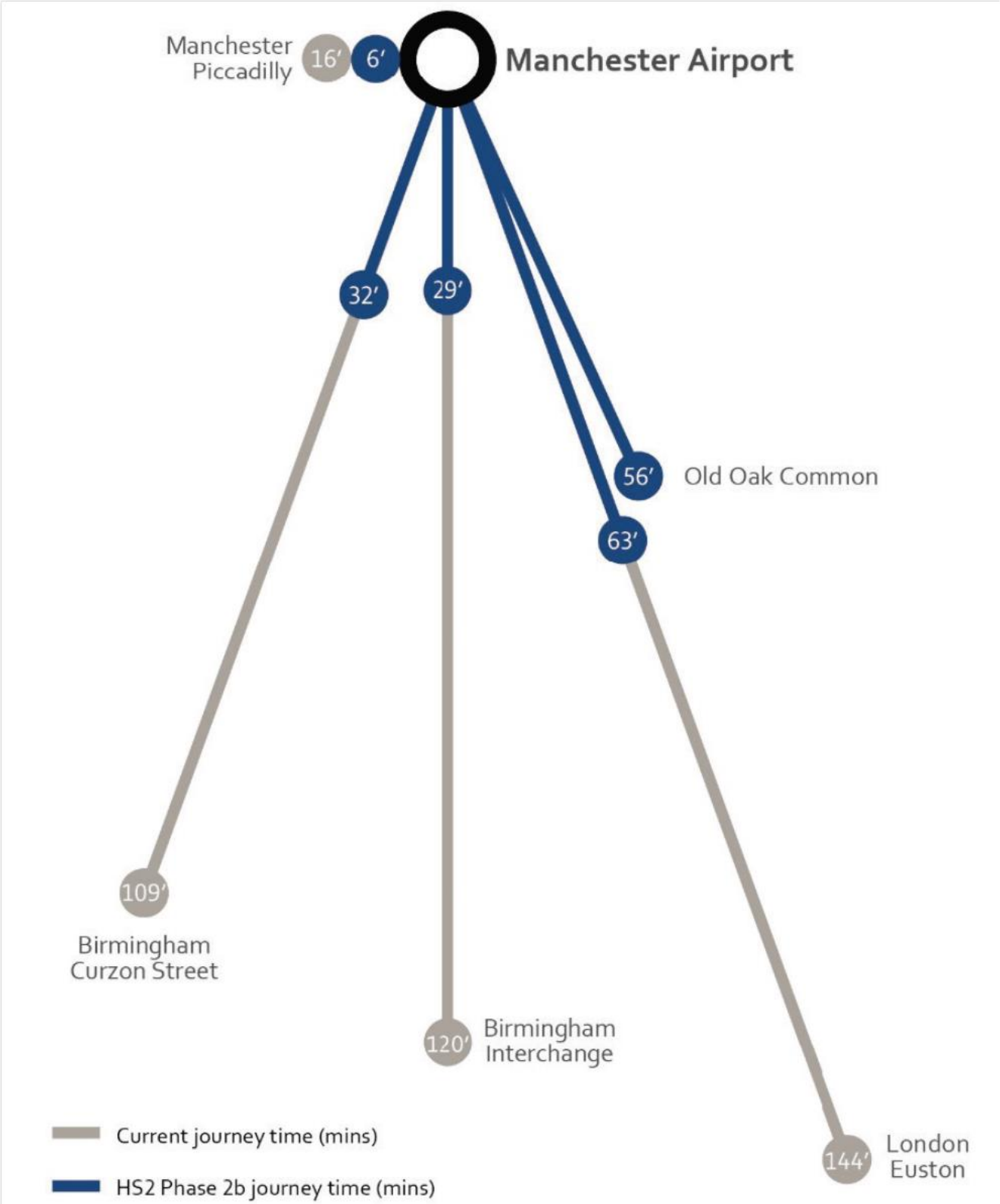


Figure 9 Manchester Airport journey times[34]

Figure A3.2 : HS2 Services and Journey Times from Manchester Airport

Figure 10 Liverpool journey times[35]

Figure 12 Crewe journey times[37]

Figure A3.3 : HS2 Services and Journey Times from Liverpool and Crewe

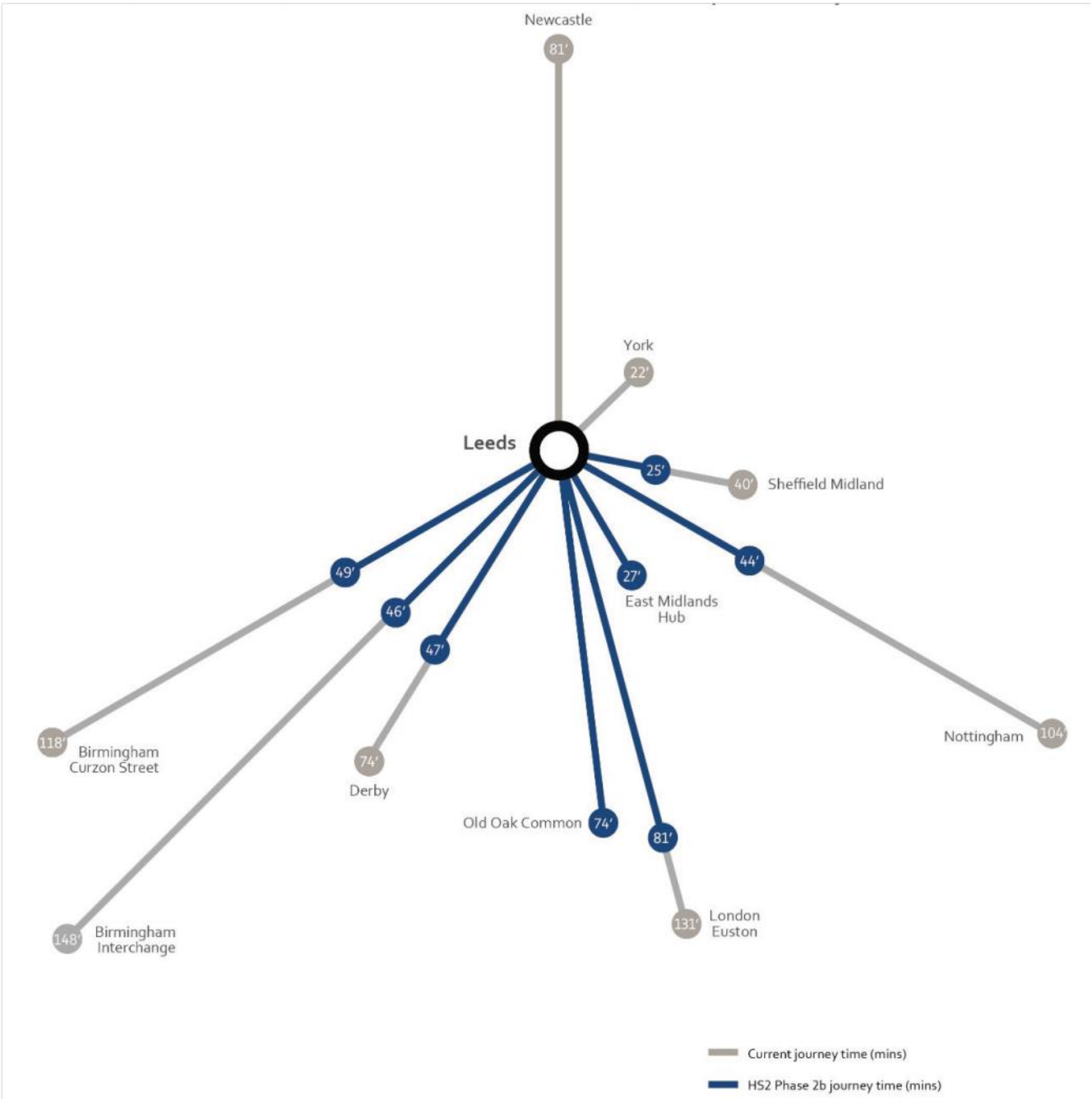


Figure 15 Leeds journey times[47]

Figure A3.4 : HS2 Services and Journey Times from Leeds

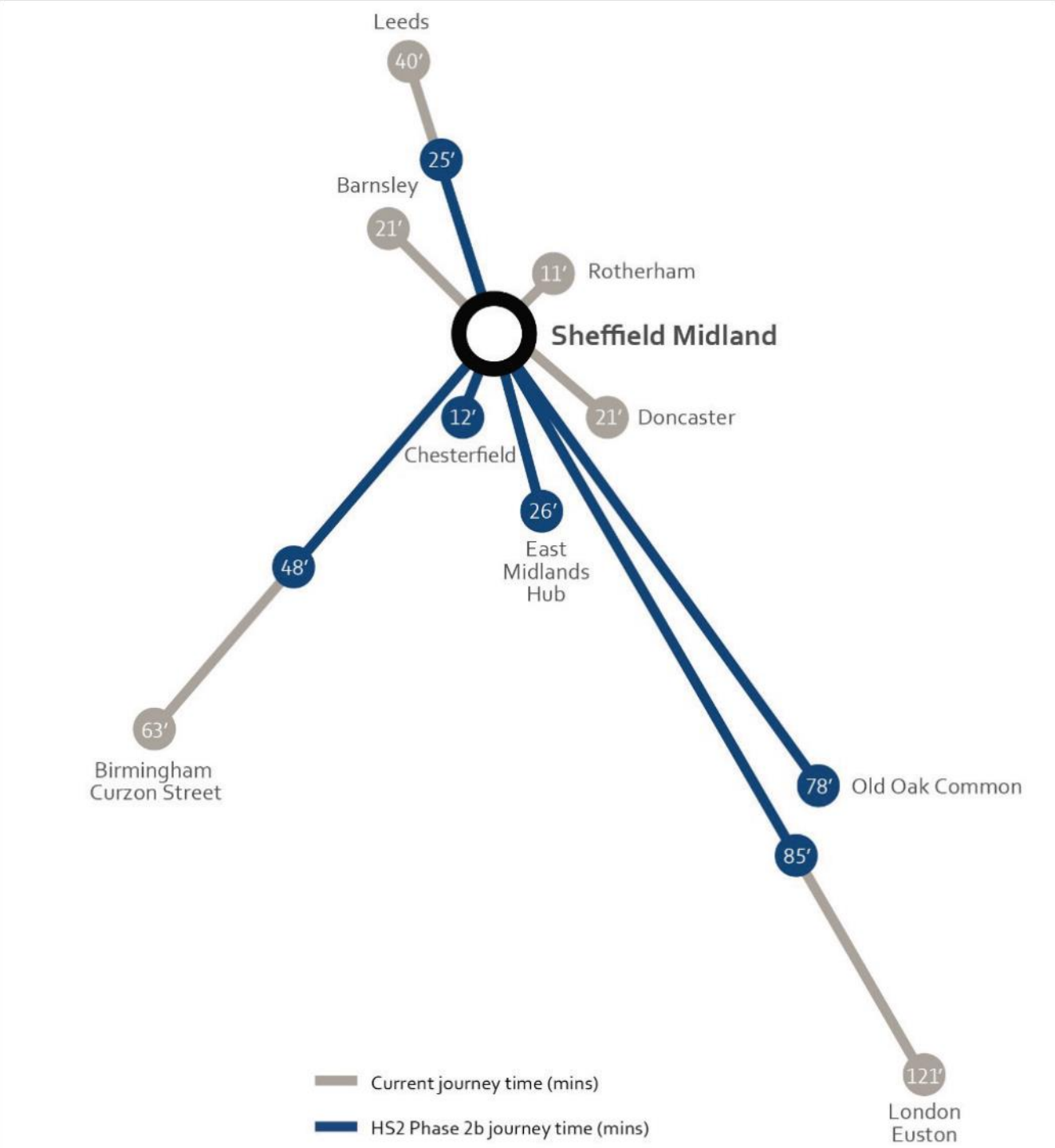


Figure 17 Sheffield Midland journey times[49]

Figure A3.5 : HS2 Services and Journey Times from Sheffield Midland

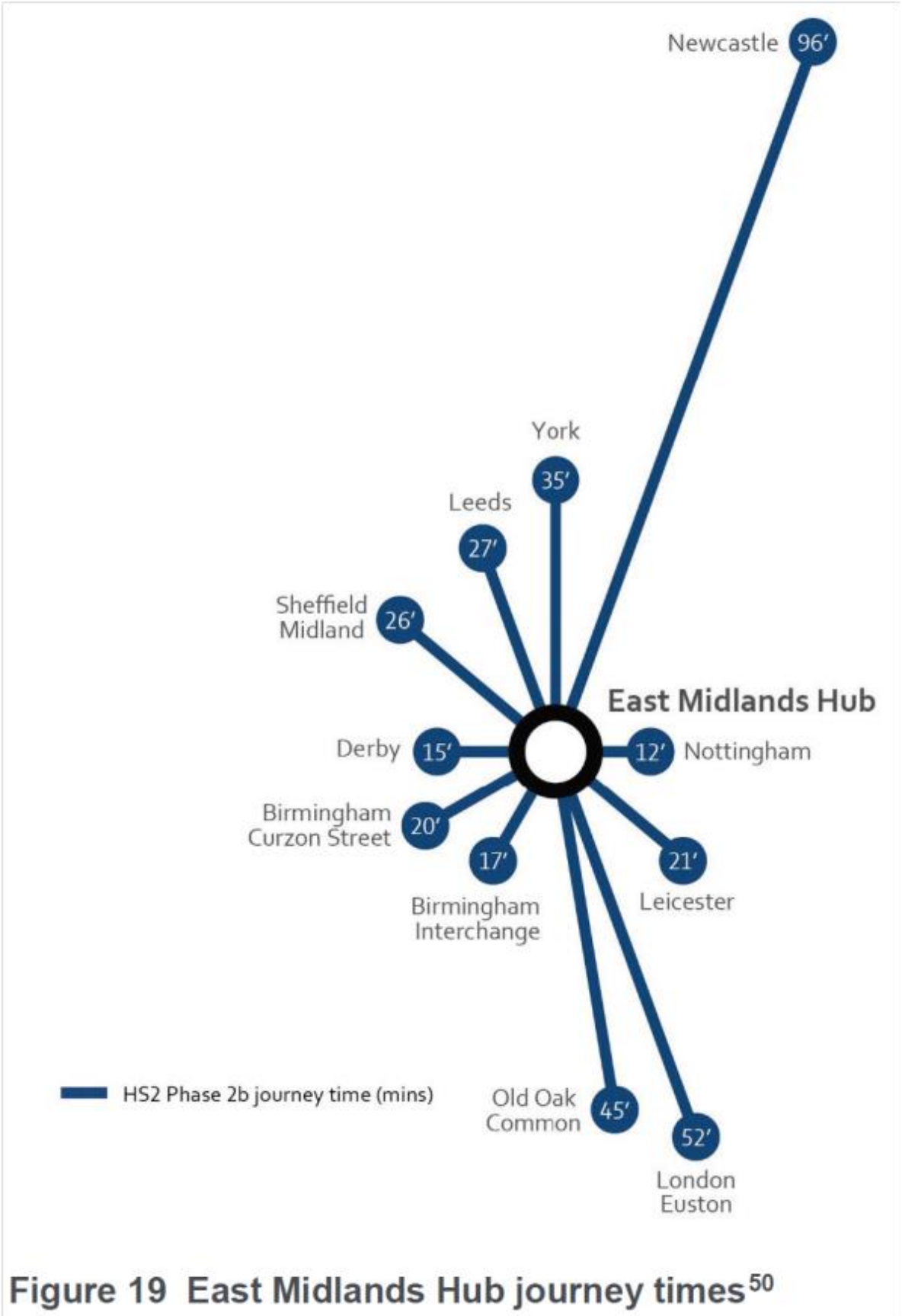


Figure 19 East Midlands Hub journey times[50]

Figure A3.6 : HS2 Services and Journey Times from Toton aka East Midlands Hub

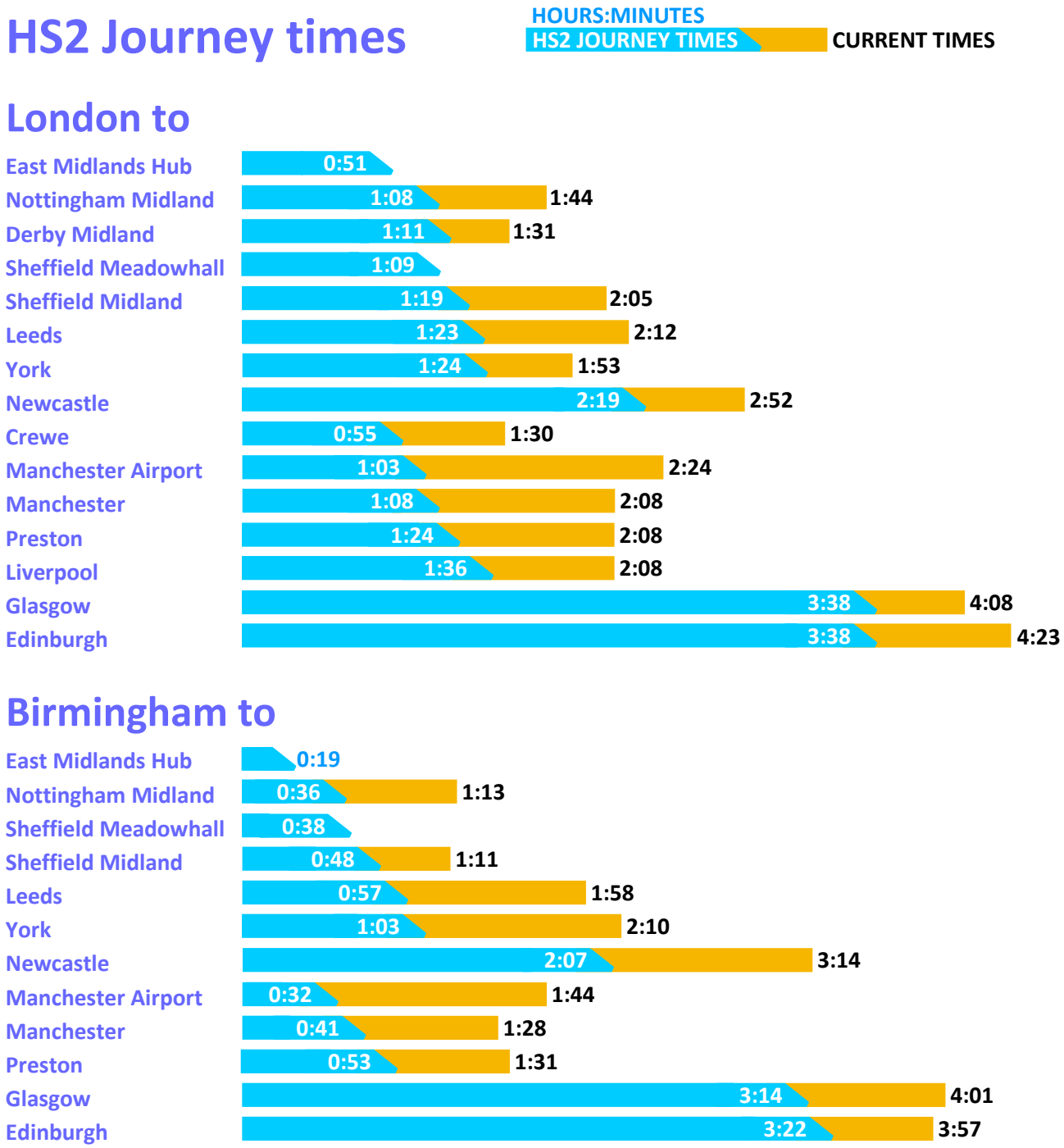


Figure A3.7:

Data Table from article in European Railway Review Vol 19, Issue 5, 2013 by

Andrew McNaughton HS2 Ltd Technical Director

(Table redrawn by CSE)

APPENDIX A4

POTENTIAL NEW SERVICES
EXPLOITING CAPACITY RELEASED BY INTRODUCTION OF HS2

Taken from:

Appendix 1 – Capacity Released

Better Connections :
Options for the integration of High Speed 2

Network Rail, July 2013

Appendix 1 – Capacity released

It should be noted that not all journey opportunities may be delivered together. These offer different options for the potential use of capacity released.

Route:	*MML*			
HS2 Phase Two Service Releasing Capacity on Existing Service	**Existing Service Released by HS2 Phase Two Service**	**Potential New Journey Opportunity**	**Type of Service**	**Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)[9]**
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Sheffield services	Extend services to Leeds	Long distance (fast and semi-fast)	Wakefield Westgate Doncaster Rotherham Central Sheffield Chesterfield Derby Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing Sheffield/ Nottingham - London St Pancras services	Additional calls south of Bedford all day (Bedford/Luton/LAP/ St Albans)	Long distance (fast and semi-fast)	Chesterfield Derby Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough Bedford Luton Luton Airport Parkway St Albans
London Euston - Leeds	On train peak capacity relief on existing Sheffield/ Nottingham - London St Pancras services	Additional calls south of Leicester all day (Kettering/ Wellingborough)	Long distance (fast and semi-fast)	Chesterfield Derby Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough

Route:	*MML*			
HS2 Phase Two Service Releasing Capacity on Existing Service	**Existing Service Released by HS2 Phase Two Service**	**Potential New Journey Opportunity**	**Type of Service**	**Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)[9]**
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham/Sheffield services	Toton/Meadowhall HS2 stations (via Erewash)	Long distance (fast and semi-fast)	Dronfield Chesterfield Alfreton Langley Mill Ilkeston Toton Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham services	Extend services to Leeds	Long distance (fast and semi-fast)	Wakefield Westgate Sheffield Dronfield Alfreton Langley Mill Ilkeston Toton Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham/Sheffield services	Extend services to Leeds via Barnsley	Long distance (fast and semi-fast)	Wakefield Kirkgate Barnsley Meadowhall Dronfield Chesterfield Alfreton Langley Mill Ilkeston Toton Beeston Long Eaton East Midlands Parkway Loughborough Leicester Market Harborough Kettering Wellingborough
London Euston - Leeds	On train peak capacity relief on existing London St Pancras - Nottingham/Sheffield services	Bristol/Swindon/ Oxford to Leicester/ Nott/Sheffield (via East-West and splitting/joining at Leicester)	Inter-urban (semi-fast)	Bristol Swindon Oxford Bedford Leicester Loughborough Derby Chesterfield

Route:	*ECML*			
HS2 Phase Two Service Releasing Capacity on Existing Service	Classic Service Released by HS2 Phase Two Service	Potential New Journey Opportunity	Type of Service	Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Cambridge to Leeds	Inter-urban	Leeds, Doncaster, Retford, Newark, Grantham, Peterborough, March, Ely, Cambridge (and then possibly to Stansted Airport or London Liverpool St)
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Cambridge to Nottingham	Inter-urban	Nottingham, Grantham, Peterborough, March, Ely, Cambridge (and then possibly to Stansted Airport or London Liverpool St)
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	London to Lincoln (via Spalding)	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Spalding, Lincoln
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	London to Peterborough	Suburban (fast)	London King's Cross, Finsbury Park, Stevenage, Huntingdon, Peterborough
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Leeds (and beyond) to York (and beyond) or Selby (and beyond)	Inter-urban or Suburban	n/a - could be all stations
London Euston - Leeds	London King's Cross - Leeds (via Hambleton)	Freight between Doncaster and the north	Freight (intermodal)	n/a
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	London - Hull (via Selby)…extended at least as far as Doncaster	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Doncaster, Selby, Howden, Brough, Hull
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	London - Middlesbrough or Sunderland… extended at least as far as York	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Doncaster, York, Northallerton, then Hartlepool and Sunderland or Thornaby and Middlesbrough
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	Birmingham - Newcastle (via Hartlepool and Sunderland)	Inter-urban	Newcastle, Cramlington, Morpeth, Alnmouth, Berwick, Dunbar, Drem, Prestonpans, Edinburgh Waverley

Route:	*ECML*			
HS2 Phase Two Service Releasing Capacity on Existing Service	**Classic Service Released by HS2 Phase Two Service**	**Potential New Journey Opportunity**	**Type of Service**	**Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)**
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	Liverpool - Newcastle (via Hartlepool and Sunderland)	Inter-urban	Birmingham New St, Tamworth, Burton, HS2 East Midlands, Chesterfield, Sheffield, HS2 South Yorkshire, Doncaster, York, Northallerton, Hartlepool, Sunderland, Newcastle
London Euston - Edinburgh London Euston - Newcastle	London King's Cross - Newcastle / Edinburgh	London - Cleethorpes (via Lincoln or Scunthorpe) or Saltburn (via Yarm) or Sheffield (via Retford) or Scarborough or Skegness (via Grantham) or Nottingham (via Grantham) or Harrogate (via York) or Bradford etc	Long distance (fast)	London King's Cross, Stevenage, Peterborough, Grantham, Newark, Lincoln, Grimsby, Cleethorpes or London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Doncaster, York, Northallerton, Thornaby, Middlesbrough, Redcar, Saltburn or London King's Cross, Stevenage, Peterborough, Grantham, Newark, Retford, Worksop, Sheffield etc.

Route:	*WCML*			
HS2 Phase Two Service Releasing Capacity on Existing Service	**Existing Service Released by HS2 Phase Two Service**	**Potential New Journey Opportunity**	**Type of Service**	**Potential intermediate calling points (Note: Services could call at one or more of these intermediate calling points)**
Euston - Manchester	Euston to Manchester Piccadilly via Stoke	South Coast - Manchester via EWR, WCML, Stoke	Cross Country (fast)	Southampton, Winchester, Reading, Oxford, Milton Keynes, Stoke, Macclesfield, Stockport
Euston - Manchester	Euston to Manchester Piccadilly via Stoke	Birmingham - Walsall - Rugeley - Stoke - Manchester	Inter-urban (semi-fast)	Walsall, Cannock, Rugeley TV, Stoke, Macclesfield, Stockport
Euston - Manchester	Euston to Manchester Piccadilly via Stoke	South East Midlands and Trent Valley to Manchester	Long distance (fast)	Milton Keynes, Nuneaton, Tamworth or Lichfield, Stafford, Crewe, Wilmslow
Euston - Liverpool	Euston to Crewe	Additional London to Crewe train per hour	Inter-urban (semi-fast)	Watford, Milton Keynes, Northampton, Rugby, Nuneaton, Lichfield, Stafford, Stoke
Euston - Glasgow	Euston to Wigan	Smaller stations served by half-hourly service	Inter-urban (semi-fast)	Watford, Milton Keynes, Rugby, Nuneaton, Tamworth, Lichfield, Rugeley TV, Stafford, Stone, Stoke, Kidsgrove
Birmingham-Scotland	Birmingham to Wigan	Birmingham-Wolverhampton-Crewe/Warrington semi-fast	Inter-urban (semi-fast)	Sandwell and Dudley, Wolverhampton, Penkridge, Stafford, Crewe, Hartford, Winsford, Warrington Bank Quay
Euston-Glasgow	Euston to Glasgow Central	Capacity on existing network is used for HS2 classic compatible train	Long distance (fast)	HS2 Phase Two service pattern stops at Carstairs.

APPENDIX A5

HS2 AND HIGH SPEED UK PROJECT REMITS

HS2 REMIT - KEY POINTS

1. **Build a high speed line from London to the West Midlands.**

2. **Consider development of HS2 further north.**

3. **Select a London terminal.**

4. **Consider intermediate parkway between London and the West Midlands.**

5. **Build an inter-change station with GWML/ Heathrow/ Crossrail services.**

6. **Connect to HS1 and the existing network.**

SUMMARY OF THE REMIT AND OBJECTIVES OF HIGH SPEED TWO

On 15 January 2009 the Secretary of State for Transport announced in 'Britain's Transport Infrastructure: High Speed Two', the setting up of a new company to look at a possible new railway line between London and the West Midlands.

HS2 was set up shortly after as a private company limited by guarantee. It is chaired by Sir David Rowlands, and Alison Munro was seconded from the Department of Transport as Chief Executive. The rest of the HS2 team comprises further secondees from the DfT and from Network Rail.

HS2's remit is to develop proposals for a new railway line from London to the West Midlands taking account of environmental, social and economic assessments. It will also provide advice to Ministers on the potential development of a high speed line beyond the West Midlands on the level of broad corridors, considering in particular the potent to extend to Greater Manchester, West Yorkshire, the North-East and Scotland.

HS2 will make recommendations on options for a terminus station or stations serving London and possible options for an intermediate parkway station between London and the West Midlands. It will also provide a proposal for an interchange station between HS2, the Great Western Main Line and Crossrail with convenient access to Heathrow Airport. HS2 will also provide suggested means of linking to HS1 and the existing rail network.

HS2 will produce a confidential report to Ministers by the end of 2009 that should be sufficiently developed to form the basis for public consultation in 2010 should Ministers decide to take the project forward. The advice will also include financing and construction proposals as well as a proposition for how best to move through the planning process within an indicative outline timetable.

Extract from July 2009 HS2 Newsletter.

Colouring by CSE

Figure A5.1 : HS2 Project Remit (2009)

HIGH SPEED UK REMIT (2016)

Starting with the existing rail network and existing service patterns, use the opportunity offered by the intervention of new-build high speed railway lines, linking London and the primary cities of the East and West Midlands, the North-West, Yorkshire, the North-East and Scotland) to create an enhanced and fully integrated national rail network. This network should be capable of performing as follows:

1. Provide direct services of intercity quality between all principal cities / major conurbations in the regions listed above;
2. Provide enhanced service levels to intermediate secondary cities, with frequent links from high speed lines to the existing network, and upgrades to existing routes, where required;
3. Integrate all existing intercity routes extending to other parts of the network with the new high speed (or upgraded) lines;
4. Maintain or enhance existing service levels;
5. Operate all intercity routes at hourly or better frequency;
6. Optimise network capacity through maximised segregation between high speed intercity services and local/freight services;
7. Achieve major journey time reductions on all routes;
8. Achieve step-change transport CO_2 reductions through road to rail modal shift enabled by enhanced capacity & connectivity;
9. Offer 'easy transfer' between national (high speed) rail and local transport services (train, metro, tram, underground, buses and taxis) at existing city centre hub railway stations;
10. Develop proposals for a London terminus;
11. Optimise connections to London suburban rail services;
12. Offer direct services to Heathrow from all principal regional UK cities, and direct services to all major regional airports from within their own respective regions, with upgrades and/or new local connections to achieve this;
13. Provide a link to HS1 without using the already overcrowded North London Line;
14. Develop supplementary proposals for a dedicated national freight network, linked to the Channel Tunnel, largely independent of major intercity passenger routes and capable of carrying trains of UIC-C loading gauge (in order to carry HGV trailers by rail and to allow larger 'Continental Gauge' wagons to enter the UK);
15. Be a 'Good Neighbour' to local communities by following existing transport corridors i.e. motorways, trunk roads and railways where there is already significant noise pollution and avoiding, as far as possible, all environmentally sensitive areas;
16. Develop a new national intercity timetable to identify capacity constraints and demonstrate exactly what connectivity benefits the HSUK design can deliver;
17. Design the new high speed line as a series of independent sections, each capable of being built as a separate stage to provide significant benefit to the local and national rail network. This would respond to local economic priorities, and not require high speed line construction to start in London.

Figure A5.2 : High Speed UK Project Remit (2016)

APPENDIX B1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

BIRMINGHAM

and West Midlands conurbation

Birmingham *and West Midlands conurbation*

Town/City	Birmingham
City Region	West Midlands
Population of built-up area**	**2,400,000**
Ranking amongst UK cities**	**3**
Number of cities directly linked by existing rail network (out of 31)	**24**

References:
HSUK London-Birmingham Rail Strategy
HSUK West Midlands Rail Strategy
HSUK Regional Map 04
HSUK Birmingham Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom - note that Wikipedia definition of Birmingham's built-up area includes Walsall and Wolverhampton

Birmingham : Intercity Connectivity with HSUK and HS2

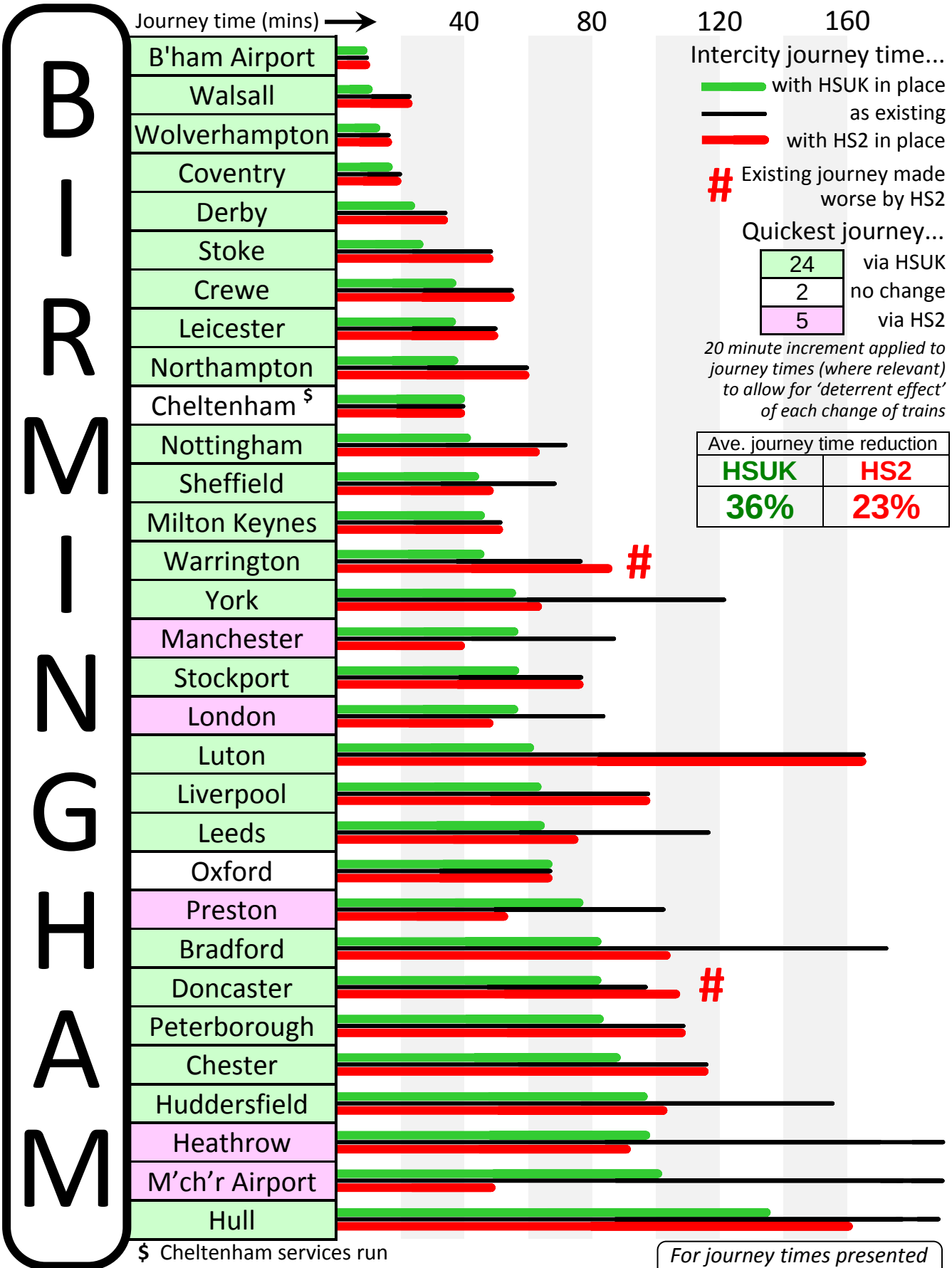
Birmingham	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**36%**	**29**	**28**	**0**	**24**
HS2	**23%**	**8**	**12**	**2**	**5**

Birmingham's central location amongst UK cities makes it the natural focus of the national rail network, and Birmingham New Street, where West Coast and CrossCountry routes intersect, is the fulcrum of the entire system. New Street station only exists because the early railway companies i.e. the London North-Western and the Midland found their original terminus stations (i.e Curzon Street and Lawley Street) inefficient and impractical for their priority of running national systems with regional and longer-distance services crossing the West Midlands. Intercity services now radiate from New Street to most parts of the UK, and likewise regional services around the West Midlands. The station, the busiest outside London, has recently been modernised to greatly improve its facilities for passengers.

The HS2 scheme fails completely to recognise the crucial importance of the New Street hub. No measures are proposed to address the existing congestion at New Street to make room for additional high speed services. Instead a new terminus station is proposed on the site of the original Curzon Street station. This will require a 10 minute walking transfer between HS2 services arriving at Curzon Street, and intercity and local services departing from New Street. Curzon Street represents a hugely regressive step which will repeat the mistakes of the past, and will have huge adverse impacts on connectivity across the entire West Midlands region.

Under HSUK proposals, existing congestion at New Street will be alleviated by 4-tracking and upgrading key radial routes towards Coventry, Wolverhampton/Walsall and Derby. With greatly increased capacity on the approach routes, it will no longer be necessary either to terminate or reverse train services at New Street. This will allow local and regional services to be greatly increased in frequency and/or coverage, and it will also permit through-running HSUK intercity services to directly connect Birmingham to most principal UK cities.

HIGH SPEED UK & HS2 LINKS TO BIRMINGHAM



$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p188

BIRMINGHAM

Integrity of national network lost through disconnection between New St & Curzon St stations

HS2

Average journey time reductions:

23%

No. of cities directly linked:

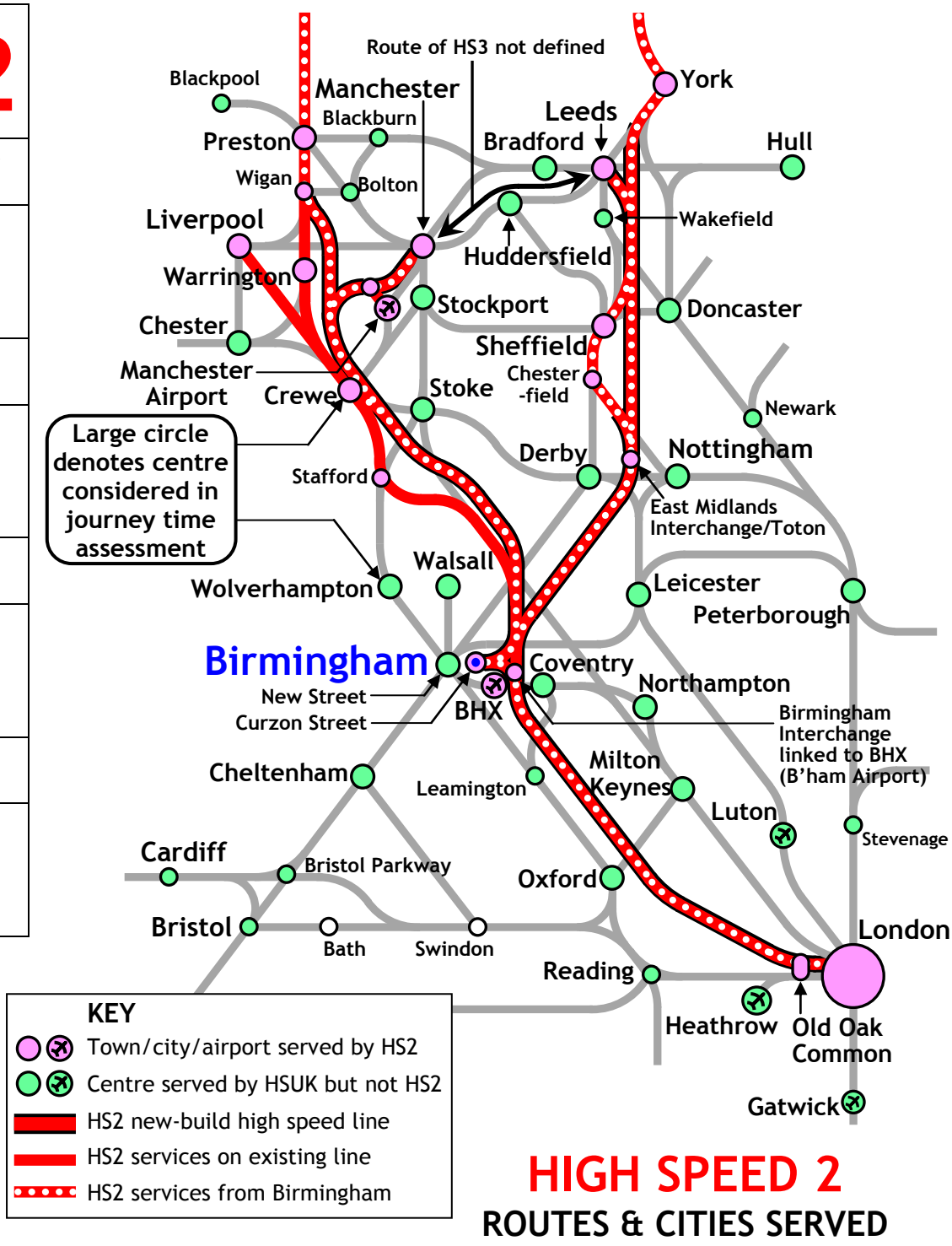
8

No. of journeys made faster:

12

No. of journeys made worse:

2



HIGH SPEED 2

ROUTES & CITIES SERVED

BIRMINGHAM

Fully connected to national high speed network, direct high speed links to all principal UK cities

HSUK

Average journey time reductions:

36%

No. of cities directly linked:

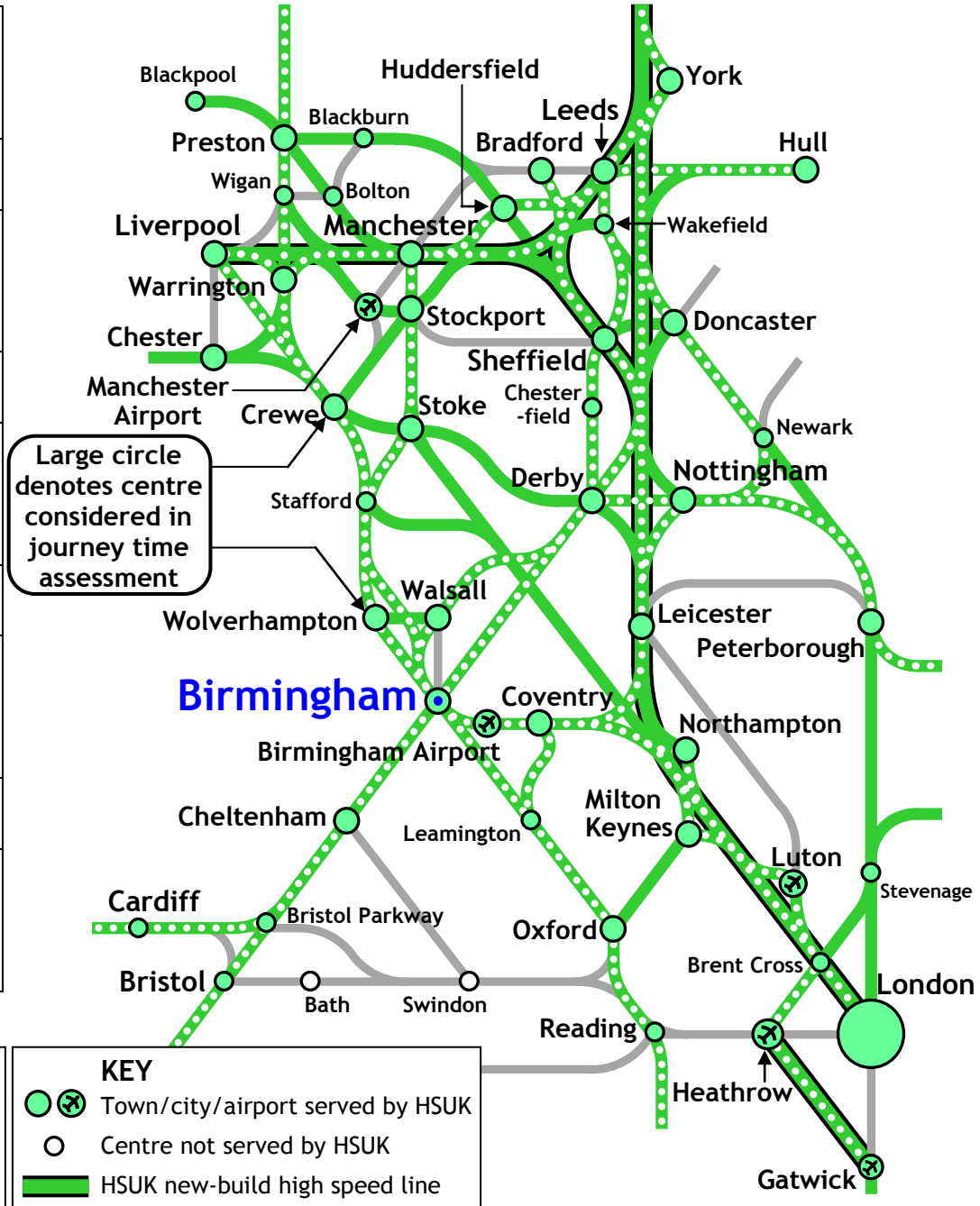
29

No. of journeys made faster:

28

No. of journeys made worse:

0



Birmingham served by:
HSUK01,04,05,06
HSUK07,08,09,10
HSUK11,12,13,15
HSUK61,62,63,64
HSUK94
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Birmingham

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Birmingham**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
BIRMINGHAM	B'ham Airport			9	10	10	9	0	10	0	10	0	
	Bradford			83	173	104	83	0	153	1	84	1	
	Cheltenham			40	40	40	40	0	40	0	40	0	
	Chester			86	117	117	66	1	97	1	97	1	
	Coventry			18	20	20	18	0	20	0	20	0	
	Crewe			37	55	55	37	0	55	0	55	0	
	Derby			22	34	34	22	0	34	0	34	0	
	Doncaster			82	98	98	82	0	98	0	98	0	#
	Heathrow			98	191	92	98	0	151	2	72	1	
	Huddersfield			98	156	102	98	0	136	1	82	1	
	Hull			138	189	162	138	0	169	1	142	1	
	Leeds			64	118	76	64	0	118	0	76	0	
	Leicester			37	50	50	37	0	50	0	50	0	
	Liverpool			64	99	99	64	0	99	0	99	0	
	London			57	83	49	57	0	83	0	49	0	
	Luton			60	165	165	60	0	145	1	145	1	
	Manchester			57	87	40	57	0	87	0	40	0	
	M'ch'r Airport			102	133	50	82	1	113	1	40	0	
	Milton Keynes			44	52	52	44	0	52	0	52	0	
	Northampton			38	60	60	38	0	60	0	60	0	
	Nottingham			40	72	62	40	0	72	0	42	1	
	Oxford			67	67	67	67	0	67	0	67	0	
	Peterborough			82	109	109	82	0	109	0	109	0	
	Preston			77	102	53	77	0	102	0	53	0	
	Sheffield			44	69	48	44	0	69	0	48	0	
	Stockport			58	78	78	58	0	78	0	78	0	
	Stoke			25	48	48	25	0	48	0	48	0	
	Walsall			10	22	22	10	0	22	0	22	0	
	Warrington			48	78	78	48	0	78	0	78	0	#
	Wolverhampton			12	17	17	12	0	17	0	17	0	
	York			56	121	63	56	0	121	0	63	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX B2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

BIRMINGHAM AIRPORT

Birmingham Airport

Airport	Birmingham
Passenger numbers per year**	**9.7 million**
Ranking amongst UK airports**	**7**
Number of cities directly linked by existing rail network (out of 31)	**12**

References:
HSUK London-B'ham Rail Strategy
HSUK West Midlands Rail Strategy
HSUK Regional Map 04
HSUK B'ham Airport Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Busiest_airports_in_the_United_Kingdom_by_total_passenger_traffic

Birmingham Airport : Intercity Connectivity with HSUK and HS2

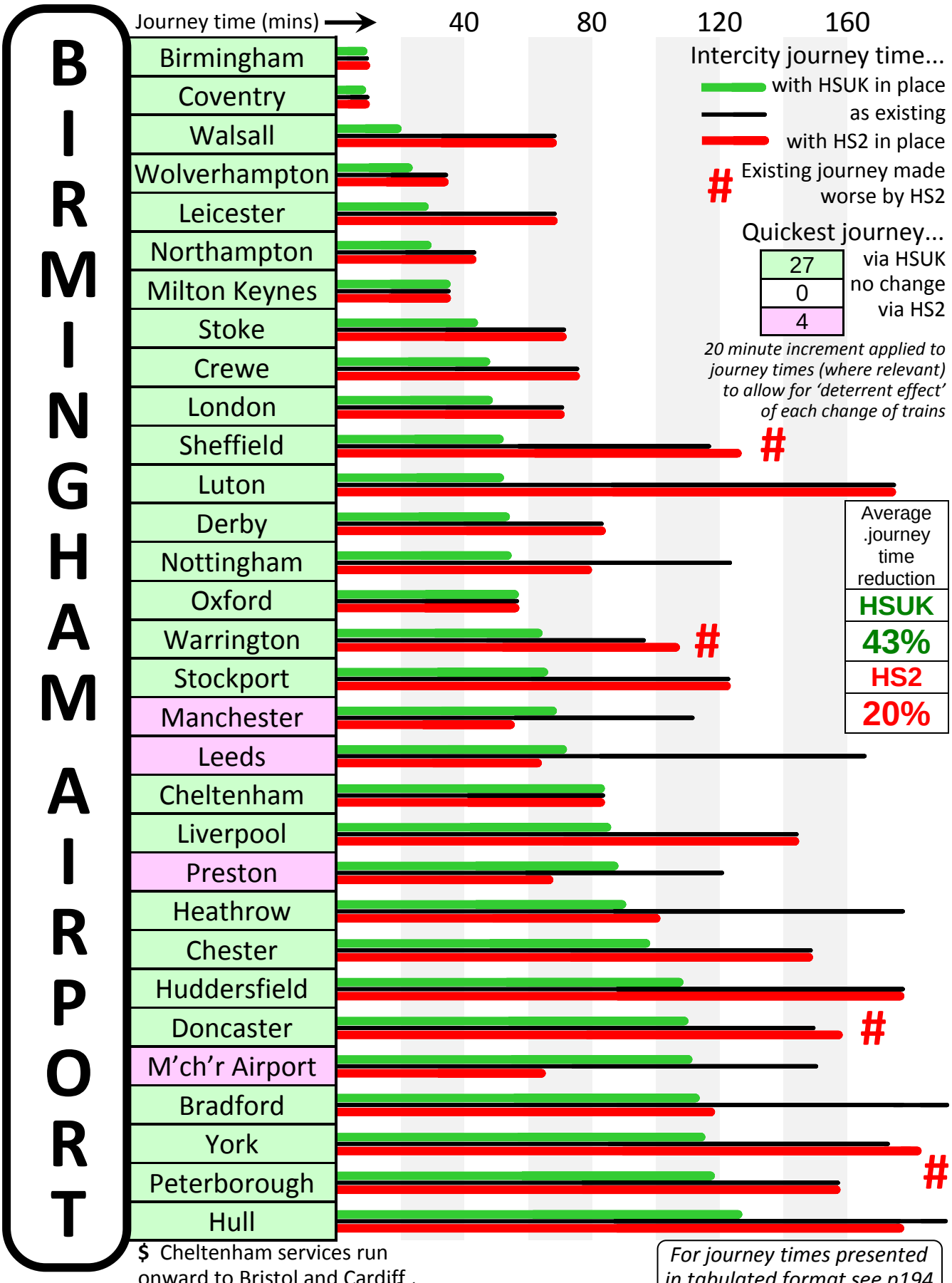
Birmingham Airport	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**43%**	**24**	**29**	**0**	**27**
HS2	**20%**	**6**	**9**	**4**	**4**

Birmingham Airport is the Midlands' primary international gateway, and the third busiest UK airport outside London's Heathrow, Gatwick, Stansted and Luton. Since the opening of Birmingham International station in 1976 Birmingham Airport and the adjacent National Exhibition Centre have enjoyed excellent connectivity along the axis of the West Coast Main Line, with services extending to London, to the South Coast, to Manchester and to Scotland. However, Birmingham Airport lacks any direct rail links to its more immediate East Midlands hinterland; for journeys to Leicester, Derby and Nottingham it is necessary to change at Birmingham New Street. To enable the 'Midlands Engine' to function to full effect, direct links from all major Midlands population centres to Birmingham Airport are clearly vital.

The location of HS2's Birmingham Interchange station close to Birmingham Airport, with a dedicated 'people mover' system to link the station to the airport, would appear to satisfy the aspiration for improved regional connectivity. Yet aside from central Birmingham (for which the existing network will continue to offer quicker journeys) HS2 will offer direct links from Birmingham Interchange to only 3 other cities – Manchester, Preston and Leeds. Journeys to all other cities will require further changes of trains (for instance at Toton/East Midlands Interchange in order to reach Nottingham or Derby) or continued use of the existing network.

HSUK's alternative strategy, to upgrade existing radial West Midlands routes rather than construct new lines, will create far greater connectivity for Birmingham Airport. The primary HSUK route from London, running via Birmingham International to Birmingham, will be 4-tracked in accordance with the long-term ambitions of the regional transport authorities. This will allow local and intercity services to be separated and thus provide a step-change increase in capacity on this critical route. A northward link to the HSUK spine route at Rugby will allow direct services to Leicester, Nottingham and Derby, as part of wider programme of works to create a 'Midlands Ring' linking Birmingham Airport to all major Midlands cities.

HIGH SPEED UK & HS2 LINKS TO BIRMINGHAM AIRPORT



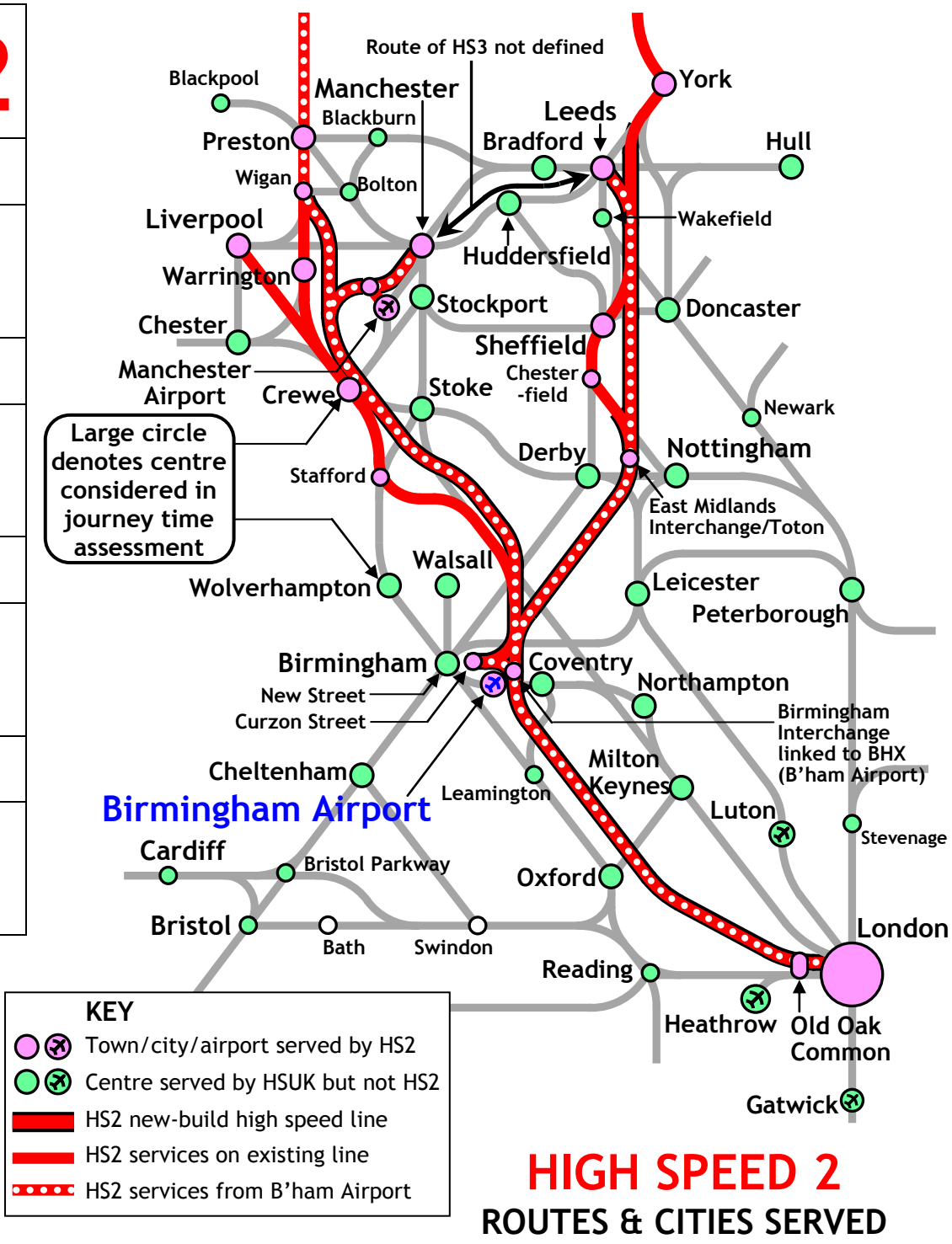
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p194

BIRMINGHAM AIRPORT

At hub of HS2 system but many major cities not linked & no gains in connectivity to Midlands cities

HS2
Average journey time reductions:
20%
No. of cities directly linked:
6
No. of journeys made faster:
9
No. of journeys made worse:
4



HIGH SPEED 2
ROUTES & CITIES SERVED

BIRMINGHAM AIRPORT

Fully connected to national high speed network, direct links to all principal Midlands cities

HSUK

Average journey time reductions:

43%

No. of cities directly linked:

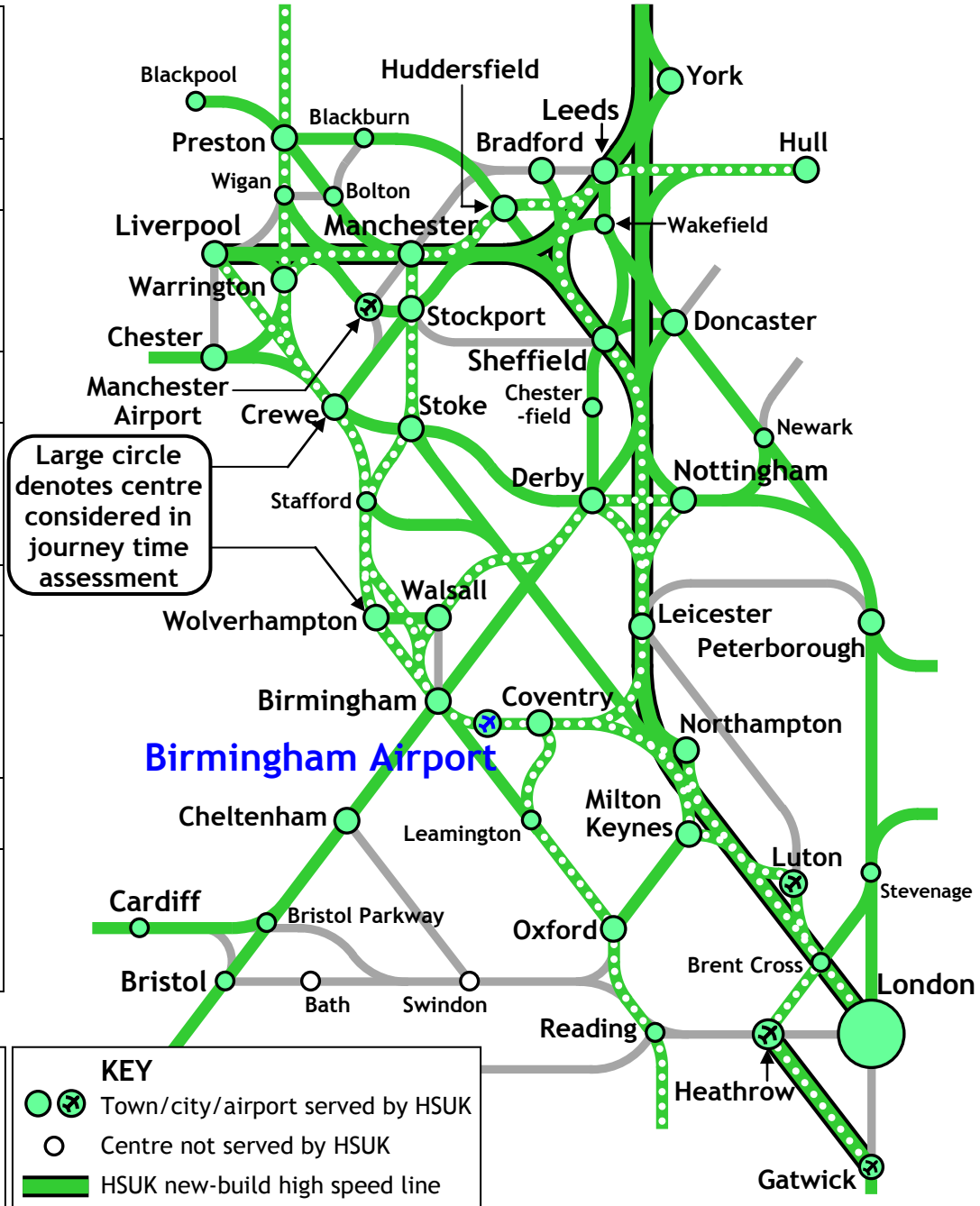
24

No. of journeys made faster:

29

No. of journeys made worse:

0



Birmingham Airport served by:

HSUK06
HSUK11
HSUK61,62,63,64
HSUK76,78
HSUK94
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from B'ham Airport

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Birmingham Airport**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
BIRMINGHAM AIRPORT	Birmingham			9	10	10	9	0	10	0	10	0	
	Bradford			115	221	119	95	1	181	2	89	1[B]	
	Cheltenham			82	85	85	62	1	65	1	65	1	
	Chester			99	149	149	79	1	129	1	129	1	
	Coventry			7	10	10	7	0	10	0	10	0	
	Crewe			46	77	77	46	0	77	0	77	0	
	Derby			53	84	83	53	0	64	1	53	1[B]	
	Doncaster			112	150	150	92	1	130	1	130	1	#
	Heathrow			88	178	101	88	0	138	2	71	1[B]	
	Huddersfield			107	181	181	107	0	161	1	161	1	
	Hull			128	238	177	128	0	198	2	147	1[B]	
	Leeds			73	166	64	73	0	146	1	54	0[B]	
	Leicester			28	91	91	28	0	71	1	71	1	
	Liverpool			84	145	145	84	0	125	1	125	1	
	London			47	71	71	47	0	71	0	71	0	
	Luton			50	155	155	50	0	135	1	135	1	
	Manchester			69	112	55	69	0	112	0	45	0[B]	
	M'ch'r Airport			111	151	65	91	1	131	1	45	1	
	Milton Keynes			34	37	37	34	0	37	0	37	0	
	Northampton			28	43	43	28	0	43	0	43	0	
	Nottingham			53	123	80	53	0	103	1	50	1[B]	
	Oxford			56	57	57	56	0	57	0	57	0	
	Peterborough			120	158	158	100	1	138	1	138	1	
	Preston			86	121	68	86	0	121	0	58	0[B]	
	Sheffield			52	118	118	52	0	98	1	98	1	#
	Stockport			67	123	123	67	0	103	1	103	1	
	Stoke			42	72	72	42	0	72	0	72	0	
	Walsall			19	68	68	19	0	48	1	48	1	
	Warrington			63	97	97	63	0	97	0	97	0	#
	Wolverhampton			22	35	35	22	0	35	0	35	0	
	York			115	172	172	95	1	152	1	152	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX B3

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

BRADFORD

Bradford

Town/City	Bradford
City Region	West Yorkshire
Population of built-up area**	**300,000**
Ranking amongst UK cities – N/A	(part of W.Yorkshire)
Number of cities directly linked by existing rail network (out of 31)	**5**

References:
HSUK Yorkshire Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Regional Map 11
HSUK Bradford Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Bradford : Intercity Connectivity with HSUK and HS2

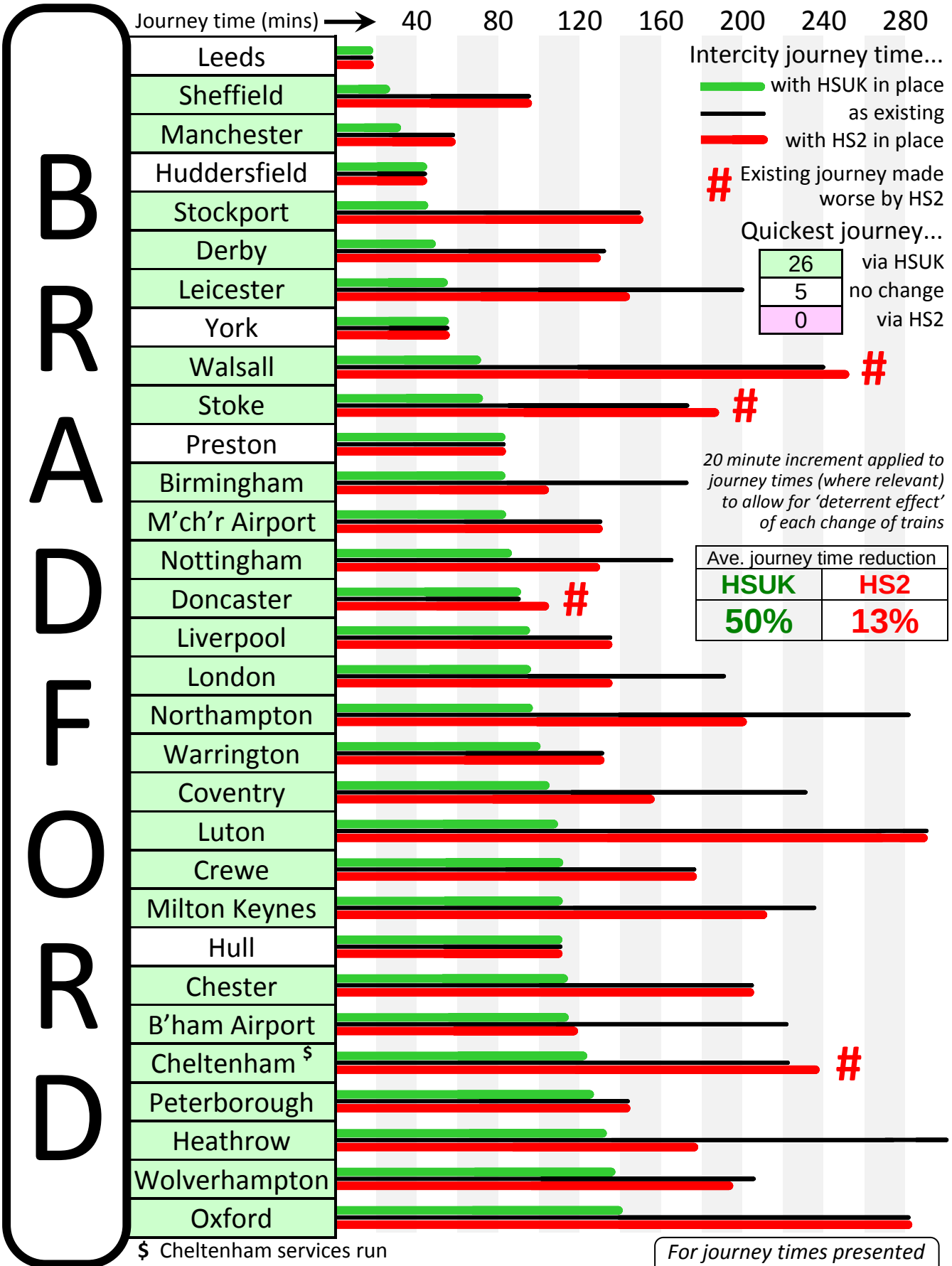
Bradford	Average journey time reduction	Cities directly linked (out of 27)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**50%**	**12**	**25**	**0**	**26**
HS2	**13%**	**0**	**12**	**4**	**0**

Bradford's rail connectivity has always been compromised by its location in a steep-sided valley on the fringe of the Pennines, and by the fragmented and unplanned development of the region's railways. These two factors have led to Bradford having 2 separate terminus stations with 2 separate suburban networks, one to the north and one to the south of the city centre. This has greatly discouraged the operation of intercity services to Bradford, and this must contribute to the city's depressed economy. Despite the recent introduction of Grand Central direct services to London (4 trains per day from Bradford Interchange), Bradford's intercity connectivity is still mostly achieved through its local links to Leeds, where a much greater range of long distance services is available.

With the recent revision of HS2 proposals in Leeds, to make the proposed terminus station contiguous with the existing Leeds Station at, a proportion of Leeds' gains from HS2 will extend to Bradford. However, these gains will be greatly limited by the fact that Leeds itself will be directly linked by HS2 only to 3 other cities – Sheffield, Birmingham and London.

It must be asserted that a city of Bradford's size and history should not be in its current subsidiary relationship to Leeds, whereby most intercity journeys to Bradford pass through Leeds station. This is not healthy either for Leeds, for Bradford or for the entire West Yorkshire region, whose rail network is almost entirely focussed on Leeds station, and this must demand radical improvements in direct intercity services to Bradford. HSUK answers this challenge through its M1-aligned route from Manchester and Sheffield to Leeds, which links naturally to a restored Spen Valley route approaching Bradford from the south, and potentially crossing the city centre northwards through implementation of the long-delayed Crossrail scheme. This will allow Bradford direct links to Sheffield, London, Birmingham, Manchester and many other UK cities, and journey time reductions of around 50%.

HIGH SPEED UK & HS2 LINKS TO BRADFORD



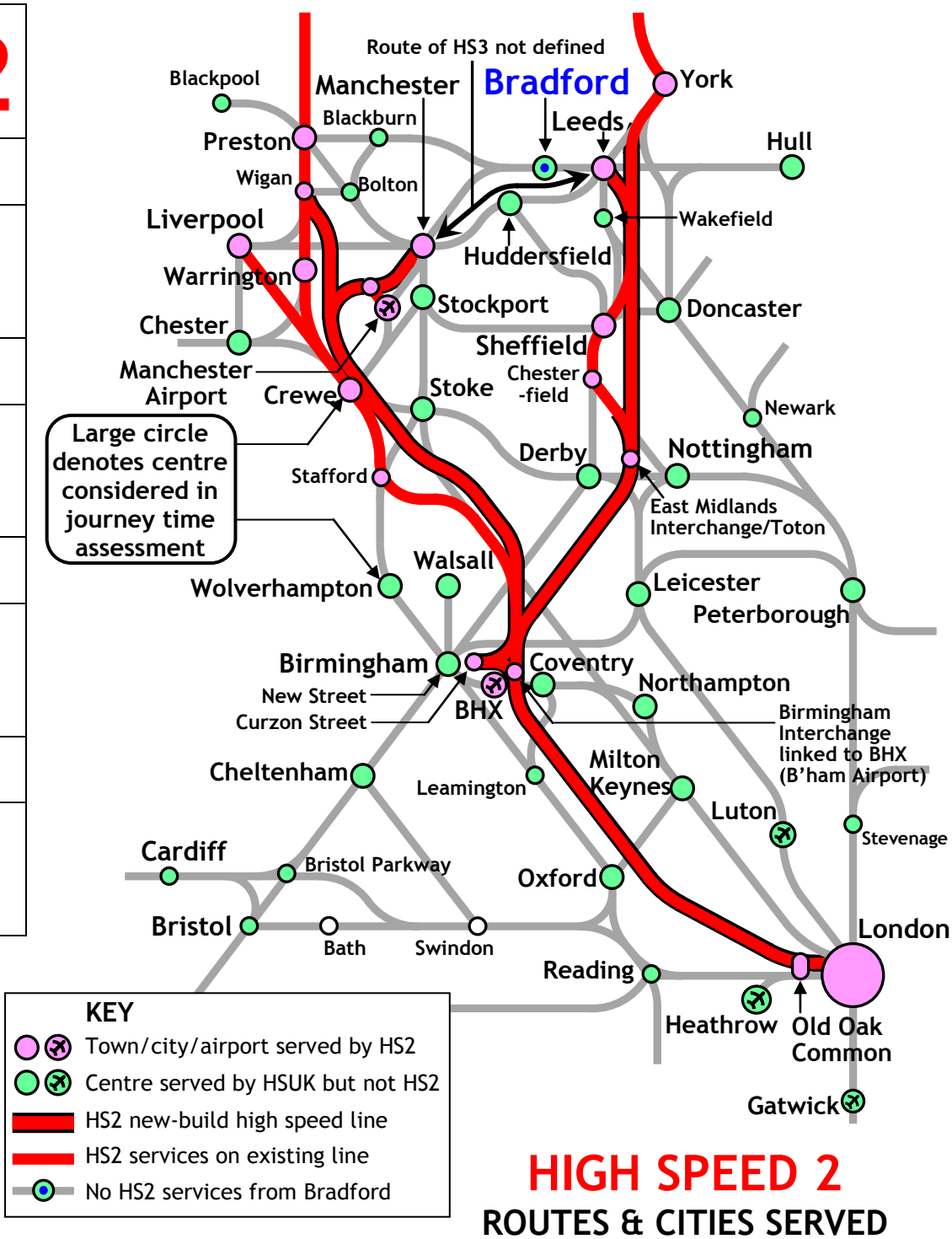
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p200

BRADFORD

Isolated from HS2, no improvement to current poor local and national connectivity

HS2
Average journey time reductions:
13%
No. of cities directly linked:
0
No. of journeys made faster:
12
No. of journeys made worse:
4



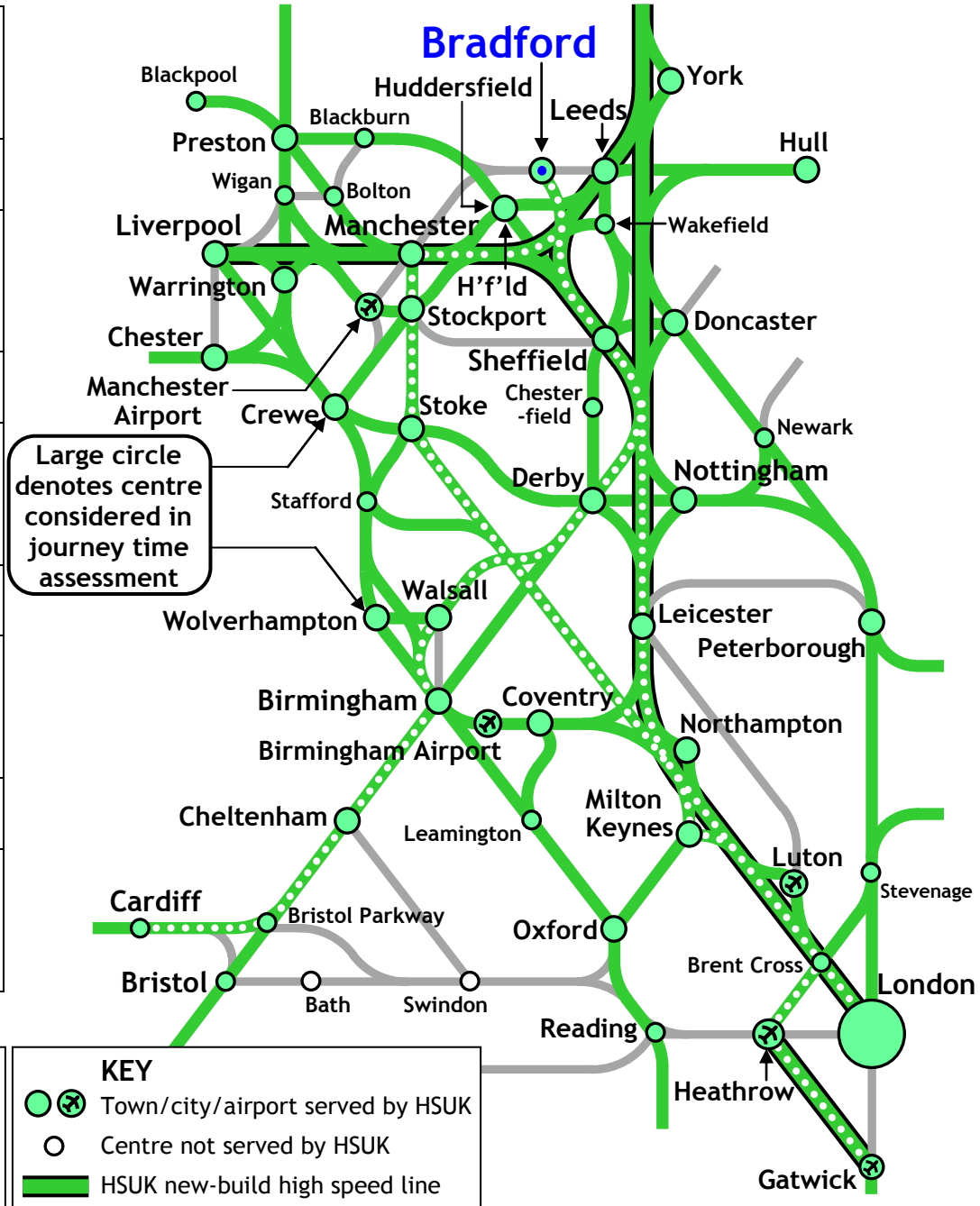
HIGH SPEED 2

ROUTES & CITIES SERVED

BRADFORD

Fully connected to national high speed network, direct links to key primary cities

HSUK
Average journey time reductions:
50%
No. of cities directly linked:
12
No. of journeys made faster:
25
No. of journeys made worse:
0



Bradford served by:
HSUK08
HSUK45
HSUK94
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Bradford

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Bradford**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
BRADFORD	Birmingham			83	173	104	83	0	153	1	84	1	
	B'ham Airport			115	221	119	95	1	181	2	89	1[B]	
	Cheltenham			123	222	222	123	0	202	1	202	1	#
	Chester			111	205	205	91	1	165	2	165	2	
	Coventry			106	231	157	86	1	191	2	107	2[B]	
	Crewe			108	178	178	88	1	138	2	138	2	
	Derby			49	132	129	49	0	112	1	89	2	
	Doncaster			91	91	91	71	1	71	1	71	1	#
	Heathrow			135	312	179	115	1	252	3	139	2	
	Huddersfield			43	43	43	43	0	43	0	43	0	
	Hull			111	111	111	91	1	91	1	91	1	
	Leeds			19	19	19	19	0	19	0	19	0	
	Leicester			51	200	143	51	0	160	2	103	2	
	Liverpool			98	137	137	78	1	117	1	117	1	
	London			95	191	136	95	0	171	1	116	1	
	Luton			111	290	290	91	1	230	3	230	3	
	Manchester			30	59	59	30	0	59	0	59	0	
	M'ch'r Airport			80	130	130	60	1	110	1	110	1	
	Milton Keynes			113	237	211	93	1	197	2	161	2[B]	
	Northampton			99	281	201	79	1	221	3	151	2[B]	
	Nottingham			88	164	129	68	1	144	1	89	2	
	Oxford			142	283	283	122	1	243	2	243	2	
	Peterborough			124	143	143	104	1	123	1	123	1	
	Preston			82	82	82	82	0	82	0	82	0	
	Sheffield			27	96	80	27	0	76	1	60	1	
	Stockport			43	148	148	43	0	108	2	108	2	
	Stoke			69	173	173	69	0	133	2	133	2	#
	Walsall			72	240	240	72	0	200	2	200	2	#
	Warrington			98	131	131	78	1	111	1	111	1	
	Wolverhampton			139	206	194	119	1	166	2	144	2[B]	
	York			56	56	56	56	0	56	0	56	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX C1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

CHELTENHAM

and onward destinations including Bristol and West Country, Cardiff and South Wales

Cheltenham *and onward destinations including Bristol and West Country, Cardiff and South Wales*

Town/City	Cheltenham
Population of built-up area**	120,000
Ranking amongst UK cities**	67
Number of cities directly linked by existing rail network (out of 31)	11

References:
HSUK West Midlands Strategy
HSUK Cheltenham Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Cheltenham : Intercity Connectivity with HSUK and HS2

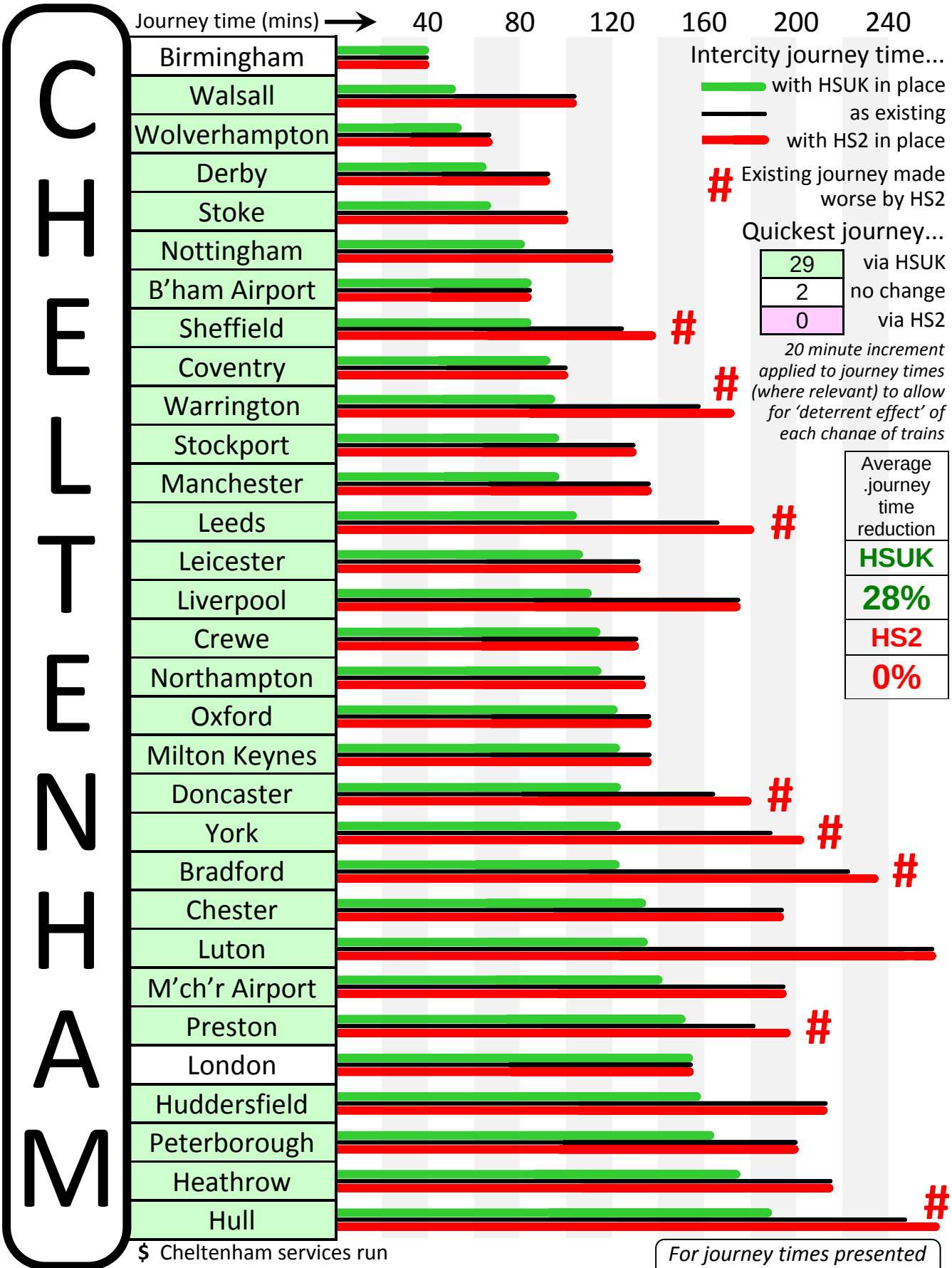
Cheltenham	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**28%**	**17**	**29**	**0**	**29**
HS2	**0%**	**0**	**0**	**8**	**0**

Cheltenham is located in the Severn Valley, approximately equidistant between Birmingham and Bristol. Its station is a principal calling point on CrossCountry services from Manchester to Bristol, Edinburgh to Plymouth and Nottingham to Cardiff. As such, rail connectivity from the Midlands, the North and Scotland to Cheltenham can be taken as indicative of connectivity to the wider West Country and South Wales regions.

These CrossCountry links will be greatly damaged by proposals for the HS2 terminus at Birmingham Curzon Street. Curzon Street will be served by HS2 trains from Scotland, Newcastle, Leeds and Manchester, but all of these trains will terminate there, and passengers en route to West Country and South Wales destinations will be forced to make a walking transfer to New Street station. This transfer is conservatively estimated to take at least 10 minutes. Existing CrossCountry services will be considerably degraded by the proposed diversion to serve the proposed East Midlands Interchange at Toton.

By contrast, HSUK will enhance the integrity of existing cross-country links through its radical alternative strategy for the West Midlands. With key radial routes upgraded by means of 4-tracking, Birmingham New Street will remain the hub of the regional and the national intercity network, and this will enable high speed services from the West Country and South Wales, calling at Cheltenham en route, to continue to all principal UK cities of the Midlands, the North and Scotland. The premier Plymouth-Edinburgh service will extend to Glasgow via the new HSUK route directly linking Scotland's 2 principal cities; and the Cardiff-Nottingham service will extend via Newark to Doncaster, York and the North-East.

HIGH SPEED UK & HS2 LINKS TO CHELTENHAM



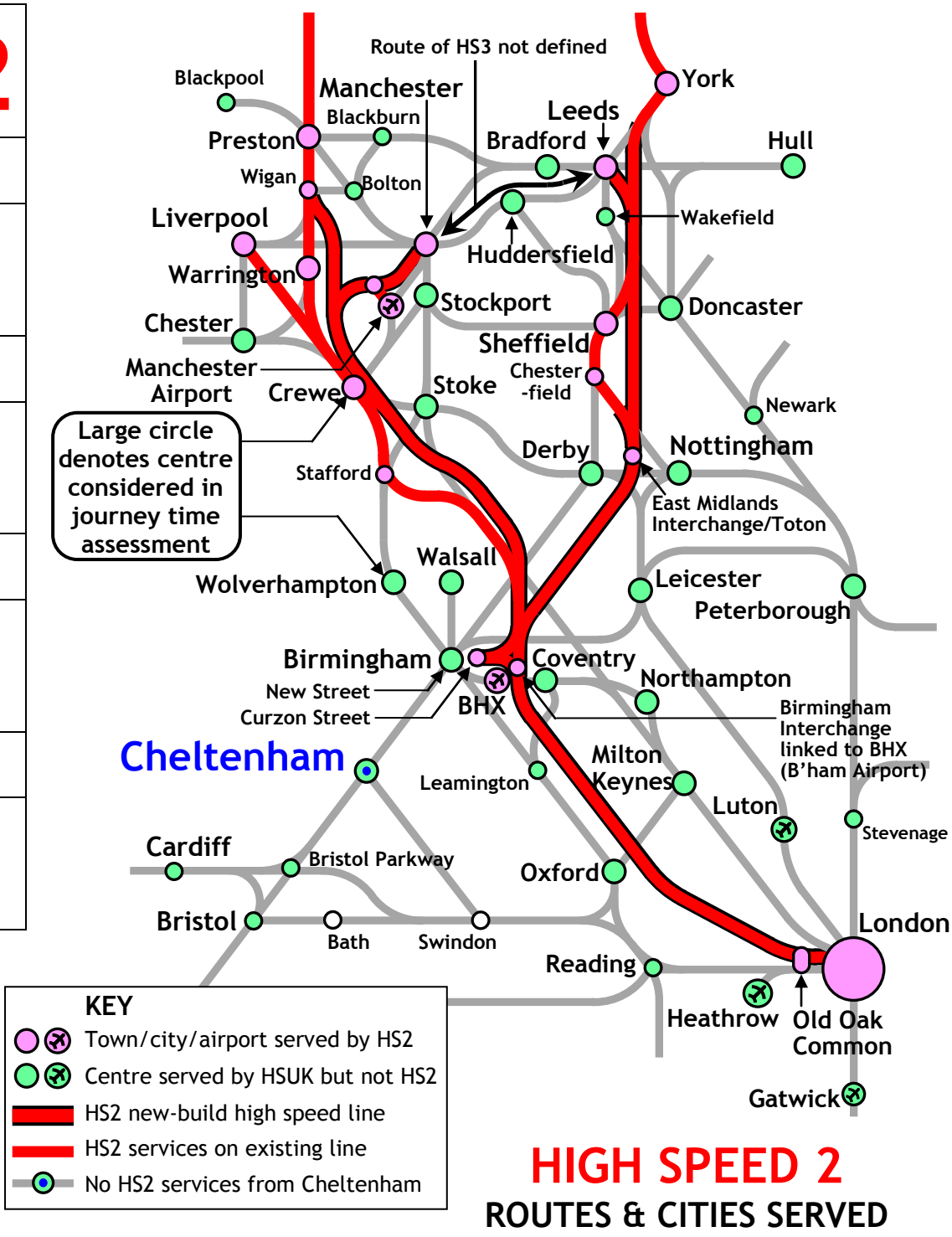
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p206

CHELTENHAM

CrossCountry route severed in Birmingham due to disconnection between New St & Curzon St stations

HS2
Average journey time reductions:
0%
No. of cities directly linked:
0
No. of journeys made faster:
0
No. of journeys made worse:
8



CHELTENHAM

On HSUK CrossCountry route from Midlands, Northern & Scottish cities to Bristol & Cardiff

HSUK

Average journey time reductions:

28%

No. of cities directly linked:

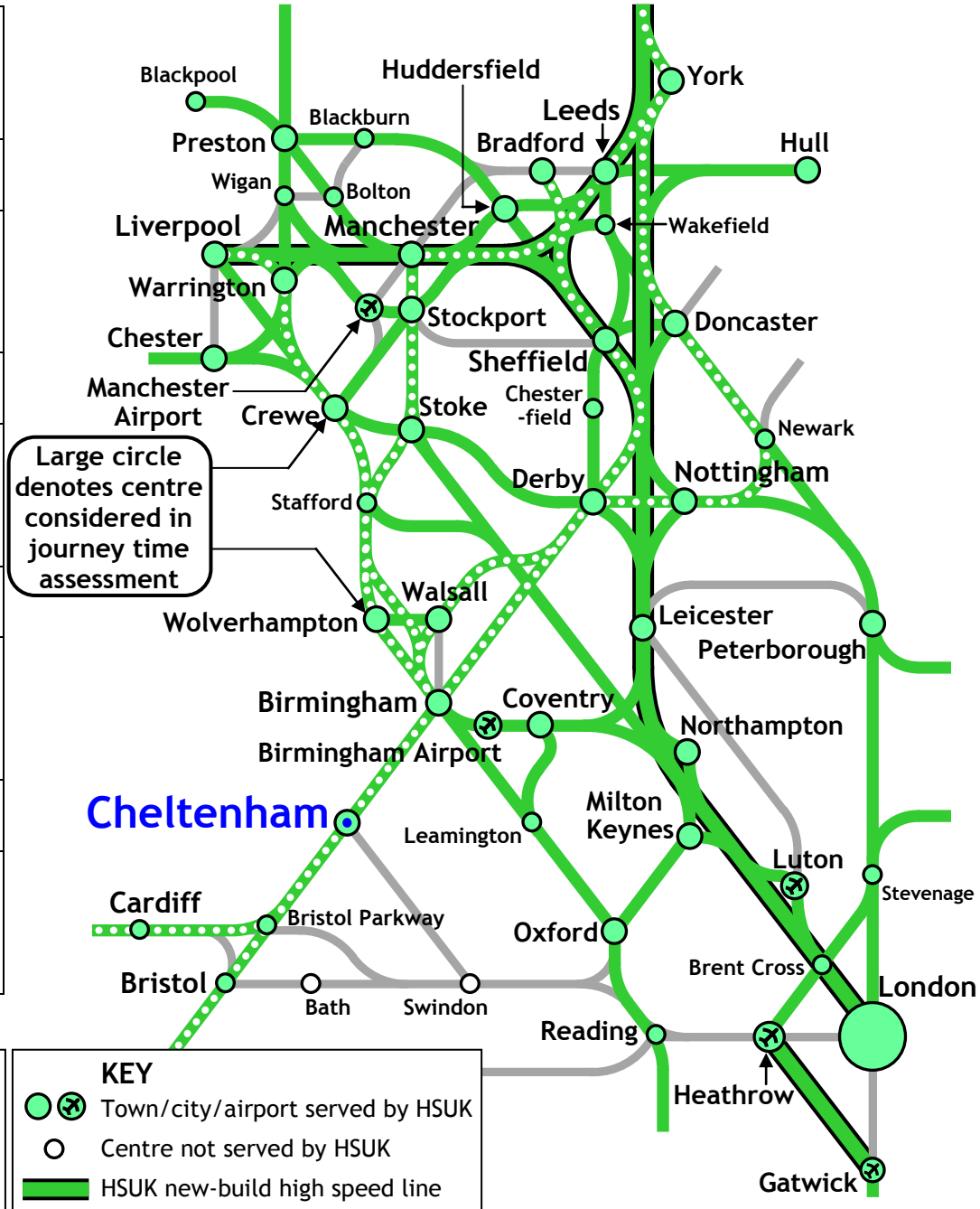
17

No. of journeys made faster:

29

No. of journeys made worse:

0



Cheltenham served by:
HSUK01,04,05,08
HSUK12,13
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Cheltenham

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Cheltenham**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
CHELTENHAM	Birmingham			40	40	40	40	0	40	0	40	0	
	B'ham Airport			82	85	85	62	1	65	1	65	1	
	Bradford			123	222	222	123	0	202	1	202	1	#
	Chester			131	195	195	111	1	155	2	155	2	
	Coventry			91	100	100	71	1	80	1	80	1	
	Crewe			110	131	131	90	1	111	1	111	1	
	Derby			62	92	92	62	0	92	0	92	0	
	Doncaster			122	165	165	122	0	145	1	145	1	#
	Heathrow			175	215	215	175	0	175	2	175	2	
	Huddersfield			159	213	213	139	1	193	1	193	1	
	Hull			190	247	247	170	1	207	2	207	2	#
	Leeds			104	167	167	104	0	167	0	167	0	#
	Leicester			106	132	132	86	1	112	1	112	1	
	Liverpool			108	176	176	108	0	156	1	156	1	
	London			156	136	136	136	1	136	0	136	0	
	Luton			134	261	261	114	1	201	3	201	3	
	Manchester			97	137	137	97	0	137	0	137	0	
	M'ch'r Airport			140	196	196	120	1	176	1	176	1	
	Milton Keynes			119	137	137	99	1	117	1	117	1	
	Northampton			111	134	134	91	1	114	1	114	1	
	Nottingham			80	120	120	80	0	120	0	120	0	
	Oxford			117	137	137	117	0	117	1	117	1	
	Peterborough			163	200	200	143	1	180	1	180	1	
	Preston			149	181	181	129	1	161	1	161	1	#
	Sheffield			84	124	124	84	0	124	0	124	0	#
	Stockport			96	128	128	96	0	128	0	128	0	
	Stoke			65	100	100	65	0	100	0	100	0	
	Walsall			50	103	103	50	0	83	1	83	1	
	Warrington			92	159	159	92	0	139	1	139	1	#
	Wolverhampton			52	67	67	52	0	67	0	67	0	
	York			121	169	169	121	0	169	0	169	0	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX C2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

CHESTER

and onward destinations in North Wales

Chester *and onward destinations in North Wales*

Town/City	Chester
Population of built-up area**	**80,000**
Ranking amongst UK cities**	N/A
Number of cities directly linked by existing rail network (out of 31)	**8**

References:
HSUK North-West Strategy
HSUK Regional Map 09
HSUK Chester Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Chester

Chester : Intercity Connectivity with HSUK and HS2

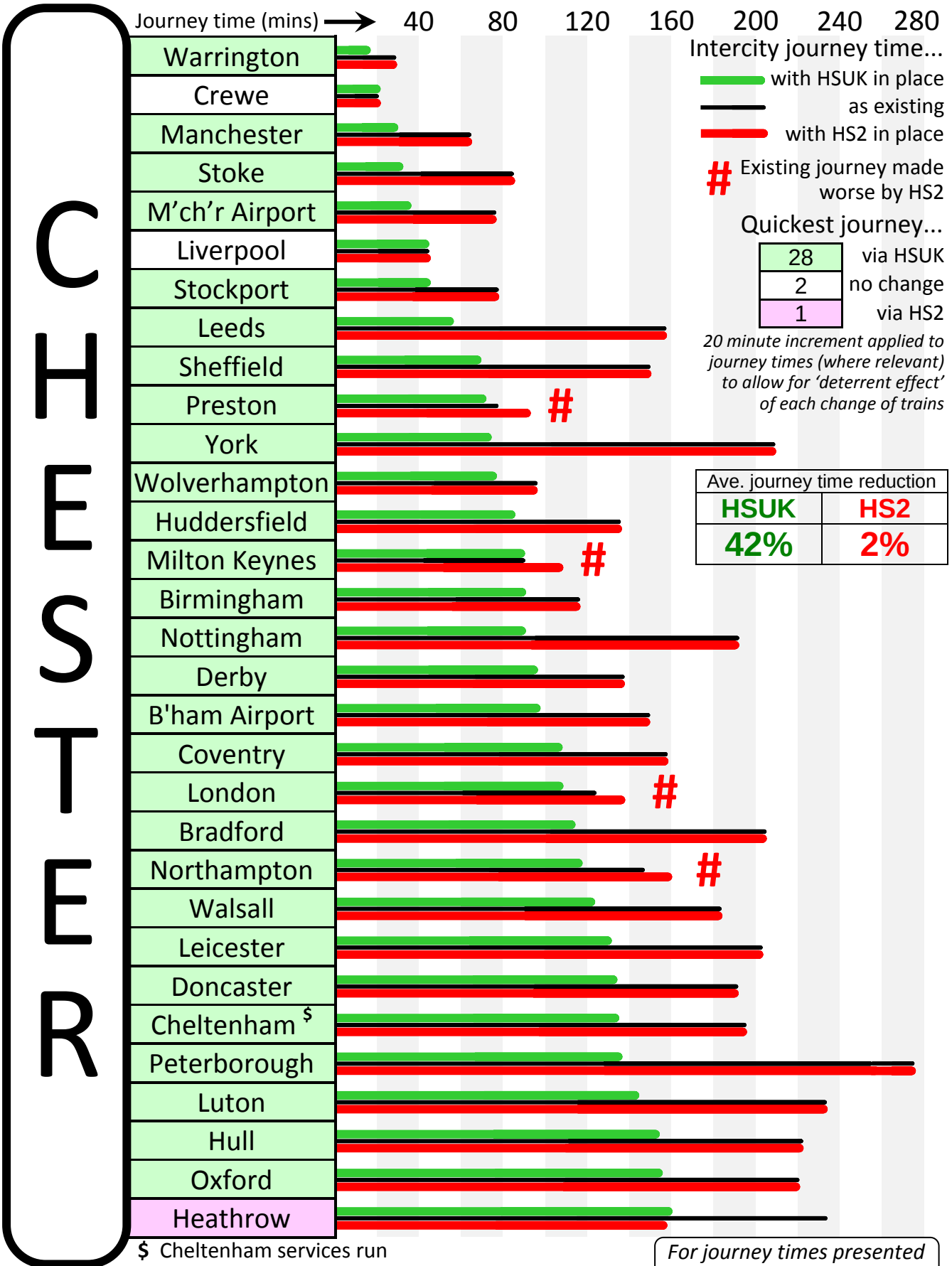
Chester	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**42%**	**12**	**29**	**0**	**28**
HS2	**2%**	**0**	**1**	**4**	**1**

Although Chester is relatively small in terms of absolute population, its status as the primary junction for the North Wales coast, Wrexham and the Wirral justifies its inclusion in the 32 key centres considered in this study. Chester currently enjoys hourly intercity services from London, with a significant proportion extending along the North Wales coast to Bangor and Holyhead, but its connectivity to other principal centres of the North, particularly Manchester and Leeds, is poor.

HS2 will significantly damage Chester's existing intercity connectivity. Through services from London to Chester and the North Wales coast will be abandoned, and passengers will instead be forced to change trains at the proposed Crewe Hub station. This new facility will only be served by HS2 services to London while HS2 services from London or Birmingham to Scotland will bypass Crewe. There is also a major concern in the proposed relocation to Crewe Hub from the existing Crewe station. The new station will no longer be at the focal point of 6 different routes, and it is possible that further local connectivity could be lost in the transfer to the new facility.

Under HSUK proposals, Chester will see major connectivity gains. Hourly services to London will be maintained, and new services are proposed, from Chester via Warrington to Manchester, Leeds, York, Darlington and Newcastle, and from Chester via Warrington to Manchester Airport, Stockport, Sheffield and Nottingham. These two services will enable Chester to become a key centre of the Northern Powerhouse, with direct links to most of the principal cities of the North. Chester will have direct intercity services to 12 of the 31 centres considered in this study (an increase from the present figure of 3) and journey times will be reduced by an average of 42%.

HIGH SPEED UK & HS2 LINKS TO CHESTER



Intercity journey time...

with HSUK in place

as existing

with HS2 in place

\# Existing journey made worse by HS2

Quickest journey...

28	via HSUK
2	no change
1	via HS2

20 minute increment applied to journey times (where relevant) to allow for 'deterrent effect' of each change of trains

Ave. journey time reduction	
HSUK	HS2
42%	2%

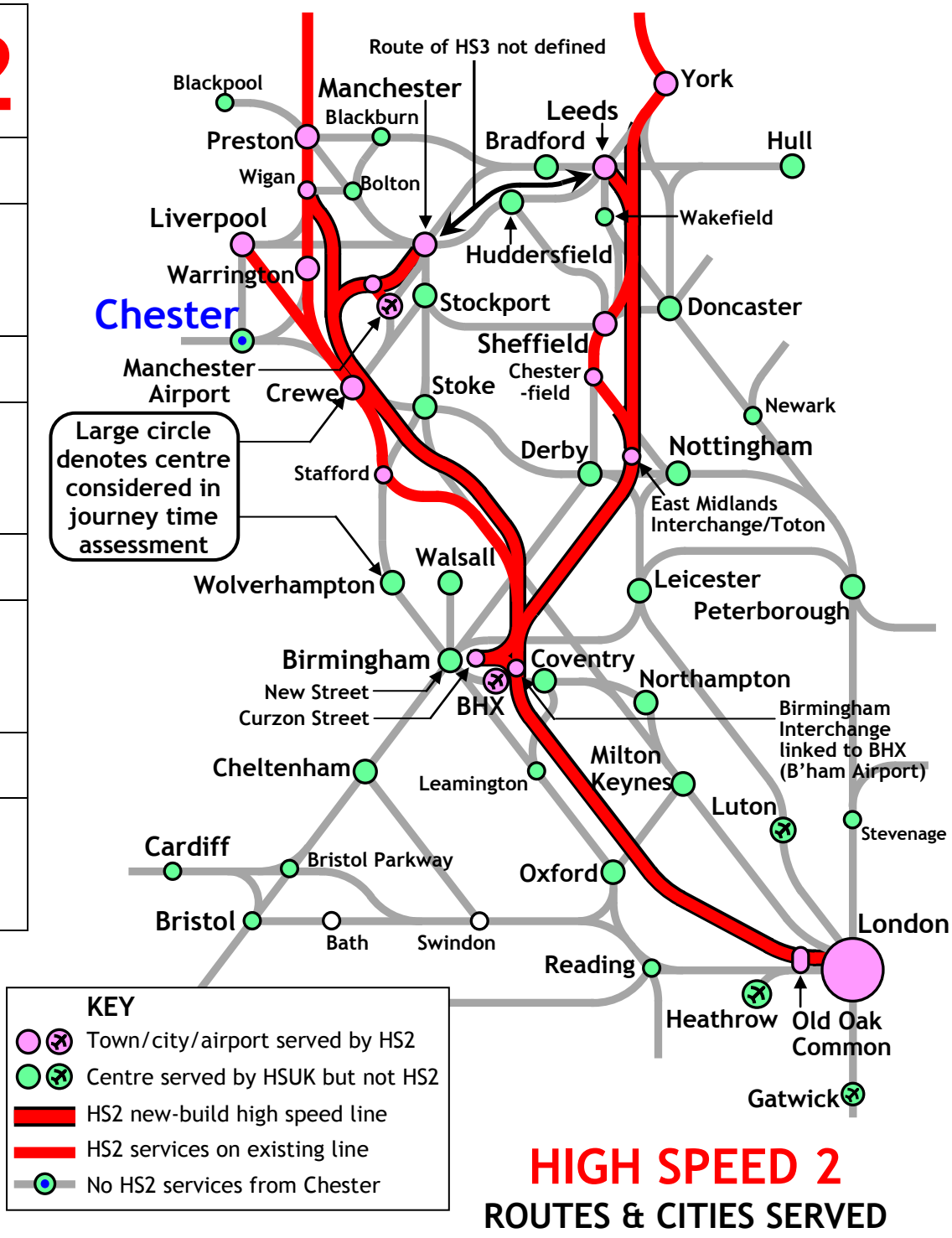
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p212

CHESTER

Direct services to London withdrawn, passengers forced to change trains at Crewe

HS2
Average journey time reductions:
2%
No. of cities directly linked:
0
No. of journeys made faster:
1
No. of journeys made worse:
4



HIGH SPEED 2
ROUTES & CITIES SERVED

CHESTER

Fully connected to national high speed network & integrated with Northern Powerhouse routes

HSUK

Average journey time reductions:

42%

No. of cities directly linked:

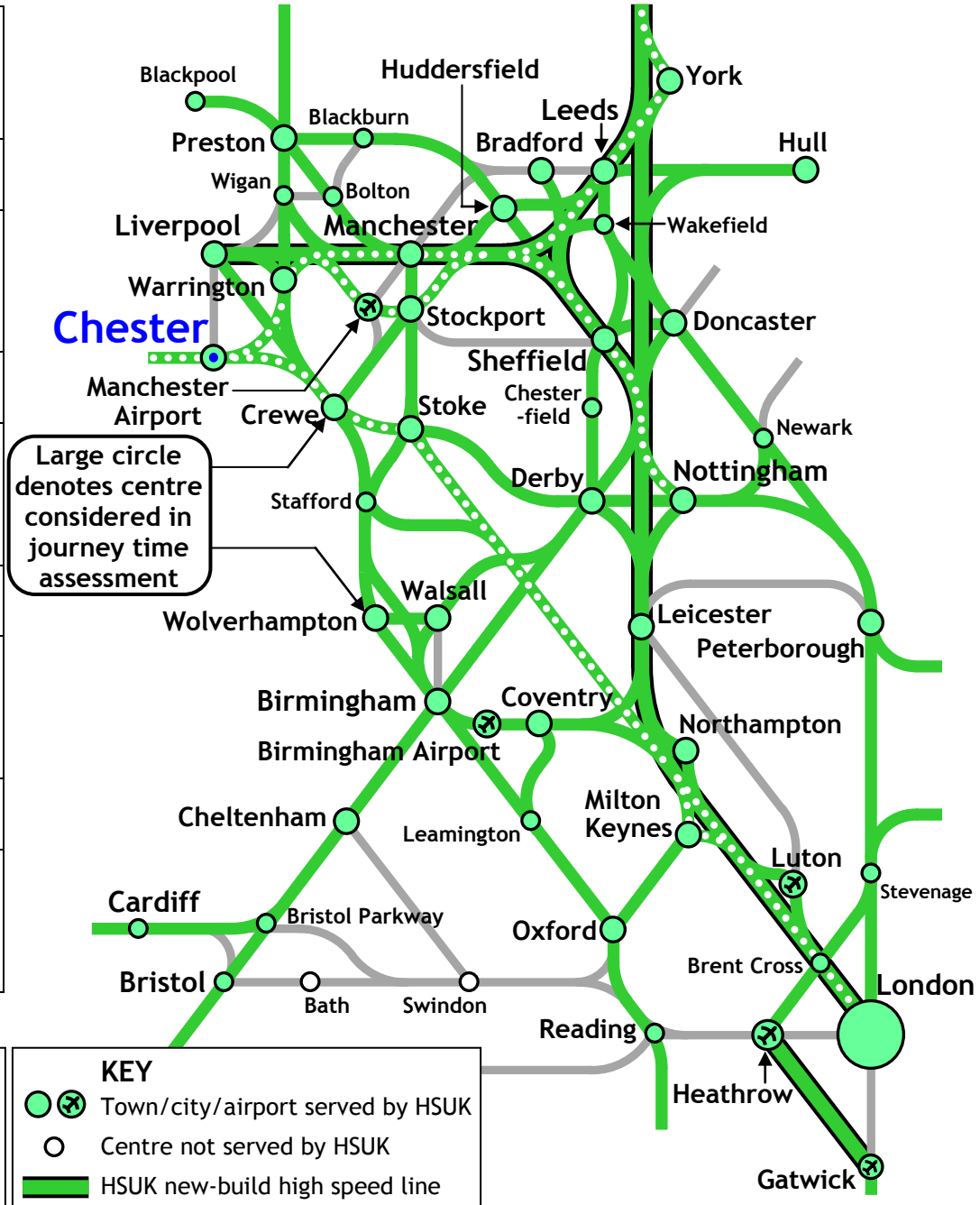
12

No. of journeys made faster:

29

No. of journeys made worse:

0



Chester served by:

HSUK23
HSUK25
HSUK52
HSUK55
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Chester

HIGH SPEED UK

ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Chester**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
CHESTER	Birmingham			86	117	117	66	1	97	1	97	1	
	B'ham Airport			99	149	149	79	1	129	1	129	1	
	Bradford			111	205	205	91	1	165	2	165	2	
	Cheltenham			131	195	195	111	1	155	2	155	2	
	Coventry			105	159	159	85	1	139	1	139	1	
	Crewe			20	20	20	20	0	20	0	20	0	
	Derby			95	138	138	75	1	118	1	118	1	
	Doncaster			131	191	191	111	1	171	1	171	1	
	Heathrow			159	234	158	139	1	194	2	118	2	
	Huddersfield			83	135	135	63	1	115	1	115	1	
	Hull			155	221	221	135	1	201	1	201	1	
	Leeds			54	158	158	54	0	138	1	138	1	
	Leicester			127	202	202	107	1	162	2	162	2	
	Liverpool			43	43	43	43	0	43	0	43	0	
	London			106	123	125	106	0	123	0	95	1	#
	Luton			141	234	234	121	1	194	2	194	2	
	Manchester			27	64	64	27	0	64	0	64	0	
	M'ch'r Airport			32	77	77	32	0	77	0	77	0	
	Milton Keynes			90	90	90	90	0	90	0	90	0	#
	Northampton			115	146	146	95	1	126	1	126	1	#
	Nottingham			91	192	192	91	0	152	2	152	2	
	Oxford			152	220	220	132	1	180	2	180	2	
	Peterborough			135	275	275	115	1	245	2	245	1	
	Preston			68	78	78	48	1	58	1	58	1	#
	Sheffield			68	149	149	68	0	129	1	129	1	
	Stockport			41	78	78	41	0	78	0	78	0	
	Stoke			30	84	84	30	0	64	1	64	1	
	Walsall			118	182	182	98	1	142	2	142	2	
	Warrington			14	28	28	14	0	28	0	28	0	
	Wolverhampton			74	95	95	54	1	75	1	75	1	
	York			72	208	208	72	0	188	1	188	1	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX C3

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

COVENTRY

Coventry

Town/City	Coventry
Population of built-up area**	360,000
Ranking amongst UK cities**	20
Number of cities directly linked by existing rail network (out of 31)	12

References:
HSUK London-Birmingham Rail Strategy
HSUK West Midlands Rail Strategy
HSUK Regional Map 04
HSUK Coventry Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Coventry : Intercity Connectivity with HSUK and HS2

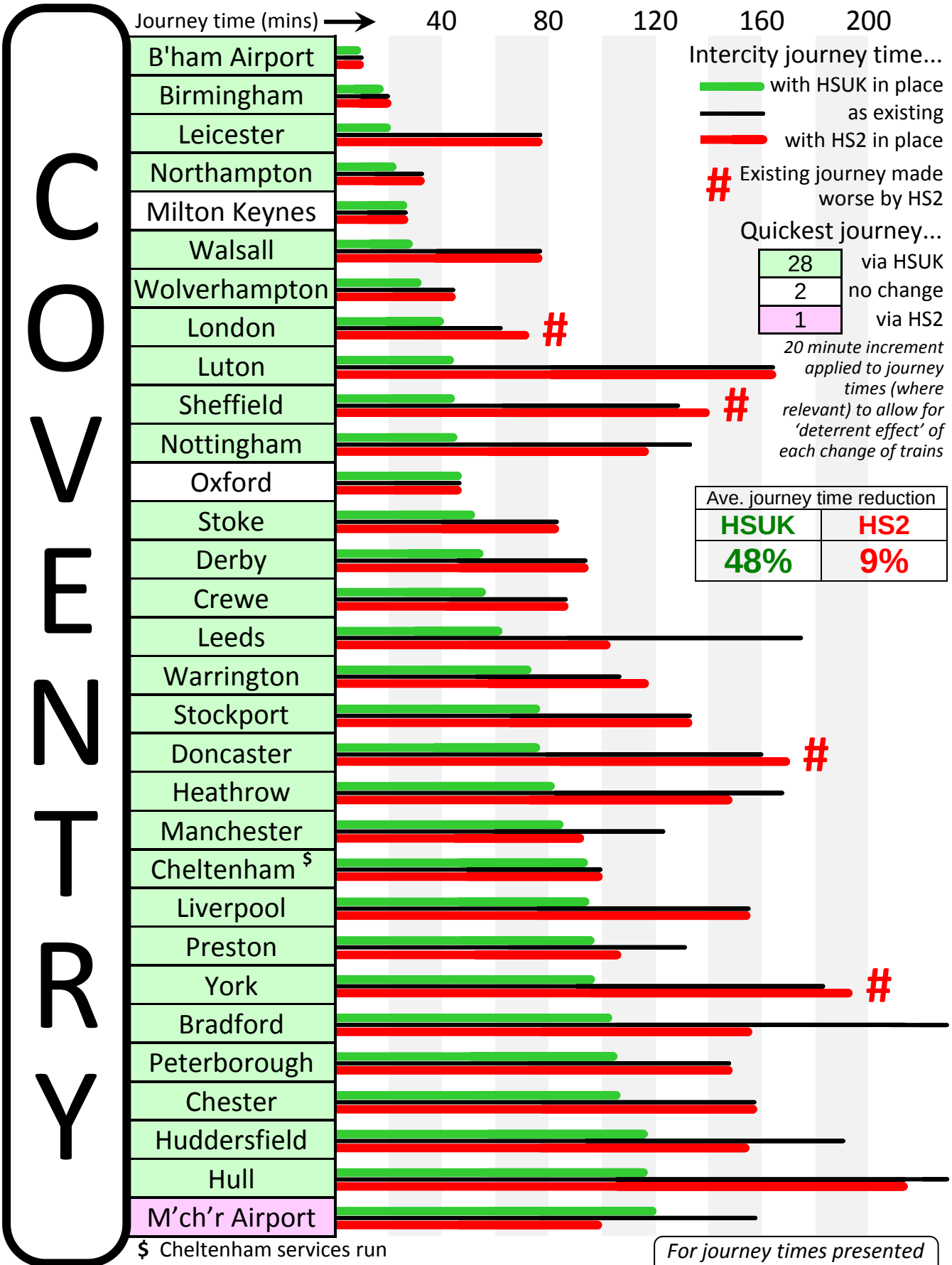
Coventry	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**48%**	**24**	**29**	**0**	**28**
HS2	**9%**	**0**	**9**	**5**	**1**

Coventry is a primary calling point on the West Coast Main Line route from London to Birmingham New Street, and as a consequence the city gains great benefit from the 3 trains per hour service from London to Birmingham. With the extension of one of these trains to Wolverhampton and onwards along the WCML to Scotland, and with Coventry also being on the CrossCountry route from Bournemouth to Manchester, the city enjoys excellent connectivity along the north-south axis of the West Coast Main Line. However, its links to other more easterly cities from Leicester through Yorkshire to the North-East are poor, mostly reliant upon change of trains at Birmingham New Street.

The introduction of HS2 will have major adverse impacts upon Coventry. Its 3 trains per hour service to London will be reduced to a single train per hour as primary Birmingham to London flows are diverted to HS2. Although there should be more capacity for local commuter services, the loss of intercity services will have the effect of reducing Coventry's status as a regional economic centre closer to that of a dormitory town. Coventry's connectivity will also suffer with the disconnection between New Street and Curzon Street stations in Birmingham, and the degradation of CrossCountry services on the north-east/south-west route.

HSUK will greatly enhance Coventry's intercity, regional and local connectivity. Its primary route from London to Birmingham will follow the existing route via Coventry, which will be 4-tracked (in accordance with the long-term ambitions of the regional transport authorities) to allow local and intercity services to be separated and thus provide a step-change increase in capacity. A northward link to the HSUK spine route at Rugby will allow direct services from Coventry to Leicester, Nottingham and Derby, as part of the establishment of a 'Midlands Ring' linking all major Midlands cities. The Rugby link will also allow for the first time direct intercity services from Coventry to the key Yorkshire cities of Sheffield, Leeds and Hull.

HIGH SPEED UK & HS2 LINKS TO COVENTRY



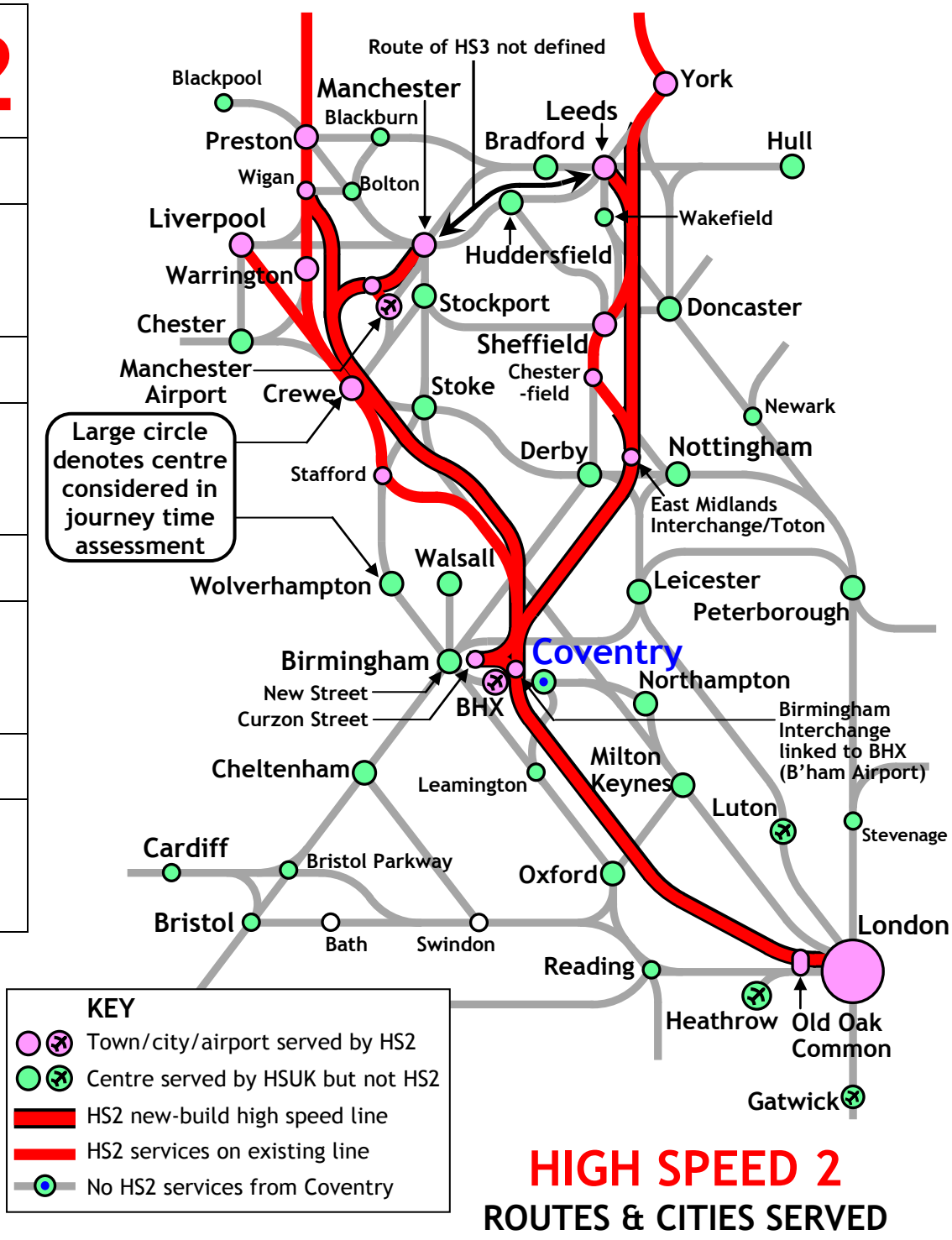
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p218

COVENTRY

Bypassed by HS2, existing 3 train per hour service to London reduced to 1 train per hour

HS2
Average journey time reductions:
9%
No. of cities directly linked:
0
No. of journeys made faster:
9
No. of journeys made worse:
5



HIGH SPEED 2

ROUTES & CITIES SERVED

COVENTRY

National and local connectivity transformed, with 'Midlands Ring' linking all principal Midlands cities

HSUK

Average journey time reductions:

48%

No. of cities directly linked:

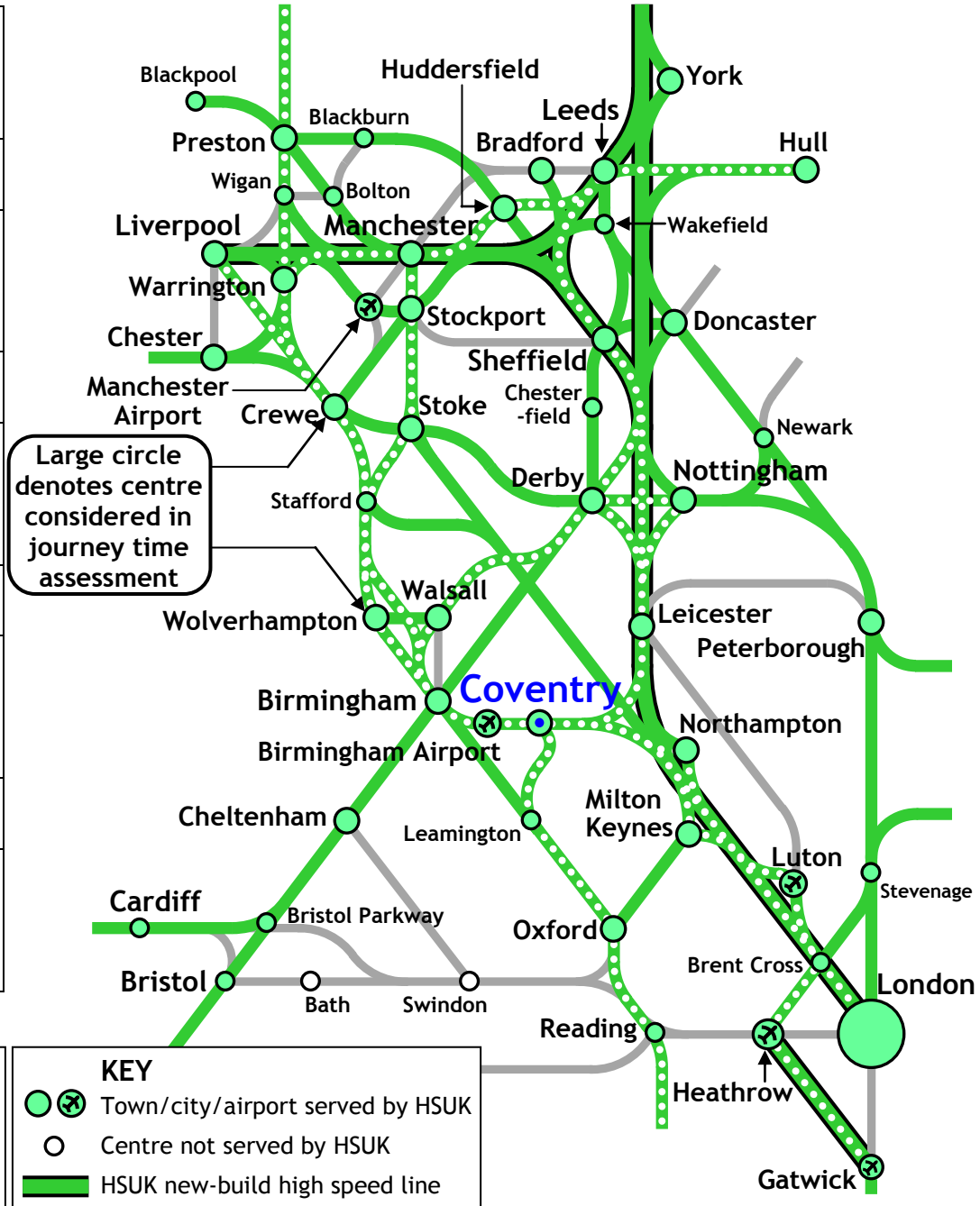
24

No. of journeys made faster:

29

No. of journeys made worse:

0



Coventry served by:
HSUK06
HSUK11
HSUK61,62,63,64
HSUK76,78
HSUK94
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Coventry

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Coventry**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
COVENTRY	Birmingham			18	20	20	18	0	20	0	20	0	
	B'ham Airport			7	10	10	7	0	10	0	10	0	
	Bradford			106	231	157	86	1	191	2	107	2[B]	
	Cheltenham			91	100	100	71	1	80	1	80	1	
	Chester			105	159	159	85	1	139	1	139	1	
	Crewe			55	87	87	55	0	87	0	87	0	
	Derby			54	94	94	54	0	74	1	74	1	
	Doncaster			75	160	160	55	1	140	1	140	1	#
	Heathrow			79	168	148	79	0	128	2	98	2[B]	
	Huddersfield			116	191	155	116	0	171	1	105	2[B]	
	Hull			119	248	215	119	0	208	2	165	2[B]	
	Leeds			64	176	102	64	0	156	1	72	1[B]	
	Leicester			19	78	78	19	0	58	1	58	1	
	Liverpool			93	155	155	93	0	135	1	135	1	
	London			38	61	61	38	0	61	0	61	0	#
	Luton			41	165	165	41	0	125	2	125	2	
	Manchester			86	122	93	86	0	122	0	63	1[B]	
	M'ch'r Airport			120	159	99	100	1	139	1	59	2	
	Milton Keynes			25	25	25	25	0	25	0	25	0	
	Northampton			19	33	33	19	0	33	0	33	0	
	Nottingham			44	133	118	44	0	113	1	68	2[B]	
	Oxford			47	47	47	47	0	47	0	47	0	
	Peterborough			104	148	148	84	1	128	1	128	1	
	Preston			95	131	106	95	0	131	0	76	1[B]	
	Sheffield			43	128	128	43	0	108	1	108	1	#
	Stockport			76	133	133	76	0	113	1	113	1	
	Stoke			51	82	82	51	0	82	0	82	0	
	Walsall			28	78	78	28	0	58	1	58	1	
	Warrington			72	107	107	72	0	107	0	107	0	#
	Wolverhampton			31	45	45	31	0	45	0	45	0	
	York			98	182	182	78	1	162	1	162	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX C4

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

CREWE

Crewe

Town/City	Crewe
Population of built-up area**	70,000
Ranking amongst UK cities**	
Number of cities directly linked by existing rail network (out of 31)	16

References:
HSUK North-West Rail Strategy
HSUK Potteries Rail Strategy
HSUK Regional Map 08
HSUK Crewe Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Crewe

Crewe : Intercity Connectivity with HSUK and HS2

Crewe	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**32%**	**20**	**25**	**0**	**25**
HS2	**6%**	**4**	**2**	**1**	**2**

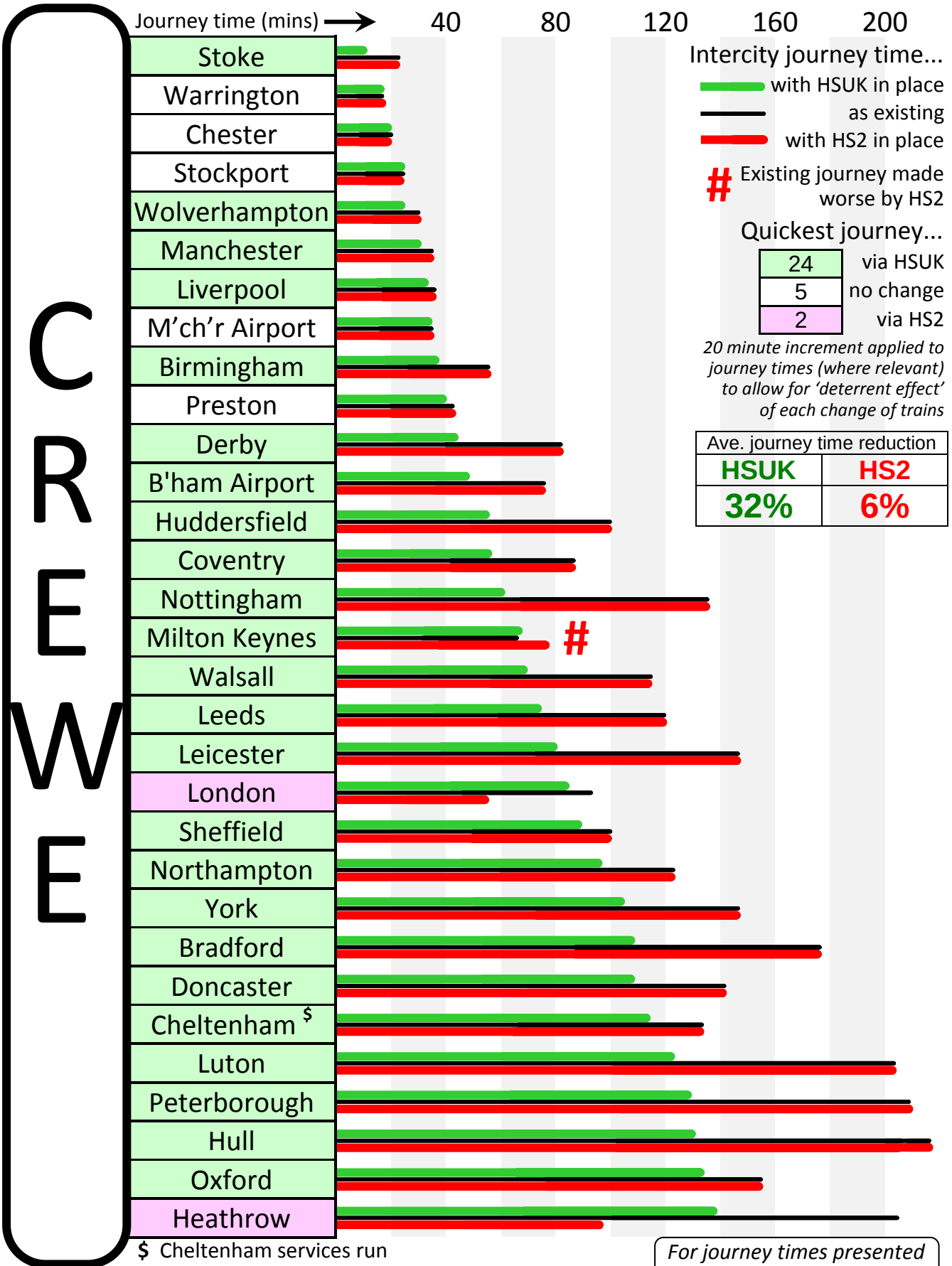
Crewe's relatively small population belies its importance as a key junction of the national railway network. It is located on the West Coast Main Line, with branches extending to Chester and the North Wales coast, to Stockport and Manchester, to Stoke and Derby, and to Shrewsbury and South Wales. It enjoys high quality intercity links to most other cities located along the West Coast Main Line, but it lacks good quality links to more east-sided cities.

Under the HS2 scheme, major developments are proposed, with plans for a new 'Crewe Hub' station to form the focus of regional connectivity. Although replacement of the existing ramshackle Victorian station might be welcomed, there are several major concerns:

- Crewe Hub will no longer be at the focal point of 6 different routes, and it is possible that local connectivity could be lost as a consequence;
- Crewe Hub will only enjoy direct HS2 links to London, Liverpool and Preston. This represents a considerable reduction in Crewe's present intercity connectivity.
- The current proposals leave the much larger adjacent Potteries region bypassed, and effectively disconnected from HS2.

Under HSUK proposals, Crewe will retain its status as a primary West Coast Main Line hub, and it will also enjoy much superior east-west links. New WCML-HSUK links at Warrington will place Crewe on a new 'North Midlands' corridor running Liverpool-Warrington-Crewe-Stoke-Derby-Nottingham, and will also permit new direct services from Crewe to Manchester, Leeds and Hull. The HSUK plans do not rule out the Crewe Hub proposals, as long as these maintain the integrity of the network hub at Crewe, and allow existing through services (especially the Manchester-Crewe-Shrewsbury-Cardiff service) to continue to operate.

HIGH SPEED UK & HS2 LINKS TO CREWE



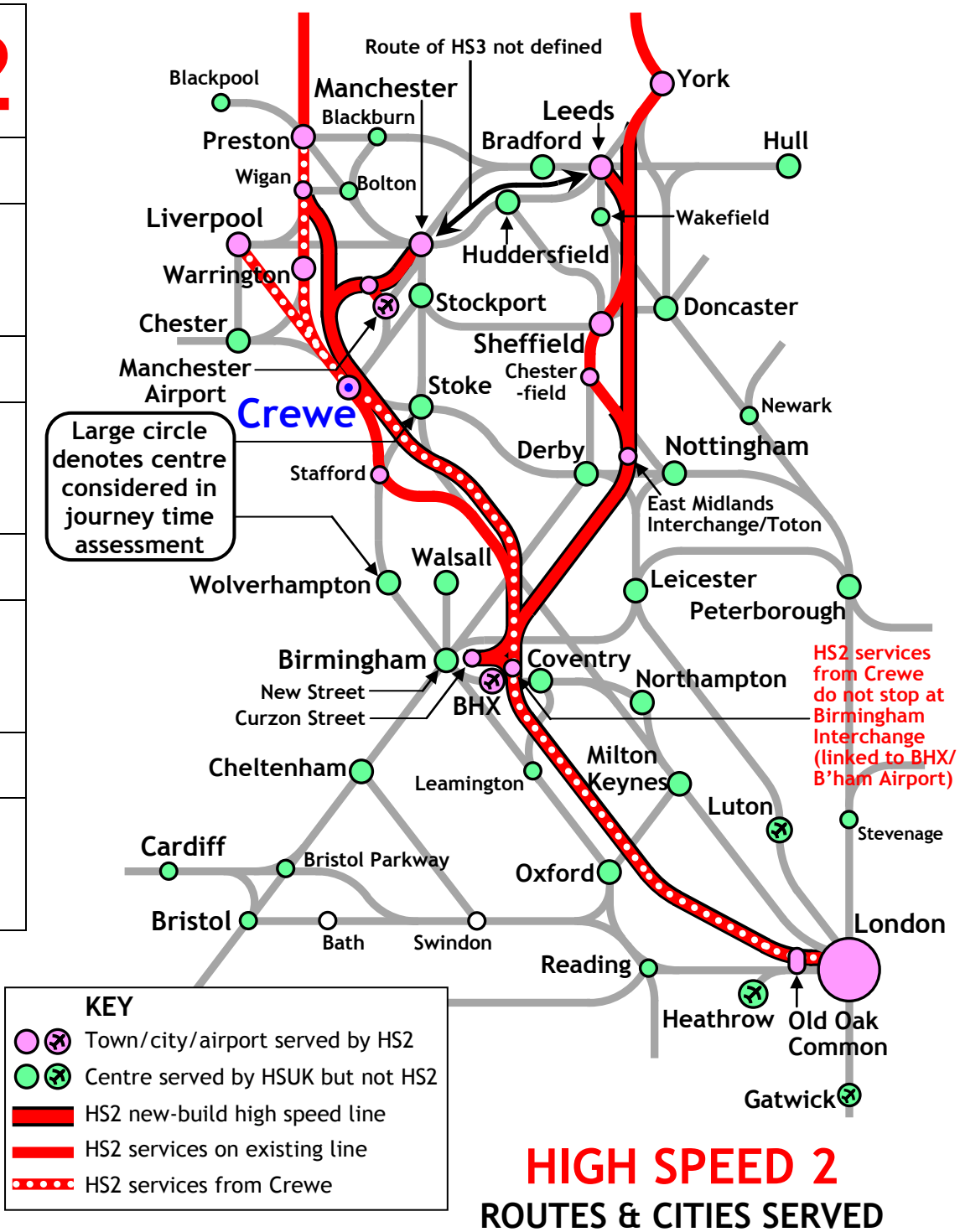
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p224

CREWE

New Crewe Hub station offers accelerated HS2 links to London and nowhere else

HS2
Average journey time reductions:
6%
No. of cities directly linked:
4
No. of journeys made faster:
2
No. of journeys made worse:
1



CREWE

Fully connected to national high speed network, new HSUK transpennine link to Yorkshire

HSUK

Average journey time reductions:

32%

No. of cities directly linked:

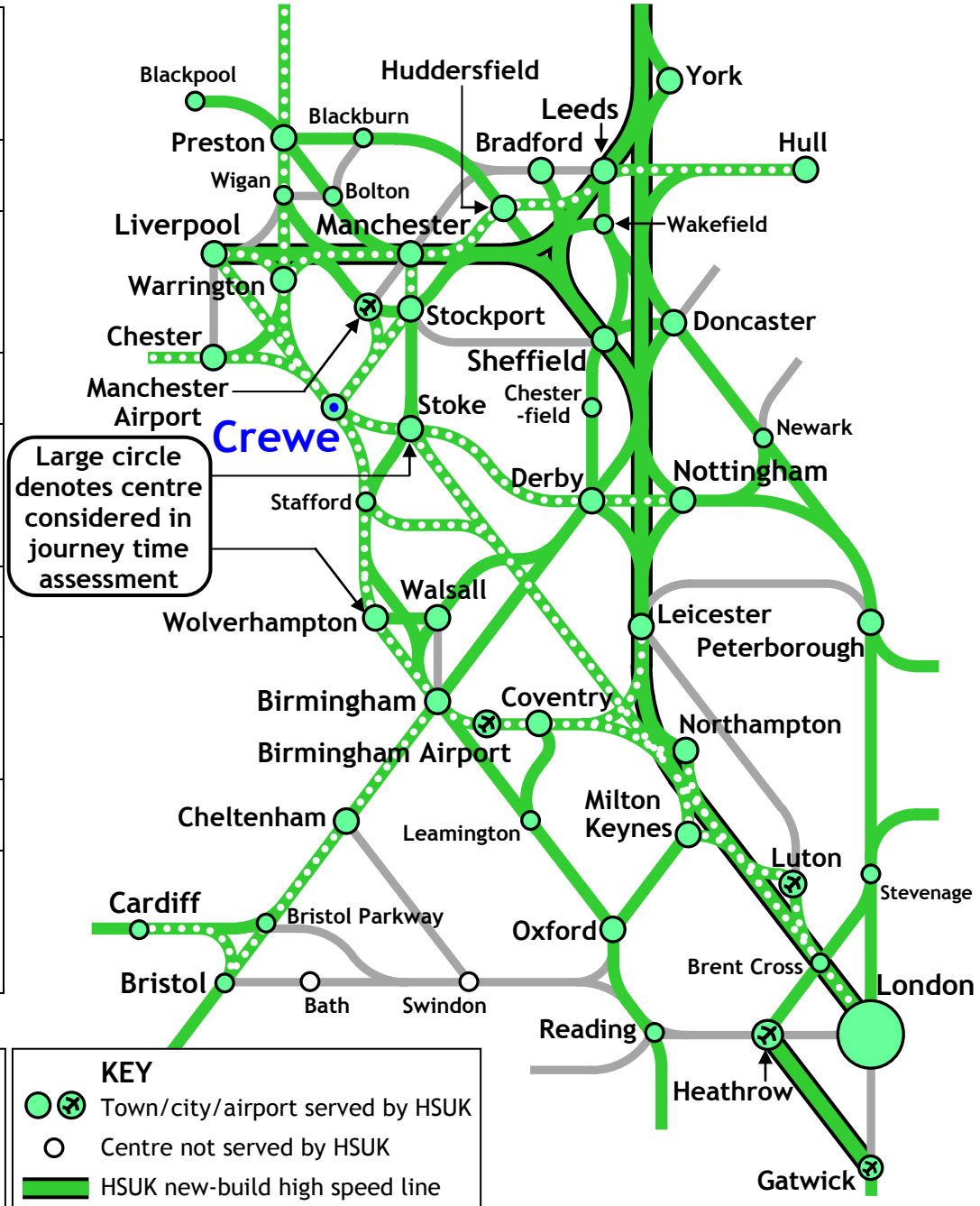
20

No. of journeys made faster:

25

No. of journeys made worse:

0



Crewe served by:
HSUK06
HSUK13,14
HSUK52,53,55
HSUK61
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Crewe

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Crewe**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
CREWE	Birmingham			37	55	55	37	0	55	0	55	0	
	B'ham Airport			46	77	77	46	0	77	0	77	0	
	Bradford			108	178	178	88	1	138	2	138	2	
	Cheltenham			110	131	131	90	1	111	1	111	1	
	Chester			20	20	20	20	0	20	0	20	0	
	Coventry			55	87	87	55	0	87	0	87	0	
	Derby			42	82	82	42	0	82	0	82	0	
	Doncaster			111	141	141	91	1	121	1	121	1	
	Heathrow			138	205	98	118	1	165	2	78	1	
	Huddersfield			55	100	100	55	0	80	1	80	1	
	Hull			128	217	217	128	0	177	2	177	2	
	Leeds			73	120	120	65	0	100	1	100	1	
	Leicester			79	147	147	79	0	127	1	127	1	
	Liverpool			31	36	36	31	0	36	0	36	0	
	London			84	93	55	84	0	93	0	55	0	
	Luton			119	203	203	99	1	163	2	163	2	
	Manchester			28	35	35	28	0	35	0	35	0	
	M'ch'r Airport			35	35	35	35	0	35	0	35	0	
	Milton Keynes			66	66	66	66	0	66	0	66	0	#
	Northampton			94	103	103	74	1	103	0	103	0	
	Nottingham			59	135	135	59	0	115	1	115	1	
	Oxford			131	155	155	111	1	135	1	135	1	
	Peterborough			126	208	208	106	1	188	1	188	1	
	Preston			42	42	42	42	0	42	0	42	0	
	Sheffield			85	100	100	65	1	80	1	80	1	
	Stockport			24	24	24	24	0	24	0	24	0	
	Stoke			8	22	22	8	0	22	0	22	0	
	Walsall			67	114	114	47	1	94	1	94	1	
	Warrington			15	15	15	15	0	15	0	15	0	
	Wolverhampton			22	31	31	22	0	31	0	31	0	
	York			103	147	147	83	1	127	1	127	1	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX D1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

DERBY

Derby

Town/City	Derby
Population of built-up area**	270,000
Ranking amongst UK cities**	29
Number of cities directly linked by existing rail network (out of 31)	12

References:
HSUK East Midlands Rail Strategy
HSUK West Midlands Rail Strategy
HSUK Regional Maps 05 & 06
HSUK Derby Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Derby : Intercity Connectivity with HSUK and HS2

Derby	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**47%**	**27**	**29**	**0**	**31**
HS2	**2%**	**0**	**4**	**12**	**0**

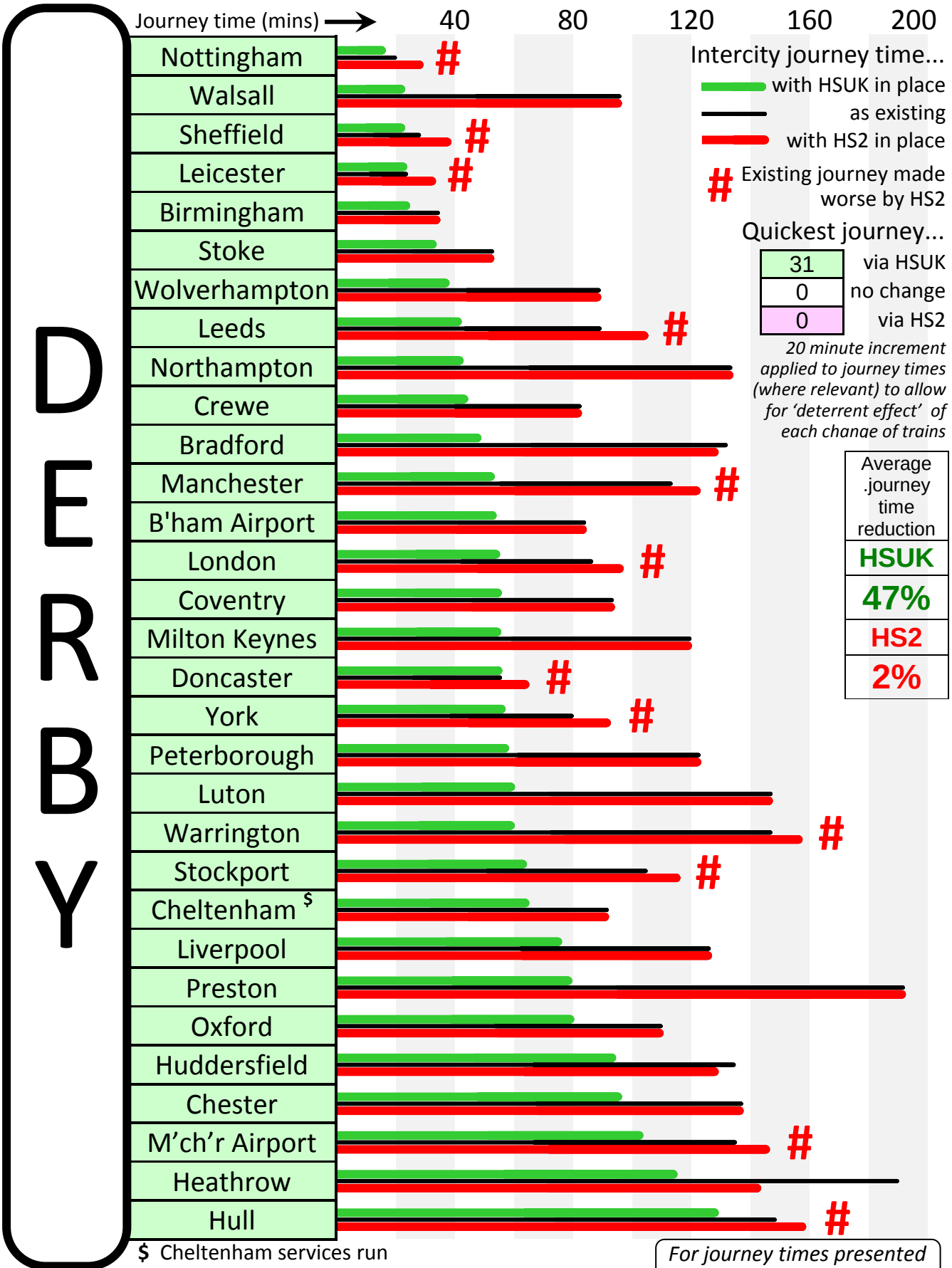
Derby is located at the hub of the former Midland Railway, at the meeting point of the present-day Midland and CrossCountry main lines. As such, it enjoys good connectivity to other principal UK cities along Midland and CrossCountry/East Coast routes, and its primary deficiency is poorer links to Manchester and Liverpool and other North-West cities.

Derby's intercity connectivity will be significantly damaged under the HS2 proposals, with significant service reductions proposed on both Midland and CrossCountry routes. Rather than serve central Derby, HS2 will serve a parkway station located midway between Nottingham and Derby at the existing Toton marshalling yard. Toton is 14km from central Derby, and currently has no rail services. As yet, no credible proposals have emerged for:

- how local services will be developed to serve Toton and provide efficient links from Toton to Derby (and Nottingham).
- how the 2-stage journeys ie Derby to Toton and Toton to London or Leeds can provide superior passenger experience than direct journeys from Derby to London and Leeds.
- how the quality and connectivity of local services diverted via Toton will be maintained.

HSUK avoids all of these problems by aligning its primary CrossCountry route through the existing Derby station. The existing CrossCountry route via Burton will be upgraded to 4 tracks, and the former Great Northern route via Ilkeston will be restored to enable a short link from Derby to the HSUK trunk route in the Erewash Valley. Derby's greatest connectivity gains will be in routes to the North-West, with the existing Derby-Stoke line upgraded to create a new intercity route running from Nottingham and Derby to Stoke, Crewe, Warrington and Liverpool. Under the HSUK proposals, Derby will enjoy direct high speed services to all principal UK cities, and average 47% journey time reductions.

HIGH SPEED UK & HS2 LINKS TO DERBY



$ Cheltenham services run onward to Bristol and Cardiff

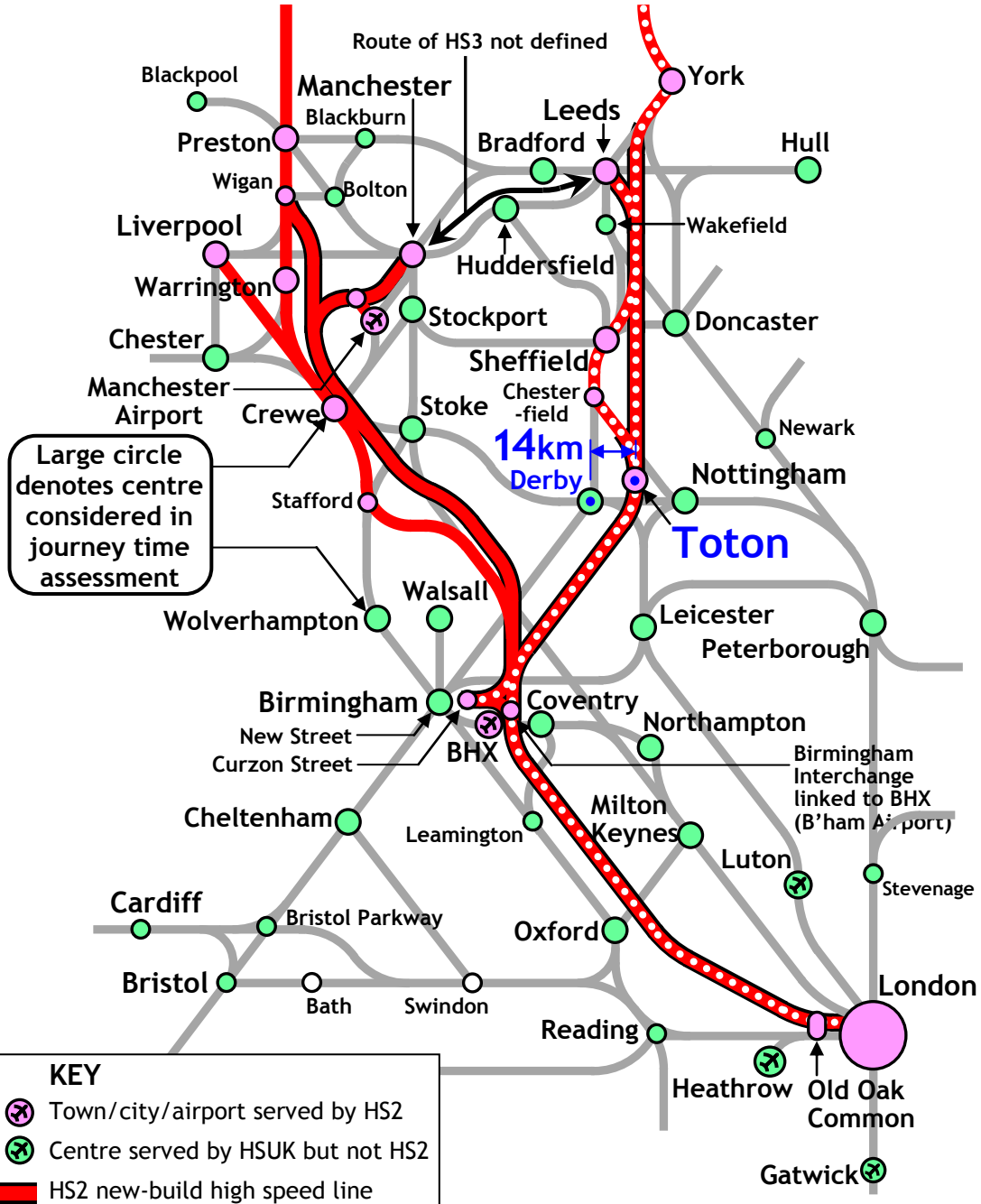
For journey times presented in tabulated format see p230

TOTON *(for Derby)*

Derby bypassed by HS2; limited connections available from Toton, 14km from Derby

HS2
Average journey time reductions:
2%
No. of cities directly linked:
0
No. of journeys made faster:
4
No. of journeys made worse:
12

Connectivity statistics relate to Derby rather than Toton



KEY

- Town/city/airport served by HS2
- Centre served by HSUK but not HS2
- HS2 new-build high speed line
- HS2 services on existing line
- No HS2 services from Derby

HIGH SPEED 2

ROUTES & CITIES SERVED

DERBY

Fully connected to national high speed network, direct high speed links to most principal UK cities

HSUK

Average journey time reductions:

47%

No. of cities directly linked:

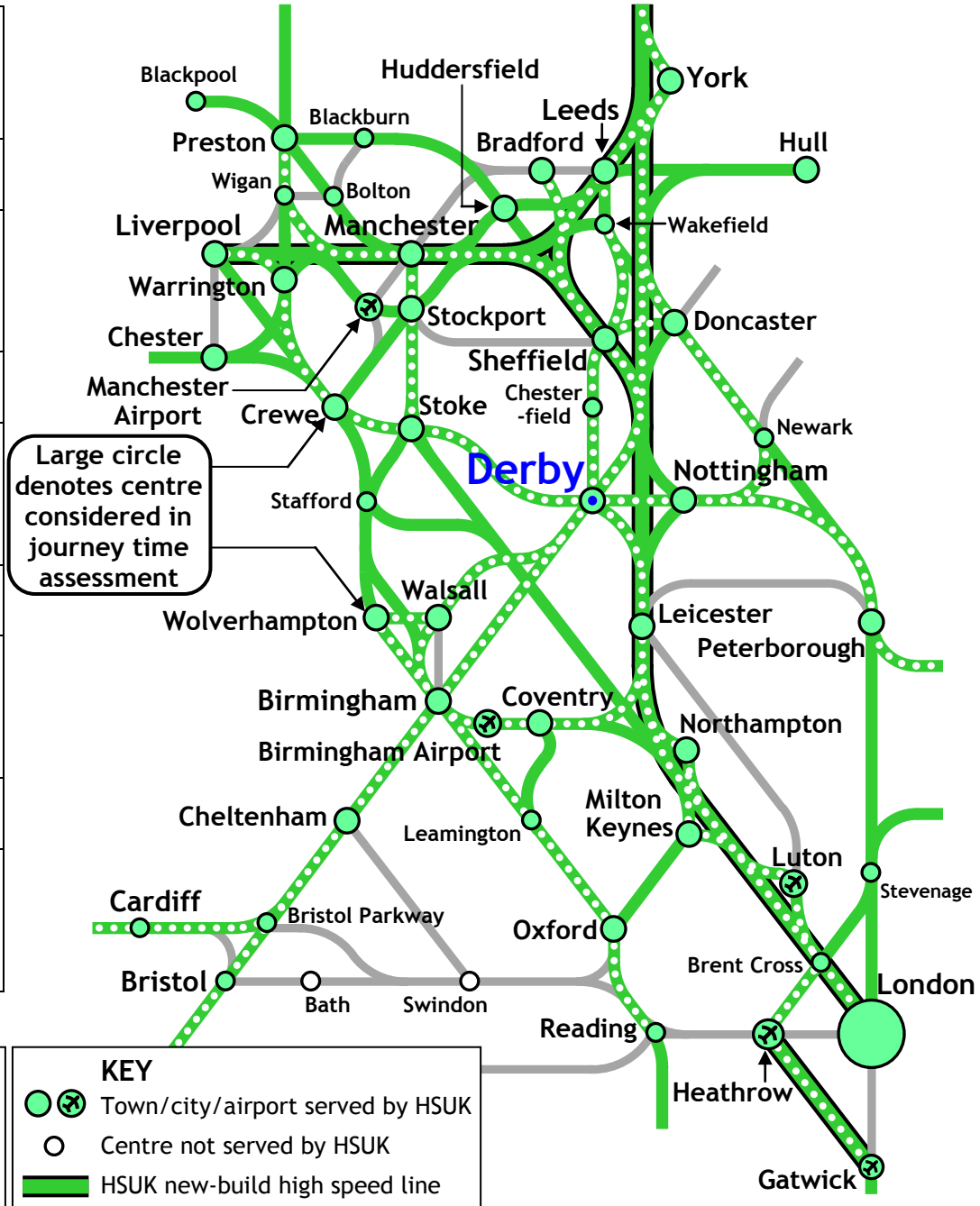
27

No. of journeys made faster:

29

No. of journeys made worse:

0



Derby served by:
HSUK01,05,07,08
HSUK09,10,14
HSUK61,62,63,64
HSUK71,72
HSUK76,77,78,79
HSUK93
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Derby

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Derby**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
DERBY	Birmingham			22	34	34	22	0	34	0	34	0	
	B'ham Airport			53	84	83	53	0	64	1	53	1[B]	
	Bradford			49	132	129	49	0	112	1	89	2	
	Cheltenham			62	92	92	62	0	92	0	92	0	
	Chester			95	138	138	75	1	118	1	118	1	
	Coventry			54	94	94	54	0	74	1	74	1	
	Crewe			42	82	82	42	0	82	0	82	0	
	Doncaster			57	57	57	57	0	57	0	57	0	#
	Heathrow			113	203	143	113	0	163	2	103	2	
	Huddersfield			93	135	129	73	1	115	1	89	2	
	Hull			126	148	148	106	1	128	1	128	1	#
	Leeds			40	76	85	40	0	76	0	55	1[A]	#
	Leicester			22	22	22	22	0	22	0	22	0	#
	Liverpool			75	166	166	75	0	146	1	146	1	
	London			53	87	87	53	0	87	0	80	0	#
	Luton			59	114	114	59	0	94	1	94	1	
	Manchester			53	114	114	53	0	94	1	94	1	#
	M'ch'r Airport			103	136	136	83	1	116	1	116	1	#
	Milton Keynes			56	120	120	56	0	100	1	100	1	
	Northampton			42	133	133	42	0	93	2	93	2	
	Nottingham			15	20	20	15	0	20	0	20	0	#
	Oxford			79	110	110	79	0	110	0	110	0	
	Peterborough			58	122	122	58	0	102	1	102	1	
	Preston			80	192	192	80	0	152	2	152	2	
	Sheffield			21	28	28	21	0	28	0	28	0	#
	Stockport			60	105	105	60	0	85	1	85	1	#
	Stoke			31	53	53	31	0	53	0	53	0	
	Walsall			21	96	96	21	0	76	1	76	1	
	Warrington			58	147	147	58	0	127	1	127	1	#
	Wolverhampton			37	89	89	37	0	69	1	69	1	
	York			57	80	93	57	0	80	0	63	1[A]	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX D2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

DONCASTER

Doncaster

Town/City	Doncaster
Population of built-up area**	160,000
Ranking amongst UK cities**	50
Number of cities directly linked by existing rail network (out of 31)	12

References:
HSUK Yorkshire Rail Strategy
HSUK Regional Maps 11 & 12
HSUK Doncaster Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Doncaster : Intercity Connectivity with HSUK and HS2

Doncaster	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**37%**	**16**	**25**	**0**	**28**
HS2	**1%**	**0**	**1**	**16**	**0**

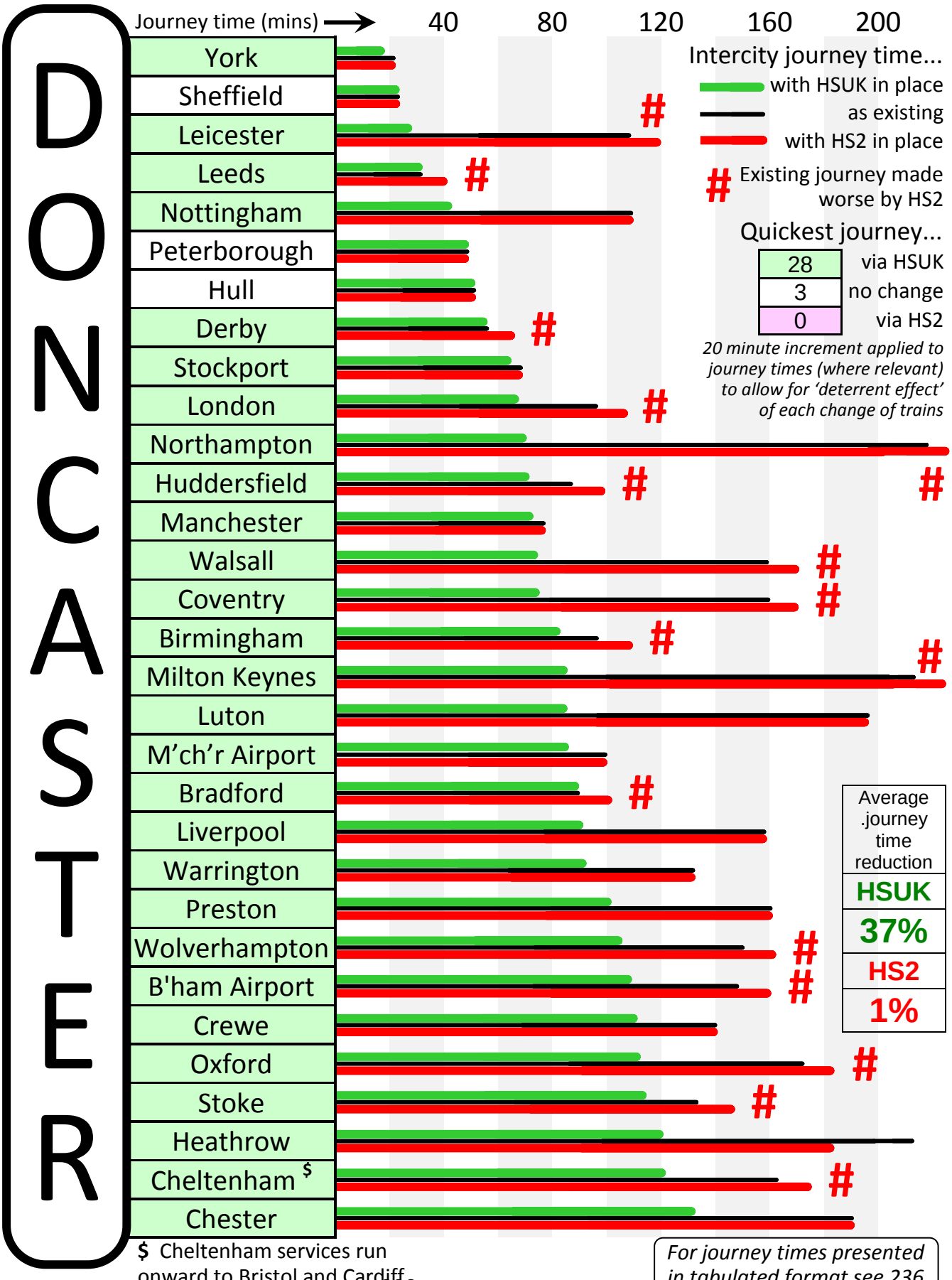
Doncaster is located at a key junction on the East Coast Main Line, and it enjoys high quality intercity services to most ECML destinations. It also enjoys CrossCountry services on the Newcastle-Birmingham-Reading route and TransPennine services on the Cleethorpes-Sheffield-Manchester Airport route.

Doncaster will see its intercity connectivity significantly reduced by the introduction of HS2. East Coast services from London to both Leeds and Newcastle/Edinburgh will be reduced in frequency, and CrossCountry services to Derby, Birmingham and many other destinations will be weakened through the proposed diversion via the proposed East Midlands Interchange at Toton. Doncaster's score of 16 out of 30 journeys made worse by HS2 is the highest of any town, city or airport considered in this study.

The revised 'M18' HS2 route will pass through the Borough of Doncaster at Mexborough, where major demolition of residential property at the 'Shimmers' estate is required to clear the way for the new line. Doncaster will not be directly served by HS2, and it will only enjoy a circuitous connection to the very limited high speed services that will operate from Sheffield Midland. Doncaster's only benefit from HS2 will be the establishment of a training college.

Under the HSUK proposals, Doncaster will maintain its status as a key hub of the UK network. It will benefit from its proximity to the HSUK trunk route with direct links to the town, both to the north and south, and it will benefit greatly from new direct links to Nottingham and Leicester, and from the enhanced connections available from both cities. Overall, Doncaster will see 37% average journey time reductions, and no journeys made worse.

HIGH SPEED UK & HS2 LINKS TO DONCASTER



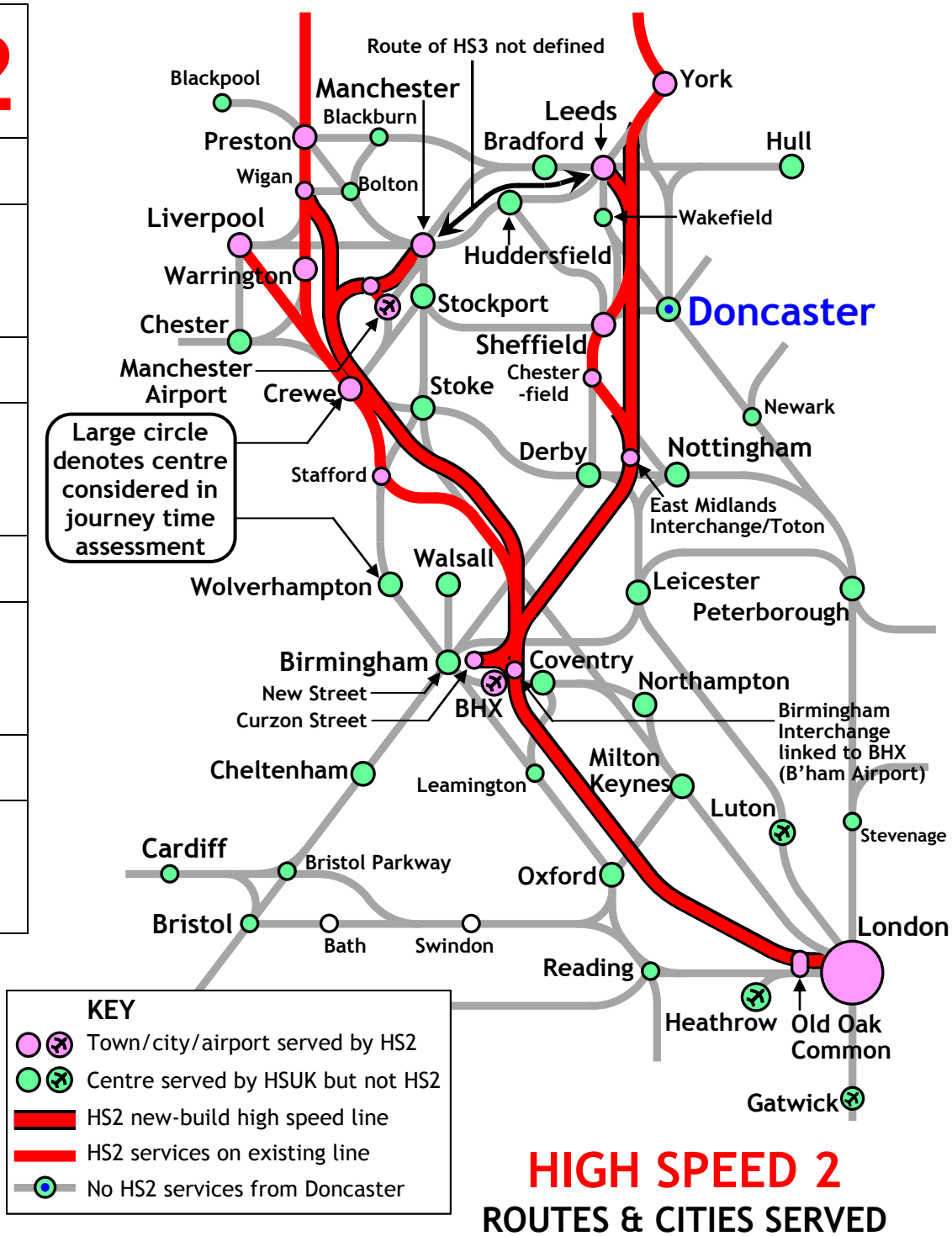
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see 236

DONCASTER

Key East Coast Main Line hub bypassed by HS2, existing services made worse

HS2
Average journey time reductions:
1%
No. of cities directly linked:
0
No. of journeys made faster:
1
No. of journeys made worse:
16



DONCASTER

Fully connected to national high speed network, existing intercity connectivity enhanced

HSUK

Average journey time reductions:

37%

No. of cities directly linked:

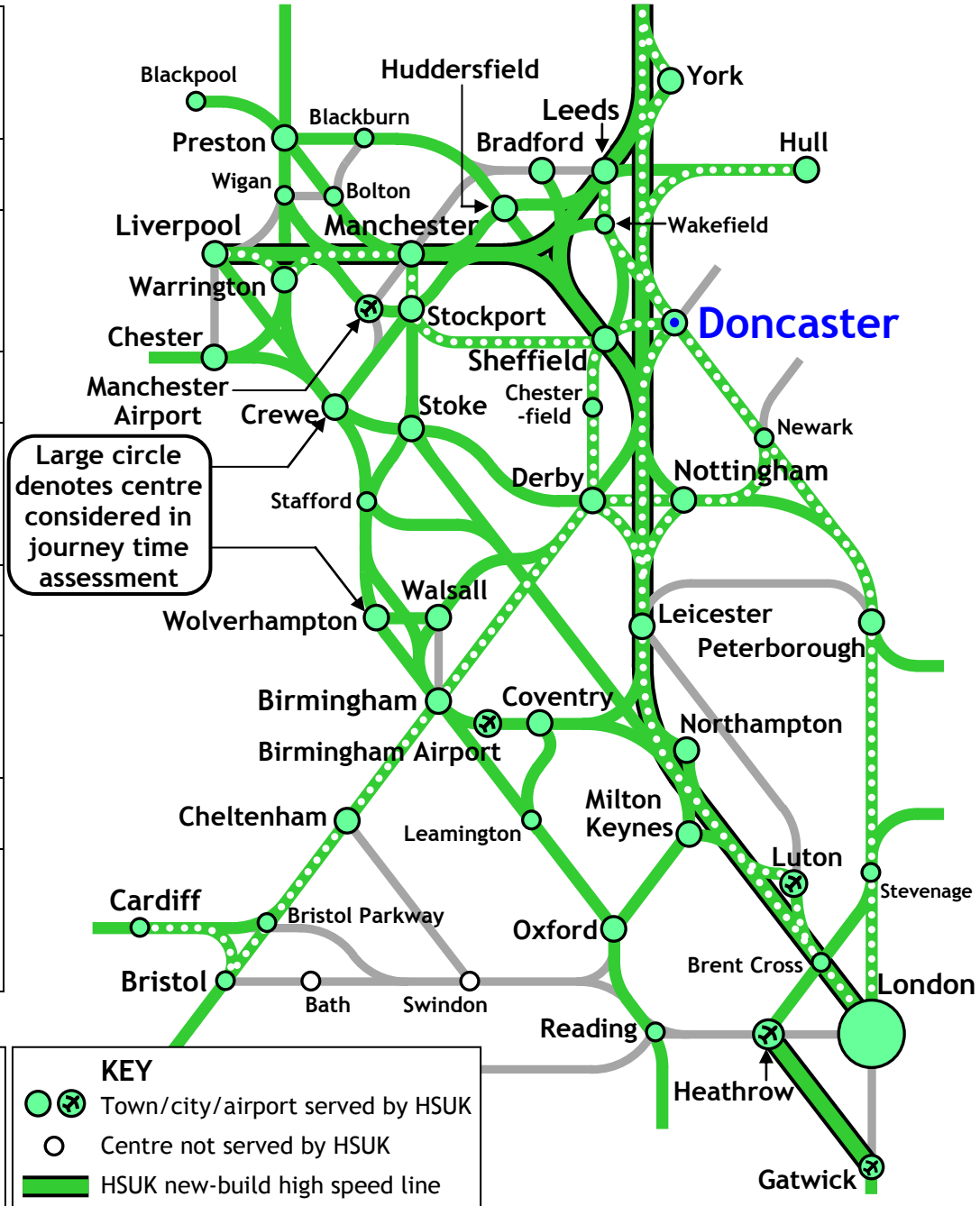
16

No. of journeys made faster:

25

No. of journeys made worse:

0



Doncaster served by:
HSUK05
HSUK27
HSUK34,36,37
HSUK72,74
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Doncaster

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Doncaster**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
DONCASTER	Birmingham			82	98	98	82	0	98	0	98	0	#
	B'ham Airport			112	150	150	92	1	130	1	130	1	#
	Bradford			91	91	91	71	1	71	1	71	1	#
	Cheltenham			122	165	165	122	0	145	1	145	1	#
	Chester			131	191	191	111	1	171	1	171	1	
	Coventry			75	160	160	55	1	140	1	140	1	#
	Crewe			111	141	141	91	1	121	1	121	1	
	Derby			57	57	57	57	0	57	0	57	0	#
	Heathrow			120	213	184	100	1	173	2	144	2	
	Huddersfield			75	87	87	55	1	67	1	67	1	#
	Hull			51	51	51	51	0	51	0	51	0	
	Leeds			28	30	30	28	0	30	0	30	0	#
	Leicester			26	109	109	26	0	89	1	89	1	#
	Liverpool			96	160	160	76	1	140	1	140	1	
	London			65	98	98	65	0	98	0	98	0	#
	Luton			86	197	197	66	1	157	2	157	2	
	Manchester			78	78	78	78	0	78	0	78	0	
	M'ch'r Airport			89	100	100	69	1	100	0	100	0	
	Milton Keynes			83	214	214	63	1	174	2	174	2	#
	Northampton			69	218	218	49	1	178	2	178	2	#
	Nottingham			40	108	108	40	0	88	1	88	1	
	Oxford			112	174	174	92	1	174	0	174	0	#
	Peterborough			51	51	51	51	0	51	0	51	0	
	Preston			105	161	161	85	1	141	1	141	1	
	Sheffield			23	23	23	23	0	23	0	23	0	
	Stockport			63	69	69	63	0	69	0	69	0	
	Stoke			121	134	134	101	1	114	1	114	1	#
	Walsall			93	160	160	73	1	140	1	140	1	#
	Warrington			92	134	134	92	0	114	1	114	1	
	Wolverhampton			106	152	152	86	1	132	1	132	1	#
	York			17	21	21	17	0	21	0	21	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX H1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

HEATHROW AIRPORT

Heathrow Airport

Airport	Heathrow
Passenger numbers per year**	**75.0 million**
Ranking amongst UK airports**	**1**
Number of cities directly linked by existing rail network (out of 31)	**1**

References:
HSUK London-Birmingham Rail Strategy
HSUK Regional Map 01
HSUK Heathrow Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Busiest_airports_in_the_United_Kingdom_by_total_passenger_traffic

Heathrow : Intercity Connectivity with HSUK and HS2

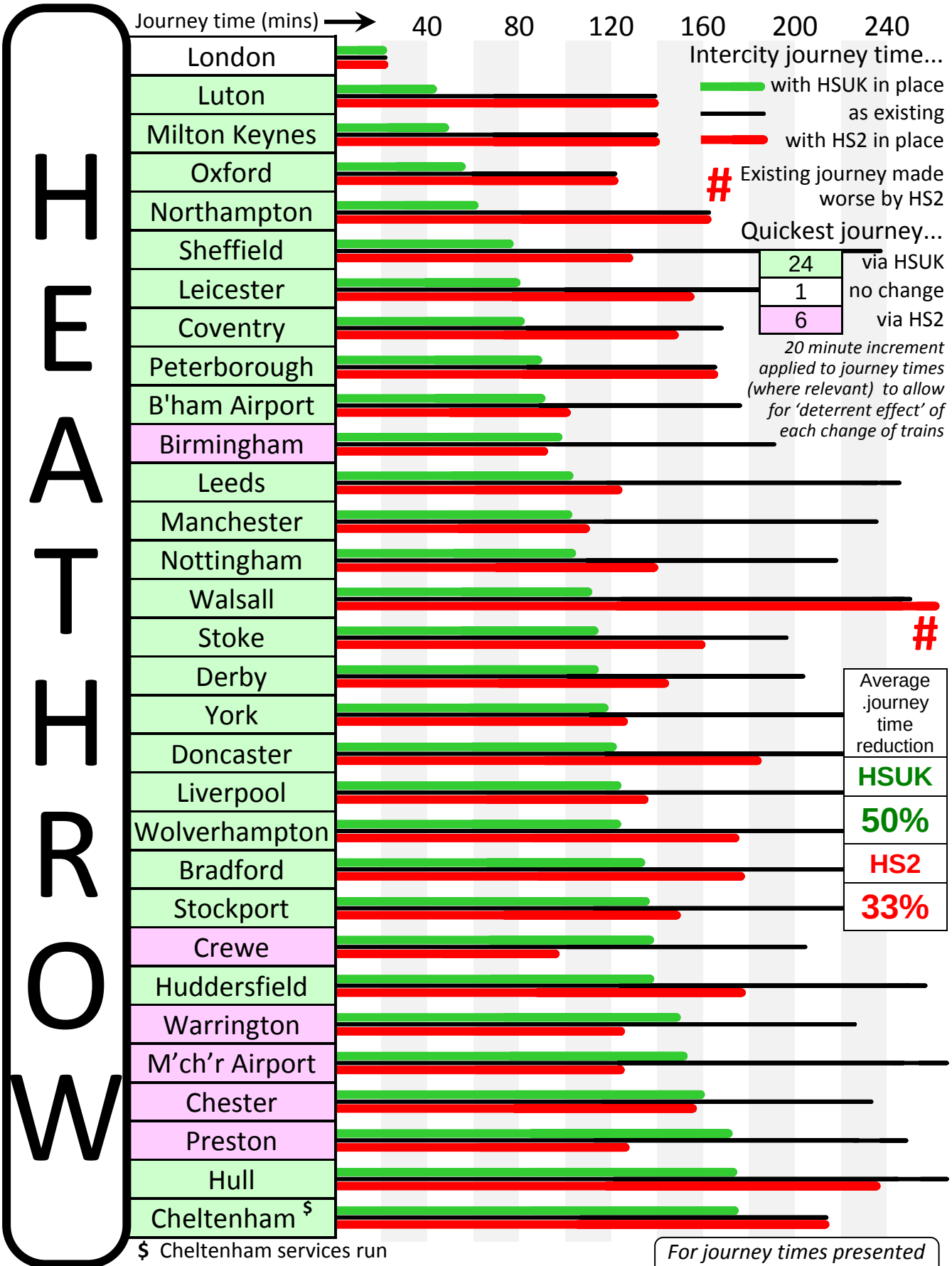
Heathrow	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**50%**	**22**	**30**	**0**	**24**
HS2	**33%**	**0**	**23**	**1**	**6**

Heathrow is the UK's principal international gateway, nearly twice as busy as its nearest rival (Gatwick) and over 3 times as busy as the next (Manchester Airport). But the development of rail routes to provide the necessary 'landside' surface access across its nationwide hinterland has lagged far behind 'airside' development. It took 50 years to open Heathrow Express, the first main line railway to access Heathrow; but this provides direct links only to Paddington station in central London. Rail routes to most cities of the Midlands, the North and Scotland then require a Tube transfer from Paddington to either Euston, St Pancras or Kings Cross. This lack of international connectivity is a huge deterrent to inward investment in the UK regions, and is one of the primary contributory factors to the current North-South Divide.

One of HS2's key selling points to Midlands and Northern communities was the prospect of direct regional services to Heathrow. However, this was never practicable due to high cost of the proposed tunnelled spur, lack of capacity on HS2's 2-track London-West Midlands stem and inefficient configuration of the HS2 'Y' which dictated separate services to each regional city. As a consequence, the spur was cancelled and passengers instead will be forced to change trains at Heathrow to access a very limited range of regional destinations.

Under HSUK proposals, a new route will be created (mostly through the upgrading of existing lined in North-West London) to link the HSUK trunk at Brent Cross to the existing Heathrow Express system. This new route, combined with the extra capacity of HSUK's 4-track spine route and its much greater routeing efficiency, will allow direct links from Heathrow to most principal regional cities. The HSUK proposals require the development of Heathrow Express as a 'through' railway, with all arms – HSUK to the north, Heathrow Express to the east, 'Airtrack' to the south and Western Rail Access towards Slough – fully integrated to create a high capacity 'Compass Point' network enabling direct rail services from Heathrow to all principal UK cities.

HIGH SPEED UK & HS2 LINKS TO HEATHROW



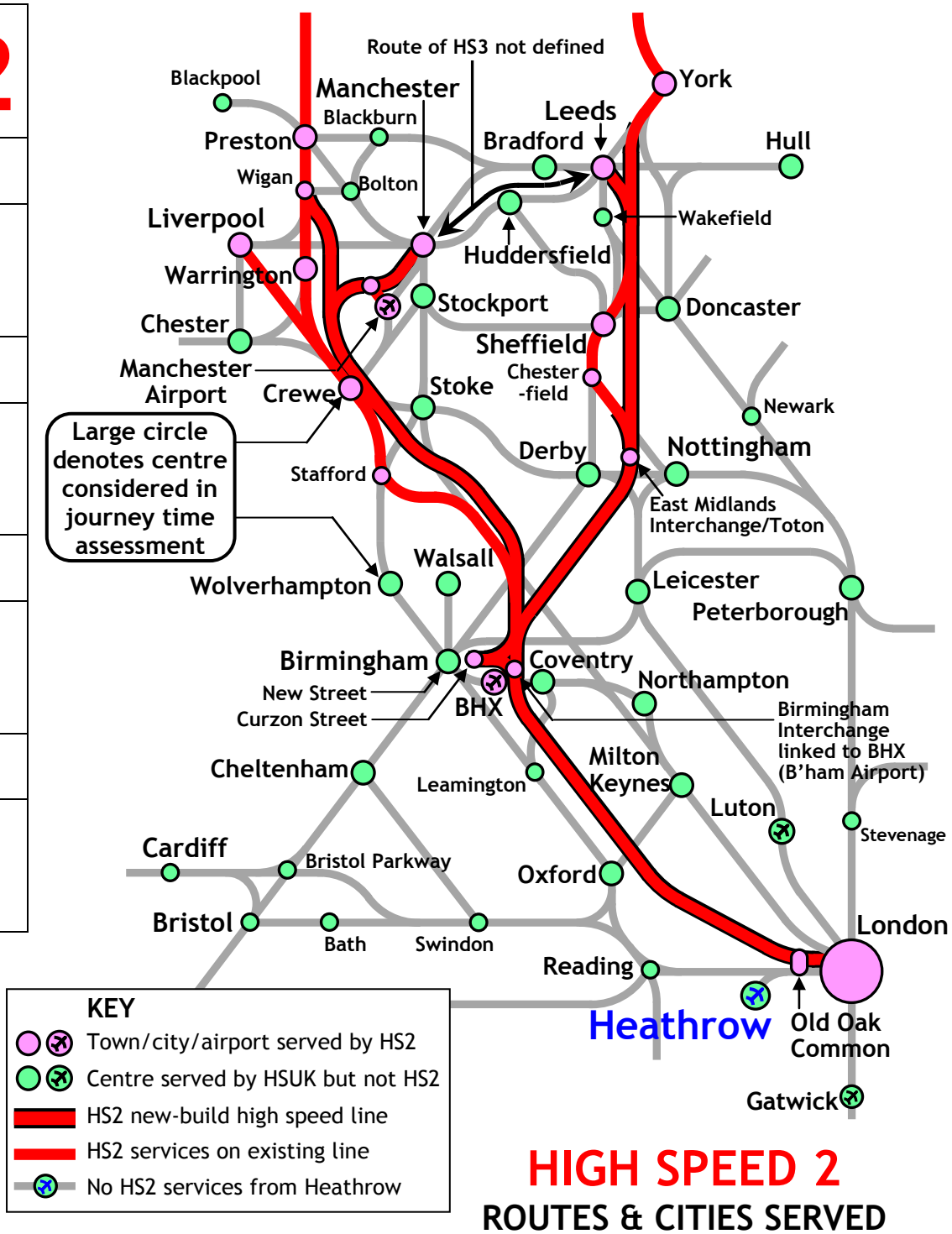
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p242

HEATHROW

No dedicated HS2 spur, limited links to UK regional cities via change of trains at Old Oak Common

HS2
Average journey time reductions:
33%
No. of cities directly linked:
0
No. of journeys made faster:
23
No. of journeys made worse:
1



HEATHROW

Heathrow Express system developed & linked to HSUK for direct services to all principal UK cities

HSUK

Average journey time reductions:

50%

No. of cities directly linked:

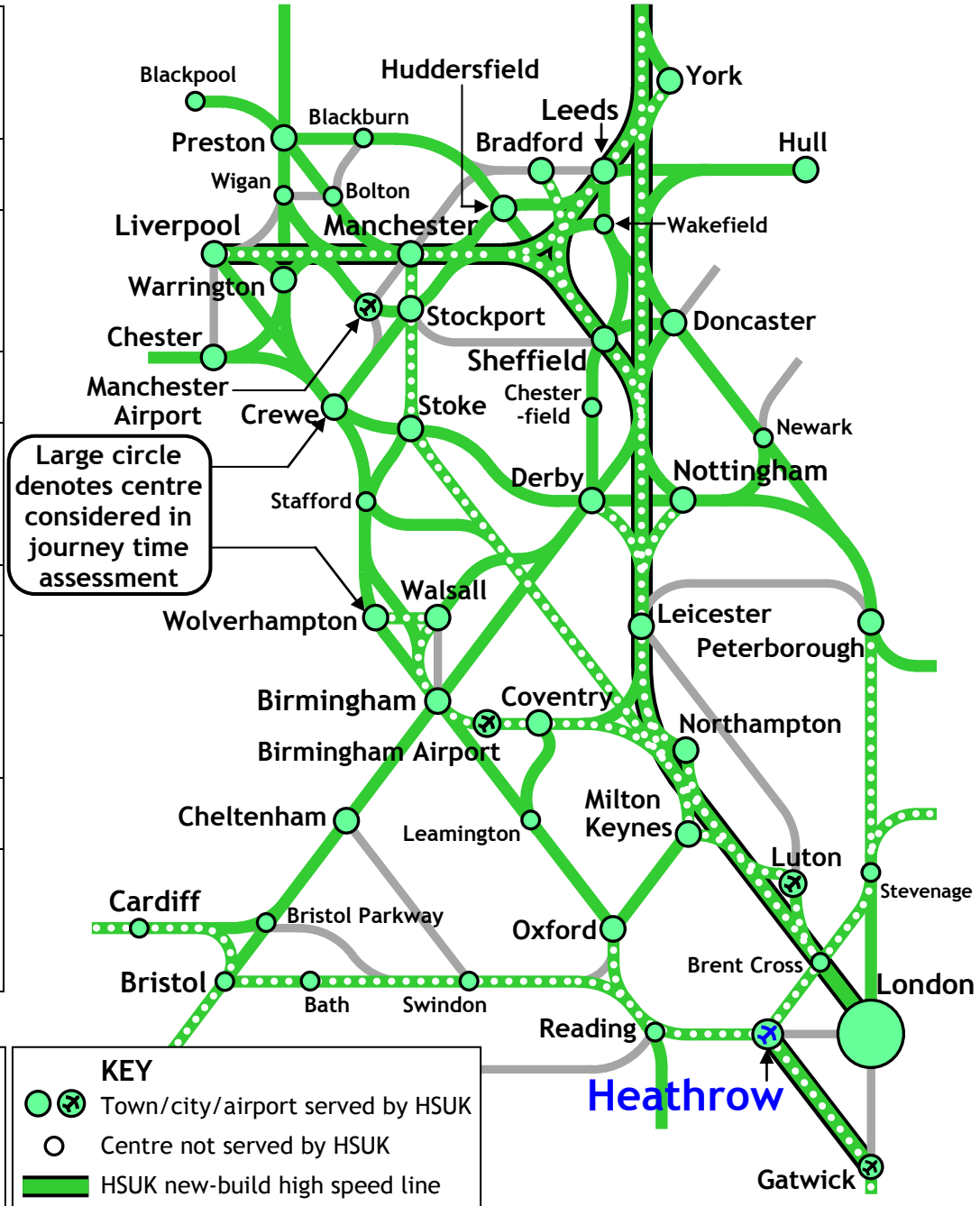
22

No. of journeys made faster:

30

No. of journeys made worse:

0



Heathrow Airport served by:
HSUK91,92,93,94
HSUK95,96,97,98
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Heathrow

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Heathrow Airport**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
HEATHROW AIRPORT	Birmingham			98	191	92	98	0	151	2	72	1	
	B'ham Airport			88	178	101	88	0	138	2	71	1[B]	
	Bradford			135	312	179	115	1	252	3	139	2	
	Cheltenham			175	215	215	175	0	175	2	175	2	
	Chester			159	234	158	139	1	194	2	118	2	
	Coventry			79	168	148	79	0	128	2	98	2[B]	
	Crewe			138	205	98	118	1	165	2	78	1	
	Derby			113	203	143	113	0	163	2	103	2	
	Doncaster			120	213	184	100	1	173	2	144	2	
	Huddersfield			139	295	179	119	1	235	3	139	2	
	Hull			173	281	237	153	1	231	3	197	2	
	Leeds			103	246	124	103	0	206	2	104	1	
	Leicester			80	180	156	80	0	140	2	116	2	
	Liverpool			124	246	136	124	0	206	2	116	1	
	London			21	21	21	21	0	21	0	21	0	
	Luton			41	142	142	41	0	102	2	102	2	
	Manchester			103	236	110	103	0	196	2	90	1	
	M'ch'r Airport			153	275	124	133	1	215	3	94	1	
	Milton Keynes			46	140	140	46	0	100	2	100	2	
	Northampton			60	162	162	60	0	122	2	122	2	
	Nottingham			104	219	140	104	0	179	2	100	2	
	Oxford			54	121	121	54	0	101	1	101	1	
	Peterborough			86	165	165	86	0	125	2	125	2	
	Preston			171	250	127	151	1	210	2	107	1	
	Sheffield			77	238	128	77	0	198	2	108	1	
	Stockport			133	226	149	113	1	186	2	109	2	
	Stoke			112	198	160	112	0	158	2	120	2	
	Walsall			109	252	252	109	0	192	3	192	3	#
	Warrington			148	227	124	128	1	187	2	104	1	
	Wolverhampton			121	225	175	121	0	185	2	135	2	
	York			121	225	127	121	0	185	2	107	1	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX H2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

HUDDERSFIELD

Huddersfield

Town/City	Huddersfield
City Region	West Yorkshire
Population of city/borough**	**160,000**
Ranking amongst UK cities – N/A	(part of W.Yorkshire)
Number of cities directly linked by existing rail network (out of 31)	**9**

References:
HSUK Yorkshire Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Regional Maps 10 & 11
HSUK Huddersfield Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Huddersfield

Huddersfield : Intercity Connectivity with HSUK and HS2

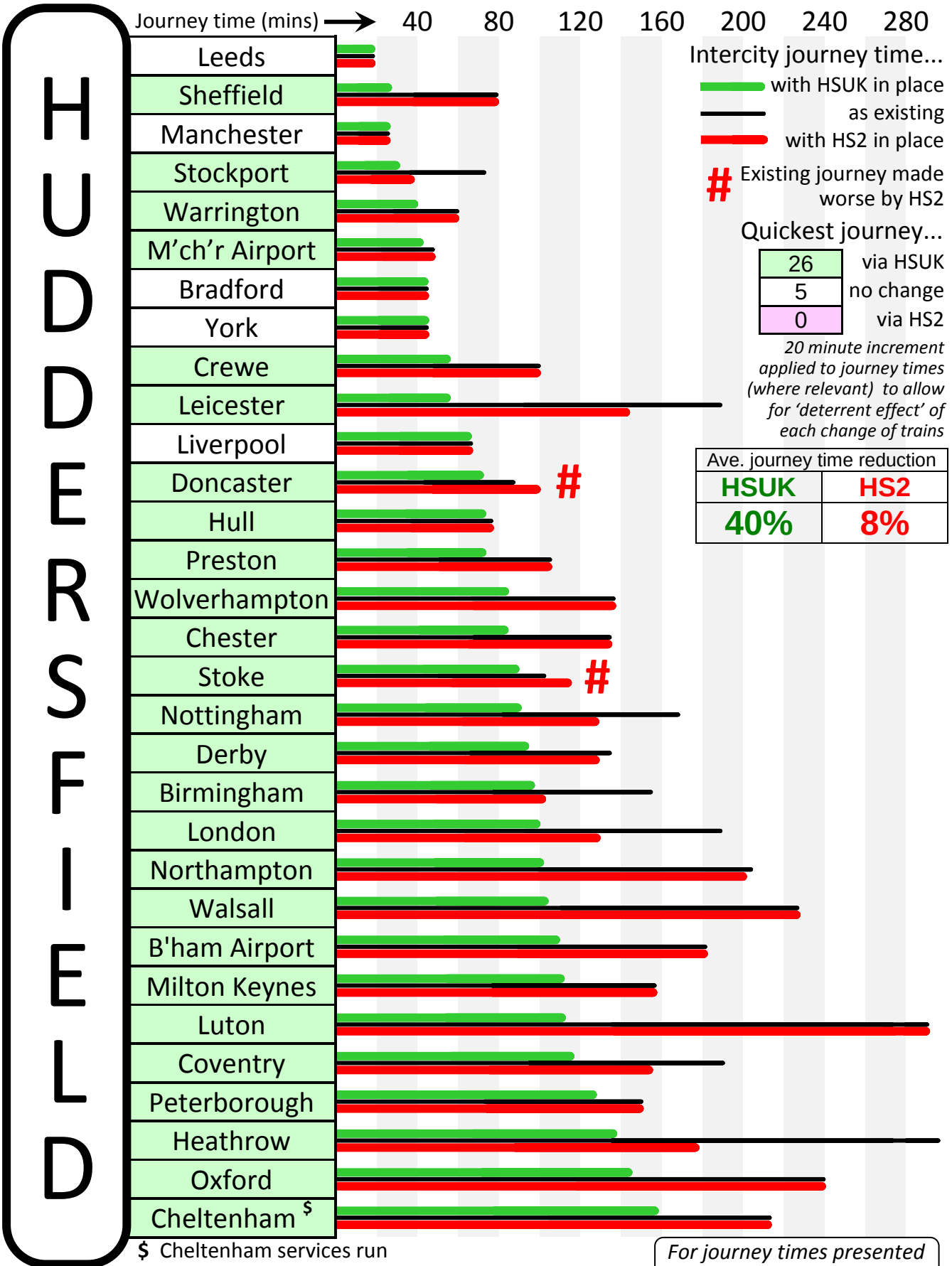
Huddersfield	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**40%**	**17**	**26**	**0**	**26**
HS2	**8%**	**0**	**8**	**2**	**0**

Huddersfield's location on the TransPennine Main Line between Leeds and Manchester gives the town good direct connectivity along a corridor extending to Liverpool in the west, and Hull and Newcastle in the east. Links to the wider intercity network are relatively easily available, at both Manchester Piccadilly and at Leeds. Huddersfield's most critical connectivity deficiency is its lack of high-quality direct links to other major UK cities, in particular Sheffield, Birmingham and London.

Although Huddersfield lies on the Leeds-Manchester TransPennine route for which major upgrades have been proposed, it is not yet clear whether the specified acceleration in Leeds-Manchester journey times from 49 to 30 minutes is compatible with a stop at Huddersfield. Detailed modelling by HSUK indicates that around 25km of new tunnelled route will be necessary to achieve the required journey time reduction. One intervention is likely to be a tunnel completely bypassing Huddersfield station. Huddersfield has no place in HS2 plans; it is assumed that passengers will change onto HS2 services either at Manchester Piccadilly or at Leeds. Given the limited range of destinations, this will leave Huddersfield primarily reliant on the existing intercity network for its intercity connectivity.

HSUK's new-build transpennine route via the abandoned Woodhead corridor will enable enhanced services from both Leeds and Sheffield to Manchester that easily beat the Northern Powerhouse specification of 30 minute journey times. HSUK's route will of necessity bypass Huddersfield; however, full integration with the existing network will allow services on the existing Huddersfield route to be enhanced, with new direct journeys to Birmingham, Manchester Airport, Crewe, Wolverhampton, Birmingham, Coventry and Leicester. Restoration of the abandoned transpennine Woodhead route and Sheffield Victoria station will also enable for the first time direct high speed services from Huddersfield to London.

HIGH SPEED UK & HS2 LINKS TO HUDDERSFIELD



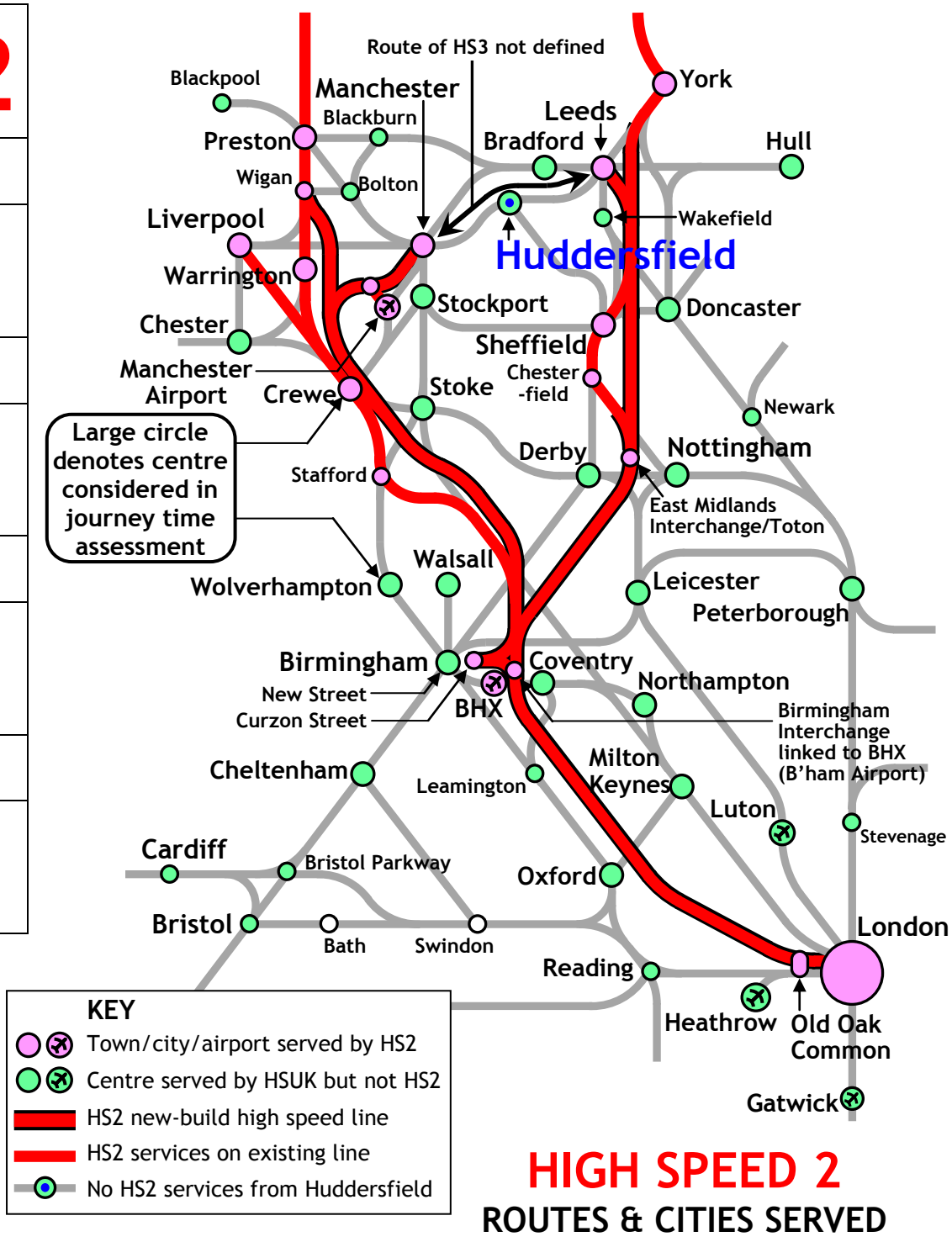
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p248

HUDDERSFIELD

Isolated from HS2, poor links to London, Sheffield & Birmingham, likely to be bypassed by HS3

HS2
Average journey time reductions:
8%
No. of cities directly linked:
0
No. of journeys made faster:
8
No. of journeys made worse:
2



HUDDERSFIELD

Fully connected to national high speed network, enhanced links to London, Sheffield & Birmingham

HSUK

Average journey time reductions:

40%

No. of cities directly linked:

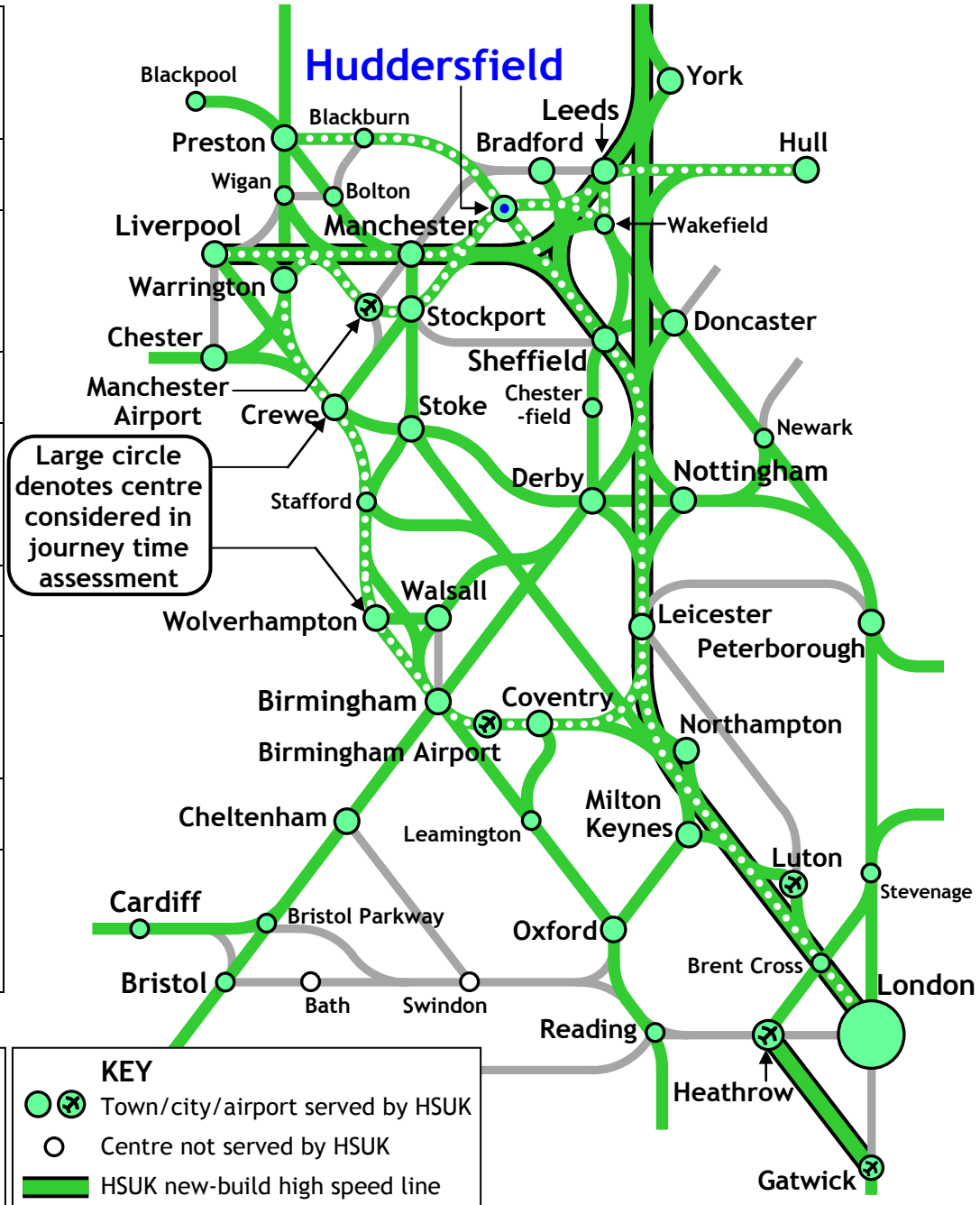
17

No. of journeys made faster:

26

No. of journeys made worse:

0



Huddersfield served by:
HSUK06
HSUK28
HSUK45
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Huddersfield

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Huddersfield**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
HUDDERSFIELD	Birmingham			98	156	102	98	0	136	1	82	1	
	B'ham Airport			107	181	181	107	0	161	1	161	1	
	Bradford			43	43	43	43	0	43	0	43	0	
	Cheltenham			159	213	213	139	1	193	1	193	1	
	Chester			83	135	135	63	1	115	1	115	1	
	Coventry			116	191	155	116	0	171	1	105	2[B]	
	Crewe			55	100	100	55	0	80	1	80	1	
	Derby			93	135	129	73	1	115	1	89	2	
	Doncaster			75	87	87	55	1	67	1	67	1	#
	Heathrow			139	295	179	119	1	235	3	139	2	
	Hull			71	78	78	71	0	78	0	78	0	
	Leeds			19	19	19	19	0	19	0	19	0	
	Leicester			56	190	143	56	0	160	2	103	2	
	Liverpool			67	67	67	67	0	67	0	67	0	
	London			100	189	129	100	0	169	1	109	1	
	Luton			113	285	285	93	1	245	2	245	2	
	Manchester			26	26	26	26	0	26	0	26	0	
	M'ch'r Airport			39	48	48	39	0	48	0	48	0	
	Milton Keynes			113	159	159	93	1	139	1	139	1	
	Northampton			101	204	201	81	1	164	2	151	2[B]	
	Nottingham			90	168	129	70	1	148	1	89	2	
	Oxford			144	240	240	124	1	220	1	220	1	
	Peterborough			124	150	150	104	1	130	1	130	1	
	Preston			71	106	106	71	0	86	1	86	1	
	Sheffield			26	80	80	26	0	80	0	60	1	
	Stockport			30	74	74	30	0	54	1	54	1	
	Stoke			84	101	101	64	1	81	1	81	1	#
	Walsall			105	227	227	85	1	187	2	187	2	
	Warrington			39	60	60	39	0	60	0	60	0	
	Wolverhampton			83	138	138	83	0	118	1	118	1	
	York			45	45	45	45	0	45	0	45	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX H3

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

HULL

Hull

Town/City	Hull
Population of built-up area**	310,000
Ranking amongst UK cities**	24
Number of cities directly linked by existing rail network (out of 31)	7

References:
HSUK Yorkshire Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Hull Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Hull : Intercity Connectivity with HSUK and HS2

	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**32%**	**16**	**26**	**0**	**26**
HS2	**3%**	**0**	**5**	**8**	**0**

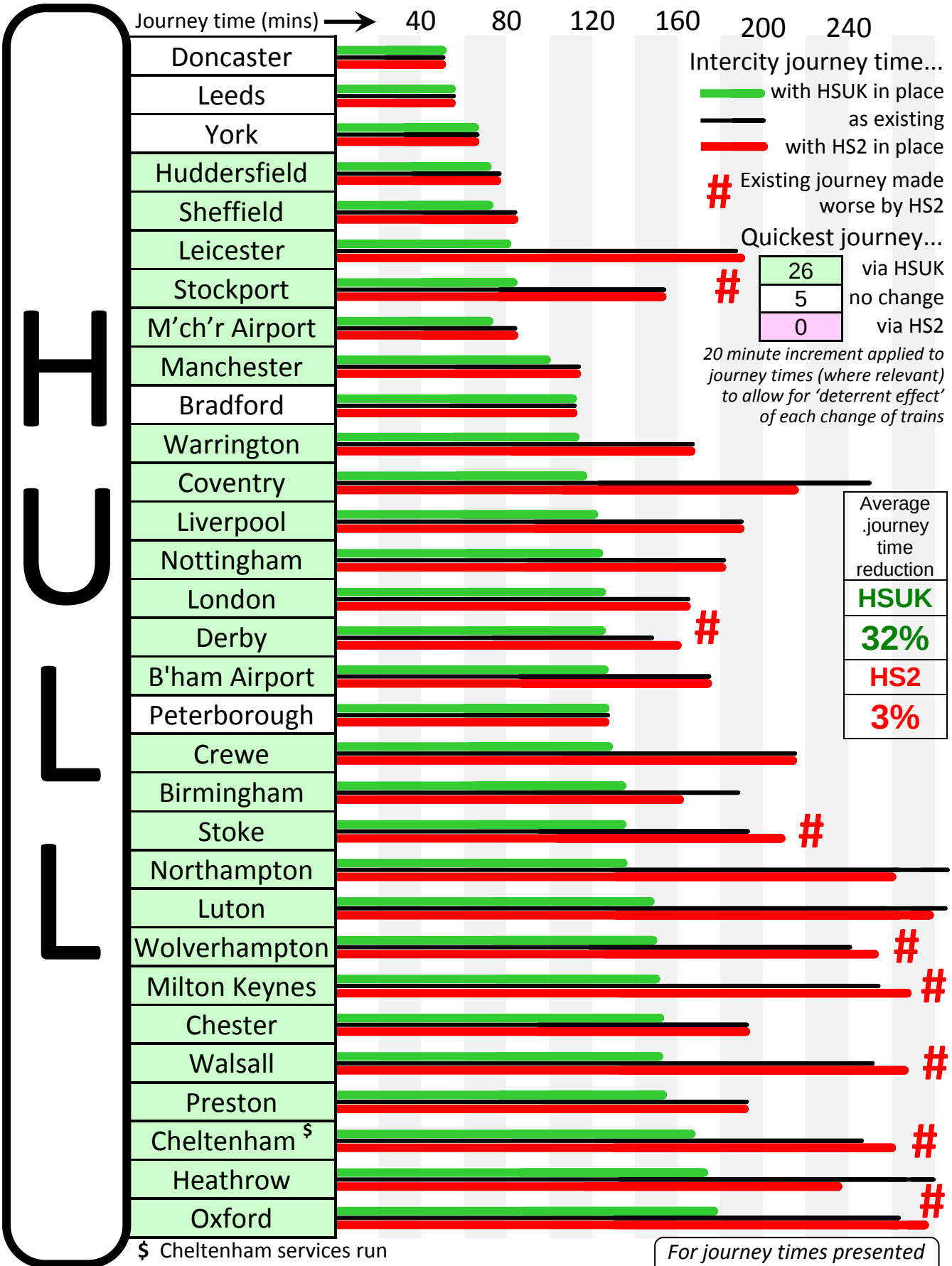
Hull's peripheral position, located close to the East Coast and on the north side of the Humber estuary, has always left the city relatively isolated. Hull's average journey time to the other 31 centres considered in this study is greater than for any other town or city, with the single exception of Luton. Hull enjoys hourly TransPennine services to Leeds and Manchester, and 2-hourly services to London, but even on these routes, journey times are long.

Improved links to Hull are seen as a vital element of emerging strategies for the Northern Powerhouse. However, there are as yet no detailed proposals for these improved links, aside from a stated ambition to reduce Leeds-Hull journey times from 55 to 45 minutes, and Hull-Sheffield journey times from 51 to 60 minutes. No HS2 services are proposed for Hull, no spare capacity exists for such services on the critical 2-track section between London and the West Midlands, and no connections to the existing network are planned, that might enable HS2 services to reach Hull.

Under the fully integrated HSUK proposals, Hull will see its intercity connectivity transformed. Direct hourly services will operate to Birmingham, Leeds, Leicester, Liverpool, London, Manchester, Manchester Airport, Sheffield and many other principal UK cities. Although construction of dedicated new lines to Hull appears not to be viable, plans are under development to upgrade sections of the existing Hull-Leeds route to 200 km/h or faster.

These upgrades will allow the achievement of the journey time improvements (from Hull to Leeds *and* Sheffield) specified for the Northern Powerhouse. This will involve limited lengths of new-build railway and the complete elimination of the existing level crossings which are the crucial limiting factor on current maximum speeds.

HIGH SPEED UK & HS2 LINKS TO HULL



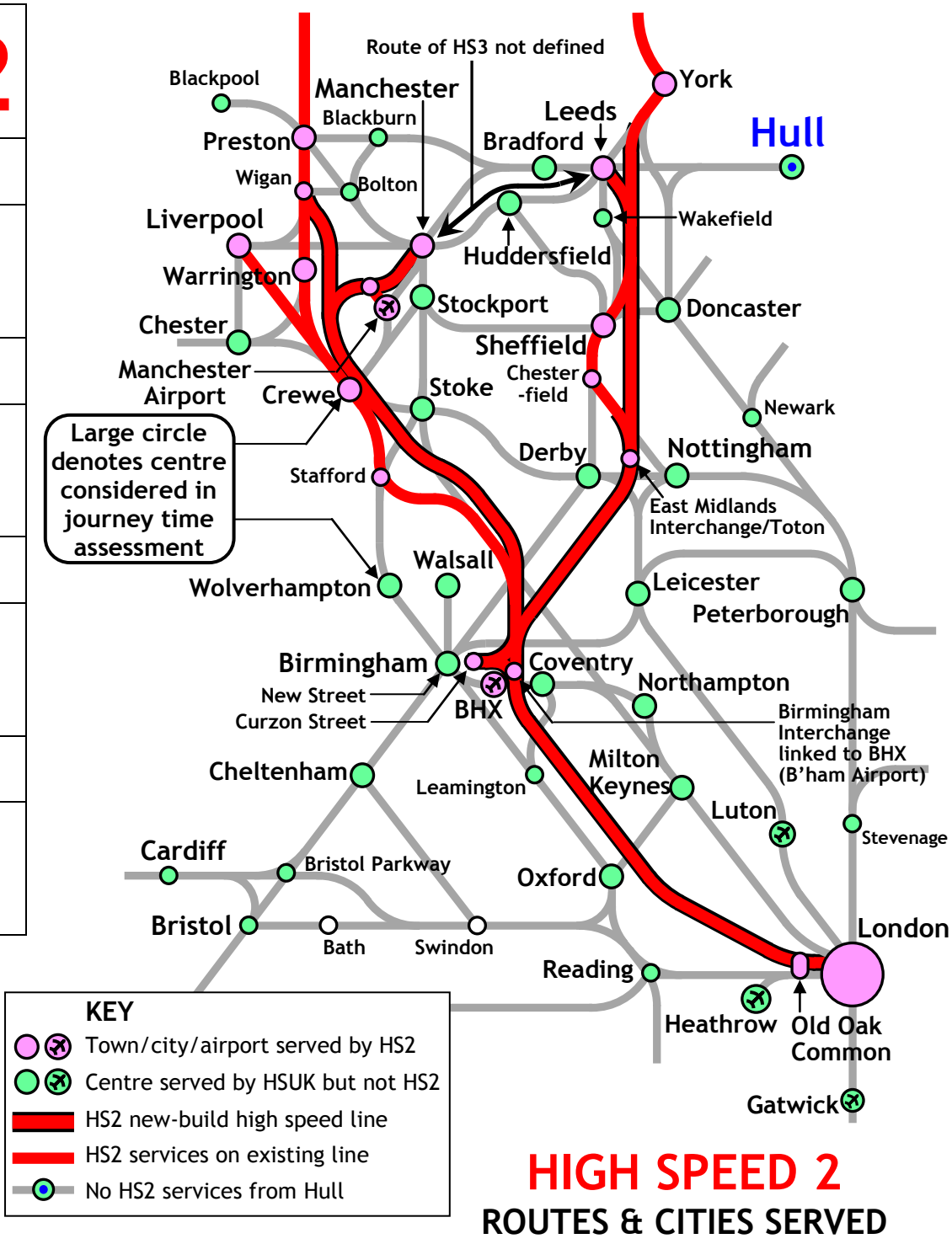
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p254

HULL

Remote from HS2, existing services made worse, no info on links to other Northern Powerhouse cities

HS2
Average journey time reductions:
3%
No. of cities directly linked:
0
No. of journeys made faster:
5
No. of journeys made worse:
8



HIGH SPEED 2
ROUTES & CITIES SERVED

HULL

Direct links to all Northern Powerhouse cities & Manchester Airport, hourly services to London

HSUK

Average journey time reductions:

32%

No. of cities directly linked:

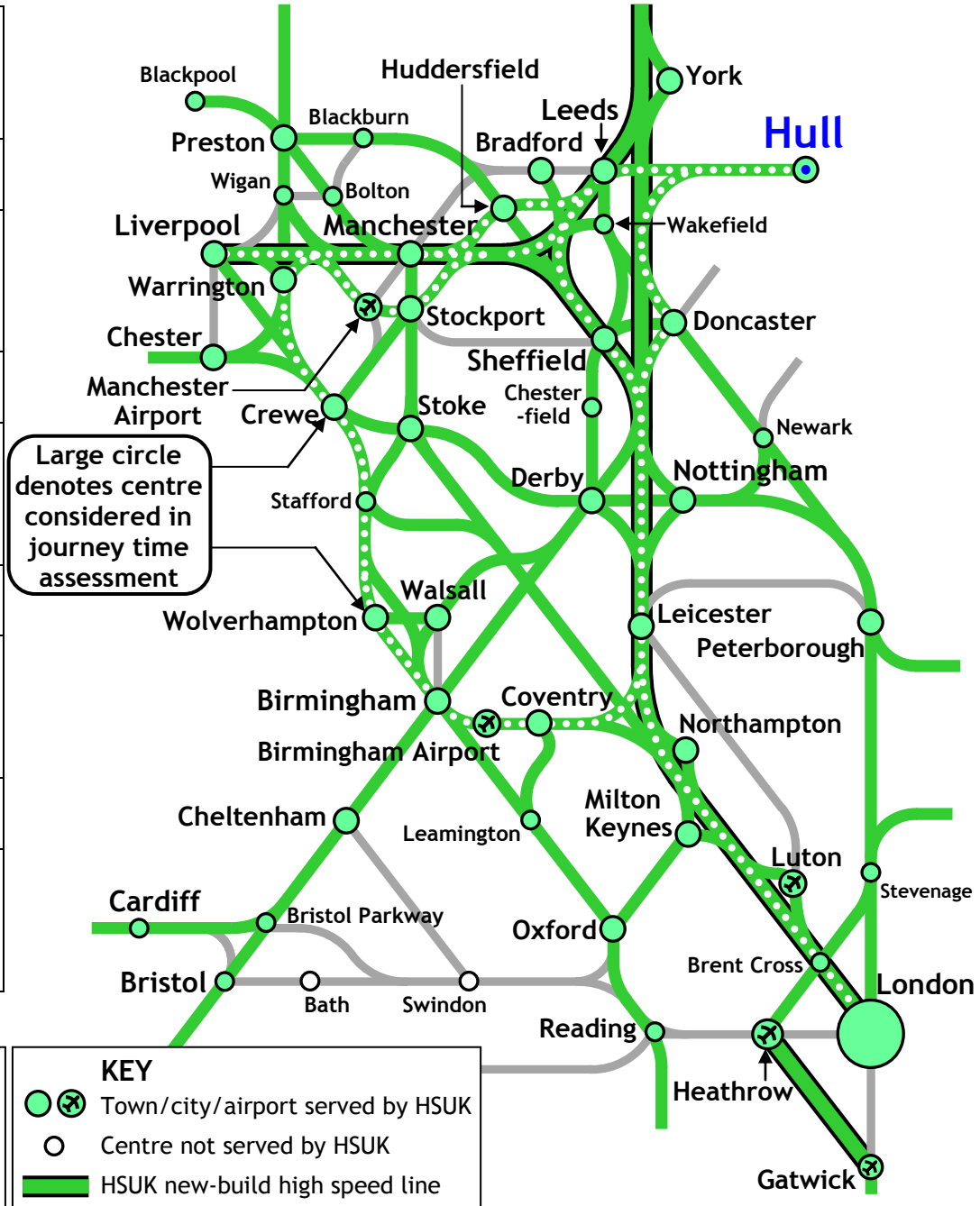
16

No. of journeys made faster:

26

No. of journeys made worse:

0



Hull served by:
HSUK06
HSUK26
HSUK35
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Hull

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Hull**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
HULL	Birmingham			138	189	162	138	0	169	1	142	1	
	B'ham Airport			128	238	177	128	0	198	2	147	1[B]	
	Bradford			111	111	111	91	1	91	1	91	1	
	Cheltenham			190	247	247	170	1	207	2	207	2	#
	Chester			155	221	221	135	1	201	1	201	1	
	Coventry			119	248	215	119	0	208	2	165	2[B]	
	Crewe			128	217	217	128	0	177	2	177	2	
	Derby			126	148	148	106	1	128	1	128	1	#
	Doncaster			51	51	51	51	0	51	0	51	0	
	Heathrow			173	281	237	153	1	231	3	197	2	
	Huddersfield			71	78	78	71	0	78	0	78	0	
	Leeds			55	55	55	55	0	55	0	55	0	
	Leicester			79	187	187	79	0	167	1	167	1	#
	Liverpool			120	190	190	120	0	170	1	170	1	
	London			124	164	164	124	0	154	1	154	0	
	Luton			148	272	272	128	1	232	2	232	2	
	Manchester			98	113	113	98	0	113	0	113	0	
	M'ch'r Airport			92	169	169	92	0	149	1	149	1	
	Milton Keynes			150	255	255	130	1	235	1	219	2[B]	#
	Northampton			136	283	261	116	1	243	2	211	2[B]	
	Nottingham			121	181	181	101	1	161	1	161	1	
	Oxford			179	263	263	159	1	243	1	243	1	#
	Peterborough			127	112	112	107	1	112	0	112	0	
	Preston			159	193	193	139	1	173	1	173	1	
	Sheffield			74	85	85	74	0	85	0	85	0	
	Stockport			84	154	154	84	0	134	1	134	1	
	Stoke			134	193	193	114	1	173	1	173	1	#
	Walsall			155	251	251	135	1	211	2	211	2	#
	Warrington			111	167	167	111	0	147	1	147	1	
	Wolverhampton			152	241	241	152	0	221	1	221	1	#
	York			66	66	66	66	0	66	0	66	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX L1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

LEEDS

and West Yorkshire conurbation

Leeds *and West Yorkshire conurbation*

Town/City	Leeds
City Region	West Yorkshire
Population of built-up area**	**1,800,000**
Ranking amongst UK cities**	**4**
Number of cities directly linked by existing rail network (out of 31)	**17**

References:
HSUK Yorkshire Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Regional Maps 11 & 12
HSUK Leeds Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom - note that Wikipedia definition of Leeds' built-up area includes Bradford and Huddersfield

Leeds : Intercity Connectivity with HSUK and HS2

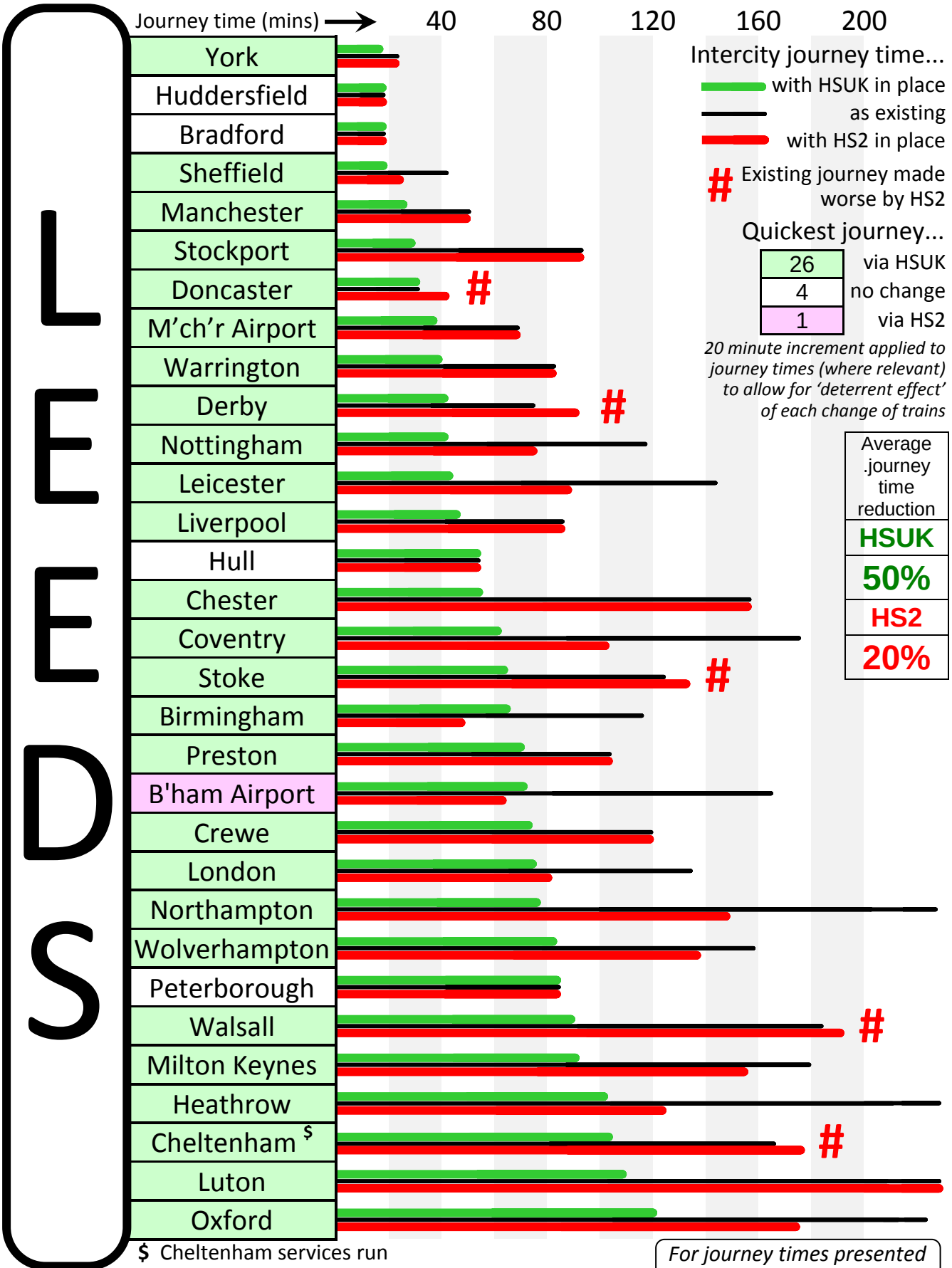
Leeds	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**50%**	**30**	**26**	**0**	**26**
HS2	**20%**	**4**	**12**	**5**	**1**

Leeds and the surrounding West Yorkshire conurbation comprise the largest urban area on the east of the Pennines, and Leeds City Station, located at the hub of the West Yorkshire rail network, is the busiest station in the North of England, with passenger numbers exceeded only by Birmingham New Street and various London termini. Although Leeds is a through station, the concentration of 6 incoming routes at its western throat, as opposed to a single route, means that it functions largely as a terminus, with most trains terminating there. As a consequence its 17 platforms (the greatest number outside London) are severely congested.

HS2 will serve Leeds by means of a south-facing spur from its trunk route (planned ultimately to continue to the North-East) to a new terminus station. This was originally planned to be located at New Lane, south of the River Aire, and remote from the existing station. Local pressure has led to revised proposals, with the station moved northward to meet the existing station in a T-bone arrangement. HS2 services will run from Leeds to Sheffield, Birmingham, Birmingham Airport and London. Major modifications to the existing station will be required to allow it to accommodate HS3 services. Existing congestion seems certain to remain.

HSUK's proposals for Leeds include the 4-tracking of the existing route to the east, the restoration of Farnley Viaduct to the south-west, and a new link from Stourton to Neville Hill to allow local services from Barnsley, Wakefield and Castleford to enter the station from the east. These 3 measures will create new capacity on the approaches to separate local and intercity services. This will allow HSUK services to operate from Leeds City Station to all principal UK cities and also free up sufficient platform space to allow local services to be approximately doubled in frequency.

HIGH SPEED UK & HS2 LINKS TO LEEDS



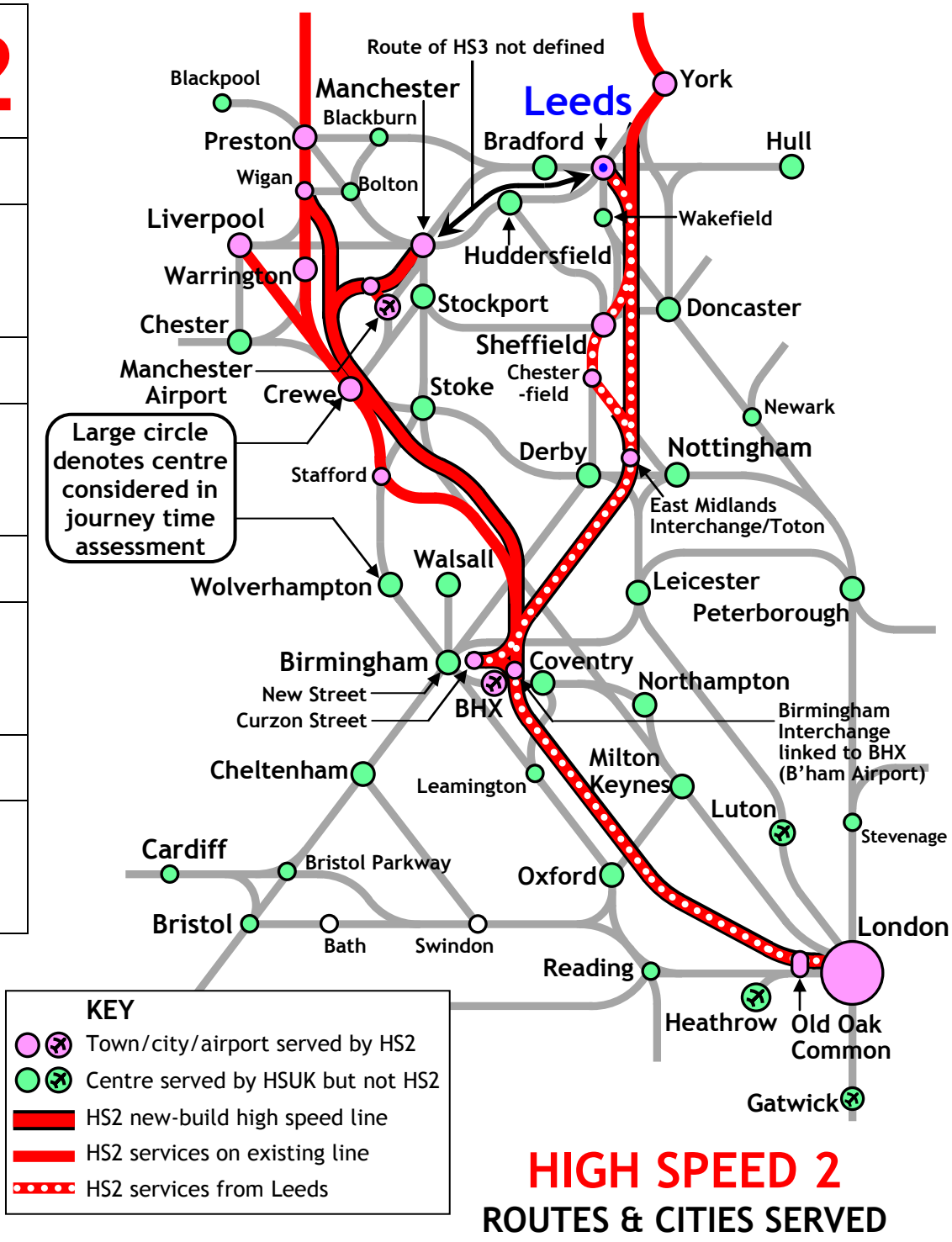
$ Cheltenham services run onward to Bristol and Cardiiff

For journey times presented in tabulated format see p260

LEEDS

Located on spur, HS2 direct links only to London, Sheffield, Birmingham & Birmingham Airport

HS2
Average journey time reductions:
20%
No. of cities directly linked:
4
No. of journeys made faster:
12
No. of journeys made worse:
5



HIGH SPEED 2
ROUTES & CITIES SERVED

LEEDS

Fully connected to national high speed network, direct high speed links to all principal UK cities

HSUK

Average journey time reductions:

50%

No. of cities directly linked:

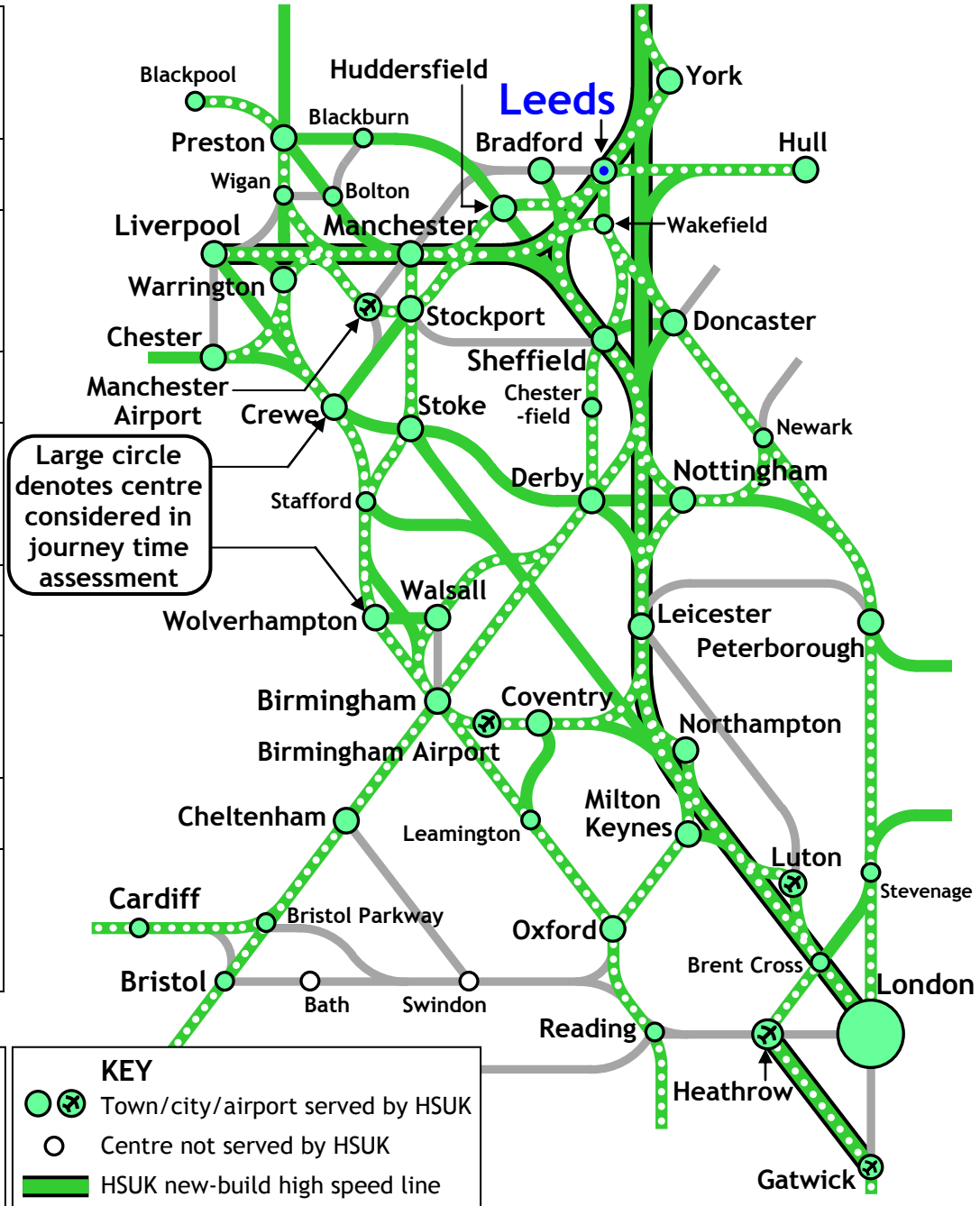
30

No. of journeys made faster:

26

No. of journeys made worse:

0



Leeds served by:
HSUK01,02,04,09
HSUK21,23,24,26
HSUK28,37
HSUK41,42
HSUK74
HSUK92
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Leeds

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Leeds**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
LEEDS	Birmingham			64	118	76	64	0	118	0	76	0	
	B'ham Airport			73	166	64	73	0	146	1	54	0[B]	
	Bradford			19	19	19	19	0	19	0	19	0	
	Cheltenham			104	167	167	104	0	167	0	167	0	#
	Chester			54	158	158	54	0	138	1	138	1	
	Coventry			64	176	102	64	0	156	1	72	1[B]	
	Crewe			73	120	120	65	0	100	1	100	1	
	Derby			40	76	85	40	0	76	0	55	1[A]	#
	Doncaster			30	30	30	28	0	30	0	30	0	#
	Heathrow			103	246	124	103	0	206	2	104	1	
	Huddersfield			19	19	19	19	0	19	0	19	0	
	Hull			55	55	55	55	0	55	0	55	0	
	Leicester			44	144	88	44	0	124	1	68	1	
	Liverpool			46	86	86	46	0	86	0	86	0	
	London			77	133	81	77	0	133	0	81	0	
	Luton			113	230	230	93	1	190	2	190	2	
	Manchester			26	51	51	26	0	51	0	51	0	
	M'ch'r Airport			37	69	69	37	0	69	0	69	0	
	Milton Keynes			95	180	156	95	0	160	1	126	1[B]	
	Northampton			82	227	148	82	0	187	2	118	1[B]	
	Nottingham			42	118	72	42	0	118	0	52	1	
	Oxford			124	224	176	124	0	204	1	146	1[B]	
	Peterborough			85	85	85	85	0	85	0	85	0	
	Preston			70	104	104	70	0	104	0	104	0	
	Sheffield			19	41	25	19	0	41	0	25	0	
	Stockport			29	93	93	29	0	73	1	73	1	
	Stoke			63	124	124	63	0	104	1	104	1	#
	Walsall			69	184	184	69	0	164	1	164	1	#
	Warrington			39	82	82	39	0	82	0	82	0	
	Wolverhampton			82	159	139	82	0	139	1	109	1[B]	
	York			15	23	23	15	0	23	0	23	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX L2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

LEICESTER

Leicester

Town/City	Leicester
Population of built-up area**	510,000
Ranking amongst UK cities**	13
Number of cities directly linked by existing rail network (out of 31)	7

References:
HSUK London-Birmingham Rail Strategy
HSUK East Midlands Rail Strategy
HSUK Regional Maps 03 & 05
HSUK Leicester Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Leicester : Intercity Connectivity with HSUK and HS2

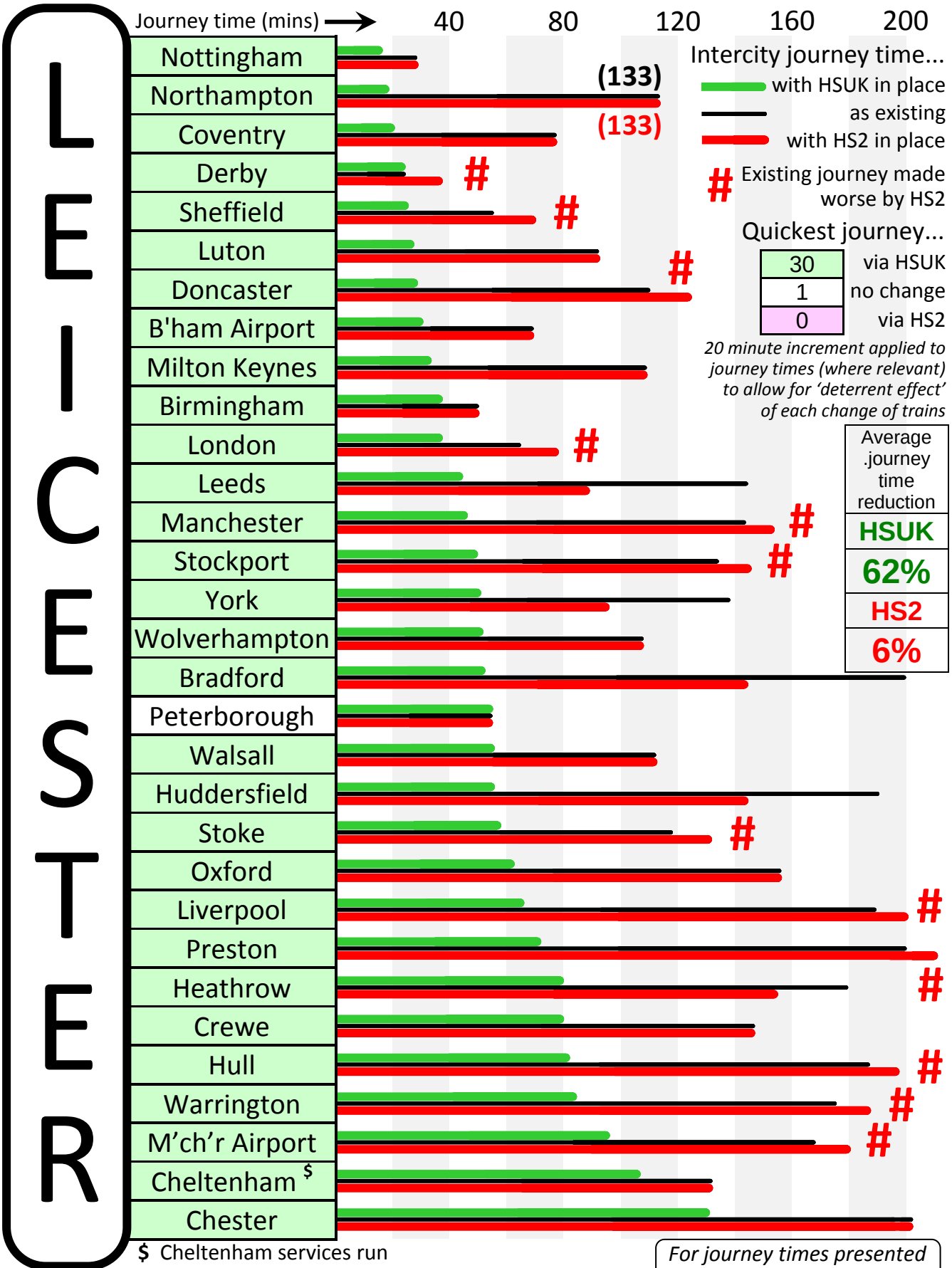
Leicester	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**62%**	**27**	**29**	**0**	**30**
HS2	**6%**	**0**	**5**	**12**	**0**

Leicester is perhaps the largest UK regional community not to be accorded primary city status, yet it has always suffered from relatively poor rail connectivity. Although it is a primary calling point on all Midland Main Line services, these links extend no further north or west than Sheffield, and journeys to other key centres of the North and Scotland (ie Manchester, Liverpool, Leeds, Hull, Newcastle, Edinburgh and Glasgow) all require a change of trains either at Sheffield or at Birmingham.

Under the HS2 initiative, Leicester has been similarly neglected. It will be entirely bypassed by HS2's trunk route which will pass through the West Midlands en route to Yorkshire and the North-East. Leicester's closest connection to HS2 will be the proposed East Midlands Interchange at Toton. Assuming that local links from Leicester to Toton will be put in place, some journeys to Yorkshire cities could be made shorter, and these savings are reflected in the 6% journey time reduction noted above. However, there is also a risk that in adapting local services to call at Toton, journey times to Nottingham and Derby could be significantly increased.

Under the HSUK scheme, Leicester becomes a key hub of the national network. HSUK's 4-track spine route will routed through the existing Leicester London Road station, approaching in tunnel from the south and continuing to the north along the existing alignment of the Midland Main Line. This will allow Leicester to be directly connected to all principal UK cities and – with connection to the West Coast Main Line at Rugby – to become part of a 'Midland Ring' interlinking most major Midlands cities including Coventry, Birmingham, Walsall, Wolverhampton, Derby and Nottingham, and also Birmingham Airport.

HIGH SPEED UK & HS2 LINKS TO LEICESTER



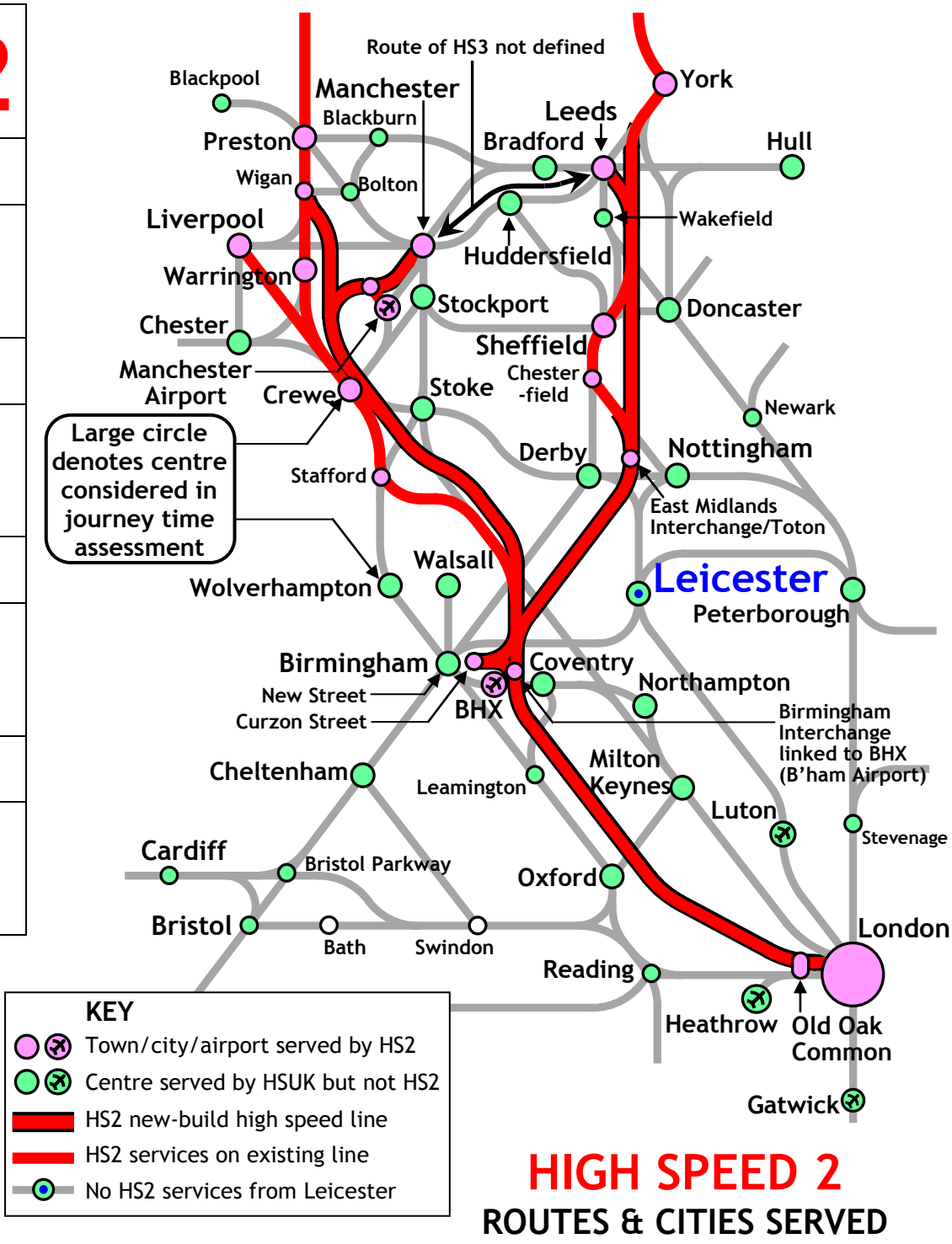
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p266

LEICESTER

Bypassed by HS2, existing services made worse, few worthwhile connections to HS2 at Toton

HS2
Average journey time reductions:
6%
No. of cities directly linked:
0
No. of journeys made faster:
5
No. of journeys made worse:
12



LEICESTER

Connectivity transformed through Leicester's location on HSUK's north-south spine

HSUK

Average journey time reductions:

62%

No. of cities directly linked:

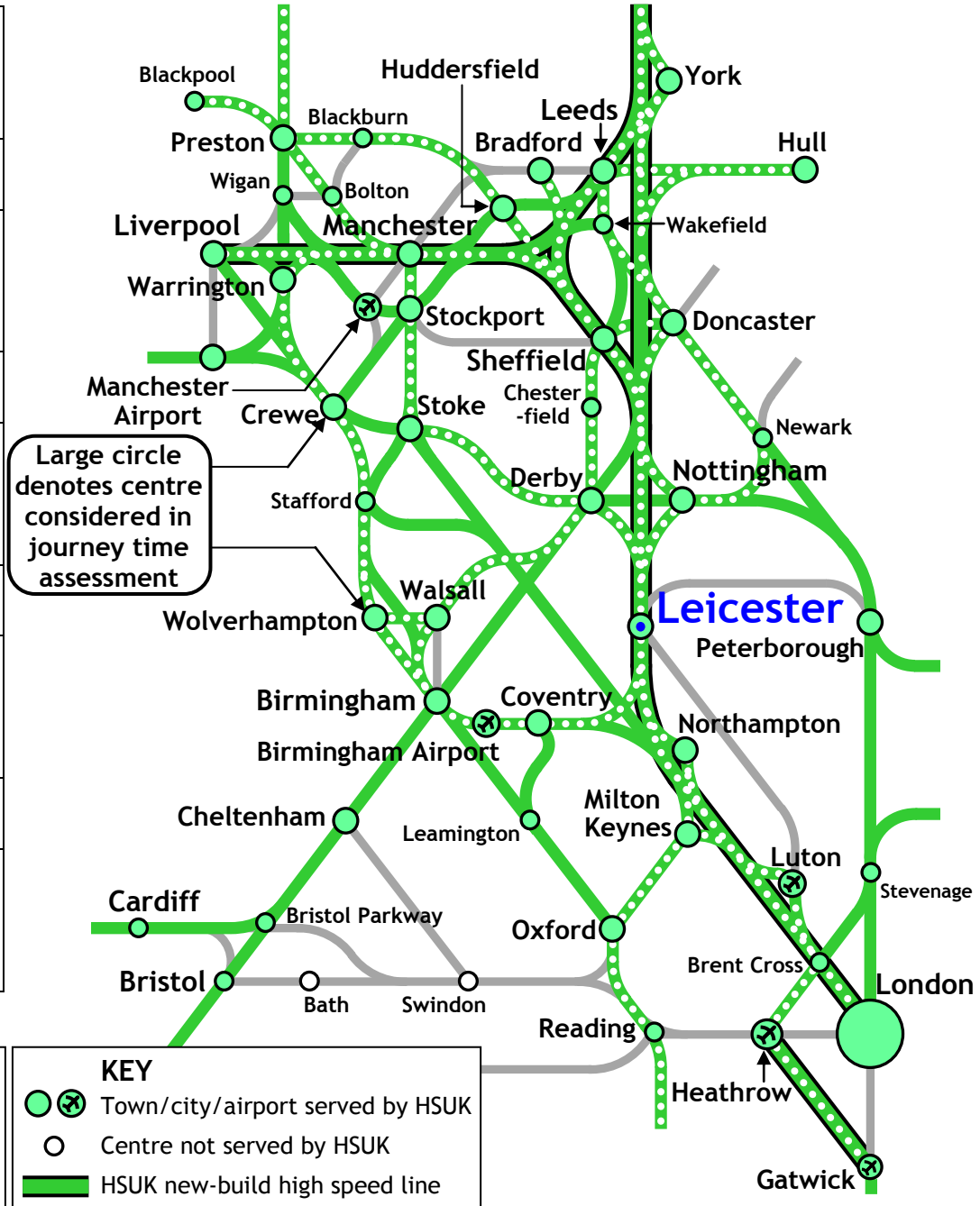
27

No. of journeys made faster:

29

No. of journeys made worse:

0



KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Leicester

Leicester served by:
HSUK02,03,06,34
HSUK42,44,45,46
HSUK72,74
HSUK76,78,79
HSUK93
See Appendix A1

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Leicester**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
LEICESTER	Birmingham			37	50	50	37	0	50	0	50	0	
	B'ham Airport			28	91	91	28	0	71	1	71	1	
	Bradford			51	200	143	51	0	160	2	103	2	
	Cheltenham			106	132	132	86	1	112	1	112	1	
	Chester			127	202	202	107	1	162	2	162	2	
	Coventry			19	78	78	19	0	58	1	58	1	
	Crewe			79	147	147	79	0	127	1	127	1	
	Derby			22	22	22	22	0	22	0	22	0	#
	Doncaster			26	109	109	26	0	89	1	89	1	#
	Heathrow			80	180	156	80	0	140	2	116	2	
	Huddersfield			56	190	143	56	0	160	2	103	2	
	Hull			79	187	187	79	0	167	1	167	1	#
	Leeds			44	144	88	44	0	124	1	68	1	
	Liverpool			68	189	189	68	0	159	2	159	1	#
	London			37	64	64	37	0	64	0	64	0	#
	Luton			25	57	57	25	0	57	0	57	0	
	Manchester			47	142	142	47	0	122	1	122	1	#
	M'ch'r Airport			97	168	168	77	1	148	1	148	1	#
	Milton Keynes			32	108	108	32	0	88	1	88	1	
	Northampton			18	133	133	18	0	93	2	93	2	
	Nottingham			14	28	28	14	0	28	0	28	0	
	Oxford			61	157	157	61	0	137	1	137	1	
	Peterborough			55	55	55	55	0	55	0	55	0	
	Preston			74	200	200	74	0	180	1	180	1	#
	Sheffield			23	56	56	23	0	56	0	56	0	#
	Stockport			50	133	133	50	0	113	1	113	1	#
	Stoke			58	119	119	58	0	99	1	99	1	#
	Walsall			55	112	112	55	0	92	1	92	1	
	Warrington			82	176	176	62	1	156	1	156	1	#
	Wolverhampton			51	107	107	51	0	87	1	87	1	
	York			51	139	96	51	0	119	1	76	1	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX L3

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

LIVERPOOL

and Merseyside conurbation

Liverpool *and Merseyside conurbation*

Town/City	Liverpool
City Region (including Wirral)	Merseyside
Population of built-up area (incl Wirral)**	**1,180,000**
Ranking amongst UK cities**	**6**
Number of cities directly linked by existing rail network (out of 31)	**16**

References:
HSUK North-West Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Regional Map 09
HSUK Liverpool Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Liverpool : Intercity Connectivity with HSUK and HS2

Liverpool	Average journey time reduction	Cities directly linked (out of 29)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**43%**	**26**	**28**	**0**	**27**
HS2	**4%**	**2**	**2**	**1**	**1**

Liverpool's situation as a coastal city means that it is bypassed by trunk routes such as the West Coast Main Line. All routes that do serve Liverpool terminate there, at Lime Street station. As a consequence, Liverpool and the entire Merseyside region are relatively poorly connected, compared with similar-sized but more centrally located conurbations such as South Yorkshire.

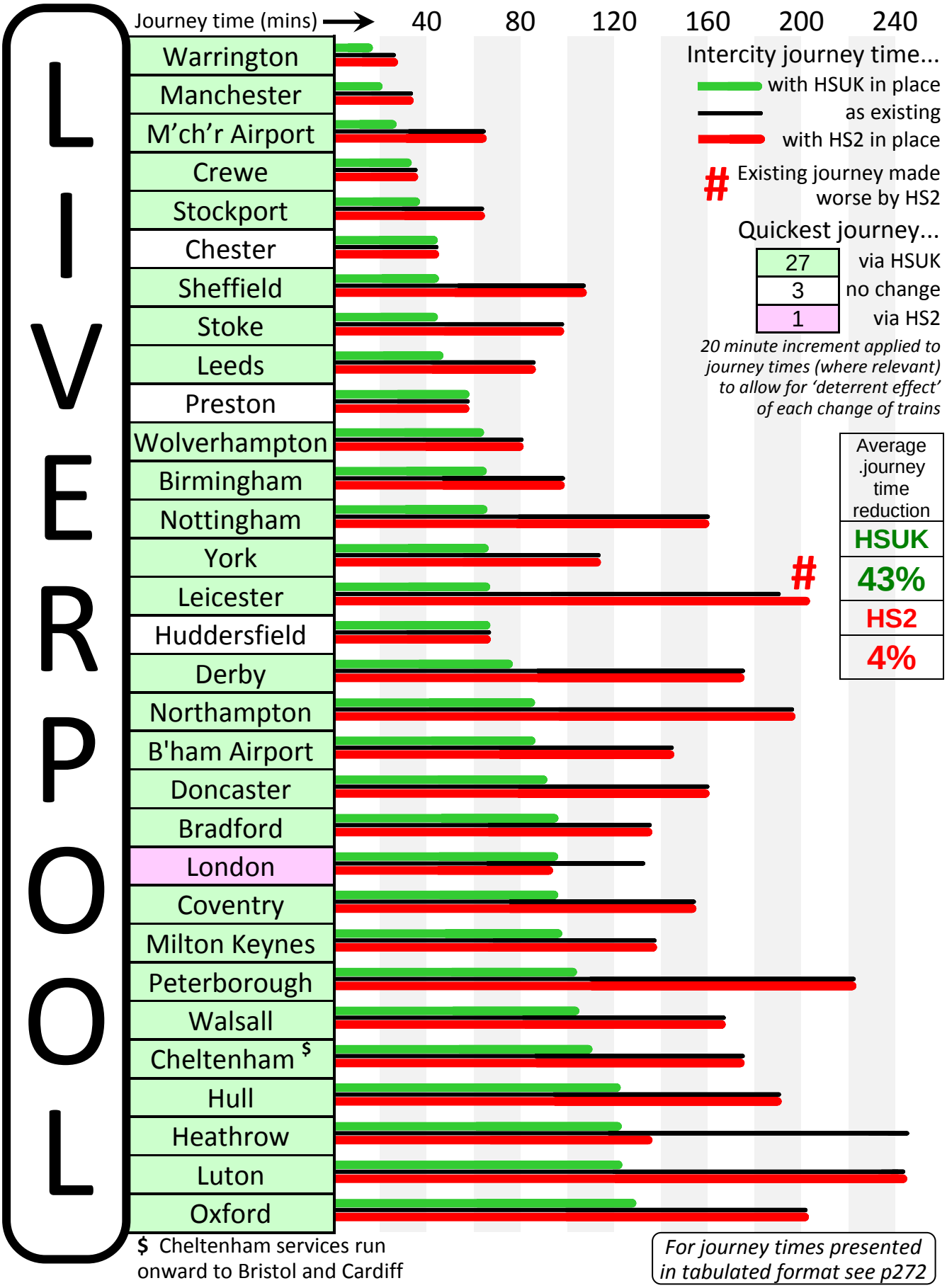
HS2 will do little to enhance Liverpool's connectivity. The proposed 2 trains per hour service to London certainly represent an improvement, but HS2 will not offer links to any other city along its route. It is particularly significant that no HS2 service to Birmingham is proposed. It would appear that a 'buffers-to-buffers' link between Liverpool Lime Street and Birmingham Curzon Street, with no major intermediate calling point, and no prospect of onward routeing other major cities, is simply not viable. There is pressure from groups such as '20 Miles More' to extend construction of HS2's new build high speed line closer to Liverpool. However, this will do nothing to resolve the fundamental routeing inefficiencies of the stand-alone HS2 scheme.

HSUK resolves these inefficiencies through full integration with the existing network, and through a radically different routeing strategy. HSUK's primary route to Liverpool via a 'Woodhead' trans-pennine crossing will enable fast and efficient services from Liverpool to most major UK cities:

- Liverpool-Manchester-London
- Liverpool-Manchester-Leeds-York-Darlington-Newcastle-Edinburgh-Glasgow
- Liverpool-Manchester-Sheffield-Leicester-Milton Keynes-Oxford-South Coast
- Liverpool-Manchester-Sheffield-Nottingham-Peterborough-Norwich
- Liverpool-Manchester-Sheffield-Heathrow
- Liverpool-Altrincham-Manchester Airport-Stockport-Leeds-Hull

Major developments of the Merseyrail system are proposed, to divert commuter services away from Lime Street station and generate the necessary increased capacity for intercity services.

HIGH SPEED UK & HS2 LINKS TO LIVERPOOL



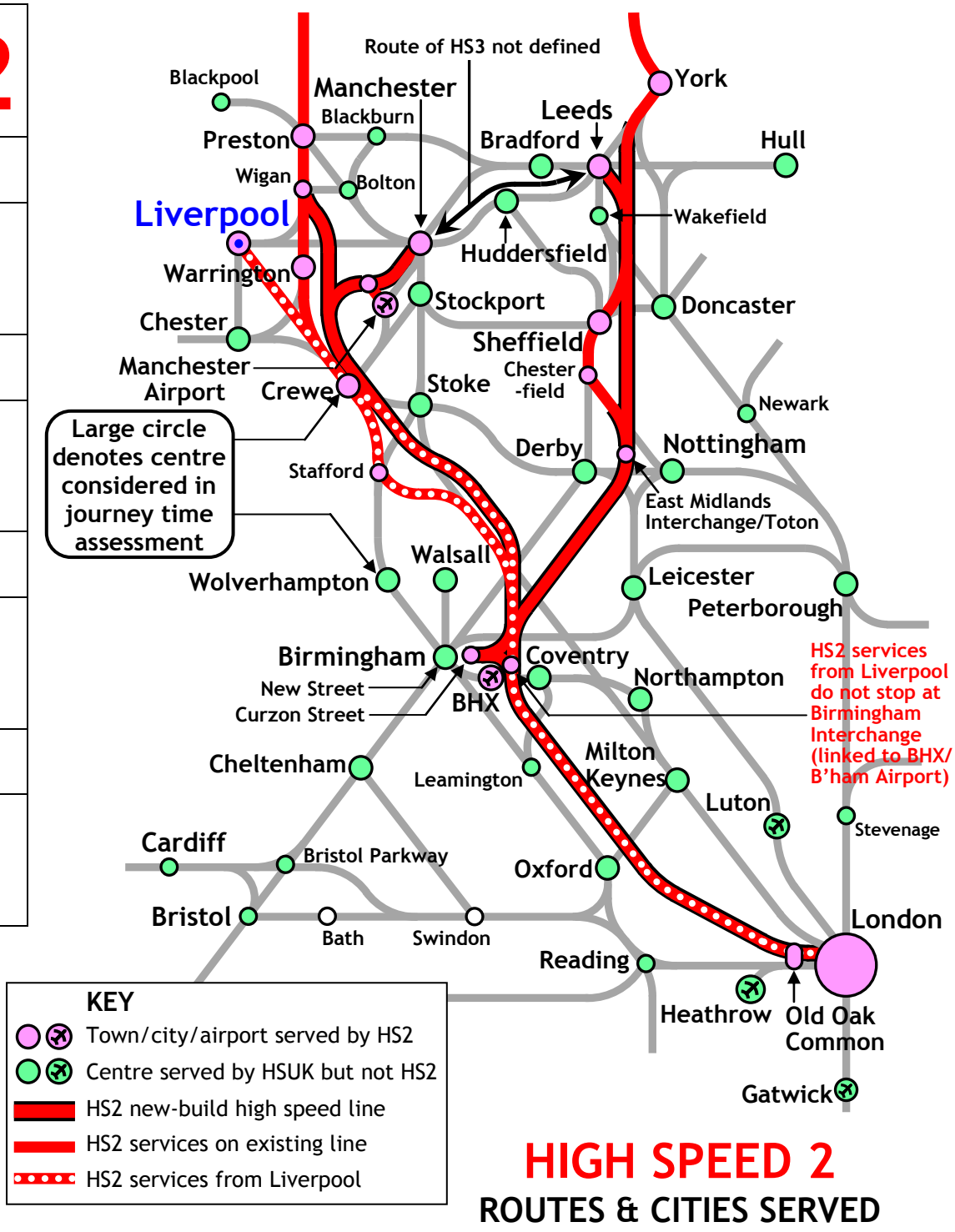
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p272

LIVERPOOL

HS2 links only to Crewe & London, no proposals for improved HS3 Northern Powerhouse links

HS2
Average journey time reductions:
4%
No. of cities directly linked:
2
No. of journeys made faster:
2
No. of journeys made worse:
1



LIVERPOOL

Fully connected to national high speed network, direct high speed links to all principal UK cities

HSUK

Average journey time reductions:

43%

No. of cities directly linked:

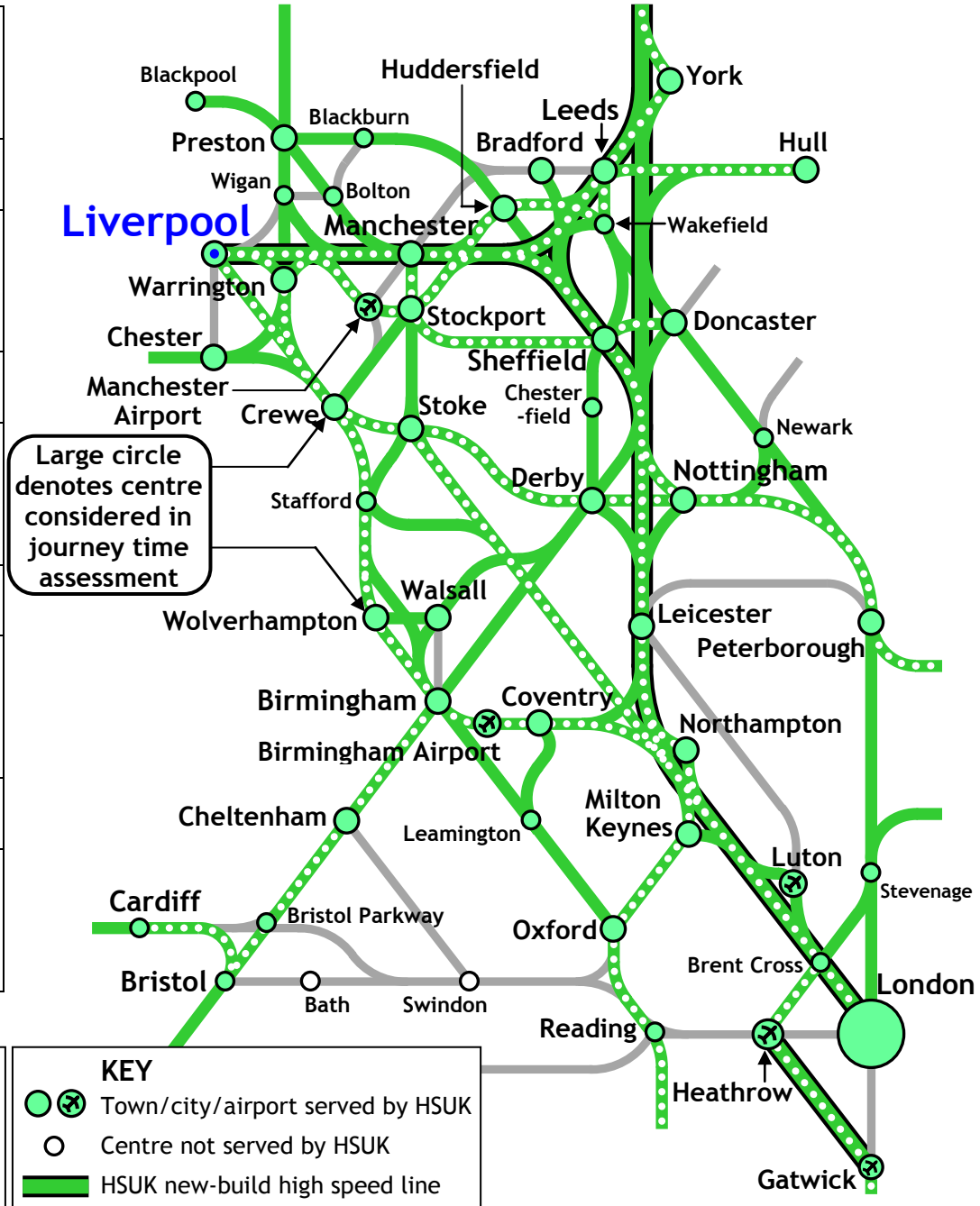
26

No. of journeys made faster:

28

No. of journeys made worse:

0



Liverpool served by:
HSUK03
HSUK13,14
HSUK21,26,27,28
HSUK43,54,62
HSUK92
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Liverpool

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from Liverpool

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
LIVERPOOL	Birmingham			64	99	99	64	0	99	0	99	0	
	B'ham Airport			84	145	145	84	0	125	1	125	1	
	Bradford			98	137	137	78	1	117	1	117	1	
	Cheltenham			108	176	176	108	0	156	1	156	1	
	Chester			43	43	43	43	0	43	0	43	0	
	Coventry			93	155	155	93	0	135	1	135	1	
	Crewe			31	36	36	31	0	36	0	36	0	
	Derby			75	166	166	75	0	146	1	146	1	
	Doncaster			96	160	160	76	1	140	1	140	1	
	Heathrow			124	246	136	124	0	206	2	116	1	
	Huddersfield			67	67	67	67	0	67	0	67	0	
	Hull			120	190	190	120	0	170	1	170	1	
	Leeds			46	86	86	46	0	86	0	86	0	
	Leicester			68	189	189	68	0	159	2	159	1	#
	London			98	133	93	98	0	133	0	93	0	
	Luton			125	244	244	105	1	204	2	204	2	
	Manchester			19	33	33	19	0	33	0	33	0	
	M'ch'r Airport			26	64	64	26	0	64	0	64	0	
	Milton Keynes			102	139	139	102	0	119	1	119	1	
	Northampton			88	197	197	88	0	157	2	157	2	
	Nottingham			66	160	160	66	0	160	0	160	0	
	Oxford			130	202	202	130	0	182	1	182	1	
	Peterborough			105	212	212	105	0	212	0	212	0	
	Preston			58	58	58	58	0	58	0	58	0	
	Sheffield			43	107	107	43	0	107	0	107	0	
	Stockport			34	63	63	34	0	63	0	63	0	
	Stoke			41	99	99	41	0	79	1	79	1	
	Walsall			105	167	167	85	1	147	1	147	1	
	Warrington			14	26	26	14	0	26	0	26	0	
	Wolverhampton			60	80	80	60	0	80	0	80	0	
	York			64	113	113	64	0	113	0	113	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX L4

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

LONDON

London

Town/City	London
City Region	Greater London
Population of built-up area**	**9,800,000**
Ranking amongst UK cities**	**1**
Number of cities directly linked by existing rail network (out of 31)	**26**

References:
HSUK London-Birmingham Rail Strategy
HSUK Regional Map 01
HSUK London Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

London : Intercity Connectivity with HSUK and HS2

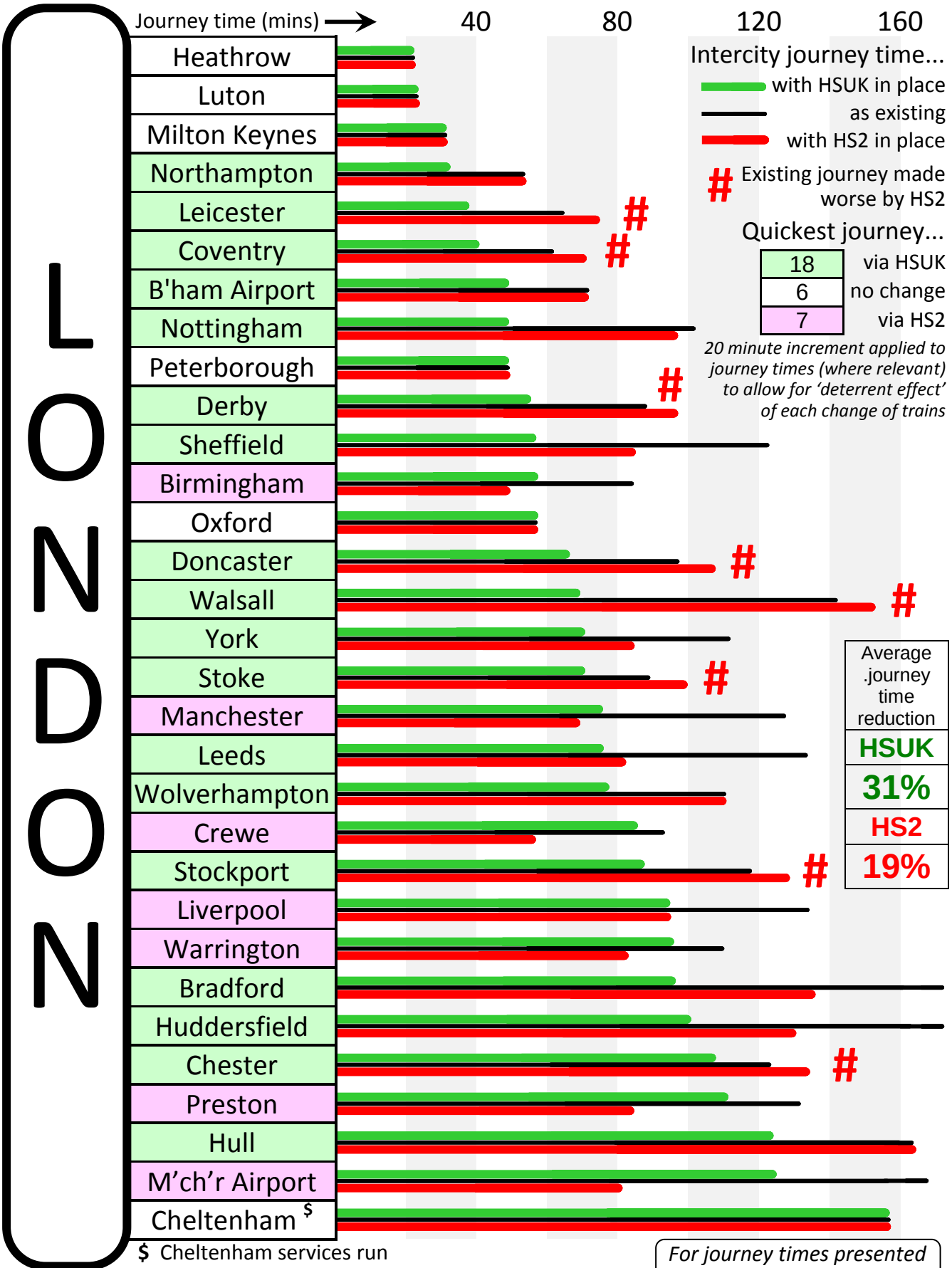
London	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**31%**	**27**	**25**	**0**	**18**
HS2	**19%**	**11**	**13**	**8**	**7**

Greater London is by far the UK's largest conurbation, and also the richest in terms of per capita income. It is also the focus of the national rail network, with more high-quality intercity services operating from London than from any other city. Its principal local airport Heathrow is the busiest international airport in the world, with a far greater range of international destinations than any other UK airport. London's connectivity far exceeds any other UK city, and it is both the effect and the cause of London's greater prosperity compared with regional cities. Long-standing Government policy of greater spending per capita on London's transport network – reflected both in greater subsidy and greater capital spending on projects such as Crossrail and Thameslink – tends only to reinforce these disparities.

Although HS2 has been promoted as a project intended to improve regional connectivity and redress the North-South divide, the reality is that its configuration is focussed on London, and the majority of its services are also focussed upon London. With HS2's connectivity focussed upon London, it is London that will derive the greatest economic benefit from HS2. At the same time London will suffer all the adverse social effects of its hot-housed economy, in particular the increasing inability of Londoners to afford to buy houses and to live in their own city.

However, London's benefits under the HS2 scheme only seem large relative to other less well-connected communities. HSUK's greater capacity and connectivity, spread across the nation, will create far greater overall economic and environmental benefit. With the poorest connected regional cities experiencing the greatest connectivity gains, and all regions gaining direct access to Heathrow and improved access to their respective regional airports, it seems likely that HSUK will also have the effect of redressing current economic imbalances. This rebalanced economy should benefit all UK regions, including London.

HIGH SPEED UK & HS2 LINKS TO LONDON



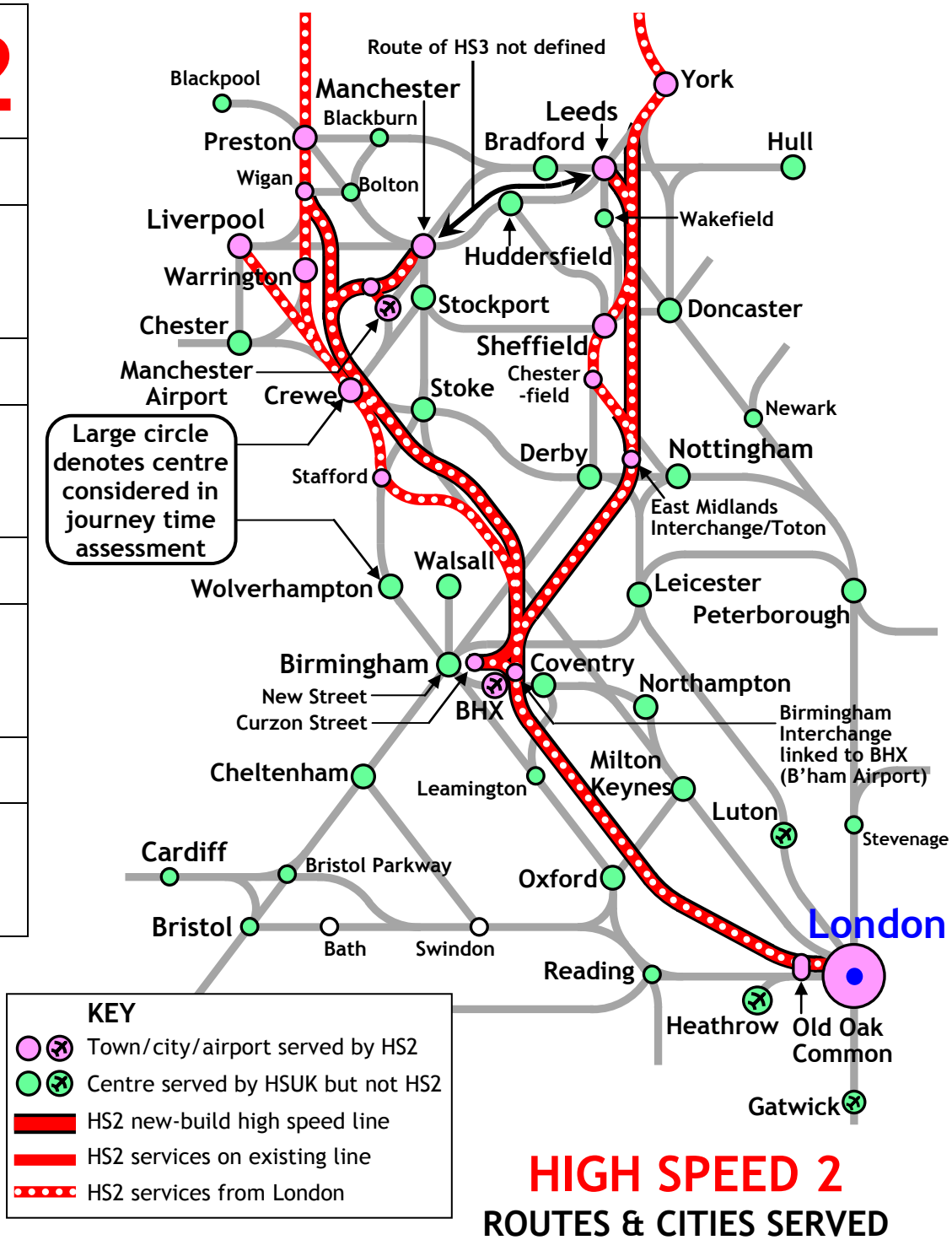
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p278

LONDON

Focus of HS2 system, but only 11 out of 31 cities & airports linked. Remainder bypassed or not served

HS2
Average journey time reductions:
19%
No. of cities directly linked:
11
No. of journeys made faster:
13
No. of journeys made worse:
8



HIGH SPEED 2

ROUTES & CITIES SERVED

LONDON

HSUK high speed links from London to all major towns & cities served by present intercity network

HSUK

Average journey time reductions:

31%

No. of cities directly linked:

27

No. of journeys made faster:

25

No. of journeys made worse:

0

London served by:
HSUK31,32,33,34
HSUK35,36,37
HSUK41,42,43,44
HSUK45,46,51,75
HSUK52,53,54,55
HSUK61,62,63,64
HSUK71,72,73,74
See Appendix A1

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **London**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
LONDON	Birmingham			57	83	49	57	0	83	0	49	0	
	B'ham Airport			47	71	71	47	0	71	0	71	0	
	Bradford			95	191	136	95	0	171	1	116	1	
	Cheltenham			156	136	136	136	1	136	0	136	0	
	Chester			106	123	125	106	0	123	0	95	1[A]	#
	Coventry			38	61	61	38	0	61	0	61	0	#
	Crewe			84	93	55	84	0	93	0	55	0	
	Derby			53	87	87	53	0	87	0	80	1[A]	#
	Doncaster			65	98	98	65	0	98	0	98	0	#
	Heathrow			21	21	21	21	0	21	0	21	0	
	Huddersfield			100	189	129	100	0	169	1	109	1	
	Hull			124	164	164	124	0	154	1	154	0	
	Leeds			77	133	81	77	0	133	0	81	0	
	Leicester			37	64	64	37	0	64	0	64	0	#
	Liverpool			98	133	93	98	0	133	0	93	0	
	Luton			22	22	22	22	0	22	0	22	0	
	Manchester			77	127	67	77	0	127	0	67	0	
	M'ch'r Airport			127	168	81	107	1	148	1	71	0	
	Milton Keynes			32	32	32	32	0	32	0	32	0	
	Northampton			30	53	53	30	0	53	0	53	0	
	Nottingham			47	101	97	47	0	101	0	77	1[A]	
	Oxford			58	58	58	58	0	58	0	58	0	
	Peterborough			49	49	49	49	0	49	0	49	0	
	Preston			112	131	84	112	0	131	0	84	0	
	Sheffield			56	122	85	56	0	122	0	85	0	
	Stockport			89	118	118	89	0	118	0	118	0	#
	Stoke			69	87	87	69	0	87	0	87	0	#
	Walsall			69	141	141	69	0	121	1	121	1	#
	Warrington			95	109	81	95	0	109	0	81	0	
	Wolverhampton			75	110	110	75	0	110	0	110	0	
	York			69	111	84	69	0	111	0	84	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX L5

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

LUTON

Luton

Town/City	Luton
Population of built-up area**	260,000
Ranking amongst UK cities**	31
Number of cities directly linked by existing rail network (out of 31)	3

References:
HSUK London-Birmingham Rail Strategy
HSUK Regional Maps 01 & 02
HSUK Luton Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Luton : Intercity Connectivity with HSUK and HS2

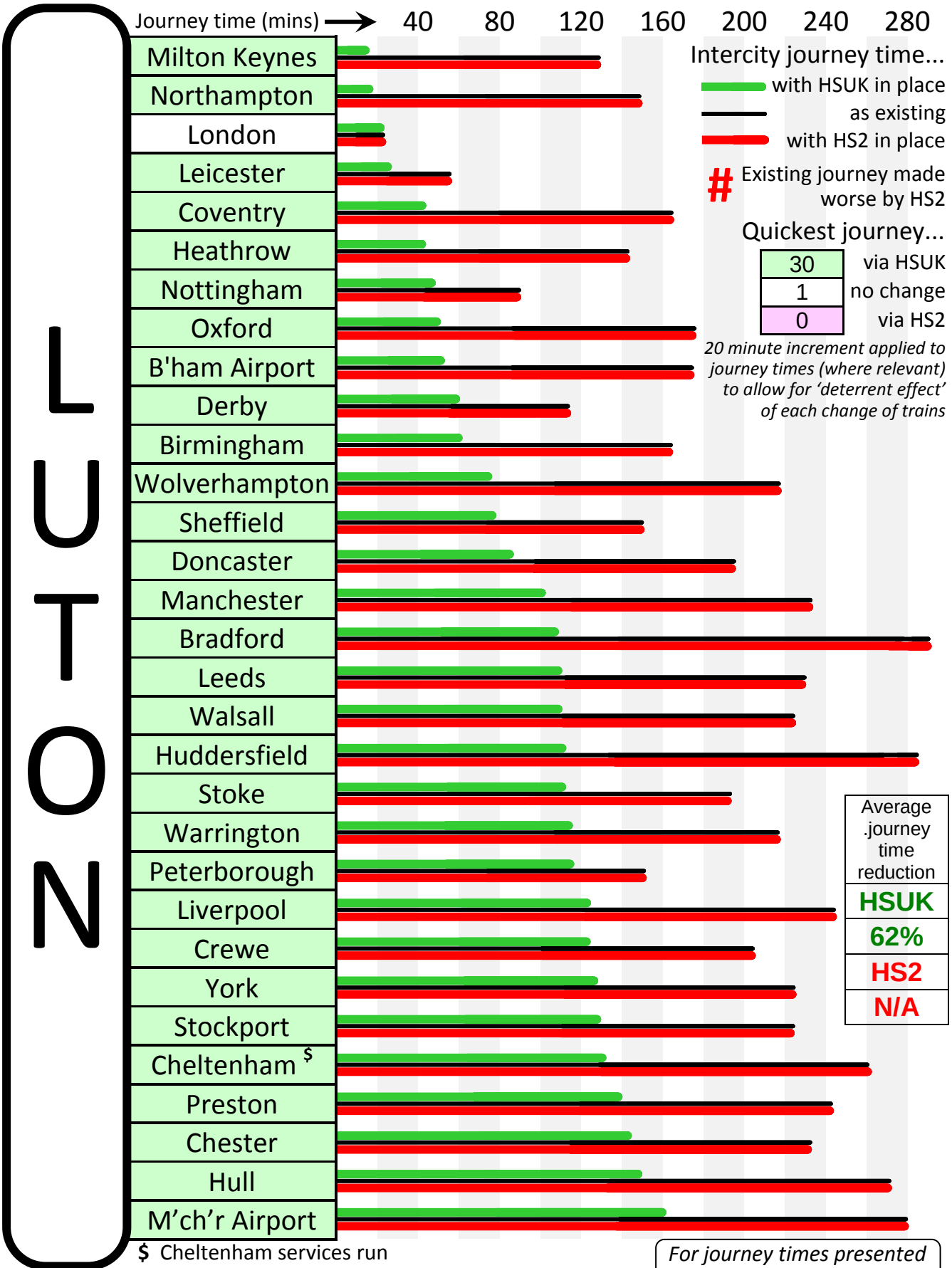
Luton	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	62%	17	30	0	30
HS2	N/A	0	N/A	N/A	0

Out of all the 32 UK towns, cities and airports considered in this study, Luton is arguably the worst connected. It lies on the Midland Main Line, and enjoys direct services (from Luton Airport Parkway rather than the more central Luton Station) to London, Leicester and Nottingham – but not to either Derby or Sheffield which would give access to many more UK cities. Hence despite its location on the primary M1 transport corridor, most of Luton's intercity links – for instance to Leeds, Manchester, Liverpool and Oxford – are routed via central London, and a transfer from St Pancras to either Kings Cross or Euston or Paddington.

Luton's poor connectivity will not be improved in any meaningful way by HS2. Local journeys along the Midland Main Line seem likely to be made worse through the projected withdrawal of intercity services. Longer distance journeys routed via central London might be made shorter by virtue of the reduced journey time of the leg to London; however the principle of routeing most intercity journeys to a centrally located community of over a quarter-million population, via the congestion of central London, 40km to the south, is so unacceptable that any such journeys cannot be rated as improvements. In consequence, no journeys to Luton have been classified either as 'made faster' or as 'made worse'.

Luton's intercity connectivity will be transformed by HSUK. Its 4-track trunk route following the M1 passes beneath the Luton/Dunstable conurbation in tunnel, and a spur from the Midland Main Line allows HSUK services routed via Luton to join the high speed line and continue northwards to either Leicester, Milton Keynes or Birmingham, where connection can be made to other HSUK services. Luton will be directly connected to 17 of the 31 other centres considered in this study, and a single change of trains is required to access the remaining 14. All routeing via central London is eliminated, and average journey times will be reduced by 62% - the best HSUK performance for any city.

HIGH SPEED UK & HS2 LINKS TO LUTON



$ Cheltenham services run onward to Bristol and Cardiff

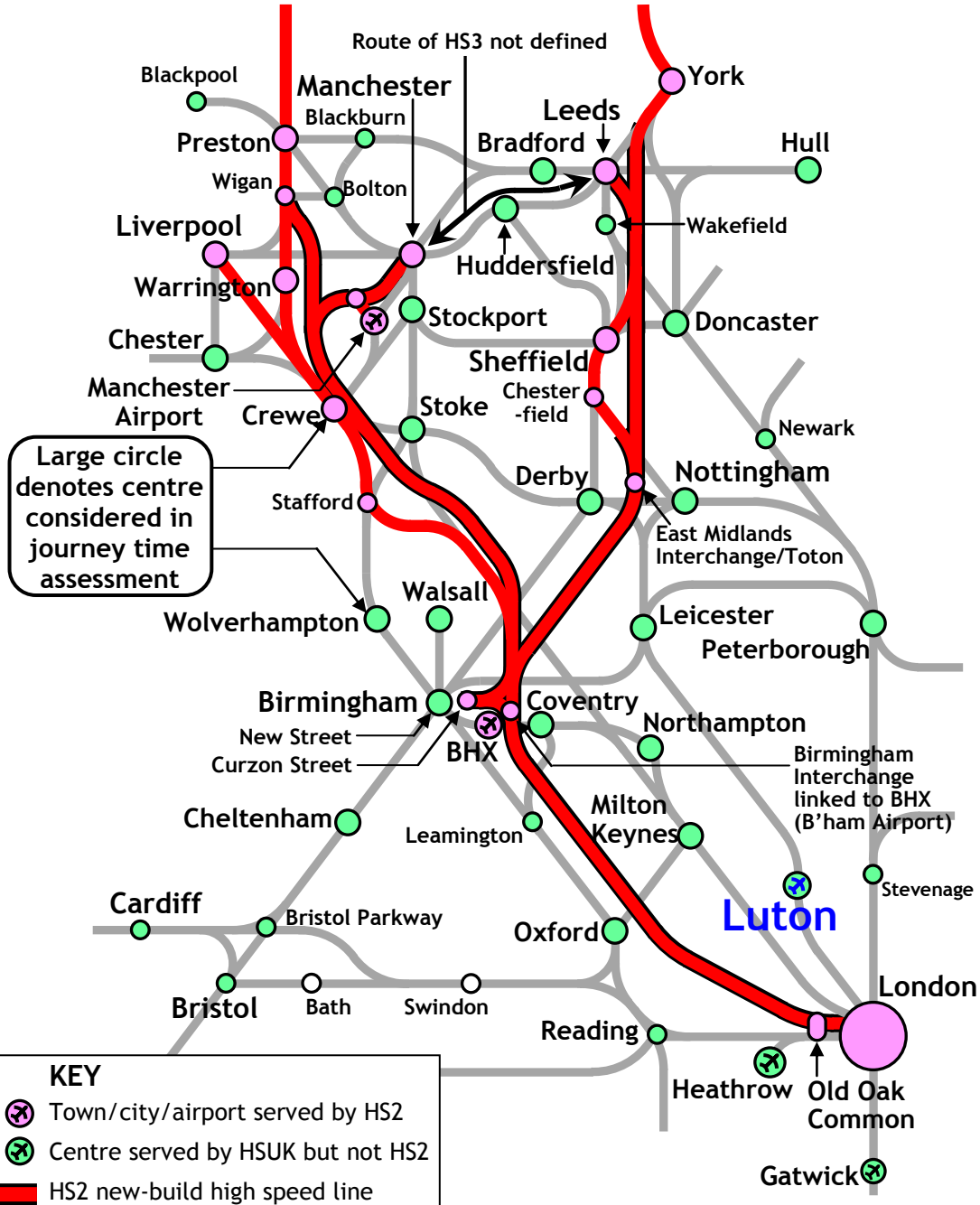
For journey times presented in tabulated format see p284

LUTON

Isolated from HS2, no improvement to current poor local and national connectivity

HS2
Average journey time reductions:
N/A*
No. of cities directly linked:
0
No. of journeys made faster:
N/A*
No. of journeys made worse:
N/A*

*HS2 journeys to Luton not assessed as made faster/ made worse due to continued routeing of most intercity journeys to Luton via London



HIGH SPEED 2

ROUTES & CITIES SERVED

LUTON

Connectivity transformed through link to HSUK spine route following M1 corridor

HSUK

Average journey time reductions:

62%

No. of cities directly linked:

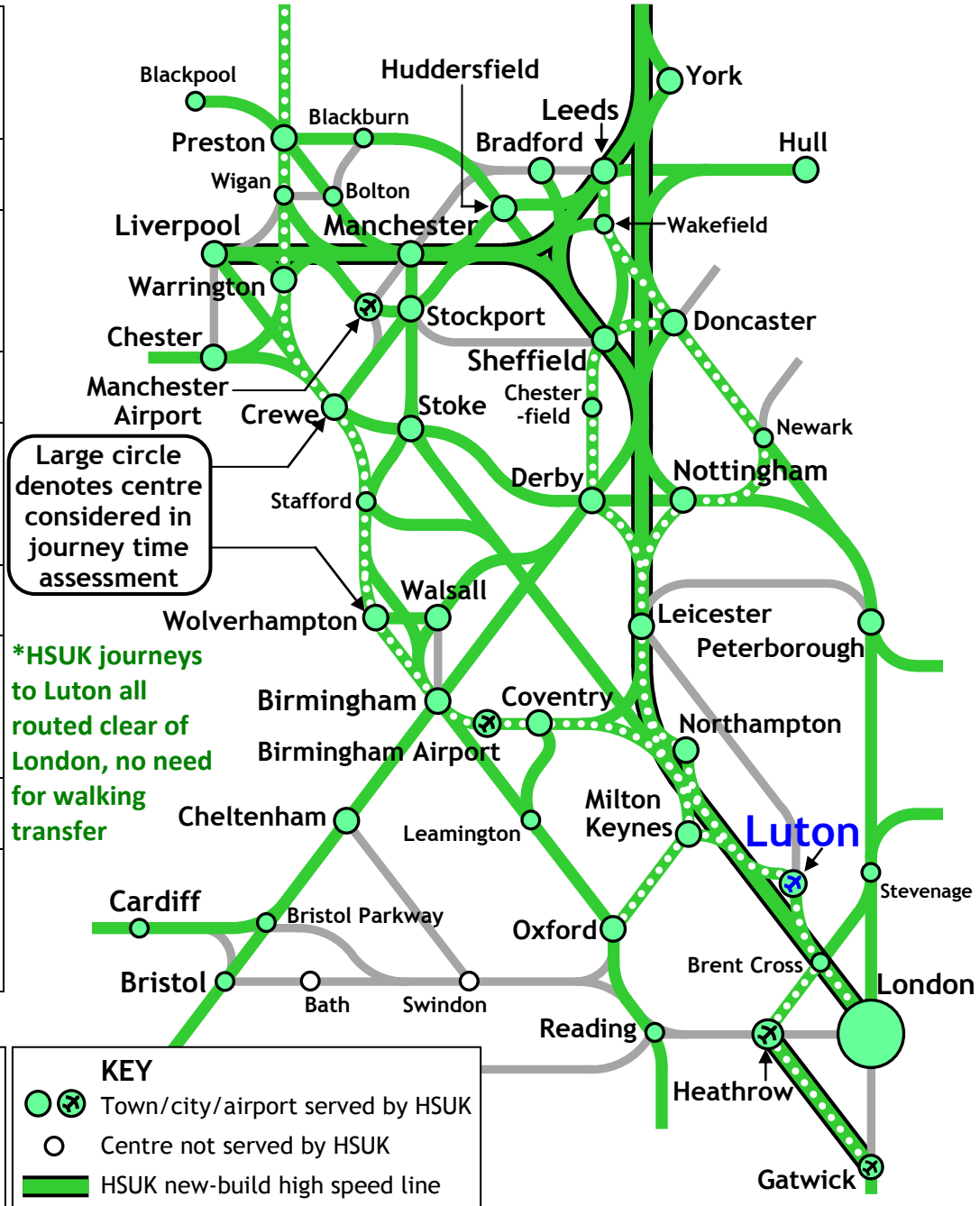
18*

No. of journeys made faster:

30*

No. of journeys made worse:

0



Luton served by:
HSUK61
HSUK72,74,75
HSUK93
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Luton

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Luton**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
LUTON	Birmingham			60	165	165	60	0	145	1	145	1	§
	B'ham Airport			50	155	155	50	0	135	1	135	1	§
	Bradford			111	290	290	91	1	230	3	230	3	§
	Cheltenham			134	261	261	114	1	201	3	201	3	§
	Chester			141	234	234	121	1	194	2	194	2	§
	Coventry			41	165	165	41	0	125	2	125	2	§
	Crewe			119	203	203	99	1	163	2	163	2	§
	Derby			59	114	114	59	0	94	1	94	1	§
	Doncaster			86	197	197	66	1	157	2	157	2	§
	Heathrow			41	142	142	41	0	102	2	102	2	§
	Huddersfield			113	285	285	93	1	245	2	245	2	§
	Hull			148	272	272	128	1	232	2	232	2	§
	Leeds			113	230	230	93	1	190	2	190	2	§
	Leicester			25	57	57	25	0	57	0	57	0	§
	Liverpool			125	244	244	105	1	204	2	204	2	§
	London			22	22	22	22	0	22	0	22	0	§
	Manchester			104	233	233	84	1	193	2	193	2	§
	M'ch'r Airport			163	280	280	143	1	220	3	220	3	§
	Milton Keynes			14	128	128	14	0	88	2	88	2	§
	Northampton			17	148	148	17	0	108	2	108	2	§
	Nottingham			48	89	89	48	0	89	0	89	0	§
	Oxford			46	177	177	46	0	137	2	137	2	§
	Peterborough			115	151	151	95	1	111	2	111	2	§
	Preston			138	242	242	138	0	202	2	202	2	§
	Sheffield			79	150	150	59	1	130	1	130	1	§
	Stockport			128	223	223	108	1	183	2	183	2	§
	Stoke			111	194	194	91	1	154	2	154	2	§
	Walsall			108	225	225	88	1	185	2	185	2	§
	Warrington			115	219	219	115	0	179	2	179	2	§
	Wolverhampton			74	219	219	74	0	179	2	179	2	§
	York			131	220	220	111	1	180	2	180	2	§

§ = Note that no assessment is made of journeys to Luton being made either faster or worse by HS2, due to continued need for walking or tube transfer between London terminus stations on most intercity journeys to Luton.

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the following special cases ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX M1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

MANCHESTER

and Greater Manchester conurbation

Manchester *and Greater Manchester conurbation*

Town/City	Manchester
City Region	Greater Manchester
Population of built-up area**	**2,550,000**
Ranking amongst UK cities**	**2**
Number of cities directly linked by existing rail network (out of 31)	**24**

References:
HSUK North-West Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Regional Maps 09 & 10
HSUK Manchester Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Manchester : Intercity Connectivity with HSUK and HS2

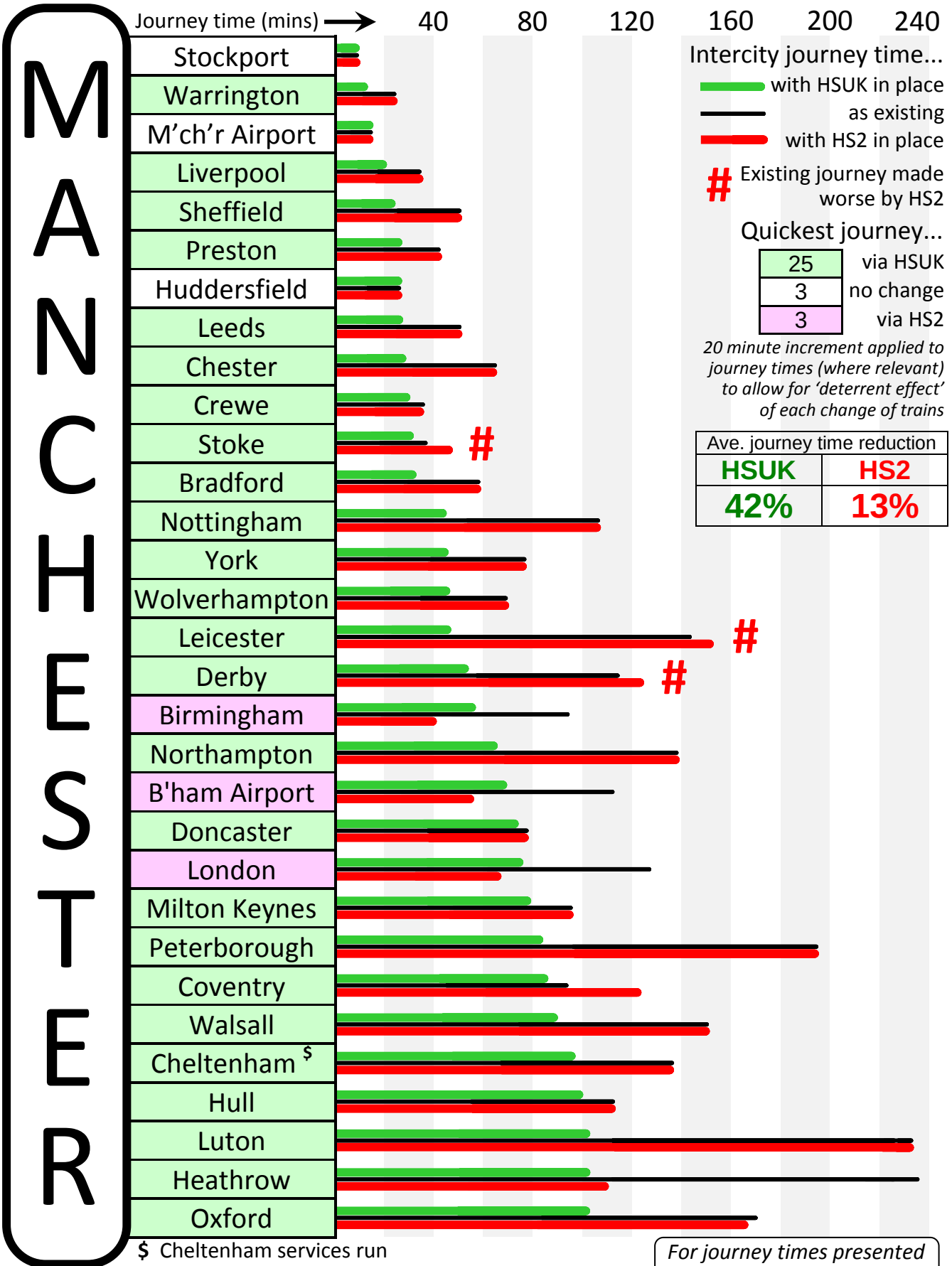
	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**42%**	**29**	**28**	**0**	**25**
HS2	**13%**	**3**	**6**	**3**	**3**

Greater Manchester is the UK's second-largest conurbation and the largest in the North of England. In consequence Manchester Piccadilly station is a natural focus for the national intercity network, and it enjoys direct links to most other principal UK cities. However, the lack of any direct 'heavy rail' link between Manchester's two principal stations – Victoria to the north, Piccadilly to the south – and lack of capacity on east-west routes greatly compromises regional and national connectivity via Manchester. Of particular concern is the lack of capacity for transpennine freight traffic (for instance container trains from the proposed 'Atlantic Gateway' Liverpool superport) to cross Manchester. These east-west cross-Manchester issues are not addressed by the ongoing 'Northern Hub' scheme.

HS2 will serve Manchester at a new terminus station to be built alongside the existing Manchester Piccadilly. However, HS2 will do very little to improve Manchester's overall connectivity. Only Birmingham, Birmingham Airport and London Euston will be directly linked, and the general disconnection of these stations will prevent further spread of HS2's connectivity benefits; links to all other UK cities will remain largely dependent upon the existing intercity network. Whilst HS3/Northern Powerhouse Rail should bring further benefits for transpennine links to Leeds and other Yorkshire cities, this also establishes a requirement for onward links towards Liverpool and to Manchester Airport with which the proposed HS2 terminus at Manchester Piccadilly is completely incompatible.

HSUK greatly improves Manchester's intercity connectivity not by building the fastest route to London, but by building the new transpennine route necessary to link Manchester (and Liverpool) to its north-south spine and therefore to most principal UK cities. Its cross-Manchester route with new tunnelled platforms at Manchester Piccadilly enables all Northern Powerhouse requirements for connectivity between Northern cities to be met in full.

HIGH SPEED UK & HS2 LINKS TO MANCHESTER



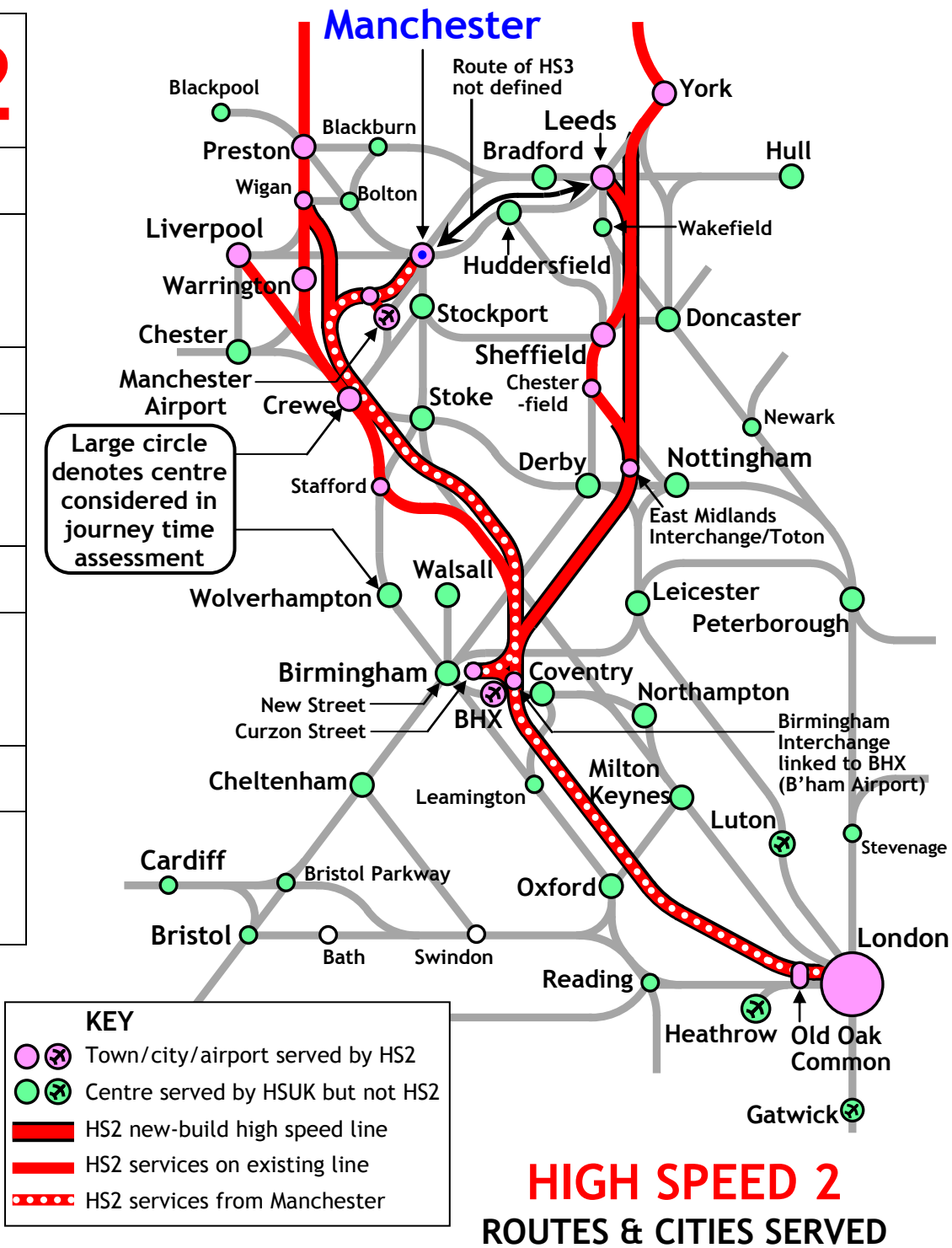
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p290

MANCHESTER

Located on spur, HS2 direct links only to London, Birmingham & Birmingham Airport

HS2
Average journey time reductions:
13%
No. of cities directly linked:
3
No. of journeys made faster:
6
No. of journeys made worse:
3



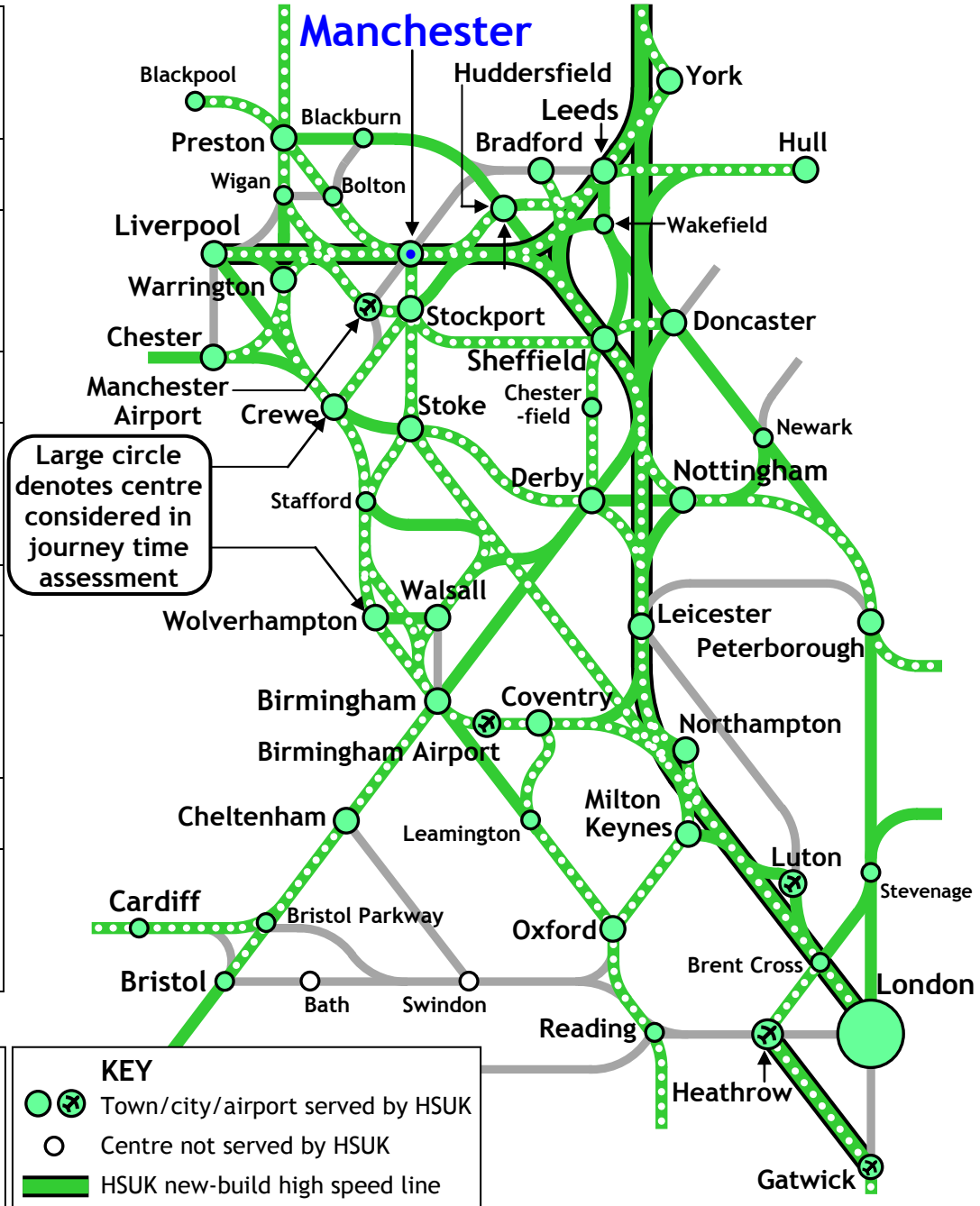
HIGH SPEED 2

ROUTES & CITIES SERVED

MANCHESTER

Fully connected to national high speed network, direct high speed links to all principal UK cities

HSUK
Average journey time reductions:
42%
No. of cities directly linked:
29
No. of journeys made faster:
28
No. of journeys made worse::
0



Manchester served by:
HSUK03,06,11,12
HSUK21,22,23,28
HSUK43,44,15,29
HSUK53,64,71
HSUK92,94
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Manchester

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Manchester**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
MANCHESTER	Birmingham			57	87	40	57	0	87	0	40	0	
	B'ham Airport			69	112	55	69	0	112	0	45	0[B]	
	Bradford			30	59	59	30	0	59	0	59	0	
	Cheltenham			97	137	137	97	0	137	0	137	0	
	Chester			27	64	64	27	0	64	0	64	0	
	Coventry			86	122	93	86	0	122	0	63	1[B]	
	Crewe			28	35	35	28	0	35	0	35	0	
	Derby			53	114	114	53	0	94	1	94	1	#
	Doncaster			78	78	78	78	0	78	0	78	0	
	Heathrow			103	236	110	103	0	196	2	90	1	
	Huddersfield			26	26	26	26	0	26	0	26	0	
	Hull			98	113	113	98	0	113	0	113	0	
	Leeds			26	51	51	26	0	51	0	51	0	
	Leicester			47	142	142	47	0	122	1	122	1	#
	Liverpool			19	33	33	19	0	33	0	33	0	
	London			77	127	67	77	0	127	0	67	0	
	Luton			104	233	233	84	1	193	2	193	2	
	M'ch'r Airport			13	13	13	13	0	13	0	13	0	
	Milton Keynes			81	95	95	81	0	95	0	95	0	
	Northampton			67	139	139	67	0	119	1	109	1[B]	
	Nottingham			45	106	106	45	0	106	0	106	0	
	Oxford			110	171	167	110	0	171	0	137	1[B]	
	Peterborough			84	174	174	84	0	154	1	154	1	
	Preston			25	41	41	25	0	41	0	41	0	
	Sheffield			23	50	50	23	0	50	0	50	0	
	Stockport			8	10	10	8	0	10	0	10	0	
	Stoke			30	36	36	30	0	36	0	36	0	#
	Walsall			88	150	150	88	0	130	1	130	1	
	Warrington			11	23	23	11	0	23	0	23	0	
	Wolverhampton			45	69	69	45	0	69	0	69	0	
	York			43	77	77	43	0	77	0	77	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX M2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

MANCHESTER AIRPORT

Manchester Airport

Airport	Manchester
Passenger numbers per year**	**23.1 million**
Ranking amongst UK airports**	**3**
Number of cities directly linked by existing rail network (out of 31)	**12**

References:
HSUK North-West Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Regional Maps 08, 09 & 10
HSUK Manchester Airport Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Busiest_airports_in_the_United_Kingdom_by_total_passenger_traffic

Manchester Airport : Intercity Connectivity with HSUK and HS2

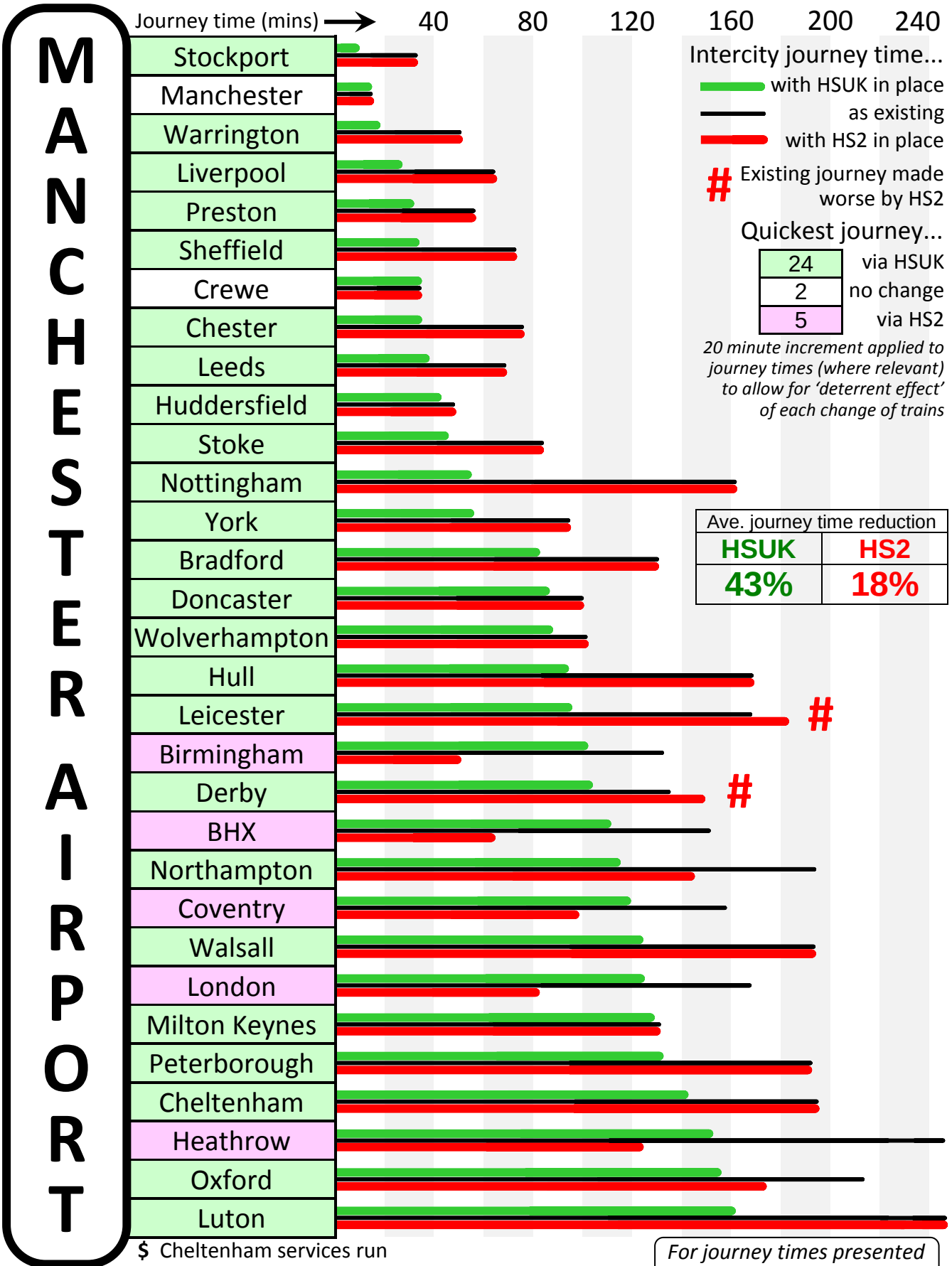
	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**43%**	**13**	**29**	**0**	**24**
HS2	**18%**	**3**	**7**	**2**	**5**

Manchester Airport is the North of England's primary international gateway, and it is the only UK airport other than Heathrow to have 2 runways. The construction of a 2km long spur from the Styal Loop in 1993 enabled direct rail links to be established to most principal Northern cities; however, the limited capacity of the 3 terminus platforms at Manchester Airport, and the limited capacity of Manchester Piccadilly and other central Manchester routes greatly restrict the further spread of the airport's surface links.

The proposed Manchester Airport station on the HS2 Manchester spur will be built near M56 Junction 5, on the far side of the motorway from the airport terminals and approximately 2km from the existing centrally located airport station. No proposals have yet emerged for the 'people mover' system necessary to link the station to the airport; but for the purposes of this study a shuttle similar to that proposed between HS2's Birmingham Interchange and the existing Birmingham International has been assumed. Although HS2 will provide extremely fast links from Manchester Airport to a few remote and generally disconnected destinations (London Euston, Birmingham Interchange and Birmingham Curzon Street), more crucially HS2 will fail to address the Northern Powerhouse requirement for efficient links from Manchester Airport to all principal Northern cities within its own Northern hinterland. Instead, HS2's configuration, with a terminus at Manchester Piccadilly, will do much to prevent the establishment of efficient direct links.

HSUK will achieve all Northern Powerhouse requirements for improved intercity links to Manchester Airport by converting the existing terminating spur into a through loop. This loop will extend around the south side of the Greater Manchester conurbation and will include key interchanges with the existing network at both Stockport and Altrincham. The conversion of Manchester Airport station to 'through' operation will create increased capacity for a much greater range of services, and the loop will provide direct access to the existing rail network and to HSUK, allowing a major reduction in existing journey times.

HIGH SPEED UK & HS2 LINKS TO MANCHESTER AIRPORT



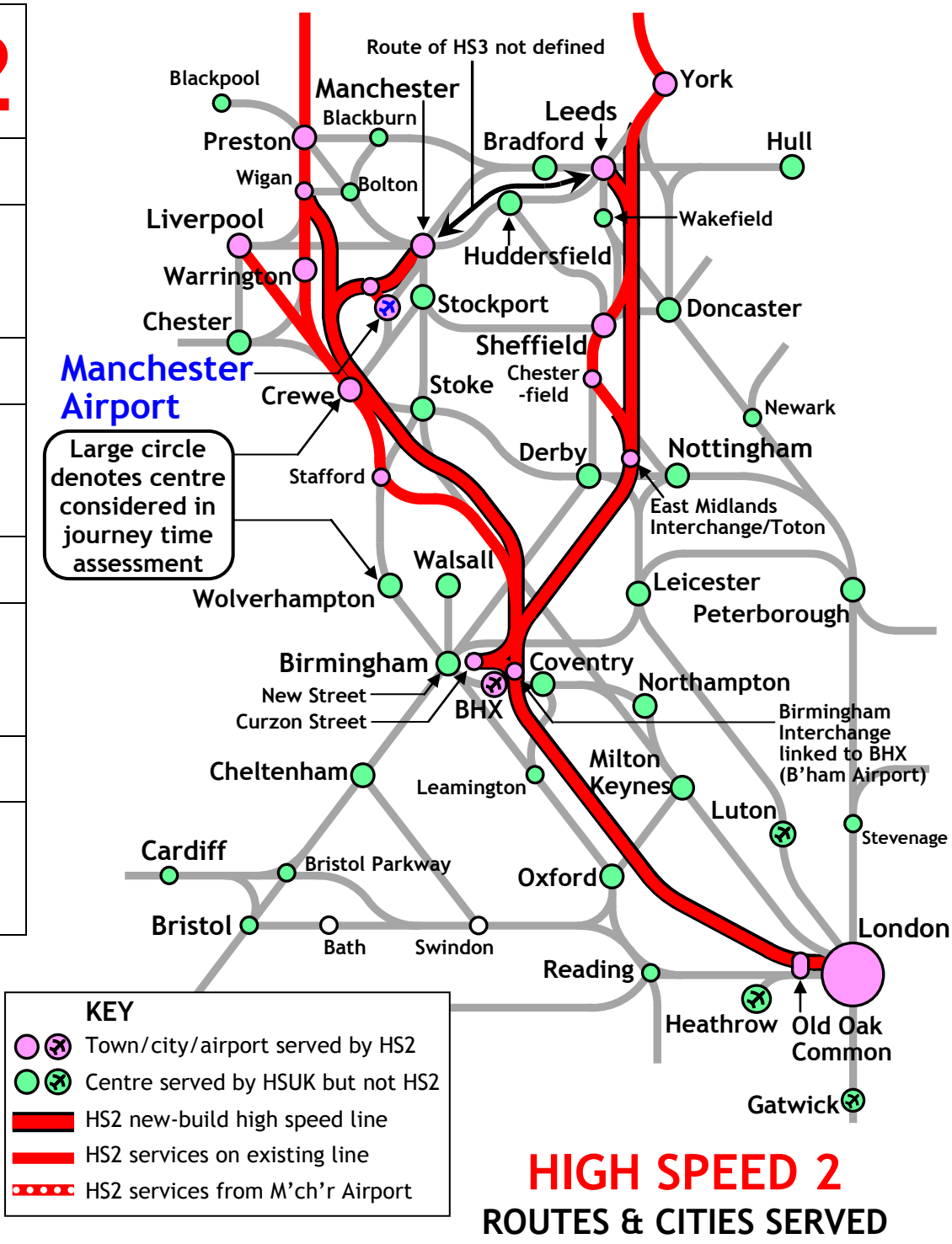
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p296

MANCHESTER AIRPORT

Direct links to Northern Powerhouse cities not possible with proposed HS2 Manchester terminus

HS2
Average journey time reductions:
18%
No. of cities directly linked:
3
No. of journeys made faster:
7
No. of journeys made worse:
2



MANCHESTER AIRPORT

Fully connected to national high speed network & to all principal Northern Powerhouse cities

HSUK

Average journey time reductions:

43%

No. of cities directly linked:

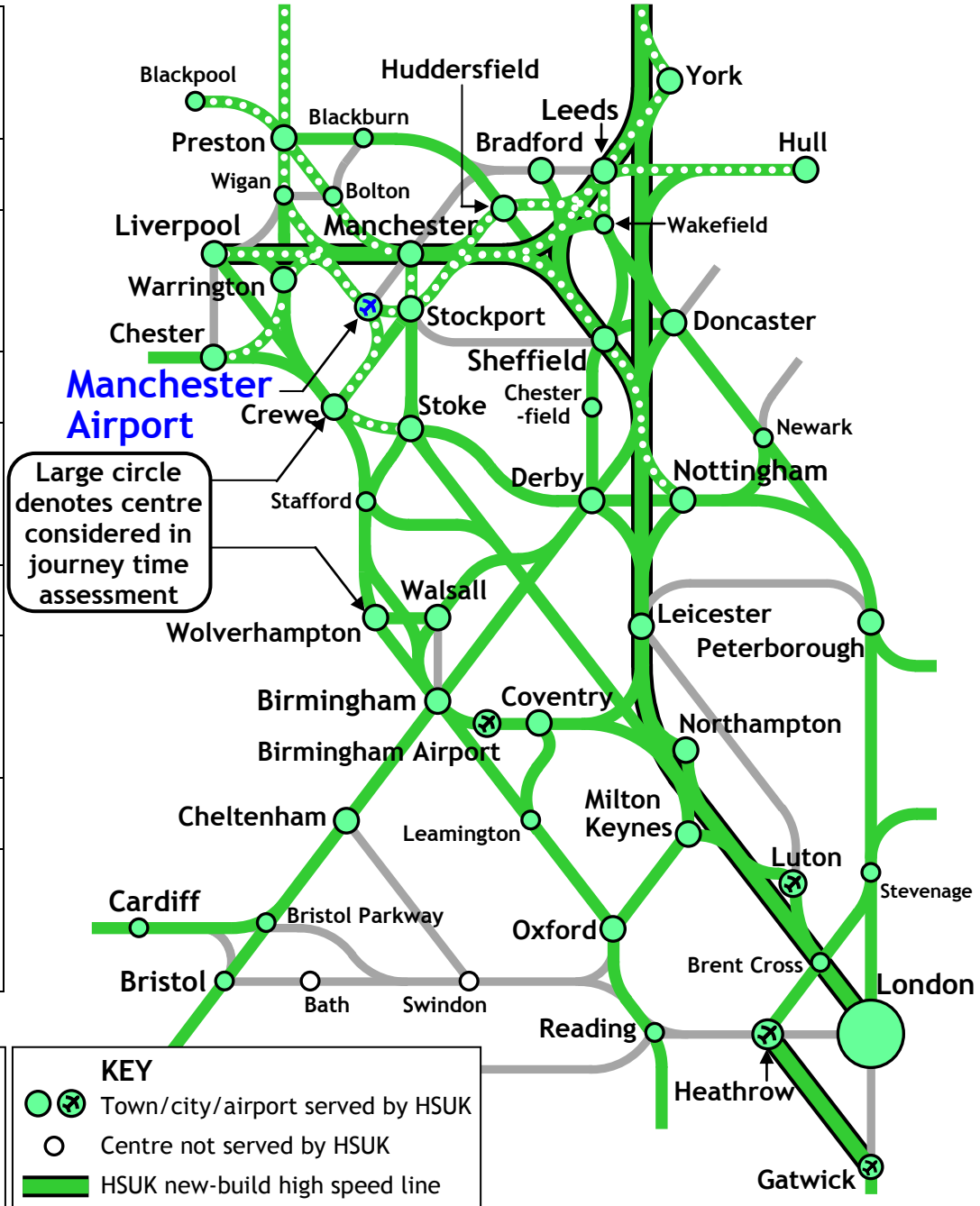
13

No. of journeys made faster:

29

No. of journeys made worse:

0



Manchester Airport served by:
HSUK24,25,26
HSUK28,29
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from M'ch'r Airport

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Manchester Airport**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
MANCHESTER AIRPORT	Birmingham			102	133	50	82	1	113	1	40	0	
	B'ham Airport			111	151	65	91	1	131	1	45	1	
	Bradford			80	130	130	60	1	110	1	110	1	
	Cheltenham			140	196	196	120	1	176	1	176	1	
	Chester			32	77	77	32	0	77	0	77	0	
	Coventry			120	159	99	100	1	139	1	59	2	
	Crewe			35	35	35	35	0	35	0	35	0	
	Derby			103	136	136	83	1	116	1	116	1	#
	Doncaster			89	100	100	69	1	100	0	100	0	
	Heathrow			153	275	124	133	1	215	3	94	1	
	Huddersfield			39	48	48	39	0	48	0	48	0	
	Hull			92	169	169	92	0	149	1	149	1	
	Leeds			37	69	69	37	0	69	0	69	0	
	Leicester			97	168	168	77	1	148	1	148	1	#
	Liverpool			26	64	64	26	0	64	0	64	0	
	London			127	168	81	107	1	148	1	71	0	
	Luton			163	280	280	143	1	220	3	220	3	
	Manchester			13	13	13	13	0	13	0	13	0	
	Milton Keynes			131	131	131	111	1	111	1	111	1	
	Northampton			117	193	145	97	1	153	2	105	2	
	Nottingham			57	161	161	57	0	141	1	141	1	
	Oxford			160	214	173	140	1	194	1	133	2	
	Peterborough			134	192	192	114	1	172	1	172	1	
	Preston			30	57	57	30	0	57	0	57	0	
	Sheffield			34	73	73	34	0	73	0	73	0	
	Stockport			7	33	33	7	0	33	0	33	0	
	Stoke			43	83	83	43	0	63	1	63	1	
	Walsall			122	194	194	102	1	154	2	154	2	
	Warrington			16	51	51	16	0	51	0	51	0	
	Wolverhampton			85	101	101	65	1	81	1	81	1	
	York			55	94	94	55	0	94	0	94	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX M3

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

MILTON KEYNES

Milton Keynes

Town/City	Milton Keynes
Population of built-up area**	230,000
Ranking amongst UK cities**	35
Number of cities directly linked by existing rail network (out of 31)	14

References:
HSUK Yorkshire Rail Strategy
HSUK Regional Map 02
HSUK Milton Keynes Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Milton Keynes : Intercity Connectivity with HSUK and HS2

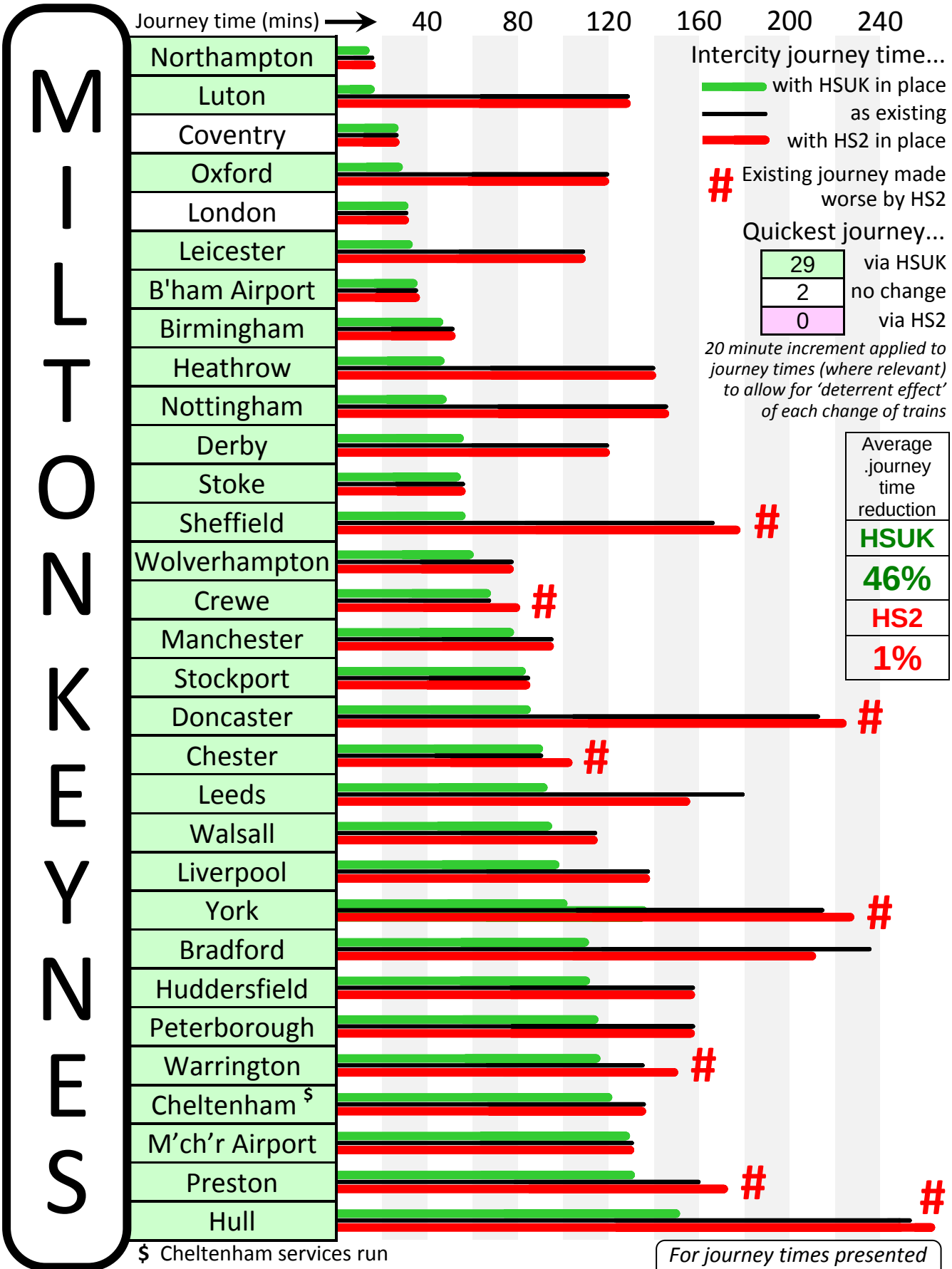
Milton Keynes	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**46%**	**22**	**28**	**0**	**29**
HS2	**1%**	**0**	**2**	**8**	**0**

Milton Keynes' score of 12 cities directly linked conceals a crucial connectivity deficiency – all these links are to cities located along the axis of the West Coast Main Line, and journeys to other UK cities served by Midland and East Coast main lines require a change of trains, generally at Birmingham New Street. These circuitous journeys compare very poorly with road journeys to the same cities along the M1. The forthcoming reopening of the East-West route, linking Milton Keynes to Oxford via Bletchley and Bicester will do little to improve the strategic situation.

HS2 will do nothing to improve Milton Keynes' intercity connectivity, and instead will make it significantly worse through the proposed withdrawal of WCML intercity services. This withdrawal of intercity services is a natural consequence of the transfer of primary city flows to HS2, and the imperative to create more capacity for commuter services. Whilst any reduction of rail congestion is welcome, this strategy, of enhancing commuter services at the expense of intercity services, can only have the effect of reinforcing Milton Keynes' status as a dormitory town rather than an independent regional centre.

The establishment of HSUK's M1-aligned trunk route combined with the ongoing reopening of the East-West route will transform Milton Keynes' intercity connectivity. These two new routes will create an entirely new cross-country corridor, running from the South Coast via Reading, Oxford, Milton Keynes and Northampton to the East Midlands and South Yorkshire, and then onwards to Manchester and Liverpool or to Leeds, the North-East and Scotland. In this way, Milton Keynes can attain direct connectivity to all principal UK cities, and thus become a key hub of the UK national network.

HIGH SPEED UK & HS2 LINKS TO MILTON KEYNES



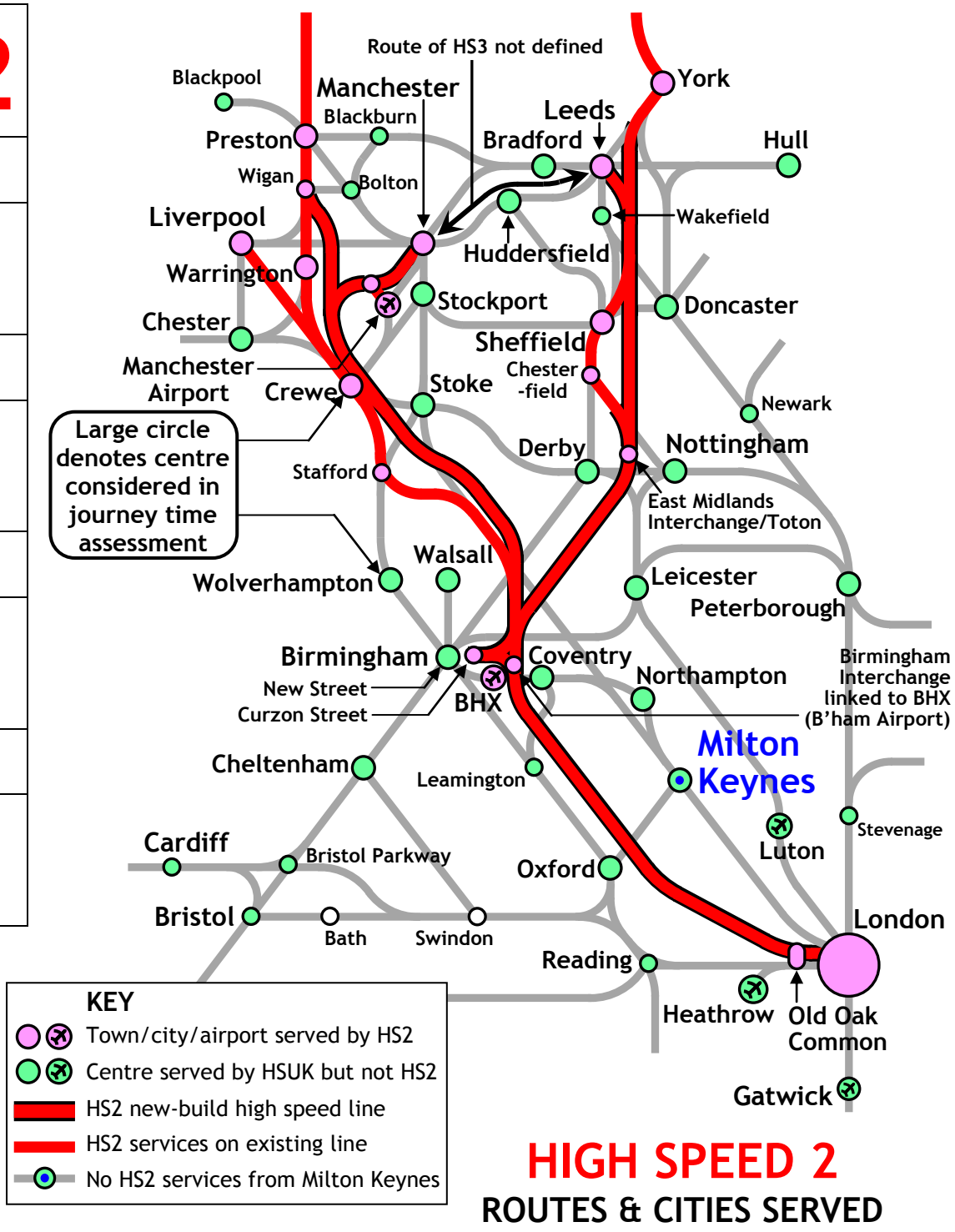
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p302

MILTON KEYNES

Bypassed by HS2, existing intercity services made worse, no rail link along M1 corridor to East Mids

HS2
Average journey time reductions:
1%
No. of cities directly linked:
0
No. of journeys made faster:
2
No. of journeys made worse:
8



HIGH SPEED 2

ROUTES & CITIES SERVED

MILTON KEYNES

Direct high speed links to most UK principal cities on new 'M1 corridor' northward intercity route

HSUK

Average journey time reductions:

46%

No. of cities directly linked:

22

No. of journeys made faster:

28

No. of journeys made worse:

0

Milton Keynes served by:
HSUK02,03
HSUK51,55,61
HSUK75,79
HSUK94
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Milton Keynes

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Milton Keynes**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
MILTON KEYNES	Birmingham			44	52	52	44	0	52	0	52	0	
	B'ham Airport			34	37	37	34	0	37	0	37	0	
	Bradford			113	237	211	93	1	197	2	161	2[B]	
	Cheltenham			119	137	137	99	1	117	1	117	1	
	Chester			90	90	90	90	0	90	0	90	0	#
	Coventry			25	25	25	25	0	25	0	25	0	
	Crewe			66	66	66	66	0	66	0	66	0	#
	Derby			56	120	120	56	0	100	1	100	1	
	Doncaster			83	214	214	63	1	174	2	174	2	#
	Heathrow			46	140	140	46	0	100	2	100	2	
	Huddersfield			113	159	159	93	1	139	1	139	1	
	Hull			150	255	255	130	1	235	1	219	2[B]	#
	Leeds			95	180	156	95	0	160	1	126	1[B]	
	Leicester			32	108	108	32	0	88	1	88	1	
	Liverpool			102	139	139	102	0	119	1	119	1	
	London			32	32	32	32	0	32	0	32	0	
	Luton			14	128	128	14	0	88	2	88	2	
	Manchester			81	95	95	81	0	95	0	95	0	
	M'ch'r Airport			131	131	131	111	1	111	1	111	1	
	Northampton			12	16	16	12	0	16	0	16	0	
	Nottingham			48	146	146	48	0	126	1	126	1	
	Oxford			27	38	38	27	0	38	0	38	0	
	Peterborough			112	159	159	92	1	119	2	119	2	
	Preston			133	160	160	113	1	160	0	130	1[B]	#
	Sheffield			56	166	166	56	0	146	1	146	1	#
	Stockport			82	85	85	82	0	85	0	85	0	
	Stoke			55	57	57	55	0	57	0	57	0	
	Walsall			92	114	114	72	1	94	1	94	1	
	Warrington			116	136	136	96	1	136	0	136	0	#
	Wolverhampton			58	79	79	58	0	79	0	79	0	
	York			113	216	216	113	0	196	1	196	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX N1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

NORTHAMPTON

Northampton

Town/City	Northampton
Population of built-up area**	220,000
Ranking amongst UK cities**	37
Number of cities directly linked by existing rail network (out of 31)	7

References:
HSUK London-Birmingham Rail Strategy
HSUK Regional Maps 02 & 03
HSUK Northampton Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Northampton : Intercity Connectivity with HSUK and HS2

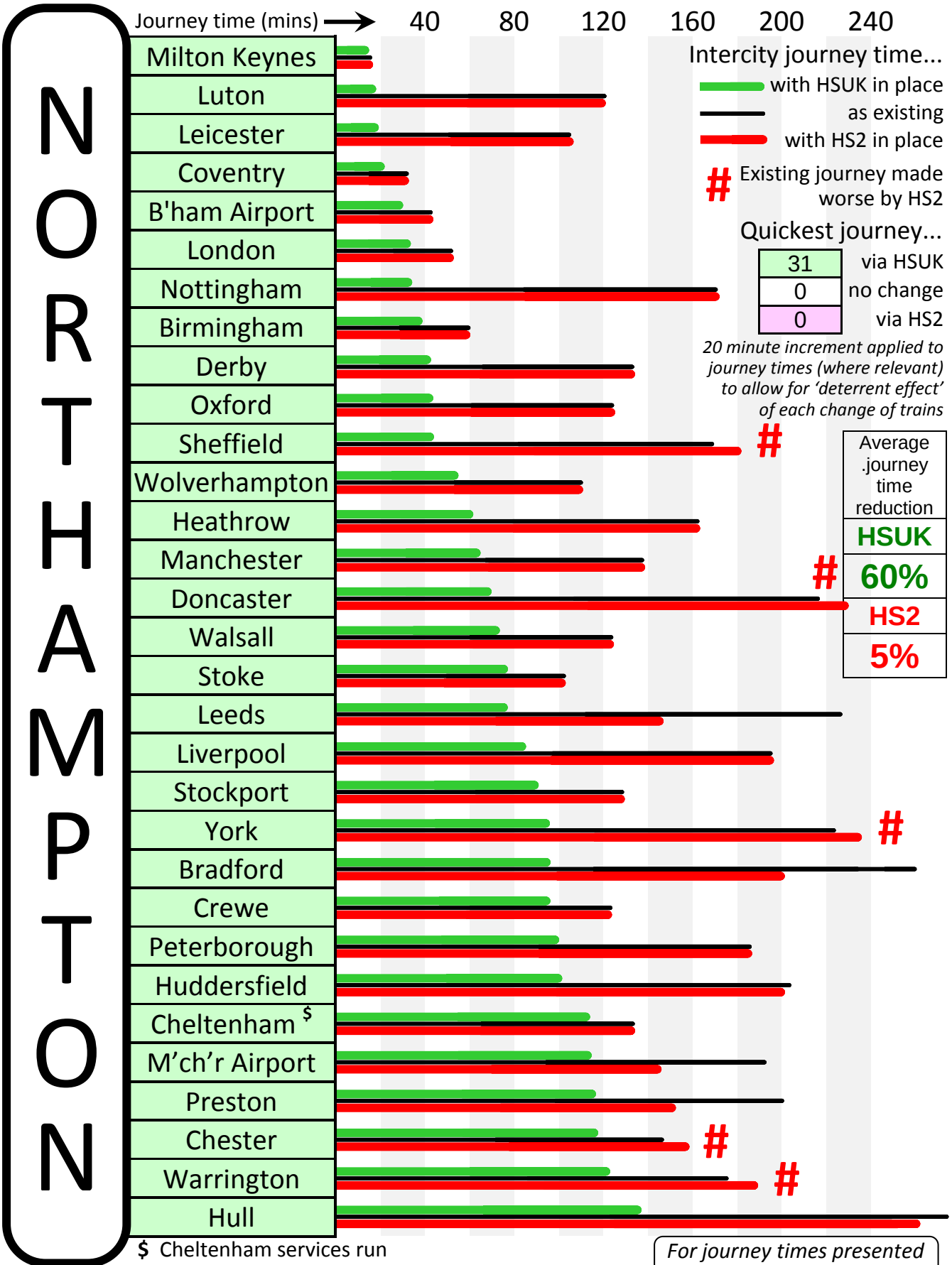
Northampton	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**60%**	**18**	**31**	**0**	**31**
HS2	**5%**	**0**	**6**	**5**	**0**

Northampton has historically been excluded from the national intercity network from the very start, when the builders of the London to Birmingham Railway (the precursor to the modern-day West Coast Main Line) chose to bypass Northampton. Its only links are local, south-eastwards to Milton Keynes and London, and north-westwards to Coventry and Birmingham, and to Stoke and Crewe. All of these links are regional London Midland services and none can be characterised as being of 'intercity' quality. The poor quality of Northampton's intercity rail links contrasts sharply with the good road connectivity that the town enjoys by virtue of its proximity to the M1, M6 and A14.

Northampton's existing intercity connectivity is so poor that HS2 can do little to make it significantly worse. Any improvements that are achieved, through northward links to HS2 services at Birmingham International/Interchange, are testament not to any merit in the part of HS2, but to the appalling connectivity that Northampton has to the present intercity network.

The establishment of HSUK's M1-aligned trunk route, combined with the ongoing reopening of the East-West route, allows Northampton to gain even greater benefit, relative to its existing connectivity, than HSUK will achieve for Milton Keynes. The East-West restoration and HSUK's M1-aligned spine route will together create an entirely new cross-country corridor, running from the South Coast via Reading, Oxford, Milton Keynes and Northampton to the East Midlands and South Yorkshire, and then onwards either to Manchester and Liverpool or to Leeds, the North-East and Scotland. In this way, Northampton can attain direct connectivity to all principal UK cities, and thus become a key hub of the UK national network.

HIGH SPEED UK & HS2 LINKS TO NORTHAMPTON



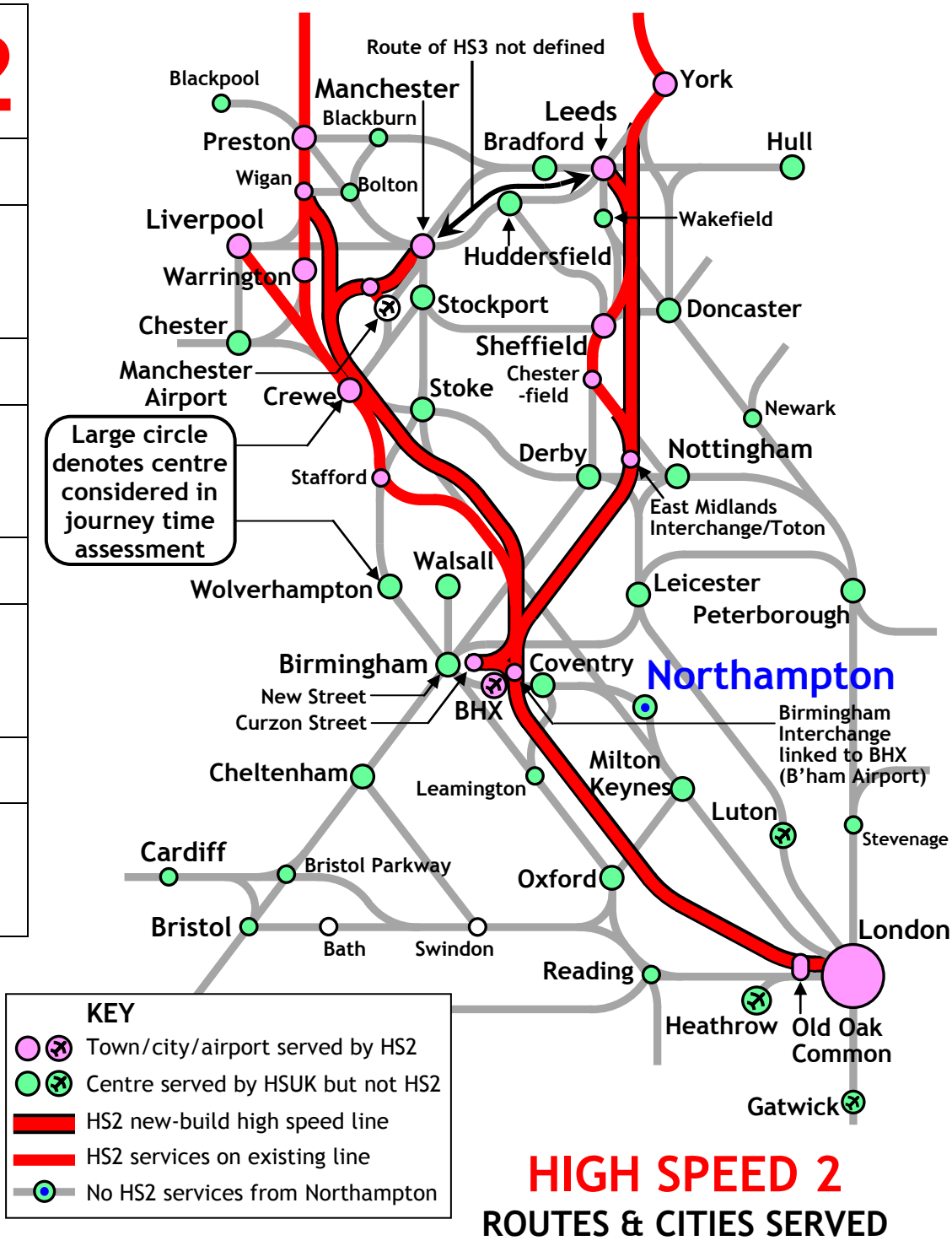
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see 308

NORTHAMPTON

Bypassed by HS2, no improvement to existing abysmal levels of intercity connectivity

HS2
Average journey time reductions:
5%
No. of cities directly linked:
0
No. of journeys made faster:
6
No. of journeys made worse:
5



NORTHAMPTON

Connectivity transformed through link to HSUK spine route following M1 corridor

HSUK

Average journey time reductions:

60%

No. of cities directly linked:

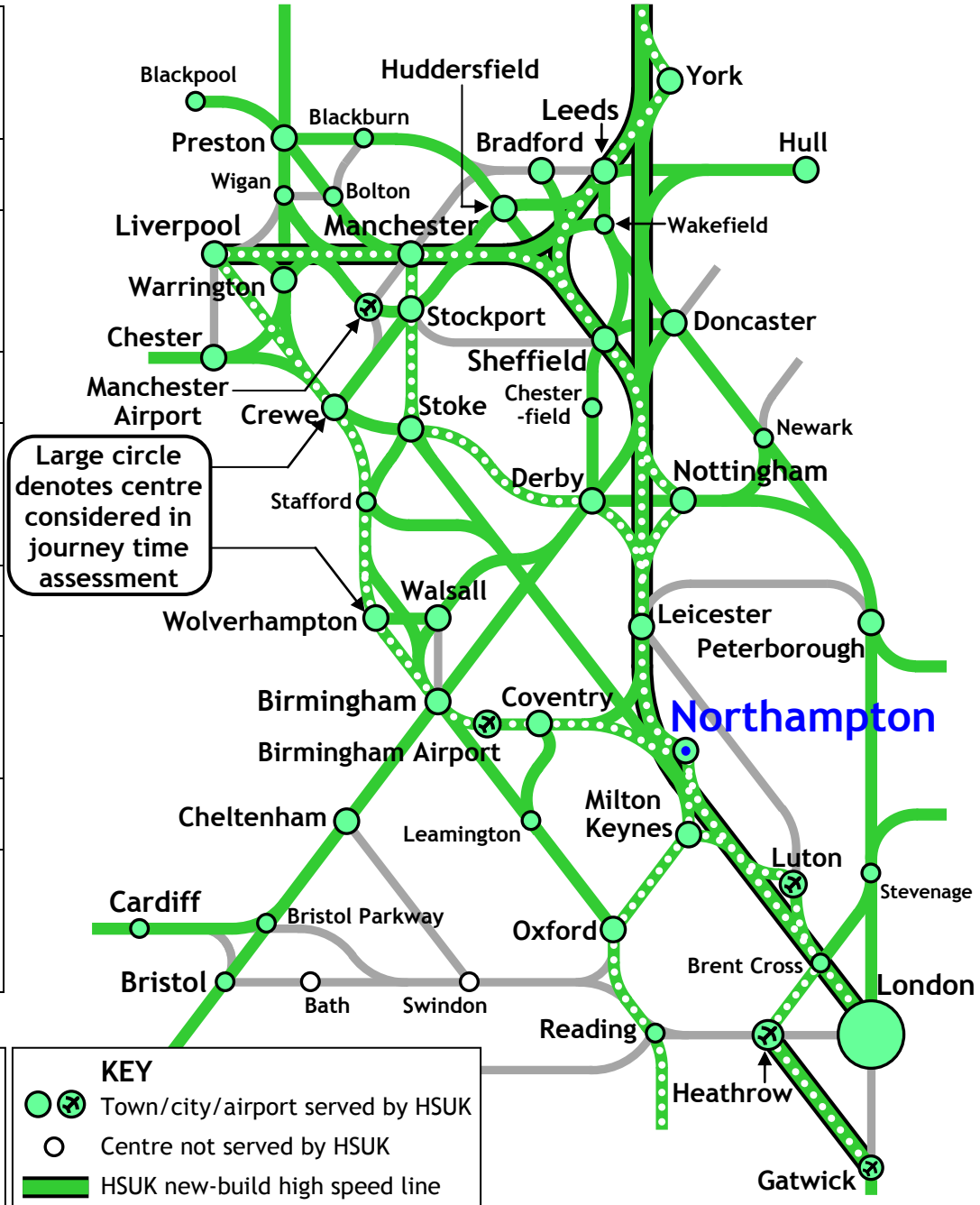
18

No. of journeys made faster:

31

No. of journeys made worse:

0



Northampton served by:
HSUK02,03
HSUK62
HSUK79
HSUK93
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Northampton

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Northampton**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
NORTHAMPTON	Birmingham			38	60	60	38	0	60	0	60	0	
	B'ham Airport			28	43	43	28	0	43	0	43	0	
	Bradford			99	281	201	79	1	221	3	151	2[B]	
	Cheltenham			111	134	134	91	1	114	1	114	1	
	Chester			115	146	146	95	1	126	1	126	1	#
	Coventry			19	33	33	19	0	33	0	33	0	
	Crewe			94	103	103	74	1	103	0	103	0	
	Derby			42	133	133	42	0	93	2	93	2	
	Doncaster			69	218	218	49	1	178	2	178	2	#
	Heathrow			60	162	162	60	0	122	2	122	2	
	Huddersfield			101	204	201	81	1	164	2	151	2[B]	
	Hull			136	283	261	116	1	243	2	211	2[B]	
	Leeds			82	227	148	82	0	187	2	118	1[B]	
	Leicester			18	133	133	18	0	93	2	93	2	
	Liverpool			88	197	197	88	0	157	2	157	2	
	London			30	53	53	30	0	53	0	53	0	
	Luton			17	148	148	17	0	108	2	108	2	
	Manchester			67	139	139	67	0	119	1	109	1[B]	
	M'ch'r Airport			117	193	145	97	1	153	2	105	2	
	Milton Keynes			12	16	16	12	0	16	0	16	0	
	Nottingham			34	171	171	34	0	131	2	122	2[B]	
	Oxford			41	94	94	41	0	74	1	74	1	
	Peterborough			98	187	187	78	1	147	2	147	2	
	Preston			120	200	152	100	1	180	1	122	1[B]	
	Sheffield			43	168	168	43	0	148	1	148	1	
	Stockport			93	129	129	73	1	109	1	109	1	#
	Stoke			78	82	82	78	0	82	0	82	0	
	Walsall			71	124	124	51	1	104	1	104	1	
	Warrington			122	176	176	102	1	156	1	156	1	#
	Wolverhampton			52	110	110	52	0	90	1	90	1	
	York			99	224	224	99	0	204	1	204	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX N2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

NOTTINGHAM

Nottingham

Town/City	Nottingham
Population of built-up area**	730,000
Ranking amongst UK cities**	9
Number of cities directly linked by existing rail network (out of 31)	13

References:
HSUK East Midlands Rail Strategy
HSUK Regional Maps 05
HSUK Nottingham Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Nottingham : Intercity Connectivity with HSUK and HS2

Nottingham	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**56%**	**27**	**31**	**0**	**31**
HS2	**10%**	**0**	**9**	**1**	**0**

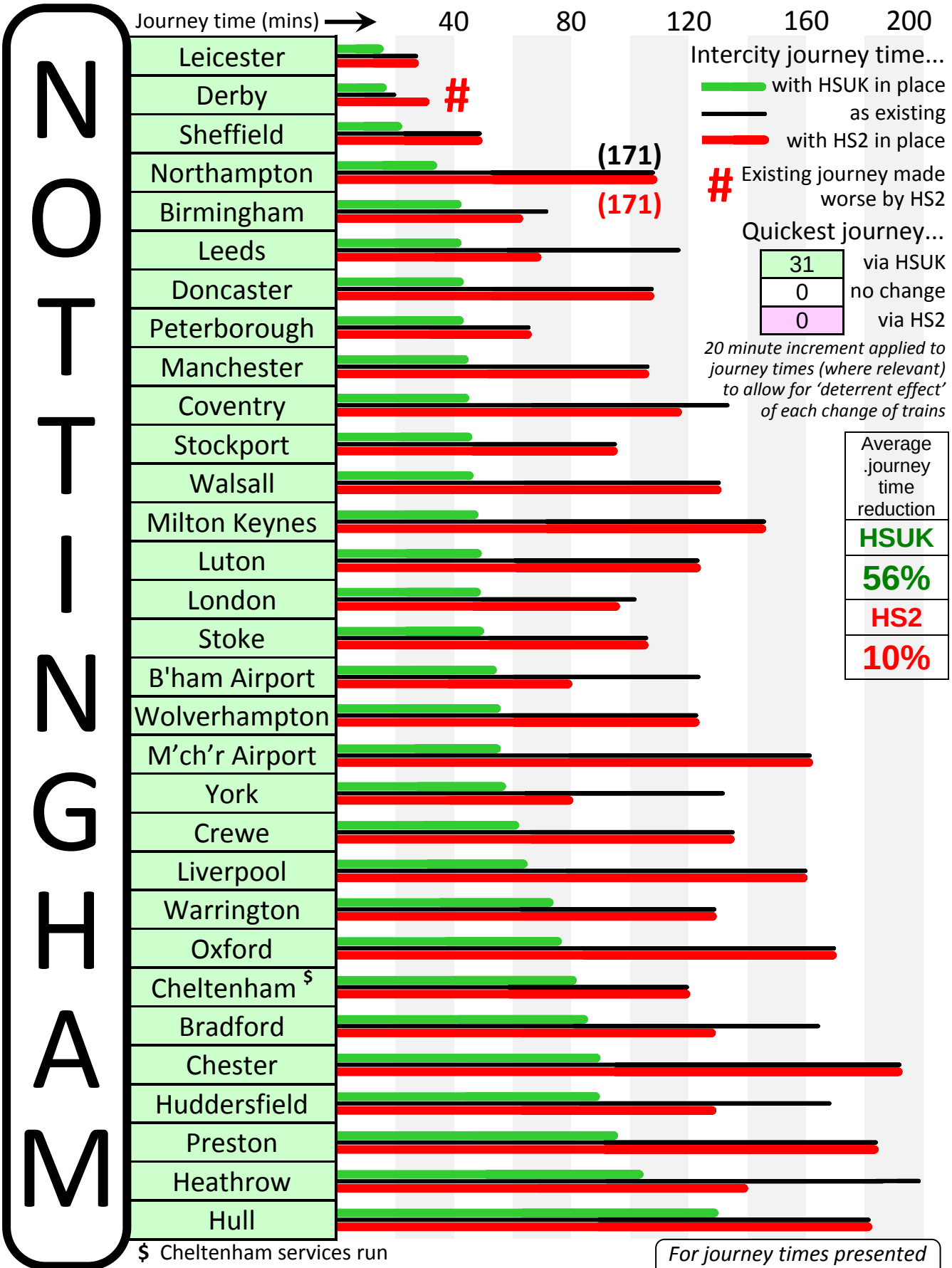
Nottingham's existing score of 13 cities (out of 31) directly linked indicates moderate connectivity, but the benefits of this connectivity are generally compromised by the poor quality rolling stock used on most services (except to London), by the poor journey times on offer and by the fact that Nottingham is located on a spur, clear of both the Midland and CrossCountry main lines. As a consequence, most intercity services to Nottingham terminate there and the advantages of through routeing are lost.

HS2 will do little to improve Nottingham's intercity connectivity. Rather than serve central Nottingham, HS2 will serve a parkway station located midway between Nottingham and Derby at the existing Toton marshalling yard. Toton is 9km from central Nottingham, and currently has no rail services. As yet, no credible proposals have emerged for:

- how local services will be developed to serve Toton and provide efficient links from Toton to Nottingham (and Derby).
- how the combined Nottingham to Toton and Toton to London/Birmingham/Leeds journey can provide a superior passenger experience than direct journeys from central Nottingham to London, Birmingham and Leeds.
- how the quality and connectivity of the local rail network will be maintained, given the likely diversion of local services via Toton.

HSUK avoids all of these problems with its high speed services routed via the existing Nottingham Midland station. Nottingham's current 'branch line' status will be redressed through the upgrading of the eastward route to Grantham, and the restoration of the former route from Bottesford to Newark Northgate. These two measures will allow through, rather than terminating routes to serve Nottingham, and will enable Nottingham's intercity connectivity to be transformed with 56% journey time reductions and direct links to all UK primary cities.

HIGH SPEED UK & HS2 LINKS TO NOTTINGHAM



$ Cheltenham services run onward to Bristol and Cardiff

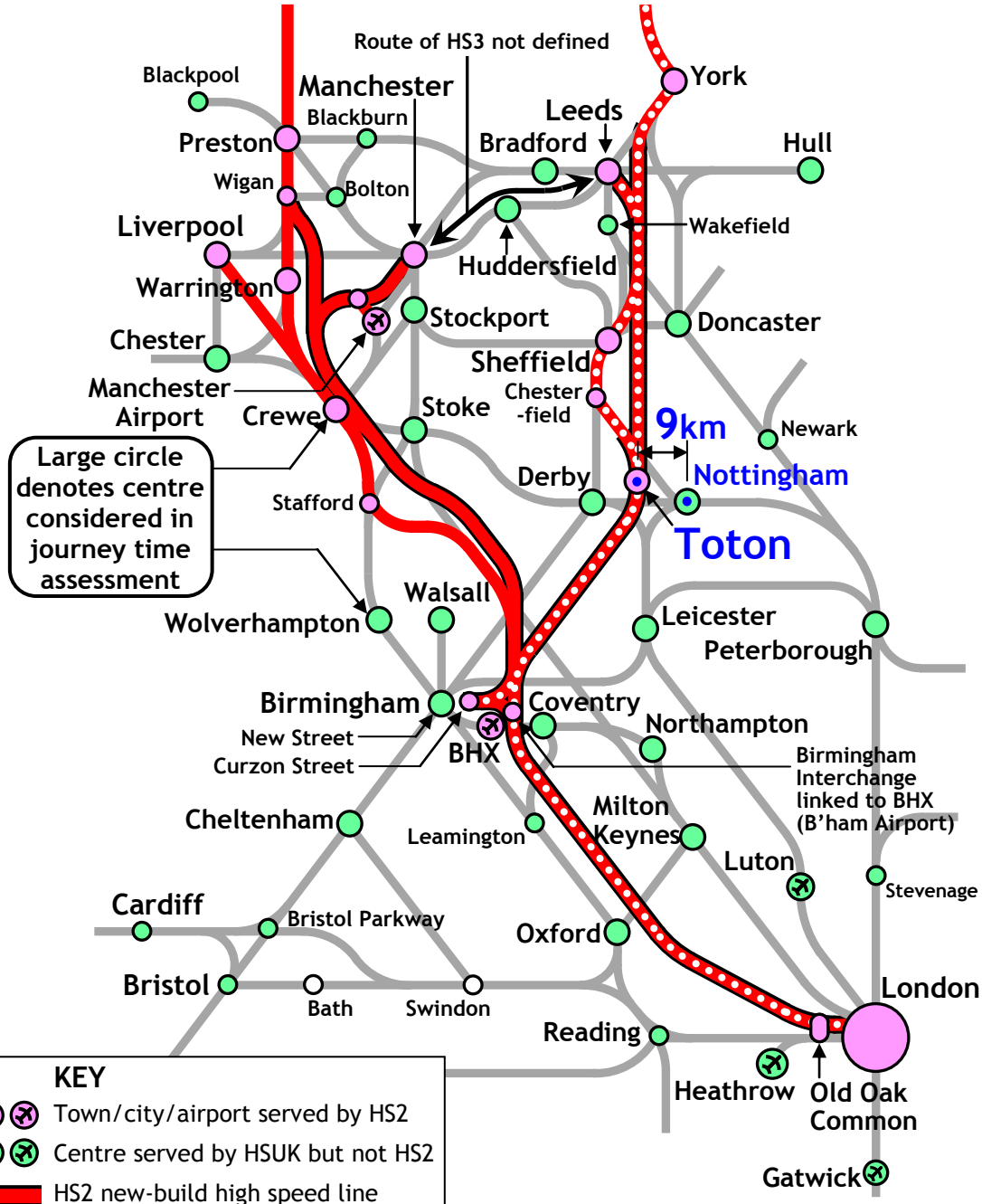
For journey times presented in tabulated format see p314

TOTON *(for Nottingham)*

Nottingham bypassed by HS2; limited connections available from Toton, 9km from Nottingham

HS2
Average journey time reductions:
10%
No. of cities directly linked:
0
No. of journeys made faster:
9
No. of journeys made worse:
1

Connectivity statistics relate to Nottingham rather than Toton



KEY

- Town/city/airport served by HS2
- Centre served by HSUK but not HS2
- HS2 new-build high speed line
- HS2 services on existing line
- No HS2 services from Nottingham

HIGH SPEED 2
ROUTES & CITIES SERVED

NOTTINGHAM

Fully connected to national high speed network, direct high speed links to most principal UK cities

HSUK

Average journey time reductions:

56%

No. of cities directly linked:

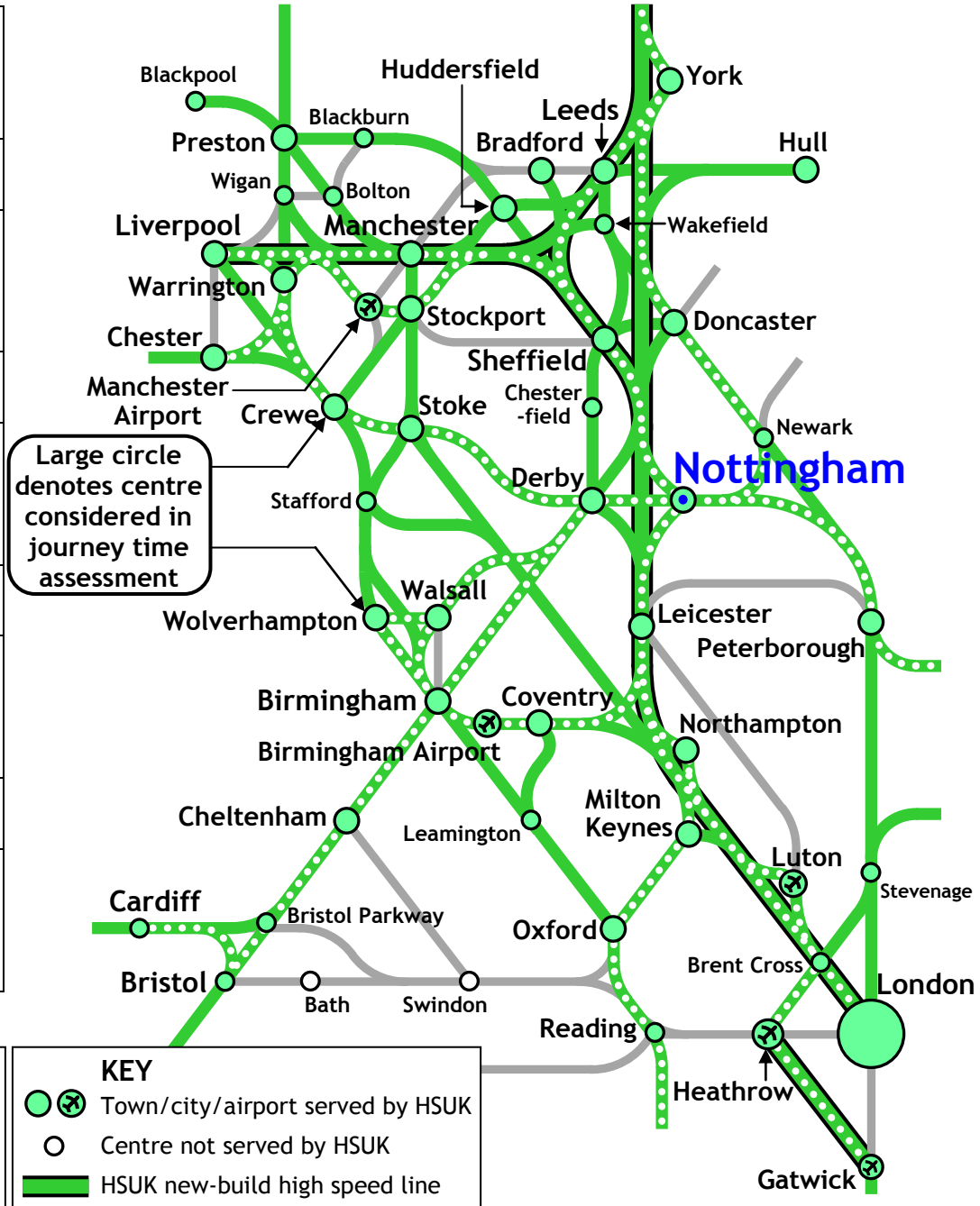
27

No. of journeys made faster:

31

No. of journeys made worse:

0



Nottingham served by:
HSUK02,05,07,14
HSUK22,25
HSUK73,74
HSUK76,77,78
HSUK93
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Nottingham

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Nottingham**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
NOTTINGHAM	Birmingham			40	72	62	40	0	72	0	42	1	
	B'ham Airport			53	123	80	53	0	103	1	50	1[B]	
	Bradford			88	164	129	68	1	144	1	89	2	
	Cheltenham			80	120	120	80	0	120	0	120	0	
	Chester			91	192	192	91	0	152	2	152	2	
	Coventry			44	133	118	44	0	113	1	68	2[B]	
	Crewe			59	135	135	59	0	115	1	115	1	
	Derby			15	20	20	15	0	20	0	20	0	#
	Doncaster			40	108	108	40	0	88	1	88	1	
	Heathrow			104	219	140	104	0	179	2	100	2	
	Huddersfield			90	168	129	70	1	148	1	89	2	
	Hull			121	181	181	101	1	161	1	161	1	
	Leeds			42	118	72	42	0	118	0	52	1	
	Leicester			14	28	28	14	0	28	0	28	0	
	Liverpool			66	160	160	66	0	160	0	160	0	
	London			47	101	97	47	0	101	0	77	1[A]	
	Luton			48	89	89	48	0	89	0	89	0	
	Manchester			45	106	106	45	0	106	0	106	0	
	M'ch'r Airport			57	161	161	57	0	141	1	141	1	
	Milton Keynes			48	146	146	48	0	126	1	126	1	
	Northampton			34	171	171	34	0	131	2	122	2[B]	
	Oxford			77	170	170	77	0	150	1	150	1	
	Peterborough			40	66	66	40	0	66	0	66	0	
	Preston			96	184	184	76	1	164	1	164	1	
	Sheffield			21	50	50	21	0	50	0	50	0	
	Stockport			48	95	95	48	0	95	0	95	0	
	Stoke			49	106	106	49	0	86	1	86	1	
	Walsall			46	131	131	46	0	111	1	111	1	
	Warrington			75	129	129	75	0	129	0	129	0	
	Wolverhampton			54	122	122	54	0	102	1	102	1	
	York			59	132	80	59	0	112	1	60	1	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX O1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

OXFORD

Reading, Thames Valley and onward destinations on South Coast

Oxford, *Reading and onward destinations on South Coast*

Town/City	Oxford
Population of built-up area**	170,000
Ranking amongst UK cities**	45
Number of cities directly linked by existing rail network (out of 31)	13

References:
HSUK London-Birmingham Rail Strategy
HSUK Oxford Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Oxford : Intercity Connectivity with HSUK and HS2

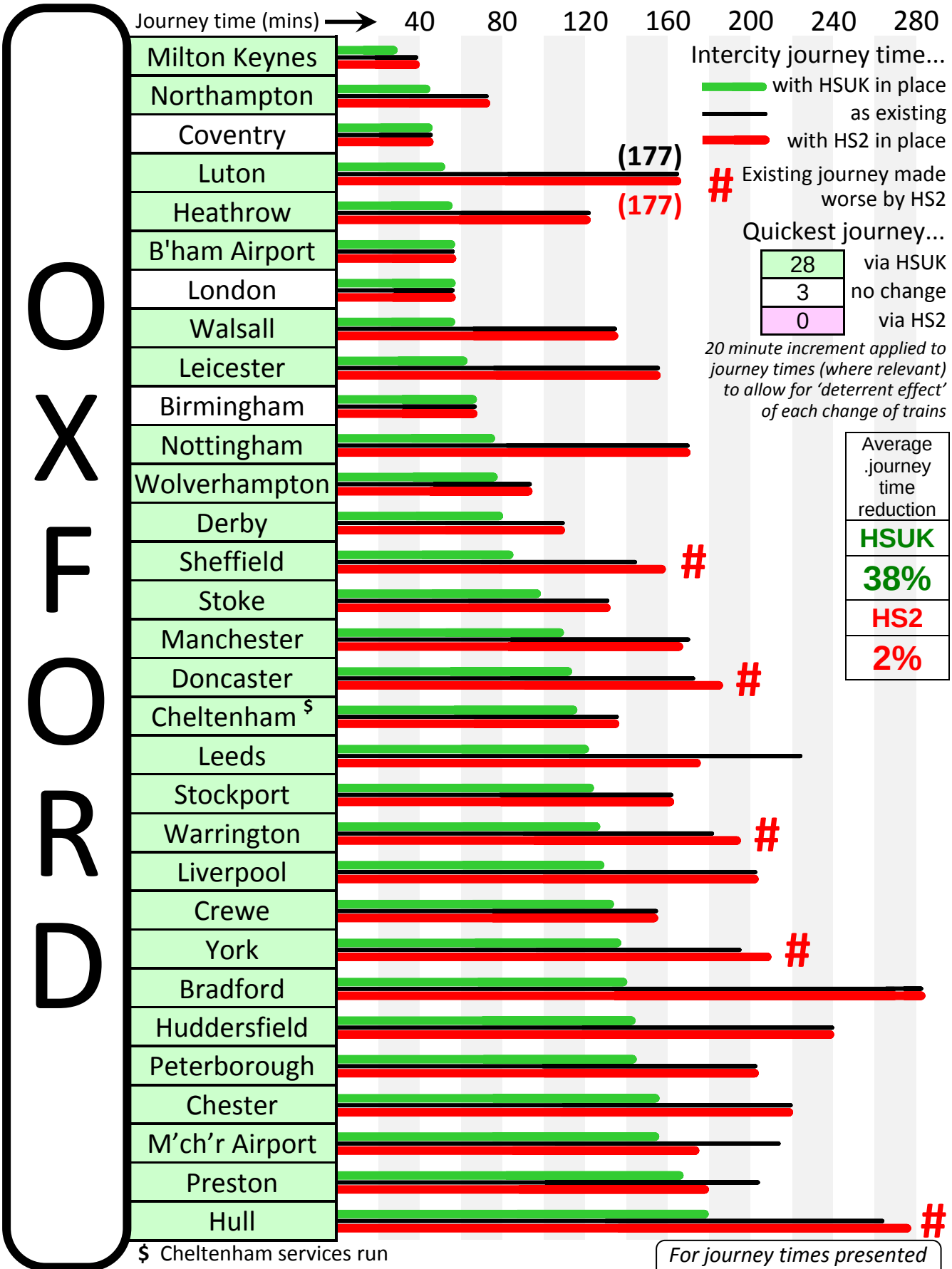
Oxford	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**38%**	**22**	**28**	**0**	**28**
HS2	**2%**	**0**	**4**	**5**	**0**

Oxford's location on the primary CrossCountry route from the South Coast to Birmingham gives the city good, if somewhat slow and circuitous links to most of the 31 other towns cities and airports considered in this study. The ongoing restoration of the East-West route to Milton Keynes will further improve Oxford's regional connectivity, with onward links to Northampton and (via Bedford) to Leicester, Luton and Nottingham.

HS2 will pass through the north-east corner of Oxfordshire, only 25km from Oxford itself. However, this will bring no benefits either to the county or the city; there will be no station, either at the intersection point with the East-West route or at any other suitable location. Rather than bring benefit to Oxford, HS2 seems more likely to harm the city's wider intercity connectivity; the HS2 proposal for its own terminus station at Birmingham Curzon Street, remote from New Street and requiring a 10 minute walking transfer, will substantially degrade Oxford's links to many Northern cities.

HSUK will bring major benefits for Oxford and Oxfordshire through its higher-capacity 4-track route following the M1 corridor, and through its alternative strategy of full integration with the existing network. HSUK's greater capacity and closer alignment with the major population centres along the M1 corridor enable the opportunity created by the restoration of East-West Rail to be exploited to the full. HSUK will establish an entirely new interregional intercity route running from the South Coast, Reading and Oxford to Milton Keynes, Northampton, Leicester, Nottingham and Sheffield. From Sheffield, trains will continue both to Manchester and Liverpool, and to Leeds, York, Darlington, Newcastle, Edinburgh and Glasgow. This will not only offer greatly reduced journey times for Oxford, it will also play a major role in reducing congestion of both trains and interchanging passengers at Birmingham New Street. Oxford will also gain greatly from HSUK's Heathrow proposals, with a new through service from Oxford via Heathrow to Brent Cross and Peterborough.

HIGH SPEED UK & HS2 LINKS TO OXFORD



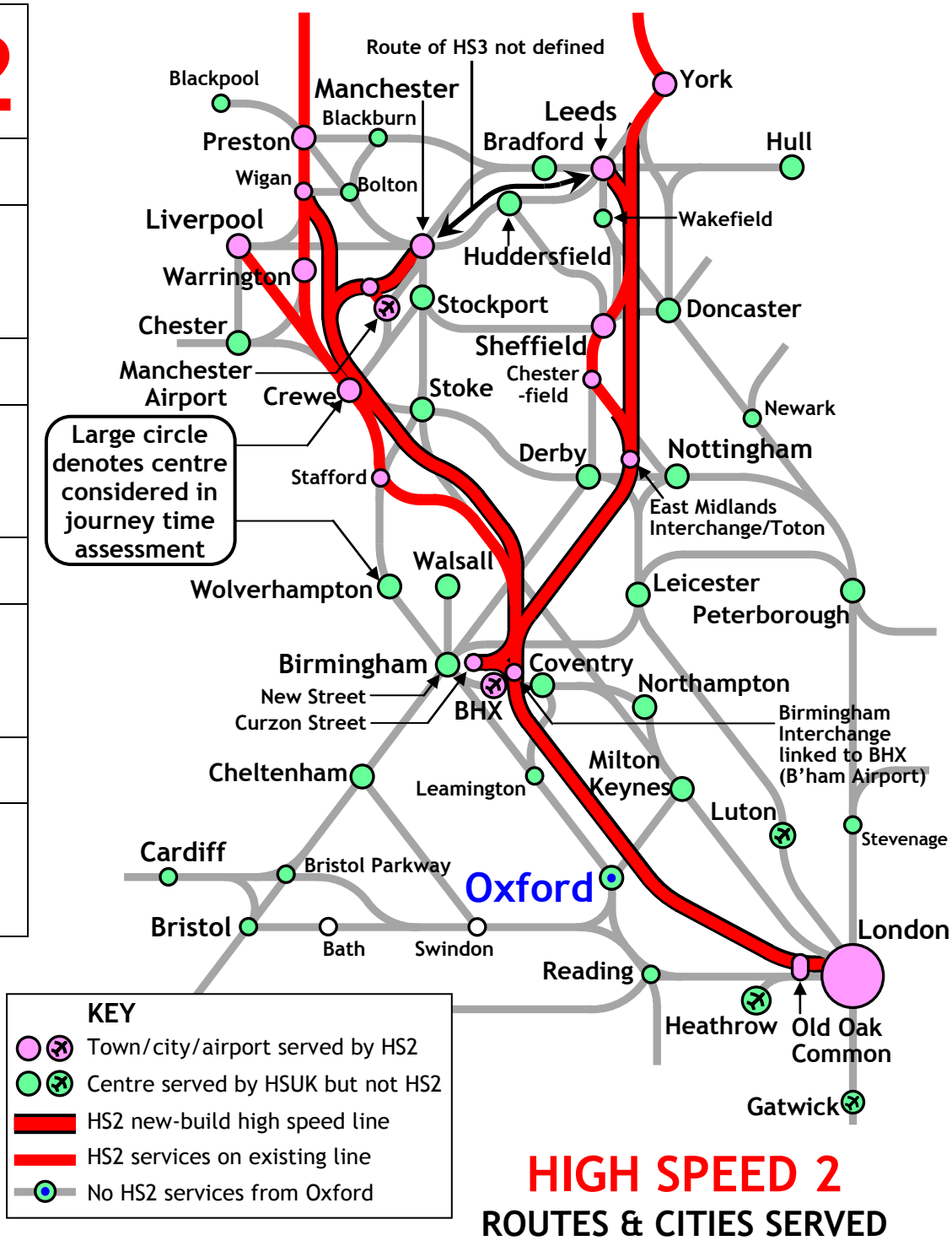
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p320

OXFORD

Bypassed by HS2, no benefits to Oxford and Oxfordshire but major environmental damage

HS2
Average journey time reductions:
2%
No. of cities directly linked:
0
No. of journeys made faster:
4
No. of journeys made worse:
5



OXFORD

Fully connected to national high speed network, new links via MK to East Midlands & Yorkshire

HSUK

Average journey time reductions:

38%

No. of cities directly linked:

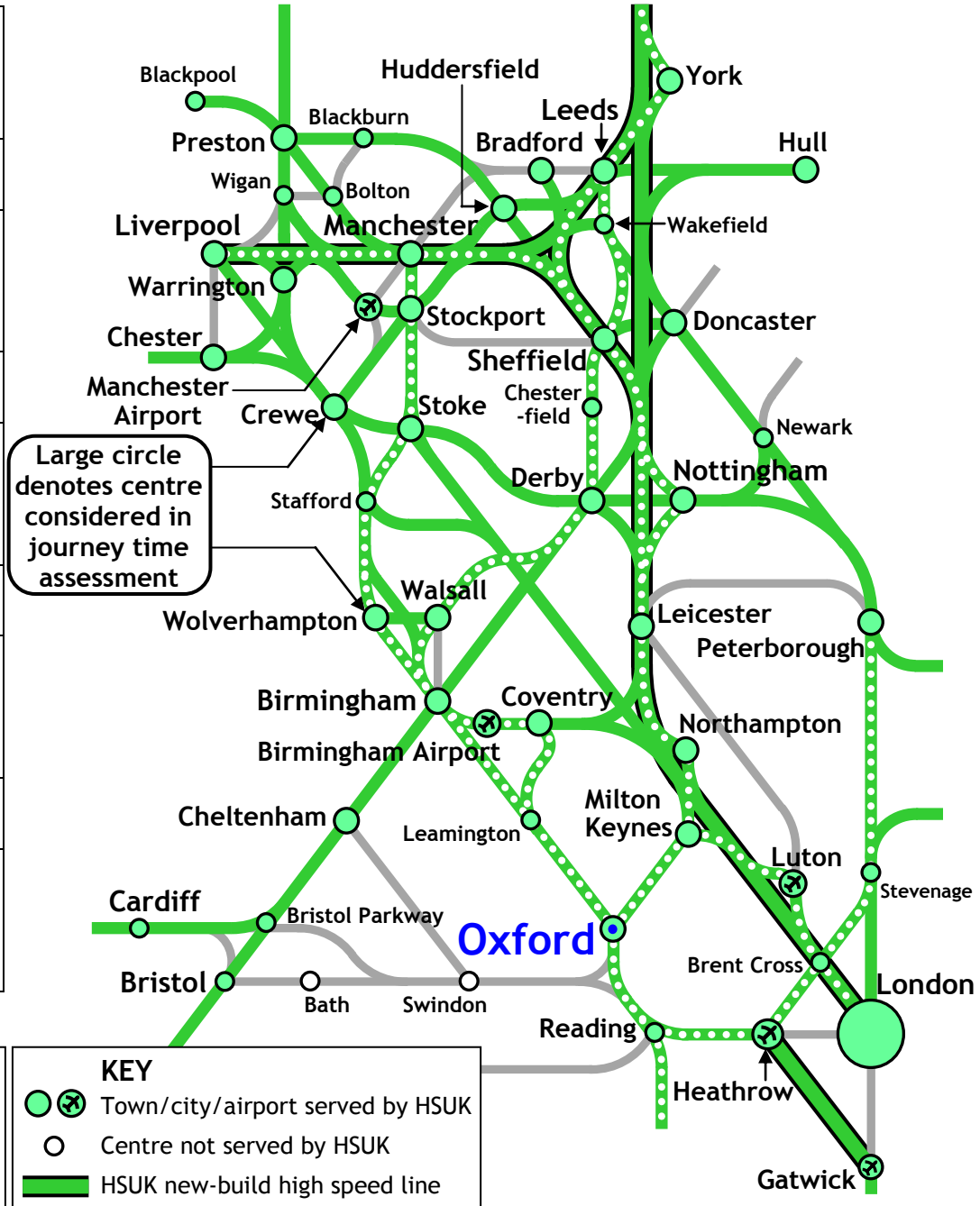
22

No. of journeys made faster:

28

No. of journeys made worse:

0



Oxford served by:
HSUK02,03
HSUK09,11
HSUK75
HSUK96
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Oxford

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Oxford**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
OXFORD	Birmingham			67	67	67	67	0	67	0	67	0	
	B'ham Airport			57	57	57	57	0	57	0	57	0	
	Bradford			142	283	283	122	1	243	2	243	2[B]	
	Cheltenham			117	137	137	117	0	117	1	117	1	
	Chester			152	220	220	132	1	180	2	180	2	
	Coventry			47	47	47	47	0	47	0	47	0	
	Crewe			131	155	155	111	1	135	1	135	1	
	Derby			79	110	110	79	0	110	0	110	0	
	Doncaster			112	174	174	92	1	174	0	174	0	#
	Heathrow			54	121	121	54	0	101	1	101	1	
	Huddersfield			144	240	240	124	1	220	1	220	1	
	Hull			179	263	263	159	1	243	1	243	1	#
	Leeds			124	224	176	124	0	204	1	146	1	
	Leicester			61	157	157	61	0	137	1	137	1	
	Liverpool			130	202	202	130	0	182	1	182	1	
	London			58	58	58	58	0	58	0	58	0	
	Luton			46	177	177	46	0	137	2	137	2	
	Manchester			110	171	167	110	0	171	0	137	1[B]	
	M'ch'r Airport			160	214	173	140	1	194	1	133	2	
	Milton Keynes			27	38	38	27	0	38	0	38	0	
	Northampton			41	94	94	41	0	74	1	74	1	
	Nottingham			77	170	170	77	0	150	1	150	1	
	Peterborough			143	202	202	143	0	162	2	162	2	
	Preston			168	204	180	148	1	184	1	150	1[B]	
	Sheffield			85	144	144	85	0	144	0	144	0	#
	Stockport			123	161	161	123	0	161	0	161	0	
	Stoke			98	131	131	98	0	131	0	131	0	
	Walsall			57	135	135	57	0	115	1	115	1	
	Warrington			128	181	181	108	1	161	1	161	1	#
	Wolverhampton			77	94	94	77	0	94	0	94	0	
	York			142	196	196	142	0	196	0	196	0	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX P1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

PETERBOROUGH

and onward destinations in East Anglia

Peterborough *and onward destinations in East Anglia*

Town/City	Peterborough
Population of built-up area**	160,000
Ranking amongst UK cities**	48
Number of cities directly linked by existing rail network (out of 31)	12

References:
HSUK London-Birmingham Rail Strategy
HSUK Peterborough Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Peterborough : Intercity Connectivity with HSUK and HS2

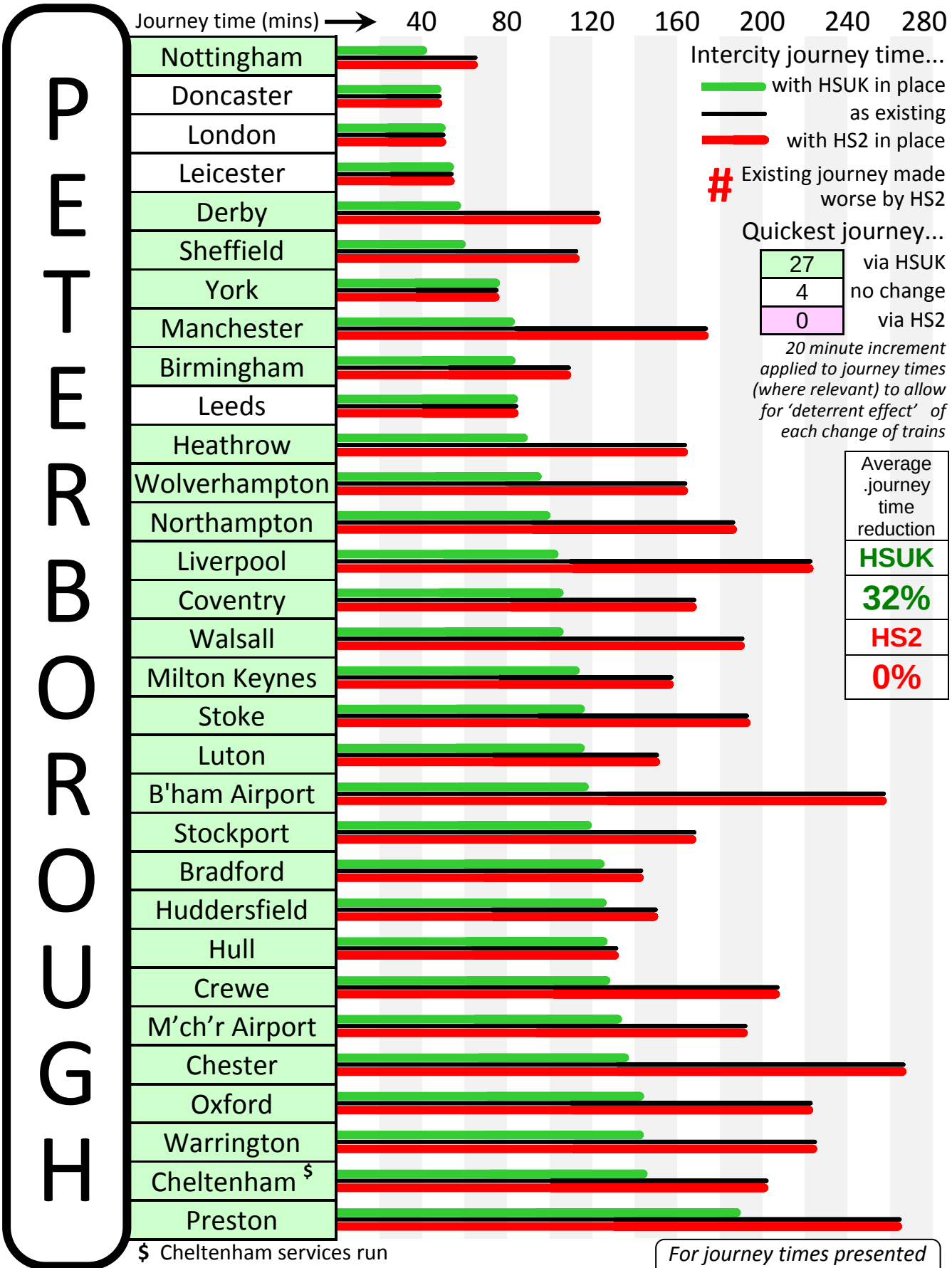
Peterborough	Average journey time reduction	Cities directly linked (out of 30)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**32%**	**14**	**26**	**0**	**27**
HS2	**0%**	**0**	**0**	**0**	**0**

Peterborough's location at the intersection point of the north-south East Coast Main Line and the east-west routes from Stansted and Cambridge to Birmingham, and from Norwich to Liverpool, gives the city direct links to most principal UK cities. However, the east-west routes are slow and generally the road network (to which Peterborough is also well connected) offers superior journey times.

Peterborough is remote from the proposed HS2 route, and since it will remain completely reliant on the existing network for its intercity connectivity, it will not gain any direct benefit from HS2. It will also be relatively unaffected by the proposed reductions in East Coast Main Line intercity services; the services likely to be cut are the faster services that do not stop at Peterborough, while the semi-fast stopping services will generally be retained.

Peterborough is almost as remote from HSUK's M1-aligned route as it is from HS2's route, but HSUK's full integration with the existing network and its associated upgrading of crucial east-west routes enables the city to share fully in the direct benefits of the UK high speed rail project. Of particular benefit to Peterborough are the proposed upgrades of the existing Grantham-Nottingham and Derby-Birmingham route, and the construction of a new transpennine high speed line from Sheffield to Liverpool. These measures will allow huge enhancement of Peterborough's existing east-west services, with greatly accelerated journey times from Stansted Airport, Cambridge and Norwich to Nottingham, Derby, Birmingham, Sheffield, Manchester and Liverpool among many other principal UK cities.

HIGH SPEED UK & HS2 LINKS TO PETERBOROUGH



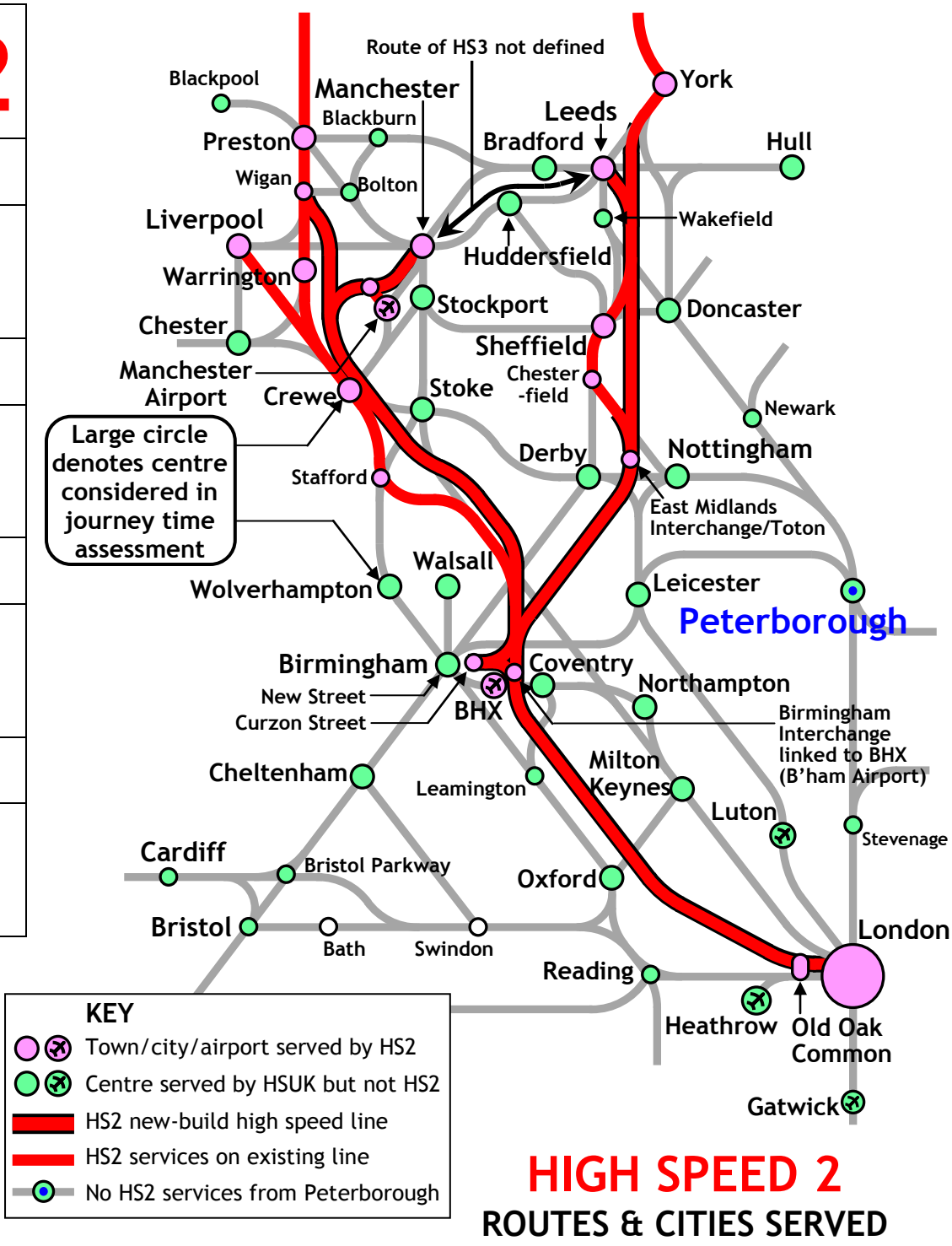
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p326

PETERBOROUGH

Remote from HS2, few benefits for Peterborough from public investment in HS2

HS2
Average journey time reductions:
0%
No. of cities directly linked:
0
No. of journeys made faster:
0
No. of journeys made worse:
0



PETERBOROUGH

Fully connected to national high speed network, key hub of HSUK routes to East Anglia & Stansted

HSUK

Average journey time reductions:

32%

No. of cities directly linked:

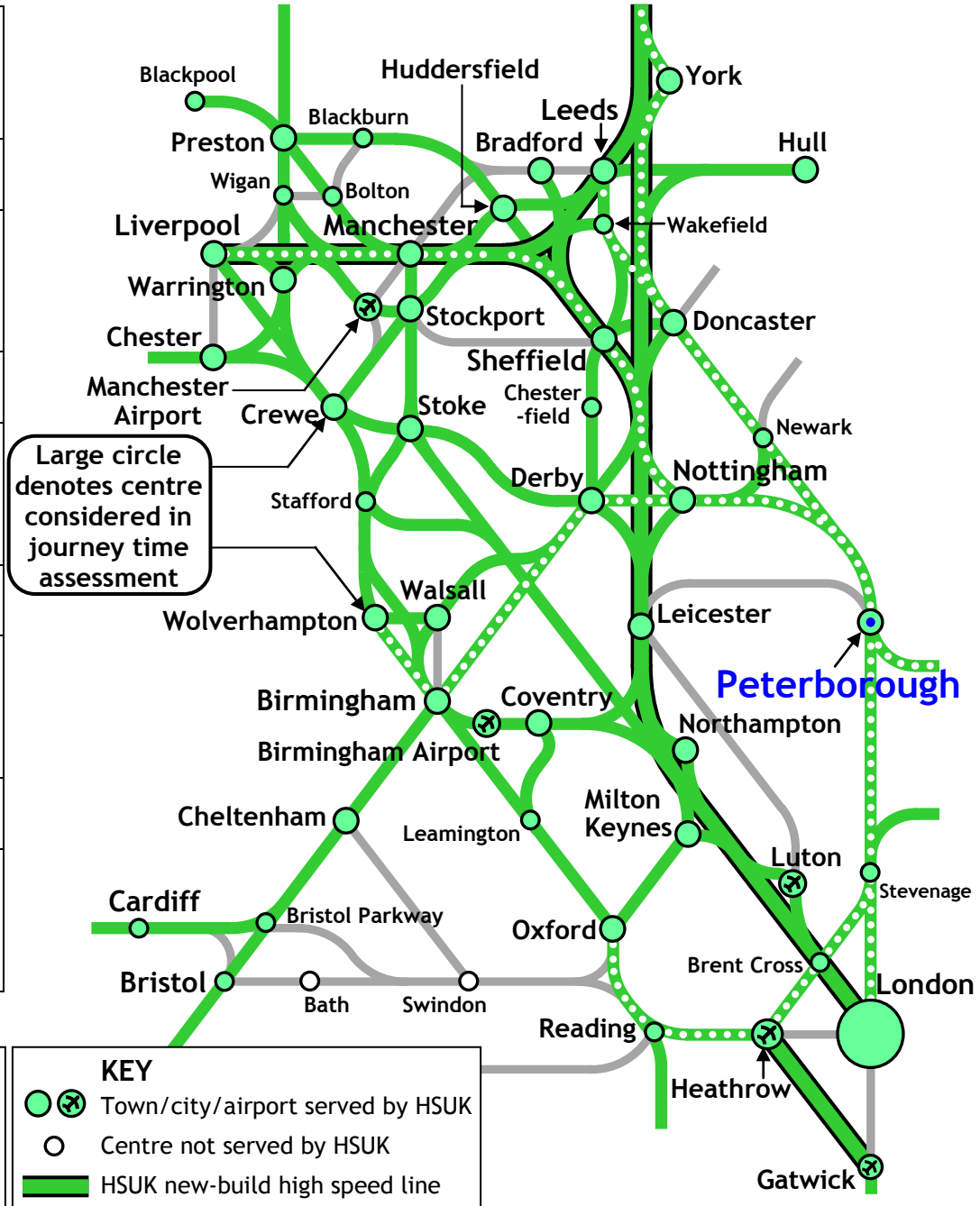
14

No. of journeys made faster:

26

No. of journeys made worse:

0



Peterborough served by:
HSUK07
HSUK22
HSUK36,37
HSUK96
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Peterborough

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Peterborough**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
PETERBOROUGH	Birmingham			82	109	109	82	0	109	0	109	0	
	B'ham Airport			120	158	158	100	1	138	1	138	1	
	Bradford			124	143	143	104	1	123	1	123	1	
	Cheltenham			163	200	200	143	1	180	1	180	1	
	Chester			135	275	275	115	1	245	2	245	1	
	Coventry			104	148	148	84	1	128	1	128	1	
	Crewe			126	208	208	106	1	188	1	188	1	
	Derby			58	122	122	58	0	102	1	102	1	
	Doncaster			51	51	51	51	0	51	0	51	0	
	Heathrow			86	165	165	86	0	125	2	125	2	
	Huddersfield			124	150	150	104	1	130	1	130	1	
	Hull			127	112	112	107	1	112	0	112	0	
	Leeds			85	85	85	85	0	85	0	85	0	
	Leicester			55	55	55	55	0	55	0	55	0	
	Liverpool			105	212	212	105	0	212	0	212	0	
	London			49	49	49	49	0	49	0	49	0	
	Luton			115	151	151	95	1	111	2	111	2	
	Manchester			84	174	174	84	0	154	1	154	1	
	M'ch'r Airport			134	192	192	114	1	172	1	172	1	
	Milton Keynes			112	159	159	92	1	119	2	119	2	
	Northampton			98	187	187	78	1	147	2	147	2	
	Nottingham			40	66	66	40	0	66	0	66	0	
	Oxford			143	202	202	143	0	162	2	162	2	
	Preston			171	245	245	151	1	225	1	225	1	
	Sheffield			60	93	93	60	0	93	0	93	0	
	Stockport			122	148	148	102	1	148	0	148	0	
	Stoke			116	194	194	96	1	174	1	174	1	
	Walsall			106	171	171	86	1	151	1	151	1	
	Warrington			143	205	205	123	1	205	0	205	0	
	Wolverhampton			97	165	165	97	0	145	1	145	1	
	York			67	76	76	67	0	76	0	76	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX P2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

PRESTON

and onward destinations in Cumbria & Scotland

Preston *and onward destinations in Cumbria & Scotland*

Town/City	Preston
Population of built-up area**	310,000
Ranking amongst UK cities**	25
Number of cities directly linked by existing rail network (out of 31)	15

References:
HSUK North Country Rail Strategy
HSUK Scottish Rail Strategy
HSUK Preston Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Preston : Intercity Connectivity with HSUK and HS2

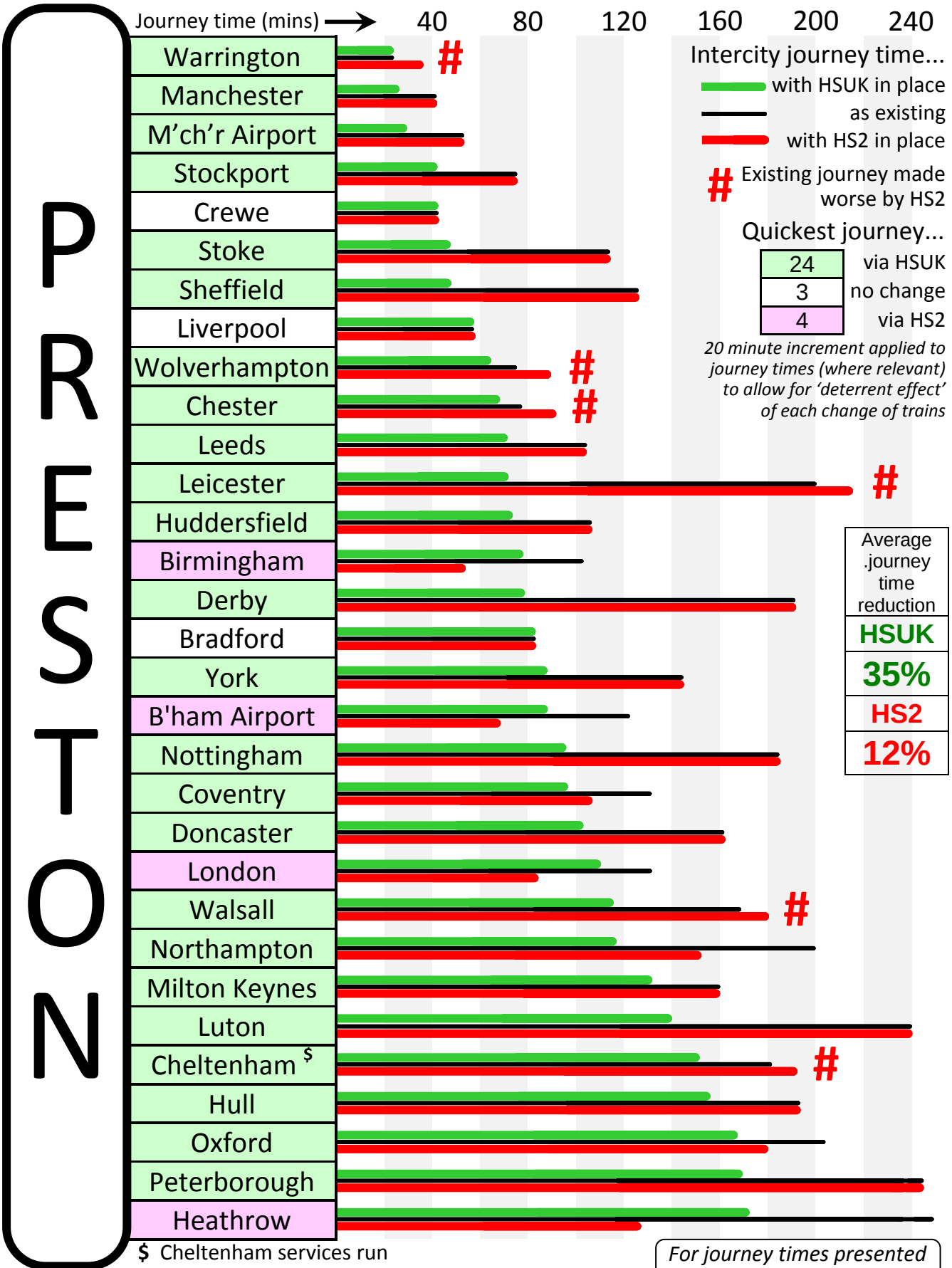
Preston	Average journey time reduction	Cities directly linked (out of 29)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**35%**	**19**	**27**	**0**	**24**
HS2	**12%**	**5**	**7**	**7**	**4**

Preston is the largest population centre on the West Coast Main Line between London and Scotland, and it is located at the hub of a dense local network, with routes extending to Manchester and Manchester Airport, to Liverpool, to Blackpool and to East Lancashire and West Yorkshire. It has always enjoyed good north-south connectivity to cities located along the axis of the West Coast Main Line, but it lacks good-quality links to any major city to the east of the Pennines.

Under the HS2 proposals, Preston will continue to be a key calling point on HS2 services from Birmingham and London to Scotland. However, whilst 'headline' services might be maintained or even enhanced, Preston will still lose direct links to many Midlands cities including Wolverhampton, Coventry and Milton Keynes, and connectivity to South Wales and West Country destinations will be lost through the disconnection between HS2's Birmingham Curzon Street station and the existing station at New Street. HS2 will offer no improvement in Preston's transpennine links, and no proposals have emerged to indicate how HS3/ Northern Powerhouse routes might extend to Preston.

HSUK will maintain existing intercity service levels along the West Coast route to Cumbria and to Scotland, and journey times will be substantially reduced through the HSUK enhancements necessary to reduce congestion in both Birmingham and Manchester. HSUK will offer a new premium service from London via Leicester, Sheffield and Manchester to Bolton and Preston, and this service will extend to Blackpool. HSUK's transformation of rail links to Manchester Airport will also benefit Preston, with a new service running Blackpool-Preston-Wigan-Altrincham-Manchester Airport-Stockport-Leeds-York-Darlington-Newcastle. These two new services represent huge enhancements to Preston's transpennine connectivity, and they effectively extend the benefits of the Northern Powerhouse to the Preston and Fylde conurbations, collectively over half a million population.

HIGH SPEED UK & HS2 LINKS TO PRESTON



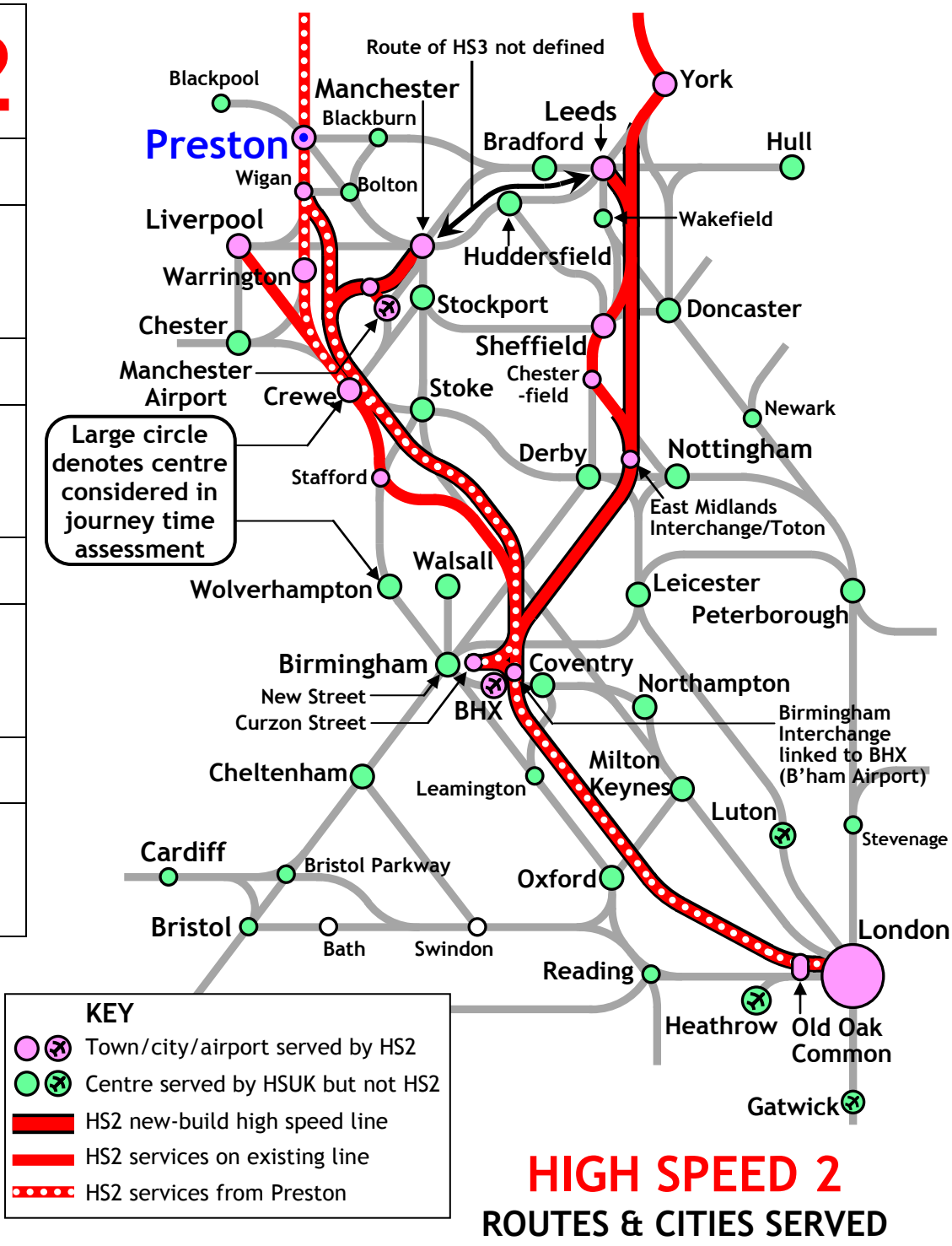
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p332

PRESTON

HS2 links only along axis of West Coast Main Line, no HS2 links to Northern Powerhouse cities

HS2
Average journey time reductions:
12%
No. of cities directly linked:
5
No. of journeys made faster:
7
No. of journeys made worse:
7



PRESTON

Fully connected to national high speed network & integrated with Northern Powerhouse routes

HSUK

Average journey time reductions:

35%

No. of cities directly linked:

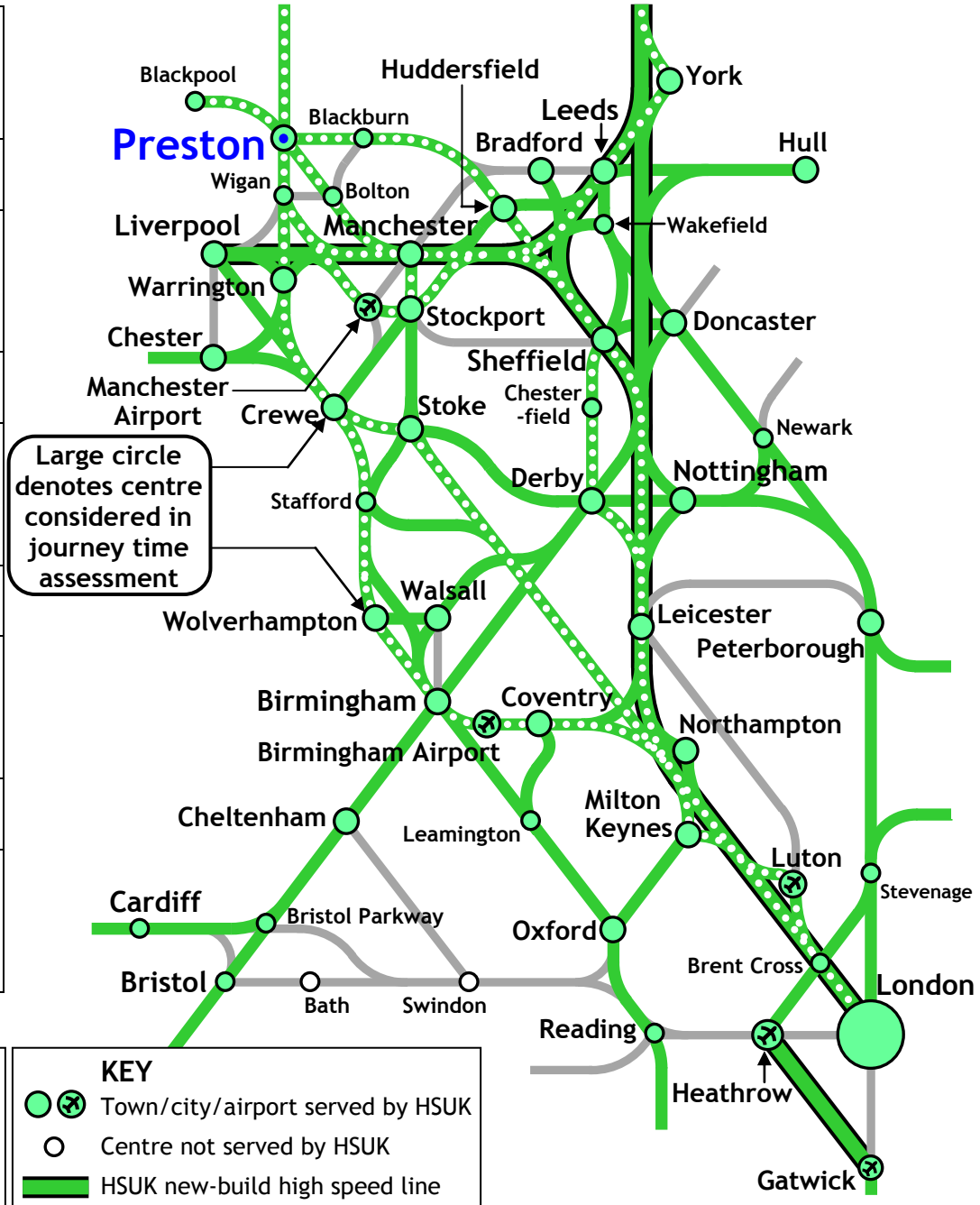
19

No. of journeys made faster:

27

No. of journeys made worse:

0



Preston served by:
HSUK24,29
HSUK44,45
HSUK52,61
HSUK71
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Preston

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Preston**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
PRESTON	Birmingham			77	102	53	77	0	102	0	53	0	
	B'ham Airport			86	121	68	86	0	121	0	58	0[B]	
	Bradford			82	82	82	82	0	82	0	82	0	
	Cheltenham			149	181	181	129	1	161	1	161	1	#
	Chester			68	78	78	48	1	58	1	58	1	#
	Coventry			95	131	106	95	0	131	0	76	1[B]	
	Crewe			42	42	42	42	0	42	0	42	0	
	Derby			80	192	192	80	0	152	2	152	2	
	Doncaster			105	161	161	85	1	141	1	141	1	
	Heathrow			171	250	127	151	1	210	2	107	1	
	Huddersfield			71	106	106	71	0	86	1	86	1	
	Hull			159	193	193	139	1	173	1	173	1	
	Leeds			70	104	104	70	0	104	0	104	0	
	Leicester			74	200	200	74	0	180	1	180	1	#
	Liverpool			58	58	58	58	0	58	0	58	0	
	London			112	131	84	112	0	131	0	84	0	
	Luton			138	242	242	138	0	202	2	202	2	
	Manchester			25	41	41	25	0	41	0	41	0	
	M'ch'r Airport			30	57	57	30	0	57	0	57	0	
	Milton Keynes			133	160	160	113	1	160	0	130	1[B]	#
	Northampton			120	200	152	100	1	180	1	122	1[B]	
	Nottingham			96	184	184	76	1	164	1	164	1	
	Oxford			168	204	180	148	1	184	1	150	1[B]	
	Peterborough			171	245	245	151	1	225	1	225	1	
	Sheffield			49	126	126	49	0	106	1	106	1	
	Stockport			39	74	74	39	0	74	0	74	0	
	Stoke			45	114	114	45	0	94	1	94	1	
	Walsall			114	169	169	94	1	149	1	149	1	#
	Warrington			23	23	23	23	0	23	0	23	0	#
	Wolverhampton			62	75	75	62	0	75	0	75	0	#
	York			87	145	145	87	0	145	0	145	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX S1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

SHEFFIELD

and South Yorkshire conurbation

Sheffield *and South Yorkshire conurbation*

Town/City	Sheffield
Population of built-up area**	690,000
Ranking amongst UK cities**	10
Number of cities directly linked by existing rail network (out of 31)	18

References:
HSUK Yorkshire Rail Strategy
HSUK Regional Map 07
HSUK Sheffield Network Map
HSUK Sheffield Victoria Brochure
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Sheffield : Intercity Connectivity with HSUK and HS2

Sheffield	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**53%**	**31**	**30**	**0**	**30**
HS2	**8%**	**3**	**5**	**11**	**0**

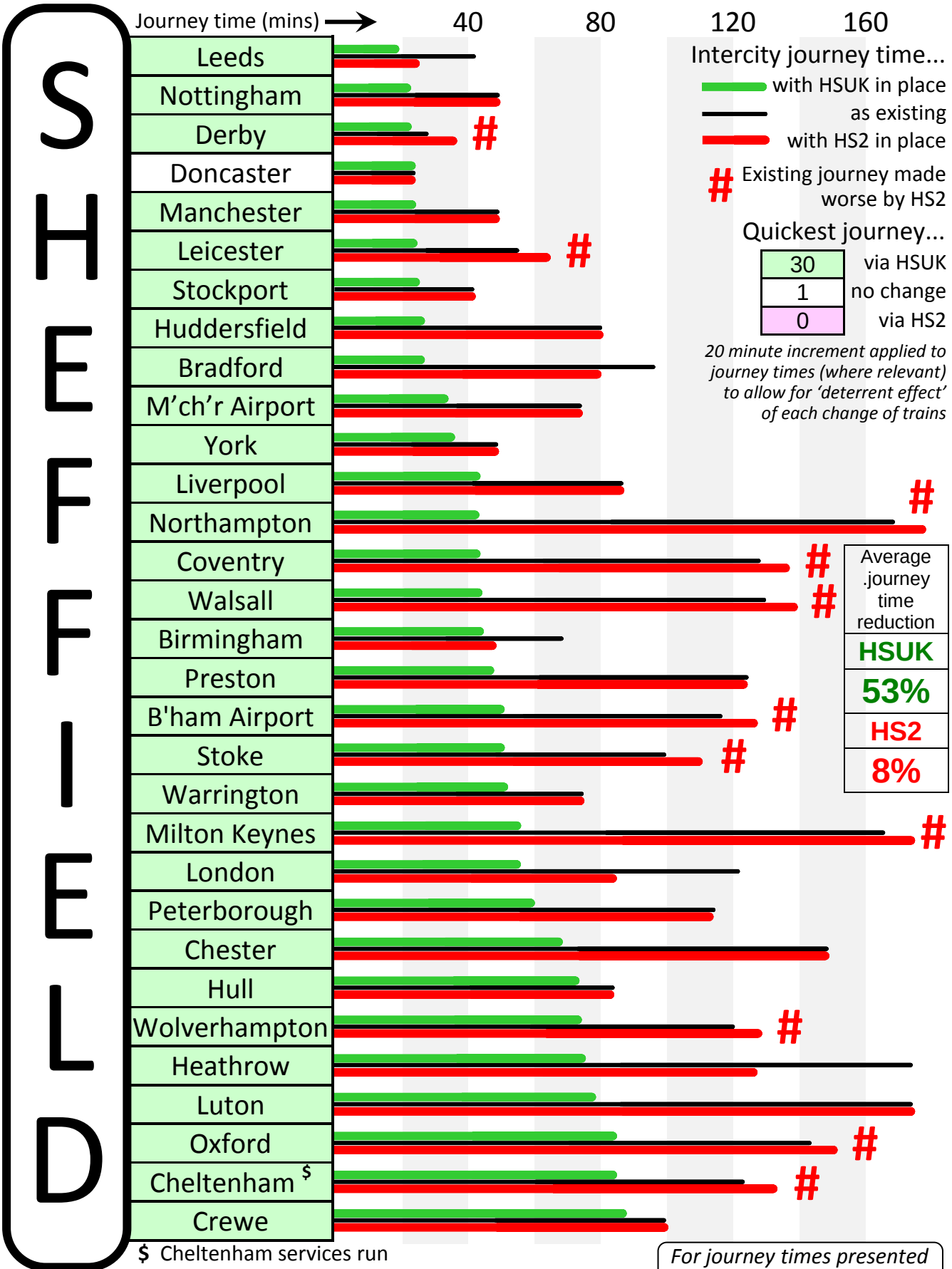
Sheffield's location on the Midland, CrossCountry and South TransPennine main lines places it at a key hub of the national rail network. This, and its status as a UK primary city with a population of over 500,000, make it imperative that Sheffield occupies a similarly pivotal position in any future UK high speed rail network, with a centrally-located station from which high speed services would radiate to all principal UK cities.

The engineering difficulties of building a high speed line through the Pennine foothills surrounding Sheffield were a major factor in the 2012 decision to align HS2's route to closely follow the M1 to the east of the city, and to site the HS2 station at Meadowhall, 5km from the city centre. This proved highly unpopular with Sheffield City Council, and incompatible with the Northern Powerhouse requirement for 'HS3' journeys between city centre stations.

As a consequence the revised HS2 proposals published in June 2016 abandoned Meadowhall in favour of a more easterly 'M18' route entirely bypassing the South Yorkshire conurbation, with Sheffield served at its existing 'Midland' station. Connections to Sheffield would be provided at Alfreton (42km to the south) and at Thurnscoe (22km to the north). The timing 'penalty' for HS2 services calling at Sheffield, compared with running non-stop on the bypassing route, is calculated at 25 minutes. This effectively places Sheffield on a very long siding, resulting in slow journey times and only 3 connections by HS2 to other UK cities. No credible proposals have yet emerged for Sheffield's crucial transpennine HS3 link to Manchester.

HSUK will directly connect Sheffield to all principal UK cities (including all centres considered in this study), with journey times reduced by an average of 53%; transpennine links to Manchester, Manchester Airport and Liverpool will meet all requirements of the Northern Powerhouse. HSUK services will operate from a restored Sheffield Victoria station, with interchange platforms on the approaches to Sheffield Midland. This will allow major enhancements to the local rail network and full access to HSUK services from key communities such as Rotherham and Barnsley.

HIGH SPEED UK & HS2 LINKS TO SHEFFIELD



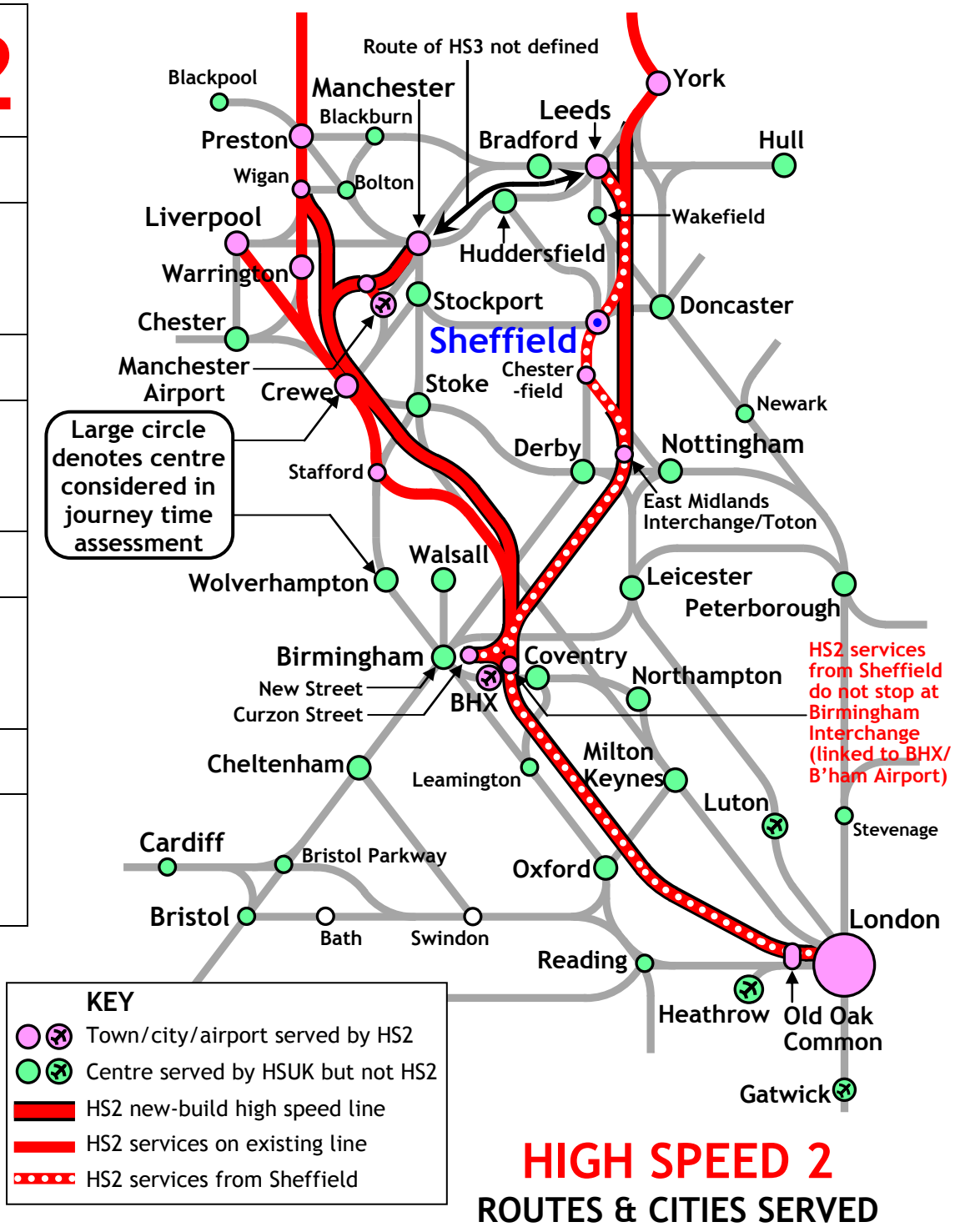
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p338

SHEFFIELD

Bypassed by HS2 trunk route, HS2 direct links only to London, Leeds and Birmingham

HS2
Average journey time reductions:
8%
No. of cities directly linked:
3
No. of journeys made faster:
5
No. of journeys made worse:
11



SHEFFIELD

Fully connected to national high speed network, direct high speed links to all principal UK cities

HSUK

Average journey time reductions:

53%

No. of cities directly linked:

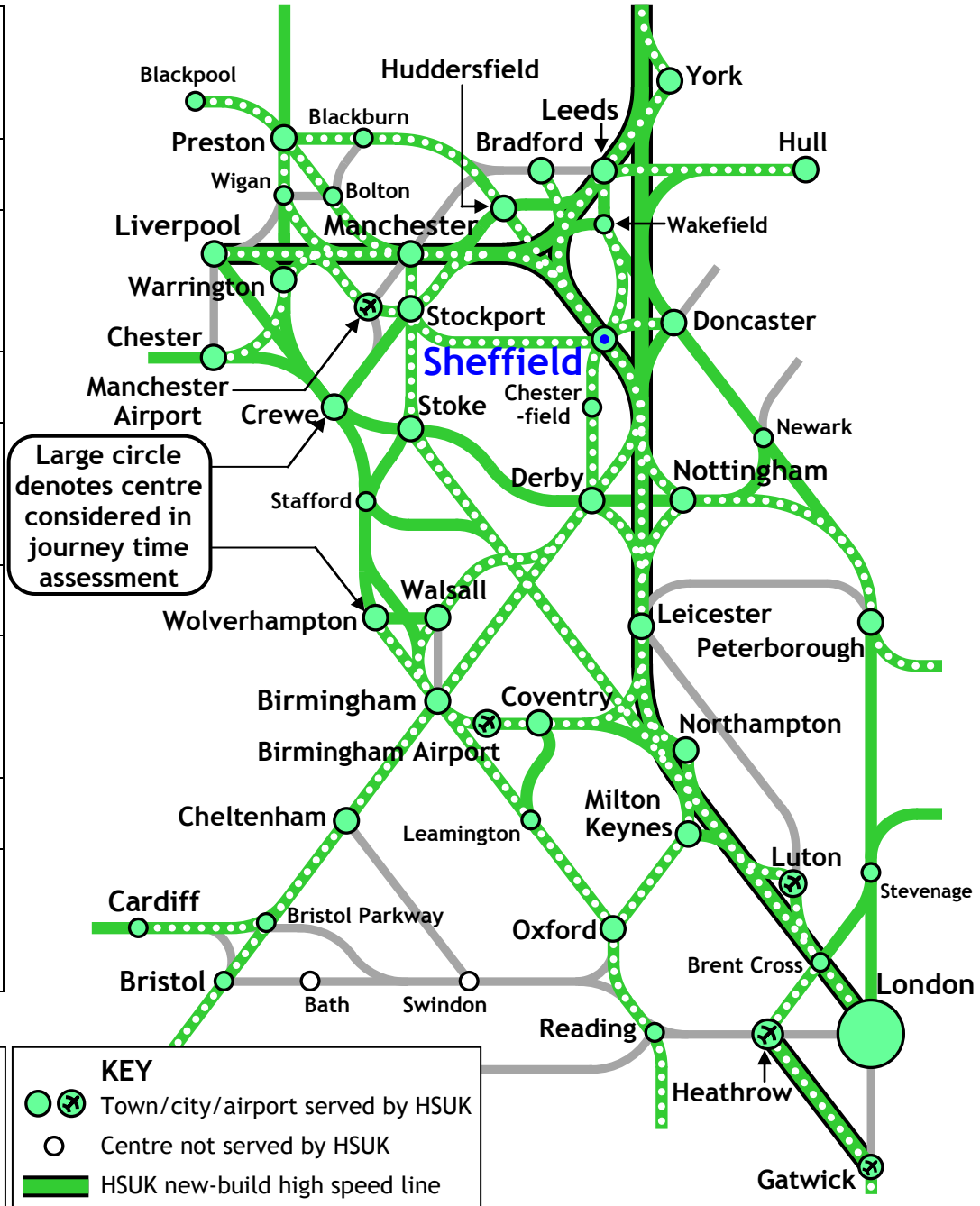
31

No. of journeys made faster:

30

No. of journeys made worse:

0



Sheffield served by
HSUK01,02,03,06
HSUK08,09
HSUK22,26,28
HSUK41,42,44,45
HSUK46,71,72
HSUK92
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Sheffield

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Sheffield**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
SHEFFIELD	Birmingham			44	69	48	44	0	69	0	48	0	
	B'ham Airport			52	118	118	52	0	98	1	98	1	#
	Bradford			27	96	80	27	0	76	1	60	1	
	Cheltenham			84	124	124	84	0	124	0	124	0	#
	Chester			68	149	149	68	0	129	1	129	1	
	Coventry			43	128	128	43	0	108	1	108	1	#
	Crewe			85	100	100	65	1	80	1	80	1	
	Derby			21	28	28	21	0	28	0	28	0	#
	Doncaster			23	23	23	23	0	23	0	23	0	
	Heathrow			77	238	128	77	0	198	2	108	1	
	Huddersfield			26	80	80	26	0	80	0	60	1	
	Hull			74	85	85	74	0	85	0	85	0	
	Leeds			19	41	25	19	0	41	0	25	0	
	Leicester			23	56	56	23	0	56	0	56	0	#
	Liverpool			43	107	107	43	0	107	0	107	0	
	London			56	122	85	56	0	122	0	85	0	
	Luton			79	150	150	59	1	130	1	130	1	
	Manchester			23	50	50	23	0	50	0	50	0	
	M'ch'r Airport			34	73	73	34	0	73	0	73	0	
	Milton Keynes			56	166	166	56	0	146	1	146	1	#
	Northampton			43	168	168	43	0	148	1	148	1	#
	Nottingham			21	50	50	21	0	50	0	50	0	
	Oxford			85	144	144	85	0	144	0	144	0	#
	Peterborough			60	93	93	60	0	93	0	93	0	
	Preston			49	126	126	49	0	106	1	106	1	
	Stockport			26	41	41	26	0	41	0	41	0	
	Stoke			53	100	100	53	0	80	1	80	1	#
	Walsall			43	130	130	43	0	110	1	110	1	#
	Warrington			52	76	76	52	0	76	0	76	0	
	Wolverhampton			76	122	122	76	0	102	1	102	1	#
	York			37	49	49	37	0	49	0	49	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX S2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

STOCKPORT

Stockport

Town/City	Stockport
City Region	Greater Manchester
Population of city/borough**	**280,000**
Ranking amongst UK cities – N/A	(part of Gr. Manchester)
Number of cities directly linked by existing rail network (out of 31)	**18**

References:
HSUK North-West Rail Strategy
HSUK Transpennine Rail Strategy
HSUK Regional Maps 08, 09 & 10
HSUK Stockport Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Metropolitan_Borough_of_Stockport#Council

Stockport : Intercity Connectivity with HSUK and HS2

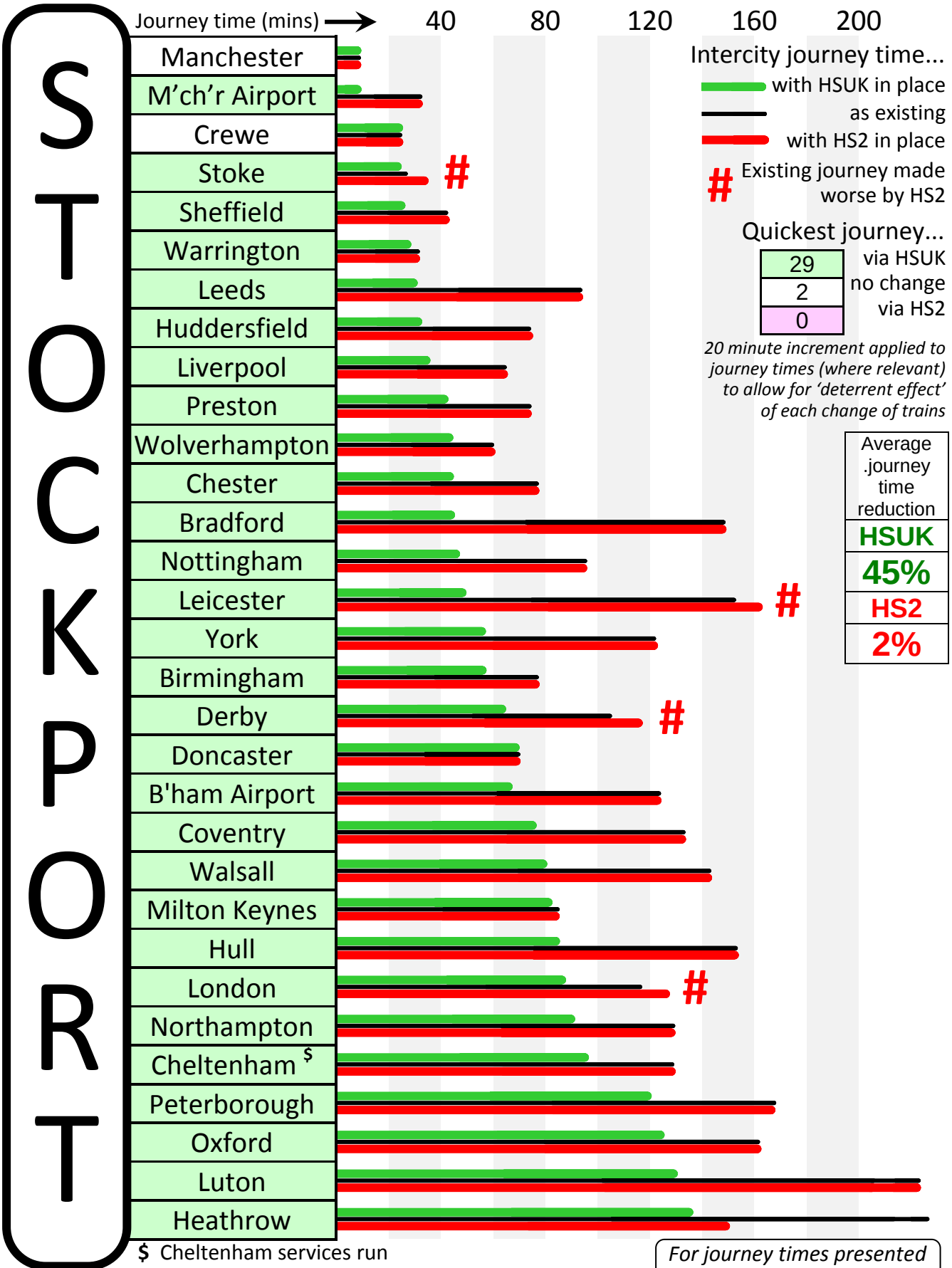
Stockport	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**45%**	**28**	**29**	**0**	**29**
HS2	**2%**	**0**	**1**	**4**	**0**

Stockport lies on the West Coast route running south from Manchester Piccadilly, and it is a primary calling point on Manchester's intercity services to London (3 trains per hour). With CrossCountry services to Birmingham and Transpennine to Sheffield, the town enjoys excellent intercity connectivity. Although the spread of Greater Manchester's urban development has entirely subsumed Stockport, the town retains a strong identity independent from that of Manchester. This is reflected in the rail network that converges upon Stockport, with routes extending to Guide Bridge and Stalybridge (and Leeds), to Sheffield, to Buxton, to Stoke, to Crewe, to Altrincham and to Manchester Piccadilly. However, the rail link to the nearby Manchester Airport does not pass through Stockport.

Under the HS2 scheme, Stockport will be left entirely bypassed. Stockport's existing intercity services to London will be reduced to a single train per hour, its only connection to HS2 will be by means of a commuting journey to Manchester Piccadilly; the proposed station at Manchester Airport is inaccessible by local rail services. With the continued lack of a direct rail link to Manchester Airport, it seems clear that the introduction of HS2 will be greatly to the detriment of Stockport.

Under HSUK proposals, Stockport will become the junction between the existing north-south intercity route and a new South Manchester Loop which will provide direct links to Manchester Airport from Leeds, Sheffield, Liverpool and most principal cities of the North. The new route will diverge from the HSUK main line at Guide Bridge, follow the existing route (suitably upgraded) to Stockport, reach Manchester Airport's existing station via a new link from the Stockport-Crewe line, and continue westwards via Altrincham to Liverpool and the West Coast Main Line. This will make Stockport a key hub of the HSUK national network, and give the town direct links to all principal cities of the Northern Powerhouse.

HIGH SPEED UK & HS2 LINKS TO STOCKPORT



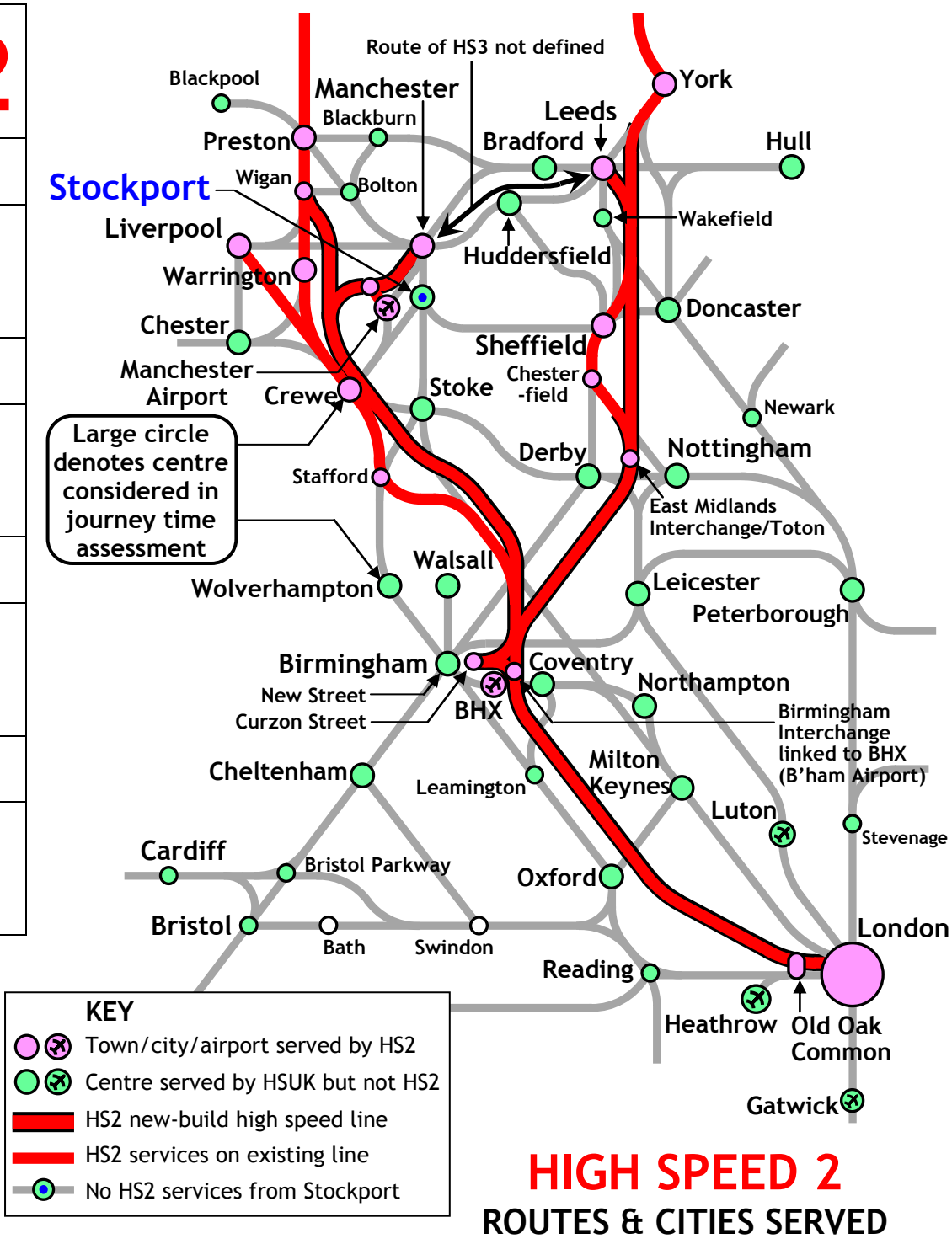
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p344

STOCKPORT

Bypassed by HS2, existing 3 train per hour service to London reduced to 1 train per hour

HS2
Average journey time reductions:
2%
No. of cities directly linked:
0
No. of journeys made faster:
1
No. of journeys made worse:
4



HIGH SPEED 2

ROUTES & CITIES SERVED

STOCKPORT

Fully connected to national high speed network & integrated with Northern Powerhouse routes

HSUK

Average journey time reductions:

45%

No. of cities directly linked:

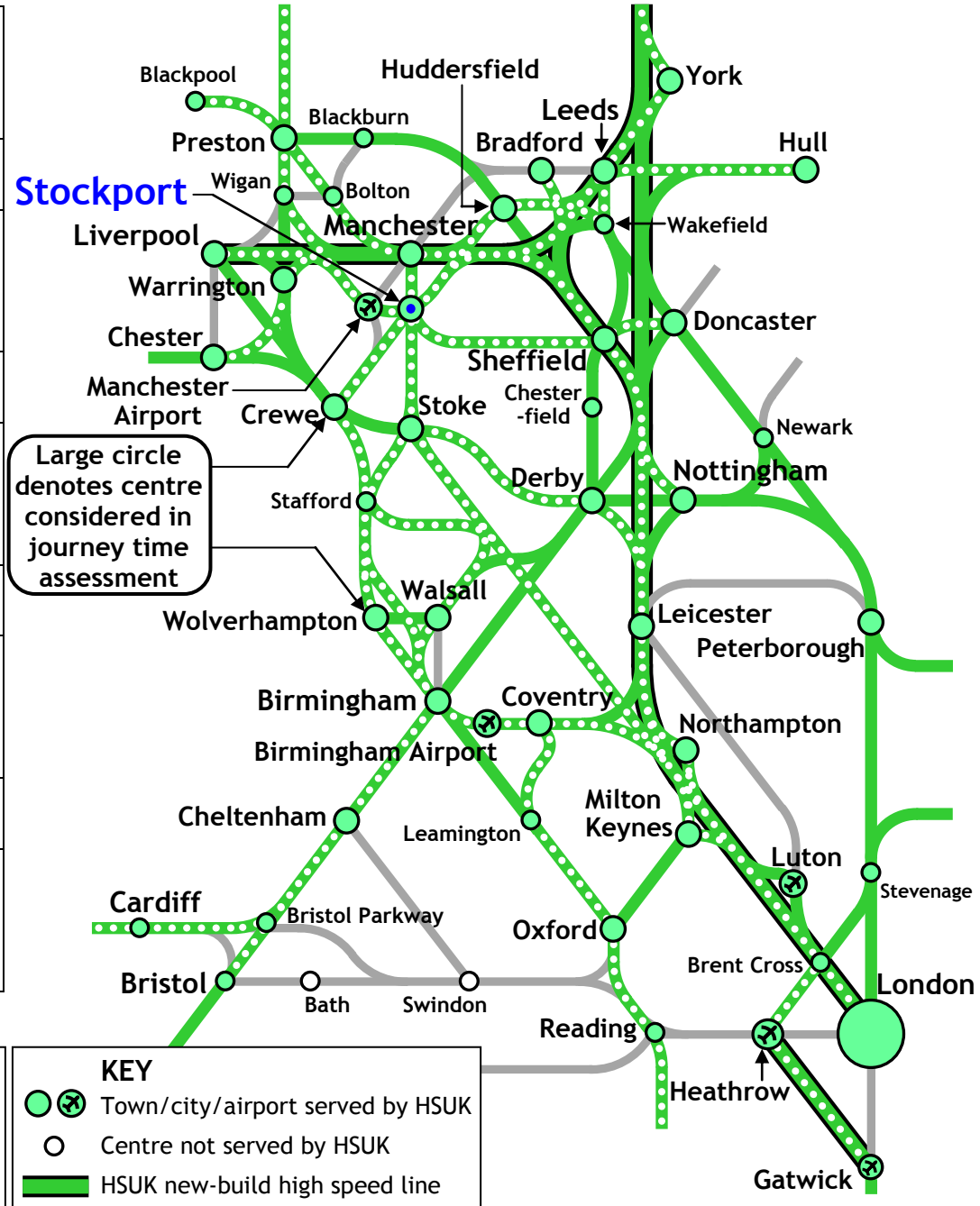
28

No. of journeys made faster:

29

No. of journeys made worse:

0



Stockport served by:
HSUK04,11,15
HSUK24,25,26,27
HSUK28,29
HSUK46,51,53,79
HSUK94
See Appendix A1

KEY

- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Stockport

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Stockport**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
STOCKPORT	Birmingham			58	78	78	58	0	78	0	78	0	
	B'ham Airport			67	123	123	67	0	103	1	103	1	
	Bradford			43	148	148	43	0	108	2	108	2	
	Cheltenham			96	128	128	96	0	128	0	128	0	
	Chester			41	78	78	41	0	78	0	78	0	
	Coventry			76	133	133	76	0	113	1	113	1	
	Crewe			24	24	24	24	0	24	0	24	0	
	Derby			60	105	105	60	0	85	1	85	1	#
	Doncaster			63	69	69	63	0	69	0	69	0	
	Heathrow			133	226	149	113	1	186	2	109	2	
	Huddersfield			30	74	74	30	0	54	1	54	1	
	Hull			84	154	154	84	0	134	1	134	1	
	Leeds			29	93	93	29	0	73	1	73	1	
	Leicester			50	133	133	50	0	113	1	113	1	#
	Liverpool			34	63	63	34	0	63	0	63	0	
	London			89	118	118	89	0	118	0	118	0	#
	Luton			128	223	223	108	1	183	2	183	2	
	Manchester			8	8	8	8	0	8	0	8	0	
	M'ch'r Airport			7	33	33	7	0	33	0	33	0	
	Milton Keynes			82	85	85	82	0	85	0	85	0	
	Northampton			93	129	129	73	1	109	1	109	1	
	Nottingham			48	95	95	48	0	95	0	95	0	
	Oxford			123	161	161	123	0	161	0	161	0	
	Peterborough			122	148	148	102	1	148	0	148	0	
	Preston			39	74	74	39	0	74	0	74	0	
	Sheffield			26	41	41	26	0	41	0	41	0	
	Stoke			23	26	26	23	0	26	0	26	0	#
	Walsall			79	142	142	79	0	122	1	122	1	
	Warrington			25	32	32	25	0	32	0	32	0	
	Wolverhampton			42	60	60	42	0	60	0	60	0	
	York			56	121	121	56	0	101	1	101	1	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX S3

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

STOKE

Stoke

Town/City	Stoke
Population of built-up area**	370,000
Ranking amongst UK cities**	19
Number of cities directly linked by existing rail network (out of 31)	13

References:
HSUK Potteries Rail Strategy
HSUK Regional Map 08
HSUK Stoke Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Stoke : Intercity Connectivity with HSUK and HS2

Stoke	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	46%	26	31	0	31
HS2	1%	0	1	11	0

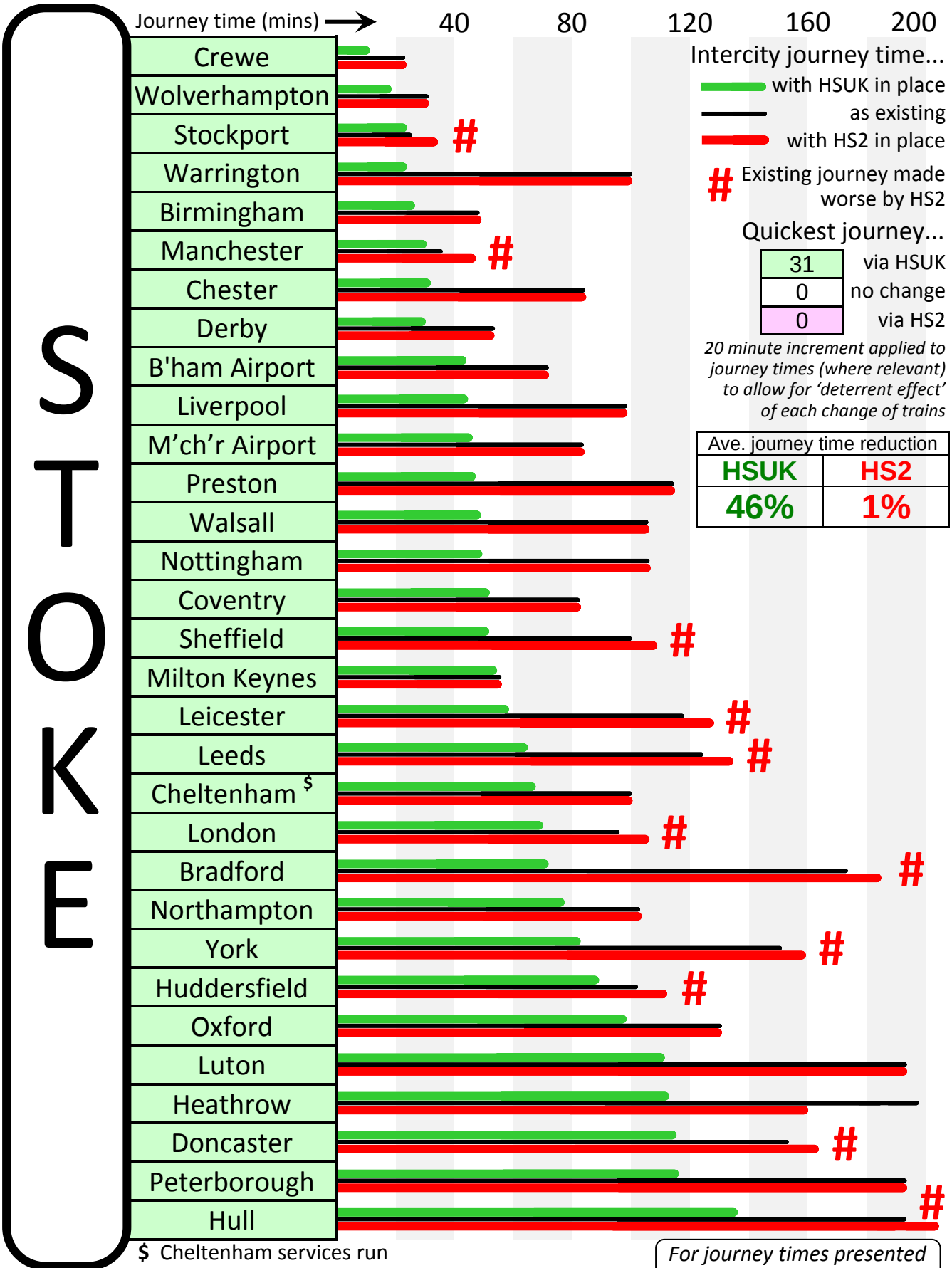
Stoke and the wider Potteries conurbation comprise the largest population centre between the West Midlands and the North-West; yet Stoke is bypassed by the primary route of the West Coast Main Line, which passes 10km to the west. Consequently it is Crewe (population 70,000) rather than Stoke (population 370,000) where the primary routes to Manchester, Liverpool and North Wales diverge. Stoke enjoys good connectivity to London, Birmingham and Manchester by virtue of its location on the North Staffordshire main line in the Trent Valley, with 2 trains per hour on both routes; however its links to other primary WCML routes (to Liverpool, Scotland and the North Wales coast) require a change of trains at Crewe. Stoke also lacks direct links to any primary city to the east of the Pennines.

Stoke's poor intercity connectivity will be considerably worsened by HS2. HS2's new-build route will follow the West Coast Main Line, London to Manchester services will bypass Stoke, and intercity services to London on the main line route via Stoke will be reduced to a single train per hour. HS2's focus on Crewe Hub (20km from Stoke) will bring no connectivity benefits for Stoke and the Potteries, and the proposed developments at Crewe are likely to suck economic activity from the more populous Potteries region.

The HSUK proposals recognise the fundamental illogicality of both West Coast Main and HS2 bypassing the large Potteries population and its high economic potential, and instead serving a much smaller population at Crewe. The HSUK strategy is to upgrade the existing North Staffordshire routes to focus regional connectivity upon Stoke, either at its existing station, or at a new site at Etruria in accordance with Stoke City Council plans. The following primary routes will intersect at Stoke:

- Liverpool-Warrington-Crewe-Stoke-Derby-Nottingham
- London-Stoke-Crewe, splitting for North Wales and Warrington-Preston-Glasgow.
- South Coast-Birmingham-Stoke-Manchester
- South Wales-Birmingham-Stoke-Manchester-Leeds-York-NorthEast-Edinburgh-Glasgow

HIGH SPEED UK & HS2 LINKS TO STOKE

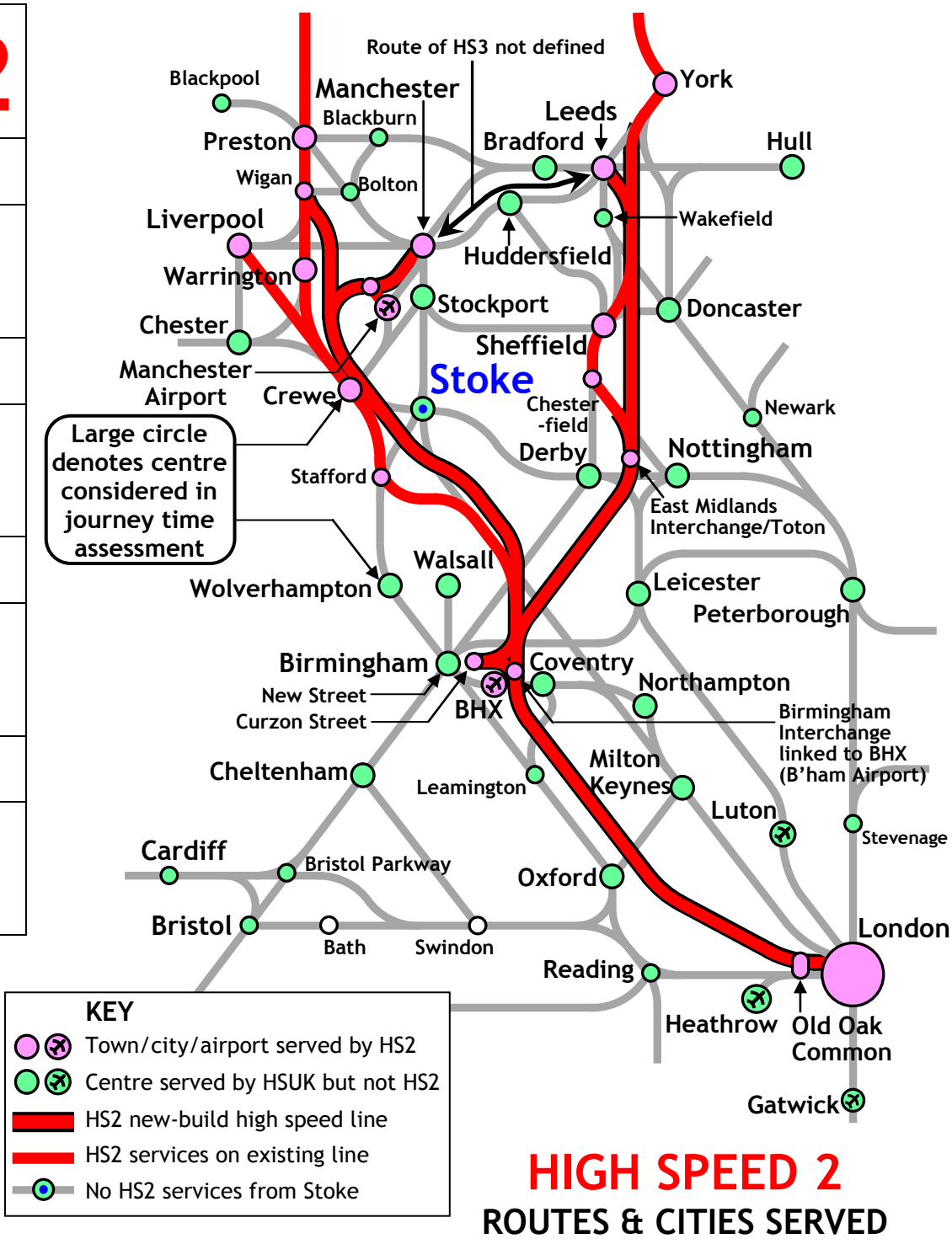


For journey times presented in tabulated format see p350

STOKE

Existing 2 train per hour service to London cut to 1 tph, Crewe Hub too far away to offer alternative

HS2
Average journey time reductions:
1%
No. of cities directly linked:
0
No. of journeys made faster:
1
No. of journeys made worse:
11



STOKE

Fully connected to national high speed network, direct high speed links to most principal UK cities

HSUK

Average journey time reductions:

46%

No. of cities directly linked:

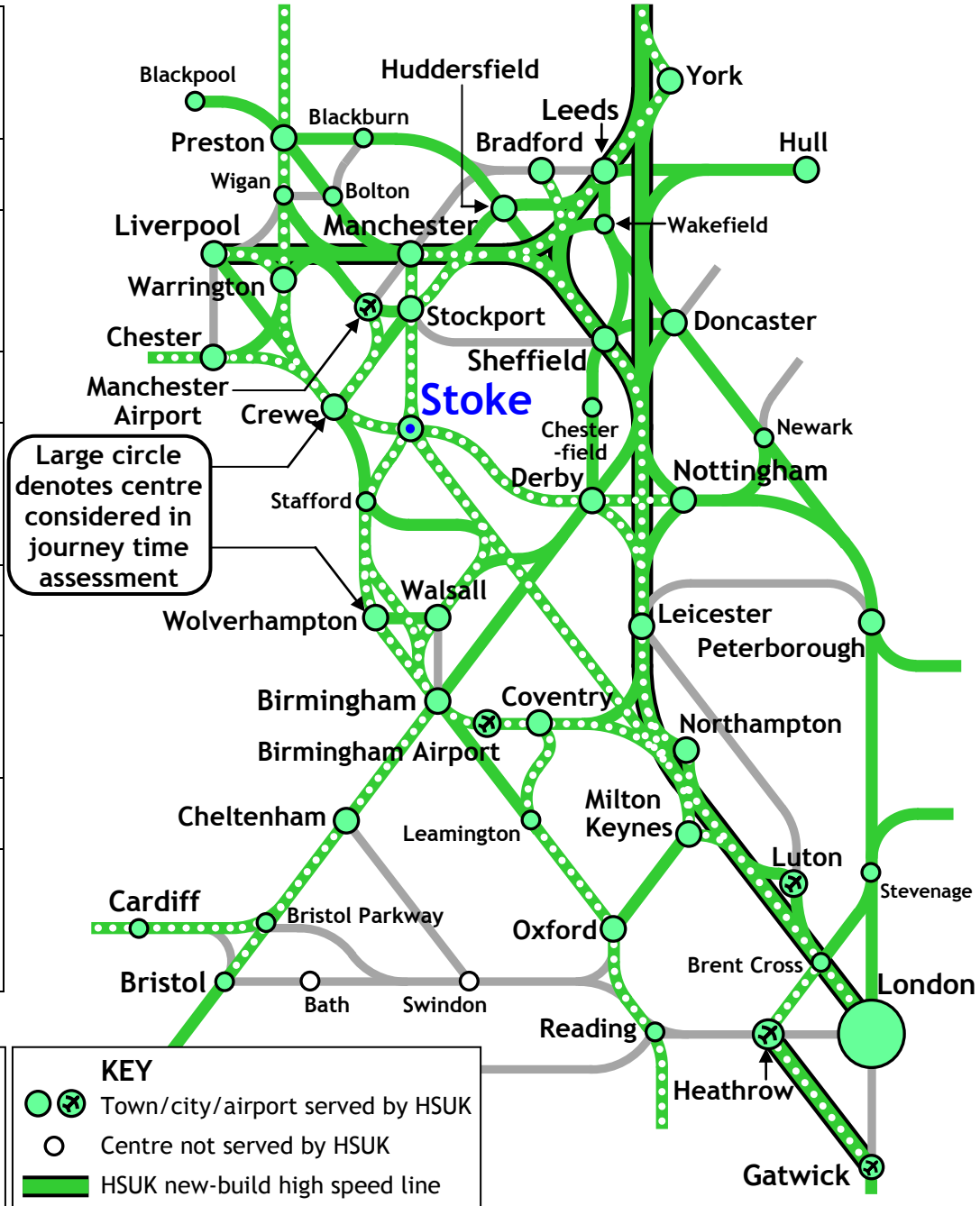
26

No. of journeys made faster:

31

No. of journeys made worse:

0



Stoke served by:
HSUK04
HSUK11,12,14,15
HSUK46,51
HSUK52,54,55
HSUK79
HSUK94
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Stoke

www.highspeeduk.co.uk

HIGH SPEED UK
ROUTES & CITIES SERVED

Comparative Journey Times from **Stoke**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
STOKE	Birmingham			25	48	48	25	0	48	0	48	0	
	B'ham Airport			42	72	72	42	0	72	0	72	0	
	Bradford			69	173	173	69	0	133	2	133	2	#
	Cheltenham			65	100	100	65	0	100	0	100	0	
	Chester			30	84	84	30	0	64	1	64	1	
	Coventry			51	82	82	51	0	82	0	82	0	
	Crewe			8	22	22	8	0	22	0	22	0	
	Derby			31	53	53	31	0	53	0	53	0	
	Doncaster			121	134	134	101	1	114	1	114	1	#
	Heathrow			112	198	160	112	0	158	2	120	2	
	Huddersfield			84	101	101	64	1	81	1	81	1	#
	Hull			134	193	193	114	1	173	1	173	1	#
	Leeds			63	124	124	63	0	104	1	104	1	#
	Leicester			58	119	119	58	0	99	1	99	1	#
	Liverpool			41	99	99	41	0	79	1	79	1	
	London			69	87	87	69	0	87	0	87	0	#
	Luton			111	194	194	91	1	154	2	154	2	
	Manchester			30	36	36	30	0	36	0	36	0	#
	M'ch'r Airport			45	83	83	45	0	63	1	63	1	
	Milton Keynes			55	57	57	55	0	57	0	57	0	
	Northampton			78	82	82	78	0	82	0	82	0	
	Nottingham			49	106	106	49	0	86	1	86	1	
	Oxford			98	131	131	98	0	131	0	131	0	
	Peterborough			116	194	194	96	1	174	1	174	1	
	Preston			45	114	114	45	0	94	1	94	1	
	Sheffield			53	100	100	53	0	80	1	80	1	#
	Stockport			23	26	26	23	0	26	0	26	0	#
	Walsall			48	106	106	48	0	86	1	86	1	
	Warrington			22	100	100	22	0	80	1	80	1	
	Wolverhampton			19	31	31	19	0	31	0	31	0	
	York			80	151	151	80	0	131	1	131	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX W1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

WALSALL

Walsall

Town/City	Walsall
City Region	West Midlands
Population of city/borough**	**270,000**
Ranking amongst UK cities – N/A	(part of W.Midlands)
Number of cities directly linked by existing rail network (out of 31)	**2**

References:
HSUK West Midlands Rail Strategy
HSUK Regional Maps 04 & 06
HSUK Walsall Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Walsall

Walsall : Intercity Connectivity with HSUK and HS2

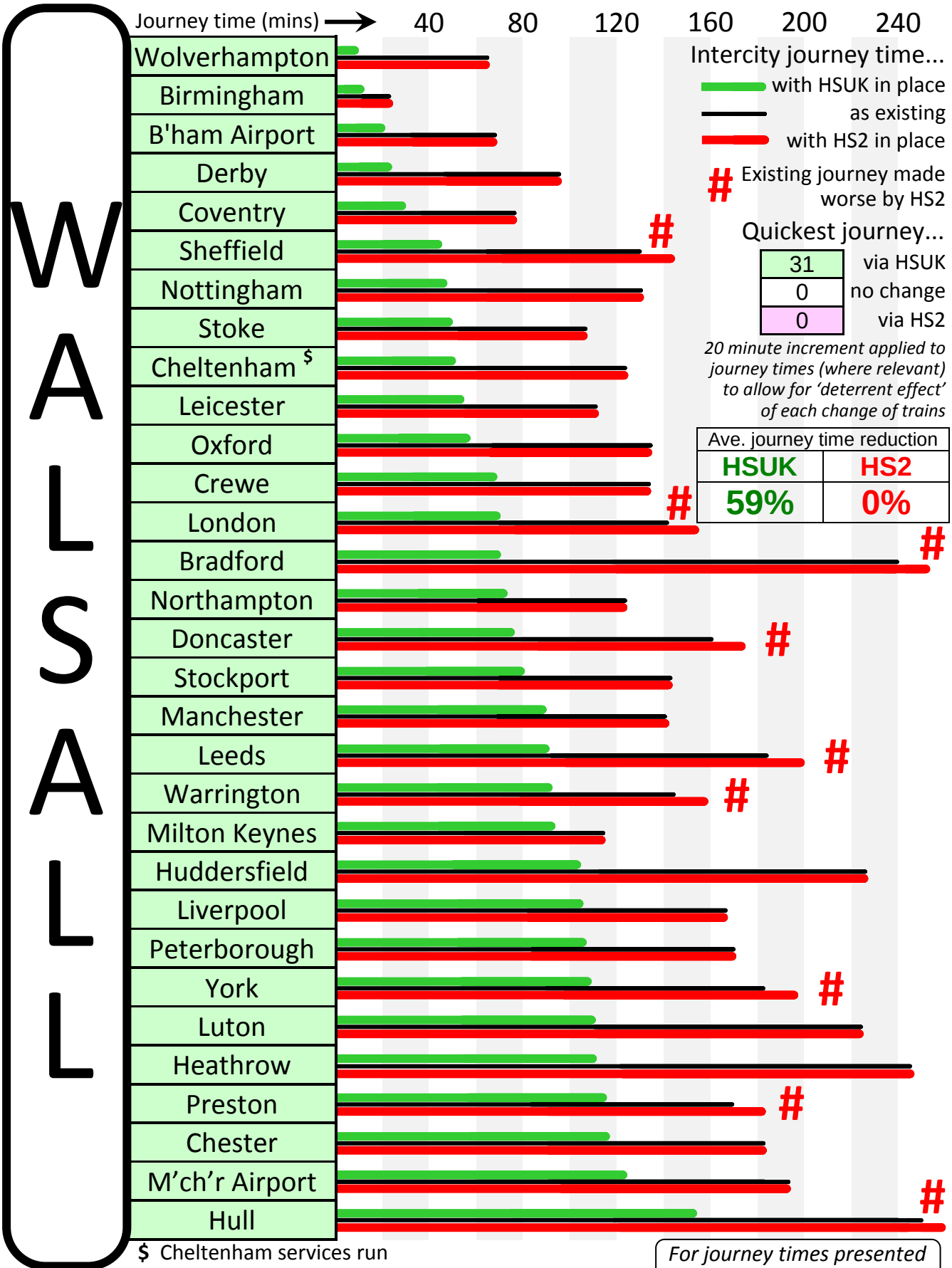
Walsall	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**59%**	**18**	**31**	**0**	**31**
HS2	**0%**	**0**	**0**	**10**	**0**

Walsall was once located at the hub of a dense network of former Great Western, Midland and London North-Western routes that extended across the West Midlands. Yet in recent years this network has retrenched to the extent that Walsall is served only by local trains running north from Birmingham ultimately to reach Rugeley in the Trent Valley. The entire Borough of Walsall is thus reliant for its intercity connectivity on a change of trains at Birmingham New Street. This compares very poorly with similar-sized communities such as Wolverhampton or Derby.

With HS2 providing direct services from Birmingham to 6 of the 31 centres considered in this study, it would do very little to improve Walsall's current low level of intercity connectivity. However, with HS2 serving Birmingham Curzon Street, accessible from New Street only by a 10 minute walking transfer, it is fair to state that HS2 will do nothing to enhance Walsall's intercity links. Instead Curzon Street's disconnection coupled with the proposed reduction in intercity services along existing routes will do much to worsen Walsall's overall connectivity.

Walsall will benefit hugely from HSUK's alternative strategy, to enhance existing radial routes into Birmingham New Street, thus greatly increasing capacity and maintaining New Street's status as regional and national network hub. For the north-westward corridor towards Wolverhampton and (ultimately) Manchester and Liverpool a new line from Soho Junction (3km north-west of New Street) to reach the former 'Grand Junction' route at Tame Bridge will create greatly increased capacity and offer significantly reduced journey times from which Walsall will also benefit. Restoration of the former route to Lichfield will place Walsall on a new intercity route between West and East Midlands that will do much to reduce capacity pressures on existing routes. It will also allow the creation of a 'Midlands Ring' of routes linking Wolverhampton, Walsall, Derby, Nottingham, Leicester, Coventry and Birmingham.

HIGH SPEED UK & HS2 LINKS TO WALSALL



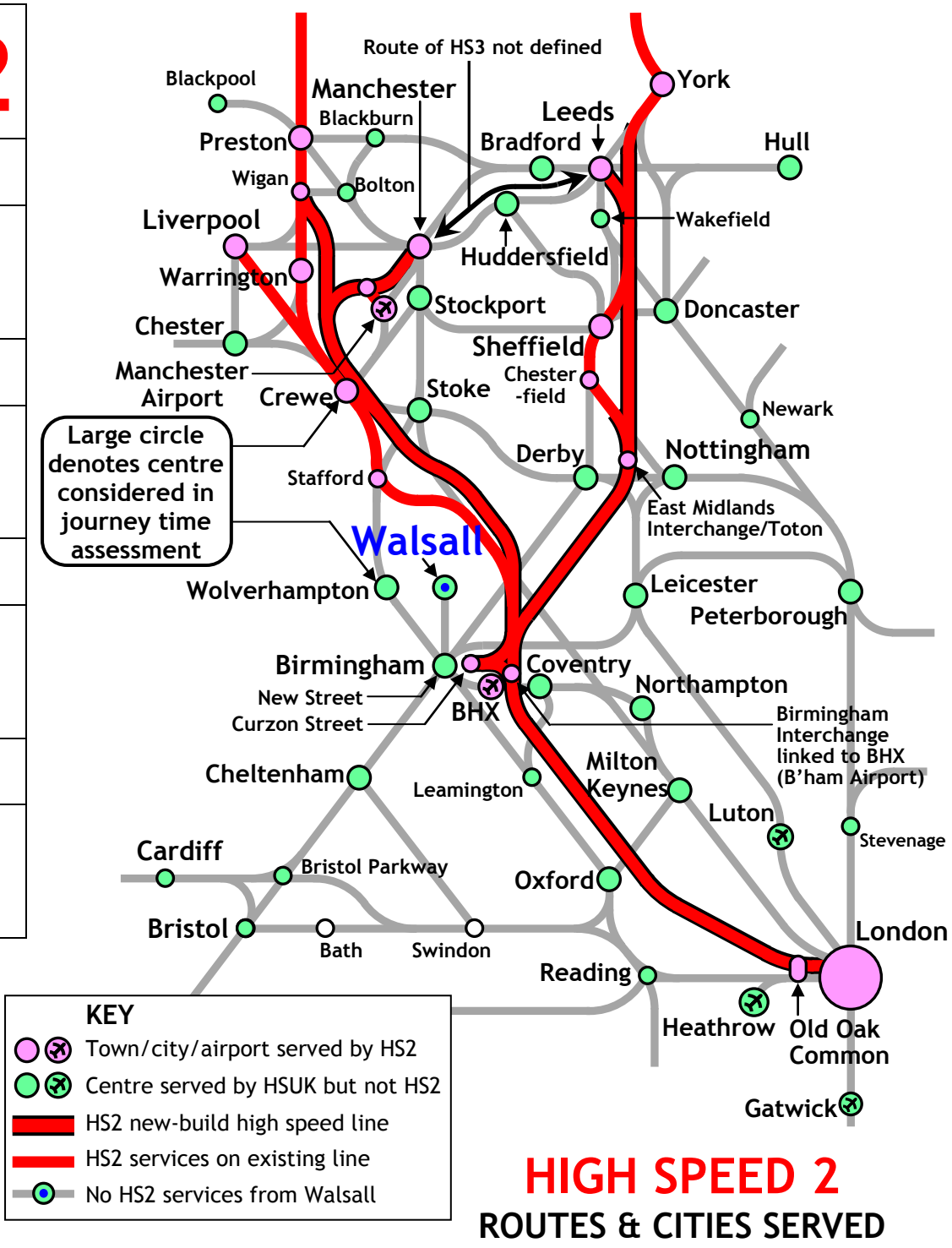
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p356

WALSALL

No link to HS2, walking connection in Birmingham required, existing services made worse

HS2
Average journey time reductions:
0%
No. of cities directly linked:
0
No. of journeys made faster:
0
No. of journeys made worse:
10



WALSALL

Transformed national and local connectivity, new 'Midlands Ring' linking all principal Midlands cities

HSUK

Average journey time reductions:

59%

No. of cities directly linked:

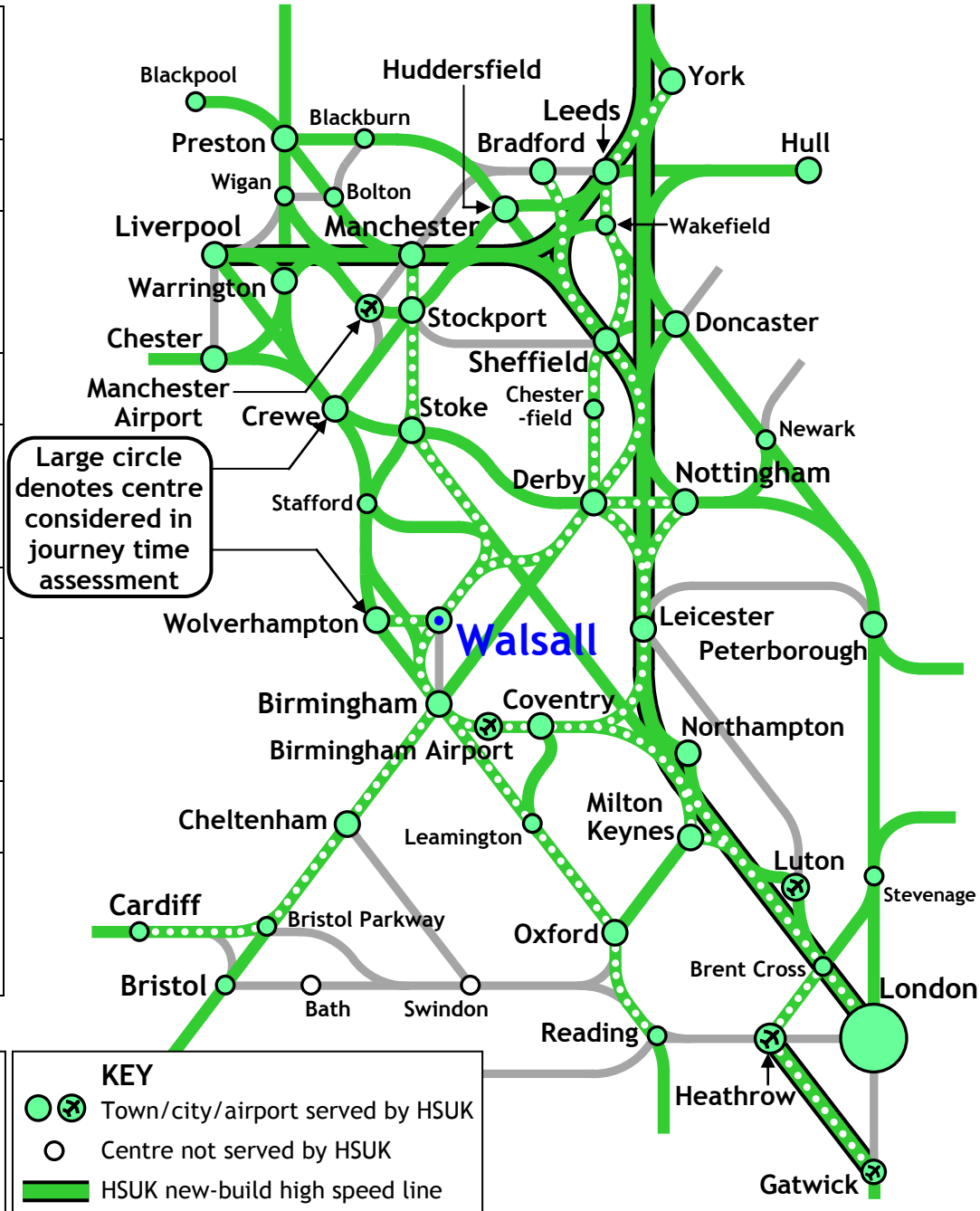
18

No. of journeys made faster:

31

No. of journeys made worse:

0



Walsall served by:
HSUK08,09
HSUK15
HSUK63
HSUK76,77,78
HSUK94
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Walsall

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Walsall**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
WALSALL	Birmingham			10	22	22	10	0	22	0	22	0	
	B'ham Airport			19	68	68	19	0	48	1	48	1	
	Bradford			72	240	240	72	0	200	2	200	2	#
	Cheltenham			50	103	103	50	0	83	1	83	1	
	Chester			118	182	182	98	1	142	2	142	2	
	Coventry			28	78	78	28	0	58	1	58	1	
	Crewe			67	114	114	47	1	94	1	94	1	
	Derby			21	96	96	21	0	76	1	76	1	
	Doncaster			93	160	160	73	1	140	1	140	1	#
	Heathrow			109	252	252	109	0	192	3	192	3	#
	Huddersfield			105	227	227	85	1	187	2	187	2	
	Hull			155	251	251	135	1	211	2	211	2	#
	Leeds			69	184	184	69	0	164	1	164	1	#
	Leicester			55	112	112	55	0	92	1	92	1	
	Liverpool			105	167	167	85	1	147	1	147	1	
	London			69	141	141	69	0	121	1	121	1	#
	Luton			108	225	225	88	1	185	2	185	2	
	Manchester			88	150	150	88	0	130	1	130	1	
	M'ch'r Airport			122	194	194	102	1	154	2	154	2	
	Milton Keynes			92	114	114	72	1	94	1	94	1	
	Northampton			71	124	124	51	1	104	1	104	1	
	Nottingham			46	131	131	46	0	111	1	111	1	
	Oxford			57	135	135	57	0	115	1	115	1	
	Peterborough			106	171	171	86	1	151	1	151	1	
	Preston			114	169	169	94	1	149	1	149	1	#
	Sheffield			43	130	130	43	0	110	1	110	1	#
	Stockport			79	142	142	79	0	122	1	122	1	
	Stoke			48	106	106	48	0	86	1	86	1	
	Warrington			90	145	145	70	1	125	1	125	1	#
	Wolverhampton			7	64	64	7	0	64	0	64	0	
	York			86	182	182	86	0	162	1	162	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX W2

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

WARRINGTON

Warrington

Town/City	Warrington
Population of built-up area**	170,000
Ranking amongst UK cities**	46
Number of cities directly linked by existing rail network (out of 31)	19

References:
HSUK North-West Rail Strategy
HSUK Regional Maps 08 & 09
HSUK Warrington Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

Warrington : Intercity Connectivity with HSUK and HS2

Warrington	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**43%**	**24**	**29**	**0**	**28**
HS2	**4%**	**0**	**2**	**12**	**2**

Warrington's location on both the West Coast Main Line and the southern TransPennine route from Liverpool to Manchester gives the town good intercity connectivity in terms of numbers of cities linked. However, the quality of this connectivity, both for Warrington and the wider North-West region, is greatly compromised by the 2 separate stations that serve the town. Bank Quay on the north-south WCML and Central on the east-west TransPennine route are over a kilometre apart, and there is no practical prospect of linking the 2 stations.

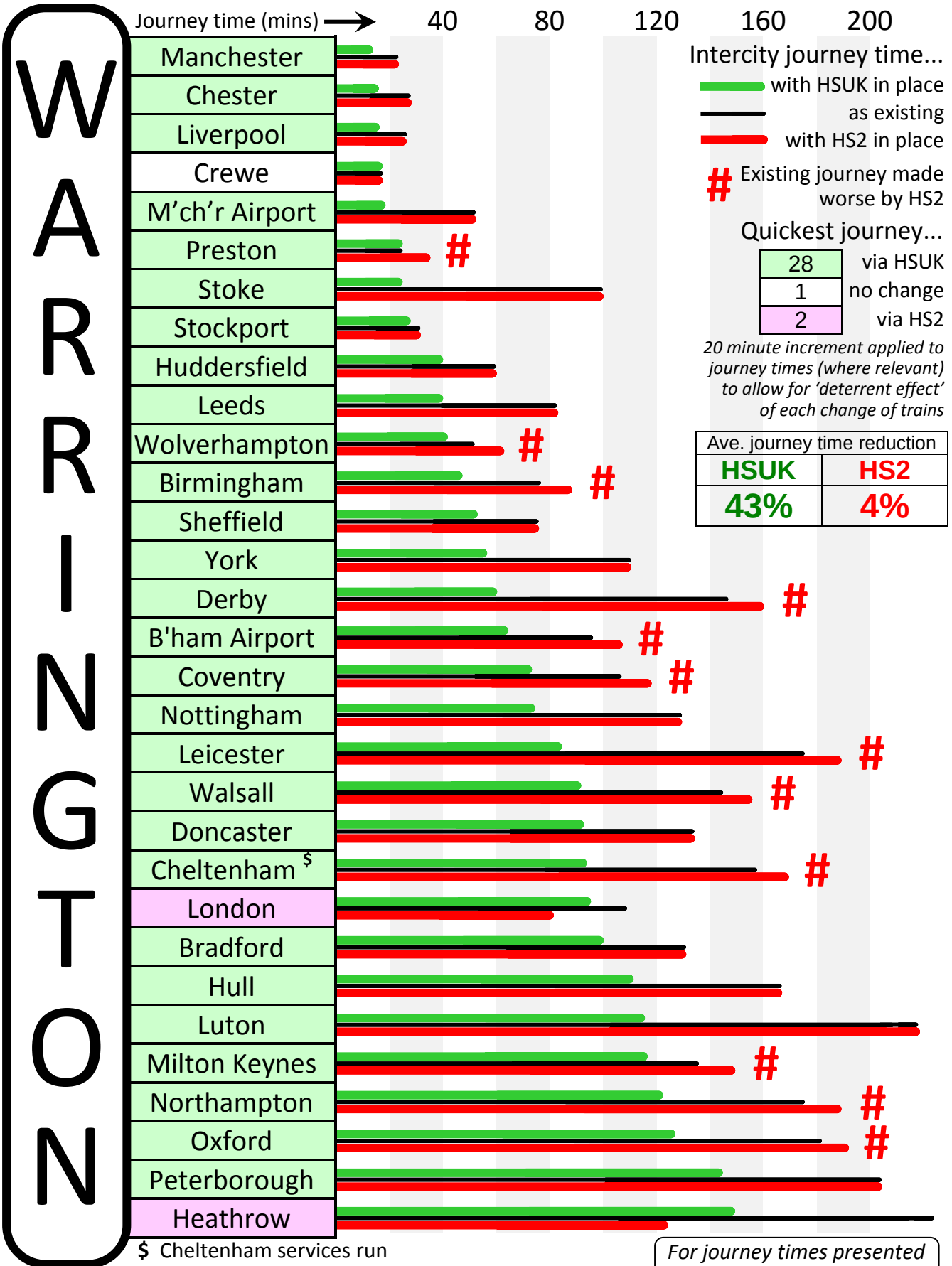
Although Warrington will be served by HS2 trains from London via Crewe to Preston, it will be bypassed by longer-distance services to Scotland from both Birmingham and London. With proposed reductions to existing intercity services, Warrington will see its present intercity connectivity greatly reduced. Under forthcoming 'HS3' proposals to link Liverpool and Manchester, it is likely that Warrington will again be bypassed.

HSUK's alternative routeing strategies will entirely avoid these problems. Whilst the HSUK trunk route from Manchester to Liverpool will bypass Warrington to the north side, connections to the West Coast Main Line will permit a large range of intercity services to intersect at Warrington Bank Quay in addition to current north-south WCML services:

- Chester-Warrington-Manchester-Leeds-York-Darlington-Newcastle
- West Midlands-Crewe-Warrington-Manchester-Huddersfield-Leeds-Hull
- West Country-West Midlands-Warrington-Liverpool
- Nottingham-Derby-Stoke-Crewe-Warrington-Liverpool
- Chester-Warrington-Manchester Airport-Stockport-Sheffield-Nottingham

The HSUK strategy allows all of Warrington's intercity services to be concentrated at Warrington Bank Quay. This will free up extra capacity on the Warrington Central line for enhanced local services to Liverpool and Manchester.

HIGH SPEED UK & HS2 LINKS TO WARRINGTON



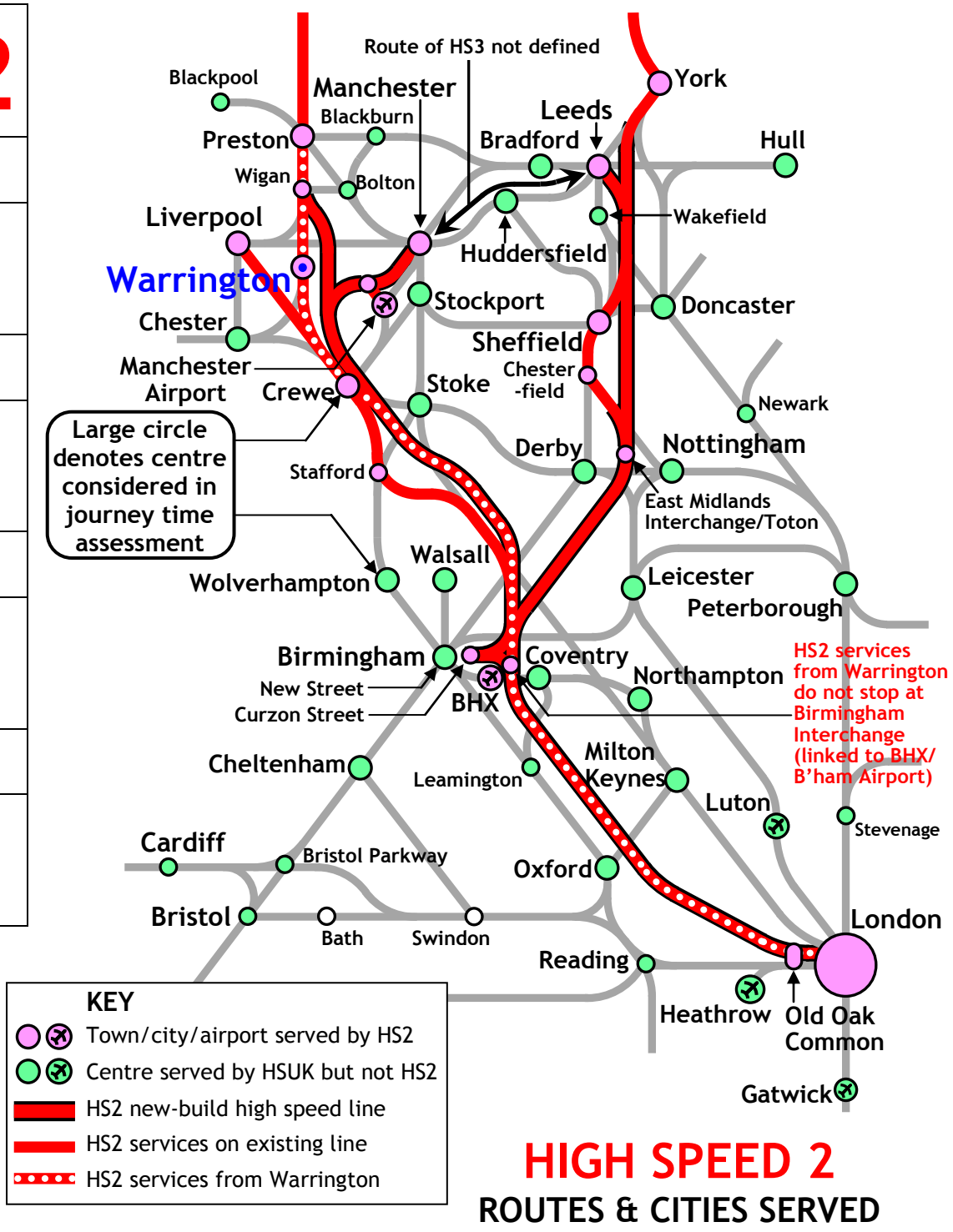
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p362

WARRINGTON

HS2 links only to Crewe & London, existing services made worse, no Northern Powerhouse connection

HS2
Average journey time reductions:
4%
No. of cities directly linked:
3
No. of journeys made faster:
2
No. of journeys made worse:
12



HIGH SPEED 2

ROUTES & CITIES SERVED

WARRINGTON

Fully connected to national high speed network & integrated with Northern Powerhouse routes

HSUK

Average journey time reductions:

43%

No. of cities directly linked:

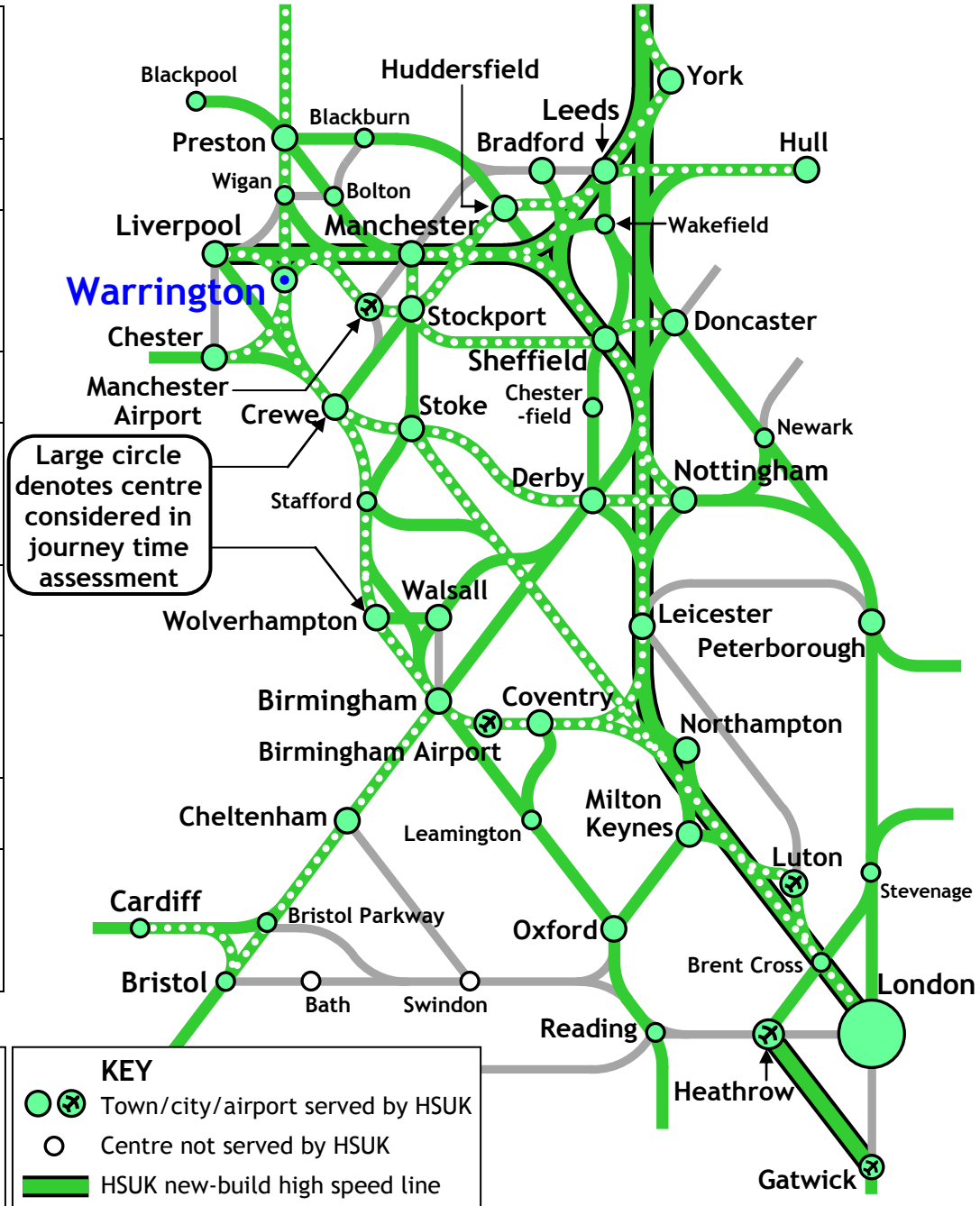
24

No. of journeys made faster:

29

No. of journeys made worse:

0



Warrington served by:
HSUK06,13,14
HSUK23,25,27
HSUK52
HSUK61
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Warrington

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Warrington**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
WARRINGTON	Birmingham			48	78	78	48	0	78	0	78	0	#
	B'ham Airport			63	97	97	63	0	97	0	97	0	#
	Bradford			98	131	131	78	1	111	1	111	1	
	Cheltenham			92	159	159	92	0	139	1	139	1	#
	Chester			14	28	28	14	0	28	0	28	0	
	Coventry			72	107	107	72	0	107	0	107	0	#
	Crewe			15	15	15	15	0	15	0	15	0	
	Derby			58	147	147	58	0	127	1	127	1	#
	Doncaster			92	134	134	92	0	114	1	114	1	
	Heathrow			148	227	124	128	1	187	2	104	1	
	Huddersfield			39	60	60	39	0	60	0	60	0	
	Hull			111	167	167	111	0	147	1	147	1	
	Leeds			39	82	82	39	0	82	0	82	0	
	Leicester			82	176	176	62	1	156	1	156	1	#
	Liverpool			14	26	26	14	0	26	0	26	0	
	London			95	109	81	95	0	109	0	81	0	
	Luton			115	219	219	115	0	179	2	179	2	
	Manchester			11	23	23	11	0	23	0	23	0	
	M'ch'r Airport			16	51	51	16	0	51	0	51	0	
	Milton Keynes			116	136	136	96	1	136	0	136	0	#
	Northampton			122	176	176	102	1	156	1	156	1	#
	Nottingham			75	129	129	75	0	129	0	129	0	
	Oxford			128	181	181	108	1	161	1	161	1	#
	Peterborough			143	205	205	123	1	205	0	205	0	
	Preston			21	21	21	21	0	21	0	21	0	#
	Sheffield			52	76	76	52	0	76	0	76	0	
	Stockport			25	32	32	25	0	32	0	32	0	
	Stoke			22	100	100	22	0	80	1	80	1	#
	Walsall			90	145	145	70	1	125	1	125	1	
	Wolverhampton			39	52	52	39	0	52	0	52	0	#
	York			56	110	110	56	0	110	0	110	0	

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX W3

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

WOLVERHAMPTON

Wolverhampton

Town/City	Wolverhampton
City Region	West Midlands
Population of city/borough**	**250,000**
Ranking amongst UK cities – N/A	(part of W.Midlands)
Number of cities directly linked by existing rail network (out of 31)	**15**

References:
HSUK West Midlands Rail Strategy
HSUK Regional Maps 04 & 06
HSUK Wolverhampton Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/Wolverhampton

Wolverhampton : Intercity Connectivity with HSUK and HS2

Wolver-hampton	Average journey time reduction	Cities directly linked (out of 31)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**47%**	**27**	**31**	**0**	**31**
HS2	**2%**	**0**	**3**	**6**	**0**

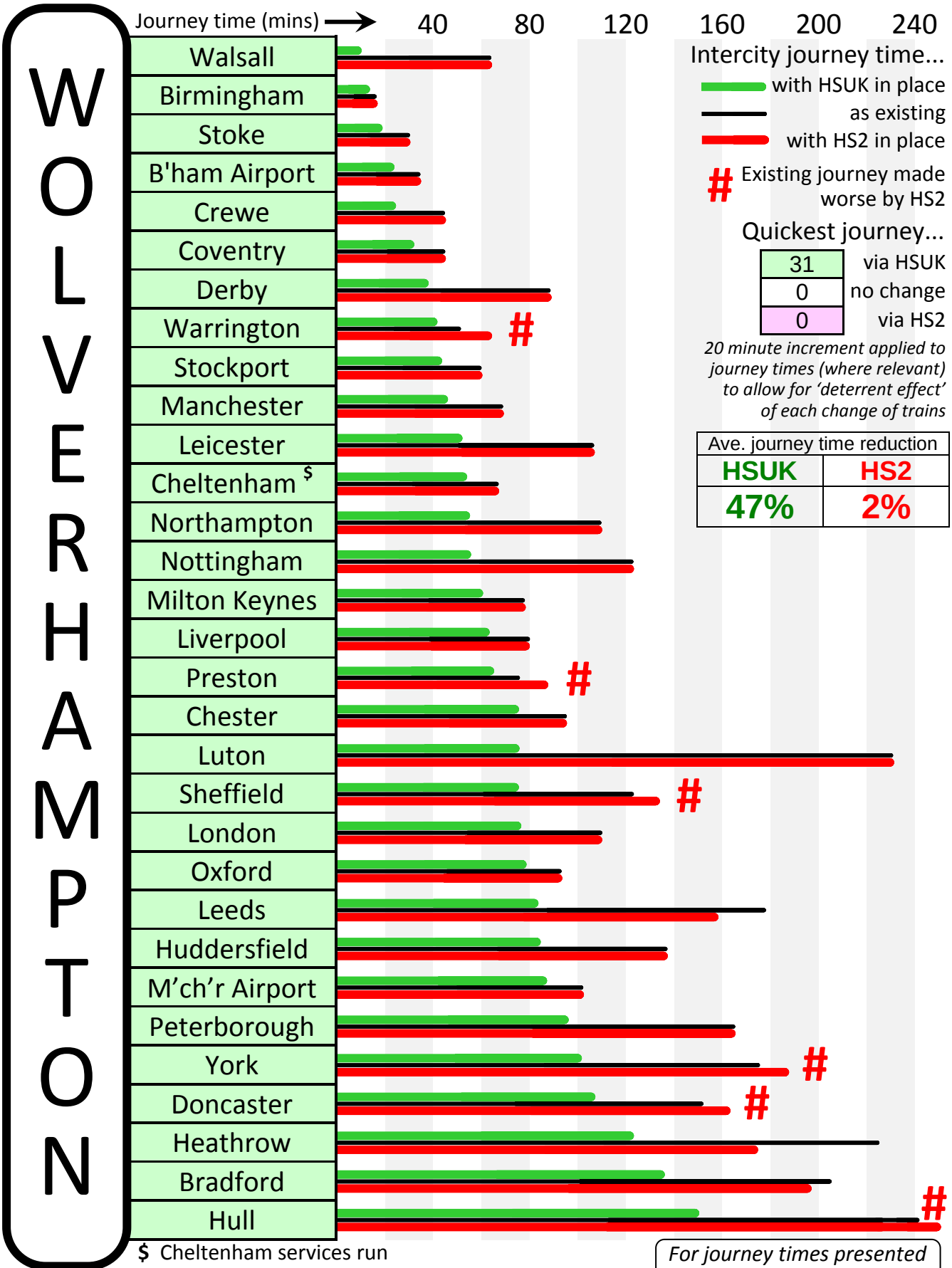
Wolverhampton's location on the main north-westward intercity route from the West Midlands gives the city good links to all principal cities along the corridor of the West Coast Main Line, both north-west and south-east of Birmingham. However, for journeys to East Midlands, Yorkshire and North-East destinations, Wolverhampton lacks the necessary direct links; instead, it is necessary to travel along the congested local route into Birmingham New Street before changing trains there.

HS2 will do little to improve Wolverhampton's connectivity, and instead will do much to make it worse. With HS2's northward route from Birmingham bypassing Wolverhampton, and with intercity services on existing routes reduced, the city will lose its direct services to Warrington and Preston, and onwards to Scotland. Its services to Stoke and Manchester will see none of HS2's journey time improvements on its direct routes from Birmingham to Manchester and Preston. Journeys to East Midlands, Yorkshire and North-East destinations will be degraded through the walking transfer between Birmingham New Street and the new HS2 terminus at Curzon Street. Moreover HS2 will do nothing to relieve congestion on the existing network of 2-track lines focussed upon New Street.

The fully integrated HSUK addresses all of these problems, offering direct connections from Wolverhampton to most UK cities and 47% average journey time reductions.

- Construction of new line from Soho Junction to Tame Bridge creates faster, higher-capacity intercity route from New Street serving both Wolverhampton and Walsall.
- Extra capacity of new and 4-tracked routes creates sufficient capacity at New Street to accommodate local and national intercity services with no need for new station.
- New HSUK links in East and West Midlands will enable a new 'Midlands Ring' linking Wolverhampton to Walsall, Derby, Nottingham, Leicester, Coventry and Birmingham.

HIGH SPEED UK & HS2 LINKS TO WOLVERHAMPTON



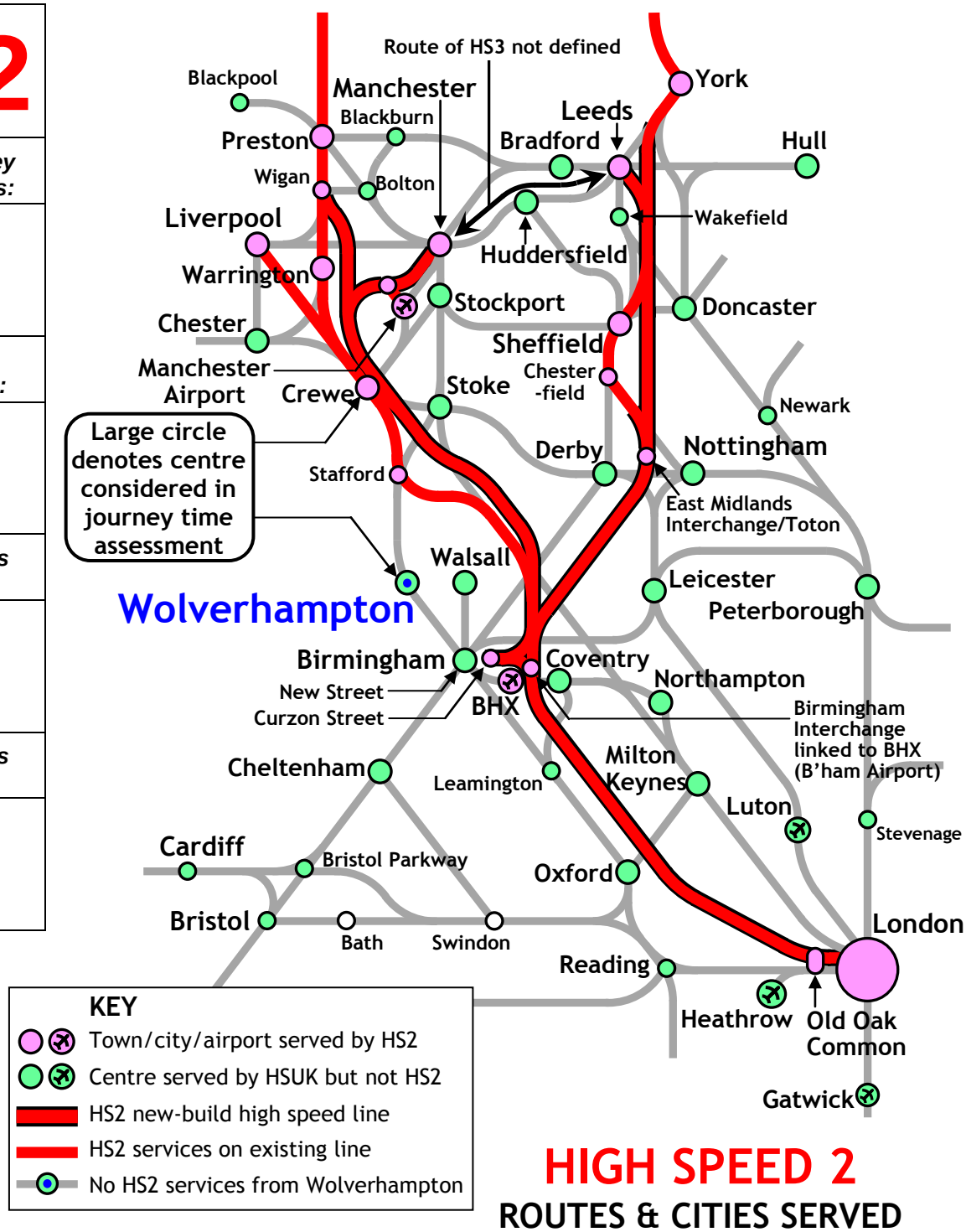
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p368

WOLVERHAMPTON

Bypassed by HS2, no useful connection to HS2, existing services made worse

HS2
Average journey time reductions:
2%
No. of cities directly linked:
0
No. of journeys made faster:
3
No. of journeys made worse:
6



HIGH SPEED 2
ROUTES & CITIES SERVED

WOLVERHAMPTON

Transformed national and local connectivity, new 'Midlands Ring' linking all principal Midlands cities

HSUK

Average journey time reductions:

47%

No. of cities directly linked:

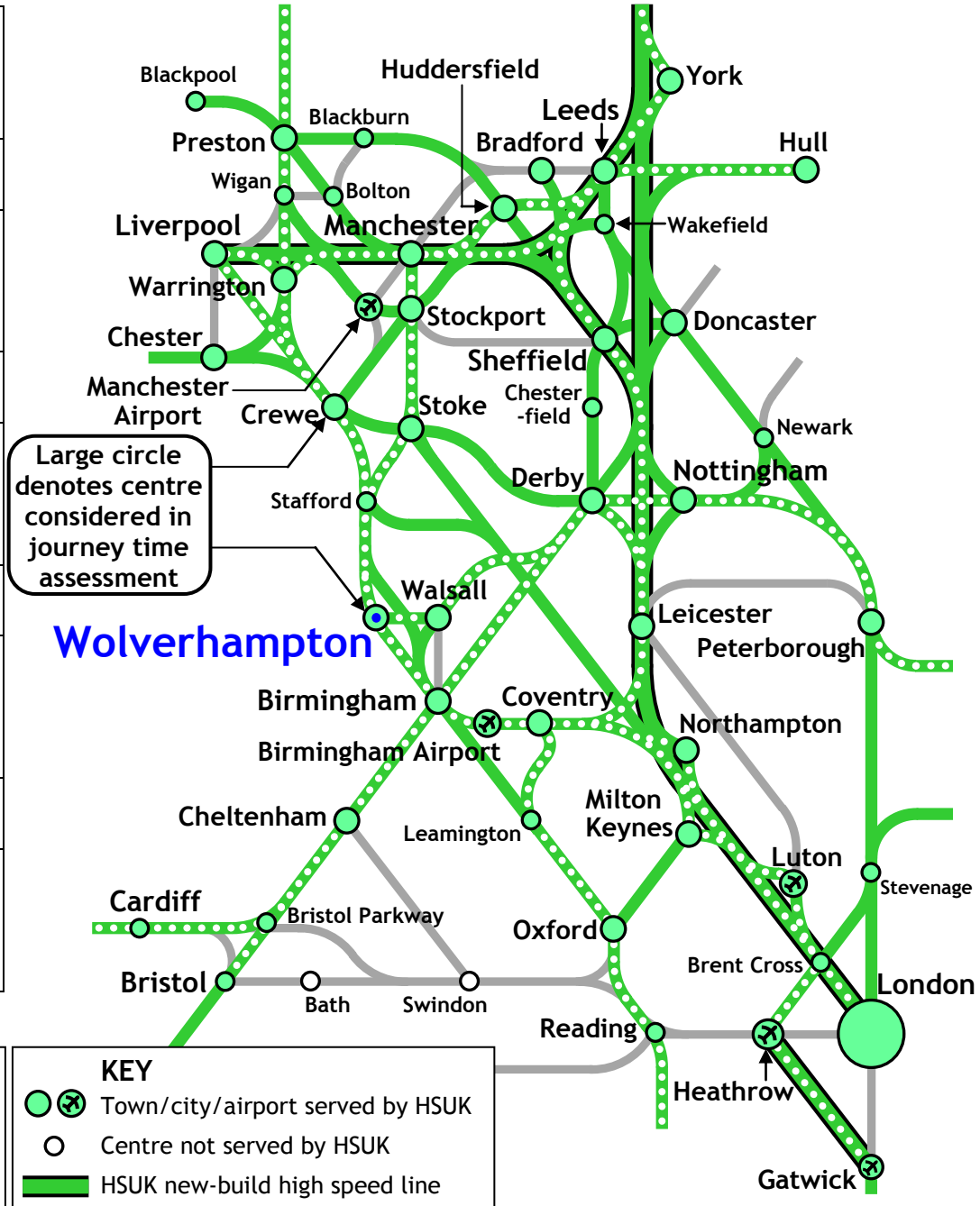
27

No. of journeys made faster:

31

No. of journeys made worse:

0



Wolverhampton served by:
HSUK04,06,07,11
HSUK61,62,64
HSUK77,78
HSUK94
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from Wolverhampton

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **Wolverhampton**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
WOLVERHAMPTON	Birmingham			12	17	17	12	0	17	0	17	0	
	B'ham Airport			22	35	35	22	0	35	0	35	0	
	Bradford			139	206	194	119	1	166	2	144	2[B]	
	Cheltenham			52	67	67	52	0	67	0	67	0	
	Chester			74	95	95	54	1	75	1	75	1	
	Coventry			31	45	45	31	0	45	0	45	0	
	Crewe			22	31	31	22	0	31	0	31	0	
	Derby			37	89	89	37	0	69	1	69	1	
	Doncaster			106	152	152	86	1	132	1	132	1	#
	Heathrow			121	225	175	121	0	185	2	135	2	
	Huddersfield			83	138	138	83	0	118	1	118	1	
	Hull			152	241	241	152	0	221	1	221	1	#
	Leeds			82	159	139	82	0	139	1	109	1[B]	
	Leicester			51	107	107	51	0	87	1	87	1	
	Liverpool			60	80	80	60	0	80	0	80	0	
	London			75	110	110	75	0	110	0	110	0	
	Luton			74	219	219	74	0	179	2	179	2	
	Manchester			45	69	69	45	0	69	0	69	0	
	M'ch'r Airport			85	101	101	65	1	81	1	81	1	
	Milton Keynes			58	79	79	58	0	79	0	79	0	
	Northampton			52	110	110	52	0	90	1	90	1	
	Nottingham			54	122	122	54	0	102	1	102	1	
	Oxford			77	94	94	77	0	94	0	94	0	
	Peterborough			97	165	165	97	0	145	1	145	1	
	Preston			62	75	75	62	0	75	0	75	0	#
	Sheffield			76	122	122	76	0	102	1	102	1	#
	Stockport			42	60	60	42	0	60	0	60	0	
	Stoke			19	31	31	19	0	31	0	31	0	
	Walsall			7	64	64	7	0	64	0	64	0	#
	Warrington			39	52	52	39	0	52	0	52	0	
	York			100	175	175	100	0	155	1	155	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.

APPENDIX Y1

CONNECTIVITY IMPROVEMENTS ACHIEVED BY HS2 AND HIGH SPEED UK FOR:

YORK

and onward destinations in North-East & Scotland

York *and onward destinations in North-East & Scotland*

Town/City	York
Population of built-up area**	150,000
Ranking amongst UK cities**	52
Number of cities directly linked by existing rail network (out of 31)	17

References:
HSUK North Country Rail Strategy
HSUK Scottish Rail Strategy
HSUK Regional Map 07
HSUK York Network Map
All available on HSUK website
www.highspeeduk.co.uk

** https://en.wikipedia.org/wiki/List_of_urban_areas_in_the_United_Kingdom

York : Intercity Connectivity with HSUK and HS2

York	Average journey time reduction	Cities directly linked (out of 29)	Journeys made faster (out of 31)	Journeys made worse (out of 31)	Best performer (out of 31 journeys)
High Speed UK	**42%**	**25**	**28**	**0**	**28**
HS2	**9%**	**2**	**5**	**10**	**0**

York is located at a key junction on the East Coast Main Line where East Coast, CrossCountry and TransPennine routes converge. As a consequence it has excellent connectivity to the majority of principal UK cities. Direct non-stop services to London already operate at an average speed of 150 km/h (93 MPH), and for York the priority in the UK high speed rail initiative is not greater speed but the maintenance and enhancement of its existing connectivity.

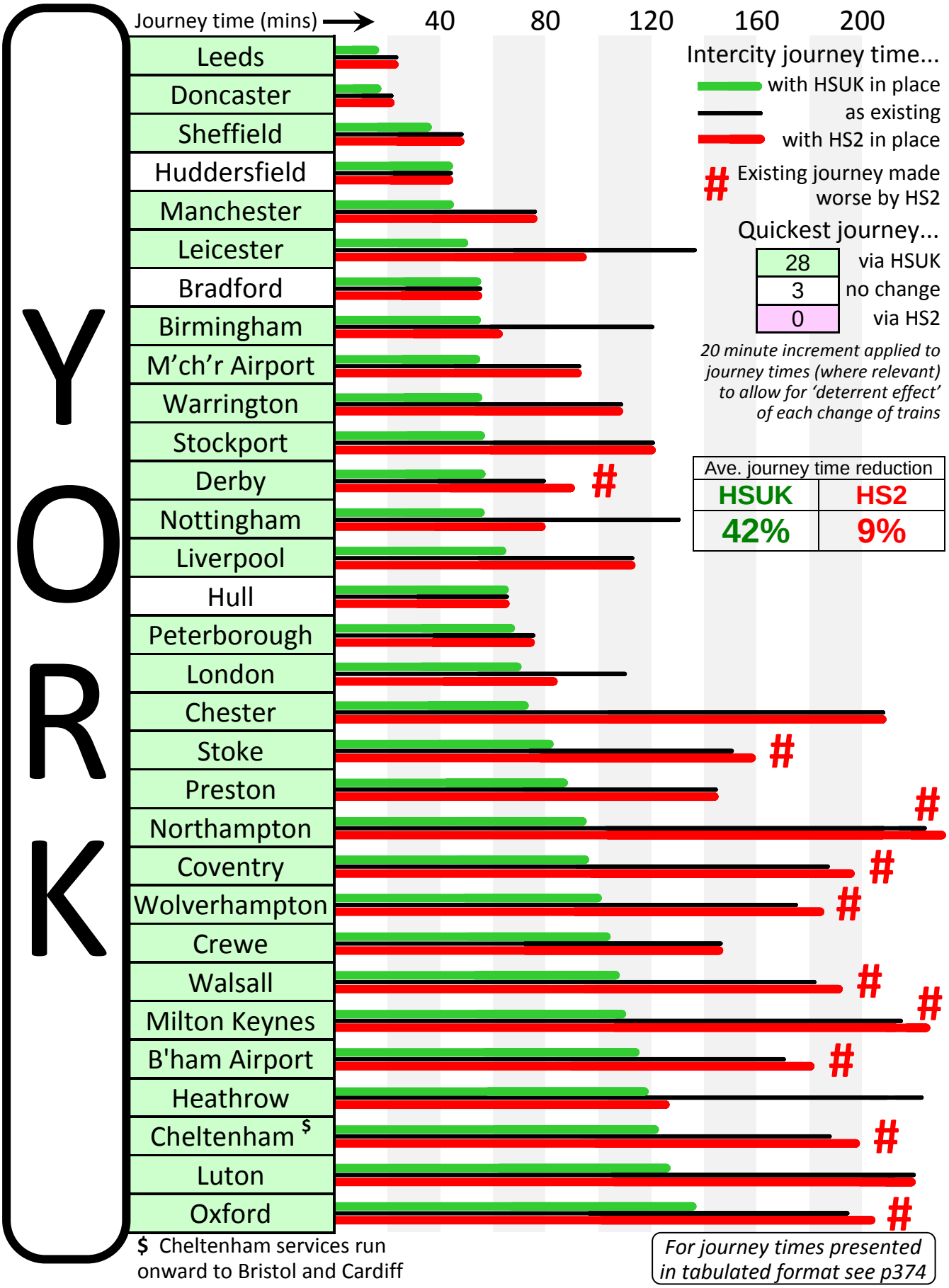
York ostensibly benefits from the HS2 proposals, with direct services to London and Birmingham. However, this is the full extent of the HS2 service offer for York; services to all other UK cities will continue to be routed via the existing network on which service levels are projected to be reduced. Another problem for York is its easterly location on the Plain of York, well to the east of the A1; whilst the peculiarities of railway history dictated that the East Coast Main Line should take its sinuous route via York and thus provide the city with excellent intercity connectivity, the logic of construction economics and optimised journey times to more populous destinations in the North-East will dictate otherwise. Subsequent phases of HS2 development north of Leeds are likely to follow a more direct route along the corridor of the A1, and leave York bypassed.

These problems will be largely avoided under the HSUK proposals. Whilst the HSUK trunk route will still bypass York, its more easterly alignment means that the route will pass much closer to the city, with a much lower time penalty for trains stopping at York. Time-sensitive services from London to Scotland will bypass York, but most other HSUK services e.g.:

- London-York-Darlington-Durham-Newcastle
- Liverpool-Manchester-Leeds-York-NorthEast-Edinburgh-Glasgow
- West Country-Birmingham-Derby-Sheffield-Leeds-York-NorthEast-Edinburgh-Glasgow
- South Coast-Oxford-MK-East Midlands-Sheffield-Leeds-York-NorthEast-E'burgh-Glasgow
- South Wales-Birmingham-Stoke-Manchester-Leeds-York-NorthEast-Edinburgh-Glasgow

will continue to call at York, giving the city direct links to most principal UK cities.

HIGH SPEED UK & HS2 LINKS TO YORK



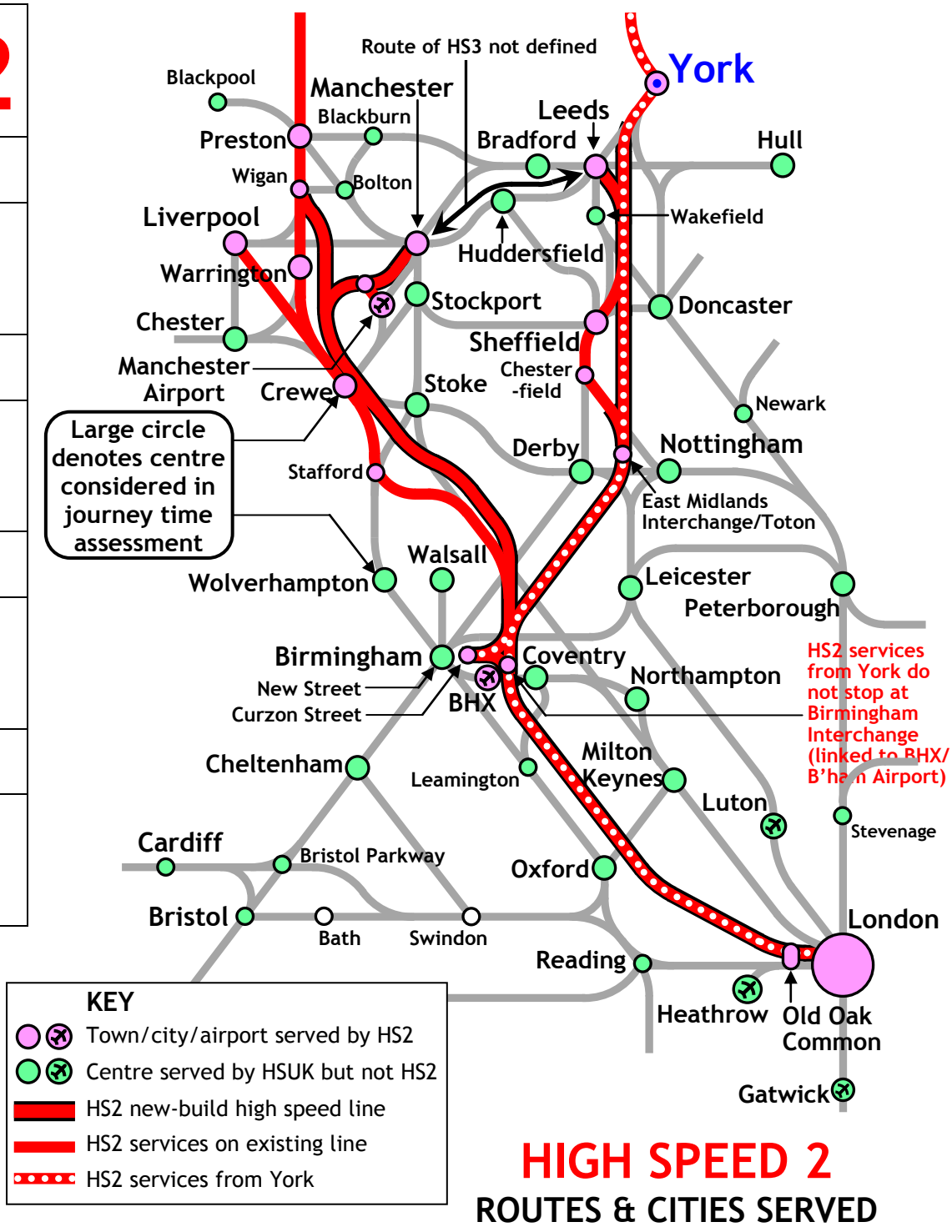
$ Cheltenham services run onward to Bristol and Cardiff

For journey times presented in tabulated format see p374

YORK

HS2 links only to Birmingham & London, journeys to most Midlands cities made worse

HS2
Average journey time reductions:
9%
No. of cities directly linked:
2
No. of journeys made faster:
5
No. of journeys made worse:
10



HIGH SPEED 2
ROUTES & CITIES SERVED

YORK

Fully connected to national high speed network, direct high speed links to most principal UK cities

HSUK

Average journey time reductions:

42%

No. of cities directly linked:

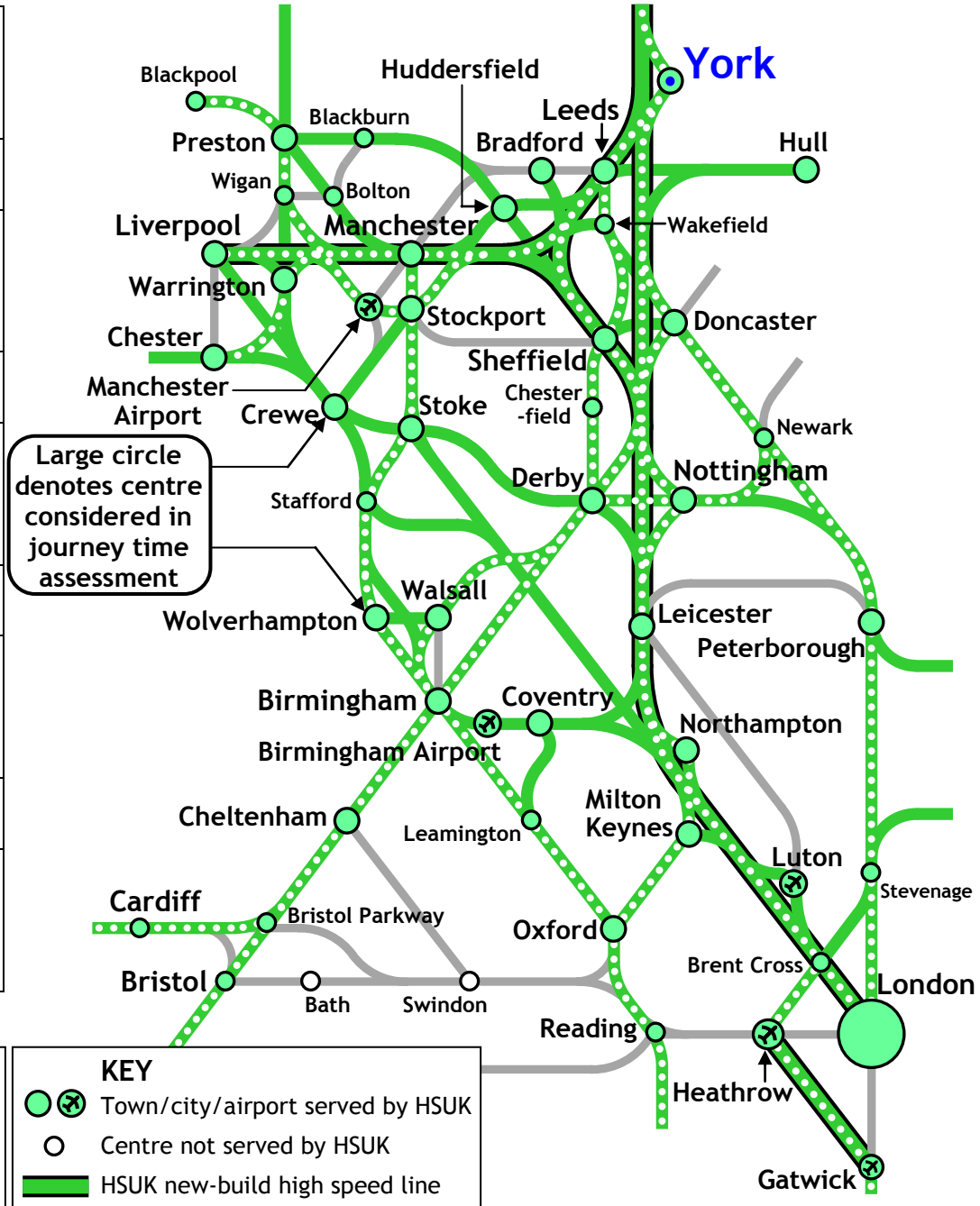
25

No. of journeys made faster:

28

No. of journeys made worse:

0



York served by:
HSUK01,02,04,09
HSUK10
HSUK21,23,24
HSUK33,35,36
HSUK92
See Appendix A1

KEY
- Town/city/airport served by HSUK
- Centre not served by HSUK
- HSUK new-build high speed line
- HSUK services on existing line
- HSUK services from York

HIGH SPEED UK
ROUTES & CITIES SERVED

www.highspeeduk.co.uk

Comparative Journey Times from **York**

Quickest via:	HSUK	No change	HS2	Journey time adjusted for number of changes			HSUK		Existing		HS2		Journey made worse by HS2
Origin	Destination			HSUK	Existing	HS2	Journey time	No of changes	Journey time	No of changes	Journey time	No of changes	
YORK	Birmingham			56	121	63	56	0	121	0	63	0	
	B'ham Airport			115	172	172	95	1	152	1	152	1	#
	Bradford			56	56	56	56	0	56	0	56	0	
	Cheltenham			121	169	169	121	0	169	0	169	0	#
	Chester			72	208	208	72	0	188	1	188	1	
	Coventry			98	182	182	78	1	162	1	162	1	#
	Crewe			103	147	147	83	1	127	1	127	1	
	Derby			57	80	93	57	0	80	0	63	1[A]	#
	Doncaster			17	21	21	17	0	21	0	21	0	
	Heathrow			121	225	127	121	0	185	2	107	1	
	Huddersfield			45	45	45	45	0	45	0	45	0	
	Hull			66	66	66	66	0	66	0	66	0	
	Leeds			15	23	23	15	0	23	0	23	0	
	Leicester			51	139	96	51	0	119	1	76	1	
	Liverpool			64	113	113	64	0	113	0	113	0	
	London			69	111	84	69	0	111	0	84	0	
	Luton			131	220	220	111	1	180	2	180	2	
	Manchester			43	77	77	43	0	77	0	77	0	
	M'ch'r Airport			55	94	94	55	0	94	0	94	0	
	Milton Keynes			113	216	216	113	0	196	1	196	1	#
	Northampton			99	224	224	99	0	204	1	204	1	#
	Nottingham			59	132	80	59	0	112	1	60	1	
	Oxford			142	196	196	142	0	196	0	196	0	#
	Peterborough			67	76	76	67	0	76	0	76	0	
	Preston			87	145	145	87	0	145	0	145	0	
	Sheffield			37	49	49	37	0	49	0	49	0	
	Stockport			56	121	121	56	0	101	1	101	1	
	Stoke			80	151	151	80	0	131	1	131	1	#
	Walsall			86	182	182	86	0	162	1	162	1	#
	Warrington			56	110	110	56	0	110	0	110	0	
	Wolverhampton			100	175	175	100	0	155	1	155	1	#

A = Change introduced by HS2 B = Change via shuttle between Birmingham International and Interchange

= Journey made worse by intervention of HS2 (no adjustment made to existing journey time)

Generally, journey times adjusted by 20 minutes to allow for each change of trains. 30 minute adjustment applied for the special cases noted above ie A – extra change introduced by HS2 and B – shuttle connection between Birmingham International and Birmingham Interchange.