

HIGH SPEED UK : J04

Journey Time/Connectivity Comparisons
between HSUK/Midland Ring and official
proposals for Midlands rail network

J04A Modelling of Midlands network

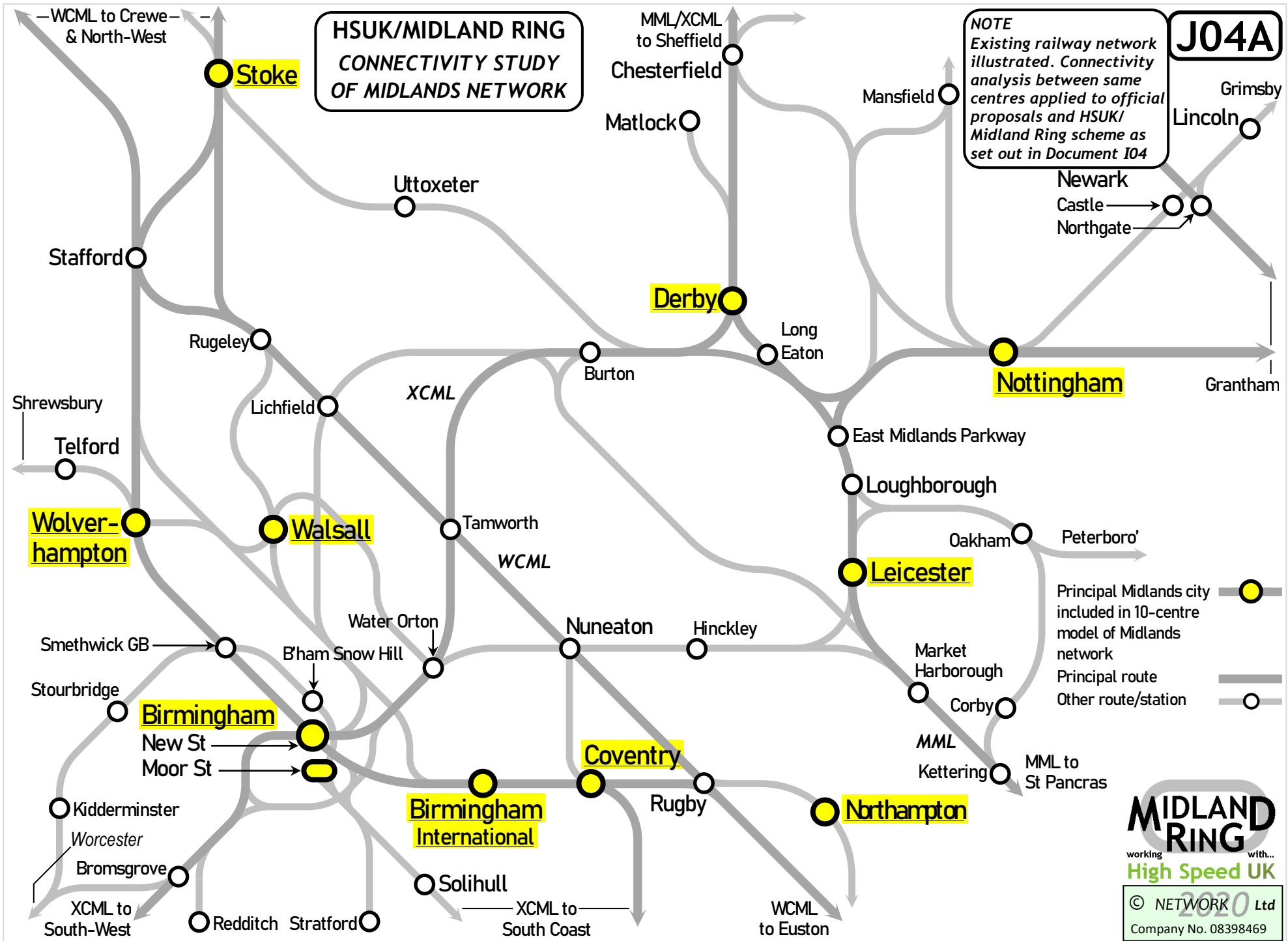
J04B Assessment Methodology and Results

J04C Comparison of Direct Connectivity

J04D Improvement of Intercity Journey Times

J04E Comparison with Journey Times by Road

April 2024 Update



**HSUK/MIDLAND RING
CONNECTIVITY STUDY
OF MIDLANDS NETWORK**

NOTE
Existing railway network illustrated. Connectivity analysis between same centres applied to official proposals and HSUK/Midland Ring scheme as set out in Document I04

J04A

Principal Midlands city included in 10-centre model of Midlands network
Principal route
Other route/station

MIDLAND RING
working with...
High Speed UK

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Methodology for Assessment of Connectivity

J04B

Connectivity is assessed according to 3 fundamental criteria:

1. Availability of direct, no change of trains, links between key cities;
2. Achievement of major journey time reductions across network;
3. Achievement of journey times similar to or superior to equivalent road journey.

Direct Links between Key Cities - see Figure J04C

For the existing network, and for the proposed HS2 and HSUK interventions (and all subsidiary projects), all possible journeys (45 journeys for a 10-centre network) are categorised by the number of changes required, and are scored as follows:

- 3 points for a direct journey - either existing or through the proposed intervention;
- 1 point for a journey requiring a single change of trains;
- 0 points for a journey requiring 2 or more changes.

Journey Times between Key Cities - see Figure J04D

Journey times are derived as follows:

- For existing journeys: from national rail website (www.nationalrail.co.uk);
- For HS2 and subsidiary projects (i.e. Northern Powerhouse Rail & Midlands Rail Hub): either from official publicity or from HSUK assessment of proposed HS2 (et al) routes;
- For HSUK and subsidiary projects (i.e. TartanTrax, Network North & Midland Ring): from HSUK assessments of proposed HSUK routes, using bespoke software validated against HS2 proposed routes and claimed journey times.

Journey times are adjusted to allow for change of trains (20 minutes added for each change) and for frequency of service (30 minutes added for 2-hourly services, or 1 hour for 3-hourly etc).

Comparison with Equivalent Road Journey - see Figure J04E

Journey times by road are obtained from Google Maps which automatically selects the quickest available route. These are measured between central railway stations in the origin and destination cities.

Results of Connectivity Assessment

Criteria	Case	Midlands	UK-wide	Scotland	North
Direct Connectivity (Figure J04C)	Existing Network	91 o/o 135 (67%)	72%	48%	70%
	HS2/MRH	95 o/o 135 (70%)	73%	48%	76%
	HSUK/Midland Ring	135 o/o 135 (100%)	95%	88%	94%
Journey Time Reductions (Figure J04D)	HS2/MRH	9% ave. JTR	6%	0%	17%
	HSUK/Midland Ring	58% ave. JTR	43%	43%	44%
Road Journey Comparisons (Figure J04E)	Existing Network	21 mins SLOWER	11 mins	55 mins	14 mins
	HS2/MRH	16 mins SLOWER	16 mins	55 mins	2 mins
	HSUK/Midland Ring	20 mins FASTER	74 mins	1 min	28 mins

Existing	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN							23	3	69	NN
Coventry		CV						22	1	22	CV
BHX Airport			BHX					0	0	0	BHX
Birmingham				BI							BI
Walsall					WS						WS
Wolverhampton						WV					WV
Stoke							ST				ST
Derby								DE			DE
Nottingham									NG		NG
Leicester										LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	

Direct existing journeys

1 change

2 changes

Aggregate Score 91

Max possible 135

%age 67%

Existing Connectivity Score : 91 out of 135 possible = 67%

HS2/MRH	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN							7	3	21	NN
Coventry		CV						18	3	54	CV
BHX Airport			BHX					20	1	20	BHX
Birmingham				BI				0	0	0	BI
Walsall					WS						WS
Wolverhampton						WV					WV
Stoke							ST				ST
Derby								DE			DE
Nottingham									NG		NG
Leicester										LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	

Direct HS2/MRH journeys

Direct existing journeys

1 change

2 changes

Aggregate Score 95

Max possible 135

%age 70%

HS2/MRH Connectivity Score : 95 out of 135 possible = 70%

HSUK/MR	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN							45	3	135	NN
Coventry		CV						0	3	0	CV
BHX Airport			BHX					0	1	0	BHX
Birmingham				BI				0	0	0	BI
Walsall					WS						WS
Wolverhampton						WV					WV
Stoke							ST				ST
Derby								DE			DE
Nottingham									NG		NG
Leicester										LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	

Direct HSUK/MR journeys

Direct existing journeys

1 change

2 changes

Aggregate Score 135

Max possible 135

%age 100%

HSUK/MR Connectivity Score : 135 out of 135 possible = 100%

HS2/MRH	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.26	1.20	NN
Coventry	1.00	CV	1.00	1.00	1.00	1.00	1.00	1.09	2.11	2.05	CV
BHX Airport	1.00	1.00	BHX	1.00	1.00	1.00	1.00	1.10	1.21	1.13	BHX
Birmingham	1.00	1.00	1.00	BI	1.00	1.00	1.12	1.00	1.22	1.19	BI
Walsall	1.00	1.00	1.00	1.00	WS	1.00	1.00	1.00	1.00	1.00	WS
Wolverhampton	1.00	1.00	1.00	1.00	1.00	WV	1.00	1.00	1.00	1.00	WV
Stoke	1.00	1.00	1.00	1.12	1.00	1.00	ST	1.00	1.00	1.00	ST
Derby	1.00	1.09	1.10	1.00	1.00	1.00	1.00	DE	1.33	1.00	DE
Nottingham	1.26	2.11	1.21	1.22	1.00	1.00	1.00	1.33	NG	1.22	NG
Leicester	1.20	2.05	1.13	1.19	1.00	1.00	1.00	1.00	1.22	LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
1.09	1.05	1.25	1.05	1.06	1.00	1.00	1.01	1.06	1.26	1.20	

Global Average Average

Average

HS2/MRH Average Acceleration Factor = 1.09

Equivalent to Journey Time Reduction = 9%

HSUK/MR	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN	1.72	1.53	1.59	2.51	1.79	1.06	3.23	5.00	7.33	NN
Coventry	1.72	CV	1.43	1.21	2.76	1.46	1.73	1.73	3.01	4.20	CV
BHX Airport	1.53	1.43	BHX	1.34	3.54	1.61	1.88	1.61	2.31	3.29	BHX
Birmingham	1.59	1.21	1.34	BI	2.26	1.39	1.67	1.45	1.75	1.35	BI
Walsall	2.51	2.76	3.54	2.26	WS	9.36	2.23	4.55	2.88	2.06	WS
Wolverhampton	1.79	1.46	1.61	1.39	9.36	WV	1.68	2.36	2.20	2.09	WV
Stoke	1.06	1.73	1.88	1.67	2.23	1.68	ST	1.69	2.18	2.08	ST
Derby	3.23	1.73	1.61	1.45	4.55	2.36	1.69	DE	1.31	1.00	DE
Nottingham	5.00	3.01	2.31	1.75	2.88	2.20	2.18	1.31	NG	1.99	NG
Leicester	7.33	4.20	3.29	1.35	2.06	2.09	2.08	1.00	1.99	LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
2.41	2.86	2.14	2.06	1.56	3.57	2.66	1.80	2.10	2.51	2.82	

Global Average Average

Average

HSUK/MR Average Acceleration Factor = 2.41

Equivalent to Journey Time Reduction = 58%

Existing	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN	11	17	5	-52	-32	23	-63	-100	-82	NN
Coventry	11	CV	10	17	-37	2	-10	-34	-72	-38	CV
BHX Airport	17	10	BHX	13	-38	2	-15	-33	-68	-45	BHX
Birmingham	5	17	13	BI	5	17	10	24	-3	10	BI
Walsall	-52	-37	-38	5	WS	-48	-62	-44	-64	-48	WS
Wolverhampton	-32	2	2	17	-48	WV	14	-29	-46	-36	WV
Stoke	23	-10	-15	10	-62	14	ST	-3	-41	-40	ST
Derby	-63	-34	-33	24	-44	-29	-3	DE	8	24	DE
Nottingham	-100	-72	-68	-3	-64	-46	-41	8	NG	19	NG
Leicester	-82	-38	-45	10	-48	-36	-40	24	19	LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
-21.2	-30	-17	-17	11	-43	-17	-14	-17	-41	-26	

Global Average Average JOURNEY TIME DIFFERENTIALS (MINS) Average

Existing Average Rail Journey Time 21min slower than by road

HS2/MRH	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN	11	17	5	-52	-32	23	-63	-65	-60	NN
Coventry	11	CV	10	17	-37	2	-10	-27	-2	2	CV
BHX Airport	17	10	BHX	13	-38	2	-15	-26	-47	-35	BHX
Birmingham	5	17	13	BI	5	17	15	24	10	18	BI
Walsall	-52	-37	-38	5	WS	-48	-62	-44	-64	-48	WS
Wolverhampton	-32	2	2	17	-48	WV	14	-29	-46	-36	WV
Stoke	23	-10	-15	15	-62	14	ST	-3	-41	-40	ST
Derby	-63	-27	-26	24	-44	-29	-3	DE	13	24	DE
Nottingham	-65	-2	-47	10	-64	-46	-41	13	NG	24	NG
Leicester	-60	2	-35	18	-48	-36	-40	24	24	LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
-15.6	-24	-4	-13	14	-43	-17	-13	-14	-24	-17	

Global Average Average JOURNEY TIME DIFFERENTIALS (MINS) Average

HS2/MRH Average Rail Journey Time 16min slower than by road

HSUK/MR	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
Northampton	NN	25	32	27	23	16	28	29	37	33	NN
Coventry	25	CV	13	21	13	16	25	6	17	21	CV
BHX Airport	32	13	BHX	16	11	15	19	-1	2	18	BHX
Birmingham	27	21	16	BI	17	22	29	35	28	23	BI
Walsall	23	13	11	17	WS	9	-4	31	22	10	WS
Wolverhampton	16	16	15	22	9	WV	27	22	20	20	WV
Stoke	28	25	19	29	-4	27	ST	19	16	22	ST
Derby	29	6	-1	35	31	22	19	DE	13	24	DE
Nottingham	37	17	2	28	22	20	16	13	NG	33	NG
Leicester	33	21	18	23	10	20	22	24	33	LE	LE
	NN	CV	BHX	BI	WS	WV	ST	DE	NG	LE	
19.9	28	17	14	24	15	19	20	20	21	23	

Global Average Average JOURNEY TIME DIFFERENTIALS (MINS) Average

HSUK/MR Average Rail Journey Time 20min faster than by road