

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 2 and Additional Provision 3 Environmental Statement

Volume 5 | Technical appendices
Transport Assessment
TR-001-000 (Part 2 of 2)

September 2015

SES2 and AP3 ES 3.5.2.1



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Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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Contents

SES2 and AP3 ES Volume 5 Appendix – Transport Assessment

Part 1 –

- Section 1: Introduction
- Section 2: Baseline
- Section 3: London assessment
 - 3.1 London regional methodology
 - 3.2 Future baseline
 - 3.3 CFA1 construction impact assessment
 - 3.4 CFA2-3 construction impact assessment

Part 2 –

- Section 3: London assessment
 - 3.5 CFA1-3 operation impact assessment
 - 3.6 CFA4-5 operation impact assessment
 - 3.7 London region sensitivity – public transport
 - 3.8 London region sensitivity – highways

SES2 and AP3 ES Appendix – Transport Assessment Annexes

Part 1 –

- Annex B(i) – Baseline survey report (CFA1)

Part 2 –

- Annex C – Model performance reports
- Annex D – Traffic data used for air quality assessment

Contents

3	London Region	446
3.5	Operation impact assessment for Euston - Station and Approach (CFA1) Camden (CFA2) and Primrose Hill to Kilburn (Camden) (CFA3)	446
3.6	Kilburn (Brent) to Old Oak Common (CFA4) and Northolt Corridor (CFA5) operation impact assessment	732
3.7	London region sensitivity analysis – public transport	768
3.8	London region sensitivity analysis - highways	839

Table of Figures

Figure 110:	Euston station - HS2 Stage A, Phase One highway layout	454
Figure 111:	Euston station approach - Stage A, HS2 Phase One highway layout	455
Figure 112:	Euston station – Stage B1, HS2 Phase Two highway layout	457
Figure 113:	Euston station approach – Stage B1, HS2 Phase Two highway layout	458
Figure 114:	HS2 line flows 2026 Stage A, HS2 Phase One	464
Figure 115:	2026 Stage A, Phase One Impacts on NR - AM peak period (07:00 to 10:00)	474
Figure 116:	2026 Stage A, Phase One Impacts on NR - PM peak period (16:00 to 19:00)	475
Figure 117:	2026 Stage A, Phase One Impacts on LU - AM peak period (07:00 to 10:00)	478
Figure 118:	2026 Stage A, Phase One Impacts on LU - PM peak period (16:00 to 19:00)	479
Figure 119:	LU crowding – 2026 future baseline AM peak period (07:00 to 10:00)	481
Figure 120:	LU crowding – 2026 HS2 Phase One AM peak period (07:00 to 10:00)	482
Figure 121:	NR crowding - 2026 future baseline AM peak period (07:00 to 10:00)	483
Figure 122:	NR crowding - 2026 HS2 Phase One AM peak period (07:00 to 10:00)	484
Figure 123:	LU crowding – 2026 future baseline PM peak period (16:00 to 19:00)	486
Figure 124:	LU crowding – 2026 HS2 Phase One PM peak period (16:00 to 19:00)	487
Figure 125:	NR crowding - 2026 future baseline PM peak period (16:00 to 19:00)	488
Figure 126:	NR crowding - 2026 HS2 Phase One PM peak period (16:00 to 19:00)	489
Figure 127:	2026 Phase One Victoria line southbound crowding per train - AM peak period (07:00 to 10:00)	490
Figure 128:	2026 Phase One Northern line (Bank branch) southbound crowding per train - AM peak period (07:00 to 10:00)	491
Figure 129:	2026 Phase One Northern Line (Charing Cross branch) southbound crowding per train - AM peak period (07:00 to 10:00)	492

Figure 130: 2026 Phase One sub-surface lines eastbound crowding per train - AM peak period (07:00 to 10:00)	492
Figure 131: 2026 Phase One Crossrail eastbound crowding per train - AM peak period (07:00 to 10:00)	493
Figure 132: HS2 line flows 2041 Stage A, HS2 Phase One	494
Figure 133: 2041 Stage A, HS2 Phase One Impacts on NR - AM peak period (07:00 to 10:00)	504
Figure 134: 2041 Stage A, HS2 Phase One Impacts on NR - PM peak period (16:00 to 19:00)	505
Figure 135: 2041 Stage A, HS2 Phase One Impacts on LU - AM peak period (07:00 to 10:00)	508
Figure 136: 2041 Stage A, HS2 Phase One Impacts on LU - PM peak period (16:00 to 19:00)	509
Figure 137: LU crowding – 2041 future baseline AM peak period (07:00 to 10:00)	511
Figure 138: LU crowding – 2041 Stage A, HS2 Phase One AM peak period (07:00 to 10:00)	512
Figure 139: NR crowding - 2041 future baseline AM peak period (07:00 to 10:00)	513
Figure 140: NR crowding - 2041 Stage A, HS2 Phase One AM peak period (07:00 to 10:00)	514
Figure 141: LU crowding – 2041 future baseline PM peak period (16:00 to 19:00)	515
Figure 142: LU crowding – 2041 Stage A, HS2 Phase One PM peak period (16:00 to 19:00)	516
Figure 143: NR crowding - 2041 future baseline PM peak period (16:00 to 19:00)	517
Figure 144: NR crowding - 2041 Stage A, HS2 Phase One PM peak period (16:00 to 19:00)	518
Figure 145: 2041 Stage A, HS2 Phase One Victoria line southbound crowding per train - AM peak period (07:00 to 10:00)	519
Figure 146: 2041 Stage A, HS2 Phase One Northern line (Bank branch) southbound crowding per train - AM peak period (07:00 to 10:00)	520
Figure 147: 2041 Stage A, HS2 Phase One Northern Line (Charing Cross branch) southbound crowding per train - AM peak period (07:00 to 10:00)	521
Figure 148: 2041 Stage A, HS2 Phase One sub-surface lines eastbound crowding per train - AM peak period (07:00 to 10:00)	521
Figure 149: 2041 Stage A, HS2 Phase One Crossrail eastbound crowding per train - AM peak period (07:00 to 10:00)	522
Figure 150: HS2 line flows 2041 HS2 Phase Two	523
Figure 151: 2041 HS2 Phase Two Impacts on NR - AM peak period (07:00 to 10:00)	534
Figure 152: 2041 HS2 Phase Two Impacts on NR - PM peak period (16:00 to 19:00)	535
Figure 153: 2041 HS2 Phase Two Impacts on LU - AM peak period (07:00 to 10:00)	538
Figure 154: 2041 HS2 Phase Two Impacts on LU - PM peak period (16:00 to 19:00)	539
Figure 155: LU crowding – 2041 future baseline AM peak period (07:00 to 10:00)	542
Figure 156: LU crowding – 2041 HS2 Phase Two AM peak period (07:00 to 10:00)	543
Figure 157: NR crowding - 2041 future baseline AM peak period (07:00 to 10:00)	544
Figure 158: NR crowding - 2041 HS2 Phase Two AM peak period (07:00 to 10:00)	545
Figure 159: LU crowding – 2041 future baseline PM peak period (16:00 to 19:00)	546
Figure 160: LU crowding – 2041 HS2 Phase Two PM peak period (16:00 to 19:00)	547
Figure 161: NR crowding - 2041 future baseline PM peak period (16:00 to 19:00)	548
Figure 162: NR crowding - 2041 HS2 Phase Two PM peak period (16:00 to 19:00)	549
Figure 163: 2041 HS2 Phase Two Victoria line southbound crowding per train - AM peak period (07:00 to 10:00)	550
Figure 164: 2041 HS2 Phase Two Northern line (Bank branch) southbound crowding per train - AM peak period (07:00 to 10:00)	551
Figure 165: 2041 HS2 Phase Two Northern Line (Charing Cross branch) southbound crowding per train - AM peak period (07:00 to 10:00)	552
Figure 166: 2041 HS2 Phase Two sub-surface lines eastbound crowding per train - AM peak period (07:00 to 10:00)	552

Figure 167: 2041 HS2 Phase Two Crossrail eastbound crowding per train - AM peak period (07:00 to 10:00)	553
Figure 168: 2026 HS2 Phase One AM peak period (07:00 to 10:00) bus difference plot (2026 baseline vs 2026 Stage A)	574
Figure 169: 2026 HS2 Phase One PM peak period (16:00 to 19:00) bus difference plot (2026 baseline vs 2026 Stage A)	575
Figure 170: 2041 HS2 Phase One AM peak period (07:00 to 10:00) bus difference plot (future baseline vs HS2 Phase Two)	582
Figure 171: 2041 HS2 Phase One PM peak period (16:00 to 19:00) bus difference plot (future baseline vs HS2 Phase Two)	583
Figure 172: 2041 HS2 Phase Two AM peak period (07:00 to 10:00) bus difference plot (future baseline vs HS2 Phase Two)	591
Figure 173: 2041 HS2 Phase Two PM peak period (16:00 to 19:00) bus difference plot (future baseline vs HS2 Phase Two)	592
Figure 174: 2026 (and 2041) completed construction Stage A pedestrian crossing locations	596
Figure 175: 2041 completed construction Stage B1 Pedestrian crossing locations	604
Figure 176: Taxi set-down facility 2026 completed construction Stage A	615
Figure 177: Taxi set-down facility completed construction Stage B1	618
Figure 178: Traffic flow changes (PCU) 2041 future baseline vs completed construction Stage A with 2041 HS2 Phase One operation - AM peak hour (08:00 to 09:00)	625
Figure 179: Traffic flow changes (PCU) 2041 future baseline vs completed construction Stage A with 2041 HS2 Phase One operation - PM peak hour (17:00 to 18:00)	626
Figure 180: Traffic flow changes (PCU) 2041 future baseline vs completed high speed station with 2041 HS2 Phase Two operation - AM peak hour (08:00 to 09:00)	642
Figure 181: Traffic flow changes (PCU) 2041 future baseline vs completed high speed station with 2041 HS2 Phase Two operation - PM peak hour (17:00 to 18:00)	643
Figure 182: Local junction assessment	669
Figure 183: Modelled A501 Euston Road / A400 Gower Street junction layout	672
Figure 184: A400 Hampstead Road/Granby Terrace/Harrington Square proposed layout	679
Figure 185: A4200 Eversholt Street/northern bus standing area layout	681
Figure 186: A400 Hampstead Road/Robert Street/Cobourg Street layout	683
Figure 187: A501 Euston Road/bus station construction Stage B1	688
Figure 188: A400 Hampstead Road/taxi facility completion construction Stage B1 layout	697
Figure 189: Gordon Street / Gower Place / Endsleigh Gardens layout	699
Figure 190: Changes in Bus Passenger loadings from 2026 & 2041 Forecast Baseline (AM peak 3 hr)	737
Figure 191: Pedestrian peak directional flows: 2041 AM outbound from Old Oak Common Station	740
Figure 192: LU flow differences 2041 AM peak Crossrail 1 to WCML	777
Figure 193: NR flow differences 2041 AM peak Crossrail 1 to WCML	778
Figure 194: Bus flow differences 2041 AM peak Crossrail 1 to WCML	779
Figure 195: NR crowding 2041 AM peak period Crossrail 1 to WCML	781
Figure 196: LU crowding 2041 AM peak period Crossrail 1 to WCML	782
Figure 197: Line crowding AM 2041 on Northern line (Bank branch) - Crossrail 1 to WCML	783
Figure 198: Line crowding AM 2041 Northern line (Charing Cross branch) - Crossrail 1 to WCML	783
Figure 199: Line crowding AM 2041 Crossrail - Crossrail 1 to WCML	783
Figure 200: NR flow differences 2041 AM peak Crossrail 2	792
Figure 201: LU flow differences 2041 AM peak Crossrail 2	793

Figure 202: Bus flow differences 2041 AM peak Crossrail 2	794
Figure 203: NR crowding 2041 AM peak period Crossrail 2	796
Figure 204: LU crowding 2041 AM peak period Crossrail 2	797
Figure 205: Line crowding AM 2041 on Northern line (Bank branch) - Crossrail 2	798
Figure 206: Line crowding AM 2041 Victoria Line - Crossrail 2	798
Figure 207: NR flow differences 2041 AM peak EAP including Crossrail 2	807
Figure 208: LU flow differences 2041 AM peak EAP including Crossrail 2	808
Figure 209: Bus flow differences 2041 AM peak EAP including Crossrail 2	809
Figure 210: NR crowding 2041 AM peak period EAP including Crossrail 2	811
Figure 211: LU crowding 2041 AM peak period EAP including Crossrail 2	812
Figure 212: LU flow differences 2041 AM peak Overground at Old Oak Common station	820
Figure 213: NR flow differences 2041 AM peak Overground at Old Oak Common station	821
Figure 214: Bus flow differences 2041 AM peak Overground at Old Oak Common station	822
Figure 215: NR crowding 2041 AM peak period Overground at Old Oak Common station	824
Figure 216: LU crowding 2041 AM peak period Overground at Old Oak Common station	825
Figure 217: LU flow differences 2041 AM peak Overground at Old Oak Common station with OAPF	833
Figure 218: NR flow differences 2041 AM peak Overground at Old Oak Common station with OAPF	834
Figure 219: Bus flow differences 2041 AM peak Overground at Old Oak Common station with OAPF	835
Figure 220: NR crowding 2041 AM peak period Overground at Old Oak Common station	837
Figure 221: LU crowding 2041 AM peak period Overground at Old Oak Common station	838
Figure 222: Traffic flow changes - 2023 Construction scenario vs. 2023 Construction scenario with increased cycling - AM peak hour (PCU/hour)	841
Figure 223: Traffic flow changes - 2026 Phase One operation vs. 2026 Phase One operation with increased cycling - AM peak (PCU/hour)	842
Figure 224: Delay at junctions – 2023 Construction Scenario 3 (AM peak hour)	851
Figure 225: Delay at junctions – 2023 Construction Scenario 3 with increase cycling (AM peak hour)	852
Figure 226: Traffic flow changes (Euston area) – 2023 construction scenario 3 vs. 2023 construction scenario 3 with the Aldgate scheme - AM peak hour (PCU/hour)	854
Figure 227: Traffic flow changes (Aldgate area) – 2023 construction scenario vs. 2023 construction scenario with the Aldgate scheme - AM peak hour (PCU/hour)	855

Table of Tables

Table 160: Forecast rail and LU passengers at Euston, AM peak period (07:00 to 10:00)	461
Table 161: Forecast rail and LU passengers at Euston, PM peak period (16:00 to 19:00)	462
Table 162: 2026 Stage A, Phase One AM peak period (07:00 to 10:00) NR demand	464
Table 163: 2026 Stage A, Phase One PM peak period (16:00 to 19:00) NR demand	465
Table 164: 2026 Stage A, Phase One AM peak period (07:00 to 10:00) LU demand	466
Table 165: 2026 Stage A, Phase One PM peak period (16:00 to 19:00) LU demand	467
Table 166: 2026 Stage A, Phase One access, egress and interchange trips at Zone 1 LU stations - AM peak period (07:00 to 10:00)	468
Table 167: 2026 Stage A, Phase One access, egress and interchange trips at Zone 1 LU stations - PM peak period (16:00 to 19:00)	470
Table 168: 2026 Stage A, Phase One passenger flows (AM and PM peak periods) on NR	472

Table 169: 2026 Stage A, Phase One passenger flows (AM and PM peak periods) underground	476
Table 170: 2041 HS2 Stage A, Phase One AM peak period (07:00 to 10:00) NR demand	494
Table 171: 2041 HS2 Stage A, Phase One PM peak period (16:00 to 19:00) NR demand	495
Table 172: 2041 Stage A, HS2 Phase One AM peak period (07:00 to 10:00) LU demand	496
Table 173: 2041 Stage A, HS2 Phase One PM peak period (16:00 to 19:00) LU demand	497
Table 174: 2041 Stage A, HS2 Phase One access, egress and interchange trips at Zone 1 LU stations - AM peak period (07:00 to 10:00)	498
Table 175: 2041 Stage A, HS2 Phase One access, egress and interchange trips at Zone 1 LU stations - PM peak period (16:00 to 19:00)	500
Table 176: 2041 Stage A, HS2 Phase One passenger flows (AM and PM peak periods) on NR	502
Table 177: 2041 Stage A, HS2 Phase One passenger flows (AM and PM peak periods) underground	506
Table 178: 2041 HS2 Phase Two AM peak period (07:00 to 10:00) NR demand	524
Table 179: 2041 HS2 Phase Two PM peak period (16:00 to 19:00) NR demand	524
Table 180: 2041 HS2 Phase Two AM peak period (07:00 to 10:00) LU demand	525
Table 181: 2041 HS2 Phase Two PM peak period (16:00 to 19:00) LU demand	526
Table 182: 2041 HS2 Phase Two access, egress and interchange trips at Zone 1 LU stations - AM peak period (07:00 to 10:00)	527
Table 183: 2041 HS2 Phase Two access, egress and interchange trips at Zone 1 LU stations - PM peak period (16:00 to 19:00)	530
Table 184: 2041 HS2 Phase Two passenger flows (AM and PM peak periods) on NR	532
Table 185: 2041 passenger flows (AM and PM peak periods) underground	536
Table 186: Selected LU station performance metrics, 2026 HS2 Phase One, AM peak hour	557
Table 187: Selected LU station performance metrics, 2026 HS2 Phase One, PM peak hour	557
Table 188: Selected rail station performance metrics, 2026 HS2 Phase One, PM peak hour	558
Table 189: Selected LU station performance metrics, 2041 HS2 Phase One, AM peak hour	559
Table 190: Selected LU station performance metrics, 2041 HS2 Phase One, PM peak hour	560
Table 191: Selected rail station performance metrics, 2041 HS2 Phase One, PM peak hour	561
Table 192: Selected LU station performance metrics, 2041 HS2 Phase Two, AM peak hour	563
Table 193: Selected LU station performance metrics, 2041 HS2 Phase Two, PM peak hour	564
Table 194: Selected rail station performance metrics, 2041 HS2 Phase Two, PM peak hour	565
Table 195: Sources for forecast onward mode share of rail and LU passengers at Euston	565
Table 196: Future mode share (from station) selected modes	566
Table 197: Future mode share (to station) selected modes	567
Table 198: HS2 2026 Stage A changes in bus journey times (in minutes) relative to future baseline	569
Table 199: 2026 bus boarding and alighting demand	573
Table 200: HS2 2041 Stage A 2041 HS2 Phase One changes in bus journey times (in minutes) relative to future baseline	577
Table 201: 2041 HS2 Phase One bus boarding and alighting demand	581
Table 202: HS2 2041 HS2 Phase Two changes in bus journey times (in minutes) relative to future baseline	586
Table 203: 2041 HS2 Phase Two bus boarding and alighting demand	590
Table 204: 2041 HS2 Phase Two bus passenger flow differences - future baseline vs HS2 Phase Two	593
Table 205: 2026 HS2 Phase One PCL assessment for pedestrian crossings	597
Table 206: 2041 HS2 Phase One PCL assessment for pedestrian crossings	602
Table 207: 2041 HS2 Phase Two PCL assessment for pedestrian crossings	606

Table 208: 2026 HS2 Phase One weekday cycle trip generation scale factors from baseline	608
Table 209: 2026 HS2 Phase One weekday cycle trip generation	608
Table 210: 2026 HS2 Phase One weekday cycle trip generation - 7% cycle mode share	609
Table 211: 2026 HS2 Phase One cycle trip distribution	610
Table 212: 2041 HS2 Phase Two weekday cycle trip generation scale factors from baseline	612
Table 213: 2041 HS2 Phase Two weekday cycle trip generation	612
Table 214: 2041 HS2 Phase Two weekday cycle trip generation - 7% cycle mode share	612
Table 215: 2041 HS2 Phase Two cycle trip distribution	613
Table 216: 2026 HS2 Phase One taxi passenger demand	616
Table 217: 2026 HS2 Phase One forecast peak hour taxi set-down and pick-up (vehicles) from all rail	616
Table 218: 2026 HS2 Phase One private vehicle passenger demand	617
Table 219: 2026 HS2 Phase One private vehicle demand	617
Table 220: 2041 HS2 Phase Two taxi passenger demand	619
Table 221: 2041 HS2 Phase Two forecast peak hour taxi set-down and pick-up (vehicles) from all rail	619
Table 222: 2041 HS2 Phase Two private vehicle passenger demand	620
Table 223: 2041 HS2 Phase Two private vehicle demand	620
Table 224: Displaced parking demand	621
Table 225: 2041 baseline and completed construction Stage A with 2041 HS2 Phase One operation traffic flows for the Euston screenlines AM peak hour (08:00 to 09:00)	627
Table 226: 2041 baseline and completed construction Stage A with 2041 HS2 Phase One operation traffic flows for the Euston screenlines PM peak hour (17:00 to 18:00)	630
Table 227: 2041 baseline and with completed construction Stage A with 2041 HS2 Phase One operation traffic flows Camden screenline AM peak hour (08:00 to 09:00)	634
Table 228: 2041 baseline and with completed construction Stage A with 2041 HS2 Phase One operation traffic flows Camden screenline PM peak hour (17:00 to 18:00)	636
Table 229: completed high speed station with 2041 HS2 Phase Two operation AM and PM peak hour impacted junctions	640
Table 230: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows for the Euston screenlines AM peak hour (08:00 to 09:00)	644
Table 231: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows for the Euston screenlines PM peak hour (17:00 to 18:00)	647
Table 232: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows Camden screenline AM peak hour (08:00 to 09:00)	651
Table 233: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows Camden screenline PM peak hour (17:00 to 18:00)	653
Table 234: Links with traffic increase, 2041 Operation AM Peak (08:00-09:00)	658
Table 235: Links with traffic increase, 2041 Operation PM Peak (17:00-18:00)	661
Table 236: Links with traffic increase, 2041 Operation AM Peak, Outside CFA1	665
Table 237: Links with traffic increase, 2041 Operation PM Peak, Outside CFA1	666
Table 238: Euston Circus modelling results - completed construction Stage A with 2026 HS2 Phase One operation	671
Table 239: A501 Euston Road/A400 Gower Street modelling results - completed construction Stage A with 2026 HS2 Phase One operation	673
Table 240: A501 Euston Road/bus station modelling results - completed construction Stage A with 2026 HS2 Phase One operation	674

Table 241: A501 Euston Road/A4200 Upper Woburn Place/Euston Square modelling results - completed construction Stage A with 2026 HS2 Phase One operation	675
Table 242: A501 Euston Road/Churchway/Dukes Road modelling results - completed construction Stage A with 2026 HS2 Phase One operation	677
Table 243: A4200 Eversholt Street/Grafton Place/Euston bus station modelling results - completed construction Stage A with 2026 HS2 Phase One operation	677
Table 244: A4200 Eversholt Street/A400 Oakley Square/Lidlington Place modelling results - completed construction Stage A with 2026 HS2 Phase One operation	678
Table 245: A400 Hampstead Road/Drummond Street modelling results - completed construction Stage A with 2026 HS2 Phase One operation	678
Table 246: A400 Hampstead Road/Granby Terrace/Harrington Square modelling results - completed construction Stage A with 2026 HS2 Phase One operation	680
Table 247: A4200 Eversholt Street/northern bus standing area/Polygon Road modelling results - completed construction Stage A with 2026 HS2 Phase One operation	681
Table 248: A400 Hampstead Road/Robert Street/Cobourg Street modelling results - completed construction Stage A with 2026 HS2 Phase One operation	683
Table 249: Euston Circus modelling results - 2041 HS2 Phase Two	685
Table 250: A501 Euston Road/A400 Gower Street modelling results - 2041 HS2 Phase Two	687
Table 251: A501 Euston Road/bus station modelling results - 2041 HS2 Phase Two	688
Table 252: A501 Euston Road/A4200 Upper Woburn Place/Euston Square modelling results - 2041 HS2 Phase Two	690
Table 253: A501 Euston Road/Churchway/Dukes Road modelling results - 2041 HS2 Phase Two	692
Table 254: A4200 Eversholt Street/Grafton Place/Euston bus station modelling results - 2041 HS2 Phase Two	692
Table 255: A4200 Eversholt Street/A400 Oakley Square/Lidlington Place modelling results - 2041 HS2 Phase Two	694
Table 256: A400 Hampstead Road/Drummond Street modelling results - 2041 HS2 Phase Two	694
Table 257: A400 Hampstead Road/Granby Terrace/Harrington Square modelling results - 2041 HS2 Phase Two	695
Table 258: A4200 Eversholt Street/northern bus standing area/Polygon Road modelling results - 2041 HS2 Phase Two	696
Table 259: A400 Hampstead Road/Robert Street/Cobourg Street modelling results - 2041 HS2 Phase Two	697
Table 260: Gordon Street/Gower Place/Endsleigh Gardens 2026 Stage A, Phase One and 2041 Phase Two modelling results - RFC and MMQ	699
Table 261: A501 Euston Road signalised junctions 2026 Stage A, Phase One and 2041 Phase Two modelling results - DoS	701
Table 262: A501 Euston Road signalised junctions 2026 Stage A, Phase One and 2041 Phase Two modelling results - MMQ	704
Table 263: King's Cross signalised junctions modelling results - DoS	711
Table 264: King's Cross signalised junctions modelling results - MMQ	713
Table 265: A400 Hampstead Road/A4200 Eversholt Street/Mornington Crescent/B512 Crowndale Road/A400 Camden High Street modelling results - DoS	717
Table 266: A400 Hampstead Road/A4200 Eversholt Street/Mornington Crescent/B512 Crowndale Road/A400 Camden High Street junction modelling results - MMQ (PCU)	718
Table 267: A4200 Eversholt Street Priority Junction modelling results - DoS	722
Table 268: A4200 Eversholt Street priority junction modelling results - MMQ (PCU)	724

Table 269: Junctions south of A501 Euston Road priority junction modelling results - RFC	727
Table 270: Junctions south of A501 Euston Road priority junction modelling results - MMQ (PCU)	727
Table 271: North Gower Street priority junction modelling results - DoS	728
Table 272: Western Junctions - priority junction modelling results - RFC	728
Table 273: Western Junctions - priority junction modelling results - MMQ (PCU)	729
Table 274: Junctions with a 30% change in daily traffic flows and more than nine accidents	730
Table 275: Rail-rail interchange boarders and alighters ¹	733
Table 276: Old Oak Common station 2026 AM peak hour rail-rail interchange and station exit/access passenger flows	733
Table 277: Old Oak Common station 2041 AM peak hour rail-rail interchange and station exit/access passenger flows	734
Table 278: Approximate Old Oak Common Station person trips per mode (2 way)	734
Table 279: Distribution of Onward Trips Generated from Old Oak Common Station (All Modes, AM peak hour)	735
Table 280: Distribution of Onward Bus Trips Generated Old Oak Common Station (AM peak hour)	736
Table 281: Difference in Bus Demand Passenger Flows: AM 2026 Baseline vs AM 2026 with Proposed Scheme (passenger per hour)	738
Table 282: Difference in Bus Demand Flows: AM 2041 Reference Case vs AM 2041 with Hs2	738
Table 283: Old Oak Common station pedestrian flows 2041 peak hour	739
Table 284: Old Oak Common station vehicle person trips (2 way)	741
Table 285: Old Oak Common station car only (vehicles 1-way)	741
Table 286: Old Oak Common station taxi flows (vehicles 1-way)	741
Table 287: Old Oak Common station vehicle movements (2 way)	742
Table 288: WELHAM highway assignment CFA ₄ and CFA ₅ AM (08:00-09:00) 2026 Operation	743
Table 289: WELHAM highway assignment CFA ₄₋₅ PM (17:00-18:00) 2026 Operation	747
Table 290: Summary of impacted links CFA ₄₋₅ 2026 Operation (AM & PM 2-way average)	751
Table 291: WELHAM highway assignment CFA ₄ and CFA ₅ 2041 AM (08:00-09:00) Operation	752
Table 292: WELHAM highway assignment CFA ₄ and CFA ₅ 2041 PM (17:00-18:00) Operation	756
Table 293: Summary of impacted links CFA ₄₋₅ 2041 Operation (AM & PM 2-way average).	760
Table 294: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Salusbury Road/Carlton Vale.	760
Table 295: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Premier Corner /Kilburn Lane	761
Table 296: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Salusbury Road/Harvist Road	762
Table 297: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Old Oak common /Du Cane Road	763
Table 298: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Old Oak Common Lane/Western Avenue	763
Table 299: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Atlas Road/ Old Oak Common	764
Table 300: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Bethune Road /Victoria Road	765
Table 301: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Western Avenue/Wales Farm Road	766
Table 302: CFA ₄ and CFA ₅ 2026 & 2041 Junction Operation Friary Road/Horn Lane junction	767
Table 303: Railplan sensitivity tests	768
Table 304: Crossrail south/eastbound services	769
Table 305: Crossrail west/northbound services	770
Table 306: 2041 AM Euston station demand, 07:00 to 10:00	771
Table 307: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations	772
Table 308: 2041 network impacts, AM peak period	774

SES2 and AP3 ES Appendix TR-001-000

Table 309: Crossrail 2 service pattern - trains per hour in each direction	784
Table 310: 2041 AM Euston station demand, 07:00 to 10:00	785
Table 311: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations	787
Table 312: 2041 network impacts, AM peak period	790
Table 313: 2041 AM Euston station demand, 07:00 to 10:00	799
Table 314: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations	801
Table 315: Distribution of additional passengers associated with EAP	804
Table 316: 2041 network impacts, AM peak period	804
Table 317: 2041 AM Euston station demand, 07:00 to 10:00	814
Table 318: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations	815
Table 319: 2041 network impacts, AM peak period	817
Table 320: 2041 AM Euston station demand, 07:00 to 10:00	826
Table 321: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations	828
Table 322: 2041 network impacts, AM peak period	831
Table 323: Screenline flow changes - 2023 Construction scenario 3 vs. 2023 Construction scenario 3 with increased cycling - AM peak hour (vehicles/hour)	843
Table 324: Screenline flow changes - 2026 Phase One operation vs. 2026 Phase One operation with increased cycling - AM peak hour (vehicles/hour)	846
Table 325: Screenline flow changes – 2023 construction scenario vs. 2023 construction scenario with the Aldgate scheme - AM peak hour (PCU/hour)	856

3 London Region

3.5 Operation impact assessment for Euston - Station and Approach (CFA1) Camden (CFA2) and Primrose Hill to Kilburn (Camden) (CFA3)

Euston - Station and Approach (CFA1) revised scheme operation description

Overview

- 3.5.1 Euston will be the London terminus for HS2. A new high speed station will be constructed in two stages to the west of the existing conventional station and will accommodate high speed train services. The high speed station will extend westwards beyond Melton Street as far as Cobourg Street which will be realigned.
- 3.5.2 The western third of the existing station will be demolished to create space for the eastern side of the high speed station. Reconfiguration of the conventional station will also involve the removal and reconfiguration of platforms west of platform 13. There will also be works to platforms 8 to 11 involving reconfiguration or removal.
- 3.5.3 The high speed railway and platforms will be built at around four metres below the level of the existing conventional railway to enable the construction of a new concourse at street level with permeability east-west and north-south across the high speed station.
- 3.5.4 The revised scheme includes provision to enable Over Site Development (OSD). This includes the construction of supporting structures, principally foundations and columns and a working deck¹⁵ over the high speed railway in the station approach and parts of the high speed station. The revised scheme does not, however, include OSD.
- 3.5.5 The new high speed station concourses, at ground level, will be arranged in a split configuration (north and south) adjacent to a central pedestrianised street and the high speed station spine building (a new station accommodation building). This enables the concourses to become an extension of the central street where a connection to a new London Underground (LU) ticket hall will be provided. There will be escalators and lifts providing access to the platforms below. At platform level, there will be a central circulation area (CCA) beneath the spine building providing links with LU and the high speed concourse. A basement will be created below the platforms in the central part of the high speed station, which will provide servicing and logistics areas with vehicular access via a new ramp connected to Hampstead Road overbridge
- 3.5.6 Improvements will be made to Euston underground station and a sub-surface connection built to Euston Square underground station, including a pedestrian subway under the A501 Euston Road. There will be a new underground entrance in Gordon Street. The existing Euston underground ticket hall will remain in its current configuration. A new ticket hall will be constructed at a lower level with connections

¹⁵ A minimum thickness deck above which the OSD structure will be built.

to the high speed platforms via the LU circulation area with step-free access from the high speed platforms.

- 3.5.7 The provision of platforms for high speed trains at Euston will require widening of the existing railway retained cutting to the north of Euston station, to the west of the existing tracks. The high speed railway will enter tunnel at the Euston portal about 100m south of Parkway. The portal will be close to the entrances to the existing railway Park Street Tunnels.
- 3.5.8 The completed high speed station will consist of 11 high speed platforms with the tracks at an elevation of +16.5m Above Ordnance Datum (AOD) accessed from ground level concourses. Below the platforms, a basement will be constructed beneath the high speed station footprint with a slab level of approximately +8.0m AOD.
- 3.5.9 At the end of 2033, when HS2 Phase One and Phase Two are operational, the classic services will operate from 11 platforms in the conventional station at their current track levels (20.5m AOD).

Euston high speed station

- 3.5.10 This section describes the proposed high speed station and works north of the high speed station as far as the Hampstead Road overbridge. The detailed design of the high speed station will be subject to a process of further approval, in accordance with the planning conditions set out in the hybrid Bill.
- 3.5.11 Key features of the functional design and layout of the revised scheme as completed in 2033 (at the end of construction Stage B1) include:
- the creation of 11 new, 415m long, high speed platforms below street level (with new concourses at street level) to accommodate high speed services. This will involve the partial demolition of the existing station west of platform 13;
 - ground level high speed station concourses which will facilitate easy access and pedestrian permeability for the Euston area. New entrances to the station will be provided to the south from A501 Euston Road and Euston Square; one to the west from A400 Hampstead Road at the northern end of Cobourg Street and an entrance to the north associated with the taxi drop-off and pick-up;
 - high speed station concourse spaces which will provide passenger facilities, including tickets and retail services. The retail units will vary in size and include cafes, restaurants and shops to serve passengers and the local community;
 - new escalators and lifts providing access between the high speed station concourses at street level and high speed platforms below. Passengers arriving on high speed trains will either proceed directly from the high speed platforms to the underground, or take escalators up to the street level station concourses. From the station concourses, there will be pedestrian routes to and from Euston underground station, Euston Square underground station, Gordon Street, the bus station and the taxi rank at the north of the station;
 - a basement beneath the high speed platforms, which will provide servicing for the high speed station and trains. Delivery and service vehicles will enter and

exit the basement via a new vehicular ramp, accessed from the A400 Hampstead Road overbridge;

- new entrances, a sub-surface circulation area and ticket halls serving Euston underground station, an entrance located centrally within the station which will also be accessible by pedestrians via sub-surface routes from Gordon Street and Euston Square as well as from the street level concourse, providing ticketing facilities and pedestrian access to all LU platforms. Existing LU pedestrian access will be improved with additional escalators serving both branches of the Northern line¹⁶ and the Victoria line;
- facilities for step free and fire brigade access to the high speed concourses, platforms and Euston underground station;
- offices and welfare facilities for high speed station and train operations staff. These will be located within the new high speed station spine building¹⁷ (located above the platform CCA) with facilities for British Transport Police and maintenance located at concourse and basement levels;
- a new pedestrian street running north-south alongside the spine building connecting the concourses and station entrances, above the high speed platforms;
- the bus station, which will remain to the south of the existing conventional station and north of Euston Square Gardens will be reconfigured as a two-way, linear bus station extending from Melton Street to A4200 Eversholt Street. The existing access for eastbound buses from the A501 Euston Road will be closed and moved to Melton Street;
- eight additional bus stands will also be provided to the north of the conventional station off A4200 Eversholt Street; and
- a new main taxi facility at the northern entrance to the high speed station which will provide for pick-up and set-down and will be accessed from the A400 Hampstead Road at the northern end of Cobourg Street for HS2 Phase One and from A400 Hampstead Road 100m north of Robert Street for HS2 Phase Two.

Station approach

3.5.12 This section describes the works proposed in the station approach, between Hampstead Road overbridge and A4201 Parkway, where the high speed railway will enter tunnel. Three bridges are to be replaced:

- A400 Hampstead Road overbridge, which currently carries a six lane road, will

¹⁶ The final leg of the pedestrian access to the Charing Cross branch is via stairs.

¹⁷ In construction Stage A (between 2017 and 2026), two three storey buildings will be constructed on the western side of the high speed station on Cobourg Street. These will be permanent buildings housing permanent retail facilities and temporary station accommodation. In addition, a temporary station servicing building will be constructed to the north of the retail and station accommodation buildings. These arrangements are shown in the illustrative plans [reference to be added]. Once the station spine building and basement have been completed in Stage B1 (2027 to 2033), station accommodation and servicing activities will be decanted from the buildings fronting Cobourg Street into the spine building and basement.

be demolished and rebuilt slightly west of its current alignment. It will be extended to a total span of about 200m;

- Granby Terrace overbridge, which will be demolished and rebuilt as a narrower bridge, without parking bays, in two sections, on a slightly altered alignment. The bridge will be extended to a length of about 90m and the carriageway level of the replacement bridge will be up to 1.8m higher at the eastern end than at present, to tie in to the raised levels along A400 Hampstead Road; and
- Mornington Street overbridge, which will be demolished and rebuilt in its current position reinstating the listed elements of the structure.

Station public realm and surface access completion construction Stage A, HS2 Phase One (2026 to 2033)

3.5.13 On completion of construction Stage A, an initial high speed station will be brought into use.

3.5.14 The two principal entrances to the high speed station will ensure that it can be accessed, step free, from the surrounding area and will encourage pedestrian use, particularly along Drummond Street and Cobourg Street. The entrances will be accessed as follows:

- the A501 Euston Road station entrance – with pedestrian routes connecting from the bus station, Drummond Street, the Cobourg Street taxi facility and A501 Euston Road; and
- the Cobourg Street station entrance – from a forecourt off Cobourg Street facing A400 Hampstead Road.

3.5.15 The more important changes and improvements to surface access in and around the station will include:

- a split north-south concourse arrangement, with appropriate links to high speed platform levels and the underground stations. It will include a new LU ticket hall;
- Cobourg Street, which will be realigned and extended north to the A400 Hampstead Road and, once completed (at the end of 2026) will include a taxi rank and a segregated cycleway;
- the permanent closure of the northern end of Gordon Street (the location of a new Euston station LU entrance) with the retention of pedestrian and cycle connections;
- the continued operation of bus services from their current alignment to the south with the additional use of a new bus standing area off A4200 Eversholt Street to the north-east of the conventional station;
- the removal of all of the public parking, car hire facilities and car hire pick-up/drop-off in the existing station. Disabled parking bays will be provided close to the western station entrance;
- improved cycle parking with a minimum of 1,000 public cycle spaces at a

number of locations round the station;

- improved north-south cycle routes around the station;
- a new layby on A4200 Eversholt Street to allow passenger set-down by taxi and private car;
- a passenger set-down area at the A400 Hampstead Road station entrance with taxi ranking along Cobourg Street extending to a passenger pick-up area to the west of the station near Drummond Street; and
- a dedicated access for delivery and service vehicles, entering and exiting the station servicing area from A400 Hampstead Road, approximately 100m north of the entrance to the Cobourg Street taxi facility (from A400 Hampstead Road). Access to the section of new basement built as part of Stage A will be accessible from the ground floor via goods lifts.

3.5.16 The high speed and conventional stations will operate as closely linked entities with pedestrian routes provided between the stations.

3.5.17 New escalators and lifts will provide access between the high speed concourses and platforms. All high speed platforms will also provide direct sub-surface exits to Euston underground station from the end of the platforms as well as via a new centrally located entrance and LU circulation area at +17m AOD beneath the high speed spine building. The new LU circulation area will provide a connection to the existing centrally located LU ticket hall and from there to the Northern line (Bank branch) and Victoria lines. There will also be connections to a new centrally located ticket hall at +8.0m AOD, which will provide direct links to the Victoria line and Northern (Bank and Charing Cross branches) line. From the concourses, there will be pedestrian routes to and from Euston underground station, Euston Square station, the bus station and the taxi rank at the north of the high speed station.

3.5.18 A pedestrian subway beneath A501 Euston Road will provide a direct sub-surface link to a new underground station entrance for the on Gordon Street, as well as access to the Euston Square underground station platforms. Step free access will be provided throughout the underground facilities with a dedicated central underground entrance that can be utilised by passengers from both railway stations. This central access will allow maximum flexibility for integration with both of the high speed concourses (southern and northern) and will provide additional sub-surface LU routes.

3.5.19 It will be possible to access the new and extended LU ticket halls from Gordon Street and Euston Square via the new pedestrian subways as well as from the high speed station concourses. Where there are significant differences in levels between the ground level underground station entrances and high speed concourses at +24.5m AOD, the exits from the pedestrian subways at +17.0m AOD and the new ticket hall at +8.0m AOD, new escalators will be provided.

Station public realm and surface access – completion Stage B1, HS2 Phase Two (2033 onwards)

3.5.20 On completion of construction Stage B1, the expanded station for HS2 Phase Two retains the Stage A entrances to the high speed station and provides an additional

northern entrance to ensure that it can be accessed, step free, from the surrounding area, encouraging pedestrian use. The entrances will be accessed as follows:

- the A501 Euston Road station entrance is reached from the south by a new pedestrian street from the bus station and from the west along Drummond Street and Cobourg Street;
- the Cobourg Street station entrance is accessed through the Cobourg Street station entrance forecourt; and
- the A400 Hampstead Road station entrance is reached by the A400 Hampstead Road station entrance forecourt and the new taxi facility to the north.

3.5.21 The revised scheme will create new and reinstated publicly accessible space, some of which will be public open space. This includes the A501 Euston Road station forecourt south of the high speed station and north of the bus station and Euston Square Gardens, as well as the Cobourg Street and A400 Hampstead Road station entrance forecourts. There will be new pedestrian streets running east-west across the front of the high speed station and existing station with links to Cobourg Street and Drummond Street. There will also be a pedestrianised street running from north to south connecting the high speed station forecourts.

3.5.22 The A501 Euston Road station forecourt will provide the central axis and main southern route to the high speed station and will also provide access to the conventional station via the existing piazza.

3.5.23 A new forecourt will be located at the northern high speed station entrance (A400 Hampstead Road station entrance) adjacent to the new main taxi facility.

3.5.24 There will be a western high speed station entrance at the northern end of Cobourg Street (the A400 Hampstead Road station entrance). This station entrance will be linked to A400 Hampstead Road station entrance forecourt. There will also be provision for passenger drop-off from private vehicles at this location.

3.5.25 Euston Square Gardens will be reinstated and unified by moving the bus station access to Melton Street instead of the present location, between the lodges, where it bisects the gardens. Pedestrian routes through the gardens will be realigned.

3.5.26 In addition to the permanent changes as part of HS2 Phase One operation, the following additional changes and improvements to surface access in and around the station will occur:

- a split north-south concourse arrangement, with appropriate links to high speed platform levels and the underground stations. It will extend across the whole of the central part of the high speed station and will include a new ticket hall and retail units. It will have waiting areas and lounges, passenger information and ticketing facilities, retail outlets, cafes and restaurants and public conveniences;
- a new taxi access road across the deck north of the high speed station accessed from the A400 Hampstead Road. This is a cul-de-sac which will be used by taxis, cyclists, for station staff access to the station car park and

pedestrians;

- pedestrian streets, providing a north-south pedestrian axis from Euston Square Gardens across the high speed station concourses and east-west across the front of both stations from Cobourg Street to A4200 Eversholt Street, broadly continuing the alignments of existing streets;
- the bus station, which will remain south of the conventional station and north of Euston Square Gardens, enlarged and reconfigured as a two-way, linear bus station extending from Melton Street to A4200 Eversholt Street. The existing access for eastbound buses from the A501 Euston Road will be closed and moved to Melton Street. Pedestrians will be able to walk across the bus station from the high speed station (i.e. from the A501 Euston Road station forecourt) to the A501 Euston Road;
- the provision of mobility impaired parking bays will be provided close to the western station entrance;
- improved cycle parking with approximately 2,000 public cycle spaces at a number of locations round the station for use by both high speed and classic passengers;
- docking stations for approximately 200 cycle hire cycles dispersed in streets close to the stations;
- improved north-south cycle routes around the station;
- a new layby on A4200 Eversholt Street to allow passenger set-down by taxi and private car. The main taxi facility at the northern entrance to the high speed station will provide for pick-up, set-down and taxi ranking accessed via the A400 Hampstead Road; and
- a dedicated access for delivery and service vehicles entering and exiting the basement via a new vehicular ramp positioned central to the site, accessed from the A400 Hampstead Road overbridge.

3.5.27 Access to Euston underground station and Euston Square underground stations will continue to operate as for HS2 Phase One. The pedestrian subway beneath A501 Euston Road and new Gordon Street entrance to the underground station will also continue to operate as for HS2 Phase One.

3.5.28 Construction of HS2 will not include a connection to Crossrail 2. However, the design of the high speed station construction works will not prevent such a connection being made in future by others. A decision on preferred alignment and station configuration for Crossrail 2 has not yet been reached but a potential point of connection has been identified at the eastern ends of the new platform level concourses to the Victoria and Northern (Bank branch) lines.

Highway network - Stage A, HS2 Phase One (2026 to 2033)

3.5.29 The completed construction Stage A station introduces several sections of new, diverted, and modified highway. The highway layout is shown on Figure 110 and Figure 111 and is anticipated to consist of predominantly 20mph local roads such as

Granby Terrace, A4200 Eversholt Street, Mornington Street and Cobourg Street. The main distributor roads are A400 Hampstead Road and A501 Euston Road.

Figure 110: Euston station - HS2 Stage A, Phase One highway layout

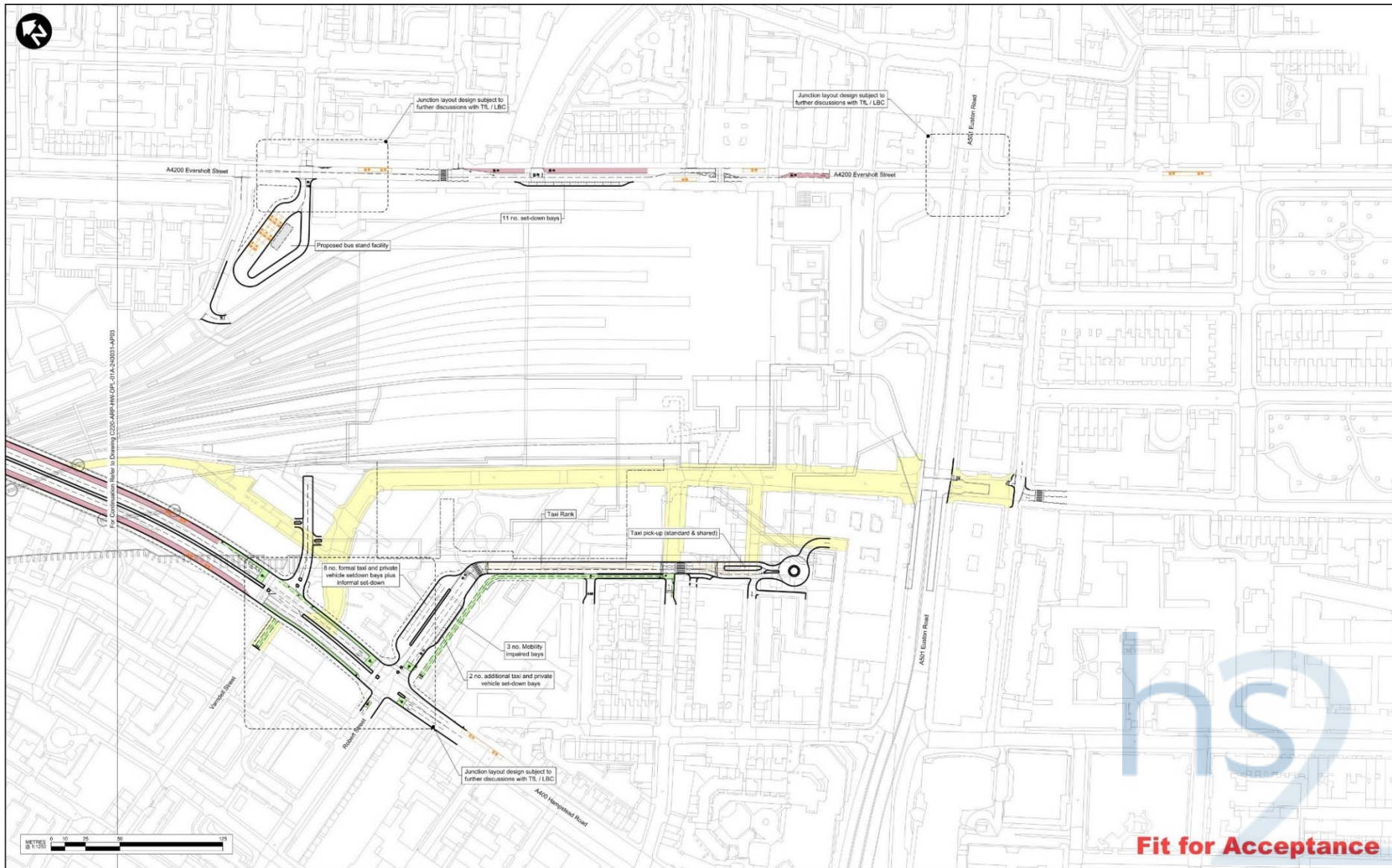
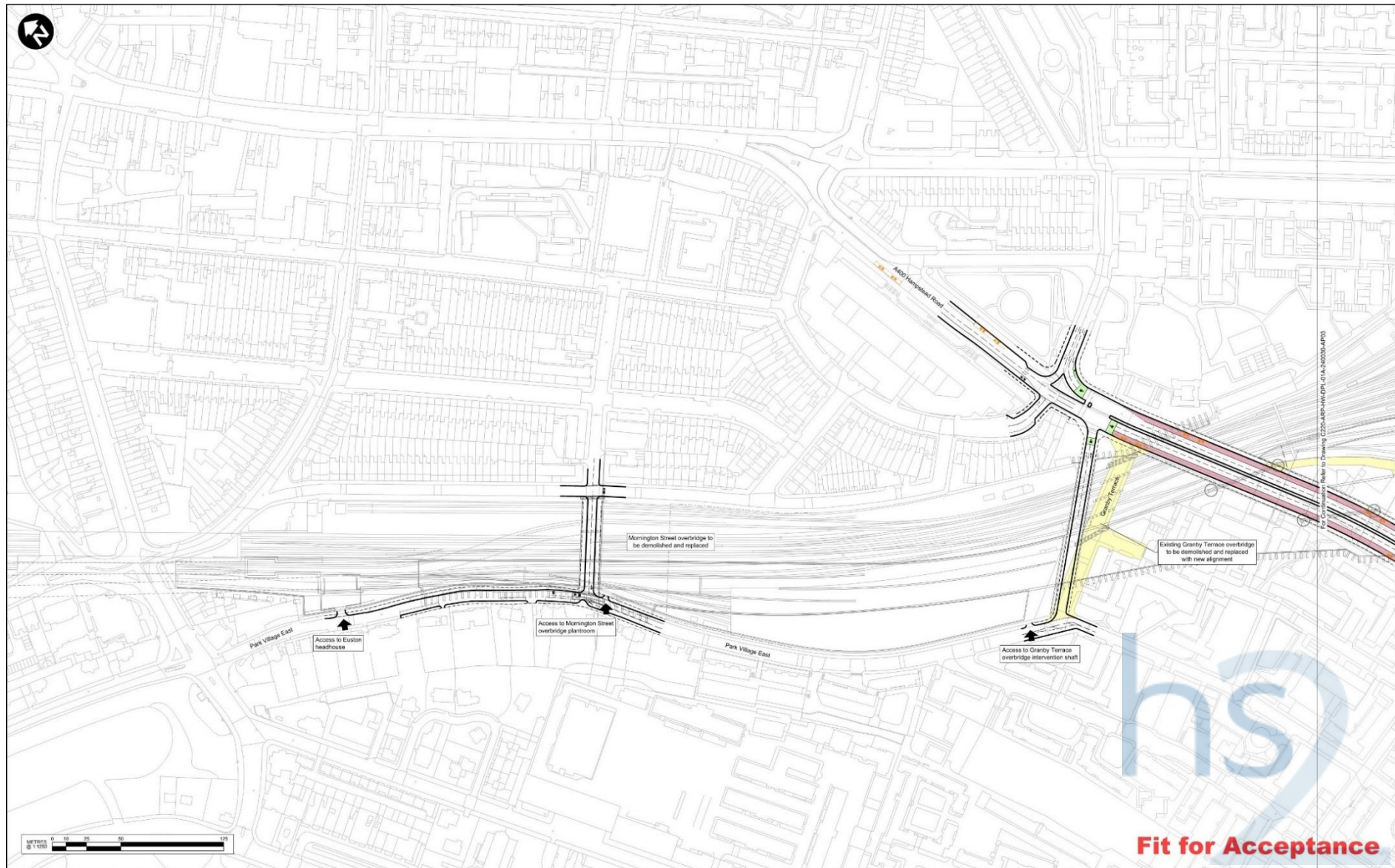


Figure 111: Euston station approach - Stage A, HS2 Phase One highway layout



- 3.5.30 Where Gordon Street is closed to vehicular traffic, a cycle link to A501 Euston Road will be provided. The new signal configuration will allow for this movement of cyclists. A new signalised crossing on A501 Euston Road on the western side of the junction will also be provided. While Melton Street will also be closed to general traffic, construction traffic will use the junction to access the construction Stage B1 site.
- 3.5.31 Access to the bus station from A501 Euston Road will remain operational with the pedestrian crossing on A501 Euston Road remaining in operation.
- 3.5.32 On A4200 Eversholt Street, a new priority junction will be created at the new northern bus standing and servicing area which is located between Polygon Road and Barnby Street.
- 3.5.33 On A400 Hampstead Road, a new signalised junction will be created between A400 Hampstead Road, Cobourg Street and Robert Street. All turning movements will be permitted, except that only left turning movements will be permitted from Robert Street. Signalised pedestrian crossings will be provided on the Cobourg Street and Robert Street arms of this junction as well as on A400 Hampstead Road to the north of the junction. On A400 Hampstead Road, two lanes will be provided in each direction and three lanes will be provided on Cobourg Street.
- 3.5.34 Approximately 100m north of the junction of A400 Hampstead Road with Cobourg Street and Robert Street, a new priority junction is proposed. This will allow access from A400 Hampstead Road (from both the north and south directions) to a new station servicing area. A signalised pedestrian crossing will also be provided on the A400 Hampstead Road northern arm of this junction.
- 3.5.35 Due to the realignment of the Granby Terrace overbridge, a new permanent signalised junction with A400 Hampstead Road will be formed. This junction will also include A400 Harrington Square. Two lanes will be provided on the Granby Terrace approach to the junction, with both allowing left turning movements and right turning permitted from the right lane only. Two lanes will be provided on A400 Hampstead Road in the southbound direction, with three, including a bus lane, provided in the northbound direction.
- 3.5.36 A400 Harrington Square will remain on its existing alignment with the same number of lanes provided. However, a signalised pedestrian crossing will be provided on the merging lane where traffic travels north from A400 Harrington Square to A400 Hampstead Road. A signalised pedestrian crossing will also be provided on A400 Hampstead Road just north of Granby Terrace.

Highway network – Stage B1, HS2 Phase Two (post 2033)

- 3.5.37 The completed revised scheme introduces several sections of new, diverted, and modified highway. The highway layout for this phase is shown on Figure 112 and Figure 113.

Figure 112: Euston station – Stage B1, HS2 Phase Two highway layout

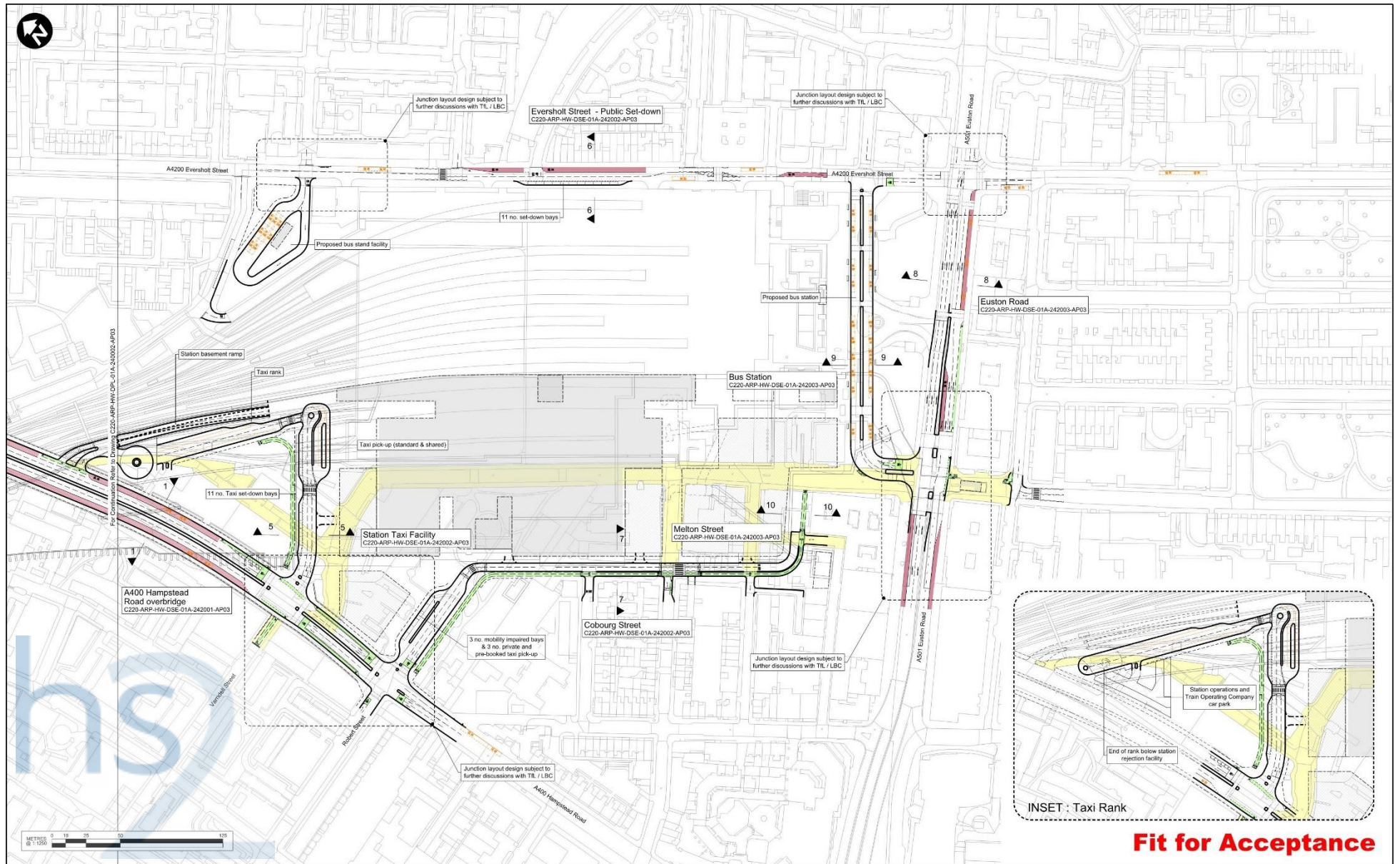
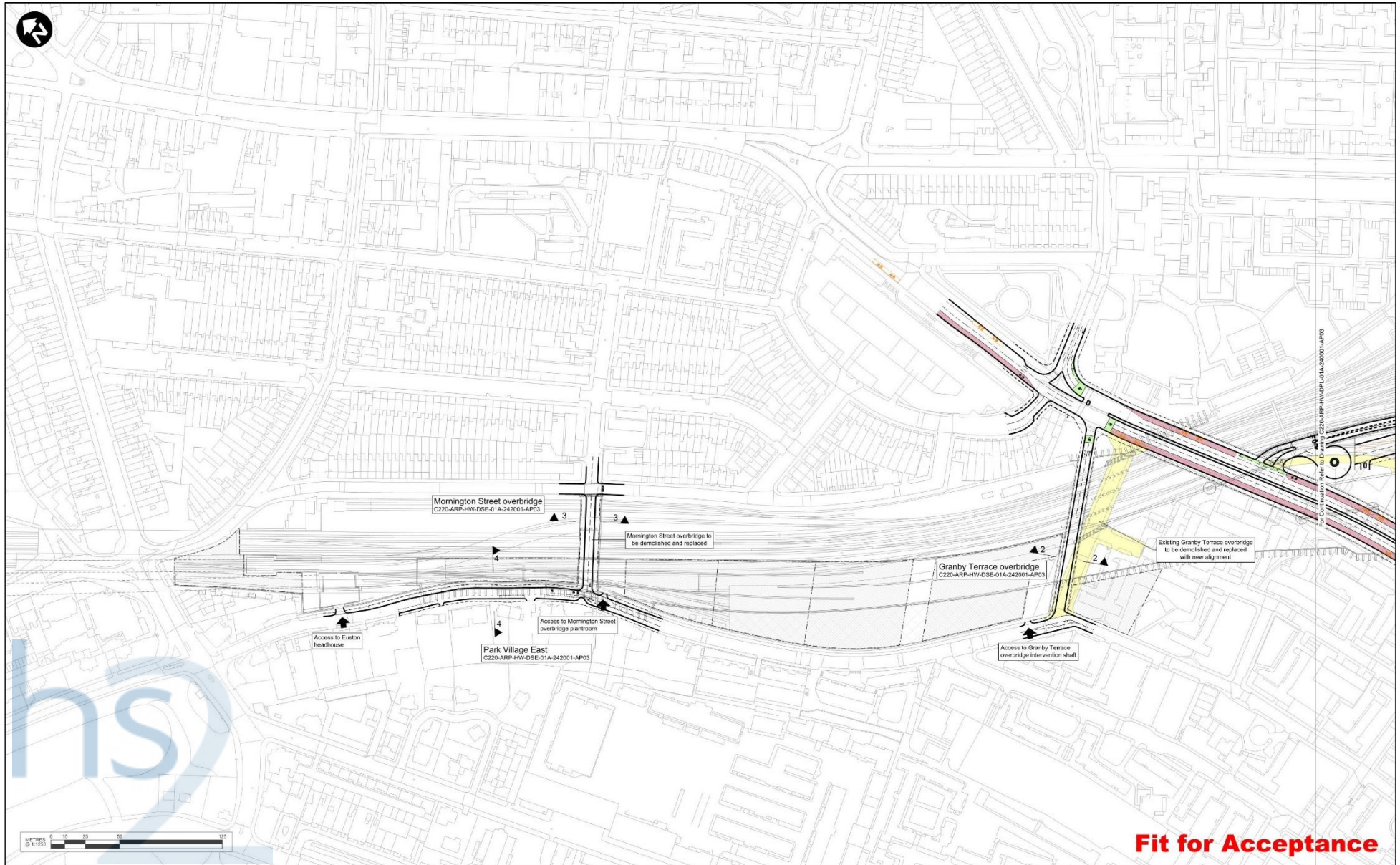


Figure 113: Euston station approach – Stage B1, Hs2 Phase Two highway layout



- 3.5.38 On A501 Euston Road, a new junction will be created with the new Euston bus station in a location similar to that of the existing junction of A501 Euston Road with Gordon Street and Melton Street. This new signalised junction will allow buses to enter from and exit the bus station on A501 Euston Road. For buses arriving from the east along A501 Euston Road, a right turn bus lane will be provided. This will mean that the number of lanes for 'ahead' movements on A501 Euston Road will be reduced to two (when compared to the existing three). While Gordon Street will be closed to vehicular traffic, a cycle link to A501 Euston Road will be provided. The new signal configuration will allow for this movement of cyclists. A new signalised crossing on A501 Euston Road on the western side of the junction will also be provided.
- 3.5.39 The existing access to the bus station from A501 Euston Road will be closed. The pedestrian crossing on A501 Euston Road will, however, remain in operation.
- 3.5.40 Access to the bus standing area on A4200 Eversholt Street, created as part of HS2 Phase One, will be maintained.
- 3.5.41 On A400 Hampstead Road, the new signalised junction and its pedestrian facilities between A400 Hampstead Road, Cobourg Street and Robert Street, created as part of HS2 Phase One, will be retained but will not provide access to the main station taxi rank and pick-up. The junction will continue to operate to provide access for the vehicle set-down and Cobourg Street.
- 3.5.42 Approximately 100m north of the junction of A400 Hampstead Road with Cobourg Street and Robert Street, a second new signalised junction is proposed. This will allow access from A400 Hampstead Road (from both the north and south directions) to the relocated passenger set-down, rank and pick-up area for taxis. A signalised pedestrian crossing will also be provided on the A400 Hampstead Road northern arm of this junction.
- 3.5.43 The junction of A400 Hampstead Road with Granby Terrace and A400 Harrington Square will continue to operate in the same manner as for Hs2 Phase One.

Euston - Station and Approach (CFA1) operation impacts

Key operation transport issues

- 3.5.44 The main impacts of the revised scheme can be summarised as:
- increases to rail passengers arriving and departing Euston station with consequential increases in onward travel by LU, bus, cycle, walk and taxi;
 - permanent road closures and associated diversions around Euston station, including closures to vehicles to all or parts of Cardington Street, Melton Street, Stephenson Way, Drummond Street, Euston Street, Varndell Street at A400 Hampstead Road, Harrington Street, Hampstead Road (a minor road which is not the A400 Hampstead Road), the existing A501 Euston Road bus station access and Gordon Street;
 - the permanent removal or reduction of parking and loading bays on Varndell Street, Harrington Street, Granby Terrace Bridge, Mornington Crescent, Drummond Street, Starcross Street, Cobourg Street, Barnby Street, Gordon Street, Euston Street, Cardington Street and Melton Street; and

- the temporary closure of three footpaths and one footway which will be re-provided either as part of the public realm, public open space or on slightly different alignments.

- 3.5.45 The design of the revised scheme and its operation creates a number of beneficial impacts. Rail passengers at Euston station will benefit from increased capacity and improved journey times to the Midlands and beyond, and lower crowding levels on trains as a result of increases in the frequencies of trains.
- 3.5.46 There will be benefits of reduced crowding on existing rail services and benefits from released capacity of existing long-distance services. The introduction of HS2 Phase Two in 2041 is forecast to result in a transfer to Euston station of passengers of high speed classic rail services who previously would have arrived at King's Cross and St. Pancras International from the north of England. This will result in some relief of King's Cross and St. Pancras International stations, with the benefit of reduced station concourse crowding, and consequent reductions in passenger volumes on underground lines from King's Cross St. Pancras underground station.
- 3.5.47 Despite LU planned upgrades, passenger volumes will increase on the Northern and Victoria Lines even without the revised scheme. While the revised scheme will contribute to the increased demand, the Mayor's Transport Strategy will need to bring forward major upgrades and schemes to reduce the impacts of demand.
- 3.5.48 The revised scheme will add to the demand for pedestrian movements on the footways and pedestrian crossings in the vicinity of Euston station. This increase in demand will be mitigated with the provision of new pedestrian infrastructure. This will include a new signalised pedestrian crossing on A501 Euston Road to the west of Gordon Street as well as a new pedestrian subway beneath A501 Euston Road to connect with Gordon Street and Euston Square underground station.
- 3.5.49 The revised scheme will result in an increase in the number of cyclists in the Euston area. However, as part of the revised scheme, connectivity and permeability for cyclists in the Euston area will be improved.
- 3.5.50 The revised scheme will provide an improved linear bus station at the south of the station in Stage B1, in addition to a bus stand on A4200 Eversholt Street to the north-east of the station in Stage A. Together, these bus facilities maintain and increase capacity for through and terminating bus routes, in order to meet the additional demand generated by HS2 Phase One and Phase Two services. The design of the modified bus station and the bus stand will provide flexibility in bus routeing and opportunities to reduce wasted bus mileage.
- 3.5.51 Demand for bus routes will be impacted as a result of the revised scheme. While some bus routes will experience a reduction in bus passenger demand due to increase use of underground services, two new bus routes are proposed which will increase the number and frequency of buses in the vicinity of Euston.
- 3.5.52 The revised scheme will require changes to the local road network in the vicinity of Euston station, including the closure of Gordon Street, Melton Street and Cardington Street. The closure of these roads will result in vehicle trips diverting to other routes, including strategic and local routes. Replacement bridges will reinstate the A400 Hampstead Road and Granby Terrace overbridge on altered alignments.

3.5.53 Cobourg Street will be permanently realigned and will provide access to a new taxi and private hire facility on the western side of the station in Stage A. Taxis will be relocated to a dedicated taxi drop-off and pick-up facility to the north of the station in Stage B1 with the a facility for private vehicle drop-off and pick-up remaining accessible on Cobourg Street (at the junction of A400 Hampstead Road with Robert Street and Cobourg Street). Increases in taxi movements and private car drop-off and pick-up activity will have a substantial impact on traffic flows on a number of roads in the vicinity of Euston station.

3.5.54 The revised scheme will remove some on-street car parking spaces in and around Euston station. This will have an impact on parking availability in the area.

Local land uses

3.5.55 A number of commercial and residential properties will be lost/relocated in order to deliver the revised scheme in the Euston station and approach area. The westward expansion of the station will mean that all buildings between the western edge of the existing station and the western edge of the proposed high speed station will be demolished. This includes the Ibis and Thistle Hotels and other building in the Cardington Street/Melton Street area.

Changes in demand 2026 and 2041

3.5.56 Use of Euston station will increase substantially in the baseline without the revised scheme to 2026 and 2041, and the increase will be greater with the revised scheme.

3.5.57 Table 160 sets out the forecast use of the station for the AM peak and Table 161 for the PM peak.

Table 160: Forecast rail and LU passengers at Euston, AM peak period (07:00 to 10:00)

Movement	AM peak period (07:00 to 10:00)		
	2026 Phase One	2041 Phase One	2041 Phase Two
Alighting			
NR alighting at Euston baseline	37,510	44,017	44,020
NR alighting at Euston with HS2	42,220 (13%)	51,466 (17%)	61,100 (38%)
HS2 alighting (included in NR)	11,840	16,243	26,040
Boarding			
National Rail boarding at Euston baseline	13,910	17,410	17,410
National Rail boarding at Euston including HS2	14,310 (3%)	18,072 (+4%)	26,620 (53%)
HS2 boarding (included in National Rail)	7,415	8,963	17,620
London underground			
LU alighting at Euston LU baseline	48,860	54,661	54,660
LU alighting at Euston LU with HS2	52,610 (13%)	59,513 (+9%)	67,470 (23%)

Movement	AM peak period (07:00 to 10:00)		
	2026 Phase One	2041 Phase One	2041 Phase Two
LU boarding at Euston LU baseline	46,780	52,695	52,695
LU boarding at Euston LU with HS2	50,650 (8%)	59,115 (+12%)	66,160 (26%)
Station entry/exit			
Station exit baseline	24,420	28,563	28,560
Station exit with HS2	29,280 (+20%)	27,236 (-5%)	36,570 (+28%)

Table 161: Forecast rail and LU passengers at Euston, PM peak period (16:00 to 19:00)

Movement	PM peak period (16:00 to 19:00)		
	2026 Phase One	2041 Phase One	2041 Phase Two
Alighting			
NR alighting at Euston baseline	15,710	20,150	20,150
NR alighting at Euston with HS2	17,750 (13%)	22,760 (+13%)	31,000 (54%)
HS2 alighting (included in NR)	8,450	10,370	18,710
Boarding			
National Rail boarding at Euston baseline	37,970	44,920	44,920
National Rail boarding at Euston including HS2	40,300 (6%)	48,980 (+9%)	58,930 (31%)
HS2 boarding (included in National Rail)	11,990	16,150	26,460
London underground			
LU alighting at Euston LU baseline	50,800	58,190	58,190
LU alighting at Euston LU with HS2	52,020 (2%)	63,965 (+10%)	71,530 (23%)
LU boarding at Euston LU baseline	45,330	52,220	52,220
LU boarding at Euston LU with HS2	49,540 (9%)	57,890 (+11%)	64,780 (24%)
Station entry/exit			
Station exit baseline	5,755	7,250	7,250
Station exit with HS2	6,695 (16%)	6,700 (-8%)	9,560 (32%)

3.5.58 With the introduction of the revised scheme (HS2 Phase One services) in 2026, rail passengers alighting at Euston station during the AM peak period are forecast to increase from 37,510 to approximately 42,200 passengers (13% increase), compared with the 2026 future baseline. Arrivals at Euston on high speed services in 2026 are forecast to be approximately 11,840.

- 3.5.59 By 2041, AM peak period baseline rail passengers will be forecast to increase to 44,020. With the introduction of HS2 Phase Two, it is estimated that rail passengers alighting at Euston station will increase to approximately 61,100 (38% increase), compared with the 2041 future baseline. This includes 5,200 passengers arriving at Euston by LU services, who would travel on classic rail services into King's Cross station in the absence of the revised scheme. Arrivals at Euston on high speed services in 2041 are approximately 26,040.
- 3.5.60 With the introduction of the revised scheme (HS2 Phase One) in 2026, onward morning peak LU boarders are forecast to increase from 46,780 in the baseline to 50,650 (8% increase) with the revised scheme and those who exit Euston station from 24,420 in the baseline to 29,280 (20% increase) with the revised scheme.
- 3.5.61 By 2041, baseline LU AM peak period boarders are forecast to increase to 52,695 and those who exit the station to 28,560. With the introduction of HS2 Phase Two, LU boarders would increase to 66,160 (26% increase) and people exiting Euston station would increase to 36,570 (28% increase).
- 3.5.62 Similar increases are forecast for the PM peak period, as shown in Table 161.

Rail impacts

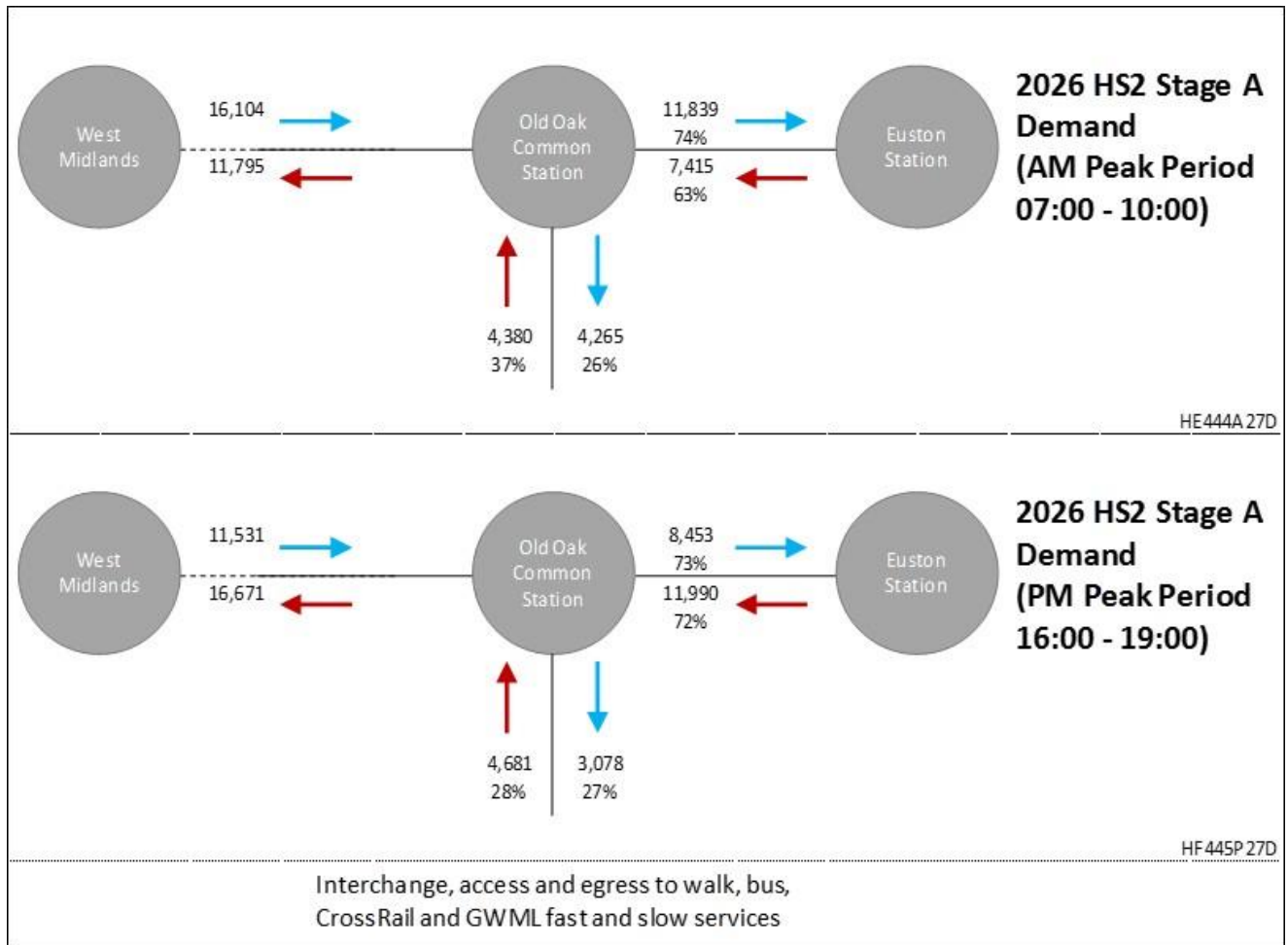
- 3.5.63 The public transport impacts of the revised scheme, including the NR and underground networks, have been assessed using TfL's Railplan model. The impacts completion of construction Stage A and operation of HS2 Phase One services in 2026 and the completed high speed station and operation of HS2 Phase Two services in 2041 (15 years after commencement of HS2 services) have been compared against the baseline for each year. The demand and network assumptions that make up the 2026 and 2041 future baseline scenarios and the 2026 HS2 Phase One and 2041 Phase Two scenarios, together with the methodology employed for the analysis, are outlined in sections 3.1 and 3.2.

Rail network 2026 HS2 Phase One

- 3.5.64 The impacts of completion of construction Stage A and operation of HS2 Phase One services in 2026 were assessed by comparing:
- 2026 future baseline Railplan outputs; and
 - HS2 Phase One 2026 Railplan outputs.
- 3.5.65 Line flows on HS2 services in 2026 into Old Oak Common (OOC) and Euston station are shown in Figure 114. Flows in the peak direction, into Euston in the AM peak period and from Euston in the PM peak period are approximately 11,840 and 11,990 respectively. Examination of interchanging at Old Oak Common station indicates that in the AM peak period, 26% of passengers from the West Midlands alight at Old Oak Common with 74% continuing on to Euston station. The majority of passengers alighting at Old Oak Common are forecast to be interchanging passengers, with few passengers entering or exiting the station. In the counter peak direction, around 63% of HS2 passengers board at Euston with 37% boarding at Old Oak Common.
- 3.5.66 In the PM peak period, around 73% of HS2 passengers board at Euston, with 27% boarding at Old Oak Common. In the counter peak direction, around 28% of

passengers from the West Midlands alight at Old Oak Common with 72% continuing on to Euston.

Figure 114: HS2 line flows 2026 Stage A, HS2 Phase One



Euston and Old Oak Common station demand

3.5.67 Station usage has been examined to assess the impact of the revised scheme on Euston station. Table 162 summarises the AM peak period station demand for Euston in 2026 for both the future baseline and 'with HS2' scenarios. This indicates a decrease or transfer in rail arrivals and departures on InterCity services for the HS2 Phase One scenario of around 12,100 passengers, countered by an increase in suburban arrivals and departures of around 2,030 passengers. Overall, including HS2, arrivals in the AM peak period increase by around 4,710 (13% increase) and departures by around 400 (3% increase).

Table 162: 2026 Stage A, Phase One AM peak period (07:00 to 10:00) NR demand

Description	2026 baseline			2026 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (departing)	4,480	-	4,480	3,930	-	3,930
Euston suburban (arriving)	-	23,720	23,720	-	22,240	22,240

Description	2026 baseline			2026 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston Intercity (departing)	9,420	-	9,420	2,970	-	2,970
Euston Intercity/other (arriving)	-	13,790	13,790	-	8,140	8,140
Euston HS2 (departing)	-	-	0	7,415	-	7,415
Euston HS2 (arriving)	-	-	0	-	11,839	11,839
Sub-total: Euston NR	13,906	37,506	51,412	14,308	42,218	56,526
Old Oak Common (OOC)						
OOC NR (departing slow services)	-	-	-	1,411	7,118	8,529
OOC NR Slow (arriving slow services)	-	-	-	20,056	2,849	22,905
OOC NR (departing fast services)	-	-	-	5,454	0	5,454
OOC NR (arriving fast services)	-	-	-	-	16,307	16,307
OOC HS2 (arriving)	-	-	-	4,380	-	4,380
OOC HS2 (departing)	-	-	-	-	4,265	4,265
Sub-total: OOC	-	-	-	31,301	30,539	61,840

3.5.68 The equivalent PM peak period analysis is set out in Table 163. This indicates a transfer of demand from rail arrivals and departures on InterCity services to HS2 services for HS2 Phase One in 2026 of around 11,560 passengers, again countered by an increase in suburban arrivals and departures of around 4,520 passengers. Overall, including HS2, arrivals in the PM peak period increase by around 1,860 (12% increase) and departures by around 2,330 (6% increase).

Table 163: 2026 Stage A, Phase One PM peak period (16:00 to 19:00) NR demand

Description	2026 baseline			2026 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (departing)	24,680	-	24,680	20,630	-	20,630
Euston suburban (arriving)	-	5,680	5,680	-	5,210	5,210
Euston Intercity (departing)	13,290	-	13,290	7,680	-	7,680
Euston Intercity/other (arriving)	-	10,030	10,030	-	4,080	4,080
Euston HS2 (departing)	-	-	0	11,990	-	11,990

Description	2026 baseline			2026 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston HS2 (arriving)	-	-	0	-	8,450	8,450
Sub-total: Euston NR	37,970	15,710	53,680	40,300	17,750	58,040
Old Oak Common (OOC)						
OOC NR (departing slow services)	-	-	-	1,750	15,290	17,050
OOC NR Slow (arriving slow services)	-	-	-	8,860	1,790	10,650
OOC NR (departing fast services)	-	-	-	12,880	-	12,880
OOC NR (arriving fast services)	-	-	-	-	6,710	6,710
OOC HS2 (arriving)	-	-	-	4,680	-	4,680
OOC HS2 (departing)	-	-	-	-	3,080	3,080
Sub-total: OOC	-	-	-	28,170	26,870	55,040

Underground station demand

3.5.69 Station usage has been examined to assess the impact of the revised scheme in 2026 on Euston and Euston Square LU stations. Table 164 and Table 165 summarise the AM peak period and PM peak period station demand for Euston in 2026, for both the future baseline and 'with HS2' scenarios respectively.

Table 164: 2026 Stage A, Phase One AM peak period (07:00 to 10:00) LU demand

Description	2026 baseline			2026 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston LU						
Northern line Charing Cross branch (northbound)	2,740	2,040	4,780	2,720	2,170	4,890
Northern line Charing Cross branch (southbound)	6,665	2,255	8,920	5,620	2,730	8,350
Northern line Bank branch (northbound)	4,590	4,470	9,060	4,950	4,125	9,075
Northern line Bank branch (southbound)	7,625	9,540	17,165	6,050	10,020	16,070
Victoria line (northbound)	3,540	10,285	13,825	3,775	11,250	15,027
Victoria line (southbound)	13,855	6,850	20,705	14,020	6,840	20,860
Sub-total: Euston LU	39,020	35,440	74,460	37,135	37,140	74,275
Euston Square LU						
Metropolitan line (northbound/westbound)	2,360	7,290	9,650	4,250	8,690	12,940

Description	2026 baseline			2026 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Metropolitan line (southbound/eastbound)	5,400	6,135	11,535	9,270	6,780	16,050
Sub-total: Euston Square LU	7,770	13,420	21,190	13,520	15,470	28,990

Table 165: 2026 Stage A, Phase One PM peak period (16:00 to 19:00) LU demand

Description	2026 baseline			2026 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston LU						
Northern line Charing Cross branch (northbound)	2,440	3,470	5,910	3,120	2,470	5,590
Northern line Charing Cross branch (southbound)	4,830	2,310	7,140	4,425	2,295	6,720
Northern line Bank branch (northbound)	9,150	8,890	18,040	8,920	6,895	15,815
Northern line Bank branch (southbound)	5,010	5,320	10,330	4,630	5,090	9,720
Victoria line (northbound)	4,160	18,730	22,890	4,660	17,020	21,680
Victoria line (southbound)	9,950	3,990	13,940	10,480	3,850	14,330
Sub-total: Euston LU	35,540	42,710	78,250	36,230	37,620	73,850
Euston Square LU						
Metropolitan line (northbound/westbound)	4,100	5,740	9,840	5,500	10,205	15,705
Metropolitan line (southbound/eastbound)	5,685	2,350	8,040	7,815	4,185	12,000
Sub-total: Euston Square LU	9,785	8,090	17,875	13,315	14,390	27,705

- 3.5.70 The increase in boarders and alighters at Euston with the revised scheme results in an increase in LU passengers. During the AM peak period, the change in LU boarders and alighters is modest with small changes on the Northern line (Charing Cross branch), Northern line (Bank branch) and Victoria line. However, there is a substantial increase in boarders and alighters at Euston Square with an increase of 3,290 passengers in the westbound direction and 4,515 passengers in the eastbound direction. This accounts for passengers travelling eastbound from Euston Square particularly as an alternative to use of the Northern line (Bank branch) at Moorgate. The new link from the HS2 platforms to Euston Square station will facilitate this movement.
- 3.5.71 During the PM peak the changes are greater with a decrease on the northbound Northern line (Bank branch) and northbound Victoria line leading to a net reduction on all lines of around 4,670 passengers (6%). As with the AM peak period, there are large increases at Euston Square, with an increase of 5,865 passengers in the westbound direction and 3,960 passengers in the eastbound direction.

Impact on Zone 1 stations

3.5.72 Table 166 shows the impact of the revised scheme during the AM peak period on stations within (fare) Zone 1, together with Camden Town, Mornington Crescent and Ealing Broadway stations. Any station within Zone 1 with a change of less than +/- 100 passengers has been excluded from Table 166.

Table 166: 2026 Stage A, Phase One access, egress and interchange trips at Zone 1 LU stations - AM peak period (07:00 to 10:00)

Station	2026 baseline	2026 HS2 Phase One	Absolute difference	Relative difference
Euston (including Euston Square)	98,529	100,971	2,442	2%
Euston	77,342	84,240	6,898	9%
Euston Square	21,187	16,731	-4,456	-21%
Liverpool Street	119,679	120,857	1,178	1%
Bond Street	43,876	45,002	1,126	3%
Victoria	142,700	143,060	360	0%
Barbican	12,114	12,460	346	3%
Green Park	39,586	39,878	292	1%
Chancery Lane	12,314	12,597	283	2%
Cannon Street	31,105	31,375	270	1%
Waterloo	160,095	160,358	263	0%
Edgware Road (Hammersmith & City and Circle lines)	9,643	9,872	229	2%
Oxford Circus	96,116	96,321	205	0%
Blackfriars	35,395	35,597	202	1%
St James' Park	23,430	23,583	153	1%
South Kensington	22,991	23,105	114	0%
Aldgate	18,680	18,790	110	1%
St. Paul's	4,161	4,061	-100	-2%
Piccadilly Circus	15,359	15,238	-121	-1%

Station	2026 baseline	2026 HS2 Phase One	Absolute difference	Relative difference
Westminster	37,479	37,354	-125	0%
Great Portland Street	13,802	13,672	-130	-1%
Lancaster Gate	2,650	2,509	-141	-5%
Russell Square	7,557	7,392	-165	-2%
Holborn	25,265	25,057	-208	-1%
Leicester Square	24,089	23,878	-211	-1%
Charing Cross	39,096	38,835	-261	-1%
Farringdon	85,500	85,192	-308	0%
Goodge Street	15,341	14,985	-356	-2%
Baker Street	43,070	42,540	-530	-1%
St. Pancras	22,975	22,229	-746	-3%
Marylebone	16,419	15,405	-1,014	-6%
Tottenham Court Road	48,483	47,151	-1,332	-3%
Warren Street	28,041	26,686	-1,355	-5%
King's Cross	72,755	70,654	-2,101	-3%
Paddington	78,889	53,926	-24,963	-32%
Sub-total	1,447,188	1,420,701	-26,487	-2%
Total (all Zone 1)	2,032,025	2,005,832	-26,193	-1%
Camden Road	17,413	17,388	-25	0%
Mornington Crescent	3,327	3,315	-12	0%
Ealing Broadway	19,784	20,504	720	4%

3.5.73 The largest increase in absolute and percentage terms in the AM peak period is at Euston station, where station activity increases by just over 6,900 passengers, an increase of 9%.

3.5.74 The impacts on other Zone 1 stations are relatively small, with the exception of some Crossrail stations with increases in activity at Liverpool Street, Bond Street and Ealing

Broadway. This is a function of Crossrail offering improved distribution and connections linking with HS2 Phase One services at Old Oak Common station.

- 3.5.75 The revised scheme will also result in a number of positive impacts at some Zone 1 stations, with reductions in passenger demand. The largest decrease is at Paddington (24,960 passengers or 32%), due to the interchange at Old Oak Common onto Crossrail services. In effect, these are passengers who, in the 2026 future baseline, would have interchanged between GWML (fast) services and Crossrail at Paddington. However, with HS2 Phase One, these passengers make the same interchange earlier at Old Oak Common.
- 3.5.76 Outside Zone 1, Ealing Broadway has a reasonable increase in activity of 720 passengers as it offers good connections to Old Oak Common and the revised scheme. Total activity at all Zone 1 stations decreases by approximately 1%.
- 3.5.77 A similar pattern is evident for the PM peak period, as shown in Table 167, albeit with a smaller increase of 1,250 passengers (2%) at Euston, and a reduction of 21,595 (27%) at Paddington. This reduction at Paddington in the PM peak may be moderated by the attraction of the wider range of amenities available to waiting passengers at Paddington in comparison to Old Oak Common. Crossrail stations experience an increase in station activity for those reasons set out for the AM peak period.

Table 167: 2026 Stage A, Phase One access, egress and interchange trips at Zone 1 LU stations - PM peak period (16:00 to 19:00)

Station	2026 baseline	2026 HS2 Phase One	Absolute difference	Relative difference
Euston (including Euston Square)	97,145	99,306	2,161	2%
Euston	79,267	80,515	1,248	2%
Euston Square	17,878	18,791	913	5%
Bond Street	64,232	66,285	2,053	3%
Farringdon	70,664	72,551	1,887	3%
Liverpool Street	97,391	97,900	509	1%
Barbican	12,736	13,075	339	3%
Victoria	124,470	124,698	228	0%
Edgware Road (Hammersmith & City and Circle lines)	10,811	10,992	181	2%
Blackfriars	29,440	29,594	154	1%
Waterloo	155,792	155,932	140	0%
Aldgate	23,265	23,390	125	1%

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Station	2026 baseline	2026 HS2 Phase One	Absolute difference	Relative difference
Knightsbridge	11,388	11,285	-103	-1%
Piccadilly Circus	24,588	24,470	-118	0%
Southwark	8,594	8,465	-129	-2%
Warren Street	17,611	17,470	-141	-1%
Chancery Lane	10,790	10,648	-142	-1%
Leicester Square	31,119	30,968	-151	0%
Mansion House	8,391	8,232	-159	-2%
Saint Paul's	4,513	4,328	-185	-4%
Holborn	27,372	27,164	-208	-1%
Charing Cross	33,508	33,298	-210	-1%
Russell Square	10,809	10,493	-316	-3%
Goodge Street	16,165	15,817	-348	-2%
Embankment	37,012	36,514	-498	-1%
St Pancras	15,663	15,060	-603	-4%
Lancaster Gate	3,394	2,740	-654	-19%
Tottenham Court Road	59,669	58,948	-721	-1%
Bank	80,317	79,555	-762	-1%
Baker Street	47,833	47,028	-805	-2%
Oxford Circus	102,910	101,915	-995	-1%
Marylebone	18,561	17,542	-1,019	-5%
King's Cross	70,038	68,319	-1,719	-2%
Paddington	79,460	57,865	-21,595	-27%
Sub-Total	1,405,650	1,382,095	-23,555	-2%
Total (all Zone 1)	2,004,050	1,981,097	-22,953	-1%

Station	2026 baseline	2026 HS2 Phase One	Absolute difference	Relative difference
Camden Town	24,217	24,049	-168	-1%
Mornington Crescent	4,853	4,744	-109	-2%
Ealing Broadway	20,800	21,184	384	2%

Impact of passenger flows

3.5.78 The impact of the revised scheme on NR services can be seen in Table 168 and in Figure 115 and Figure 116 for the AM and PM peak periods respectively, with the red bars representing an increase in demand and the green bars a decrease.

Table 168: 2026 Stage A, Phase One passenger flows (AM and PM peak periods) on NR

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2026 baseline	2026 HS2 Phase One	% difference	2026 baseline	2026 HS2 Phase One	% difference
Classic suburban	Inbound	23,720	22,243	-6%	5,677	5,214	-8%
	Outbound	4,483	3,927	-12%	24,679	20,628	-16%
Classic inter-city	Inbound	13,786	8,136	-41%	10,034	4,080	-59%
	Outbound	9,423	2,966	-69%	13,293	7,678	-42%
HS2 at Euston	Inbound	-	11,839	-	-	8,453	-
	Outbound	-	7,415	-	-	11,990	-
HS2 west of Old Oak Common	Inbound	-	16,104	-	-	11,531	-
	Outbound	-	11,795	-	-	16,671	-
GWML slow/Crossrail (baseline: Acton to Paddington) ("with HS2": Acton to OOC)	Eastbound	24,122	22,641	-6%	11,773	10,615	-10%
	Westbound	11,509	12,141	5%	24,446	26,780	10%
GWML fast (baseline: Acton to Paddington) ("with HS2": OOC to Paddington)	Eastbound	25,876	12,627	-51%	12,235	8,559	-30%
	Westbound	8,619	5,791	-33%	23,816	12,596	-47%
GWML slow (baseline: Acton to Paddington) ("with HS2": N/A)	Eastbound	6,417	-	-100%	3,289	-	-100%
	Westbound	2,408	-	-100%	3,841	-	-100%

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Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2026 baseline	2026 HS2 Phase One	% difference	2026 baseline	2026 HS2 Phase One	% difference
GWML slow/Crossrail (baseline: N/A) ("with HS2": OOC to Paddington)	Eastbound	-	39,848	-	-	17,684	-
	Westbound	-	17,848	-	-	40,318	-

Figure 115: 2026 Stage A, Phase One Impacts on NR - AM peak period (07:00 to 10:00)

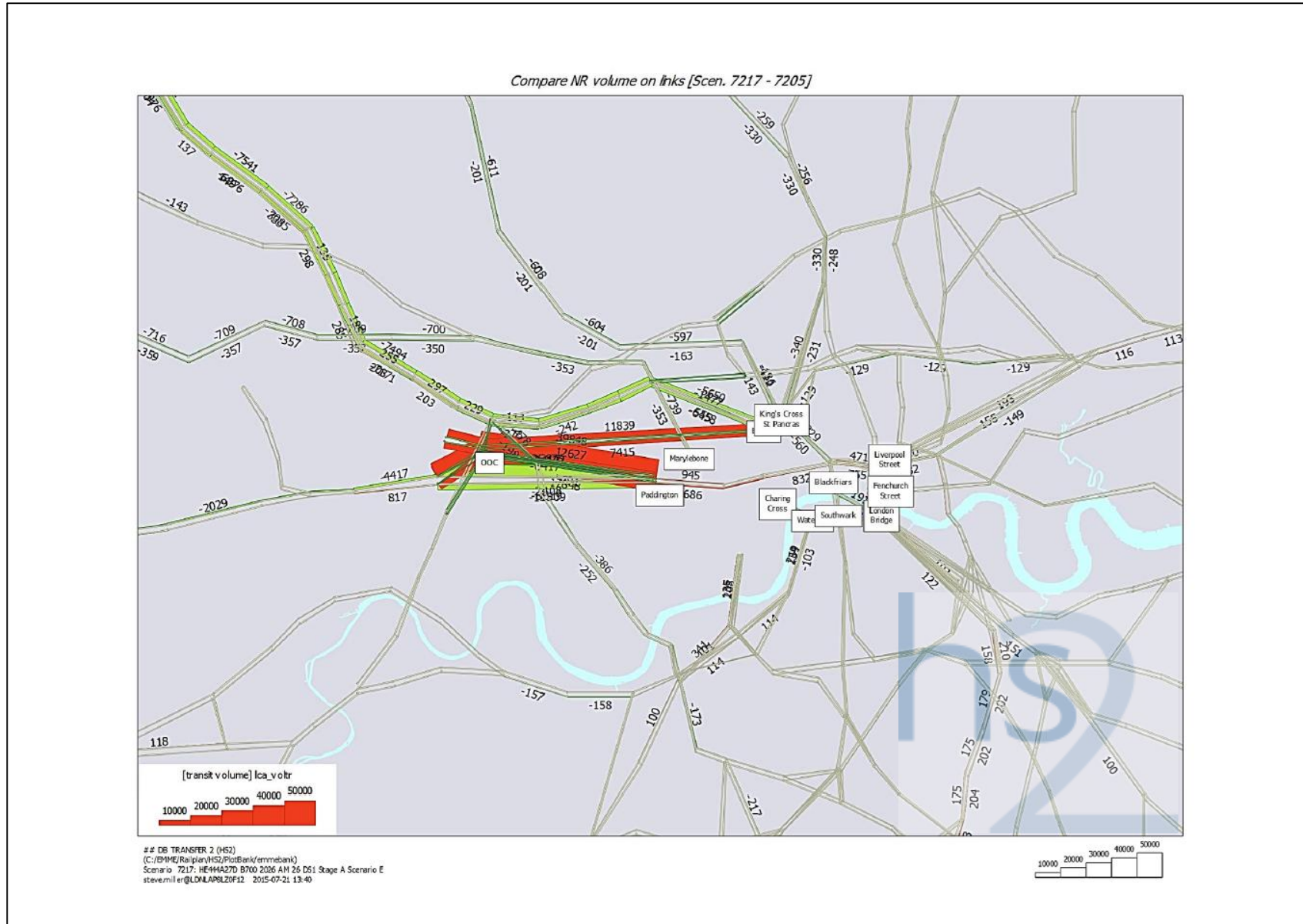
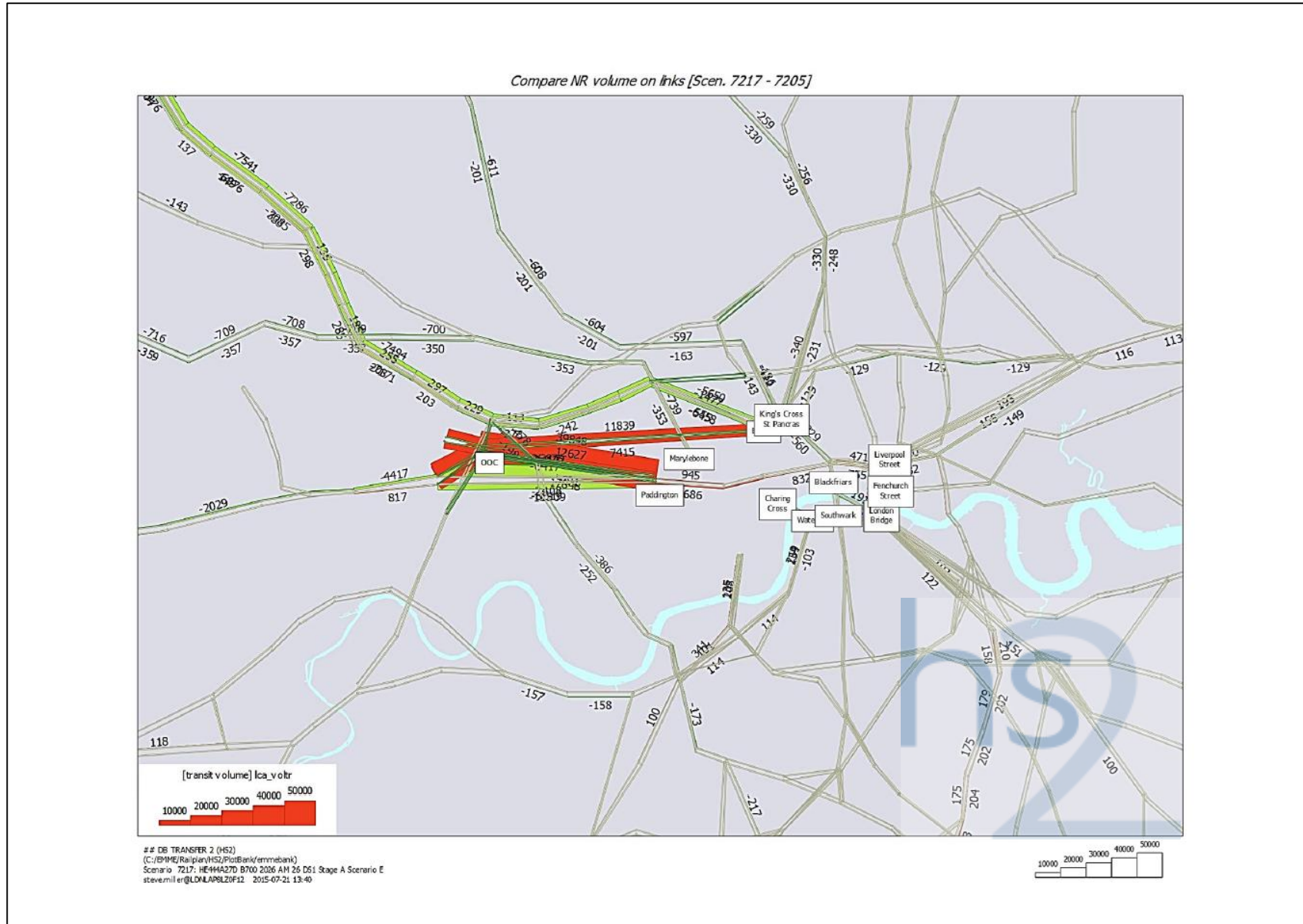


Figure 116: 2026 Stage A, Phase One Impacts on NR - PM peak period (16:00 to 19:00)



- 3.5.79 A feature of the pattern of the AM peak boarders and alighters at Old Oak Common is the level of interchange between Great West Mainline (GWML) (fast) eastbound services and GWML (slow) or Crossrail eastbound services. The attractiveness of this option results in increases in passenger flows on the GWML and Crossrail services between Old Oak Common and Paddington.
- 3.5.80 Figure 115 and Figure 116 show increased passenger loadings along the HS2 corridor with passenger transfer from the existing NR corridors occurring. The increases in passenger loadings into and out of Paddington station are also shown. This is directly associated with the interchange between GWML and Crossrail services at Old Oak Common.
- 3.5.81 The impact of the HS2 Phase One in 2026 on passenger flows to and from Euston station and Euston Square station for LU, and on Crossrail and London Overground (North London Line (NLL) and West London Line (WLL)) services are set out in and shown in Table 169 and Figure 117 and Figure 118 for the AM and PM peak periods respectively with the red bars represent an increase in demand while the green bars represent a decrease in demand.

Table 169: 2026 Stage A, Phase One passenger flows (AM and PM peak periods) underground

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2026 baseline	2026 HS2 Phase One	% difference	2026 baseline	2026 HS2 Phase One	% difference
Victoria line (north of Euston)	Northbound	24,869	24,934	0%	57,172	57,738	1%
	Southbound	63,201	63,300	0%	35,501	35,197	-1%
Victoria line (south of Euston)	Northbound	31,614	32,410	3%	71,742	70,098	-2%
	Southbound	70,204	70,476	0%	41,463	41,821	1%
Northern line Bank branch (North of Euston)	Northbound	20,913	21,128	1%	35,663	35,559	0%
	Southbound	41,199	41,228	0%	24,036	23,849	-1%
Northern line Bank branch (South of Euston)	Northbound	20,786	20,299	-2%	35,404	33,532	-5%
	Southbound	39,285	37,253	-5%	23,722	23,383	-1%
Northern line Charing Cross branch (north of Euston)	Northbound	14,518	14,384	-1%	35,397	35,750	1%
	Southbound	37,791	38,035	1%	22,482	22,420	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2026 baseline	2026 HS2 Phase One	% difference	2026 baseline	2026 HS2 Phase One	% difference
Northern line Charing Cross branch (south of Euston)	Northbound	13,818	13,833	0%	36,426	35,101	-4%
	Southbound	42,201	40,922	-3%	25,004	24,550	-2%
Metropolitan, H&C and Circle lines (west of Euston Square)	Eastbound	51,271	50,015	-2%	42,326	42,614	1%
	Westbound	39,951	40,476	1%	44,349	44,211	0%
Metropolitan, H&C and Circle lines (east of Euston Square)	Eastbound	50,540	52,505	4%	45,658	46,241	1%
	Westbound	44,875	44,919	0%	45,988	48,915	6%
Crossrail OOC to Paddington	Eastbound	24,122	39,848	65%	11,773	17,684	50%
	Westbound	11,509	17,848	55%	24,446	40,318	65%
Crossrail Paddington to Bond Street	Eastbound	47,520	48,465	2%	24,957	26,263	5%
	Westbound	21,745	24,431	12%	41,178	44,907	9%
Crossrail Bond Street to Tottenham Court Road	Northbound	43,445	43,461	0%	38,746	39,440	2%
	Southbound	29,951	31,497	5%	40,592	42,001	3%
NLL Acton to Willesden Junction	Northbound	2,122	2,217	4%	2,579	2,665	3%
	Southbound	1,848	1,845	0%	1,415	1,468	4%
WLL Shepherds Bush to Willesden Junction	Eastbound	1,126	1,191	6%	3,210	3,139	-2%
	Westbound	2,484	2,572	4%	674	633	-6%

Figure 117: 2026 Stage A, Phase One Impacts on LU - AM peak period (07:00 to 10:00)

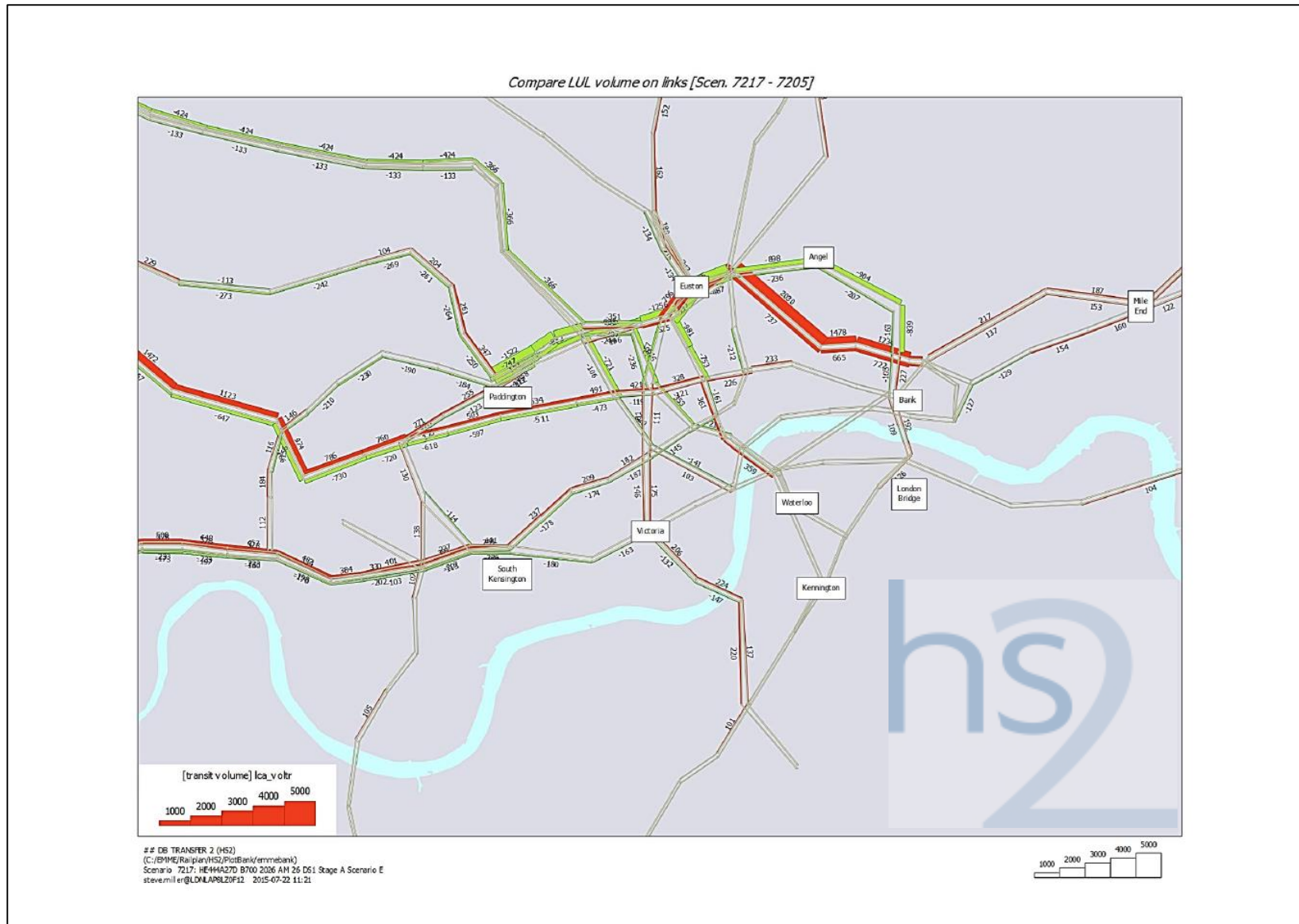
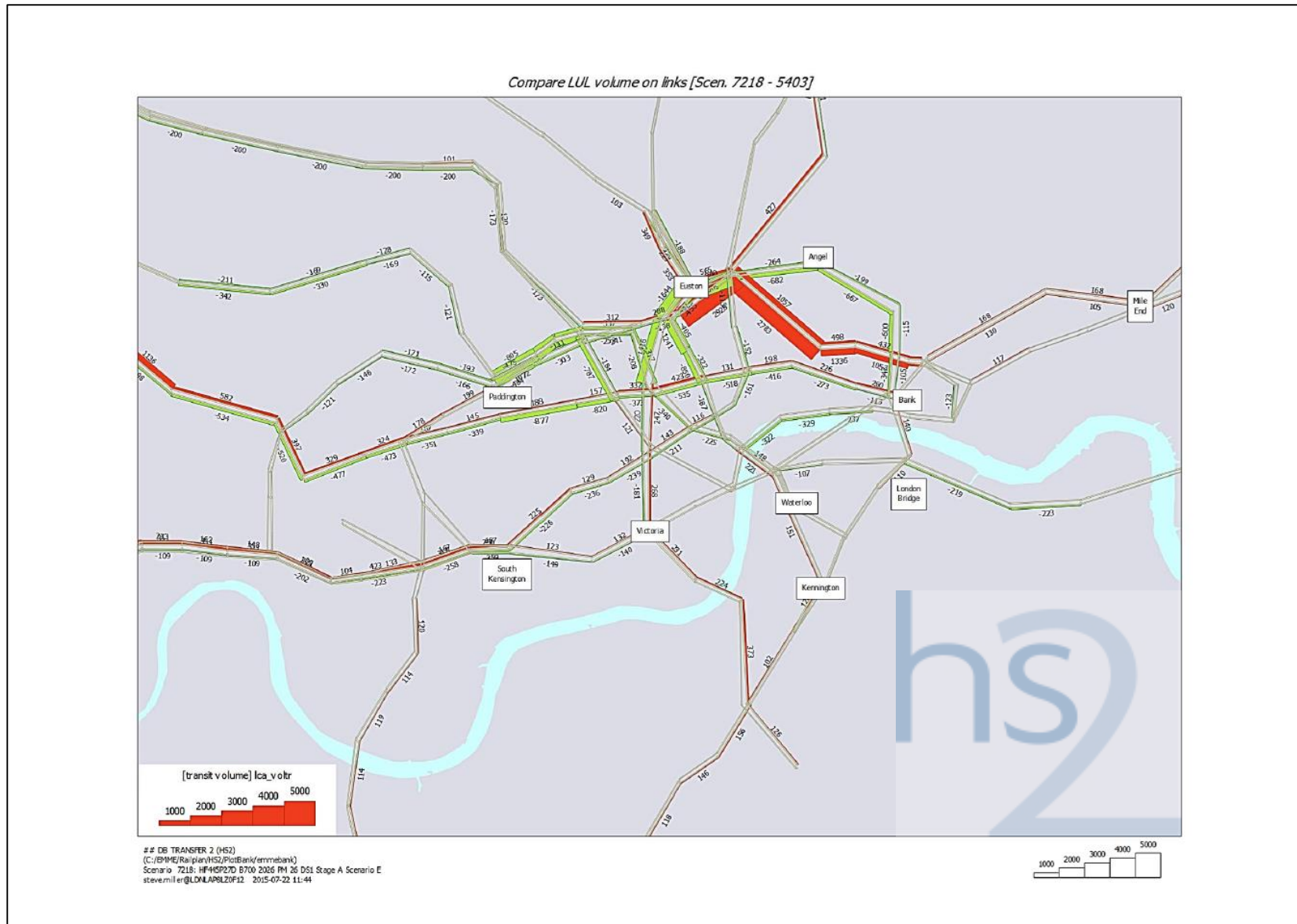


Figure 118: 2026 Stage A, Phase One Impacts on LU - PM peak period (16:00 to 19:00)



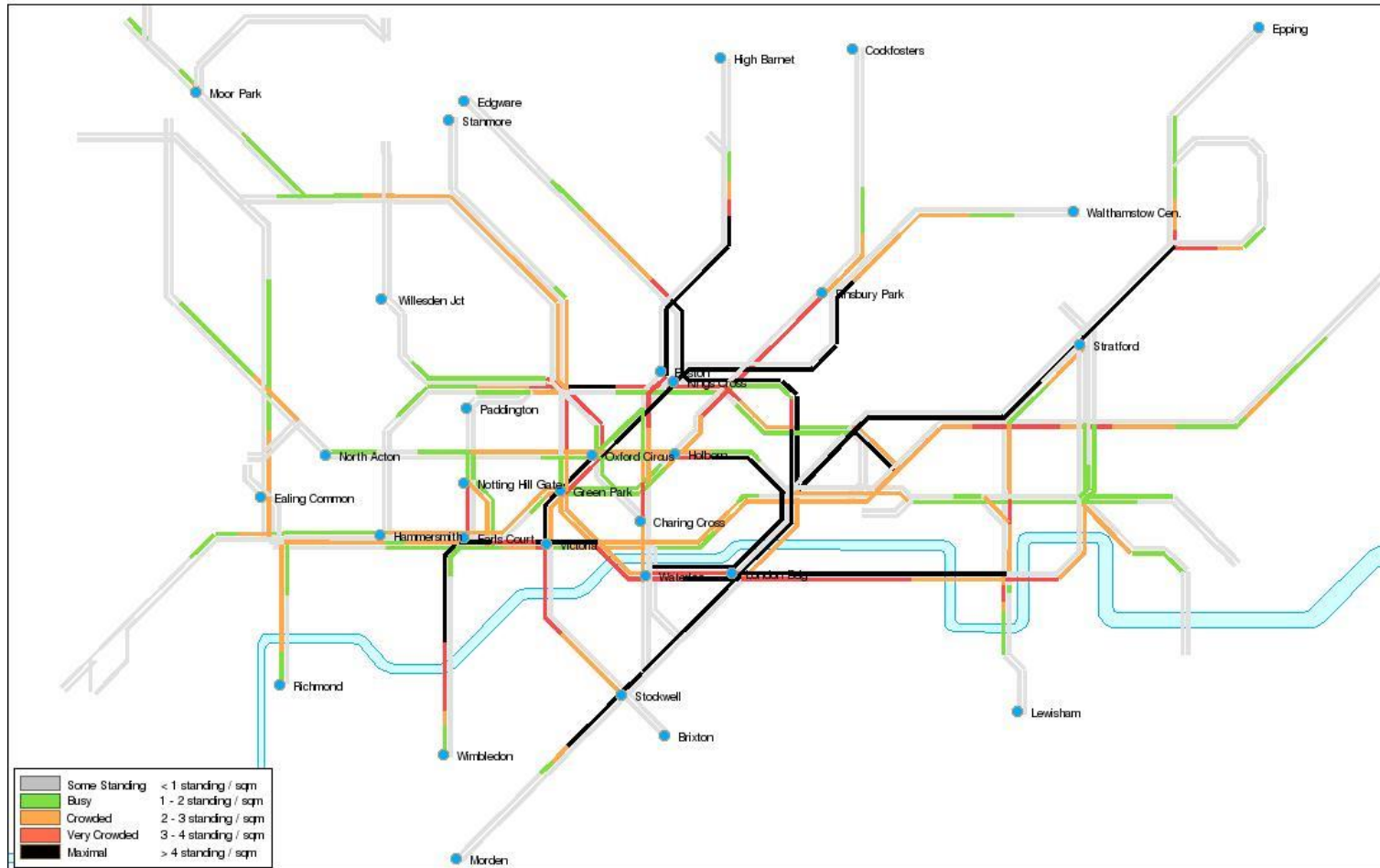
- 3.5.82 The increase in classic and HS2 boarders and alighters at Euston station with the revised scheme in 2026, results in small changes in LU passengers, as shown in Table 169. During the AM peak period, the change in LU flows is modest with most changes south of Euston station; however, these are generally less than 2% with the exception of the southbound Northern line (Bank branch) (south of Euston) (5% reduction) and Northern line (Charing Cross branch) (3% reduction). However, there is a substantial increase in LU flows to and from Euston Square, with an increase east of Euston Square of 1,965 passengers in the AM peak period in the eastbound direction and 2,930 passengers in the PM peak period in the westbound direction. This is supported by the flow increases which indicates the largest increases on the sub-surface lines (i.e. Circle, Metropolitan and Hammersmith & City lines) from Euston Square particularly as far as Moorgate where there is interchange onto the southbound Northern line (Bank branch). This is a result of crowding on the LU lines from Euston making the sub-surface lines (Metropolitan, Hammersmith & City and Circle lines) an attractive option. A more detailed description of crowding is presented later in this section.
- 3.5.83 Figure 117 and Figure 118 also show the secondary impact of the level of interchange available between the revised scheme and GWML and Crossrail services at Old Oak Common. The attractiveness of this option results in flow reductions on the sub-surface LU lines (Metropolitan, Circle and Hammersmith & City lines) from Paddington and, to a lesser extent, on the Central line, particularly between westbound between Oxford Circus and White City. This also accounts for the large increases in passenger demand on Crossrail services between Old Oak Common and Paddington.

Impact of crowding levels

- 3.5.84 Whilst the increase in passenger volumes on NR and LU services associated with the HS2 Phase One in 2026 have been discussed, it is important to also consider the impacts of the revised scheme on NR and LU service crowding. The impact of the revised scheme on crowding on NR and LU services has been assessed using TfL's post-model crowding processes within Railplan, with four passengers per square metre (PPSM) considered as a proxy for practical capacity.
- 3.5.85 Figure 119 to Figure 122 show AM peak period crowding on NR and LU during the 2026 future baseline and with HS2 Phase One at the network level. However, it should be noted that the fairly broad classification of crowding into PPSM categories means that there are limited changes from one crowding category to another.

Figure 119: LU crowding – 2026 future baseline AM peak period (07:00 to 10:00)

LUL and DLR Crowding
HE414A25D - 2026 AM Do-Minimum



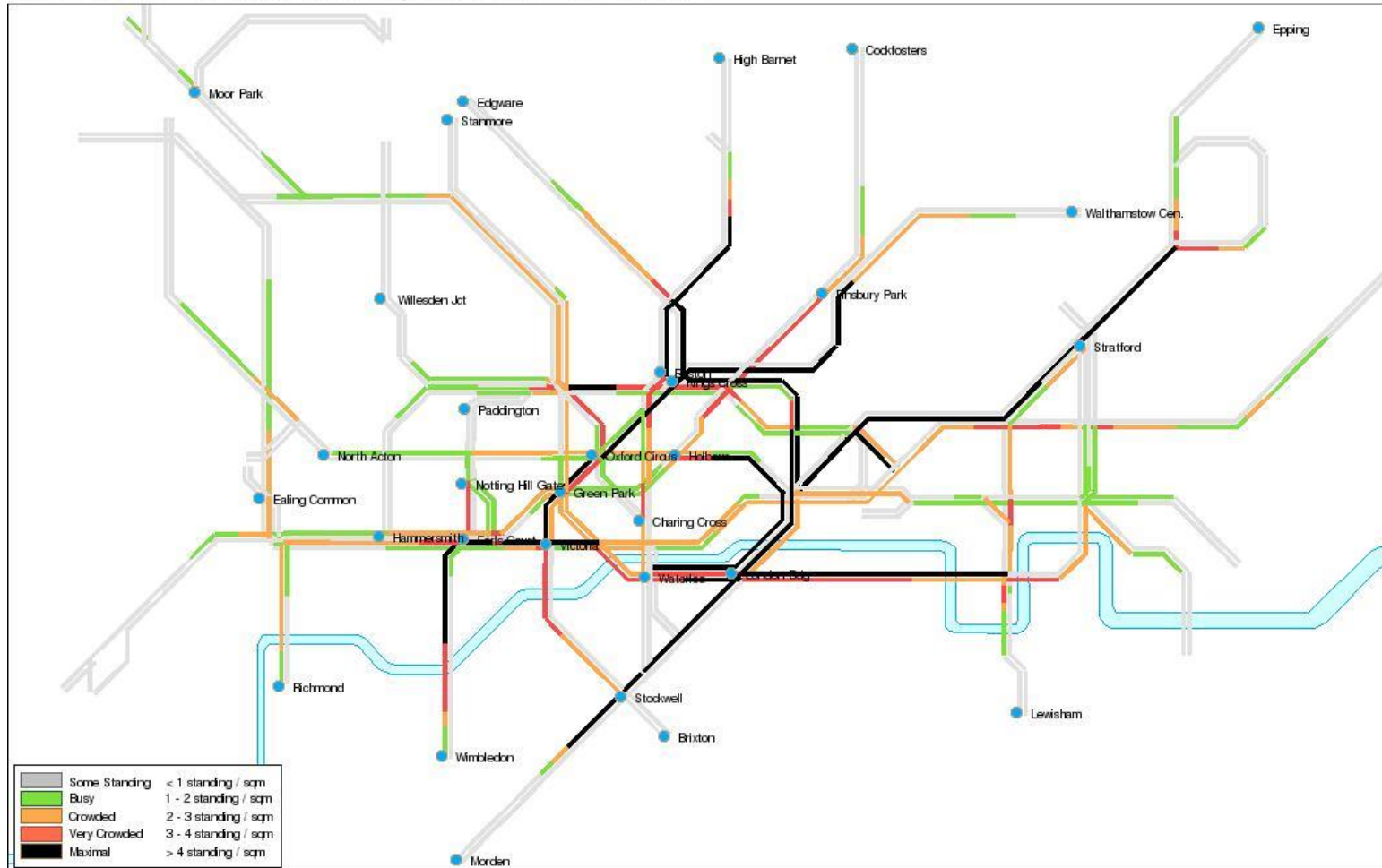
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 120: LU crowding – 2026 HS2 Phase One AM peak period (07:00 to 10:00)

LUL and DLR Crowding
HE444A27D - 2026 AM DS1 Stage A OOC Stub Scenario E



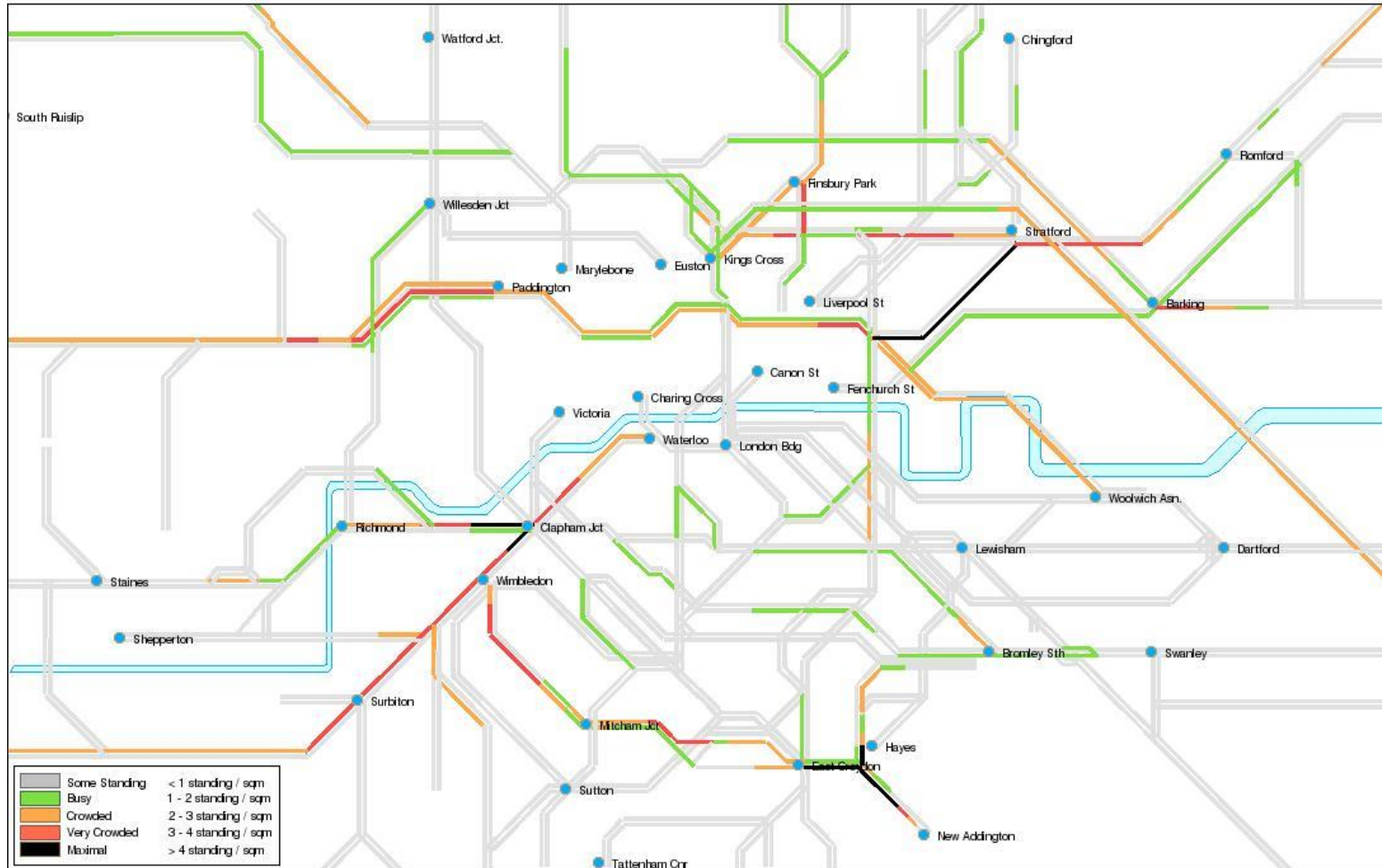
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pas/sqm
 - Includes reliability factor

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Figure 121: NR crowding - 2026 future baseline AM peak period (07:00 to 10:00)

National Rail and Tramlink Crowding
HE414A25D - 2026 AM Do-Minimum



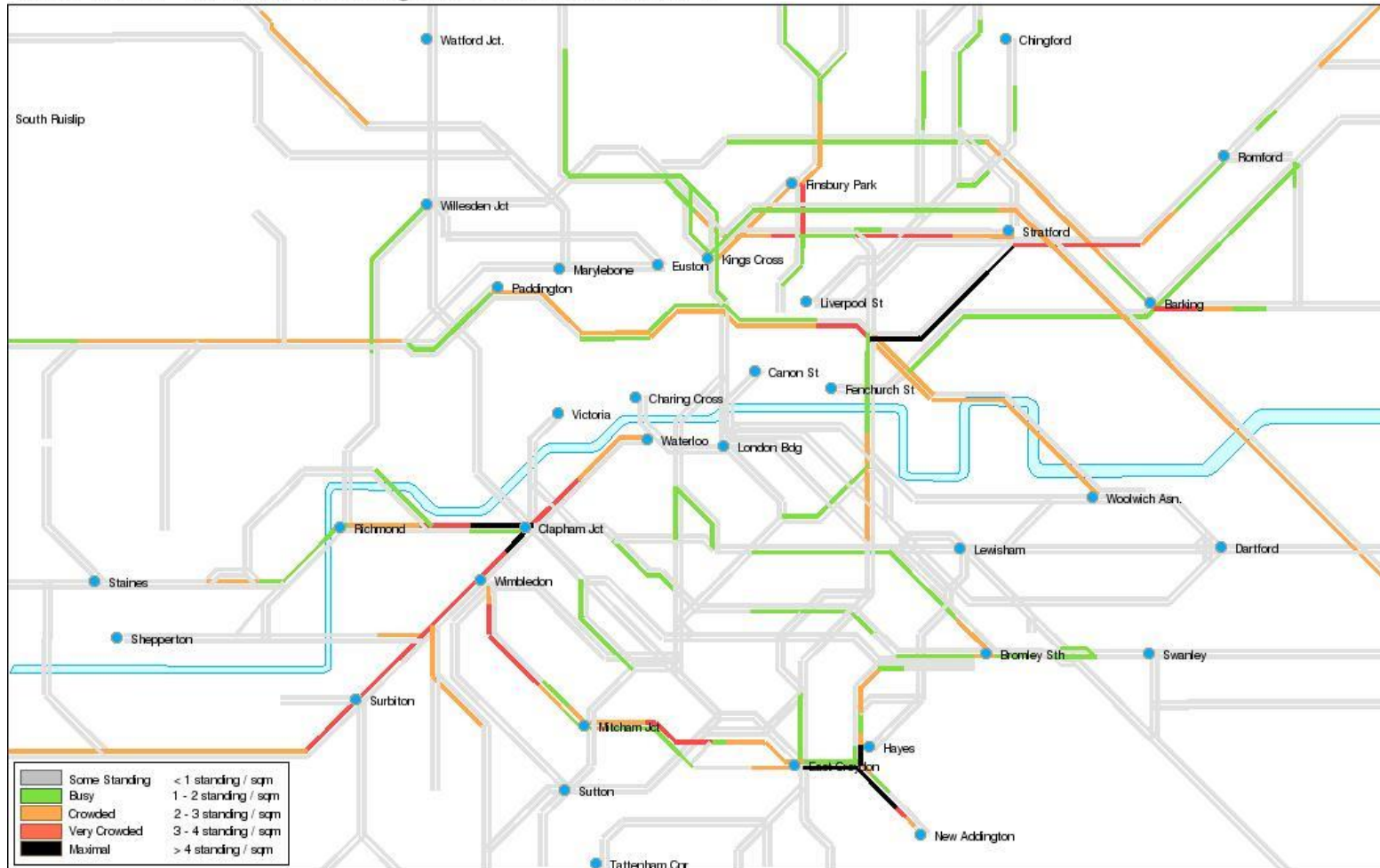
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 122: NR crowding - 2026 HS2 Phase One AM peak period (07:00 to 10:00)

National Rail and Tramlink Crowding
HE444A27D - 2026 AM DS1 Stage A OOC Stub Scenario E



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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3.5.86 The analysis shows:

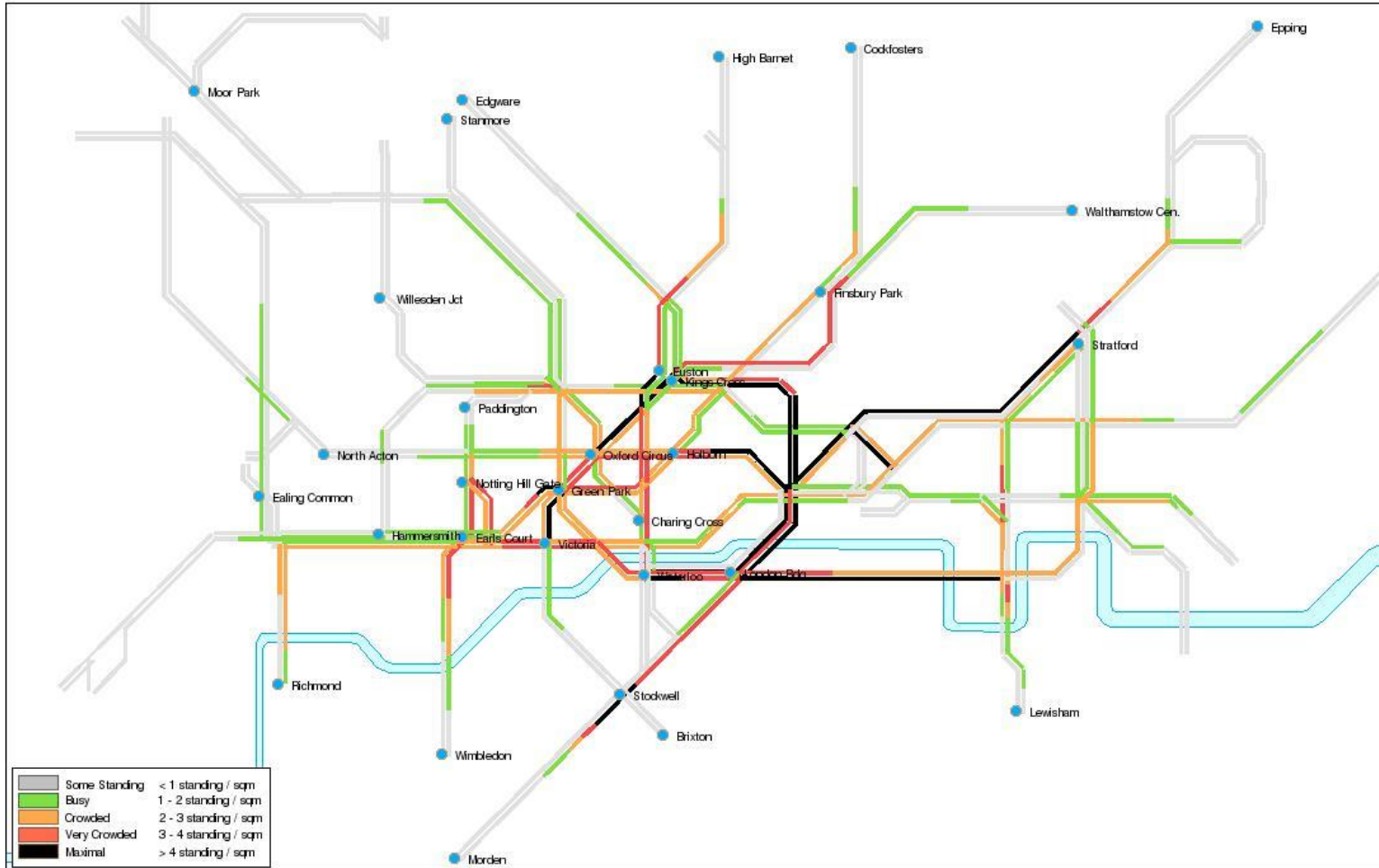
- a reduction in crowding on the Chiltern line between South Ruislip and Marylebone with a decrease from 1 - 2 PPSM to less than 1 PPSM;
- a reduction in crowding on GWML services into Paddington from greater than 3 - 4 PPSM to 2 - 3 PPSM.

3.5.87 The reductions in crowding are a positive impact of the revised scheme due to the level of interchange with HS services available with GWML and Crossrail services at Old Oak Common.

3.5.88 Figure 123 to Figure 126 show the PM peak period crowding on the NR and LU during the 2026 future baseline and with the revised scheme in 2026.

Figure 123: LU crowding – 2026 future baseline PM peak period (16:00 to 19:00)

LUL and DLR Crowding
 HF418P25D - 2026 PM Do-Minimum



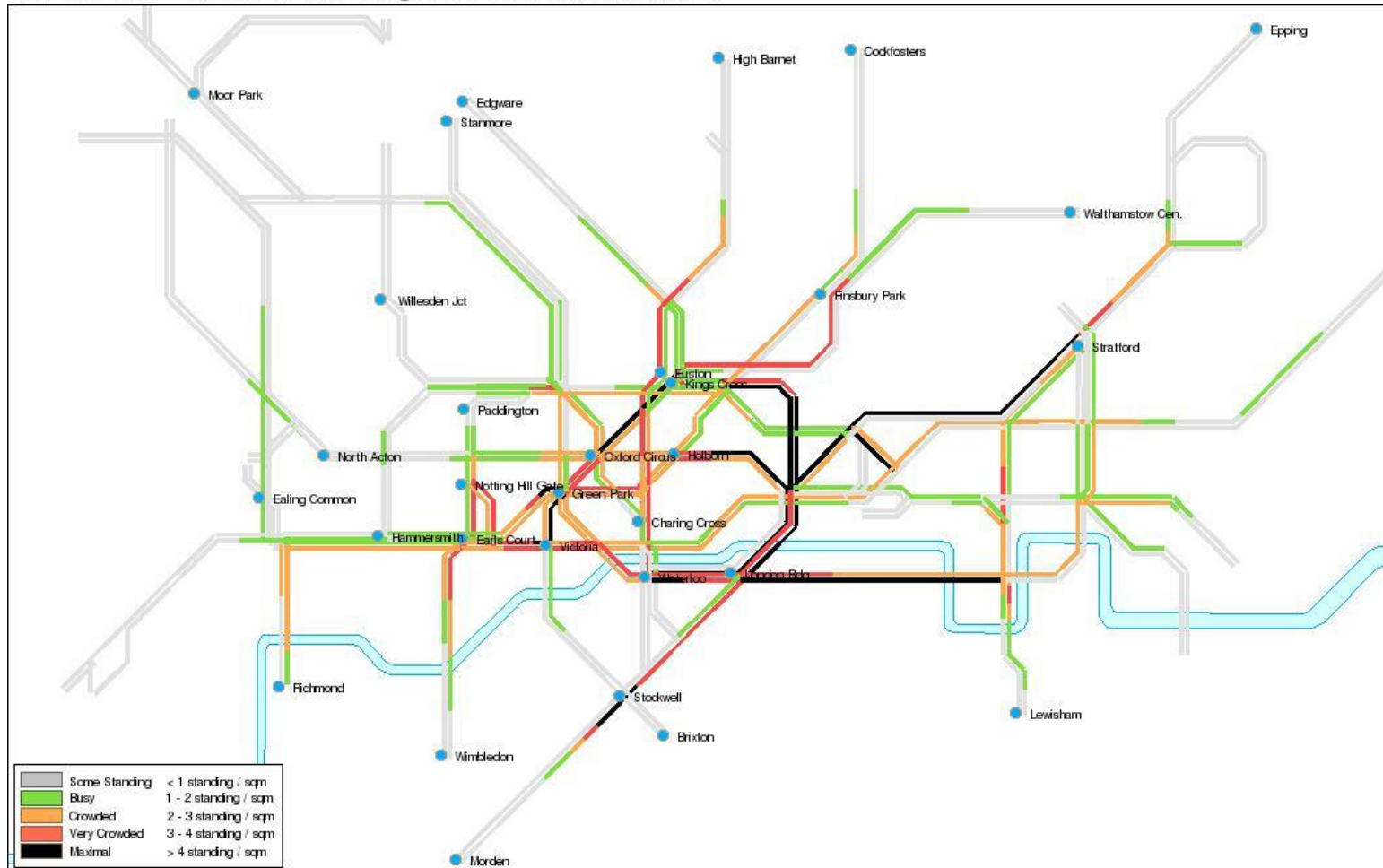
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 124: LU crowding – 2026 HS2 Phase One PM peak period (16:00 to 19:00)

LUL and DLR Crowding
 HF445P27D - 2026 PM DS1 Stage A OOC Stub Scenario E



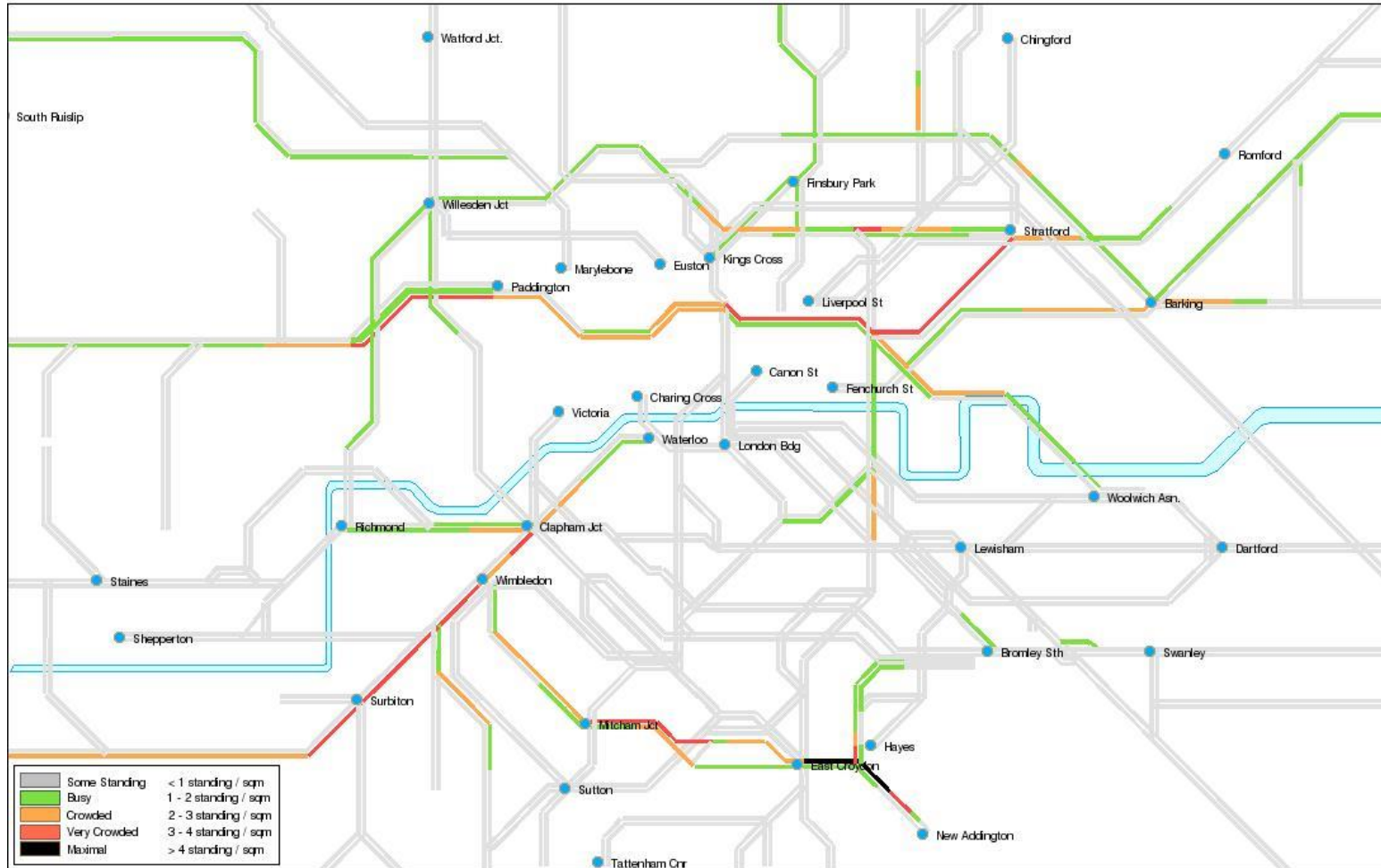
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 125: NR crowding - 2026 future baseline PM peak period (16:00 to 19:00)

National Rail and Tramlink Crowding
HF418P25D - 2026 PM Do-Minimum



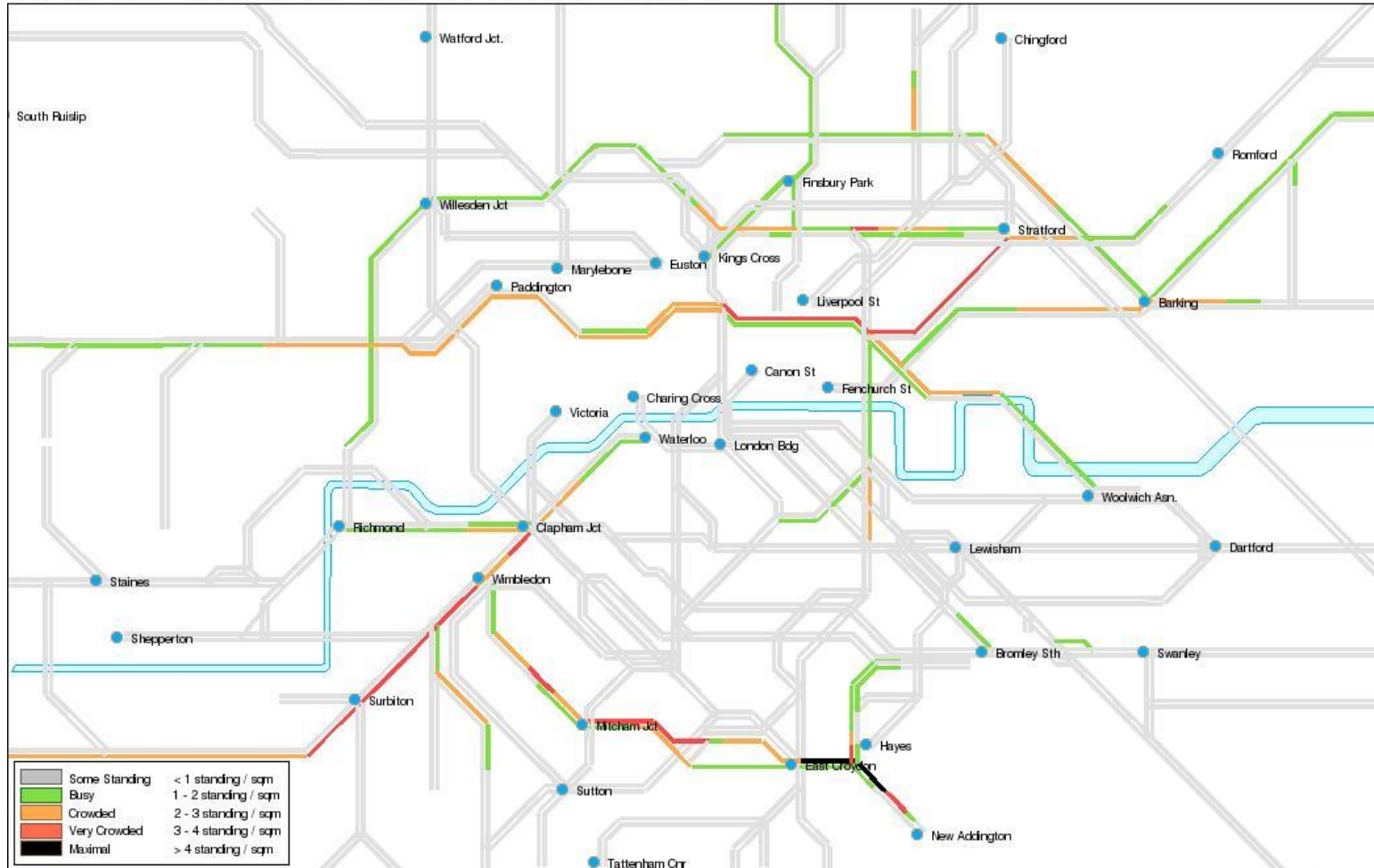
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 126: NR crowding - 2026 HS2 Phase One PM peak period (16:00 to 19:00)

National Rail and Tramlink Crowding
 HF445P27D - 2026 PM DS1 Stage A OOC Stub Scenario E



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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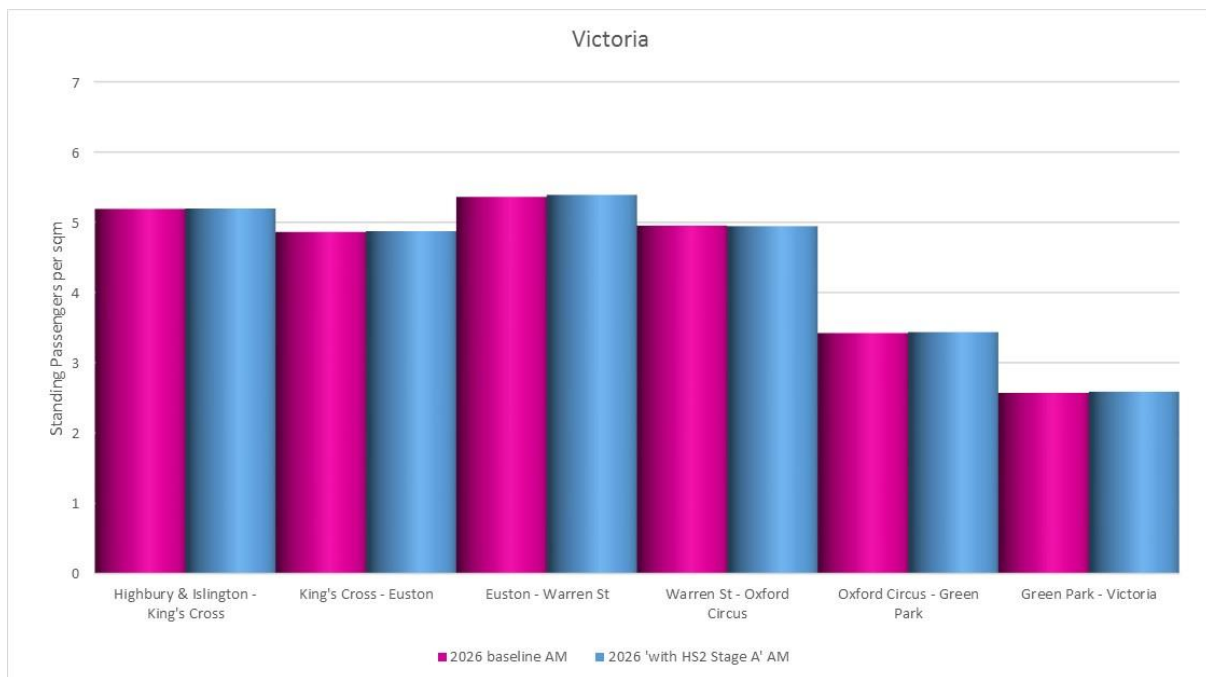
3.5.89 Changes in crowding during the PM peak period are similar to the AM peak and show:

- a reduction in crowding on the Chiltern line between South Ruislip and Marylebone with a decrease from 1 - 2 PPSM to less than 1 PPSM;
- a reduction in crowding on GWML services into Paddington; and
- an increase in crowding on the sub-surface lines between Euston Square and Barbican from >1 PPSM to 1 - 2 PPSM.

3.5.90 In order to assess the changes in crowding in more detail, a station to station analysis has been undertaken for the Northern line (Bank and Charing Cross branches), Victoria line, sub-surface (Metropolitan, Circle and Hammersmith & City) lines and the Piccadilly line which offers an alternative north-east to south-west route to the Victoria line. The analysis compared crowding for the 2026 future baseline with that of the 'with HS2' scenario and relates this to a practical capacity of 4 PPSM.

3.5.91 Figure 127 shows the station to station analysis on the Victoria Line in the southbound direction during the AM peak period.

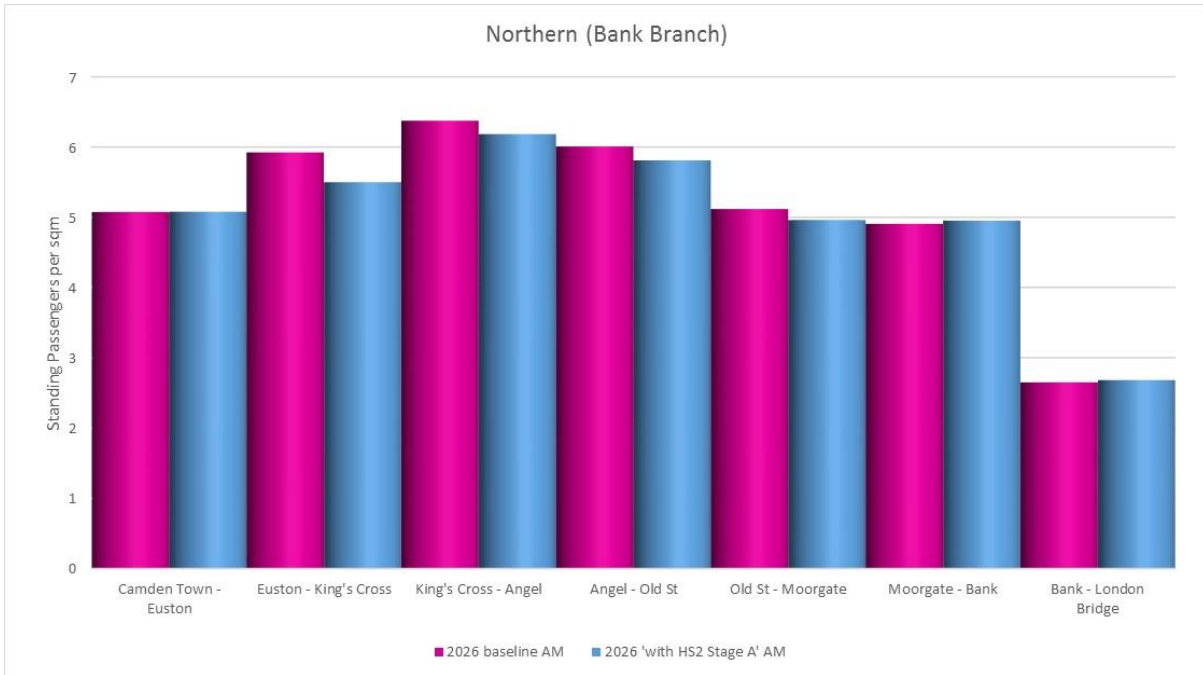
Figure 127: 2026 Phase One Victoria line southbound crowding per train - AM peak period (07:00 to 10:00)



3.5.92 During the AM peak period, crowding on certain sections of the Victoria line (Highbury & Islington to Oxford Circus) will be close to 5 PPSM during the 2026 future baseline scenario. The revised scheme has a negligible impact on crowding on the southbound Victoria line, given the high levels of crowding already experienced during the future baseline scenario.

3.5.93 Figure 128 shows the station to station analysis on the Northern line (Bank branch) in the southbound direction during the AM peak period. The analysis shows that crowding on the Northern line (Bank branch) is above 5 PPSM between Camden Town and Moorgate for the 2026 future baseline scenario.

Figure 128: 2026 Phase One Northern line (Bank branch) southbound crowding per train - AM peak period (07:00 to 10:00)



- 3.5.94 The impact of HS2 demand will result in very little additional crowding on the Northern line (Bank branch) due to the fact that trains are already crowded during the future baseline scenario. Crowding decreases from Euston southbound as far as Moorgate due to transfers to the sub-surface lines (Metropolitan, Circle and Hammersmith & City lines) where crowding with HS2 increases slightly.
- 3.5.95 For the Northern line (Charing Cross branch) and sub-surface lines, crowding levels are generally below 4PPSM with the exception of between Camden Town and Euston on the Northern line (Charing Cross branch) and between Baker Street and Great Portland Street on the sub-surface lines. This is shown in Figure 129 for the Northern line (Charing Cross branch) and Figure 130 for the sub-surface lines.
- 3.5.96 Most additional crowding attributable to the revised scheme occurs on the eastbound sub-surface lines between Euston Square and Moorgate, where crowding levels increase by approximately 0.2 PPSM. This is because these lines experience crowding levels of less than 4 PPSM during the 2026 future baseline and are, therefore, better able to absorb additional passengers. This is reflected in the large increase in additional passengers boarding at Euston Square in the HS2 Phase One scenario.

Figure 129: 2026 Phase One Northern Line (Charing Cross branch) southbound crowding per train - AM peak period (07:00:00)

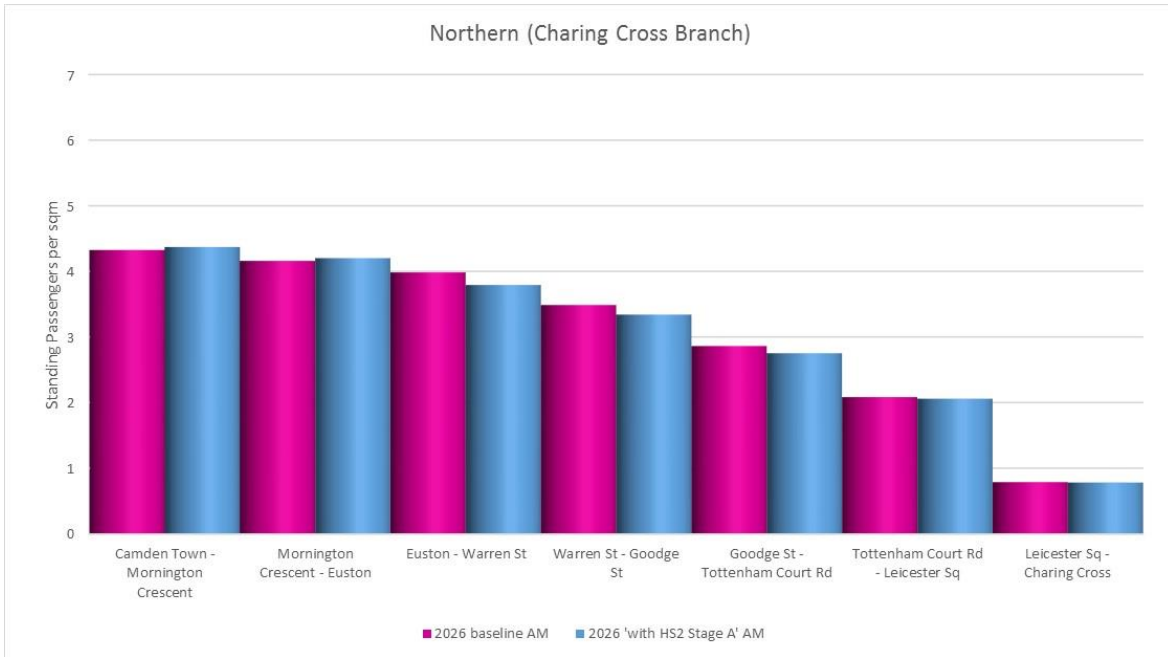
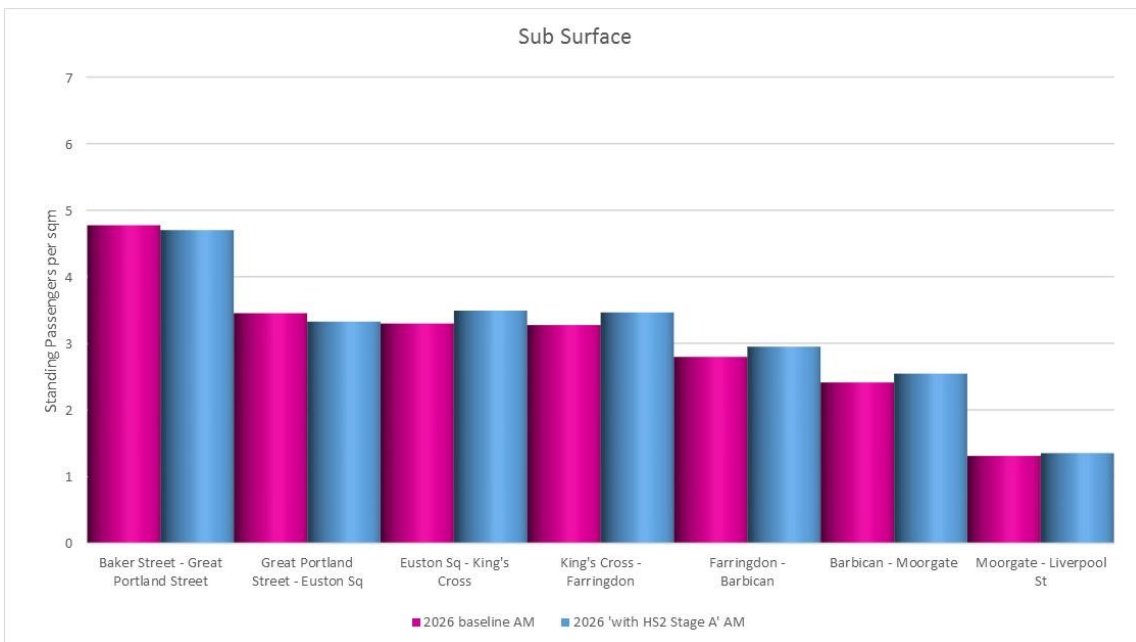
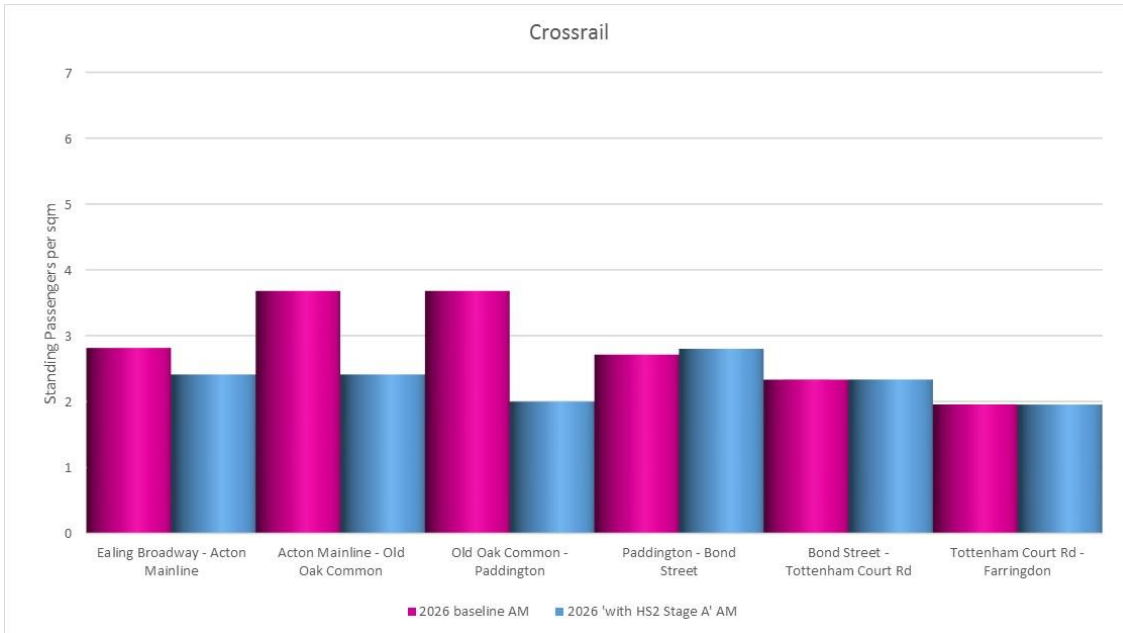


Figure 130: 2026 Phase One sub-surface lines eastbound crowding per train - AM peak period (07:00 to 10:00)



3.5.97 Crowding on Crossrail increases slightly between Paddington and Bond Street by around 0.1 PPSM as a result of additional passenger demand associated with the revised scheme boarding Crossrail at Old Oak Common. It should be noted that there is no additional crowding on Crossrail between Ealing Broadway and Paddington. In the future baseline, Crossrail runs directly between Acton Main Line and Paddington but with the revised scheme, Crossrail calls additionally at Old Oak Common. Moreover, the 12 Crossrail services starting at Paddington in the future baseline are extended back to start at Old Oak Common with the revised scheme. This additional capacity from Old Oak Common provided sufficient capacity to accommodate the additional passengers boarding Crossrail at Old Oak Common. Additional crowding is evident only as far as Bond Street.

Figure 131: 2026 Phase One Crossrail eastbound crowding per train - AM peak period (07:00 to 10:00)



3.5.98 For the PM peak period, crowding was assessed in the opposite direction to the AM peak period, reflecting the peak crowded movements. The pattern is very similar to the AM peak period. 2026 future baseline crowding levels are generally lower than during the AM peak although the Northern line (Bank branch) is above 4 PPSM between Bank and King's Cross. Despite this, and in common with the AM peak period, the revised scheme adds most additional crowding to the eastbound sub-surface lines between Farringdon and Euston Square, where crowding increases by around 0.3 PPSM. As with the AM peak period, the sub-surface lines are those with the lowest level of 2026 future baseline crowding, consistently below 3 PPSM and, therefore, have spare capacity to absorb additional passengers.

3.5.99 For all other lines, crowding shows a small reduction with the revised scheme in operation, with the exception of a small increase in crowding of 0.05 PPSM on the Northern line (Charing Cross branch) between Euston and Camden Town.

Rail network HS2 Stage A Phase One (2041)

3.5.100 This section sets out the assessment of the HS2 Phase One operation in 2041.

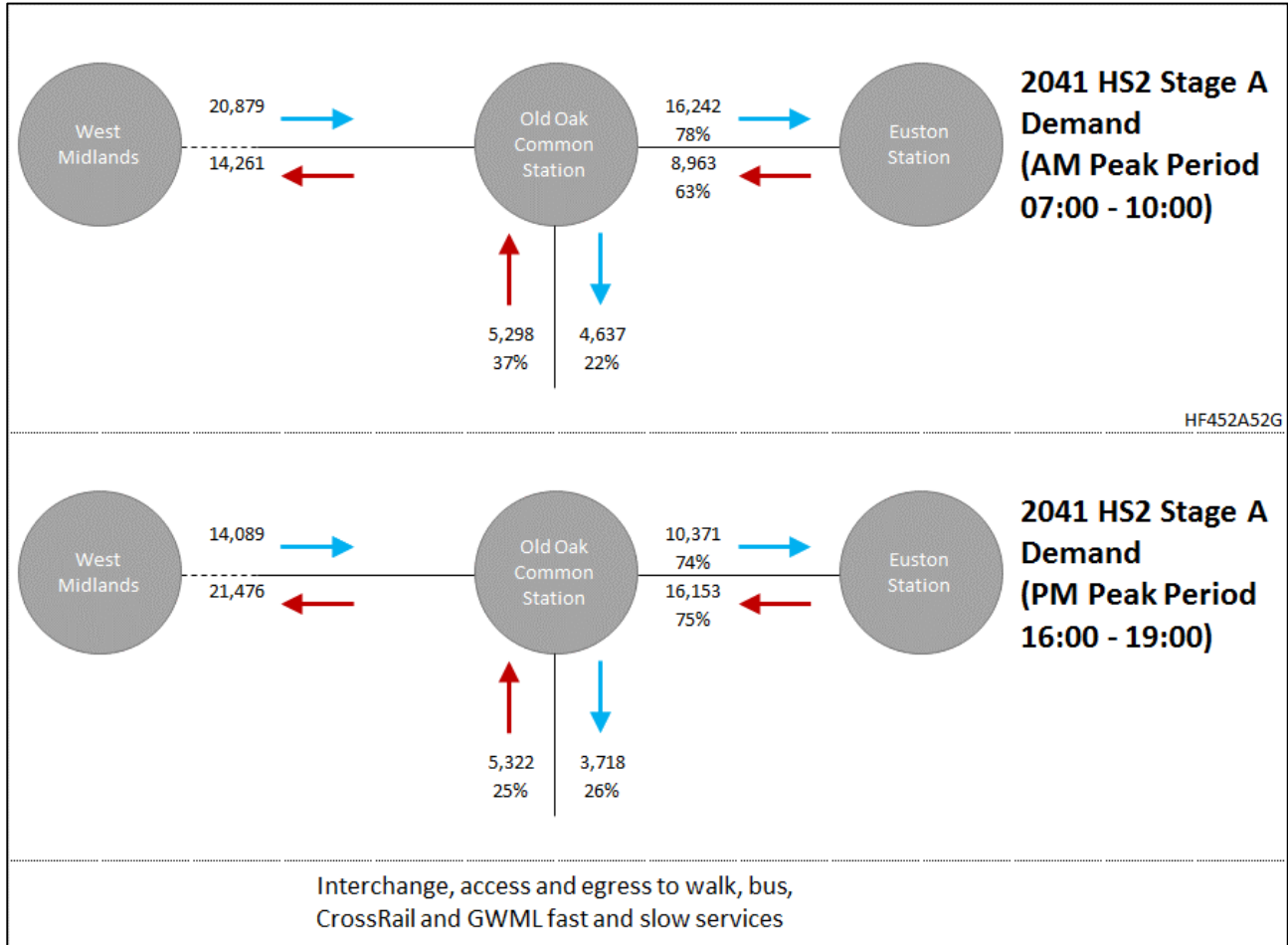
3.5.101 The impacts of the HS2 Phase One in 2041 were assessed by comparing:

- 2041 future baseline Railplan outputs; and
- HS2 Phase One 2041 Railplan outputs.

3.5.102 Line flows on HS2 services in 2041 into Old Oak Common and Euston station are shown in Figure 132. Flows in the peak direction, into Euston in the AM peak period and from Euston in the PM peak period are approximately 16,240 and 16,150 respectively. Examination of interchanging at Old Oak Common indicates that in the AM peak period, 22% of passengers from the West Midlands alight at Old Oak Common with 78% continuing on to Euston station. The majority of passengers alighting at Old Oak Common are forecast to be interchanging passengers, with few passengers entering or exiting the station. In the counter peak direction, around 63% of HS2 passengers board at Euston with 37% boarding at Old Oak Common.

3.5.103 In the PM peak period, around 75% of HS2 passengers board at Euston, with 25% boarding at Old Oak Common. In the counter peak direction, around 26% of passengers from the West Midlands alight at Old Oak Common with 74% continuing on to Euston.

Figure 132: HS2 line flows 2041 Stage A, HS2 Phase One



Euston and Old Oak Comment station demand

3.5.104 Station usage has been examined to assess the impact of the revised scheme on Euston station. Table 170 summarises the AM peak period station demand for Euston for 2041 Phase One for both the 2041 future baseline and 'with HS2' scenarios. This indicates a decrease or transfer in rail arrivals and departures on InterCity services for the HS2 Phase One scenario of around 15,330 passengers and on suburban arrivals and departures of around 1,755 passengers. Overall, including HS2, arrivals in the AM peak period increase by around 8,120 (17% increase) and departures by around 660 (4% increase).

Table 170: 2041 Hs2 Stage A, Phase One AM peak period (07:00 to 10:00) NR demand

Description	2041 baseline			2041 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (departing)	6,100	-	6,100	5,010	-	5,010
Euston suburban (arriving)	-	27,130	27,130	-	26,470	26,470

Description	2041 baseline			2041 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston Intercity (departing)	11,310	-	11,310	4,100	-	4,100
Euston Intercity/other (arriving)	-	16,880	16,880	-	8,750	8,750
Euston HS2 (departing)	-	-	0	8,960	-	8,960
Euston HS2 (arriving)	-	-	0	-	16,240	16,240
Sub-total: Euston NR	17,410	44,020	61,430	18,070	51,470	69,540
Old Oak Common (OOC)						
OOC NR (departing slow services)	-	-	-	1,400	7,855	9,255
OOC NR Slow (arriving slow services)	-	-	-	21,265	3,235	24,500
OOC NR (departing fast services)	-	-	-	6,153	0	6,153
OOC NR (arriving fast services)	-	-	-	-	17,280	17,280
OOC HS2 (arriving)	-	-	-	5,300	-	5,300
OOC HS2 (departing)	-	-	-	-	4,640	4,640
Sub-total: OOC	-	-	-	34,115	33,010	67,125

3.5.105 The equivalent PM peak period analysis is set out in Table 171. This indicates a transfer of demand from rail arrivals and departures on InterCity services to HS2 services for HS2 Phase One in 2026 of around 14,440 passengers, a decrease in suburban arrivals and departures of around 5,480 passengers. Overall, including HS2, arrivals in the PM peak period increase by around 2,610 (13% increase) and departures by around 4,060 (9% increase).

Table 171: 2041 HS2 Stage A, Phase One PM peak period (16:00 to 19:00) NR demand

Description	2041 baseline			2041 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (departing)	27,905	-	27,905	23,290	-	23,290
Euston suburban (arriving)	-	7,630	7,630	-	6,770	6,770
Euston Intercity (departing)	17,010	-	17,010	9,540	-	9,540
Euston Intercity/other (arriving)	-	12,529	12,520	-	5,610	5,610
Euston HS2 (departing)	-	-	0	16,150	-	16,150

Description	2041 baseline			2041 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston HS2 (arriving)	-	-	0	-	10,370	10,370
Sub-total: Euston NR	44,929	20,150	65,070	48,980	22,760	71,730
Old Oak Common (OOC)						
OOC NR (departing slow services)	-	-	-	1,985	15,320	17,305
OOC NR Slow (arriving slow services)	-	-	-	10,275	1,885	12,160
OOC NR (departing fast services)	-	-	-	12,710	0	12,710
OOC NR (arriving fast services)	-	-	-	-	8,020	8,025
OOC HS2 (arriving)	-	-	-	5,320	-	5,320
OOC HS2 (departing)	-	-	-	-	3,720	3,720
Sub-total: OOC	-	-	-	30,290	28,945	59,240

Underground station demand

3.5.106 Station usage has been examined to assess the impact of the HS2 Phase One revised scheme in 2041 on Euston and Euston Square LU stations. Table 172 and Table 173 summarise the AM peak period and PM peak period station demand for Euston in 2041, for both the future baseline and 'with HS2' scenarios respectively.

Table 172: 2041 Stage A, HS2 Phase One AM peak period (07:00 to 10:00) LU demand

Description	2041 baseline			2041 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston LU						
Northern line Charing Cross branch (northbound)	2,985	2,570	5,560	2,985	3,175	6,160
Northern line Charing Cross branch (southbound)	7,420	2,600	10,020	6,830	3,150	9,980
Northern line Bank branch (northbound)	5,075	5,090	10,165	5,600	4,665	10,265
Northern line Bank branch (southbound)	8,410	10,345	18,755	6,810	10,750	17,560
Victoria line (northbound)	4,145	11,865	16,010	4,470	12,380	16,850
Victoria line (southbound)	15,270	7,196	22,460	15,430	7,500	22,930
Sub-total: Euston LU	43,300	39,670	82,970	42,120	41,620	83,740

Description	2041 baseline			2041 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston Square LU						
Metropolitan line (northbound/westbound)	2,790	8,190	10,980	5,005	9,915	14,920
Metropolitan line (southbound/eastbound)	6,600	6,800	13,400	11,990	7,980	19,970
Sub-total: Euston Square LU	9,395	14,985	24,380	17,000	17,890	34,890

Table 173: 2041 Stage A, HS2 Phase One PM peak period (16:00 to 19:00) LU demand

Description	2041 baseline			2041 HS2 Phase One		
	Board	Alight	Total	Board	Alight	Total
Euston LU						
Northern line Charing Cross branch (northbound)	2,870	4,175	7,047	4,610	4,800	9,410
Northern line Charing Cross branch (southbound)	5,945	2,525	8,470	6,210	3,110	9,320
Northern line Bank branch (northbound)	10,030	10,220	20,246	9,290	7,820	17,110
Northern line Bank branch (southbound)	5,775	5,720	11,497	4,970	5,580	10,545
Victoria line (northbound)	4,950	21,110	26,059	5,270	19,070	24,340
Victoria line (southbound)	11,425	4,445	15,871	11,330	4,560	15,890
Sub-total: Euston LU	40,995	48,195	89,190	41,680	44,940	86,615
Euston Square LU						
Metropolitan line (northbound/westbound)	4,690	7,200	11,890	6,307	13,470	19,775
Metropolitan line (southbound/eastbound)	6,540	2,800	9,340	9,903	5,555	15,460
Sub-total: Euston Square LU	11,230	10,000	21,230	16,210	19,025	35,235

- 3.5.107 The increase in boarders and alighters at Euston with the revised scheme results in an increase in LU passengers. During the AM peak period, the change in LU boarders and alighters is modest with small changes on the Northern Line Charing Cross branch Line, Bank branch and Victoria Line; the total change in AM peak boarders and alighters at Euston LU station is 770 passengers. However, there is a substantial increase in boarders and alighters at Euston Square with an increase of 3,940 passengers in the westbound direction and 6,570 passengers in the eastbound direction. This accounts for passengers travelling eastbound from Euston Square particularly as an alternative to the Northern Line (Bank branch). The new link from the Euston station to Euston Square station will facilitate this movement.
- 3.5.108 During the PM peak the changes are greater with a decrease on the northbound Northern Line Bank branch and northbound Victoria Line leading to a net reduction on all lines of around 2,575 passengers (3%). As with the AM peak, there are large

increases at Euston Square, with an increase of 7,885 passengers in the westbound direction and 6,120 passengers in the eastbound direction.

Impact on Zone 1 stations

3.5.109 Table 174 shows the impact of the revised scheme during the AM peak period on stations within (fare) Zone 1, together with Camden Town, Mornington Crescent and Ealing Broadway stations. Any station within Zone 1 with a change of less than +/- 100 passengers has been excluded from Table 174.

Table 174: 2041 Stage A, HS2 Phase One access, egress and interchange trips at Zone 1 LU stations - AM peak period (07:00 to 10:00)

Station	2041 baseline	2041 HS2 Phase One	Absolute difference	Relative difference
Euston (including Euston Square)	113,656	119,021	5,365	5%
Euston	89,273	99,373	10,100	11%
Euston Square	24,383	19,648	-4,735	-19%
Liverpool Street	138,485	139,725	1,240	1%
Farringdon	91,018	92,029	1,011	1%
Bond Street	47,185	47,944	759	2%
Barbican	13,400	13,953	553	4%
Victoria	156,101	156,458	357	0%
Edgware Road (Hammersmith & City and Circle lines)	9,760	10,108	348	4%
Waterloo	183,551	183,881	330	0%
Cannon Street	33,570	33,825	255	1%
Bank	102,492	102,720	228	0%
St. James' Park	24,549	24,768	219	1%
South Kensington	24,296	24,502	206	1%
Embankment	29,913	30,098	185	1%
Notting Hill Gate	13,032	13,204	172	1%
Baker Street	48,421	48,573	152	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Station	2041 baseline	2041 HS2 Phase One Phase One	Absolute difference	Relative difference
Angel	22,612	22,756	144	1%
Aldgate	20,413	20,551	138	1%
Moorgate	35,573	35,709	136	0%
Blackfriars	38,867	39,000	133	0%
Fenchurch Street	32,023	32,137	114	0%
Marble Arch	6,390	6,501	111	2%
Aldgate East	14,690	14,586	-104	-1%
Holborn	29,709	29,594	-115	0%
Charing Cross	43,302	43,179	-123	0%
Pimlico	11,096	10,968	-128	-1%
Elephant & Castle	31,601	31,473	-128	0%
Chancery Lane	15,548	15,419	-129	-1%
Regent's Park	5,599	5,463	-136	-2%
Oxford Circus	114,466	114,300	-166	0%
London Bridge	159,491	159,307	-184	0%
Russell Square	8,167	7,978	-189	-2%
Goodge Street	16,087	15,842	-245	-2%
Piccadilly Circus	20,083	19,775	-308	-2%
Lancaster Gate	3,518	3,124	-394	-11%
St Pancras	27,598	27,034	-564	-2%
Leicester Square	24,653	24,070	-583	-2%
Marylebone	20,246	19,292	-954	-5%
Warren Street	29,168	27,774	-1,394	-5%

Station	2041 baseline	2041 HS2 Phase One	Absolute difference	Relative difference
Tottenham Court Road	52,821	50,784	-2,037	-4%
King's Cross	83,840	81,031	-2,809	-3%
Paddington	92,174	66,068	-26,106	-28%
Sub-Total	1,989,160	1,964,680	-24,480	-1%
Total (all Zone 1)	2,287,412	2,263,263	-24,149	-1%
Camden Town	18,598	18,536	-62	0%
Mornington Crescent	3,801	3,789	-12	0%

- 3.5.110 The largest increase in absolute and percentage terms in the AM peak period is at Euston station, where station activity increases by just over 10,100 passengers, an increase of 11%.
- 3.5.111 The impacts on other Zone 1 stations are relatively small, with the exception of some Crossrail stations with increases in activity at Liverpool Street, Farringdon, Bond Street and Ealing Broadway. This is a function of Crossrail offering improved distribution and connections linking with HS2 Phase One services at Old Oak Common.
- 3.5.112 The revised scheme will also result in a number of positive impacts at some Zone 1 stations, with reductions in passenger demand. The largest decrease is at Paddington (26,100 passengers or 28%), due to the interchange at Old Oak Common onto Crossrail services. In effect, these are passengers who, in the 2026 future baseline, would have interchanged between GWML (fast) services and Crossrail at Paddington. However, with HS2 Phase One, these passengers make the same interchange earlier at Old Oak Common.
- 3.5.113 Outside Zone 1, Ealing Broadway has a reasonable increase in activity of 1,180 passengers as it offers good connections to Old Oak Common and the revised scheme. Total activity at all Zone 1 stations decreases by approximately 1%.
- 3.5.114 A similar pattern is evident for the PM peak period, as shown in Table 175, similar increase of passengers at Euston (4,690 or 4%), and a reduction of 22,880 (28%) at Paddington. This reduction at Paddington in the PM peak may be moderated by the attraction of the wider range of amenities available to waiting passengers at Paddington in comparison to Old Oak Common. Crossrail stations experience an increase in station activity for those reasons set out for the AM peak period.

Table 175: 2041 Stage A, HS2 Phase One access, egress and interchange trips at Zone 1 LU stations - PM peak period (16:00 to 19:00)

Station	2041 baseline	2041 HS2 Phase One	Absolute difference	Relative difference
Euston (including Euston Square)	114,388	119,078	4,690	4%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Station	2041 baseline	2041 HS2 Phase One	Absolute difference	Relative difference
Euston	93,162	95,026	1,864	2%
Euston Square	21,226	24,052	2,826	13%
Farringdon	80,086	82,773	2,687	3%
Bond Street	69,835	71,628	1,793	3%
Liverpool Street	117,388	118,493	1,105	1%
Barbican	14,494	14,852	358	2%
Edgware Road (Hammersmith & City and Circle lines)	11,339	11,649	310	3%
Aldgate	26,336	26,622	286	1%
Blackfriars	33,662	33,939	277	1%
Baker Street	54,150	54,322	172	0%
Pimlico	14,759	14,879	120	1%
Tower Hill	25,602	25,721	119	0%
Regent's Park	7,026	7,143	117	2%
Elephant & Castle	30,468	30,366	-102	0%
Westminster	29,266	29,153	-113	0%
Mansion House	9,106	8,963	-143	-2%
Temple	15,720	15,529	-191	-1%
Saint Paul's	5,287	5,091	-196	-4%
Goodge Street	17,151	16,946	-205	-1%
Warren Street	19,203	18,923	-280	-1%
Russell Square	11,908	11,571	-337	-3%
Waterloo	182,375	181,960	-415	0%
Victoria	141,190	140,751	-439	0%

Station	2041 baseline	2041 HS2 Phase One	Absolute difference	Relative difference
London Bridge	134,479	134,034	-445	0%
Embankment	39,595	39,109	-486	-1%
Lancaster Gate	3,817	3,205	-612	-16%
Bank	101,429	100,791	-638	-1%
St Pancras	19,539	18,882	-657	-3%
Marylebone	22,914	21,880	-1,034	-5%
Tottenham Court Road	65,744	64,643	-1,101	-2%
Oxford Circus	124,494	122,823	-1,671	-1%
King's Cross	79,889	77,798	-2,091	-3%
Paddington	94,866	71,986	-22,880	-24%
Sub-Total	1,717,507	1,695,794	-21,713	-1%
Total (all Zone 1)	2,305,086	2,283,928	-21,158	-1%
Camden Town	26,434	26,103	-331	-1%
Mornington Crescent	5,585	5,340	-245	-4%
Ealing Broadway	23,906	24,224	318	1%

Impact of passenger flows

3.5.115 The impact of the revised scheme on NR services can be seen in Table 176 and in Figure 133 and Figure 134 for the AM and PM peak periods respectively, with the red bars representing an increase in demand and the green bars a decrease.

Table 176: 2041 Stage A, HS2 Phase One passenger flows (AM and PM peak periods) on NR

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Phase One	% difference	2041 baseline	2041 HS2 Phase One	% difference
Conventional suburban	Inbound	27,134	26,473	-2%	7,633	6,773	-11%
	Outbound	6,102	5,008	-18%	27,905	23,289	-17%
Conventional inter-city	Inbound	16,882	8,754	-48%	12,517	5,612	-55%
	Outbound	11,308	4,103	-64%	17,011	9,537	-44%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Phase One	% difference	2041 baseline	2041 HS2 Phase One	% difference
HS2 at Euston	Inbound	-	16,242	-	-	10,371	-
	Outbound	-	8,963	-	-	16,153	-
HS2 west of Old Oak Common	Inbound	-	20,879	-	-	14,089	-
	Outbound	-	14,261	-	-	21,476	-
GWML slow/Crossrail (baseline: Acton to Paddington) ("with HS2": Acton to OOC)	Eastbound	25,498	24,040	-6%	12,722	11,631	-9%
	Westbound	11,925	13,396	12%	26,228	29,470	12%
GWML fast (baseline: Acton to Paddington) ("with HS2": OOC to Paddington)	Eastbound	30,069	16,607	-45%	14,780	10,272	-31%
	Westbound	10,310	7,257	-30%	28,083	17,552	-37%
GWML slow (baseline: Acton to Paddington) ("with HS2": N/A)	Eastbound	7,141	-	-100%	4,006	-	-100%
	Westbound	2,829	-	-100%	4,820	-	-100%
GWML slow/Crossrail (baseline: N/A) ("with HS2": OOC to Paddington)	Eastbound	-	42,068	-	-	20,022	-
	Westbound	-	19,851	-	-	42,804	-

Figure 133:2041 Stage A, HS2 Phase One Impacts on NR - AM peak period (07:00 to 10:00)

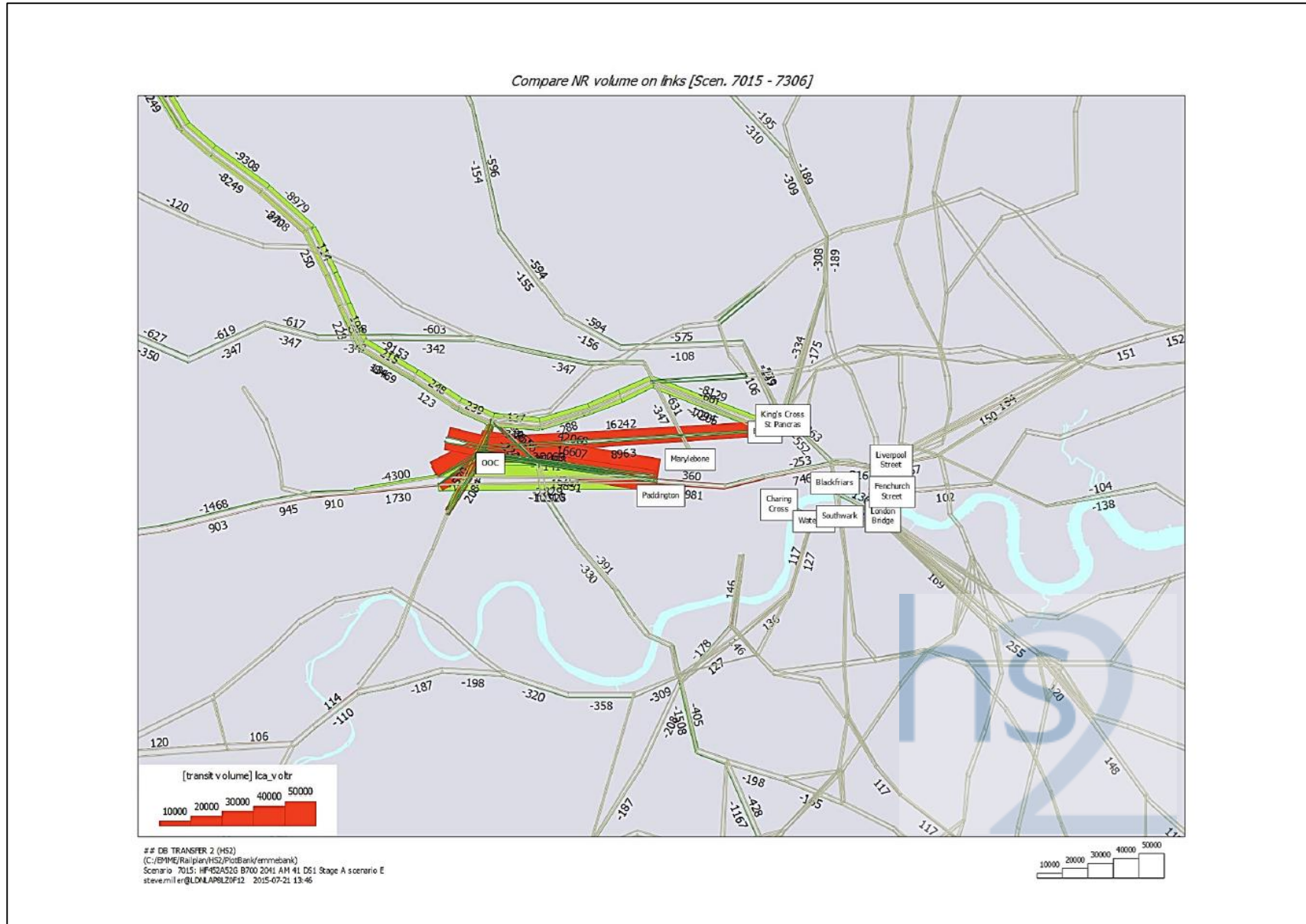
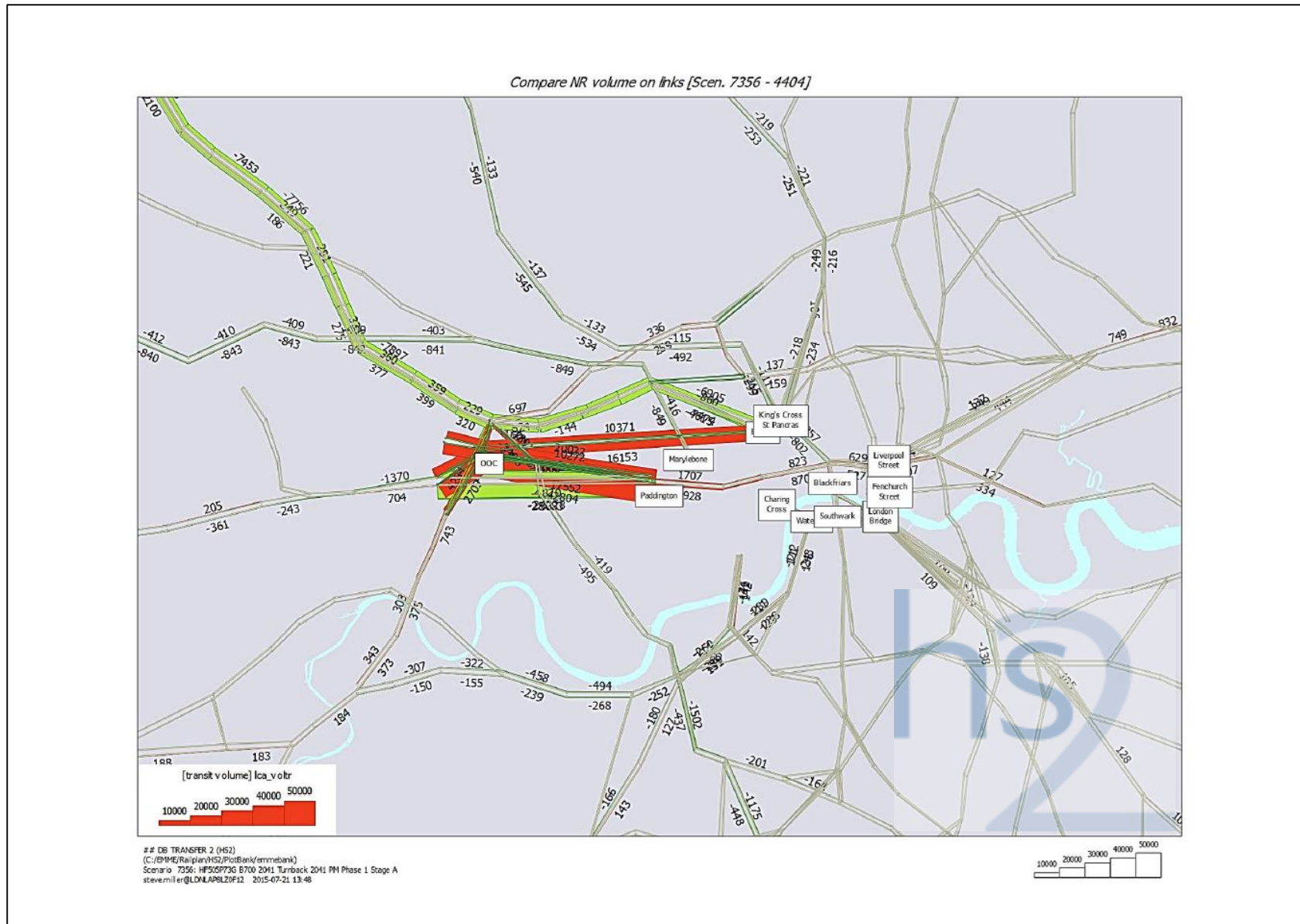


Figure 134: 2041 Stage A, HS2 Phase One Impacts on NR - PM peak period (16:00 to 19:00)



- 3.5.116 A feature of the pattern of the AM peak boarders and alighters at Old Oak Common is the level of interchange between Great West Mainline (GWML) (fast) eastbound services and GWML (slow) or Crossrail eastbound services. The attractiveness of this option results in increases in passenger flows on the GWML and Crossrail services between Old Oak Common and Paddington.
- 3.5.117 Figure 133 and Figure 134 show increased passenger loadings along the HS2 corridor with passenger transfer from the existing NR corridors occurring. The increases in passenger loadings into and out of Paddington station are also shown. This is directly associated with the interchange between GWML and Crossrail services at Old Oak Common.
- 3.5.118 The impact of the HS2 Phase One in 2041 on passenger flows to and from Euston station and Euston Square station for LU, and on Crossrail and London Overground (North London Line (NLL) and West London Line (WLL)) services are set out in and shown in Table 197 and on Figure 135 and Figure 136 for the AM and PM peak periods respectively with the red bars represent an increase in demand while the green bars represent a decrease in demand.

Table 177: 2041 Stage A, HS2 Phase One passenger flows (AM and PM peak periods) underground

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Phase One	% difference	2041 baseline	2041 HS2 Phase One	% difference
Victoria line (north of Euston)	Northbound	29,560	29,635	0%	62,130	62,578	1%
	Southbound	67,068	67,448	1%	41,496	41,376	0%
Victoria line (south of Euston)	Northbound	37,282	37,544	1%	78,289	76,372	-2%
	Southbound	75,141	75,377	0%	48,477	48,142	-1%
Northern line Bank branch (North of Euston)	Northbound	22,320	22,493	1%	38,690	38,597	0%
	Southbound	44,282	44,352	0%	25,783	25,649	-1%
Northern line Bank branch (South of Euston)	Northbound	22,333	21,559	-3%	38,880	37,125	-5%
	Southbound	42,345	40,408	-5%	25,836	25,038	-3%
Northern line Charing Cross branch (north of Euston)	Northbound	16,428	16,349	0%	38,867	39,249	1%
	Southbound	40,795	41,007	1%	25,073	25,110	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Phase One	% difference	2041 baseline	2041 HS2 Phase One	% difference
Northern line Charing Cross branch (south of Euston)	Northbound	16,018	16,540	3%	40,170	39,435	-2%
	Southbound	45,611	44,687	-2%	28,495	28,205	-1%
Metropolitan, H&C and Circle lines (west of Euston Square)	Eastbound	54,365	52,836	-3%	45,665	46,208	1%
	Westbound	42,735	43,618	2%	48,878	48,436	-1%
Metropolitan, H&C and Circle lines (east of Euston Square)	Eastbound	54,171	56,851	5%	49,401	50,556	2%
	Westbound	48,134	48,528	1%	51,389	55,598	8%
Crossrail OOC to Paddington	Eastbound	25,498	42,068	65%	12,722	20,022	57%
	Westbound	11,925	19,851	66%	26,228	42,804	63%
Crossrail Paddington to Bond Street	Eastbound	51,383	51,743	1%	27,649	29,356	6%
	Westbound	23,705	26,686	13%	45,263	49,191	9%
Crossrail Bond Street to Tottenham Court Road	Northbound	47,743	47,449	-1%	41,255	42,265	2%
	Southbound	31,745	33,469	5%	44,898	46,767	4%
NLL Acton to Willesden Junction	Northbound	2,487	1,327	-47%	2,934	3,398	16%
	Southbound	2,098	2,556	22%	1,759	712	-60%
WLL Shepherds Bush to Willesden Junction	Eastbound	1,279	2,570	101%	3,309	4,284	29%
	Westbound	2,482	2,084	-16%	727	2,709	273%

Figure 135: 2041 Stage A, HS2 Phase One Impacts on LU - AM peak period (07:00 to 10:00)

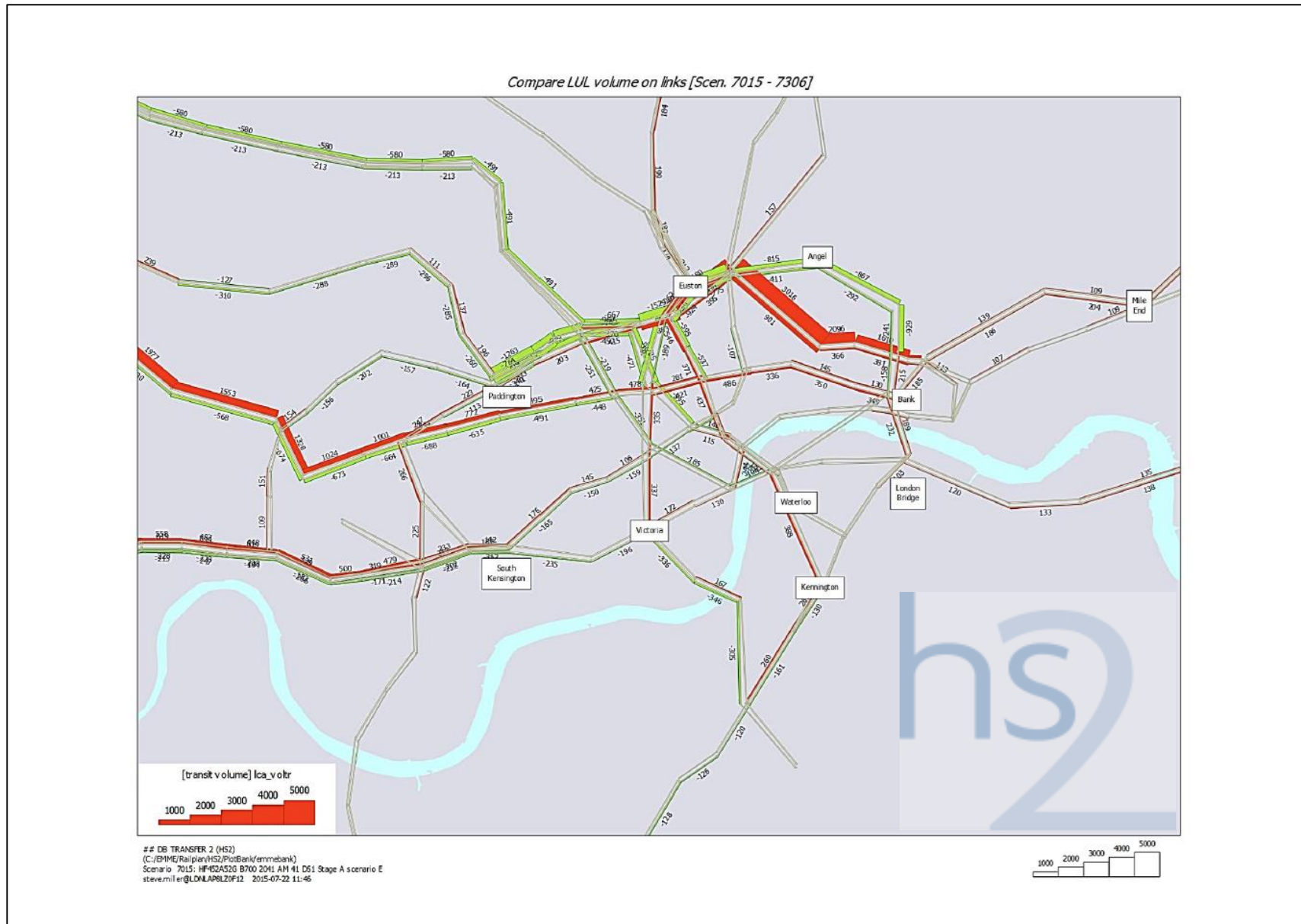
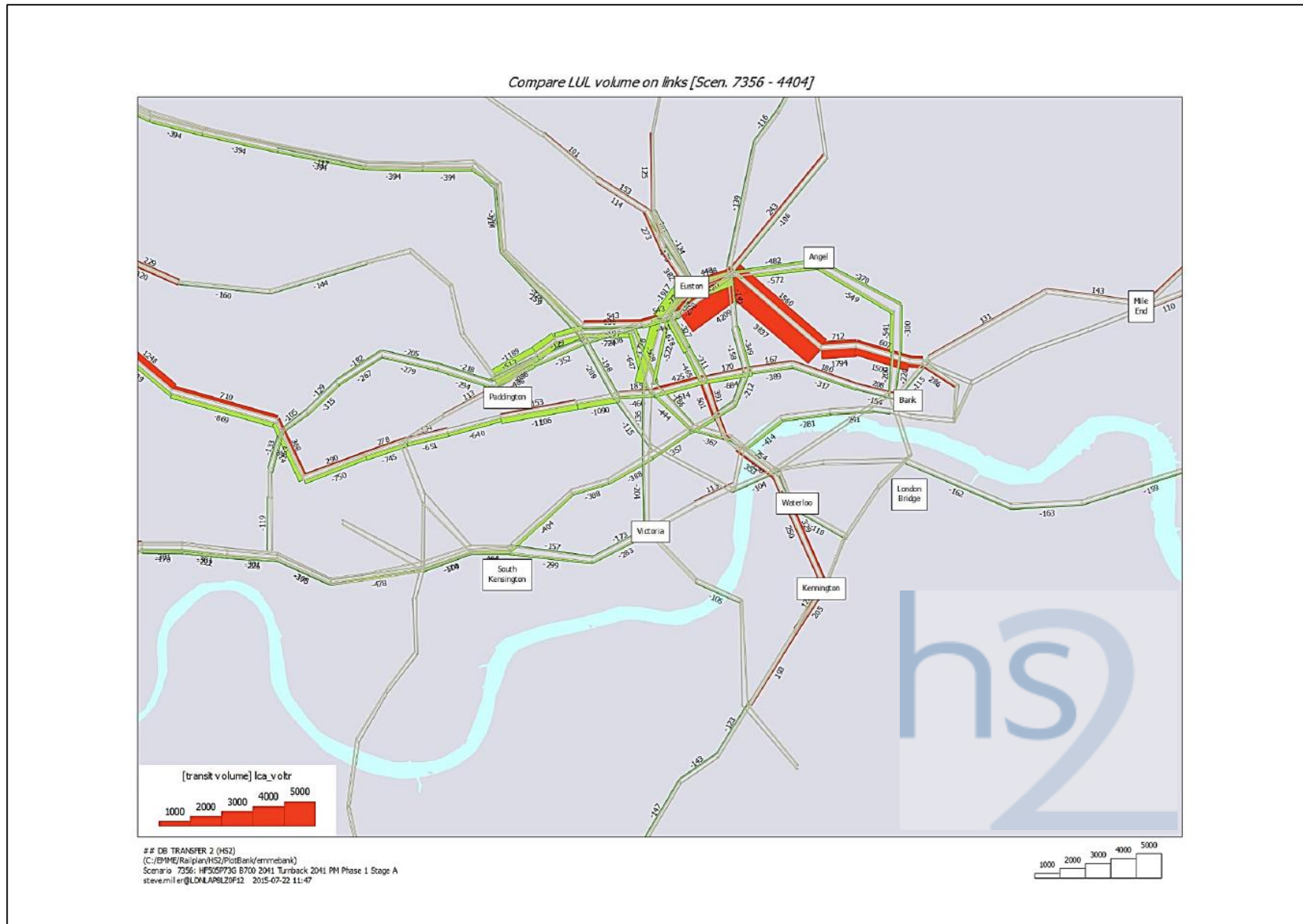


Figure 136: 2041 Stage A, HS2 Phase One Impacts on LU - PM peak period (16:00 to 19:00)



3.5.119 The increase in conventional and HS2 boarders and alighters at Euston station with the Phase One revised scheme in 2041, results in small changes in LU passengers as shown in Table 177. During the AM peak period, the change in LU flows is modest with most changes south of Euston station; however, these are generally less than 2% with the exception of the northbound and southbound Northern line (Bank branch) (south of Euston) (3% and 5% reduction respectively). However, as with 2026 Phase One, there is a substantial increase in LU flows to and from Euston Square, with an increase east of Euston Square of 2,680 passengers in the AM peak westbound direction and 2,930 passengers in the PM peak westbound direction. This is supported by the flow increases which indicates the largest increases on the sub-surface lines (i.e. Circle, Metropolitan and Hammersmith & City lines) from Euston Square particularly as far as Moorgate where there is interchange onto the southbound Northern line (Bank branch). This is a result of crowding on the LU lines from Euston making the sub-surface lines (Metropolitan, Hammersmith & City and Circle lines) an attractive option. A more detailed description of crowding is presented later in this section.

3.5.120 Figure 135 and Figure 136 also show the secondary impact of the level of interchange available between the revised scheme and GWML and Crossrail services at Old Oak Common. The attractiveness of this option results in flow reductions on the sub-surface LU lines (Metropolitan, Circle and Hammersmith & City lines) from Paddington and on the Central line, particularly westbound between Oxford Circus and White City. This also accounts for the large increases in passenger demand on Crossrail services between Old Oak Common and Paddington.

Impact of crowding levels

3.5.121 Figure 137 to Figure 140 show AM peak period crowding on NR and LU during the 2041 future baseline and 2041 with HS2 Phase One. The analysis shows:

- a reduction in crowding on the Chiltern line between South Ruislip and Marylebone with a decrease from 2 - 3 PPSM to less than 1 - 2 PPSM; and
- a reduction in crowding on GWML services into Paddington.

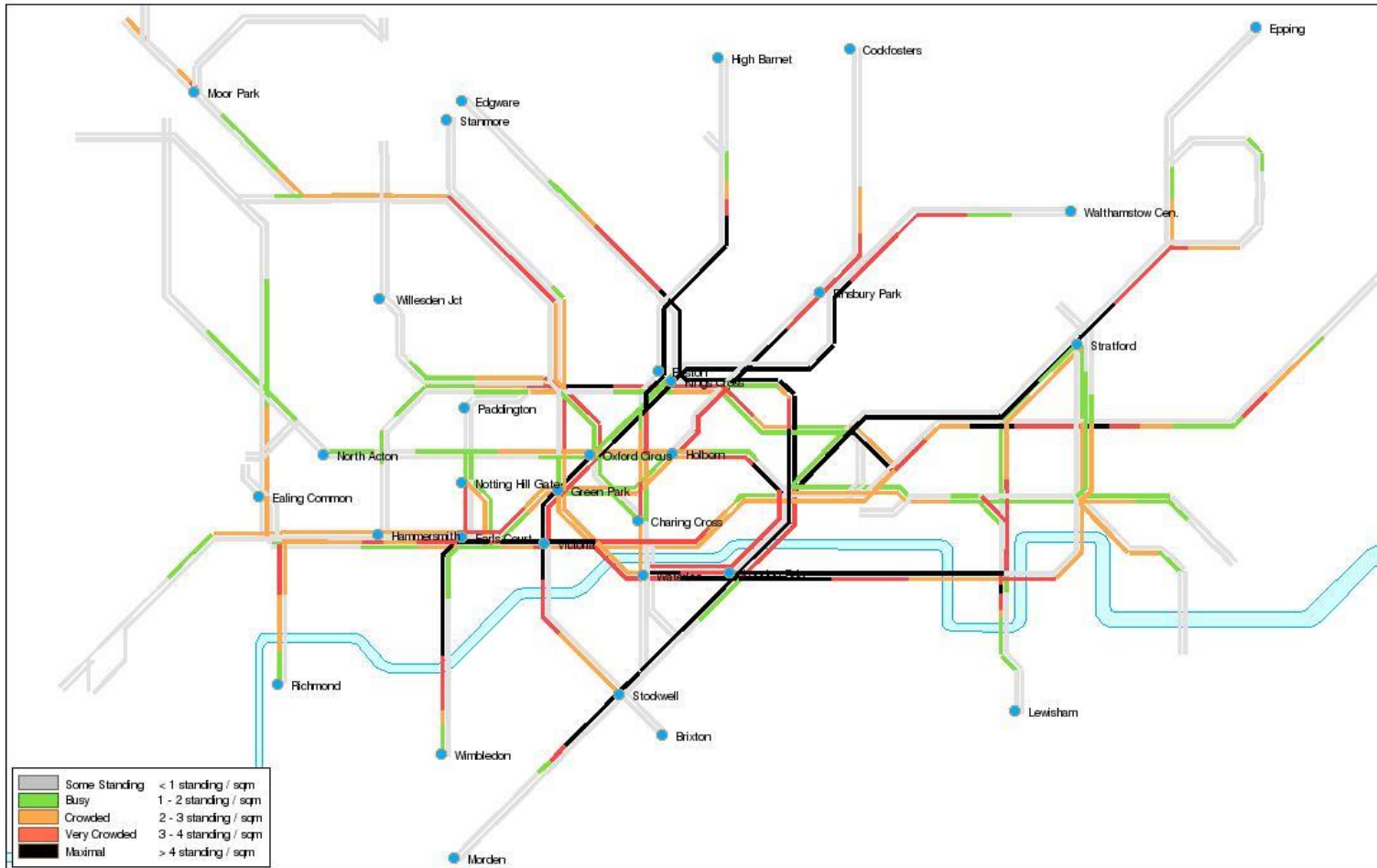
3.5.122 The reductions in crowding are a positive impact of the revised scheme due to the level of interchange with HS2 services available with GWML and Crossrail services at Old Oak Common.

3.5.123 Crowding changes for the PM peak period (Figure 141 to Figure 144 on the NR and LU networks) are broadly similar to those for the AM peak period for the Chiltern Line and GWML services but with some additional impacts, namely:

- an increase in crowding on the West London Line between Gunnersbury and Acton Central from 1-2 PPSM to 2-3 PPSM and between Acton Central and Willesden Junction from 2-3 PPSM to 3-4 PPSM;
- an increase in crowding on the Victoria line between Euston and King's Cross from 3 - 4 PPSM to greater than 4 PPSM; and
- an increase in crowding on the sub-surface lines between Great Portland Street and Euston Square from 1 - 2 PPSM to 2 - 3 PPSM.

Figure 137: LU crowding – 2041 future baseline AM peak period (07:00 to 10:00)

LUL and DLR Crowding
HE415A44G - 2041 AM Do-Minimum



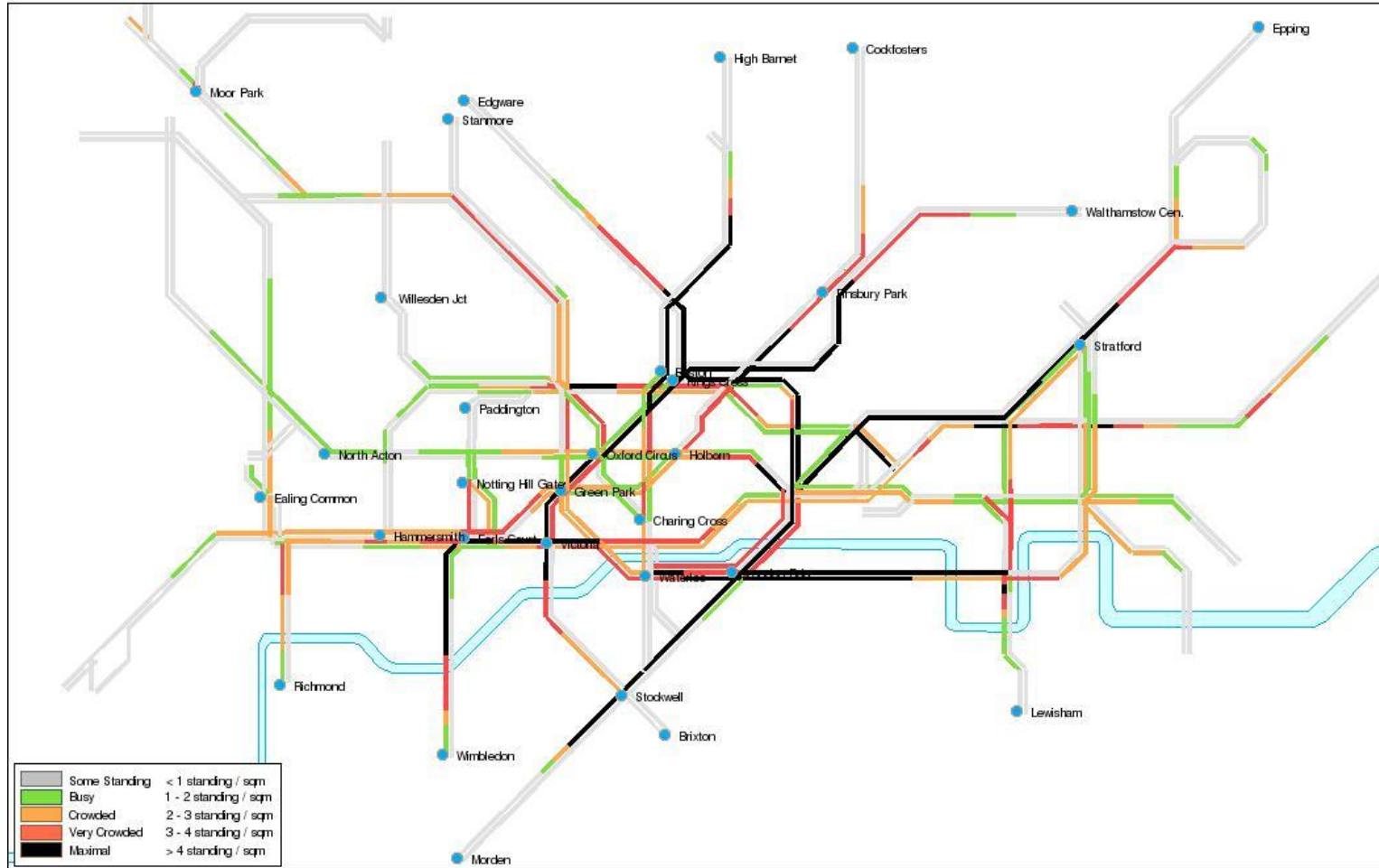
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 138: LU crowding – 2041 Stage A, HS2 Phase One AM peak period (07:00 to 10:00)

LUL and DLR Crowding
 HF452A52G - 2041 AM DS1 Stage A Scenario E



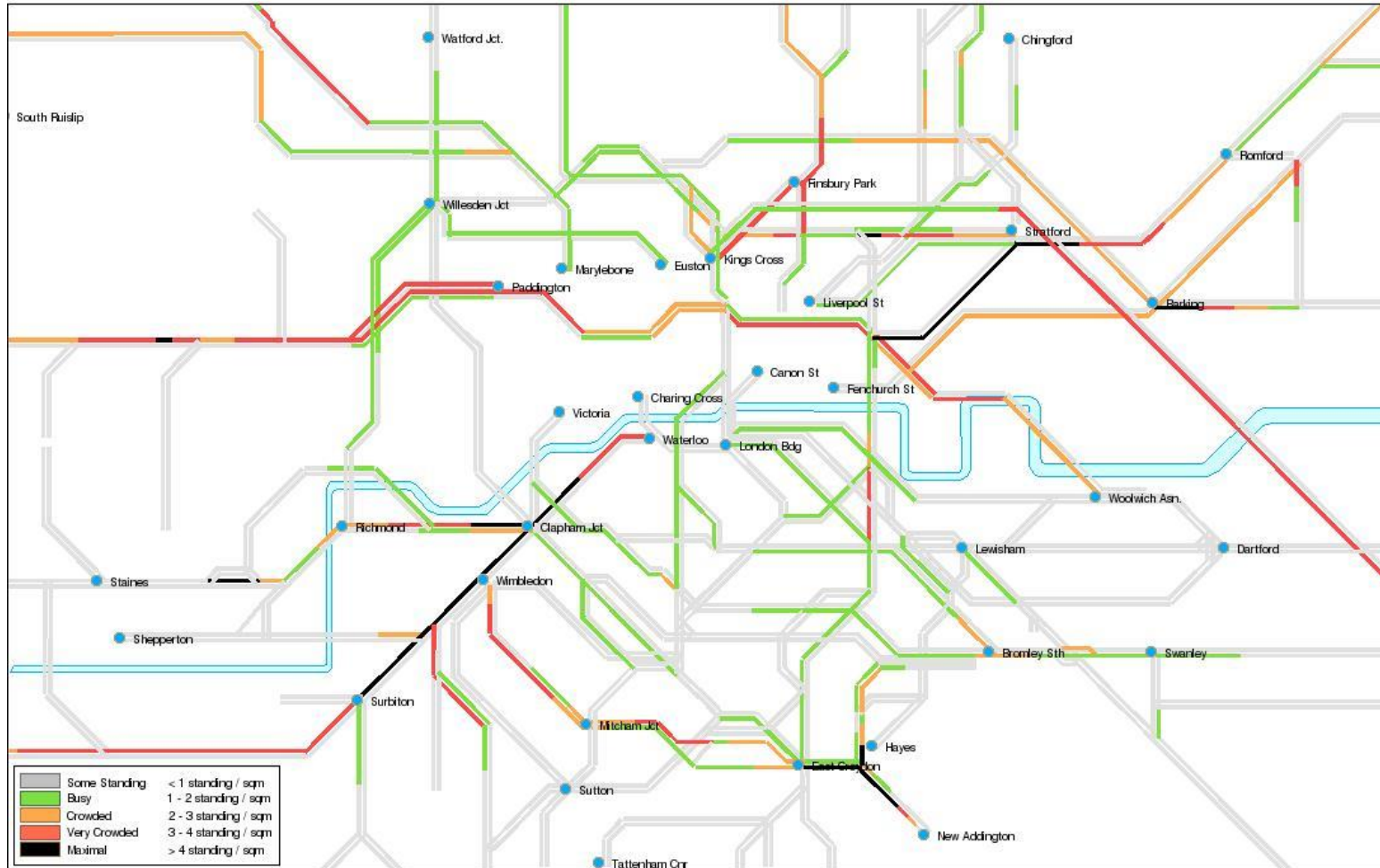
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 139: NR crowding - 2041 future baseline AM peak period (07:00 to 10:00)

National Rail and Tramlink Crowding
HE415A44G - 2041 AM Do-Minimum



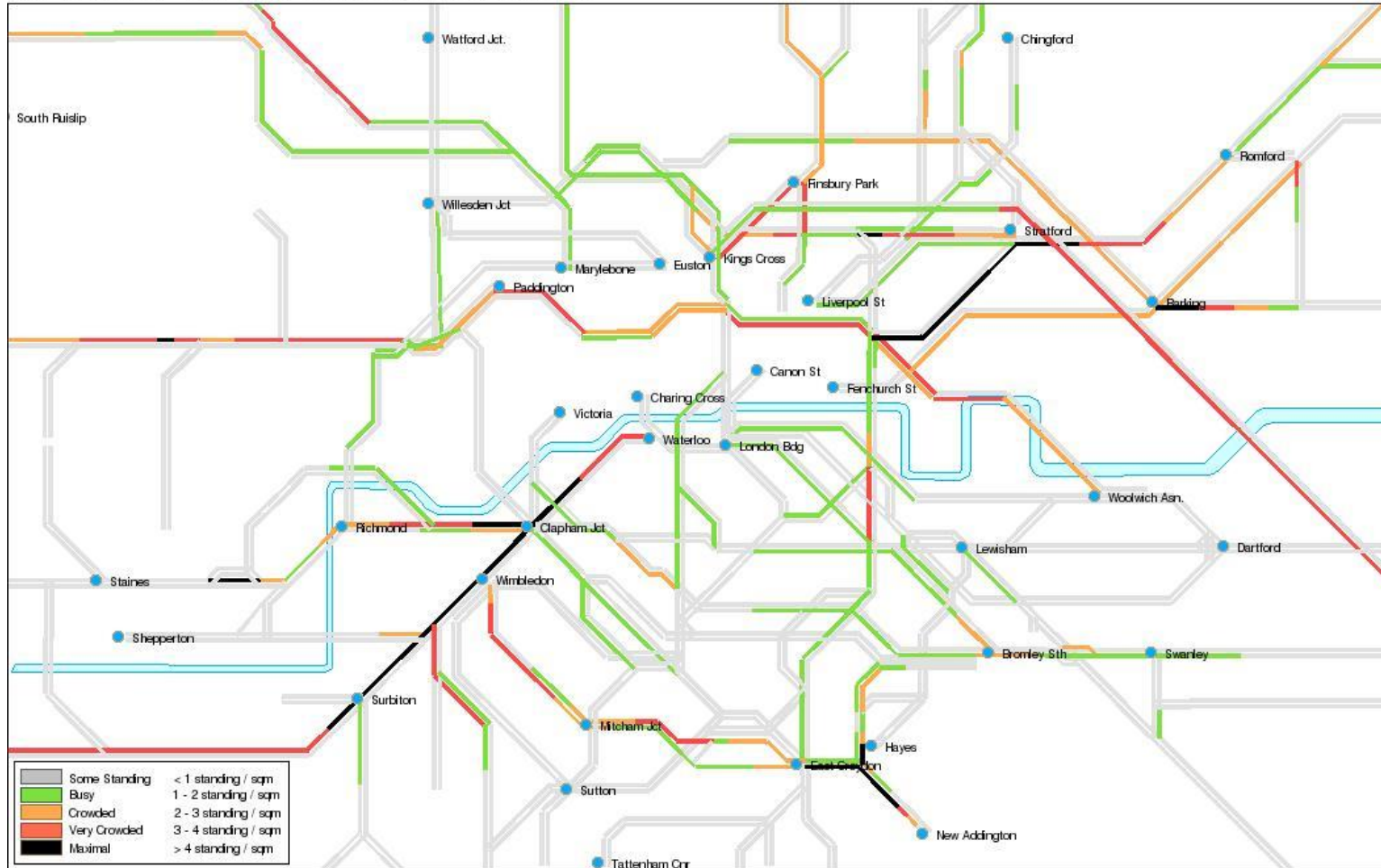
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 140: NR crowding - 2041 Stage A, HS2 Phase One AM peak period (07:00 to 10:00)

National Rail and Tramlink Crowding
 HF452A52G - 2041 AM DS1 Stage A Scenario E



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 141: LU crowding – 2041 future baseline PM peak period (16:00 to 19:00)

LUL and DLR Crowding
HF419P44G - 2041 PM Do-Minimum



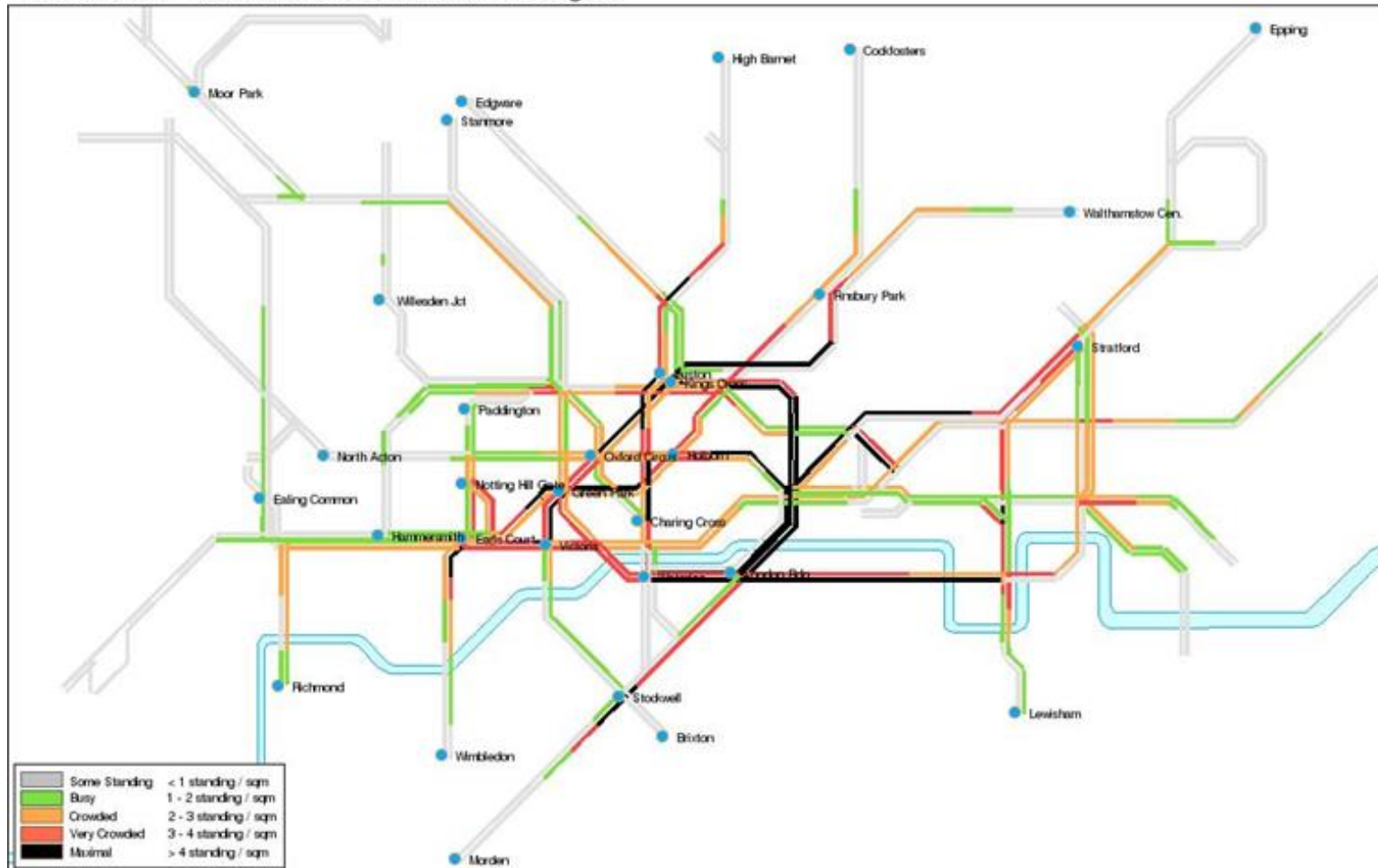
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 14.2: LU crowding – 2041 Stage A, HS2 Phase One PM peak period (16:00 to 19:00)

LUL and DLR Crowding
 HF505P73G - Turnback 2041 PM Phase 1 Stage A



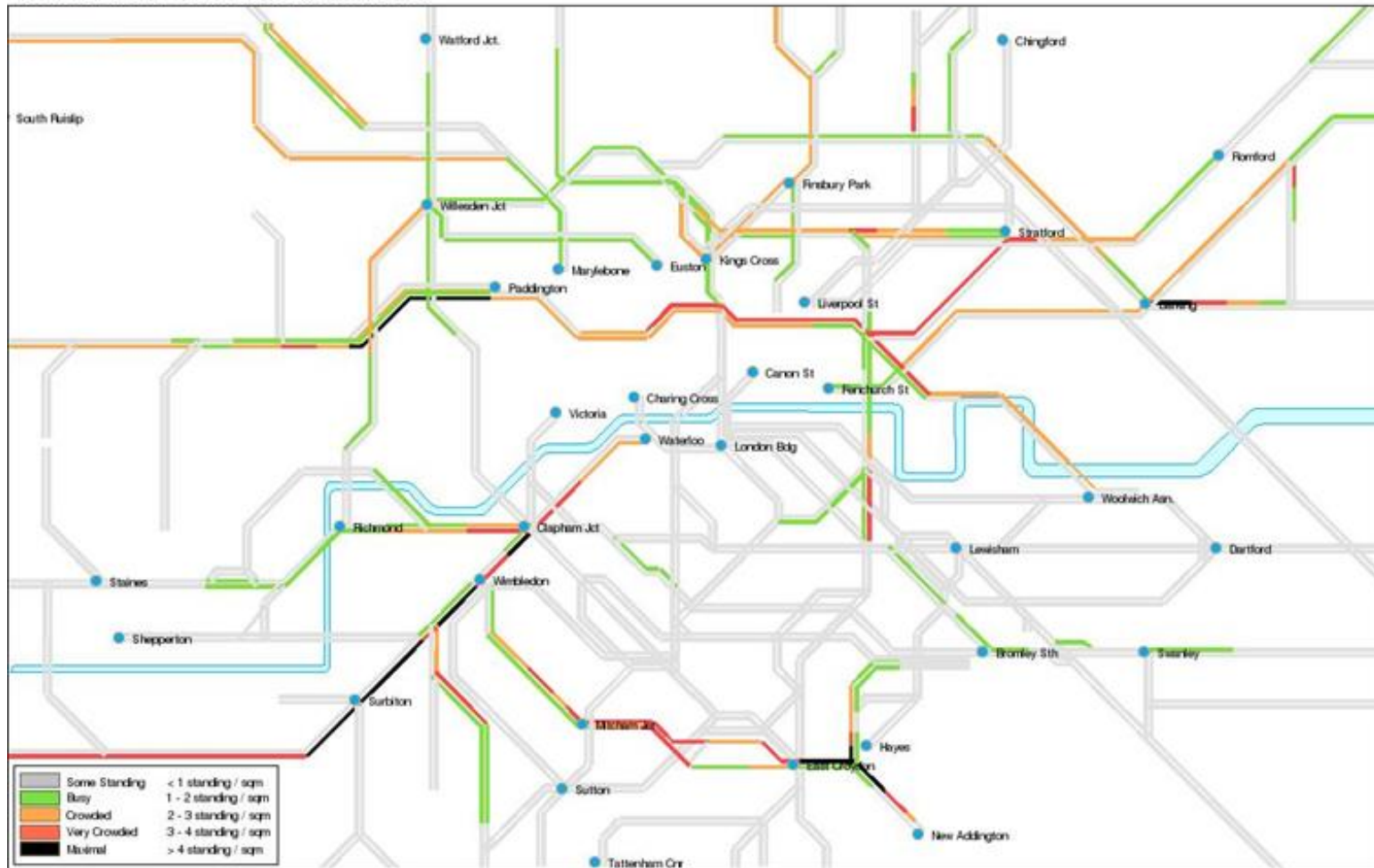
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 143: NR crowding - 2041 future baseline PM peak period (16:00 to 19:00)

National Rail and Tramlink Crowding
HF419P44G - 2041 PM Do-Minimum



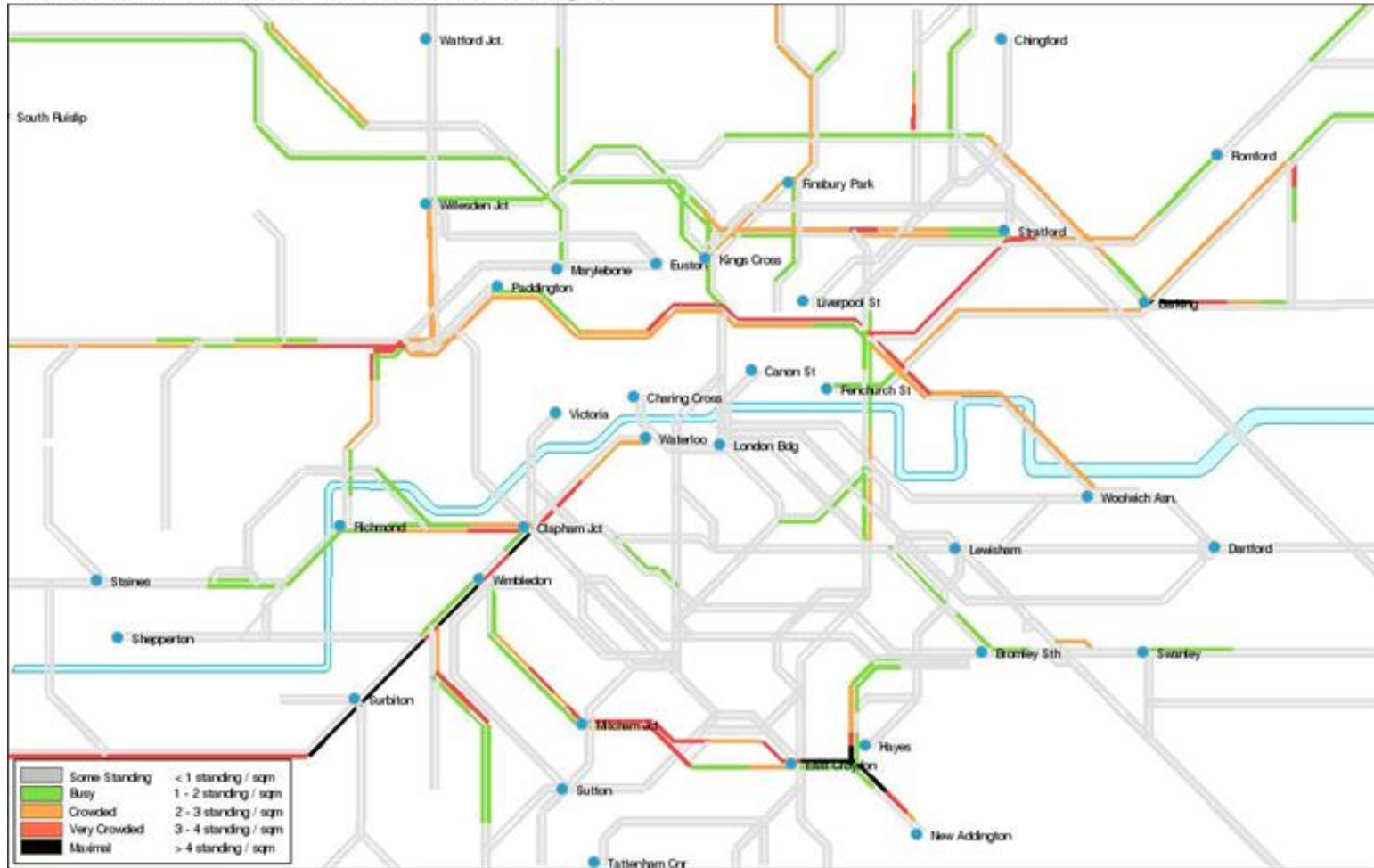
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 144: NR crowding - 2041 Stage A, HS2 Phase One PM peak period (16:00 to 19:00)

National Rail and Tramlink Crowding
HF505P73G - Turnback 2041 PM Phase 1 Stage A



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

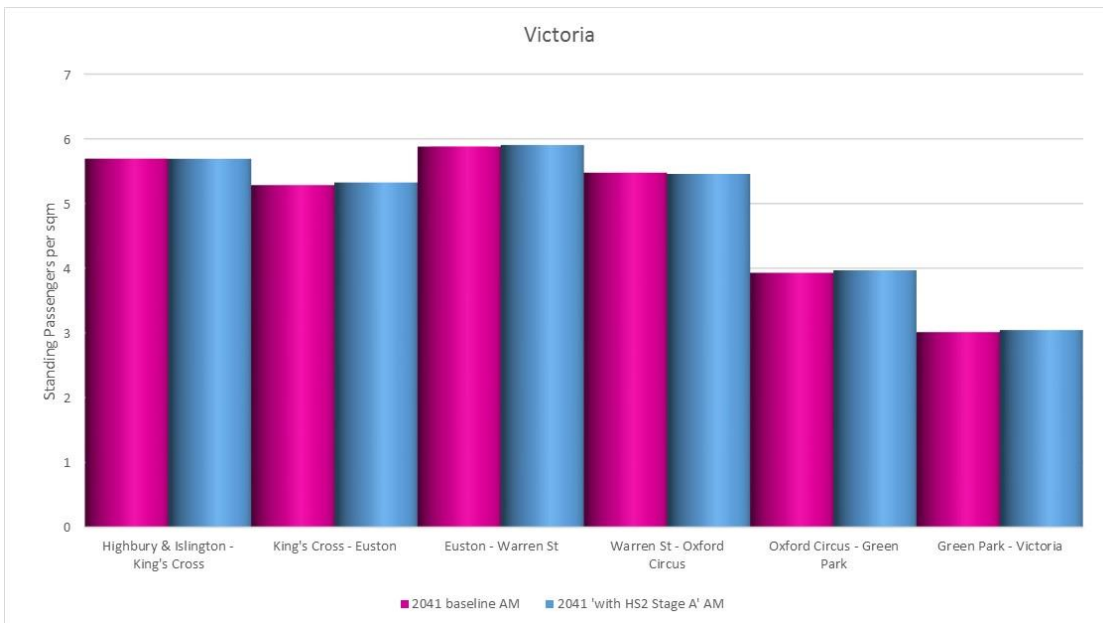
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3.5.124 As for 2026 HS2 Phase One, a station to station analysis has been undertaken for the Northern line (Bank and Charing Cross branches), Victoria line, sub-surface (Metropolitan, Circle and Hammersmith & City) lines and the Piccadilly line which offers an alternative north-east to south-west route to the Victoria line. The analysis compared crowding for the 2041 future baseline with that of the 2041 HS2 Phase One Phase One scenario and relates this to a practical capacity of 4 PPSM.

3.5.125 Figure 145 shows the station to station analysis on the Victoria Line in the southbound direction during the AM peak period.

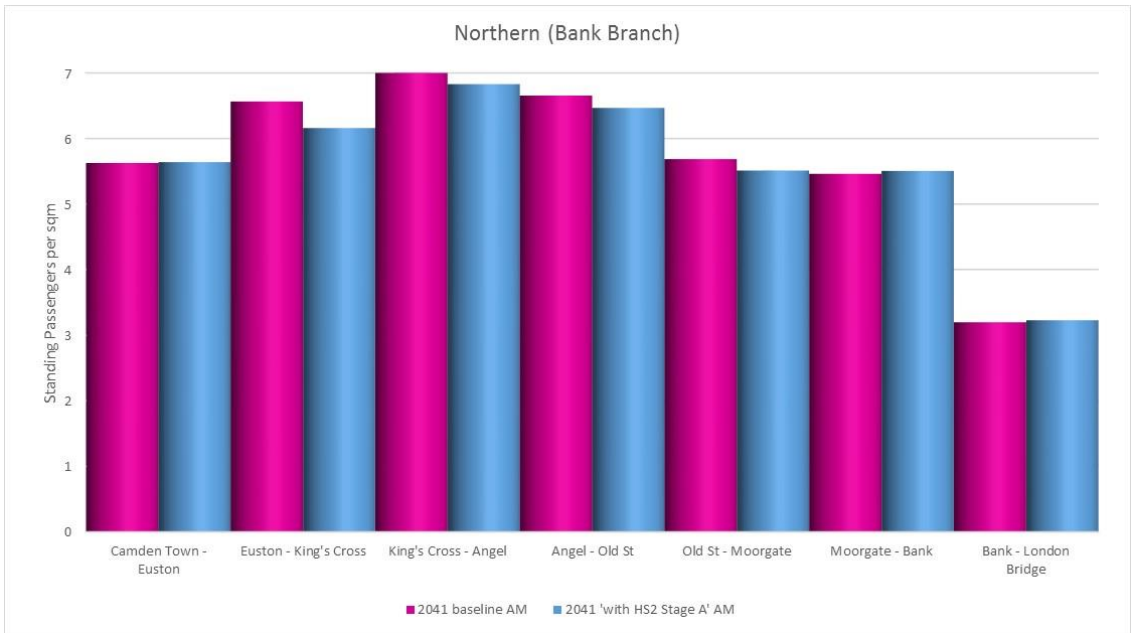
Figure 145: 2041 Stage A, HS2 Phase One Victoria line southbound crowding per train - AM peak period (07:00 to 10:00)



3.5.126 During the AM peak period, crowding on certain sections of the Victoria line (Highbury & Islington to Oxford Circus) will be close to 6 PPSM during the 2041 future baseline scenario. The revised scheme has a negligible impact on crowding on the southbound Victoria line, given the high levels of crowding already experienced during the future baseline scenario.

3.5.127 Figure 146 shows the station to station analysis on the Northern line (Bank branch) in the southbound direction during the AM peak period. The analysis shows that crowding on the Northern line (Bank branch) is above 7 PPSM between King's Cross and Moorgate for the 2041 future baseline scenario.

Figure 146: 2041 Stage A, HS2 Phase One Northern line (Bank branch) southbound crowding per train - AM peak period (07:00 to 10:00)



- 3.5.128 The impact of HS2 demand will result in very little additional crowding on the Northern line (Bank branch) due to the fact that trains are already crowded during the future baseline scenario. Crowding decreases from Euston southbound as far as Moorgate due to transfers to the sub-surface lines where crowding increases slightly.
- 3.5.129 For the Northern line (Charing Cross branch), as shown in Figure 147, crowding levels increase from 2026 to approaching 5 PPSM by 2041, gradually reducing to around 4 PPSM by Warren Street. Crowding increases marginally (by less than 0.5PPSM) between Camden Town and Euston but reduces from Euston onwards.
- 3.5.130 For the sub-surface lines, crowding is around 5 PPSM between Baker Street and Great Portland Street but falls back to just under 4 PPSM as far as Moorgate. This is shown in Figure 148.
- 3.5.131 Most additional crowding attributable to the revised scheme occurs on the eastbound sub-surface lines between Euston Square and Moorgate, where crowding levels increase by approximately 0.3 PPSM. This is because these lines experience lower crowding levels than other lines in the 2041 future baseline and are, therefore, better able to absorb additional passengers. This is reflected in the large increase in additional passengers boarding at Euston Square in the 2041 HS2 Phase One scenario.

Figure 147: 2041 Stage A, HS2 Phase One Northern Line (Charing Cross branch) southbound crowding per train - AM peak period (07:00:00)

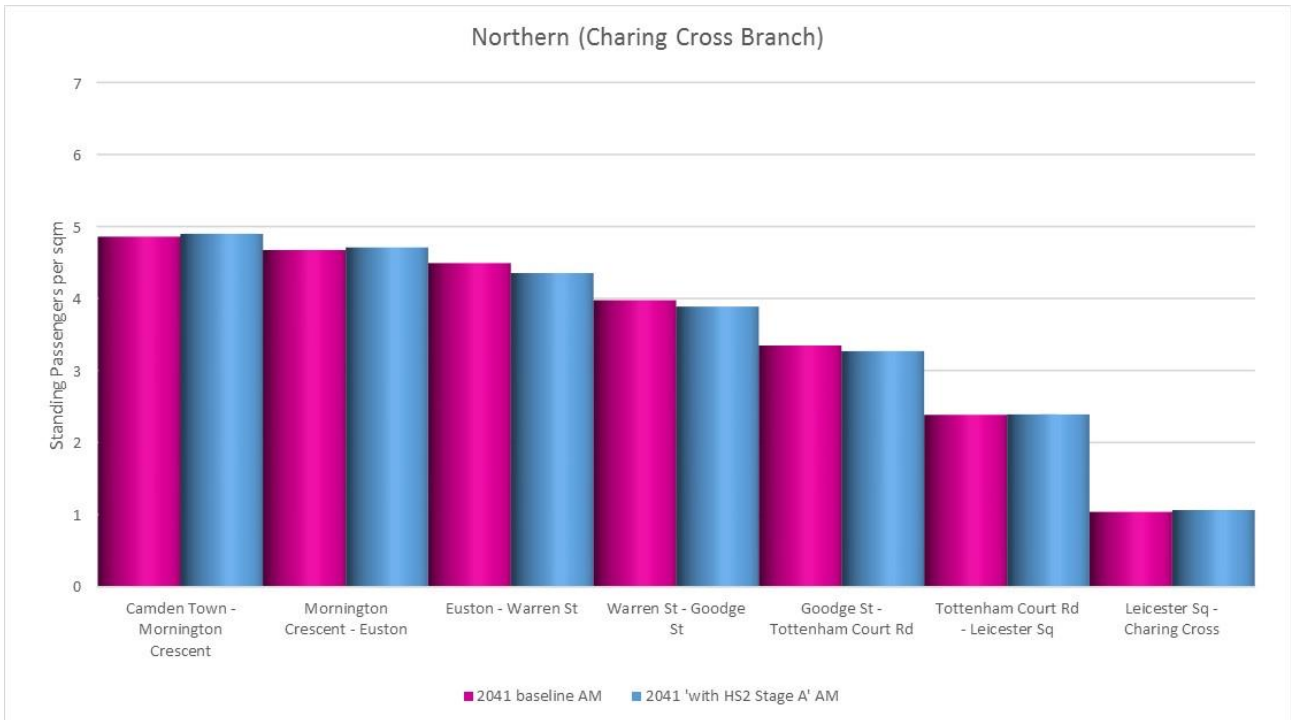
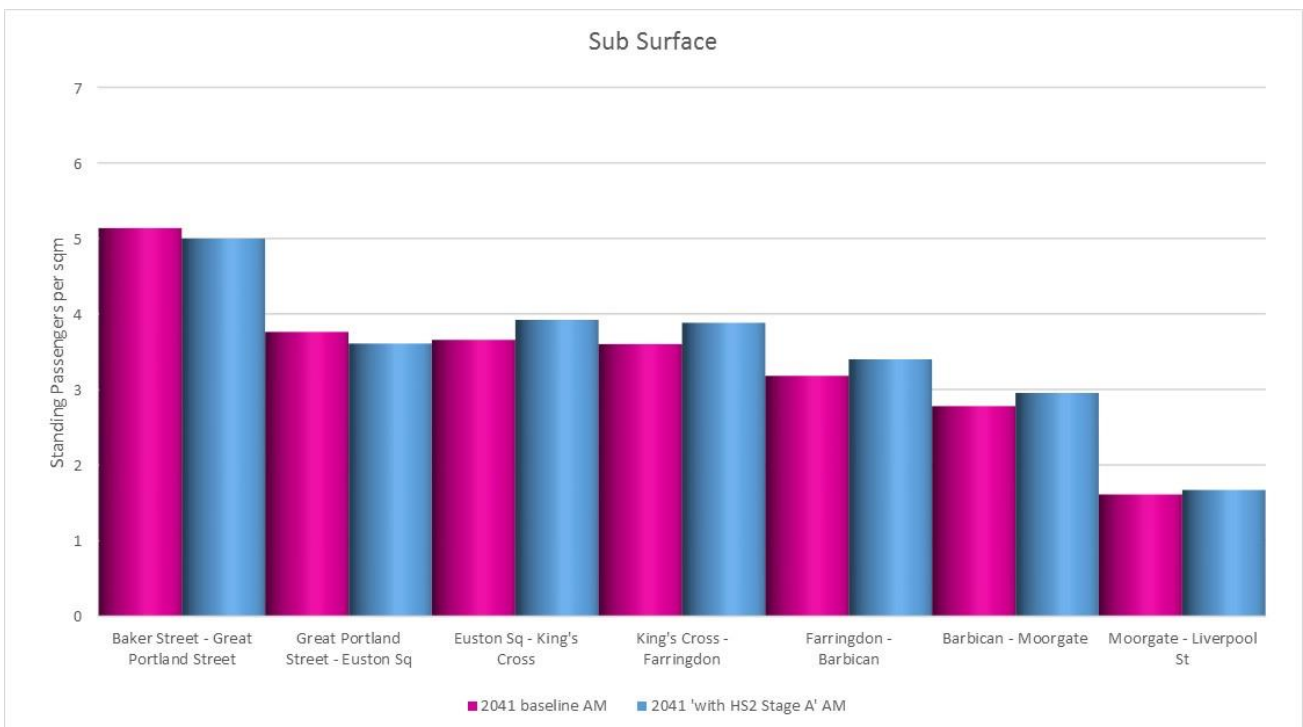
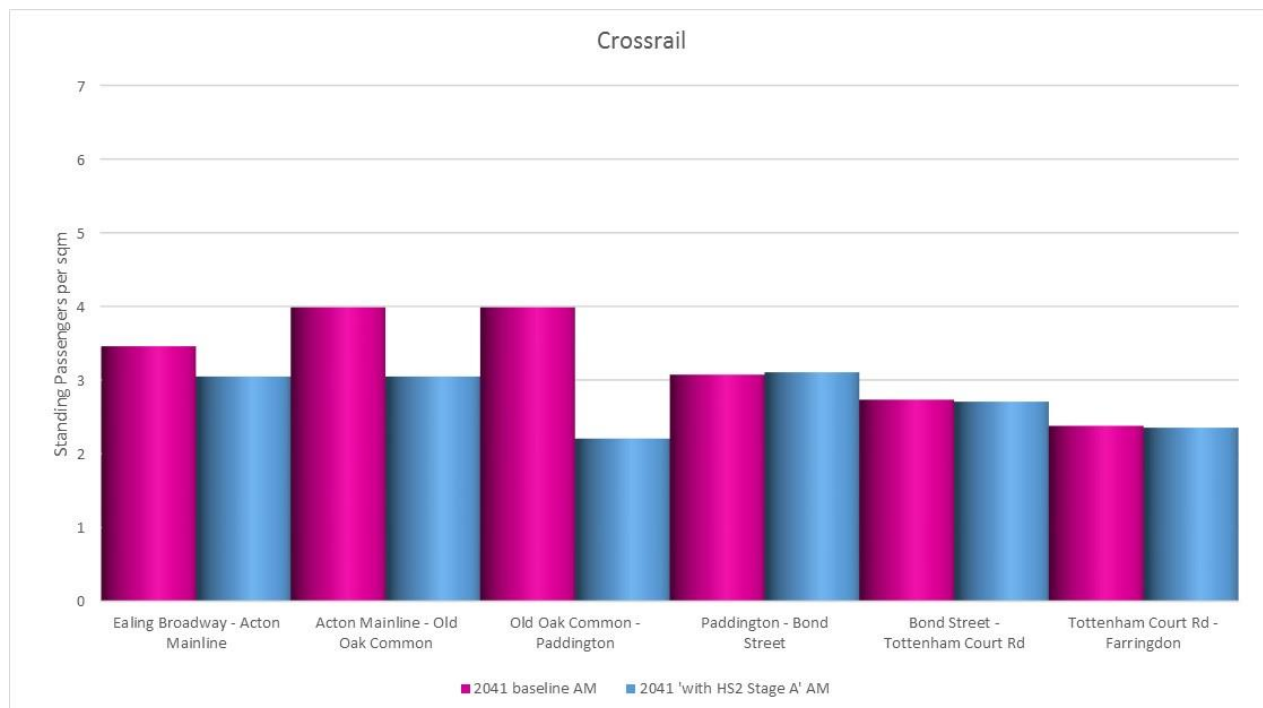


Figure 148: 2041 Stage A, HS2 Phase One sub-surface lines eastbound crowding per train - AM peak period (07:00 to 10:00)



3.5.132 Crowding on Crossrail increases slightly between Paddington and Bond Street by around 0.1 PPSM as a result of additional passenger demand associated with the revised scheme boarding Crossrail at Old Oak Common. This is shown on Figure 149.

Figure 149: 2041 Stage A, HS2 Phase One Crossrail eastbound crowding per train - AM peak period (07:00 to 10:00)



3.5.133 For the PM peak period, crowding was assessed in the opposite direction to the AM peak period, reflecting the peak crowded movements. The pattern is very similar to the AM peak period. 2041 future baseline crowding levels are generally lower than during the AM peak although the Northern line (Bank branch) approaches 6 PPSM between Old Street and King's Cross. Despite this, and in common with the AM peak period, the revised scheme adds most additional crowding to the eastbound sub-surface lines between Farringdon and Euston Square, where crowding increases by between 0.3 and 0.4 PPSM. As with the AM peak, the sub-surface lines are those with the lowest level of 2041 future baseline crowding, consistently at or just above 3 PPSM and, therefore, have spare capacity to absorb additional passengers.

3.5.134 For all other lines, crowding shows a small reduction with the revised scheme in operation, with the exception of a small increase in crowding of 0.05 PPSM on the Northern line (Charing Cross branch) between Euston and Camden Town.

Rail network 2041 HS2 Phase Two (2041)

3.5.135 This section sets out the assessment of the HS2 Phase Two operation in 2041.

3.5.136 The impacts of the HS2 Phase Two in 2041 were assessed by comparing:

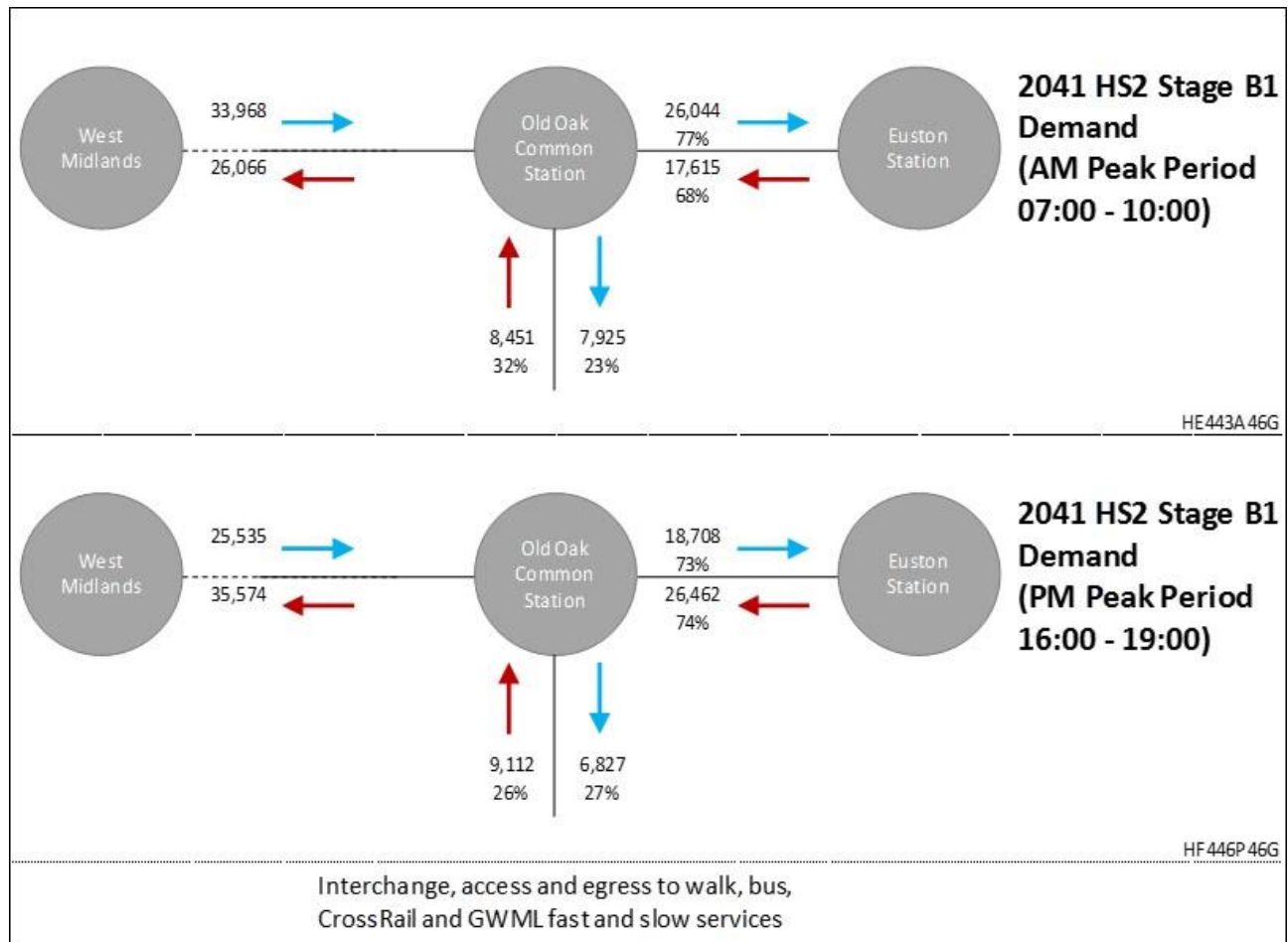
- 2041 future baseline Railplan outputs; and
- HS2 Phase Two 2041 Railplan outputs.

3.5.137 Line flows on HS2 services in 2041 into Old Oak Common and Euston station are shown in Figure 150. Flows in the peak direction, into Euston in the AM peak period and from Euston in the PM peak period are approximately 26,040 and 26,460 respectively. Examination of interchanging at Old Oak Common indicates that in the AM peak period, 23% of passengers from the West Midlands alight at Old Oak Common with 77% continuing on to Euston station. The majority of passengers

alighting at Old Oak Common are forecast to be interchanging passengers, with few passengers entering or exiting the station. In the counter peak direction, around 68% of HS2 passengers board at Euston with 32% boarding at Old Oak Common.

- 3.5.138 In the PM peak period, around 73% of HS2 passengers board at Euston, with 27% boarding at Old Oak Common. In the counter peak direction, around 27% of passengers from the West Midlands alight at Old Oak Common with 73% continuing on to Euston.

Figure 150: HS2 line flows 2041 HS2 Phase Two



Euston and Old Oak Comment station demand

- 3.5.139 Station usage has been examined to assess the impact of the revised scheme on Euston station. Table 178 summarises the AM peak period station demand for Euston for 2041 Phase Two for both the 2041 future baseline and 'with HS2' scenarios. This indicates a decrease or transfer in rail arrivals and departures on InterCity services for the HS2 Phase Two scenario of around 15,330 passengers and on suburban arrivals and departures of around 1,755 passengers. Overall, including HS2, arrivals in the AM peak period increase by around 8,120 (17% increase) and departures by around 660 (4% increase).

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Table 178: 2041 HS2 Phase Two AM peak period (07:00 to 10:00) NR demand

Description	2041 baseline			2041 HS2 Stage B1		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (departing)	6,100	-	6,100	5,130	-	5,130
Euston suburban (arriving)	-	27,135	27,135	-	26,360	26,360
Euston Intercity (departing)	11,310	-	11,310	3,880	-	3,880
Euston Intercity/other (arriving)	-	16,880	16,880	-	8,700	8,700
Euston HS2 (departing)	-	-	0	17,615	-	17,615
Euston HS2 (arriving)	-	-	0	-	26,040	26,040
Sub-total: Euston NR	17,410	44,020	61,430	26,620	61,110	87,730
Old Oak Common (OOC)						
OOC NR (departing slow services)	-	-	-	1,770	9,015	10,785
OOC NR Slow (arriving slow services)	-	-	-	22,530	3,720	26,250
OOC NR (departing fast services)	-	-	-	7,010	0	7,010
OOC NR (arriving fast services)	-	-	-	-	17,820	17,820
OOC HS2 (arriving)	-	-	-	8,450	-	8,450
OOC HS2 (departing)	-	-	-	-	7,925	7,925
Sub-total: OOC	-	-	-	39,760	38,480	78,240

3.5.140 The equivalent PM peak period analysis is set out in Table 179. This indicates a transfer of demand from rail arrivals and departures on InterCity services to HS2 services for HS2 Phase Two in 2041 of around 15,000 passengers and a decrease in suburban arrivals and departures of around 5,310 passengers. Overall, including HS2, arrivals in the PM peak period increase by around 10,845 (54% increase) and departures by around 14,010 (31% increase).

Table 179: 2041 HS2 Phase Two PM peak period (16:00 to 19:00) NR demand

Description	2041 baseline			2041 HS2 Stage B1		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (departing)	27,905	-	27,905	23,380	-	23,380

Description	2041 baseline			2041 HS2 Stage B1		
	Board	Alight	Total	Board	Alight	Total
Euston suburban (arriving)	-	7,630	7,630	-	6,845	6,845
Euston Intercity (departing)	17,010	-	17,010	9,080	-	9,080
Euston Intercity/other (arriving)	-	12,520	12,520	-	5,440	5,440
Euston HS2 (departing)	-	-	0	26,460	-	26,460
Euston HS2 (arriving)	-	-	0	-	18,710	18,710
Sub-total: Euston NR	44,920	20,150	65,066	58,925	30,995	89,920
Old Oak Common (OOC)						
OOC NR (departing slow services)	-	-	-	2,450	17,200	19,650
OOC NR Slow (arriving slow services)	-	-	-	11,710	2,180	13,890
OOC NR (departing fast services)	-	-	-	13,005	0	13,005
OOC NR (arriving fast services)	-	-	-	-	8,680	8,680
OOC HS2 (arriving)	-	-	-	9,110	-	9,110
OOC HS2 (departing)	-	-	-	-	6,830	6,830
Sub-total: OOC	-	-	-	36,280	34,880	71,160

Underground station demand

3.5.141 Station usage has been examined to assess the impact of the Phase Two revised scheme in 2041 on Euston and Euston Square LU stations. Table 180 and Table 181 summarise the AM peak period and PM peak period station demand for Euston in 2041, for both the future baseline and 'with HS2' Phase Two scenarios respectively.

Table 180: 2041 HS2 Phase Two AM peak period (07:00 to 10:00) LU demand

Description	2041 baseline			2041 HS2 Stage B1		
	Board	Alight	Total	Board	Alight	Total
Euston LU						
Northern line Charing Cross branch (northbound)	2,983	2,573	5,556	3,385	5,508	8,893
Northern line Charing Cross branch (southbound)	7,419	2,603	10,022	8,452	4,610	13,062
Northern line Bank branch (northbound)	5,075	5,089	10,164	5,244	5,199	10,443
Northern line Bank branch (southbound)	8,408	10,345	18,753	7,045	10,664	17,709

Description	2041 baseline			2041 HS2 Stage B1		
	Board	Alight	Total	Board	Alight	Total
Victoria line (northbound)	4,145	11,867	16,012	4,497	13,090	17,587
Victoria line (southbound)	15,267	7,194	22,461	15,866	8,707	24,573
Sub-total: Euston LU	43,297	39,671	82,968	44,489	47,778	92,267
Euston Square LU						
Metropolitan line (northbound/westbound)	2,792	8,191	10,983	5,376	11,372	16,748
Metropolitan line (southbound/eastbound)	6,603	6,797	13,400	16,299	8,321	24,620
Sub-total: Euston Square LU	9,395	14,988	24,383	21,675	19,693	41,368

Table 181: 2041 HS2 Phase Two PM peak period (16:00 to 19:00) LU demand

Description	2041 baseline			2041 HS2 Stage B1		
	Board	Alight	Total	Board	Alight	Total
Euston LU						
Northern line Charing Cross branch (northbound)	2,872	4,175	7,047	4,893	6,234	11,127
Northern line Charing Cross branch (southbound)	5,946	2,524	8,470	8,710	3,297	12,007
Northern line Bank branch (northbound)	10,028	10,218	20,246	9,378	8,540	17,918
Northern line Bank branch (southbound)	5,775	5,722	11,497	5,396	5,830	11,226
Victoria line (northbound)	4,950	21,109	26,059	5,495	20,279	25,774
Victoria line (southbound)	11,426	4,445	15,871	13,174	4,878	18,052
Sub-total: Euston LU	40,997	48,193	89,190	47,046	49,058	96,104
Euston Square LU						
Metropolitan line (northbound/westbound)	4,688	7,200	11,888	6,834	16,302	23,136
Metropolitan line (southbound/eastbound)	6,537	2,801	9,338	10,904	6,171	17,075
Sub-total: Euston Square LU	11,225	10,001	21,226	17,738	22,473	40,211

3.5.14.2 The increase in boarders and alighters at Euston with the revised scheme results in an increase in LU passengers. During the AM peak period, the change in LU boarders and alighters with HS2 Phase Two is much greater than for Phase One (both 2026 and 2041) with the greatest increases on the Northern line (Charing Cross branch) (increases of 3,340 in the northbound direction and 3020 in the southbound direction) and Victoria line (increases of 1,575 in the northbound direction and 2110 southbound in the southbound direction). Changes on the Northern line (Bank branch) are smaller

(with the southbound flow decreasing), most likely due to higher crowding levels on this line. Total boarders and alighters at Euston increase by 9,300 with HS2 Phase Two in 2041. As with Phase One, there is a substantial increase in boarders and alighters at Euston Square with an increase of 5,765 passengers in the westbound direction and 11,220 passengers in the eastbound direction. This accounts for passengers travelling eastbound from Euston Square particularly as an alternative to the Northern line (Bank branch). The new link from Euston station to Euston Square station will facilitate this movement.

- 3.5.143 During the PM peak period the changes are smaller with total boarders and alighters at Euston increase by 6,910 with HS2 Phase Two. Whilst the changes are large on the Northern line (Charing Cross) branch (increase on 4,080 in the northbound direction and 3,540 in the southbound direction), there is a reduction in Northern line (Bank branch) northbound flows (2,330) reducing the overall increase at Euston.
- 3.5.144 As with the AM peak period, there are large increases at Euston Square, with an increase of 11,250 passengers in the westbound direction and 7,740 passengers in the eastbound direction.

Impact on Zone 1 stations

- 3.5.145 Table 182 shows the impact of the revised scheme during the AM peak period on stations within (fare) Zone 1, together with Camden Town, Mornington Crescent and Ealing Broadway stations. Any station within Zone 1 with a change of less than +/- 100 passengers has been excluded from Table 182.

Table 182: 2041 HS2 Phase Two access, egress and interchange trips at Zone 1 LU stations - AM peak period (07:00 to 10:00)

Station	2041 baseline	2041 HS2 Stage B1 Phase Two	Absolute difference	Relative difference
Euston (including Euston Square)	113,656	137,002	23,346	21%
Euston	89,273	115,620	26,347	30%
Euston Square	24,383	21,382	-3,001	-12%
Liverpool Street	138,485	140,201	1,716	1%
Farringdon	91,018	92,457	1,439	2%
Bond Street	47,185	48,564	1,379	3%
Waterloo	183,551	184,504	953	1%
Barbican	13,400	14,303	903	7%
Victoria	156,101	156,617	516	0%
Aldgate	20,413	20,823	410	2%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Station	2041 baseline	2041 HS2 Stage B1 Phase Two	Absolute difference	Relative difference
Baker Street	48,421	48,827	406	1%
Charing Cross	43,302	43,659	357	1%
Angel	22,612	22,919	307	1%
Edgware Road (Hammersmith & City and Circle lines)	9,760	10,049	289	3%
Cannon Street	33,570	33,846	276	1%
St James' Park	24,549	24,806	257	1%
Notting Hill Gate	13,032	13,220	188	1%
South Kensington	24,296	24,475	179	1%
Bank	102,492	102,642	150	0%
Marble Arch	6,390	6,527	137	2%
Fenchurch Street	32,023	32,158	135	0%
Borough	4,658	4,768	110	2%
High Street Kensington	9,334	9,441	107	1%
Piccadilly Circus	20,083	19,964	-119	-1%
Regent's Park	5,599	5,475	-124	-2%
Russell Square	8,167	8,034	-133	-2%
City Thameslink	17,087	16,911	-176	-1%
Elephant & Castle	31,601	31,414	-187	-1%
Leicester Square	24,653	24,456	-197	-1%
Chancery Lane	15,548	15,343	-205	-1%
Great Portland Street	14,936	14,707	-229	-2%
Aldgate East	14,690	14,433	-257	-2%

Station	2041 baseline	2041 HS2 Stage B1 Phase Two	Absolute difference	Relative difference
Oxford Circus	114,466	114,100	-366	0%
Lancaster Gate	3,518	3,151	-367	-10%
Marylebone	20,246	19,282	-964	-5%
Warren Street	29,168	28,182	-986	-3%
Goodge Street	16,087	15,018	-1,069	-7%
St Pancras	27,598	25,291	-2,307	-8%
Tottenham Court Road	52,821	49,703	-3,118	-6%
King's Cross	83,840	76,284	-7,556	-9%
Paddington	92,174	66,926	-25,248	-27%
Sub-Total	1,730,526	1,720,609	-9,917	-1%
Total (all Zone 1)	2,287,412	2,277,508	-9,904	0%
Camden Town	18,598	18,378	-220	-1%
Mornington Crescent	3,801	3,702	-99	-3%
Ealing Broadway	23,332	25,411	2,079	9%

- 3.5.146 The largest increase in absolute and percentage terms in the AM peak period is at Euston station, where station activity increases by just over 26,350 passengers, an increase of 30%.
- 3.5.147 The impacts on other Zone 1 stations are relatively small, with the exception of some Crossrail stations with increases in activity at Liverpool Street, Farringdon, Bond Street and Ealing Broadway. This is a function of Crossrail offering improved distribution and connections linking with HS2 Phase Two services at Old Oak Common.
- 3.5.148 The revised scheme will also result in a number of positive impacts at some Zone 1 stations, with reductions in passenger demand. The largest decreases are at King's Cross (7,760 passengers or 9%), Tottenham Court Road (3,120 passengers or 6%), St. Pancras (2,310 passengers or 9%) and at Paddington (25,250 passengers or 32%).
- 3.5.149 For all these stations, the majority of the reduction is in interchange flows but with reductions of between 1,000 and 1,500 in passengers leaving these stations. For Paddington in particular, this is due to the ability to interchange at Old Oak Common (rather than Paddington in the baseline) onto Crossrail services. In effect, these are passengers who, in the 204 future baseline, would have interchanged between GWML

(fast) services and Crossrail at Paddington. However, with HS2 Phase Two, these passengers make the same interchange earlier at Old Oak Common.

- 3.5.150 Outside Zone 1, Ealing Broadway has a reasonable increase in activity of 2,080 passengers as it offers good connections to Old Oak Common and the revised scheme. Total activity at all Zone 1 stations decreases by less than 1%.
- 3.5.151 A similar pattern is evident for the PM peak period, as shown in Table 183, albeit with a smaller increase of 16,260 passengers (17%) at Euston, and a reduction of 21,620 (23%) at Paddington. This reduction at Paddington in the PM peak may be moderated by the attraction of the wider range of amenities available to waiting passengers at Paddington in comparison to Old Oak Common. Crossrail stations experience an increase in station activity for those reasons set out for the AM peak period.

Table 183: 2041 HS2 Phase Two access, egress and interchange trips at Zone 1 LU stations - PM peak period (16:00 to 19:00)

Station	2041 baseline	2041 HS2 Phase Two services	Absolute difference	Relative difference
Euston (including Euston Square)	114,388	136,904	22,516	20%
Euston	93,162	109,420	16,258	17%
Euston Square	21,226	27,484	6,258	29%
Bond Street	69,835	72,622	2,787	4%
Farringdon	80,086	82,432	2,346	3%
Liverpool Street	117,388	118,578	1,190	1%
Waterloo	182,375	182,948	573	0%
Barbican	14,494	14,994	500	3%
Aldgate	26,336	26,716	380	1%
Charing Cross	37,528	37,902	374	1%
Regent's Park	7,026	7,382	356	5%
Green Park	54,434	54,738	304	1%
Edgware Road (Hammersmith & City and Circle lines)	11,339	11,571	232	2%
Leicester Square	33,377	33,564	187	1%
Victoria	141,190	141,372	182	0%

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Station	2041 baseline	2041 HS2 Phase Two services	Absolute difference	Relative difference
Knightsbridge	11,860	11,962	102	1%
Covent Garden	8,301	8,177	-124	-1%
Temple	15,720	15,585	-135	-1%
Westminster	29,266	29,100	-166	-1%
City Thameslink	12,738	12,566	-172	-1%
Monument	10,248	10,065	-183	-2%
Saint Paul's	5,287	5,095	-192	-4%
Embankment	39,595	39,386	-209	-1%
Goodge Street	17,151	16,870	-281	-2%
Russell Square	11,908	11,527	-381	-3%
Bank	101,429	101,028	-401	0%
Warren Street	19,203	18,702	-501	-3%
London Bridge	134,479	133,912	-567	0%
Lancaster Gate	3,817	3,240	-577	-15%
Marylebone	22,914	21,854	-1,060	-5%
Tottenham Court Road	65,744	64,551	-1,193	-2%
St Pancras	19,539	17,926	-1,613	-8%
Oxford Circus	124,494	122,153	-2,341	-2%
King's Cross	79,889	72,107	-7,782	-10%
Paddington	94,866	73,242	-21,624	-23%
Sub-Total	1,718,246	1,711,062	-7,184	0%
Total (all Zone 1)	2,305,086	2,298,401	-6,685	0%
Camden Town	26,434	25,692	-742	-3%

Station	2041 baseline	2041 HS2 Phase Two services	Absolute difference	Relative difference
Mornington Crescent	5,585	5,319	-266	-5%
Ealing Broadway	23,906	24,431	525	2%

Impact of passenger flows

3.5.152 The impact of the revised scheme on NR services can be seen in Table 184 and Figure 151 and Figure 152 for the AM and PM peak periods respectively, with the red bars representing an increase in demand and the green bars a decrease.

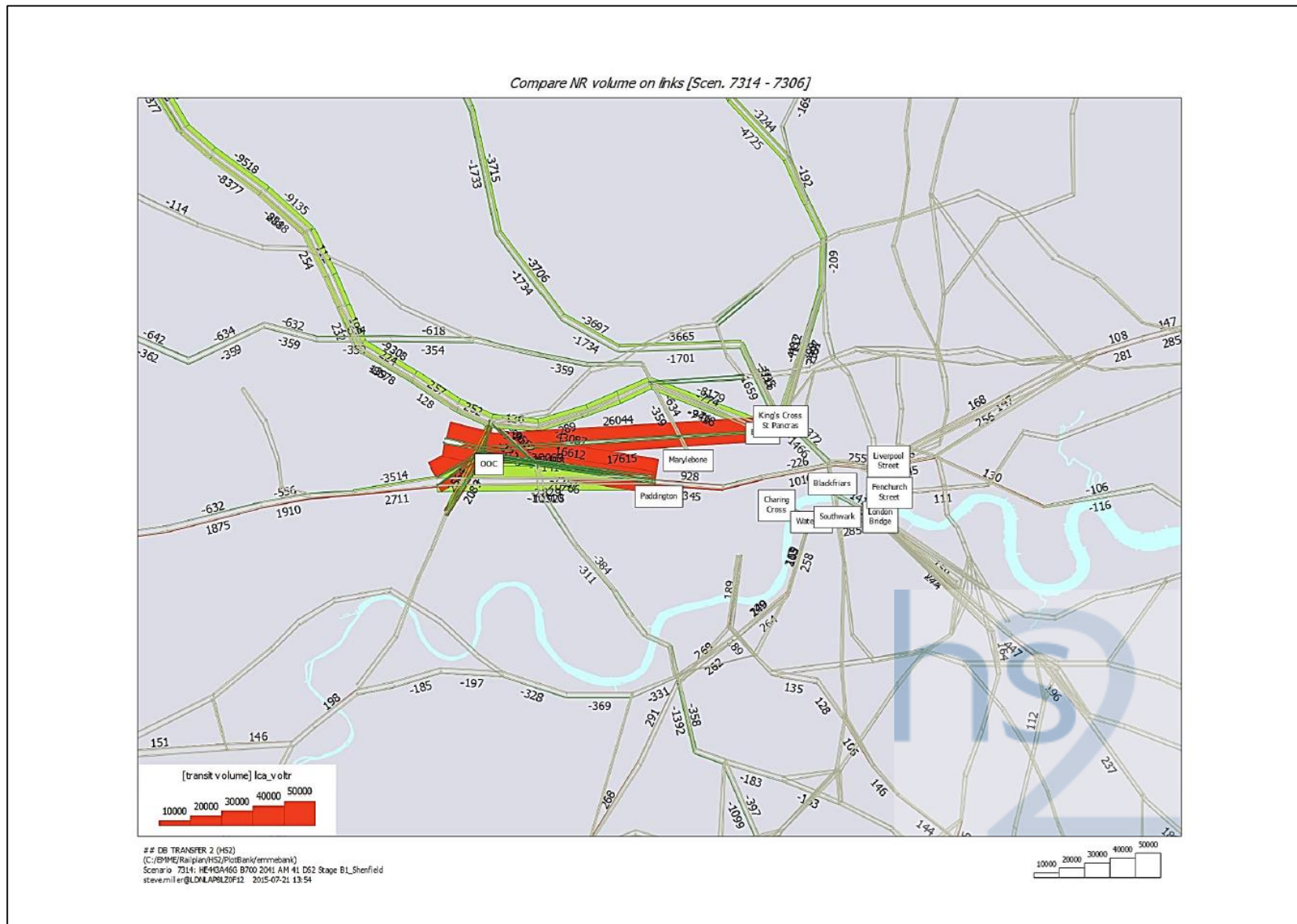
Table 184: 2041 HS2 Phase Two passenger flows (AM and PM peak periods) on NR

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Stage B1	% difference	2041 baseline	2041 HS2 Stage B1	% difference
Conventional suburban	Inbound	27,134	26,359	-3%	7,633	6,845	-10%
	Outbound	6,102	5,126	-16%	27,905	23,380	-16%
Conventional inter-city	Inbound	16,882	8,703	-48%	12,517	5,442	-57%
	Outbound	11,308	3,880	-66%	17,011	9,084	-47%
HS2 at Euston	Inbound	-	26,044	-	-	18,708	-
	Outbound	-	17,615	-	-	26,462	-
HS2 west of Old Oak Common	Inbound	-	33,968	-	-	25,535	-
	Outbound	-	26,066	-	-	35,574	-
GWML slow/Crossrail (baseline: Acton to Paddington) ("with HS2": Acton to OOC)	Eastbound	25,498	24,279	-5%	12,722	11,777	-7%
	Westbound	11,925	13,519	13%	26,228	29,593	13%
GWML fast (baseline: Acton to Paddington) ("with HS2": OOC to Paddington)	Eastbound	30,069	16,612	-45%	14,780	10,197	-31%
	Westbound	10,310	7,257	-30%	28,083	17,884	-36%
GWML slow (baseline: Acton to Paddington) ("with HS2": N/A)	Eastbound	7,141	-	-100%	4,006	-	-100%
	Westbound	2,829	-	-100%	4,820	-	-100%
	Eastbound	-	43,087	-	-	21,309	-

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

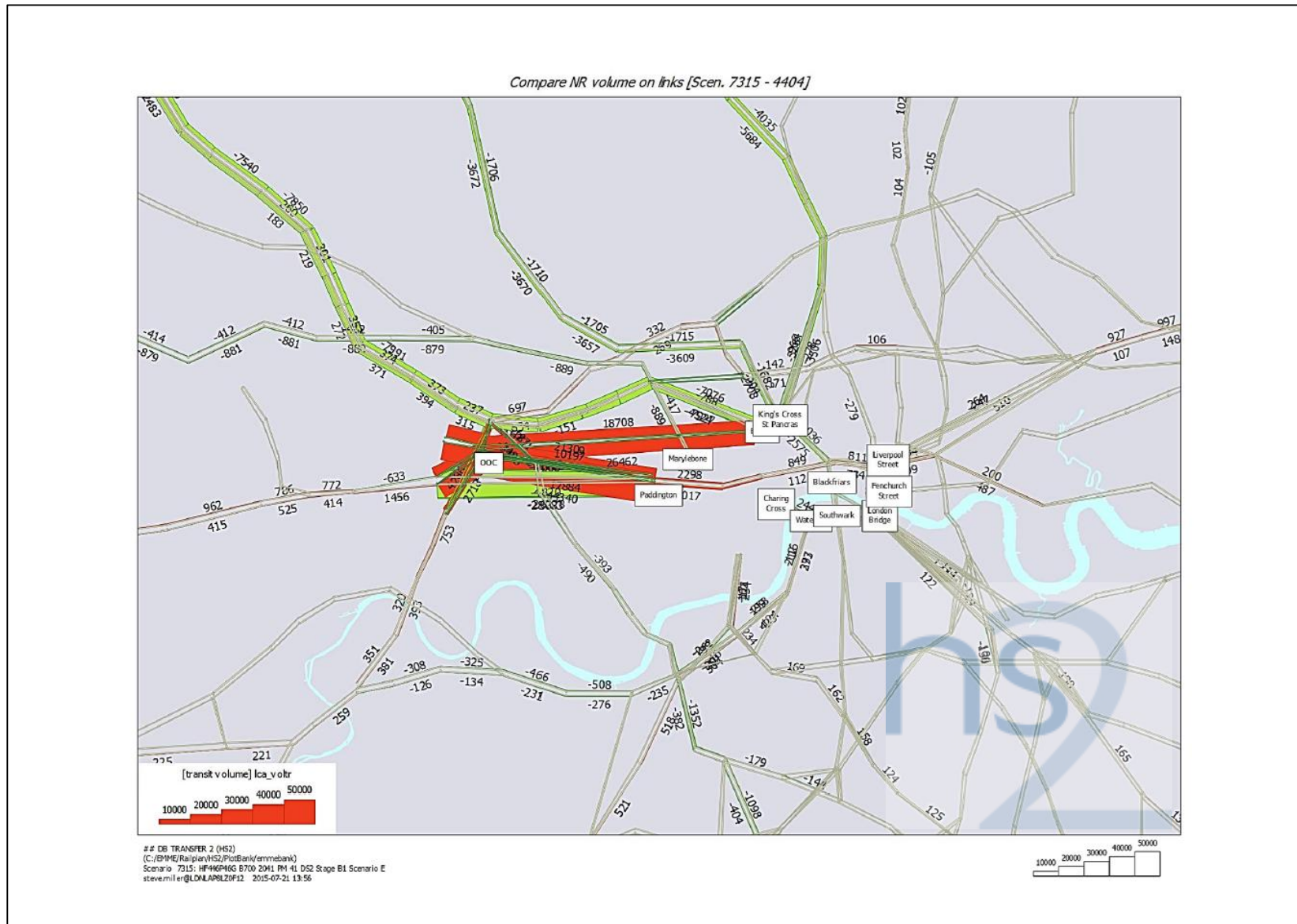
Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Stage B1	% difference	2041 baseline	2041 HS2 Stage B1	% difference
GWML slow/Crossrail (baseline: N/A) ("with HS2": OOC to Paddington)	Westbound	-	20,766	-	-	44,340	-

Figure 151: 2041 HS2 Phase Two Impacts on NR - AM peak period (07:00 to 10:00)



SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Figure 152: 2041 HS2 Phase Two Impacts on NR - PM peak period (16:00 to 19:00)



- 3.5.153 A feature of the pattern of the AM peak borders and alighters at Old Oak Common is the level of interchange between Great West Mainline (GWML) (fast) eastbound services and GWML (slow) or Crossrail eastbound services. The attractiveness of this option results in increases in passenger flows on the GWML and Crossrail services between Old Oak Common and Paddington.
- 3.5.154 Figure 151 and Figure 152 show increased passenger loadings along the HS2 corridor with passenger transfer from the existing NR corridors occurring. The increases in passenger loadings into and out of Paddington station are also shown. This is directly associated with the interchange between GWML and Crossrail services at Old Oak Common.
- 3.5.155 The impact of the HS2 Phase Two in 2041 on passenger flows to and from Euston station and Euston Square station for LU, and on Crossrail and London Overground (North London Line (NLL) and West London Line (WLL)) services are set out in and shown in Table 185 and Figure 153 and Figure 154 for the AM and PM peak periods respectively with the red bars represent an increase in demand while the green bars represent a decrease in demand.

Table 185: 2041 passenger flows (AM and PM peak periods) underground

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Stage B1	% difference	2041 baseline	2041 HS2 Stage B1	% difference
Victoria line (north of Euston)	Northbound	29,560	28,806	-3%	62,130	61,430	-1%
	Southbound	67,068	67,694	1%	41,496	39,806	-4%
Victoria line (south of Euston)	Northbound	37,282	37,398	0%	78,289	76,214	-3%
	Southbound	75,141	74,853	0%	48,477	48,101	-1%
Northern line Bank branch (North of Euston)	Northbound	22,320	22,357	0%	38,690	38,519	0%
	Southbound	44,282	44,422	0%	25,783	25,890	0%
Northern line Bank branch (South of Euston)	Northbound	22,333	22,312	0%	38,880	37,681	-3%
	Southbound	42,345	40,804	-4%	25,836	25,455	-1%
Northern line Charing Cross branch (north of Euston)	Northbound	16,428	16,421	0%	38,867	39,146	1%
	Southbound	40,795	41,326	1%	25,073	24,720	-1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Service	Direction	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		2041 baseline	2041 HS2 Stage B1	% difference	2041 baseline	2041 HS2 Stage B1	% difference
Northern line Charing Cross branch (south of Euston)	Northbound	16,018	18,544	16%	40,170	40,487	1%
	Southbound	45,611	45,168	-1%	28,495	30,133	6%
Metropolitan, H&C and Circle lines (west of Euston Square)	Eastbound	54,365	52,212	-4%	45,665	45,828	0%
	Westbound	42,735	43,457	2%	48,878	48,092	-2%
Metropolitan, H&C and Circle lines (east of Euston Square)	Eastbound	54,171	60,189	11%	49,401	50,562	2%
	Westbound	48,134	49,453	3%	51,389	57,560	12%
Crossrail OOC to Paddington	Eastbound	25,498	43,087	69%	12,722	21,309	67%
	Westbound	11,925	20,766	74%	26,228	44,340	69%
Crossrail Paddington to Bond Street	Eastbound	51,383	52,310	2%	27,649	29,947	8%
	Westbound	23,705	27,050	14%	45,263	50,280	11%
Crossrail Bond Street to Tottenham Court Road	Northbound	47,743	47,517	0%	41,255	42,472	3%
	Southbound	31,745	33,755	6%	44,898	47,175	5%
NLL Acton to Willesden Junction	Northbound	2,487	1,336	-46%	2,934	3,403	16%
	Southbound	2,098	2,562	22%	1,759	721	-59%
WLL Shepherds Bush to Willesden Junction	Eastbound	1,279	2,564	100%	3,309	4,286	30%
	Westbound	2,482	2,089	-16%	727	2,718	274%

Figure 153: 2041 HS2 Phase Two Impacts on LU - AM peak period (07:00 to 10:00)

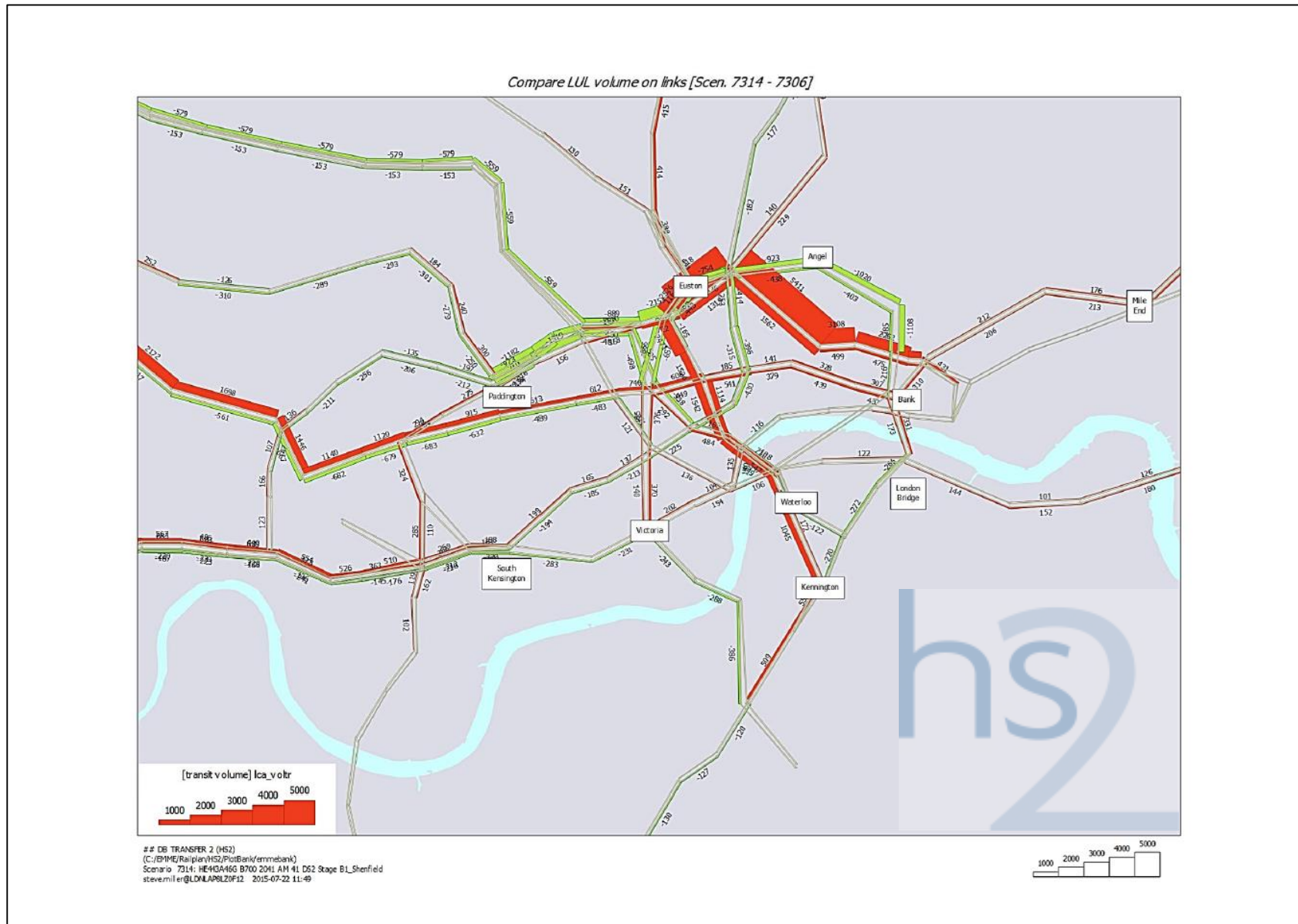
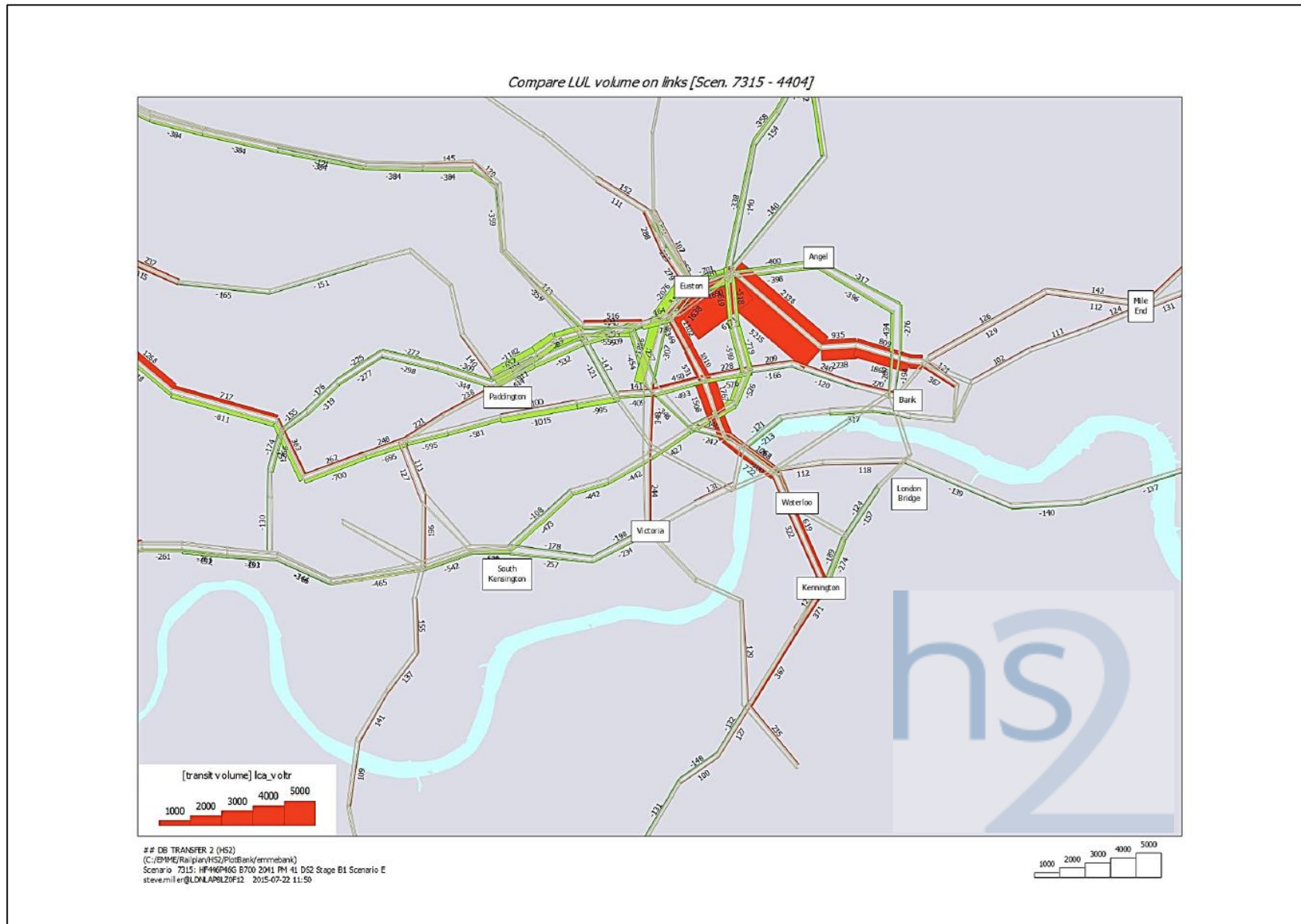


Figure 154: 2041 HS2 Phase Two Impacts on LU - PM peak period (16:00 to 19:00)



- 3.5.156 The increase in conventional and HS2 boarders and alighters at Euston station with the revised scheme HS2 Phase Two in 2041, results in small changes in LU passengers. During the AM peak period, the change in LU flows is modest with most changes south of Euston station. However, these are generally less than 4% with the exception of the northbound Northern line (Charing Cross branch) (south of Euston) which sees a 16% increase. The pattern is repeated for the PM peak period with relatively small changes with the exception of the southbound Northern line (Charing Cross branch) (south of Euston) which sees a 6% increase. However, there is a substantial increase in LU flows to and from Euston Square, with an increase east of Euston Square of 6,020 passengers in the AM peak eastbound direction and 6,170 passengers in the PM peak westbound direction.
- 3.5.157 This is supported by the flow increases which indicate the largest increases on the sub-surface lines (Circle, Metropolitan and Hammersmith & City lines) from Euston Square particularly as far as Moorgate where there is interchange onto the southbound Northern line (Bank branch). This is a result of crowding on the LU lines from Euston making the sub-surface lines (Metropolitan, Hammersmith & City and Circle lines) an attractive option. For 2041 HS2 Phase Two, there is also an increase in passengers on the Northern line (Charing Cross branch) and in the AM peak period, an increase on the eastbound Central line, as a result of increased Crossrail crowding and the eastbound District line. A more detailed description of crowding is presented later in this section.
- 3.5.158 Figure 153 and Figure 154 also show the secondary impact of the level of interchange available between the revised scheme and GWML and Crossrail services at Old Oak Common. The attractiveness of this option results in flow reductions on the sub-surface LU lines (Metropolitan, Circle and Hammersmith & City Lines) from Paddington and in the westbound contra-peak direction on the Central Line, particularly between Oxford Circus and White City. This also accounts for the large increases in passenger demand on Crossrail services between Old Oak Common and Paddington.

Impact of crowding levels

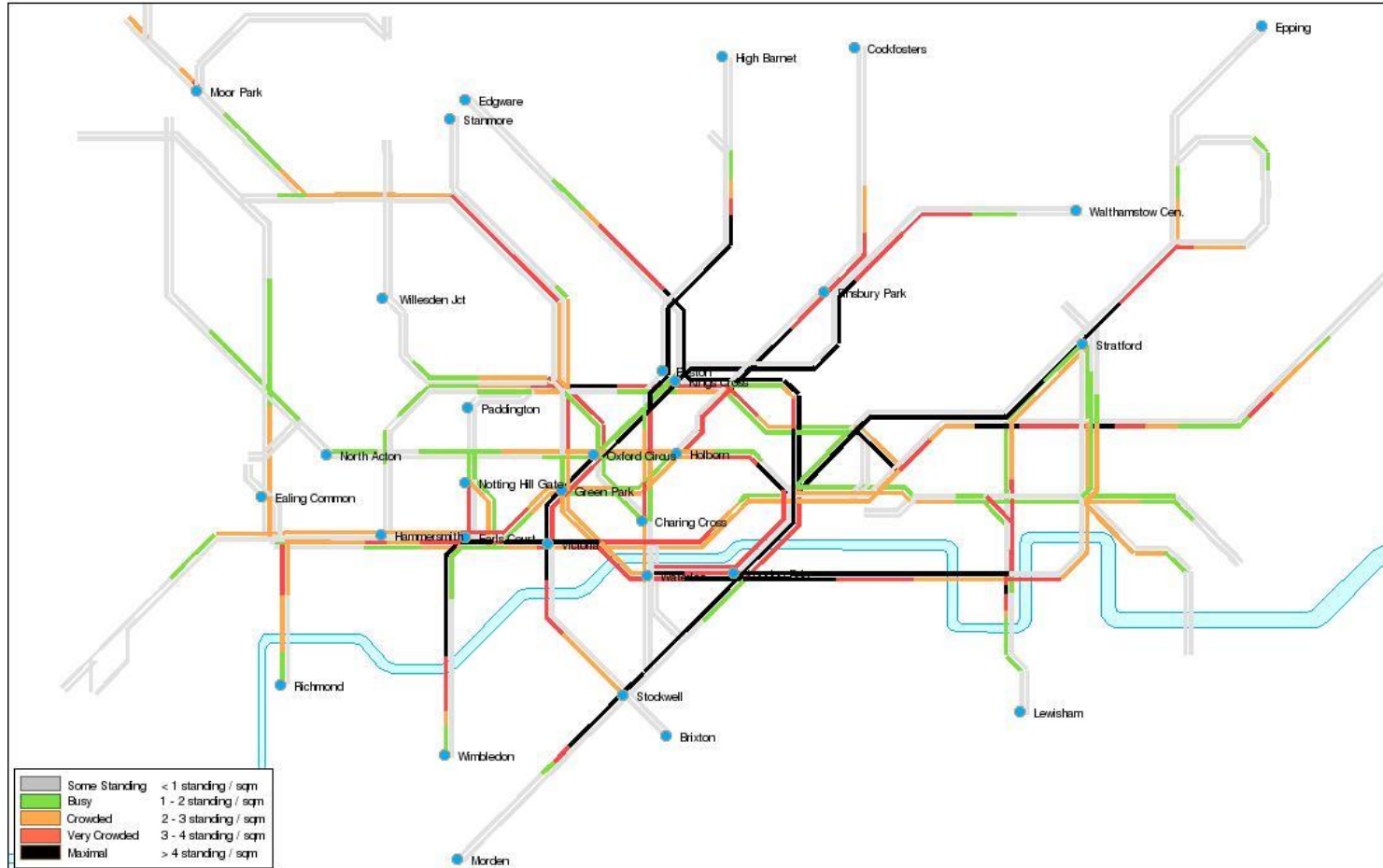
- 3.5.159 Figure 155 to Figure 158 show AM peak crowding on NR and LU during the 2041 future baseline and 2041 with HS2 Phase Two. The analysis shows:
- an increase from 3 - 4 PPSM to greater than 4 PPSM on the sub-surface (Metropolitan, Circle and Hammersmith & City) lines between Euston Square and Farringdon and from 2 - 3 to 3 - 4 PPSM between Farringdon and Moorgate;
 - an increase from 2 - 3 PPSM to 3 - 4 PPSM on the District line between embankment and Blackfriars;
 - a reduction in crowding on the Chiltern line between South Ruislip and Marylebone with a decrease from 2 - 3 PPSM to 1 - 2 PPSM;
 - a reduction in crowding on GWML services into Paddington from 3 - 4 PPSM to 2 - 3 PPSM;

- a reduction in crowding between Finsbury Park and King's Cross (2 - 3 PPSM to less than 1 PPSM); and
- a reduction in crowding on services approaching Euston from 2 - 3 PPSM to less than 1 PPSM.

3.5.160 Changes to crowding in the PM peak are similar to those in the AM peak with reductions of around 1 PPSM on the Chiltern Line, GWML but increases on the northbound NLL along most of the route between Richmond and Willesden Junction and on eastbound Crossrail services towards Paddington. There are limited changes to crowding on LUL services. The PM peak changes to crowding are shown in Figure 159 to Figure 162.

Figure 155: LU crowding – 2041 future baseline AM peak period (07:00 to 10:00)

LUL and DLR Crowding
HE415A44G - 2041 AM Do-Minimum



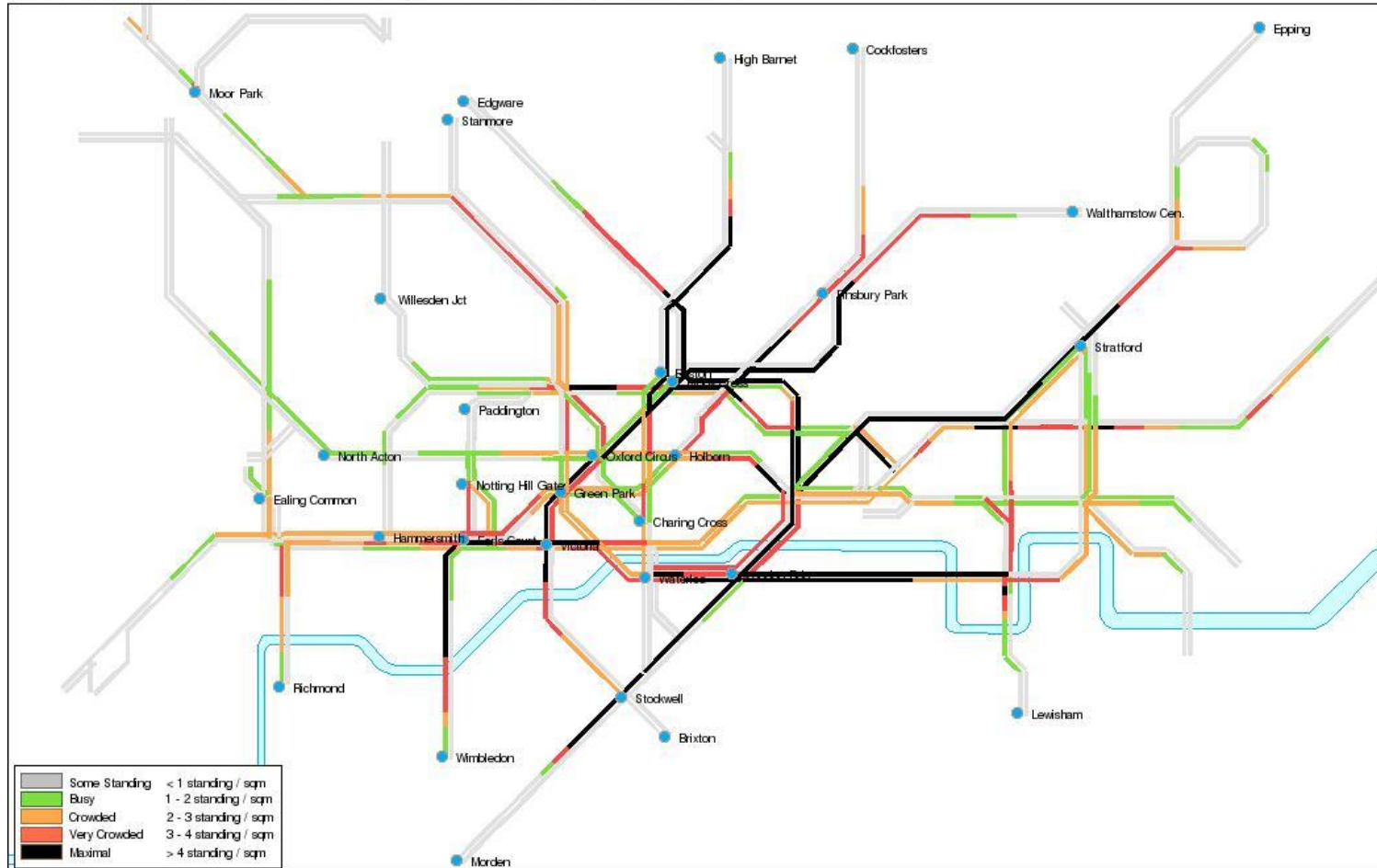
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 156: LU crowding – 2041 HS2 Phase Two AM peak period (07:00 to 10:00)

LUL and DLR Crowding
HE443A46G - 2041 AM DS2 Stage B1 OOC Stub Scenario E



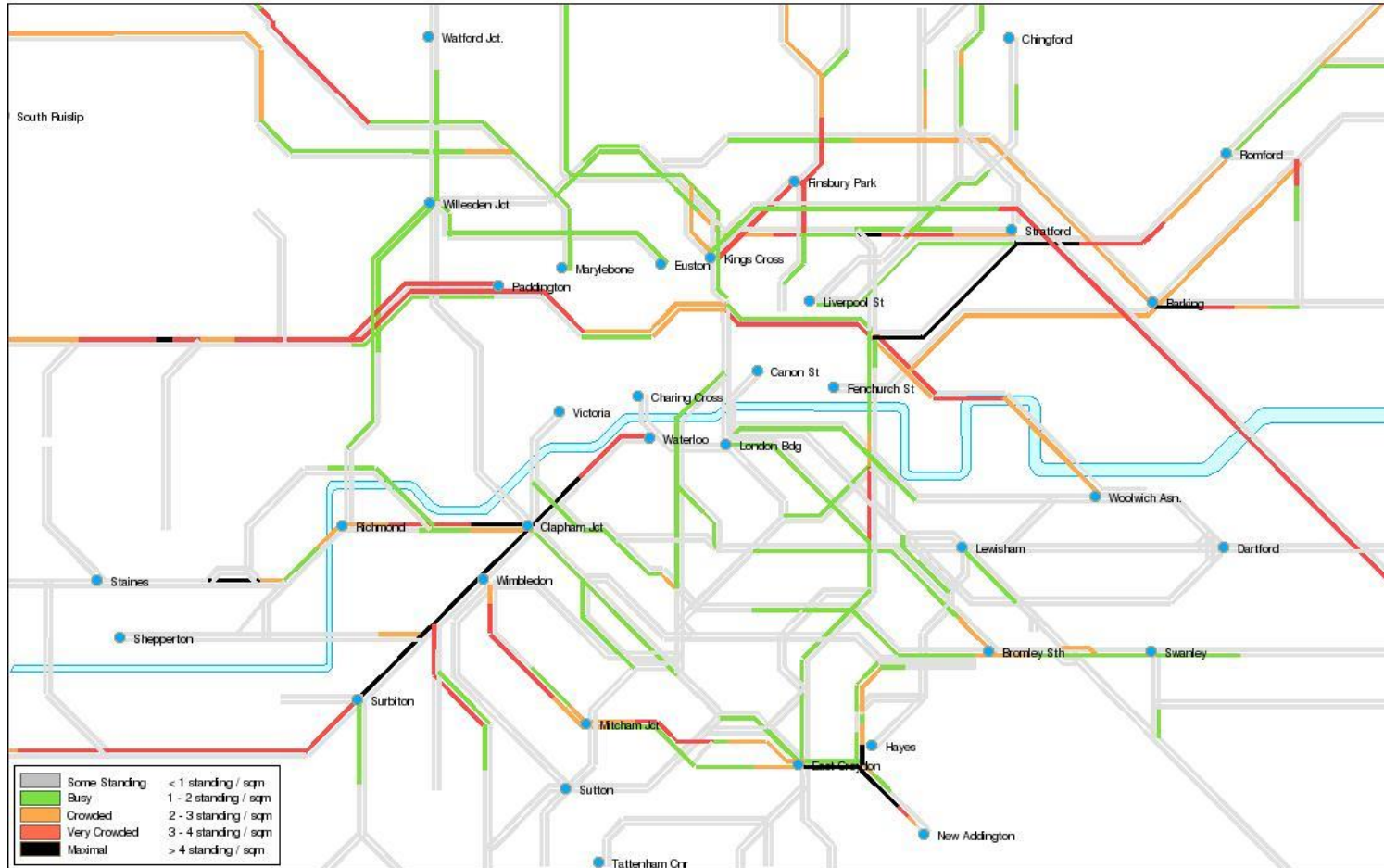
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 157: NR crowding - 2041 future baseline AM peak period (07:00 to 10:00)

National Rail and Tramlink Crowding
HE415A44G - 2041 AM Do-Minimum



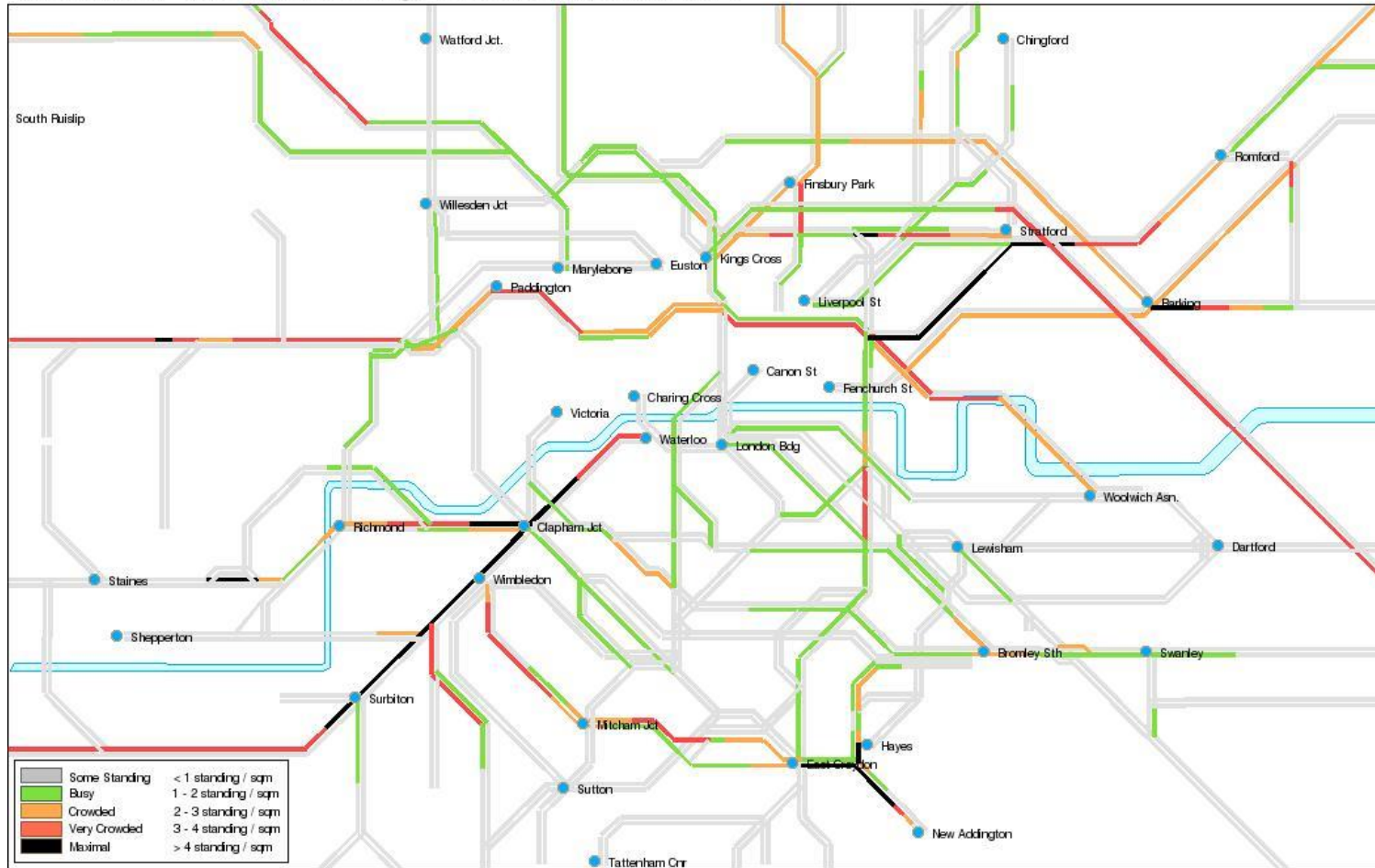
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 158: NR crowding - 2041 HS2 Phase Two AM peak period (07:00 to 10:00)

National Rail and Tramlink Crowding
HE443A46G - 2041 AM DS2 Stage B1 OOC Stub Scenario E



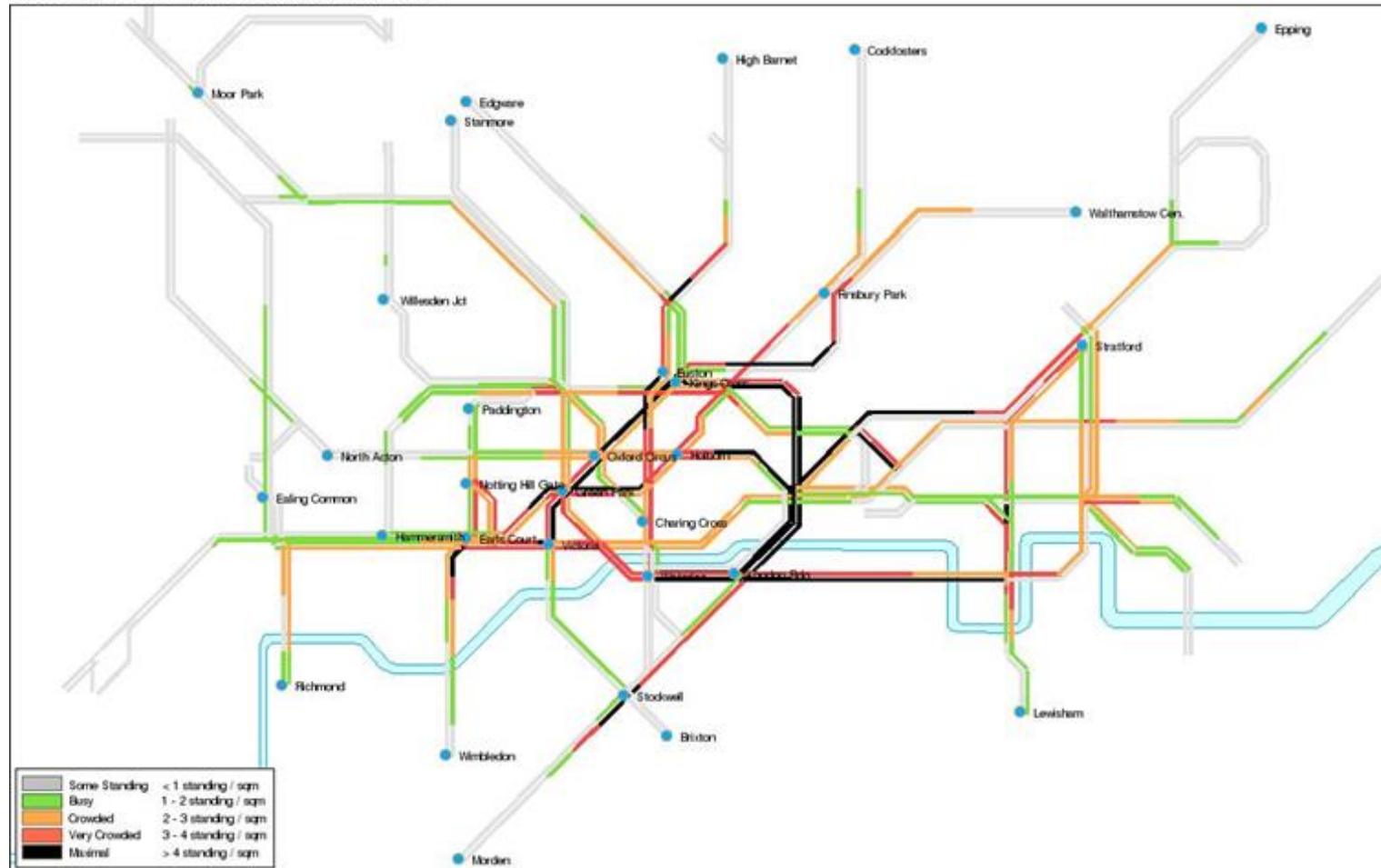
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 159: LU crowding – 2041 future baseline PM peak period (16:00 to 19:00)

LUL and DLR Crowding
 HF419P44G - 2041 PM Do-Minimum



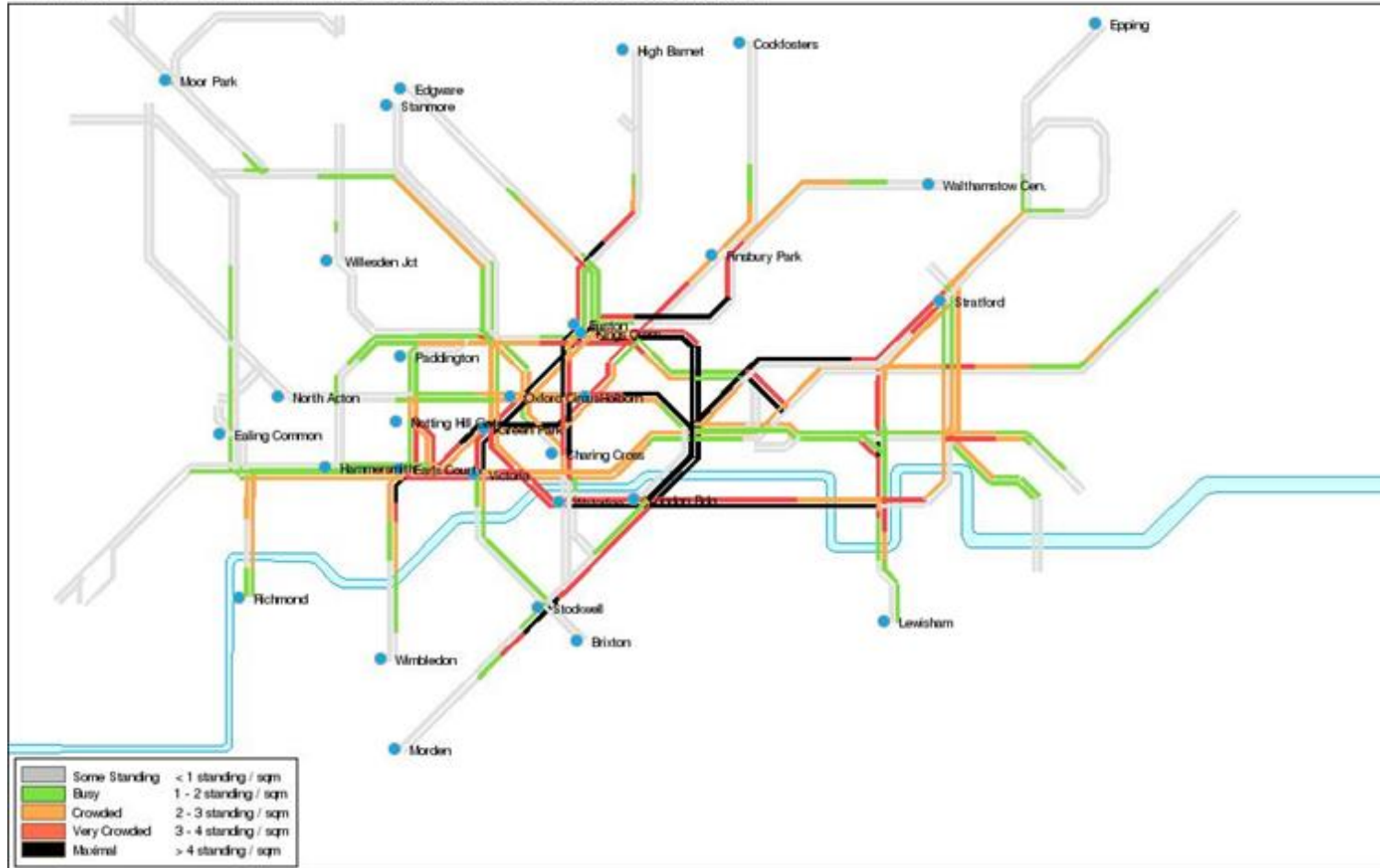
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 16: LU crowding – 2041 HS2 Phase Two PM peak period (16:00 to 19:00)

LUL and DLR Crowding
HF446P46G - 2041 PM DS2 Stage B10OC Stub Scenario E



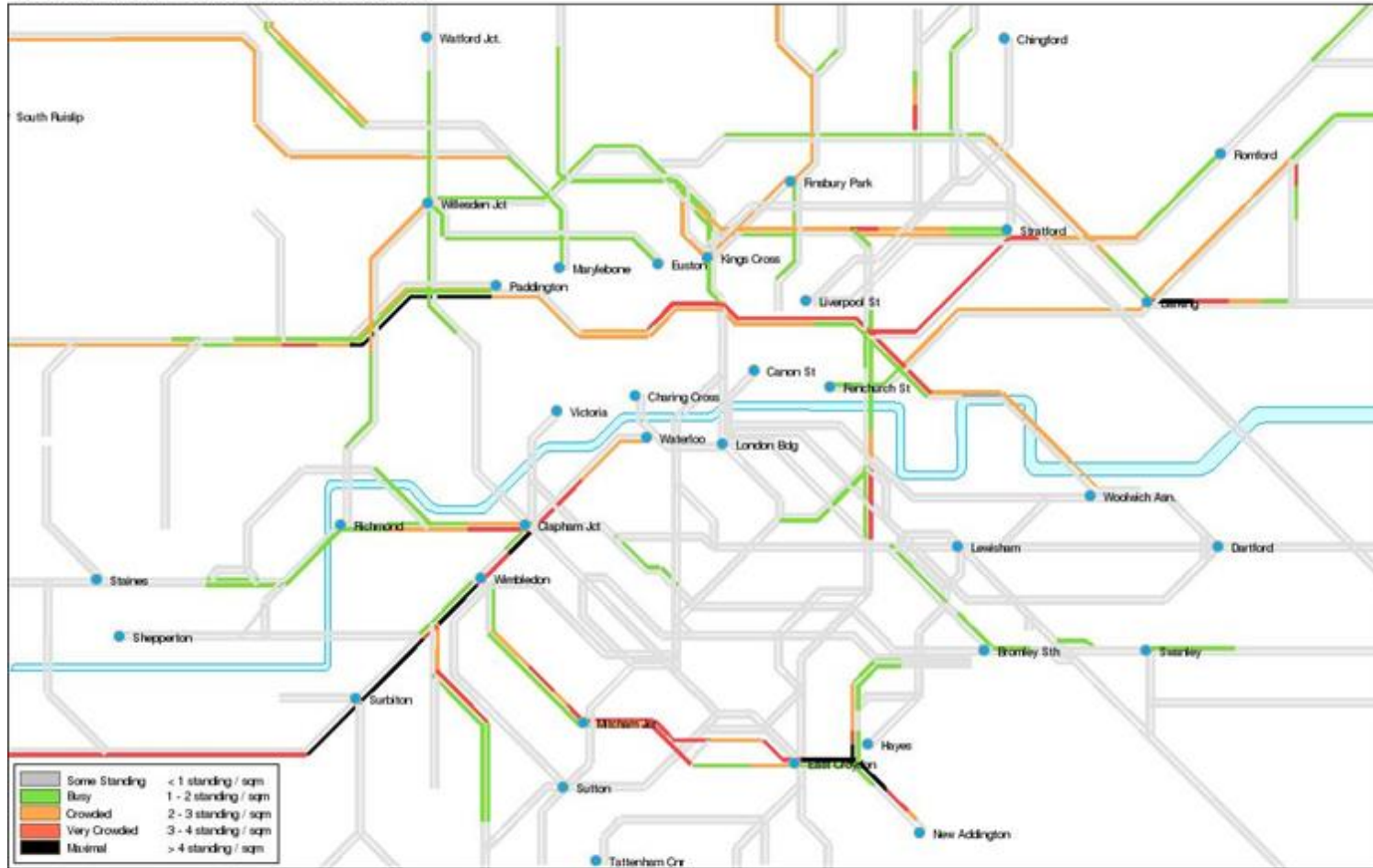
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 161: NR crowding - 2041 future baseline PM peak period (16:00 to 19:00)

National Rail and Tramlink Crowding
 HF419P44G - 2041 PM Do-Minimum



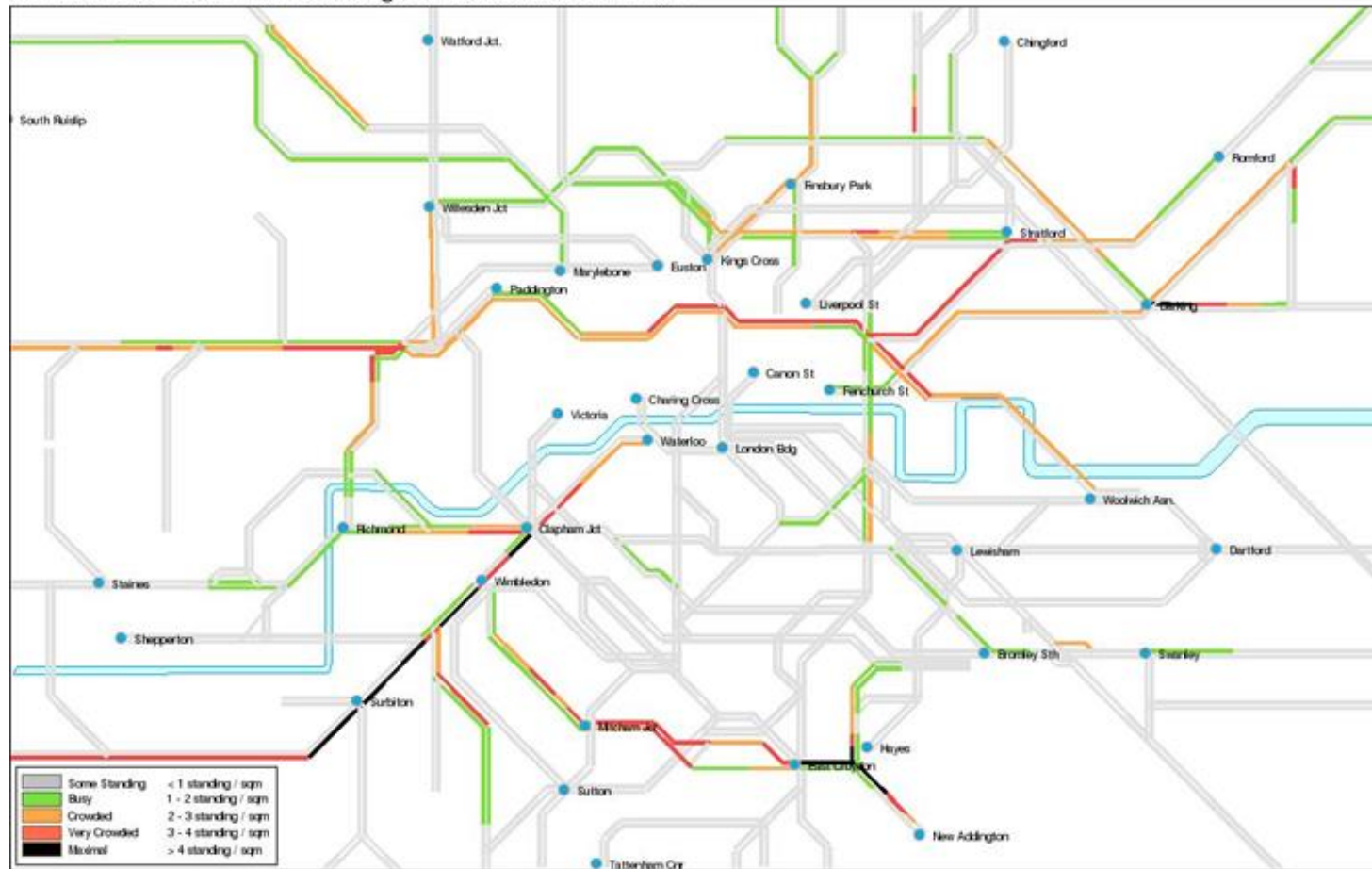
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 162: NR crowding - 2041 HS2 Phase Two PM peak period (16:00 to 19:00)

National Rail and Tramlink Crowding
 HF446P46G - 2041 PM DS2 Stage B100C Stub Scenario E



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 p/sqm
 - Includes reliability factor

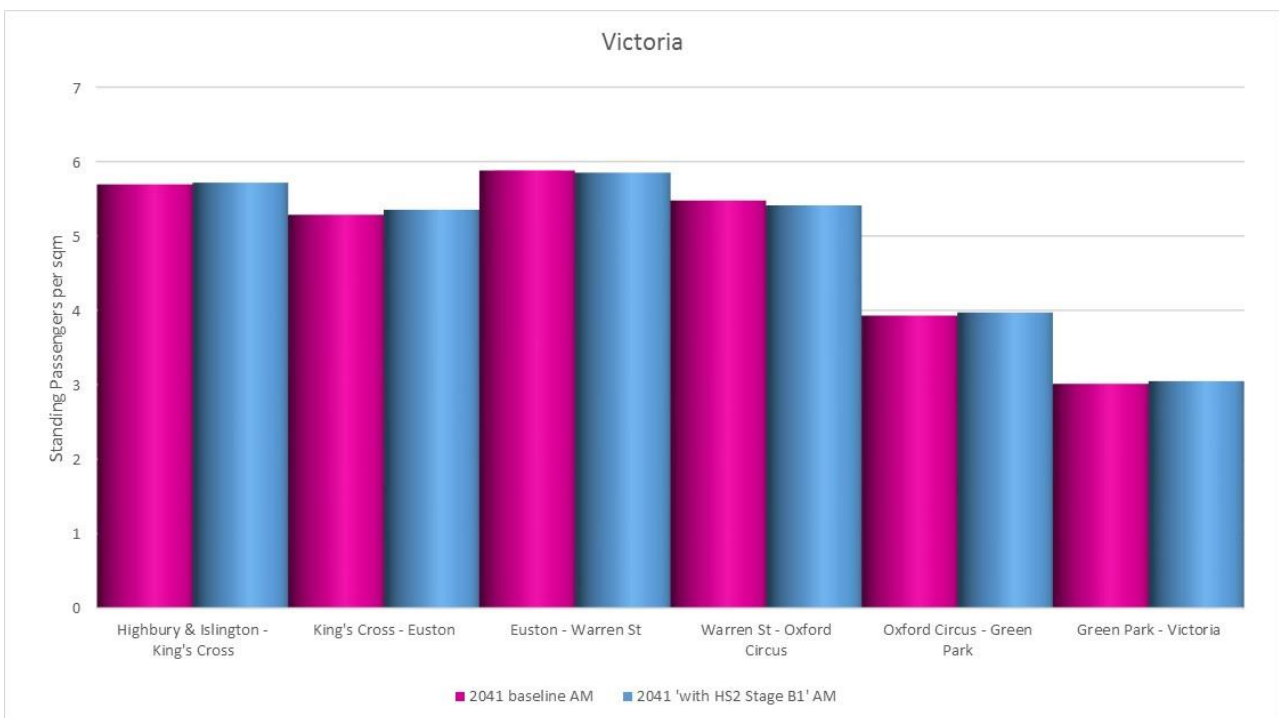
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3.5.161 As for 2026 and 2041 Phase One scenarios, a station to station analysis has been undertaken for the Northern line (Bank and Charing Cross branches), Victoria line, sub-surface (Metropolitan, Circle and Hammersmith & City) lines and the Piccadilly line. The analysis compared crowding for the 2041 future baseline with that of the 2041 HS2 Stage B1 Phase Two scenario and relates this to a practical capacity of 4 PPSM.

3.5.162 Figure 163 shows the station to station analysis on the Victoria Line in the southbound direction during the AM peak period.

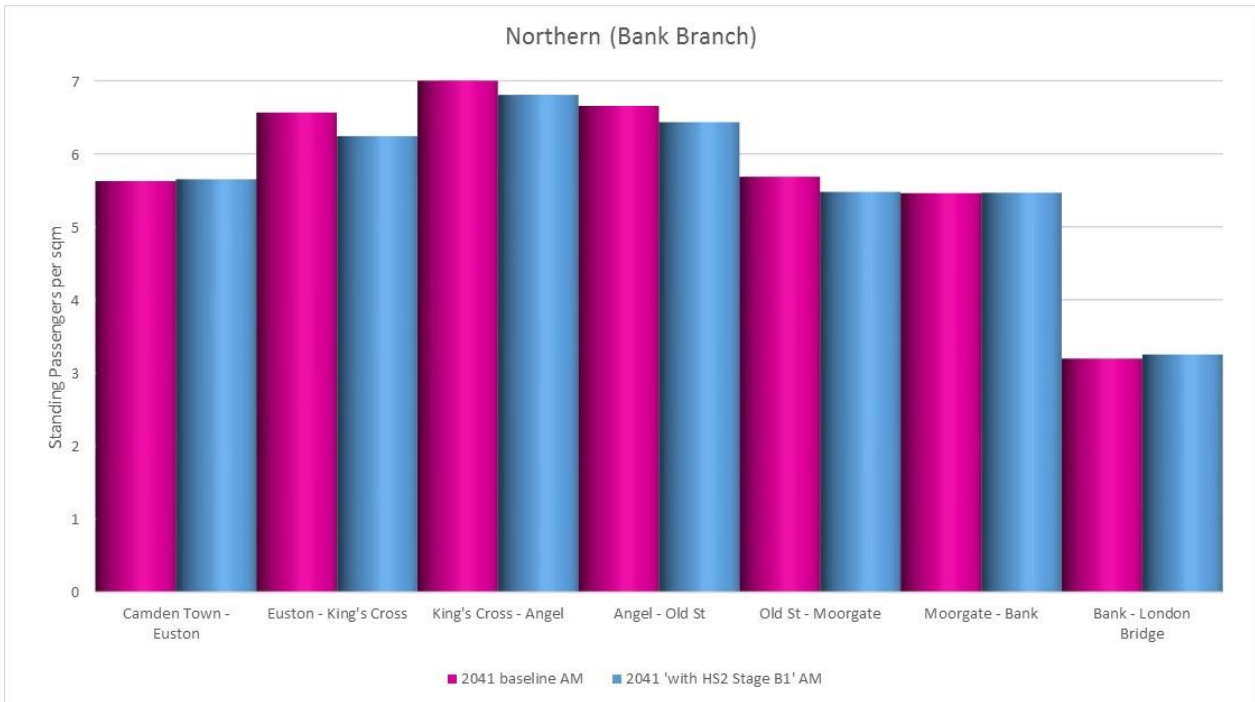
Figure 163: 2041 HS2 Phase Two Victoria line southbound crowding per train - AM peak period (07:00 to 10:00)



3.5.163 During the AM peak period, crowding on certain sections of the Victoria line (Highbury & Islington to Oxford Circus) will be close to 6 PPSM during the 2041 future baseline scenario. The revised scheme has a negligible impact on crowding on the southbound Victoria line, given the high levels of crowding already experienced during the future baseline scenario.

3.5.164 Figure 164 shows the station to station analysis on the Northern line (Bank branch) in the southbound direction during the AM peak period. The analysis shows that crowding on the Northern line (Bank branch) is above 7 PPSM between King's Cross and Old Street for the 2041 future baseline scenario.

Figure 164: 2041 HS2 Phase Two Northern line (Bank branch) southbound crowding per train - AM peak period (07:00 to 10:00)



- 3.5.165 The impact of HS2 demand will result in very little additional crowding on the Northern line (Bank branch) due to the fact that trains are already crowded during the future baseline scenario. Crowding decreases from Euston southbound as far as Moorgate where crowding with HS2 increases slightly.
- 3.5.166 For the Northern line (Charing Cross branch), as shown in Figure 165, crowding levels increase from 2026 to approaching 5 PPSM by 2041, gradually reducing to around 4 PPSM by Warren Street. Crowding increases marginally (by less than 0.1 PPSM) between Camden Town and Euston but reduces from Euston onwards.
- 3.5.167 For the sub-surface lines, crowding is around 5 PPSM between Baker Street and Great Portland Street but falls back to just under 4 PPSM as far as Moorgate. This is shown in Figure 166.
- 3.5.168 Most additional crowding attributable to the revised scheme occurs on the eastbound sub-surface lines between Euston Square and Moorgate, where crowding levels increase by between 0.6 PPSM to 0.3 PPSM. This is because these lines experience lower crowding levels than other lines in the 2041 future baseline and are, therefore, better able to absorb additional passengers. This is reflected in the large increase in additional passengers boarding at Euston Square in the 2041 HS2 Phase Two scenario.

Figure 165: 2041 HS2 Phase Two Northern Line (Charing Cross branch) southbound crowding per train - AM peak period (07:00:10:00)

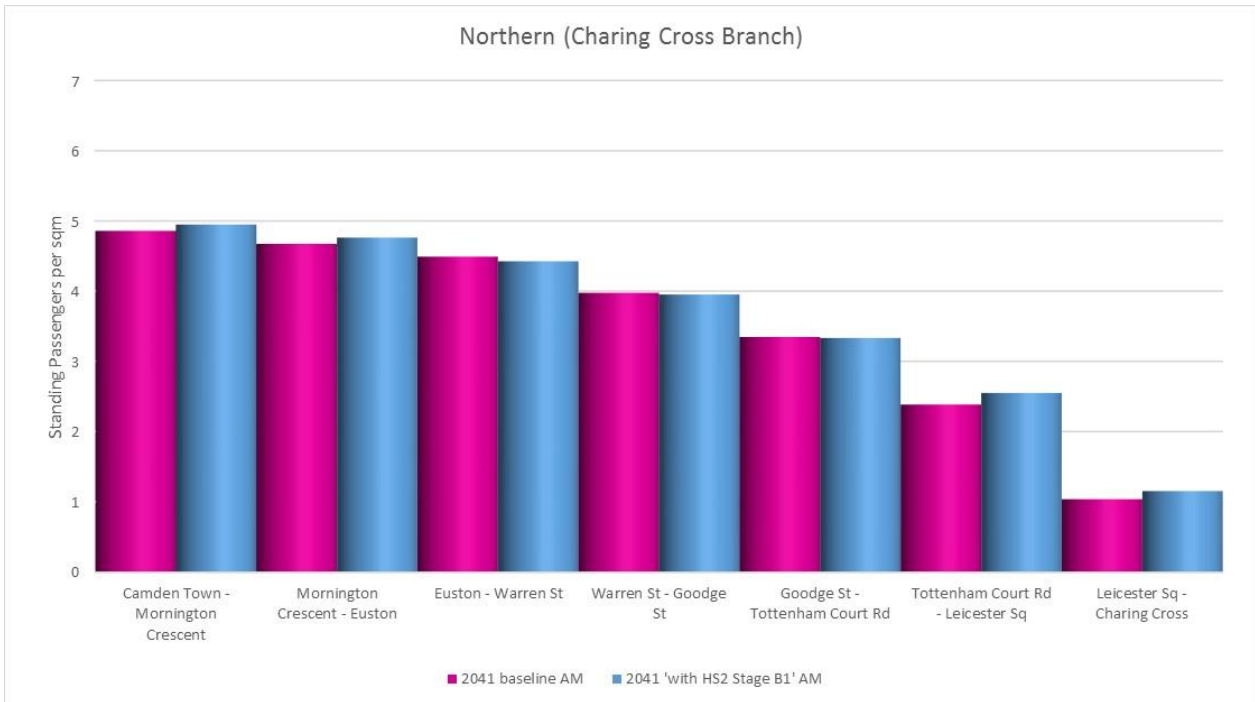
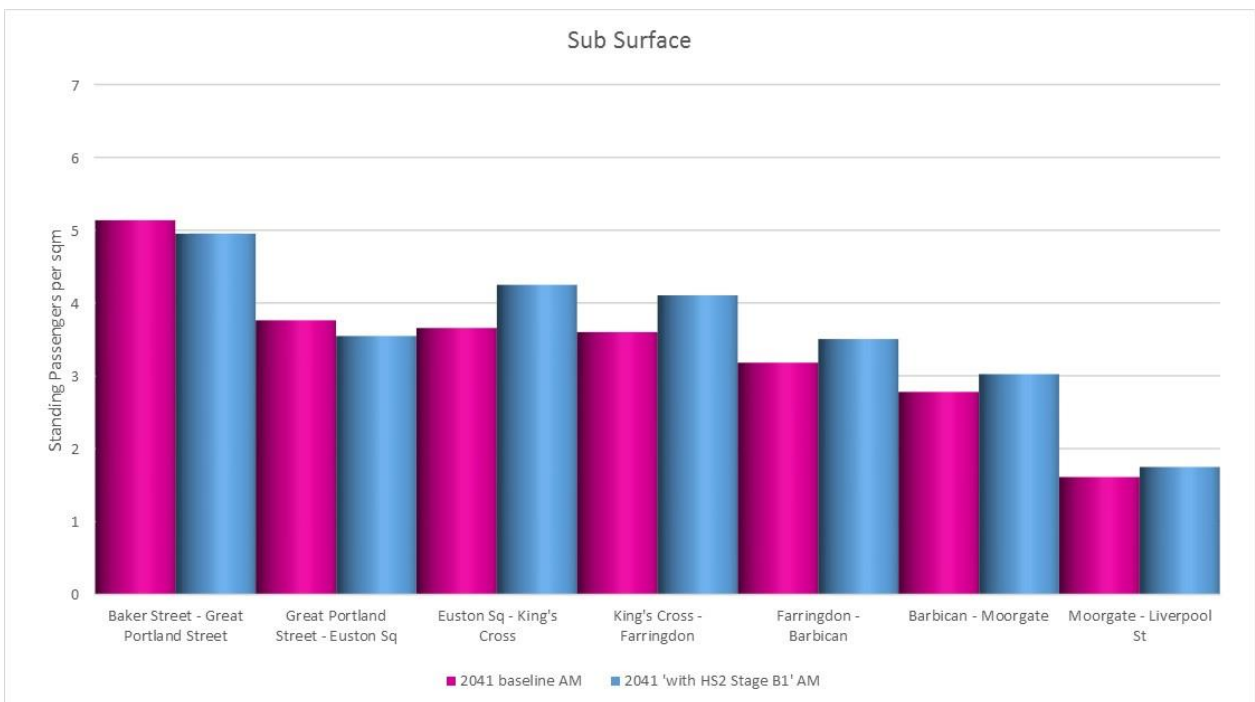
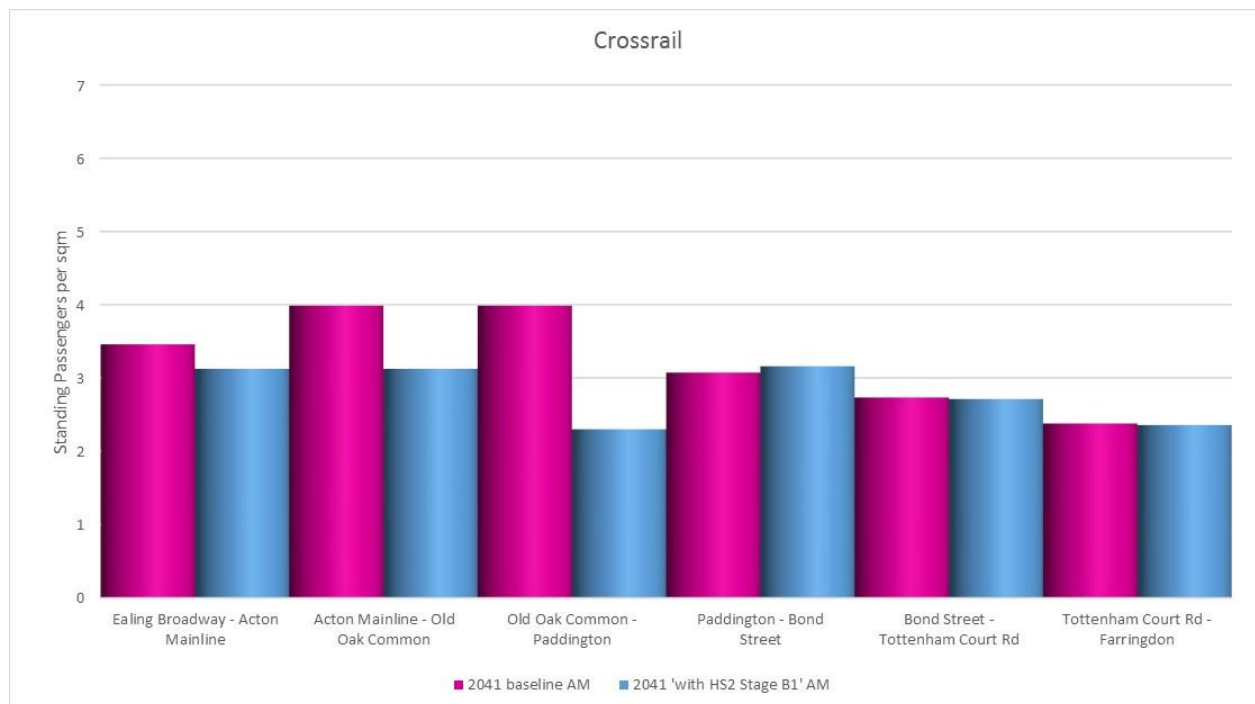


Figure 166: 2041 HS2 Phase Two sub-surface lines eastbound crowding per train - AM peak period (07:00 to 10:00)



3.5.169 Crowding on Crossrail increases slightly between Paddington and Bond Street by around 0.1 PPSM as a result of additional passenger demand associated with the revised scheme boarding Crossrail at Old Oak Common. This is shown on Figure 167.

Figure 167: 2041 HS2 Phase Two Crossrail eastbound crowding per train - AM peak period (07:00 to 10:00)



- 3.5.170 For the PM peak period crowding was assessed in the opposite direction to the AM peak period, reflecting the peak crowded movements. The pattern is very similar to the AM peak period. 2041 future baseline crowding levels are generally lower than during the AM peak although the Northern line (Bank branch) approaches 6 PPSM between Old Street and King's Cross. Despite this, and in common with the AM peak period, the revised scheme adds most additional crowding to the eastbound sub-surface lines between Farringdon and Euston Square, where crowding increases by approximately 0.5 PPSM. As with the AM peak, the sub-surface lines are those with the lowest level of 2041 future baseline crowding, consistently at or just above 3 PPSM and, therefore, have greater available capacity to absorb additional passengers.
- 3.5.171 For all other lines, crowding shows a small reduction with the revised scheme in operation, with the exception of a small increase in crowding of 0.05 PPSM on the Northern line (Charing Cross branch) between Euston and Camden Town.

Public transport interchanges

- 3.5.172 Assessment of interchange in the revised scheme has covered two primary station configurations:
- revised scheme in 2026 with completion of construction Stage A and HS2 Phase One in operation; and
 - revised scheme in 2041 with completion of construction Stage B1 and HS2 Phase Two in operation.
- 3.5.173 Assessment of HS2 Phase Two has been undertaken using forecasts for Phase two operations in 2041 and 2041+20%, which represents a scenario where high speed services operate at capacity. This allows the revised scheme to be assessed and sized for its full potential usage.

3.5.174 Assessment of the HS2 Phase One configuration has been undertaken using forecasts for Phase One operations in 2026 and 2041. While all permanent works delivered in this phase have been sized to meet their long term usage requirements this analysis allows the operational capacity of the station facilities, including any temporary facilities, provided in this initial stage to be assessed and demonstrates the operability of both the new high speed station elements and Euston underground station following opening of HS2 Phase One.

Public transport interchanges completed construction Stage A with 2026 Phase One operation

3.5.175 On completion of construction Stage A at the end of 2026, there will be a number of substantial improvements and additions to the functioning of Euston NR and LU stations. High speed rail services will be introduced with six new dedicated high speed rail platforms at the west of the station.

3.5.176 The high speed platforms are served by a pair of dedicated concourse areas, located at grade level, centrally and to the south end of the high speed platforms. These will be configured to allow passengers to wait in close proximity to all services and connect through to the north-west entrance to the station on A400 Hampstead Road in addition to the upgraded Euston Road entrances. The design also allows for independent operation of the conventional, HS2 and LU services if required (e.g. during disruption).

3.5.177 Improved access from the high speed station to Euston and Euston Square underground stations will also be provided through a 'Comb' route, which provides direct links from platform level to the new LU ticket hall, without the need to travel via the station concourse.

3.5.178 LU services will continue to operate via the existing platforms and lines. Access and interchange are, however, substantially enhanced, with a new station entrance provided to the south. This includes a new ticket hall area and new platform access routes, supporting a number of major improvements:

- Additional access capacity for the Victoria line and Northern line (Bank branch);
- Step free access for the Victoria line and Northern line (Bank branch);
- A new eastern entrance to Euston Square station; and
- Independent operations in the event of service disruption.

3.5.179 For HS2 Phase One configuration, classic rail services continue to operate within the modified conventional station.

Capacity assessment

3.5.180 HS2 Phase One operation has been assessed using a range of techniques, including static analysis and dynamic modelling of the proposed configuration. This confirms that the HS2 Phase One configuration has sufficient capacity to accommodate the forecast 2026 usage of the station with HS2 Phase One in operation.

Euston station

- 3.5.181 HS2 Phase One operation at Euston station includes six new High speed platforms, two concourse areas and a 'Comb' route connecting to Euston underground station and Euston Square station.
- 3.5.182 The design of the high speed platforms has been developed to provide a minimum clear width of 3.0m.
- 3.5.183 The design of the access arrangements for the high speed platforms have been developed to minimise journey times and facilitate onward interchange with LU services. The new 'Comb' route providing access from HS2 services to Euston underground station and the Euston Square link has been sized as a one-way passageway and escalator provision has been developed to meet a recommended three minute platform clearance time. Step free access is provided to all high speed platforms.
- 3.5.184 The revised scheme has limited impacts on the existing conventional Euston station during this period. Where changes are made to the existing station as part of the revised scheme, these proposals have been developed with reference to Network Rail Station Capacity Assessment Guidance, with the aim of maximising the performance of the existing facilities.
- 3.5.185 HS2 Phase One operation changes to the existing station include relocation of the existing ticket hall and the reconfiguration of the station from 18 to 16 platforms. The platform reconfiguration will affect the utilisation of platforms and LU access routes. Additional infrastructure, including ramp widening to platforms 1-3 and an additional escalator from concourse to the LU ticket hall, will be provided to support these revised routeings.

Euston underground station and the Euston Square link

- 3.5.186 The design of the proposed Euston underground station and the Euston Square link has been developed with reference to the LU's Station Planning Standards and Guidance (SPSG). Performance requirements set out in this document have been used in conjunction with the forecast usage for each station element to develop a design which integrates well with current facilities, addresses current congestion issues and is able to accommodate forecast growth.
- 3.5.187 Completion of construction Stage A with HS2 Phase One operation includes the delivery of key elements of the scheme. This includes the new link to Euston Square station, along with a new ticket hall area and new platform access routes, supporting a number of major improvements at Euston underground station.
- 3.5.188 HS2 Stage A design substantially expands access and interchange capacity within Euston underground station. The layout and provision of new escalators has been developed, in accordance with LU's SPSG, to both provide sufficient total access and egress capacity to all platforms in the HS2 Phase Two operations, 2041+20% scenario and to support effective station management.
- 3.5.189 The design of the new Euston underground station entrance has been developed with LU to facilitate interchange between Euston underground station and Euston station

whilst enabling independent operations in the event of service disruptions. Interchange capacity has been sized in accordance with LU's SPSG for the HS2 Phase Two operations, 2041+20% scenario.

- 3.5.190 The design of the Euston Square link, including the Gordon Street entrance and connections to the eastbound and westbound platforms at Euston Square station has been developed to facilitate interchange with services from Euston Square station and dispersal of passengers south of A501 Euston Road.
- 3.5.191 While the main body of the link has been sized in accordance with LU's SPSG for the Phase Two operations, 2041+20% scenario, the width restrictions between the existing sub-surface line (Metropolitan, Hammersmith & City and Circle lines) tunnels and the basement of the existing building at 1 - 9 Melton Street and utility constraints mean the target width cannot be provided at this location, and that while performance for HS2 Phase One operation is unlikely to be an issue, in the longer term, the new platform link would operate with a reduced level of service during the AM and PM peak hours.
- 3.5.192 The performance and operation of these new Euston Square station connections has been explored in further detail using dynamic modelling techniques in collaboration with LU and is considered to remain a major beneficial element of the proposed design despite this longer term congestion issue.

Summary

- 3.5.193 Overall the impacts of HS2 Phase One operation on public transport interchange are strongly positive. In addition to the new high speed facilities, it provides substantial additional capacity within the LU station, addressing the impact of continued trend growth of existing classic services and supporting the introduction of HS2 Phase One services to Euston, including allowing for further growth during construction Stage B1.
- 3.5.194 Interchange between rail and underground services is also improved with both the new connection from Euston station to Euston Square station facilitating interchange to the sub-surface lines (Metropolitan, Hammersmith & City and Circle lines) and the introduction of the new 'Comb' routes, giving direct access from the high speed platforms to Euston underground station and the Euston Square link.
- 3.5.195 Step free access is provided throughout the new high speed station and to the Victoria line and Northern line (Bank branch) at Euston underground station and at Euston Square station.
- 3.5.196 Performance metrics, as calculated by static analysis using relevant HS2 Ltd, LU and NR station planning guidance, for selected station elements in the 2026 HS2 Phase One situation are highlighted in Table 186, Table 187 and Table 188.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2 and CFA3)

Table 186: Selected LU station performance metrics, 2026 HS2 Phase One, AM peak hour

Station element	Design	Capacity (ppm ¹⁸)	Peak demand ¹⁹ (ppm)
Existing LU station entrance	2 up escalators	200	80
	2 down escalators	200	114
South station entrance (upper level)	2 up escalators	200	95
	1 down escalators	100	64
South station entrance (lower level)	1 up escalator	100	92
	2 down escalators	200	79
Existing LU interchange level	2 up escalators	200	73
	2 down escalators	200	126
Southbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	72
	2 down escalators	200	131
Northbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	94
	2 down escalators	200	29
Northern line (Charing Cross branch) access	2.3m stair (up)	81	70
	2.6m stair(down)	91	75

Table 187: Selected LU station performance metrics, 2026 HS2 Phase One, PM peak hour

Station element	Design	Capacity (ppm ²⁰)	Peak demand ²¹ (ppm)
Existing LU station entrance	3 up escalators	300	174
	1 down escalator	100	44

¹⁸ Passengers per minute

¹⁹ Demand per minute in the busiest 15 minutes

²⁰ Passengers per minute

²¹ Demand per minute in the busiest 15 minutes

Station element	Design	Capacity (ppm ²⁰)	Peak demand ²¹ (ppm)
South station entrance (upper level)	1 up escalator	200	21
	2 down escalators	100	66
South station entrance (lower level)	1 up escalator	100	15
	2 down escalators	200	108
Existing LU interchange level	2 up escalators	200	132
	2 down escalators	200	73
Southbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	26
	2 down escalators	200	95
Northbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	121
	2 down escalators	200	39
Northern line (Charing Cross branch) access	2.3m stair (up)	81	57
	2.6m stair(down)	91	61

Table 188: Selected rail station performance metrics, 2026 HS2 Phase One, PM peak hour

Station element	Identified waiting areas based on design	Peak demand (15 minute occupancy)	Concourse Level of Service (LoS)
Existing conventional rail concourse	~1,700m ² (internal concourse) ~1,100m ² (piazza)	3,017	LoS C - D ²² 0.93- 0.56m ² /passenger
Stage A high speed station concourse	~900m ² (south concourse) ~1700m ² (central concourse)	1,278	LoS A >1..2m ² /passenger

Public transport interchanges 2041 HS2 Phase One Operations

3.5.197 The completed construction Stage A station arrangement with HS2 Phase One operation has also been assessed using forecasts for Phase One operations in in 2041. Giving an understanding of how performance might evolve during construction Stage B1.

²² Conventional concourse LoS varies depending on assumed use of the Piazza. This likely to be lower in poor weather.

Capacity assessment

3.5.198 HS2 Phase One operation in 2041 has been assessed using a range of techniques, including static analysis and dynamic modelling of the proposed configuration. This confirms that while congestion levels do increase in comparison to the 2026 Phase One operations, the Stage A configuration has sufficient capacity to accommodate the forecast 2041 usage of the station with 2041 HS2 Phase One in operation.

Euston station

3.5.199 Design of the high speed elements of Euston station is, however, largely driven by the final revised scheme arrangement, which has been developed to meet the requirements of the Phase Two operational scenario for 2041+20%. It therefore provides a high level of performance in this 2041 Phase One operational scenario.

3.5.200 Performance of the conventional station in this scenario would however be expected to decline, with increased passenger volumes placing concourse and platform access facilities under increased pressure.

Euston underground station and the Euston Square link

3.5.201 The capacity assessment of the 2041 HS2 Phase One operation Euston underground station shows that while performance of the station remains at a high level, increased passenger growth with the Stage A station would introduce new congestion issues. These relate to two areas, access to and from the Northern line (Charing Cross branch) platforms and access within the new HS2 Phase One operation Euston underground station entrance, where peak flows are very close to or marginally exceed guidance, these however remain within operable levels.

Summary

3.5.202 Overall the impacts of the completed construction Stage A station with HS2 Phase One operation in 2041 on public transport interchange are strongly positive. In addition to the new high speed facilities, it provides substantial additional capacity within the LU station, addressing the impact of continued trend growth of existing classic services supporting the introduction of HS2 Phase One services to Euston.

3.5.203 As identified previously, this configuration allows for further growth when tested with the 2041 Phase One operational scenario.

3.5.204 Performance metrics, as calculated by static analysis using relevant HS2 Ltd, LU and NR station planning guidance, for selected station elements in the 2041 HS2 Phase One situation are highlighted in Table 189, Table 190 and Table 191.

Table 189: Selected LU station performance metrics, 2041 HS2 Phase One, AM peak hour

Station element	Design	Capacity (ppm ²³)	Peak demand ²⁴ (ppm)
Existing LU station entrance	2 up escalators	200	101

²³ Passengers per minute

²⁴ Demand per minute in the busiest 15 minutes

Station element	Design	Capacity (ppm ²³)	Peak demand ²⁴ (ppm)
	2 down escalators	200	132
South station entrance (upper level)	2 up escalators	200	109
	1 down escalators	100	75
South station entrance (lower level)	1 up escalator	100	102
	2 down escalators	200	107
Existing LU interchange level	2 up escalators	200	91
	2 down escalators	200	148
Southbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	81
	2 down escalators	200	149
Northbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	103
	2 down escalators	200	36
Northern line (Charing Cross branch) access	2.3m stair (up)	81	83
	2.6m stair(down)	91	87

Table 190: Selected LU station performance metrics, 2041 HS2 Phase One, PM peak hour

Station element	Design	Capacity (ppm ²⁵)	Peak demand ²⁶ (ppm)
Existing LU station entrance	3 up escalators	300	214
	1 down escalator	100	58
South station entrance (upper level)	1 up escalator	200	69
	2 down escalators	100	75
South station entrance (lower level)	1 up escalator	100	22

²⁵ Passengers per minute

²⁶ Demand per minute in the busiest 15 minutes

Station element	Design	Capacity (ppm ²⁵)	Peak demand ²⁶ (ppm)
Existing LU interchange level	2 down escalators	200	114
	2 up escalators	200	166
	2 down escalators	200	104
Southbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	33
	2 down escalators	200	103
Northbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	137
	2 down escalators	200	40
Northern line (Charing Cross branch) access	2.3m stair (up)	81	81
	2.6m stair(down)	91	84

Table 191: Selected rail station performance metrics, 2041 HS2 Phase One, PM peak hour

Station element	Identified waiting areas based on design	Peak demand (15 minute occupancy)	Concourse Level of Service (LoS)
Existing conventional rail concourse	~1,700m ² (internal concourse) ~1,100m ² (piazza)	3,499	LoS C - D ²⁷ 0.8-0.49m ² /passenger
Stage A high speed station concourse	~900m ² (south concourse) ~1700m ² (central concourse)	1,722	LoS A >1..2m ² /passenger

Public transport interchanges 2041 HS2 Phase Two Operations

- 3.5.205 Assessment of the revised scheme including completion of construction Stage B1 has been undertaken using forecasts for HS2 Phase Two operations in 2041 and 2041+20%, which represents a scenario where high speed services operate at capacity. This allows the revised scheme to be assessed and sized for its full potential usage.
- 3.5.206 The high speed station will be expanded to 11 platforms to support HS2 Phase Two operation with concourse areas expanded and relocated eastward, maintaining the principles of the HS2 Phase Two operation arrangement.
- 3.5.207 High speed platforms are served by a pair of dedicated concourse areas, located at grade level, centrally and to the south end of the high speed platforms. These will be

²⁷ Conventional concourse LoS varies depending on assumed use of the Piazza. This likely to be lower in poor weather.

configured to allow passengers to wait in close proximity to all services and connect through to the Cobourg Street station entrance. The design also allows for independent operation of the classic, HS2 and LU services if required (e.g. during disruption).

- 3.5.208 The revised scheme provides for a substantial expansion of Euston underground station, with an extended circulation area connecting from the south station entrance, delivered as part of HS2 2026 Phase One operation, northwards to integrate with the completed high speed station, further increasing connectivity and capacity.
- 3.5.209 At the north, this connects directly to the central concourse of the high speed station. Centrally, a connection is also provided to link this new circulation area with the existing Euston underground ticket hall. To the south, this is integrated with the A501 Euston Road station entrance and provides for a new link to the Northern line (Charing Cross branch) platforms, increasing access capacity and allowing the introduction of step-free access.
- 3.5.210 The revised scheme has limited impacts on the existing Euston station during this period. There are, however, a number of changes to support relocation of displaced station accommodation in both the station and piazza area. This introduces station accommodation structures on platforms 2/3 and 8/9.

Capacity assessment

- 3.5.211 The revised scheme has been assessed using both static and dynamic modelling techniques. This has allowed the performance of the revised scheme to be assessed in an integrated manner. This analysis confirms that the completed Stage B1 station has sufficient capacity to accommodate the forecasts for HS2 Phase Two operations and projected use of the overall station in 2041 and 2041+20%, which represents a scenario where high speed services operate at capacity.

Euston station

- 3.5.212 The revised scheme at Euston station provides 11 high speed platforms, two concourse areas and a 'Comb' route connecting to Euston underground station and Euston Square station. The design of the high speed platforms has been developed to provide a minimum clear width of 3.0m.
- 3.5.213 The design of the access arrangements for the high speed platforms has been developed to minimise journey times and facilitate onwards interchange to LU services. The new 'Comb' route providing access from HS2 services to Euston underground station and the Euston Square link has been sized as a one-way passageway and escalator provision has been developed to meet a recommended three minute platform clearance time. Step free access is provided to all high speed platforms.
- 3.5.214 The revised scheme has a number of impacts on the existing conventional Euston station. Changes include relocation of displaced station accommodation in both the station and piazza area, which introduces station accommodation structures on platforms 2/3 and 8/9, reconfigures the retail accommodation in the piazza and the reconfiguration of the station to 11 platforms. These proposals have been developed

with reference to Network Rail Station Capacity Assessment Guidance, with the aim of maximising the performance of the existing facilities.

Euston underground station and the Euston Square link

- 3.5.215 HS2 Phase Two operation continues to provide for a substantial expansion of Euston underground station, the Euston Square link include the Gordon Street entrance and connections to the eastbound and westbound platforms at Euston Square. These are all delivered at the end of construction Stage A at the end of 2026.
- 3.5.216 The revised scheme have been configured to facilitate interchange between Euston underground station and Euston station whilst enabling independent operations in the event of service disruptions. Interchange capacity has been sized in accordance with SPSG for the HS2 Phase Two operations, 2041+20% scenario.
- 3.5.217 The performance and operation of this area of the design has been explored in further detail using dynamic modelling techniques in collaboration with LU and is considered to remain a major beneficial element of the proposed design despite this longer term congestion issue.

Summary

- 3.5.218 Overall the impacts of the revised scheme on public transport interchange are strongly positive. In addition to the new high speed facilities, it provides substantial additional capacity within the LU station supporting both continued trend growth of the underground, classic services and the introduction of HS2 Phase Two services to Euston.
- 3.5.219 Interchange between rail and underground services is also improved with both the new connection from Euston station to Euston Square station facilitating interchange to the sub-surface lines and the introduction of the new 'Comb' routes, giving direct access from the High Speed platforms to Euston underground station and the Euston Square link.
- 3.5.220 The design allows for independent operation of high speed, conventional and underground stations. Step free access is provided throughout the new high speed station and at Euston underground station and Euston Square stations.
- 3.5.221 Performance metrics, as calculated by static analysis using relevant HS2 Ltd, LU and NR station planning guidance, for selected station elements in the 2041 HS2 Phase Two situation are highlighted in Table 192, Table 193 and Table 195.

Table 192: Selected LU station performance metrics, 2041 HS2 Phase Two, AM peak hour

Station element	Design	Capacity (ppm)	Peak demand (ppm)
Existing LU station entrance	1 up escalators	100	54
	3 down escalators	300	189
LU circulation area (north)	2 up escalators	200	118

Station element	Design	Capacity (ppm)	Peak demand (ppm)
	2 down escalators	200	37
LU circulation area (south)	1 up escalator	100	107
	2 down escalators	200	11
Existing LU interchange level	4 up escalators	400	242
Southbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	89
	2 down escalators	200	153
Northbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	114
	2 down escalators	200	34
Northern line (Charing Cross branch) access	4.4m stair (up)	154	115
	4.4m stair(down)	154	104

Table 193: Selected LU station performance metrics, 2041 HS2 Phase Two, PM peak hour

Station element	Design	Capacity (ppm)	Peak demand (ppm)
Existing LU station entrance	3 up escalators	300	165
	1 down escalator	100	68
LU circulation area (north)	3 up escalator	300	143
	1 down escalators	100	41
LU circulation area (south)	1 up escalator	100	22
	2 down escalators	200	64
Existing LU interchange level	4 up escalators	400	217
Southbound Victoria line and Northern line (Bank branch) access	3 up escalators	300	35
	2 down escalators	200	119
	3 up escalators	300	150

Station element	Design	Capacity (ppm)	Peak demand (ppm)
Northbound Victoria line and Northern line (Bank branch) access	2 down escalators	200	42
Northern line (Charing Cross branch) access	4.4m stair (up)	154	94
	4.4m stair (down)	154	104

Table 194: Selected rail station performance metrics, 2041 HS2 Phase Two, PM peak hour

Station element	Identified waiting areas based on design	Peak demand (15 minute occupancy)	Concourse Level of Service (LoS)
Existing conventional rail concourse	~1,600m ² (internal concourse)	3,461	LoS C - D ²⁸
	~1,700m ² (piazza)		0.95-0.46m ² /passenger
Stage A+B1 high speed station concourse	~1,700m ² (south concourse)	2,821	LoS A
	~2,800m ² (central concourse)		>1..2m ² /passenger

Onward mode share

3.5.222 As shown in Table 195, onward mode share analysis has been undertaken to support assessment of the forecast demand on the transport network. This builds on three key inputs, analysis of the current (2012 baseline) situation, Railplan projections for 2026 and 2041 and stakeholder consultation with TfL, NR and LU.

Table 195: Sources for forecast onward mode share of rail and LU passengers at Euston

Mode	Analysis	Source		
		Railplan	Survey analysis	Mode share consultation
Walking	Footway and crossing impacts outside of the station	Yes	Yes	Yes
Taxi and car	Highway Network impacts	Yes	Yes	Yes
	Taxi and pick-up/set-down facility provision and design	Yes	Yes	Yes
Bus and coach	Public transport network impacts	Yes		
	Bus facility provision and design	Yes	Yes	
Cycling	Highway network impacts	Yes	Yes	Yes
	Cycle facility provision and design	Yes	Yes	Yes

²⁸ Conventional concourse LoS varies depending on assumed use of the Piazza. This likely to be lower in poor weather.

- 3.5.223 The mode share for cycling and walking has been informed by analysis of current mode share trends and adjusted in consultation with TfL to reflect future policy.
- 3.5.224 The mode share for taxi has been derived from analysis of the current (2012 baseline) situation and reflects the higher taxi mode share associated with longer distance rail services. The mode share for private vehicle movements reflects the removal of the basement car parking facility at Euston station.
- 3.5.225 For assessment of pedestrian footways and crossings, the underlying survey analysis has been used in conjunction with the Railplan outputs to determine the future footway flows.
- 3.5.226 The station access and station egress mode share values for taxi, car-parking, car pick-up and set-down and cycling are shown in Table 196 and Table 197 and, as reflected in the following analysis, remain consistent across the 2026 and 2041 scenarios. This adds these modes in addition to the total public transport and walk access forecasts from Railplan. While in total, this implies a cumulative mode share of greater than 100%, this range of approaches has been adopted to ensure that each mode is assessed with a robust mode share estimate. Where necessary, additional mode-specific sensitivity tests have also been undertaken. These are reported on in the relevant sections.

Table 196: Future mode share (from station) selected modes

Period	Mode	London Underground	Commuter rail	Long distance high speed (classic and HS2)
AM peak period (07:00 to 10:00)	Taxi	0.4%	2%	6%
	Car parked	NA - disabled parking only		
	Car pick-up	0.1%	0%	0%
	Cycle		3%	2%
	Walk	24%	24%	16%
PM peak period (16:00 to 19:00)	Taxi	0.6%	3%	6%
	Car parked	NA - disabled parking only		
	Car pick-up	0.1%	0%	0%
	Cycle		3%	2%
	Walk	24%	24%	16%

Table 197: Future mode share (to station) selected modes

Period	Mode	London Underground	Commuter rail	Long distance high speed (classic and HS2)
AM peak period (07:00 to 10:00)	Taxi	0.4%	2%	6%
	Car parked	NA - disabled parking only		
	Car pick-up	0.1%	0%	0%
	Cycle		7%	7%
	Walk	24%	24%	16%
PM peak period (16:00 to 19:00)	Taxi	0.6%	3%	6%
	Car parked	NA - disabled parking only		
	Car pick-up	0.1%	0%	0%
	Cycle		7%	7%
	Walk	24%	24%	16%

3.5.227 The onward mode shares by bus and LU have been derived directly using outputs from the Railplan modelling.

Bus

Bus 2026 - completed construction Stage A with 2026 HS2Phase One operation

Bus provision

3.5.228 For 2026, the existing Euston bus station will continue to operate. However, a new bus standing area will be provided at the north-east side of the station off A4200 Eversholt Street.

3.5.229 Detailed plans for the future bus network are not known at this stage. It is expected that the existing bus network will continue to evolve.

3.5.230 2026 HS2 Phase One includes the following changes to bus facilities around Euston station:

- on A4200 Eversholt Street, 'Aldenham Street' southbound bus stop S is proposed to be relocated to the south by approximately 70m, so it can be served by bus routes which start from the new northern bus standing area;
- on A400 Hampstead Road, 'Silverdale' northbound bus stop B will be relocated to the south by 90m and southbound bus stop W is proposed to be relocated to the north by 90m, placing them at the end rather than at the centre of the new A400 Hampstead Road overbridge;

- on A400 Hampstead Road, 'Robert Street' southbound bus stop is proposed to be relocated to the south by approximately 90m to avoid the new junction of A400 Hampstead Road with Robert Street and Cobourg Street; and
- Bus Stop AZ on A501 Euston Road will be relocated approximately 100m to the east.

3.5.231 A new northern bus standing area will be provided at the north-east of the station, accessible from A4200 Eversholt Street. This will accommodate standing space for up to eight buses which could accommodate up to four bus routes. Buses travelling between the existing bus station and the new northern bus standing area will do so along A4200 Eversholt Street.

Bus service changes

3.5.232 It is not anticipated that there would be any changes to the bus services in the vicinity of Euston station upon commencement of HS2 Phase One at the end of 2026.

Bus journey times

3.5.233 Table 198 shows the impact on bus journey times of the bus route changes and diversions, as well as some additional bus delay on the route as a whole. The journey time changes also account for the impact of additional and diverted traffic on the local highway network.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 198: HS2 2026 Stage A changes in bus journey times (in minutes) relative to future baseline

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2026 baseline	2026 Stage A	Actual Change	% change	2026 baseline	2026 Stage A	Actual Change	% change
10	King's Cross to Hammersmith	Eastbound	52.2	56.6	4.4	8.4%	54.3	62.8	8.5	15.7%
		Westbound	51.9	52.4	0.5	1.0%	50.8	52.0	1.2	2.4%
18	Euston to Sudbury	Terminates	54.6	54.2	-0.4	-0.7%	47.1	47.0	-0.1	-0.2%
		Westbound	47.5	47.6	0.1	0.2%	48.9	49.4	0.5	1.0%
24	Hampstead Heath to Grosvenor Road	Terminates	52.4	57.2	4.8	9.2%	56.7	65.6	8.9	15.7%
		Southbound	49	49.4	0.4	0.8%	50.3	50.9	0.6	1.2%
27	Chalk Farm to Chiswick	Northbound	65.6	65.7	0.1	0.2%	55.3	55.6	0.3	0.5%
		Southbound	58.7	58.9	0.2	0.3%	60.6	60.7	0.1	0.2%
29	Trafalgar Square to Wood Green	Northbound	50.1	54.9	4.8	9.6%	55.7	64.5	8.8	15.8%
		Southbound	42.9	43.3	0.4	0.9%	43.8	44.2	0.4	0.9%
30	Hackney Wick to Oxford Street	Eastbound	51.8	51.4	-0.4	-0.8%	54.3	54.2	-0.1	-0.2%
		Westbound	54.7	54.9	0.2	0.4%	50.1	49.8	-0.3	-0.6%
73	Victoria to Stoke Newington	Eastbound	60.2	64.5	4.3	7.1%	62.1	70.6	8.5	13.7%
		Westbound	55.1	55.6	0.5	0.9%	53.5	54.7	1.2	2.2%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2026 baseline	2026 Stage A	Actual Change	% change	2026 baseline	2026 Stage A	Actual Change	% change
88	Camden Town to Clapham Common	Northbound	46.9	47.0	0.1	0.2%	60.1	60.7	0.6	1.0%
		Southbound	62.3	62.9	0.6	1.0%	57.4	58.3	0.9	1.6%
134	North Finchley to Tottenham Court Road	Northbound	50.7	55.7	5	9.9%	52.7	61.4	8.7	16.5%
		Southbound	48	48.3	0.3	0.6%	47.7	48.1	0.4	0.8%
168	Hampstead Heath to Old Kent Road	Northbound	112.6	113.1	0.5	0.4%	121.5	123.5	2	1.6%
		Southbound	46.5	46.5	0	0.0%	54.2	53.6	-0.6	-1.1%
205	Paddington to Bow	Eastbound	59.5	59.2	-0.3	-0.5%	57.7	57.6	-0.1	-0.2%
		Westbound	58.8	59.3	0.5	0.9%	57.3	58.1	0.8	1.4%
253	Euston to Hackney	Northbound	35.3	35.7	0.4	1.1%	37.2	37.4	0.2	0.5%
		Terminates	36.3	36.3	0	0.0%	35.5	35.5	0	0.0%
390	Archway to Notting Hill Gate	Northbound	54.6	59.0	4.4	8.1%	54.6	63.1	8.5	15.6%
		Southbound	45.5	46.1	0.6	1.3%	45.6	46.8	1.2	2.6%
14	Putney Heath to Warren Street station	Terminates	55.6	60.2	4.6	8.3%	59.2	67.9	8.7	14.7%
		Southbound	47.1	47.3	0.2	0.4%	52.9	53.3	0.4	0.8%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2026 baseline	2026 Stage A	Actual Change	% change	2026 baseline	2026 Stage A	Actual Change	% change
59	Streatham Hill to King's Cross	Eastbound	115.9	116.8	0.9	0.8%	119.6	121.9	2.3	1.9%
		Southbound	48.6	48.9	0.3	0.6%	54.4	54.9	0.5	0.9%
68	Euston to West Norwood	Terminates	133.6	133.8	0.2	0.1%	138.5	140.3	1.8	1.3%
		Southbound	68.4	68.3	-0.1	-0.1%	76.8	75.7	-1.1	-1.4%
91	Trafalgar Square to Hornsey	Eastbound	44.0	45.0	1	2.3%	43.9	46.3	2.4	5.5%
		Southbound	40.5	40.9	0.4	1.0%	40.1	40.3	0.2	0.5%
476	Euston to Northumberland Park	Eastbound	41.3	41.8	0.5	1.2%	42.5	42.9	0.4	0.9%
		Terminates	48.8	49.1	0.3	0.6%	46.7	47.0	0.3	0.6%

- 3.5.234 Table 198 shows that eight bus routes are predicted to have an increase of over 5% in end-to-end journey time during the AM peak hour. These are:
- bus route 10 in the eastbound direction;
 - bus route 24 in the northbound direction;
 - bus route 29 in the northbound direction;
 - bus route 73 in the northbound direction;
 - bus route 134 in the northbound direction;
 - bus route 390 in the northbound direction;
 - bus route 14 in the northbound direction; and
 - bus route 91 in the northbound direction.
- 3.5.235 During the PM peak hour, with the exception of bus route 91, all of these routes experience an increase in the end-to-end journey time of between 13.5% and 16.5%. Bus route 91 experiences an increase of 5.5%
- 3.5.236 For the bus routes operating along A400 Hampstead Road/A400 Tottenham Court Road (bus routes 14, 24, 29 and 134), these changes can be attributed to delays incurred at the junction of A501 Euston Road with A400 Hampstead Road and A400 Tottenham Court Road. These delays can be mitigated through the optimisation of signal timings at this junction.
- 3.5.237 For bus routes 10, 73, 91 and 390, these changes can be part attributed to a combination of increased journey time through the new bus station and increased journey time on other sections of the routes.
- 3.5.238 For all other bus routes, the impact on the end-to-end bus journey times is generally less than 5%. Some minor decreases in end-to-end journey times have also been recorded.

Bus passenger demand

- 3.5.239 Table 199 shows the estimated change in bus boarding and alighting demand at Euston station. This includes Euston bus station, together with bus stops on A501 Euston Road and A4200 Eversholt Street that could be used to access the station. The estimated change in boarding and alighting demand on bus routes using A400 Hampstead Road is also outlined in Table 199.
- 3.5.240 The increase bus passenger demand has been derived by calculating the proportional increase between the future baseline and HS2 Phase Two scenarios, in Railplan, and applying this to the 2012 baseline demand. Whilst the Railplan bus boarding and alighting validation is good at an aggregate sub-regional level, it underestimates the 2012 baseline level of bus travel. The assessment of the 2026 bus boarding and alighting demand, which is based on the Railplan model, focusses on the relative difference between the 2026 future baseline Railplan model and the 2026 HS2 Phase One Railplan model, rather than the absolute values. The change in flows between tests will be a better representation of change than the absolute change in values. However, the results should be treated as approximate.

Table 199: 2026 bus boarding and alighting demand

Location	Scenario	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		Boarders	Alighters	Total	Boarders	Alighters	Total
Euston station	2026 baseline	2,740	1,859	4,599	3,308	3,346	6,654
	2026 'with HS2'	3,108	2,151	5,259	3,782	3,587	7,369
	Change (in passengers)	368	293	661	474	241	715
A400 Hampstead Road	2026 baseline	605	357	962	463	860	1,323
	2026 'with HS2'	1,282	1,585	2,867	871	2,447	3,318
	Change (in passengers)	677	1,228	1,905	408	1,587	1,995

3.5.241 Figure 168 and Figure 169 show the absolute difference in 2026 bus passenger flows between the future baseline and HS2 Phase One scenarios in the AM and PM peak periods respectively, as obtained from Railplan.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Figure 168: 2026 HS2 Phase One AM peak period (07:00 to 10:00) bus difference plot (2026 baseline vs 2026 Stage A)



SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Figure 169: 2026 HS2 Phase One PM peak period (16:00 to 19:00) bus difference plot (2026 baseline vs 2026 Stage A)



- 3.5.242 Figure 168 and Figure 169 indicate an increase in flows along A4200 Upper Woburn Place and A400 Gower Street during the AM peak period and on A400 Tottenham Court road in the PM peak period. There are also a small number of negligible flow changes on other north to south corridors.
- 3.5.243 On A501 Euston Road west of Euston station, the reduction in bus passenger flows can be part attributed to a shift from bus to Crossrail services, resulting in a reduction in bus flows along this bus corridor.

Bus 2041 - completed construction Stage A with HS2 Phase One operation

Bus provision

- 3.5.244 Although a replacement bus station is provided as part of construction Stage B1, for this assessment in 2041, the existing Euston bus station is assumed to continue to operate, with only the completion of construction Stage A completed. However, a new bus standing area will be provided at the north-east side of the station off A4200 Eversholt Street.
- 3.5.245 Detailed plans for the future bus network are not known at this stage. It is expected that the existing bus network will continue to evolve.
- 3.5.246 The revised scheme includes the following changes to bus facilities around Euston station in 2041 (Phase One) as reported for the 2026 HS2 Phase One bus provision.

Bus service changes

- 3.5.247 It is not anticipated that there would be any changes to the bus services in the vicinity of Euston station in 2041 (Phase One).

Bus journey times

- 3.5.248 Table 200 shows the impact on bus journey times of the bus route changes and diversions, as well as some additional bus delay on the route as a whole. The journey time changes also account for the impact of additional and diverted traffic on the local highway network.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 200: HS2 2041 Stage A2041 HS2 Phase One changes in bus journey times (in minutes) relative to future baseline

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2041 baseline	2041 Stage B1	Actual Change	% change	2041 baseline	2041 Stage B1	Actual Change	% change
10	King's Cross to Hammersmith	Eastbound	58.8	63.4	4.6	7.8%	64.0	63.9	-0.1	-0.2%
		Westbound	52.9	53.5	0.6	1.1%	51.2	52.2	1	2.0%
18	Euston to Sudbury	Terminates	54.5	54.1	-0.4	-0.7%	47.9	47.7	-0.2	-0.4%
		Westbound	47.9	48.0	0.1	0.2%	48.5	49.4	0.9	1.9%
24	Hampstead Heath to Grosvenor Road	Terminates	59.0	63.9	4.9	8.3%	67.5	66.7	-0.8	-1.2%
		Southbound	50.0	50.4	0.4	0.8%	51.3	51.8	0.5	1.0%
27	Chalk Farm to Chiswick	Northbound	66.2	66.7	0.5	0.8%	56.5	56.8	0.3	0.5%
		Southbound	59.4	59.5	0.1	0.2%	60.7	61.2	0.5	0.8%
29	Trafalgar Square to Wood Green	Northbound	57.1	62.1	5	8.8%	66.5	65.6	-0.9	-1.4%
		Southbound	43.7	44.0	0.3	0.7%	44.2	44.5	0.3	0.7%
30	Hackney Wick to Oxford Street	Eastbound	52.9	52.6	-0.3	-0.6%	55.6	55.5	-0.1	-0.2%
		Westbound	56.7	56.9	0.2	0.4%	51.7	51.0	-0.7	-1.4%
73	Victoria to Stoke Newington	Eastbound	67.1	71.7	4.6	6.9%	72.3	72.2	-0.1	-0.1%
		Westbound	56.8	57.3	0.5	0.9%	54.2	55.3	1.1	2.0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2041 baseline	2041 Stage B1	Actual Change	% change	2041 baseline	2041 Stage B1	Actual Change	% change
88	Camden Town to Clapham Common	Northbound	47.4	47.7	0.3	0.6%	62.4	63.5	1.1	1.8%
		Southbound	63.7	64.1	0.4	0.6%	59.6	60.4	0.8	1.3%
134	North Finchley to Tottenham Court Road	Northbound	56.7	61.8	5.1	9.0%	61.6	61.6	0	0.0%
		Southbound	48.3	48.4	0.1	0.2%	48.1	48.4	0.3	0.6%
168	Hampstead Heath to Old Kent Road	Northbound	113.5	115.1	1.6	1.4%	122.4	124.6	2.2	1.8%
		Southbound	48.3	48.7	0.4	0.8%	55.5	56.2	0.7	1.3%
205	Paddington to Bow	Eastbound	61.1	61.1	0	0.0%	59.7	59.5	-0.2	-0.3%
		Westbound	63.3	63.5	0.2	0.3%	57.5	58.8	1.3	2.3%
253	Euston to Hackney	Northbound	36.0	37.0	1	2.8%	38.0	38.5	0.5	1.3%
		Terminates	36.9	36.9	0	0.0%	36.0	36.0	0	0.0%
390	Archway to Notting Hill Gate	Northbound	61.5	66.1	4.6	7.5%	64.4	64.4	0	0.0%
		Southbound	46.6	47.2	0.6	1.3%	46.1	47.2	1.1	2.4%
14	Putney Heath to Warren Street station	Terminates	62.7	67.5	4.8	7.7%	70.6	69.5	-1.1	-1.6%
		Southbound	47.8	48.3	0.5	1.0%	54.3	54.6	0.3	0.6%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2041 baseline	2041 Stage B1	Actual Change	% change	2041 baseline	2041 Stage B1	Actual Change	% change
59	Streatham Hill to King's Cross	Eastbound	117.5	119.2	1.7	1.4%	121.2	123.7	2.5	2.1%
		Southbound	50.7	51.0	0.3	0.6%	57.0	57.5	0.5	0.9%
68	Euston to West Norwood	Terminates	134.7	135.4	0.7	0.5%	139.2	141.0	1.8	1.3%
		Southbound	70.4	70.5	0.1	0.1%	77.5	77.9	0.4	0.5%
91	Trafalgar Square to Hornsey	Eastbound	45.6	48.2	2.6	5.7%	45.5	47.9	2.4	5.3%
		Southbound	41.7	42.2	0.5	1.2%	41.4	40.8	-0.6	-1.4%
476	Euston to Northumberland Park	Eastbound	42.0	42.9	0.9	2.1%	43.4	44.0	0.6	1.4%
		Terminates	50.4	50.6	0.2	0.4%	47.4	47.7	0.3	0.6%

- 3.5.249 Table 200 shows that eight bus routes are predicted to have an increase of over 5% in end-to-end journey time during the AM peak hour. These are:
- bus route 10 in the eastbound direction;
 - bus route 24 in the northbound direction;
 - bus route 29 in the northbound direction;
 - bus route 73 in the northbound direction;
 - bus route 134 in the northbound direction;
 - bus route 390 in the northbound direction;
 - bus route 14 in the northbound direction; and
 - bus route 91 in the northbound direction.
- 3.5.250 During the PM peak hour, only one route experiences an increase in the end-to-end journey time of over 5%. This is bus route 91 in the eastbound direction.
- 3.5.251 For the bus routes operating along A400 Hampstead Road/A400 Tottenham Court Road (bus routes 14, 24, 29 and 134), these changes can be attributed to delays incurred at the junction of A501 Euston Road with A400 Hampstead Road and A400 Tottenham Court Road. These delays can be mitigated through the optimisation of signal timings at this junction.
- 3.5.252 For all other bus routes, the impact on the end-to-end bus journey times is generally less than 5%. Some minor decreases in end-to-end journey times have also been identified.

Bus passenger demand

- 3.5.253 Table 201 shows the estimated change in bus boarding and alighting demand at Euston station. This includes Euston bus station, together with bus stops on A501 Euston Road and A4200 Eversholt Street that could be used to access the station. The estimated change in boarding and alighting demand on bus routes using A400 Hampstead Road is also outlined in Table 201.
- 3.5.254 The increase bus passenger demand has been derived by calculating the proportional increase between the future baseline and HS2 Phase Two scenarios, in Railplan, and applying this to the 2012 baseline demand. Whilst the Railplan bus boarding and alighting validation is good at an aggregate sub-regional level, it should be noted that it underestimates the 2012 baseline level of bus travel. The assessment of the 2041 bus boarding and alighting demand, which is based on the Railplan model, focusses on the relative difference between the 2026 future baseline Railplan model and the 2041 HS2 Phase Two Railplan model, rather than the absolute values. The change in flows between tests will be a better representation of change than the absolute change in values. However, the results should be treated as approximate.

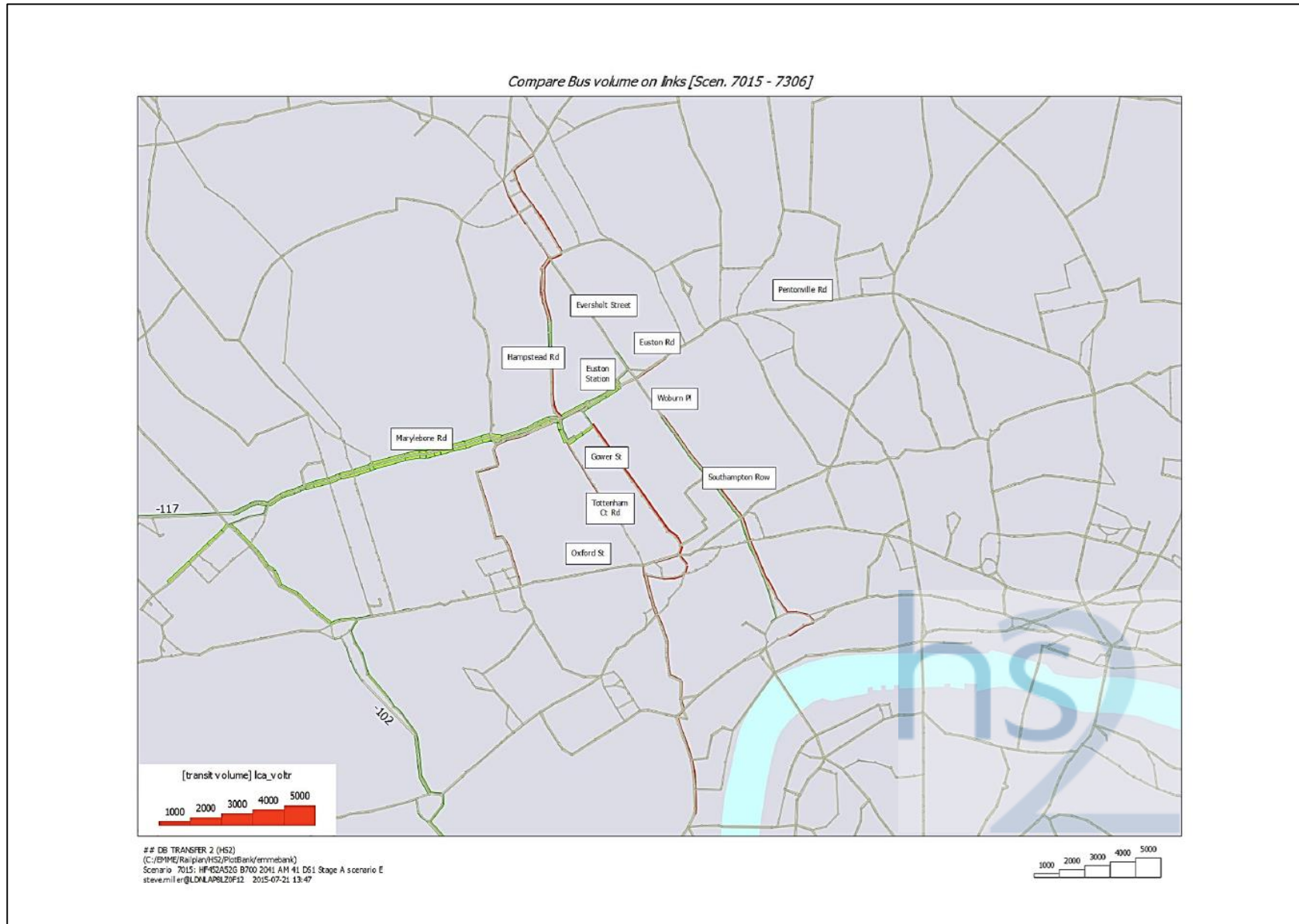
Table 201: 2041 HS2 Phase One bus boarding and alighting demand

Location	Scenario	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		Boarders	Alighters	Total	Boarders	Alighters	Total
Euston station	2041 baseline	3,493	2,236	5,729	4,055	3,816	7,971
	2041 'with HS2'	3,832	2,570	6,402	4,691	3,606	8,297
	Change (in passengers)	339	333	672	636	-311	325
A400 Hampstead Road	2041 baseline	793	485	1,278	543	1,199	1,742
	2041 'with HS2'	1,963	1,987	3,950	1,088	1,931	3,019
	Change (in passengers)	1,171	1,502	2,673	545	732	1,277

3.5.255 Figure 170 and Figure 171 show the absolute difference in 2041 bus passenger flows between the future baseline and HS2 Phase Two scenarios in the AM and PM peak periods respectively, as obtained from Railplan.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Figure 170: 2041 HS2 Phase One AM peak period (07:00 to 10:00) bus difference plot (future baseline vs HS2 Phase Two)



SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Figure 171: 2041 HS2 Phase One PM peak period (16:00 to 19:00) bus difference plot (future baseline vs HS2 Phase Two)



- 3.5.256 Figure 170 and Figure 171 indicate an increase in flows along A4200 Upper Woburn Place during the AM peak period of around 250 passengers in the southbound direction and 130 passengers in the northbound direction. There are also a small number of small flow changes on other north to south corridors.
- 3.5.257 On A501 Euston Road west of Euston station, the reduction in bus passenger flows can be part attributed to a shift from bus to Crossrail services, resulting in a reduction in bus flows along this bus corridor.

Bus 2041 – completion construction Stage B1 and HS2 Phase Two operation

Bus provision

- 3.5.258 With completion of construction Stage B1, the revised scheme will provide a new linear bus station to the south of Euston station. In addition, the new bus standing area will continue to operate at the northeast side of the station off A4200 Eversholt Street.
- 3.5.259 Together, the new bus station and northern bus standing area increase capacity for through and terminating bus routes to meet the additional demand generated by general growth and the revised scheme. The linear bus station can also accommodate an increased frequency of through bus routes, while the relocation of some bus standing to the northern bus standing area will improve the operation of the bus station.
- 3.5.260 The design of the new bus station and northern bus standing area provide flexibility in bus routing while reducing bus mileage. The proposals provide a new right turn lane for buses from A501 Euston Road into the new bus station.
- 3.5.261 Detailed plans for the future bus network are not known at this stage. It is expected that the existing bus network and the proposed bus routes will continue to evolve.
- 3.5.262 The revised scheme includes the following changes to bus facilities around Euston station:
- on A501 Euston Road, 'Euston Station' eastbound bus stop H is proposed to be relocated to the east by approximately 90m and a short section of eastbound bus lane is proposed to be removed. A new right lane for buses from A501 Euston Road into the new bus station will be provided; and
 - on A4200 Upper Woburn Place, 'Upper Woburn Place' southbound bus stop M will be relocated to the south by approximately 70m to reduce the risk of traffic queues from the bus stop affecting A501 Euston Road.

Bus service changes

- 3.5.263 The 'south to east' bus route 91 currently bypasses the existing bus station when travelling from east to south. The revised scheme will enable the 91 bus to stop at the bus station in both directions.
- 3.5.264 Both bus routes 59 and 91 will turn right from A501 Euston Road into the bus station when travelling from south to east. Bus route 253 will also be diverted to leave the bus station via A501 Euston Road, Churchway and Grafton Place.

3.5.265 In addition to the new bus station and new northern bus standing area, TfL has requested that provision is made for the existing bus routes to be supplemented by two proposed bus routes which would require standing space for four buses. These proposed routes are:

- A terminating route which travels eastwards from Euston, with similarities to existing bus route 476 or to the eastern half of route 205. It has been assumed that this route would operate at a frequency of 10 buses per hour; and
- A terminating bus route which travels southward from Euston, with similarities to the existing bus route 68. It has been assumed that this route would operate at a frequency of 10 buses per hour.

Bus journey times

3.5.266 Table 202 shows the impact on bus journey times of the bus route changes and diversions, as well as some additional bus delay on the route as a whole. The journey time changes also account for the impact of additional and diverted traffic on the local highway network.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 202: HS2 2041 HS2 Phase Two changes in bus journey times (in minutes) relative to future baseline

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2041 baseline	2041 Stage B1	Actual Change	% change	2041 baseline	2041 Stage B1	Actual Change	% change
10	King's Cross to Hammersmith	Eastbound	58.8	64.8	6.0	10.2%	64.0	61.0	-3.0	-4.7%
		Westbound	52.9	53.8	0.9	1.7%	51.2	53.2	2.0	3.9%
18	Euston to Sudbury	Terminates	54.5	54.1	-0.4	-0.7%	47.9	48.0	0.1	0.2%
		Westbound	47.9	48.8	0.9	1.9%	48.5	50.0	1.5	3.1%
24	Hampstead Heath to Grosvenor Road	Terminates	59.0	65.4	6.4	10.8%	67.5	64.3	-3.2	-4.7%
		Southbound	50.0	51.0	1.0	2.0%	51.3	52.4	1.1	2.1%
27	Chalk Farm to Chiswick	Northbound	66.2	66.9	0.7	1.1%	56.5	57.2	0.7	1.2%
		Southbound	59.4	60.0	0.6	1.0%	60.7	61.4	0.7	1.2%
29	Trafalgar Square to Wood Green	Northbound	57.1	63.6	6.5	11.4%	66.5	63.2	-3.3	-5.0%
		Southbound	43.7	44.5	0.8	1.8%	44.2	44.9	0.7	1.6%
30	Hackney Wick to Oxford Street	Eastbound	52.9	52.9	0.0	0.0%	55.6	55.7	0.1	0.2%
		Westbound	56.7	56.7	0.0	0.0%	51.7	51.7	0.0	0.0%
73	Victoria to Stoke Newington	Eastbound	67.1	73.2	6.1	9.1%	72.3	69.4	-2.9	-4.0%
		Westbound	56.8	57.6	0.8	1.4%	54.2	56.1	1.9	3.5%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2041 baseline	2041 Stage B1	Actual Change	% change	2041 baseline	2041 Stage B1	Actual Change	% change
88	Camden Town to Clapham Common	Northbound	47.4	47.8	0.4	0.8%	62.4	64.3	1.9	3.0%
		Southbound	63.7	64.6	0.9	1.4%	59.6	61.0	1.4	2.3%
134	North Finchley to Tottenham Court Road	Northbound	56.7	63.1	6.4	11.3%	61.6	58.9	-2.7	-4.4%
		Southbound	48.3	49.0	0.7	1.4%	48.1	48.9	0.8	1.7%
168	Hampstead Heath to Old Kent Road	Northbound	113.5	115.8	2.3	2.0%	122.4	124.8	2.4	2.0%
		Southbound	48.3	49.0	0.7	1.4%	55.5	56.6	1.1	2.0%
205	Paddington to Bow	Eastbound	61.1	61.3	0.2	0.3%	59.7	59.7	0.0	0.0%
		Westbound	63.3	63.5	0.2	0.3%	57.5	59.2	1.7	3.0%
253	Euston to Hackney	Northbound	36.0	37.3	1.3	3.6%	38.0	38.6	0.6	1.6%
		Terminates	36.9	36.9	0.0	0.0%	36.0	36.0	0.0	0.0%
390	Archway to Notting Hill Gate	Northbound	61.5	67.5	6.0	9.8%	64.4	61.6	-2.8	-4.3%
		Southbound	46.6	47.6	1.0	2.1%	46.1	48.2	2.1	4.6%
14	Putney Heath to Warren Street station	Terminates	62.7	68.6	5.9	9.4%	70.6	66.8	-3.8	-5.4%
		Southbound	47.8	48.4	0.6	1.3%	54.3	54.7	0.4	0.7%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Bus route	From / to	Direction	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
			2041 baseline	2041 Stage B1	Actual Change	% change	2041 baseline	2041 Stage B1	Actual Change	% change
59	Streatham Hill to King's Cross	Eastbound	117.5	119.6	2.1	1.8%	121.2	123.5	2.3	1.9%
		Southbound	50.7	51.0	0.3	0.6%	57.0	57.8	0.8	1.4%
68	Euston to West Norwood	Terminates	134.7	135.7	1.0	0.7%	139.2	140.9	1.7	1.2%
		Southbound	70.4	70.7	0.3	0.4%	77.5	77.7	0.2	0.3%
91	Trafalgar Square to Hornsey	Eastbound	45.6	48.3	2.7	5.9%	45.5	48.4	2.9	6.4%
		Southbound	41.7	41.3	-0.4	-1.0%	41.4	40.8	-0.6	-1.4%
476	Euston to Northumberland Park	Eastbound	42.0	43.1	1.1	2.6%	43.4	44.0	0.6	1.4%
		Terminates	50.4	50.3	-0.1	-0.2%	47.4	47.6	0.2	0.4%

- 3.5.267 Table 202 shows that four bus routes are predicted to have an increase of over 10% in end-to-end journey time during the AM peak hour. These are:
- bus route 10 in the eastbound direction;
 - bus route 24 in the northbound direction;
 - bus route 29 in the northbound direction; and
 - bus route 134 in the northbound direction.
- 3.5.268 An additional four bus routes experience an increase in the end-to-end-journey time of over 5%. These are:
- bus route 73 in the northbound direction;
 - bus route 390 in the northbound direction;
 - bus route 14 in the northbound direction; and
 - bus route 91 in the northbound direction.
- 3.5.269 During the PM peak hour, only one route experiences an increase in the end-to-end journey time of over 5%. This is bus route 91 in the eastbound direction.
- 3.5.270 For the bus routes operating along A400 Hampstead Road/A400 Tottenham Court Road (bus routes 14, 24, 29 and 134), these changes can be attributed to delays incurred at the junction of A501 Euston Road with A400 Hampstead Road and A400 Tottenham Court Road. These delays can be mitigated through the optimisation of signal timings at this junction.
- 3.5.271 For bus routes 10, 73, 91 and 390, these changes can be part attributed to a combination of increased journey time through the new bus station and increased journey time on other sections of the routes. It should be noted that the new bus station, at 200m long, is approximately twice the length of the existing bus station.
- 3.5.272 For all other bus routes, the impact on the end-to-end bus journey times is generally less than 5%. Some minor decreases in end-to-end journey times have also been identified.

Bus passenger demand

- 3.5.273 Table 203 shows the estimated change in bus boarding and alighting demand at Euston station. This includes Euston bus station, together with bus stops on A501 Euston Road and A4200 Eversholt Street that could be used to access the station. The estimated change in boarding and alighting demand on bus routes using A400 Hampstead Road is also outlined in Table 203.
- 3.5.274 The increase in bus passenger demand has been derived by calculating the proportional increase between the future baseline and HS2 Phase Two scenarios, in Railplan, and applying this to the 2012 baseline demand. Whilst the Railplan bus boarding and alighting validation is good at an aggregate sub-regional level, it should be noted that it underestimates the 2012 baseline level of bus travel. The assessment of the 2041 bus boarding and alighting demand, which is based on the Railplan model, focusses on the relative difference between the 2026 future baseline Railplan model

and the 2041 HS2 Phase Two Railplan model, rather than the absolute values. The change in flows between tests will be a better representation of change than the absolute change in values. However, the results should be treated as approximate.

Table 203: 2041 HS2 Phase Two bus boarding and alighting demand

Location	Scenario	AM peak period (07:00 to 10:00)			PM peak period (16:00 to 19:00)		
		Boarders	Alighters	Total	Boarders	Alighters	Total
Euston station	2041 baseline	3,493	2,236	5,729	4,055	3,916	7,971
	2041 'with HS2'	3,124	2,252	5,379	4,151	3,429	7,580
	Change (in passengers)	-369	16	-353	97	-488	-391
A400 Hampstead Road	2041 baseline	793	485	1,278	543	1,199	1,742
	2041 'with HS2'	2,161	1,751	3,912	1,205	1,904	3,109
	Change (in passengers)	1,368	1,266	2,634	661	705	1,399

3.5.275 Figure 172 and Figure 173 show the absolute difference in 2041 bus passenger flows between the future baseline and HS2 Phase Two scenarios in the AM and PM peak periods respectively, as obtained from Railplan.

Figure 172: 2041 HS2 Phase Two AM peak period (07:00 to 10:00) bus difference plot (future baseline vs HS2 Phase Two)

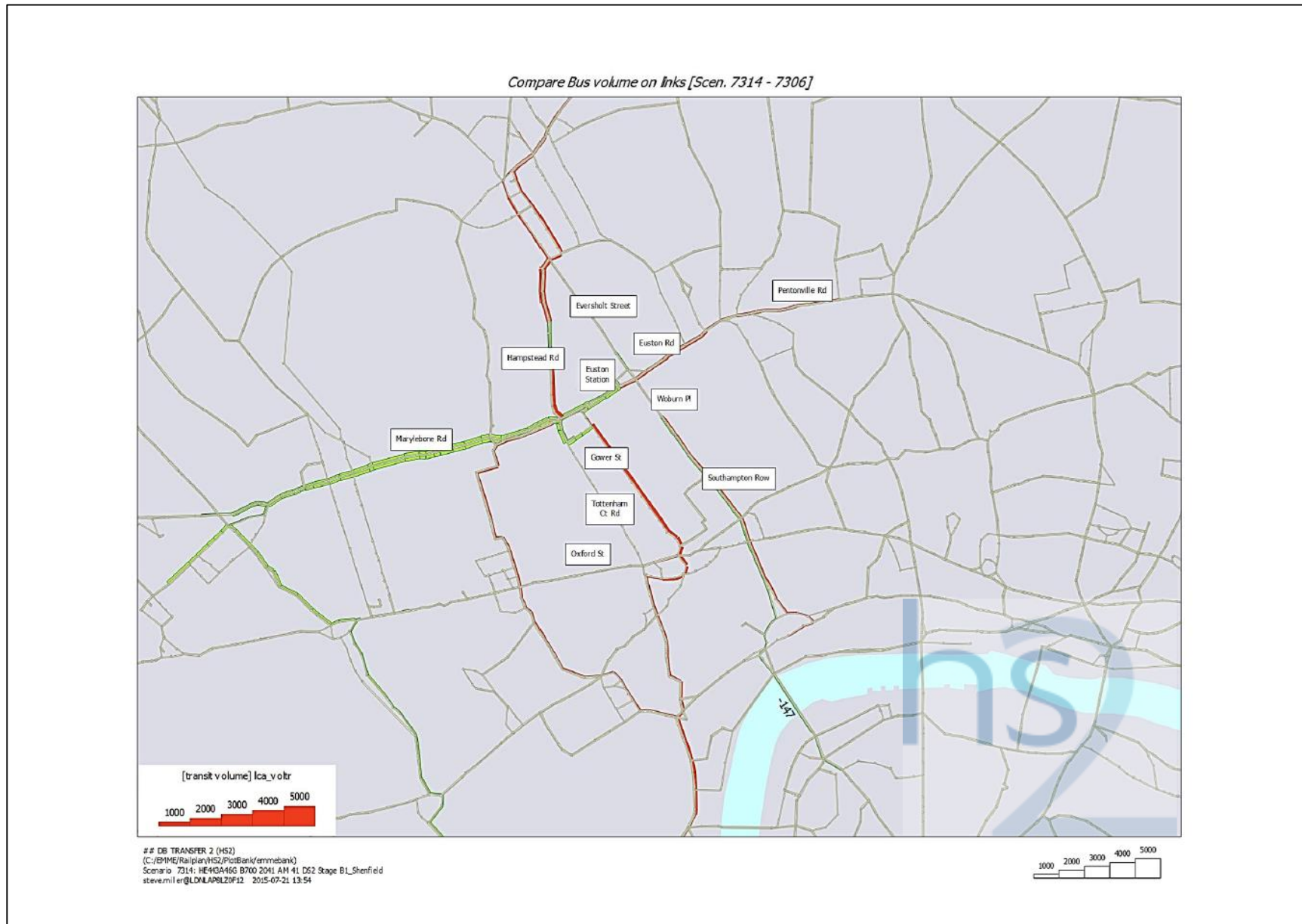


Figure 173: 2041 HS2 Phase Two PM peak period (16:00 to 19:00) bus difference plot (future baseline vs HS2 Phase Two)



- 3.5.276 Figure 172 and Figure 173 indicate an increase in flows along A4200 Upper Woburn Place during the AM peak period of around 250 passengers in the southbound direction and 130 passengers in the northbound direction. There are also a small number of small flow changes on other north to south corridors.
- 3.5.277 On A501 Euston Road west of Euston station, the reduction in bus passenger flows can be part attributed to a shift from bus to Crossrail services, resulting in a reduction in bus flows along this bus corridor.
- 3.5.278 The bus passenger flow difference plots provide a geographical illustration of how the scheme changes demand on the bus corridors serving Euston station. The impacts are summarised in Table 204.

Table 204: 2041 HS2 Phase Two bus passenger flow differences - future baseline vs HS2 Phase Two

Link	AM peak period (07:00 to 10:00)		PM peak period (16:00 to 17:00)	
	Towards Euston	Away from Euston	Towards Euston	Away from Euston
A501 Marylebone Road	-476	-140	-1276	-84
A501 Pentonville Road	318	124	174	-243
A4200 Eversholt Street	51	-32	30	56
A4200 Upper Woburn Place	-215	283	-119	-32
A400 Tottenham Court Road/Gower Street	67	676	540	121
A400 Hampstead Road (north of station entrance)	409	365	331	241

- 3.5.279 The analysis shows that some additional bus services may be required to accommodate the additional bus demand generated by HS2. However, when compared against the existing bus provision on each route, the number of additional buses required would be small.

Coach HS2 completion construction Stage A and construction Stage B1

- 3.5.280 With completed construction Stage A in 2026, a coach set-down bay will be provided close to the A400 Hampstead Road station entrance. This will be provided on the road leading to the logistics centre and adequate space is available for turning. Coaches for mobility impaired people will be able to set-down and pick-up passengers here, where Network Rail staff assistance can be called. Alternatively, coaches would be able to set-down on A4200 Eversholt Street.
- 3.5.281 For completed construction Stage B1 (2033) and HS2 Phase Two operation, coaches will be able to set-down on Cobourg Street. Coaches would be able to access Cobourg Street either via Drummond Street or Stephenson Way.
- 3.5.282 Staff assistance will be available for mobility impaired persons.

Pedestrians HS2 completed construction Stage A with 2026 Phase One operation

- 3.5.283 The revised scheme includes substantial improvements for pedestrians. On completion of the construction Stage A station at the end of 2026, the revised scheme includes:
- provision of a new sub-surface link to Euston Square station which will provide for the pedestrian interchange traffic to and from Euston Square station and Euston station and Euston underground station;
 - provision of new subway beneath A501 Euston Road linking Euston station to Gordon Street, which will reduce demand on busy crossings and will include lifts that will provide step free access;
 - the north end of Gordon Street will be closed to motor vehicles, to create a shared pedestrian/cycle route which will be free of traffic;
 - improved pedestrian and cycle crossings on A400 Hampstead Road (provided at the end of construction Stage A); and
 - a northern station entrance that will improve walking accessibility from the north and connections with A400 Hampstead Road bus services.
- 3.5.284 On completion of the HS2 Phase Two station at the end of 2041, the following additional facilities will be provided:
- the closure of Melton Street to general traffic and a reconfiguration of the station and bus station, eliminating the need for pedestrians travelling to and from the station from the west along A501 Euston Road to cross at a signalised crossing;
 - new signalised pedestrian crossing on A501 Euston Road to the west of Gordon Street/new bus station access;
 - expanded public space at the front plaza and western entrance;
 - the provision of direct routes through Euston Square Gardens to assist with the dispersal of pedestrians during the AM peak period. In particular, the route on the east side of the Euston Square Gardens, from the corner of A501 Euston Road and A4200 Eversholt Street, will provide a much more direct route into the station for pedestrians travelling to and from the east; and
 - a new area of public realm at the Euston station Cobourg Street entrance and Cobourg Street entrance station forecourt.
- 3.5.285 Euston station will also benefit from a new area of public realm to the south of the high speed station. Euston Square Gardens will no longer be bisected by the vehicular route to the bus station. This will be relocated to the west. Pedestrian routes through the gardens will be provided and it will be more permeable for pedestrians accessing the station from A501 Euston Road. This increased permeability will continue through the bus station with pedestrian crossing points provided at regular intervals.

Pedestrian demand

- 3.5.286 Pedestrian movements around the station in the future operational scenarios have been forecast using observed baseline station entry and exit volumes and Railplan forecasts for the future baseline scenarios. These predicted changes in flows on routes to and from the station are used to uplift walkway and crossing flows, allowing the assessment of their performance during operation of the revised scheme. This assessment has been undertaken on the basis of TfL's Pedestrian Comfort Guidance for London.
- 3.5.287 The pedestrian demand for the 2026 HS2 Phase One, 2041 HS2 Phase One and 2041 HS2 Phase Two, scenarios has been derived from observed and forecast pedestrian demand using the following process:
- future AM and PM peak hour flows to and from the station are calculated by applying 2012 observed routeings to the 2026 and 2041 Future Baseline Railplan outputs;
 - non-station flows are generated by applying a 0.5% growth per year to the background pedestrian network demand;
 - total flows are scaled to street level flows, based on the re-routeing impacts from the operational configuration, such as use of the Euston Square sub-surface link; and
 - resulting forecast and baseline flows on the routes to and from the station are used to generate growth factors which are used to scale observed 2014 peak hour flows at selected walkway and crossing locations.
- 3.5.288 The pedestrian crossing and footway comfort level assessments, using this demand, are outlined in the subsequent sections.

Pedestrians completed construction Stage A with 2026 HS2 Phase One operation

- 3.5.289 The impacts on pedestrians upon completion of construction Stage A with commencement of HS2 Phase One operation at the end 2026 are outlined below for selected signalised crossings and footway areas in the Euston station area.

Pedestrian crossing assessment summary

- 3.5.290 The 2026 Stage A pedestrian crossing comfort assessment aims to understand if the infrastructure is comfortable for users during the 2026 operational scenarios. Table 205 shows the pedestrian comfort level (PCL) assessment for the pedestrian crossing in the vicinity of Euston station for the 2012 baseline and Stage A 2026 HS2 Phase One operation scenario.
- 3.5.291 A PCL A shows the most comfortable conditions while a PCL E shows the least comfortable conditions²⁹. The pedestrian crossing locations can be seen in Figure 174.

²⁹ Pedestrian Comfort Level guidance document (TfL, 2010)

Figure 174: 2026 (and 2041) completed construction Stage A pedestrian crossing locations



SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 205: 2026 HS2 Phase One PCL assessment for pedestrian crossings

No.	Location	Actual width (m)	AM peak hour (08:00 to 09:00)			PM peak hour (17:00 to 18:00)		
			2014 baseline	2026 baseline	2026 HS2 Phase One	2014 baseline	2026 baseline	2026 HS2 Phase One
1	A4200 Upper Woburn Place at A501 Euston Road	2.4	B	B	B-	C+	B	B-
2	Euston Square at A501 Euston Road	2.4	B	B-	B-	B-	B	B
3	A501 Euston Road (West) at A4200 Upper Woburn Place	2.8	E	E	E	E	E	E
4	A501 Euston Road (West) at Euston Square	2.8	C	C-	C-	D	D	C-
5	A501 Euston Road (East) at A4200 Upper Woburn Place	2.4	E	E	E	E	E	D
6	A501 Euston Road	3.2	C+	C	C	C+	C+	C+
7	A501 Euston Road (East) at Gordon Street	3	B-	B-	C-	C	B	B-
8	A501 Euston Road (East) at Gordon Street	3	E	E	E	E	E	E
9	Gordon Street at A501 Euston Road ³⁰	3	B+	C+	-	B	C	-
10	Melton Street at A501 Euston Road	3	E	E	E	E	E	E
11	Melton Street at A501 Euston Road	3	D	E	B	D	E	C+
12	Bus station access at A4200 Eversholt Street	3	E	E	E	E	E	E

³⁰ Crossing removed as part of the revised scheme

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

No.	Location	Actual width (m)	AM peak hour (08:00 to 09:00)			PM peak hour (17:00 to 18:00)		
			2014 baseline	2026 baseline	2026 HS2 Phase One	2014 baseline	2026 baseline	2026 HS2 Phase One
13	Euston Square at Grafton Way	2.5	C+	C	C-	B-	B	B
14	A4200 Eversholt Street at Grafton Way	2.5	C	C-	D	D	D	D
15	A501 Euston Road at Gordon Street (new crossing)	N/A	Uncontrolled crossing in baseline and Phase One					
16	A4200 Eversholt Street at Doric Way	2.4	B+	B+	B+	B+	A-	B+

3.5.292 This highlights two key beneficial impacts, namely the opening of the Euston Square link and the Gordon Street entrance, reducing pedestrian flows on the A501 Euston Road at the junction of A501 Euston Road with Gordon Street/Melton Street. In certain instances, the PCL on footways improved between the 2014 and 2026 future baseline scenarios. This is due to a predicted lower number of pedestrians arriving on foot and more people arriving at Euston station by public transport with or without HS2.

Pedestrian footway assessment summary

- 3.5.293 This section provides results for the 2026 pedestrian comfort level (PCL) assessment on footways for the HS2 Phase One operation scenario with completion of construction Stage A infrastructure at Euston station. For footways, a PCL A describes the most comfortable conditions, while a PCL F describes the least comfortable conditions.
- 3.5.294 A number of footways within the vicinity of Euston station have been considered and then assessed to establish the PCL for the HS2 Phase One operation scenario in 2026.
- 3.5.295 The assessment shows that the majority of streets in the vicinity of Euston station have footway widths that are comfortable for users in the 2026 HS2 Phase one scenario. There are however a small number of existing issues, where inadequate widths have been identified.
- 3.5.296 This relates to the south side of A501 Euston Road where the presence of bus stops reduces the clear width available to below the minimum required. Additionally, multiple locations on Euston Street and Drummond Street are identified where inadequate clear width is provided due to the narrow footway widths on Euston Street and Drummond Street (all PCL F). In various locations the footway width is further reduced by the presence of street furniture. Improvements to these areas should therefore be considered by TfL and LBC to ameliorate baseline pedestrian conditions.
- 3.5.297 For the Stage A scenario, the bus stop on the south side of A501 Euston Road, between A4200 Upper Woburn Place and Gordon Street will be moved approximately 90m east as part of the revised scheme. While the full footway width is adequate for the majority of this link, there remains a local issue, as the clear width at the new bus stop location is still not sufficient given the 1.4m bus stop width and the 1.5m buffer required behind the bus stop to accommodate waiting passengers.
- 3.5.298 Aside from baseline issues identified in Euston Street and Drummond Street and the residual width restriction following relocation of the bus stop, the PCL footway analysis shows that all other footways continue to achieve a PCL level of at least B- in the AM peak hour and B+ in the PM peak hour.
- 3.5.299 Rationalisation of street furniture could help to improve pedestrian comfort on the street network surrounding Euston station in collaboration with LBC and TfL. A review of pedestrian crossing timings and signal equipment could facilitate improved area connectivity and permeability in collaboration with LBC and TfL.

Pedestrians 2041 completed construction Stage B1 with 2041 HS2 Phase One operation

3.5.300 The impacts of completed construction Stage A with HS2 Phase One in 2041 are outlined below for selected signalised crossings and footway areas in the Euston station area. This provides a robust assessment of higher levels of use with the Stage A infrastructure provision.

Pedestrian crossing assessment summary

3.5.301 The 2041 Stage A pedestrian crossing comfort assessment aims to understand if the infrastructure is comfortable for users during the 2041 operational scenarios. Table 206 shows the pedestrian comfort level (PCL) assessment for the pedestrian crossing in the vicinity of Euston station for the 2012 baseline and Stage A 2041 HS2 Phase One operational scenario. The pedestrian crossing locations can be seen in Figure 174 and are the same as the 2026 HS2 Phase One operational scenario.

3.5.302 This highlights two key beneficial impacts, namely the opening of the Euston Square link and the Gordon Street entrance, reducing pedestrian flows on the A501 Euston Road at the junction of A501 Euston Road with Gordon Street/Melton Street. Elsewhere continued growth in pedestrian volumes result in reduced performance at a number of other junctions.

Pedestrian footway assessment summary

3.5.303 This section provides results for the 2041 pedestrian comfort level (PCL) assessment on footways for the HS2 Phase One operation scenario at Euston station with the construction Stage A infrastructure. For footways, a PCL A describes the most comfortable conditions, while a PCL E describes the least comfortable conditions. A number of footways within the vicinity of Euston station have been assessed to understand the PCL with only Stage A of the revised scheme in operation in 2041.

3.5.304 The assessment shows that the majority of streets in the vicinity of Euston station have footway widths that are comfortable for users in the Stage A and HS2 Phase One operation scenario in 2041. There are however a small number of existing issues, where inadequate widths have been identified.

3.5.305 In the 2041 Stage A and HS2 Phase One operation scenario, the bus stop on the south side of A501 Euston Road, between A4200 Upper Woburn Place and Gordon Street will be moved approximately 90m east as part of the revised scheme. While the full footway width is adequate for the majority of this link, there remains a local issue, as the clear width at the new bus stop location is still not sufficient given the 1.4m bus stop width and the 1.5m buffer required behind the bus stop to accommodate waiting passengers.

3.5.306 Aside from baseline issues identified in Euston Street and Drummond Street and the residual width restriction following relocation of the bus stop, the PCL footway analysis shows that all other footways continue to achieve a PCL level of at least C+ in the AM peak hour and B in the PM peak hour.

3.5.307 Rationalisation of street furniture could help to improve pedestrian comfort on the street network surrounding Euston station in collaboration with LBC and TfL. A review

pedestrian crossing timings and signal equipment could facilitate improved area connectivity and permeability in collaboration with LBC and TfL.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 206: 2041 HS2 Phase One PCL assessment for pedestrian crossings

No.	Location	Actual width (m)	AM peak hour (08:00 to 09:00)			PM peak hour (17:00 to 18:00)		
			2014 baseline	2041 baseline	2041 HS2 Phase One	2014 baseline	2041 baseline	2041 HS2 Phase One
1	A4200 Upper Woburn Place at A501 Euston Road	2.4	B	B-	C+	C+	B	C+
2	Euston Square at A501 Euston Road	2.4	B	C+	C+	B-	B	B-
3	A501 Euston Road (West) at A4200 Upper Woburn Place	2.8	E	E	E	E	E	E
4	A501 Euston Road (West) at Euston Square	2.8	C	C-	D	D	D	D
5	A501 Euston Road (East) at A4200 Upper Woburn Place	2.4	E	E	E	E	E	D
6	A501 Euston Road	3.2	C+	C-	D	C+	C+	C
7	A501 Euston Road (East) at Gordon Street	3	B-	C+	B-	C	B	B-
8	A501 Euston Road (East) at Gordon Street	3	E	E	E	E	E	E
9	Gordon Street at A501 Euston Road	3	B+	C+	-	B	C	-
10	Melton Street at A501 Euston Road	3	E	E	E	E	E	E
11	Melton Street at A501 Euston Road	3	D	E	B-	D	E	C-
12	Bus station access at A4200 Eversholt Street	3	E	E	E	E	E	E
13	Euston Square at Grafton Way	2.5	C+	C-	D	B-	B	B-

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

No.	Location	Actual width (m)	AM peak hour (08:00 to 09:00)			PM peak hour (17:00 to 18:00)		
			2014 baseline	2041 baseline	2041 HS2 Phase One	2014 baseline	2041 baseline	2041 HS2 Phase One
14	A4200 Eversholt Street at Grafton Way	2.5	C	D	D	D	D	D
15	A501 Euston Road at Gordon Street (new crossing)	N/A	Uncontrolled crossing in baseline and Stage A					
16	A4200 Eversholt Street at Doric Way	2.4	B+	B+	B	B+	A-	B+

Pedestrians HS2 Phase Two

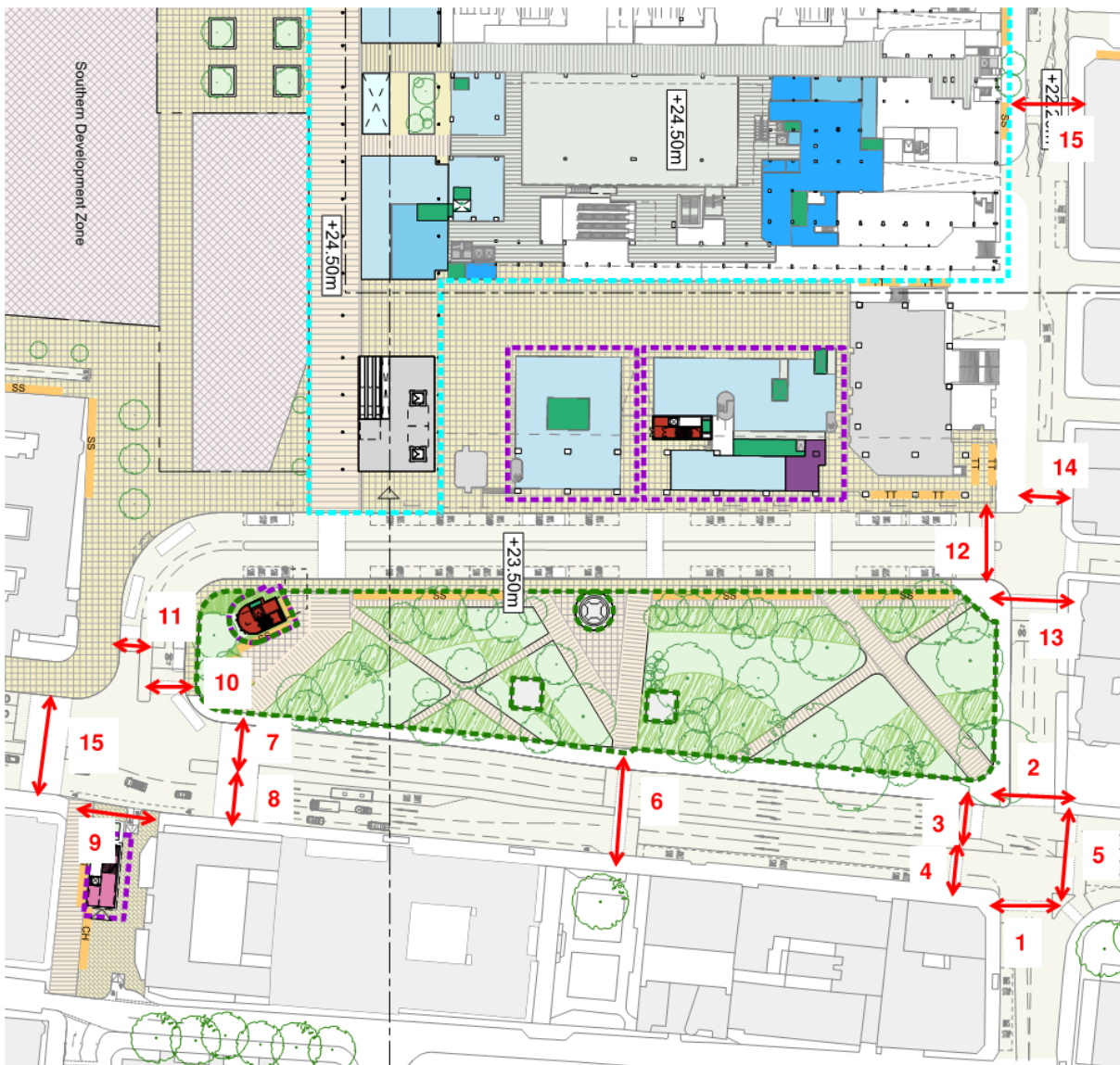
Pedestrians 2041 HS2 Phase Two

3.5.308 The impacts for the completed high speed station following completion of construction Stage B1 and with HS2 Phase Two operation scenario in 2041 are outlined below for selected signalised crossings and footway areas in the Euston station area.

Pedestrian crossing assessment summary

3.5.309 For the completed high speed station and HS2 Phase Two operation scenario in 2041, the pedestrian crossing comfort assessment aims to understand if the infrastructure is comfortable for users during the 2041 HS2 Phase Two operation scenario. Table 207 shows the pedestrian comfort level (PCL) assessment for the pedestrian crossing in the vicinity of Euston station for the 2012 baseline and the completed high speed station with HS2 Phase Two operation scenario in 2041. The pedestrian crossing locations can be seen in Figure 175.

Figure 175: 2041 completed construction Stage B1 Pedestrian crossing locations



- 3.5.310 This highlights two key beneficial impacts, opening of the Euston Square link and Gordon Street entrance, reducing pedestrian flows on the A501 Euston Road at the junction of A501 Euston Road with Gordon Street/Melton Street. Elsewhere continued growth in pedestrian volumes result in reduced performance at a number of other junctions with or without HS2.
- 3.5.311 In addition, improvements occur on some crossings due to slight changes in the signal timings, which have been obtained from the A501 Euston Road TRANSYT model, resulting in additional pedestrian green time.

Pedestrian footway assessment summary

- 3.5.312 This section provides results for the 2041 pedestrian comfort level (PCL) assessment on footways with the completed high speed station with HS2 Phase Two in operation in 2041 at Euston station. For footways, a PCL A describes the most comfortable conditions, while a PCL F describes the least comfortable conditions.
- 3.5.313 Results from this analysis are comparable with those of the 2041 HS2 Phase One assessment, and aside from baseline issues identified in Euston Street and Drummond Street and the residual width restriction following relocation of the bus stop, the PCL footway analysis shows that all other footways continue to achieve a PCL level of at least C+ in the AM peak hour and B in the PM peak hour.
- 3.5.314 Rationalisation of street furniture could help to improve pedestrian comfort on the street network surrounding Euston station in collaboration with LBC and TfL. A review pedestrian crossing timings and signal equipment could facilitate improved area connectivity and permeability in collaboration with LBC and TfL.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 207: 2041 HS2 Phase Two PCL assessment for pedestrian crossings

No.	Location	Actual width (m)	AM peak hour (08:00 to 09:00)			PM peak hour (17:00 to 18:00)		
			2014 baseline	2041 baseline	2041 HS2 Phase Two	2014 baseline	2041 baseline	2041 HS2 Phase Two
1	A4200 Upper Woburn Place at A501 Euston Road	2.4	B	B-	C	C+	B	C+
2	Euston Square at A501 Euston Road	2.4	B	C+	C	B-	B	B-
3	A501 Euston Road (West) at A4200 Upper Woburn Place	2.8	E	E	E	E	E	E
4	A501 Euston Road (West) at Euston Square	2.8	C	C-	D	D	D	D
5	A501 Euston Road (East) at A4200 Upper Woburn Place	2.4	E	E	E	E	E	D
6	A501 Euston Road	3.2	C+	C-	D	C+	C+	C
7	A501 Euston Road (East) at Gordon Street	3	B-	C+	A	C	B	B-
8	A501 Euston Road (East) at Gordon Street	3	E	E	A	E	E	E
9	Gordon Street at A501 Euston Road	3	B+	C+	-	B	C	-
10	Melton Street at A501 Euston Road	3	E	E	D	E	E	E
11	Melton Street at A501 Euston Road	3	D	E	A	D	E	A
12	Bus station access at A4200 Eversholt Street	3	E	E	E	E	E	E
13	Euston Square at Grafton Way	2.5	C+	C-	C-	B-	B	B
14	A4200 Eversholt Street at Grafton Way	2.5	C	D	D	D	D	E

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

No.	Location	Actual width (m)	AM peak hour (08:00 to 09:00)			PM peak hour (17:00 to 18:00)		
			2014 baseline	2041 baseline	2041 HS2 Phase Two	2014 baseline	2041 baseline	2041 HS2 Phase Two
15	A501 Euston Road at Gordon Street (new crossing)	N/A	Uncontrolled in baseline		A-	Uncontrolled in baseline		A-
16	A4200 Eversholt Street at Doric Way	2.4	B+	B+	B	B+	A-	B+

Cycling

Cycling 2026 - completed construction Stage A with 2026 Phase One operation

Cycle network

- 3.5.315 When construction Stage A is completed at the end of 2026, Euston station will also be served by all existing cycle routes with the exception of Melton Street and Cardington Street.

Cycle network demand

- 3.5.316 Many stakeholders, including TfL, predict a growth in cycle mode share from mainline stations. The current cycle mode share at Euston station is between 2% and 3%. Following consultation with TfL, a 7% mode share scenario has been used to inform the assessment and design of cycle facilities. The demand is based on the existing mode share and an uplift to 7% is also presented in this section.
- 3.5.317 The Railplan model results have been used to calculate a scale factor based on the estimated change in rail passenger numbers and any change in cycle mode share. The cycle trip generation for the revised scheme has been estimated by applying this scale factor to the 2012 cycle trips.
- 3.5.318 Table 208 shows the scale factors and Table 209 shows the resulting weekday cycle trip generation.

Table 208: 2026 HS2 Phase One weekday cycle trip generation scale factors from baseline

Case and scenario		AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
		To Euston	From Euston	To Euston	From Euston
Based on existing cycle mode share	2026 baseline	1.67	1.62	1.60	1.51
	2026 'with HS2'	1.73	1.77	1.92	1.81
Based on 7% cycle mode share	2026 baseline	15.22	7.81	15.07	11.59
	2026 'with HS2'	15.69	8.77	15.97	13.09

Table 209: 2026 HS2 Phase One weekday cycle trip generation

Case and scenario		AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
		Trips to Euston	Trips from Euston	Trips to Euston	Trips from Euston
Based on existing cycle mode share	2026 baseline	50	258	197	35
	2026 'with HS2'	52	281	236	42
	Change (in cyclists with HS2)	2	23	39	7
	2026 baseline	457	1,242	1,854	267

Case and scenario		AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
		Trips to Euston	Trips from Euston	Trips to Euston	Trips from Euston
Based on 7% cycle mode share	2026 'with HS2'	471	1,394	1,964	301
	Change (in cyclists with HS2)	14	152	110	34

3.5.319 Table 210 shows the estimated split between different types of cycle for the 7% cycle mode share scenario. This is based on the existing split between different types of cyclists.

Table 210: 2026 HS2 Phase One weekday cycle trip generation - 7% cycle mode share

Case and scenario	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
	To Euston		From Euston		To Euston		From Euston	
	No. trips	% of total	No. trips	% of total	No. trips	% of total	No. trips	% of total
Folding bicycles taken on train	63	13.3%	500	35.9%	671	34.2%	26	8.7%
Non-folding bicycles taken on train	141	30.0%	132	9.4%	271	13.8%	65	21.7%
Non-folding bicycles parked at station	126	26.7%	246	17.6%	303	15.5%	131	43.5%
Cycle hire	141	30.0%	517	37.1%	719	36.6%	79	26.1%
Total cyclists	471	100.0%	1,394	100.0%	1,964	100.0%	301	100.0%

3.5.320 On opening of HS2 Phase One in 2026, the allocation of Euston station's cycle trip generation to the cycle network will change to reflect the new station entrances and proportions of passengers using those entrances and to reflect the provision of new cycle routes, parking and hire facilities.

3.5.321 Surveys of the existing station show that 45% of cyclists carry their cycle on a train, which could be a folding or non-folding cycle (subject to the train operator's policy and/or reservations). These cyclists do not use the station's cycle parking or hire facilities, and will be assumed to use the station entrance nearest their platform. In 2026, 30% of AM peak period alighting passengers and PM peak period boarding passengers use the HS2 platforms and 70% use the conventional platforms. From the HS2 platforms, passengers have been assumed to split equally between the northwest and southwest entrances. From the conventional platforms, passengers have been assumed to split equally between the south-west and south-east entrance.

3.5.322 Surveys show that 45% of cyclists collect a cycle at the station, which could be a parked non-folding cycle or Cycle Hire. These cyclists will be influenced by the location of the station's cycle parking and hire facilities. It is assumed that the split of these cyclists between station entrances reflects the proportion of cycle parking/hire facilities nearest each entrance.

3.5.323 Table 211 shows the weighted average of the two distributions of cyclists between station entrances. The assumed distribution informs the assessment and design, but can only be approximated and, consequently, all percentages are rounded to the nearest 2.5%.

3.5.324 The cyclists from each station entrance are then distributed to ten points on the cycle network, in accordance with cyclist destination survey information and in reflection of the new cycle routes provided by the scheme.

Table 211: 2026 HS2 Phase One cycle trip distribution

Type	Northwest entrance	Southwest entrance	Southeast entrance	All station entrances
Passengers who carry cycles on train	30.5%	32.0%	37.5%	100.0%
Passengers who collect cycles at station	28.0%	42.0%	30.0%	100.0%
Weighted average between entrances	34.5%	32.0%	33.5%	100.0%
Road				
A4200 Eversholt Street (north)	-	-	5.0%	5.0%
Polygon Road	-	2.5%	7.5%	10.0%
A501 Euston Road (east)	-	2.5%	2.5%	5.0%
A4200 Upper Woburn Place	-	5.0%	10.0%	15.0%
Gordon Street	5.0%	15.0%	5.0%	25.0%
A400 Tottenham Court Road/Gower Street	5.0%	5.0%	-	10.0%
A501 Marylebone Road	2.5%	2.5%	-	5.0%
Drummond Street	2.5%	7.5%	-	10.0%
Varndell Street	8.0%	2.0%	-	10.0%
A400Hampstead Road (north)	5.0%	-	-	5.0%

3.5.325 In the baseline scenario the allocation of Euston station's cycle trip generation to the cycle network is assumed to remain the same as the existing allocation.

3.5.326 The local highway capacity assessment has been based on the 7% cycle mode share scenario and this has also informed the design of proposed facilities to meet Euston Station's cycle demand.

Cycle parking

- 3.5.327 Following a review of available space in and around the proposed Euston station design, it is assumed that a minimum of 1,000 cycle parking spaces are provided as part of construction Stage A in 2026 for use by both HS2 and classic passengers.
- 3.5.328 Staff cycle parking will be provided in addition to the total above, and would include showers and lockers. Cycle parking for staff will be considered at the next design stage but is likely to be integrated with the public cycle parking.
- 3.5.329 A phased approach to cycle parking capacity will be adopted. The 1,000 cycle parking spaces provided as part of the Stage A infrastructure are a substantial uplift above the existing cycle parking provision and will promote growth. It is likely that the uptake of these spaces will be gradual. Travel Plan measures could include monitoring of the cycle parking occupancy to inform construction Stage A cycle parking capacity.

Cycling 2041 - completed construction Stage B1 with HS2 Phase Two operation

Cycle network

- 3.5.330 When construction Stage B1 is completed in 2033, all existing cycle routes will be reinstated. Euston station will also be served by two new cycle routes which connect to the open public spaces at the north and north-west entrances of the station, with the latter passing the station's main cycle parking area. These routes are:
- a north to south 'quietway' cycle route linking Mornington Crescent to Tavistock Place/Gordon Square, which replaces unofficial LCN Route 6a. This route consists of shared bus and cycle lanes or protected cycle lanes on A400 Hampstead Road leading to a segregated cycle track in the public space at Euston station's northwest entrance, passing the new station's main cycle parking area, a segregated on carriageway two way cycleway along Cobourg Street to a shared pedestrian / cycle route in the public space to the southwest of Euston station connecting to Gordon Street to the south; and
 - a new east-west 'quietway' cycle route linking Regent's Park to the new open space and cycle parking to the north of the station consisting of shared pedestrian/cycle ramp at the east end of Varndell Street (which will be closed to motor vehicles), toucan crossing(s) across A400 Hampstead Road to a new two way cycle track leading to the propose open space and cycle parking.

Cycle network demand

- 3.5.331 As for 2026 HS2 Phase One, the Railplan model results have been used to estimate a scale factor based on the estimated change in rail passenger numbers and any change in cycle mode share. The 2041 cycle trip generation has been estimated by applying this scale factor to the 2012 cycle trip generation.
- 3.5.332 Table 212 shows the scale factors and Table 213 shows the resulting 2041 HS2 Phase Two operation weekday cycle trip generation.

Table 212: 2041 HS2 Phase Two weekday cycle trip generation scale factors from baseline

Case and scenario		AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
		To Euston	From Euston	To Euston	From Euston
Based on existing cycle mode share	2041 baseline	2.08	1.89	1.95	1.90
	2041 'with HS2'	3.25	2.49	3.08	3.35
Based on 7% cycle mode share	2041 baseline	19.06	9.17	17.82	14.86
	2041 'with HS2'	29.16	12.70	23.36	22.88

Table 213: 2041 HS2 Phase Two weekday cycle trip generation

Case and scenario		AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
		Trips to Euston	Trips from Euston	Trips to Euston	Trips from Euston
Based on existing cycle mode share	2041 baseline	62	301	240	44
	2041 'with HS2'	98	396	379	77
	Change (in cyclists with HS2)	36	95	139	33
Based on 7% cycle mode share	2041 baseline	572	1,458	2,192	342
	2041 'with HS2'	875	2,019	2,873	526
	Change (in cyclists with HS2)	303	561	681	184

3.5.333 Table 214 shows the estimated split between different types of cycle for the 7% cycle mode share scenario. This is based on the existing split between different types of cyclists.

Table 214: 2041 HS2 Phase Two weekday cycle trip generation - 7% cycle mode share

Case and scenario	AM peak hour (08:00 to 09:00)				PM peak hour (17:00 to 18:00)			
	To Euston		From Euston		To Euston		From Euston	
	No. trips	% of total	No. trips	% of total	No. trips	% of total	No. trips	% of total
Folding bicycles taken on train	117	13.3%	724	35.9%	981	34.1%	46	8.7%
Non-folding bicycles taken on train	262	30.0%	191	9.4%	397	13.8%	114	21.7%
Non-folding bicycles parked at station	233	26.7%	356	17.6%	444	15.4%	226	43.5%
Cycle hire	262	30.0%	749	37.1%	1,051	36.6%	137	26.1%
Total cyclists	875	100.0%	2,019	100.0%	2,873	100.0%	526	100.0%

- 3.5.334 As for 2026, for the 2041 HS2 Phase Two operation from the completed high speed station, the allocation of Euston station's cycle trips to the cycle network has been revised to reflect the new station entrances and proportions of passengers using those entrances, and to reflect the provision of new cycle routes, parking and hire facilities.
- 3.5.335 In 2041, 45% of AM peak period alighting passengers and PM peak period passengers use the HS2 platforms and 55% use the conventional platforms.
- 3.5.336 By following the methodology set out for 2026, this leads to a slightly higher proportion of cyclists using the northwest entrance and a slightly lower proportion of cyclists using the southeast entrance. The distribution of cyclists from each station entrance to the cycle network reflects this slight change, with the northwest entrance/southeast entrance split for the Varndell Street route amended. This is shown in Table 215.

Table 215: 2041 HS2 Phase Two cycle trip distribution

Type	Northwest entrance	Southwest entrance	Southeast entrance	All station entrances
Passengers who carry cycles on train	30.5%	32.0%	37.5%	100.0%
Passengers who collect cycles at station	28.0%	42.0%	30.0%	100.0%
Weighted average between entrances	34.5%	32.0%	33.5%	100.0%
Road				
A4200 Eversholt Street (north)	-	-	5.0%	5.0%
Polygon Road	-	2.5%	7.5%	10.0%
A501 Euston Road (east)	-	2.5%	2.5%	5.0%
A4200 Upper Woburn Place	-	5%	10.0%	15.0%
Gordon Street	5%	15%	5%	25.0%
A400 Tottenham Court Road/Gower Street	5%	5%	-	10.0%
A501 Marylebone Road	2.5%	2.5%	-	5.0%
Drummond Street	2.5%	7.5%	-	10.0%
Varndell Street	8%	2%	-	10.0%
A400 Hampstead Road (north)	5%	-	-	5.0%

- 3.5.337 The highway capacity assessment has been based on the 7% cycle mode share scenario and this has also informed the design of proposed facilities to meet Euston station's cycle demand.

Cycle parking

- 3.5.338 Following a review of available space in and around the proposed Euston station design, it is assumed that a minimum of 2,000 cycle parking spaces are provided as part of the completed Stage B1 high speed station for use by both HS2 and classic passengers.
- 3.5.339 Staff cycle parking will be provided in addition to the total above, and would include showers and lockers. Cycle parking for staff will be considered at the next design stage but is likely to be integrated with the public cycle parking.
- 3.5.340 A phased approach to cycle parking capacity will be adopted. The 2,000 cycle parking spaces provided in construction Stage B1 are a substantial uplift above the existing cycle parking provision and will promote growth. It is likely that the uptake of these spaces will be gradual. Travel Plan measures could include monitoring of the cycle parking occupancy to inform Euston station cycle parking capacity.

Cycle hire

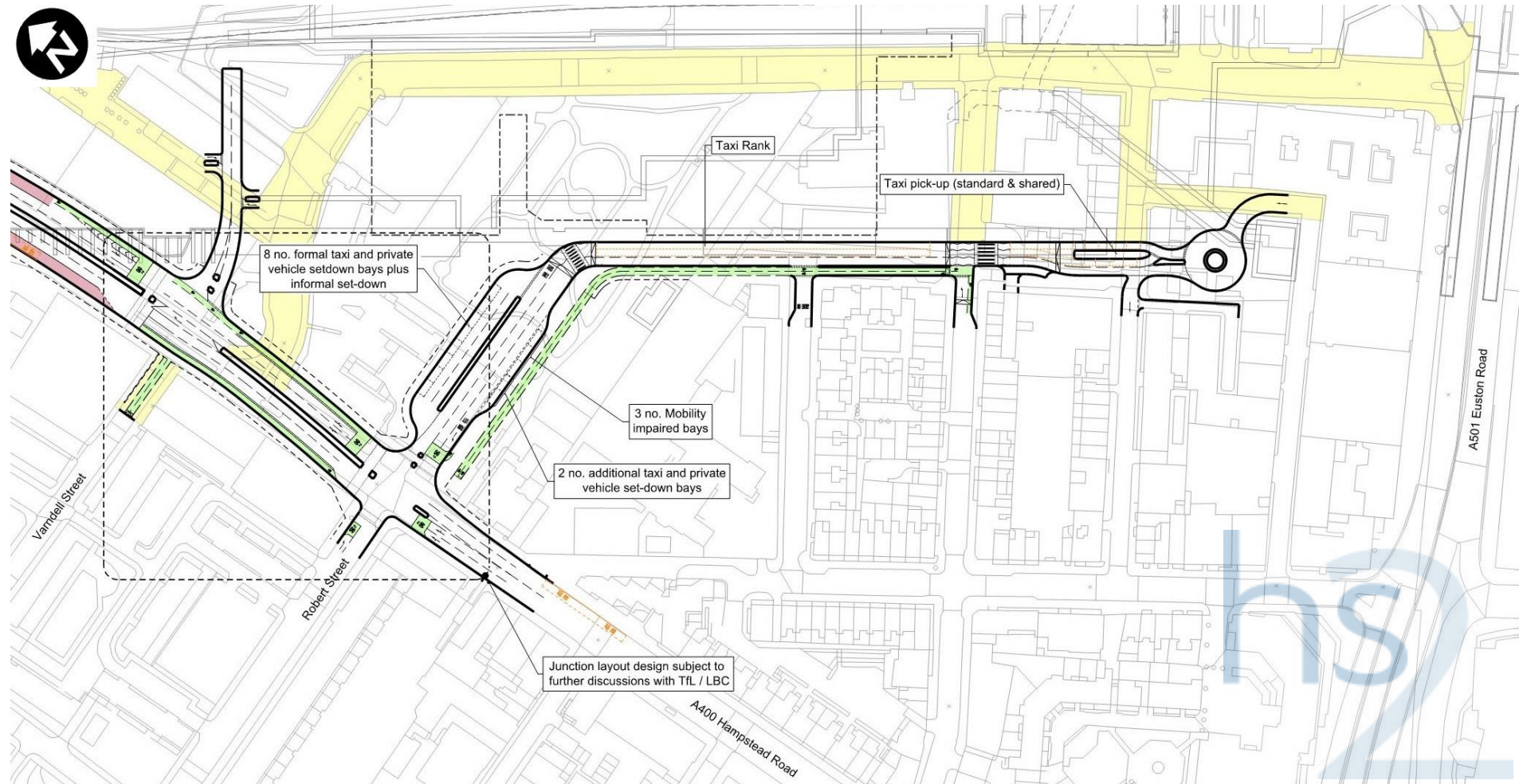
- 3.5.341 A total of 200 docking stations will be provided dispersed on streets in the vicinity of Euston station, including the replacement of any docking stations relocated during construction Stage A and Stage B1. The number and location of the new docking stations is yet to be decided but will be agreed with TfL and LBC.

Taxis and private hire

Taxis - completed construction Stage A with 2026 HS2 Phase One operation

- 3.5.342 Figure 176 shows the proposed taxi and private hire pick-up and set-down facilities at Euston station along with the location of the proposed taxi rank for construction Stage A.
- 3.5.343 Taxis and private vehicles can access the set-down facility from the south and north on A400 Hampstead Road via a new signalised junction at Robert Street. The passenger set-down will be located adjacent to the northwest entrance to Euston station and will comprise the following:
- three marked disabled bays;
 - ten marked set-down bays; and
 - five informal set-down bays.
- 3.5.344 From the set-down area, taxis and private vehicles will be able to exit, via a U-turn facility, to return to A400 Hampstead Road or Robert Street. For those taxis that have dropped passengers off and wish to pick-up passengers, a route is provided so that they will be able to continue south on Cobourg Street to join the back of the rank. The ranking space will be for taxis only (southbound on Cobourg Street) and allows for double ranking of approximately 59 taxis (not including pick-up spaces).

Figure 176: Taxi set-down facility 2026 completed construction Stage A



- 3.5.345 From the rank, taxis will be fed into the taxi passenger pick-up area located south of Drummond Street on Cobourg Street. There will be a total of eight designated taxi pick-up bays, four of these will be for standard and four for shared pick-up. It is likely that the shared pick-up will be in operation during peak periods with marshals present to manage the facility.
- 3.5.346 After passenger pick-up, taxis will be required to utilise the U-turning facility provided at the southern end of Cobourg Street, in order to continue their journey and exit onto A400 Hampstead Road.
- 3.5.347 Table 216 shows the forecast demand for both classic and HS2 passengers in 2026 HS2 Phase One that will be dropped-off or picked-up by taxi at Euston station. The tables show the demand for both the AM and PM peak hours.

Table 216: 2026 HS2 Phase One taxi passenger demand

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	328	96	277	370
HS2 Stage A	243	141	175	262
Total	571	237	452	633

- 3.5.348 Table 217 shows the expected number of taxi movements that will be required to cater for the forecast number of passengers picked-up and set-down at Euston station. The taxi occupancy rates used for this assessment are as follows:
- taxi occupancy rate of 2.2 for trips from the station and 1.5 for trips to the station during the AM peak hour³¹; and
 - taxi occupancy rate of 1.6 for trips from the station and 1.9 for trips to the station during the PM peak hour³².
- 3.5.349 The future taxi trip generation assumes improved taxi circulation at the station, a reduction in empty taxi movements and the implementation of a taxi share scheme to reduce the overall number of taxi movements.

Table 217: 2026 HS2 Phase One forecast peak hour taxi set-down and pick-up (vehicles) from all rail

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	149	64	173	195
HS2 Stage A	110	94	109	138
Total	260	158	282	333

³¹ Aspirational taxi occupancy based on the assumptions that taxi circulation will be improved and the implementation of a taxi share scheme.

³² Based on the 2012 baseline taxi occupancy surveys

Private vehicle - completed construction Stage A with 2026 HS2 Phase One operation

3.5.350 Table 218 and Table 219 show the 2026 forecast passenger and vehicle set-down and pick-up demand for both classic/LU and HS2 by private vehicle at Euston station.

Table 218: 2026 HS2 Phase One private vehicle passenger demand

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	19	57	20	59
HS2 Stage A	0	19	0	10
Total	19	76	20	68

Table 219: 2026 HS2 Phase One private vehicle demand

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	16	36	18	28
HS2 Stage A	0	12	0	5
Total	16	47	18	33

3.5.351 The private vehicle occupancy rates used in Table 218 and Table 219 are as follows:

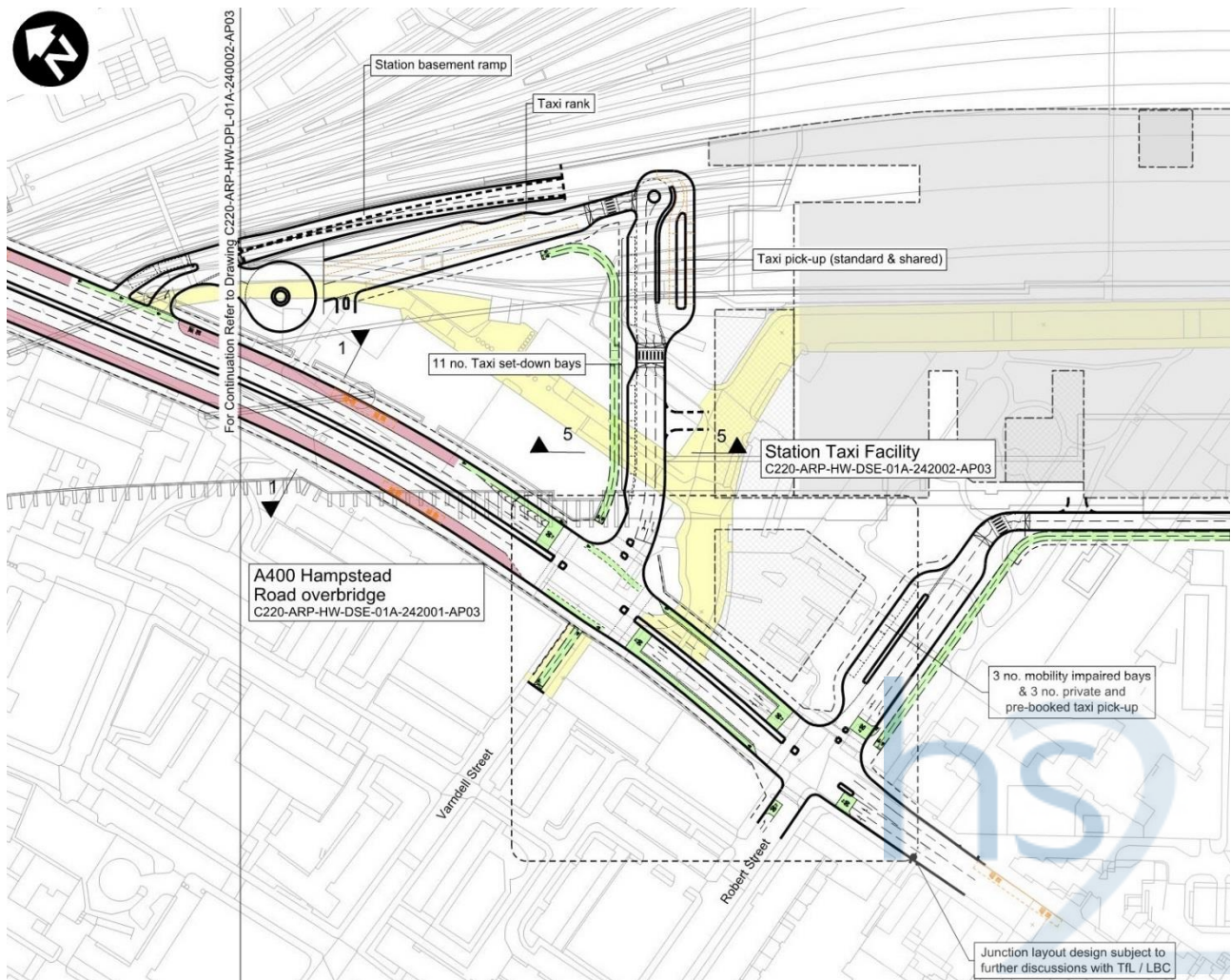
- private vehicle occupancy rate of 1.2 for trips from the station and 1.6 for trips to the station during the AM peak hour; and
- private vehicle occupancy rate of 1.1 for trips from the station and 2.1 for trips to the station during the PM peak hour.

3.5.352 Set-down facilities will be provided for private vehicles on A4200 Eversholt Street and close to the new north-west entrance to the Euston station.

Taxis 2041 - completed construction Stage B1 with 2041 HS2 Phase Two operation

3.5.353 Figure 177 shows the proposed taxi and private hire pick-up and set-down facilities at Euston station along with the location of the proposed taxi rank provided on completion of construction Stage B1 of the revised scheme in 2033.

Figure 177: Taxi set-down facility completed construction Stage B1



- 3.5.354 With the completed high speed station, taxis can access the set-down facility from the south and north on A400 Hampstead Road via a new signalised junction (at Varndell Street). The passenger set-down will be located on the north side of the entrance to the facility and will comprise 11 marked set-down bays for taxis.
- 3.5.355 From the set-down area, taxis will be able to exit, via a U-turn facility adjacent to the pick-up area, to return to A400 Hampstead Road. For taxis that wish to pick-up passengers, a route is provided for taxis to join the back of the rank. The ranking will be for taxi only and allows for both single and double ranking (in separate sections) of approximately 60 taxis (not including pick-up spaces).
- 3.5.356 From the rank, taxis will be fed into the taxi passenger pick-up area located to the north of the northern station entrance. There will be a total of eight designated taxi pick-up bays, four of these will be for standard and four for shared pick-up (during the AM peak hour). It is likely that the shared pick-up will be in operation during peak periods with marshals present to manage the facility.
- 3.5.357 After passenger pick-up taxis will continue their journey and exit the facility onto A400 Hampstead Road.
- 3.5.358 Table 225 shows the forecast demand for both classic and HS2 passengers in 2041 with HS2 Phase Two services that will be dropped-off or picked-up by taxi at Euston station. The tables show the demand for both the AM and PM peak hours.

Table 220: 2041 HS2 Phase Two taxi passenger demand

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	376	125	374	447
HS2 Stage B1	535	334	387	581
Total	911	459	761	1028

3.5.359 Table 221 shows the expected number of taxi movements that will be required to cater for the forecast number of passengers picked-up and set-down at Euston station. The taxi occupancy rates used for this assessment are as follows:

- taxi occupancy rate of 2.2 for trips from the station and 1.5 for trips to the station during the AM peak hour³³; and
- taxi occupancy rate of 1.6 for trips from the station and 1.9 for trips to the station during the PM peak hour³⁴.

3.5.360 The future taxi trip generation assumes improved taxi circulation at the station, a reduction in empty taxi movements and the implementation of a taxi share scheme to reduce the overall number of taxi movements.

Table 221: 2041 HS2 Phase Two forecast peak hour taxi set-down and pick-up (vehicles) from all rail

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	171	83	234	235
HS2 Stage B1	243	223	242	306
Total	414	306	476	541

Private vehicle - completed construction Stage B1 with 2041 HS2 Phase Two operation

3.5.361 With the completed high speed station, private vehicles can access the set-down facility and disabled bays located at the northern end of Cobourg Street from A400 Hampstead Road via a new signalised junction north of Robert Street. The passenger set-down will be located adjacent to the northwest entrance to Euston station and will comprise the following:

- Three marked disabled bays;
- Three formal set-down bays; and
- Three informal set-down bays.

³³ Aspirational taxi occupancy based on the assumptions that taxi circulation will be improved and the implementation of a taxi share scheme.

³⁴ Based on the 2012 baseline taxi occupancy surveys

3.5.362 From the set-down area, private vehicles will be able to exit, via a U-turn facility, to return to A400 Hampstead Road or Robert Street.

3.5.363 Table 222 and Table 223 show the forecast passenger and vehicle set-down and pick-up demand for classic/LU and with HS2 Phase Two services in 2041 by private vehicle at Euston station.

Table 222: 2041 HS2 Phase Two private vehicle passenger demand

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	25	75	27	74
HS2 Stage B1	0	44	0	21
Total	25	119	27	95

Table 223: 2041 HS2 Phase Two private vehicle demand

	AM peak hour (08:00 to 09:00)		PM peak hour (17:00 to 18:00)	
	Pick-up from station	Drop-off at station	Pick-up from station	Drop-off at station
Classic rail + LU	21	47	25	35
HS2 Stage B1	0	28	0	10
Total	21	74	25	45

3.5.364 The private vehicle occupancy rates used in Table 222 and Table 223 are as follows:

- private vehicle occupancy rate of 1.2 for trips from the station and 1.6 for trips to the station during the AM peak hour; and
- private vehicle occupancy rate of 1.1 for trips from the station and 2.1 for trips to the station during the PM peak hour.

3.5.365 Set-down facilities will be provided for private vehicles on A4200 Eversholt Street and close to the new north-west entrance to the Euston station.

Persons with restricted mobility (PRM) access

3.5.366 Escorted and disabled pick-up and set-down facilities will be located within the station footprint. For both the completion of construction Stage A and Stage B1, the escorted and disabled pick-up and set-down facilities will be available close to the Cobourg Street station entrance and on A4200 Eversholt Street. It is anticipated that mobility assistance buggies will be available on demand, providing access to both the concourse mobility assistance reception and the appropriate platform/service for arrivals/departures. Engagement with NR is ongoing to develop the infrastructure and management processes required to enable this facility to be operated in a satisfactory manner.

Parking

Short stay parking at Euston station

- 3.5.367 There will be no short stay parking facilities provided as part of the revised scheme. Private vehicles will be able to drop-off passengers at the station using the facility at the north-west side of the station (near the entrance on A400 Hampstead Road) and on A4200 Eversholt Street.
- 3.5.368 Three disabled parking spaces will be provided as part of the revised scheme. This will be provided as part of the private vehicle set-down area close to the northwest entrance of the station.

Off-street long stay demand

- 3.5.369 The existing basement car park facility at Euston station (217 spaces) is not being re-provided as part of the revised scheme. Therefore, the revised scheme will not result in any long stay parking demand at the station.
- 3.5.370 In addition, due to the enlargement of the station footprint as part of the revised scheme, the public car park at the Ibis Hotel (100 spaces) will be removed. Existing vehicle trips associated with the Ibis Hotel will not occur when the revised scheme is in operation.

Displaced on-street demand

- 3.5.371 The revised scheme will result in the loss of a number of on-street parking spaces as a result of the increased station footprint, as described in Table 224.

Table 224: Displaced parking demand

Location	Coach	Resident permit	Pay and display	Motorcycle	Car club	Loading	Bus stand
Varndell Street	-	-	3	-	-	-	-
Harrington Street	-	3	2	-	-	-	-
Granby Terrace overbridge	-	19	7	-	-	-	-
Mornington Crescent	-	1	2	-	-	-	-
Drummond Street	-	7	1	7		1	
Starcross Street	-	2	-	-	-	-	-
Cobourg Street	-	19		-	-	-	-
Barnby Street		2	5	-	-	-	-
Gordon Street	-	-	-	-		2	
Euston Street	-	-	6	7	-	-	-

Location	Coach	Resident permit	Pay and display	Motorcycle	Car club	Loading	Bus stand
Cardington Street	1	-	45	-	1	-	-
Melton Street	-	-	-	-	3	-	-

- 3.5.372 Due to the loss of a number of buildings along Cobourg Street, Drummond Street, Starcross Street, Euston Street and Stephenson Way, the demand for parking associated with these buildings will not be present when the revised scheme is in operation.
- 3.5.373 In addition, due to the need to raise A400 Hampstead Road overbridge whilst keeping access to adjacent buildings on Mornington Crescent accessible, a two tier footway is proposed. This level change results in the need to widen the existing footways and extend the current footway build-outs at the junction of Mornington Crescent with A400 Hampstead Road. As a consequence, two pay and display bays and one residential parking bay on Mornington Crescent will be removed.
- 3.5.374 It is not proposed to replace the parking on Granby Terrace overbridge which will result in the loss of 19 residential parking bays and seven pay and display bays
- Station servicing - completed construction Stage A with 2026 HS2 Phase One operation*
- 3.5.375 Upon completion of construction Stage A at the end of 2026, the majority of deliveries to the HS2 station will access a logistics centre at grade level, north of the HS2 concourse area. This area will be accessible from A400 Hampstead Road, approximately 90m to the north of the junction of A400 Hampstead Road with Cobourg Street (station taxi facility entrance).
- 3.5.376 Delivered items will be unloaded at loading bays within the logistics centre and taken by goods lift to the HS2 service basement below the HS2 platforms. From there, service corridors will give access to train catering facilities and storage areas at basement level and to retail units and additional storage areas at concourse and upper levels utilising goods lifts.
- 3.5.377 Deliveries to the southern HS2 station accommodation and retail units will be made at grade via a lay-by on Cobourg Street. Goods will be handled from this loading bay across Cobourg Street into a back of house area where it will be received by the tenants.
- 3.5.378 The conventional station will continue to be serviced from the Parcels Deck (which will have a revised two-way access arrangement at Gate H on A4200 Eversholt Street) and the service basement using Gate M on A4200 Eversholt Street. The loading bays accessed through Gate M and the basement servicing area will not be impacted in Stage A. However, both access to and egress from Gate M would be from A4200 Eversholt Street and the use of traffic management measures would be required to facilitate this.
- 3.5.379 No additional access points within the remaining conventional station will be impacted during this stage. Movement of goods and staff between the existing

Parcels Deck and the conventional concourse building will be via internal ramps on the eastern side of the station linking the Parcels Deck and platforms 1 and 2-3.

- 3.5.380 In terms of vehicle deliveries, it is estimated that there would be approximately 63 daily servicing vehicle trips to service the HS2 Phase One station. In addition, there would be a further 117 daily servicing vehicle trips per day to the classic station.

Station servicing completed construction Stage B1 with 2041 HS2 Phase Two operation

- 3.5.381 Upon completion of construction Stage B1 at the end of 2033, all HS2 servicing and deliveries will be undertaken from the service basement beneath the station platforms. The service basement will be accessed via a ramp from A400 Hampstead Road overbridge.
- 3.5.382 The service basement will have been expanded to accommodate the additional demand from the completed HS2 facilities. From the loading bays at basement level, service corridors will give access to train catering facilities and storage areas at basement level and to retail units and additional storage areas at basement mezzanine, concourse and upper levels utilising goods lifts.
- 3.5.383 There will be no additional impacts to conventional station delivery servicing strategy at this stage.
- 3.5.384 In terms of vehicle deliveries, it is estimated that there would be approximately 230 daily servicing vehicle trips per day to the combined servicing area with operation of HS2 Phase Two services. This would comprise approximately 110 daily servicing vehicle trips for HS2 and a further 120 for the classic station.

Strategic highway network analysis

Completed construction Stage A with 2026 HS2 Phase One operation

- 3.5.385 The strategic highway network for completed construction Stage A with 2026 HS2 Phase One operation is identical to the assessment of the highway network for construction scenario 4 (2031 Phase One operation and construction Stage B1) in terms of the highway layout. Although the 2031 scenario includes some construction traffic flows generated by the construction works for Stage B1, the highway impacts are very similar being affected mainly by the same road network changes. As the operation of the revised scheme is also the same, the results of the two assessments are almost identical. As such, the results of the 2026 HS2 Phase One assessment have not been presented as the conclusion of the assessment is the same as for construction scenario 4 presented in Section 3.4.

Strategic highway network analysis 2041 HS2 Phase One

Strategic and local road network flows - completed construction Stage A with 2041 HS2 Phase One operation

- 3.5.386 The traffic flow impacts of construction Stage A with 2041 levels of use of HS2 Phase One services were assessed strategically through CLoHAM by comparing the change in traffic flow between the 2041 future baseline and 'with HS2' scenarios. The flow differences for the AM and PM peak hours are shown in Figure 178 and Figure 179 respectively. The width of the band indicates the proportional change in traffic with

red representing an increase and green a decrease when compared with the 2041 future baseline scenario.

3.5.387 In order to capture flow changes of the revised scheme around Euston and further north, three screenlines were defined. These are as follows:

- one running east-west immediately south of A501 Euston Road;
- one east-west immediately north of A501 Euston Road; and
- one further north running east-west between A5203 Caledonian Road and A5 Kilburn High Road (Camden screenline).

3.5.388 The latter screenline is outside of CFA1 and runs through CFA2 and CFA3. The flows are shown in Table 225 and Table 226 for north and south of A501 Euston Road, together with 3 locations on Euston Road for the AM and PM peak hour respectively and in Table 227 and Table 228 for the Camden screenline for the AM and PM peak hours.

Figure 178: Traffic flow changes (PCU) 2041 future baseline vs completed construction Stage A with 2041 HS2 Phase One operation - AM peak hour (08:00 to 09:00)

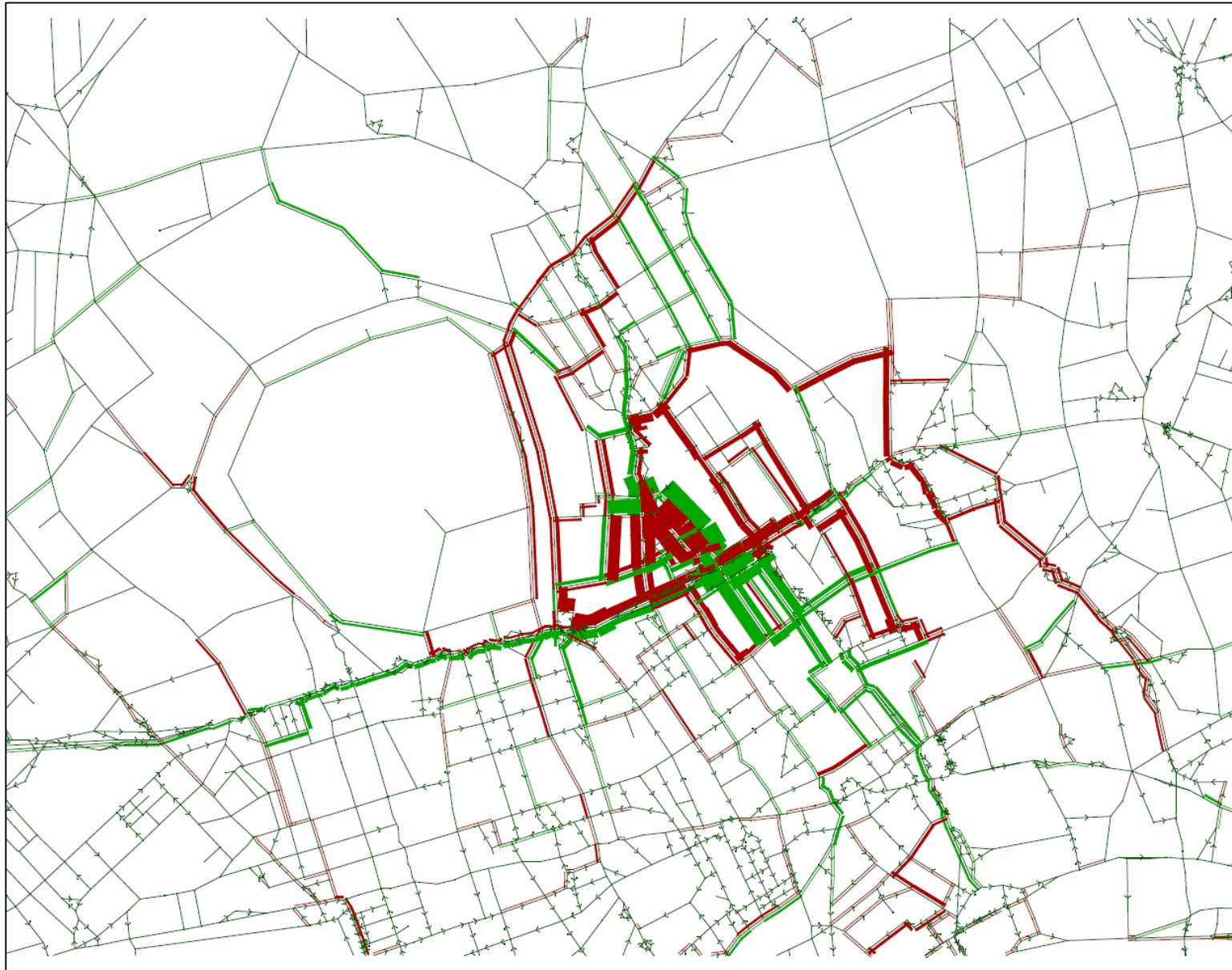
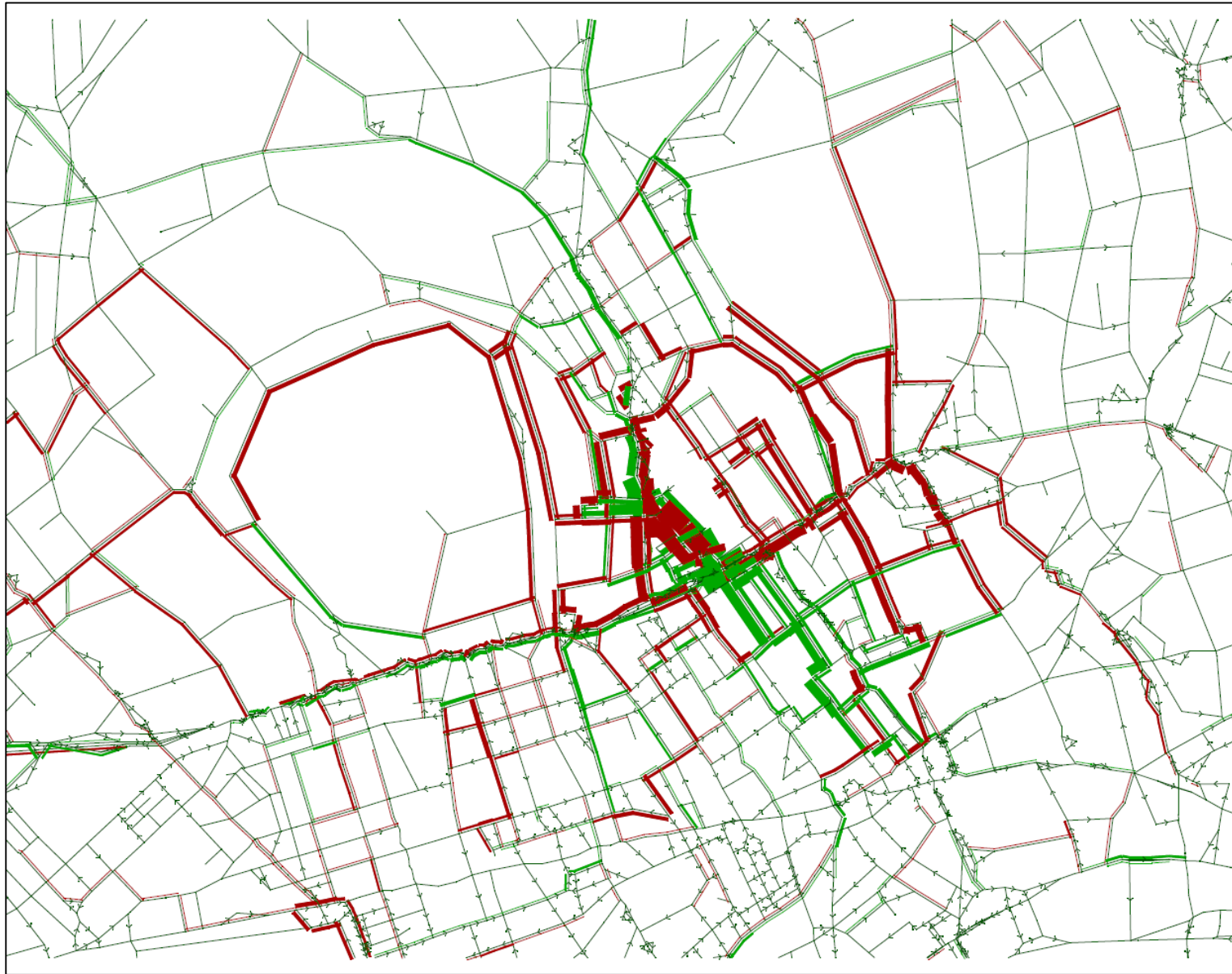


Figure 179: Traffic flow changes (PCU) 2041 future baseline vs completed construction Stage A with 2041 HS2 Phase One operation - PM peak hour (17:00 to 18:00)



SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 225: 2041 baseline and completed construction Stage A with 2041 HS2 Phase One operation traffic flows for the Euston screenlines AM peak hour (08:00 to 09:00)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Outer Circle (between Park Square East and Chester Road)	Northbound	135	0	150	0	15	0	11%	0%
	Southbound	200	7	232	7	32	0	16%	0%
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	348	10	374	10	26	0	7%	-3%
	Southbound	359	18	411	18	52	0	14%	2%
Stanhope Street (between Longford Street and Robert Street)	Northbound	117	9	51	11	-66	2	-56%	25%
	Southbound	189	3	403	4	214	0	113%	11%
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	227	24	417	24	190	0	84%	-2%
	Southbound	778	2	954	4	176	1	23%	60%
Cardington Street (north of Drummond Street) ³⁵	Northbound	32	0	0	0	-32	0	-100%	-100%
	Southbound	325	3	0	0	-325	-3	-100%	-100%
New Cobourg Street (north of Starcross Street) ³⁶	Northbound	0	0	278	1	278	1	0%	0%
	Southbound	0	0	361	0	361	0	0%	0%

³⁵ Cardington Street will be permanent closed as part of the revised scheme hence there are no flows in the 2041 HS2 Phase Two scenarios.

³⁶ New street to be provided as part of the revised scheme, hence there are no baseline flows

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A4200 Eversholt Street (between Phoenix Road and Polygon Road)	Northbound	232	11	297	6	65	-5	28%	-42%
	Southbound	555	25	573	20	18	-5	3%	-19%
Chalton Street (between A501 Euston Road and Phoenix Road)	Northbound	249	58	234	54	-15	-4	-6%	-7%
	Southbound	229	17	257	15	28	-2	12%	-13%
Midland Road (between Brill Place and A501 Euston Road)	Southbound	681	24	650	30	-31	6	-5%	25%
A5202 Pancras Road (between A501 Euston Road and Goods Way)	Northbound	251	9	250	9	-1	0	0%	-1%
	Southbound	108	8	111	8	3	0	3%	-1%
A5203 York Way between A501 Euston Road and Caledonia Street	Northbound	490	51	590	52	100	1	20%	2%
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	205	37	235	36	30	-1	15%	-2%
	Southbound	345	4	323	4	-22	0	-6%	-6%
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Southbound	601	24	562	24	-39	-1	-6%	-2%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	244	3	253	12	9	8	4%	259%
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Northbound	479	42	478	41	-1	-1	0%	-2%
	Southbound	71	0	60	0	-11	0	-16%	0%
A400 Gower Street (between Grafton Way and Gower Place)	Northbound	46	2	75	8	29	7	64%	408%
	Southbound	794	37	883	23	89	-14	11%	-37%
Gordon Street (between Endsleigh Gardens and A501 Euston Road)	Northbound	447	7	0	0	-447	-7	-100%	-100%
	Southbound	401	5	0	0	-401	-5	-100%	-100%
A4200 Upper Woburn Place (between Endsleigh Gardens and A501 Euston Road)	Northbound	224	14	408	11	184	-3	82%	-21%
	Southbound	540	54	614	51	74	-3	14%	-6%
B504 Judd Street (between Bidborough Street and A501 Euston Road)	Northbound	118	5	120	2	3	-3	2%	-64%
	Southbound	312	24	380	33	68	9	22%	38%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1,909	131	1,996	134	87	3	5%	2%
A501 Euston Road between Euston Circus and Melton Street	Eastbound	1,673	159	1,858	166	185	8	11%	5%
	Westbound	1,953	90	1,858	86	-95	-4	-5%	-4%
A501 Euston Road between Melton Street and A4200 Upper Woburn Place	Eastbound	1,720	159	1,918	166	198	6	12%	4%
	Westbound	1,752	83	1,858	86	106	3	6%	4%
A501 Euston Road between A4200 Upper Woburn Place and Churchway	Eastbound	1,466	129	1,633	133	167	3	11%	3%
	Westbound	1,721	85	1,752	86	31	1	2%	1%

Table 226: 2041 baseline and completed construction Stage A with 2041 HS2 Phase One operation traffic flows for the Euston screenlines PM peak hour (17:00 to 18:00)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		2041 HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Outer Circle (between Park Square East and Chester Road)	Northbound	351	0	408	0	56	0	16%	0%
	Southbound	210	2	215	2	6	0	3%	-1%
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	530	12	532	12	2	0	0%	2%
	Southbound	244	3	238	4	-6	1	-2%	31%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		2041 HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Stanhope Street (between Longford Street and Robert Street)	Northbound	106	5	74	10	-32	5	-30%	116%
	Southbound	131	2	157	1	26	0	20%	-17%
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	324	12	548	8	224	-4	69%	-31%
	Southbound	424	9	472	5	48	-4	11%	-47%
Cardington Street (north of Drummond Street) ³⁷	Northbound	102	2	0	0	-102	-2	-100%	-100%
	Southbound	100	3	0	0	-100	-3	-100%	-100%
New Cobourg Street (north of Starcross Street) ³⁸	Northbound	0	0	250	0	250	0	0%	0%
	Southbound	0	0	356	0	356	0	0%	0%
A4200 Eversholt Street (between Phoenix Road and Polygon Road)	Northbound	431	13	439	11	8	-2	2%	-15%
	Southbound	291	4	334	3	43	-1	15%	-19%
Chalton Street (between A501 Euston Road and Phoenix Road)	Northbound	283	8	272	7	-12	-1	-4%	-13%
	Southbound	205	6	244	6	39	-1	19%	-12%

³⁷ Cardington Street will be permanent closed as part of the revised scheme hence there are no flows in the 2041 HS2 Phase Two scenarios.

³⁸ New street to be provided as part of the revised scheme, hence there are no baseline flows

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		2041 HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Midland Road (between Brill Place and A501 Euston Road)	Southbound	555	15	647	17	91	3	16%	19%
A5202 Pancras Road (between A501 Euston Road and Goods Way)	Northbound	134	8	195	9	60	2	45%	20%
	Southbound	292	2	310	2	18	0	6%	-1%
A5203 York Way between A501 Euston Road and Caledonia Street	Northbound	702	36	806	37	104	0	15%	1%
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	403	1	418	2	15	0	4%	31%
	Southbound	279	3	284	3	6	0	2%	-2%
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Southbound	324	7	278	6	-46	0	-14%	-7%
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	164	5	197	5	33	0	20%	1%
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Northbound	544	15	541	11	-3	-5	-1%	-31%
	Southbound	66	0	56	0	-10	0	-15%	0%
A400 Gower Street (between Grafton Way and Gower Place)	Northbound	84	8	132	15	48	6	57%	76%
	Southbound	778	17	881	18	104	1	13%	7%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		2041 HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Gordon Street (between Endsleigh Gardens and A501 Euston Road)	Northbound	441	18	0	0	-441	-18	-100%	-100%
	Southbound	325	12	0	0	-325	-12	-100%	-100%
A4200 Upper Woburn Place (between Endsleigh Gardens and A501 Euston Road)	Northbound	372	10	453	12	81	2	22%	19%
	Southbound	646	8	691	14	44	7	7%	90%
B504 Judd Street (between Bidborough Street and A501 Euston Road)	Northbound	84	3	128	5	44	1	53%	30%
	Southbound	301	6	368	7	67	1	22%	17%
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1,787	58	1,941	60	154	2	9%	3%
A501 Euston Road between Euston Circus and Melton Street	Eastbound	1,822	28	1,804	34	-18	5	-1%	19%
	Westbound	1,870	50	1,842	40	-28	-10	-2%	-20%
A501 Euston Road between Melton Street and A4200 Upper Woburn Place	Eastbound	1,843	28	1,876	34	33	5	2%	18%
	Westbound	1,626	34	1,842	40	216	6	13%	17%
A501 Euston Road between A4200 Upper Woburn Place and Churchway	Eastbound	1,645	28	1,686	29	41	1	3%	2%
	Westbound	1,595	32	1,787	36	192	4	12%	13%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 227: 2041 baseline and with completed construction Stage A with 2041 HS2 Phase One operation traffic flows Camden screenline AM peak hour (08:00 to 09:00)

Location	Direction	2041 baseline flows		2041 with HS2 Phase One flows		With HS2 Phase One actual change from 2041 baseline		With HS2 Phase One % change from 2026 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A5203 Caledonian Road (south of Wheelwright Road)	Northbound	653	8	664	8	10	0	2%	-1%
	Southbound	808	38	809	38	1	0	0%	0%
A5200 York Way (north of Vale Road)	Northbound	259	20	261	19	3	-1	1%	-5%
	Southbound	486	12	495	11	9	-1	2%	-10%
A5202 St Pancras Way (north of Baynes Street)	Southbound	914	51	892	56	-22	4	-2%	9%
Randolph Street (East of Royal College Street)	Eastbound	107	11	120	13	13	2	12%	14%
Royal College Street (south of Camden Rd)	Northbound	769	58	730	51	-39	-7	-5%	-12%
A503 Camden Road (south of Royal College St)	Northbound	488	27	515	27	27	0	6%	0%
	Southbound	920	54	961	54	41	0	4%	0%
A400 Camden Street (south of Camden Gardens)	Southbound	1027	55	1018	51	-9	-4	-1%	-7%
A400 Kentish Town Road (south of Camden Gardens)	Northbound	293	17	298	21	5	4	2%	26%
	Southbound	485	24	489	24	4	0	1%	1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 with HS2 Phase One flows		With HS2 Phase One actual change from 2041 baseline		With HS2 Phase One % change from 2026 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Hawley Road	Northbound	856	39	855	40	0	1	0%	3%
A502 Chalk Farm Road (west of Hawley Street)	Northbound	441	15	440	15	-1	0	0%	-1%
	Southbound	604	24	603	25	-1	1	0%	4%
Primrose Hill Road (south of B509 Adelaide Road)	Northbound	288	19	291	18	3	0	1%	-2%
	Southbound	795	46	785	44	-9	-2	-1%	-4%
Avenue Road (south of B509 Adelaide Road)	Northbound	189	9	188	9	-1	0	-1%	2%
	Southbound	100	1	101	1	0	0	0%	0%
A41 Finchley Road (south of B509 Adelaide Road)	Northbound	374	35	371	35	-3	0	-1%	0%
	Southbound	564	18	572	19	8	0	1%	2%
Loudoun Road (south of Alexandra Place)	Northbound	498	12	500	12	2	0	0%	0%
	Southbound	265	18	261	18	-3	0	-1%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 with HS2 Phase One flows		With HS2 Phase One actual change from 2041 baseline		With HS2 Phase One % change from 2026 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A507 Abbey Road (south of B509 Belsize Road)	Northbound	235	5	236	5	1	0	0%	0%
	Southbound	410	10	409	11	-2	0	0%	5%
A5 Kilburn High Road (south of B509 Belsize Road)	Northbound	596	25	601	25	5	0	1%	0%
	Southbound	929	52	936	51	7	0	1%	-1%

Table 228: 2041 baseline and with completed construction Stage A with 2041 HS2 Phase One operation traffic flows Camden screenline PM peak hour (17:00 to 18:00)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		2041 HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A5203 Caledonian Road (south of Wheelwright Road)	Northbound	557	5	559	5	2	0	0%	3%
	Southbound	736	3	738	3	2	0	0%	9%
A5200 York Way (north of Vale Road)	Northbound	359	19	370	20	11	1	3%	4%
	Southbound	330	6	354	6	23	0	7%	5%
A5202 St Pancras Way (north of Baynes Street)	Southbound	617	11	552	14	-65	3	-11%	28%
Randolph Street (East of Royal College Street)	Eastbound	288	3	270	3	-18	0	-6%	-6%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		2041 HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Royal College Street (south of Camden Rd)	Northbound	665	16	636	15	-29	-1	-4%	-4%
A503 Camden Road (south of Royal College St)	Northbound	722	19	715	19	-7	0	-1%	-2%
	Southbound	673	20	716	20	43	0	6%	0%
A400 Camden Street (south of Camden Gardens)	Southbound	788	17	775	14	-13	-3	-2%	-18%
A400 Kentish Town Road (south of Camden Gardens)	Northbound	403	14	398	13	-5	-1	-1%	-5%
	Southbound	302	1	299	1	-3	0	-1%	-12%
Hawley Road	Northbound	589	10	574	10	-15	1	-2%	8%
A502 Chalk Farm Road (west of Hawley Street)	Northbound	523	9	492	8	-32	-1	-6%	-11%
	Southbound	277	1	279	1	2	0	1%	-2%
Primrose Hill Road (south of B509 Adelaide Road)	Northbound	291	17	292	17	1	0	0%	1%
	Southbound	682	15	679	15	-2	0	0%	-2%
Avenue Road (south of B509 Adelaide Road)	Northbound	191	0	185	0	-6	0	-3%	-6%
	Southbound	80	9	70	9	-10	0	-12%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase One flows		2041 HS2 Phase One actual change from 2041 baseline		2041 HS2 Phase One % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A41 Finchley Road (south of B509 Adelaide Road)	Northbound	359	35	353	35	-5	0	-2%	1%
	Southbound	515	14	512	14	-2	0	0%	1%
Loudoun Road (south of Alexandra Place)	Northbound	585	2	596	2	11	0	2%	-1%
	Southbound	97	3	98	3	1	0	1%	4%
A507 Abbey Road (south of B509 Belsize Road)	Northbound	346	3	346	3	0	0	0%	-10%
	Southbound	279	1	281	1	2	0	1%	10%
A5 Kilburn High Road (south of B509 Belsize Road)	Northbound	595	9	606	9	10	0	2%	-1%
	Southbound	666	7	675	7	9	0	1%	7%

- 3.5.389 Traffic flow changes as a result of the completed Stage A station with 2041 HS2 Phase One operation are relatively local to the Euston area although cover a slightly larger area than for the 2026 HS2 Phase One operation scenario, particularly for the AM peak hour. In particular, the area affected north of A501 Euston Road runs from the B507 Lisson Grove to A5203 York Way and to the south of A501 Euston Road from A41 Gloucester Place to A201 Farringdon Road. Many of the changes to the south of A501 Euston Road are an impact of cars and taxis re-routeing as a result of the closure of the northern section of Gordon Street and the relocation of taxis to Cobourg Street, particularly onto B504 Judd street and A5200 Gray's Inn Road.
- 3.5.390 The most noticeable impacts in terms of traffic flow changes during the AM and PM peak hours, as shown on Figure 178 and Figure 179 are:
- A501 Euston Road, east of Euston station - increases in both the eastbound and westbound directions and in both the AM and PM peak hours;
 - A501 Euston Road, west of Euston station - reduction immediately west of A400 Hampstead Road, in the westbound direction in both the AM and PM peak hours;
 - A400 Hampstead Road - increase in both the northbound and southbound directions in the AM and PM peak hours between A501 Euston Road and Robert Street, due to taxis entering and exiting the set-down and pick-up facilities on Cobourg Street;
 - Gordon Street - closed in the 2041 HS2 Phase One scenario. The maximum flow was 450 vehicles, in the northbound direction in the AM peak hour in the 2041 future baseline;
 - Access to the taxi set-down and pick-up on Cobourg Street; and
 - A400 Gower Street, B504 Judd Street, A5200 Gray's Inn Road and A201 Farringdon Road all experience flow increases in the northbound and southbound directions in the AM and PM peak hours due to the closure of Gordon Street.
- 3.5.391 Taking the flows on the screenline to the north of A501 Euston Road, most roads, with the exception of A400 Hampstead Road and the Cobourg Street taxi pick-up and set-down, experience only a small change in flows. Total flow across the screenline increases by between approximately 560 vehicles during the PM peak hour in the northbound direction, with a future baseline total of approximately 2,960 vehicles per hour, and, 550 vehicles per hour during the AM peak hour in the northbound direction (with a future baseline total of approximately 2,080 vehicles per hour).
- 3.5.392 On the screenline to the south of A501 Euston Road, the closure of Gordon Street leads to a small net decrease in total across the screenline of between approximately 115 vehicles per hour in the northbound direction during the PM peak hour (with a future baseline total of approximately 3,715 vehicles per hour), and approximately 240 vehicles per hour in the southbound direction in the AM peak hour (with a future baseline total of 3,310 per hour). Those roads immediately adjacent to Gordon Street, namely A400 Gower Street in the southbound direction and A4201 Upper Woburn

Place in the northbound direction, experience the largest flow increases, but with increases further east on B504 Judd Street and A4200 Gray's Inn Road.

- 3.5.393 There is a negligible change between the 2041 future baseline and 2041 HS2 Phase One across the Camden screenline with around a 1% difference in all vehicles in both directions across the AM and PM peak hours. On individual roads, all vehicles increase by a slightly higher percentage but the increase does not exceed 12% on any road. The percentage increase in HGVs is greater but the absolute increases in HGV numbers are much lower than for all vehicles. The low level of flow changes across the screenlines reflects the fact that the impacts of the revised scheme at Euston station decrease rapidly with increasing distance from the local area.

Strategic highway network analysis completed high speed station with 2041 HS2 Phase Two operation

Strategic highway assessment model analysis

- 3.5.394 With the completed high speed station and 2041 Phase Two operation, junction capacity analysis has been undertaken comparing junction operation in the 2041 future baseline scenario with the 2041 HS2 Phase Two operation. The assessment of junctions is based on the relationship of flow to capacity, measured as the Volume Capacity (VoC) ratio.
- 3.5.395 The highway network is affected by permanent changes to the road network and changes to, particularly, taxis. The total number of NR passengers alighting at Euston during the AM peak three hour with HS2 Phase Two in 2041 increases from 41,220 in 2026 to 61,100 in 2041, an increase of some 19,880 (48%). This comprises 34,700 long distance/HS2 and 26,360 suburban rail passengers. The number of taxis forecast to serve Euston station is therefore higher in 2041, which contributes to the increase in impacted junctions. The level of taxi demand generated by the revised scheme is based on 2% of shorter distance rail passengers and 6% of long distance NR and HS2 passengers completing their onward journey by taxi.
- 3.5.396 The assessment of the completed high speed station with 2041 HS2 Phase Two operation indicates that 19 junctions are impacted by the revised scheme. These are shown in Table 229.

Table 229: completed high speed station with 2041 HS2 Phase Two operation AM and PM peak hour impacted junctions

Junction name	Control type
A40 New Oxford Street / Coptic Street	Signalised
A400 Camden Street / B512 Crowndale Road	Signalised
A4200 Eversholt Street / A4200 Grafton Place	Signalised
A4200 Russell Square / Bernard Street	Signalised
A501 Euston Road / Ossulston Street	Signalised
A501 Marylebone Road / A41 Gloucester Place	Signalised

Junction name	Control type
A5202 Crowndale Road / A5202 Royal College Street	Signalised
A5204 Goodge Street / Charlotte Street	Signalised
A501 Marylebone Road / A41 Baker Street	Signalised
A400 Bloomsbury Street / Great Russell Street	Signalised
A501 Euston Road / Duke's Road / Churchway	Signalised
A501 Marylebone Road / A4201 Park Crescent	Signalised
A400 Gower Street / Torrington Place	Signalised
A400 Tottenham Court Road / A400 Grafton Way	Signalised
A4200 Eversholt Street / A400 Oakley Square	Signalised
A501 Euston Road (westbound) / A400 Hampstead Road	Signalised
A501 Euston Road / A4200 Eversholt Street - AM peak	Signalised
A501 Euston Road / Chalton Street - AM peak	Priority
A501 Marylebone Road (eastbound) / Upper Montagu Street	Signalised

3.5.397 The impacted junctions that are signalised were locally optimised in SATURN to represent how the junction operation could improve with revised green times but with the same overall cycle time. This indicated that the VoC would reduce below the 87% threshold in the 'with HS2' scenario at some junctions. Further analysis of the junctions close to Euston station has been undertaken as part of the local highway assessment.

Strategic and local road network flows completed high speed station with 2041 HS2 Phase Two operation

3.5.398 The traffic flow impacts of the revised scheme were assessed strategically in CLOHAM by comparing the change in traffic flow between the 2041 future baseline and 'with HS2' scenarios. The flow differences for the AM and PM peak hours are shown in Figure 180 and Figure 181 respectively. The width of the band indicates the proportional change in traffic with red representing an increase and green a decrease compared with the 2041 future baseline scenario.

3.5.399 The traffic flows on the A501 Euston Road screen lines are shown in Figure 178 and Figure 179 for the AM and PM peak hours respectively while the Camden screenline traffic flows are shown in Figure 180 and Figure 181 for the AM and PM peak hours respectively.

Figure 18o: Traffic flow changes (PCU) 2041 future baseline vs completed high speed station with 2041 HS2 Phase Two operation - AM peak hour (08:00 to 09:00)

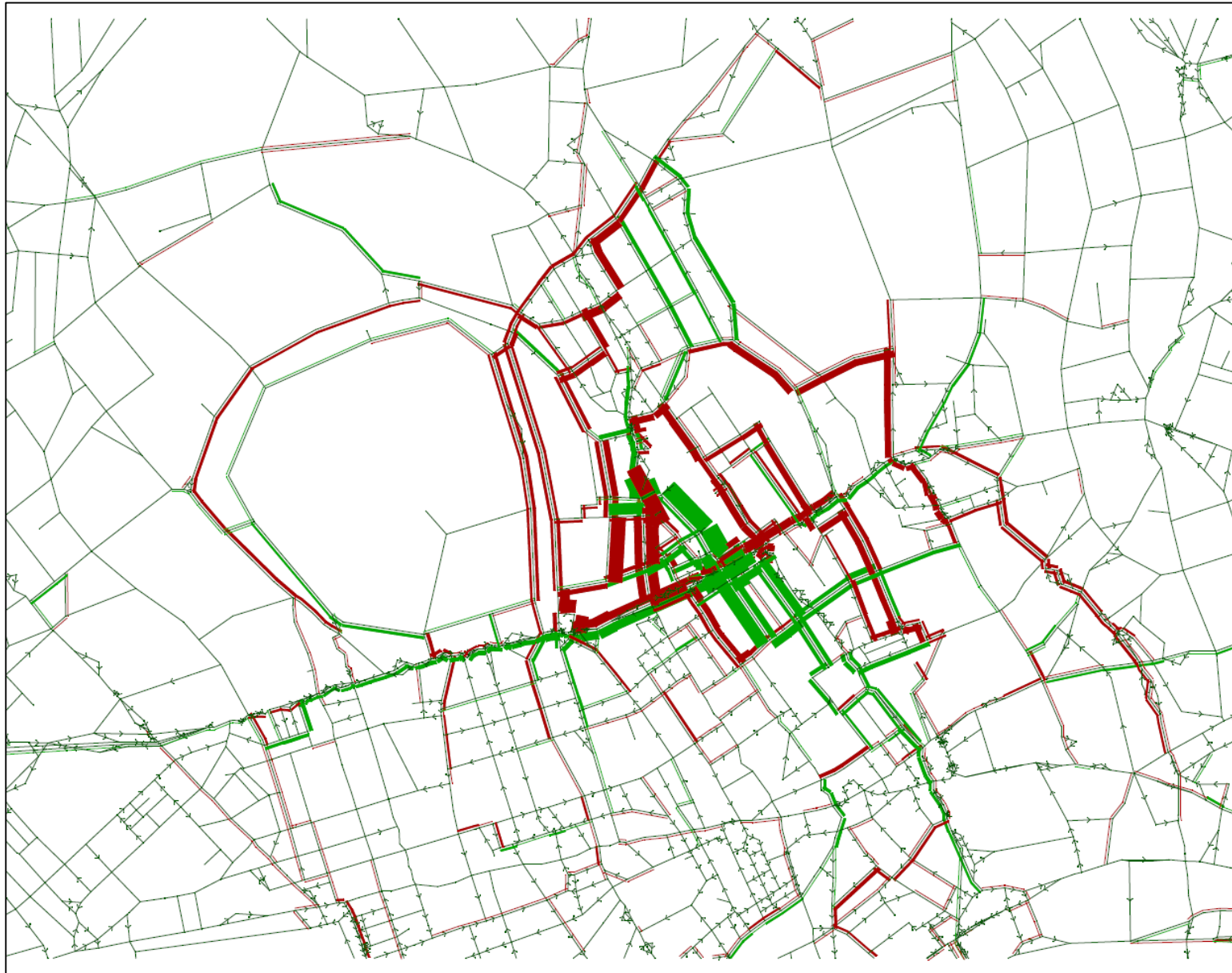
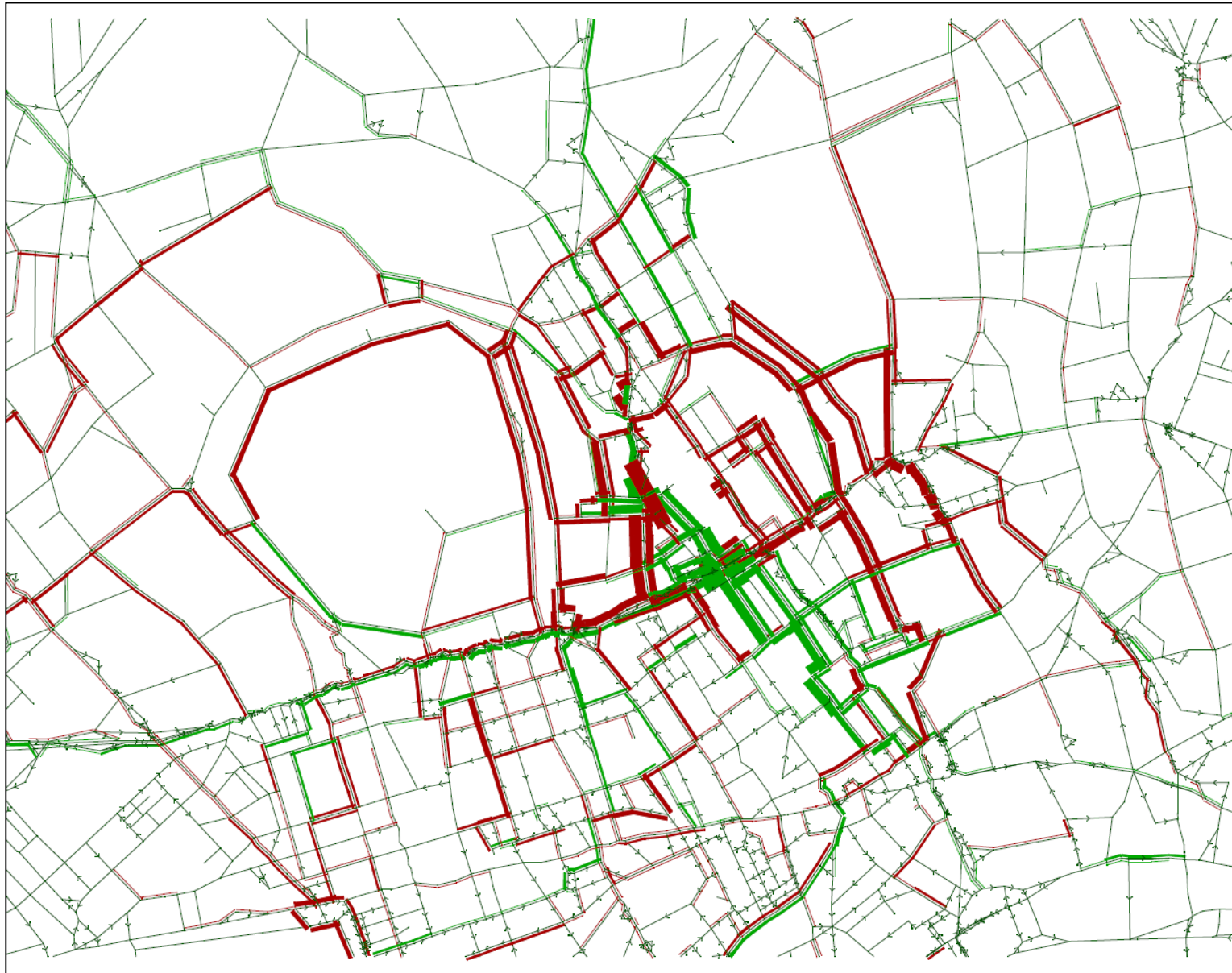


Figure 181: Traffic flow changes (PCU) 2041 future baseline vs completed high speed station with 2041 HS2 Phase Two operation - PM peak hour (17:00 to 18:00)



SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 230: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows for the Euston screenlines AM peak hour (08:00 to 09:00)

Location	Direction	2041 baseline flows		2041 HS2 Phase Two flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Outer Circle (between Park Square East and Chester Road)	Northbound	135	0	162	0	27	0	20%	0%
	Southbound	200	7	245	7	45	0	22%	0%
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	348	10	377	10	29	-1	8%	-5%
	Southbound	359	18	409	19	50	1	14%	3%
Stanhope Street (between Longford Street and Robert Street)	Northbound	117	9	112	13	-5	4	-5%	45%
	Southbound	189	3	463	5	274	2	145%	46%
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	227	24	368	21	141	-3	62%	-11%
	Southbound	778	2	1018	4	240	2	31%	68%
Cardington Street (north of Drummond Street) ³⁹	Northbound	32	0	0	0	-32	0	-100%	-100%
	Southbound	325	3	0	0	-325	-3	-100%	-100%
New Cobourg Street (north of Starcross Street) ⁴⁰	Northbound	0	0	18	1	18	1	0%	0%
	Southbound	0	0	36	0	36	0	0%	0%

³⁹ Cardington Street will be permanent closed as part of the revised scheme hence there are no flows in the 2041 HS2 Phase Two scenarios.

⁴⁰ New street to be provided as part of the revised scheme, hence there are no baseline flows.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase Two flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A4200 Eversholt Street (between Phoenix Road and Polygon Road)	Northbound	232	11	305	6	73	-5	31%	-42%
	Southbound	555	25	579	20	24	-4	4%	-18%
Chalton Street (between A501 Euston Road and Phoenix Road)	Northbound	249	58	229	55	-20	-2	-8%	-4%
	Southbound	229	17	256	15	26	-2	11%	-12%
Midland Road (between Brill Place and A501 Euston Road)	Southbound	681	24	660	30	-21	6	-3%	24%
A5202 Pancras Road (between A501 Euston Road and Goods Way)	Northbound	251	9	251	9	0	0	0%	-1%
	Southbound	108	8	110	8	2	0	2%	-3%
A5203 York Way between A501 Euston Road and Caledonia Street	Northbound	490	51	602	51	112	0	23%	0%
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	205	37	239	37	35	-1	17%	-2%
	Southbound	345	4	324	4	-21	0	-6%	-8%
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Southbound	601	24	575	24	-26	0	-4%	0%
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	244	3	259	12	15	9	6%	265%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase Two flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Northbound	479	42	478	36	-1	-6	0%	-15%
	Southbound	71	0	68	0	-3	0	-5%	0%
A400 Gower Street (between Grafton Way and Gower Place)	Northbound	46	2	82	8	36	7	78%	404%
	Southbound	794	37	914	22	120	-15	15%	-40%
Gordon Street (between Endsleigh Gardens and A501 Euston Road)	Northbound	447	7	0	0	-447	-7	-100%	-100%
	Southbound	401	5	0	0	-401	-5	-100%	-100%
A4200 Upper Woburn Place (between Endsleigh Gardens and A501 Euston Road)	Northbound	224	14	376	10	152	-4	68%	-29%
	Southbound	540	54	637	55	96	1	18%	2%
B504 Judd Street (between Bidborough Street and A501 Euston Road)	Northbound	118	5	119	6	1	1	1%	10%
	Southbound	312	24	382	31	70	7	23%	28%
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1,909	131	1,988	131	80	0	4%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 Phase Two flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A501 Euston Road between Euston Circus and Melton Street	Eastbound	1,673	159	1,836	165	163	6	10%	4%
	Westbound	1,953	90	1,796	82	-156	-8	-8%	-9%
A501 Euston Road between Melton Street and A4200 Upper Woburn Place	Eastbound	1,720	159	1,855	164	135	5	8%	3%
	Westbound	1,752	83	1,776	82	24	-1	1%	-1%
A501 Euston Road between A4200 Upper Woburn Place and Churchway	Eastbound	1,466	129	1,620	131	154	1	11%	1%
	Westbound	1,721	85	1,720	85	-2	0	0%	0%

Table 231: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows for the Euston screenlines PM peak hour (17:00 to 18:00)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Outer Circle (between Park Square East and Chester Road)	Northbound	351	0	410	0	59	0	17%	#DIV/o!
	Southbound	210	2	220	2	11	0	5%	-1%
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	530	12	527	12	-4	0	-1%	2%
	Southbound	244	3	280	4	36	1	15%	36%
Stanhope Street (between Longford Street and Robert Street)	Northbound	106	5	100	11	-5	6	-5%	131%
	Southbound	131	2	132	2	2	0	1%	-4%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	324	12	562	6	238	-6	73%	-46%
	Southbound	424	9	552	4	128	-5	30%	-55%
Cardington Street (north of Drummond Street) ⁴¹	Northbound	102	2	0	0	-102	-2	-100%	-100%
	Southbound	100	3	0	0	-100	-3	-100%	-100%
New Cobourg Street (north of Starcross Street) ⁴²	Northbound	0	0	40	1	40	1	0%	0%
	Southbound	0	0	24	0	24	0	0%	0%
A4200 Eversholt Street (between Phoenix Road and Polygon Road)	Northbound	431	13	433	12	2	-1	0%	-7%
	Southbound	291	4	337	2	47	-2	16%	-48%
Chalton Street (between A501 Euston Road and Phoenix Road)	Northbound	283	8	272	7	-11	-1	-4%	-15%
	Southbound	205	6	244	6	40	0	19%	-5%

⁴¹ Cardington Street will be permanent closed as part of the revised scheme hence there are no flows in the 2041 HS2 Phase Two scenarios

⁴² New street to be provided as part of the revised scheme, hence there are no baseline flows

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Midland Road (between Brill Place and A501 Euston Road)	Southbound	555	15	659	18	104	3	19%	23%
A5202 Pancras Road (between A501 Euston Road and Goods Way)	Northbound	134	8	208	9	74	2	55%	22%
	Southbound	292	2	318	2	25	0	9%	-2%
A5203 York Way between A501 Euston Road and Caledonia Street	Northbound	702	36	819	37	117	0	17%	1%
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	403	1	422	1	19	0	5%	6%
	Southbound	279	3	287	3	8	0	3%	-3%
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Southbound	324	7	281	6	-43	0	-13%	-6%
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	164	5	217	5	53	0	33%	-1%
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Northbound	544	15	541	8	-3	-7	-1%	-45%
	Southbound	66	0	60	0	-6	0	-9%	0%
A400 Gower Street (between Grafton Way and Gower Place)	Northbound	84	8	134	14	50	5	60%	64%
	Southbound	778	17	889	17	111	0	14%	1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Gordon Street (between Endsleigh Gardens and A501 Euston Road)	Northbound	441	18	0	0	-441	-18	-100%	-100%
	Southbound	325	12	0	0	-325	-12	-100%	-100%
A4200 Upper Woburn Place (between Endsleigh Gardens and A501 Euston Road)	Northbound	372	10	439	13	67	3	18%	30%
	Southbound	646	8	712	16	66	8	10%	108%
B504 Judd Street (between Bidborough Street and A501 Euston Road)	Northbound	84	3	111	5	27	1	32%	30%
	Southbound	301	6	385	6	84	0	28%	-4%
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1,787	58	1,953	59	166	2	9%	3%
A501 Euston Road between Euston Circus and Melton Street	Eastbound	1,822	28	1,804	33	-17	4	-1%	15%
	Westbound	1,870	50	1,770	39	-100	-11	-5%	-21%
A501 Euston Road between Melton Street and A4200 Upper Woburn Place	Eastbound	1,843	28	1,821	32	-22	4	-1%	14%
	Westbound	1,626	34	1,750	39	124	5	8%	15%
A501 Euston Road between A4200 Upper Woburn Place and Churchway	Eastbound	1,645	28	1,679	28	34	0	2%	0%
	Westbound	1,595	32	1,735	39	140	7	9%	21%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 232: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows Camden screenline AM peak hour (08:00 to 09:00)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A5203 Caledonian Road (south of Wheelwright Road)	Northbound	653	8	662	8	8	0	1%	0%
	Southbound	808	38	804	37	-4	-1	-1%	-3%
A5200 York Way (north of Vale Road)	Northbound	259	20	266	19	7	-1	3%	-4%
	Southbound	486	12	494	10	8	-2	2%	-16%
A5202 St Pancras Way (north of Baynes Street)	Southbound	914	51	865	56	-50	5	-5%	10%
Randolph Street (East of Royal College Street)	Eastbound	107	11	125	12	18	1	17%	12%
Royal College Street (south of Camden Rd)	Northbound	769	58	733	52	-36	-6	-5%	-10%
A503 Camden Road (south of Royal College St)	Northbound	488	27	516	27	28	0	6%	2%
	Southbound	920	54	1004	55	84	1	9%	2%
A400 Camden Street (south of Camden Gardens)	Southbound	1027	55	1022	51	-6	-4	-1%	-6%
A400 Kentish Town Road (south of Camden Gardens)	Northbound	293	17	299	21	6	4	2%	25%
	Southbound	485	24	496	27	11	3	2%	12%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Hawley Road	Northbound	856	39	854	43	-1	4	0%	10%
A502 Chalk Farm Road (west of Hawley Street)	Northbound	441	15	449	15	8	0	2%	-1%
	Southbound	604	24	601	28	-3	4	0%	16%
Primrose Hill Road (south of B509 Adelaide Road)	Northbound	288	19	291	19	3	0	1%	2%
	Southbound	795	46	789	41	-6	-4	-1%	-10%
Avenue Road (south of B509 Adelaide Road)	Northbound	189	9	189	8	0	-1	0%	-7%
	Southbound	100	1	100	1	0	0	0%	0%
A41 Finchley Road (south of B509 Adelaide Road)	Northbound	374	35	374	35	0	0	0%	1%
	Southbound	564	18	574	18	10	0	2%	-1%
Loudoun Road (south of Alexandra Place)	Northbound	498	12	496	12	-2	0	0%	1%
	Southbound	265	18	261	18	-4	0	-2%	1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A507 Abbey Road (south of B509 Belsize Road)	Northbound	235	5	234	5	-1	0	0%	0%
	Southbound	410	10	410	11	0	0	0%	4%
A5 Kilburn High Road (south of B509 Belsize Road)	Northbound	596	25	604	25	8	0	1%	0%
	Southbound	929	52	933	52	4	0	0%	0%

Table 233: 2041 baseline and completed high speed station with 2041 HS2 Phase Two operation traffic flows Camden screenline PM peak hour (17:00 to 18:00)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
A5203 Caledonian Road (south of Wheelwright Road)	Northbound	557	5	558	5	1	0	0%	2%
	Southbound	736	3	740	3	4	0	1%	12%
A5200 York Way (north of Vale Road)	Northbound	359	19	374	20	15	1	4%	4%
	Southbound	330	6	354	6	24	0	7%	4%
A5202 St Pancras Way (north of Baynes Street)	Southbound	617	11	551	14	-65	3	-11%	31%
Randolph Street (East of Royal College Street)	Eastbound	288	3	270	3	-18	0	-6%	-7%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Royal College Street (south of Camden Rd)	Northbound	665	16	633	15	-32	-1	-5%	-5%
A503 Camden Road (south of Royal College St)	Northbound	722	19	734	19	12	0	2%	-2%
	Southbound	673	20	720	20	48	0	7%	0%
A400 Camden Street (south of Camden Gardens)	Southbound	788	17	770	11	-18	-5	-2%	-33%
A400 Kentish Town Road (south of Camden Gardens)	Northbound	403	14	405	13	2	-1	0%	-4%
	Southbound	302	1	300	3	-2	2	-1%	118%
Hawley Road	Northbound	589	10	580	10	-9	1	-2%	8%
A502 Chalk Farm Road (west of Hawley Street)	Northbound	523	9	516	8	-7	-1	-1%	-12%
	Southbound	277	1	281	1	4	0	1%	-1%
Primrose Hill Road (south of B509 Adelaide Road)	Northbound	291	17	274	17	-17	0	-6%	0%
	Southbound	682	15	666	15	-16	-1	-2%	-4%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	2041 baseline flows		2041 HS2 (Stage B1) flows		2041 HS2 Phase Two actual change from 2041 baseline		2041 HS2 Phase Two % change from 2041 baseline	
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	All vehicles	HGV
Avenue Road (south of B509 Adelaide Road)	Northbound	191	0	190	0	-1	0	-1%	-8%
	Southbound	80	9	75	9	-5	0	-7%	0%
A41 Finchley Road (south of B509 Adelaide Road)	Northbound	359	35	355	35	-3	0	-1%	0%
	Southbound	515	14	513	14	-1	0	0%	0%
Loudoun Road (south of Alexandra Place)	Northbound	585	2	596	2	11	0	2%	-1%
	Southbound	97	3	102	3	5	0	5%	10%
A507 Abbey Road (south of B509 Belsize Road)	Northbound	346	3	348	3	2	0	1%	-13%
	Southbound	279	1	281	1	2	0	1%	3%
A5 Kilburn High Road (south of B509 Belsize Road)	Northbound	595	9	608	9	13	0	2%	1%
	Southbound	666	7	679	7	13	1	2%	10%

- 3.5.400 Traffic flow changes as a result of the completed high speed station with Hs2 Phase Two operation in 2041 are relatively local to the Euston area and cover a very similar area to the 2041 HS2 Phase One scenario. In particular, the area affected north of A501 Euston Road, during the AM peak hour, runs from the B507 Lisson Grove to A5203 York Way and to the south of A501 Euston Road from A41 Gloucester Place to A201 Farringdon Road. Many of the changes to the south of A501 Euston Road are an impact of cars and taxis re-routeing as a result of the closure of the northern section of Gordon Street and, to the north of A501 Euston Road as a result of the relocation of taxis to their permanent location to the north of Euston station accessed via A400 Hampstead Road.
- 3.5.401 The most noticeable impacts in terms of traffic flow changes during the AM and PM peak hours, as shown on Figure 180 and Figure 181 are:
- A501 Euston Road, east of Euston station - increases in both the eastbound and westbound directions and in both the AM and PM peak hours;
 - A501 Euston Road, west of Euston station - reduction immediately west of A400 Hampstead Road in the westbound direction particularly in the AM peak hour;
 - A400 Hampstead Road - increase in the northbound direction for the AM and PM peak hours south of Robert Street, due to taxis entering and exiting the set-down and pick-up facilities to the north of Euston station;
 - Stanhope Street – increase in southbound flows in the AM peak hour due to taxis using Stanhope Street and Robert Street to travel westbound on A501 Euston Road;
 - Gordon Street - closed in the 2041 HS2 Phase Two scenario. The maximum flow was 440 vehicles, in the northbound direction in the AM peak hour in the 2041 future baseline;
 - A5202 Pancras Road – increase in both the northbound and southbound directions in the AM peak hour; and
 - A400 Gower Street, B504 Judd Street, A5200 Gray's Inn Road and A201 Farringdon Road all experience flow increases in the northbound and southbound directions in the AM and PM peak periods due to the closure of Gordon Street.
- 3.5.402 Taking the flows on the screenline to the north of A501 Euston Road, most roads, with the exception of A400 Hampstead Road, experience only a small change in flows. The total flow across the screenline increases by between approximately 410 vehicles during the PM peak hour in the northbound direction, with a future baseline total of approximately 2,960 vehicles per hour, and, 340 vehicles per hour during the AM peak hour in the northbound direction (with a future baseline total of approximately 2,080 vehicles per hour).
- 3.5.403 On the screenline to the south of A501 Euston Road, the closure of Gordon Street leads to a small net decrease in total across the screenline of between approximately 130 vehicles per hour in the northbound direction during the PM peak hour (with a future baseline total of approximately 3,715 vehicles per hour), and approximately 155

vehicles per hour in the southbound direction in the AM peak hour (with a future baseline total of 3,310 per hour). Those roads immediately adjacent to Gordon Street, namely A400 Gower Street in the southbound direction and A4201 Upper Woburn Place in the northbound direction, experience the largest flow increases, but with increase further east on B504 Judd Street and A4200 Gray's Inn Road.

- 3.5.404 There is a very small change between the 2041 future baseline and 2041 HS2 Phase Two across the Camden screenline with less than a 1% difference in all vehicles in both directions across the AM and PM peak hours. On individual roads, all vehicles increase by a slightly higher percentage but do not exceed 17% on any road. The percentage increase in HGVs is greater but the absolute numbers are much lower than for all vehicles. The low level of flow changes across the screenlines reflect the fact that the impacts of the revised scheme at Euston station decrease rapidly with increasing distance from the local area.
- 3.5.405 In addition to screenline comparisons, roads that will likely experience a substantial increase in traffic flow have been identified. Table 234 and Table 235 outline those traffic flows for HS2 Phase Two assessment for CFA1.
- 3.5.406 The tables indicate relatively low changes to HGV flows with construction activities complete. For all vehicles, the increases are relatively local to Euston station and reflect the Stage B1 operation of the station resulting from changed taxi operations and permanent changes to the highway network, including A4201 Osnauburgh Street/Longford Street/Drummond Street and North Gower Street.
- 3.5.407 Roads identified in CFA2-4 as having a substantial increase in daily traffic flow are reported in Table 236 and Table 237 for the AM and PM peak hours respectively.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 234: Links with traffic increase, 2041 Operation AM Peak (08:00-09:00)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
A400 Harrington Square/ Lidlington Place	EB	CFA1	694	141	845	103	151	-38	22%	-27%
A4200 Russell Square	NB	CFA1	24	0	27	0	3	0	13%	-
A4201 Osnaburgh Street	SB	CFA1	563	67	759	110	196	43	35%	65%
A4201 Parkway	WB	CFA1	354	44	414	63	60	18	17%	42%
A5200 Gray's Inn Rd	NB	CFA1	370	50	467	59	98	10	26%	19%
A5204 Goodge St/ Mortimer St	WB	CFA1	82	35	85	35	3	0	4%	1%
A5205 St. John's Wood Rd	WB	CFA1	362	73	341	72	-21	0	-6%	0%
Arlington Road	SB	CFA1	93	21	185	30	92	9	99%	45%
B502 Bernard St	EB	CFA1	117	25	181	26	63	2	54%	7%
B502 Brunswick Square/ Lansdowne Terrace/ B504 Grenville St	WB	CFA1	113	22	214	18	102	-4	90%	-19%
B512 Crowndale Road	EB	CFA1	409	60	407	60	-2	0	0%	0%
Bayham Street	SB	CFA1	611	70	629	69	17	0	3%	0%
Bidborough St	WB	CFA1	64	22	172	27	107	4	167%	19%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
Byng Place	EB	CFA1	406	78	499	51	93	-27	23%	-34%
Camley St	SB	CFA1	131	18	137	18	7	0	5%	-1%
Cumberland Market	NB	CFA1	42	7	42	7	0	0	-1%	-2%
Drummond St (West of North Gower St)	WB	CFA1	78	8	140	0	62	-8	80%	-100%
Eastcastle St	WB	CFA1	114	31	125	30	12	-1	10%	-3%
Goods Way	WB	CFA1	285	62	398	66	113	5	40%	7%
Grafton Way	WB	CFA1	350	106	392	78	42	-27	12%	-26%
Granby Terrace	EB	CFA1	199	30	148	14	-51	-16	-26%	-54%
Great Ormond St	EB	CFA1	118	30	108	30	-10	0	-9%	0%
Great Russell St	EB	CFA1	433	178	491	174	58	-3	13%	-2%
Guilford Place	NB	CFA1	321	58	334	57	12	-1	4%	-1%
Harrison St	EB	CFA1	138	75	151	76	13	1	10%	1%
Longford St	WB	CFA1	86	9	69	13	-16	4	-19%	47%
Mabledon Place	NB	CFA1	33	1	137	1	104	0	314%	-5%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
Marchmont St	SB	CFA1	77	9	139	9	62	0	80%	-1%
Margaret St	WB	CFA1	120	37	132	37	12	0	10%	0%
Mornington St	EB	CFA1	106	22	198	32	92	10	87%	45%
North Gower St	SB	CFA1	48	8	148	0	100	-8	207%	-100%
Nottingham Place	NB	CFA1	231	18	246	18	15	0	7%	-1%
Old Gloucester St	NB	CFA1	118	30	108	30	-10	0	-9%	0%
Ossulston Street	NB	CFA1	139	18	224	14	85	-4	61%	-24%
Park Village East	SB	CFA1	224	58	281	52	57	-6	26%	-10%
Phoenix Rd	EB	CFA1	93	31	114	38	21	7	23%	21%
Plender Street	EB	CFA1	338	34	328	37	-10	2	-3%	7%
Polygon Rd	WB	CFA1	139	18	224	14	85	-4	61%	-24%
Robert Street	WB	CFA1	132	17	163	13	31	-4	23%	-24%
Russell Square	EB	CFA1	71	4	88	4	17	0	24%	-7%
Seaford St	NB	CFA1	56	14	69	15	13	1	23%	8%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
Shelton St	WB	CFA1	396	105	439	117	43	12	11%	12%
Tavistock Place	EB	CFA1	201	42	199	54	-2	12	-1%	28%
Torrington Place	EB	CFA1	217	41	351	18	134	-22	62%	-55%
Upper Wimpole St	NB	CFA1	68	18	69	18	1	0	2%	0%
Wells St	SB	CFA1	207	69	219	68	12	-1	6%	-2%
Wimpole St	NB	CFA1	189	49	198	49	8	0	4%	0%

Table 235: Links with traffic increase, 2041 Operation PM Peak (17:00-18:00)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
A400 Harrington Square/ Lidlington Place	EB	CFA1	732	62	840	48	108	-14	15%	-23%
A4200 Russell Square	NB	CFA1	88	0	187	0	99	0	113%	-
A4201 Osnaburgh Street	SB	CFA1	470	33	558	55	88	22	19%	68%
A4201 Parkway	WB	CFA1	255	17	314	19	60	2	23%	10%
A5200 Gray's Inn Rd	NB	CFA1	390	48	543	57	153	8	39%	17%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
A5204 Goodge St/ Mortimer St	WB	CFA1	75	3	113	10	38	7	50%	223%
A5205 St. John's Wood Rd	WB	CFA1	326	41	372	35	47	-6	14%	-14%
Arlington Road	SB	CFA1	65	5	94	7	28	2	43%	37%
B502 Bernard St	EB	CFA1	460	47	451	45	-9	-2	-2%	-4%
B502 Brunswick Square/ Lansdowne Terrace/ B504 Grenville St	WB	CFA1	66	12	166	10	101	-2	153%	-18%
B512 Crowndale Road	EB	CFA1	454	36	534	31	80	-5	18%	-14%
Bayham Street	SB	CFA1	550	40	649	35	99	-5	18%	-13%
Bidborough St	WB	CFA1	43	6	142	6	100	0	232%	-4%
Byng Place	EB	CFA1	759	67	768	39	9	-28	1%	-42%
Camley St	SB	CFA1	151	4	199	5	47	1	31%	15%
Cumberland Market	NB	CFA1	133	2	188	3	55	1	42%	31%
Drummond St (West of North Gower St)	WB	CFA1	111	15	147	0	36	-15	33%	-100%
Eastcastle St	WB	CFA1	155	7	218	9	64	1	41%	21%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
Goods Way	WB	CFA1	463	68	541	71	79	3	17%	5%
Grafton Way	WB	CFA1	437	59	496	33	59	-26	14%	-44%
Granby Terrace	EB	CFA1	81	15	157	7	77	-8	95%	-54%
Great Ormond St	EB	CFA1	251	21	329	21	78	0	31%	-2%
Great Russell St	EB	CFA1	501	122	548	125	47	3	9%	2%
Guilford Place	NB	CFA1	235	37	308	36	73	-1	31%	-2%
Harrison St	EB	CFA1	101	21	145	22	44	1	44%	6%
Longford St	WB	CFA1	4	4	89	10	85	6	2185%	157%
Mabledon Place	NB	CFA1	6	2	104	2	98	0	1623%	-4%
Marchmont St	SB	CFA1	414	32	387	28	-27	-4	-6%	-13%
Margaret St	WB	CFA1	156	8	225	16	69	7	44%	88%
Mornington St	EB	CFA1	57	5	129	8	72	3	126%	67%
North Gower St	SB	CFA1	78	10	80	0	2	-10	2%	-100%
Nottingham Place	NB	CFA1	414	21	460	23	47	2	11%	10%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
Old Gloucester St	NB	CFA1	251	21	329	21	78	0	31%	-2%
Ossulston Street	NB	CFA1	104	17	182	17	78	0	75%	2%
Park Village East	SB	CFA1	158	17	217	12	59	-5	37%	-27%
Phoenix Rd	EB	CFA1	167	26	222	35	54	9	33%	36%
Plender Street	EB	CFA1	457	26	562	21	105	-5	23%	-21%
Polygon Rd	WB	CFA1	104	17	182	17	78	0	75%	2%
Robert Street	WB	CFA1	172	12	208	9	36	-3	21%	-26%
Russell Square	EB	CFA1	296	39	366	27	70	-12	24%	-30%
Seaford St	NB	CFA1	89	18	132	19	43	1	49%	5%
Shelton St	WB	CFA1	355	44	360	44	5	0	1%	-1%
Tavistock Place	EB	CFA1	212	35	261	42	49	7	23%	20%
Torrington Place	EB	CFA1	340	34	434	17	94	-16	28%	-49%
Upper Wimpole St	NB	CFA1	238	20	331	32	93	11	39%	56%
Wells St	SB	CFA1	268	18	331	21	63	3	24%	19%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 Operation Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
Wimpole St	NB	CFA1	399	34	487	44	88	10	22%	28%

Table 236: Links with traffic increase, 2041 Operation AM Peak, Outside CFA1

Location	Direction	CFA	2041 Baseline		2041 construction Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
A201 King's Cross Road/ Farringdon Road	NB	CFA2	243	67	263	67	20	0	8%	0%
	SB		496	116	502	121	7	5	1%	4%
A503 Bayham Street	SB	CFA2	495	109	549	120	54	11	11%	10%
A503 Camden Road	EB	CFA2	244	42	278	42	33	0	14%	0%
	WB		495	109	549	120	54	11	11%	10%
A503 Delancey Street	WB	CFA2	568	125	626	135	58	10	10%	8%
A503 Pratt Street	WB	CFA2	416	109	469	120	53	11	13%	10%
A5200 York Way	NB	CFA2	233	63	330	65	96	2	41%	4%
	SB		263	48	280	49	17	1	6%	1%
Pratt Street	EB	CFA2	40	20	33	20	-8	0	-19%	-1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	20241 Baseline		2041 construction Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
	WB		76	17	76	17	0	0	0%	0%
Abercon Place	EB	CFA3	434	49	431	49	-3	1	-1%	2%
	WB		208	29	208	29	0	0	0%	0%
Albert Terrace	NB	CFA3	472	75	469	76	-4	1	-1%	1%
B413 Clifton Gdns/ Formosa Street/ Shirland Road/ Warwick Ave	EB		132	20	129	20	-3	-1	-3%	-2%
	WB		244	40	244	40	-1	0	0%	0%
Elgin Avenue	EB	CFA4	317	46	317	47	0	2	0%	4%
	WB		354	59	354	58	-1	0	0%	-1%
Sutherland Avenue	EB	CFA4	176	29	175	29	-1	0	0%	0%
	WB		292	36	291	36	-1	0	0%	0%

Table 237: Links with traffic increase, 2041 Operation PM Peak, Outside CFA1

Location	Direction	CFA	2041 Baseline		2041 construction Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
A201 King's Cross Road/ Farringdon Road	NB	CFA2	274	52	304	52	30	-1	11%	-1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 construction Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
	SB		510	77	507	78	-3	1	-1%	1%
A503 Bayham Street	SB	CFA2	430	55	451	54	20	0	5%	-1%
A503 Camden Road	EB	CFA2	418	61	417	62	-2	1	0%	1%
	WB		430	55	451	54	20	0	5%	-1%
A503 Delancey Street	WB	CFA2	414	49	432	47	18	-2	4%	-3%
A503 Pratt Street	WB	CFA2	347	55	367	54	19	-1	6%	-1%
A5200 York Way	NB	CFA2	417	74	519	78	102	4	25%	5%
	SB		147	16	169	20	22	5	15%	28%
Pratt Street	EB	CFA2	9	2	9	1	0	-1	-3%	-37%
	WB		33	6	33	6	0	0	0%	-1%
Abercon Place	EB	CFA3	248	20	250	20	3	0	1%	0%
	WB		298	14	337	14	39	-1	13%	-4%
Albert Terrace	NB	CFA3	412	41	423	41	11	0	3%	0%
	EB		102	16	107	16	5	0	5%	-3%

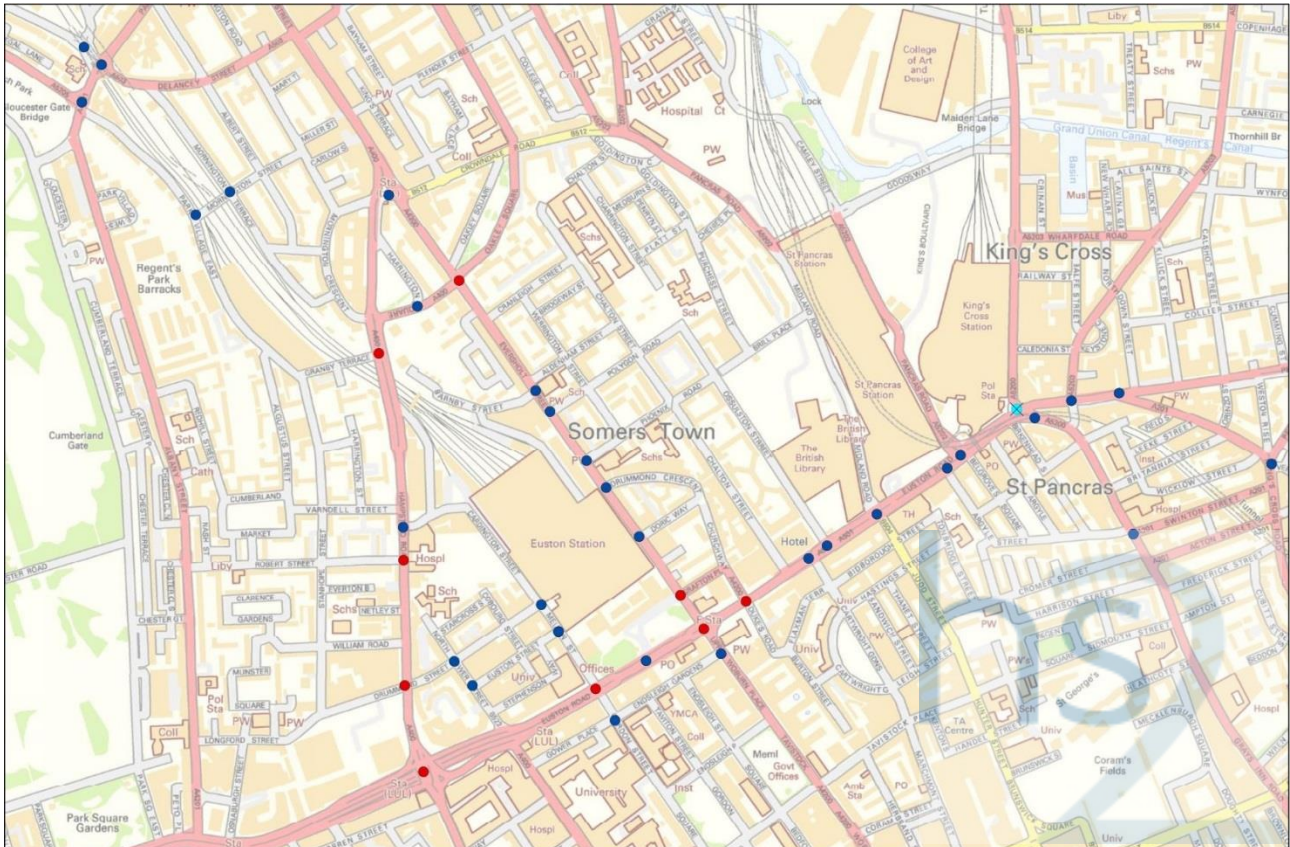
SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Location	Direction	CFA	2041 Baseline		2041 construction Scenario		With HS2 actual change from 2021 baseline		With HS2 % change from 2021 baseline	
			All veh incl. Buses	HGV	All veh incl. Buses	HGV	All veh	HGV	All veh	HGV
B413 Clifton Gdns/ Formosa Street/ Shirland Road/ Warwick Ave	WB		244	28	289	21	45	-7	18%	-23%
Elgin Avenue	EB	CFA4	286	22	279	22	-7	0	-2%	1%
	WB		301	23	344	23	43	0	14%	-1%
Sutherland Avenue	EB	CFA4	148	20	151	22	3	1	2%	6%
	WB		237	29	291	25	54	-4	23%	-15%

Junction performance - completed construction Stage A with 2026 HS2 Phase One operation

3.5.408 A series of junctions in the vicinity of Euston station and in the wider Euston area have been modelled to determine what impact, if any, the completion of construction Stage A and HS2 Phase One operations in 2026 will have. The location of the junctions that have been assessed can be seen on Figure 182.

Figure 182: Local junction assessment



3.5.409 The modelling results of a number of junctions in the direct vicinity of Euston station are presented in this section (those shown in red on Figure 182). These junctions include:

- Euston Circus (A501 Euston Road/A400 Tottenham Court Road/A400 Hampstead Road);
- A501 Euston Road/A400 Gower Street;
- A501 Euston Road/A400 Upper Woburn Place/Euston Square;
- A501 Euston Road/Churchway/Dukes Road;
- A4200 Eversholt Street/Grafton Place/Euston bus station;
- A4200 Eversholt Street/A400 Oakley Square/A400 Lidlington Place;
- A400 Hampstead Road/Drummond Street;
- A400 Hampstead Road/Granby Terrace/Harrington Square;

- A400 Hampstead Road/Robert Street/Cobourg Street;
- A501 Euston Road/Euston bus station; and
- A4200 Eversholt Street/northern bus station.

3.5.410 A summary of the other junctions that have been assessed is also provided. This considers both HS2 Phase One operation in 2026 following completion of construction Stage A and for HS2 Phase Two operation in 2041 for the completed high speed station.

Euston Circus

3.5.411 Euston Circus is the common name for the junction of A501 Euston Road with A400 Hampstead Road and A400 Tottenham Court Road. This junction will experience increased traffic flows as a result of the revised scheme. These traffic flow increases are largely associated with taxi movements to and from the new taxi facility on Cobourg Street which has its entry and exit on A400 Hampstead Road. The modelling accounts for the changes to the junction associated with the West End Project (i.e. two-way flows for buses and cyclists on A400 Tottenham Court Road).

3.5.412 Table 238 presents the results of the modelling undertaken for Euston Circus. The modelling has been undertaken using TRANSYT and the results are presented in terms of the degree of saturation (DoS) and mean maximum queue (MMQ), which is measured in PCU. The junction has been modelled at a cycle time of 96 seconds.

3.5.413 The results show Euston Circus is forecast to operate over capacity on the A400 Hampstead Road and A501 Euston Road approaches during the Stage A, 2026 HS2 Phase One scenario during the AM peak hour. However, during the 2026 future baseline scenario, these approaches are also forecast to operate over capacity and, as such, mitigation measures should be considered at this junction irrespective of the revised scheme.

3.5.414 During the PM peak hour, three approaches to the junction are forecast to operate approaching capacity (over 90%) in the Stage A, 2026 HS2 Phase One scenario. However, two of these approaches are forecast to be approaching capacity in the future baseline scenario with all three showing an improvement when compared with the future baseline scenario.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

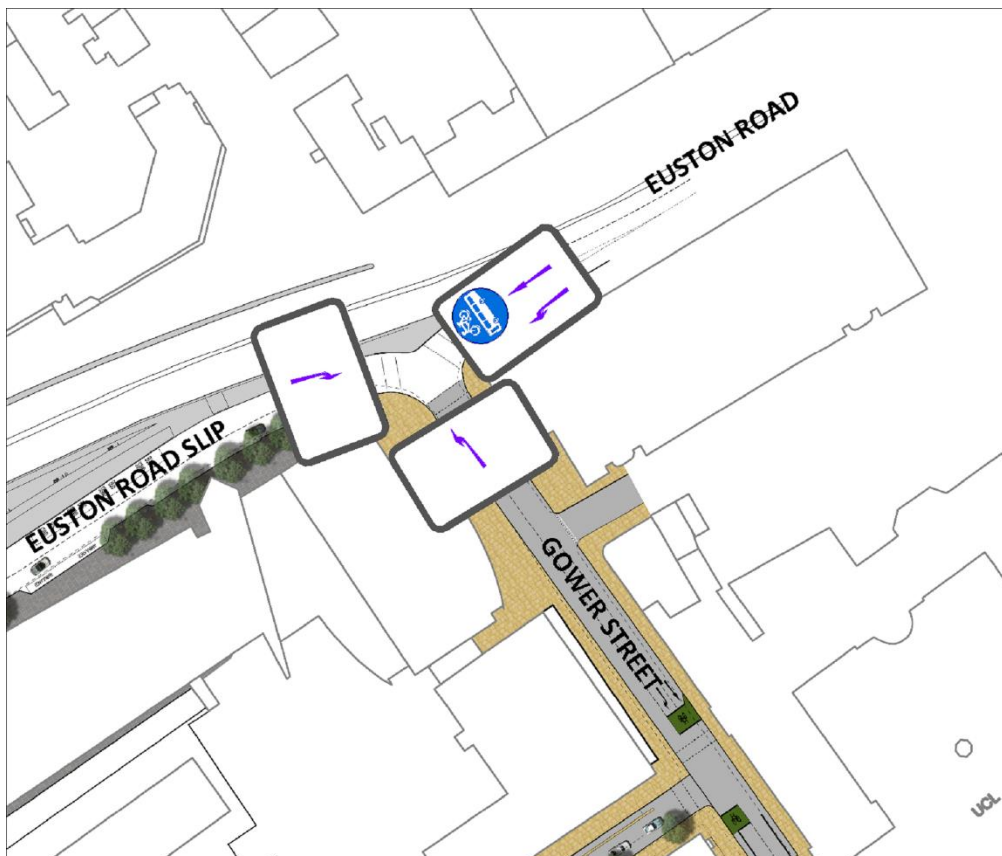
Table 238: Euston Circus modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2026 baseline			2026 'with HS2'			2026 baseline			2026 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north	Right	451	48%	4	182	73%	6	280	81%	7	389	56%	4
	Left, ahead	430	108%	36	392	128%	52	368	106%	19	392	103%	17
A501 Euston Road east	Left, ahead	226	107%	18	248	95%	11	228	118%	27	219	99%	14
A400 Tottenham Court Road	Left, ahead, right	917	53%	6	1,098	82%	16	1,160	101%	40	851	92%	21
A501 Euston Road west	Left	350	20%	2	481	38%	4	468	55%	7	334	68%	10
	Ahead	155	22%	3	530	26%	4	591	86%	17	192	71%	13
	Right	111	52%	8	394	48%	7	293	72%	12	215	68%	12

A501 Euston Road/A400 Gower Street

- 3.5.415 Table 239 presents the results of the modelling undertaken for the junction of A501 Euston Road with A400 Gower Street. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 88 seconds. The modelling accounts for the changes to the junction associated with the West End Project (i.e. two-way flows on the A400 Gower Street).
- 3.5.416 The modelling assumed the new scheme design which is currently under construction. The junction layout is shown in Figure 183.

Figure 183: Modelled A501 Euston Road / A400 Gower Street junction layout



- 3.5.417 The results show that the junction of A501 Euston Road with A400 Gower Street is forecast to be approaching capacity during the AM peak hour for future baseline and over-capacity for the with Stage A, HS2 Phase One scenario. As the junction is also forecast to be approaching capacity during the future baseline scenario, mitigation should be considered regardless of the revised scheme.
- 3.5.418 During the PM peak hour, the junction operates within model theoretical capacity on all approaches during the future baseline and Stage A, HS2 Phase One scenario. While the A501 Euston Road east left turn, A501 Euston Road west right turn and A400 Gower Street approaches both have DoS values of over 90% during the Stage A, HS2 Phase One scenario, the level of queueing predicted can be accommodated with the available link length

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 239: A501 Euston Road/A400 Gower Street modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2026 baseline			2026 'with HS2'			2026 baseline			2026 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A501 Euston Road east	Ahead	210	51%	5	210	51%	5	203	55%	5	207	67%	6
	Left	454	111%	40	451	110%	38	303	82%	10	287	92%	12
A400 Gower Street	Left	41	29%	1	73	51%	2	36	25%	1	139	97%	9
A501 Euston Road west	Right	644	93%	21	738	102%	38	649	89%	21	781	98%	30

A501 Euston Road/bus station entrance

- 3.5.419 Table 240 presents the results of the modelling undertaken for the reconfigured junction of A501 Euston Road with Melton Street. Melton Street will only be used by construction traffic during construction Stage B1.
- 3.5.420 The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). As the layout of the junction changes as part of Stage A of the revised scheme, no future baseline results are presented. The junction has been modelled at a cycle time of 96 seconds.

Table 240: A501 Euston Road/bus station modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2026 'with HS2'			2026 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ
Melton Street	Left, right	20	7%	0	20	13%	1
A501 Euston Road east	Ahead	1,726	65%	23	1,079	41%	3
	Ahead	512	31%	1	562	35%	2
A501 Euston Road west	Left, ahead	1,910	68%	23	1,450	51%	13
	Ahead	389	22%	3	502	28%	4

- 3.5.421 The results show that the junction of A501 Euston Road with the bus station is forecast to operate within the model theoretical capacity on all approaches during the AM and PM peak hours for the Stage A, HS2 Phase One scenario. The largest predicted DoS of 68% is predicted on the A501 Euston Road west approach to the junction during the AM peak hour with a queue of 23 PCU. The queue can be accommodated within the available link length. The queues predicted on the A501 Euston Road west approach to the junction can also be accommodated within the available link length.

A501 Euston Road/A4200 Upper Woburn Place/Euston Square

- 3.5.422 Table 241 presents the results of the modelling undertaken for the junction of A501 Euston Road with A4200 Upper Woburn Place and Euston Square for the Stage A, HS2 Phase One scenario. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.
- 3.5.423 The results show that the junction of A501 Euston Road with the A4200 Upper Woburn Place and Euston Square is forecast to operate within or at theoretical capacity on all approaches during the AM and PM peak hours for the Stage A, HS2 Phase One scenario. The largest predicted DoS of 100% is predicted on the A501 Euston Road west approach to the junction during the AM peak hour with a queue of 19 PCU. However, the DoS on this approach is 94% for the 2026 future baseline for the AM peak hour and as such, mitigation should be considered regardless of the revised scheme.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 241: A501 Euston Road/A4200 Upper Woburn Place/Euston Square modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2026 baseline			2026 'with HS2'			2026 baseline			2026 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
Euston Square	Ahead	476	87%	7	453	77%	8	245	45%	3	269	43%	3
A501 Euston Road east	Ahead	1,389	86%	33	1,458	96%	45	733	45%	12	886	60%	14
	Left, ahead	703	90%	19	626	87%	15	559	71%	10	639	90%	14
Upper Woburn Place	Ahead	435	81%	13	542	89%	17	440	82%	13	558	83%	17
	Left, ahead	311	77%	9	430	93%	16	234	58%	6	260	54%	6
A501 Euston Road west	Right	366	94%	14	383	100%	19	316	86%	11	316	86%	11
	Ahead	1,810	72%	10	1,939	80%	28	1,794	72%	34	1,852	80%	38

A501 Euston Road/Churchway/Dukes Road

- 3.5.424 Table 242 presents the results of the modelling undertaken for the junction of A501 Euston Road with Churchway and Dukes Road. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.
- 3.5.425 The results show that during the AM peak hour, the junction of A501 Euston Road with the Churchway and Dukes Road is forecast to operate with approaches at or approaching capacity for the Stage A, HS2 Phase One scenario. However, many approaches to the junction are also approaching capacity during the future baseline scenario. However, the queues can be accommodated within the available link length. Similarly for the PM peak hour, some approaches to the junction are approaching capacity but the queues can be accommodated within the available link length.

A4200 Eversholt Street/Grafton Place/Euston bus station

- 3.5.426 Table 243 presents the results of the modelling undertaken for the junction of A4200 Eversholt Street with Grafton Place and Euston bus station. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.
- 3.5.427 The results show that the junction of A4200 Eversholt Street with Grafton Place and Euston bus station is forecast to operate within modelled theoretical capacity on all approaches, during the AM and PM peak hours for the Stage A, HS2 Phase One scenario. The queues predicted at the junction can also be accommodated within the available link length.

A4200 Eversholt Street/A400 Oakley Square/Lidlington Place

- 3.5.428 Table 244 results shows that during the AM and PM peak hours, the junction of A4200 Eversholt Street with A400 Oakley Square and Lidlington place is forecast to operate within theoretical capacity on all approaches to the junction for the Stage A, HS2 Phase One scenario. The analysis assumes that the junction would operate at a 96 second cycle time (as opposed to 72 seconds which it currently runs at) to ensure the junction operates most efficiently.

A400 Hampstead Road/Drummond Street

- 3.5.429 Table 245 presents the results of the modelling undertaken for the junction of A400 Hampstead Road with Drummond Street. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.
- 3.5.430 The results show that the junction of A400 Hampstead Road with Drummond Street is forecast to operate with sufficient spare capacity on all approaches to the junction, during the AM and PM peak hour, for the Stage A, HS2 Phase One scenario. The queues predicted at the junction can also be accommodated within the available link length.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 242: A501 Euston Road/Churchway/Dukes Road modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2026 baseline			2026 'with HS2'			2026 baseline			2026 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
Churchway	Left, ahead, right	137	92%	10	237	85%	9	263	94%	11	260	92%	11
A501 Euston Road east	Ahead, right	174	79%	6	244	86%	7	256	92%	11	306	96%	11
	Ahead	1,278	96%	27	1,163	89%	17	549	43%	8	630	48%	1
	Left, ahead	796	59%	10	910	70%	10	628	49%	9	767	59%	5
Dukes Road	Left, ahead, right	30	4%	0	20	7%	0	20	7%	0	25	9%	1
A501 Euston Road west	Left, ahead	1,966	85%	17	1,877	82%	24	1,927	90%	43	1,846	86%	36

Table 243: A4200 Eversholt Street/Grafton Place/Euston bus station modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM Peak (08:00 to 09:00)						PM Peak (17:00 to 18:00)					
		2026 baseline			2026 'with HS2'			2026 baseline			2026 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A4200 Eversholt Street north	Left, ahead	460	94%	17	453	95%	15	293	72%	9	343	77%	11
Grafton Place	Left, right	259	96%	13	217	93%	10	248	82%	9	266	95%	12
Euston Square	Ahead, right	507	74%	11	553	80%	9	506	83%	7	609	94%	12
Euston bus station	Left, ahead, right	223	108%	19	223	93%	10	208	86%	8	208	93%	10

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 244: A4200 Eversholt Street/A400 Oakley Square/Lidlington Place modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2026 baseline			2026 with HS2			2026 baseline			2026 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A4200 Eversholt Street north	Ahead, right	412	79%	12	390	75%	10	268	39%	5	263	42%	5
A400 Oakley Square	Right	469	76%	13	444	83%	13	331	85%	11	325	87%	11
	Ahead	556	77%	15	529	83%	15	422	86%	14	410	88%	14
	Left, ahead	10	2%	0	10	2%	0	11	3%	0	11	3%	0
A4200 Eversholt Street south	Left, ahead	469	76%	13	444	83%	13	331	85%	11	325	87%	11

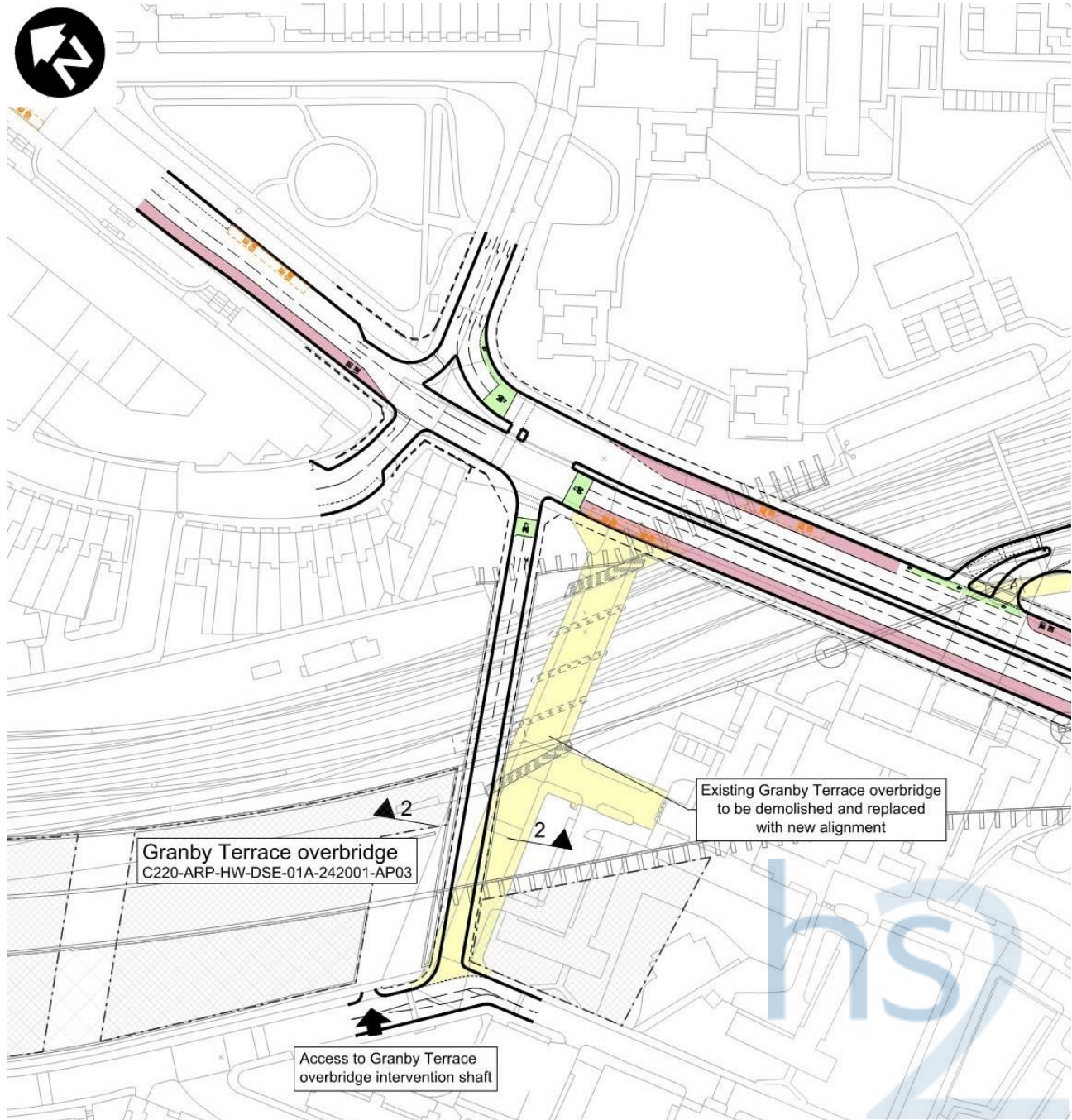
Table 245: A400 Hampstead Road/Drummond Street modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2026 baseline			2026 with HS2			2026 baseline			2026 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north	Left, ahead	684	61%	12	827	89%	23	340	34%	6	614	54%	10
	Ahead	180	22%	3	173	26%	3	132	20%	2	123	10%	2
Drummond Street east	Left, ahead, right	305	51%	4	170	33%	4	194	34%	4	151	49%	4
A400 Hampstead Road south	Left, ahead	494	22%	2	573	35%	8	601	37%	6	691	32%	8
Drummond Street west	Left, ahead	88	28%	2	160	32%	4	157	35%	4	157	53%	4

A400 Hampstead Road/Granby Terrace/Harrington Square

3.5.431 The Granby Terrace approach to the junction with the A400 Hampstead Road will be realigned, as part of the revised scheme, and form a new junction with A400 Hampstead Road and Harrington Square. The approach currently comprises two lanes, one for left turning vehicles only and one for right turning vehicles only onto A400 Hampstead Road. As part of the revised scheme, the Granby Terrace approach will comprise one lane for left turning vehicles only, and one for left and right turning vehicles combined. The junction layout can be seen in Figure 184.

Figure 184: A400 Hampstead Road/Granby Terrace/Harrington Square proposed layout



3.5.432 Table 246 presents the results of the modelling undertaken for the junction of A400 Hampstead Road with Granby Terrace and Harrington Square. The modelling has been undertaken using LINSIG and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds. As this new junction layout forms part of the revised scheme, no future baseline results are presented.

Table 246: A400 Hampstead Road/Granby Terrace/Harrington Square modelling results - completed construction Stage A with 2026 HS2 Phase One operation

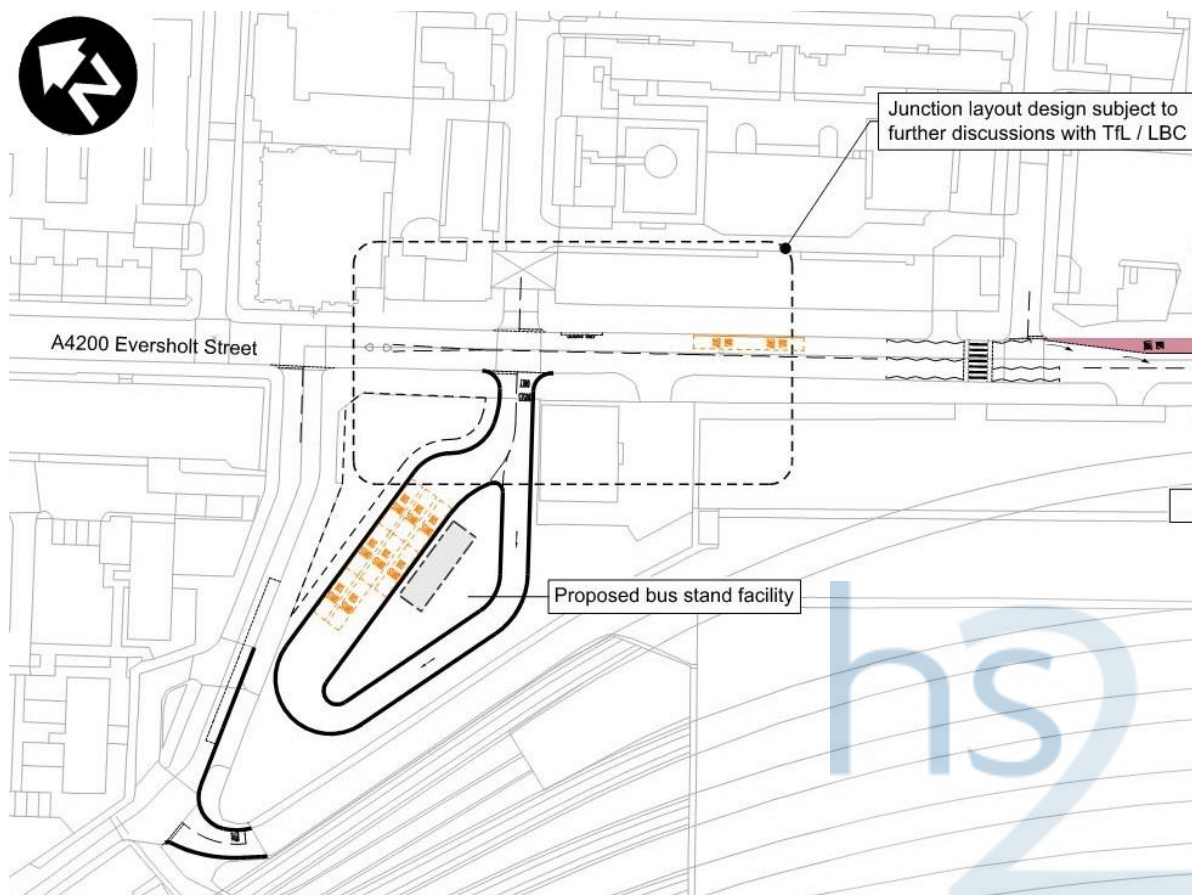
Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2026 with HS2			2026 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north	Ahead	99	44%	3	176	61%	5
	Ahead	769	80%	19	522	63%	12
A400 Hampstead Road south	Ahead	707	79%	18	475	61%	11
	Ahead	84	9%	1	114	15%	2
	Ahead	293	32%	5	511	64%	12
Granby Terrace	Left, right	260	30%	5	464	62%	11
	Left	138	74%	5	145	60%	4
Mornington Crescent	Left	42	6%	0	47	7%	0
Harrington Square	Right	99	44%	3	176	61%	5

3.5.433 The results show that the junction of A400 Hampstead Road with Granby Terrace and Harrington Square is forecast to operate with sufficient spare capacity on all approaches to the junction, during the AM and PM peak hours, for the Stage A, HS2 Phase One scenario. The queues predicted at the junction can also be accommodated within the available link length.

A4200 Eversholt Street/northern bus standing area

3.5.434 The new junction of A4200 Eversholt Street with the new northern bus standing area has been modelled to determine the impact of the junction on the local highway network. The junction layout can be seen in Figure 185.

Figure 185: A4200 Eversholt Street/northern bus standing area layout



3.5.435 Table 247 presents the results of the modelling undertaken for the junction of A4200 Eversholt Street with the northern bus standing area. Polygon Road has also been included in the model, given its proximity to the northern bus standing area. While this is a give-way junction, the modelling has been undertaken using TRANSYT (as part of the wider A501 Euston Road model) and the results are presented in terms of the DoS and MMQ (in PCU). As this new junction forms part of the revised scheme, no future baseline results are presented.

Table 247: A4200 Eversholt Street/northern bus standing area/Polygon Road modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2026 with HS2			2026 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A4200 Eversholt Street north	Left, ahead, right	700	39%	0	382	21%	0
Polygon Road	Left, ahead, right	143	37%	0	35	7%	0
A4200 Eversholt Street south	Left, ahead, right	706	72%	9	640	61%	6
Northern Bus Standing Area	Left, ahead, right	38	8%	0	38	7%	0

- 3.5.436 The results show that the junction of A4200 Eversholt Street with the northern bus standing area and Polygon Road is forecast to operate with sufficient spare capacity on all approaches to the junction, during the AM and PM peak hour, for the Stage A, Hs2 Phase One scenario. A small amount of queueing has been predicted on the A4200 Eversholt Street arm but this is associated with the zebra crossing that is provided on A4200 Eversholt Street rather than as a result of the junction.

A400 Hampstead Road/Robert Street/Cobourg Street

- 3.5.437 The existing priority junction of Robert Street with A400 Hampstead Road is to be altered as part of the revised scheme. The Robert Street approach to the junction currently comprises one lane which is one way for left turning vehicles. The A400 Hampstead Road approach to the junction comprises one lane in each direction. Under the revised scheme the junction will become signalised. It is proposed that the layout approach on Robert Street will remain the same. The junction layout can be seen in Figure 186.
- 3.5.438 The A400 Hampstead Road approaches will comprise two lanes in each direction and there will be a new link introduced into the junction named Cobourg Street that will be an exit only link from the taxi pick-up/drop-off area. Cobourg Street will comprise two lanes, a near side left-turn only lane and an offside lane for all (left, ahead and right) movements. The new junction design will accommodate the traffic flow associated with the new taxi facility on Cobourg Street.
- 3.5.439 Table 248 presents the results of the modelling undertaken for A400 Hampstead Road with Robert Street and Cobourg Street. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds. As this new junction forms part of the revised scheme, no future baseline results are presented. A priority junction located some 50m to the north of the junction of A400 Hampstead Road with Robert Street and Cobourg Street, which will provide access to the Euston station Phase One servicing area, has also been included in the model. This includes the toucan crossing on A400 Hampstead Road to the north of the servicing access road.

Figure 186: A400 Hampstead Road/Robert Street/Cobourg Street layout

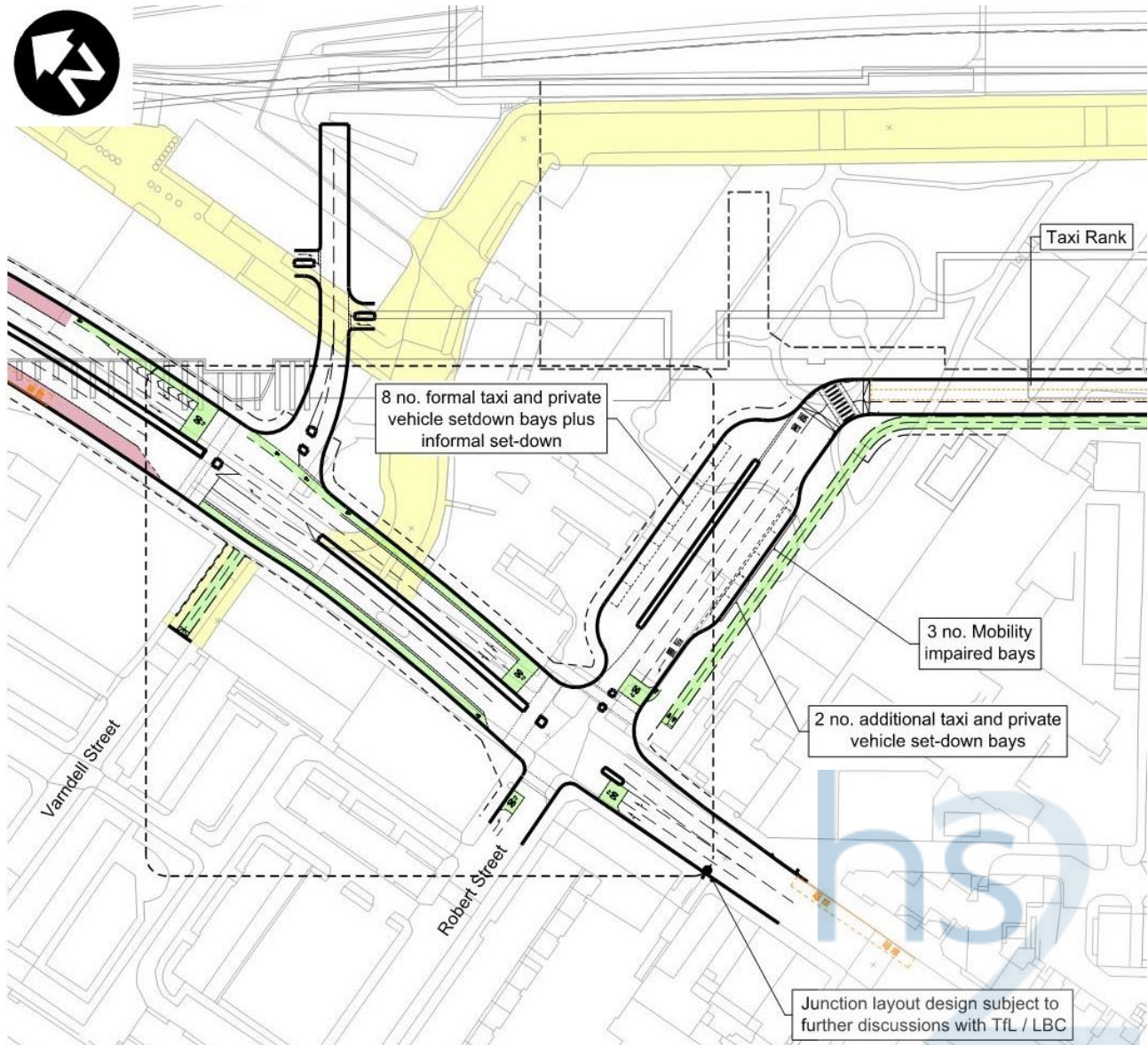


Table 24.8: A400 Hampstead Road/Robert Street/Cobourg Street modelling results - completed construction Stage A with 2026 HS2 Phase One operation

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2026 with HS2			2026 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north (at toucan crossing)	Ahead	622	49%	9	539	27%	4
	Ahead	622	52%	10	339	45%	8
Servicing access	Left, ahead, right	127	32%	1	101	26%	1
A400 Hampstead Road north (at Cobourg Street)	Ahead, right	537	76%	17	408	56%	9
	Left, ahead	727	86%	16	391	86%	13

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2026 with HS2			2026 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
Cobourg Street	Left	266	75%	8	196	69%	6
	Left, ahead, right	153	84%	6	214	84%	8
A400 Hampstead Road south (at Varndell Street)	Ahead, right	181	74%	6	409	82%	11
	Left, ahead	346	73%	10	360	58%	8
Robert Street	Left	10	3%	0	35	6%	1

3.5.440 The results show that the junction of A400 Hampstead Road with Robert Street and Cobourg Street is forecast to operate below theoretical capacity on all approaches to the junction, during the AM and PM peak hours, for the Stage A, HS2 Phase One scenario. While some approaches to the junction are approaching capacity, the predicted level of queueing can be accommodated within the available link length.

Junction performance - completed high speed station with 2041 HS2 Phase Two operation

3.5.441 As for 2026, the junctions within close proximity to Euston station, as well as any new junction that form part of the revised scheme have been modelled. A summary of a number of other junctions assessed is also been provided. The assessment is based upon the completed high speed station following completion of construction Stage A and construction Stage B1 with HS2 Phase Two operation. This scenario is referred to below as 2041 HS2 Phase Two.

Euston Circus

3.5.442 Table 260 presents the results of the modelling undertaken for Euston Circus. The modelling has been undertaken using TRANSYT and the results are presented in terms of the degree of saturation (DoS) and mean maximum queue (MMQ), which is measured in PCU. The junction has been modelled at a cycle time of 88 seconds.

3.5.443 The results show Euston Circus is forecast to be approaching capacity on the A400 Hampstead Road, A400 Tottenham Court Road and A501 Euston Road east approaches during the 2041 HS2 Phase Two scenario during the AM peak hour. However, during the 2041 future baseline scenario, these approaches are forecast to operate over capacity and, as such, mitigation measures should be considered at this junction irrespective of the revised scheme.

3.5.444 During the PM peak hour, two approaches to the junction are forecast to operate approaching capacity (over 90%) in the 2041 HS2 Phase Two scenario.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 249: Euston Circus modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2041 baseline			2041 'with HS2'			2041 baseline			2041 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north	Right	528	63%	5	339	51%	4	262	77%	6	263	83%	7
	Left, ahead	461	133%	66	558	107%	26	289	98%	13	359	90%	9
A501 Euston Road east	Left, ahead	311	108%	24	227	98%	13	216	94%	10	236	94%	11
A400 Tottenham Court Road	Left, ahead, right	908	97%	20	859	97%	22	1,052	90%	20	922	94%	24
A501 Euston Road west	Left	366	19%	2	347	38%	4	459	50%	6	549	78%	12
	Ahead	133	17%	2	192	26%	4	561	77%	15	528	70%	13
	Right	113	49%	8	214	50%	7	281	66%	11	545	77%	14

A501 Euston Road/A400 Gower Street

- 3.5.445 Table 250 presents the results of the modelling undertaken for the junction of A501 Euston Road with A400 Gower Street. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 88 seconds. The modelling accounts for the changes to the junction associated with the West End Project (i.e. two-way flows on the A400 Gower Street). The junction layout is shown in Figure 183.
- 3.5.446 The results show that the junction of A501 Euston Road with A400 Gower Street is forecast to be over capacity during the AM peak hour for future baseline and HS2 Phase Two scenario. As the junction is also forecast to be over capacity during the future baseline scenario, mitigation should be considered regardless of the revised scheme.
- 3.5.447 During the PM peak hour, the junction operates within theoretical capacity for the future and HS2 Phase Two scenario. The level of queueing predicted can be accommodated with the available link length.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 250: A501 Euston Road/A400 Gower Street modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2041 baseline			2041 'with HS2'			2041 baseline			2041 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A501 Euston Road east	Ahead	224	41%	5	218	59%	6	202	55%	5	210	60%	6
	Left	436	80%	13	438	109%	49	303	82%	10	290	83%	10
A400 Gower Street	Left	89	55%	3	89	62%	3	10	7%	0	136	85%	6
A501 Euston Road west	Right	659	123%	78	810	106%	50	667	88%	19	665	91%	21

A501 Euston Road/bus station entrance

3.5.448 Table 251 presents the results of the modelling undertaken for the reconfigured junction of A501 Euston Road with Melton Street. This becomes a bus station access with completion of construction Stage B1 in 2033.

3.5.449 The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). As the layout of the junction changes as part of Phase Two of the revised scheme, as shown on Figure 187, no future baseline results are presented. The junction has been modelled at a cycle time of 96 seconds.

Figure 187: A501 Euston Road/bus station construction Stage B1

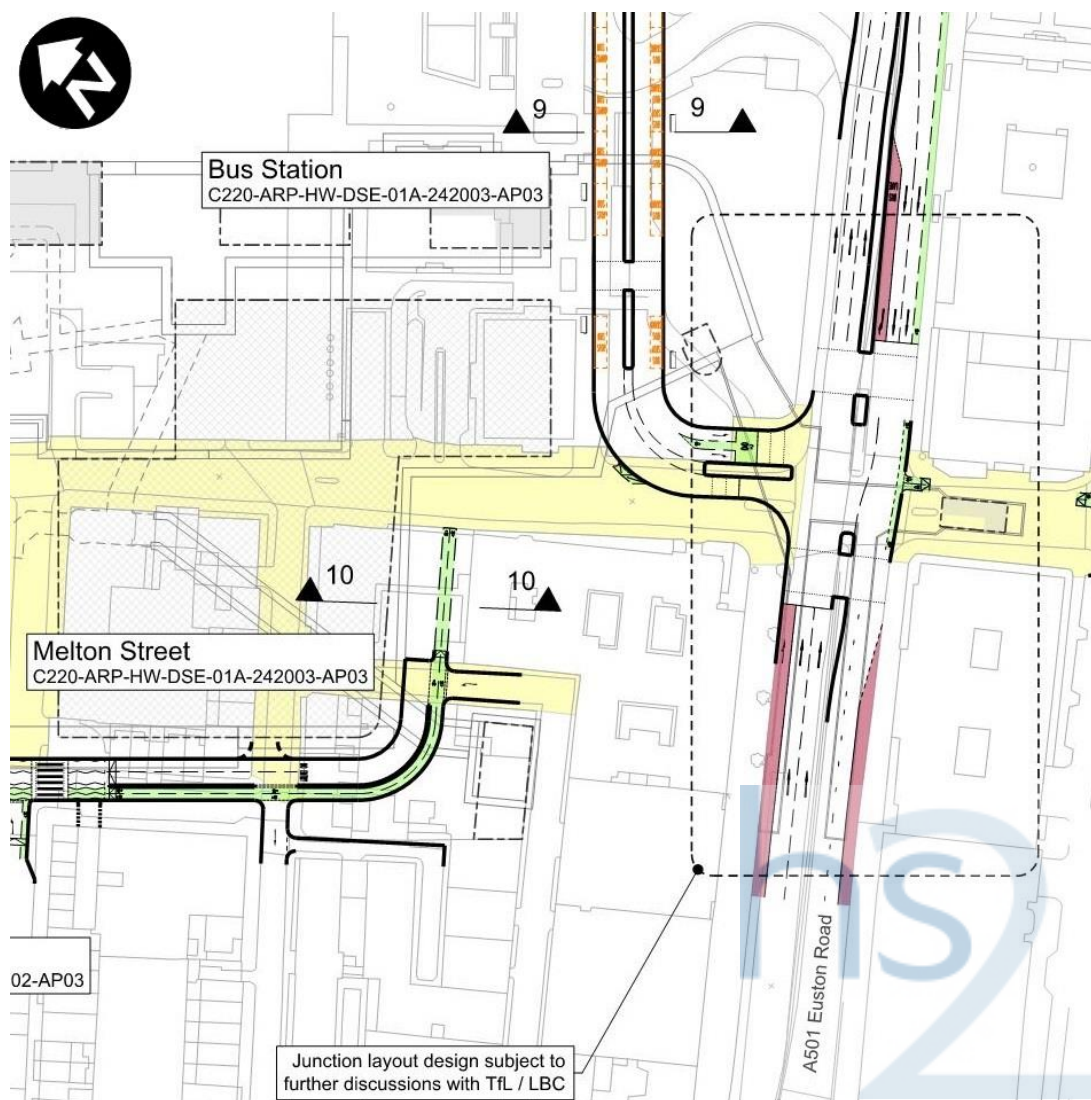


Table 251: A501 Euston Road/bus station modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2041 'with HS2'			2041 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ
Bus station	Right	40	42%	1	40	42%	1
	Left	60	35%	2	60	35%	2

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2041 'with HS2'			2041 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A501 Euston Road east	Right	72	30%	2	72	18%	0
	Ahead	2,294	85%	43	1,472	66%	25
A501 Euston Road west	Ahead	1,972	71%	36	1,435	53%	22
	Left, ahead	541	47%	8	579	52%	10

3.5.450 The results show that the junction of A501 Euston Road with the bus station is forecast to operate within the model theoretical capacity on all approaches during the AM and PM peak hours for the HS2 Phase Two scenario. The largest predicted DoS of 90% is predicted on the A501 Euston Road approach to the junction during the AM peak hour with a queue of 51 PCU. The queue can be accommodated within the available link length. The queues predicted on the A501 Euston Road west approach to the junction can also be accommodated within the available link length.

3.5.451 While not directly comparable due to the changes to the junction, the DoS on A501 Euston Road east approach was 97% for the 2041 future baseline with a queue of 37 PCU. In general, during the AM peak hour, the overall junction performance is improved when compared with the 2041 future baseline.

A501 Euston Road/A4200 Upper Woburn Place/Euston Square

3.5.452 Table 252 presents the results of the modelling undertaken for the junction of A501 Euston Road with A4200 Upper Woburn Place and Euston Square for the HS2 Phase One scenario. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.

3.5.453 The results show that the junction of A501 Euston Road with the A4200 Upper Woburn Place and Euston Square is forecast to be approaching modelled theoretical capacity during the AM peak hour for the HS2 Phase Two scenario. The largest predicted DoS of 102% is predicted on the A501 Euston Road west approach to the junction during the AM peak hour with a queue of 22 PCU. This is directly related to the increase in north to south movements due to the closure of Gordon Street. However, as the junction is predicted to be approaching capacity in the 2041 future baseline scenarios, mitigation is recommended regardless of the revised scheme. The junction will operate with spare capacity on all approaches during the PM peak hour in the 2041 HS2 Phase Two scenario.

3.5.454 The queues predicted on the A501 Euston Road east and west approaches to the junction can also be accommodated within the available link length.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 252: A501 Euston Road/A4200 Upper Woburn Place/Euston Square modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2041 baseline			2041 'with HS2'			2041 baseline			2041 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
Euston Square	Ahead	527	88%	7	551	81%	7	308	50%	4	334	54%	4
A501 Euston Road east	Ahead	1,476	94%	40	1,441	93%	40	823	55%	12	936	64%	17
	Left, ahead	625	83%	14	668	90%	20	573	79%	10	616	87%	14
Upper Woburn Place	Ahead	491	81%	14	534	88%	17	456	75%	12	447	74%	12
	Left, ahead	312	68%	9	399	87%	13	365	79%	11	324	70	9
A501 Euston Road west	Right	366	94%	14	392	102%	22	323	86%	11	318	87%	11
	Ahead	1,871	78%	26	2,035	89%	31	1,805	75%	32	1,828	89%	34

A501 Euston Road/Churchway/Dukes Road

- 3.5.455 Table 253 presents the results of the modelling undertaken for the junction of A501 Euston Road with Churchway and Dukes Road. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.
- 3.5.456 The results show that for the HS2 Phase Two scenario during the AM peak hour, the approach to the junction along A501 Euston Road west would operate with a DoS of 93%. This would be an improvement from 105% in the 2041 future baseline scenarios. In general, the capacity at the junction has been improved for the AM peak hour and this has been achieved through balancing the traffic flows. However, many approaches to the junction are also approaching capacity during the future baseline scenario. However, the queues can be accommodated within the available link length.
- 3.5.457 For the PM peak hour, the approaches to the junction along Churchway and A501 Euston Road west have a DoS of 93% and 90% respectively. These results represent slight increase when compared with the 2041 future baseline scenarios but the junction would still operate with some spare capacity and the queue could be accommodated within the available link length.

A4200 Eversholt Street/Grafton Place/Euston bus station

- 3.5.458 Table 254 presents the results of the modelling undertaken for the junction of A4200 Eversholt Street with Grafton Place and Euston bus station. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.
- 3.5.459 The results show that during the AM peak hour, the junction of A4200 Eversholt Street with Grafton Place and Euston bus station is forecast to operate with the approach to the junction along Grafton Place and A4200 Eversholt Street north over capacity. However, the results show that the junction would operate over capacity during the 2041 future baseline scenario also suggesting that mitigation may be required regardless of the revised scheme.
- 3.5.460 The results of the PM peak modelling also show that the junction would operate over capacity during the 2041 future baseline and 2041 HS2 Phase Two scenarios.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 253: A501 Euston Road/Churchway/Dukes Road modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2041 baseline			2041 'with HS2'			2041 baseline			2041 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
Churchway	Left, ahead, right	236	94%	10	236	89%	9	239	91%	10	261	93%	11
A501 Euston Road east	Ahead, right	389	95%	15	122	63%	4	238	88%	6	184	84%	5
	Ahead	1,186	83%	16	1,227	89%	20	649	50%	10	722	56%	7
	Left, ahead	778	54%	9	875	75%	12	635	49%	9	770	60%	8
Dukes Road	Left, ahead, right	20	9%	1	20	8%	0	20	8%	0	20	7%	0
A501 Euston Road west	Left, ahead	1,973	105%	109	2,132	93%	36	2,004	86%	45	2,030	90%	42

Table 254: A4200 Eversholt Street/Grafton Place/Euston bus station modelling results - 2041 HS2 Phase Two

Approach	Movement	AM Peak (08:00 to 09:00)						PM Peak (17:00 to 18:00)					
		2041 baseline			2041 'with HS2'			2041 baseline			2041 'with HS2'		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A4200 Eversholt Street north	Left, ahead	501	96%	21	527	101%	27	354	73%	10	397	82%	9
Grafton Place	Left, right	285	110%	24	238	109%	21	256	95%	12	264	113%	26
Euston Square	Ahead, right	556	76%	13	618	85%	15	707	103%	32	630	92%	11
Euston bus station	Left, ahead, right	222	117%	26	174	78%	6	207	100%	13	174	72%	6

A4200 Eversholt Street/A400 Oakley Square/Lidlington Place

- 3.5.461 Table 254 presents the results of the modelling undertaken for the junction of A4200 Eversholt Street with A400 Oakley Square and Lidlington Place. The modelling has been undertaken using LinSig and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds. This has been increased from the existing cycle time of 72 seconds to ensure that the junction operates as efficiently as possible in both the 2041 future baseline and 2041 HS2 Phase Two scenarios.
- 3.5.462 Table 255 results shows that during the AM and PM peak hours, the junction of A4200 Eversholt Street with A400 Oakley Square and Lidlington Place is forecast to operate with some spare capacity on all approaches to the junction. During the AM peak hour for the 2041 HS2 Phase Two scenario, the highest DoS is 93% on the A4200 Eversholt Street and A400 Oakley Square (ahead only lane) approaches, increasing from 87% and 86% respectively from the 2041 future baseline scenario. The predicted level of queueing can be accommodated within the available link lengths.
- 3.5.463 During the PM peak hour for the 2041 HS2 Phase Two scenario, the highest DoS is 95% on the A400 Oakley Square (ahead only lane) approaches, increasing from 90% from the 2041 future baseline scenario. The predicted level of queueing can be accommodated within the available link length. The approaches along A400 Oakley Square (right turn) and A4200 Eversholt Street south also have a DoS of 94% for the 2041 HS2 Phase Two scenario with the DoS on both approaches increasing from 89% in the 2041 future baseline scenarios. The queues predicted on these approaches can also be accommodated within the available link length.

A400 Hampstead Road/Drummond Street

- 3.5.464 Table 256 presents the results of the modelling undertaken for the junction of A400 Hampstead Road with Drummond Street. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds.
- 3.5.465 The results show that the junction of A400 Hampstead Road with Drummond Street is forecast to operate with spare capacity on all approaches to the junction, during the AM and PM peak hour, for the HS2 Phase Two scenario. The highest predicted DoS is 86% on the A400 Hampstead Road north approach during the AM peak hour. This can be attributed to the increase in taxi movements from the HS2 Phase Two operation taxi facility that will be accessible from A400 Hampstead Road. The queues predicted at the junction can be accommodated within the available link length.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 255: A4200 Eversholt Street/A400 Oakley Square/Lidlington Place modelling results -2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2041 baseline			2041 with HS2			2041 baseline			2041 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A4200 Eversholt Street north	Ahead, right	487	87%	15	458	93%	16	283	45%	6	308	47%	6
A400 Oakley Square	Right	491	85%	15	494	92%	18	348	89%	13	356	94%	15
	Ahead	584	86%	17	593	93%	20	441	90%	15	445	95%	18
	Left, ahead	10	2%	0	10	2%	0	11	3%	0	11	3%	0
A4200 Eversholt Street south	Left, ahead	491	85%	15	494	92%	18	348	89%	13	356	94%	15

Table 256: A400 Hampstead Road/Drummond Street modelling results -2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)						PM peak (17:00 to 18:00)					
		2041 baseline			2041 with HS2			2041 baseline			2041 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north	Left, ahead	817	63%	13	1,039	86%	25	344	38%	6	482	44%	8
	Ahead	122	14%	1	154	17%	2	114	19%	2	92	12%	2
Drummond Street east	Left, ahead, right	330	64%	5	165	66%	5	212	28%	3	160	44%	4
A400 Hampstead Road south	Left, ahead	473	18%	2	602	26%	5	574	35%	6	749	41%	10
Drummond Street west	Left, ahead	90	37%	2	152	63%	5	154	30%	3	169	48%	4

A400 Hampstead Road/Granby Terrace/Harrington Square

- 3.5.466 The Granby Terrace approach to the junction with the A400 Hampstead Road will be realigned, as part of the revised scheme, and form a new junction with A400 Hampstead Road and Harrington Square. The approach currently comprises two lanes, one for left turning vehicles only and one for right turning vehicles only onto Hampstead Road. As part of the revised scheme, the Granby Terrace approach will comprise one lane for left turning vehicles only, and one for left and right turning vehicles combined. The junction layout can be seen in Figure 184.
- 3.5.467 Table 257 presents the results of the modelling undertaken for the junction of A400 Hampstead Road with Granby Terrace and Harrington Square. The modelling has been undertaken using LINSIG and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds. As this new junction layout forms part of the revised scheme, no future baseline results are presented.

Table 257: A400 Hampstead Road/Granby Terrace/Harrington Square modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2041 with HS2			2041 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north	Ahead	857	85%	23	519	68%	13
	Ahead	791	84%	21	474	66%	12
A400 Hampstead Road south	Ahead	91	10%	1	116	16%	2
	Ahead	334	34%	6	432	59%	10
	Ahead	298	33%	5	392	57%	9
Granby Terrace	Left, right	121	81%	5	134	65%	4
	Left	121	81%	5	135	66%	4
Mornington Crescent	Left	29	4%	0	37	5%	0
Harrington Square	Right	105	46%	3	255	65%	7

- 3.5.468 The results show that the junction of A400 Hampstead Road with Granby Terrace and Harrington Square is forecast to operate with spare capacity on all approaches to the junction, during the AM and PM peak hours, for the HS2 Phase Two scenario. The queues predicted at the junction can also be accommodated within the available link length.

A4200 Eversholt Street/northern bus standing area

- 3.5.469 The new junction of A4200 Eversholt Street with the new northern bus standing area has been modelled to determine the impact of the junction on the local highway network. The junction layout can be seen in Figure 185.

3.5.470 Table 258 presents the results of the modelling undertaken for the junction of A4200 Eversholt Street with the northern bus standing area. Polygon Road has also been included in the model, given its proximity to the northern bus standing area. While this is a give-way junction, the modelling has been undertaken using TRANSYT (as part of the wider A501 Euston Road model) and the results are presented in terms of the DoS and MMQ (in PCU). As this new junction forms part of the revised scheme, no future baseline results are presented.

Table 258: A4200 Eversholt Street/northern bus standing area/Polygon Road modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2041 with HS2			2041 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A4200 Eversholt Street north	Left, ahead, right	664	37%	0	474	26%	0
Polygon Road	Left, ahead, right	147	35%	0	27	6%	0
A4200 Eversholt Street south	Left, ahead, right	642	54%	4	785	70%	8
Northern Bus Standing Area	Left, ahead, right	38	7%	0	38	8%	0

3.5.471 The results show that the junction of A4200 Eversholt Street with the northern bus standing area and Polygon Road is forecast to operate with sufficient spare capacity on all approaches to the junction, during the AM and PM peak hour, for the HS2 Phase Two scenario. A small amount of queueing has been predicted on the A4200 Eversholt Street arm but this is associated with the zebra crossing that is provided on A4200 Eversholt Street rather than as a result of the junction.

A400 Hampstead Road/Robert Street/Cobourg Street and A400 Hampstead Road / taxi facility

3.5.472 A400 Hampstead Road will form a new junction with the Euston station taxi facility some 90m north of Robert Street. The A400 Hampstead Road approaches will comprise two lanes in each direction and there will be a new link introduced into the junction which will lead to the station taxi facilities. This will comprise two lanes with the nearside lane for left-turning vehicles and the offside lane for left and right-turning vehicles.

3.5.473 The existing priority junction of Robert Street with A400 Hampstead Road is also to be altered as part of the revised scheme. The Robert Street approach to the junction currently comprises one lane which is one way for left turning vehicles. The A400 Hampstead Road approach to the junction comprises one lane in each direction. Under the revised scheme the junction will become signalised. It is proposed that the layout approach on Robert Street will remain the same.

3.5.474 The junction layouts can be seen in Figure 188.

3.5.475 Table 259 presents the results of the modelling undertaken for A400 Hampstead Road with Robert Street and Cobourg Street. The modelling has been undertaken using TRANSYT and the results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled at a cycle time of 96 seconds. As this new junction forms

part of the revised scheme, no future baseline results are presented. A priority junction located some 90m to the north of the junction of A400 Hampstead Road with Robert Street and Cobourg Street, which will provide access to the Euston station Stage B1 servicing area, has also been included in the model. This includes the toucan crossing on A400 Hampstead Road to the north of the servicing access road.

Figure 188: A400 Hampstead Road/taxi facility completion construction Stage B1 layout

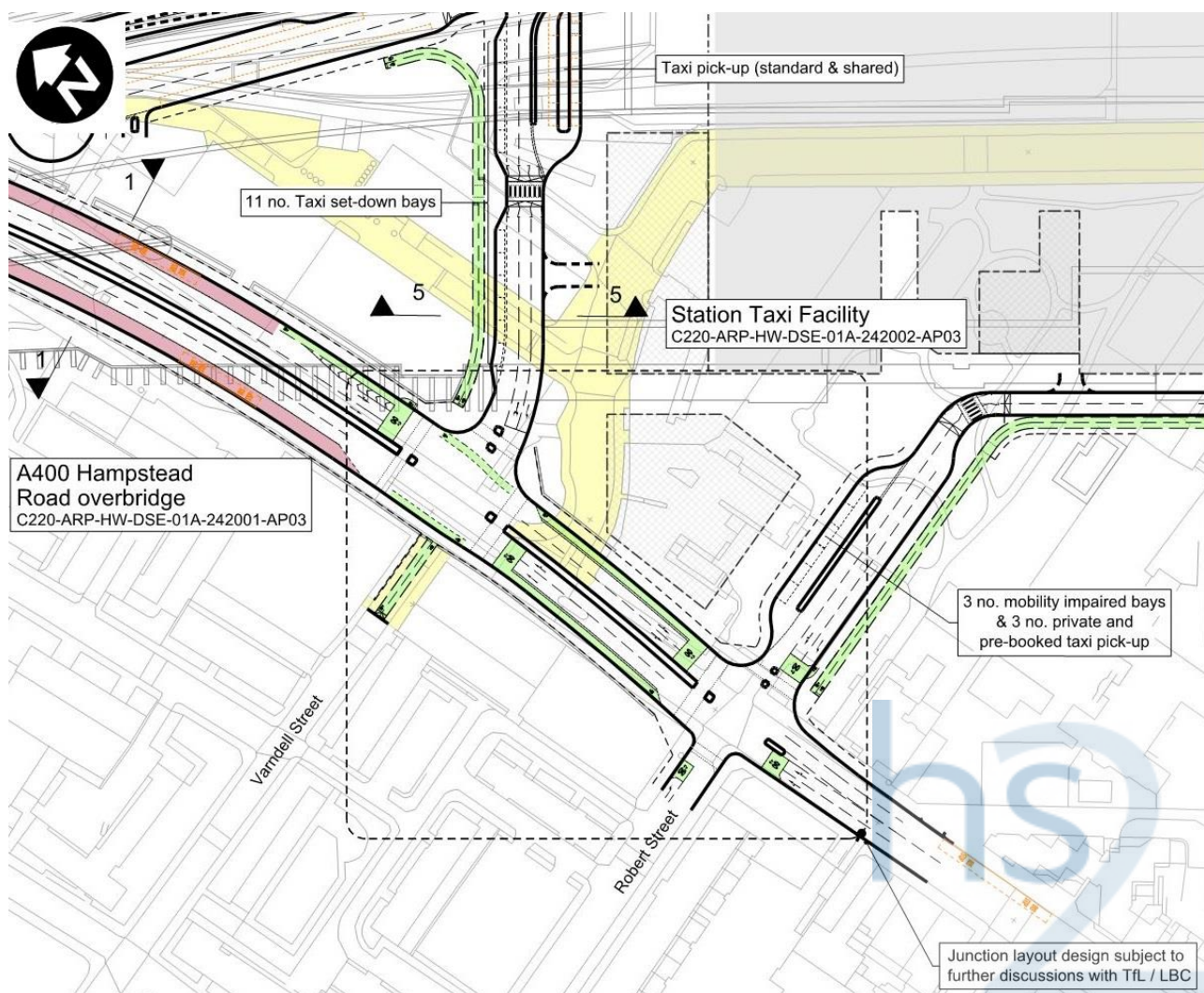


Table 259: A400 Hampstead Road/Robert Street/Cobourg Street modelling results - 2041 HS2 Phase Two

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2041 with HS2			2041 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north (at taxi access)	Ahead	745	88%	21	267	40%	6
	Left, ahead	619	71%	15	579	84%	17
Taxi access	Left, right	412	86%	13	55	85%	16
	Left	304	68%	8	223	37%	5
	Ahead, right	268	36%	5	491	84%	14

Approach	Movement	AM peak (08:00 to 09:00)			PM peak (17:00 to 18:00)		
		2041 with HS2			2041 with HS2		
		Flow	DoS	MMQ	Flow	DoS	MMQ
A400 Hampstead Road north (at Taxi access)	Ahead	116	14%	2	223	35%	2
A400 Hampstead Road north (at Cobourg Street)	Ahead, right	798	81%	22	189	24%	3
	Left, ahead	539	40%	12	258	21%	1
Cobourg Street	Ahead, right	55	67%	2	69	56%	2
	Left	42	20%	1	31	11%	11
A400 Hampstead Road south (at Cobourg Street)	Ahead, right	232	36%	5	375	34%	5
	Left, ahead	289	45%	6	484	44%	7
Robert Street	Left	40	30%	1	63	32%	2

3.5.476 The results show that the junction of A400 Hampstead Road with Robert Street and Cobourg Street is forecast to operate below theoretical capacity on all approaches to the junction, during the AM and PM peak hours, for the HS2 Phase Two scenario. While some approaches to the junction are approaching capacity, the predicted level of queueing can be accommodated within the available link length.

Junction performance at other junctions - 2026 Phase One and 2041 Phase Two

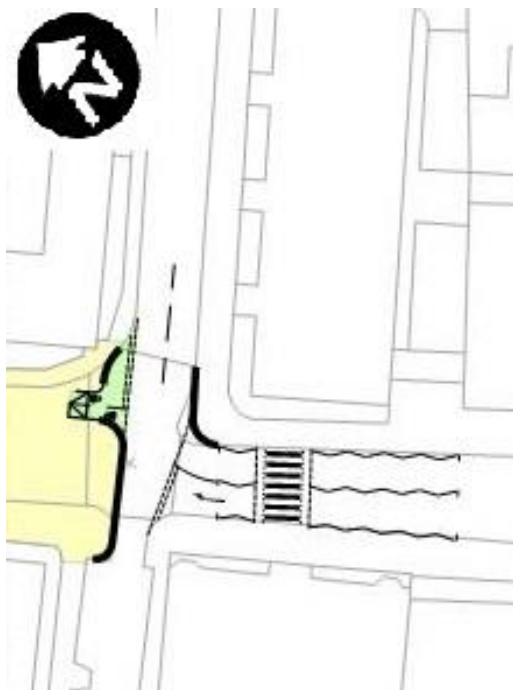
3.5.477 A series of other signalised junctions have also been modelled along the A501 Euston Road and A400 Hampstead Road corridors for 2026 with completion of construction Stage A and operation of HS2 Phase One and for 2041 with HS2 Phase Two services operating from the completed high speed station. The results of these models show that spare capacity will be available at all junctions in the future baseline and with the HS2 Phase One and Phase Two scenarios, with the exception of the junction of A501 Euston Road with A5202 Pancras Road. At this junction the right turn from A501 Euston Road (westbound) to A5202 Pancras Road experiences a DoS in excess of 100% in the case of the future baseline plus both the 2026 and 2041 HS2 scenarios. However, the DoS is also in excess of 100% for the future baseline scenario and, as such, mitigation measures should be considered irrespective of the revised scheme.

3.5.478 Other minor junctions in the vicinity of the revised scheme have been modelled using the priority junction (and roundabout) modelling software, Junctions 8. Further details on the additional modelling undertaken follows below.

Gordon Street/Gower Place/Endsleigh Gardens

3.5.479 The existing crossroads junction of Gordon Street/Gower Place and Endsleigh Gardens is to be reconfigured as part of the revised scheme. This is a result of the closure to vehicles of the section of Gordon Street between Euston Road and Endsleigh Gardens. The junction will comprise a three arm junction and the layout can be seen in Figure 189.

Figure 189: Gordon Street / Gower Place / Endsleigh Gardens layout



3.5.480 Table 260 presents the results of the modelling completed for this junction. The modelling has been undertaken using Junctions 8 and the results are presented in terms of the RFC and MMQ (in PCU). As this new junction forms part of the revised scheme, no future baseline results are presented.

Table 260: Gordon Street/Gower Place/Endsleigh Gardens 2026 Stage A, Phase One and 2041 Phase Two modelling results - RFC and MMQ

Peak	Approach	Movement	2026 Stage A, HS2 Phase One		2041 HS2 Phase Two	
			RFC	MMQ	RFC	MMQ
AM peak hour (08:00 to 09:00)	Gordon Street south	Left, right	27%	0	40%	1
PM peak hour (17:00 to 18:00)	Gordon Street south	Left, right	54%	1	59%	1

3.5.481 The results indicate that the reconfigured junction of Gordon Street with Endsleigh Gardens and Gower Place have sufficient spare capacity on all approaches to the junction during the AM and PM peak hour for both HS2 scenario. Very limited queueing has been predicted.

Junctions east of Churchway

3.5.482 A series of junction on A501 Euston Road have also been modelled as part of the A501 Euston Road TRANSYT. These junctions are:

- A501 Euston Road/Mabledon Place;
- A501 Euston Road/Ossulston Street;
- A501 Euston Road/Midland Road/B504 Judd Street;
- A501 Euston Road/Argyle Road;
- A501 Euston Road/A5202 Pancras Road/Belgrove Street; and
- A501 Euston Road/A5203 York Way.

3.5.483 Table 261 and Table 262 provide the modelling results of these junctions for the AM and PM peak hours. The results are presented in terms of the DoS and MMQ (in PCU). Each junction has a cycle time of 96 seconds.

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Table 261: A501 Euston Road signalised junctions 2026 Stage A, Phase One and 2041 Phase Two modelling results - DoS

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak	A501 Euston Road/Mabledon Place	A501 Euston Road east	Ahead	64%	67%	71%	69%
			Left, ahead	28%	30%	27%	28%
		Mabledon Place	Right	18%	38%	21%	48%
		A501 Euston Road west	Ahead	75%	78%	74%	83%
	A501 Euston Road/Ossulston Street	Ossulston Street	Left	55%	49%	49%	49%
			A501 Euston Road east	Ahead	73%	73%	76%
		A501 Euston Road west	Ahead	37%	39%	36%	36%
			Left, ahead	64%	68%	63%	74%
	A501 Euston Road/Midland Road/B504 Judd Street	Midland Road	Right	91%	89%	93%	85%
			Left, ahead	80%	82%	77%	58%
		A501 Euston Road east	Left, ahead	82%	81%	85%	98%
		B504 Judd Street	Left	70%	84%	84%	64%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
		A501 Euston Road west	Right	91%	81%	91%	80%
			Ahead	83%	79%	81%	87%
			Ahead	24%	25%	24%	26%
	A501 Euston Road/Argyle Road	A501 Euston Road east	Ahead	72%	72%	72%	69%
		Argyle Road	Left	5%	4%	4%	5%
	A501 Euston Road/A5202 Pancras Road	A5202 Pancras Road	Left, ahead, right	116%	105%	110%	103%
			A501 Euston Road east	Right	100%	101%	97%
		A501 Euston Road west	Ahead	100%	102%	101%	97%
			Right	9%	8%	8%	9%
			Left, ahead	90%	89%	91%	91%
			Left, ahead	50%	52%	51%	51%
	A501 Euston Road/A5203 York Way	A501 Gray's Inn Road	Ahead	93%	78%	77%	93%
		A501 Euston Road	Left, ahead	95%	44%	32%	50%
			Left, ahead	35%	90%	90%	97%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
PM peak	A501 Euston Road/Mabledon Place	A501 Euston Road east	Ahead	35%	38%	39%	40%
			Left, ahead	45%	45%	45%	45%
		Mabledon Place	Right	36%	47%	35%	59%
		A501 Euston Road west	Ahead	76%	76%	79%	79%
	A501 Euston Road/Ossulston Street	Ossulston Street	Left	39%	28%	39%	58%
		A501 Euston Road east	Ahead	40%	43%	45%	45%
			Ahead	48%	48%	48%	48%
		A501 Euston Road west	Left, ahead	68%	70%	70%	73%
	A501 Euston Road/Midland Road/B504 Judd Street	Midland Road	Right	66%	69%	68%	71%
			Left, ahead	75%	85%	82%	89%
		A501 Euston Road east	Left, ahead	55%	57%	59%	60%
		B504 Judd Street	Left	72%	78%	80%	79%
		A501 Euston Road west	Right	41%	29%	43%	72%
			Ahead	82%	87%	87%	93%
			Ahead	48%	46%	49%	49%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	A501 Euston Road/Argyle Road	A501 Euston Road east	Ahead	48%	47%	50%	49%
		Argyle Road	Left	4%	5%	4%	5%
	A501 Euston Road/A5202 Pancras Road	A5202 Pancras Road	Left, ahead, right	87%	89%	97%	102%
		A501 Euston Road east	Right	92%	99%	102%	104%
			Ahead	65%	65%	68%	67%
		A501 Euston Road west	Right	3%	2%	3%	3%
			Left, ahead	88%	90%	89%	88%
			Left, ahead	72%	68%	70%	71%
	A501 Euston Road/A5203 York Way	A501 Gray's Inn Road	Ahead	96%	100%	95%	98%
		A501 Euston Road	Left, ahead	48%	58%	57%	58%
			Left, ahead	101%	101%	97%	101%

Table 262: A501 Euston Road signalised junctions 2026 Stage A, Phase One and 2041 Phase Two modelling results - MMQ

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak	A501 Euston Road/Mabledon Place	A501 Euston Road east	Ahead	1	16	16	16
			Left, ahead	1	1	1	1

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
		Mabledon Place	Right	2	4	2	5
		A501 Euston Road west	Ahead	41	31	40	22
	A501 Euston Road/Ossulston Street	Ossulston Street	Left	3	2	2	2
		A501 Euston Road east	Ahead	21	21	21	19
			Ahead	5	5	3	2
		A501 Euston Road west	Left, ahead	3	5	3	11
	A501 Euston Road/Midland Road/B504 Judd Street	Midland Road	Right	16	15	18	14
			Left, ahead	12	12	12	10
		A501 Euston Road east	Left, ahead	33	34	38	57
		B504 Judd Street	Left	5	7	8	6
		A501 Euston Road west	Right	6	4	5	4
			Ahead	14	31	26	33
			Ahead	1	4	3	2

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two	
	A501 Euston Road/Argyle Road	A501 Euston Road east	Ahead	24	24	25	21	
		Argyle Road	Left	0	0	0	0	
	A501 Euston Road/A5202 Pancras Road	A5202 Pancras Road	Left, ahead, right	46	28	38	20	
		A501 Euston Road east	Right	17	18	15	14	
			Ahead	67	78	71	39	
		A501 Euston Road west	Right	0	0	0	0	
			Left, ahead	13	13	17	20	
			Left, ahead	10	8	8	4	
	A501 Euston Road/A5203 York Way	A501 Gray's Inn Road	Ahead	20	15	11	23	
		A501 Euston Road	Left, ahead	0	1	0	2	
			Left, ahead	32	24	30	30	
	PM peak	A501 Euston Road/Mabledon Place	A501 Euston Road east	Ahead	0	0	0	0
				Left, ahead	1	1	1	1
Mabledon Place			Right	4	5	3	6	

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
		A501 Euston Road west	Ahead	49	29	51	23
	A501 Euston Road/Ossulston Street	Ossulston Street	Left	2	1	2	3
		A501 Euston Road east	Ahead	10	12	10	12
			Ahead	7	6	7	5
		A501 Euston Road west	Left, ahead	5	12	5	12
	A501 Euston Road/Midland Road/B504 Judd Street	Midland Road	Right	9	9	9	10
			Left, ahead	11	15	13	16
		A501 Euston Road east	Left, ahead	17	19	20	19
		B504 Judd Street	Left	6	7	7	7
		A501 Euston Road west	Right	1	1	1	3
			Ahead	16	28	22	40
			Ahead	3	5	3	4
		A501 Euston Road/Argyle Road	A501 Euston Road east	Ahead	16	12	17

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
		Argyle Road	Left	0	0	0	0
	A501 Euston Road/A5202 Pancras Road	A5202 Pancras Road	Left, ahead, right	14	11	19	21
		A501 Euston Road east	Right	11	16	19	24
			Ahead	14	14	15	13
		A501 Euston Road west	Right	0	0	0	0
			Left, ahead	12	14	15	18
			Left, ahead	7	6	7	6
	A501 Euston Road/A5203 York Way	A501 Gray's Inn Road	Ahead	27	32	27	12
		A501 Euston Road	Left, ahead	1	4	2	1
			Left, ahead	61	68	30	61

- 3.5.484 The results show that the junction of A501 Euston Road with Mabledon Place is forecast to operate with spare capacity during the AM peak hour for the 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios. The junction is also forecast to operate within the capacity for the PM peak hour for the Stage A, HS2 Phase One and HS2 Phase Two scenarios. The highest DoS recorded was during the 2041 HS2 Phase Two scenario is 83% on the approach to the junction along A501 Euston Road west during the PM peak hour. However, the queue of 22 PCU can be accommodated comfortably within the available link length.
- 3.5.485 The junction of A501 Euston Road with Ossulston Street is forecast to operate with spare capacity during the AM peak hour for the 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios. The junction is also forecast to operate within the theoretical model capacity for the PM peak hour for the Stage A, HS2 Phase One and HS2 Phase Two scenarios. The level of queueing predicted can be accommodated within the available link length.
- 3.5.486 The junction of A501 Euston Road with Midland Road and B504 Judd Street is forecast to operate with some spare capacity during the AM and PM peak hours for 2026 Stage A, HS2 Phase One scenario. The highest modelled DoS for the 2026 Stage A, HS2 Phase One scenario is 89% on the approach to the junction along Midland Road (right turn lane) during the AM peak hour. The DoS is forecast to decrease from 91% during the 2026 future baseline scenario.
- 3.5.487 For the 2041 HS2 Phase Two scenario, the junction is forecast to operate below theoretical capacity during the AM peak hour. However, two approaches, A501 Euston Road west and Midland Road are approaching capacity. The queues on both approaches can be accommodated within the available link length. During the PM peak hour, the junction is forecast to operate with spare capacity on all approaches with the highest DoS predicted to be 93% on the A501 Euston Road west (ahead movement) approach. The overall performance of the junction does not substantially change when compared with the 2041 future baseline scenario with the DoS on some approaches improving.
- 3.5.488 The junction of A501 Euston Road with Argyle Road operates with spare capacity for the Stage A, HS2 Phase One and 2041 Phase Two scenarios.
- 3.5.489 At the junction of A501 Euston Road with A5202 Pancras Road, the approaches to the junction on A501 Euston Road from the east (right turn onto A5202 Pancras Road) and A5202 Pancras are forecast to be over capacity for the AM peak hour in the 2026 Stage A, HS2 Phase One scenario. However, the junction is also forecast to be over capacity for the 2026 future baseline scenario and there is an improvement in the DoS on the A5202 Pancras Road approach for the 2041 HS2 Phase Two scenario.
- 3.5.490 For the 2041 Phase Two scenario during the AM peak hour, the DoS on A5202 Pancras Road is over capacity at 103%. However, this decreases from 110% when compared with the future baseline scenario. The approach to the junction along A501 Euston Road east is also approaching capacity during the AM peak hour but the DoS actually decreases slightly from the 2041 future baseline scenario. For 2041 Phase Two PM peak hour, the DoS on the A5202 Pancras Road is at 102%. However, this only increases very slightly from the 2041 future baseline scenario when the DoS is

predicted to be 97%. The A501 Euston Road approach also experiences a very slight increase from 102% to 104%.

- 3.5.491 The junction of A501 Euston Road with A5203 York Way and Gray's Inn Road is forecast to be above or approaching capacity during the 2026 Phase One and 2041 Phase Two scenarios. However, the increases in DoS are very minor when compared with the future baseline scenarios.

King's Cross junctions

- 3.5.492 A series of junction in the King's Cross area have also been modelled as part of the A501 Euston Road TRANSYT. These junctions are:
- A501 Euston Road/A501 Gray's Inn Road;
 - A501 Euston Road/A5203 Caledonian Road;
 - A501 Gray's Inn Road/Swinton Street;
 - A501 Euston Road A501 Pentonville Road; and
 - A201 King's Cross Road/A501 Penton Rise.
- 3.5.493 Table 263 and Table 264 provide the modelling results of these junctions for the AM and PM peak hours. The junctions have been modelled using TRANSYT. The results are presented in terms of the DoS and MMQ (in PCU). Each junction has a cycle time of 96 seconds.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 263: King's Cross signalised junctions modelling results - DoS

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	A501 Euston Road/A501 Gray's Inn Road	A501 Gray's Inn Road	Ahead	97%	100%	103%	104%
	A501 Pentonville Road/A5203 Caledonian Road	A5203 Caledonian Road	Left, ahead	83%	80%	83%	89%
			Left, ahead	14%	13%	14%	13%
		A501 Pentonville Road east	Left	22%	24%	22%	25%
		A501 Pentonville Road west	Ahead	87%	80%	81%	86%
	A501 Gray's Inn Road/King's Cross Bridge	King's Cross Bridge	Left	91%	92%	88%	100%
		A501 Gray's Inn Road	Ahead	88%	89%	89%	98%
			Ahead	9%	9%	9%	9%
	A501 Gray's Inn Road/A501 Swinton Street	A501 Swinton Street	Right	73%	70%	73%	78%
		A501 Gray's Inn Road	Ahead	59%	65%	60%	72%
		Argyle Street	Left	11%	11%	11%	14%
	A201 King's Cross Road/A501 Penton Rise	A501 Penton Rise	Left, ahead, right	74%	74%	71%	78%
		Vernon Rise	Left	15%	14%	15%	18%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two	
		A201 King's Cross Road	Left, ahead, right	69%	64%	72%	73%	
PM peak hour	A501 Euston Road/A501 Gray's Inn Road	A501 Gray's Inn Road	Ahead	67%	71%	73%	76%	
	A501 Pentonville Road/A5203 Caledonian Road	A5203 Caledonian Road	Left, ahead	70%	74%	74%	71%	
			Left, ahead	17%	17%	16%	15%	
		A501 Pentonville Road east	Left	17%	16%	18%	19%	
			A501 Pentonville Road west	Ahead	76%	79%	74%	77%
	A501 Gray's Inn Road/King's Cross Bridge	King's Cross Bridge	Left	65%	70%	71%	76%	
			A501 Gray's Inn Road	Ahead	74%	76%	79%	82%
				Ahead	11%	11%	11%	8%
	A501 Gray's Inn Road/A501 Swinton Street	A501 Swinton Street	Right	54%	53%	57%	71%	
			A501 Gray's Inn Road	Ahead	51%	54%	53%	54%
			Argyle Street	Left	8%	8%	13%	14%
			A501 Penton Rise	Left, ahead, right	50%	51%	50%	52%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	A201 King's Cross Road/A501 Penton Rise	Vernon Rise	Left	2%	8%	8%	13%
		A201 King's Cross Road	Left, ahead, right	49%	53%	51%	54%

Table 264: King's Cross signalised junctions modelling results - MMQ

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	A501 Euston Road/A501 Gray's Inn Road	A501 Gray's Inn Road	Ahead	38	48	68	81
	A501 Pentonville Road/A5203 Caledonian Road	A5203 Caledonian Road	Left, ahead	21	18	19	21
			Left, ahead	1	1	1	1
		A501 Pentonville Road east	Left	2	3	2	2
		A501 Pentonville Road west	Ahead	43	25	34	32
	A501 Gray's Inn Road/King's Cross Bridge	King's Cross Bridge	Left	15	23	14	30
		A501 Gray's Inn Road	Ahead	28	27	28	41
			Ahead	0	0	0	0
	A501 Gray's Inn Road/A501 Swinton Street	A501 Swinton Street	Right	24	19	25	24
		A501 Gray's Inn Road	Ahead	18	19	19	22

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
		Argyle Street	Left	0	0	0	1
	A201 King's Cross Road/A501 Penton Rise	A501 Penton Rise	Left, ahead, right	12	12	12	13
		Vernon Rise	Left	0	0	0	0
		A201 King's Cross Road	Left, ahead, right	11	9	11	10
PM peak hour	A501 Euston Road/A501 Gray's Inn Road	A501 Gray's Inn Road	Ahead	15	17	16	19
	A501 Pentonville Road/A5203 Caledonian Road	A5203 Caledonian Road	Left, ahead	20	14	14	23
			Left, ahead	1	1	1	2
		A501 Pentonville Road east	Left	2	2	2	2
		A501 Pentonville Road west	Ahead	14	18	12	14
	A501 Gray's Inn Road/King's Cross Bridge	King's Cross Bridge	Left	11	12	13	13
		A501 Gray's Inn Road	Ahead	18	19	11	15
		Argyle Street	Ahead	1	1	1	0
		A501 Swinton Street	Right	8	8	9	17

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	A501 Gray's Inn Road/A501 Swinton Street	A501 Gray's Inn Road	Ahead	10	10	10	20
		Argyle Street	Left	0	0	1	1
	A201 King's Cross Road/A501 Penton Rise	A501 Penton Rise	Left, ahead, right	7	7	7	7
		Vernon Rise	Left	0	0	0	0
		A201 King's Cross Road	Left, ahead, right	6	6	6	7

- 3.5.494 The results show that for the 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios for the AM and PM peak hours, the following junctions are forecast to operate with spare capacity on all approaches to the particular junctions:
- A501 Pentonville Road with A5203 Caledonian Road;
 - A501 Gray's Inn Road with A501 Swinton Street; and
 - A201 King's Cross Road with A501 Penton Rise.
- 3.5.495 The junction of A501 Euston Road with A501 Gray's Inn Road is forecast to operate approaching capacity for both the 2026 future baseline and 2026 Phase One scenarios, and is forecast to operate over capacity for the 2041 future baseline and 2041 Phase Two scenario. The junction is forecast to operate with spare capacity for the PM peak hour for the 2026 Phase One and 2041 Phase Two scenarios.
- 3.5.496 The junction of King's Cross Road with A501 Gray's Inn Road is forecast to operate with a small level of spare capacity in the 2026 Stage A, HS2 Phase One scenario for the AM peak hour. The junction will, however, be approaching capacity for the 2041 Phase Two scenario. The increases in DoS are small when compared with the future baseline scenario. The junction operates with spare capacity on all approaches for the PM peak hour for the 2026 Stage A, HS2 Phase One and 2041 Phase Two scenarios.

A400 Hampstead Road/A4200 Eversholt Street/Mornington Crescent/B512 Crowndale Road/A400 Camden High Street

- 3.5.497 Table 265 and Table 266 provide the modelling results for the junction of the A400 Hampstead Road/A4200 Eversholt Street/Mornington Crescent/B512 Crowndale Road/A400 Camden High Street for the AM and PM peak hours. The junction has been modelled using TRANSYT. The results are presented in terms of the DoS and MMQ (in PCU). The junction has been modelled with a 72 second cycle time.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 265: A400 Hampstead Road/A4200 Eversholt Street/Mornington Crescent/B512 Crowndale Road/A400 Camden High Street modelling results - DoS

Peak	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	B512 Crowndale Road	Left	27%	26%	28%	28%
		Ahead	46%	48%	48%	49%
		Right	50%	49%	50%	52%
	A4200 Eversholt Street	Left, ahead	48%	48%	51%	51%
	Harrington Square	Ahead	21%	22%	22%	23%
	A400 Hampstead Road	Ahead	60%	56%	65%	60%
	Mornington Crescent	Left	50%	45%	61%	64%
	A400 Camden High Street	Ahead	5%	5%	5%	5%
		Ahead	29%	27%	32%	31%
PM peak hour	B512 Crowndale Road	Left	38%	18%	22%	22%
		Ahead	32%	30%	29%	29%
		Right	46%	45%	48%	49%
	A4200 Eversholt Street	Left, ahead	48%	47%	49%	49%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	Harrington Square	Ahead	18%	12%	14%	12%
	A400 Hampstead Road	Ahead	95%	94%	99%	94%
	Mornington Crescent	Left	60%	54%	70%	64%
	A400 Camden High Street	Ahead	12%	14%	12%	16%
		Ahead	38%	36%	40%	36%

Table 266: A400 Hampstead Road/A4200 Eversholt Street/Mornington Crescent/B512 Crowndale Road/A400 Camden High Street junction modelling results - MMQ (PCU)

Peak	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	B512 Crowndale Road	Left	2	1	2	2
		Ahead	6	6	6	6
		Right	5	5	6	6
	A4200 Eversholt Street	Left, ahead	6	6	6	6
	Harrington Square	Ahead	0	0	0	0
	A400 Hampstead Road	Ahead	5	5	6	5
	Mornington Crescent	Left	1	1	2	2

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	A400 Camden High Street	Ahead	0	0	0	0
		Ahead	7	7	8	8
PM peak hour	B512 Crowndale Road	Left	2	1	1	1
		Ahead	3	3	3	3
		Right	5	4	5	5
	A4200 Eversholt Street	Left, ahead	6	6	6	6
	Harrington Square	Ahead	3	0	0	0
	A400 Hampstead Road	Ahead	17	16	24	16
	Mornington Crescent	Left	2	2	3	3
	A400 Camden High Street	Ahead	1	1	1	1
		Ahead	10	10	11	10

3.5.498 The results indicate that the junction operates with spare capacity on all approach arms during the AM peak hour for the 2026 and 2041 future baseline and 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios.

3.5.499 The results show that the A400 Hampstead Road (ahead) approach to the junction is approaching capacity during the PM peak hour for the HS2 2026 Phase One scenario. However, this approach to the junction is also approaching capacity for the 2026 future baseline. The queues predicted at the junction can also be accommodated within the available link length. For 2041, the A400 Hampstead Road (ahead) approach to the junction is also approaching capacity for both the 2041 future baseline scenario and with HS2 Phase Two scenario.

Other priority junctions

3.5.500 This section presents results for the priority junctions in the vicinity of Euston station. For ease reporting, these have been divided into four further groups. These are as follows:

- A4200 Eversholt Street junctions:
 - A4200 Eversholt Street/Lancing Street;
 - A4200 Eversholt Street/Doric Way;
 - A4200 Eversholt Street/Drummond Crescent;
 - A4200 Eversholt Street/Phoenix Road;
 - A4200 Eversholt Street/Polygon Road; and
 - A4200 Eversholt Street/Barnby Street/Aldenham Street.
- A4200 Upper Woburn Place/Endsleigh Gardens;
- North Gower Street junctions:
 - Drummond Street/North Gower Street; and
 - North Gower Street/Euston Street.
- Western Junctions:
 - Park Village East/Mornington Street;
 - Mornington Street/Mornington Terrace; and
 - Harrington Square/A400 Lidlington Place.

A4200 Eversholt Street junctions

3.5.501 Table 267 and Table 268 provide the modelling results for the junction of the A4200 Eversholt Street priority junctions for the AM and PM peak hours. The junction has been modelled using TRANSYT as they are included in A501 Euston Road model. As all of the junctions along A4200 Eversholt Street were modelled in TRANSYT, the results are presented in terms of the DoS and MMQ, measured in PCU. Where the traffic flows at a junction along were found to be higher than the entry and exit flows

at the next junction, the higher traffic flows were used and distributed along the A4200 Eversholt Street corridor.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Table 267: A4200 Eversholt Street Priority Junction modelling results - DoS

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	A4200 Eversholt Street/Lancing Street	A4200 Eversholt Street north	Left, ahead	20%	25%	21%	24%
			Ahead	1%	2%	1%	4%
		Lancing Street	Left, right	4%	4%	4%	4%
		A4200 Eversholt Street south	Ahead, right	40%	40%	44%	50%
	A4200 Eversholt Street/Doric Way	A4200 Eversholt Street north	Left, ahead	20%	25%	21%	24%
			Ahead	1%	2%	2%	4%
		A4200 Eversholt Street south	Ahead, right	33%	36%	36%	37%
	A4200 Eversholt Street/Drummond Crescent	Drummond Crescent	Left, right	5%	5%	30%	5%
	A4200 Eversholt Street/Phoenix Road	A4200 Eversholt Street north	Left, ahead	52%	67%	60%	67%
		Phoenix Road	Left, right	60%	37%	30%	24%
		A4200 Eversholt Street south	Ahead, right	32%	72%	36%	36%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	A4200 Eversholt Street/Barnby Street	A4200 Eversholt Street north	Left, ahead, right	33%	42%	37%	40%
		A4200 Eversholt Street south	Left, ahead, right	38%	46%	33%	35%
		Barnby Street	Left, ahead, right	10%	10%	10%	9%
PM peak hour	A4200 Eversholt Street/Lancing Street	A4200 Eversholt Street north	Left, ahead	14%	19%	18%	22%
			Ahead	2%	2%	2%	4%
		Lancing Street	Left, right	4%	4%	4%	4%
		A4200 Eversholt Street south	Ahead, right	38%	47%	52%	52%
	A4200 Eversholt Street/Doric Way	A4200 Eversholt Street north	Left, ahead	15%	20%	19%	22%
			Ahead	2%	2%	2%	4%
		A4200 Eversholt Street south	Ahead, right	34%	36%	36%	36%
	A4200 Eversholt Street/Drummond Crescent	Drummond Crescent	Left, right	6%	6%	6%	6%
	A4200 Eversholt Street/Phoenix Road	A4200 Eversholt Street north	Left, ahead	28%	37%	35%	48%
		Phoenix Road	Left, right	65%	54%	96%	82%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
		A4200 Eversholt Street south	Ahead, right	34%	36%	36%	36%
	A4200 Eversholt Street/Barnby Street	A4200 Eversholt Street north	Left, ahead, right	20%	25%	24%	30%
		A4200 Eversholt Street south	Left, ahead, right	34%	34%	41%	37%
		Barnby Street	Left, ahead, right	6%	8%	7%	7%

Table 268: A4200 Eversholt Street priority junction modelling results - MMQ (PCU)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	A4200 Eversholt Street/Lancing Street	A4200 Eversholt Street north	Left, ahead	0	0	0	0
			Ahead	0	0	0	0
		Lancing Street	Left, right	0	0	0	0
		A4200 Eversholt Street south	Ahead, right	9	11	9	18
	A4200 Eversholt Street/Doric Way	A4200 Eversholt Street north	Left, ahead	0	0	0	0
			Ahead	0	0	0	0
		A4200 Eversholt Street south	Ahead, right	2	6	6	6

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	A4200 Eversholt Street/Drummond Crescent	Drummond Crescent	Left, right	0	0	0	0
	A4200 Eversholt Street/Phoenix Road	A4200 Eversholt Street north	Left, ahead	1	1	1	1
		Phoenix Road	Left, right	1	0	0	0
		A4200 Eversholt Street south	Ahead, right	0	9	0	0
	A4200 Eversholt Street/Barnby Street	A4200 Eversholt Street north	Left, ahead, right	0	6	0	0
		A4200 Eversholt Street south	Left, ahead, right	0	0	0	0
		Barnby Street	Left, ahead, right	0	0	0	0
PM peak hour	A4200 Eversholt Street/Lancing Street	A4200 Eversholt Street north	Left, ahead	0	0	0	0
			Ahead	0	0	0	0
		Lancing Street	Left, right	0	0	0	0
		A4200 Eversholt Street south	Ahead, right	10	14	17	19
	A4200 Eversholt Street/Doric Way	A4200 Eversholt Street north	Left, ahead	0	0	0	0
			Ahead	0	0	0	0

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
		A4200 Eversholt Street south	Ahead, right	6	6	6	6
	A4200 Eversholt Street/Drummond Crescent	Drummond Crescent	Left, right	0	0	0	0
	A4200 Eversholt Street/Phoenix Road	A4200 Eversholt Street north	Left, ahead	0	0	0	0
		Phoenix Road	Left, right	1	1	11	4
		A4200 Eversholt Street south	Ahead, right	0	0	0	0
	A4200 Eversholt Street/Barnby Street	A4200 Eversholt Street north	Left, ahead, right	0	0	0	0
		A4200 Eversholt Street south	Left, ahead, right	0	0	0	0
		Barnby Street	Left, ahead, right	0	0	0	0

3.5.502 The results show that all of the priority junctions along A4200 Eversholt Street are forecast to operate with adequate spare capacity during the AM and PM peak hours for the 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios.

A4200 Upper Woburn Place/Endsleigh Gardens

3.5.503 Table 269 and Table 270 provide the modelling results for the junction of A4200 Upper Woburn Place with Endsleigh Gardens for the AM and PM peak hours. The junctions have been modelled using Junctions 8. The results are presented in terms of the RFC and MMQ, measured in PCU.

Table 269: Junctions south of A501 Euston Road priority junction modelling results - RFC

Peak	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	A4200 Upper Woburn Place north	Ahead, right	40%	66%	40%	74%
PM peak hour	A4200 Upper Woburn Place north	Ahead, right	64%	49%	60%	21%

Table 270: Junctions south of A501 Euston Road priority junction modelling results - MMQ (PCU)

Peak	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	A4200 Upper Woburn Place north	Ahead, right	1	2	1	3
PM peak hour	A4200 Upper Woburn Place north	Ahead, right	2	1	1	0

3.5.504 The results indicate that the junction operates with spare capacity on all approach arms during the AM and PM peak hours for the 2012 baseline, 2026 and 2041 future baseline and 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios. The DoS on all other links is well below the practical capacity threshold of 90% for signalised junctions.

North Gower Street junctions

3.5.505 Table 271 provides the modelling results for the junctions with North Gower Street for the AM and PM peak hours. With the exception of the junction of North Gower Street with A501 Euston Road, the junctions have been modelled using Junctions 8. The results are presented in terms of the RFC. The MMQs have not been provided as no queues have been predicted.

Table 271: North Gower Street priority junction modelling results - DoS

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	North Gower Street / Drummond Street	Drummond Street east	Left, ahead, right	19%	0%	20%	0%
		North Gower Street south	Left, ahead, right	3%	1%	4%	1%
		Drummond Street west	Left, ahead, right	21%	33%	22%	28%
	North Gower Street/Euston Street	Euston Street east	Left, right	13%	1%	15%	1%
PM peak hour	North Gower Street / Drummond Street	Drummond Street east	Left, ahead, right	3%	0%	8%	0%
		North Gower Street south	Left, ahead, right	16%	3%	13%	3%
		Drummond Street west	Left, ahead, right	30%	24%	32%	17%
	North Gower Street/Euston Street	Euston Street east	Left, right	11%	4%	22%	3%

3.5.506 The results show that all of the priority junctions along North Gower Street are forecast to operate with adequate spare capacity during the AM and PM peak hours for the 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios.

Western junctions

3.5.507 Table 272 and Table 273 provide the modelling results for the western junctions for the AM and PM peak hours. The junctions have been modelled using Junctions 8. The results are presented in terms of the RFC and MMOQ, measured in PCU.

Table 272: Western Junctions - priority junction modelling results - RFC

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	Park Village East/Mornington Street	Mornington Street	Left	17%	7%	23%	25%
		Park Village East south	Right	11%	9%	17%	25%
	Mornington Street/Mornington Terrace	Morning Street east	Ahead	24%	32%	32%	39%
		Mornington Street west	Left, ahead	64%	64%	77%	87%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA1, CFA2, CFA3)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	Harrington Square/A400 Lidlington Place	Harrington Square north	Right	73%	72%	104%	94%
PM peak hour	Park Village East/Mornington Street	Mornington Street	Left	14%	13%	15%	6%
		Park Village East south	Right	13%	14%	15%	22%
	Mornington Street/Mornington Terrace	Morning Street east	Ahead	17%	16%	17%	9%
		Mornington Street west	Left, ahead	58%	53%	67%	63%
	Harrington Square/A400 Lidlington Place	Harrington Square north	Right	59%	60%	59%	59%

Table 273: Western Junctions - priority junction modelling results - MMQ (PCU)

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
AM peak hour	Park Village East/Mornington Street	Mornington Street	Left	0	0	0	0
		Park Village East south	Right	0	0	0	0
	Mornington Street/Mornington Terrace	Morning Street east	Ahead	0	1	1	1
		Mornington Street west	Left, ahead	2	2	3	6
	Harrington Square/A400 Lidlington Place	Harrington Square north	Right	3	3	22	10
PM peak hour	Park Village East/Mornington Street	Mornington Street	Left	0	0	0	0
		Park Village East south	Right	0	0	0	0
	Mornington Street/Mornington Terrace	Morning Street east	Ahead	0	0	0	0
		Mornington Street west	Left, ahead	1	1	2	2

Peak	Junction	Approach	Movement	2026 baseline	2026 Stage A, HS2 Phase One	2041 baseline	2041 Hs2 Phase Two
	Harrington Square/A400 Lidlington Place	Harrington Square north	Right	1	1	1	1

3.5.508 The results indicate that all junctions are forecast to operate within theoretical capacity on all approach arms during the AM and PM peak hours for the 2012 baseline, 2026 and 2041 future baseline and 2026 Stage A, HS2 Phase One and 2041 HS2 Phase Two scenarios. Apart from the Harrington Square north approach to the junction of A400 Lidlington Place/A400 Harrington Square with Harrington Square for the 2041 HS2 Phase Two scenario, the RFC on all approaches is well below the practical capacity threshold of 90% for priority junctions and the predicted level of queueing is extremely low. The Harrington Square north approach has an RFC of 94% but this is a reduction from 104% when compared with the 2041 future baseline scenario.

Accidents and safety

- 3.5.509 Accident data for a 36 month period from April 2009 to March 2012 has been reviewed. The baseline safety assessments identified a number of locations at which there have been nine or more accidents (which is defined as a cluster of accidents) over a three year period to the end of March 2012.
- 3.5.510 An increase in flows on roads and through junctions could bring a corresponding increase in the risk of an accident occurring. When the revised scheme is in operation during 2026 and 2041, there could be an increase in the risk of accidents if there was an increase in traffic flows of at least 30%.
- 3.5.511 The baseline safety assessments identified a number of locations at which there have been nine or more accidents over the last three year period. Table 274 shows those locations at which predicted daily traffic flows are forecast to increase by 30% or more between 2012 and 2026, and between 2012 and 2041.

Table 274: Junctions with a 30% change in daily traffic flows and more than nine accidents

Location	Stage	No. of accidents - April 2009 - March 2012
A400 Hampstead Road/Robert Street	2026 Phase One	21 (19 slight, 2 serious)
A400 Hampstead Road/Drummond Street	2041 Phase One	15 (13 slight, 2 serious)
A400 Hampstead Road/taxi facility (previously Cardington Street)	2041 Phase Two	9 (9 slight)

Equestrian

- 3.5.512 There are no equestrian routes within the study area for CFA1 to CFA3. Therefore there will be no impact on equestrian routes.

Waterways and canals

- 3.5.513 There are no canals or waterways in within the study area for CFA1 to CFA3 that will be affected by the revised scheme. Therefore there will be no operational impact on waterways and canals.

3.6 Kilburn (Brent) to Old Oak Common (CFA4) and Northolt Corridor (CFA5) operation impact assessment

Kilburn (Brent) to Old Oak Common (CFA4) and Northolt Corridor (CFA5) revised scheme description

- 3.6.1 The SES and AP2 TA includes updated baseline and future baseline projections for 2021, 2026 and 2041 which includes use of the updated WeLHAM traffic model.
- 3.6.2 Old Oak Common station is unchanged from the scheme described in the main ES and there are no relevant changes in CFA4 or CFA5 in relation to operation. Construction impacts in CFA4 and CFA5 attributable to design changes in these CFAs were addressed in the SES and AP2 TA.
- 3.6.3 However, the revised Euston station affects both construction traffic and has operational impacts across a wide area, including CFA4 and CFA5.
- 3.6.4 The changes to Euston station potentially affect passenger use of Old Oak Common Station, and in particular the numbers of users going to and from the station from the wider area. The phasing of construction works means that both construction and operation impacts at Euston Station are considered along with operational impacts in CFA4 in the 2026 operational scenario.
- 3.6.5 The changes that are relevant to the assessment of operation impacts in CFA4 and CFA5 are:
- the revised design of Euston Station within CFA1 (SES2-001-001);
 - corrections to car and taxi numbers in operation at Old Oak Common station; and
 - consequential use of the updated WeLHAM and Railplan transport models.
- 3.6.6 The improvement scheme at the junction of Old Oak Common Lane and Victoria Road proposed in the main ES to be implemented for the operational scenarios in the main TA will be implemented in the construction phase and retained. However, LB Ealing has recently implemented a scheme which has changed the junction of Victoria Road and Old Oak Common Lane from signal control to a roundabout. The main ES proposal will replace this roundabout.

Kilburn (Brent) to Old Oak Common (CFA4) and Northolt Corridor (CFA5) construction impacts

- 3.6.7 Direct construction impacts in CFA4 and CFA5 were reported in the SES and AP2 TA. However, some of the impacts of traffic changes during construction of the high speed station at Euston affect CFA4. These are included within the assessment of CFA1-3 in Sections 3.3 and 3.4.

Kilburn (Brent) to Old Oak Common (CFA4) and Northolt Corridor (CFA5) operation impacts

Changes in demand 2026 and 2041

- 3.6.8 Table 162 and Table 163 show the overall demand for HS2 Phase One services and the use of Euston and Old Oak Common station in 2026. Table 178 and Table 179 show the

equivalent for 2041 HS2 Phase Two services. These are illustrated graphically in Figure 114 and Figure 150.

3.6.9 Table 6-249 in the main TA outlined the pattern of interchange between rail services at Old Oak Common station in the peak periods and this is replaced by Table 275 below

Table 275: Rail-rail interchange boarders and alighters²⁹

	2026 AM peak hour		2026 PM peak hour		2041 AM peak hour		2041 PM peak hour	
	Board to	Alight from	Board to	Alight from	Board to	Alight from	Board to	Alight from
Crossrail plus NR relief line EB	65%	9%	32%	7%	56%	10%	33%	6%
Crossrail plus NR relief line WB	5%	23%	6%	57%	4%	24%	7%	49%
GWML EB	0%	53%	0%	25%	0%	47%	0%	25%
GWML WB	18%	0%	46%	0%	18%	0%	36%	0%
HS2 EB	0%	14%	0%	11%	0%	21%	0%	20%
HS2 WB	14%	0%	17%	0%	21%	0%	25%	0%
Totals	101%	99%	101%	100%	99%	101%	101%	100%

Old Oak Common demand and impacts

3.6.10 Table 6-250 and 6-251 in the main TA which showed the expected arrivals and departures and pattern of interchange for 2026 and for 2041 with HS2 Phase Two services for the AM peak hour, respectively, are replaced with Table 276 and Table 277.

Table 276: Old Oak Common station 2026 AM peak hour rail-rail interchange and station exit/access passenger flows

Departure route Arrival Route	Crossrail and GWML Local services	GWML Fast Services	HS2	Station exit (bus and walk)	Totals
Crossrail and GWML Local services	580	2,009	1,283	614	4,485
GWML Fast services	6,733	59	355	191	7,338
HS2	1,552	297	0	71	1,919
Station access (bus and walk – excludes car/taxi)	796	90	334	0	1,219

²⁹ Movements to and from station exit/entrance are not shown

Departure route Arrival Route	Crossrail and GWML Local services	GWML Fast Services	HS2	Station exit (bus and walk)	Totals
Totals	9,660	2,455	1,971	876	14,961

Table 277: Old Oak Common station 2041 AM peak hour rail-rail interchange and station exit/access passenger flows

Departure route Arrival Route	Crossrail and GWML local services	GWML Fast Services	HS2	Station exit (bus and walk)	Totals
Crossrail and GWML Local Services	667	2,181	2,349	534	5,731
GWML Fast Services	6,886	70	876	187	8,019
HS2	2,613	788	0	166	3,567
Station access (bus and walk – excludes car/taxi)	768	117	578	0	1,463
Totals	10,934	3,155	3,803	887	18,779

3.6.11 Paragraph 6.7.224 in the main TA is revised to reflect the updated forecasts:

“These tables illustrate the patterns of interchange through the station. Total arrivals on HS2 services account for less than 15% of users of the station in both 2026 and 2041, with departures some 19% of total departures in 2026 increasing to 21% in 2041. Users of GWML fast services make up some 49% of arrivals in 2026 and 42% in 2041 and 17% of departures. There is a high level of interchange between GWML services and Crossrail because Old Oak Common provides an easy and convenient link between the two. This will in turn reduce pressure on Paddington station.”

Onward Mode Share

3.6.12 Table 6-252 in the main TA has been updated with the revised forecasts and is replaced by Table 278.

Table 278: Approximate Old Oak Common Station person trips per mode (2 way)

Demand / mode	2026 Phase One	2041 Phase Two
	AM peak hour	AM peak hour
	Boarders/Alighters	Boarders/Alighters (with typical surface access mode share % 2041)
Approximate Total Passengers Through Front Door	2,370	2,660 (100 %)
Car (short-stay parking)	<15	<15 (0.5 %)
Taxi	100	110 (4.0 %)

Demand / mode	2026 Phase One	2041 Phase Two
	AM peak hour	AM peak hour
	Boarders/Alighters	Boarders/Alighters (with typical surface access mode share % 2041)
Motorcycle	40	40 (1.5 %)
Bus	1,140	1,280 (48.0 %)
Walk / Cycle	930	1,040 (39.0 %)
Kiss and Ride	170	190 (7.0 %)
Total by vehicle (person trips)	280	310
Rail-rail interchange inc. HS1	13,280	16,880

3.6.13 Paragraphs 6.7.228 – 6.7.230 in the main TA are revised to reflect the new forecasts:

“With the introduction of the Revised Scheme in 2026, there will be approximately 2,370 rail passengers entering or leaving the station to or from trains in the morning peak hour and around 2,172 in the evening peak hour.

In 2041 with Phase Two, these numbers will increase to approximately 2,660 passengers entering or leaving the station to or from trains in the morning peak hour and approximately 2,405 passengers in the evening peak hour.

In 2026, these passengers are forecast to generate around 280 two way person trips by vehicle (assuming i.e. total of both inbound and outbound trips) in the morning peak hour (08:00-09:00) and 250 two way trips by vehicle in the evening peak hour (17:00-18:00). In 2041, these passengers are forecast to generate around 310 two way trips in the morning peak hour and 280 two way trips by vehicle in the evening peak hour. These trips by vehicle represent under 1.5% of total users of the station (or under 12% of passengers through the station front door) and are small in relation to overall traffic levels. Using a car and taxi occupancy of 1.3 passengers per vehicle this equates to a maximum of nearly 400 vehicles (2way) in the busiest 2041 AM peak hour, after taking into account empty return Kiss- and-Ride and taxi trips.”

3.6.14 Table 6-253 in the main TA is replaced with Table 279.

Table 279: Distribution of Onward Trips Generated from Old Oak Common Station (All Modes, AM peak hour)

Origin/Destination	Percentage	2026 AM		2041 AM	
		Boarders	Alighters	Boarders	Alighters
North	22%	309	222	370	225
South	27%	369	265	443	269
East	23%	323	232	388	235

Origin/Destination	Percentage	2026 AM		2041 AM	
		Boarders	Alighters	Boarders	Alighters
West	27%	376	270	452	274
Total		1,377	989	1,653	1,003
Tidality		58%	42%	62%	38%

Bus flows & facilities

3.6.15 The bus data in Table 6-254 in the main TA is replaced with that shown in Table 280.

Table 280: Distribution of Onward Bus Trips Generated Old Oak Common Station (AM peak hour)

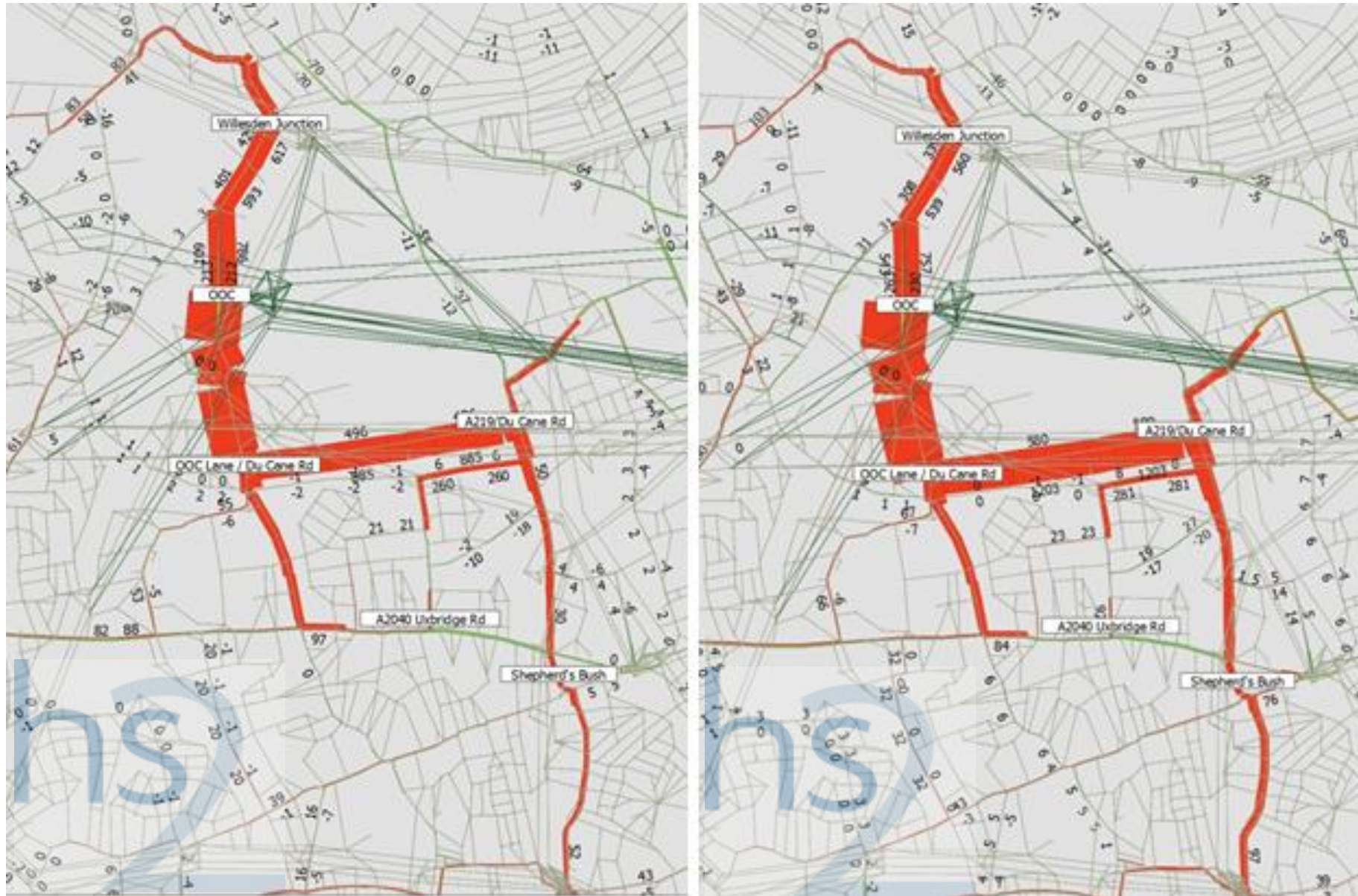
Origin/Destination	Percentage	2026 AM		2041 AM	
		Boarding trains/alighting buses	Alighting trains/boarding buses	Boarding trains/alighting buses	Alighting trains/boarding buses
North	17%	112	81	135	82
South	37%	245	176	293	178
East	30%	198	142	238	144
West	16%	106	76	127	77
Total		661	475	793	481
Total 2 way		1,136		1,275	

3.6.16 Paragraph 6.7.235 in the main TA is revised to include the new bus forecasts:

3.6.17 "Passengers using Old Oak Common Station will add around 1,150 additional trips (2-way) on buses in the area in 2026 AM peak hour increasing to approximately 1,300 additional trips in 2041. Compared to the main TA, there are fewer passengers forecast to alight from buses both in 2026 and in 2041. Boarding passenger numbers are closer to those forecast in the main TA.

3.6.18 Figure 6-197 which showed changes in bus passenger flows in 2026 and 2041 from the respective baseline flow is replaced by Figure 110. These plots provide a geographical illustration of how the revised scheme changes demand on the bus corridors around Old Oak Common station. Tables 6-255 and 6-256, which provide a summary of these impacts in the main TA, have been updated and are replaced with Table 281 and Table 282 below."

Figure 190: Changes in Bus Passenger loadings from 2026 & 2041 Forecast Baseline (AM peak 3 hr)



3.6.19 Paragraph 6.7.239 in the main TA is deleted.

“The plots in Figure 190 provide a geographical illustration of how the revised scheme changes demand on the bus corridors around Old Oak Common station. Tables 6-255 and 6-256, which provide a summary of these impacts in the main TA, have been updated with the passenger flow changes and are replaced with Table 281 and Table 282 below.”

Table 281: Difference in Bus Demand Passenger Flows: AM 2026 Baseline vs AM 2026 with Proposed Scheme (passenger per hour)

Link	Change factor	AM peak hour change	
		Towards OOC	Away and From OOC
Scrubs Lane / Mitre Bridge	Change (in passengers)	-5	-26
	Change (in approximate buses per hour)	0	0
Old Oak Common Lane / The Fairway	Change (in passengers)	676	410
	Change (in approximate buses per hour)	0	0
Du Cane Road / Wood Lane	Change (in passengers)	398	210
	Change (in approximate buses per hour)	0	0
Old Oak Lane / Webb Place	Change (in passengers)	267	193
	Change (in approximate buses per hour)	4	4
Victoria Road / Chandos Road	Change (in passengers)	2	-12
	Change (in approximate buses per hour)	0	0
Old Oak common Lane/Wells House Road	Change (in passengers)	660	403
	Change (in approximate buses per hour)	26	26

Table 282: Difference in Bus Demand Flows: AM 2041 Reference Case vs AM 2041 with Hs2

Link	Change factor	AM peak period change	
		Towards OOC	Away and From OOC
Scrubs Lane / Mitre Bridge	Change (in passengers)	2	-15
	Change (in approximate buses per hour)	0	0
Old Oak Common Lane / The Fairway	Change (in passengers)	864	452
	Change (in approximate buses per hour)	0	0

Link	Change factor	AM peak period change	
		Towards OOC	Away and From OOC
Du Cane Road / Wood Lane	Change (in passengers)	541	248
	Change (in approximate buses per hour)	0	0
Old Oak Lane / Webb Place	Change (in passengers)	243	153
	Change (in approximate buses per hour)	4	4
Victoria Road / Chandos Road	Change (in passengers)	14	-20
	Change (in approximate buses per hour)	0	0
Old Oak common lane/Wells House Road	Change (in passengers)	848	446
	Change (in approximate buses per hour)	26	26

3.6.20 The following sentence is added at the end of paragraph 6.7.240 in the main TA:

3.6.21 “There is a reduction in bus passenger flows outbound from Old Oak Common station in the AM peak period both in 2026 and 2041”.

Pedestrians

3.6.22 Paragraph 6.7.247 in the main TA is revised to reflect both updated pedestrian flows and tidality factors:

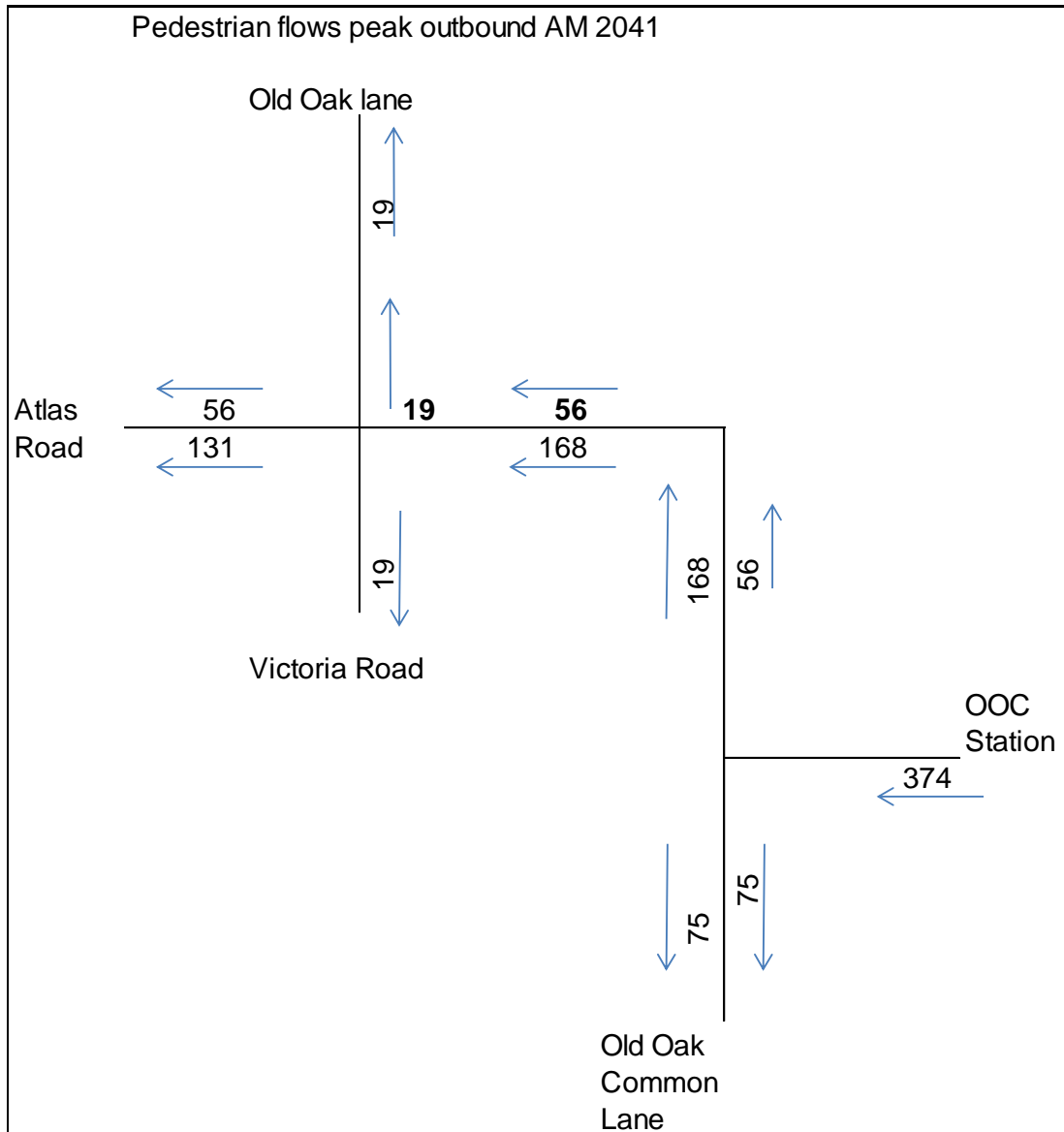
3.6.23 “Flows have been disaggregated to estimate the direction of trips. A 62:38 (station exit: station entry) tidality factor for the AM peak was applied based on analysis of Railplan data. Table 283 replaces Table 6-257 in the main TA and shows the resulting flows for the busiest 2041 AM peak hour. Of almost 1,040 pedestrian movements in the AM peak hour in 2041 (Phase 2), there would be around 375 outbound pedestrians and 665 inbound towards the station. The reverse flow would occur in the PM peak hour.”

Table 283: Old Oak Common station pedestrian flows 2041 peak hour

Period	Total peds 2 way 2041	Directional %		Directional flow	
		In	Out	In	Out
AM	1040	0.62	0.38	665	375
PM	930	0.38	0.62	330	600

3.6.24 Figure 6-199 in the main TA that showed directional pedestrian flows in the vicinity of Old Oak Common station is replaced by Figure 191.

Figure 191: Pedestrian peak directional flows: 2041 AM outbound from Old Oak Common Station



Strategic & Local Road Network

Car and taxi trips

3.6.25 As a consequence of the revised forecasts, paragraphs 6.7.263 to 6.7.264 have been updated:

“Although only very limited short-stay parking will be provided, kiss and ride and taxi access will be available. Forecasts of onward journey mode split suggest around 272 trips (two way) during the AM peak hour in 2026, rising to 310 trips by 2041 (Phase 2).

3.6.26 As indicated above, analysis of Railplan data indicates that of the 305 trips in the am peak hour in 2026, around 154 would be outbound trips, and 213 inbound. The estimates of passenger trips are shown in Table 284.”

3.6.27 Table 6-258 in the main TA is replaced by Table 284.

Table 284: Old Oak Common station vehicle person trips (2 way)

Forecast year	2026		2041	
Time period	AM peak hour	PM peak hour	AM peak hour	PM peak hour
Total trips by vehicle	272	250	305	277
Car in	103	106	124	117
Car out	74	57	75	63
Car (person trips) total	177	163	199	180
Taxi in	55	57	66	62
Taxi out	40	30	40	34
Taxi total (trips)	95	87	106	96

3.6.28 Paragraphs 6.7.265 and 6.7.266 of the main TA are replaced to include the revised forecasts:

“Vehicle occupancy rates at 1.3 were applied to estimates of the generated passenger trips for car (short stay), kiss and ride, and taxi modes, resulting in the vehicle trips shown in Table 285 and Table 286. This takes into account return Kiss and Ride and taxi vehicles.

The revised scheme is likely to generate some additional demand for taxi trips, with an estimated 95 additional taxi passengers (overall 2 way) in the am peak hour in 2026 (Phase 1), rising to 106 in 2041 (Phase 2). The 106 person trips by taxi (2-way) equates to 102 taxis per hour in the peak direction for the 2041 AM peak including the empty taxis.”

3.6.29 Tables 6-259 and 6-260 in the main TA are replaced by Table 285 and Table 286.

Table 285: Old Oak Common station car only (vehicles 1-way)

	2026 AM	2026 PM	2041 AM	2041 PM
Car (Vehs)	265	262	296	268
CAR in	133	122	149	135
Car out	132	120	147	133

Table 286: Old Oak Common station taxi flows (vehicles 1-way)

Vehicles	2026 AM	2026 PM	2041 AM	2041 Pm
Taxi in	42	44	51	48
Taxi out	43	43	51	48

- 3.6.30 As a consequence of the revised forecasts, paragraph 6.7.271 is replaced by:
- 3.6.31 “The analysis is summarised in Table 287 and shows that as a maximum there will be under 398 total car and taxi vehicle movements overall (2-way) in the AM peak in 2041. As indicated above, there are estimated to be nearly 200 vehicles in each direction in 2041 when account is taken of empty taxi and Kiss-and-Ride trips.”
- 3.6.32 Table 6-262 is replaced by Table 287.

Table 287: Old Oak Common station vehicle movements (2 way)

	2026 AM	2026 PM	2041 AM	2041 PM
vehicle occupancy	1.3	1.3	1.3	1.3
Car (parked)	9	8	10	9
Taxi	86	87	102	96
Kiss and Ride	253	234	286	258
total vehs	350	330	398	364

Highway flow impacts 2026 & 2041

- 3.6.33 In relation to CFA5, the tables presented below show traffic flow changes and junction performance as a result of the revised scheme in both CFA4 and CFA5. Paragraph 6-8-113 to 6-8-128 and Table 6-309 to Table 6-315 are deleted in their entirety and replaced with the data in the combined CFA4 and CFA5 tables below.
- 3.6.34 Tables 6-264 and 6-265 in the main TA, which show the 2026 AM and PM peak baseline flows and the 2026 operational scenario flows, have been replaced Table 288 and Table 289.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

Table 288: WELHAM highway assignment CFA4 and CFA5 AM (08:00-09:00) 2026 Operation

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WELHAM AM Flows	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
CFA4									
Kilburn High Road (south of Belsize Road)	NB	654	85	658	85	4	0	1%	0%
	SB	846	120	851	120	5	0	1%	0%
Salisbury Road (north of Premier Corner)	NB	403	9	414	9	10	0	3%	-1%
	SB	763	9	782	10	19	0	3%	5%
Premier Corner (north of Kilburn Lane)	NB	680	44	685	44	5	0	1%	-1%
Chamberlayne Road (north of Kilburn Lane)	NB	493	51	480	50	-13	-1	-3%	-1%
	SB	785	57	791	58	5	0	1%	0%
Harrow Road (west of College Road)	WB	433	47	428	47	-5	0	-1%	-1%
	EB	413	35	405	36	-8	1	-2%	2%
Scrubs Lane (north of Hythe Road)	NB	458	32	474	33	16	1	4%	2%
	SB	811	53	836	53	25	0	3%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WELHAM AM Flows	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Old Oak Common Lane (north of Wulfstan Street)	NB	306	16	246	38	-60	23	-20%	145%
	SB	364	22	284	42	-80	21	-22%	96%
Old Oak Common Lane (south of Du Cane Road)	NB	620	29	649	30	29	1	5%	3%
	SB	372	26	374	26	2	0	1%	-2%
Wales Farm Road	SB	1261	70	1319	68	58	-2	5%	-3%
Victoria Road (north of Park Royal Road)	NB	1063	69	1146	68	83	-1	8%	-2%
Park Royal Road	NB	390	48	406	49	16	1	4%	1%
	SB	316	24	313	24	-3	0	-1%	0%
CFA5									
Coronation Road	EB	136	8	136	8	0	0	0%	0%
	WB	123	12	124	12	0	0	0%	0%
Connell Crescent bridge	EB	837	25	830	24	-7	-1	-1%	-4%
	WB	249	24	249	24	1	0	0%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WELHAM AM Flows	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Hanger Lane East Bridge	SB	4790	350	4817	351	27	1	1%	0%
Hanger Lane West Bridge	NB	4342	220	4338	226	-3	5	0%	2%
Alperton Lane	NB	638	54	652	50	14	-5	2%	-8%
	SB	370	2	371	2	1	0	0%	2%
Bideford Avenue	NB	19	0	15	0	-3	0	-17%	0%
	SB	411	9	413	9	1	0	0%	1%
Horsenden Lane	NB	363	12	363	12	0	0	0%	0%
	SB	280	16	279	16	0	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	547	27	554	27	7	0	1%	0%
	SB	821	32	825	32	3	0	0%	-1%
Greenford Road (south of Uneeda Drive)	NB	970	56	973	56	3	0	0%	0%
	SB	1013	64	1013	63	1	-1	0%	-1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WELHAM AM Flows	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Oldfield Lane (north of Uneeda Drive)	NB	364	13	362	13	-1	0	0%	0%
	SB	555	14	554	14	-1	0	0%	-1%
Mandeville Road (north of Eastcote Lane)	NB	1398	44	1395	44	-3	0	0%	0%
	SB	791	38	792	38	1	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1825	77	1824	77	-1	0	0%	0%
	SB	959	64	964	64	5	0	1%	0%
Eastcote Lane	EB	1160	16	1154	16	-6	0	-1%	0%
	WB	262	16	262	16	0	0	0%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

Table 289: WELHAM highway assignment CFA4-5 PM (17:00-18:00) 2026 Operation

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WeLHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
CFA4									
Kilburn High Road (south of Belsize Road)	NB	608	70	613	71	5	0	1%	0%
	SB	603	67	607	67	4	0	1%	0%
Salisbury Road (north of Premier Corner)	NB	596	6	595	6	-1	0	0%	0%
	SB	429	2	438	2	9	0	2%	6%
Premier Corner (north of Kilburn Lane)	NB	845	38	844	38	-1	0	0%	0%
Chamberlayne Road (north of Kilburn Lane)	NB	591	49	597	48	6	0	1%	0%
	SB	526	45	537	45	11	0	2%	0%
Harrow Road (west of College Road)	WB	471	28	471	28	1	0	0%	0%
	EB	436	26	447	26	10	0	2%	0%
Scrubs Lane (north of Hythe Road)	NB	1075	29	1075	30	0	1	0%	4%
	SB	487	16	500	16	14	1	3%	5%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WeLHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Old Oak Common Lane (north of Wulfstan Street)	NB	421	17	365	39	-56	22	-13%	132%
	SB	336	11	198	32	-138	21	-41%	194%
Old Oak Common Lane (south of Du Cane Road)	NB	680	28	764	28	84	0	12%	-2%
	SB	417	18	386	17	-31	-1	-7%	-6%
Wales Farm Road	SB	1226	39	1315	39	89	0	7%	1%
Victoria Road (north of Park Royal Road)	NB	889	40	967	41	78	1	9%	1%
Park Royal Road	NB	552	24	564	24	12	0	2%	-1%
	SB	271	17	308	17	37	1	14%	3%
CFA5									
Coronation Road	EB	211	6	201	6	-10	0	-5%	1%
	WB	167	12	167	12	0	0	0%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WELHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Connell Crescent bridge	EB	216	12	214	13	-2	0	-1%	2%
	WB	539	11	547	11	8	0	1%	-3%
Hanger Lane East Bridge	SB	4539	162	4563	162	25	0	1%	0%
Hanger Lane West Bridge	NB	4697	162	4716	160	19	-1	0%	-1%
Alperton Lane	NB	812	5	814	5	2	0	0%	0%
	SB	222	0	224	0	2	0	1%	-1%
Bideford Avenue	NB	23	0	23	0	0	0	0%	0%
	SB	471	7	482	6	11	0	2%	-7%
Horsenden Lane	NB	402	12	408	12	6	0	1%	1%
	SB	314	10	314	10	0	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	719	17	721	17	2	0	0%	0%
	SB	750	10	752	9	1	0	0%	-1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2026		2026 Operation with HS2					
WELHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2026 Future Baseline All Vehicles	Change from 2026 Future Baseline HGV	Change from 2026 Future Baseline All Vehicles %	Change from 2026 Future Baseline HGV %
Greenford Road (south of Uneeda Drive)	NB	1269	44	1275	44	7	0	1%	0%
	SB	1099	27	1099	27	1	0	0%	0%
Oldfield Lane (north of Uneeda Drive)	NB	665	13	664	13	0	0	0%	0%
	SB	472	14	471	14	-1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1297	59	1306	59	9	0	1%	0%
	SB	990	18	992	18	2	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1744	81	1741	81	-3	0	0%	0%
	SB	485	37	482	37	-4	0	-1%	0%
Eastcote Lane	EB	690	11	692	11	2	0	0%	0%
	WB	878	45	869	45	-9	0	-1%	0%

3.6.35 There is no material adverse change to the highway forecasts shown in Figures 6-202 and 6-203 in the main TA as a result of the revised scheme. There are a lower number of roads where increases of 10% for either general traffic or HGVs are forecast with the revised scheme, when compared to the main TA. This is reflected in the following replacement for paragraph 6.7.287 of the main TA:

“The revised scheme is expected to result in increases in peak hour traffic flows of more than 10% in 2026 on four roads near to Old Oak Common Station in CFA4 as shown below in Table 290. It should be noted that the forecast increase on Old Oak Common Lane is mainly attributable to the provision of new bus services. There are no roads in CFA5 where traffic is forecast to increase by more than 10%.”

3.6.36 Table 6-266 is replaced by Table 290.

Table 290: Summary of impacted links CFA4-5 2026 Operation (AM & PM 2-way average)

2026 Operation		Increase in General Traffic		Increase in Buses and HGVs	
CFA	Roads impacted by increase	PCU	%	Vehicles	%
4	Du Cane Rd	86	13%	N/A	N/A
4	Fitzneal Street	80	15%	N/A	N/A
4	Old Oak Common Lane	N/A	N/A	41	202%
4	Central Way	N/A	N/A	1	10%

3.6.37 The results of the highway assignment for the 2041 operational scenario AM and PM peak hours are tabulated in Table 291 and Table 292. These tables replace Tables 6-267 and 6-268 in the main TA.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

Table 291: WELHAM highway assignment CFA4 and CFA5 2041 AM (08:00-09:00) Operation

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WeLHAM AM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
CFA4									
Kilburn High Road (south of Belsize Road)	NB	653	84	650	84	-4	0	-1%	0%
	SB	875	123	883	123	8	0	1%	0%
Salisbury Road (north of Premier Corner)	NB	471	8	471	8	0	0	0%	-3%
	SB	793	11	803	11	10	0	1%	1%
Premier Corner (north of Kilburn Lane)	NB	773	44	767	43	-6	-1	-1%	-1%
Chamberlayne Road (north of Kilburn Lane)	NB	521	50	523	51	3	1	0%	1%
	SB	802	58	808	58	6	0	1%	0%
Harrow Road (west of College Road)	WB	455	46	455	48	0	1	0%	2%
	EB	414	36	413	34	-2	-2	0%	-6%
Scrubs Lane (north of Hythe Road)	NB	501	32	523	33	22	1	4%	3%
	SB	817	53	839	55	22	2	3%	3%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WeLHAM AM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Old Oak Common Lane (north of Wulfstan Street)	NB	341	18	293	39	-49	21	-14%	118%
	SB	364	21	289	41	-76	21	-21%	99%
Old Oak Common Lane (south of Du Cane Road)	NB	635	31	673	31	38	-1	6%	-2%
	SB	385	26	390	25	5	0	1%	-1%
Wales Farm Road	SB	1335	69	1406	68	71	-1	5%	-1%
Victoria Road (north of Park Royal Road)	NB	1138	66	1200	63	62	-3	5%	-4%
Park Royal Road	NB	415	46	434	47	19	1	5%	2%
	SB	328	21	332	21	5	-1	1%	-3%
CFA5									
Coronation Road	EB	137	8	137	8	0	0	0%	-1%
	WB	127	12	127	12	0	0	0%	0%
Connell Crescent bridge	EB	877	25	885	25	8	0	1%	0%
	WB	275	29	276	29	1	1	0%	2%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WeLHAM AM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Hanger Lane East Bridge	SB	4952	344	4975	345	22	0	0%	0%
Hanger Lane West Bridge	NB	4550	246	4552	250	3	4	0%	2%
Alperton Lane	NB	746	25	766	23	20	-2	3%	-8%
	SB	401	2	397	2	-4	0	-1%	-1%
Bideford Avenue	NB	19	0	15	0	-4	0	-22%	4%
	SB	472	10	474	10	3	0	1%	1%
Horsenden Lane	NB	365	12	367	12	2	0	1%	0%
	SB	284	16	284	16	0	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	548	25	546	24	-2	0	0%	0%
	SB	833	31	834	32	1	0	0%	0%
Greenford Road (south of Uneeda Drive)	NB	983	56	973	56	-9	0	-1%	0%
	SB	1014	66	1015	66	2	0	0%	-1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WeLHAM AM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Oldfield Lane (north of Uneeda Drive)	NB	441	15	440	15	-1	0	0%	0%
	SB	600	15	600	15	1	0	0%	0%
Mandeville Road (north of Eastcote Lane)	NB	1420	46	1424	46	4	0	0%	0%
	SB	823	38	823	38	0	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1740	78	1742	78	1	0	0%	0%
	SB	865	64	869	64	4	0	0%	0%
Eastcote Lane	EB	1315	16	1318	16	3	0	0%	0%
	WB	305	17	306	17	1	0	0%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

Table 292: WELHAM highway assignment CFA4 and CFA5 2041 PM (17:00-18:00) Operation

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WeLHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
CFA4									
Kilburn High Road (south of Belsize Road)	NB	648	71	651	71	3	0	0%	0%
	SB	638	67	639	67	2	0	0%	0%
Salisbury Road (north of Premier Corner)	NB	615	6	618	6	3	0	0%	0%
	SB	494	2	507	2	13	0	3%	4%
Premier Corner (north of Kilburn Lane)	NB	878	39	877	39	-1	0	0%	0%
Chamberlayne Road (north of Kilburn Lane)	NB	633	48	643	49	9	0	1%	0%
	SB	565	45	574	45	9	0	2%	1%
Harrow Road (west of College Road)	WB	463	28	461	27	-2	-1	0%	-3%
	EB	395	26	404	26	9	0	2%	0%
Scrubs Lane (north of Hythe Road)	NB	1076	30	1085	29	9	0	1%	-1%
	SB	499	15	522	16	23	1	5%	4%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WELHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Old Oak Common Lane (north of Wulfstan Street)	NB	444	16	377	40	-67	23	-15%	144%
	SB	402	11	217	32	-185	22	-46%	203%
Old Oak Common Lane (south of Du Cane Road)	NB	650	27	780	28	130	1	20%	3%
	SB	438	18	405	17	-33	-1	-7%	-3%
Wales Farm Road	SB	1351	42	1437	40	86	-1	6%	-3%
Victoria Road (north of Park Royal Road)	NB	963	41	1003	40	39	-1	4%	-3%
Park Royal Road	NB	584	25	597	24	12	0	2%	-1%
	SB	303	19	328	18	25	-1	8%	-7%
CFA5									
Coronation Road	EB	210	6	207	6	-3	0	-2%	0%
	WB	170	10	169	10	0	0	0%	0%
Connell Crescent bridge	EB	236	14	237	13	1	0	0%	-3%
	WB	555	9	559	10	4	0	1%	3%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WeLHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Hanger Lane East Bridge	SB	4660	162	4690	161	30	-1	1%	0%
Hanger Lane West Bridge	NB	4836	157	4867	156	30	0	1%	0%
Alperton Lane	NB	810	4	805	4	-5	0	-1%	-1%
	SB	288	0	290	0	2	0	1%	-11%
Bideford Avenue	NB	24	0	23	0	0	0	-2%	0%
	SB	496	6	507	6	11	0	2%	0%
Horsenden Lane	NB	420	11	422	12	2	1	0%	5%
	SB	316	10	315	10	-1	0	0%	0%
Greenford Road (north of Uneeda Drive)	NB	728	17	727	17	-1	0	0%	0%
	SB	765	7	767	6	3	-1	0%	-12%
Greenford Road (south of Uneeda Drive)	NB	1258	43	1260	43	2	0	0%	0%
	SB	1109	25	1108	24	-1	-1	0%	-3%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

WELHAM Screenline Analysis		Future Baseline 2041		2041 Operation with HS2					
WELHAM PM Flows (Vehicles)	Direction	All Vehicles	HGV	All Vehicles	HGV	Change from 2041 Future Baseline All Vehicles	Change from 2041 Future Baseline HGV	Change from 2041 Future Baseline All Vehicles %	Change from 2041 Future Baseline HGV %
Oldfield Lane (north of Uneeda Drive)	NB	729	15	729	15	0	0	0%	0%
	SB	539	15	538	16	-1	1	0%	5%
Mandeville Road (north of Eastcote Lane)	NB	1314	56	1319	57	5	0	0%	0%
	SB	980	17	982	17	2	0	0%	0%
Mandeville Road (south of Eastcote Lane)	NB	1809	78	1807	78	-1	0	0%	0%
	SB	497	33	494	33	-3	0	-1%	0%
Eastcote Lane	EB	745	11	747	11	2	0	0%	0%
	WB	1000	45	995	45	-5	0	0%	0%

3.6.38 There is no material adverse change to the highway forecasts shown in Figures 6-204 and 6-205 in the main TA as a result of the revised scheme. As in the 2026 operational scenario, there are a lower number of roads where increases of 10% for either general traffic or HGVs are forecast with the revised scheme, when compared to the main TA. This is reflected in the following replacement to paragraph 6.7.294:

“The revised scheme is expected to result in increases in peak hour traffic flows of more than 10% in 2041 on four roads near to Old Oak Common Station in CFA4 as shown below in Table 293. It should be noted that the forecast increase on Old Oak Common Lane is mainly attributable to the provision of new bus services. There are no roads in CFA5 where traffic is forecast to increase by more than 10%.”

3.6.39 Table 6-269 in the main TA is replaced by Table 293.

Table 293: Summary of impacted links CFA4-5 2041 Operation (AM & PM 2-way average).

2041 Operation		Increase in General Traffic		Increase in Buses and HGVs	
CFA	Roads impacted by increase	PCU	%	Vehicles	%
4	Du Cane Rd	133	20%	*	*
4	Fitzneal Street	129	25%	*	*
4	Old Oak Common Lane	*	*	41	196%
4	Central Way	*	*	1	11%

Junction performance in 2026 & 2041

3.6.40 As a consequence of the revised traffic forecasts, paragraphs 6.7.299 to 6.7.309 and Tables 6-270 to 6-278 Table 294 to Table 302 in the main TA are deleted. The following section, including Table 294 to Table 302, provides a replacement.

Salisbury Road / Carlton Vale / Fernhead Road

Table 294 shows the changes in flows at this junction and replaces Table 6-270 in the main TA. Salisbury Road carries the highest traffic flow in both the AM and PM peak. However the modelling indicates that the junction operates within capacity under all operational scenarios, with no material increase with the revised scheme”.

Table 294: CFA4 and CFA5 2026 & 2041 Junction Operation Salisbury Road/Carlton Vale.

Salisbury Road / Carlton Vale / Fernhead Road	2026 AM baseline			2026 AM Reference + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Salisbury Road	1162	21	0	1176	21	0	1216	22	0	1221	22	0
Carlton Vale	491	12	0	497	12	0	561	14	0	558	14	0

Fernhead Road	143	17	0	146	18	0	152	19	0	150	19	0
Kilburn Lane* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Salisbury Road	882	16	0	1176	21	0	966	17	0	975	18	0
Carlton Vale	494	12	0	497	12	0	509	13	0	509	13	0
Fernhead Road	258	30	0	146	18	0	264	31	0	262	31	0
Kilburn Lane* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*

Premier Corner / Kilburn Lane

3.6.41 Table 295 shows the traffic flow changes at this junction and replaces Table 6-271 in the main TA. The modelling indicates that the junction operates within capacity under all operational scenarios and there is no material increase with the revised scheme.

Table 295: CFA4 and CFA5 2026 & 2041 Junction Operation Premier Corner /Kilburn Lane

Premier Corner / Kilburn Lane	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Premier Corner* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*
Kilburn Lane (WB)	943	16	0	964	17	0	1026	18	0	1026	18	0
Kilburn Lane (EB)	396	31	0	390	30	0	442	34	0	434	33	0
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Premier Corner* (1 way out)	*	*	*	*	*	*	*	*	*	*	*	*
Kilburn Lane (WB)	920	16	0	964	17	0	968	17	0	968	17	0
Kilburn Lane (EB)	394	33	0	390	30	0	419	34	0	420	35	0

Salisbury Road / Brondesbury Road / Harvist Road

3.6.42 Table 296 shows the changes in flows at this junction and replaces Table 6-272 in the main TA. Salisbury Road northbound carries the highest traffic flow in both the AM

and PM peak. The modelling indicates that the junction operates within capacity under all operational scenarios, with the AM peak hour experiencing slightly higher levels of saturation (at 70% saturation). There will be no material increase with the revised scheme either in degree of saturation or queues.

Table 296: CFA4 and CFA5 2026 & 2041 Junction Operation Salisbury Road/Harvist Road

Salisbury Road / Brondesbury Road / Harvist Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Salisbury Road (SB)	528	75	9	536	76	9	520	74	8	524	75	8
Brondesbury Road	336	35	6	335	35	6	357	38	6	354	37	6
Salisbury Road (NB)	415	46	6	425	48	6	482	53	7	481	54	7
Harvist Road	212	33	4	225	35	4	241	38	4	249	40	4
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Salisbury Road (SB)	332	43	5	536	76	9	361	46	5	363	46	5
Brondesbury Road	203	28	4	335	35	6	233	32	5	235	32	5
Salisbury Road (NB)	603	46	8	425	48	6	623	48	8	626	48	8
Salisbury Road (NB)	110	21	2	225	35	4	119	24	2	124	25	2

Old Oak Common Lane / Du Cane Road

3.6.43 Table 297 shows the changes in flows at this junction and replaces table 6-273 in the main TA. Old Oak Common Lane northbound carries the highest traffic flow in both the AM and PM peak in the baseline periods, but with Old Oak Common Lane northbound experiencing the highest levels of saturation. There is a 2% saturation change in the AM peak period with HS2, but a maximum 8 % increase in the PM period 2026, and 13% increase in 2041. However queue lengths remain little affected. These increases are likely to be due to a combination of some additional traffic accessing the station routing via the junction and diversionary impacts.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

Table 297: CFA4 and CFA5 2026 & 2041 Junction Operation Old Oak common /Du Cane Road

Old Oak Common Lane / Du Cane Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Old Oak Common Lane (SB)	247	55	10	247	55	10	254	57	10	256	57	10
Du Cane Road	71	42	2	71	42	2	71	42	2	71	42	2
Old Oak Common Lane (NB)	654	50	11	684	52	12	671	50	11	708	52	12
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Old Oak Common Lane (SB)	351	47	10	247	55	10	367	49	10	308	42	9
Du Cane Road	177	34	4	71	42	2	183	35	4	212	41	5
Old Oak Common Lane (NB)	712	78	17	684	52	12	681	74	16	811	87	19

Old Oak Common Lane / Western Avenue / Old Oak Road

3.6.44 Table 298 shows the changes in flows at this junction and replaces Table 6-274 in the main TA. There are no material changes to the observations made on junction performance in paragraph 6.7.303 of the main TA.

Table 298: CFA4 and CFA5 2026 & 2041 Junction Operation Old Oak Common Lane/Western Avenue

Old Oak Common Lane / Western Avenue / Old Oak Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Old Oak Common Lane (SB)	401	100	12	403	101	12	414	101	12	418	102	12
A40 West Way	2461	89	48	2477	90	48	2614	95	50	2625	95	50
Old Oak Road	*	*	*	*	*	*	*	*	*	*	*	*
Old Oak Common Lane (NB)	1495	92	27	1500	94	27	1560	93	27	1566	92	27
A40 Western Avenue (EB)	3795	84	43	3823	85	43	3887	85	43	3916	85	43

Old Oak Common Lane / Western Avenue / Old Oak Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Old Oak Common Lane (SB)	436	91	13	403	101	12	457	92	13	423	101	12
A40 West Way	2729	96	50	2477	90	48	2780	98	51	2784	98	51
Old Oak Road	*	*	*	*	*	*	*	*	*	*	*	*
Old Oak Common Lane (NB)	1489	90	26	1500	94	27	1518	91	26	1527	92	26
A40 Western Avenue (EB)	3029	70	33	3823	85	43	3201	73	35	3385	77	37

Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road

3.6.45 Table 299 shows the changes in flows at this junction and replaces Table 6-275 in the main TA. Victoria Road and Old Oak Lane carry the highest flows at the Old Oak Common Lane junction, and experience the highest levels of saturation. Flow changes with the scheme on the Old Oak common Lane arm increase by up to 20 percent, and the degree of saturation on this arm also increases substantially 55 to 71 percent in the PM peak. With detailed re-optimisation this would be expected to be substantially lower. These increases are likely to be due to a combination of traffic accessing the station routeing via the junction and diversionary impacts.

Table 299: CFA4 and CFA5 2026 & 2041 Junction Operation Atlas Road/ Old Oak Common

Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Atlas Road	13	1	0	13	5	0	15	1	0	15	6	0
Old Oak Lane (SB)	810	74	0	732	77	16	816	74	0	752	79	16
Old Oak Common Lane (NB)	367	43	0	456	68	9	405	47	0	517	77	10
Victoria Road (NB)	365	38	0	400	48	8	394	41	0	427	51	8
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		

Atlas Road / Old Oak Lane / Old Oak Common Lane / Victoria Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Atlas Road	147	27	2	0	13	5	0	29	3	0	29	14
Old Oak Lane (SB)	660	522	50	0	732	77	16	577	58	0	511	54
Old Oak Common Lane (NB)	421	474	51	0	564	67	12	497	55	0	599	71
Victoria Road (NB)	441	550	59	2	400	48	8	605	63	2	583	92

Bethune Road / Victoria Road

3.6.46 Table 300 shows the changes in flows at this junction and replaces Table 6-276 in the main TA. Victoria Road carries the main flow to and from the A40. Bethune Road is a small side road. Access onto Victoria Road will in fact be closed off as part of the scheme but the assessment helps to illustrate the volume of traffic that would be expected to transfer to alternative routes with operation of the revised scheme

Table 300: CFA4 and CFA5 2026 & 2041 Junction Operation Bethune Road /Victoria Road

Bethune Road / Victoria Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Bethune Road	193	44	0	195	48	1	211	50	1	211	54	1
Victoria Road (SB)	568	31	0	597	32	0	594	32	0	646	35	0
Victoria Road (NB)	401	22	0	474	25	0	434	23	0	489	26	0
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Bethune Road	305	65	1	195	48	1	300	68	1	258	63	1
Victoria Road (SB)	563	31	0	597	32	0	647	36	0	704	39	0
Victoria Road (NB)	404	22	0	474	25	0	454	25	0	474	26	0

Western Avenue / A4000 Wales Farm Road

3.6.47 Table 301 shows the changes in flows at this junction and replaces Table 6-277 in the main TA. The Wales Farm Road /Western Avenue node forms part of the Gypsy Corner junction. Again flows are dominated by the Western Avenue arms. In terms of the RFC the incremental impact of the scheme is 11% on an approach arm, but under 2% overall.

Table 301: CFA4 and CFA5 2026 & 2041 Junction Operation Western Avenue/Wales Farm Road

Western Avenue / A4000 Wales Farm Road	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Western Avenue (EB)	3374	88	25	3403	88	25	3465	88	25	3495	89	25
Wales Farm Road	1346	70	35	1402	73	37	1419	74	37	1489	77	39
Wesrn Avenue (WB)	2657	55	30	2691	56	30	2778	56	31	2797	56	31
A4000	*	*	*	*	*	*	*	*	*	*	*	*
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Western Avenue (EB)	2774	77	25	3403	88	25	2936	80	26	3031	83	27
Wales Farm Road	1269	62	32	1402	73	37	1398	68	35	1483	72	37
Western Avenue (WB)	2829	60	34	2691	56	30	2887	61	34	2910	61	34
A4000	*	*	*	*	*	*	*	*	*	*	*	*

Friary Road / Horn Lane

3.6.48 Table 302 shows the changes in flows at this junction and replaces table 6-278 in the main TA.

3.6.49 Horn Lane southbound experiences the highest level of saturation, with a maximum 20% change on the Friary Road (WB) arm, and with an average of just over 2% change on all arms. Queue lengths are effectively unchanged.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (CFA4 and CFA5)

Table 302: CFA4 and CFA5 2026 & 2041 Junction Operation Friary Road/Horn Lane junction

Friary Road / Horn Lane	2026 AM baseline			2026 AM baseline + HS2 Operation			2041 AM baseline			2041 AM baseline + HS2 Operation		
	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)	Flow (pcu)	RFC (%)	Max Queue (pcu)
Horn Lane (SB)	690	90	9	689	90	9	700	90	9	693	89	9
Friary Road (WB)	313	72	7	320	74	7	334	76	7	341	78	7
Horn Lane (NB)	772	92	10	766	92	10	769	92	10	769	91	10
	2026 PM baseline			2026 PM baseline + HS2 Operation			2041 PM baseline			2041 PM baseline + HS2 Operation		
Horn Lane (SB)	564	93	6	689	90	9	551	90	5	548	90	5
Friary Road (WB)	328	54	4	320	74	7	334	55	4	343	56	4
Horn Lane (NB)	625	92	6	766	92	10	646	93	6	645	92	6

Summary of impacts on junction performance

3.6.50 There are no material changes to the observations and conclusions previously drawn in the main TA as a result of the revised scheme.

Impact on parking, accidents and safety and pedestrians 2026 & 2041

3.6.51 There are no changes to the impacts on parking, accidents & safety, and pedestrians in CFA4 and CFA5 reported in the main TA arising from the revised scheme.

3.7 London region sensitivity analysis – public transport

Context

- 3.7.1 In order to test the revised scheme against potential, but as yet unconsented, transport infrastructure and development schemes in London, a number of sensitivity tests have been undertaken. The main objective of undertaking the sensitivity tests was to ascertain any potential capacity issues on the transport network when the proposals for HS2 were combined with any of these potential schemes and to understand how any of these schemes could help mitigate the transport impacts of HS2.
- 3.7.2 The scale of a number of these schemes means that they are likely to have generation, re-distribution or mode shift impacts, i.e. they could generate new demand or lead to a change in origin or destination due to new travel opportunities or could affect a shift from other modes including private car. For these reasons, and because TfL's Railplan model uses a fixed demand, it was necessary to run TfL's London Transportation Studies (LTS) model which takes trip generation, redistribution and modal choice into account.
- 3.7.3 Given the nature of these sensitivity tests, they have generally focussed on the completed high speed station with the HS2 Phase Two service operation for the 2041 AM peak period only. The exception is the Euston Area Plan (EAP) with Crossrail 2 which was also run for the PM peak period. This consequently includes HS2 demand resulting from the HS2 Phase Two operation network.
- 3.7.4 The sensitivity tests undertaken are set out in Table 303. The impact of these schemes, in terms of station impacts, line loadings and crowding, are covered in the following sections with all comparisons made against the 2041 AM future baseline plus HS2 operation scenario in order to isolate the incremental impact of each scheme. For the Euston Area Plan (with Crossrail 2) test, the impact of the development is identified by comparison with the Crossrail 2 test.

Table 303: Railplan sensitivity tests

Scenario	Year/time period
2041 future baseline plus HS2 Phase Two operation	2041 AM peak
	2041 AM peak
Crossrail 1 link to / from the WCML	2041 AM peak
Crossrail 2	2041 AM peak
Euston Area Plan with Crossrail 2	2041 AM peak and 2041 PM peak
Overground connectivity at Old Oak Common	2041 AM peak
Old Oak Common OAPF with Overground connectivity	2041 AM peak

Crossrail 1 link to/from the WCML

Scheme details

- 3.7.5 This scheme would provide a link between the Great West Main Line (GWML) and West Coast Main Line (WCML), allowing Crossrail services access to destinations on the WCML, and Crossrail services would replace some of the London Midland services that currently run into Euston station. This would have the impact of reducing the number of 'classic' passengers travelling into Euston station, helping reduce congestion at the station. The scheme was identified in the Network Rail London and South East Route Utilisation Study (RUS) (2011).
- 3.7.6 This scenario extends six Crossrail trains per hour from Old Oak Common onto the West Coast Main Line replacing certain London Midland services to/from Euston station. All Crossrail 1 trains operating to/from the WCML would call at Old Oak Common. Services provided across the three hour morning peak are set out in Table 304 for south-eastbound services. Calling patterns for these services are:
- Berkhamsted, Hemel Hempstead, Watford Junction, Bushey, Harrow & Wealdstone, Wembley Central, Old Oak Common, Paddington and all Crossrail stations east of Paddington;
 - Berkhamsted, Hemel Hempstead, Apsley, Kings Langley, Watford Junction, Old Oak Common, Paddington and all Crossrail stations east of Paddington; and
 - Bushey, Harrow & Wealdstone, Wembley Central, Old Oak Common, Paddington and all Crossrail stations east of Paddington.

Table 304: Crossrail south/eastbound services

Number	Origin	Destination	Trains/three hours	Calling pattern	Comment
1	Tring	Shenfield	6	As a)	-
2	Tring	Abbey Wood	6	As b)	-
4	Watford Junction	Shenfield	12	As c)	-
5	Old Oak Common	Abbey Wood	6	NA	18 in future baseline plus operation
6	Old Oak Common	Shenfield	6	NA	

- 3.7.7 London Midland southbound residual services are assumed to be:
- one train per hour from Milton Keynes plus one train per hour from Bletchley to Euston calling all stations to Watford Junction, Bushey and Harrow Wealdstone; and
 - the other trains in the peak period which run non-stop south of Leighton Buzzard, or call just at Berkhamsted or Watford Junction, are unchanged.

3.7.8 Services provided across the three hour morning peak are set out in Table 305 for north and westbound services. Calling patterns for these services are as in the opposite direction.

Table 305: Crossrail west/northbound services

Number	Origin	Destination	Trains per peak period	Calling pattern	Comment
1	Shenfield	Tring	6	As a)	-
2	Abbey Wood	Tring	6	As b)	-
3	Shenfield	Watford Junction	12	As c)	-
4	Abbey Wood	Old Oak Common	6	NA	18 in future baseline plus operation
5	Shenfield	Old Oak Common	6	NA	

3.7.9 London Midland northbound residual services are assumed to be:

- one train per hour Euston to Milton Keynes plus one train per hour Euston to Bletchley calling stations as in the opposite direction; and
- the hourly faster services which make limited stops, e.g. Watford Junction, Berkhamsted, Leighton Buzzard and Milton Keynes are unchanged.

3.7.10 The following services were assumed to be unchanged:

- Southern services via the West London Line;
- the longer distance faster London Midland services that stop south of Leighton Buzzard and most at Berkhamsted and Watford Junction; and
- Crossrail services that run to destinations beyond Old Oak Common on the GWML.

Comparison with 2041 AM Revised Scheme

Station demand

3.7.11 Table 306 shows minor impacts on the balance of HS2 flows between Euston and Old Oak Common. However, there is a substantial reduction in boarding and alighting NR suburban passenger at Euston of 1,880 and 9,610 respectively. At Old Oak Common, there are reductions in boarding passengers of 1,460 on eastbound NR slow services (these include Crossrail) and reductions in alighting passengers of 640 from eastbound NR fast services. These changes are a direct result of the Crossrail connections to the WCML offering alternatives to services from both Euston and Old Oak Common.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Table 306: 2041 AM Euston station demand, 07:00 to 10:00

Description	HS2 Phase Two operation 2041 AM			Crossrail 1 to/from WCML sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (outbound)	5,126	-	5,126	3,247	-	3,247
Euston suburban (inbound)	-	26,359	26,359	-	16,747	16,747
Euston inter-city (outbound)	3,880	-	3,880	3,855	-	3,855
Euston inter-city/other (inbound)	-	8,703	8,703	-	8,708	8,708
Euston HS2 (outbound))	17,615	-	17,615	17,377	-	17,377
Euston HS2 (inbound)	-	26,044	26,044	-	26,182	26,182
Sub-total: Euston NR	26,621	61,106	87,727	24,479	51,637	76,116
Euston LU						
Euston Northern line (Charing Cross branch) northbound	3,385	5,508	8,893	3,271	5,337	8,608
Euston Northern line (Charing Cross branch) southbound	8,452	4,610	13,062	7,139	4,575	11,714
Euston Northern line (Bank branch) northbound	5,244	5,199	10,443	5,132	4,921	10,053
Euston Northern line (Bank branch) southbound	7,045	10,664	17,709	5,931	10,618	16,549
Euston Victoria line (northbound)	4,497	13,090	17,587	4,174	12,883	17,057
Euston Victoria line (southbound)	15,866	8,707	24,573	14,459	8,567	23,026
Sub-total: Euston LU	44,489	47,778	92,267	40,106	46,901	87,007
Euston Square LU						
Euston Square sub-surface lines (northbound/westbound)	5,376	11,372	16,748	4,901	11,088	15,989
Euston Square sub-surface lines (southbound/eastbound)	16,299	8,321	24,620	14,665	8,316	22,981
Sub-total: Euston Square LU	21,675	19,693	41,368	19,566	19,404	38,970
Old Oak Common (OOC)						
OOC NR slow (outbound)	1,769	9,016	10,785	2,842	9,266	12,108

Description	HS2 Phase Two operation 2041 AM			Crossrail 1 to/from WCML sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
OOO NR slow (inbound)	22,527	3,719	26,246	21,068	4,854	25,922
OOO NR fast (outbound)	7,011	-	7,011	7,497	-	7,497
OOO NR fast (inbound)	-	17,820	17,820	-	17,183	17,183
OOO HS2 (inbound)	-	7,925	7,925	-	7,787	7,787
OOO HS2 (outbound)	8,451	-	8,451	8,689	-	8,689
Sub-total: OOO	39,758	38,480	78,238	40,096	39,090	79,186

Demand at other stations

3.7.12 Table 307 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than 100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.

Table 307: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	HS2 Phase Two operation 2041 AM	Crossrail 1 to/from WCML sensitivity test 2041 AM	Absolute difference	% difference
Euston (including Euston Square)	137,129	126,740	-10,389	-8%
Bond Street	48,564	49,943	1,379	3%
Tottenham Court Road	49,703	50,580	877	2%
Farringdon	92,457	93,282	825	1%
Paddington	66,926	67,374	448	1%
King's Cross	76,284	76,585	301	0%
Piccadilly Circus	19,964	20,114	150	1%
St James' Park	24,806	24,942	136	1%
Lancaster Gate	3,151	3,274	123	4%
Westminster	38,307	38,418	111	0%
Warren Street	28,182	28,074	-108	0%
Green Park	41,258	41,130	-128	0%

Station	HS2 Phase Two operation 2041 AM	Crossrail 1 to/from WCML sensitivity test 2041 AM	Absolute difference	% difference
Aldgate	20,823	20,677	-146	-1%
Moorgate	35,562	35,367	-195	-1%
Leicester Square	24,456	24,257	-199	-1%
St Pancras	25,291	25,087	-204	-1%
Victoria	156,617	156,401	-216	0%
Old Street	27,737	27,503	-234	-1%
London Bridge	159,438	159,196	-242	0%
Barbican	14,303	14,039	-264	-2%
Bank	102,642	102,300	-342	0%
Liverpool Street	140,201	139,849	-352	0%
Baker Street	48,827	48,340	-487	-1%
Sub-Total	1,382,628	1,373,472	-9,156	-1%
Total (all Zone 1)	2,277,508	2,268,461	-9,047	0%
Camden Town	18,378	18,370	-8	0%
Mornington Crescent	3,702	3,708	6	0%
Ealing Broadway	25,411	26,018	607	2%

3.7.13 Connecting Crossrail to the WCML results in substantial increases of 11% and 5% in eastbound and westbound Crossrail flows respectively. The corresponding reduction in station usage at Euston (10,400 fewer access, egress and interchange trips) is a direct result of passengers using Crossrail and, as necessary interchanging with other LU lines elsewhere, such as at Bond Street, Tottenham Court Road, Farrington and Paddington.

Impact on flows

3.7.14 Table 308 and Figure 192 to Figure 194 show the passenger flow impact of Crossrail 1 services to/from the WCML. The LU network shows reductions of around 1,000 passengers in the AM peak period on all southbound lines south of Euston, namely the southbound Northern Line Bank branch, Northern Line Charing Cross branch and Victoria Line and the eastbound Metropolitan/Hammersmith & City and Circle Line. Reductions in northbound LU flows north of Euston are generally lower.

3.7.15 On NR, connecting Crossrail to the WCML results in a substantial increase in eastbound and westbound Crossrail flows, starting at Old Oak Common with an

increase in passengers between Old Oak Common and Paddington of some 6,230 but decreasing steadily towards Tottenham Court Road with the increase reducing to around 3,380 passengers. There is a corresponding reduction in southbound WCML flows into Euston of around 9,600 passengers.

3.7.16 Flow changes on other NR services or local buses are negligible.

Table 308: 2041 network impacts, AM peak period

Services	Direction	HS2 Phase Two operation 2041 AM	Crossrail 1 to WCML sensitivity test 2041 AM	% difference
Classic suburban	Inbound	26,359	16,747	-36%
	Outbound	5,126	3,247	-37%
Classic inter-city	Inbound	8,703	8,708	0%
	Outbound	3,880	3,855	-1%
HS2 at Euston	Inbound	26,044	26,182	1%
	Outbound	17,615	17,377	-1%
HS2 at Old Oak Common	Inbound	33,968	33,968	0%
	Outbound	26,066	26,066	0%
Victoria line, north of Euston	Northbound	28,806	28,636	-1%
	Southbound	67,694	67,984	0%
Victoria line, south of Euston	Northbound	37,398	37,344	0%
	Southbound	74,853	73,876	-1%
Northern line (Bank branch), north of Euston	Northbound	22,357	22,343	0%
	Southbound	44,422	44,546	0%
Northern line (Bank branch), south of Euston	Northbound	22,312	22,131	-1%
	Southbound	40,804	39,859	-2%
Northern line (Charing Cross branch), north of Euston	Northbound	16,421	16,174	-2%
	Southbound	41,326	41,531	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Services	Direction	HS2 Phase Two operation 2041 AM	Crossrail 1 to WCML sensitivity test 2041 AM	% difference
Northern line (Charing Cross branch), south of Euston	Northbound	18,544	18,239	-2%
	Southbound	45,168	44,095	-2%
Metropolitan/Hammersmith & City, Circle lines (west of Euston Square)	Eastbound	52,212	52,988	1%
	Westbound	43,457	42,999	-1%
Metropolitan/Hammersmith & City, Circle lines (east of Euston Square)	Eastbound	60,189	59,337	-1%
	Westbound	49,453	49,186	-1%
GWML slow/Crossrail (Acton Main line to Old Oak Common)	Eastbound	24,279	24,375	0%
	Westbound	13,519	14,067	4%
Crossrail Old Oak Common to Paddington	Eastbound	43,087	49,317	14%
	Westbound	20,766	23,269	12%
Crossrail Paddington to Bond Street	Eastbound	52,310	57,011	9%
	Westbound	27,050	28,974	7%
Crossrail Bond Street to Tottenham Court Road	Northbound	47,517	50,896	7%
	Southbound	33,755	35,149	4%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,336	1,313	-2%
	Southbound	2,562	2,554	0%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	2,564	2,582	1%
	Westbound	2,089	2,099	0%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	16,612	17,162	3%
	Westbound	7,257	6,805	-6%
GWML slow (Old Oak Common to Paddington)	Eastbound	43,087	49,317	14%
	Westbound	20,766	23,269	12%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Services	Direction	HS2 Phase Two operation 2041 AM	Crossrail 1 to WCML sensitivity test 2041 AM	% difference
Crossrail link from WCML	Eastbound	-	8,728	-
	Westbound	-	2,778	-

Figure 192: LU flow differences 2041 AM peak Crossrail 1 to WCML

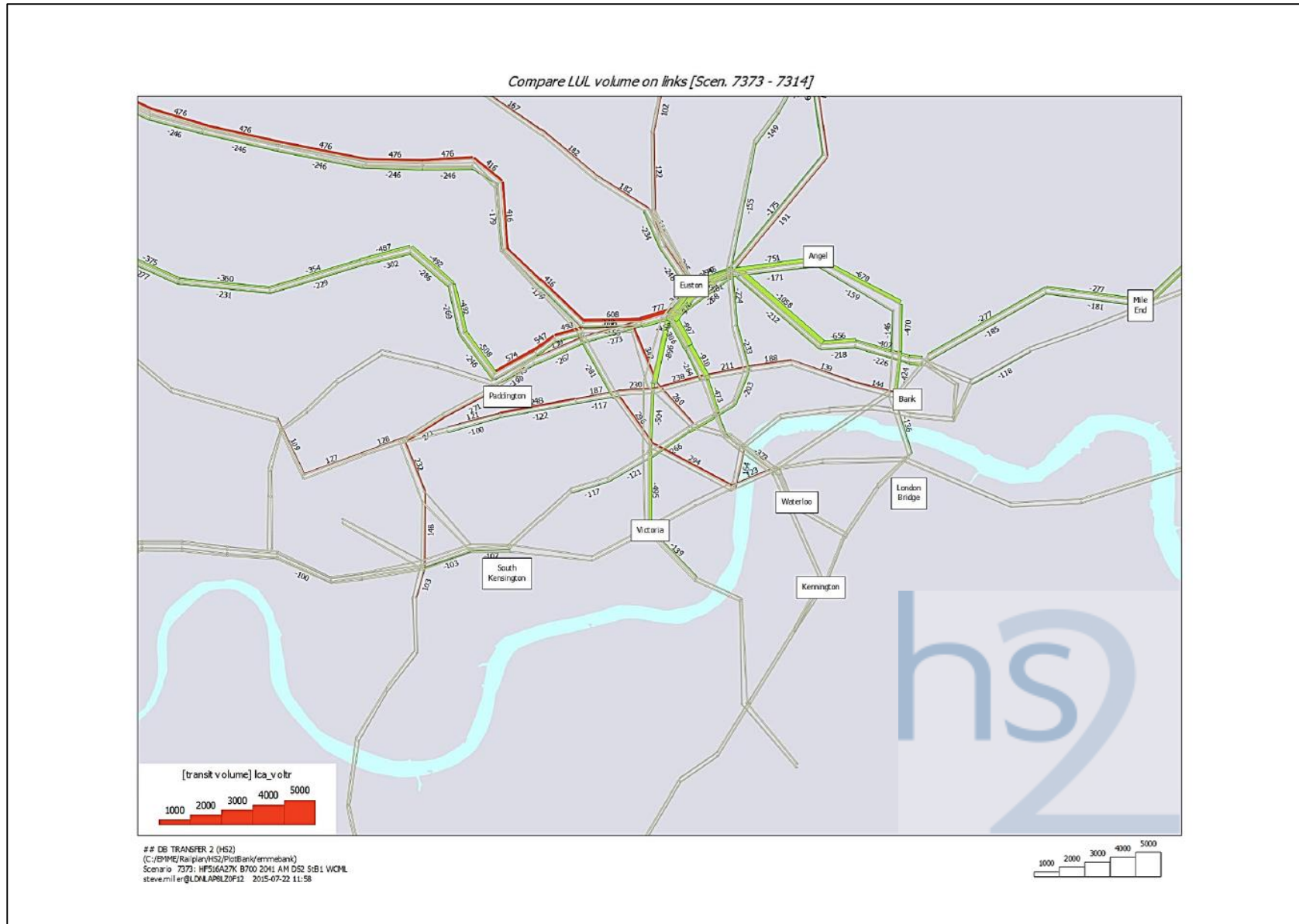


Figure 193: NR flow differences 2041 AM peak Crossrail 1 to WCML

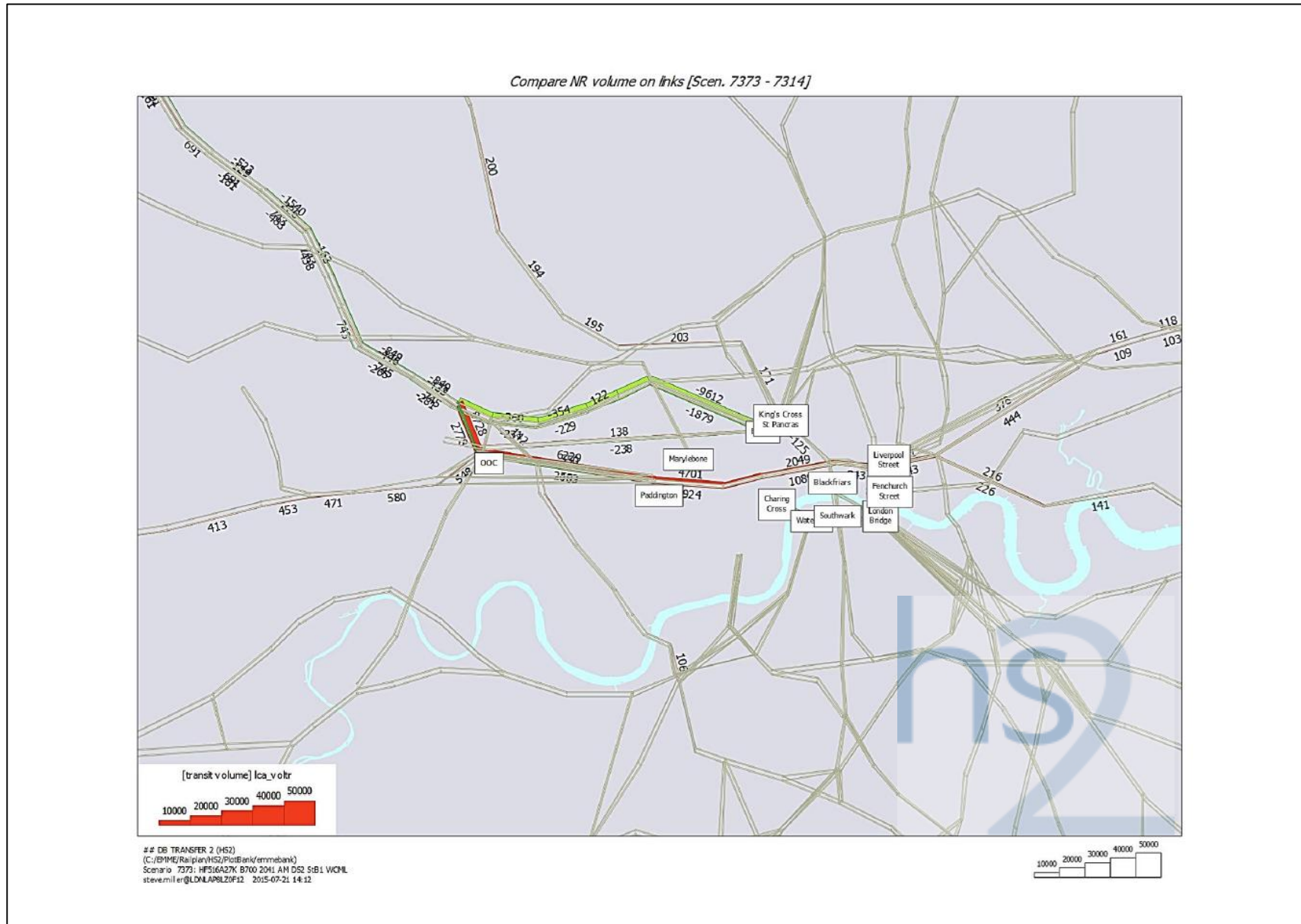


Figure 194: Bus flow differences 2041 AM peak Crossrail 1 to WCML



Impacts at Old Oak Common

- 3.7.17 Old Oak Common sees a small increase of around 1.5% in overall interchange movements with Crossrail 1 services to/from the WCML. There is a decrease in the number of movements between eastbound main line GWML fast services and GWML slow (Crossrail) services (because Crossrail services will arrive at Old Oak Common carrying substantially higher numbers of passengers and consequent higher levels of crowding will discourage such movements). This is cancelled out by increased interchange between eastbound relief line (Crossrail) services and other services.
- 3.7.18 The impact on local buses is minor.

Impact on crowding

- 3.7.19 The crowding impacts of the Crossrail 1 services to/from the WCML test is shown for NR and LU in Figure 195 and Figure 196 and on the Northern line and Crossrail in Figure 197 to Figure 199.
- 3.7.20 This indicates that changes to crowding are mainly confined to:
- some increases in the order of 0.4 PPSM on the eastbound central section of Crossrail which increases network crowding from 2-3 PPSM to 3-4 PPSM between Bond Street and Tottenham court Road; and
 - very small changes (reductions) in crowding on LU lines around Euston.

Figure 195: NR crowding 2041 AM peak period Crossrail 1 to WCML

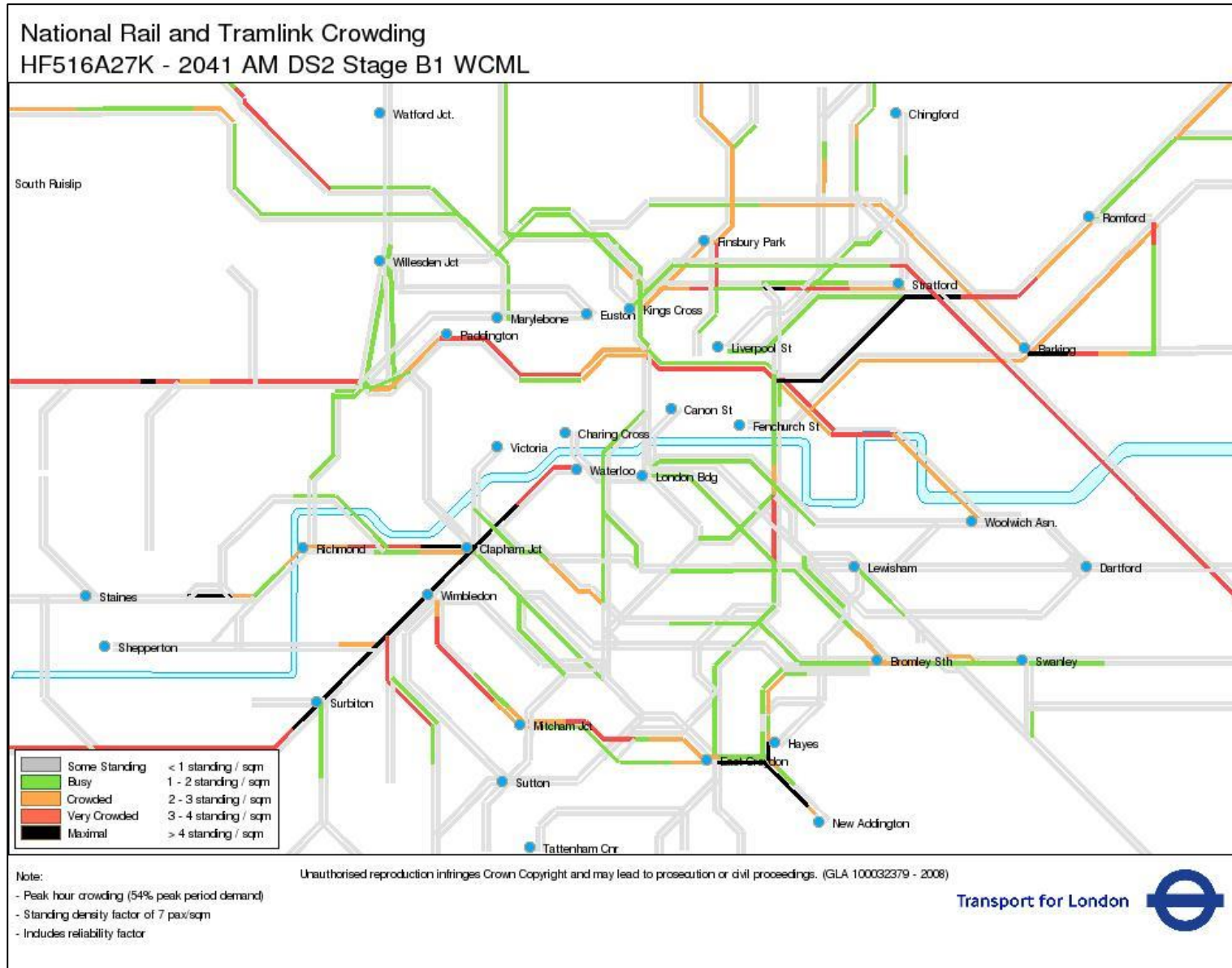


Figure 196: LU crowding 2041 AM peak period Crossrail 1 to WCML

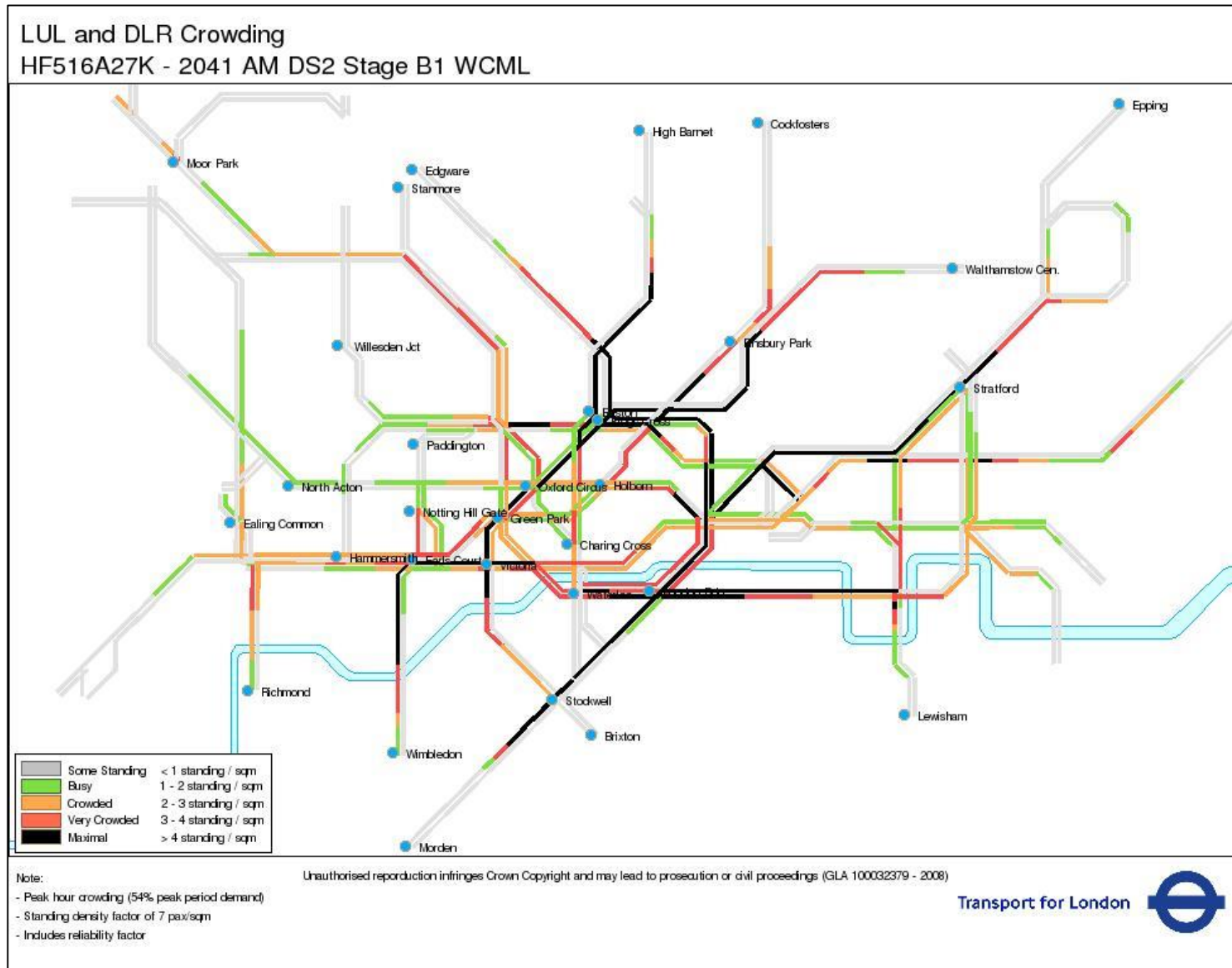


Figure 197: Line crowding AM 2041 on Northern line (Bank branch) - Crossrail 1 to WCML

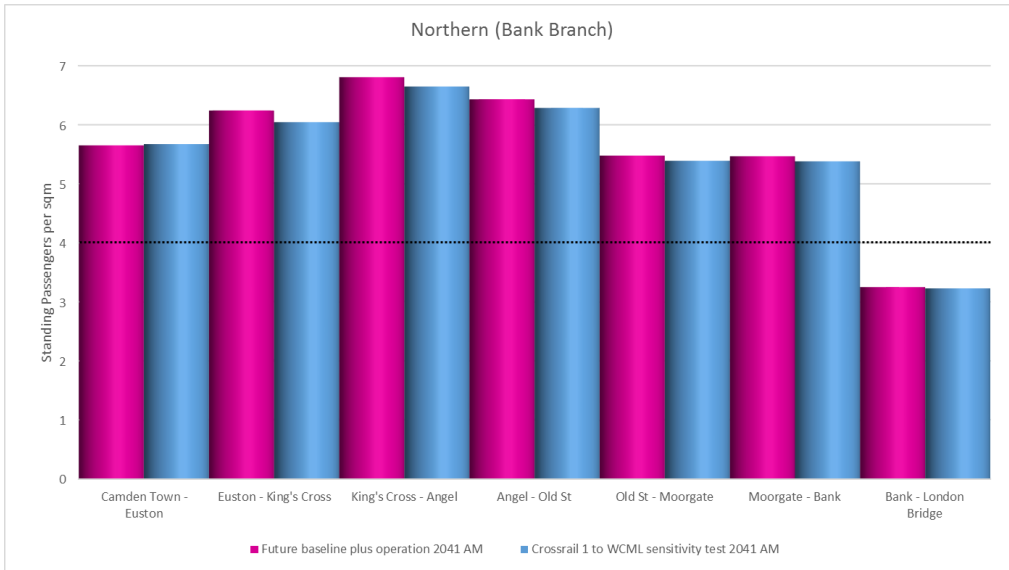


Figure 198: Line crowding AM 2041 Northern line (Charing Cross branch) - Crossrail 1 to WCML

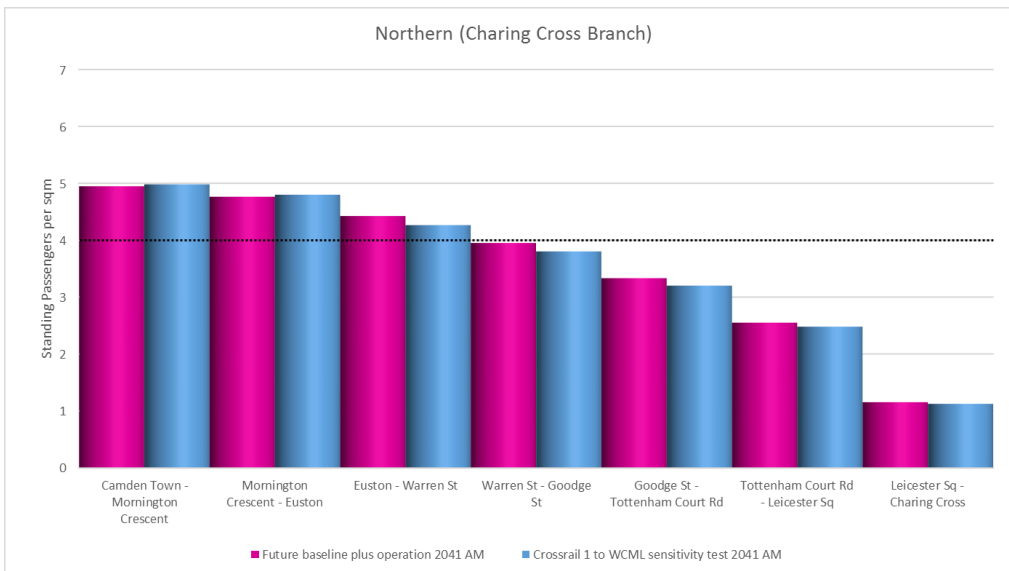
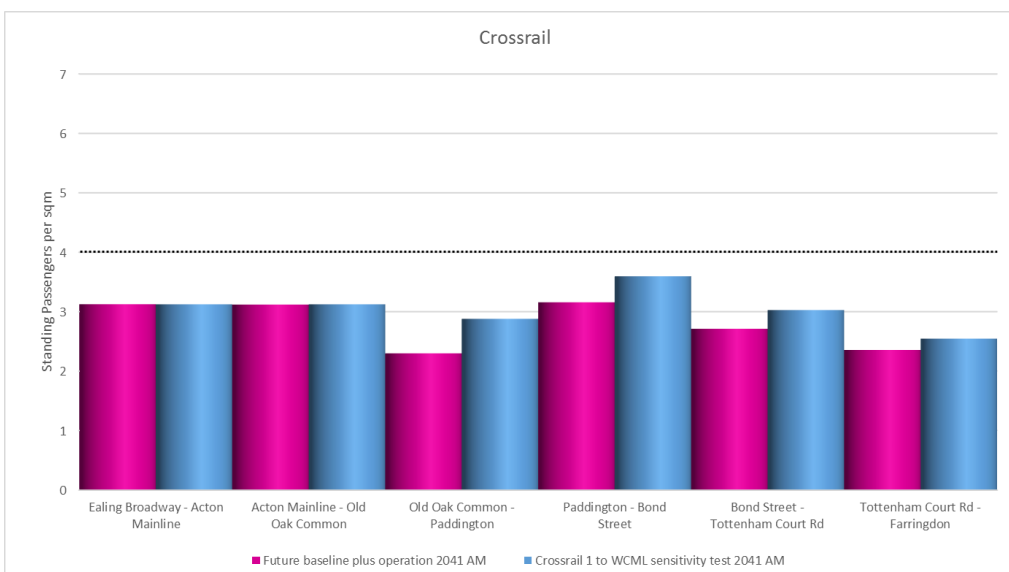


Figure 199: Line crowding AM 2041 Crossrail - Crossrail 1 to WCML



Crossrail 2

Scheme details

- 3.7.21 Crossrail 2, a proposed south-west to north-east railway across London, is being promoted by TfL and NR as one of the key long-term projects needed to support growth in London. Public consultation was undertaken between May and August 2013 on two options: a Metro option and a Regional option which includes the Metro option but with extensions northwards into Hertfordshire and southwards into southwest London and Surrey. This sensitivity test assumes the Regional option.
- 3.7.22 The service pattern for the Regional option is set out in Table 309, resulting in a maximum peak hour frequency of 30 tph in each direction (averaging to 27 tph over the three hour peak period) through the core section Wimbledon-Tooting Broadway-Clapham Junction-Kings Road Chelsea- Victoria- Tottenham Court Road-Euston/St Pancras-Angel.
- 3.7.23 The likely trip generation, redistribution and modal shift impacts of Crossrail 2 meant that a run of LTS was required.

Table 309: Crossrail 2 service pattern - trains per hour in each direction

From	To	Trains per hour in each direction
Sunbury	New Southgate	3
Wimbledon	New Southgate	4
Shepperton	New Southgate	4
Epsom	New Southgate	3
Chessington South	New Southgate	2
Wimbledon	Broxbourne	5
Hampton Court	New Southgate	2
Chessington South	Hertford East	2
Hampton Court	Hertford East	2
Total		27

Comparison with 2041 AM Proposed Scheme

Station demand

- 3.7.24 Table 310 shows that Crossrail 2 has a small impact on the balance of HS2 flow between Euston and Old Oak Common with an increase of 990 boarders and 490 alighters at Euston with corresponding reductions at Old Oak Common in the 3 hour peak period. For overall NR use at Euston (excluding Crossrail 2), there is an increase of 1,700 boarders and 1,050 alighters. Crossrail 2 itself attracts substantial numbers of passengers with around 17,000 boarding northbound and 9,000 both alighting from

and boarding southbound services. The net reduction in boarders and alighters (boarders increase and alighters reduce) to/from LU at Euston is due to the general transfer of demand in central London from LU to Crossrail 2. It should be noted that this does not include internal interchange between LU lines and with Crossrail 2. As noted below, these interchange movements reduce substantially.

Table 310: 2041 AM Euston station demand, 07:00 to 10:00

Description	HS2 Phase Two operation 2041 AM			Crossrail 2 sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (outbound)	5,126	-	5,126	5,770	-	5,770
Euston suburban (inbound)	-	26,359	26,359	-	26,934	26,934
Euston inter-city (outbound)	3,880	-	3,880	3,948	-	3,948
Euston inter-city/other (inbound)	-	8,703	8,703	-	8,692	8,692
Euston HS2 (outbound)	17,615	-	17,615	18,609	-	18,609
Euston HS2 (inbound)	-	26,044	26,044	-	26,531	26,531
Crossrail 2 (Northbound)				3,384	17,003	20,387
Crossrail 2 (Southbound)				9,085	9,604	18,689
Sub-total: Euston NR	26,621	61,106	87,727	40,796	88,764	129,560
Euston LU						
Euston Northern line (Charing Cross branch) northbound	3,385	5,508	8,893	4,976	4,270	9,246
Euston Northern line (Charing Cross branch) southbound	8,452	4,610	13,062	7,219	5,949	13,168
Euston Northern line (Bank branch) northbound	5,244	5,199	10,443	7,282	4,891	12,173
Euston Northern line (Bank branch) southbound	7,045	10,664	17,709	6,853	12,026	18,879
Euston Victoria line (northbound)	4,497	13,090	17,587	4,030	10,202	14,232
Euston Victoria line (southbound)	15,866	8,707	24,573	15,543	7,019	22,562
Sub-total: Euston LU	44,489	47,778	92,267	45,903	44,357	90,260

Description	HS2 Phase Two operation 2041 AM			Crossrail 2 sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston Square LU						
Euston Square sub-surface lines (northbound/westbound)	5,376	11,372	16,748	5,794	11,220	17,014
Euston Square sub-surface lines (southbound/eastbound)	16,299	8,321	24,620	16,112	8,168	24,280
Sub-total: Euston Square LU	21,675	19,693	41,368	21,906	19,388	41,294
Old Oak Common (OOC)						
OOC NR slow (outbound)	1,769	9,016	10,785	1,750	9,159	10,909
OOC NR slow (inbound)	22,527	3,719	26,246	22,257	3,611	25,868
OOC NR fast (outbound)	7,011	-	7,011	7,816	-	7,816
OOC NR fast (inbound)	-	17,820	17,820	-	17,874	17,874
OOC HS2 (outbound)	8,451	-	8,451	7,458	-	7,458
OOC HS2 (inbound)	-	7,925	7,925	-	7,434	7,434
Sub-total: OOC	39,758	38,480	78,238	39,281	38,078	77,359

Demand at other stations

- 3.7.25 Table 311 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway. These figures include entries and exits to/from the station but also includes interchange between lines.
- 3.7.26 Crossrail 2 has a profound impact on station activity at those stations in central London that it serves with Tottenham Court Road experiencing the largest increase at over 57,000 passengers (+115%) during the AM peak period, followed by Angel (+19,870, an increase of 87%), Victoria (+13,285 an increase of 8%) and St Pancras (+1,500, an increase of 6%). At Euston underground station, there is an increase of nearly 20,000, which is likely to be interchange with Crossrail.
- 3.7.27 A large number of Zone 1 stations experience a reduction in station activity due to the attractiveness of Crossrail 2 with the largest reductions at Waterloo, Liverpool St, King's Cross, Bank and Oxford Circus, due to lower levels of passengers on most of the LU network.

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Table 311: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	HS2 Phase Two operation 2041 AM peak period	Crossrail 2 sensitivity test 2041 AM peak period	Absolute difference	% difference
Euston (including Euston Square)	137,129	156,579	19,450	14%
Tottenham Court Road	49,703	106,827	57,124	115%
Angel	22,919	42,789	19,870	87%
Victoria	156,617	169,902	13,285	8%
St Pancras	25,291	26,799	1,508	6%
Tower Hill	20,232	20,922	690	3%
Elephant & Castle	31,414	32,044	630	2%
Temple	19,350	19,829	479	2%
Saint Paul's	5,151	5,540	389	8%
Marble Arch	6,527	6,847	320	5%
Borough	4,768	5,065	297	6%
Chancery Lane	15,343	15,610	267	2%
Marylebone	19,282	19,496	214	1%
Southwark	10,762	10,890	128	1%
High Street Kensington	9,441	9,568	127	1%
Monument	11,097	11,202	105	1%
Green Park	41,258	41,132	-126	0%
Baker Street	48,827	48,635	-192	0%
Moorgate	35,562	35,367	-195	-1%
Tower Gateway	4,225	4,011	-214	-5%
Pimlico	11,108	10,881	-227	-2%
Aldgate	20,823	20,562	-261	-1%
Edgware Road (SSL)	10,049	9,745	-304	-3%

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Station	HS2 Phase Two operation 2041 AM peak period	Crossrail 2 sensitivity test 2041 AM peak period	Absolute difference	% difference
Notting Hill Gate	13,220	12,884	-336	-3%
Knightsbridge	8,614	8,239	-375	-4%
Regent's Park	5,475	5,062	-413	-8%
Gloucester Road	13,104	12,684	-420	-3%
Hyde Park Corner	3,693	3,177	-516	-14%
Cannon Street	33,846	33,327	-519	-2%
St James' Park	24,806	24,281	-525	-2%
Barbican	14,303	13,765	-538	-4%
Covent Garden	5,163	4,607	-556	-11%
Waterloo East	10,384	9,746	-638	-6%
London Bridge	159,438	158,751	-687	0%
Westminster	38,307	37,537	-770	-2%
Great Portland Street	14,707	13,859	-848	-6%
Embankment	29,920	28,995	-925	-3%
Old Street	27,737	26,725	-1,012	-4%
Bond Street	48,564	47,470	-1,094	-2%
Russell Square	8,034	6,911	-1,123	-14%
Holborn	29,751	28,626	-1,125	-4%
Piccadilly Circus	19,964	18,482	-1,482	-7%
Warren Street	28,182	26,624	-1,558	-6%
Goodge Street	15,018	13,255	-1,763	-12%
Charing Cross	43,659	41,879	-1,780	-4%
Paddington	66,926	64,827	-2,099	-3%

Station	HS2 Phase Two operation 2041 AM peak period	Crossrail 2 sensitivity test 2041 AM peak period	Absolute difference	% difference
Leicester Square	24,456	22,114	-2,342	-10%
Blackfriars	38,777	36,200	-2,577	-7%
South Kensington	24,475	21,604	-2,871	-12%
Sloane Square	14,295	11,405	-2,890	-20%
Farringdon	92,457	89,404	-3,053	-3%
Oxford Circus	114,100	109,597	-4,503	-4%
Bank	102,642	97,636	-5,006	-5%
King's Cross	76,284	67,125	-9,159	-12%
Liverpool Street	140,201	130,463	-9,738	-7%
Waterloo	184,504	162,872	-21,632	-12%
Sub-Total	2,191,884	2,220,375	28,491	1%
Total (all Zone 1)	2,277,508	2,306,091	28,583	1%
Camden Town	18,378	18,196	-182	-1%
Mornington Crescent	3,702	3,710	8	0%
Ealing Broadway	25,411	24,879	-532	-2%

Impact on flows

- 3.7.28 Table 312 and Figure 200 to Figure 202 show the passenger flow impact of Crossrail 2 compared with the future baseline plus operation. The LU network shows substantial reductions on all south-north lines with the greatest impacts on the southbound and northbound Victoria Line north of Euston (-13,870 and -4,270 respectively), the Victoria Line south of Euston (-9,500 in both northbound and southbound directions) and the southbound Piccadilly line south of Kings Cross (-6,075). The most notable flow increases on the LU network are on the eastbound Central Line east of Tottenham Court Road (-2,340) which acts as a feeder to Crossrail 2.
- 3.7.29 This is reflected in the changes on NR, where Crossrail 2 attracts some 66,400 passengers northbound towards Tottenham Court Road station and 50,860 passengers southbound towards Tottenham Court Road station. There are corresponding reductions in flow on NR services into Victoria, Waterloo (-12,000), Blackfriars, London Bridge and Liverpool Street (-8,100).
- 3.7.30 There are substantial flow reductions forecast on bus routes paralleling Crossrail 2, particularly Theobalds Road/Rosebery Avenue and Charing Cross Road/Shafesbury Avenue, but also on roads around Euston including Gower Street, Euston Road,

Hampstead Road, City Road and Woburn Place with flow reductions westbound along Euston Road.

Table 312: 2041 network impacts, AM peak period

Services	Direction	HS2 Phase Two operation 2041 AM peak period	Crossrail 2 sensitivity test 2041 AM peak period	% difference
Classic suburban	Inbound	26,359	26,934	2%
	Outbound	5,126	5,770	13%
Classic inter-city	Inbound	8,703	8,692	0%
	Outbound	3,880	3,948	2%
HS2 at Euston	Inbound	26,044	26,531	2%
	Outbound	17,615	18,609	6%
HS2 at Old Oak Common	Inbound	33,968	33,966	0%
	Outbound	26,066	26,066	0%
Victoria line, north of Euston	Northbound	28,806	22,476	-22%
	Southbound	67,694	56,405	-17%
Victoria line, south of Euston	Northbound	37,398	28,648	-23%
	Southbound	74,853	64,930	-13%
Northern line (Bank branch), north of Euston	Northbound	22,357	23,589	6%
	Southbound	44,422	44,354	0%
Northern line (Bank branch), south of Euston	Northbound	22,312	21,198	-5%
	Southbound	40,804	39,181	-4%
Northern line (Charing Cross branch), north of Euston	Northbound	16,421	17,438	6%
	Southbound	41,326	40,734	-1%
Northern line (Charing Cross branch), south of Euston	Northbound	18,544	16,732	-10%
	Southbound	45,168	42,004	-7%

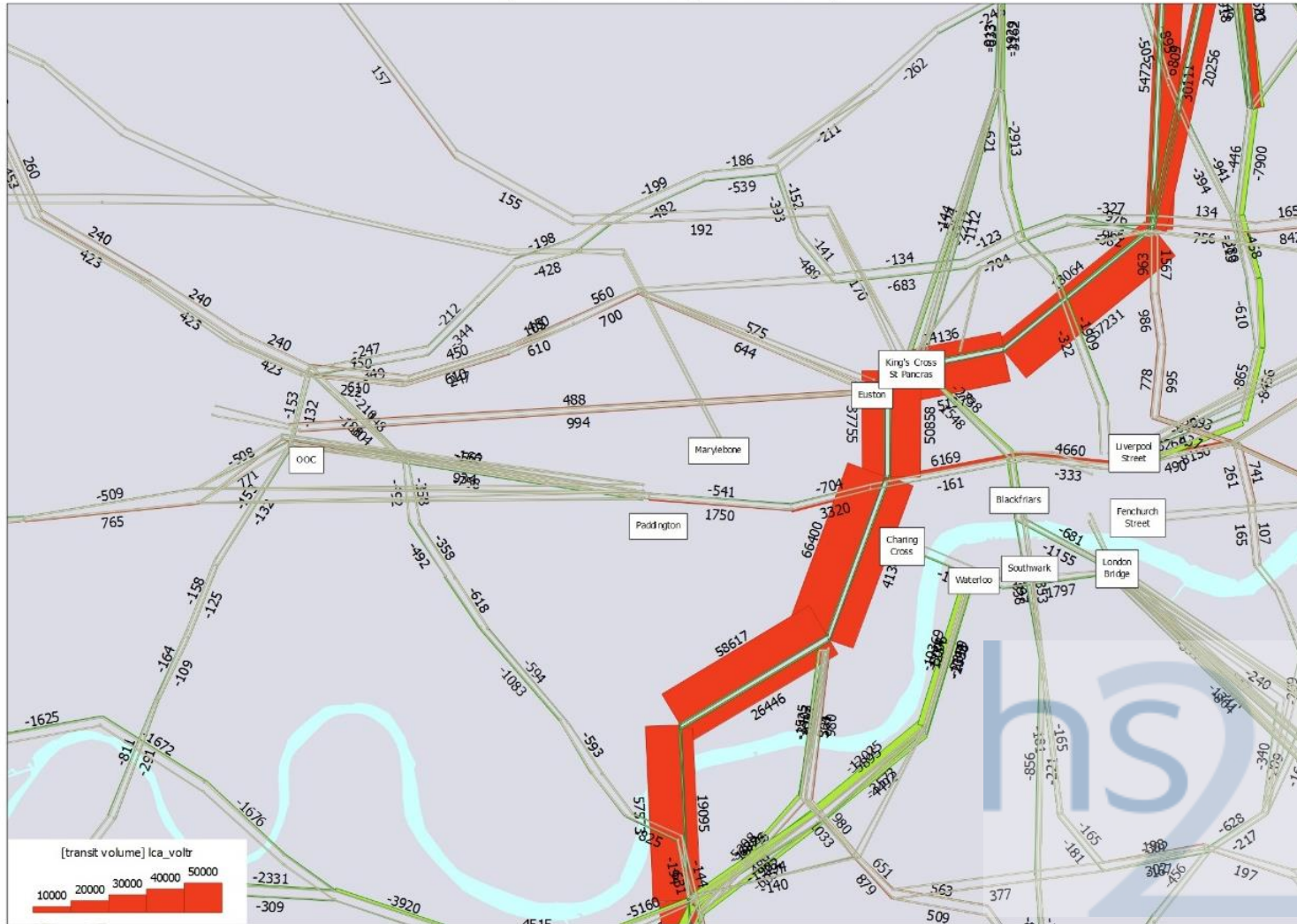
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Services	Direction	HS2 Phase Two operation 2041 AM peak period	Crossrail 2 sensitivity test 2041 AM peak period	% difference
Metropolitan/Hammersmith & City, Circle lines (west of Euston Square)	Eastbound	52,212	51,853	-1%
	Westbound	43,457	41,612	-4%
Metropolitan/Hammersmith & City, Circle lines (east of Euston Square)	Eastbound	60,189	59,797	-1%
	Westbound	49,453	47,039	-5%
GWML slow/Crossrail (Acton Main line to Old Oak Common)	Eastbound	24,279	24,275	0%
	Westbound	13,519	14,290	6%
Crossrail Old Oak Common to Paddington	Eastbound	43,087	42,922	0%
	Westbound	20,766	21,700	4%
Crossrail Paddington to Bond Street	Eastbound	52,310	51,769	-1%
	Westbound	27,050	28,800	6%
Crossrail Bond Street to Tottenham Court Road	Northbound	47,517	46,812	-1%
	Southbound	33,755	37,075	10%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,336	1,032	-23%
	Southbound	2,562	2,415	-6%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	2,564	2,411	-6%
	Westbound	2,089	1,956	-6%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	16,612	16,049	-3%
	Westbound	7,257	6,500	-10%
GWML slow (Old Oak Common to Paddington)	Eastbound	43,087	42,922	0%
	Westbound	20,766	21,700	4%

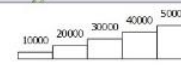
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Figure 200: NR flow differences 2041 AM peak Crossrail 2

Compare NR volume on links [Scen. 7391 - 7314]

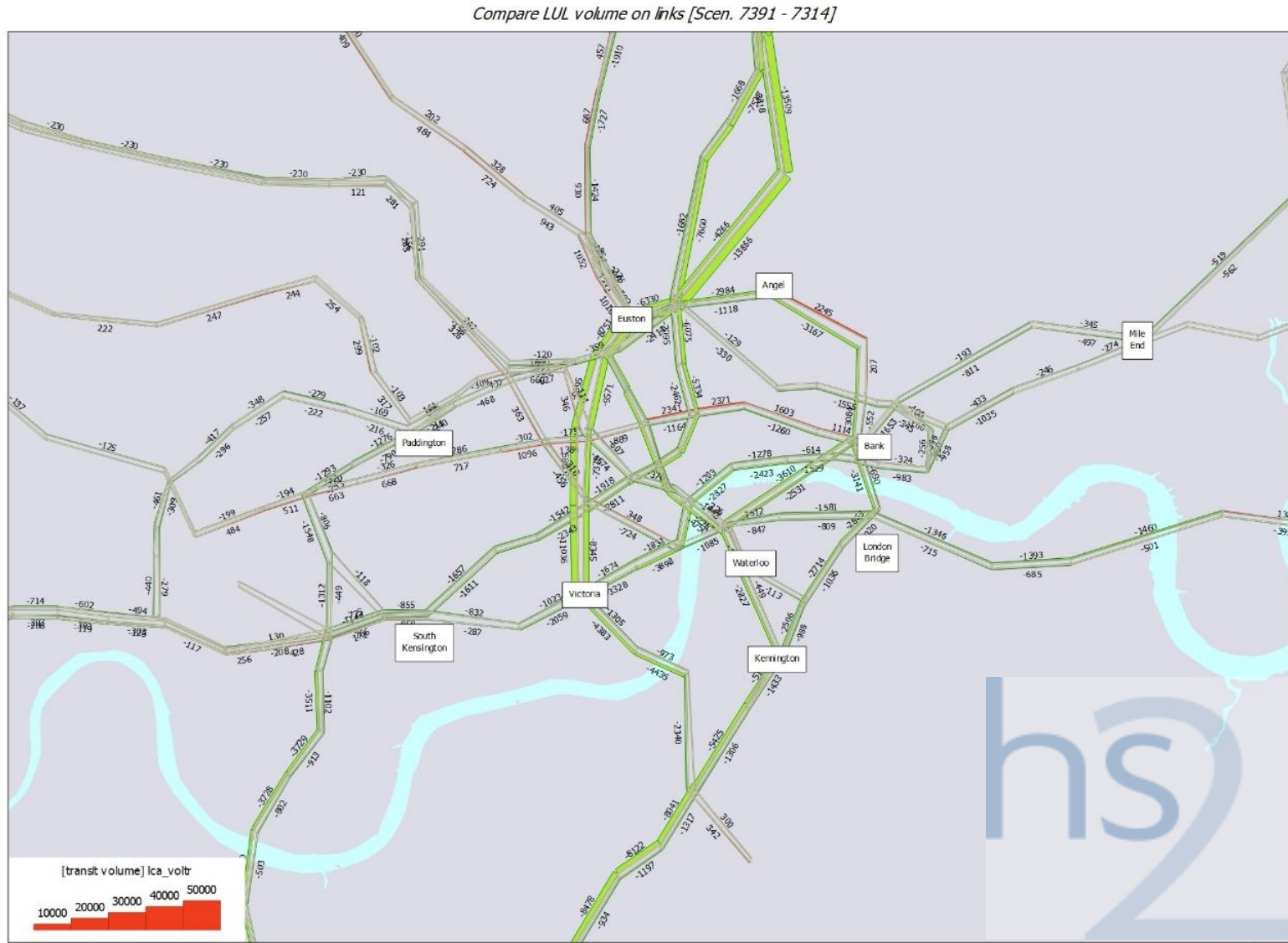


DB TRANSFER 2 (HS2)
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 steve.miller@LDNLAPB1.Z0F12 2015-08-03 14:50

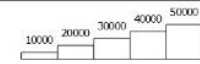


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Figure 201: LU flow differences 2041 AM peak Crossrail 2



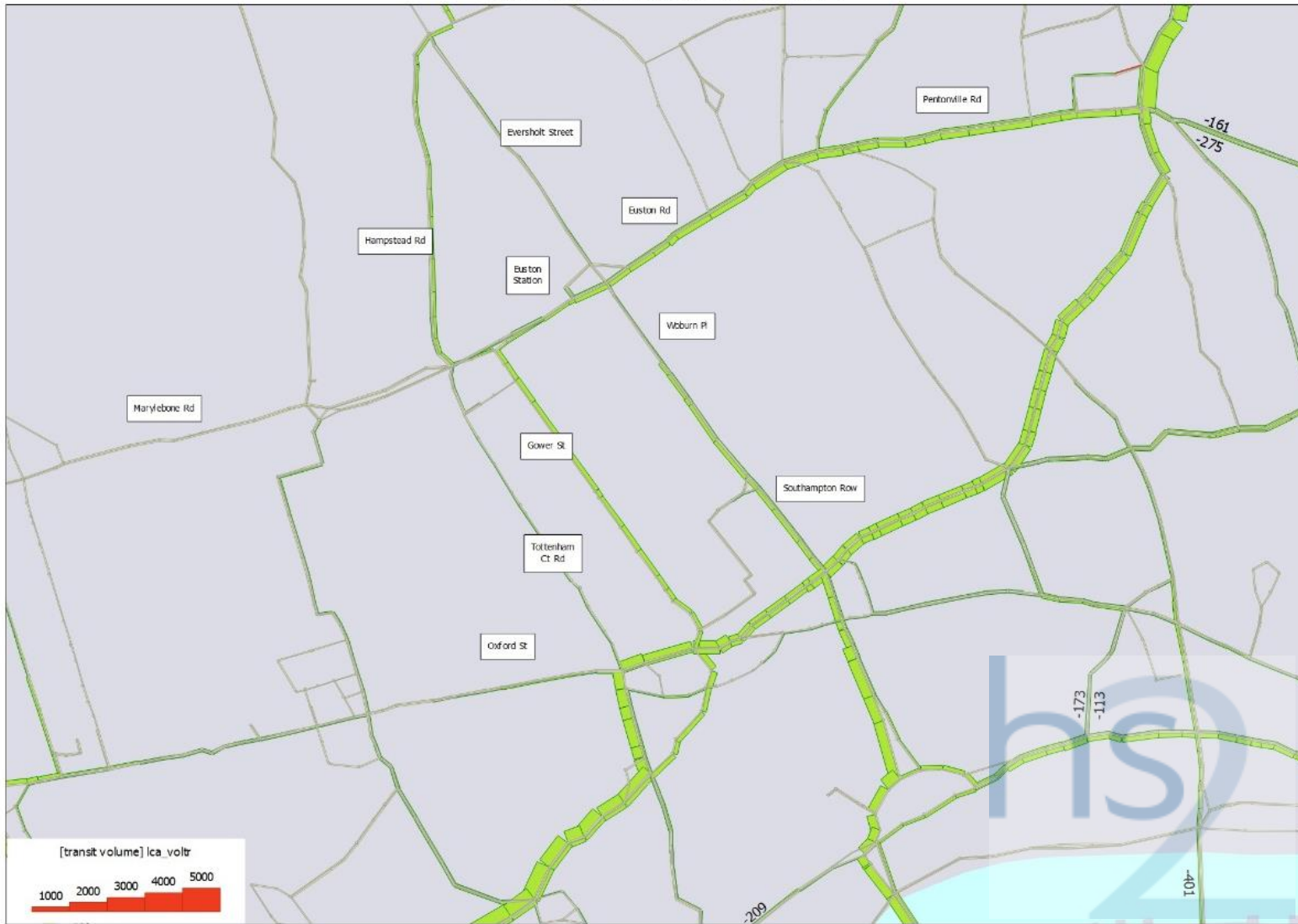
DB TRANSFER 2 (HS2)
 (C:/EMME/Railplan/HS2/PlotBank/emmebank)
 Scenario 7391: HE53465G B700 2041 AM AP3 Stage B1 w. CR2 rerun
 steve.miller@LDNLARL.ZDF12 2015-08-03 14:53



SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Figure 202: Bus flow differences 2041 AM peak Crossrail 2

Compare Bus volume on links [Scen. 7391 - 7314]



DB TRANSFER 2 (HS2)
 (C:/EMME/Railplan/HS2/Plot/Link/emmebank)
 Scenario 7391: HES3A65G B700 2041 AM AP3 Stage B1 w CR2 renun
 steve.miller@LDNLAPL2012 2015-08-03 14:56



Impacts at Old Oak Common station

- 3.7.31 The overall impact of Crossrail 2 on station interchange at Old Oak Common station is small – total use reduces by some 900 trips (1%), with the scale of individual changes also being relatively minor. Subsequently, the impact on station access and egress is marginal with the impact on local buses minimal.

Impact on crowding

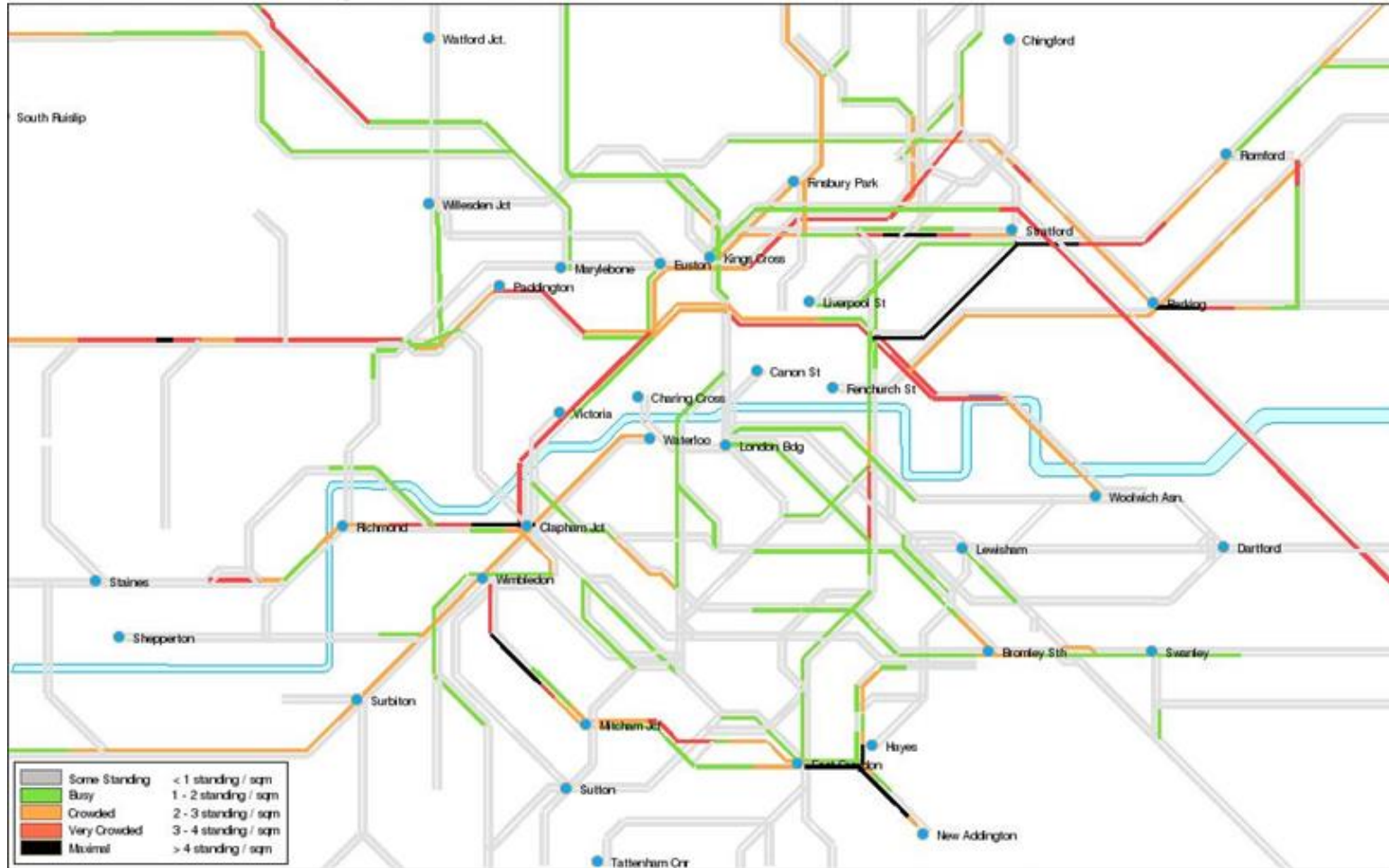
- 3.7.32 The crowding impacts of Crossrail 2 are shown in Figure 203 and Figure 204 for the LU and NR networks respectively and in Figure 205 and Figure 206 for the Northern Line (Bank branch) line and Victoria line respectively. Crossrail 2 has substantial crowding benefits particularly on the LU network. The largest crowding reductions are forecast on:

- southbound Piccadilly Line from Seven sisters to Holborn reduction of around 1 PPSM);
- southbound Victoria Line from Seven Sisters to Highbury & Islington reduction of around 1 PPSM)
- Northern Line Charing Cross branch between Euston and Tottenham Court Road reduction of around 1 PPSM);
- southbound Victoria Line from Highbury & Islington to Victoria reduction of between 2 and 1 PPSM); and
- northbound District Line from Wimbledon (reduction of around 1 PPSM).

- 3.7.33 On the NR network, there are substantial reductions in crowding on services into Waterloo with reductions of 1-2 PPSM, on the northbound West London Line (WLL) and on southbound services south of Finsbury Park. Crossrail 1 shows an increase in crowding between Tottenham Court Road and Farringdon. Crossrail 2 is itself relatively busy with between 3-4PPSM through the central area.

Figure 203: NR crowding 2041 AM peak period Crossrail 2

National Rail and Tramlink Crowding
HE534A65G - 2041 AM Stage B1 with CR2 rerun



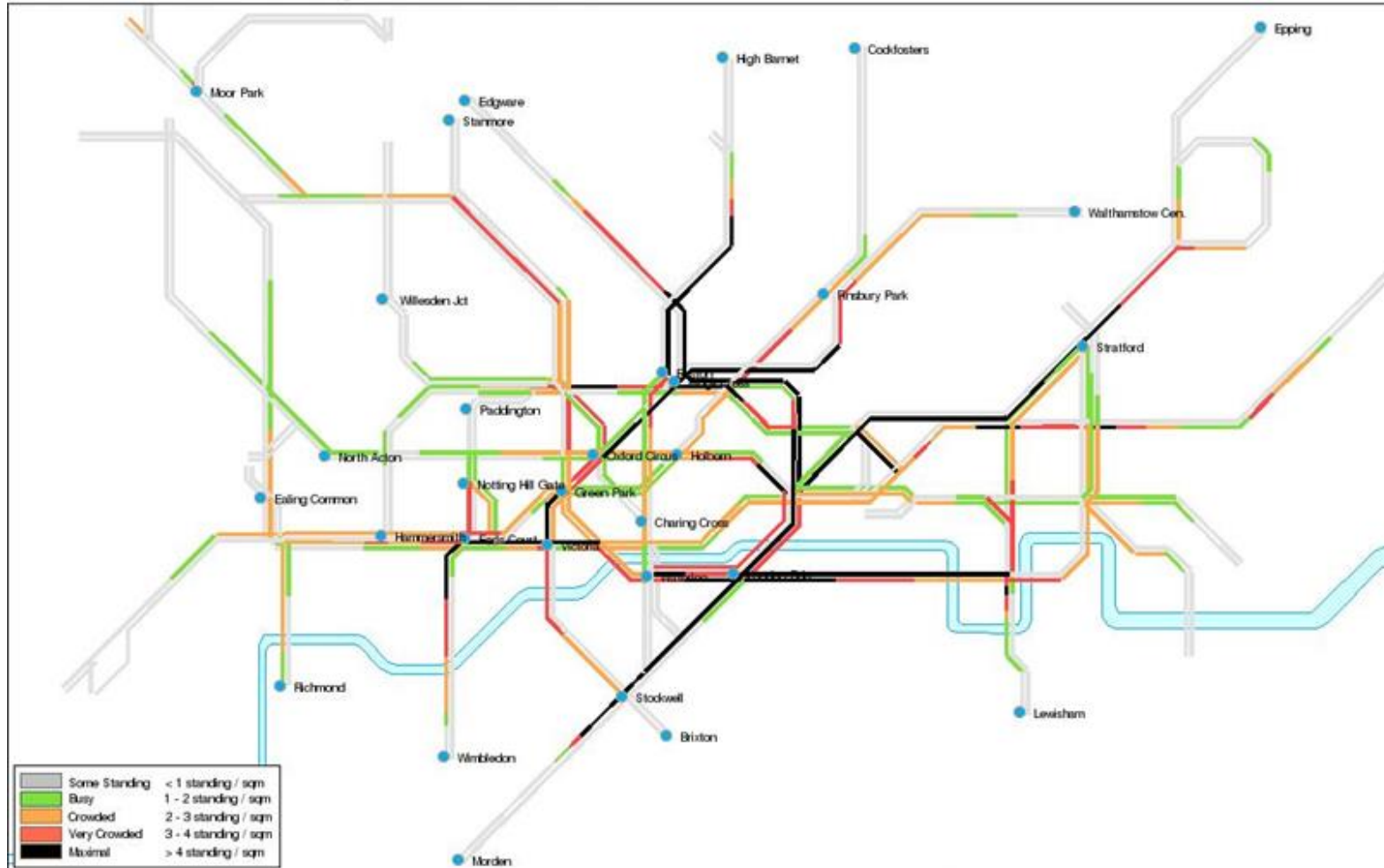
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 204: LU crowding 2041 AM peak period Crossrail 2

LUL and DLR Crowding
HE534A65G - 2041 AM Stage B1 with CR2 rerun



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 205: Line crowding AM 2041 on Northern line (Bank branch) - Crossrail 2

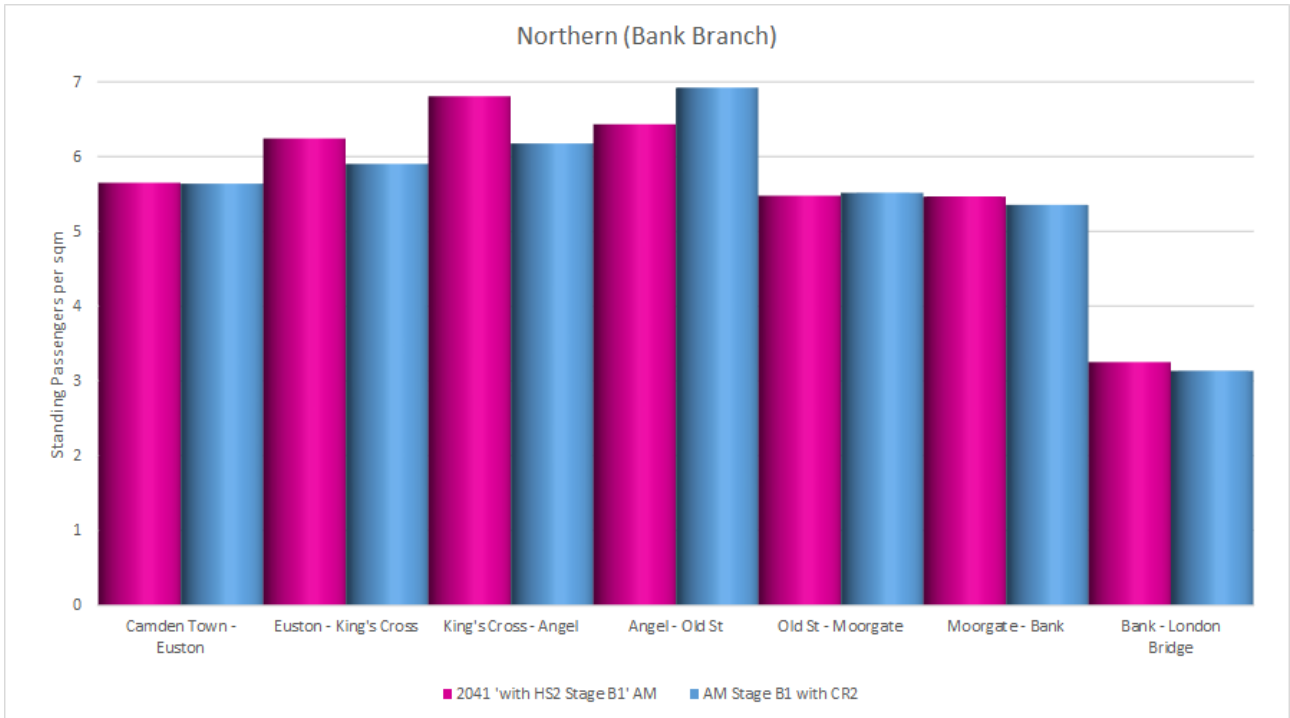
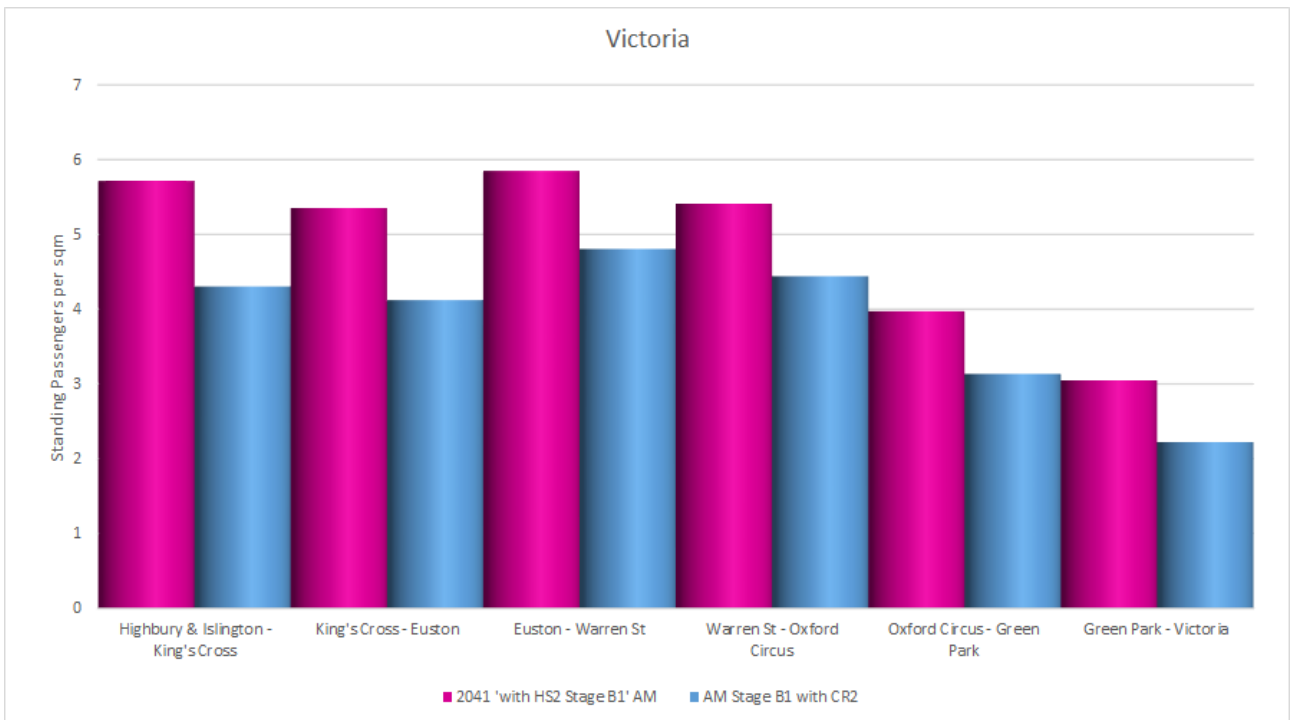


Figure 206: Line crowding AM 2041 Victoria Line - Crossrail 2



Euston Area Plan (with Crossrail 2)

Scheme description

3.7-34 The Euston Area Plan (EAP) contains proposals for a number of development scenarios. For the purposes of this test, a 'mid-level' scenario of 2,540 homes and 5,150 jobs⁴⁴ has been assumed. These were included in an LTS run with the resulting change in public transport demand used in Railplan. It is assumed that such development aspirations would require a prior commitment to the Crossrail 2 scheme described above. There are no other material changes to the supply networks. HS2 total use is unchanged for the EAP scenario.

Comparison with 2041 AM Proposed Scheme (with Crossrail 2)

Station demand

3.7-35 Table 313 shows the impacts of the EAP with Crossrail 2 test compared the 2041 Phase Two operation. Comparing this with the Crossrail 2 test indicates around 700 additional passengers boarding/alighting from rail (including Crossrail 2), 610 additional passengers boarding/alighting from LU services at Euston and 1,050 additional passengers boarding/alighting from LU services at Euston Square. Comparing the Crossrail 2 levels of use to the EAP indicates that the increased population and employment opportunities within the EAP result in limited extra rail and LU demand.

Table 313: 2041 AM Euston station demand, 07:00 to 10:00

Description	HS2 Phase Two operation 2041 AM			EAP with Crossrail 2 sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (outbound)	5,126	-	5,126	5,768	-	5,768
Euston suburban (inbound)	-	26,359	26,359	-	26,956	26,956
Euston inter-city (outbound)	3,880	-	3,880	3,938	-	3,938
Euston inter-city/other (inbound)	-	8,703	8,703	-	8,777	8,777
Euston HS2 (outbound))	17,615	-	17,615	18,601	-	18,601
Euston HS2 (inbound)	-	26,044	26,044	-	26,529	26,529
Crossrail 2 (Northbound)	-	-	-	3,407	17,391	20,798
Crossrail 2 (Southbound)	-	-	-	9,151	9,742	18,893
Sub-total: Euston NR	26,621	61,106	87,727	40,865	89,395	130,260

⁴⁴ The EAP assumptions for additional homes and jobs are over and above the 2041 Reference Case

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Description	HS2 Phase Two operation 2041 AM			EAP with Crossrail 2 sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston LU						
Euston Northern line (Charing Cross branch) northbound	3,385	5,508	8,893	4,982	4,367	9,349
Euston Northern line (Charing Cross branch) southbound	8,452	4,610	13,062	7,223	6,000	13,223
Euston Northern line (Bank branch) northbound	5,244	5,199	10,443	7,286	5,028	12,314
Euston Northern line (Bank branch) southbound	7,045	10,664	17,709	6,882	12,071	18,953
Euston Victoria line (northbound)	4,497	13,090	17,587	4,017	10,328	14,345
Euston Victoria line (southbound)	15,866	8,707	24,573	15,539	7,150	22,689
Sub-total: Euston LU	44,489	47,778	92,267	45,929	44,944	90,873
Euston Square LU						
Euston Square sub-surface lines (northbound/westbound)	5,376	11,372	16,748	5,943	11,565	17,508
Euston Square sub-surface lines (southbound/eastbound)	16,299	8,321	24,620	16,377	8,457	24,834
Sub-total: Euston Square LU	21,675	19,693	41,368	22,320	20,022	42,342
Old Oak Common (OOC)						
OOC NR slow (outbound)	1,769	9,016	10,785	1,751	9,178	10,929
OOC NR slow (inbound)	22,527	3,719	26,246	22,246	3,610	25,856
OOC NR fast (outbound)	7,011	-	7,011	7,829	-	7,829
OOC NR fast (inbound)	-	17,820	17,820	-	17,863	17,863
OOC HS2 (inbound)	8,451	-	8,451	7,465	-	7,465
OOC HS2 (outbound)	-	7,925	7,925	-	7,439	7,439
Sub-total: Old Oak Common	39,758	38,480	78,238	39,291	38,090	77,381

Demand at other stations

3.7.36 Table 314 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.

3.7.37 The results are similar to the Crossrail 2 sensitivity test with the exception of Euston where the access, egress and interchange flows increase with EAP by 22,000, compared with an increase of 19,450 with Crossrail 2 only. The increase in around 2,500 passengers are likely to be primarily increases in access and egress trips to increased population and employment opportunities within the Euston area with the EAP.

Table 314: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	HS2 Phase Two operation 2041 AM peak period	EAP plus Crossrail 2 sensitivity test 2041 AM peak period	Absolute difference	% difference
Euston (inc. Euston Square)	137,129	159,157	22,028	16%
Tottenham Court Road	49,703	106,713	57,010	115%
Angel	22,919	42,747	19,828	87%
Victoria	156,617	170,028	13,411	9%
St Pancras	25,291	27,167	1,876	7%
Tower Hill	20,232	20,925	693	3%
Elephant & Castle	31,414	32,066	652	2%
Temple	19,350	19,802	452	2%
Saint Paul's	5,151	5,536	385	7%
Marble Arch	6,527	6,856	329	5%
Borough	4,768	5,068	300	6%
Chancery Lane	15,343	15,602	259	2%
Marylebone	19,282	19,490	208	1%
High Street Kensington	9,441	9,571	130	1%
Southwark	10,762	10,891	129	1%
Green Park	41,258	41,129	-129	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Station	HS2 Phase Two operation 2041 AM peak period	EAP plus Crossrail 2 sensitivity test 2041 AM peak period	Absolute difference	% difference
Aldgate	20,823	20,627	-196	-1%
Pimlico	11,108	10,892	-216	-2%
Tower Gateway	4,225	4,008	-217	-5%
Moorgate	35,562	35,329	-233	-1%
Baker Street	48,827	48,577	-250	-1%
Edgware Road (SSL)	10,049	9,732	-317	-3%
Notting Hill Gate	13,220	12,884	-336	-3%
Knightsbridge	8,614	8,239	-375	-4%
Regent's Park	5,475	5,088	-387	-7%
Gloucester Road	13,104	12,685	-419	-3%
Barbican	14,303	13,791	-512	-4%
Hyde Park Corner	3,693	3,174	-519	-14%
Cannon Street	33,846	33,319	-527	-2%
St James' Park	24,806	24,258	-548	-2%
Covent Garden	5,163	4,600	-563	-11%
London Bridge	159,438	158,825	-613	0%
Waterloo East	10,384	9,737	-647	-6%
Westminster	38,307	37,538	-769	-2%
Great Portland Street	14,707	13,857	-850	-6%
Embankment	29,920	28,972	-948	-3%
Old Street	27,737	26,736	-1,001	-4%
Warren Street	28,182	27,145	-1,037	-4%
Russell Square	8,034	6,945	-1,089	-14%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Station	HS2 Phase Two operation 2041 AM peak period	EAP plus Crossrail 2 sensitivity test 2041 AM peak period	Absolute difference	% difference
Bond Street	48,564	47,471	-1,093	-2%
Holborn	29,751	28,604	-1,147	-4%
Piccadilly Circus	19,964	18,479	-1,485	-7%
Charing Cross	43,659	41,931	-1,728	-4%
Goodge Street	15,018	13,188	-1,830	-12%
Paddington	66,926	64,836	-2,090	-3%
Leicester Square	24,456	22,145	-2,311	-9%
Blackfriars	38,777	36,221	-2,556	-7%
South Kensington	24,475	21,603	-2,872	-12%
Sloane Square	14,295	11,409	-2,886	-20%
Farringdon	92,457	89,383	-3,074	-3%
Oxford Circus	114,100	109,512	-4,588	-4%
Bank	102,642	97,581	-5,061	-5%
King's Cross	76,284	67,286	-8,998	-12%
Liverpool Street	140,201	130,602	-9,599	-7%
Waterloo	184,504	162,923	-21,581	-12%
Sub-Total	2,180,787	2,212,880	32,093	1%
Total (all Zone 1)	2,277,508	2,309,789	32,281	1%
Camden Town	18,378	18,160	-218	-1%
Mornington Crescent	3,702	3,805	103	3%
Ealing Broadway	25,411	24,880	-531	-2%

Impact on flows

- 3.7.38 Table 316 and Figure 207 to Figure 209 show the passenger flow impact of EAP and indicate small changes in line flows. For clarity, and in order to separate out the impacts of the EAP and Crossrail 2, while the table compares the scenario without Crossrail 2 and the EAP with Crossrail 2, the Figures show the differences between the EAP with Crossrail 2 and Crossrail 2 only (i.e. without EAP). The flow differences therefore represent the incremental increases resulting from the EAP.
- 3.7.39 This indicates that, for the AM peak period, the EAP attracts approximately 790 additional passengers to LU services and 520 additional passengers to NR services. These are split as indicated in Table 315.

Table 315. Distribution of additional passengers associated with EAP

Direction	Absolute increase in AM Passengers with EAP	Percentage increase in AM Passengers with EAP
Victoria line NB	220	16%
Northern Line (Charing Cross branch) line NB	150	11%
Northern Line (Bank branch) line NB	130	9%
Circle, Hammersmith & City and Metropolitan lines (EB & WB)	390	28%
Crossrail 2 NB	360	26%
Thameslink NB	160	11%
Total	1,410	100%

Table 316: 2041 network impacts, AM peak period

Services	Direction	HS2 Phase Two operation 2041 AM	EAP with Crossrail 2 sensitivity test 2041 AM	% difference
Classic suburban	Inbound	26,359	26,956	2%
	Outbound	5,126	5,768	13%
Classic inter-city	Inbound	8,703	8,777	1%
	Outbound	3,880	3,938	1%
HS2 at Euston	Inbound	26,044	26,529	2%
	Outbound	17,615	18,601	6%

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Services	Direction	HS2 Phase Two operation 2041 AM	EAP with Crossrail 2 sensitivity test 2041 AM	% difference
HS2 at Old Oak Common	Inbound	33,968	33,968	0%
	Outbound	26,066	26,066	0%
Victoria line, north of Euston	Northbound	28,806	22,525	-22%
	Southbound	67,694	56,473	-17%
Victoria line, south of Euston	Northbound	37,398	28,835	-23%
	Southbound	74,853	64,862	-13%
Northern line (Bank branch), north of Euston	Northbound	22,357	23,570	5%
	Southbound	44,422	44,362	0%
Northern line (Bank branch), south of Euston	Northbound	22,312	21,313	-4%
	Southbound	40,804	39,173	-4%
Northern line (Charing Cross branch), north of Euston	Northbound	16,421	17,469	6%
	Southbound	41,326	40,739	-1%
Northern line (Charing Cross branch), south of Euston	Northbound	18,544	16,854	-9%
	Southbound	45,168	41,962	-7%
Metropolitan/Hammersmith & City, Circle lines (west of Euston Square)	Eastbound	52,212	51,984	0%
	Westbound	43,457	41,608	-4%
Metropolitan/Hammersmith & City, Circle lines (east of Euston Square)	Eastbound	60,189	59,904	0%
	Westbound	49,453	47,231	-4%
GWML slow/Crossrail (Acton Main line to Old Oak Common)	Eastbound	24,279	24,292	0%
	Westbound	13,519	14,281	6%
Crossrail Old Oak Common to Paddington	Eastbound	43,087	42,927	0%
	Westbound	20,766	21,708	5%

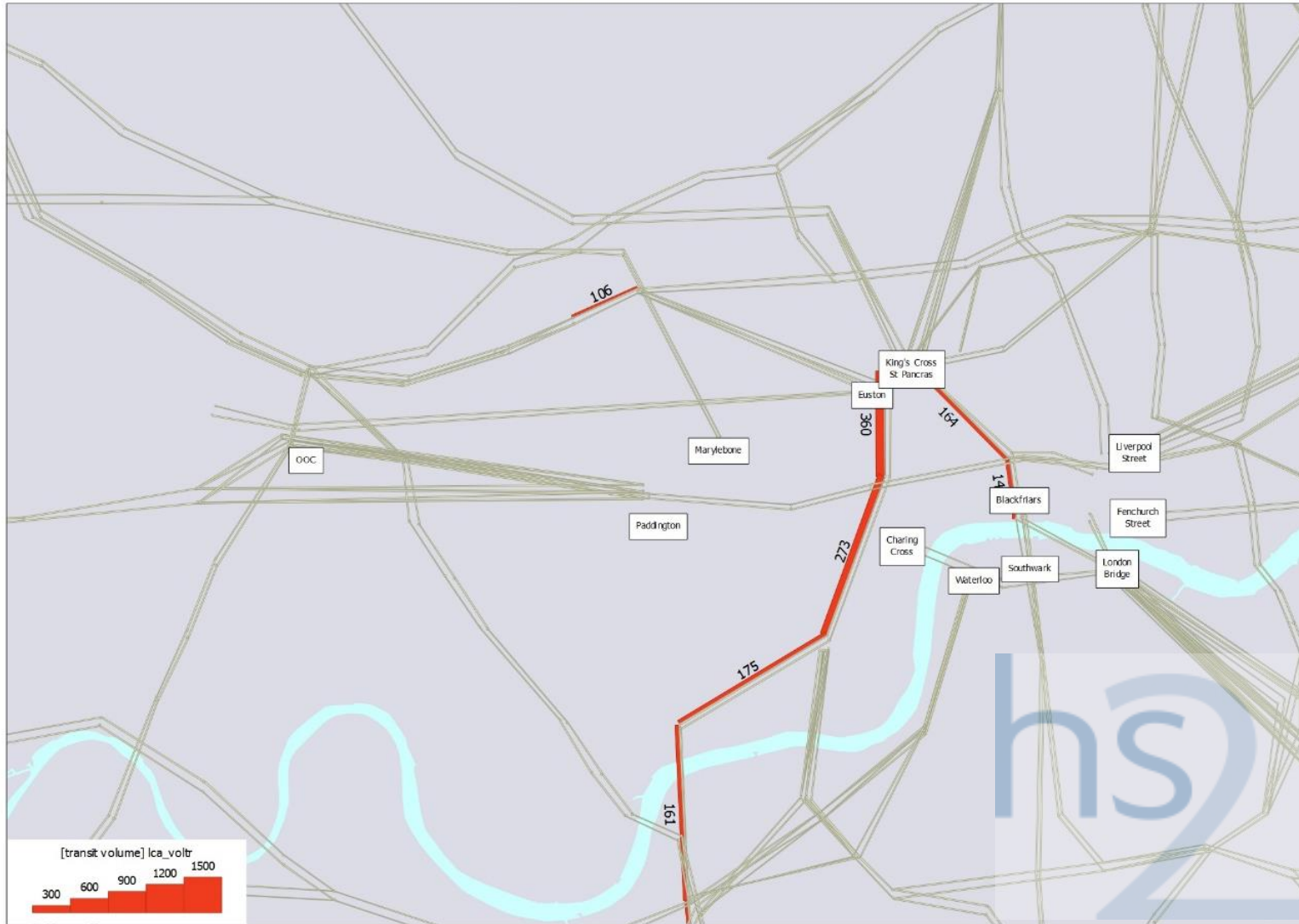
SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Services	Direction	HS2 Phase Two operation 2041 AM	EAP with Crossrail 2 sensitivity test 2041 AM	% difference
Crossrail Paddington to Bond Street	Eastbound	52,310	51,791	-1%
	Westbound	27,050	28,789	6%
Crossrail Bond Street to Tottenham Court Road	Northbound	47,517	46,843	-1%
	Southbound	33,755	37,046	10%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,336	1,032	-23%
	Southbound	2,562	2,415	-6%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	2,564	2,411	-6%
	Westbound	2,089	1,955	-6%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	16,612	16,088	-3%
	Westbound	7,257	6,474	-11%
GWML slow (Old Oak Common to Paddington)	Eastbound	43,087	42,927	0%
	Westbound	20,766	21,708	5%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Figure 207: NR flow differences 2041 AM peak EAP including Crossrail 2

Compare NR volume on links [Scen. 7392 - 7391]



DB TRANSFER 2 (HS2)
 (C:/EMME/Railplan/HS2/PlotBank/em mebank)
 Scenario 7392: HES35A11K B700 2041 AM EAP Test w AP3 Stage B1 + CR2
 steve.miller@LDNLAPRIL2012 2015-06-03 15:02

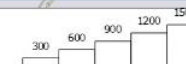
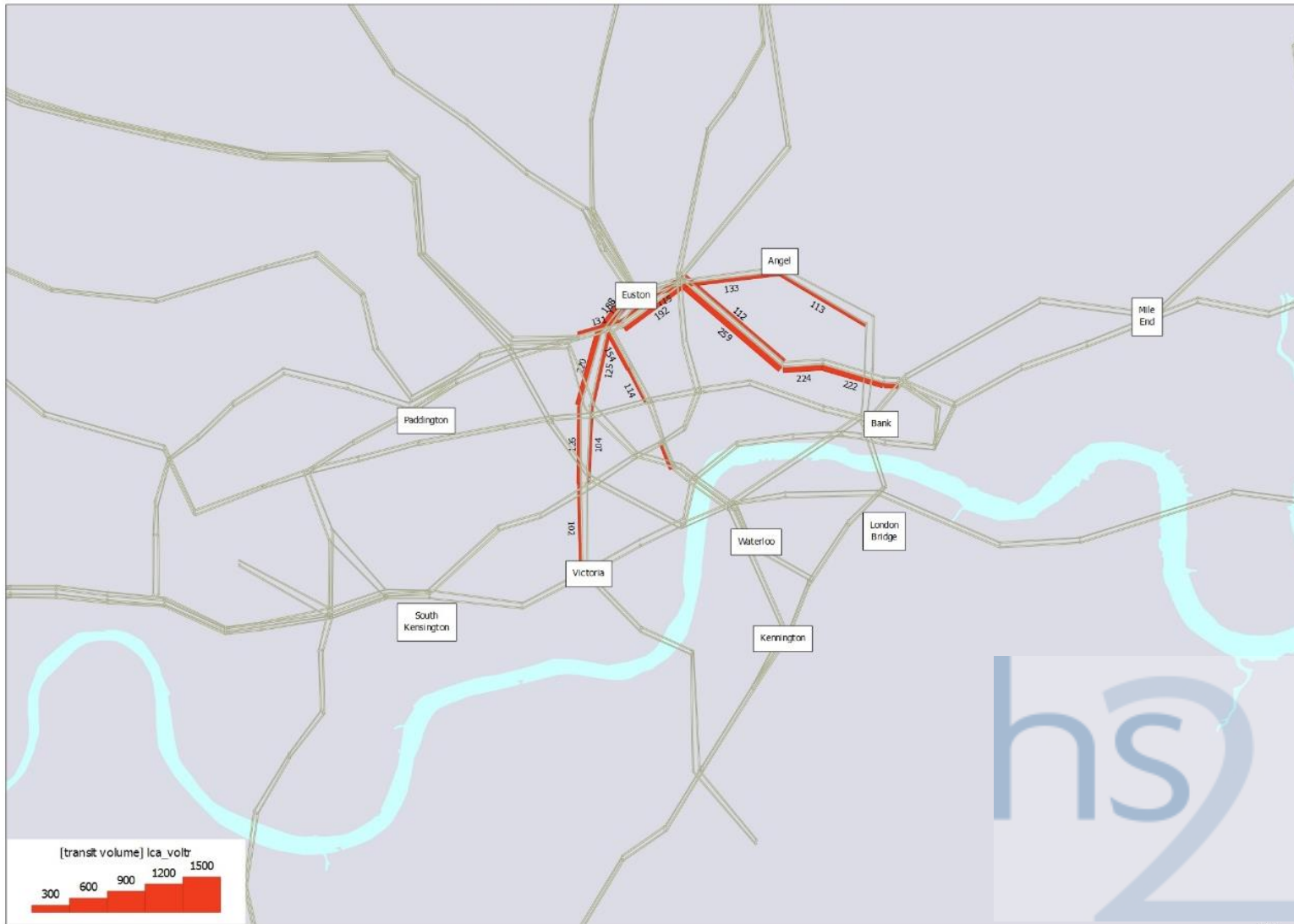
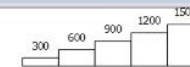


Figure 2o8: LU flow differences 2041 AM peak EAP including Crossrail 2

Compare LUL volume on links [Scen. 7392 - 7391]



DB TRANSFER 2 (HS2)
 (C:/EMME/Railplan/HS2/PlotBank/emmebank)
 Scenario: 7392: HES3SA11K B700 2041 AM EAP Test w AP3 Stage B1 + CR2
 steve.miller@LDNLAPBL20F12 2015-08-03 15:03



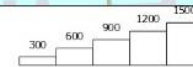
SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Figure 209: Bus flow differences 2041 AM peak EAP including Crossrail 2

Compare Bus volume on links [Scen. 7392 - 7391]



DB TRANSFER 2 (HS2)
 (C:/EMM/7/Relplan/HS2/PlotBank/emmebank)
 Scenario 7392: HESSA11K 8700 2041 AM EAP Test w AP3 Stage B1 + CR2
 steve.miller@LDNLAP0L20F12 2015-08-03 15:03



Impacts at Old Oak Common

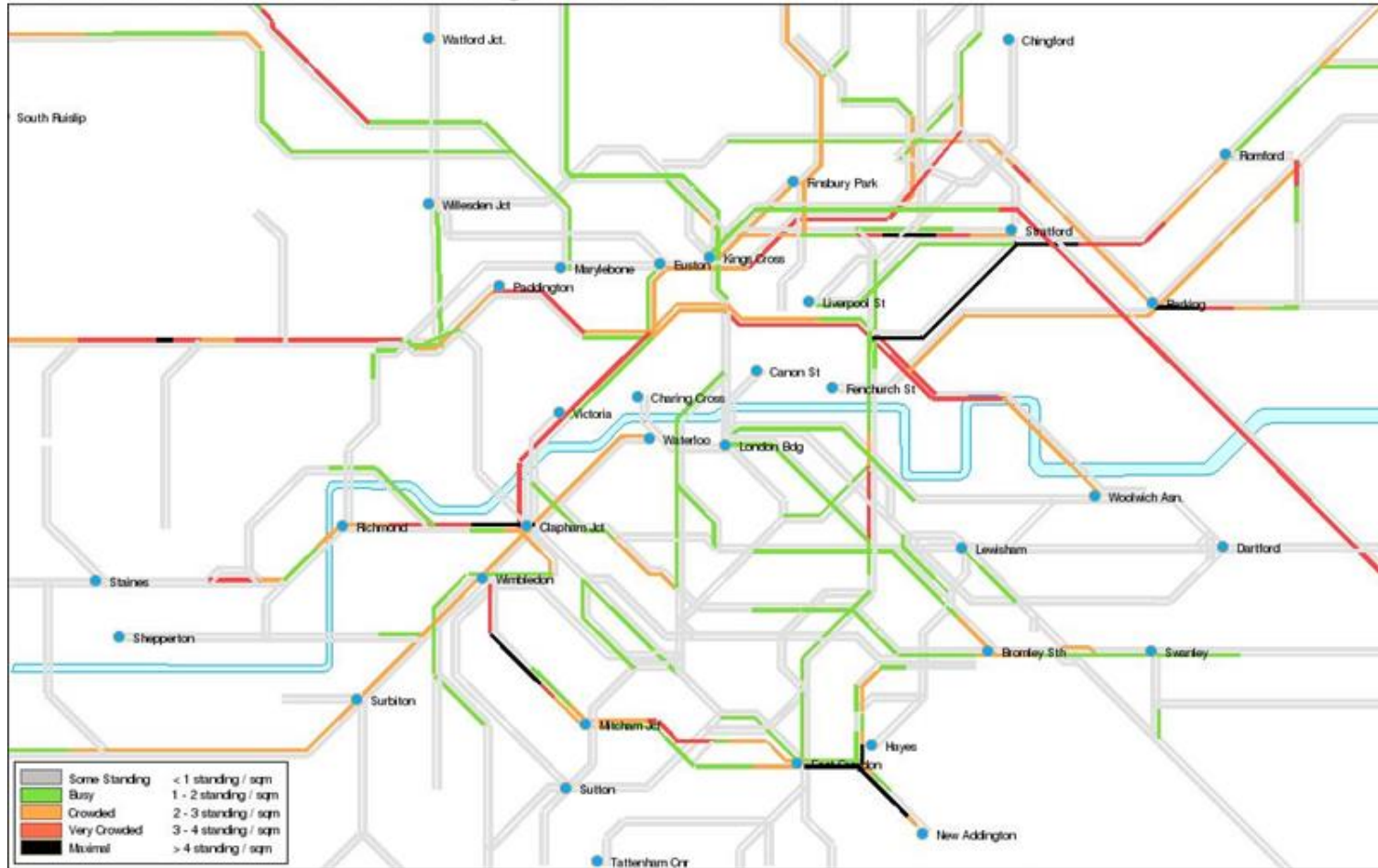
3.7.40 Due to the very localised impacts of the EAP around Euston, this sensitivity test has no discernible impacts at Old Oak Common.

Impact on crowding

3.7.41 Crowding for NR and LU networks is shown in Figure 210 and Figure 211. These Figures indicate that the EAP does not add materially to crowding, over and above the changes in crowding as a result of Crossrail 2. Line by line graphs have not been reproduced for this sensitivity test due to the similarity to those for the Crossrail 2 test (Figure 203, Figure 204, Figure 205 and Figure 206).

Figure 210: NR crowding 2041 AM peak period EAP including Crossrail 2

National Rail and Tramlink Crowding
HE535A11K - 2041 AM EAP Test with Stage B1 with CR2



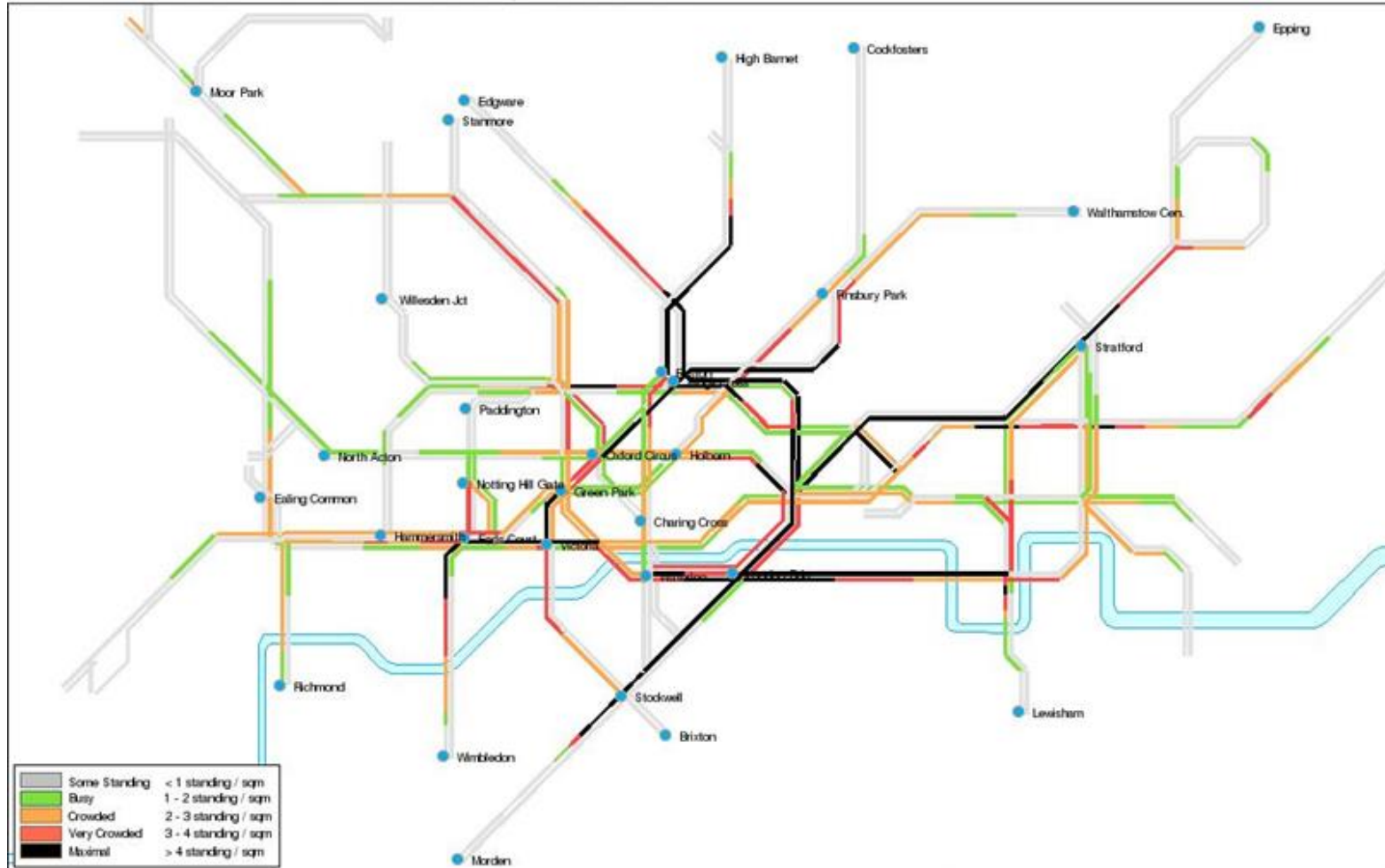
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 211: LU crowding 2041 AM peak period EAP including Crossrail 2

LUL and DLR Crowding
HE535A11K - 2041 AM EAP Test with Stage B1 with CR2



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Overground connectivity at Old Oak

Scheme details

- 3.7.42 This sensitivity test comprises Overground stations at Old Oak Common Lane and Hythe Road with walk links to the main Old Oak Common station, as well as the following service changes (both directions):
- Richmond – Stratford services call at Old Oak Common Lane;
 - Clapham Junction – Willesden Junction/Stratford, diverted and call at Hythe Road;
 - additional two tph Clapham Junction – Hythe Road in the peak hours only; and
 - all Southern services from Croydon/Clapham Junction to Shepherds Bush (and reverse) extended to end/start from this new Hythe Road station.
- 3.7.43 In addition this test includes a North Acton Link which would provide a walk route between North Acton LU station and Old Oak Common station.
- 3.7.44 This scheme would connect the orbital London Overground services into the proposed HS2/GWML/Crossrail Old Oak Common station. In the context of HS2, this would allow HS2 passengers to change at Old Oak Common, with direct links to Clapham Junction, Richmond and stations on the North London Line. The scheme could potentially reduce pressure at Euston by attracting more HS2 passengers to interchange at Old Oak Common.

Demand

- 3.7.45 An LTS scenario was required to provide updated demand matrices for this test. This utilised the LTS network developed as part of the Old Oak Common OAPF work, with the Overground stations linked to Old Oak Common station.
- 3.7.46 The resulting LTS public transport matrices were amended to include HS2 demand. Whilst no analysis of the likely highway impacts has been assessed, highway demand is forecast to reduce with the Overground station in place.

Comparison with 2041 AM Proposed Scheme

Station demand

- 3.7.47 Table 317 shows a reduction in HS2 boarders and alighters at Euston of 3,070 and 850 respectively with these passengers boarding and alighting at Old Oak Common instead due to its improved connections. There are corresponding reductions in onward LU movements at Euston, particularly on northbound Victoria Line and Northern Line Charing Cross branch lines.

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Table 317: 2041 AM Euston station demand, 07:00 to 10:00

Description	HS2 Phase Two operation 2041 AM			Overground at OOC sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (outbound)	5,126	-	5,126	5,055	-	5,055
Euston suburban (inbound)	-	26,359	26,359	-	26,151	26,151
Euston inter-city (outbound)	3,880	-	3,880	3,881	-	3,881
Euston inter-city/other (inbound)	-	8,703	8,703	-	8,702	8,702
Euston HS2 (outbound))	-	26,044	26,044	-	25,192	25,192
Euston HS2 (inbound)	17,615	-	17,615	14,541	-	14,541
Sub-total: Euston NR	26,621	61,106	87,727	23,477	60,045	83,522
Euston LU						
Euston Northern line (Charing Cross branch) northbound	3,385	5,508	8,893	3,276	4,186	7,462
Euston Northern line (Charing Cross branch) southbound	8,452	4,610	13,062	8,216	4,545	12,761
Euston Northern line (Bank branch) northbound	5,244	5,199	10,443	5,137	5,157	10,294
Euston Northern line (Bank branch) southbound	7,045	10,664	17,709	7,030	10,548	17,578
Euston Victoria line (northbound)	4,497	13,090	17,587	4,423	12,024	16,447
Euston Victoria line (southbound)	15,866	8,707	24,573	15,571	8,619	24,190
Sub-total: Euston LU	44,489	47,778	92,267	43,653	45,079	88,732
Euston Square LU						
Euston Square sub-surface lines (northbound/westbound)	5,376	11,372	16,748	5,112	11,220	16,332
Euston Square sub-surface lines (southbound/eastbound)	16,299	8,321	24,620	16,145	7,957	24,102
Sub-total: Euston Square LU	21,675	19,693	41,368	21,257	19,177	40,434

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Description	HS2 Phase Two operation 2041 AM			Overground at OOC sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Old Oak Common						
OOO NR slow (outbound)	1,769	9,016	10,785	2,163	8,879	11,042
OOO NR slow (inbound)	22,527	3,719	26,246	23,870	3,353	27,223
OOO NR fast (outbound)	7,011	0	7,011	8,009	-	8,009
OOO NR fast (inbound)	-	17,820	17,820	-	18,207	18,207
OOO HS2 (inbound)	-	7,925	7,925	-	8,776	8,776
OOO HS2 (outbound)	8,451	-	8,451	11,526	-	11,526
Sub-total: Old Oak Common	39,758	38,480	78,238	45,568	39,215	84,783

Demand at other stations

3.7.48 Table 318 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway. There are limited increases at a number of stations. The larger reductions are at Waterloo, Paddington, Victoria, Oxford Circus and Euston/Euston Square. This is a result of additional capacity to/from Old Oak Common which reduces passenger loadings on HS2 between Old Oak Common and Euston and diverts passengers from Paddington, Victoria and Waterloo due to WLL and NLL improvements, together with the generative impacts (through LTS) of additional capacity.

Table 318: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	HS2 Phase Two operation 2041 AM	Overground at OOC sensitivity test 2041 AM	Absolute difference	% difference
Euston (including Euston Square)	137,129	132,754	-4,375	-3%
Goodge Street	15,018	15,563	545	4%
Regent's Park	5,475	5,647	172	3%
Charing Cross	43,659	43,554	-105	0%
Fenchurch Street	32,158	32,044	-114	0%
Angel	22,919	22,792	-127	-1%
Notting Hill Gate	13,220	13,093	-127	-1%
Leicester Square	24,456	24,317	-139	-1%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Station	HS2 Phase Two operation 2041 AM	Overground at OOC sensitivity test 2041 AM	Absolute difference	% difference
Westminster	38,307	38,160	-147	0%
Moorgate	35,562	35,414	-148	0%
Baker Street	48,827	48,676	-151	0%
Blackfriars	38,777	38,621	-156	0%
Warren Street	28,182	28,001	-181	-1%
St Pancras	25,291	25,104	-187	-1%
Old Street	27,737	27,547	-190	-1%
London Bridge	159,438	159,227	-211	0%
Green Park	41,258	40,990	-268	-1%
Farringdon	92,457	92,160	-297	0%
Tottenham Court Road	49,703	49,278	-425	-1%
Bond Street	48,564	48,110	-454	-1%
Bank	102,642	102,184	-458	0%
Holborn	29,751	29,252	-499	-2%
King's Cross	76,284	75,544	-740	-1%
Oxford Circus	114,100	112,965	-1,135	-1%
Liverpool Street	140,201	138,866	-1,335	-1%
Waterloo	184,504	182,766	-1,738	-1%
Victoria	156,617	154,814	-1,803	-1%
Paddington	66,926	63,757	-3,169	-5%
Sub-Total	1,799,162	1,781,200	-17,962	-1%
Total (all Zone 1)	2,277,508	2,259,414	-18,094	-1%

Station	HS2 Phase Two operation 2041 AM	Overground at OOC sensitivity test 2041 AM	Absolute difference	% difference
Camden Town	18,378	17,962	-416	-2%
Mornington Crescent	3,702	3,692	-10	0%
Ealing Broadway	25,411	24,681	-730	-3%

Impact on flows

- 3.7.49 Table 319 and Figure 212 to Figure 214 show the passenger flow impact of the Overground connectivity at Old Oak Common compared to the 2041 AM future baseline plus operation. The LU network shows modest flow reductions over the 07:00-10:00 period in excess of 1,000 on the southbound Bakerloo Line between Queens Park and Paddington, of around 800 passengers on the westbound Central Line between Oxford Circus and Shepherds Bush, of 900 on the northbound Victoria Line between Victoria and Oxford Circus and of 1,700 on the northbound Northern Line Charing Cross branch south of Euston.
- 3.7.50 On NR, the addition of a new station connecting Old Oak Common to the Overground, results in increased passenger flow on the Overground between Acton Central and Willesden Junction (NLL) of 1,220 northbound and 3,310 southbound and between Shepherds Bush and Willesden Junction (WLL) of 810 westbound.
- 3.7.51 With the exception of HS2 services into Euston (Figure 213 and Table 317), which experience a passenger decrease of around 3,070 into Euston and 850 from Euston, the impacts on the NR network are limited.
- 3.7.52 The strengthening of the Clapham Junction – Old Oak Common (WLL) service by an additional 2tph has a substantial impact on flows from Clapham Junction northbound with an additional 4,455 northbound and 3,340 southbound as far as Shepherds Bush. As well as newly generated trips, these were trips previously using LU services including the parallel Central Line (Shepherds Bush-Oxford Circus) and District Line (towards Victoria) / Victoria Line (towards Euston) to make north-south journeys.

Table 319: 2041 network impacts, AM peak period

Services	Direction	HS2 Phase Two operation 2041 AM	Overground at OOC sensitivity test 2041 AM	% difference
Classic suburban	Inbound	26,359	26,151	-1%
	Outbound	5,126	5,055	-1%
Classic inter-city	Inbound	8,703	8,702	0%
	Outbound	3,880	3,881	0%

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Services	Direction	HS2 Phase Two operation 2041 AM	Overground at OOC sensitivity test 2041 AM	% difference
HS2 at Euston	Inbound	26,044	25,192	-3%
	Outbound	17,615	14,541	-17%
HS2 at Old Oak Common	Inbound	33,968	33,968	0%
	Outbound	26,066	26,066	0%
Victoria line, north of Euston	Northbound	28,806	28,876	0%
	Southbound	67,694	67,604	0%
Victoria line, south of Euston	Northbound	37,398	36,476	-2%
	Southbound	74,853	74,556	0%
Northern line (Bank branch), north of Euston	Northbound	22,357	21,675	-3%
	Southbound	44,422	44,130	-1%
Northern line (Bank branch), south of Euston	Northbound	22,312	21,695	-3%
	Southbound	40,804	40,612	0%
Northern line (Charing Cross branch), north of Euston	Northbound	16,421	15,897	-3%
	Southbound	41,326	41,039	-1%
Northern line (Charing Cross branch), south of Euston	Northbound	18,544	16,807	-9%
	Southbound	45,168	44,710	-1%
Metropolitan/Hammersmith & City, Circle lines (west of Euston Square)	Eastbound	52,212	51,753	-1%
	Westbound	43,457	42,771	-2%
Metropolitan/Hammersmith & City, Circle lines (east of Euston Square)	Eastbound	60,189	59,942	0%
	Westbound	49,453	48,879	-1%
GWML slow/Crossrail (Acton Main line to Old Oak Common)	Eastbound	24,279	23,655	-3%
	Westbound	13,519	13,559	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Services	Direction	HS2 Phase Two operation 2041 AM	Overground at OOC sensitivity test 2041 AM	% difference
Crossrail Old Oak Common to Paddington	Eastbound	43,087	44,172	3%
	Westbound	20,766	20,276	-2%
Crossrail Paddington to Bond Street	Eastbound	52,310	53,038	1%
	Westbound	27,050	26,880	-1%
Crossrail Bond Street to Tottenham Court Road	Northbound	47,517	47,968	1%
	Southbound	33,755	33,504	-1%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,336	2,556	91%
	Southbound	2,562	5,875	129%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	2,564	2,057	-20%
	Westbound	2,089	2,898	39%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	16,612	16,227	-2%
	Westbound	7,257	6,386	-12%
GWML slow (Old Oak Common to Paddington)	Eastbound	43,087	44,172	3%
	Westbound	20,766	20,276	-2%

Figure 212: LU flow differences 2041 AM peak Overground at Old Oak Common station

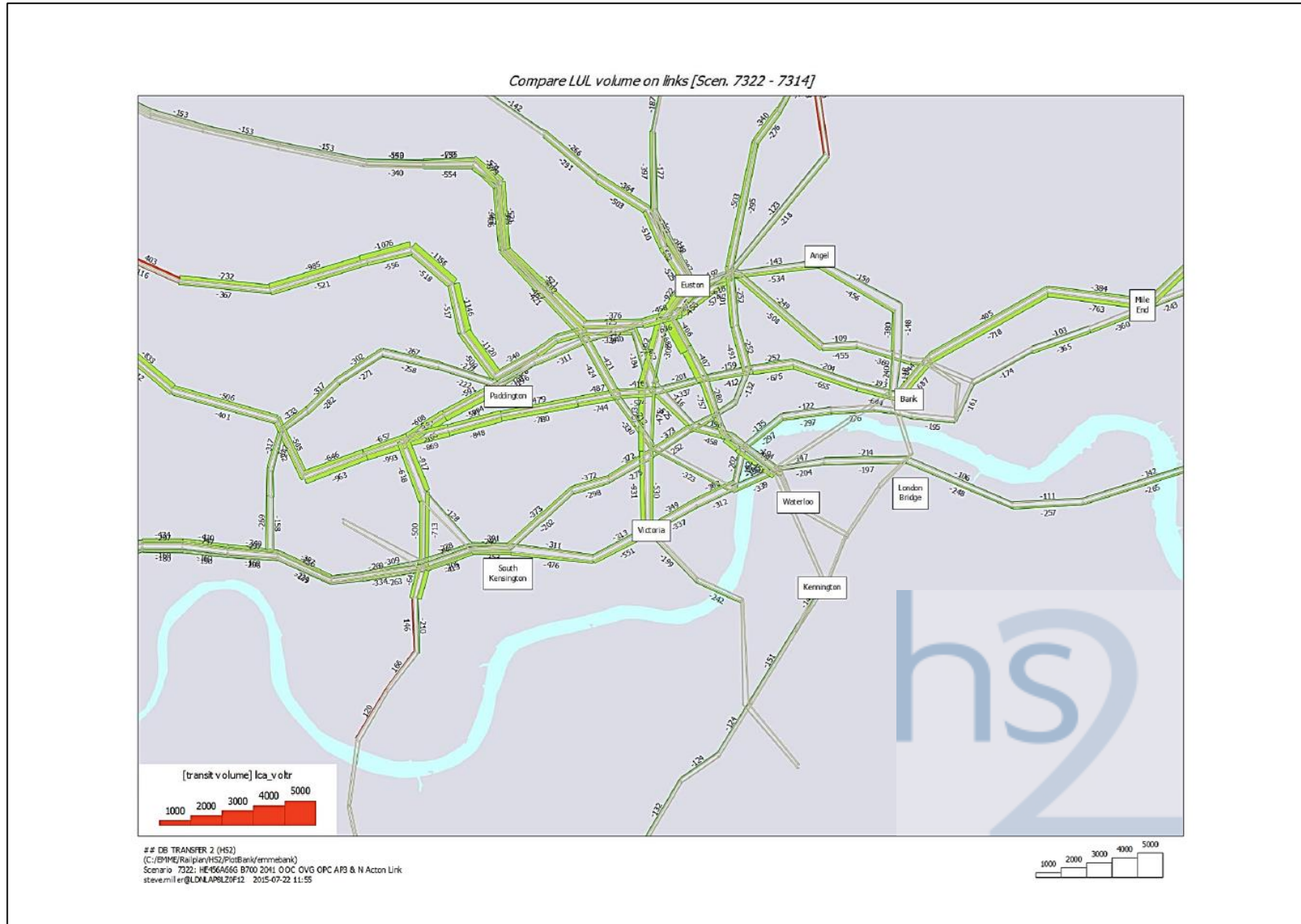


Figure 213: NR flow differences 2041 AM peak Overground at Old Oak Common station

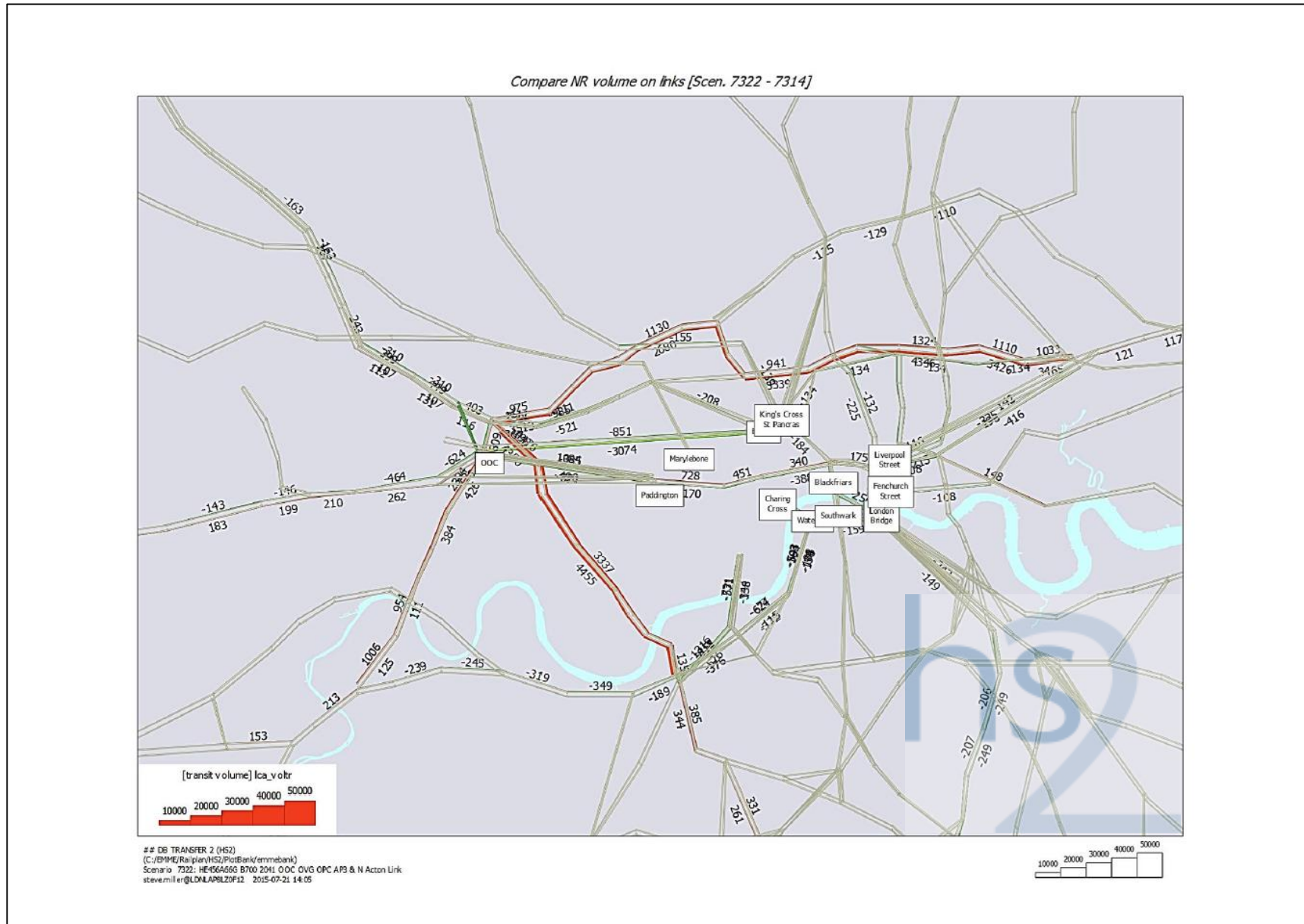
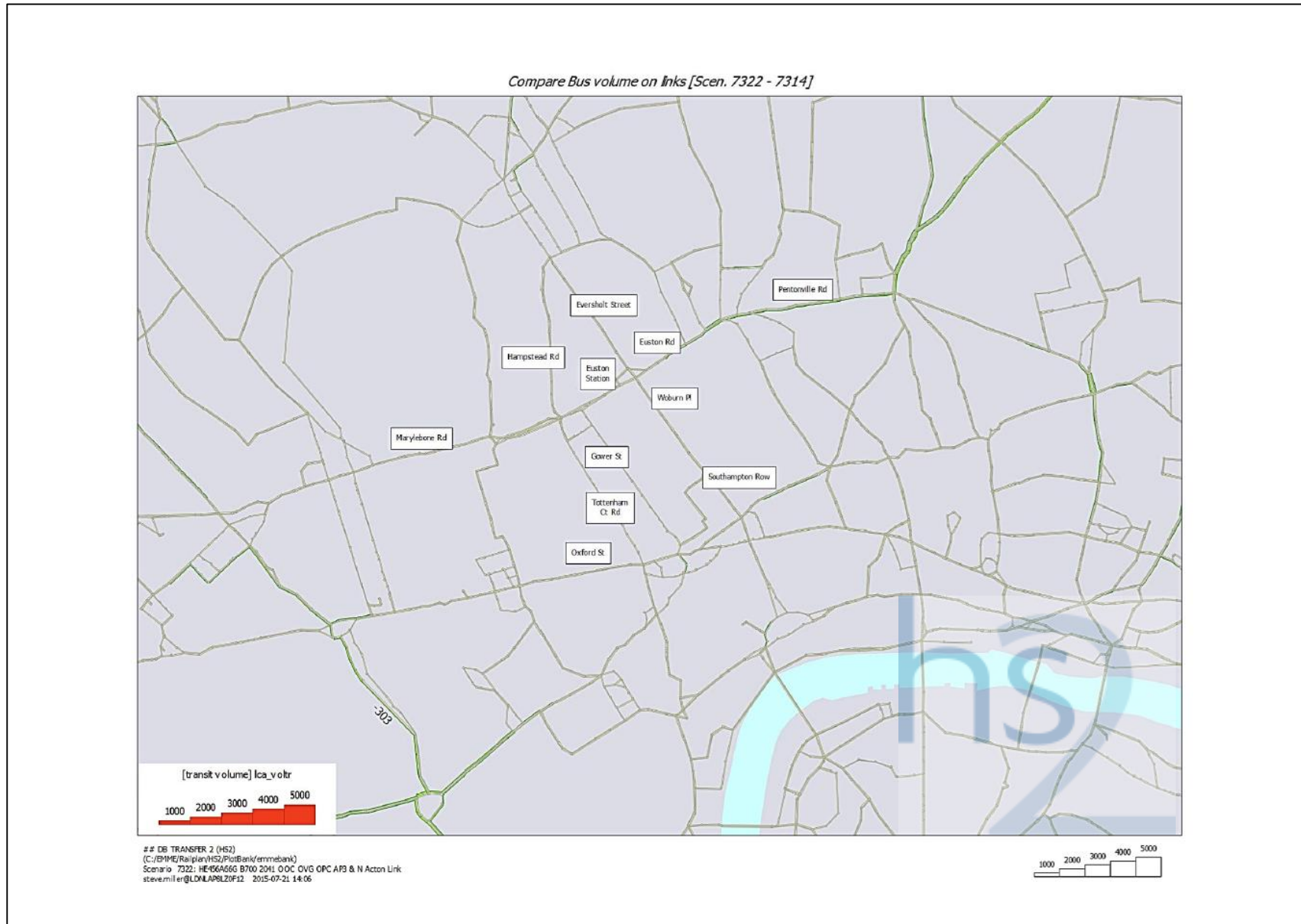


Figure 214: Bus flow differences 2041 AM peak Overground at Old Oak Common station



Impacts at Old Oak Common

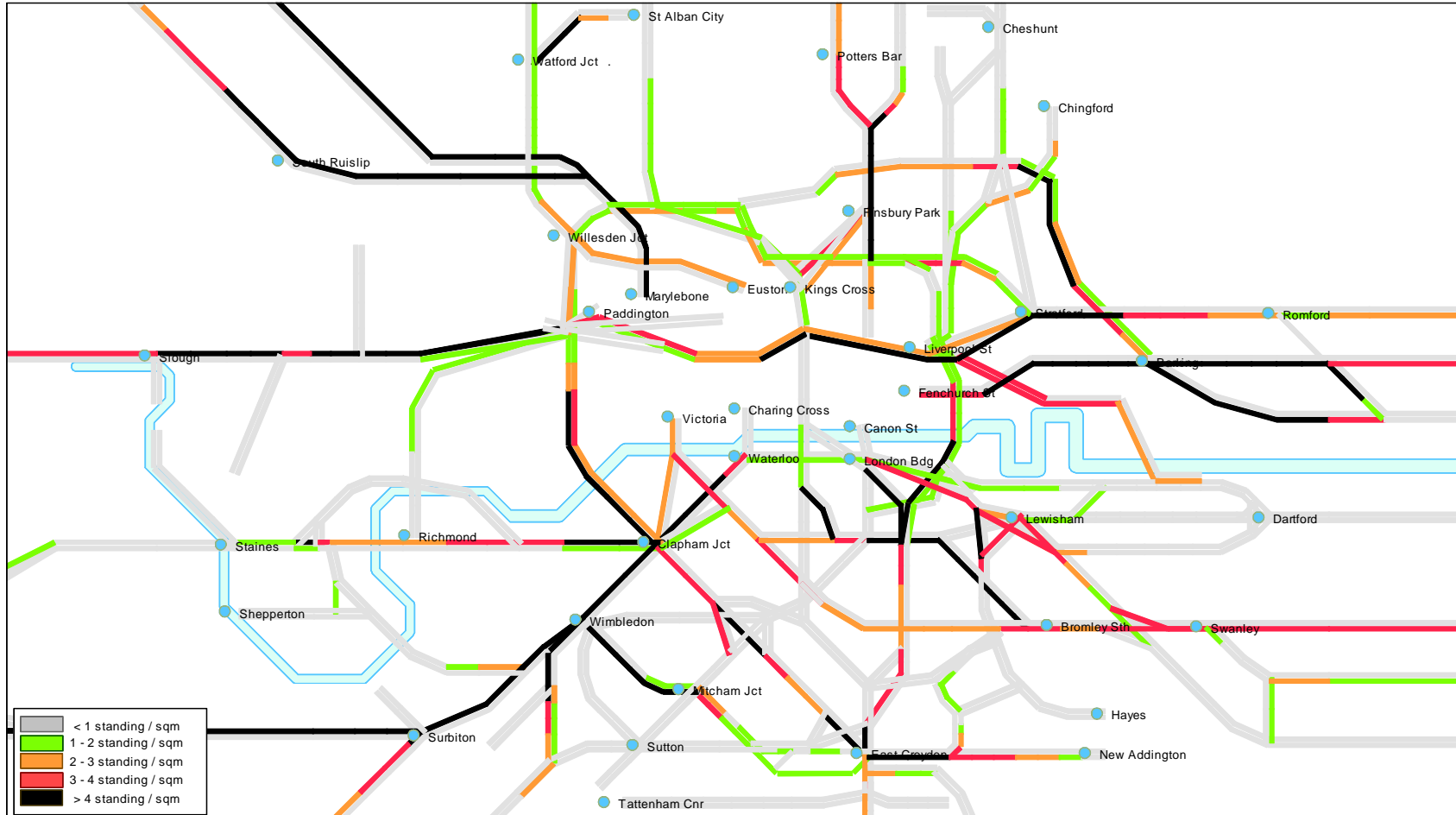
- 3.7.53 The impact the Overground connectivity test on interchange movements at Old Oak Common is substantial with an overall increase in movements of approximately 25%. More than half of these trips are interchanging to/from HS2 services with a redistribution of interchange movements within the station.
- 3.7.54 Volumes into and out of the station from local bus and walk are reduced slightly, suggesting some trips can use another London Overground rail station as their initial boarding point before interchanging at Old Oak Common. Conversely, volumes out of the station entrance increase, driven by London Overground passengers, suggesting that a combination of London Overground and bus services at Old Oak Common is attractive for some movements.
- 3.7.55 The impact on local buses is as expected. The only route impacted is Route 72 which is the primary north-south route serving Old Oak Common. Along this route the introduction of a north-south rail service at Old Oak Common reduces bus loading on some sections of the route.

Impact on crowding

- 3.7.56 The impacts of the Overground connectivity test on crowding are extremely limited with negligible increases (<0.1 PPSM) on LU lines around Euston and minimal increases of around 0.1 PPSM on the eastbound central Line from Ealing Broadway. There are minor impacts, in terms of an increase from 1-2 PPSM to 2-3 PPSM on northbound NLL services between South Acton and Willesden Junction. This is reflected in Figure 215 and Figure 216 for network crowding.
- 3.7.57 Line by line graphs have not been reproduced for this sensitivity test due to the limited crowding impacts.

Figure 215: NR crowding 2041 AM peak period Overground at Old Oak Common station

National Rail and Tramlink Crowding
Crowded_HD201AH25: Scenario 2150



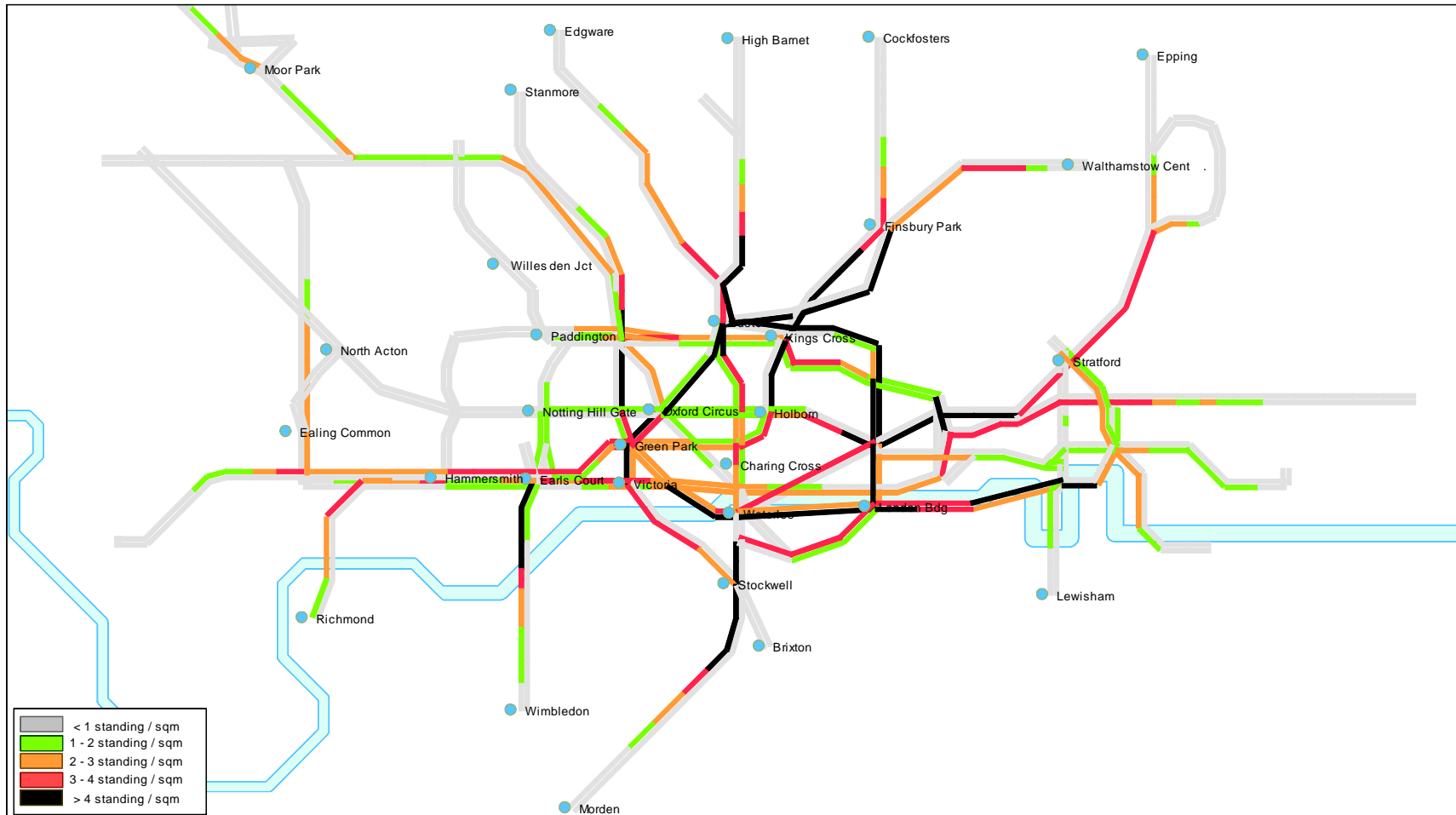
Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Figure 216: LU crowding 2041 AM peak period Overground at Old Oak Common station

LUL and DLR Crowding
Crowded_HD201AH25: Scenario 2150



Note:
 - Peak hour crowding (54% peak period demand)
 - Standing density factor of 7 pax/sqm
 - Includes reliability factor

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Old Oak Common OAPF with Overground

Scheme description

- 3.7.58 This sensitivity test combines the transport supply changes from the Old Oak Common Overground connectivity sensitivity test with the 24,000 homes and 55,000 jobs assumed in the Old Oak Common Opportunity Area Planning Framework (OAPF).

Comparison with 2041 AM Proposed Scheme

Station demand

- 3.7.59 Table 320 shows the balance of HS2 flows between Euston and Old Oak Common in this sensitivity test is very similar to that in the Overground Connectivity (without OAPF) sensitivity test with a reduction in boarders and alighters at Euston and a compensating increase at Old Oak Common. No allowance has been made for any increase in use of HS2 services at Old Oak Common due to increased population and employment in the local area, but any change is expected to be very small. There are increases in all boarders and alighters at Old Oak Common due to the cumulative impact of improved connectivity and increased population and employment opportunities. The largest increases are from NR slow/Crossrail services where boarders and alighters increase by some 10% in the westbound direction and 23% in the eastbound direction. Overall, there is a 21% increase in boarders and alighters at Old Oak Common station

Table 320: 2041 AM Euston station demand, 07:00 to 10:00

Description	HS2 Phase Two operation 2041 AM			OAPF plus Overground at OOC sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston NR						
Euston suburban (outbound)	5,126	-	5,126	5,110	-	5,110
Euston suburban (inbound)	-	26,359	26,359	-	26,056	26,056
Euston inter-city (outbound)	3,880	-	3,880	3,902	-	3,902
Euston inter-city/other (inbound)	-	8,703	8,703	-	8,503	8,503
Euston HS2 (outbound)	-	26,044	26,044	-	25,446	25,446
Euston HS2 (inbound)	17,615	-	17,615	15,173	-	15,173
Sub-total: Euston NR	26,621	61,106	87,727	24,185	60,005	84,190
Euston LU						
Euston Northern line (Charing Cross branch) northbound	3,385	5,508	8,893	3,171	4,245	7,416
Euston Northern line (Charing Cross branch) southbound	8,452	4,610	13,062	8,000	4,376	12,376

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Description	HS2 Phase Two operation 2041 AM			OAPF plus Overground at OOC sensitivity test 2041 AM		
	Board	Alight	Total	Board	Alight	Total
Euston Northern line (Bank branch) northbound	5,244	5,199	10,443	5,158	5,185	10,343
Euston Northern line (Bank branch) southbound	7,045	10,664	17,709	7,055	10,543	17,598
Euston Victoria line (northbound)	4,497	13,090	17,587	4,359	12,040	16,399
Euston Victoria line (southbound)	15,866	8,707	24,573	15,939	8,590	24,529
Sub-total: Euston LU	44,489	47,778	92,267	43,682	44,979	88,661
Euston Square LU						
Euston Square sub-surface lines (northbound/westbound)	5,376	11,372	16,748	5,135	11,356	16,491
Euston Square sub-surface lines (southbound/eastbound)	16,299	8,321	24,620	15,439	7,860	23,299
Sub-total: Euston Square LU	21,675	19,693	41,368	20,574	19,216	39,790
Old Oak Common						
OOO NR slow (outbound)	1,769	9,016	10,785	2,608	14,212	16,820
OOO NR slow (inbound)	22,527	3,719	26,246	27,934	4,330	32,264
OOO NR fast (outbound)	7,011	0	7,011	7,966	-	7,966
OOO NR fast (inbound)	-	17,820	17,820	-	17,988	17,988
OOO HS2 (inbound)	-	7,925	7,925	-	8,522	8,522
OOO HS2 (outbound)	8,451	-	8,451	10,893	-	10,893
Sub-total: Old Oak Common	39,758	38,480	78,238	49,401	45,052	94,453

Demand at other stations

- 3.7.60 Table 321 shows all stations in Zone 1 which either increase by more than +100 passengers or decrease by more than -100 passengers in the three hour peak period, together with the changes at Camden Town, Mornington Crescent and Ealing Broadway.
- 3.7.61 There are reductions in demand, particularly at Euston but also at King's Cross, Blackfriars, Farringdon, Barbican, Baker Street, Old Street, Holborn, Waterloo, London Bridge, Victoria and Paddington as a result of additional capacity to/from Old Oak Common. This reduces passenger loadings on HS2 between Old Oak Common

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

and Euston and diverts passengers from Paddington, Victoria and Waterloo due to WLL and NLL improvements, together with the generative impacts (through LTS) of additional capacity. Total zone 1 LU demand falls by over 27,000 passengers equating to a 1% decrease.

Table 321: 2041 AM peak access, egress and interchange trips – Zone 1 LU stations

Station	HS2 Phase Two operation 2041 AM	OAPF plus Overground at OOC sensitivity test 2041 AM	Absolute difference	% difference
Euston (including Euston Square)	137,129	132,784	-4,345	-3%
Tottenham Court Road	49,703	50,631	928	2%
Moorgate	35,562	36,204	642	2%
Marble Arch	6,527	7,033	506	8%
Goodge Street	15,018	15,521	503	3%
Sloane Square	14,295	14,736	441	3%
Temple	19,350	19,600	250	1%
Lancaster Gate	3,151	3,396	245	8%
Pimlico	11,108	11,320	212	2%
Covent Garden	5,163	5,334	171	3%
Tower Gateway	4,225	4,369	144	3%
Queensway	3,356	3,495	139	4%
Monument	11,097	11,210	113	1%
City Thameslink	16,911	17,013	102	1%
Borough	4,768	4,665	-103	-2%
Hyde Park Corner	3,693	3,584	-109	-3%
High Street Kensington	9,441	9,329	-112	-1%
Chancery Lane	15,343	15,221	-122	-1%
Regent's Park	5,475	5,323	-152	-3%
Russell Square	8,034	7,877	-157	-2%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Station	HS2 Phase Two operation 2041 AM	OAPF plus Overground at OOC sensitivity test 2041 AM	Absolute difference	% difference
St. Paul's	5,151	4,956	-195	-4%
Mansion House	6,456	6,258	-198	-3%
Aldgate East	14,433	14,228	-205	-1%
Great Portland Street	14,707	14,384	-323	-2%
South Kensington	24,475	24,142	-333	-1%
Aldgate	20,823	20,486	-337	-2%
Marylebone	19,282	18,919	-363	-2%
Oxford Circus	114,100	113,725	-375	0%
Embankment	29,920	29,537	-383	-1%
Angel	22,919	22,534	-385	-2%
Leicester Square	24,456	24,070	-386	-2%
Tower Hill	20,232	19,822	-410	-2%
Elephant & Castle	31,414	30,998	-416	-1%
Bond Street	48,564	48,075	-489	-1%
Waterloo East	10,384	9,875	-509	-5%
Knightsbridge	8,614	8,079	-535	-6%
St. James' Park	24,806	24,091	-715	-3%
Piccadilly Circus	19,964	19,218	-746	-4%
Bank	102,642	101,874	-768	-1%
Green Park	41,258	40,422	-836	-2%
Cannon Street	33,846	32,859	-987	-3%
Liverpool Street	140,201	139,146	-1,055	-1%
King's Cross	76,284	75,201	-1,083	-1%

Station	HS2 Phase Two operation 2041 AM	OAPF plus Overground at OOC sensitivity test 2041 AM	Absolute difference	% difference
Blackfriars	38,777	37,554	-1,223	-3%
Farringdon	92,457	91,229	-1,228	-1%
Barbican	14,303	13,047	-1,256	-9%
Baker Street	48,827	47,539	-1,288	-3%
Old Street	27,737	26,359	-1,378	-5%
Holborn	29,751	28,173	-1,578	-5%
Waterloo	184,504	182,623	-1,881	-1%
London Bridge	159,438	157,173	-2,265	-1%
Victoria	156,617	154,201	-2,416	-2%
Paddington	66,926	64,166	-2,760	-4%
Sub-Total	2,053,617	2,023,608	-25,461	-1%
Total (all Zone 1)	2,277,508	2,249,833	-27,675	-1%
Camden Town	18,378	18,092	-286	-2%
Mornington Crescent	3,702	3,676	-26	-1%
Ealing Broadway	25,411	25,200	-211	-1%

Impact on flows

- 3.7.62 Table 322 and Figure 217 to Figure 219 show the passenger flow impact of the Old Oak Common and Overground Connectivity test. As well as the reduction in HS2 flows particularly out of Euston (-2,440), there are increases around Old Oak Common on the WLL from Clapham Junction in excess of 6,000 northbound and approaching 4,000 southbound (+1,260) and the NLL from Stratford of 3,540 westbound and 1,800 eastbound. These increases reflect the substantial growth in homes and jobs in the OAPF area. There are smaller increases on the NLL south of Old Oak Common and on Crossrail where demand rises by 3,750 passengers (14%) westbound between Bond Street and Paddington.
- 3.7.63 Because Old Oak Common cannot be accessed directly by LU services, changes in LU flows are lower than on rail, with a pattern of flow increases in outer areas and flow reductions in central London. For example, there are flow increases on the Central Line west of Shepherds Bush (where passengers interchange onto the WLL), on the northbound District Line from Wimbledon towards West Brompton where passengers also interchange onto the WLL and on the southbound Bakerloo Line towards Willesden Junction where passengers interchange onto the NLL.

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

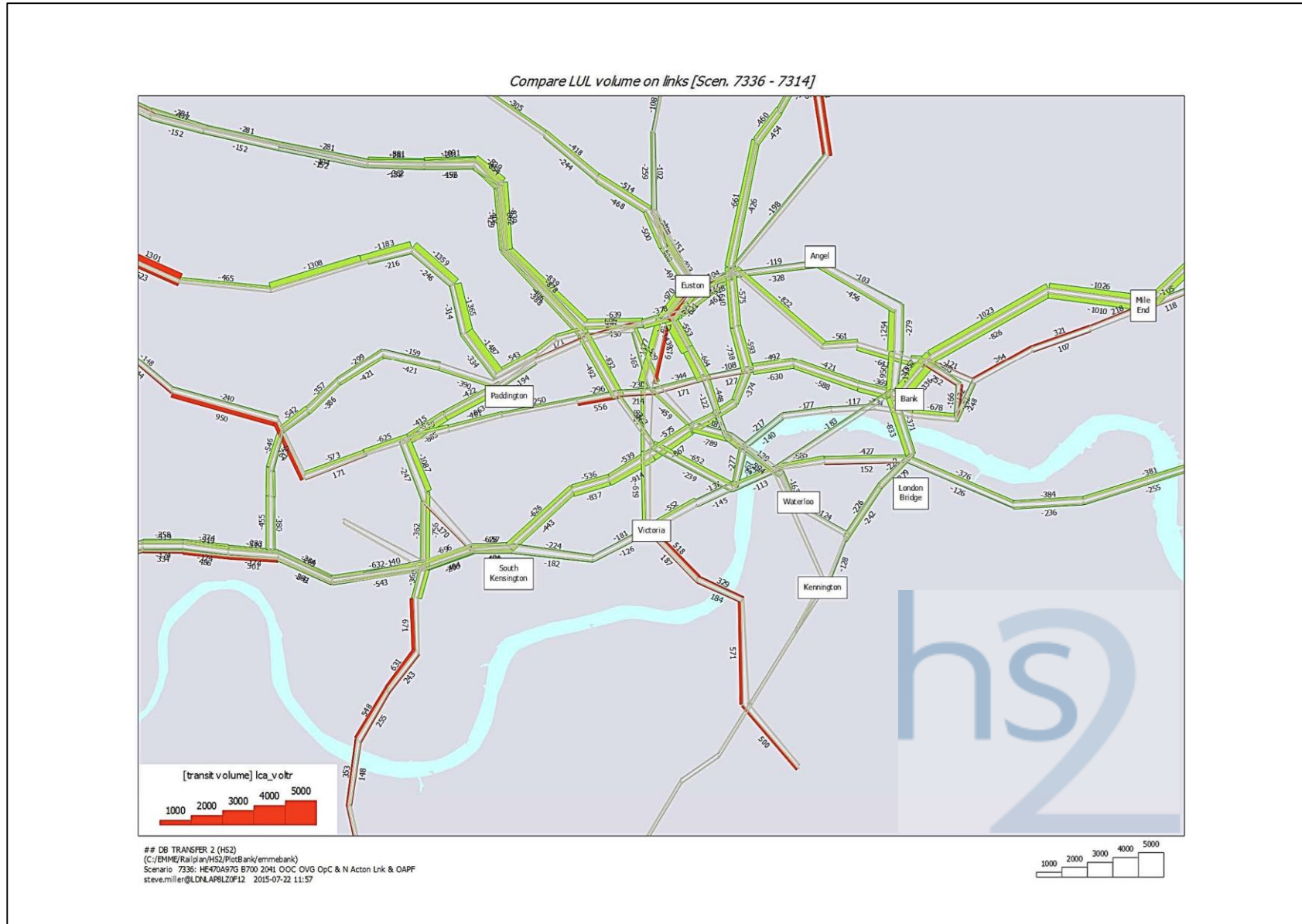
Table 322: 2041 network impacts, AM peak period

Services	Direction	HS2 Phase Two operation 2041 AM	OAPF plus Overground at OOC sensitivity test 2041 AM	% difference
Classic suburban	Inbound	26,359	26,056	-1%
	Outbound	5,126	5,110	0%
Classic inter-city	Inbound	8,703	8,503	-2%
	Outbound	3,880	3,902	1%
HS2 at Euston	Inbound	26,044	25,446	-2%
	Outbound	17,615	15,173	-14%
HS2 at Old Oak Common	Inbound	33,968	33,968	0%
	Outbound	26,066	26,066	0%
Victoria line, north of Euston	Northbound	28,806	28,747	0%
	Southbound	67,694	68,131	1%
Victoria line, south of Euston	Northbound	37,398	36,428	-3%
	Southbound	74,853	75,479	1%
Northern line (Bank branch), north of Euston	Northbound	22,357	21,757	-3%
	Southbound	44,422	44,188	-1%
Northern line (Bank branch), south of Euston	Northbound	22,312	21,784	-2%
	Southbound	40,804	40,700	0%
Northern line (Charing Cross branch), north of Euston	Northbound	16,421	15,925	-3%
	Southbound	41,326	40,923	-1%
Northern line (Charing Cross branch), south of Euston	Northbound	18,544	16,999	-8%
	Southbound	45,168	44,547	-1%
Metropolitan/Hammersmith & City, Circle lines (west of Euston Square)	Eastbound	52,212	51,834	-1%
	Westbound	43,457	42,771	-2%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

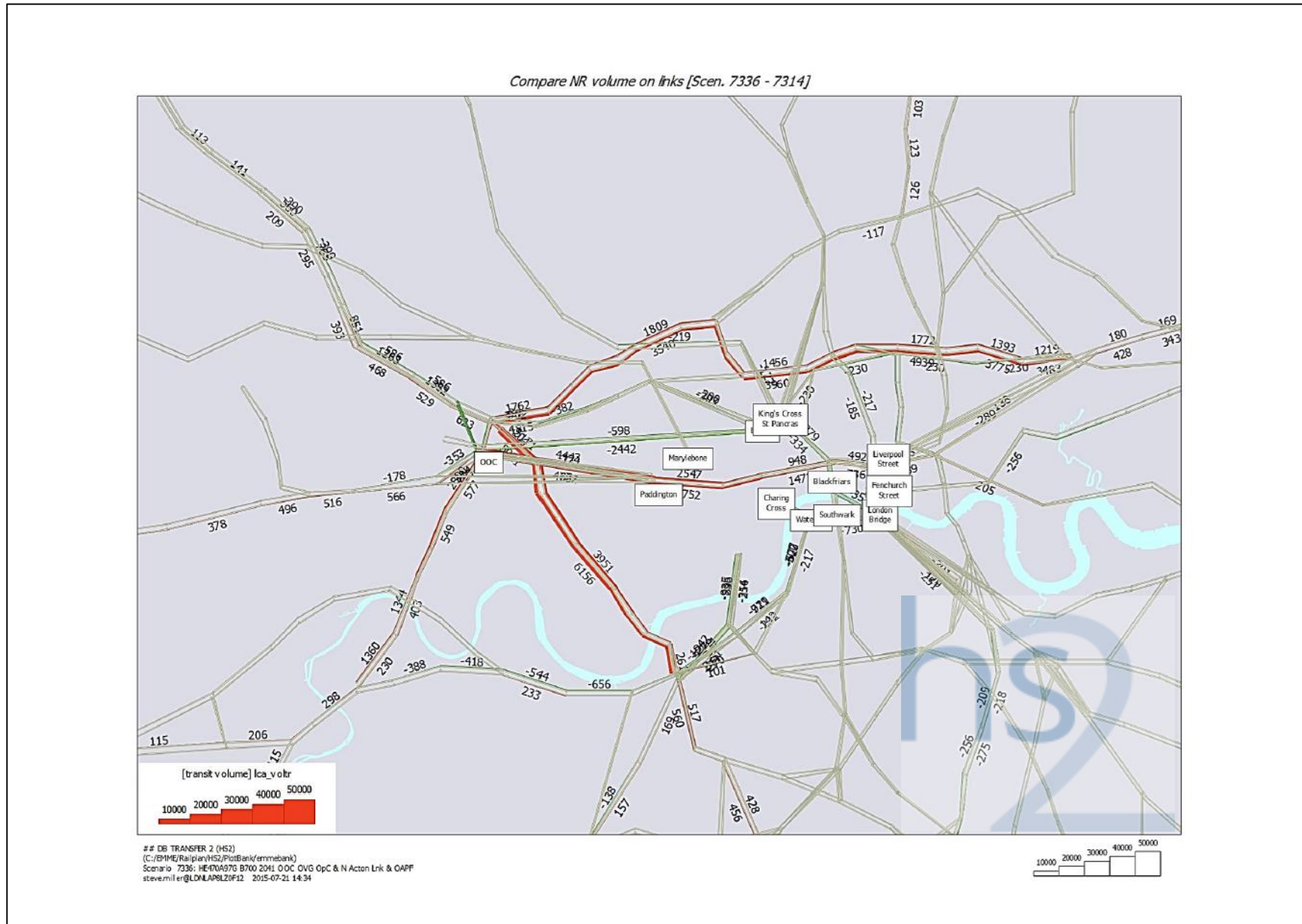
Services	Direction	HS2 Phase Two operation 2041 AM	OAPF plus Overground at OOC sensitivity test 2041 AM	% difference
Metropolitan/Hammersmith & City, Circle lines (east of Euston Square)	Eastbound	60,189	59,413	-1%
	Westbound	49,453	48,992	-1%
GWML slow/Crossrail (Acton Main line to Old Oak Common)	Eastbound	24,279	23,926	-1%
	Westbound	13,519	13,844	2%
Crossrail Old Oak Common to Paddington	Eastbound	43,087	47,530	10%
	Westbound	20,766	25,448	23%
Crossrail Paddington to Bond Street	Eastbound	52,310	54,857	5%
	Westbound	27,050	30,802	14%
Crossrail Bond Street to Tottenham Court Road	Northbound	47,517	49,269	4%
	Southbound	33,755	36,331	8%
Overground Acton Central to Willesden Junction (NLL)	Northbound	1,336	2,994	124%
	Southbound	2,562	6,362	148%
Overground Shepherds Bush to Willesden Junction (WLL)	Eastbound	2,564	2,212	-14%
	Westbound	2,089	3,347	60%
GWML fast (Old Oak Common to Paddington IC)	Eastbound	16,612	16,438	-1%
	Westbound	7,257	6,485	-11%
GWML slow (Old Oak Common to Paddington)	Eastbound	43,087	47,530	10%
	Westbound	20,766	25,448	23%

Figure 217: LU flow differences 2041 AM peak Overground at Old Oak Common station with OAPF



SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Figure 218: NR flow differences 2041 AM peak Overground at Old Oak Common station with OAPF



SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Figure 219: Bus flow differences 2041 AM peak Overground at Old Oak Common station with OAPF



Impacts at Old Oak Common

- 3.7.64 The impact of the Old Oak Common OAPF with Overground test on station interchange is, overall, that the number of station movements increases by nearly 30% compared with the Overground sensitivity and by 70% over the future baseline; with particular increases to and from Crossrail.
- 3.7.65 This scenario has a large impact on front door access/egress movements. Station egress increases by 130%, driven by the large increase in employment opportunities in the OAPF, along with the new rail access to the local area from the north and south on London Overground. Crossrail trains from central London serve the majority of these trips. The reduction in the number of movements between HS2 eastbound and the station entrance (-37%) suggests that passengers substitute London Overground services for local buses.

Impact on crowding

- 3.7.66 Crowding for NR and LU networks is shown in Figure 220 and Figure 221. The introduction of Overground connections with the Old Oak Common OAPF results in some crowding increases to the next highest band of crowding on the northbound WLL and NLL (towards Old Oak Common) and on Crossrail between Bond Street and Tottenham Court Road (in both directions).
- 3.7.67 LU line by line graphs have not been reproduced for this sensitivity test due to the limited crowding impacts.

Figure 220: NR crowding 2041 AM peak period Overground at Old Oak Common station

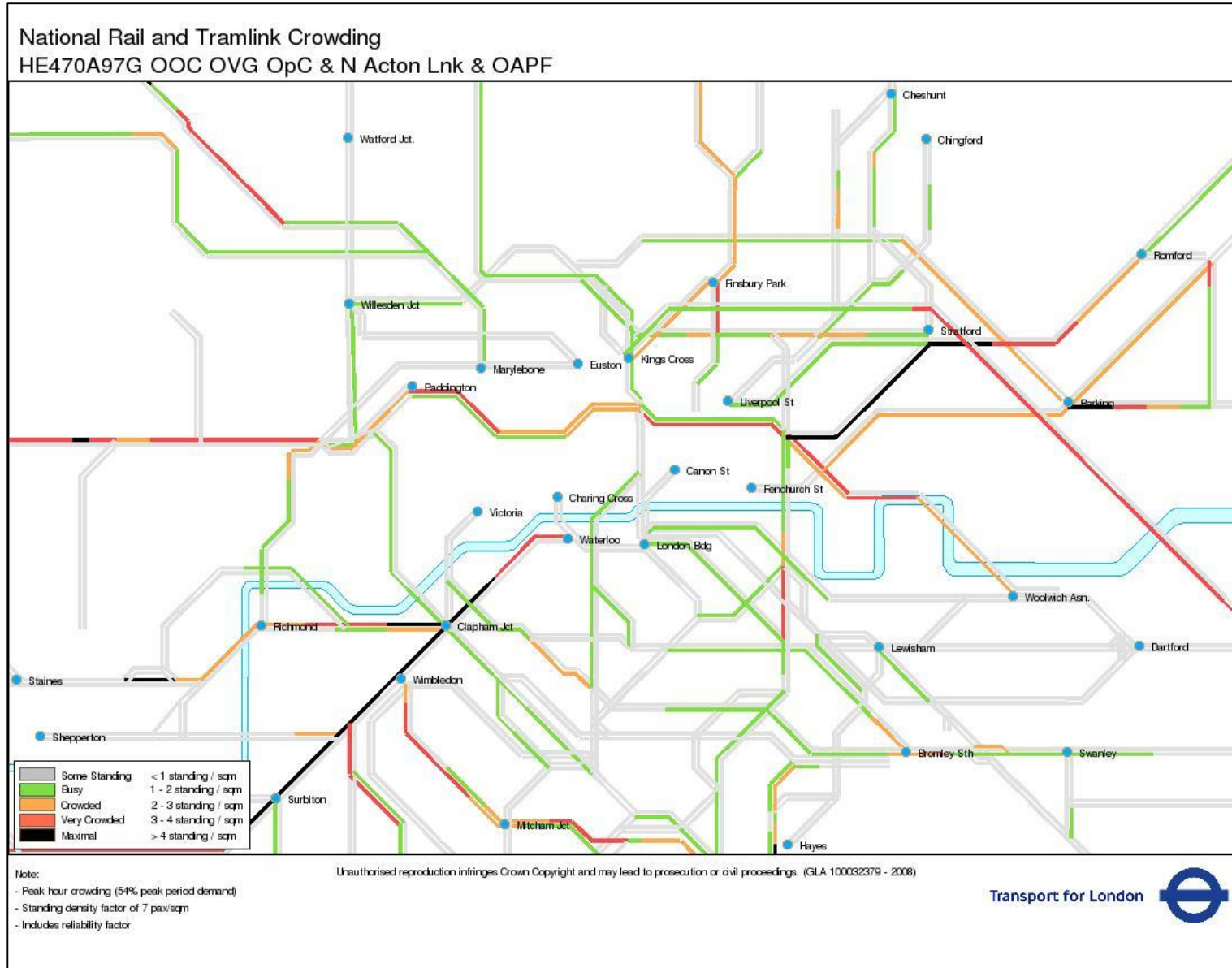
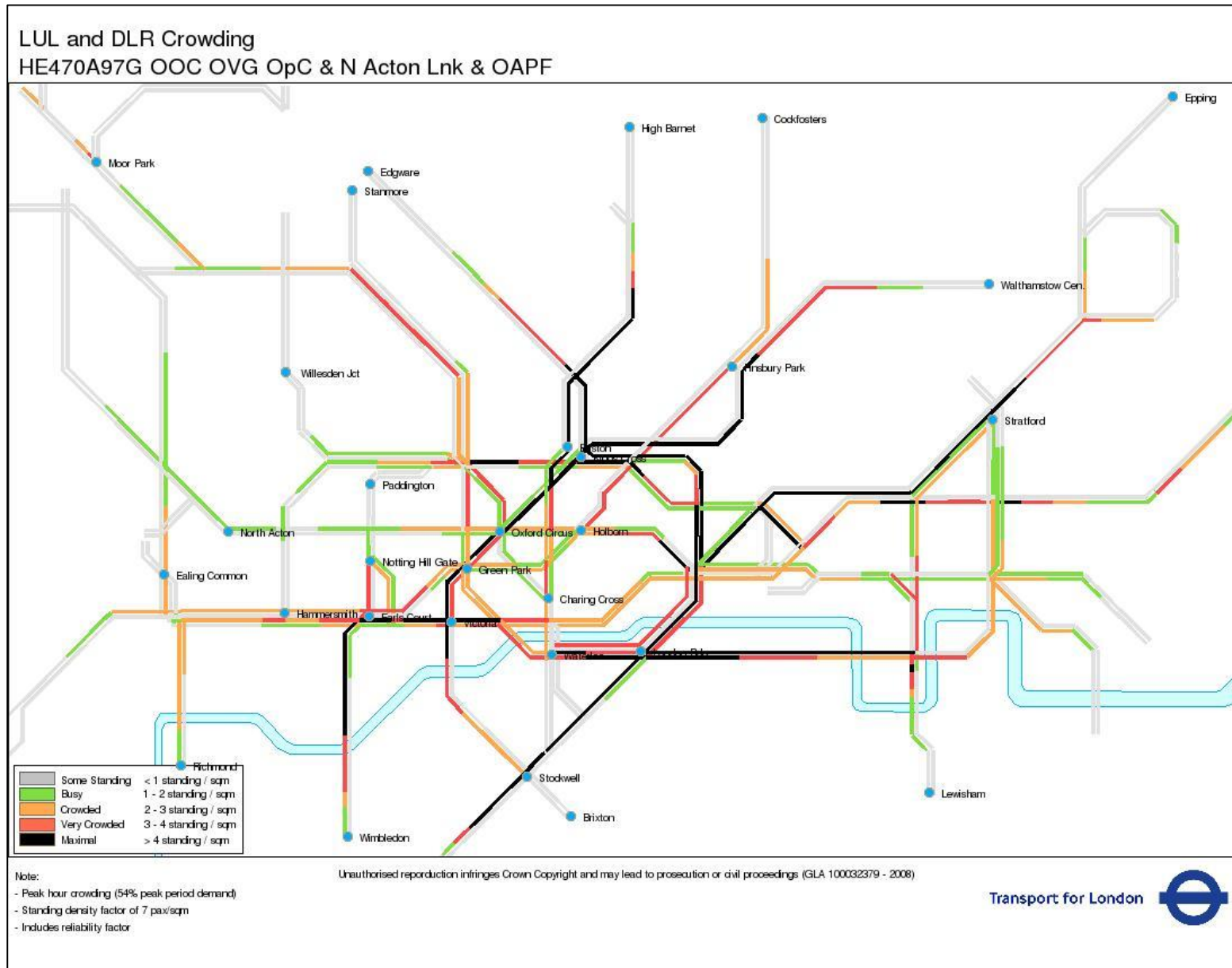


Figure 221: LU crowding 2041 AM peak period Overground at Old Oak Common station



3.8 London region sensitivity analysis - highways

Context

- 3.8.1 In order to test the revised scheme against potential transport infrastructure and development schemes in London not included in the agreed reference case, a number of sensitivity tests have been undertaken. The main objective of undertaking the sensitivity testing was to ascertain any potential capacity issues on the transport network when the revised scheme is combined with any of these potential schemes and to understand how any of these schemes could help mitigate the transport impacts of HS2.
- 3.8.2 Two highway sensitivity tests were undertaken:
- a test comprising an increased level of cycling in the future; this compares the 2023 construction scenario 3³¹ with the same scenario but with increased cycling and for also the completed construction Stage A with 2026 Phase One operation scenario against the same scenario with increased cycling; and
 - a test comprising the Aldgate Gyratory Scheme; this was tested for the 2023 construction scenario 3 against the 2021 future baseline.
- 3.8.3 These sensitivities did not require a separate LTS run and were based on scheme details and model coding provided by TfL.

Increased Level of Cycling

Changes to the highway network

- 3.8.4 In order to model an increased mode share of cycling in London in line with TfL aspirations, TfL has introduced a process for adding cycle use into the CLoHAM model. The process draws on a separate TfL cycling model to produce a cyclist travel matrix where each cycle is given a passenger car unit (PCU) of 0.25, i.e. four cycles are equivalent to one car. This is assigned to the CLoHAM network. As the objective is to model the impact of cyclists on highway traffic, roads that have a segregated cycle lane are not affected (so that they do not interact with highway vehicles on these roads).
- 3.8.5 Due to uncertainty in what the increase in cycling will be, together with the fact that increasing cycle use will lead to more cycle schemes such as Cycle Superhighways which would lessen the impact on highway vehicles, this was treated as a sensitivity test.
- 3.8.6 Tests were undertaken for one construction scenario (scenario 3, 2023) and the completed construction Stage A with 2026 Phase One operation with both compared with the same scenarios without the cycle travel added.

Impacts on operation on the road network in 2023 and 2026

- 3.8.7 The traffic flow impacts were assessed by comparing the change in traffic flow between the 2023 construction scenario 3 with and without the cycle overlay. The flow

³¹ 2023 construction scenario was selected as it represents the peak of construction activity

differences (in PCU/hour) for the AM peak hour (08:00 to 09:00) are shown in Figure 222. The width of the band indicates the absolute change in traffic with red representing an increase and green a decrease compared to the 2026 HS2 Phase One operation scenario. The flows, in vehicles/hour, on key links forming two screenlines north and south of A501 Euston Road are shown in Table 323 for the AM peak hour. Changes in the PM peak hour are lower than in the AM peak hour and so are not reported. Flow changes for the completed construction Stage A with 2026 Phase One operation scenario with and without cycles are reported in Figure 223 and Table 324.

- 3.8.8 Figure 222 and Figure 223 indicate a general increase in total vehicles. This is because cycles are included (as 0.25 per vehicle) in the total flow. Consequently virtually all roads experience a flow increase with the exception of roads with segregated cycle priority lanes and some parts of the Cycle Super Highways.
- 3.8.9 North of A501 Euston Road, as shown in Table 323, most roads experience an increase in flow with the southbound (peak direction) total flow across the screenline increasing by 10% north of A501 Euston Road and by 14% south of A501 Euston Road. Roads experiencing the largest southbound increase in flow are A4200 Eversholt Street north of A501 Euston Road, and A400 Gower Street and A4200 Upper Woburn Place south of A501 Euston Road. The flow increases are lower in the PM peak hour and generally occur in the northbound direction.
- 3.8.10 The impact of the increase in cycling is greater by 2026, as shown in Figure 223 and in Table 324, with southbound (peak direction) total flow across the screenline increasing by 16% north of A501 Euston Road and 24% south of A501 Euston Road. Flow increases are on the same roads as in 2023 but are of a greater magnitude.

Figure 222: Traffic flow changes - 2023 Construction scenario vs. 2023 Construction scenario with increased cycling - AM peak hour (PCU/hour)

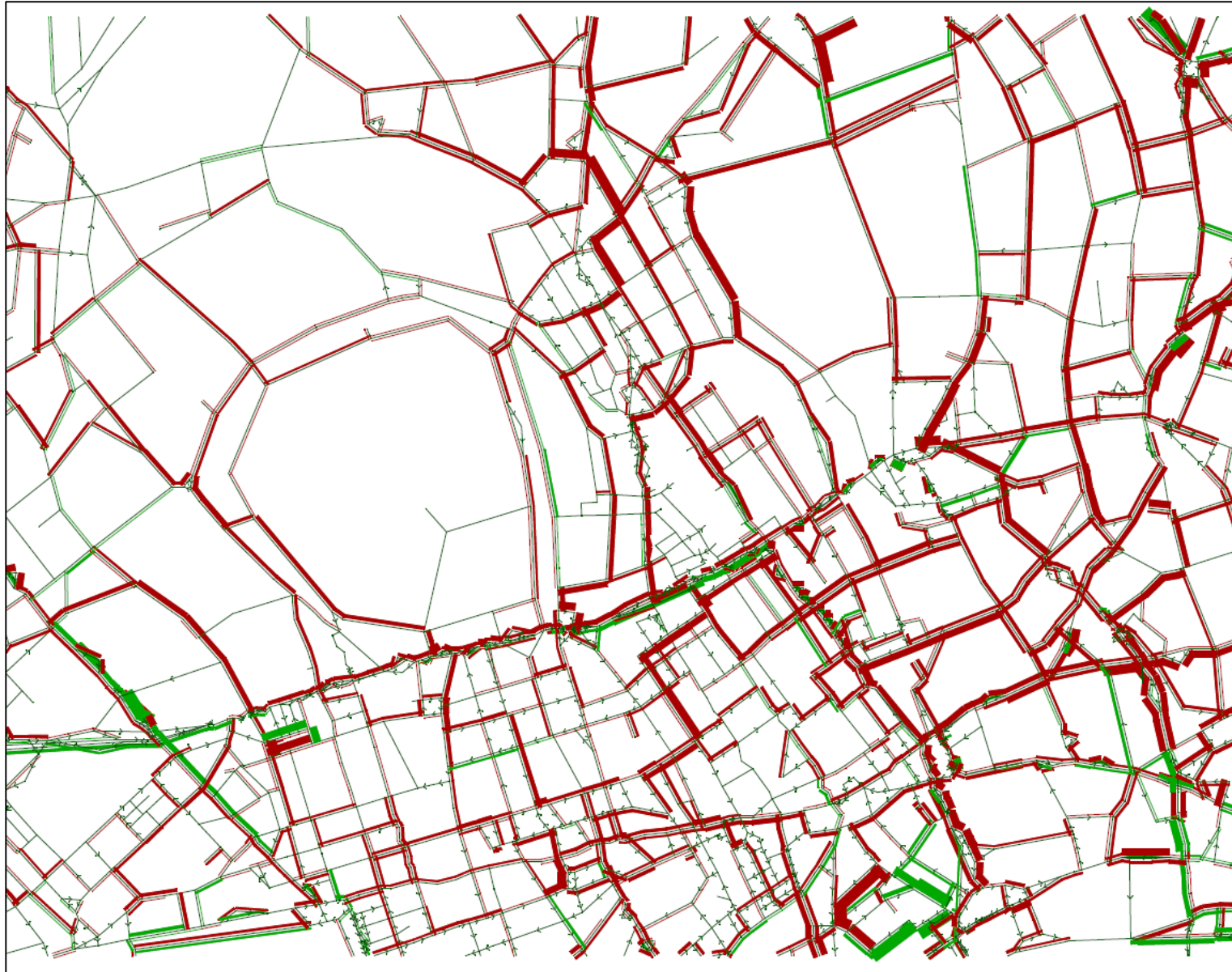
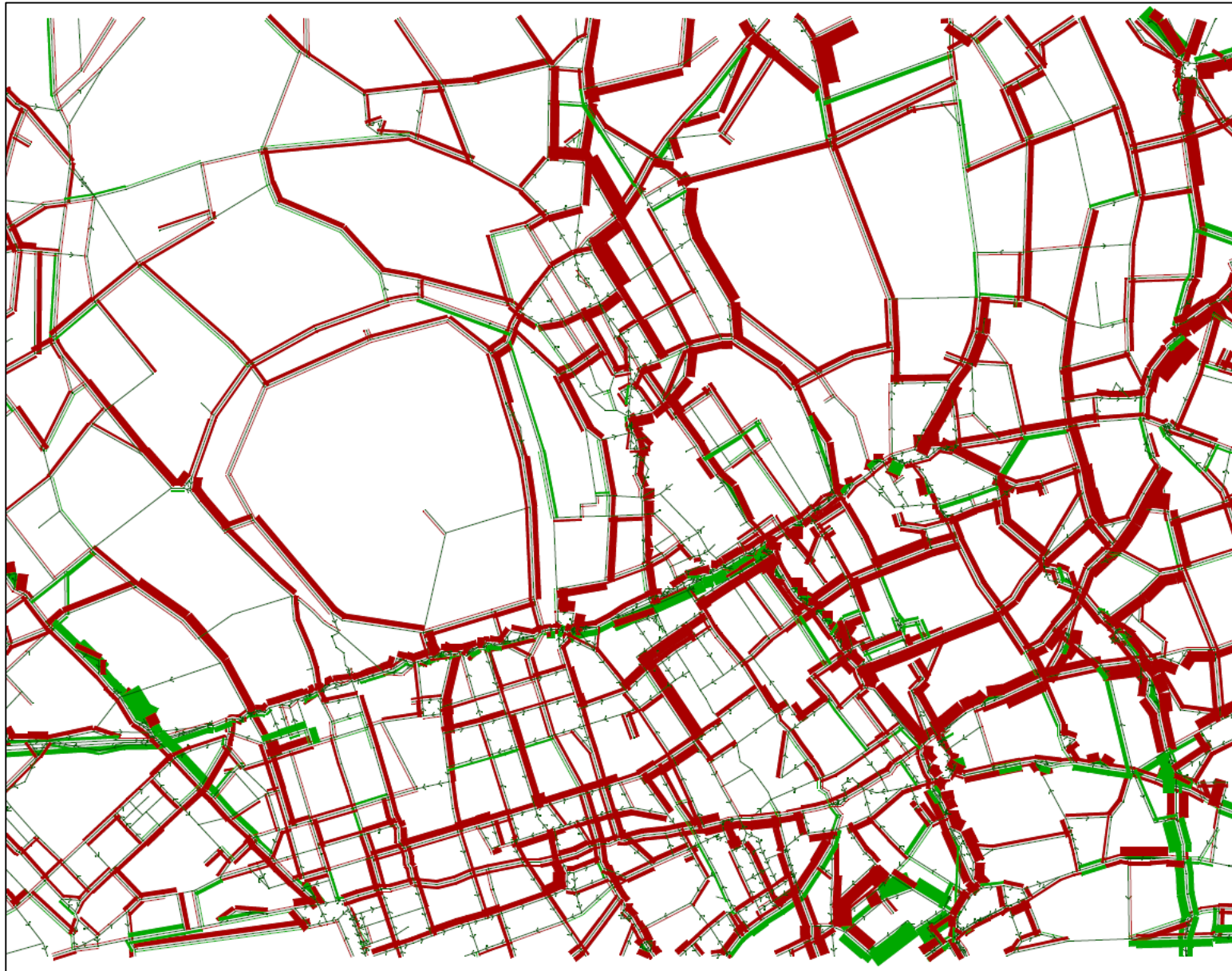


Figure 223: Traffic flow changes - 2026 Phase One operation vs. 2026 Phase One operation with increased cycling - AM peak (PCU/hour)



SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Table 323: Screenline flow changes - 2023 Construction scenario 3 vs. 2023 Construction scenario 3 with increased cycling - AM peak hour (vehicles/hour)

Link		2023 construction scenario 3		2023 construction scenario with increased cycling		Actual change		% change	
		All veh	HGV	All veh	HGV	All veh	HGV	All veh	HGV
Outer circle (between Park Square East and Chester Road)	Northbound	90	0	108	0	18	0	20%	0%
	Southbound	210	7	234	7	23	0	11%	0%
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	351	11	362	11	11	0	3%	-1%
	Southbound	445	21	440	12	-5	-9	-1%	-43%
Stanhope Street (between Longford Street and Robert Street)	Northbound	146	9	153	9	6	0	4%	1%
	Southbound	456	4	530	5	73	1	16%	20%
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	275	64	264	61	-11	-3	-4%	-5%
	Southbound	778	53	867	54	90	1	12%	2%
Cardington Street (north of Drummond Street)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%
New Cobourg Street (north of Starcross Street)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Link		2023 construction scenario 3		2023 construction scenario with increased cycling		Actual change		% change	
		All veh	HGV	All veh	HGV	All veh	HGV	All veh	HGV
A4200 Eversholt St (between Phoenix Road and Polygon Road)	Northbound	335	14	395	13	60	0	18%	-3%
	Southbound	499	5	611	4	112	-1	23%	-14%
Chalton Street (between A501 Euston Road and Phoenix Road)	Northbound	221	49	228	48	7	-1	3%	-1%
	Southbound	250	13	262	14	13	1	5%	11%
Midland Road (between Brill Place and A501 Euston Road)	Southbound	655	40	698	44	43	4	7%	10%
A5202 Pancras Road (between A501 Euston Road and Goods Way)	Northbound	209	7	214	7	5	0	2%	-2%
	Southbound	101	6	104	6	3	0	3%	-1%
A5203 York Way between A501 Euston Road and Caledonia Street	Northbound	519	67	515	64	-4	-3	-1%	-4%
North of A501 Euston Road	Northbound	2,147	220	2,240	213	87	-7	4%	-3%
	Southbound	3,393	148	3,746	146	350	-2	10%	-2%
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	190	38	202	38	12	0	6%	0%
	Southbound	308	12	329	11	21	-1	7%	-8%
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Northbound	611	22	633	13	22	-9	4%	-42%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Link		2023 construction scenario 3		2023 construction scenario with increased cycling		Actual change		% change	
		All veh	HGV	All veh	HGV	All veh	HGV	All veh	HGV
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	210	3	216	8	6	5	3%	205%
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Northbound	455	63	454	58	-1	-4	0%	-7%
	Southbound	71	0	69	0	-2	0	-3%	0%
A400 Gower Street (between Grafton Way and Gower Place)	Northbound	54	4	52	4	-3	0	-5%	-9%
	Southbound	755	37	943	29	188	-8	25%	-22%
Gordon Street (between Endsleigh Gardens and A501 Euston Road)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%
A4200 Upper Woburn Place (between Endsleigh Gardens and A501 Euston Road)	Northbound	388	8	393	7	4	0	1%	-2%
	Southbound	638	48	780	45	143	-3	22%	-6%
B504 Judd Street (between Bidborough Street and A501 Euston Road)	Northbound	117	4	112	3	-4	0	-4%	-11%
	Southbound	327	39	345	31	18	-8	6%	-22%
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1,859	143	1,876	131	16	-12	1%	-8%
South of A501 Euston Road	Northbound	3,065	259	3,089	242	7	-17	1%	-7%
	Southbound	2,920	161	3,315	137	371	-24	14%	-15%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Table 324: Screenline flow changes - 2026 Phase One operation vs. 2026 Phase One operation with increased cycling - AM peak hour (vehicles/hour)

Link		2026 Phase One operation		2026 Phase One operation with increased cycling		Actual change		% change	
		All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)
Outer circle (between Park Square East and Chester Road)	Northbound	101	0	141	0	40	0	40%	0%
	Southbound	210	7	299	7	89	0	42%	-1%
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	383	9	376	9	-7	1	-2%	7%
	Southbound	416	20	428	2	12	-18	3%	-91%
Stanhope Street (between Longford Street and Robert Street)	Northbound	49	14	45	10	-4	-3	-9%	-25%
	Southbound	358	3	483	4	125	1	35%	40%
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	352	28	342	29	-10	1	-3%	3%
	Southbound	948	4	1,067	12	118	8	12%	211%
Cardington Street (north of Drummond Street)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%
New Cobourg Street (north of Starcross Street)	Northbound	273	1	284	1	11	1	4%	0%
	Southbound	255	0	251	0	-4	0	-1%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Link		2026 Phase One operation		2026 Phase One operation with increased cycling		Actual change		% change	
		All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)
A4200 Eversholt St (between Phoenix Road and Polygon Road)	Northbound	240	7	324	5	83	-2	35%	-26%
	Southbound	468	21	593	15	124	-5	27%	-26%
Chalton Street (between A501 Euston Road and Phoenix Road)	Northbound	214	54	197	52	-17	-2	-8%	-3%
	Southbound	233	11	255	12	22	1	9%	13%
Midland Road (between Brill Place and A501 Euston Road)	Southbound	651	28	719	30	68	2	10%	6%
A5202 Pancras Road (between A501 Euston Road and Goods Way)	Northbound	219	8	225	7	6	0	3%	-5%
	Southbound	95	6	107	6	12	0	13%	-2%
A5203 York Way between A501 Euston Road and Caledonia Street	Northbound	505	59	525	54	20	-5	4%	-8%
North of A501 Euston Road	Northbound	2,337	178	2,459	168	111	-11	5%	-6%
	Southbound	3,635	100	4,202	89	556	-11	16%	-11%
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	197	37	221	38	24	1	12%	1%
	Southbound	304	4	362	3	58	-1	19%	-17%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Link		2026 Phase One operation		2026 Phase One operation with increased cycling		Actual change		% change	
		All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Northbound	578	25	654	7	76	-19	13%	-73%
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	240	3	282	12	43	9	18%	294%
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Northbound	472	49	474	47	2	-2	0%	-4%
	Southbound	71	0	67	0	-4	0	-6%	0%
A400 Gower Street (between Grafton Way and Gower Place)	Northbound	64	9	75	8	10	-1	16%	-10%
	Southbound	805	36	995	19	191	-17	24%	-48%
Gordon Street (between Endsleigh Gardens and A501 Euston Road)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%
A4200 Upper Woburn Place (between Endsleigh Gardens and A501 Euston Road)	Northbound	353	12	381	7	28	-4	8%	-37%
	Southbound	588	60	867	54	279	-6	47%	-10%
B504 Judd Street (between Bidborough Street and A501 Euston Road)	Northbound	106	1	119	3	12	2	12%	121%
	Southbound	340	26	404	24	64	-3	19%	-10%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Link		2026 Phase One operation		2026 Phase One operation with increased cycling		Actual change		% change	
		All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1842	137	1928	107	86	-29	5%	-21%
South of A501 Euston Road	Northbound	3,034	245	3,197	211	128	-34	5%	-14%
	Southbound	2,927	154	3,632	118	669	-36	24%	-23%

Impacts on operation on junctions in 2023

- 3.8.11 An analysis of junction delay has been undertaken by comparing delays between the 2023 construction scenario and the same scenario but with the cycle overlay added. Figure 224 and Figure 225 show the delays from these scenarios and indicate a general increase in delay at junctions across the network.
- 3.8.12 Most signalised junctions in central London are under adaptive control, such as SCOOT, which will optimise the signal stages in real time to account for changes in traffic patterns and volumes. Therefore, some of those junctions could be mitigated through adaptive control.

Figure 224: Delay at junctions – 2023 Construction Scenario 3 (AM peak hour)



Figure 225: Delay at junctions – 2023 Construction Scenario 3 with increase cycling (AM peak hour)



Aldgate Gyratory

Changes to the highway network

- 3.8.13 The City of London plans to remove the gyratory around Aldgate. This was not included in the Reference Case for the main ES but has recently become part of TfL's Reference Case; accordingly, Even though this was remote from the Euston area, it has been included as a sensitivity test. As part of the removal of the gyratory, the southern section of Houndsditch between A1211 Duke's Place and Minories will be pedestrianised and A1211 St. Botolph Street, Minories and Aldgate High Street will become two-way. Mansell Street, the rest of Houndsditch and A1211 Duke's Place will remain one-way.
- 3.8.14 AM and PM peak hour tests were undertaken comparing the 2023 construction scenario 3 including the Aldgate scheme against the 2023 construction scenario 3 without the Aldgate scheme.

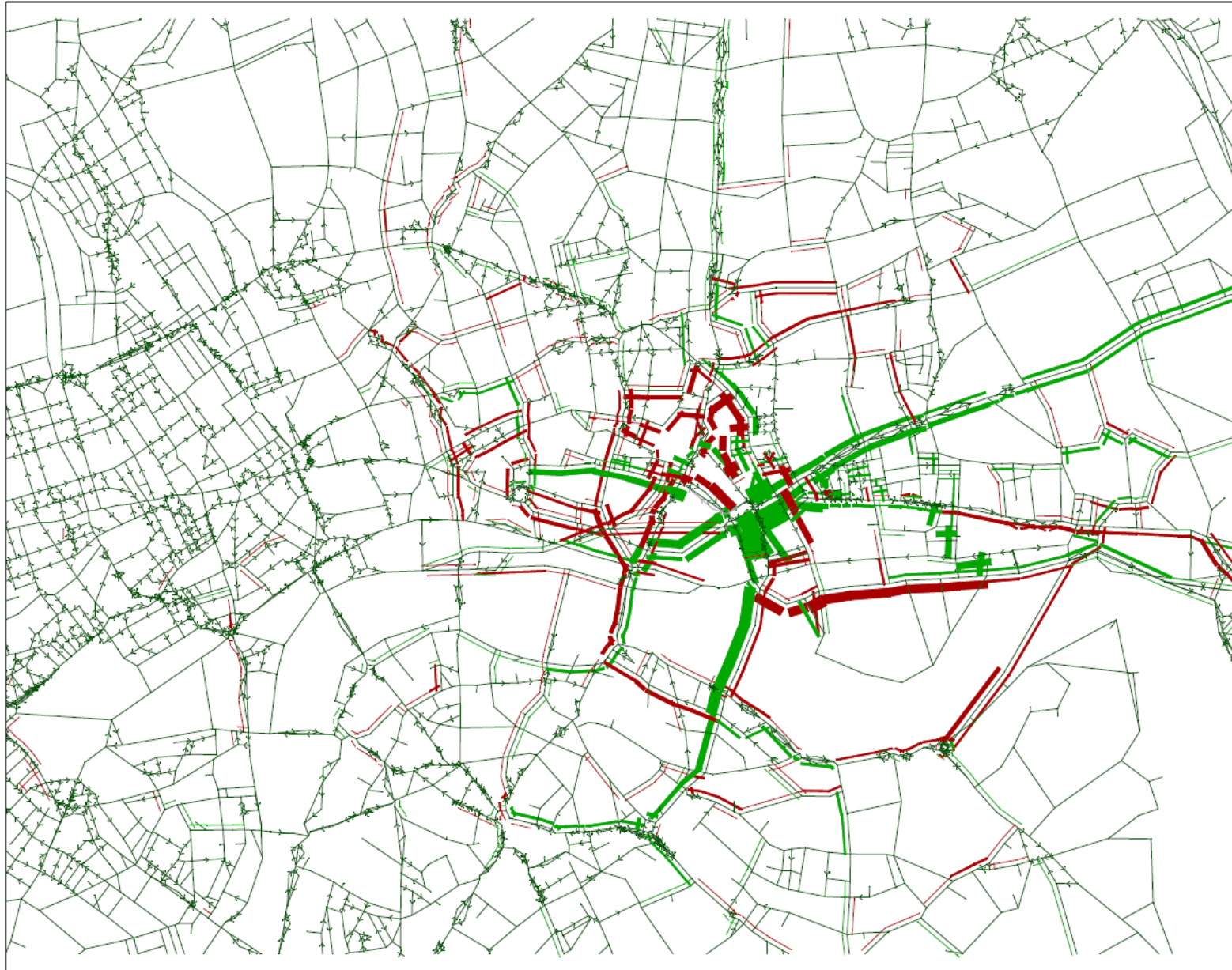
Impacts on operation on road network in 2023

- 3.8.15 The traffic flow impacts of the Aldgate scheme were assessed by comparing the change in traffic flow between the two scenarios. The flow differences for the AM peak hour centred on the Euston area are shown in Figure 226 in PCU/hour with flow changes for the Aldgate area shown in Figure 227. The width of the band indicates the absolute change in traffic with red representing an increase and green a decrease compared to the 2023 construction scenario 3. The flows, in vehicles/hour on key links forming two screenlines north and south of Euston Road are shown in Table 325 for the AM peak. Changes in the PM peak hour are lower than in the AM peak hour and so are not tabulated.
- 3.8.16 Figure 226 and Figure 227 indicates that traffic flow changes as a result of the Aldgate scheme are very local to the Aldgate area the with no discernible changes in traffic flows to the west of A201 Farringdon Road. Therefore, it can be concluded that there is no impact on the Euston area. The impact of the Aldgate scheme in the local Aldgate area is shown in Figure 227 which shows reductions on the A11 Whitechapel High Street and corresponding increases on the A1203 The Highway. This again indicates no impact west of the A201 Farringdon Road.
- 3.8.17 Taking the flows to the north and south of A501 Euston Road as shown in Table 325, most roads experience no change in flow in either direction. Total screenline flows vary by between 0.1% and 0.4%.
- 3.8.18 PM peak hour flow changes are not tabulated as the flow changes are equally small. Similarly, traffic delay plots are not reproduced due to the similarities between the 2023 construction scenario 3 and 2023 construction scenario 3 with the Aldgate scheme.

Figure 226: Traffic flow changes (Euston area) – 2023 construction scenario 3 vs. 2023 construction scenario 3 with the Aldgate scheme - AM peak hour (PCU/hour)



Figure 227: Traffic flow changes (Aldgate area) – 2023 construction scenario vs. 2023 construction scenario with the Aldgate scheme - AM peak hour (PCU/hour)



SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Table 325: Screenline flow changes – 2023 construction scenario vs. 2023 construction scenario with the Aldgate scheme - AM peak hour (PCU/hour)

Link		2023 construction scenario 3		2023 construction scenario 3 with Aldgate scheme		Actual change		% change	
		All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)
Outer circle (between Park Square East and Chester Road)	Northbound	90	0	89	0	-1	0	-1%	0%
	Southbound	210	7	210	7	0	0	0%	0%
A4201 Albany Street (between Robert Street and Longford Street)	Northbound	351	11	353	11	2	0	1%	0%
	Southbound	445	21	443	22	-2	1	0%	4%
Stanhope Street (between Longford Street and Robert Street)	Northbound	146	9	147	9	1	0	1%	1%
	Southbound	456	4	456	4	0	0	0%	2%
A400 Hampstead Road (between Drummond Street and Robert Street)	Northbound	275	64	275	63	0	0	0%	0%
	Southbound	778	53	777	53	-1	0	0%	0%
Cardington Street (north of Drummond Street)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%
New Cobourg Street (north of Starcross Street)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Link		2023 construction scenario 3		2023 construction scenario 3 with Aldgate scheme		Actual change		% change	
		All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)
A4200 Eversholt St (between Phoenix Road and Polygon Road)	Northbound	335	14	334	14	0	0	0%	0%
	Southbound	499	5	500	5	1	0	0%	0%
Chalton Street (between A501 Euston Road and Phoenix Road)	Northbound	221	49	220	49	-1	0	-1%	1%
	Southbound	250	13	250	13	1	0	0%	0%
Midland Road (between Brill Place and A501 Euston Road)	Southbound	655	40	655	40	-1	0	0%	0%
A5202 Pancras Road (between A501 Euston Road and Goods Way)	Northbound	209	7	209	7	0	0	0%	0%
	Southbound	101	6	100	6	-1	0	-1%	0%
A5203 York Way between A501 Euston Road and Caledonia Street	Northbound	519	67	521	67	2	0	0%	0%
North of A501 Euston Road	Northbound	2,147	220	2,149	220	2	0	0.1%	0%
	Southbound	3,393	148	3,391	149	-2	1	-0.1%	1%
A4201 Portland Place (between Devonshire Street and Park Crescent)	Northbound	190	38	189	38	-1	0	-1%	0%
	Southbound	308	12	309	11	1	-1	0%	-8%
B506 Great Portland Street (between Park Crescent Mews East and Devonshire Street)	Northbound	611	22	613	23	2	1	0%	4%

SES2 and AP3 ES Appendix TR-001-000 | London assessment (sensitivity tests)

Link		2023 construction scenario 3		2023 construction scenario 3 with Aldgate scheme		Actual change		% change	
		All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)	All vehicles (veh)	HGV (veh)
Cleveland Street (between Greenwell Street and Clipstone Street)	Southbound	210	3	211	3	0	0	0%	0%
A400 Tottenham Court Road (between Grafton Way and Warren Street)	Northbound	455	63	456	62	1	0	0%	-1%
	Southbound	71	0	71	0	0	0	0%	0%
A400 Gower Street (between Grafton Way and Gower Place)	Northbound	54	4	56	4	1	0	3%	1%
	Southbound	755	37	760	37	5	0	1%	-1%
Gordon Street (between Endsleigh Gardens and A501 Euston Road)	Northbound	0	0	0	0	0	0	0%	0%
	Southbound	0	0	0	0	0	0	0%	0%
A4200 Upper Woburn Place (between Endsleigh Gardens and A501 Euston Road)	Northbound	388	8	390	7	2	0	1%	-2%
	Southbound	638	48	638	48	0	0	0%	-1%
B504 Judd Street (between Bidborough Street and A501 Euston Road)	Northbound	117	4	122	4	5	0	5%	2%
	Southbound	327	39	329	40	2	1	1%	4%
A501 Gray's Inn Road (east of Birkenhead Street)	Northbound	1859	143	1853	145	-6	3	0%	2%
South of A501 Euston Road	Northbound	3,065	259	3,067	261	5	2	0.1%	1%
	Southbound	2,920	161	2,931	162	12	1	0.4%	0%

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Y22