

20th SUPPLEMENTAL AGREEMENT

between

NETWORK RAIL INFRASTRUCTURE LIMITED
as Network Rail

And

GOVIA THAMESLINK RAILWAY LIMITED
as Train Operator

relating to the Track Access Contract (Passenger Services) dated 02 March 2016

CONTENTS

1.	INTERPRETATION.....	3
2.	EFFECTIVE DATE AND TERM	3
3.	AMENDMENTS TO CONTRACT	3
4.	GENERAL.....	4
5.	THIRD PARTY RIGHTS.....	4
6.	LAW.....	4
7.	COUNTERPARTS	4
8.	ANNEX A.....	6
9.	ANNEX B.....	7
10.	ANNEX C.....	20

THIS 20TH SUPPLEMENTAL AGREEMENT is dated *18th July 2018* 2018 and made

BETWEEN:

- (1) **NETWORK RAIL INFRASTRUCTURE LIMITED**, a company registered in England under number 2904587 having its registered office at 1 Eversholt Street, London, NW1 2DN ("Network Rail"); and
- (2) **GOVIA THAMESLINK RAILWAY LIMITED**, a company registered in England under number 07934306, having its registered office at 3rd Floor, 41-51 Grey Street, Newcastle upon Tyne, NE1 6EE (the "Train Operator").

WHEREAS:

- (A) The parties entered into a Track Access Contract (Passenger Services) dated 02 March 2016 in a form approved by the Office of Rail and Road ("ORR") pursuant to Section 18(7) of the Act, as amended by various supplemental agreements each in a form approved by ORR pursuant to Section 22 of the Act (which track access contract as subsequently amended is hereafter referred to as the "Contract").
- (B) The parties wish to amend the Contract in the terms described below.

IT IS HEREBY AGREED as follows:

1. INTERPRETATION

In this Supplemental Agreement:

- 1.1 Words and expressions defined in and rules of interpretation set out in the Contract shall have the same meaning and effect when used in this Supplemental Agreement except where the context requires otherwise; and
- 1.2 "Effective Date" means the date upon which the Office of Rail and Road issues its approval, pursuant to Section 22 of the Act, of the terms of this Supplemental Agreement.

2. EFFECTIVE DATE AND TERM

- 2.1. The amendments to the Contract pursuant to this Supplemental Agreement shall have effect from the Effective Date and shall cease to have effect on the expiry or earlier termination of the Contract.

3. RETROSPECTIVE EFFECT

Notwithstanding the Effective Date, the amendments shall be applied retrospectively from 0200 hours on 20th May 2018.

4. AMENDMENTS TO THE CONTRACT

The table in Annex A in Part 3 of Schedule 4 – Notification Factors will be deleted and replaced by the table set out in Annex A to this Supplemental Agreement.

The table and maps in Annex B to Part 3 of Schedule 4 – Lookup Table for EBM Weights will be deleted and replaced by the table and maps set out in Annex B to this Supplemental Agreement.

The table in Annex C to Part 3 of Schedule 4 – Payment Rate per train mile table will be deleted and replaced by the table set out in Annex C to this Supplemental Agreement.

5. GENERAL

The Contract, as amended by this Supplemental Agreement, shall remain in full force and effect in accordance with its terms, and during the period in which the amendments made by this Supplemental Agreement are to have effect, all references in the Contract to "the contract", "herein", "hereof", "hereunder" and other similar expressions shall, unless the context requires otherwise, be read and construed as a reference to the Contract as amended by this Supplemental Agreement.

6. THIRD PARTY RIGHTS

No person who is not a party to this Supplemental Agreement shall have any right under the Contracts (Rights of Third Parties) Act 1999 to enforce any term of this Supplemental Agreement.

7. LAW

This Supplemental Agreement shall be governed by, construed and given effect to in all respects in accordance with English Law.

8. COUNTERPARTS

This Supplemental Agreement may be executed in any number of counterparts, each of which when executed and delivered shall constitute an original, but all the counterparts shall together constitute but one and the same document.

IN WITNESS whereof the duly authorised representatives of Network Rail and the Train Operator have executed this Supplemental Agreement on the date first above written.

SIGNED by..... J. Halsall

Print name..... J. Halsall

Duly authorised for and on behalf of
NETWORK RAIL INFRASTRUCTURE LIMITED

SIGNED by..... M. J. Brown

Print name..... M. J. Brown

Duly authorised for and on behalf of
GOVIA THAMESLINK RAILWAY LIMITED

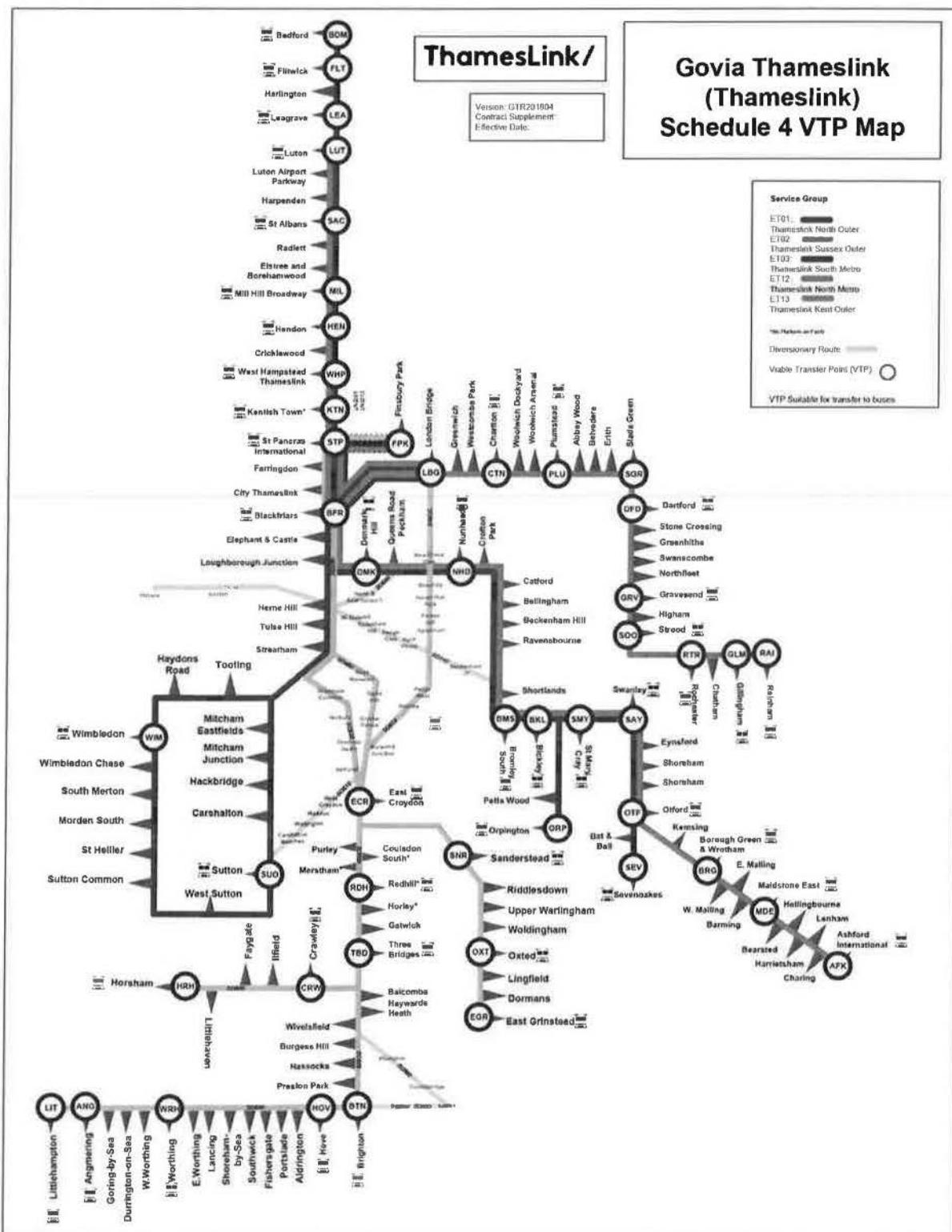
Annex A**Annex A to Part 3 of Schedule 4 – Notification Factors**

	A	B	C	D	E
Service Group Description	Service Group Code	Type	By D-26	By TW- 22	After TW- 22
Govia Thameslink Railway Limited					
Bedford Mainline	ET01	Off Peak	0.5	0.68	0.85
Bedford Mainline	ET01	Peak	0.55	0.70	0.85
Brighton Mainline	ET02	Off Peak	0.5	0.68	0.85
Brighton Mainline	ET02	Peak	0.5	0.68	0.85
South London	ET03	Off Peak	0.55	0.7	0.85
South London	ET03	Peak	0.55	0.7	0.85
Northern Inners	ET04	Off Peak	0.55	0.7	0.85
Northern Inners	ET04	Peak	0.55	0.7	0.85
Northern Outers	ET05	Off Peak	0.55	0.7	0.85
Northern Outers	ET05	Peak	0.55	0.7	0.85
TL South - Kent Inner	ET06	Off Peak	0.55	0.7	0.85
TL South - Kent Inner	ET06	Peak	0.55	0.7	0.85
Southern - Coastway (Non-London)	ET07	All Trains	0.5	0.68	0.85
Southern - Mainline	ET08	Off Peak	0.5	0.68	0.85
Southern - Mainline	ET08	Peak	0.5	0.68	0.85
Southern South London Metro	ET09	Off Peak	0.55	0.7	0.85
Southern South London Metro	ET09	Peak	0.55	0.7	0.85
Southern West London Line	ET10	Off Peak	0.55	0.7	0.85
Southern West London Line	ET10	Peak	0.55	0.7	0.85
Gatwick Express	ET11	Off Peak	0.4	0.63	0.85
Gatwick Express	ET11	Peak	0.4	0.63	0.85
Thameslink North Metro (MML)	ET12	Off Peak	0.5	0.68	0.85
Thameslink North Metro (MML)	ET12	Peak	0.55	0.70	0.85
Thameslink Kent Outer	ET13	Off Peak	0.55	0.7	0.85
Thameslink Kent Outer	ET13	Peak	0.55	0.7	0.85

Annex B

Annex B to Part 3 of Schedule 4 – Lookup Table for EBM Weights

Name	Description	Type	Performance Metrics		Resource Utilization		Network Latency		Throughput		Reliability		Cost			
			Latency (ms)	Throughput (Mbps)	CPU (%)	Memory (GB)	Bandwidth (Mbps)	Latency (ms)	Throughput (Mbps)	Loss (%)	Throughput (Mbps)	Loss (%)	Throughput (Mbps)	Loss (%)	Cost (\$)	Cost (\$)
Standard Router	Basic routing functionality.	Router	100	10	15	2	1000	100	1000	0.1%	1000	0.1%	1000	0.1%	100	100
Advanced Firewall	Includes stateful inspection and deep packet inspection.	Router/Firewall	150	15	20	2	1500	150	1500	0.2%	1500	0.2%	1500	0.2%	150	150
Cloud Router	Optimized for cloud environments, supports multi-tenancy.	Router	80	12	18	1.5	800	80	800	0.15%	800	0.15%	800	0.15%	80	80
Network Function Virtualization (NFV)	Virtualized network functions running on standard hardware.	Router	120	18	25	2.5	1200	120	1200	0.25%	1200	0.25%	1200	0.25%	120	120
Software-defined Network (SDN)	Centralized control plane managing multiple network nodes.	Router	90	14	22	2.2	900	90	900	0.18%	900	0.18%	900	0.18%	90	90
Containerized Network Functions (CNF)	Containerized network functions running on virtual machines.	Router	110	16	24	2.4	1100	110	1100	0.22%	1100	0.22%	1100	0.22%	110	110
Edge Router	Designed for edge computing, low latency, high bandwidth.	Router	70	18	12	1.8	700	70	700	0.12%	700	0.12%	700	0.12%	70	70
High Availability Router	Redundant components for failover and load balancing.	Router	130	17	23	2.3	1300	130	1300	0.23%	1300	0.23%	1300	0.23%	130	130
Cloud Optimized Router	Optimized for cloud traffic patterns, includes traffic engineering.	Router	95	13	19	1.9	950	95	950	0.13%	950	0.13%	950	0.13%	95	95
AI-powered Router	Includes machine learning for traffic optimization and anomaly detection.	Router	105	19	26	2.6	1050	105	1050	0.26%	1050	0.26%	1050	0.26%	105	105
Network Function Virtualization (NFV) - Enhanced	Advanced NFV implementation with improved performance.	Router	140	22	30	3.0	1400	140	1400	0.30%	1400	0.30%	1400	0.30%	140	140
Software-defined Network (SDN) - Enhanced	Enhanced SDN control plane for better management and control.	Router	100	20	28	2.8	1000	100	1000	0.20%	1000	0.20%	1000	0.20%	100	100
Containerized Network Functions (CNF) - Enhanced	Improved CNF performance and compatibility with modern cloud platforms.	Router	115	21	29	2.9	1150	115	1150	0.21%	1150	0.21%	1150	0.21%	115	115
Edge Router - Enhanced	Optimized for edge computing with enhanced security and reliability.	Router	75	23	14	2.3	750	75	750	0.14%	750	0.14%	750	0.14%	75	75
High Availability Router - Enhanced	Redundant components with advanced failover and load balancing.	Router	135	24	31	3.1	1350	135	1350	0.31%	1350	0.31%	1350	0.31%	135	135
Cloud Optimized Router - Enhanced	Optimized for cloud traffic with improved performance and reliability.	Router	90	21	17	1.7	900	90	900	0.17%	900	0.17%	900	0.17%	90	90
AI-powered Router - Enhanced	Advanced AI integration for traffic optimization and security.	Router	100	25	27	2.7	1000	100	1000	0.25%	1000	0.25%	1000	0.25%	100	100
Network Function Virtualization (NFV) - Premium	Advanced NFV implementation with enterprise-grade features.	Router	155	28	33	3.3	1550	155	1550	0.33%	1550	0.33%	1550	0.33%	155	155
Software-defined Network (SDN) - Premium	Advanced SDN control plane for enterprise-level management.	Router	105	26	29	2.9	1050	105	1050	0.26%	1050	0.26%	1050	0.26%	105	105
Containerized Network Functions (CNF) - Premium	Advanced CNF performance and compatibility with enterprise systems.	Router	120	27	30	3.0	1200	120	1200	0.27%	1200	0.27%	1200	0.27%	120	120
Edge Router - Premium	Optimized for edge computing with enterprise-grade security and reliability.	Router	80	29	16	1.6	800	80	800	0.16%	800	0.16%	800	0.16%	80	80
High Availability Router - Premium	Redundant components with enterprise-grade failover and load balancing.	Router	145	30	34	3.4	1450	145	1450	0.34%	1450	0.34%	1450	0.34%	145	145
Cloud Optimized Router - Premium	Optimized for cloud traffic with enterprise-grade performance and reliability.	Router	95	28	19	1.9	950	95	950	0.19%	950	0.19%	950	0.19%	95	95
AI-powered Router - Premium	Advanced AI integration for enterprise-grade traffic optimization and security.	Router	105	31	28	2.8	1050	105	1050	0.31%	1050	0.31%	1050	0.31%	105	105
Network Function Virtualization (NFV) - Enterprise	Advanced NFV implementation with enterprise-grade features.	Router	160	32	35	3.5	1600	160	1600	0.35%	1600	0.35%	1600	0.35%	160	160
Software-defined Network (SDN) - Enterprise	Advanced SDN control plane for enterprise-level management.	Router	110	30	27	2.7	1100	110	1100	0.27%	1100	0.27%	1100	0.27%	110	110
Containerized Network Functions (CNF) - Enterprise	Advanced CNF performance and compatibility with enterprise systems.	Router	125	31	32	3.2	1250	125	1250	0.31%	1250	0.31%	1250	0.31%	125	125
Edge Router - Enterprise	Optimized for edge computing with enterprise-grade security and reliability.	Router	85	33	17	1.7	850	85	850	0.17%	850	0.17%	850	0.17%	85	85
High Availability Router - Enterprise	Redundant components with enterprise-grade failover and load balancing.	Router	140	34	36	3.6	1400	140	1400	0.36%	1400	0.36%	1400	0.36%	140	140
Cloud Optimized Router - Enterprise	Optimized for cloud traffic with enterprise-grade performance and reliability.	Router	90	32	18	1.8	900	90	900	0.18%	900	0.18%	900	0.18%	90	90
AI-powered Router - Enterprise	Advanced AI integration for enterprise-grade traffic optimization and security.	Router	100	35	29	2.9	1000	100	1000	0.35%	1000	0.35%	1000	0.35%	100	100
Network Function Virtualization (NFV) - Government	Advanced NFV implementation with government-grade features.	Router	170	36	37	3.7	1700	170	1700	0.37%	1700	0.37%	1700	0.37%	170	170
Software-defined Network (SDN) - Government	Advanced SDN control plane for government-level management.	Router	120	34	28	2.8	1200	120	1200	0.28%	1200	0.28%	1200	0.28%	120	120
Containerized Network Functions (CNF) - Government	Advanced CNF performance and compatibility with government systems.	Router	135	35	33	3.3	1350	135	1350	0.35%	1350	0.35%	1350	0.35%	135	135
Edge Router - Government	Optimized for edge computing with government-grade security and reliability.	Router	90	33	18	1.8	900	90	900	0.18%	900	0.18%	900	0.18%	90	90
High Availability Router - Government	Redundant components with government-grade failover and load balancing.	Router	145	36	38	3.8	1450	145	1450	0.36%	1450	0.36%	1450	0.36%	145	145
Cloud Optimized Router - Government	Optimized for cloud traffic with government-grade performance and reliability.	Router	95	34	19	1.9	950	95	950	0.19%	950	0.19%	950	0.19%	95	95
AI-powered Router - Government	Advanced AI integration for government-grade traffic optimization and security.	Router	105	37	30	3.0	1050	105	1050	0.37%	1050	0.37%	1050	0.37%	105	105
Network Function Virtualization (NFV) - Defense	Advanced NFV implementation with defense-grade features.	Router	180	38	38	3.8	1800	180	1800	0.38%	1800	0.38%	1800	0.38%	180	180
Software-defined Network (SDN) - Defense	Advanced SDN control plane for defense-level management.	Router	130	36	30	3.0	1300	130	1300	0.30%	1300	0.30%	1300	0.30%	130	130
Containerized Network Functions (CNF) - Defense	Advanced CNF performance and compatibility with defense systems.	Router	145	37	35	3.5	1450	145	1450	0.37%	1450	0.37%	1450	0.37%	145	145
Edge Router - Defense	Optimized for edge computing with defense-grade security and reliability.	Router	95	35	19	1.9	950	95	950	0.19%	950	0.19%	950	0.19%	95	95
High Availability Router - Defense	Redundant components with defense-grade failover and load balancing.	Router	150	38	39	3.9	1500	150	1500	0.39%	1500	0.39%	1500	0.39%	150	150
Cloud Optimized Router - Defense	Optimized for cloud traffic with defense-grade performance and reliability.	Router	100	36	20	2.0	1000	100	1000	0.20%	1000	0.20%	1000	0.20%	100	100
AI-powered Router - Defense	Advanced AI integration for defense-grade traffic optimization and security.	Router	110	39	31	3.1	1100	110	1100	0.39%	1100	0.39%	1100	0.39%	110	110
Network Function Virtualization (NFV) - Research	Advanced NFV implementation with research-grade features.	Router	190	40	39	3.9	1900	190	1900	0.39%	1900	0.39%	1900	0.39%	190	190
Software-defined Network (SDN) - Research	Advanced SDN control plane for research-level management.	Router	140	38	32	3.2	1400	140	1400	0.32%	1400	0.32%	1400	0.32%	140	140
Containerized Network Functions (CNF) - Research	Advanced CNF performance and compatibility with research systems.	Router	155	39	36	3.6	1550	155	1550	0.39%	1550	0.39%	1550	0.39%	155	155
Edge Router - Research	Optimized for edge computing with research-grade security and reliability.	Router	105	37	21	2.1	1050	105	1050	0.21%	1050	0.21%	1050	0.21%	105	105
High Availability Router - Research	Redundant components with research-grade failover and load balancing.	Router	160	38	40	4.0	1600	160	1600	0.40%	1600	0.40%	1600	0.40%	160	160
Cloud Optimized Router - Research	Optimized for cloud traffic with research-grade performance and reliability.	Router	110	36	22	2.2	1100	110	1100	0.22%	1100	0.22%	1100	0.22%	110	110
AI-powered Router - Research	Advanced AI integration for research-grade traffic optimization and security.	Router	120	39	33	3.3	1200	120	1200	0.33%	1200	0.33%	1200	0.33%	120	120
Network Function Virtualization (NFV) - Education	Advanced NFV implementation with education-grade features.	Router	200	40	40	4.0	2000	200	2000	0.40%	2000	0.40%	2000	0.40%	200	200
Software-defined Network (SDN) - Education	Advanced SDN control plane for education-level management.	Router	150	38	34	3.4	1500	150	1500	0.34%	1500	0.34%	1500	0.34%	150	150
Containerized Network Functions (CNF) - Education	Advanced CNF performance and compatibility with education systems.	Router	165	39	38	3.8	1650	165	1650	0.39%	1650	0.39%	1650	0.39%	165	165
Edge Router - Education	Optimized for edge computing with education-grade security and reliability.	Router	115	38	22	2.2	1150	115	1150	0.22%	1150	0.22%	1150	0.22%	115	115
High Availability Router - Education	Redundant components with education-grade failover and load balancing.	Router	170	39	41	4.1	1700	170	1700	0.41%	1700	0.41%	1700	0.41%	170	170
Cloud Optimized Router - Education	Optimized for cloud traffic with education-grade performance and reliability.	Router	120	37	23	2.3	1200	120	1200	0.23%	1200	0.23%	1200	0.23%	120	120
AI-powered Router - Education	Advanced AI integration for education-grade traffic optimization and security.	Router	130	39	35	3.5	1300	130	1300	0.35%	1300	0.35%	1300	0.35%	130	130
Network Function Virtualization (NFV) - Research & Development	Advanced NFV implementation with R&D-grade features.	Router	210	40	41	4.1	2100	210	2100	0.41%	2100	0.41%	2100	0.41%	210	210
Software-defined Network (SDN) - Research & Development	Advanced SDN control plane for R&D-level management.	Router	160	38	36	3.6	1600	160	1600	0.36%	1600	0.36%	1600	0.36%	160	160
Containerized Network Functions (CNF) - Research & Development	Advanced CNF performance and compatibility with R&D systems.	Router	175	39	40	4.0	1750	175	1750	0.40%	1750	0.40%	1750	0.40%	175	175
Edge Router - Research & Development	Optimized for edge computing with R&D-grade security and reliability.	Router	125	38	23	2.3	1250	125	1250	0.23%	1250	0.23%	1250	0.23%	125	125
High Availability Router - Research & Development	Redundant components with R&D-grade failover and load balancing.	Router	180	39	42	4.2	1800	180	1800	0.42%	1800	0.42%	1800	0.42%	180	180
Cloud Optimized Router - Research & Development	Optimized for cloud traffic with R&D-grade performance and reliability.	Router	130	37	24	2.4	1300	130	1300	0.24%	1300	0.24%	1300	0.24%	130	130
AI-powered Router - Research & Development	Advanced AI integration for R&D-grade traffic optimization and security.	Router	140	39	37	3.7	1400	140	1400	0.37%	1400	0.37%	1400	0.37%	140	140
Network Function Virtualization (NFV) - Manufacturing	Advanced NFV implementation with manufacturing-grade features.	Router	220	40	42	4.2	2200	220	2200	0.42%	2200	0.42%	2200	0.42%	220	220
Software-defined Network (SDN) - Manufacturing	Advanced SDN control plane for manufacturing-level management.	Router	170	38	37	3.7	1700	170	1700	0.37%	1700	0.37%	1700	0.37%	170	170
Containerized Network Functions (CNF) - Manufacturing	Advanced CNF performance and compatibility with manufacturing systems.	Router	185	39	43	4.3	1850	185	1850	0.43%	1850	0.43%	1850	0.43%	185	185
Edge Router - Manufacturing	Optimized for edge computing with manufacturing-grade security and reliability.	Router	135	38	24	2.4	1350	135	1350	0.24%	1350	0.24%	1350	0.24%	135	135
High Availability Router - Manufacturing	Redundant components with manufacturing-grade failover and load balancing.	Router	190	39	44	4.4	1900	190	1900	0.44%	1900	0.44%	1900	0.44%	190	190
Cloud Optimized Router - Manufacturing	Optimized for cloud traffic with manufacturing-grade performance and reliability.	Router	140	37	25	2.5	1400	140	1400	0.25%	1400	0.25%	1400	0.25%	140	140
AI-powered Router - Manufacturing	Advanced AI integration for manufacturing-grade traffic optimization and security.	Router	150	39	38	3.8	1500	150	1500	0.38%	1500	0.38%	1500	0.38%	150	150
Network Function Virtualization (NFV) - Retail	Advanced NFV implementation with retail-grade features.	Router	230	40	43	4.3	2300	230	2300	0.43%	2300	0.43%	2300	0.43%	230	230
Software-defined Network (SDN) - Retail	Advanced SDN control plane for retail-level management.	Router	180	38	38	3.8	1800	180	1800	0.38%	1800	0.38%	1800	0.38%	180	180
Containerized Network Functions (CNF) - Retail	Advanced CNF performance and compatibility with retail systems.	Router	195	39	44	4.4	1950	195	1950	0.44%	1950	0.44%	1950	0.44%	195	195



Govia Thameslink (Great Northern) Schedule 4 VTP Map

Great Northern

Version: GTR201804
Contract Supplement:
Effective Date:

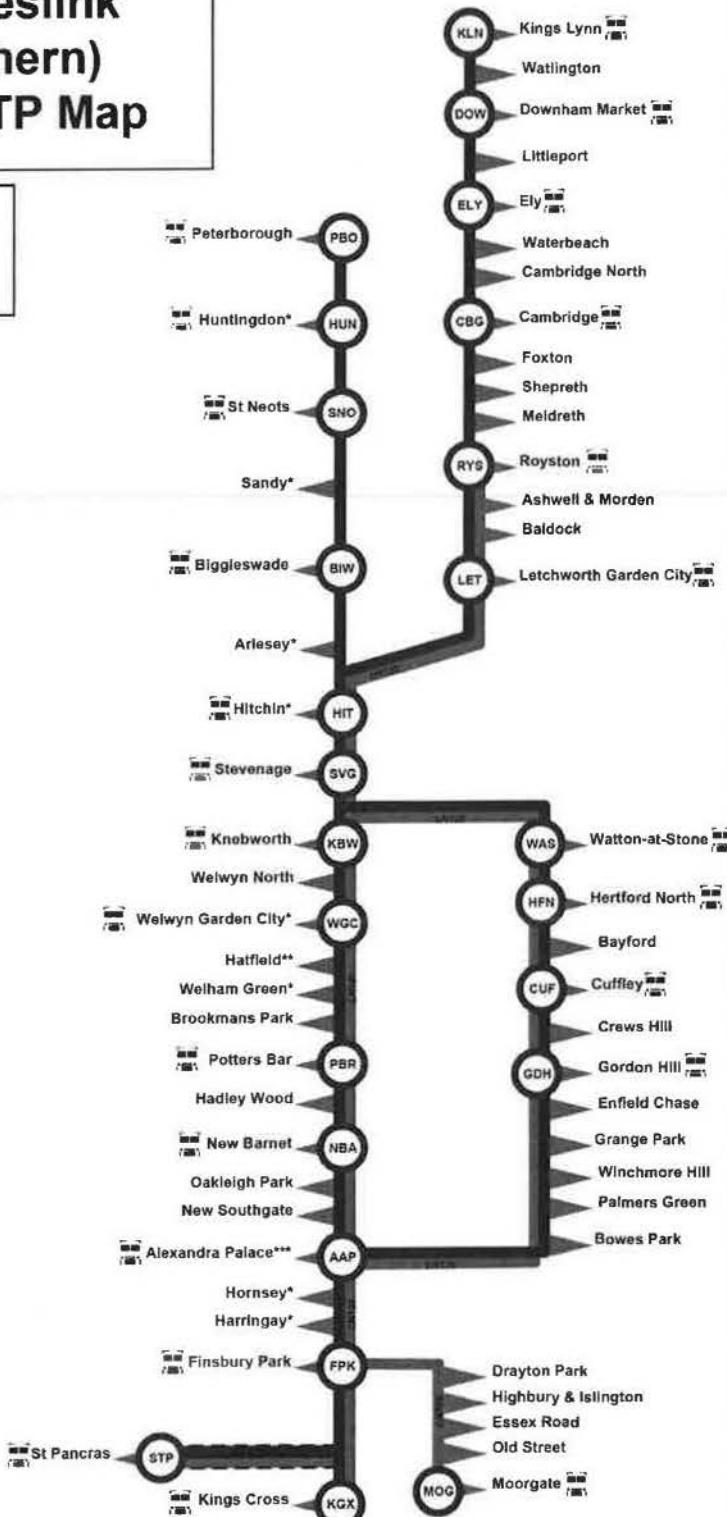
Service Group

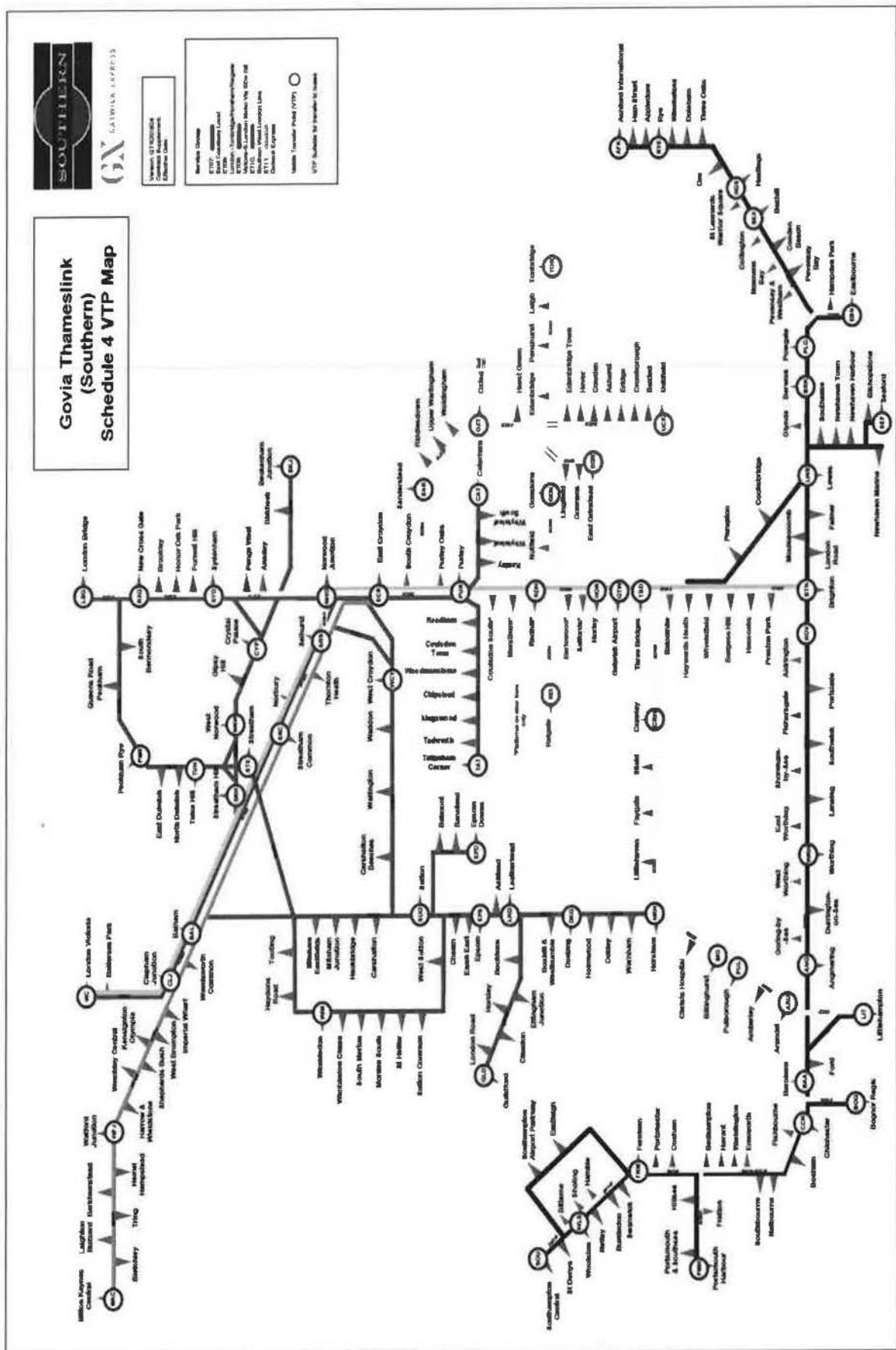
ET04: Great Northern Inners
ET05: Great Northern Outers

Viable Transfer Point (VTP)

VTP Suitable for transfer to buses

* No Platform on East Lines
** No Platform on Up Fast
*** No Platform on Down Fast





Annex C

Annex C to Part 3 of Schedule 4 – Payment Rate per train mile

Service Group	Description	Compensation Rate	Total Train Cost per Mile (Pence)
ET01	Bedford Mainline (Off Peak)	LSE	[REDACTED]
ET01	Bedford Mainline (Peak)	LSE	[REDACTED]
ET02	Brighton Main Line (Off Peak)	LSE	[REDACTED]
ET02	Brighton Main Line (Peak)	LSE	[REDACTED]
ET03	South London (Off Peak)	LSE	[REDACTED]
ET03	South London (Peak)	LSE	[REDACTED]
ET04	Great Northern Inners (Off Peak)	LSE	[REDACTED]
ET04	Great Northern Inners (Peak)	LSE	[REDACTED]
ET05	Great Northern Outers (Off Peak)	LSE	[REDACTED]
ET05	Great Northern Outers (Peak)	LSE	[REDACTED]
ET06	TL South - Kent (Orpington via Herne Hill)	LSE	[REDACTED]
ET06	TL South - Kent (Sevenoaks via Catford)	LSE	[REDACTED]
ET07	Southern Coastway London	LSE	[REDACTED]
ET08	Southern Mainline (Off Peak)	LSE	[REDACTED]
ET08	Southern Mainline (Peak)	LSE	[REDACTED]
ET09	Southern South London Metro (Off Peak)	LSE	[REDACTED]
ET09	Southern South London Metro (Peak)	LSE	[REDACTED]
ET10	Southern West London Line (Off Peak)	LSE	[REDACTED]
ET10	Southern West London Line (Peak)	LSE	[REDACTED]
ET11	Gatwick Express (Off Peak)	LSE	[REDACTED]
ET11	Gatwick Express (Peak)	LSE	[REDACTED]
ET12	Thameslink North Metro (Off Peak)	LSE	[REDACTED]
ET12	Thameslink North Metro (Peak)	LSE	[REDACTED]

ET13	Thameslink Kent Outer	LSE	[REDACTED]
ET13	Thameslink Kent Outer	LSE	[REDACTED]