

Crossrail Central Operating Section Network Statement

2019

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1 General Information

1.1 Introduction

The CCOS infrastructure consists of tunnel, track and associated infrastructure. The track connects Portobello Junction in the west of London to Pudding Mill Lane Junction in the north east of London and Abbey Wood Station in the south east of London.

The Infrastructure Manager is the infrastructure manager of CCOS under the Act, for the purposes of the ROGS Regulations and under the Rail Regulations 2016 and has issued this Network Statement for the CCOS.

There are ten stations served by the CCOS infrastructure:

- **RfL(I)Stations:** Paddington (CCOS) Station; Canary Wharf Station; Custom House Station; Woolwich Station and Abbey Wood Station are owned by the Infrastructure Manager¹ who will be the facility owner. The CTOC will operate the RfL(I) Stations on a day-to-day basis pursuant to an operator agreement with the Infrastructure Manager.
- **LUL Stations:** Bond Street, Tottenham Court Road, Farringdon, Liverpool Street and Whitechapel are owned and operated by LUL (LUL is the facility owner).

1.2 Objective

The Network Statement's objective is to inform Applicants, the authorities and other interested parties about the CCOS, and the terms and conditions for allocation of capacity and use.

The Network Statement presents the services that the Infrastructure Manager offers, with information regarding where they are accessible, how the allocation of services functions, which charges apply, and the conditions that apply for gaining access to the services.

This Network Statement has been developed pursuant to the requirements of directive 2012/34/EU and the Rail Regulations 2016. In particular, this Network Statement provides general information about the CCOS; conditions of access to the CCOS by transport operators; rules, procedures and criteria for allocation of capacity and payments for the same.

1.3 Legal Framework

The legal framework of the rail industry of Great Britain is primarily governed by the Act, the Railways Act 2005, the Railways and Transport Safety Act 2003 and a range

¹ Note to consultees. Please see the assumptions in respect of ownership of Abbey Wood station set out in paragraph 2.2 of the initial consultation document <https://consultations.tfl.gov.uk/rail/ccos-network-statement/>

of secondary legislation. In relation to the CCOS, the Crossrail Act 2008 is also relevant to the construction, maintenance and operation of the CCOS.

This has been supplemented by European rail legislation. EU Directive 2001/14/EC (known as the First Railway Package) sets out various requirements on the allocation of railway infrastructure capacity, the levying of charges for use of railway infrastructure and the licensing of TOCs. These requirements include the development and publication of network statements by infrastructure managers. The Directive was transposed into domestic law by the Rail Regulations 2005 and The Railways (Licensing of Railway Undertakings) Regulations 2005.

EU Directive 2001/14/EC was recast in 2012 by EU Directive 2012/34/EU with the aim, amongst other things, of strengthening the separation of infrastructure managers and TOCs. This has been transposed into UK law by the Rail Regulations 2016. The Rail Regulations 2016 also made modifications to The Railways (Licensing of Railway Undertakings) Regulations 2005.

The Infrastructure Manager considers this Network Statement to be compliant with the Rail Regulations 2016 and the Act.

There is a Fourth Railway Package of legislative measures which has been approved by the European legislative institutions and industry stakeholders. These will need to be implemented into English law by the UK government. It is unlikely, even if the proposals were to progress in their current form, that there would be any legal changes in Great Britain until late 2018. The Infrastructure Manager has prepared this Network Statement and the arrangements referred to in this Network Statement to be consistent with the Fourth Railway Package of legislation. However, this may be affected by the UK's proposed withdrawal from the European Union. If this is the case, amendments may be required to the regulatory arrangements for the CCOS (including this CCOS Network Statement). RfL(I) will update the CCOS Network Statement as part of a subsequent review and consultation.

The Infrastructure Manager intends to operate the CCOS in accordance with all Relevant Legislation.

1.4 Legal Status

1.4.1 General Remarks

This Network Statement is intended as a source of information for the Infrastructure Manager's current and potential customers. As such, it is intended to be an informative document only and accordingly it has no contractual force. It is not intended to be an invitation to treat or to be an offer to enter into a contract.

1.4.2 Liability

Reasonable efforts have been made to ensure that the information provided in this Network Statement is accurate. The Infrastructure Manager does not accept any liability for errors, omissions or inaccuracies. Errors which are notified to the Infrastructure Manager will be reviewed and corrected where appropriate in the next issue of the Network Statement.

No responsibility can be accepted for the content of any external website referred to within this Network Statement.

1.4.3 Appeals Procedure

The CCOS Network Code is a set of rules codifying rail industry procedures in relation to the operation of the CCOS and forms part of each Framework Track Access Contract and Track Access Contract. A party has a right to challenge decisions made by the Infrastructure Manager in relation to its functions under Part D of the CCOS Network Code as to timetabling, the CCOS Engineering Access Statement or the CCOS Timetable Planning Rules. Such challenges are heard by the relevant panel established under the CCOS Access Dispute Resolution Rules (which are annexed to the CCOS Network Code).

The CCOS Access Dispute Resolution Rules address disputes such as those above or any others arising out of or in connection with Framework Track Access Contracts and Track Access Contracts. The Access Disputes Committee for the NR Network provides the dispute services for the CCOS². The charges for the provision of such services are passed on to the TOCs in the Framework Track Access Contracts and Track Access Contracts.

The ORR is the regulatory body to which an appeal may be made in accordance with the Rail Regulations 2016 if any applicant for capacity on the CCOS believes it has been unfairly treated, discriminated against or is in any other way aggrieved concerning this Network Statement or any of the other matters specified in regulation 32(2) of the Rail Regulations 2016. Details of the procedure can be obtained from the ORR website: http://www.orr.gov.uk/data/assets/pdf_file/0017/23570/guidance-on-new-access-and-management-regulations-december-2016.pdf.

Where the subject matter of an appeal is such that it could have been dealt with through directions by the ORR under the Act, then that will be deemed the appropriate procedure. In other cases, the ORR would generally expect to adopt a similar approach as in relation to the procedure under the Act.

If an applicant for allocation of infrastructure capacity is aggrieved regarding the Infrastructure Manager's decisions concerning this Network Statement, including the information that has been (or in an applicant's view should have been) included in it, there is a right of appeal to the ORR. The Infrastructure Manager would invite anyone who has concerns regarding this Network Statement to raise them with the Infrastructure Manager (see 1.8.1) in the first instance, so that consideration can be given as to how those concerns may be accommodated.

1.5 Structure of Network Statement

The structure of this NS follows the 'Network Statement Common Structure', adopted by European Infrastructure Managers that are members of RailNetEurope (see 1.9), on the basis of the applicable legal framework. The document is revised annually and

² Note to consultees: Whilst it is currently envisaged that the Access Disputes Committee for the NR Network will provide dispute services for the CCOS (and this has in principle been agreed), arrangements have not yet been finalised and so this may be subject to change.

the most recent version is available on the RNE website (<http://www.rne.eu/organisation/network-statements/>). The goal of this Common Structure is that all Applicants and interested parties can find the same information in the same place in the NS of any participating Infrastructure Manager.

The NS is thus structured in 6 chapters constituting the main document and appendixes giving further details:

- Chapter 1 gives general information about the NS and contacts
- Chapter 2 defines the legal requirements and procedure for gaining access to the railway network
- Chapter 3 describes the main technical and functional characteristics of the railway network
- Chapter 4 sets the procedure for the allocation of the train paths
- Chapter 5 lists the services provided by the infrastructure manager and other service facilities managers
- Chapter 6 refers to the charging of the provided services as well as incentive schemes. The version of the common structure dated 7 February 2017 has been considered for the purposes of this Network Statement.

1.6 Validity and Updating Process

1.6.1 Validity Period

The Rail Regulations 2016 require the Infrastructure Manager as an infrastructure manager to publish a Network Statement four months before the deadline for applications for infrastructure capacity (the Priority Date for the relevant timetable). The CCOS is expected to be available for railway services from 9th December 2018 and, in the context of the CCOS allocation process, the 2019 Network Statement is for use for capacity requests for the 2019 timetable year (9th December 2018 to 15th December 2019). It should be noted that the Infrastructure Manager is not obliged to publish a 2020 Network Statement for the CCOS, valid for capacity requests for the December 2020 timetable, until October 2018.

The provisions of this Network Statement³ will also apply to any testing services to be run between acceptance of the CCOS infrastructure by the Infrastructure Manager and the availability of the CCOS for railway services as above.

1.6.2 Updating Process

The Infrastructure Manager will update the current Network Statement on its website as may be necessary to include any additional information or reflect significant changes throughout the year.

³ Except for section 6 where only the specific charging arrangements for testing services set out in section 6.3.1.4 will apply, together with related billing and, if applicable, credit protection arrangements.

The Infrastructure Manager will consult on an updated version of the Network Statement once a year, usually between August and October. It should be noted that once the Network Statement has been downloaded from the TfL website, it will fall outside any change control process offered by the Infrastructure Manager.

Many of the documents referred to in this Network Statement (such as the CCOS Network Code, CCOS Engineering Access Statement and CCOS Timetable Planning Rules) are subject to existing change control processes.

1.7 Publishing

In order for this Network Statement to be an easy-to-use document, it facilitates access to further information by means of links to websites or contact details, in addition to the information set out within it. The Network Statement is therefore only published in an electronic format.

It will be kept up-to-date with any changes and the Infrastructure Manager will make clear where updating has taken place (by way of version control).

This Network Statement can be downloaded free, from the Infrastructure Manager section of the Transport for London (TfL) website (<http://www.tfl.gov.uk/xxx/network-statement>⁴).

1.8 Contacts

1.8.1 On all issues relating to the CCOS (including comments and suggestions on content of this Network Statement)

Network Performance and Strategy Manager
Rail for London (Infrastructure) Limited
25 Canada Square
London
E14 5LQ
Tel: +44 (0)203 229 9336
Website: www.tfl.gov.uk

1.8.2 On issues relating to Old Oak Common Depot:

Managing Director
Bombardier Transportation UK Ltd
Litchurch Lane
Derby
DE24 8UD
Tel: +44 (0)1332 344 666
Website: www.bombardier.com/en/transportation.html

1.8.3 On issues relating to track access on the NR Network (East)

Anglia Route Managing Director
Network Rail Infrastructure Limited

⁴ Link to be included in final document

1 Stratford Place
Montfichet Road
London
E20 1EJ
Tel: +44 (0)203 356 2432
Email: Meliha.Duymaz@networkrail.co.uk
Website: www.networkrail.co.uk

1.8.4 On issues relating to track access on the NR Network (West)

Western Route Managing Director
Network Rail Infrastructure Limited
Western House
1 Holbrook Way
Swindon
SN1 1BD
Tel: +44 (0)1793 389 643
Email: Mark.Langman@networkrail.co.uk
Website: www.networkrail.co.uk

1.8.5 On issues relating to the NR Operational Planning Production Schedule (timetabling)

Head of Capacity Planning Controls
Network Rail
The Quadrant:MK
Milton Keynes
MK9 1EN
Tel: +44 (0)7734 282 514
Website: www.networkrail.co.uk

1.8.6 On issues related to the RfL(I) Stations

Network Performance and Strategy Manager
Rail for London (Infrastructure) Limited
25 Canada Square
London
E14 5LQ
Tel: +44 (0)203 229 9336
Website: www.tfl.gov.uk

1.8.7 On issues relating to LUL Stations

Managing Director
London Underground Limited
Windsor House
42-50 Victoria Street
London
SW1H 0TL

1.8.8 On issues relating to Docklands Light Railway

Managing Director
Docklands Light Railway Limited
Castor Ln
London
E14 0DS

1.8.9 On issues relating to the Heathrow spur

Rail Project Manager
Heathrow Airport Limited
Compass Centre
Nelson Road
Middlesex
TW6 2GW
Website: www.heathrow.com/company/company-news-and-information/rail-regulation

1.9 RailNetEurope – Cooperation between European Infrastructure Managers

RailNetEurope (RNE) was created in January 2004 on the initiative of a number of European railway Infrastructure Managers and Allocation Bodies (IMs/ABs). As a non-profit making association of IMs/ABs, it is dedicated to facilitating international traffic on the European Rail Infrastructure.

RNE is committed to facilitating international traffic on the European rail infrastructure. It provides support to Railway Undertakings (RUs) in their international activities (both for freight and passengers) and strives to increase the efficiency of the IMs'/ABs' processes. As a trans-European association, RNE plays a pivotal role in encouraging the industry to follow harmonised, transparent and non-discriminatory rules in the international railway business.

Together, the Members of RailNetEurope are making international rail transport conditions more uniform and introducing a corporate approach to promote the European railway business for the benefit of the entire rail industry across Europe.

For further information – see <http://www.rne.eu/>

2 Access Conditions

2.1 Introduction

Chapter 2 of this Network Statement describes the terms and conditions related to access to the railway infrastructure managed by the Infrastructure Manager.

2.2 General Access Requirements

Access to the CCOS is principally governed by the Act (as amended) and the Rail Regulations 2016. This regime also covers networks other than the CCOS, to the extent that such networks have not been exempted or otherwise excluded from regulation (the LUL network is an example of a network exempted from the Act and excluded from the scope of the Rail Regulations 2016).

Following a consultation, the ORR has indicated that it intends to grant the Infrastructure Manager an exemption in respect of the CCOS from the requirement to hold a network licence under the Act. The exemption is intended to be issued before any train operations commence on the CCOS. However, the access provisions of the Act, together with the Rail Regulations 2016 are still intended to apply to the CCOS and the Infrastructure Manager.

Under the Act, anyone seeking access to the rail network in order to operate trains requires a track access contract with the relevant “facility owner”, granting permission to use that facility. The Infrastructure Manager is the facility owner of the CCOS track network.

Stations and light maintenance depots are treated as separate facilities. If a TOC requires access to a station or light maintenance depot, it will need to enter into either an access contract with the facility owner (where the facility is regulated under the Act) or a usage agreement with the relevant owner (where the facility has been exempted from the relevant provisions of the Act). The Infrastructure Manager is the facility owner of each of the RfL(I) Stations. LUL is the relevant facility owner of each of the LUL Stations.

Under the Act, TOCs and others may only enter into an access contract with a facility owner (e.g. the Infrastructure Manager or another facility owner) for permission to use that owner’s facility if the ORR so directs. If these access contracts (and any amendments to them) are not approved by the ORR where that is required by law, they are invalid. A direction of the ORR is not required for a usage agreement in respect of a facility which has been exempted from the relevant provisions of the Act.

Where the parties have not been able to agree on the terms of an access contract or subsequent amendment where the applicant is seeking increased access to the network, the ORR may be asked to issue directions requiring the facility owner to enter into or amend the access contract as determined by the ORR.

The Infrastructure Manager will guide TOCs seeking access to the CCOS through the track access application process. Please contact the Network Performance and Strategy Manager (see section 1.8.1).

The ORR has also developed a guide to help prospective operators entitled “Starting Main Line Train operations: A guide to the regulatory framework” for potential train operators⁵.

The Rail Regulations 2016 also provide applicants with rights of appeal to the ORR in certain circumstances (see section 1.4.3).

2.2.1 Requirements to Apply for a Train Path

To apply for a Train Path on the CCOS, an Applicant must have entered into a Framework Track Access Contract or a Track Access Contract or confirm in writing that it will be willing to enter into a Framework Track Access Contract or a Track Access Contract. Please refer to Section 2.3 for further information.

The timetabling process (governed by Part D of the CCOS Network Code) is open to anyone who is a party to the CCOS Network Code by virtue of having a Framework Track Access Contract or a Track Access Contract with the Infrastructure Manager or who proposes (in good faith) to enter into such a Framework Track Access Contract or Track Access Contract and has agreed to be bound by the relevant provisions of the CCOS Network Code and the CCOS Access Dispute Resolution Rules. Such a person does not need otherwise to satisfy the requirements referred to in section 2.2.2 below to participate in the timetabling process, although those requirements will need to be satisfied before actual use of the Train Paths takes place.

Following a credible approach from a current or potential TOC, the Infrastructure Manager will provide an update on its framework capacity statement (see 4.4.4) to advise on the available capacity on the CCOS. If such Train Paths are available or are likely to become available, the Infrastructure Manager will guide the TOC through the timetabling process.

TOCs normally participate directly in the timetabling process. However, a TOC (or potential TOC or other holder of access rights) may engage a third party (such as another TOC or an independent consultancy) to make its requests for Train Paths. Where an operator makes use of the “One Stop Shop” arrangements offered by another European infrastructure manager or RailNetEurope then that infrastructure manager acts as the “Timetable Participant” within the Great Britain timetabling process.

Under the Rail Regulations 2016 an applicant who has been granted Train Paths by the Infrastructure Manager, either through a Framework Track Access Contract specifying the characteristics of the access granted or specific infrastructure capacity in the form of a Train Path, cannot trade that capacity with another applicant or transfer it to another undertaking or service.

Any person who trades in capacity contrary to the provisions stated above shall not be entitled to apply for capacity for the period of the Working Timetable to which the allocation of capacity transferred relates.

⁵ http://orr.gov.uk/_data/assets/pdf_file/0015/4434/starting-mainline-operations.pdf

2.2.2 Who is allowed to Perform Train Operations

Framework Track Access Contracts and Track Access Contracts contain a number of conditions which must be satisfied by an Applicant before it can use a Train Path. These conditions require the Applicant to:

- (a) hold a valid licence to be the operator of trains granted under section 8 of the Act or a licence exemption granted by the ORR or hold a European Licence and a Statement of National Regulatory Provisions ("SNRP") granted or recognised under the Railway (Licensing of Railway Undertakings) Regulations 2005 (as amended by the Rail Regulations 2016);
- (b) hold a valid and current safety certificate (see section 2.2.4);
- (c) become a signatory to the Claims Allocation and Handling Agreement and to the CCOS Access Dispute Resolution Rules (which are incorporated into a Framework Track Access Contract or Track Access Contract by way of the CCOS Network Code);
- (d) if the Applicant is intending to operate passenger services, become a signatory to the Station Access Agreements (or Station Usage Agreements) for the stations it intends to use and such other agreements as may be specified in the relevant Framework Track Access Contract or Track Access Contract; and
- (e) have appropriate insurance (see section 2.2.5) – this may also form part of the conditions to obtain the licence referred to in paragraph (a) above.

As noted above, the Act requires the ORR to direct the Infrastructure Manager to enter into a track access contract (whether a Track Access Contract or Framework Track Access Contract) in respect of the CCOS. Otherwise, such agreement will be invalid. In addition, the Infrastructure Manager reserves the right to require the Applicant to provide credit protection for the benefit of the Infrastructure Manager (see section 6.8).

The CCOS has been declared as Specialised Infrastructure pursuant to regulation 25 of the Rail Regulations 2016 (see section 3.4.1). Applicants who require access to and egress from the CCOS by means of other networks are advised also to check the requirements of the relevant infrastructure managers (see also section 1.8).

2.2.3 Licences

The Act makes it an offence to act as the operator of a train in Great Britain without holding a licence or a licence exemption granted under the Act. However, where a person seeking to act as the operator of a passenger train or freight train falls within the scope of the Railway (Licensing of Railway Undertakings) Regulations 2005 (as amended by the Rail Regulations 2016), then he may do so with the benefit of a European licence.

The ORR is the body responsible for issuing licences under the Act, European Licences under the Railways (Licensing of Railway Undertakings) Regulations 2005 (as amended by the Rail Regulations 2016) (which may also be issued by corresponding bodies in other member states of the European Union) and SNRPs in

Great Britain, to domestic and international users. For further information, please refer to the ORR website <http://orr.gov.uk/>.

To the extent that a train operator is required to be licensed, there will be obligations within the licence with which that train operator must comply, which may include becoming a licensed member of the Rail Delivery Group, producing a Disabled People's Protection Policy and a Complaints Handling Procedure. The train operator may also be required to become a member of the Rail Safety and Standards Board.

2.2.4 Safety Certificate

Anyone seeking to operate a train on the CCOS will be required to establish and maintain an appropriate safety management system and hold a safety certificate meeting the requirements of the ROGS Regulations.

Subject to compatibility, Part A of the EU safety certificate is recognised for such purposes whilst Part B is required to operate in Great Britain and is granted by the ORR. Applications for a safety certificate under the ROGS should be made to the ORR and copied to affected parties, including the Infrastructure Manager. Please visit the ORR's website for more details:

<http://orr.gov.uk/what-and-how-we-regulate/health-and-safety/regulation-and-certification>

<http://orr.gov.uk/what-and-how-we-regulate/health-and-safety/regulation-and-certification/rogs/safety-certificates-and-authorisation>

Rolling Stock acceptance and staff competence are dealt with in sections 2.7 and 2.8, respectively. Further information, including guidance documentation and details on how to make an application can be found on the ORR's website at:

<http://orr.gov.uk/what-and-how-we-regulate/health-and-safety/regulation-and-certification> .

2.2.5 Cover of liabilities

All licensed TOCs are required to maintain the insurance cover required by the conditions of their licence (or SNRP) against third party liabilities. The required levels of insurance will normally be such as are set by the ORR. In respect of third party liabilities, TOCs are required to maintain an insurance cover of not less than £155 million per incident in respect of all liabilities to third parties, as set out in the ORR's general approval; however, lower limits may be agreed where appropriate on application to the ORR. Unlicensed TOCs will be required to maintain equivalent insurance.

The ORR's general approval can be downloaded from the ORR's website at the following link: http://orr.gov.uk/data/assets/pdf_file/0015/2193/3rdptyins_genapp-230207.pdf

2.3 General Business / Commercial Conditions

2.3.1 Framework Track Access Contract

A framework track access agreement specifies the characteristics of the infrastructure capacity allocated to an Applicant over a period of time exceeding the

duration of a single timetable period. It does not specify Train Paths in detail but provides an assurance that suitable capacity should be available to meet the commercial needs of the Applicant as envisaged at the time of entering into the agreement.

For the CCOS, the function of framework agreements is fulfilled by the Framework Track Access Contracts made between the Applicant and the Infrastructure Manager.

2.3.2 Access Contracts

Where an Applicant wishes to enter into a Framework Track Access Contract it should contact the Infrastructure Manager at the earliest opportunity to discuss its requirements. There are no application forms which need to be submitted prior to contacting the Infrastructure Manager with a request for a Framework Track Access Contract.

TOCs and authorised Applicants seeking access to the CCOS must enter into a Framework Track Access Contract or Track Access Contract with the Infrastructure Manager to cover the full scope of the intended operations before those operations may begin. TOCs seeking access to stations or light maintenance depots that they do not operate themselves will need to enter into separate access contracts with the relevant station or depot facility owner (in the case of a facility regulated under the Act) or usage contracts with the relevant station or depot owner (where a facility is exempted from certain provisions of the Act).

As already noted above, all regulated access contracts (and any amendments to such access contracts) are subject to approval by the ORR; if not approved, the contracts will be legally invalid. The process for doing so will be established by ORR. Unregulated Station Usage Agreements in relation to the LUL Stations do not require the approval of the ORR.

A range of model access contracts have been published by the Infrastructure Manager on its website at: <https://consultations.tfl.gov.uk/rail/ccos-access> . The model contracts have been published on the basis that the ORR encourages, and expects, their use. Where the contracting parties wish to depart from a model contract, they must explain the reasons for this.

2.3.3 Contracts with Applicants (the CCOS Codes)

The CCOS Network Code, CCOS Railway Operational Code, CCOS Emergency Access Code, CCOS Performance Data Accuracy Code and the CCOS Systems Code, (together the "CCOS Codes") (web link: <https://consultations.tfl.gov.uk/rail/ccos-access>) describe the operational arrangements applicable to encourage the safe and efficient operation of CCOS. Incorporated as part of the Framework Track Access Contracts or Track Access Contracts (as applicable), the CCOS Codes aim to govern the operational behaviour of the Infrastructure Manager and Applicants in relation to each other.

2.3.3.1 CCOS Network Code

The CCOS Network Code is a common set of rules that is incorporated by reference into each Framework Track Access Contract and Track Access Contract. This covers the multilateral legal relationship between the Infrastructure Manager and each train

operator that uses the CCOS. The CCOS Network Code does not create any contractual relationship between train operators but it should be noted that, in the event that there is a conflict of interpretation between the CCOS Network Code and the Framework Track Access Contract or Track Access Contract, the CCOS Network Code prevails. Any person who is party to a Framework Track Access Contract or Track Access Contract is subject to meeting all the obligations within the CCOS Network Code.

The CCOS Network Code sets out procedures relating to the operation of the CCOS. The code regulates change including changes to railway vehicles and to the CCOS itself. The CCOS Network Code also deals with the process for establishing a working timetable, addressing operational disruption and performance improvement planning and monitoring.

The Delay Attribution Principles and Rules are incorporated into the CCOS Network Code (Part B) and provide guidance for the consistency of application and approach by all parties involved in the process of delay attribution. The Delay Attribution Principles and Rules used on the CCOS is the same as the Delay Attribution Principles and Rules used by NR in relation to the NR Network. The CCOS Access Dispute Resolution Rules are appended to the CCOS Network Code and set out how disputes under track access contracts are resolved.

Particular attention is drawn to the requirements under Part D of the CCOS Network Code setting out the processes outlined for establishing the CCOS Engineering Access Statement and the CCOS Timetable Planning Rules.

2.3.3.2 CCOS Railway Operational Code

The CCOS Railway Operational Code is discussed in section 2.4.1 below.

2.3.3.3 CCOS Emergency Access Code

The CCOS Emergency Access Code grants a TOC permitted to use the CCOS a permission to use railway facilities of other TOCs and the Infrastructure Manager in case of an emergency on or affecting the CCOS for the duration of such emergency and for as long after the cessation of such emergency as shall be reasonably necessary. The stabling charges for accessing any such facility in an emergency can be obtained from the relevant owner.

2.3.3.4 CCOS Performance Data Accuracy Code

The CCOS Performance Data Accuracy Code specifies the standards of accuracy in the recording of data required to be satisfied by the performance monitoring system established in the CCOS Network Code. It also provides a mechanism for agreeing and notifying changes to such standards.

2.3.3.5 CCOS Systems Code

The CCOS Systems Code describes the systems utilised on the CCOS and the process required to be undertaken for changes proposed to those systems.

2.4 Operational Rules

2.4.1 CCOS Railway Operational Code

The purpose of the CCOS Railway Operational Code is to sustain the operation of train services on the CCOS and to restore the operation of the CCOS following disruption.

2.4.2 CCOS Standards and CCOS Rule Book

CCOS Standards are Railway Group Standards, technical standards and operating procedures contributing to safe railway system operation published by the Railway Safety and Standards Board (RSSB). Compliance is mandatory by RSSB and the members of RSSB and it is subject to any approved non-compliance arrangements that are in place. The Infrastructure Manager is a member of RSSB.

RSSB has integrated the management of Railway Group Standards with the work that it does to support the industry on interoperability standards.

Railway Group Standards are available at: <https://www.rssb.co.uk/standards-and-the-rail-industry>.

The CCOS Standards include the CCOS Rule Book, a modular document that includes procedures and specific working instructions in relation to general safety responsibilities: electrified lines; mishaps, incidents and extreme weather; on-track plant and machines; signals; speeds; shunting and station duties; track and signalling work; train signalling regulations and signalling general instructions; and train working.

2.4.3 CCOS Sectional Appendix

The physical attributes of CCOS are described in an appendix to the CCOS Rule Book, the CCOS Sectional Appendix. It also contains any special instructions required to amplify the CCOS Rule Book in respect of operations at specific locations.

2.4.4 RfL(I) Station Access Conditions

When an Applicant enters into a Station Access Contract in respect of an RfL(I) Station, the Station Access Contract shall incorporate the RfL(I) Station Access Conditions which set out the operational arrangements applicable to the operation of the RfL(I) Stations⁶.

Where an Applicant requires a Station Usage Agreement in respect of an LUL Station, the usage agreement will set out the operational arrangements applicable to the operation and use of that LUL Station.

Any queries should be addressed to the relevant facility owner (see section 1.8).

⁶ The RfL(I) Station Access Conditions are being consulted on at or around the time of the consultation on this Network Statement. The consultation will be available here: https://consultations.tfl.gov.uk/consultation_finder/?sort_on=iconsultable_enddate&sort_order=descending&advanced=1&tx=ccos&pc=&st=open&au=&in=&de=&ar=

2.5 Exceptional Transports

Special conditions of travel may need to be applied to certain vehicles or loads because of their size, weight or other unusual features. These conditions may include speed restrictions, train marshalling restrictions and/or special instructions for passing trains on adjoining lines, and are determined on an individual basis by comparing the consignment with the characteristics of the CCOS.

2.6 Dangerous Goods

Goods which are capable of posing a risk to health, safety, property and the environment during carriage by rail are classified as "Dangerous Goods" according to the Regulations concerning the International Carriage of Dangerous Goods by Rail and the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2012. Both sets of regulations apply to TOCs operating on the CCOS. Dangerous Goods will not be permitted on the CCOS.

2.7 Rolling Stock Acceptance Process

2.7.1 Guidelines

Any party wishing to introduce a new vehicle onto the CCOS network or make a change to the operation or engineering of an existing vehicle must consider the effect of this on all other TOCs and on the Infrastructure Manager. To aid TOCs in the discharge of this duty, the Infrastructure Manager engages in compatibility consultation processes which provide a structured mechanism for assessing and agreeing any capacity, safety, regulatory and commercial issues that exist between the TOC, the Infrastructure Manager, and other TOCs. Consultation is required for:

- (a) introduction of new rail vehicles;
- (b) substantial alterations to vehicles; and
- (c) addition of vehicles with route clearance to vehicles permitted under a Framework Track Access Contract or Track Access Contract.

There are two processes involved:

- 1 demonstration of compatibility between a vehicle and the routes over which the TOC wishes to operate it, as per Railway Group Standard GE/RT8270 Issue Two, resulting in a Summary of Compatibility; and
- 2 Vehicle Change (Part F of the CCOS Network Code) which deals with the commercial issues associated with the introduction of new vehicles, or new routes for existing vehicles.

In addition to this, TOCs must arrange for new vehicles to be assessed to prove that they are compliant with all relevant CCOS Standards and Technical Specifications for Interoperability as part of their authorisation (by the ORR); provision of this evidence facilitates an efficient compatibility assessment. Further information on the ORR's authorisation process can be found at: <http://orr.gov.uk/rail/health-and-safety/health-and-safety-laws>

A full clearance assessment will need to be carried out before any introduction of rolling stock to the CCOS.

The CCOS is currently cleared for Bombardier Aventura Model LV-BXR-13 (Class 345).

The full clearance assessment can be through various approaches including absolute or comparative gauging techniques as set out below:

- (a) If the new vehicle fits within the dynamic envelope of a class 345 unit, clearance can be applied for through comparative gauging; or
- (b) Otherwise, clearance can be applied for through the “structure gauge approach”. This requires the vehicles to be specifically assessed by the Infrastructure Manager against the CCOS structure gauges. Various assessments are undertaken to ensure that sufficient clearance exists between the new Rolling Stock, other vehicles or structures, after allowance has been made for displacements of the vehicles on curves and through the platform areas.

The Infrastructure Manager generally expects a party wishing to introduce new rolling stock onto the CCOS to first ensure that the rolling stock is accepted for introduction on a network other than the CCOS. The same applies to a party wishing to make modifications to rolling stock already operating on the CCOS under the Vehicle Change process set out in Part F of the CCOS Network Code. Given the size of the CCOS (and necessary connections to the NR Network) this is intended to avoid disproportionate levels of disruption on the CCOS which may arise from unproven or modified rolling stock being operated.

Please also see section 3.3.2.1 (Loading Gauge) below. If more information is required, please contact the Infrastructure Manager.

2.7.2 Register of Infrastructure (RINF)

A Register of Infrastructure is being developed which will be used for planning purposes in designing new trains and developing routes prior to the start of operation. The RINF will provide a consideration for the design processes for rolling stock sub systems, enabling technical compatibility assessment for fixed installations, monitoring interoperability status of the UK railway network and assessing route compatibility for planned trains. It is intended to provide an overview of general compatibility, though the TOC, vehicle manufacturer or other authorised users will need to undertake more detailed assessments prior to a vehicle being cleared to operate on a new route.

The RINF will hold specific information of the railway infrastructure in the UK.

In the UK the RINF is managed by NR. The Infrastructure Manager is responsible for submitting information in relation to the CCOS infrastructure to NR.

For more information about the RINF, please contact:

National Registration Entity
Network Rail
The Quadrant:MK

Elder Gate
Milton Keynes
MK9 1EN
Tel: +44 (0) 1908 781 000
Email: RINF.NRE@networkrail.co.uk

2.7.3 National Vehicle Register (NVR)

The National Vehicle Register is a database of vehicles authorised to operate in Great Britain under the Railways (Interoperability) Regulations 2011. The Secretary of State has appointed NR as the Registration Entity, who is responsible for maintaining the Register. When a vehicle is placed into service for the first time, the Registration Holder is responsible for notifying details of the entity in charge of maintenance (ECM) to NR. The ROGS Regulations require that no person may place in service or use a vehicle on the mainline railway unless that vehicle has an ECM assigned to it, and that ECM is registered as such in the NVR. For more information, please contact:

NVR Registration Entity
Network Rail
The Quadrant:MK
Elder Gate
Milton Keynes
MK9 1EN
Tel: +44 (0) 1908 781 346
Email: NVR@networkrail.co.uk

2.8 Staff Competence Process

2.8.1 General

TOCs are responsible for ensuring that their staff that are involved with or affect the movement of trains are competent to perform their duties and comply with the relevant policies and codes of practice applicable to the CCOS.

The ORR has published guidance on Developing and Maintaining Staff Competence: http://orr.gov.uk/_data/assets/pdf_file/0016/4264/sf-dev-staff.pdf

2.8.2 Train Driving Licences

The Train Driving Licences and Certificates Regulations 2010 establish a licensing and certification system for train drivers on the rail network. It is aimed not only at drivers but also at other train crew who participate directly or indirectly in driving and whose professional qualifications therefore contribute to transport safety.

The application and authorisation process is managed by the ORR – further details can be found at: <http://orr.gov.uk/rail/licensing/train-driving-licences-and-certificates>

3 Infrastructure

3.1 Introduction

CCOS is a high capacity, largely tunnelled urban network that links the NR Network in the east and the NR Network in the west via central London.

It is an electrified railway on which train operations with diesel locomotives are not permitted (due to the limited ventilation system and risk of fire), except under special instructions and arrangements.

The Infrastructure Manager is responsible for operating, maintaining, renewing, replacing, improving, enhancing and developing the CCOS.

Under regulation 15(6) of the Rail Regulations 2016 the Secretary of State, after consultation with the Mayor of London has specified outputs required from the Infrastructure Manager⁷ for the period from commencement of railway services in December 2018 to 31st March 2027⁸. These outputs are consistent with the Sponsors' Requirements for the Crossrail project:

(http://www.parliament.uk/business/publications/business-papers/commons/deposited-papers/?fd=2008-12-04&td=2008-12-04&search_term=Department+for+Transport&itemId=122029) and are reflected in the TfL business plan available at <https://tfl.gov.uk/corporate/publications-and-reports/business-plan>.

The TfL asset management policy is available here <http://content.tfl.gov.uk/tfl-asset-management-policy.pdf> .

The draft Business plan of the Infrastructure Manager is available on request to potential Applicants who can demonstrate a credible interest in applying for the allocation of capacity on the CCOS.

3.2 Extent of Network

3.2.1 Limits

The CCOS runs from Portobello Junction (exclusive) to Abbey Wood Sidings (including Plumstead Sidings) and Pudding Mill Lane Junction (exclusive). Please refer to Appendix 5 for a route map of the CCOS.

The infrastructure maintenance depot at Plumstead is not available for normal railway operations and is restricted to Network Services only.

⁷ This is a new requirement under the Rail Regulations 2016. Discussions are ongoing with the Department for Transport as to how the Secretary of State will discharge his duties and the role of the Mayor of London therein. It is anticipated that any resulting contract between the Infrastructure Manager and the Secretary of State will be informed by the Sponsors' Requirements that set out the required capability and performance of the CCOS infrastructure.

⁸ The Rail Regulations 2016 require that the resulting contract covers a period of not less than five years. It is assumed it will cover the period until the second contractual review of charges (see 6.2)

3.2.2 Connected Rail Networks

The CCOS connects to other railway networks at the following locations:

Location	Infrastructure Manager
Portobello Junction (Great Western Mainline) ⁽¹⁾	Network Rail Infrastructure Limited
Pudding Mill Lane Junction (Great Eastern Mainline) ⁽²⁾	Network Rail Infrastructure Limited
East of Abbey Wood sidings (North Kent Line) ⁽³⁾	Network Rail Infrastructure Limited

Notes:

- (1) Operational from December 2019
- (2) Operational from May 2019
- (3) There will be a physical single line connection to the east of Abbey Wood sidings. This will not be electrified and access will be gained under controlled (signal protected) arrangements for Network Services only. Operational from December 2018

3.2.3 Further Information

Further details about the CCOS can be found in the CCOS Sectional Appendix.

3.3 Network Description

3.3.1 Geographical Identification

3.3.1.1 Track Typologies

The CCOS is a double-track railway, including connections with the NR Network (with the exception of the connection to the North Kent Line (see section 3.2.2 above)).

Crossovers will be provided in the vicinity of the tunnel portals to enable bidirectional working in tunnels. There will also be crossovers at Fisher Street (between Tottenham Court Road and Farringdon stations) and Vallance Road (between Liverpool Street (CCOS) and Whitechapel stations). It will be possible to turn around trains at Custom House and eastbound trains at Westbourne Park.

3.3.1.2 Track Gauge

The nominal track gauge is 1,435mm.

3.3.1.3 Stations and Nodes

Appendix 5 contains a CCOS route map including locations of stations.

There are 10 Stations on the CCOS. Please see section 1.1 above for more details on this. Of these stations, Abbey Wood and Custom House are surface stations, the remainder being sub-surface.

Bond Street, Tottenham Court Road, Farringdon, Liverpool Street and Whitechapel are owned and operated by LUL. These stations are outside the scope of the Act and the Rail Regulations 2016.

Distances between stations and other principal nodes, such as junctions, can be derived from the CCOS Sectional Appendix.

The maximum length of train that may be accommodated at a station is stated in section 3.3.2.5.

All sub-surface Stations are equipped with platform screen doors to which passenger train door configurations will need to be aligned.

3.3.2 Capabilities

3.3.2.1 Loading Gauge

Crossrail specific structure gauges have been developed for the CCOS for the purposes of maintaining the infrastructure and for determining available clearances for rail vehicles.

The Crossrail structure gauges define a space into which structures, temporary or permanent, may not intrude. The gauges do not allow for any construction tolerances for structures. These tolerances need to be considered separately as part of the design of the structures.

The Crossrail structure gauges include for normal clearances to overhead line equipment (OHLE) and pantographs. If structures, other than OHLE equipment, need to occupy this area, guidance shall be sought from the Infrastructure Manager at the address set out in section 1.8.1.

The Crossrail structure gauge drawings and a Crossrail structure gauge application map are available from the Infrastructure Manager.

3.3.2.2 Weight Limits

The maximum axle load shall not exceed 16.5 tonnes. In the UK, axle weight limits and equivalent distributed vehicle loadings are classified into Route Availability (RA) values between 1 and 10.

The maximum axle load for the CCOS shall be commensurate with an RA 4 rating.

3.3.2.3 Line Gradients

The maximum line gradient is 1 in 27.

3.3.2.4 Line Permissible Speeds

Maximum line permissible speeds on the CCOS are as follows:

	All Trains
Route other than Connaught Tunnel	100km/h
Connaught Tunnel	80km/h

There is a 70km/h line speed limit through stations for non-stopping trains.

3.3.2.5 Maximum Train Lengths

Due to the configuration of signalling system employed on the CCOS the train length must be 205m, which is also the maximum train length. Applicants considering utilising Rolling Stock with a train length less than 205m should contact the Infrastructure Manager.

3.3.2.6 Power supply

The CCOS will be powered by 25kV 50Hz AC Overhead Line Equipment which is compliant with the Conventional Rail Energy TSI. The contact wire height is generally set at 4.25m in tunnels and 4.7m on open routeway.

The principal characteristics of the power supply system are as follows:

Description	Performance
Nominal voltage	25kV
Maximum voltage (continuous)	27.5kV
Minimum voltage (continuous)	19kV
Nominal frequency	50Hz
Maximum fault current	12kA

Pantographs are to comply with Euronorm (EN) 50206-1:2010 - Railway applications - Rolling stock – Pantographs Characteristics and tests Part 1: Pantographs for main line vehicles.

The power supply network will be capable of receiving regenerated electrical power from trains.

3.3.3 Traffic Control and Communication Systems

The RCC is the combined traffic control, signalling control, electrical control and a communication centre for the CCOS and is responsible for all day-to-day railway operating activities.

3.3.3.1 Signalling Systems

The CCOS will use the Siemens Rail Automation “Trainguard MT” Communications Based Train Control (“CBTC”) signalling system.

Automatic reversing functionality is incorporated into the signalling at Westbourne Park sidings to assist in the prompt reversal of trains that terminate at Paddington (CCOS) station. Similar functionality is also in place to move trains between Abbey Wood station and Plumstead sidings and to reverse trains using the crossovers at Fisher Street, Vallance Road and at Custom House.

Rolling Stock must be fitted with a CBTC system, compatible with Siemens Trainguard, for operation on the CCOS.

CBTC will interface with standard lineside signalling at the interfaces with the NR Network at Portobello Junction in the West and between Pudding Mill Lane Junction and Stratford station in the East.

Rolling Stock traversing the interfaces must be able to operate on the move without interruption between the respective signalling systems.

It is anticipated that this will require:

- 1 between the CCOS and the NR Great Western Mainline ability to operate without interruption between CBTC and TPWS/AWS (ETCS level 2 from April 2019 – see further below); and
- 2 between the CCOS and the NR Great Eastern Mainline ability to operate without interruption between CBTC and TPWS/AWS.

NR's deployment plan is to commission ETCS level 2 as an overlay from London Paddington to Heathrow Airport by the end of April 2019, in accordance with NR's Crossrail Programme Key Milestone dates. The exact timing of this implementation is currently under review recognising a number of factors including other business change activities currently being implemented or proposed for the Western Route. For further information contact NR (see 1.8.4).

3.3.3.2 Traffic Control Systems

Trains on the CCOS are regulated according to train regulation policies agreed in accordance with the CCOS Railway Operational Code. Traffic is regulated by the management of real time performance.

The traffic management system utilised by the RCC operates on three levels:

- 1 Manual route setting: This may be used for degraded modes, management of unplanned services and overrides as required;
- 2 Automatic Route Setting: in this mode the system sets routes to the timetable when trains are running to time. During perturbation Automatic Route Setting will set routes to minimise delays; and
- 3 Automatic Train Regulation: in this mode the system will correct minor perturbations by monitoring the train service and making adjustments to station dwell times and inter-station run profiles to bring a train back to right time running.

3.3.3.3 Communication Systems

GSM-R will be installed throughout the CCOS. GSM-R is a secure radio system used for communication between drivers and signallers. It allows signalling staff to address drivers of individual trains and to create emergency calls and other broadcasts to all trains in pre-defined areas to alert them to incidents or operational circumstances that affect them. Drivers may also create similar emergency calls in the event of an emergency that threatens the operational safety of other vehicles. All traction units that operate on the CCOS must be fitted with this system.

3.3.3.4 Train Control Systems

The signalling system provides Automatic Train Protection (ATP) and Automatic Train Operation (ATO) functionality.

3.4 Traffic Restrictions

3.4.1 Specialised Infrastructure

The Infrastructure Manager may designate particular sections of its infrastructure for use by specified types of rail service and may give priority to that specified type in the allocation of infrastructure capacity. This is subject to certain matters as set out in regulation 25 of the Rail Regulations 2016. The purpose of such a designation is to enable priority to be given to the specified type of rail service, even though there may be other types of rail service which conform to the characteristics necessary to use that infrastructure.

The whole of the CCOS has been designated by the Infrastructure Manager as Specialised Infrastructure under regulation 25 of the Rail Regulations 2016. This has the effect that for the allocation of capacity, priority will be given to high capacity metro passenger rail services⁹.

3.4.2 Environmental Restrictions

TOCs are required to provide the Infrastructure Manager with copies of their current environmental policy and environmental management systems. A TOC's environmental policy must have due regard to the environmental policy of the Infrastructure Manager¹⁰ and adopting good industry practice in relation to energy efficiency. Further environmental restrictions applicable to the CCOS can be found in Part E of the CCOS Network Code.

Rolling stock must be configured so that Electromagnetic compatibility (EMC) complies with adjacent NR, LUL and DLR requirements as well as those of the CCOS.

⁹ <https://consultations.tfl.gov.uk/rail/crossrail-cos>

¹⁰ Under development. The TfL policy is available here: <http://content.tfl.gov.uk/tfl-health-safety-and-environment-policy.pdf>

3.4.3 Dangerous Goods

Please refer to section 2.6.

3.4.4 Tunnel Restrictions

Passenger trains shall comply with the Safety in Railway Tunnels TSI Category A.

Passenger train running capability shall be sufficient to ensure that, in the event of a fire being initiated immediately on departure from a sub-surface station, the train shall be capable of reaching within five minutes the next CCOS station or a location where a passenger evacuation can be performed (see below).

Passenger train peak heat release rate shall not exceed 8.8MW within a period of 30 minutes from ignition of the fire for all reasonably foreseeable fire scenarios. Scenarios shall include a passenger luggage fire source of up to 500kW.

Passenger evacuation may be performed at:

- (a) all RfL(I) Stations (see section 1.1);
- (b) all LUL Stations (see section 1.1); and
- (c) the tunnel portal areas at Pudding Mill Lane, Royal Oak, Victoria Dock, North Woolwich and Plumstead.

Electric freight locomotives shall comply with the Safety in Railway Tunnels TSI. As indicated in section 3.1, the CCOS is an electrified railway on which train operations with diesel locomotives are not permitted (due to the limited ventilation system and risk of fire), except under special instructions and arrangements.

To facilitate rescue in event of break down, all trains on the CCOS must be capable of being coupled to, and propelled by, a Class 345 unit. Class 345 units are equipped with a Dellner 12 coupler with a centreline 925mm above rail level and a nominal air pressure of 10bar.

As noted in 3.3.1.3 the sub-Surface Stations are equipped with platform screen doors. Applicants wishing to operate passenger services with Rolling Stock with a door configuration not compatible with the platform screen doors (including services not stopping on the CCOS) will need to demonstrate that acceptable evacuation times can be achieved.

3.4.5 Bridge Restrictions

There are no bridge restrictions on the CCOS.

3.5 Availability of the Infrastructure

The CCOS remains closed on 25 December every year. However, TOCs may apply to operate train services on this day and the Infrastructure Manager may accommodate such requests.

For further restrictions on the availability of the CCOS, please refer to section 4.5.

3.6 Service Facilities

3.6.1 Passenger Stations

Please refer to section 1.1 for information about the stations.

3.6.2 Freight Terminals

No freight terminals are available on the CCOS.

3.6.3 Train Formation Yards

None available on the CCOS.

3.6.4 Storage Sidings

Eight sidings will be available at Plumstead for train stabling from May 2019. A further three sidings at this location will be restricted to Network Services.

The turn back sidings at Westbourne Park will have no external access and therefore will not be suitable for stabling.

Please refer to the CCOS Sectional Appendix for details or contact the Infrastructure Manager for further information at the address set out in section 1.8.1.

3.6.5 Maintenance Facilities (off the CCOS)

Bombardier Transportation UK Limited has facilities at Old Oak Common depot which can undertake berthing, light servicing, light and heavy maintenance of train sets which are compatible with Class 345 units. This depot is not part of the CCOS. Please contact Bombardier Transportation UK Limited for further information at the address set out in section 1.8.2 or refer to the Connected Facilities section of the NR website (<https://www.networkrail.co.uk/industry-commercial-partners/information-operating-companies/network-statement/>)

3.6.6 Technical Facilities

Vehicle Health Monitoring Equipment is not provided on the CCOS.

3.6.7 Refuelling facilities

None available on the CCOS.

3.6.8 Other facilities - Heathrow spur

Certain services operated on the CCOS by the CTOC continue on to Heathrow Airport, via a spur from the NR Great Western Mainline. The final section of the spur from Heathrow Tunnel junction to the airport is owned by Heathrow Airport Limited. Please contact Heathrow Airport Limited for further information at the address set out in section 1.8.9.

3.7 Infrastructure Development

The CCOS is new infrastructure operational from December 2018.

As such there are currently no plans for enhancement of the infrastructure in the period until the first review of charges (see section 6.2).

The CCOS infrastructure has been designed and delivered to enable a subsequent upgrade in the maximum available capacity to thirty 240m long trains per hour. There is no current funded plan to deliver this upgrade.

4 Capacity Allocation

4.1 Introduction

The Infrastructure Manager is responsible for allocation of capacity on the CCOS. TOCs provide the Infrastructure Manager with details of the trains they wish to run on the CCOS and the Infrastructure Manager in conjunction with NR co-ordinates these capacity requests into a working timetable.

TOCs have specified rights to be allocated capacity on the CCOS. These are set out in a Schedule (usually Schedule 5) to each Track Access Contract or Framework Track Access Contract that the TOC has with the Infrastructure Manager. Provision is also made for those who aspire to obtain a Track Access Contract or Framework Track Access Contract to have access to capacity information. This is to assist them in obtaining the necessary Track Access Contract or Framework Track Access Contract and Train Slots in the timetable. See section 2.2.1 above for more information on this.

4.2 Description of Process

How the Infrastructure Manager allocates capacity is set out in Part D of the CCOS Network Code.

As noted in section 3.4.1 the CCOS is designated Specialised Infrastructure such that priority in the allocation of capacity will be given to high capacity metro passenger rail services.

The reservation of capacity on the CCOS will be undertaken by the Infrastructure Manager through entering into a Framework Track Access Contract or a Track Access Contract. The capacity rights under a Framework Track Access Contract or a Track Access Contract are translated into Train Slots in the timetable through the timetabling process. Details of the timetabling process are found in Part D of the CCOS Network Code, and described in sections 4.3 and 4.4 below.

Where an Applicant has requested and has been allocated capacity on the CCOS in accordance with regulation 22(1) or 24(1) of the Rail Regulations 2016 and it has not entered into a Framework Track Access Contract, it will be required to enter into a Track Access Contract with the Infrastructure Manager. The Track Access Contract will expire at the end of the relevant timetable period and will only reflect the capacity which has been allocated to that Applicant through the timetabling process (i.e. the Train Paths allocated to that Applicant for the relevant timetable period).

As access to the CCOS requires entry from the NR Network, and services operating solely on the CCOS must access the NR Network for facilities such as rolling stock maintenance, Applicants for access must not only seek rights from the Infrastructure Manager but also from NR.

The timescale for access requests for the CCOS thus mirrors the timetable employed on the NR Network (see 4.3 below).

Further, NR will manage the coordination of capacity requests into a working timetable. Applicants should therefore also include details of any CCOS only paths in their application to NR¹¹.

4.3 Schedule for Path Requests and Allocation Process

The Infrastructure Manager follows the process and timeline for scheduling path requests as specified in Part D of the CCOS Network Code.

So that timetable changes occur on the same day across Europe, the Infrastructure Manager's annual timetable starts on the Sunday immediately after the second Saturday in December. This is known as the Principal Timetable. To allow TOCs to fine-tune their services mid-way through the year, a new updated timetable starts each May. This is known as the Subsidiary Timetable.

The 2019 Principal Timetable runs from Sunday 9th December 2018 to Saturday 18th May 2019 and the Subsidiary Timetable runs from Sunday 19th May 2019 to Saturday 14th December 2019.

The 2020 timetable runs from Sunday 16th December 2019 to Saturday 12th December 2020.

4.3.1 Schedule for Working Timetable

Each year at D-67 before the Principal Change Date the Infrastructure Manager will publish a schedule of dates for timetable production. This is set out in Appendix 6 to this Network Statement. The CCOS Network Code sets out when each step should be completed by D – x. Each new timetable starts at D-0 so D-1 is at 1700 on the Friday one week before the timetable change. The various steps then number back from this point.

NR also produces a more comprehensive document setting out all the dates and stages involved in creating the Principal and Subsidiary Timetables and the weekly amended timetable process. Copies of this document are supplied free of charge to all people and organisations who participate in the NR capacity allocation process. Initial copies are available from NR at the address shown in section 1.8.5 above and on the NR website <http://www.networkrail.co.uk/aspx/3741.aspx>.

Potential TOCs are advised to contact the Infrastructure Manager or NR to obtain further information about the timetabling process.

4.3.2 Schedule for requests for Train Paths outside the timetabling process

Where TOCs wish to obtain additional Train Paths or amend any of their existing paths, the Infrastructure Manager will endeavour to process such requests in line with the process used for Train Operator Variations as set out in Condition D3 of the CCOS Network Code, and described in section 4.4 below.

¹¹ Note to consultees: Whilst NR has confirmed in principle it is content to fulfil this role arrangements have not yet been finalised.

In accordance with the Infrastructure Manager's obligations under the Rail Regulations 2016, the Infrastructure Manager's procedures for dealing with requests for capacity allocation (including ad hoc requests) are designed to ensure that the Infrastructure Manager treats all current and potential TOCs in a fair and non-discriminatory way.

TOCs can make ad hoc requests for capacity under condition D3 of the CCOS Network Code to meet variations in traffic.

Where a TOC is seeking an additional Train Path in excess of the capacity it has reserved in its Framework Track Access Contract or Track Access Contract, unless the TOC has rights to additional (or relief) train slots for special events in its Framework Track Access Contract or Track Access Contract, a supplemental agreement would be required to grant the additional rights. The Infrastructure Manager and the TOC would need to obtain the approval of the ORR to any supplemental agreement.

Changes for engineering work under condition D3 are planned on a weekly basis with the objective of having a confirmed timetable 12 weeks in advance of their operation which can then be used, with confidence, by TOCs and for their passengers to plan their journeys.

However, sometimes the Infrastructure Manager has to undertake short notice Possessions. These are dealt with under condition D3 of the CCOS Network Code.

4.4 Allocation Process

4.4.1 Co-ordination Process

The CCOC Network Code requires that the Infrastructure Manager determines significant Events that will be taking place over the next 4 years and procure that NR records these in NR's Calendar of Events published under the NR Network Code. An Event is a major change (e.g. to infrastructure, a service pattern or rolling stock) which may lead to a change to an existing timetable that is more extensive than usually occurs during the bi-annual timetable change. These changes are planned in a separate process over a longer period of time by an Event Steering Group. For the introduction of services to be operated by the CTOC on the CCOS the outputs of this process have been delivered by a dedicated Timetable Reference Group established for the purpose. In the future it is envisaged the process outlined in the CCOS Network Code will operate.

4.4.1.1 Timetable Planning Rules

The CCOS Timetable Planning Rules contain the rules regulating the standard timings together with other matters enabling trains to be scheduled into the working timetable for the CCOS.

The rules will include such data as sectional running times, headway and station working rules.

To ensure compatibility with the high capacity metro passenger services run on the CCOS, Rolling Stock will require a minimum braking and acceleration capability. For

details please refer to the CCOS Timetable Planning Rules or contact the Infrastructure Manager (see section 1.8.1).

The CCOS Timetable Planning Rules also contain a procedure to enable amendments to be made to the CCOS Engineering Access Statement and the CCOS Timetable Planning Rules other than through the annual consultation process set out in Condition D2 of Part D of the CCOS Network Code.

The CCOS Timetable Planning Rules are settled each year through a consultation process set out in Condition D2 of Part D of the CCOS Network Code.

The CCOS Timetable Planning Rules document is available here:

http://www.tfl.gov.uk/xxx/Timetable_Planning_Rules¹²

TOCs planning significant new services or significant amendments to their services that are not considered Events must notify the Infrastructure Manager and NR at the earliest opportunity and when possible before D-55. NR (as the co-ordinating infrastructure manager) then works on advanced proposals from D-55 to D-40.

TOCs wishing to amend their services should send the Infrastructure Manager and NR an Access Proposal. Access Proposals received by the Priority Date at D-40 (which is 2nd March 2018 for the 2019 Principal Timetable and 10th August 2018 for the Subsidiary Timetable) have a higher priority than those received after the Priority Date. If TOCs wish to run new services they should state if they have unused access rights they wish to exercise, or if they intend to obtain new access rights. Services that are unchanged by an Access Proposal will continue in the timetable as a Rolled Over Access Proposal.

Once NR (on behalf of the Infrastructure Manager) has all the Access Proposals and all the Rolled Over Access Proposals it will co-ordinate all the Train Slots within the timetable, so that each train is compliant with the CCOS Timetable Planning Rules. This takes place between D-40 and D-26. The New Working Timetable is published at D-26.

If NR (on behalf of the Infrastructure Manager) is unable to find compliant slots for all Access Proposals and Roll Over Access Proposals, Train Slots will be allocated in the priority order as set out in Part D of the CCOS Network Code.

4.4.2 Dispute Resolution Process

See section 1.4.3 for information on the appeals procedure.

4.4.3 Congested Infrastructure; Definition, Priority Criteria and Process

Under regulation 26 of the Rail Regulations 2016, the Infrastructure Manager must declare the relevant element of the CCOS to be congested if:

- After coordination and consultation, it is not possible to adequately satisfy a request for infrastructure capacity; or

¹² Link not active - the latest draft of the CCOS Timetable Planning Rules was published alongside this Network Statement

- During the preparation of the timetable for the next timetable period it looks likely that an element of infrastructure will become congested during that timetable period.

The CCOS is currently not a congested network within the above definition. Any declaration of congested infrastructure made by the Infrastructure Manager will be published in future Network Statements.

In the event that all or part of the CCOS becomes congested, the Infrastructure Manager will follow the process set out below to manage the congestion. The process comprises the following stages:

- Stage 1: Identification of the congested network segment and/or time zone;
- Stage 2: Undertake capacity analysis;
- Stage 3: Negotiation of a commercial resolution;
- Stage 4: Application of the regulatory framework to prioritise requests; and
- Stage 5: Determination of a specific investment resolution as identified in the capacity enhancement plan.

The Infrastructure Manager's long-term planning processes already provide opportunities to both identify elements of congested infrastructure and provide a range of capacity analysis plans that are required to be published in association with any such declarations.

4.4.4 Impact of Framework Agreements and Framework Capacity Statement

A Framework Track Access Contract is an agreement between the Infrastructure Manager and a TOC which specifies the capacity to which the TOC is entitled (access rights) for a period in excess of one year. Access rights can be firm or contingent. The Working Timetable must be consistent with the exercised firm rights of TOCs, provided that they have been exercised at or before the relevant Priority Date. The Infrastructure Manager must also attempt to accommodate all Access Proposals supported by contingent rights but firm rights always take priority. If it is not possible to accommodate all Access Proposals then Train Slots will be allocated in the following priority order, as set out in Part D of the CCOS Network Code:

- 1 First, high capacity metro passenger rail services; and
- 2 Second, other trains,

following which the Infrastructure Manager will apply certain considerations set out in Condition D4.6.1(b) of the CCOS Network Code to Access Proposals falling within the same "tier". This is in order to achieve the objective of sharing the capacity on the CCOS for the safe carriage of passengers and goods in the most efficient and economical manner in the overall interest of current and prospective users, providers and funders of railway services.

Potential Applicants can obtain information about the capacity allocated under Framework Track Access Contracts and thus the indicative capacity still available for concluding Framework Track Access Contracts by referring to the Framework

Capacity Statements available here:

http://www.tfl.gov.uk/xxx/Framework_Capacity_Statements¹³

The Infrastructure Manager considers the maximum available capacity to be 24 trains per hour between Paddington and Stepney Green Junction throughout operational hours and indicative capacity available is calculated accordingly.

4.5 Allocation of Capacity for Maintenance, Renewal and Enhancement

The CCOS Engineering Access Statement sets out the Possessions required by the Infrastructure Manager in order to carry out inspections, maintenance, repair, renewal and enhancement works on the CCOS. The CCOS Engineering Access Statement specifies:

- (a) the location, number, timing and duration of any Possessions of any track or section of track, which enable inspection, maintenance, renewal and repair thereof or of any other railway asset or any other works in relation thereto, and any restrictions regarding those Possessions;
- (b) any temporary speed and other restrictions on the operation of trains on any section of track (including the intended duration of such restrictions), which may be necessary to carry out any inspection, maintenance, renewal or repair referred to in section (a) above; and
- (c) any alternative stopping patterns which may apply during any Possessions referred to in section (a) above.

The CCOS Engineering Access Statement is settled each year through a consultation process set out in Condition D2 of Part D of the CCOS Network Code.

Once agreed the CCOS Engineering Access Statement and the CCOS Timetable Planning Rules form the Infrastructure Manager's firm rights for running engineering trains and allocating capacity for the purposes of undertaking engineering activities.

The relevant Framework Track Access Contract or the Track Access Contract will set out the provisions for the compensation to be payable by the Infrastructure Manager when it seeks to place restrictions of use on the CCOS for the purposes of carrying out inspections, maintenance, repair, renewal and enhancement works on the CCOS. Under the Possessions regime applicable on the CCOS, the relevant TOC will be entitled to recover its directly incurred incremental costs and demonstrable revenue losses arising from restrictions of use placed by the Infrastructure Manager in excess of an allowance specified in the relevant Framework Track Access Contract or Track Access Contract and reflected in the CCOS Engineering Access Statement (see Appendix 4).

The CCOS Engineering Access Statement document is available here:

http://www.tfl.gov.uk/xxx/Engineering_Access_Statement¹⁴

¹³ Link not active – the draft Framework Capacity Statement was published alongside this Network Statement

4.6 Non-Usage/Cancellation Rules

Part J of the CCOS Network Code, which is incorporated into Framework Track Access Contracts and Track Access Contracts, provides a means by which access rights may be removed in the event that a TOC fails to use them or there is a "better use" for such access rights. This reflects Article 52 of EU Directive 2012/34/EU.

4.7 Exceptional Transports and Dangerous Goods

Dangerous Goods are not permitted on the CCOS.

The TOC is obliged to state whether the transport that it wants to run has a load of such nature that it must be run as an exceptional transport.

Please refer to sections 2.5 and 2.6 for further details.

4.8 Special Measures to be taken in the Event of Operational Disruption

4.8.1 Principles

The measures to be undertaken in the case of disruption or anticipated disruption so as to sustain, and where necessary restore, operation of train services on the CCOS in accordance with the Working Timetable are set out the CCOS Railway Operational Code.

When a Disruptive Event occurs, the Infrastructure Manager will determine the appropriate actions to restore the Working Timetable as soon as is reasonably practicable, taking into account the needs of TOCs, the interests of safety and security and the efficient and economic operation of trains and the CCOS. TOCs are required to co-operate as regards such actions, which may include the provision of trains and train crew to clear the line.

The Infrastructure Manager will lead the process of development and maintenance of contingency plans and codes of practice which can be implemented in cases of Disruptive Events. Where a Disruptive Event is expected to continue for an extended period it is usual for an amended timetable to be prepared by the Infrastructure Manager in consultation with the affected TOCs.

4.8.2 Operational Regulation

The Infrastructure Manager develops and maintains train regulation policies so as to provide a framework to enable regulating decisions to be made in a way that is fair, consistent and in the best interests of all TOCs so far as can reasonably be achieved, facilitating achievement of their performance objectives. Train regulation policies are established by the Infrastructure Manager in consultation with TOCs, who may propose variations to them. Any disputes are determined by reference to the CCOS Access Dispute Resolution Rules and if necessary by further appeal to the ORR.

¹⁴ Link not active the draft CCOS 2019 Engineering Access Statement was published alongside this Network Statement

4.8.3 Foreseen Problems

The CCOS Railway Operational Code provides for contingency plans to accommodate changes to the train service which may be expected to result in operational disruption. This may include pre-planned amended timetables that can be uploaded to the industry systems used on the CCOS quickly so that passengers can see what train services will be running on the following day.

4.8.4 Unforeseen Problems

Where a problem is unforeseen, but may be expected to result in operational disruption, and there is no contingency plan to cover it, the Infrastructure Manager will, under the CCOS Railway Operational Code, consult with affected TOCs as may be reasonably practicable and determine the most appropriate action to be taken.

4.9 Allocation of capacity for service facilities

Capacity for service facilities managed by the Infrastructure Manager (Plumstead stabling sidings) is allocated in the same manner as outlined in section 4.4.

For details for other service facilities connected to the CCOS contact the respective service facility owner as shown in section 1.8.

5 Services

5.1 Introduction

Regulations 6(1) and 6(2) of the Rail Regulations 2016 oblige the Infrastructure Manager to provide the following services to the TOCs:

- (a) the minimum access package (as set out in section 5.2 below); and
- (b) track access to service facilities and, as a service provider, the supply of services, both as set out in section 5.3 below.

Regulation 6(11) of the Rail Regulations 2016 provides that an infrastructure manager may offer and provide the additional services as set out in section 5.4 below.

Regulation 6(12) of the Rail Regulations 2016 provides that a TOC may request the supply of any of the ancillary services as set out in section 5.5 below from an infrastructure manager but the infrastructure manager is under no obligation to supply the services requested.

5.2 Minimum Access Package

The minimum access package as described in Schedule 2 of the Rail Regulations 2016 comprises the following:

- (a) handling of requests for infrastructure capacity; and
- (b) the right to utilise capacity which is granted, in particular:
 - (i) such railway infrastructure including track, points and junctions as are necessary to utilise that capacity;
 - (ii) electrical supply equipment for traction current, where available and as is necessary to utilise that capacity;
 - (iii) train control including signalling, regulation, dispatching and the communication and provision of information on train movements; and
 - (iv) all other information required to implement or operate the service for which capacity has been granted.

5.2.1 Handling of Requests for Infrastructure Capacity

This service refers to the processes outlined in section 4 (Capacity Allocation).

5.2.2 The Right to Utilise Capacity which is Granted

Under a Framework Track Access Contract or a Track Access Contract (as applicable), the Infrastructure Manager may grant a TOC permission to use certain capacity on the CCOS subject to the timetabling process. This means permission to use the track comprised in the specified routes for the provision of railway passenger services using the railway vehicles specified in the agreement. Such permission is

subject to the CCOS Codes, the CCOS Engineering Access Statement and the CCOS Timetable Planning Rules.

5.2.3 Connected Facilities

In relation to rail facilities that are not part of the CCOS, the provision of the minimum access package is the responsibility of the relevant service provider.

5.3 Track Access to Service Facilities and Supply of Services

5.3.1 Access to Service Facilities

5.3.1.1 Passenger Stations, Buildings and Other Facilities

Please refer to section 3.3.1.3 for further details.

The Infrastructure Manager is the facility owner of the RfL(I) Stations. The Infrastructure Manager has appointed the CTOC to operate the RfL(I) Stations on a day-to-day basis under an operator agreement.

Other TOCs who want to use an RfL(I) Station (known as beneficiaries) must enter into a Station Access Contract with the Infrastructure Manager. Such agreements govern the provision of common station amenities and services by the Infrastructure Manager, including such matters as the availability of concourses and platforms, non-exclusive staff amenities, cleaning and lighting and train despatch. Such Station Access Contract must be approved by the ORR prior to it being entered into, else it will have no legal effect.

The LUL Stations are owned and operated by LUL. TOCs who want to use an LUL Station must enter into a Station Usage Agreement with LUL. Such agreement governs the provision of certain amenities and services by LUL.

5.3.1.2 Freight Terminals

Does not apply to the CCOS.

5.3.1.3 Marshalling Yards and Train Formation facilities

Does not apply to the CCOS.

5.3.1.4 Storage Sidings

Rolling stock which is not in service is generally stabled at facilities owned or leased by TOCs.

There is limited provision for stabling on the CCOS - refer to section 3.6.4 for further details.

Alternatively, the ability to stable rolling stock in specified sidings on NR's network may be granted as part of the access rights under a track access contract with NR.

5.3.1.5 Maintenance Facilities

The infrastructure maintenance depot for CCOS is located at Plumstead. This is not a rolling stock maintenance facility.

Please refer to section 3.6.5 for further information on the maintenance facilities off CCOS.

5.3.1.6 Other technical facilities, including cleaning and washing facilities

Does not apply to the CCOS.

5.3.1.7 Refuelling Facilities

Does not apply to the CCOS.

5.4 Additional Services

5.4.1 Traction Current

Power will be supplied to the TOCs by or on behalf of the Infrastructure Manager to facilitate the access rights granted to a TOC under the relevant Framework Track Access Contract or Track Access Contract.

All electric trains on CCOS shall be fitted with train meters compliant with EN 50463 Energy Measurement on Board Trains.

5.4.2 Services for trains (Pre-heating, water supply, toilet waste disposal etc.)

Not provided on the CCOS.

5.4.3 Services for Exceptional Transports

A risk assessment service in respect of compatibility with the CCOS may be provided by the Infrastructure Manager as part of the route acceptance procedure for exceptional transport.

5.4.4 Any Other Additional Services

Not provided on the CCOS.

5.5 Ancillary Services

5.5.1 Access to telecommunications network

The use of the Infrastructure Manager's communications network described in section 3.3.3 is for those activities contained within the minimum access package.

5.5.2 Provision of Supplementary Information

There will be a charge for the provision of supplementary information which will be assessed on the nature and scope of the information being requested and levied in accordance with the Rail Regulations 2016.

5.5.3 Any Other Ancillary Services

None proposed.

6 Charges

6.1 Charging Principles

This section sets out the current charging principles for access to the CCOS which apply from the commencement of operations on the CCOS to 31 March 2022, this being the period until the initial contractual review of charges (see section 6.2 below).

6.2 Charging System

Charges for the use of the CCOS are set out in the Framework Track Access Contracts and Track Access Contracts through which the Infrastructure Manager grants permission to TOCs to use the CCOS. These agreements require the ORR's approval, and hence this approval extends to the charging arrangements within them. Under Regulation 14 of the Rail Regulations 2016, the ORR must also establish the charging framework and specific charging rules governing the determination of fees. Essentially the ORR is responsible for establishing the charging framework and the Infrastructure Manager is responsible for calculating all track access charges within this framework.

The model Framework Track Access Contract and Track Access Contract contain provisions whereby the charges can be reviewed on a periodic basis. The frequency of reviews is every five years but with an initial review after approximately three years. The shorter initial review period reflects the fact that the CCOS is new infrastructure and as such charges are based on prospective cost information and thus it will allow emerging deviations from expectation to be considered and reflected in the charges where appropriate at the earliest practicable opportunity.

6.3 Tariffs

This section sets out the different charges for access to the CCOS.

The tariff will comprise:

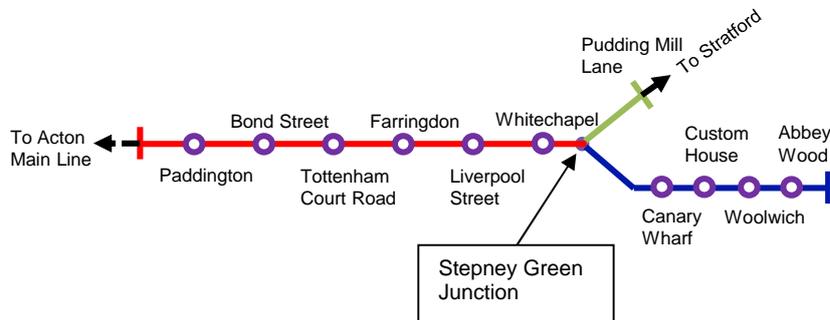
- (a) Investment Recovery Charge (passenger services only)
- (b) Operations, Maintenance and Renewal Charges comprising:
 - (i) Costs Directly Incurred Charge; and
 - (ii) Fixed Cost Charge
- (c) Traction Electricity Charge
- (d) Other Services Charge

The charge for the Minimum Access Package shall comprise (a) and (b) above.

Charges in relation to (a) and (b) will be disaggregated by the following route sections:

- Westbourne Park / Portobello Junction to Stepney Green Junction,

- Stepney Green Junction to Pudding Mill Lane Junction and
- Stepney Green Junction to Abbey Wood



The charges for a train service will then be derived by aggregating the costs for the route sections relevant to that service and then dividing by a capacity utilisation metric.

The capacity utilisation metric for these charges is a Train Path or a train movement.

The expected capacity utilisation for the period to the first contractual review shall be based on the contractual service level commitment (as at the date of this Network Statement) to be operated by CTOC from December 2019¹⁵.

CCOS Infrastructure route section	Paths, #'000	Movements, #'000
Westbourne Park / Portobello Junction to Stepney Green Junction	301	263
Stepney Green Junction to Pudding Mill Lane Junction	151	132
Stepney Green Junction to Abbey Wood	151	132

6.3.1 Track Access Charge

6.3.1.1 Investment Recovery Charge

The purpose of the Investment Recovery Charge (IRC) is to recover publicly funded capital costs of the CCOS in accordance with paragraph 3 of schedule 3 of the Rail Regulations 2016.

The Sponsors of the Crossrail project sought confirmation from the ORR before substantial inception that a charge could be levied to recover up to the publicly funded costs of the project.

¹⁵ The Infrastructure Manager is not aware at this time of other prospective TOCs on the CCOS and therefore considers this to be an appropriate assumption. This includes the additional services announced in March 2017 see <http://content.tfl.gov.uk/16-elizabeth-line.pdf>

In November 2008 the ORR issued a Regulatory Statement¹⁶ in relation to Crossrail that stated “we agree in principle ... that the infrastructure manager would be entitled to set charges based on the long term costs of the project”.

Whilst almost all of the funding of the project could be considered to be publicly funded in order to promote maximum utilisation of the infrastructure the Infrastructure Manager intends to recover only those costs that have been directly funded by the Sponsors.

The recoverable public funding has been allocated pro rata between project spend within the scope of access pursuant to the terms outlined in this Network Statement and that outside the scope (e.g. the LUL Stations).

The capital cost to be recovered through the IRC of £3.7bn will be the initial Regulatory Asset Base (RAB).

This initial RAB will be subject to amortisation as follows:

Asset Category	Amortisation approach
Long Life Civils Assets	Not amortised
Other Assets	Amortised over fixed period determined by asset class

Long Life Civils Assets comprise the tunnels and associated civil engineering structures which have a design life of 120 years and thus add long-term economic value to the CCOS.

The IRC (in real terms) will be calculated as follows:

$$IRC_t = (WACC_t \times RAB_t) + AmortisationOtherAssets.$$

Where:

WACC is the Weighted Average Cost of Capital. This is a pre-tax WACC for a notional third party infrastructure manager with characteristics similar to the Infrastructure Manager.

RAB is the Regulatory Asset Base.

AmortisationOtherAssets is the amortisation allowance for assets other than Long Life Civils Assets.

For the period until the first review of charges the WACC has been set at 3.8%. The principal assumptions behind the WACC are set out in Appendix 1.

The IRC can be calculated annually based on the opening RAB and amortisation for a given year, leading to a declining profile of charge. To provide certainty the IRC will be a fixed amount, in real terms, for the period to the first charges review (and for future periods between charges reviews). The fixed IRC over this period will have an

¹⁶ http://orr.gov.uk/data/assets/pdf_file/0017/10745/crossrail-reg-statmnt-131108.pdf

equivalent net present value when discounted to December 2018 at the WACC as an annually recalculated declining IRC over the same period.

Construction (capital) costs have been allocated to the route sections identified in section 6.3. Whilst most costs can be allocated directly some project-wide costs and attributable overheads have been allocated based on appropriate metrics or engineering judgement. Applying the public funding recovery to these allocated costs then gives a RAB value per route section from which an annual IRC per route section can be derived as above. This is then divided by the expected annual number of Train Paths utilised over the respective route section to give an IRC per Train Path over that section.

This is summarised below:

CCOS Infrastructure route section	Ref	IRC £ per path, each way(16/17 prices)
Westbourne Park / Portobello Junction to / from Stepney Green Junction	(a)	282
Stepney Green Junction to / from Pudding Mill Lane Junction	(b)	183
Stepney Green Junction to / from Abbey Wood	(c)	321

The above values can then be used to determine the IRC charges for Train Paths as follows:

Train Path	Calc	IRC £ per path, each way (16/17 prices)
Westbourne Park / Portobello Junction (NR West) to / from Pudding Mill Lane Junction (NR East)	(a) + (b)	465
Westbourne Park / Portobello Junction (NR West) to / from Abbey Wood	(a) + (c)	603

Any future enhancement to the CCOS network will be added to the RAB, subject to the approval of the ORR at the relevant time, and will generate a further IRC calculated in accordance with the principles above.

6.3.1.2 Operations, Maintenance and Renewals Charges

The costs of Operations, Maintenance and Renewal (OMR) are recovered through two charges:

- (a) The Costs Directly Incurred Charge (CDIC); and
- (b) The Fixed Costs Charge (FCC).

CDIC and FCC are calculated based on the OMR expenditure forecast over 60 years, to obtain an average annual total OMR cost.

The CDIC recovers those costs that are directly incurred as a result of operating train services. These costs are recovered in accordance with paragraph 1(4) of Schedule 3 of the Rail Regulations 2016.

The FCC recovers those OMR costs not directly incurred as a result of operating train services. These costs comprise the long term operating costs of the Crossrail project and are recovered in accordance with paragraph 3 of Schedule 3 of the Rail Regulations 2016.

Cost categorisation is based on the guidance set out in Commission Implementing Regulation (EU) 2015/909.

The CDIC and FCC charges recover the total OMR costs for the expected capacity utilisation.

Further information is provided in Appendix 2.

6.3.1.3 Traction Electricity Charge

Traction electricity (EC4T) is procured by the Infrastructure Manager on behalf of all TOCs. All charges that the Infrastructure Manager incurs in respect of traction electricity will be passed through to the TOCs. The "tariff" referred to below will include delivery charges such as charges levied by the UK national grid provider.

(a) Where there is only one TOC using the CCOS

If there is only one TOC using the CCOS at any point in time, the EC4T charge will be calculated as follows:

EC4T charge (£) = electricity consumption recorded on the infrastructure meters (kWh) x tariff (pence/kWh)

(b) Where there is more than one TOC using the CCOS

If there is more than one TOC using the CCOS at any point in time, the EC4T charge will be calculated as follows:

EC4T charge (£) = (electricity consumption recorded on the on-train meters (kWh) – electricity regeneration recorded on the on-train meters (kWh)) x (1 + distribution losses uplift) x tariff (pence/kWh)

Where there is more than one TOC using the CCOS at any point in time, there will be an annual adjustment to reflect any difference between the cost recovered as above and actual cost to the Infrastructure Manager of providing traction electricity. This adjustment process will take place following the end of each year ending on 31 March.

6.3.1.4 Charges for Testing Train Services

In so far as a TOC proposing to operate rail services needs to operate services during a testing period (and without revenue earning passengers on board) it will be

liable to pay the CDIC plus any specific one off costs incurred by the Infrastructure Manager in facilitating such testing services. It may also be required to provide a performance bond to cover potential liabilities under the Track Access Contract or Framework Track Access Contract (see also section 6.8 below).

6.3.2 Track access to service facilities and supply of services

Track access to service facilities located on the CCOS (other than Stations (see 6.3.3 below) is included in the minimum access package.

6.3.3 Supply of services referred to in section 5.3

6.3.3.1 Station Access Charges – LUL Stations

Charges for access to the LUL Stations are available from LUL using the contacts set out in section 1.8.

6.3.3.2 Station Access Charges – RfL(I) Stations

The Station Access Charges for use of the RfL(I) Stations comprise the Common charges and the Exclusive charges.

(a) Common charges

The common charges are made up of the following components:

- (i) **Qualifying expenditure:** This is the operating expenditure described in the RfL(I) Station Access Conditions and relevant Annexes incurred by the Infrastructure Manager calculated in accordance with the formula specified in the RfL(I) Station Access Conditions and relevant Annexes. The formula apportions the qualifying expenditure between TOCs by taking into account each TOC's vehicle departures at the RfL(I) Station. The qualifying expenditure is levied on all TOCs using the relevant RfL(I) Station.
- (ii) **Long term charge:** The long term charge will reflect the Infrastructure Manager's costs of the maintenance, renewal and repair activities at each RfL(I) Station. The charge will be recovered from all TOCs whose services stop at the RfL(I) Station in proportion to the number of vehicle departures for each TOC. The amount of the long term charge will be specified in the relevant Annexes to the RfL(I) Station Access Conditions for each RfL(I) Station and will be reviewed as per the specified formula.
- (iii) **IRC:** The purpose of the IRC is to recover publicly funded capital costs of the CCOS (including the RfL(I) Stations) in line with paragraph 3 of schedule 3 of the Rail Regulations 2016. Section 6.3.1.1 sets out further background on the IRC in the context of the Track Access Charge, which applies equally in respect of the Station Access Charge. As noted above, the project spend to which the IRC for the RfL(I) Stations applies has excluded the project spend for the LUL Stations.

The capital cost of the RfL(I) Stations to be recovered through the IRC of £1.2bn will be the initial RfL(I) Stations RAB. This initial RAB will be subject to amortisation as follows:

Asset Category	Amortisation approach
Long Life Civils Assets	Not amortised
Other Assets	Amortised over fixed period determined by asset class

Long Life Civils Assets comprise the station boxes (subterranean stations), station buildings and associated civil engineering structures which have a design life of 120 years and thus add long-term economic value to the CCOS.

The IRC (in real terms) will be calculated as follows:

$$IRC_t = (WACC_t \times RAB_t) + AmortisationOtherAssets.$$

where:

WACC is the Weighted Average Cost of Capital. This is a pre-tax WACC for a notional third party infrastructure manager with characteristics similar to the Infrastructure Manager.

RAB is the Regulatory Asset Base.

AmortisationOtherAssets is the amortisation allowance for assets other than Long Life Civils Assets.

For the period until the first review of charges, the WACC has been set at 3.8%. The principal assumptions behind the WACC (both in relation to the CCOS and the RfL(I) Stations) are set out in Appendix 1. The IRC can be calculated annually based on the opening RAB and amortisation for a given year, leading to a declining profile of charge. To provide certainty the IRC will be a fixed amount, in real terms, for the period to the first review of charges (and for future periods between charges reviews). The fixed IRC over this period will have an equivalent net present value when discounted to December 2018 at the WACC as an annually recalculated declining IRC over the same period.

Construction (capital) costs have been allocated to the RfL(I) Stations. Whilst most costs can be allocated directly, some project-wide costs and attributable overheads have been allocated based on appropriate metrics or engineering judgement. Applying the public funding recovery to these allocated costs then gives a RAB value per RfL(I) Station from which an annual IRC per RfL(I) Station can be derived as above. This is then divided by the expected annual number of station calls utilised to give an IRC per RfL(I) Station call.

The number of station calls is based on the expected CCOS capacity utilisation for the period to the first contractual review as per the contractual

service level commitment (as at the date of this consultation) to be operated by CTOC from December 2019¹⁷.

Indicative IRC charges per RfL(I) Station are set out below¹⁸. These are based on a per call basis for a nine car Class 345 to allow a more ready comparison to the IRC for the CCOS network infrastructure. Please note the charging in the RfL(I) Station Access Conditions is on a “per vehicle departure” basis.

RfL(I) Station	IRC £ per RfL(I) Station call (16/17 prices)
Paddington (CCOS)	86
Custom House	16
Canary Wharf	120
Woolwich	57

The number of station calls assumed in the calculation of the above is as follows:

RfL(I) Station	RfL(I) Station Calls pa (#'000)
Paddington	263
Custom House, Canary Wharf and Woolwich	132

Any future enhancement to the RfL(I) Stations will be added to the RAB, subject to the approval of the ORR at the relevant time and will generate a further IRC calculated in accordance with the principles above.

(b) Exclusive charges

These are the charges to be paid by the respective TOC for any bespoke services provided by the Infrastructure Manager to such TOC at the relevant RfL(I) Station.

6.3.4 Ancillary Services

As noted in section 5.5.2 there will be a charge for the provision of supplementary information which will be assessed on the nature and scope of the information being requested and levied in accordance with the Rail Regulations 2016.

¹⁷ TfL/RfL(I) is not aware at this time of other prospective train operators on the CCOS and therefore considers this to be an appropriate assumption.

¹⁸ Abbey Wood station was rebuilt as part of the works carried out by NR to facilitate Crossrail services. NR is remunerated for these works by a supplementary access charge payable by TfL. The element of this access charge in relation to Abbey Wood station is proposed to be recovered from the Infrastructure Manager / Facility Owner by TfL through lease rentals and from access beneficiaries as part of the Qualifying Expenditure charge.

6.4 Financial Penalties and Incentives

Regulation 17 of the 2016 Regulations authorises an infrastructure manager to levy an appropriate charge for capacity that is requested but not used. The Infrastructure Manager proposes to levy such reservation charges under the relevant Framework Track Access Contract. The charge will be the sum of the IRC and FCC for the relevant Train Path.

It is proposed that the capacity reservation charge would be payable by the TOC on and from the date the reservation of capacity commences unless the reserved capacity is used by the TOC or another person. Capacity will be treated as having been used by a TOC if, as part of the timetabling process, such capacity has been translated into a Train Path and included in the relevant Working Timetable.

If the reserved capacity is used by another person then the TOC would be entitled to a rebate of the lower of (a) the capacity reservation charge and (b) the equivalent amount paid by the operator using the Train Path.

The capacity reservation charge would not be payable by the TOC:

- in relation to any part of the reserved capacity which the TOC surrenders in accordance with the terms of the Framework Track Access Contract; or
- if it bids for a Train Path in accordance with the relevant provisions of the CCOS Network Code but is unsuccessful in obtaining the Train Path.

Where a Framework Track Access Contract is structured so as to provide an Applicant with an option to require the Infrastructure Manager to allocate to a TOC certain specified capacity on CCOS, such capacity would be subject to the capacity reservation charge from the date when the option has been exercised and the TOC is entitled to bid for the capacity, in accordance with the principles described above.

6.5 Performance Scheme

Regulation 14 of the Rail Regulations 2016 provides that an infrastructure manager must establish a performance regime as part of the charging system to encourage railway undertakings and the infrastructure manager to minimise disruption and improve the performance of the railway network. The Infrastructure Manager has developed a performance regime which is incorporated in the relevant Framework Track Access Contract or Track Access Contract. Please refer to Appendix 3 for more details.

6.6 Changes to Charges

Subject to the paragraph below, the applicable track access charges shall remain constant in real terms over the period to the initial contractual review (scheduled to have effect from 01 April 2022). Each year the charges are adjusted by RPI.

The model Framework Track Access Contract and Track Access Contract contain provisions whereby the charges may be amended on the occurrence of a “material” change in circumstances which beneficially or adversely affects the cost of delivering the Infrastructure Manager’s obligations and/or its asset management strategy and maintenance and renewals plans pursuant to that strategy. Such a material change

includes the increase or decrease of 10% or more timetabled train movements on the CCOS, significant physical modifications to the CCOS and a material change to the CCOS Asset Management Strategy.

6.7 Billing Arrangements

The Infrastructure Manager will invoice TOCs via the TfL Financial Service Centre. Agreed terms and conditions, including those relating to non-payment or late payment are set out in the relevant Framework Track Access Contract or Track Access Contract. Certain payments are to be made four weekly in advance, other payments are to be made four weekly in arrears and a further payment is to be made following the calculation of any traction electricity charge adjustment.

6.7.1 Charges to be paid four weekly in advance

The following charges are to be paid four weekly in advance:

- (a) the proportion of the annual IRC payable in respect of such period;
- (b) the proportion of the annual FCC payable in respect of such period; and
- (c) any further IRC which may become payable in respect of such period.

6.7.2 Charges to be paid four weekly in arrears

The following charges are to be paid four weekly in arrears:

- (a) the IRC for any additional trains operated during such period;
- (b) the FCC for any additional trains operated during such period;
- (c) the CDIC payable in respect of such period; and
- (d) the EC4T payable in respect of such period.

6.7.3 Charge to be paid following the end of each year

Where more than one TOC is operating on the CCOS at any point in time, as noted in section 6.3.1.3(b) a traction electricity adjustment charge will become payable following the end of each year ending on 31 March.

6.8 Credit Protection

The Infrastructure Manager reserves the right to require the Applicant to provide credit protection for the benefit of the Infrastructure Manager, which may be by way of: (a) advance payments to reduce and anticipate future obligations to pay infrastructure charges; or (b) contractual arrangements by which a financial institution such as a bank commits to ensure that such payments are effected once they are due. The Infrastructure Manager may do so where the TOC's credit rating suggests that it may have difficulties in effecting regular payments for infrastructure charges. Any such request will be based on credit ratings not older than two years and will be for an amount not exceeding the estimated amount of infrastructure charges during two months of train operations requested. Any advance payments for infrastructure charges will be deducted from the aforementioned maximum amount.

Glossary of Terms

Term	Definition
Act	Railways Act 1993
Applicant	Any person that wants to apply for a Train Path including TOCs and combined transport operators applying on behalf of a TOC
Access Proposal	Any notification made by any Applicant for a Train Slot as provided under the CCOS Network Code
AWS	Automatic Warning System
CBTC	Communications Based Train Control
CCOS	Crossrail Central Operating Section rail infrastructure to which this Network Statement relates
CCOS Access Dispute Resolution Rules	The rules for the resolution of access disputes on the CCOS, as appended to the CCOS Network Code
CCOS Codes	The CCOS Network Code, the CCOS Emergency Access Code, the CCOS Railway Operational Code, the CCOS Performance Data Accuracy Code and the CCOS Systems Code
CCOS Engineering Access Statement	The CCOS Engineering Access Statement sets out the Possessions requirements of the Infrastructure Manager in order to carry out inspections, maintenance, repair, renewal and enhancement works on the CCOS
CCOS Network Code	The CCOS Network Code as updated from time to time
CCOS Rule Book	The CCOS Rule Book as updated from time to time

CCOS Sectional Appendix	The CCOS Sectional Appendix as updated from time to time
CCOS Standards	Railway Group Standards published by the Railway Safety and Standards Board (RSSB)
RfL(I) Station Access Conditions	RfL(I) Station Access Conditions and the annexes in relation to the relevant RfL(I) Station as each are modified in respect of the relevant RfL(I) Station from time to time
CCOS Timetable Planning Rules	The CCOS Timetable Planning Rules containing operating procedures and a procedure to enable amendments to be made to the CCOS Engineering Access Statement other than through the annual consultation process set out in Condition D2 of Part D of the CCOS Network Code
CDIC	Costs Directly Incurred Charge
Class 345	Bombardier Aventra Model LV-BXR-13
Connaught Tunnel	That tunnelled section of the CCOS between Royal Victoria Dock and Royal Albert Dock
Crossrail Train Operating Concession	Agreement between Rail for London Limited (a wholly owned subsidiary of TfL) and CTOC for the provision of specified railway passenger services for a period
CTOC	The operator of the Crossrail Train Operating Concession from time to time which, as at the date of this Network Statement, is MTR Corporation (Crossrail) Limited
Disruptive Event	Any event or circumstance which materially prevents or materially disrupts the operation of trains on any part of CCOS in accordance with the relevant Working Timetable

DLR	Docklands Light Railway
ETCS	European Train Control System
FCC	Fixed Cost Charge
Framework Track Access Contract	Agreement between the Infrastructure Manager and an Applicant for the allocation of capacity on the CCOS for a duration of more than one Timetable Period
GSM-R	Global system for mobile telecommunications - railway
IRC	Investment Recovery Charge
Infrastructure Manager	Rail for London (Infrastructure) Limited, a wholly owned subsidiary of TfL
LUL	London Underground Limited
LUL Stations	Bond Street, Tottenham Court Road, Farringdon, Liverpool Street and Whitechapel
Network Services	Railway services other than the carriage of passengers and goods, light maintenance of rolling stock and station services. Essentially the operation maintenance and renewal of the CCOS infrastructure
New Working Timetable	The version of the Working Timetable which is formally offered to Applicants 26 weeks prior to coming into effect, and after the resolution of any disputes
NR	Network Rail Infrastructure Limited – also referred to as Network Rail
NR Network	The railway operated by NR
Old Oak Common Depot	The maintenance depot located at Old Oak Common, London
OMR	Operations, Maintenance and Renewal

ORR	Office of Rail and Road
OSS	One Stop Shop
Possession	Restriction of use of railway infrastructure assets
Principal Change Date	The date normally falling on the Sunday next following the second Saturday in December in any calendar year
Rail Regulations 2005	Railways Infrastructure (Access & Management) Regulations 2005 as amended by the Railways Infrastructure (Access and Management) (Amendment) Regulations 2009 which have since been repealed by the Rail Regulations 2016
Rail Regulations 2016	The Railways (Access, Management and Licensing of Railway Undertakings) Regulations 2016
RCC	Romford Route Control Centre
Relevant Legislation	<p>(a) EU Directive 2001/14/EC (known as the First Railway Package) (transposed into domestic law by the Rail Regulations 2005 and The Railways (Licensing of Railway Undertakings) Regulations 2005;</p> <p>(b) EU Directive 2012/34/EU (transposed into domestic law by the Rail Regulations 2016);</p> <p>(c) the Second Railway Package of EU legislation (transposed into domestic law by the ROGS Regulations, The Railways (Interoperability) Regulations 2006 (since superseded by The Railways (Interoperability) Regulations 2011), and The</p>

	<p>Railways (Access to Training Services) Regulations 2006;</p> <p>(d) the Third Railway Package of EU legislation (transposed into domestic law by The Train Driving Licences and Certificates Regulations 2010);</p> <p>(e) the Act; and</p> <p>(f) the Railways Act 2005</p>
RfL(l) Stations	Paddington (CCOS) Station; Canary Wharf Station; Custom House Station; Woolwich Station; and Abbey Wood Station
RNE	RailNetEurope, an association of European infrastructure managers
ROGS Regulations	<p>The Railways and Other Guided Transport (Safety) Regulations 2006 as amended including by the:</p> <p>(a) Railways and Other Guided Transport Systems (Safety) (Amendment) Regulations 2013; and</p> <p>(b) The Railways and Other Guided Transport Systems (Safety) (Amendment) Regulations 2015</p>
Rolling Stock	Wheeled vehicles capable of movement on a railway, whether self-propelled or not
Secretary of State	Secretary of State for Transport
SNRP	Statement of National Regulatory Provisions
Sponsors	TfL and the Department for Transport
Stations	The RfL(l) Stations and the LUL Stations
Station Access Contract	Agreement between the CTOC and an Applicant for access to the

	relevant RfL(I) Station
Station Usage Agreement	Agreement between LUL and an Applicant for access to the relevant LUL Station
Subsidiary Change Date	The date normally falling on the Sunday next following the second Saturday in May in any calendar year
TfL	Transport for London
Timetable Period	The period of operation of the relevant Working Timetable
TOC	A Train Operating Company, being any public or private undertaking, licensed according to applicable European Community legislation (or exempt from licensing), the principal business of which is to provide services for the transport of goods and/or passengers by rail with a requirement that the undertaking must ensure traction; this also includes undertakings which provide traction only
TPWS	Train Protection and Warning System
Track Access Contract	Agreement between the Infrastructure Manager and an Applicant for the allocation of capacity on the CCOS for duration of up to and including a single Timetable Period
Train Operator Variation	Any formal request made to change, delete or add to the Train Slots shown in the Working Timetable
Train Path	The infrastructure capacity needed to run a train between two places over a given time period
Train Slot	A train movement or a series of train movements, identified by arrival and departure times at each of the start, intermediate (where

	appropriate) and end points of each train movement
TSI	Technical Specification for Interoperability
WACC	Weighted Average Cost of Capital
Working Timetable	The timetable for the train services on the CCOS established in accordance with Part D of the CCOS Network Code for the relevant Timetable Period

Appendix 1 – Weighted Average Cost of Capital (WACC)

A required input in the calculation of the IRC, is the WACC. The WACC represents a fair rate of return commensurate with the risks faced by the Infrastructure Manager.

The WACC which will be applied to the indexed RAB will be a pre-tax, real WACC. An allowance for taxation expenditure is therefore reflected in the WACC. The pre-tax WACC is designed to be set with reference to a notional third party with the characteristics of a CCOS infrastructure manager.

The pre-tax cost of capital is calculated using the following formula:

$$\text{Pretax WACC} = (g \times K_d) + \frac{(1 - g)(K_e)}{(1 - \tau)}$$

Where:

' g ' is the gearing of the notional CCOS infrastructure manager,

' K_d ' is the cost of debt,

' K_e ' is the post-tax cost of equity, and

' τ ' is a measure of the UK corporate tax rate.

The assumptions to be applied in estimating each of these components are set out below.

Gearing: the gearing for a *notional* CCOS infrastructure manager with an investment grade credit rating (rather than the actual gearing of the Infrastructure Manager, see below).

Cost of debt: yields on long-dated bonds from benchmark UK corporate bond investment grade indices are assumed to capture an appropriate cost of debt (rather than the actual cost of debt of the Infrastructure Manager, see below).

Cost of equity: the Capital Asset Pricing Model (CAPM) is assumed to produce a fair return on equity for the notional CCOS infrastructure manager. The cost of equity (CoE) is equal to:

$$\text{CoE} = \text{RFR} + \beta(\text{EMRP})$$

where:

RFR is the UK real risk-free rate;

β is the equity beta specific to the notional CCOS infrastructure manager; and

EMRP is the equity market risk premium for the UK.

Tax rate: although the pre-tax WACC is set with reference to a notional CCOS infrastructure manager, it is assumed that the tax-rate is zero, based on the current tax position of the TfL Group. This assumption will be revisited at the review of charges and if the ownership structure changes, as any taxation cost would need to be recovered through the IRC.

The approach to use *notional* rather than *actual* parameters to establish the WACC used to calculate charges is a standard approach used by regulators including the ORR, the CAA, Ofwat and Ofgem. This approach is considered appropriate in the context of the Infrastructure Manager for a number of reasons:

- It provides incentives for the Infrastructure Manager to financially outperform its settlement (in contrast, if *actual* values were employed, the Infrastructure Manager may be held financially neutral to any financial out- and/or under-performance);
- It provides for certainty to TOCs and promotes inter-generational equity by maintaining stability of charges over time, even upon a change of ownership (e.g. a sale of the Infrastructure Manager or the CCOS assets), although no change of ownership outside the TfL group is currently envisaged; and
- It provides appropriate price-signals to the market that recognises the risks being taken by the Infrastructure Manager (and, ultimately, by the Sponsors).

The pre-tax WACC for the period to the first review of charges has been set at 3.8%.

The Infrastructure Manager considers that a pragmatic and economic approach to determining the CP1 WACC is appropriate. Two broad approaches were therefore considered in determining this WACC figure:

- Firstly, to consider regulatory precedents and market data to reach a high-level pragmatic view on the parameters which influence the WACC for the CCOS. The Infrastructure Manager followed this approach in preparation of the draft Network Statement – producing an indicative range of 3.5% to 4.2% (this analysis is restated below in table A.1). The WACC that has been set clearly falls within this range.
- Secondly, to make direct comparisons with other rail infrastructure managers in Great Britain (GB). The key WACC benchmarks from GB rail are those of (i) NR and (ii) High Speed 1:
 - NR (PR13) – The ORR adopted a point estimate for the real pre-tax WACC of 4.9%. Adjusting for a 0% tax rate, as proposed for the CCOS WACC (see above), the equivalent NR WACC is 4.3%. We note that the ORR’s publications relating to PR18 will be released shortly after publication of this Network Statement. Given movements in the sterling debt market since PR13, it seems likely that a notional WACC figure for NR could be lower than the PR13 benchmark thus approaching the WACC set for the CCOS in CP1.
 - High Speed 1 (PR14) – For CP2, HS1 proposed a nominal pre-tax WACC of 6.6% be applied to further investment in its infrastructure.

Applying HS1's RPI assumption of 2.75%, this is equivalent to a real pre-tax WACC of 3.75%.

It is acknowledged that in determining the CP1 WACC for the CCOS a number of factors were not considered in the same depth as may apply in similar exercises for NR or other large infrastructure managers. These factors include: the most appropriate cost of debt methodology for the CCOS; detailed consideration of the risks of RfL(l)'s business relative to other regulated businesses; assumptions about appropriate notional gearing; and equity beta assumptions.

Nonetheless the Infrastructure Manager considers that the approach taken results in a WACC that is appropriate for the CCOS for CP1.

The WACC is subject to periodic review, with the first such review being effective from 1st April 2022 (see 6.2). It is intended that further analysis of the WACC will be conducted as part of this review.

Table A1 - Indicative WACC components (restated from draft CCOS 2019 Network Statement)

Parameter	Low	High	Comment
Gearing	60%	60%	Based on UK regulatory precedents, a gearing of 60% is regarded as being commensurate with an investment grade credit rating.
Risk-free rate	-0.5%	0.5%	UK regulatory precedents for the risk-free rate have not fallen below 0.5%, this provides the upper end of range. Spot market yields on index-linked gilts – a proxy for the risk-free rate – have been negative for some time though. We therefore adopt a symmetric range around zero to lend some weight to current market evidence.
Total market return	6.50%	6.50%	The CMA has employed a total market return range of 5% to 6.5% in recent decisions. Consistent with other regulatory precedents we adopt an estimate at the top end of this range.
Asset Beta	0.35	0.45	Based on an inspection of UK regulatory precedents we adopt an asset beta range towards the centre-ground of recent determinations.
Equity Beta	0.88	1.13	Calculated.
Cost of Equity (post-tax)	5.6%	7.3%	Calculated.

Cost of Debt (pre-tax)	2.0%	2.2%	Based on long-term averages of Iboxx investment grade corporate bond indices.
Tax-rate	0%	0%	See discussion above.
WACC (pre-tax)	3.5%	4.2%	Calculated.

Appendix 2 - Operations, Maintenance and Renewals Charges

Section 6.3.1.2. explains that OMR expenditure incurred by the Infrastructure Manager shall be recovered through two charges:

- (a) the Costs Directly Incurred Charge (CDIC); and
- (b) the Fixed Costs Charge (FCC).

The purpose of this appendix is to set out the principles of each of these charges including, at a high level, how they have been calculated.

Cost recovery

The CDIC recovers those OMR costs that are directly incurred as a result of operating the train service (with an appropriate degree of “smoothing” over time to provide for inter-generational equity and stability of charges over time, see further details below). These costs are recovered in accordance with paragraph 1(4) of Schedule 3 of the Rail Regulations 2016.

The FCC recovers those OMR costs that are not directly incurred as a result of operating train services. These costs comprise the long term operating costs of the Crossrail project and are recovered in accordance with paragraph 3 of Schedule 3 of the Rail Regulations 2016¹⁹.

Taken together, the CDIC and FCC charges recover the total OMR costs incurred on the CCOS for the expected capacity utilisation.

Basis for calculating the CDIC

The calculation of the CDIC is based on the following steps:

- 1 **Total OMR costs when expected number of services are run**²⁰ - This is the sum of CCOS infrastructure maintenance and renewal expenditure projected by the Crossrail Maintenance Cost Model²¹ (CMCM), together with TfL forecasts of CCOS operational costs. The maintenance and renewal costs are projected over a period of 60 years from the commencement of services in 2018. Given that the profile of costs is not flat and costs increase significantly

¹⁹ Long term capital expenditure is recovered through the Investment Recovery Charge (IRC) set out in section 6.3.1.1.

²⁰ The expected services are as set out in the concession agreement between RfL and CTOC. The Infrastructure Manager is not aware at this time of other prospective TOCs on the CCOS and therefore considers this to be an appropriate assumption.

²¹ Owned by Crossrail Ltd and developed by Asset Management Consulting Limited.

in certain years (due to the renewal of significant assets for example) a 60 year annual average of these renewal costs is used for the basis of calculating the charges, together with an annual average of operations and maintenance costs over the period to the first review of charges .

- 2 **Distinguishing between fixed and directly incurred costs** - As a second step, it is necessary to split average annual OMR costs between those that are assumed to be directly incurred (in accordance with paragraph 1(4) of Schedule 3 of the Rail Regulations 2016) and those which are not directly incurred or “fixed”. Such costs deemed to be directly incurred are recovered through the CDIC with the remainder being assumed to be fixed and as such, deemed long term costs of the project, recovered through the FCC (see below). To make this distinction, a line-by-line review of the Infrastructure Manager’s forecast costs was undertaken to calculate total costs incurred in the absence of train movements²². Such an exercise involved the review of the OMR activities and distinguishing between whether they are assumed to be directly incurred or otherwise. For example, reactive maintenance activities were all assumed to be directly incurred (as they are directly brought about by the passage of trains), whereas activities related to telecommunications equipment were not because the costs to operate, maintain and renew such assets does not vary with traffic²³. In undertaking such a review, due care has been taken to ensure that the cost categorisation is in keeping with the guidance set out in Commission Implementing Regulation (EU) 2015/909. The total costs incurred in the absence of train movements are then subtracted from those projected to be incurred when running the expected number of services to calculate total costs directly incurred.
- 3 **Attributing costs to services** - To determine the CDIC, total costs directly incurred are attributed to different geographical sections of the network (as set out in section 6.3) and are disaggregated between station and non-station assets (charges in relation to station costs being set out in the RfL(I) Station Access Conditions). Each of these different cost allocations is then divided through by the expected number of annual train movements through the specific part of the network to determine the CDIC for that section. This is then used to provide a series of average per movement charges in accordance with paragraph 1(9) of Schedule 3 of the Rail Regulations 2016²⁴.

²² Assuming that the assets are maintained in a steady-state such that trains could be accommodated in future.

²³ In undertaking this analysis we have taken a cautious approach so that when it was not clear-cut as to whether an activity was directly incurred or otherwise, the activity was assumed to not be directly incurred.

²⁴ It is noteworthy that taking this bottom-up approach to determining the CDIC results in a significantly lower charge than would be levied if a short-run marginal cost (SRMC) approach was implemented. Should a SRMC approach be used, we expect that it would result in an over-recovery of costs given the anticipated high capacity utilisation of the network.

Basis for calculating the FCC

The calculation of the FCC is based on the following steps:

- 1 **Calculating total costs that are not directly incurred** – Having distinguished between the activities and costs assumed to be directly incurred or otherwise, as set out above, this results in a total annual figure for OMR costs not directly incurred, or fixed (being the residual of the total costs incurred by the Infrastructure Manager for operating train services less the costs assumed to be directly incurred).
- 2 **Attributing costs to services** – To determine the FCC, total costs not directly incurred are attributed to sections of the infrastructure. These cost attributions are then divided by the expected Train Path utilisation over that section and a series of average per Train Path charges to recover fixed OMR costs incurred by the Infrastructure Manager derived.

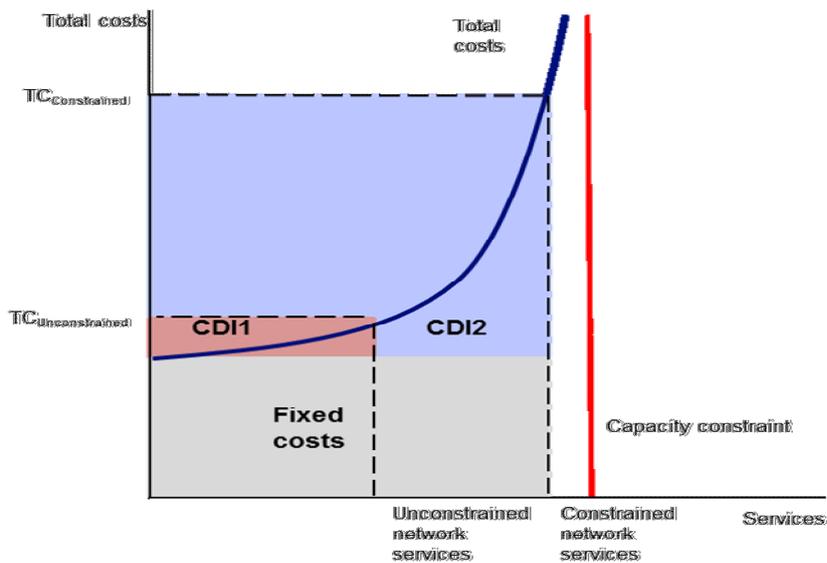
Relative size of the charges

The line-by-line analysis of the Infrastructure Manager's forecast costs suggest that approximately 46% of the OMR costs are directly incurred. This estimated proportion is considered a realistic assessment given the Infrastructure Manager's cost base for the reasons set out below:

- **The relationship between costs and service levels** – the CCOS is expected to be, from opening, utilised at capacity for peak periods and highly throughout the remainder of operational hours. The volume of services is thus large relative to the size/scope of the asset, meaning that variable costs incurred (i.e. CDIC) will be a relatively large proportion of total costs.

As shown in Figure 1 below if two networks are compared, one with a low capacity utilisation and one with high utilisation (akin to the CCOS) then, assuming constant fixed costs, as the utilisation increases, the total cost increases as does the portion of total costs that are directly incurred.

Figure 1: The relationship between costs and service levels



- **The nature of the CCOS asset** – CCOS will be almost entirely subterranean, meaning that relatively few OMR costs are incurred in the state where no services are run (for example, little track maintenance is required as it is shielded from the elements).

Recovery metric and indicative charge format

The CDIC and FCC charges will be levied so as to recover costs on a per train movement and per Train Path utilised basis respectively.

The Infrastructure Manager proposes these metrics for simplicity and transparency and because only one type of vehicle will be used by CTOC for running CCOS services.

However, it may be appropriate to increase the level of granularity in respect of how charges are levied to take into account different rolling stock cleared to run on the CCOS. Therefore, the Infrastructure Manager reserves the right to change the way that charges are levied at a later date in the event of such an occurrence being anticipated and would welcome discussions with prospective operators at that time to introduce more suitable price lists.

The price list is set out below:

CDIC:

Movement	CDIC, each way £ (16/17 prices)
Westbourne Park / Portobello Junction (NR West) to / from Pudding Mill Lane Junction (NR East)	94
Westbourne Park / Portobello Junction (NR West) to / from Abbey Wood	151

FCC:

Train Path utilised	FCC, each way £ (16/17 prices)
Westbourne Park / Portobello Junction (NR West) to / from Pudding Mill Lane Junction (NR East)	82
Westbourne Park / Portobello Junction (NR West) to / from Abbey Wood	172

The above charges are, subject to those matters described in section 6.6, fixed in real terms over the initial period to the first review of charges (scheduled to have effect from 1 April 2022).

The charges are based on current forecasts of the cost of operating, maintaining and renewing the CCOS infrastructure.

The first review of charges will take into account how the actual costs and expenses for the initial period differ from the forecast costs and expenses in respect of that period.

As the CCOS Infrastructure is still under construction and accordingly maintenance plans are still under development, the charges above should not necessarily be seen therefore as an indication of those charges that will be in place following the review.

Appendix 3 - Performance Scheme

1 Introduction

As access to the CCOS network requires entry from the NR network, the CCOS performance regime is intended to reflect the regime within Schedule 8 of the model NR track access contract, as far as is practicable. The main differences from the NR Schedule 8 regime are in relation to:

- Granularity of measurement;
- The CCOS regime being reflective only of lateness gained on the CCOS and excludes lateness accrued on other networks; and
- The necessary prioritisation of train service frequency and journey times over running to strict schedule on the CCOS.

This regime is for passenger operators timetabled in the Long Term Plan.

Planned disruption will be the subject of a separate possessions regime (see Appendix 4).

2 Principles

The regime is based upon any additional journey time of a service on the CCOS in excess of the journey time scheduled in the timetable. For example, if a service is scheduled to take 25 minutes to traverse the CCOS (from entry/starting point to exit/terminating point), any time in excess of this in principle forms part of the regime (i.e. 25 minutes and 1 second and above, although see below in relation to the applicable threshold).

The time a service enters or starts its journey on the CCOS will be recorded – it is this aspect which is key to the operation of the performance regime. Whilst service lateness (or early running services) will be measured for all operated services (whether on entry to the CCOS or at the point of origin if on the CCOS), except as set out below, early or late running from another network is disregarded for the purposes of the regime. It is only the journey time of the service on the CCOS which counts.

When a service exits (or terminates within) the CCOS the time will again be recorded. The difference between the entry/starting time recorded and the exit/terminating time will then be calculated and compared with the scheduled difference in entry/starting time and exit/terminating time in the applicable timetable. Any positive variation (delta) in journey time which is greater than the applicable threshold (30 seconds) is then required to be investigated and a Lateness Event (LE) is created on the reporting system.

If a LE arises because a service enters the CCOS from the NR Network at an earlier time than is scheduled in the timetable and the Infrastructure Manager takes steps to regulate the service so that it exits the CCOS/terminates on the CCOS at the time which is scheduled in the timetable (so the journey time is longer than scheduled) neither party is allocated responsibility.

Where a train presents outside normal operating hours, it will not be admitted to the CCOS.

Reliability Events including cancellations or missed station calls will incur a deemed SL delta value and will be recorded as a LE. Specific deemed seconds lateness values will apply for each station missed. However, if a service is cancelled on a network other than the CCOS (and therefore never enters the CCOS) it will not form part of the performance regime for any purpose.

Responsibility for a LE will be investigated and attributed in line with the principles set out in the Delay Attribution Principles and Rules as updated from time to time.

Performance Regime payment rates will be based on the standard industry approach to the estimation of demand elasticity²⁵ impact of the SL delta on the respective TOC. A Marginal Revenue Effect (MRE) will be derived which will require each TOC to provide appropriately validated prospective revenue information.

Payment rates may vary dependent upon Peak and Off Peak periods (based on throughput of trains per hour) and by train service group.

3 Application

For each LE, investigation action will be initially undertaken by staff at the Route Control Centre (RCC) who will interrogate the CCOS Performance Monitoring System (PMS) to locate any time losses at and between stations.

Where the RCC finds the Infrastructure Manager to be responsible, a LE will be attributed against it.

Only after thorough investigation where the RCC cannot find issue with the Infrastructure Manager will the LE be attributed to the TOC for it to investigate.

Attribution to the TOC may be challenged under the process outlined in the CCOS Network Code (which is incorporated into each Track Access Contract and Framework Track Access Contract) within two working days.

The Infrastructure Manager will pay the cost of its average SL delta above a benchmark (Performance Point). The Performance Point will be based on a reasonable expectation of the Infrastructure Manager's contribution to measured performance, having regard to the outputs noted in section 3.1.

The TOC will pay a cost for its average SL delta based on the cost of that SL delta for other TOCs above a benchmark (Performance Point). The performance point will be based on a reasonable expectation of the TOC's contribution to measured performance (having regard to the outputs noted in section 3.1).

²⁵ Demand elasticity for UK National Rail operations is calculated using the principles of the Passenger Demand Forecasting Handbook (PDFH) published by the Rail Delivery Group. PDFH does not yet recognise the difference in elasticities anticipated between current suburban markets and those of intensive cross-London services that will be operated by both Thameslink and Crossrail. These values will need to be determined through a new study.

The TOC will pay this amount to the Infrastructure Manager who will pass on to the impacted TOCs. Akin to the NR 'star' model, the regime will be calibrated to be financially neutral based on the expected performance.

TfL expects that it would not take a substantial negative deviation from the performance benchmark to cause significant problems for CCOS operations more widely. Therefore, TfL proposes to establish a separate "Special Measures" regime that could come into force if a TOC or the Infrastructure Manager performs at a level which breaches a pre-determined "lower bound"²⁶ of performance. Such a regime would be analogous to NR's Sustained Poor Performance (SPP) regime where once a lower bound of performance is breached, affected parties may claim for incremental "actual losses" if payments under the liquidated sums regime²⁷ exceed a given amount in any two consecutive Periods or any four Periods in any consecutive rolling period of thirteen Periods.

SPP may lead to special measures being applied²⁸. Such measures may, in the case of a TOC, include temporary suspension of access pending of implementation of remedial plans.

The CCOS signalling system will pass movement data to both the Crossrail Performance Monitoring System (PMS) and to the NR train describer system (which feeds NR's TRUST DA system and will be used to feed NR charging processes).

PMS data will be used by the infrastructure managers on the Crossrail route to improve end to end performance across the wider Crossrail network.

4 Calculation

The Infrastructure Manager payment for a service group for a Period will be calculated as:

- the Infrastructure Manager's performance benchmark for that service group; less
- the weighted average seconds late for that service group attributable to the Infrastructure Manager; and then multiplied by
- the busyness factor; and then multiplied by

²⁶ The lower bound of performance will be established during calibration of the regime.

²⁷ When applying the SPP regime it is necessary to "net off" standard revenues impacts captured under the liquidated sums regime from payments made under the special measures framework to ensure no "double counting" takes place. Failure to do so could make the performance regime financially non-neutral and/or result in windfall gains/losses to industry parties.

²⁸ In contrast to the regime set out by NR, TfL propose that SPP applies to both TOCs and the Infrastructure Manager. This means both TOCs and the Infrastructure Manager will be subject to a "lower bound" of performance which, if breached, will mean that the special measures regime comes into force. In addition, the poor performing party (TOC or Infrastructure Manager) will be contractually obliged to put a clear mitigation plan in place to tackle significant poor performance, to remedy any problems going forward.

- the payment rate for the Infrastructure Manager.

The busyness factor is the total number of trains scheduled for the Period due to pass a particular monitoring point.

The TOC payment for a service group for a Period will be calculated as:

- the TOC's performance benchmark for that service group; less
- the weighted average seconds late for that service group attributable to the TOC; and then multiplied by
- the busyness factor; and then multiplied by
- the payment rate for the TOC.

The busyness factor is the total number of trains scheduled for the Period due to pass a particular monitoring point.

5 Review

The performance benchmarks for each service group and the payment rates (both for the Infrastructure Manager and the TOC) will be reviewed and, if appropriate, recalibrated / amended 26 periods after commencement of the December 2019 timetable (and coming into effect on 01 April 2022) or when a "material performance change" occurs.

A "material performance change" includes a significant physical modification to the CCOS, a physical modification due to an inherent defect in the construction of the CCOS, an increase or decrease of not less than ten per cent. (10%) of timetabled train movements on the CCOS in any hour, a significant change in the performance and reliability of a TOC's rolling stock, a Framework Track Access Agreement or Track Access Agreement is entered into in respect of the CCOS which is material to the CCOS performance regime and a material anticipated change in the performance of the NR Network which impacts or is reasonably expected to impact on the interfaces between the CCOS and the NR Network.

Aside from a "material performance change", the model Track Access Contract and Framework Track Access Contract contains provisions whereby the above performance regime inputs will be reviewed with the same frequency as the periodic review of charges referred to in section 6.2.

This regime is predicated on the fundamental ability to always pass trains through the CCOS how-so-ever late or early they present (with the basis of the regime being the number of seconds spent on the CCOS in excess of the scheduled number). If at any stage this core assumption is found not to hold in practice, the Infrastructure Manager will need to consider and consult on an alternative regime.

6 Outline Process for Regime Calibration

- 1 Establish the baseline performance of the CCOS.
- 2 Establish the revenue of the operator and the elasticity of that revenue.

- 3 Establish the cost of the elasticity of the performance beyond the baseline calculated in 1 above.
- 4 Set the TOC and Infrastructure Manager Performance Points appropriate to 3 with regard to the anticipated contribution of each party to CCOS performance.

Appendix 4 – Possessions Regime

Possessions on the CCOS will be undertaken largely in “white periods”²⁹. However, the Infrastructure Manager expects that there may be a need for Possessions that require a restriction of the use of the entire CCOS or specific sections of it during normal service periods.

The Infrastructure Manager will be given a “Possessions Allowance” of 104 hours³⁰ over the year from 1st April to 31st March within which to undertake necessary possessions inside of normal service periods. The proposed utilisation of this allowance will be set out in the CCOS Engineering Access Statement for the relevant year.

If the duration of a possession undertaken inside normal service periods exceeds the utilisation of the Possessions Allowance (as set out in the CCOS Engineering Access Statement) the Infrastructure Manager recognises that this could mean TOCs may incur financial losses.

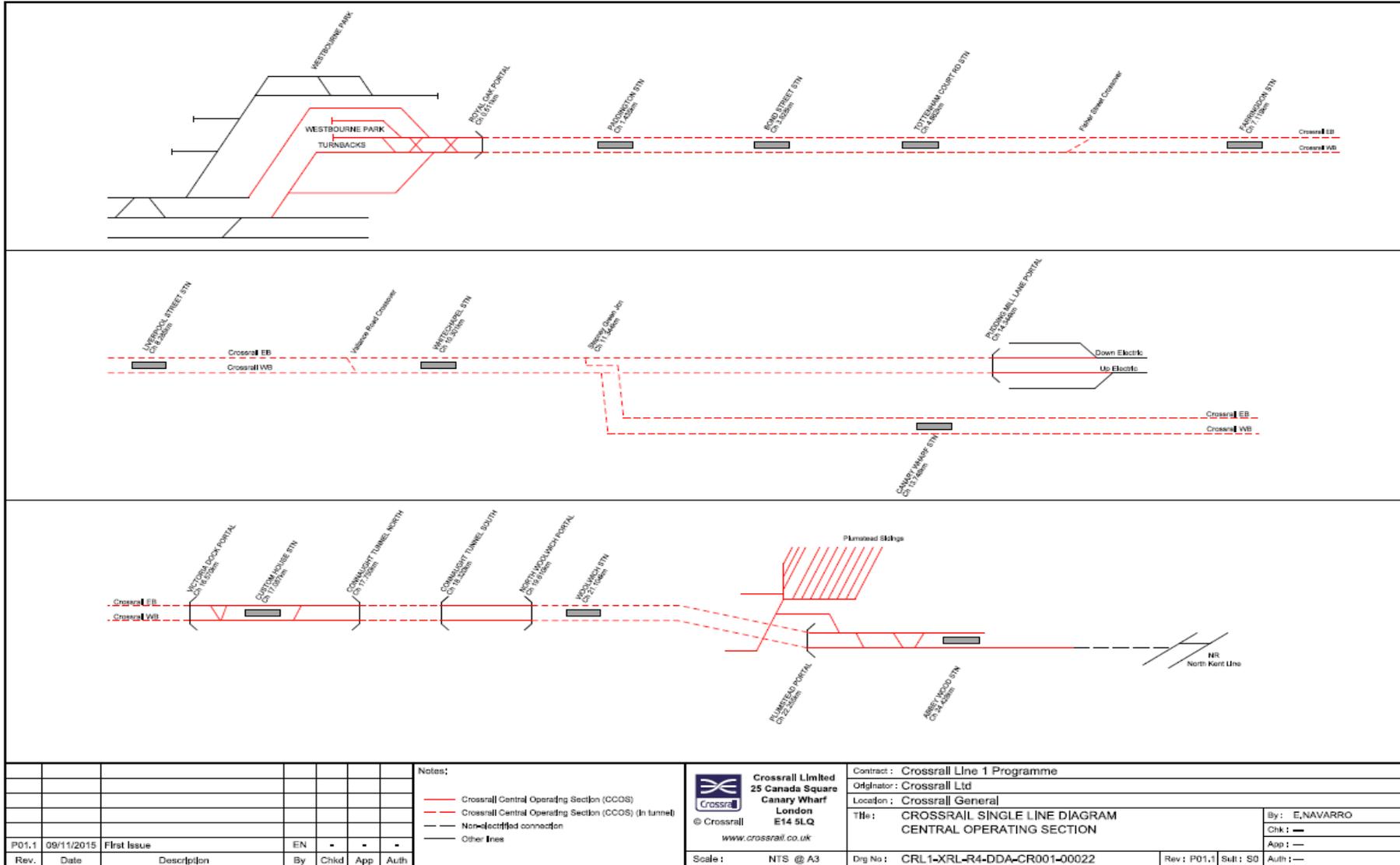
In such a circumstance TOCs will be able to enter a negotiation process with the Infrastructure Manager to claim for compensation based on actual incremental costs incurred and demonstrable revenue losses suffered. These losses would be those incurred only for the extra hours a Possession is undertaken over and above the Possessions Allowance and could encompass lost passenger revenues and/or extra costs incurred by the TOC (e.g. the costs of replacement bus service provision).

If the Infrastructure Manager gives notice of a Possession any later than 10pm the evening before the day of the proposed Possession the CCOS performance scheme shall apply (see Appendix 3).

²⁹ A white period is a time when no trains are timetabled to run on a particular section of line (to allow pre-planned engineering works). This will vary by CCOS route section but will be approximately between 00.30 and 05.30

³⁰ This quantum is consistent with the requirements established by the Sponsors at the outset of the Crossrail project which informed the infrastructure design and detailed specification.

Appendix 5 - CCOS Route Map



Appendix 6 – Timetable Calendar (December 2018 and May 2019)

Timetable Development Dates	Party	Principal Change	Subsidiary Change
<i>Development of Rules</i>			
D-64 Consultation on draft CCOS Timetable Planning Rules and Engineering Statement begins Proposed Changes to the Rules	Infrastructure Manager	15.09.17	23.02.18
D-60 End of Consultation on Rules		13.10.17	23.03.18
D-59 Draft Rules published	Infrastructure Manager	20.10.17	30.03.18
D-54 Responses to Draft Rules		24.11.17	04.05.18
D-54 to D-44 Infrastructure Manager review of responses	Infrastructure Manager		
D-44 Infrastructure Manager publishes Final Rules	Infrastructure Manager	02.02.18	13.07.18
D-41 End of Appeal Period for Final Rules		23.02.18	03.08.18
Initial Consultation Period			
D-64 Publication of draft Calendar of Events for CCOS	Infrastructure Manager	15.09.17	23.02.18
D-55 Notification by Timetable Participants of major timetable changes		17.11.17	27.04.18
D-55 Process begins of developing the New Working Timetable by working with TOCs to understand their aspirations for changes to their services	NR (on behalf of the Infrastructure Manager)	17.11.17	27.04.18

D-54 Publication of final Calendar of Events for CCOS	Infrastructure Manager	24.11.17	04.05.18
D-45 Copy of Prior Working Timetable to Timetable Participants	NR (on behalf of the Infrastructure Manager)	26.01.18	06.07.18
D-40 Priority Date		02.03.18	10.08.18
Timetable Preparation Period			
D-40 Start of Timetable Preparation Period	NR (on behalf of the Infrastructure Manager)	02.03.18	10.08.18
D-26 Publication of New Working Timetable	NR (on behalf of the Infrastructure Manager)	08.06.18	16.11.18
D-22 End of appeal period for New Working Timetable		06.07.18	14.12.18
D-0 Timetable Commencement Date		09.12.18	19.05.19
Timetable end date		18.05.19	14.12.19