Schedule 1
Maintenance Services

Part A: Maintenance Services

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Part A Maintenance Services

1. The Services - General Obligations

Purpose

1.1 (a) This schedule sets out the Standard Services and the Additional Services to be undertaken by the Maintainer in respect of the Units and Equipment.

(b) As described in clause 5 (*Relationship with the Operator and Representatives*) of the Agreement, the Purchaser's role and obligations in respect of the operation of the Units may be subcontracted and performed principally by the Operator, and therefore the Maintainer acknowledges and agrees that references in this Schedule 1 to the ***Purchaser*** may in operational practice (where appropriate) be interpreted as being to the ***Operator*** where under clause 5 the Purchaser has given notice to the Maintainer that this is the case.

Services

1.2 The Maintainer shall:

(a) provide the Standard Services (as described in paragraph 2);

(b) provide the Additional Services (as described in paragraph 3); and

(c) comply with the following general obligations as part of those Services:

(i) the Maintainer shall be responsible (except as otherwise expressly provided in this Agreement) for all plant, goods, materials, equipment, road vehicles, support services and all labour (including supervision and management) and other resources, whether temporary or permanent in nature, required for the performance of the Services;

(ii) the Maintainer shall make available to the Purchaser on a daily basis Units for service in accordance with the Diagrams set out in Schedule 2 (*Diagrams*), the Train Plan provided by the Purchaser in accordance with clause 11.1 from time to time and the Train Plan Parameters; and

(iii) the Maintainer shall comply with its obligations under Schedule 9 (*Maintenance Facilities – Willesden Depot*), the Maintenance Plan, the Preparation, Presentation and Hand-Back Procedure, the In-Service Support Procedure and the Fault Notification Procedure.

Purchaser Obligations

1.3 The Purchaser shall comply with its obligations under Schedule 9 (*Maintenance Facilities – Willesden Depot*), the Preparation, Presentation and Hand-Back Procedure, the In-Service Support Procedure and the Fault Notification Procedure.

2. The Standard Services

In relation to each Unit and item of Equipment (as applicable), the Maintainer shall carry out all the Standard Services, in accordance with this paragraph 2.

Presentation of Units and Simulator Availability

2.1 (a) The Maintainer shall deliver each Unit to the Purchaser on a daily basis at the relevant Entry Time and at the relevant Entry Point in accordance with the Train Plan Parameters, the Train Plan and the Preparation, Presentation and Hand-Back Procedure. When presented for service, each Unit shall:

(i) subject to Fair Wear and Tear, comply in all respects with the Train Technical Requirements, the Maintenance Plan, the Manuals and associated procedures;

(ii) comply in all respects with all Applicable Laws and Standards, all Relevant Approvals, the Services Quality Management Plan and the provisions of this Agreement;

(iii) be Fit for Purpose;

(iv) be free from Purchaser Faults except to the extent that they are Allowable Failures;

(v) comply with the Minimum Aesthetic Condition in paragraph 7 of this Part A; and

(vi) be accompanied by a Hand-Over Certificate from the Maintainer relating to that Unit.

(b) A Unit presented in accordance with paragraph 2.1(a) shall be ***Available.***

(c) The Maintainer shall not make the Purchaser's drivers responsible for any testing or preparation of the Units pursuant to complying with this paragraph 2.1.

Collection of Units

2.2 (a) The Maintainer shall take delivery of, and the Purchaser shall deliver, the Units in accordance with the Preparation, Presentation and Hand-Back Procedure at the relevant Exit Time and at the Exit Point.

(b) The Purchaser shall present the Maintainer with a Hand-Back Certificate in accordance with the Preparation, Presentation and Hand-Back Procedure.

(c) The Maintainer shall not make the Purchaser's drivers responsible for any train shut-down activities at the Exit Point taking longer than 2 minutes.

Simulator Availability

2.3 The Maintainer shall make the Simulator available to the Purchaser for the Simulator Available Hours to meet the Minimum Simulator Operating Condition.

Maintenance

2.4 The Maintainer shall maintain each Unit, Vehicle and each item of Equipment in accordance with:

(a) the Maintenance Plan;

(b) the Manuals and any other associated maintenance procedures; and

(c) this Schedule 1.

Repairs

2.5 The Maintainer shall undertake any repairs in accordance with the procedures set out in the Manuals and the Maintenance Plan for the repair of the Units, Vehicles, Parts and Equipment. All changes to the repair procedures will be made in accordance with all Applicable Laws and Standards and be subject to the written approval of the Purchaser.

Diligence in Fault-finding

2.6 The Maintainer shall undertake any Fault-finding with due diligence in accordance with the procedures set out in the Manuals and the Fault Notification Procedure. In Fault-finding, the Maintainer will structure its activities to mitigate to the greatest extent possible the risk of a repeat Fault occurring at a later date through not being adequately detected and diagnosed at the Fault-finding stage.

Work arising

2.7 The Maintainer shall conduct the examinations and inspections referred to in the Maintenance Plan, the Manuals and in respect of aesthetic standards/cleanliness pursuant to paragraphs 2.1(a), 5 (*State of Repair*) and 6 (*Exterior Cleaning*) and shall undertake all work arising from and required as a result of such examinations and inspections, provided that the cost of work arising shall be determined in accordance with the provisions of paragraph 3 of this Part A to the extent that it arises as a direct result of a Purchaser Fault.

Refurbishments

2.8 The Maintainer shall undertake the periodic refurbishment of the Units, Vehicles and Equipment in accordance with the Maintenance Plan, the Manuals (where applicable) and Appendix 3 (*Refurbishments*) to this Part A.

Failure

2.9 (a) Where any Unit is not Fit to Remain in Service and/or is not Fit to Run (including without limitation, as a result of a Purchaser Fault) (a ***Unit Failure***), then the Maintainer shall provide all or any of the following services (***Unit Failure Services***) as shall be required promptly after the occurrence of any such Unit Failure (irrespective of any Disputes as to which Party should bear the responsibility for and should pay the costs of any such Unit Failure):

(i) appropriately qualified and competent persons to attend such Unit and technical advice to be provided on an immediate basis to the relevant driver and other relevant Purchaser staff to promote rapid Fault-finding;

(ii) investigation and evaluation of the causes of the relevant Unit Failure;

(iii) protection of the Purchaser's interests in respect of such Unit;

(iv) effecting the isolation of that Unit; and

(v) technical assistance in connection with the rail and non-rail transportation of Units where requested including technical assistance relating to the re-railing or wheel skating of a derailed or failed Unit and the removal of such Unit by coupling it to a functioning Unit.

(b) The cost of providing the services referred to in paragraph 2.9(a) shall be borne by the Maintainer unless the relevant Unit Failure occurred as a direct result of a Purchaser Fault, in which case those services shall be Generally Approved Additional Services (or Additional Services where the threshold for Generally Approved Additional Services in paragraph 3.4(a) has been exceeded) and to the extent reasonably and properly incurred, the cost of such Generally Approved Additional Services or Additional Services (as the case may be) shall be determined by the Purchaser in accordance with paragraph 3 (*The Additional Services*) of this Part A and Appendix 1 (*Periodic Standard Services Charge*) to Schedule 6 (*Payment Mechanism*).

(c) The Parties shall work together on a daily basis to seek to establish and agree the cause of any Unit Failure and allocate the costs of providing the services referred to in paragraph 2.9(a) accordingly. If the Parties are unable to agree the allocation of costs of providing the services referred to in paragraph 2.9(a), each Party shall conduct such further investigations as it shall consider necessary and appropriate, and the matter shall be further considered by the Parties on the following day. If the Parties are still not able to agree such allocation of costs, the matter shall be referred to the next Performance Review Meeting for resolution unless otherwise agreed. If by the end of the Performance Review Meeting the Parties are still not able to agree such a matter, it shall be referred to as an Expert Dispute for resolution pursuant to the Dispute Resolution Procedure.

Operator's Control Room and Maintainer Service Technician

2.10 (a) The Maintainer shall provide a suitably qualified and competent person (the ***Maintainer Service Technician***) to be in the Operator's Control Room at all times during which the Units are operating in passenger service and at the times set out in paragraph 2.10(b) to deal with requests made by the Purchaser for in-service technical support and provision of the relevant Services.

(b) The Maintainer Service Technician shall be on duty in the Operator's Control Room from no later than 30 minutes before the planned start of the first Diagram in accordance with the Train Plan until 15 minutes after the actual finish of the last Diagram.

(c) The Maintainer shall ensure that the Maintainer Service Technician is able to fully access and utilise data from the Train Management System and that procedures (to be approved by the Purchaser) are adopted to encourage close working co-operation between the Purchaser and the Maintainer in delivering fast and effective remedial action and other in-service technical support and to ensure compliance with the In-Service Support Procedure.

(d) The Maintainer Service Technician shall be a Key Post and the provisions of paragraph 4 (*Organisational Arrangements*) of Schedule 8 (*Contract Management*) shall apply.

Response times

2.11 (a) The Maintainer shall attend a Unit in respect of which a Unit Failure has been reported as soon as reasonably practicable in the circumstances, and in any event will use all reasonable endeavours to comply with the following response times in respect of any Unit Failures reported to it:

(i) verbal advice and assistance by telephone, radio or other means as soon as reasonably possible but within two minutes at the latest; and

(ii) the provision of an appropriately qualified and competent person on site as soon as reasonably practicable and no longer than 30 minutes for the Liverpool Street Approach and otherwise 60 minutes.

(b) The Maintainer shall attend the Simulator when a Simulator Failure has been reported or on any occasion on which the Simulator does not meet the Minimum Simulator Operating Condition during the Minimum Simulator Available Hours as soon as reasonably practicable in the circumstances, and in any event will use all reasonable endeavours to comply with the following response times in respect of any such failure reported to it:

(i) verbal advice and assistance by telephone, radio or other means as soon as reasonably possible but within 30 minutes at the latest; and

(ii) the provision of an appropriately qualified and competent person on site as soon as reasonably practicable but within 6 hours at the latest.

Information and instructions

2.12 The Purchaser shall comply with the reasonable instructions and reasonable requests of the Maintainer in respect of the Unit Failure Services referred to in paragraph 2.9 and shall procure that the Purchaser's train crew present at the location of the Unit Failure shall provide the Maintainer with such co-operation and assistance as the Maintainer shall reasonably require, provided that this shall be without prejudice to, and shall not in any way relieve the Maintainer of, its obligations to interrogate the

Units and obtain information pursuant to the In-Service Support Procedure, the Fault Notification Procedure and the Preparation, Presentation and Hand-Back Procedure.

Reporting

2.13 (a) **Notification of Fault, loss or damage to Units, Vehicles or Equipment**

(i) Where either Party becomes aware of any Fault or any material loss or damage sustained in respect of a Unit, Vehicle or item of Equipment (including as a result of a Purchaser Fault), it shall notify the other Party of the same as soon as reasonably practicable in accordance with the Fault Notification Procedure.

(ii) The Maintainer shall at its own cost set up, use, maintain and make accessible to the Purchaser and the Operator at all times a means to electronically record Faults and to share Fault data between the Maintainer, the Purchaser and the Operator.

(b) **Notification of safety critical issues**

(i) If the Maintainer becomes aware of any matters which are or may be safety critical in respect of a Unit, Vehicle or item of Equipment (including as a result of a Purchaser Fault), it shall notify the Purchaser via verbal report to the Operator's Control Room immediately (with all details known at the time), and then provide to the Purchaser written details of the matters then known to the Maintainer as soon as possible thereafter and in any event within 48 hours. Full written details shall be notified by the Maintainer to the Purchaser as soon as possible thereafter and in any event within four Working Days.

(ii) The Parties shall co-operate in respect of the provision of details of any matters which are or may be safety critical to other parties for the purpose of complying with the procedures under Railway Group Standard GE/RT 8250 "Reporting High Risk Defects" issue 2 (June 2007) (or as the same is updated or replaced from time to time) and any relevant related procedures.

(c) **Progress Reports**

On and from the Operating Date, the Maintainer shall provide reports to the Purchaser each Railway Period on its progress in connection with the provision of maintenance and related services and in satisfying each of the other requirements specified in this Agreement relating to maintenance and servicing of the Units and Equipment and the provision of Units for service (the ***Maintenance Progress Report***). The Maintainer shall ensure that the Maintenance Progress Report contains the following information (unless otherwise specified by the Purchaser):

(i) an undertaking that the provision of maintenance and related services is proceeding in accordance with the requirements of this Agreement or details of the reason such an undertaking cannot be given;

(ii) the physical status of each Unit and item of Equipment in respect of its maintenance, including outstanding jobs list;

(iii) analysis of each Unit Failure and each Failure (including information as to the root causes of any Unit Failure and Failure and trends in the condition of the Units) and details of preventative/corrective action taken to address any Unit Failure and/or Failure (including timescales taken to complete such work) in addition to the information provided in the Maintainer Daily Performance Record provided by the Maintainer pursuant to paragraph 10.1 of Schedule 5 (*Performance Regime*);

(iv) cleaning performance pursuant to paragraph 6.1 and provision of train wash facilities pursuant to paragraph 6.2, in addition to any information to be provided pursuant to the Performance Regime;

(v) internal audit performance by reference to the requirements of clauses 8.15 and 8.16 of the Agreement;

(vi) configuration and modification reports in a form agreed by the Parties and in connection with the operation of a configuration management system to be implemented by the Maintainer (and approved by the Purchaser) so as to ensure that the state of each Unit is known at all times;

(vii) interpretative analysis of material supply performance (to include unsatisfied demand, failure analysis reports from original equipment manufacturers, statistical analysis of materials failure and recommendations for long term material stock levels);

(viii) status of warranty claims (to include details of parts sent away for repair and their return dates);

(ix) where applicable, details of the presence of any corrosion to the bodyshells, underframes and underframe equipment and the measures that the Maintainer has taken to correct it;

(x) progress/cost/breakdown of any Additional Services provided in accordance with paragraph 3 of this Part A;

(xi) commentary on any activities where the Maintainer considers that any problems may arise, including:

(A) the reason for the problem;

(B) the extent of the problem and the potential impact on the Availability and/or operation of the Units and/or any Equipment and the occurrence of Failure;

(C) the mitigation measures that the Maintainer has taken or proposes to undertake to reduce the impact; and

(D) the measures taken, and the measures proposed, to prevent recurrence of the event which caused the problem and/or similar such events in the future.

(xii) subject to any obligations of confidentiality to which the Maintainer is subject, a section highlighting any defects, or design, maintenance or operational issues that have arisen:

(A) in respect of any analogous rolling stock maintained (or being maintained) by the Maintainer that the Maintainer reasonably considers may occur or otherwise affect the maintenance of the Units or any Equipment; or

(B) in respect of any related services provided (or being provided) by the Maintainer in respect of any analogous rolling stock that the Maintainer reasonably considers may occur or otherwise affect the Units or any Equipment; and

(C) any other information reasonably required by the Purchaser.

Other Standard Services

2.14 (a) **General engineering support and advice**

The Maintainer shall at all times provide the Purchaser with such professional, engineering and technical support and advice in relation to the Services as the Purchaser may reasonably require including: (i) enabling the Purchaser to maintain and comply with all Relevant Approvals; (ii) enabling the Purchaser to comply with the terms of the Operator's Safety Certificate; (iii) providing input to the Purchaser in relation to Fault handling; and (iv) participating in Fault handling exercises and technically validating the Purchaser training material.

(b) **Technical investigations**

(i) Without prejudice to the Fault Notification Procedure, upon a reasonable request by the Purchaser to investigate any defects, Faults, incidents and accidents in relation to the Units, Vehicles or Equipment (including arising from relevant information provided by third parties), the Maintainer shall undertake promptly (at its own cost) technical investigations in relation to such Units, Vehicles or Equipment;

(ii) The Purchaser shall provide driver reports to the Maintainer in a timely manner and any further information that the Maintainer reasonably requests and the Purchaser is reasonably able to provide;

(iii) The Maintainer shall give the Purchaser two Working Days' notice of any technical investigation it intends to carry out and shall allow up to two representatives of the Purchaser to attend and observe the investigation. The Maintainer shall provide written reports on the results of such investigations to the Purchaser;

(iv) If a technical investigation reveals a Fault, the Maintainer shall take such action in respect of that Fault as is required by the terms of this Agreement.

(c) **Maintenance Plan and Manuals Development**

Without prejudice to the Change Procedure, the Maintainer shall:

(i) liaise with the Purchaser to understand any concerns or problems the Purchaser has with the Maintenance Plan, the Manuals and/or the In-Service Support Procedure and progress these to ensure that they are adequately addressed;

(ii) develop, amend and/or update and validate maintenance examinations and supporting documentation as reasonably required by the Purchaser from time to time;

(iii) amend and/or update and validate the Maintenance Plan and Manuals to accommodate any changes to the working practices and procedures described therein which are adopted by the Maintainer in the performance of its maintenance of the Units or Equipment;

(iv) amend and/or update and validate the Maintenance Plan and Manuals to accommodate any changes to the working practices and procedures which result from any Modification to the Units, Vehicles or Equipment; and

(v) amend, update and/or validate any manifest error or omission in the Maintenance Plan and/or Manuals.

(d) **Monitoring Changes in Law**

Without prejudice to the Change Procedure, the Maintainer shall monitor all Changes in Law relating to rolling stock and related equipment which may affect the Maintainer's ability to perform its obligations under this Agreement or require a Mandatory Modification and shall, promptly after becoming aware of such Change in Law, advise the Purchaser accordingly.

(e) **Provision of technical services for Modifications**

The Maintainer shall provide technical support services in respect of design Modifications and shall obtain the Relevant Approvals for (including from any relevant design authority) and implement Modifications in accordance with the Change Procedure.

(f) **Purchaser access to train data**

The Maintainer shall provide to the Purchaser unlimited, real-time access to all Train Management Systems and Fault data in respect of each Unit (and any management system information and data relating to the Simulator), including relevant software and training of the Purchaser's employees for the purpose of accessing and interpreting the train management and control systems and Fault data.

(g) **Movement of Units at Maintenance Facilities and Chingford Stabling Site**

The Maintainer shall provide, or shall implement arrangements with the Operator to provide, staff who are, to the Purchaser's satisfaction, competent and legally authorised to move Units around and within each of the Maintenance Facilities, the Chingford Stabling Site and the Ilford Depot, pursuant to the need to carry out the Services but shall not otherwise be required to provide staff to move Units at any other Stabling Sites. The Operator shall be entitled to move Units to and from the Network to and from the Entry Points and Exit Points at each of the Maintenance Facilities.

3. The Additional Services

The Additional Services

3.1 (a) If any Unit or item of Equipment has a Purchaser Fault or a Unit Failure has occurred as a direct result of a Purchaser Fault, the Maintainer shall, promptly on becoming aware of such Purchaser Fault or Unit Failure (and in any event within two Working Days) submit a written notice (***Additional Services Notice***) to the Operator's Control Room and to the Purchaser notifying the Purchaser and the Operator of such services, work or activities as are necessary to rectify the Purchaser Fault (the ***Additional Services***), save only in respect of Prioritised Additional Services implemented in accordance with paragraph 3.2.

(b) Additional Services may include without limitation:

(i) removal of graffiti;

(ii) replacement of internal or external deliberately damaged glass;

(iii) replacement of broken fixtures and fittings caused by the Purchaser, the Operator or passenger misuse or abuse;

(iv) Unit repairs following in-service incidents other than in-service incidents caused by the Maintainer or any Subcontractor; and

(v) Simulator repairs following incidents and/or damage caused by a Purchaser Fault,

to the extent directly resulting from a Purchaser Fault in each case. Each Additional Services Notice shall include all relevant details of the circumstances requiring such Additional Services and the details of the Additional Services required, including the information required to be included in the Request for Additional Services Authorisation (as defined in paragraph 3.3).

General Requirements

3.2 (a) Subject to paragraph (b), the Maintainer shall use all reasonable endeavours to work with the Purchaser in order to establish a solution to each Purchaser

Fault which, so far as practicable, best meets the Purchaser's requirements in terms of cost and minimising the effects on the Standard Services and the impact on the Train Plan and the Diagrams.

(b) Without prejudice to the generality of paragraph 3.2(a), the Maintainer shall, if specifically requested by the Purchaser, prioritise (over the carrying out of Standard Services or other Additional Services) the implementation of particular Additional Services in respect of which the existence of the relevant Purchaser Fault or Unit Failure is notified to the Maintainer by an authorised agent of the Purchaser in writing (***Prioritised Additional Services***). If the Purchaser makes such a notification to the Maintainer and informs the Maintainer that it is considering requiring the prioritisation of such Additional Services, the Parties shall immediately discuss in good faith the relevant information in respect of such Additional Services as set out in paragraph 3.5 of this Part A, on the basis that the implementation of such Additional Services are prioritised. If, following such discussion, the Purchaser specifically requests the Maintainer to prioritise the implementation of the Prioritised Additional Services, the Maintainer shall do so, and any Failure which the Purchaser agrees (acting reasonably) arises as a direct result of such implementation of the Prioritised Additional Services shall be an Allowable Failure pursuant to and on the terms of the Performance Regime, provided that the Maintainer confirms the outcome of the discussion of the relevant information in respect of the Prioritised Additional Services in writing within two Working Days of the carrying out of the Prioritised Additional Services.

Request for Additional Services Authorisation

3.3 Each time the Maintainer sends an Additional Services Notice in respect of Additional Services other than Generally Approved Additional Services, the Maintainer shall, at the same time, submit a written request (each a ***Request for Additional Services Authorisation***) to the Purchaser requesting authority from the Purchaser to undertake the relevant Additional Services and containing the information set out in paragraph 3.5.

Generally Approved Additional Services

3.4 (a) Subject to the Maintainer (acting reasonably) being satisfied that the relevant Additional Service is a Generally Approved Additional Service, the Maintainer shall as soon as reasonably practicable commence and diligently carry out and complete (without specific approval from the Purchaser) any Additional Services, the cost (labour and materials) of which, calculated in accordance with the Agreed Rates as set out in Appendix 2 (*Additional Services Payments*) to Schedule 6 (*Payment Mechanism*), is less than £5,000 (indexed by the Indexation Adjustment Formula), provided that:

(i) the aggregate cost of all Additional Services carried out by the Maintainer under this paragraph 3.4(a) shall not exceed £20,000 (indexed by the Indexation Adjustment Formula) per Railway Period or such other amount as may be agreed between the Parties from time

to time, it being acknowledged that the Purchaser may from time to time revise or reduce such amount upwards or downwards (including a reduction to nil) or further specify or restrict the nature of the work which may constitute Generally Approved Additional Services if it so chooses (acting in its absolute discretion) having provided ten Working Days' written notice of the date from which such change shall take effect;

(ii) the carrying out of that Additional Service will not result in the Maintainer (in its reasonable opinion) applying for any relief under this Agreement; and

(iii) it is feasible to carry out the Additional Service in accordance with the Train Plan Parameters.

(b) Where the Maintainer carries out a Generally Approved Additional Service, it shall as soon as reasonably practicable and in any event within two Working Days of the date the Maintainer commences such work, advise the Purchaser of all relevant information required in respect of Additional Services as set out in paragraph 3.5.

Information from Maintainer: Additional Services

3.5 Each Request for Additional Services Authorisation shall detail, without limitation:

(a) the identity and location of the affected Unit, Vehicle or item of Equipment;

(b) the nature and extent of the requirement for the relevant Additional Service;

(c) the Maintainer's reasonable proposals for carrying out the relevant Additional Service required, including as appropriate:

(i) the period of time to undertake the relevant Additional Service (from the time the proposal is approved by the Purchaser) and for the Unit or item of Equipment to become Fault Free (the ***Remedy Period***). In proposing the duration of the Remedy Period for the relevant Additional Service the Maintainer shall:

(A) take into consideration the Maintainer's obligations pursuant to paragraph 3.2(a) (or, if applicable paragraph 3.2(b));

(B) propose such reasonable Remedy Period for carrying out the relevant Additional Service: (aa) as would be expected of a professional maintainer of trains taking into account all relevant factors (including the availability of staff, the capacity of the relevant maintenance facilities available to the Maintainer, the workload of the Maintainer and the availability of materials); and (bb) is consistent with the principle of prioritising the undertaking of the Additional Services amongst the different items so as to maximise, on a daily basis, the Availability of the Units;

(ii) any Parts to be replaced or refurbished;

(iii) any effects on the Spares which are held, or which it will be necessary or desirable to hold, following the completion of the relevant Additional Service and whether Additional Services Initial Spares will be used;

(iv) any effects on the Standard Services, the Train Plan, Simulator availability or the Diagrams and the extent to which the relevant Additional Services may result in the Maintainer (acting reasonably) claiming any relief;

(v) the cost of the relevant Additional Service, calculated in accordance with the Agreed Rates, but recognising that where it is not possible to identify a fixed cost the Maintainer will provide its best estimate of the costs and its proposed basis for calculating the actual cost;

(vi) the time when the affected Unit, Vehicle, Simulator or other item of Equipment would be rendered Fault Free and capable of being made available to the Purchaser/Operator (if any amendment is required to the then current Diagrams or Train Plan);

(vii) any restrictions or limitations which may apply to the affected Unit, Vehicle, Simulator or other item of Equipment pending carrying out the relevant Additional Service;

(viii) any additional track or other access requirements or safety requirements necessary to facilitate the carrying out of the relevant Additional Service;

(ix) the level of labour resources required to carry out the relevant Additional Service; and

(x) the location where the Additional Service will be carried out.

Any damage to or Fault arising in any Unit, Vehicle, Simulator or other item of Equipment not notified to the Purchaser within the time period specified in paragraphs 3.1(a) or 3.4(b) shall be presumed conclusively to be outside the scope of Additional Services and not a Purchaser Fault.

Approval of the Additional Services

3.6 (a) If the Purchaser approves a Request for Additional Services Authorisation, the Purchaser shall so notify the Maintainer and on receipt of such notification the Maintainer shall, as soon as reasonably practicable, commence and diligently carry out and complete that Additional Service in accordance with the approved Request for Additional Services Authorisation.

(b) If the Purchaser does not approve a Request for Additional Services Authorisation, then it shall so notify the Maintainer in writing. In such circumstances, the Purchaser may direct the Maintainer to present the Unit for service at the Entry Point at the next Entry Time or make the Simulator

available (as the case may be) notwithstanding the condition that gave rise to the delivery of the relevant Additional Services Notice, and in such circumstances the Maintainer shall not be liable for any Adjustment pursuant to the Performance Regime in respect of such Unit or Simulator whilst the Allowable Relief Period continues in accordance with the Performance Regime.

Costs

3.7 All Additional Services shall be performed at the cost and expense of the Purchaser and determined in accordance with paragraph 2.4 of Schedule 6 (*Payment Mechanism*).

Disputes

3.8 If a Dispute arises as to whether any services, work or activities are a Standard Service, an Additional Service or a Generally Approved Additional Service, the Maintainer shall carry out the relevant work without delay if requested to do so by the Purchaser and the aggregate cost of the relevant services, work or activities is £10,000 (indexed by the Indexation Adjustment Formula) or less. Any such Disputes and any other Disputes relating to Additional Services shall be dealt with as an Expert Dispute for resolution in accordance with the Dispute Resolution Procedure.

4. Co-Operation and Liaison

Co-operation between Parties

4.1 The Parties shall co-operate in order to ensure that each Party is able to comply with the terms of this Agreement and the Maintainer also undertakes to cooperate with the Operator so as to facilitate in the most efficient manner possible the carrying out by each of the Parties of its obligations under this Agreement.

Daily liaison

4.2 (a) The Maintainer shall liaise on a daily basis with the Purchaser and the Operator in relation to the Maintainer's requirements for scheduled and unscheduled maintenance of the Units.

(b) The Maintainer shall liaise on a weekly basis with the Purchaser and the Operator in relation to the Maintainer's requirements for scheduled and unscheduled Simulator maintenance.

Failure to agree

4.3 If the Parties are unable to agree any matter relating to the interpretation or application of Appendix 1 (*Definition of Fit for Service, Fit to Remain in Service and Fit to Run*) or Appendix 2 (*Aesthetic Condition Standards*) to this Part A, such disagreement shall be referred to the next Performance Review Meeting for resolution. If the Parties are still not able to agree such a matter once it has been referred to three Performance Review Meetings and either Party reasonably considers that the relevant situation is likely to continue or recur (even if the immediate

disagreement is resolved), the matter shall be referred as an Expert Dispute for resolution in accordance with the Dispute Resolution Procedure.

5. State of Repair

The Maintainer shall carry out an examination (***Aesthetic Exam***) on each Vehicle at least once every 30 days. When assessed at that time in accordance with paragraphs 2.2 and 3.1 in Appendix 2 (*Aesthetic Condition Standards*) to this Part A the Vehicle shall score eight or more (***Aesthetic Exam Benchmark***).

6. Exterior Cleaning

Heavy Clean

6.1 The Maintainer shall carry out a heavy clean of the exterior of each Vehicle in accordance with the Manuals at least once every 30 Working Days (***Exterior Heavy Clean***). The Maintainer shall assess the cleanliness at that time in accordance with paragraphs 2.1(a) to 2.1(d) in Appendix 2 (*Aesthetic Condition* Standards) to this Part A, and each Vehicle shall achieve:

(a) a score of eight or more in paragraph 2.1(a);

(b) a score of eight or more in paragraph 2.1(b);

(c) a score of eight or more in paragraph 2.1(c); and

(d) a score of eight or more in paragraph 2.1(d),

together the ***Exterior Heavy Clean Benchmark***.

48-hour Train Wash

6.2 The Maintainer shall procure that the Operator has access to suitable and functioning carriage wash facilities at the Willesden Depot in order to allow the Operator to fulfil its obligations to clean vehicles under its concession agreement with the Purchaser, save only to the extent of scheduled maintenance of such facilities that is notified to the Operator at least one week in advance.

7. Minimum Aesthetic Condition

Minimum Aesthetic Condition means, for any Unit, that each Vehicle, when assessed against and in accordance with Appendix 2 (*Aesthetic Condition Standards*) to this Part A scores at least the minimum scores as set out below:

Appendix 2 paragraph	Appendix 2 attribute	Appendix 2 scoring Table	Minimum score
2.2	**external state of repair**		
2.2(a)	scratched graffiti	1.2.1	6
2.2(b)	non scratched graffiti	1.2.2	6
2.2(c)	colour and gloss level	1.2.3	5
2.2(d)	corrosion, chips and scratches	1.2.4	6

REDACTED

Appendix 2 paragraph	Appendix 2 attribute	Appendix 2 scoring Table	Minimum score
3.1	**internal state of repair**		
3.1(a)	scratched graffiti	2.2.1	6
3.1(b)	non scratched graffiti	2.2.2	6
3.1(c)	colour and gloss level	2.2.3	7
3.1(d)	corrosion, chips and scratches	2.2.4	6
3.1(e)	floor coverings	2.2.5	5
3.1(f)	labelling	2.2.6	6
3.1(g)	armrests	2.2.7	6
3.1(h)	handrails	2.2.8	8
3.1(i)	seats	2.2.9	6

Appendix 1 to Part A
Definitions of Fit for Service, Fit to Remain in Service and Fit to Run

Class [•] Rolling Stock – Minimum Operating Requirements
The Units shall meet all standards mandated by the Rule Book (GE/RT8000) and in addition the specific provisions of the table below.

For the purpose of this Appendix 1:
WA means "with customer approval"
RAFOP means "remove at first opportunity"
TED means "to end of day"

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
	Air Supply			
1	Both compressors failed	(1) NO (2) NO	NO	NO
2	One compressor failed	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES - WA
3	Compressor running continuously	(1) NO (2) YES - RAFOP	YES - RAFOP	YES - WA

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
4	Air pressure lower than normal, within operational limits, systems operational (i.e. minor leak or defective gauge)	(1) NO (2) NO	NO	YES - WA
5	Major air leak and system cannot maintain minimum pressure	(1) NO (2) NO	NO	NO
	Brakes			
6	Dynamic brake (rheostatic and/or regenerative) failed	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES - WA
	Cab Interior, Equipment & Controls			
7	Broken 'tell tales' or seals on safety critical circuit switches or circuit breakers	(1) NO (2) NO	YES - WA	YES - WA
8	Emergency equipment missing or damaged	(1) NO (2) NO	NO	YES - WA

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
9	Driving controls and ancillary equipment missing or damaged or not adequately Illuminated	(1) NO (2) NO	NO	YES - WA
10a	Drivers cab instrument illumination degraded however vital gauges can still be read	(1) NO (2) NO	YES - WA - RAFOP	YES - WA
10b	Drivers cab instrument illumination defective	(1) NO (2) NO	NO	YES - WA
11	Train borne doorway CCTV camera or in-cab display not operational for driver only operation	(1) NO (2) NO	NO	YES
12	Train Management System display screen (TMS) defective (HMI screen defective)	(1) NO (2) YES - WA - TED	YES - WA - TED	YES

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
13a	Windscreen wiper (drivers side) defective however weather conditions and cleanliness sufficiently clear so as not to present a risk	(1) NO (2) NO	YES - WA - RAFOP	YES - WA
13b	Windscreen wiper (driver's side) defective and driver considers sight lines compromised	(1) NO (2) NO	NO	YES - WA
14	Windscreen wiper (trainers side) defective	(1) YES – WA (2) YES - WA	YES - WA	YES
15	Evidence of water ingress in cab - water coming from HVAC vents due to blocked drains etc - not from condensation	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES - WA
16	Driver's side sun blind defective - ripped, torn or missing	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES - WA
17	Driver's seat does not adjust within full range of movement	(1) NO (2) NO	YES - RAFOP	YES - WA

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
18	Trainers seat defective	(1) YES – WA (2) YES - WA	YES - WA	YES
19	HVAC - CAB No heating or cooling available.	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES
20	HVAC - cab noise level significantly higher than normally expected	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES
21	HVAC - fan supplied fresh air ventilation defective	(1) NO (2) NO	NO	YES
	Communication systems			
22	Pre-recorded announcements not available.	(1) YES - WA – TED (2) YES - WA - TED	YES - WA - TED	YES
23	Saloon or external displays defective	(1) YES - WA – TED (2) YES - WA - TED	YES - WA - TED	YES
	Doors			
24	Cab to saloon door damaged, unable to close, open or lock	(1) NO (2) NO	NO	YES - WA

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
25	Detrainment door damaged, unable to close, open or lock - red error LED illuminated	(1) NO (2) NO	NO	YES - WA
26	Detrainment door seals missing	(1) NO (2) NO	YES - WA - TED	YES
27	Body side indicator light (BIL) defective	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES
28	A door at the leading end of the first passenger-carrying vehicle or a door at the trailing end of the last passenger carrying vehicle is defective	(1) NO (2) NO	NO	YES - WA
29	Two adjacent doors locked out of use on the same coach	(1) NO (2) NO	NO	YES - WA
	HVAC - Saloon			
30	HVAC - saloon heating and/or cooling capacity degraded	(1) YES - WA – TED (2) YES - WA - TED	YES - WA - TED	YES

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
31	HVAC unit noise level in the saloon significantly louder than normally expected	(1) YES - WA – TED (2) YES - WA - TED	YES - WA - TED	YES
32	HVAC fresh air ventilation defective in a single vehicle	(1) NO (2) YES - WA	YES - WA	YES
	Lighting - Interior			
33	All cab lighting (not instrument lamps) defective	(1) NO (2) NO	YES - WA - RAFOP	YES - WA
34	More than 3 saloon (non battery fed) lighting tubes defective or more than 3 (battery fed) lighting tubes defective in that saloon	(1) NO (2) NO	YES - WA - TED	YES
35	Broken glass in the saloon interior	(1) NO (2) NO	NO	YES
	Saloon Interior			

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
36	Seat damaged - risk of cutting, abrasion or trapping	(1) NO (2) NO	NO	YES
37	Equipment cubicle cannot be locked	(1) NO (2) NO	NO	YES
38	Floor damaged - trip hazard	(1) NO (2) NO	NO	YES
39	Saloon CCTV single camera defective in a vehicle	(1) YES – WA (2) YES - WA - TED	YES - WA - TED	YES
40	Two or more saloon CCTV cameras defective in a vehicle	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES
41	Saloon grab rails/handles damaged - risk of cutting abrasion or trapping	(1) NO (2) NO	NO	YES
42	Saloon draught screen broken	(1) NO (2) NO	NO	YES
43	Saloon draught screen missing	(1) NO (2) YES - WA - TED	YES - WA - TED	YES

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
44	Evidence of water leaks from saloon HVAC vents in saloon environment	(1) NO (2) YES - WA	YES - WA	YES
45	Cover missing from emergency device (e.g. door egress handle/passenger alarm unit)	(1) NO (2) YES - WA – TED	YES - WA - TED	YES
46	Broken windows in saloon outer	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES - WA
47	Broken windows in saloon inner	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES
	Traction & Auxiliary Supply			
48	Traction failure - loss of one traction package / traction inverter (Unit is able to run to timetable)	(1) NO (2) YES - WA - TED	YES - WA - TED	YES
49	Auxiliary power supply output defective, loss of one auxiliary converter	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
50	Pantograph or AC current collection circuit defective (on AC route)	(1) NO (2) NO	NO	NO
51	Pantograph or AC current collection circuit defective (on DC route)	(1) YES – WA (2) YES - WA	YES - WA	YES
52	AC transformer defective (on an AC route)	(1) NO (2) NO	NO	NO
53	AC transformer defective (on an DC route)	(1) YES – WA (2) YES - WA	YES - WA	YES
	Underframe & Bogie			
54	Auto coupler (no electrical coupling)	(1) NO (2) YES - WA	YES - WA	YES
55	Wheel flats - severe	(1) NO (2) NO	NO	YES - WA
56	Wheel flats - serious (excessive noise or vibration)	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES - WA

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
57	Wheel flats (slight)	(1) YES – WA (2) YES - WA	YES - WA	YES
58	Primary suspension unit defective - Chevron has degraded beyond allowable limits defined in maintenance manuals	(1) NO (2) NO	NO	YES - WA
59	Secondary suspension air bag defective	(1) NO (2) YES - WA - RAFOP	YES - WA - RAFOP	YES - WA
60	Equipment case covers missing	(1) NO (2) NO	NO	YES - WA
61	One 3rd rail current collector shoe lost per side or shoe fuse blown	(1) Dual Voltage Unit: NO AC Only Unit: YES – WA (2) Dual Voltage Unit: YES - WA – RAFOP AC Only Unit: YES - WA	Dual Voltage Unit: YES - WA – RAFOP AC Only Unit: YES - WA	Dual Voltage Unit: YES – WA AC Only Unit: YES - WA

	Fault Exhibited in Part	Does the Unit meet the standard required for it to be Fit for Service entering service (1) from a Maintenance Facility (2) from a location that is not a Maintenance Facility?	Does the Unit meet the standard required for it to be Fit to Remain in Service?	Does the Unit meet the standard required for it to be Fit to Run?
62	More than one 3rd rail current collector shoe lost per side or shoe fuses blown	(1) Dual Voltage Unit: NO AC Only Unit: YES – WA (2) Dual Voltage Unit: NO AC Only Unit: YES - WA	Dual Voltage Unit: NO AC Only Unit: YES - WA	Dual Voltage Unit: YES – WA AC Only Unit: YES - WA
63	Shoe gear worn below allowable limit	(1) Dual Voltage Unit: NO AC Only Unit: YES – WA (2) Dual Voltage Unit: NO AC Only Unit: YES - WA	Dual Voltage Unit: NO AC Only Unit: YES - WA	Dual Voltage Unit: YES AC Only Unit: YES - WA

Appendix 2 to Part A
Aesthetic Condition Standards

1. Definitions

In this Appendix 2 the following words and expressions shall have the following meanings:

Extensive means the area of coverage of the aesthetic defect is greater than 33 per cent. but less than 66 per cent. of the area being assessed;

Extremely means the area of coverage of the aesthetic defect is equal to or greater than 66 per cent. of the area being assessed;

Graffiti means painted, written, sprayed or scratched graffiti and/or stickers; and

Spotlessly Clean means the area being assessed has no evidence of dirt or streaking caused by poor rinsing and the finish is not dulled.

2. External Condition

2.1 External Cleanliness of a Unit

(a) **Bodysides and Roof: Assessment Procedure**

Assess the bodysides and roof of each Vehicle as follows:

(i) identify the condition of the exterior of the bodysides and roof of the Vehicle including but not limited to the windows of the Vehicle;

(ii) do not include Graffiti and other damage not covered by Table 1.1.1; and

(iii) score the Vehicle in accordance with Table 1.1.1.

Table 1.1.1: Bodysides and Roof Scoring Matrix

Condition		Score
(a)	Spotlessly Clean	10
	Condition falls between (a) and (b)	9
(b)	Very clean appearance, i.e. no dirt noticeable but "dull" not shiny	8
	Condition falls between (b) and (c)	7
(c)	Generally clean, i.e. some minor marks, dust, dirt or "streaking"	6
	Condition fall between (c) and (d)	5
(d)	Many dirty marks	4
	Condition falls between (d) and (e)	3
(e)	Extensive dirt, including door steps or door controls having inadequate contrast with their surroundings, or visibility of platform signs through windows reduced	2
	Condition falls between (e) and (f)	1

(f)	Extremely dirty with risk of soiling upon contact or any stain caused by striking of birds, animals or humans or by lubricants, or visibility through windows very poor	0

(b) **Driving End: Assessment Procedure**

Assess the driving end of each Vehicle as follows:

(i) identify the condition of the exterior of the driving end of the Vehicle including but not limited to the windows of the Vehicle;

(ii) do not include Graffiti and other damage not covered by Table 1.1.2; and

(iii) score the Vehicle in accordance with Table 1.1.2.

Table 1.1.2: Driving End Scoring Matrix

Condition		Score
(a)	Spotlessly Clean	10
	Condition falls between (a) and (b)	9
(b)	Very clean appearance, i.e. no dirt noticeable but "dull" not shiny	8
	Condition falls between (b) and (c)	7
(c)	Generally clean, i.e. some minor marks, dust, dirt or "streaking" or "flystrike"	6
	Condition fall between (c) and (d)	5
(d)	Many dirty marks or areas of "flystrike" but visibility through cab windscreens unaffected and visibility of the Unit from the front (afforded by areas painted "warning yellow", if used, and lights) not affected.	4
	Condition falls between (d) and (e)	3
(e)	Extensive dirt or Extensive "flystrike" or any stain caused by the train striking birds	2
	Condition falls between (e) and (f) or (g)	1
(f)	Extremely dirty with risk of soiling upon contact or any stain caused by the striking of animals or humans or by lubricants	0
(g)	Dirt or detritus on windscreen (affecting visibility through cab windscreens), or areas painted "warning yellow" (if used) or lights (affecting visibility of the Unit from the front).	0

(c) **Intermediate Bodyend: Assessment Procedure**

Assess the intermediate bodyend of each Vehicle as follows:

(i) identify the condition of the exterior of the intermediate bodyend of the Vehicle including the flexible gangway between the Vehicles;

(ii) do not include Graffiti and other damage not covered by Table 1.1.3; and

(iii) score the Vehicle in accordance with Table 1.1.3.

Table 1.1.3: Intermediate Bodyend Scoring Matrix

	Condition	Score
(a)	Spotlessly Clean	10
	Condition falls between (a) and (b)	9
(b)	Very clean appearance, i.e. no dirt noticeable but "dull" not shiny	8
	Condition falls between (b) and (c)	7
(c)	Generally clean, i.e. some minor marks, dust, dirt or "streaking"	6
	Condition fall between (c) and (d)	5
(d)	Many dirty marks	4
	Condition falls between (d) and (e)	3
(e)	Extensive dirt	2
	Condition falls between (e) and (f)	1
(f)	Extremely dirty with risk of soiling upon contact	0

(d) **Underframe: Assessment Procedure**

Assess the underframe of each Vehicle as follows:

(i) identify the condition of the underframe of the Vehicle;

(ii) do not include Graffiti and other damage not covered by Table 1.1.4; and

(iii) score the Vehicle in accordance with Table 1.1.4.

Table 1.1.4: Underframe Scoring Matrix

	Condition	Score
(a)	Light patina of dirt and no Graffiti removal staining (staining from Graffiti removal chemicals washed off liveried areas of Vehicle)	10
	Condition falls between (a) and (b)	8
(b)	Some Graffiti removal staining or Extensive dirt	4
	Condition falls between (b) and (c)	3
(c)	Debris from the train striking a bird or Extensive Graffiti removal staining	2
	Condition fall between (c) and (d)	1
(d)	Extremely dirty or heavily stained by Graffiti removal or any human or animal debris	0

2.2 **External State of Repair**

(a) **External level of Scratched Graffiti: Assessment Procedure**

Assess the external level of scratched Graffiti on each Vehicle as follows:

(i) identify all scratched Graffiti but not other (painted) Graffiti on the exterior of the Vehicle, wherever it is on the exterior of the Vehicle including but not limited to any windows, glass panels, paintwork and decals; and

(ii) score the Vehicle as follows:

(A) if any offensive or derogatory Graffiti or any damaged logo or branding to the extent that it is unrecognisable has been identified under paragraph 2.2(a)(i), score the Vehicle in accordance with Table 1.2.1(a); or

(B) if no offensive or derogatory Graffiti or damaged logo or branding to the extent that it is unrecognisable has been identified under paragraph 2.2(a)(i) find the worst area (1 square metre) of the Vehicle affected by Graffiti which has been identified under that paragraph (if any). Estimate how many A5 areas are needed to cover up all the Graffiti so identified (if any) and score the Vehicle in accordance with Table 1.2.1.

Table 1.2.1: External Level of Scratched Graffiti Scoring Matrix

	Condition	Score
(a)	No scratched Graffiti whatsoever	10
	Condition falls between (a) and (b)	9
(b)	One area of scratched Graffiti of up to 4 inches (i.e. equal to two travel cards)	8
	Condition falls between (b) and (c)	7
(c)	2 A5 size areas to cover all the scratched Graffiti on the worst area of the Vehicle	6
	Condition fall between (c) and (d)	5
(d)	4 A5 size areas to cover all the scratched Graffiti on the worst area of the Vehicle	4
	Condition falls between (d) and (e)	3
(e)	8 A5 size areas to cover all the scratched Graffiti on the worst area of the Vehicle	2
	Condition falls between (e) and (f)	1
(f)	12 or more A5 size areas to cover all the scratched Graffiti on the worst area of the Vehicle	0
(g)	Any offensive or derogatory Graffiti regardless of size of area	0

(h)	Any logo or branding damaged to the extent it is unrecognisable (regardless of size of area)	0

(b) **External Level of Other (non-scratched) Graffiti: Assessment Procedure**

Assess the external level of non-scratched Graffiti on each Vehicle as follows:

(i) identify all Graffiti which is not scratched Graffiti, including but not limited to any painted, written or sprayed Graffiti, stickers, marks where Graffiti has been, wherever it is on the exterior of the Vehicle including but not limited to any windows, glass panels, paintwork, decals and inter-Vehicle gangways; and

(ii) score the Vehicle as follows:

(A) if any offensive or derogatory Graffiti or any damaged logo branding to the extent that it is unrecognisable has been identified under paragraph 2.2(b)(i), score the Vehicle in accordance with Table 1.2.2; or

(B) if no offensive or derogatory Graffiti or damaged logo or branding to the extent that it is unrecognisable has been identified under paragraph 2.2(b)(i), find the worst area (one square metre) of the Vehicle affected by Graffiti which has been identified under that paragraph (if any). Estimate how many A5 areas are needed to cover up all the Graffiti so identified (if any) and score the Vehicle in accordance with Table 1.2.2.

Table 1.2.2: External Level of Other (non-scratched) Graffiti Scoring Matrix

	Condition	Score
(a)	No sprayed, painted or written Graffiti whatsoever (no marks)	10
	Condition falls between (a) and (b)	9
(b)	No Graffiti but there are marks where previously present in the worst area of the Vehicle	8
	Condition falls between (b) and (c)	7
(c)	2 A5 size areas to cover all the non-scratched Graffiti on the worst area of the Vehicle	6
	Condition fall between (c) and (d)	5
(d)	4 A5 size areas to cover all the non-scratched Graffiti on the worst area of the Vehicle	4
	Condition falls between (d) and (e)	3
(e)	8 A5 size areas to cover all the non-scratched Graffiti on the worst area of the Vehicle	2

	Condition falls between (e) and (f)	1
(f)	12 or more A5 size areas to cover all the non-scratched Graffiti on the worst area of the Vehicle	0
(g)	Any offensive or derogatory Graffiti (regardless of size of area)	0
(h)	Any logo or branding damaged to the extent it is unrecognisable (regardless of size of area)	0

(c) **Colour and Gloss Level: Assessment Procedure**

Assess the colour and gloss level of each Vehicle as follows:

(i) identify the level of colour and gloss on the exterior of the Vehicle; and

(ii) score the Vehicle in accordance with Table 1.2.3.

Table 1.2.3: Colour and Gloss Level Scoring Matrix

	Condition	Score
(a)	Gloss level at the maximum level defined on the reference sample and homogeneous. No discolouration or fading when compared with the colour-match reference sample	10
	Condition falls between (a) and (b)	8
(b)	Gloss level within the maximum and minimum limits (as defined by the reference samples). Slight but homogeneous discolouration	6
	Condition falls between (b) and (c)	5
(c)	Gloss level with the maximum and minimum limits (as defined by the reference samples). Slight non homogeneous discolouration	3
	Condition fall between (c) and (d)	2
(d)	Gloss level lower than the minimum level on the reference samples. Excessive homogeneous or non homogeneous discolouration	0

(d) **Surface corrosion/Paint Chips/Scratches: Assessment Procedure**

Assess the external level of corrosion, chipped paint and scratching on each Vehicle as follows:

(i) identify all corrosion, chips, scratches (but not scratched Graffiti) and/or dents revealing undercoat or metal substrate on the exterior of the Vehicle; and

(ii) score the Vehicle as follows:

(A) find the worst area of one (1) square metre or more of the Vehicle affected by corrosion, chips, scratches and/or dents identified under paragraph 2.2(d)(i) (if any). Estimate how many A5 areas are needed to cover up all the corrosion, chips, scratches or dents revealing undercoat or metal substrate identified under paragraph 2.2(d)(i) above (if any) and score the Vehicle in accordance with Table 1.2.4.

Table 1.2.4: Surface Corrosion/Paint Chips/Scratches Scoring Matrix

Condition		Score
(a)	No corrosion, chips or scratches or dents revealing undercoat or metal substrate	10
	Condition falls between (a) and (b)	9
(b)	No corrosion, chips or scratches or dents revealing undercoat or metal substrate but patch repairs made and not visible from 5m	8
	Condition falls between (b) and (c)	7
(c)	2 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal substrate on the worst area of the Vehicle and any patch repairs not visible from 5m	6
	Condition fall between (c) and (d)	5
(d)	4 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal substrate on the worst area of the Vehicle and any patch repairs not visible from 5m	4
	Condition falls between (d) and (e)	3
(e)	8 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal substrate on the worst area of the Vehicle and any patch repairs not visible from 5m	2
	Condition falls between (e) and (f)	1
(f)	12 or more A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal substrate on the worst area of the Vehicle and any patch repairs greater than A6 size from 10m	0
(g)	Any logo or branding damaged to the extent that it is unrecognisable (regardless of size of area)	0

3. Internal Condition

3.1 Internal State of Repair

(a) **Internal Level of Scratched Graffiti: Assessment Procedure**

Assess the internal level of scratched Graffiti in each Vehicle as follows:

(i) identify all scratched Graffiti but not other (painted) Graffiti on the interior of the Vehicle wherever it is on the Vehicle including but not limited to any windows, glass panels and paintwork; and

(ii) score the Vehicle as follows:

(A) if any offensive Graffiti has been identified under paragraph 3.1(a)(i), score the Vehicle in accordance with Table 2.2.1; or

(B) if no offensive Graffiti has been identified under paragraph 3.1(a)(i) find the worst area (one square metre) of the Vehicle affected by the Graffiti identified under that paragraph (if any). Estimate how many A5 areas are needed to cover up all the Graffiti so identified (if any) and score the Vehicle in accordance with Table 2.2.1.

Table 2.2.1: Internal Level of Scratched Graffiti Scoring Matrix

Condition		Score
(a)	No scratched Graffiti whatsoever	10
	Condition falls between (a) and (b)	9
(b)	One very small area of scratched Graffiti, up to 4 inches (the size of two travel cards) in the worst area of the Vehicle	8
	Condition falls between (b) and (c)	7
(c)	2 A5 size areas to cover all the scratched Graffiti in the worst area of the Vehicle	6
	Condition fall between (c) and (d)	5
(d)	4 A5 size areas to cover all the scratched Graffiti in the worst area of the Vehicle	4
	Condition falls between (d) and (e)	3
(e)	8 A5 size areas to cover all the scratched Graffiti in the worst area of the Vehicle	2
	Condition falls between (e) and (f)	1
(f)	Any offensive Graffiti (regardless of size of area)	0

(b) **Internal Level of Other (non-scratched) Graffiti: Assessment Procedure**

Assess the internal level of scratched Graffiti in each Vehicle as follows:

(i) identify all Graffiti which is not scratched Graffiti, including but not limited to painted, written or sprayed Graffiti, stickers, marks where Graffiti has been removed on the interior of the Vehicle wherever it is on the Vehicle including but not limited to any windows, glass panels and paintwork; and

(ii) score the Vehicle as follows:

(A) if any offensive Graffiti has been identified under paragraph 3.1(b)(i), score the Vehicle in accordance with Table 2.2.2; or

(B) if no offensive Graffiti has been identified under paragraph 3.1(b)(i), find the worst area (one square metre) of the Vehicle affected by Graffiti identified under that paragraph (if any). Estimate how many A5 areas are needed to cover up all the Graffiti so identified (if any) and score the Vehicle in accordance with Table 2.2.2.

Table 2.2.2: Internal Level of Other (non-scratched) Graffiti Scoring Matrix

Condition		Score
(a)	No sprayed, painted or written Graffiti whatsoever. No marks where previously present	10
	Condition falls between (a) and (b)	9
(b)	No Graffiti but there are marks where previously present in the worst area of the Vehicle	8
	Condition falls between (b) and (c)	7
(c)	2 A5 size areas to cover all the non-scratched Graffiti in the worst area of the Vehicle	6
	Condition fall between (c) and (d)	5
(d)	4 A5 size areas to cover all the non-scratched Graffiti in the worst area of the Vehicle	4
	Condition falls between (d) and (e)	3
(e)	8 A5 size areas to cover all the non-scratched Graffiti in the worst area of the Vehicle	2
	Condition falls between (e) and (f)	1
(f)	12 or more A5 size areas to cover all the non-scratched Graffiti in the worst areas of the Vehicle	0
(g)	Any offensive Graffiti (regardless of size of area)	0

(c) **Colour and Gloss Level: Assessment Procedure**

Assess the level of gloss and colour in each Vehicle as follows:

(i) identify the level of colour and gloss on the interior of the Vehicle; and

(ii) score the Vehicle in accordance with Table 2.2.3.

Table 2.2.3: Colour and Gloss Level Assessment Procedure Scoring Matrix

Condition		Score
(a)	Gloss level at the maximum level defined on the	10

	reference sample and homogeneous. No discolouration or fading when compared with the colour-match reference sample	
	Condition falls between (a) and (b)	8
(b)	Gloss level within the maximum and minimum limits (as defined by the reference samples). Slight but homogeneous discolouration	6
	Condition falls between (b) and (c)	5
(c)	Gloss level with the maximum and minimum limits (as defined by the reference samples). Slight non homogeneous discolouration	3
	Condition fall between (c) and (d)	2
(d)	Gloss level lower than the minimum level on the reference samples. Excessive homogeneous or non homogeneous discolouration	0

(d) **Surface Corrosion/Paint Chips/ Scratches: Assessment Procedure**

Assess the internal level of corrosion, chipped paint and scratching or denting in each Vehicle as follows:

(i) identify all corrosion, chips, scratches (but not scratched Graffiti) and/or dents revealing undercoat or metal substrate on the interior of the Vehicle; and

(ii) score the Vehicle as follows:

find the worst area of one square metre or more of the Vehicle affected by corrosion, chips, scratches and/or dents identified under paragraph 3.1(d)(i). Estimate how many A5 areas are needed to cover up all the corrosion, chips, scratches or dents revealing undercoat or metal substrate identified under paragraph 3.1(d)(i) and score the Vehicle in accordance with Table 2.2.4.

Table 2.2.4: Surface Corrosion/Paint Chips/Scratches Scoring Matrix

	Condition	Score
(a)	No corrosion, chips or scratches or dents revealing undercoat or metal substrate	10
	Condition falls between (a) and (b)	9
(b)	No corrosion, chips or scratches or dents revealing undercoat or metal substrate but patch repairs made and not visible from 2m	8
	Condition falls between (b) and (c)	7
(c)	1 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal	6

	substrate on the worst area of the Vehicle and any patch repairs not visible from 2m	
	Condition fall between (c) and (d)	5
(d)	2 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal substrate on the worst area of the Vehicle and any patch repairs not visible from 2m	4
	Condition falls between (d) and (e)	3
(e)	4 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal substrate on the worst area of the Vehicle and any patch repairs not visible from 2m	2
	Condition falls between (e) and (f)	1
(f)	More than 4 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoats or metal substrate on the worst area of the Vehicle and any patch repairs greater than A7 size from 2m	0

(e) **Floor Coverings: Assessment Procedure**

Assess the state of the floor covering in each Vehicle in accordance with the following procedure:

(i) identify the state of the floor covering in the Vehicle; and

(ii) score the Vehicle in accordance with Table 2.2.5.

Table 2.2.5: Floor Coverings Scoring Matrix

	Condition	Score
(a)	No delamination, bubbles or ripples	10
	Condition falls between (a) and (b)	9
(b)	No delamination, bubbles or ripples but patch repairs made and not visible from 2m	8
	Condition falls between (b) and (c)	7
(c)	1 A5 size areas to cover all the delamination, bubbles or ripples in the worst area of the Vehicle and any patch repairs not visible from 2m	6
	Condition fall between (c) and (d)	5
(d)	2 A5 size areas to cover all delamination, bubbles or ripples in the worst area of the Vehicle and any patch repairs not visible from 2m	4
	Condition falls between (d) and (e)	3
(e)	Either 4 A5 size areas to cover all delamination, bubbles or ripples in the worst area of the Vehicle or any patch repairs greater than A6 size visible from 2m	2

	Condition falls between (e) and (f)	1
(f)	Either more than 4 A5 size areas to cover all the corrosion, chips scratches or dents revealing undercoat or metal substrate in the worst area of the Vehicle or any patch repairs greater than A6 size visible from 4m	0

(f) **Labelling: Assessment Procedure**

Assess the labelling on the interior of each Vehicle in accordance with the following procedure:

(i) identify the state of the labelling in the Vehicle; and

(ii) score the Vehicle in accordance with Table 2.2.6.

Table 2.2.6: Labelling Scoring Matrix

	Condition	Score
(a)	No labelling missing, damaged or defaced	10
(b)	1 label missing, damaged or defaced in any Vehicle	8
(c)	2 labels missing, damaged or defaced in any Vehicle	6
(d)	3 labels missing, damaged or defaced in any Vehicle	4
(e)	More than 3 labels missing, damaged or defaced in any Vehicle	2
(f)	Any mandatory labelling (including safety and RVAR labelling) missing or rendered illegible by damaged or defacing	0

(g) **Condition of Arm Rests between Seats: Assessment Procedure**

Assess the presence, proper positioning (e.g., not loose or bent) and condition of the arm rests in each Vehicle in accordance with the following procedure:

(i) identify the presence, positioning and condition of the arm rests in the Vehicle including the absence of any which should be there; and

(ii) score the Vehicle in accordance with Table 2.2.7.

Table 2.2.7: Condition of Arm Rests between Seats Scoring Matrix

	Condition	Score
(a)	All are in place, intact, in good condition, and with no scratches	10
	Condition falls between (a) and (b)	9
(b)	All are in place but with minor scratches or chips	8
	Condition falls between (b) and (c)	6
(c)	One missing	4

	Condition fall between (c) and (d)	3
(d)	Two or more missing or substantially damaged	2
	Condition falls between (d) and (e)	1
(e)	Five or more missing or substantially damaged	0

(h) **Condition of Hand Rails and Hangers: Assessment Procedure**

Assess the existence, positioning and condition of hand rails and hangers, other rails and straps in each Vehicle in accordance the following procedure:

(i) identify the presence, positioning and condition of the hand rails and hangers, other rails and straps in the Vehicle including the absence of any which should be there; and

(ii) score the Vehicle in accordance with Table 2.2.8.

Table 2.2.8: Condition of Hand Rails and Hangers Scoring Matrix

	Condition	Score
(a)	All are in place, intact, in good condition, and with no scratches	10
	Condition falls between (a) and (b)	9
(b)	All are in place but with minor scratches or chips	8
	Condition falls between (b) and (c)	6
(c)	One missing or substantially damaged (e.g. stretched or bent out of shape)	4
	Condition fall between (c) and (d)	3
(d)	Two or four missing or substantially damaged (e.g. stretched or bent out of shape)	2
	Condition falls between (d) and (e)	1
(e)	Five or more missing or substantially damaged (e.g. stretched or bent out of shape	0

(i) **Condition of Train Seats: Assessment Procedure**

Assess the condition of the seating in each Vehicle in accordance the following procedure:

(i) identify the condition of the seating in the Vehicle taking into account all aspects of seating;

(ii) do not include cleanliness; and

(iii) score the Vehicle in accordance with Table 2.2.9.

Table 2.2.9: Condition of Train Seats Scoring Matrix

	Condition	Score
(a)	All in as new condition. No detached upholstery components	10
	Condition falls between (a) and (b)	9
(b)	All in good condition but with slight fading. No detached upholstery components	8
	Condition falls between (b) and (c)	7
(c)	Some evidence of wear (e.g. worn upholstery). No detached upholstery components. No repairs evident	6
	Condition fall between (c) and (d)	5
(d)	General evidence of wear or evidence of repairs. No detached upholstery	4
	Condition falls between (d) and (e)	3
(e)	Extensive wear or unrepaired rips less than 2.5cm in length or cigarette burns on more than 10 per cent. of seats. No detached upholstery components	2
	Condition fall between (e) and (f)	1
(f)	More than 5 per cent. of seats Extremely worn or with unrepaired rips longer than 2.5m Detached Upholstery components	0

4. General

Each Party acknowledges and agrees that any reference to standards or samples referred to in this Appendix 2 shall be agreed between the Parties no later than 25 weeks prior to Provisional Acceptance of the first Unit to be Accepted.

Appendix 3 to Part A
Refurbishments

1. The Maintainer shall refurbish the Units and Vehicles periodically which shall include but not be limited to:

   (a) replacement of saloon floor coverings including vestibules and gangways no later than 15 years from Provisional Acceptance of such Unit;

   (b) replacement of soft furnishings no later than seven years from Provisional Acceptance of such Unit and every seven years thereafter;

   (c) re-paint/re-finish of interior hard surfaces, vestibule surrounds, exterior door interior panels no later than 10 years from the date of Provisional Acceptance of such Unit and every 10 years thereafter;

   (d) re-paint/re-finish of cab interior panelling no later than 15 years from Provisional Acceptance of such Unit;

   (e) re-paint/re-finish of saloon interior ceiling panels no later than 15 years from Provisional Acceptance of such Unit; and

   (f) re-paint exteriors and carry out re-livery (for the avoidance of doubt the Maintainer shall undertake one repaint/re-livery of each Unit no later than 15 years from Provisional Acceptance of such Unit).

2. The refurbishments listed in paragraph 1 shall be undertaken on at least a like-for-like basis provided that the Maintainer shall offer and, if approved by the Purchaser, incorporate any technical enhancements if such technical enhancements are available at no additional cost to the Maintainer compared to a like-for-like refurbishment.

Part B Train Plan Parameters

1. Train Plan

1.1 The Train Plan shall set out the scheduled arrival and departure times and corresponding Hand-Back time and Hand-Over time of each Diagram at each of the Ilford Depot and/or the Willesden Depot and/or the Stabling Sites on each day, including Saturdays and Sundays. The arrival and departure times shall accord with the Diagrams.

1.2 The Purchaser shall prepare the Train Plan such that Units are in the possession of the Maintainer for at least the periods of time shown in the Train Plan Parameters set out in paragraph 2.

2. Train Plan Parameters

2.1 The Train Plan Parameters shall set out the minimum requirements for Units to be in the possession of the Maintainer, in order to allow the Maintainer sufficient time to perform the Services.

2.2 The maximum number of Units which may be diagrammed in any one day shall be as set out in Schedule 2 (*Diagrams*).

2.3 The tables below set out the maintenance parameters for each of the Maintenance Facilities and the Stabling Sites (as applicable):

Pertaining to Existing Fleet and Dual Voltage Units

Services	Willesden Depot	Stabling Sites
Minimum number of EF Units and Units arriving per night in aggregate (scheduled)	4 Existing Fleet / 5 new EMUs	
Maximum number of Class 378 units that the Operator will be permitted to stable at Willesden Depot (including maintenance and HOT spares)	Case a). The un-electrified sidings at Willesden Depot remain un-electrified. = 3. At least one of which will have access to the maintenance building. Case b). The unelectrified sidings at Willesden Depot are electrified by RfL to provide additional stabling for 4 x 160m trains.= 7. At least one of which will have access to the	

Services	Willesden Depot	Stabling Sites
	Maintenance building.	
Minimum train preparation time per Unit/EF Unit	1 hour subject to the train diagramming allowing for the Maintainer to prepare trains sequentially.	1 hour subject to the train diagramming allowing for the Maintainer to prepare trains sequentially at Euston, Gospel Oak, Watford and Cheshunt.
Earliest end of day scheduled arrival at the depot boundary*	No restriction. Driver is to berth the train in the yard in designated positions.	
Latest end of day scheduled arrival at the depot boundary*	01:35 for 4 Existing Fleet / 5 new EMUs otherwise no restriction. Driver is to berth the train in the yard in designated positions.	
Earliest start of day scheduled departure from the depot boundary*	04:00 Two trains not to be diagrammed to depart before 05:25	
Latest start of day scheduled departure from the depot boundary*	No restriction	
Minimum time between arrivals at the depot boundary	5 minutes	
Minimum time between departures from the depot boundary	5 minutes	

* The arrival and departure times are specified for the end of, and start of planned Diagrams only. Units (or EF Units as applicable) planned to arrive/depart part-way through their Diagrams, unplanned or ad-hoc Units may arrive and/or depart at any time. The minimum time on depot requirement only applies to Units (or EF Units as applicable) on Diagrams planned to arrive. Without prejudice to the requirements of the Performance Regime (or EF Performance Regime as applicable), unplanned or ad-hoc arrivals (e.g. for Additional Services, Fault finding or Fault rectification) are not subject to any minimum time on depot. Bidders shall note that Hand-Back will occur up to 15 minutes after the stated depot boundary arrival time in the Diagrams, and Hand-Over must occur at least 15 minutes prior the depot boundary departure times in the Diagrams.

AC Only Units

Services	Ilford Depot	Stabling Sites
Minimum number of Units arriving per night (scheduled)	4	[redacted]
Minimum number of Units arriving between am and pm peaks (inter-peak) Monday to Friday for not less than 5 hours*	[redacted]	Chingford: 2
Minimum number of Units arriving between am and pm peaks (inter-peak) Monday to Friday for not less than 2 hour*		Chingford: 6
Minimum train preparation time per Unit	1 hour subject to the train diagramming allowing for the Maintainer to prepare trains sequentially.	1 hour subject to the train diagramming allowing for the Maintainer to prepare trains sequentially.
Earliest end of day scheduled arrival at the depot boundary*	No restriction. Driver is to berth the train in the yard in designated positions.	[redacted]
Latest end of day scheduled arrival at the depot boundary*	23:00 Two trains to arrive by 20:45	
Earliest start of day scheduled departure from the depot boundary*	04:00	
Latest start of day scheduled departure from the depot boundary*	No restriction	

* The arrival and departure times are specified for the end of, and start of planned Diagrams only. Units planned to arrive/depart part-way through their Diagrams, unplanned or ad-hoc Units may arrive and/or depart at any time. The minimum time on depot requirement only applies to Units on Diagrams planned to arrive. Without prejudice to the requirements of the Performance Regime, unplanned or ad-hoc arrivals (e.g. for Additional Services, Fault finding or Fault rectification) are not subject to any minimum time on depot. Bidders shall note that Hand-Back will occur up to 15 minutes after the stated depot boundary arrival time in the Diagrams, and Hand-Over must occur at least 15 minutes prior the depot boundary departure times in the Diagrams

Appendix 1 to Part B
Entry Points and Exit Points

1. For a Unit to be considered present at the Entry Point and Exit Point the Unit must be correctly berthed in the location in accordance with:

   (a) Network Rail operating rules applicable to the Entry Points and Exit Points on the Network; and

   (b) the Ilford Depot and/or the Willesden Depot rules of operation for the Entry Points and Exit Points at the Ilford Depot and/or Willesden Depot.

2. The Entry Points and Exit Points shall be those locations on the LO Infrastructure as specified in Schedule 2 (*Diagrams*).

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Part C Maintenance Plan

Service Delivery Plan

Bombardier's maintenance plan for the NRSLO project will provide RfL with reliable units from day one, deliver trains into service on time every day, minimise the whole-life, whole-system costs of the fleet and increase passenger capacity per £ spent. Our *AVENTRA* platform has been designed as a robust and reliable Unit that takes the best of our proven technology and features from existing designs for Crossrail, London Underground and overground commuter rail systems. These have been integrated with state-of-the-art Health Usage Monitoring Systems (HUMS), prognostics and diagnostics and wayside Automatic Visual Inspection Systems (AVIS) to deliver a low maintenance, high reliability train. The *AVENTRA* has been designed for maintenance (DfM) from the outset, underpinned by a condition-based maintenance strategy that replaces traditional periodic inspection and replacement, as well as fault finding and repair once failures have occurred. As a result, many unnecessary maintenance interventions can be removed from the maintenance plan, allowing staff to maintain based on condition and concentrate on preventing failure using the predictive tools within the on- and off-train systems. The *AVENTRA*'s prognostics, diagnostics and AVIS systems will detect system degradations before failures occur and alert operators to the need to take pre-emptive action before corrective action is required or SAFs occur.

A. Introduction

This Service Delivery Plan details the arrangements which will be put in place for deployment of the maintenance services and demonstrates that all obligations under the MSA and TSA have been taken into account and that the depot, facilities, support services, materials supply (including out-based locations), resources (including out-based locations), third party subcontractors and maintenance services all align and support delivery of the trains into service.

In addition this Maintenance Plan includes a Vehicle Maintenance Schedule (Star Chart) and a component overhaul schedule (RfL Appendix One: Star Chart of Maintenance tasks), together these schedules identify the periodicity of the required maintenance activities.

Appendix 3 contains the proposed Maintenance Depot Unit Movement Management Plan.

This maintenance plan has been developed, produced and influenced by Bombardier's depot strategy which identifies a two depot approach, Bombardiers Ilford 'A' Maintenance Depot to support the 31 AC only units and Willesden Maintenance Depot to support the 14 DV units.

Our maintenance plan will:

- Provide RfL and the Train Operator with trains which meet the reliability requirements from day one
- Provide RfL and the Train Operator with a dependable maintenance service that delivers highly reliable trains into service on time every day
- Minimise the whole-life costs of the fleet
- Optimise cost per passenger mile
- Provide every aspect of the maintenance scope on time and to the required standard, whilst being flexible to adapt to changes in stakeholder requirements

Bombardier has extensive experience of undertaking full fleet management projects in the UK, for which we routinely produce and execute maintenance plans that are fully compliant to

GM/RT2004 Rail Vehicle Maintenance.

We design the maintenance plan and its associated documentation to be in accordance with GM/RT2004 and the associated standards, including:

- GM/GN2571 Guidance on storage and re-commissioning of traction and rolling stock
- GM/GN2646 Guidance on axle bearing maintenance
- RIS-2701-RST Rail Industry Standard for NDT processes on rail vehicles
- GM/RT2000 Engineering acceptance of rail vehicles

To ensure our maintenance plan complies fully we will divide it into the same sub-sections as GM/RT2004, with each sub-section explaining how we will meet that aspect of the standard. A Bombardier-appointed independent Maintenance Conformance Certification Body (MCCB) will provide a final compliance check to ensure that we have complied with all relevant standards and provide the fleet with the required maintenance and engineering certification for the maintenance plan.

This approach has been taken on all UK fleet introductions since 1999.

Product Overview

Bombardier's *AVENTRA* platform has been developed in line with the increased expectations of all rolling stock stakeholders for a highly reliable, 'value for money' product. To ensure these expectations are fulfilled during service operation our maintenance draws upon existing asset management knowledge experience and expertise and combines this with our innovative approach to maintenance using the intelligence of the *AVENTRA* platform and our Integrated Vehicle Health Monitoring (IVHM)system.

A highly focused maintenance regime will be developed for the RfL fleet by applying design for maintenance processes throughout the train design so ensuring all manual maintenance activities are optimised and condition-based maintenance is maximised. This maintenance focused approach reduces both the opportunity for human error and Unit downtime. The regime improves reliability by targeting specific systems on a condition basis and reduces periodic interventions by forecasting system degradation.

Our condition-based maintenance strategy will use the IVHM system incorporating the following:

Table 1 - IVHM Features and Benefits

	Features	Benefits
	Prognostic and diagnostic systems	Highlights degraded component and system performance before a Service Affecting Failure (SAF) occurs, allowing proactive maintenance Reduced SAFs, increased reliability and availability
	Condition-based maintenance	Robust ability to deliver the train plan due to low maintenance intervention requirement Reduced through-life cost Health and Usage Monitoring Systems (HUMS)

	Features	Benefits
	Automated Visual Inspection Systems (AVIS)	Continuous fleet monitoring Consistency of inspecting and reporting Increased frequency of inspections = higher reliability and availability

To fully utilise our maintenance approach, we propose that the core locations for investment in advanced maintenance technology (AVIS) will be Willesden depot for the dual voltage units and Chingford sidings for the AC units, these locations have been identified as optimal locations, considering diagram information and the regular frequency at which units visits these prime locations. Trains will travel through AVIS during their visits to Willesden depot and Chingford sidings with an average three day period between AVIS inspections to facilitate semi-automatic train preparation.

B. Maintenance principals and philosophies