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1 INTRODUCTION

Id	Requirement	Referring to
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A1:1.a	<p>I Norske tog AS (hereby referred to as NT) invites you to a challenge with this delivery of new Long-distance trainsets. This project will be of great importance to the Norwegian public transport sector over the next decades, and there are many stakeholders. Delivering the best possible solution must therefore be our highest priority. Against this background, NT seeks a long-lasting and prosperous partnership and is strongly committed to contributing to our mutual success.</p>	
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In order to succeed with the challenge ahead it is essential that we have a common understanding of the mission. The results we achieve will highly depend on the quality of communication between us. Therefore, NT has strived in the specification process to reach the required level of quality and clarity in the scope of work for this mission. Nevertheless, if you should discover any ambiguities or errors, we urge you to bring this forward.

2 NT'S ROLLING STOCK STRATEGY

Id	Requirement	Referring to
A1:2.a	<p>I NT's mission is to manage and further develop today's fleet of passenger trains in an efficient, appropriate and future-oriented manner, as well as procure new vehicles that contribute to safe and environmentally friendly transportation. Currently, NT's fleet of trains consists of over 256 trainsets, divided on 17 different types of trains. If NT's fleet is to be included in various traffic packages and across lease contracts, it is important to standardize the fleet with fewer, but more modular, types of trains. Fewer types will provide greater flexibility and more cost-effective operations. It will make it easier to adjust the number of vehicles in accordance with the customer base and traffic growth, and make properties such as capacity, speed and door systems more uniform throughout the fleet. Standardization is therefore a main pillar in NT's rolling stock strategy, and we ultimately aim towards offering three main types of trains, jointly covering the segments of local, regional and long-distance travel.</p>	

3 NEW LONG-DISTANCE TRAINSETS

3.1 Introduction

Id	Requirement	Referring to
A1:3.1.a	<p>I Providing the right type of Trainset is a key decision for any passenger railway, and this decision needs to reflect the requirements of passengers in the relevant market segment. NT has rolling stock suitable for the key markets of inner-suburban, outer-suburban and longer-distance travel, and has a strong focus on enabling the Operators to offer their passengers the best possible travel experience. The Primary Delivery in this Contract will be a certain number of Long-distance Trainsets based on seating, sleeping and associated service capacities. NT shall have the option to order additional Trainsets. Due to the need for flexibility, the Contract provides the possibility to order Variations to the trainset.</p>	

3.2 Key success factors

3.2.1 Capacity and passenger satisfaction

Id	Requirement	Referring to
A1:3.2.1.a	<p>I Strong passenger growth over the recent years constitutes an increasing challenge in terms of capacity. Capacity can be divided into line capacity (number of trains per line) and Trainset capacity (number of passengers per Trainset). Where line capacity is nearly fully utilized, it becomes especially important that the Trainset has strong acceleration, retardation and at the same time allowing for effective station stop times.</p> <p>Increasing Trainset capacity can be achieved in various ways, including wider and longer Trainsets . Whilst many Trainsets in the Oslo area are now of their maximum length of 220m, Norway is fortunate in having a relatively wide loading gauge by international standards.</p> <p>A solution which favours high capacity, both in terms of passenger capacity and efficient utilization of line capacity, will be a high priority for this procurement. At the same time, passenger satisfaction is also an essential aspect. Elements such as comfort, onboard passenger solutions, interior floor plan and universal design will have significant importance.</p>	

Exhibit A01: General

3.2.2 Safety, reliability and environment

Id	Requirement	Referring to
A1:3.2.2.a	<p>I Another key priority for this procurement is to deliver a very safe and reliable train. Railway vehicles operating on Norwegian tracks must sustain everything from snow and ice to steep gradients and long tunnels, while still offering a safe and punctual service to passengers.</p> <p>The Contractor will be required to document the reliability of the train by responding to the RAM-requirements. NT urges you to pay close attention to reliability and safety in your project organisation, and a solid understanding of the importance of demonstrating reliability in every aspect of the work. If a proposed solution represents a risk to the reliability of the train you are required to explain how, why and to what extent. NT firmly believes that the industry has products which, with only few adjustments that do not affect the reliability, will match the presented requirements.</p>	

3.2.3 Cost effectiveness

Id	Requirement	Referring to
A1:3.2.3.a	<p>I A central focus for NT is to procure a high-quality solution with associated support systems, which is cost effective from the purchasing phase to the end of life. NT aims to see a high rate of return on capital from the investment through every-day performance and quality. In addition, low power consumption and low maintenance cost are both essential.</p>	

3.3 Primary Delivery

Id	Requirement	Referring to
A1:3.3.a	<p>K Life expectancy/ design life for each trainset shall be 30 years.</p>	
A1:3.3.b	<p>M The delivery shall include electrical powered trainsets and trainsets for operation on non-electrified lines.</p>	
A1:3.3.c	<p>M The delivery of trainsets shall contain a minimum capacity of 5750 seats and 900 beds in total.</p>	
A1:3.3.d	<p>K The Contract includes the design, construction and delivery of a sufficient number of Long-distance Trainsets based on the overall capacity requirements in section 3.4.2.</p> <p>The expectations from Nt are described in Appendix A1-1 and A1-2.</p> <p>The Contractor is expected to provide their specific solution to meet the seating and sleeping capacity for the all lines and applicable requirements in A1.</p>	

3.3.1 Operational conditions

Id	Requirement	Referring to
A1:3.3.1.a	<p>I Average operating time per year is 14 hours/day 365 days/year. Actual operating time can be up to 17 hours/day. The baseline for calculations is an operating distance of 360 000 km/year. This is an increase compared with today's operation with the intention to achieve one full turn/return trip per day. The standby time is 2 hours/day 365 days/year. The stabling time is 8 hours/day 365 days/year</p>	
A1:3.3.1.b	<p>I The total fleet shall support the following operations in various trainset configurations: Sørlandsbanen: 2 day operations and 1 night operation in each direction Bergensbanen: 3 day operations and 1 night operation in each direction Dovrebanen: 2 day operations and 1 night operation in each direction Nordlandsbanen: 1 day operations and 1 night operation in each direction</p>	
A1:3.3.1.c	<p>I The reference route for the procurement is Nordlandsbanen for the non-electric trainset and Bergensbanen for the electrical trainset. This shall be the baseline for all calculations.</p> <p>The infrastructure profile for all the routes are available at https://www.banenor.no/kundeportal/jernbanen-i-norge/infrastruktur/</p>	
A1:3.3.1.d	<p>E The trainset will support service both during day and night. If possible, Nt will prefer a solution where these needs are combined in the same trainset.</p> <p><i>The Tenderer shall demonstrate compliance by describing if/how passenger areas, excluding normal passenger seats, can be used in day service as well as night service</i></p>	
A1:3.3.1.e	<p>K The travelling times including intermediate stops, between the following stations shall be guaranteed. Timetable "Ruteplan R22" shall be used.</p> <p>The most recent timetables are available at: https://www.banenor.no/kundeportal/ruter-og-sportilgang/tjenesteruteboker/ https://www.banenor.no/kundeportal/ruter-og-sportilgang/grafiske-togruter2/</p> <p>The latest version of timetable shall be used.</p>	
A1:3.3.1.f	<p>M An electric solution shall be proposed for the Sørlandsbanen, Bergensbanen and Dovrebanen.</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.3.1.g	<p>M A bimodal solution shall be proposed for the Nordlandsbanen.</p>	
A1:3.3.1.h	<p>I The operational conditions will vary over 24 hours and also over the week and seasons. Therefore reconfiguration of trainsets between various lengths and day/night service will be the norm for Operation. In order to facilitate this the complete or parts of a trainset will operate as separate units. The longest trainset to configure will be 275 meter. Units may be replaced in the trainset. A trainset is built up by Units, where a Unit can be one or more cars coupled together. The length of the car and Unit is subject to suppliers solutions, as long as all requirements are fulfilled. This is applicable for Multiple Unit's and Locomotive hauled trainset in this requirement specification.</p>	
A1:3.3.1.i	<p>K Trainset configuration in operation shall be based on fixed or predefined Multiple Unit formations with possibility to rearrange with Units to fit the operational needs, alternatively, the trainset configuration shall be based on locomotive hauled individual coaches or fixed formations arranged to fit the operational needs.</p>	
A1:3.3.1.j	<p>K For an MU solution, it shall be possible to operate the end units as separate units under low speed conditions for shunting purposes in station areas and depots.</p>	
A1:3.3.1.k	<p>E Units with traction power, for example locomotives and powered EMU units, shall be able to operate on batteries during shunting in order to change train configuration in depot and stations when overhead line power is not available. <i>This may be future option.</i></p>	
A1:3.3.1.l	<p>K It shall only be possible to operate trainsets in Approved Formations. For predefined Multiple Unit formations shall the Trainset functionality prohibit operation of not Approved Formations.</p>	
A1:3.3.1.m	<p>I Norske Tog and the operators foresee a growing interest from the passengers for the night services. There is a demand for a higher flexibility ad variation in sleeping comfort than today's trainset can offer.</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.3.1.n	<p>K The trainset configured for night operation shall include at least one sleeping comfort level between sleeping compartment and the normal passenger seat.</p> <p><i>The Tenderer shall demonstrate compliance by describing the comfort levels for sleeping.</i></p>	

3.4 Capacity

3.4.1 Train performance

Id	Requirement	Referring to
A1:3.4.1.a	<p>K The maximum speed of the trainset shall be 200 km/h on electrified lines, and the trainset shall comply to TSI LOC&PAS.</p>	TSI LOC&PAS
A1:3.4.1.b	<p>K It shall be possible to move a Unit in a depot either by own power, alternatively by shunting.</p> <p><i>The tenderer shall demonstrate compliance by describing how individual unit(s) can be moved</i></p>	
A1:3.4.1.c	<p>K The maximum speed of the Trainset shall be minimum 160 km/h on non electrified lines</p>	
A1:3.4.1.d	<p>E The average acceleration of a trainset up to at least 110 meter length shall be minimum 0,7m/s² , 0-80km/h, with 100% seated passengers.</p> <p><i>The tenderer shall supply a calculation. The calculation of acceleration shall be based on level track and with medium worn wheels. Validation at delivery shall be performed against calculations adjusted for new wheels and as an average of four consecutive tests, two in each direction of travel.</i></p> <p><i>The average acceleration is defined from driver initiates acceleration until trainset has reached 80 km/h and calculated/measured from distance and time travelled.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.4.1.e	<p>E The average acceleration for trainsets longer than 200 meter, defined as trainsets that cannot meet the 3.4.1.d, shall be minimum 0,45 m/s², 0-80km/h, with 100% seated passengers.</p> <p><i>The tenderer shall supply a calculation. The calculation of acceleration shall be based on level track and with medium worn wheels. Validation at delivery shall be performed against calculations adjusted for new wheels and as an average of four consecutive tests, two in each direction of travel.</i></p> <p><i>The average acceleration is defined from driver initiates acceleration until trainset has reached 80 km/h and calculated/measured from distance and time travelled.</i></p>	

3.4.2 Passenger capacity

Id	Requirement	Referring to
A1:3.4.2.a	<p>K The minimum passenger capacity of the various longest trainsets for Day service shall be:</p> <p>Sörlandsbanen: 220 seated Bergensbanen: 486 seated Dovrebanen: 356 seated Nordlandsbanen: 252 seated</p> <p><i>The Tenderer shall demonstrate compliance by presenting the interior layout with seats for the trainsets.</i> <i>The maximum seated passenger capacity of the trainset shall be as high as possible.</i> <i>The capacity will be evaluated taking the train length into consideration.</i></p>	
A1:3.4.2.b	<p>K The minimum passenger capacity of the various trainsets for Night service shall be:</p> <p>Sörlandsbanen: 168 seated, 60 beds/reclined Bergensbanen: 238 seated, 90 beds/reclined Dovrebanen: 204 seated, 90 beds/reclined Nordlandsbanen: 168 seated, 60 beds/reclined</p> <p><i>The Tenderer shall demonstrate compliance by presenting the interior layout with seats and beds for the trainsets.</i> <i>The maximum seated/sleeping passenger capacity of the trainset shall be as high as possible.</i> <i>The capacity will be evaluated taking the train length into consideration.</i></p>	

Exhibit A01: General

3.5 Operational concept

3.5.1 Trainset modes

Id	Requirement	Referring to
A1:3.5.1.a	<p>K The design of the modes of operation should be robust, user-friendly, intuitive and support the onboard train crew in their task.</p> <p><i>The Tenderer shall demonstrate compliance by describing their concept for modes of operation.</i></p>	
A1:3.5.1.b	<p>E The trainset shall have at least the following modes of operation:</p> <ul style="list-style-type: none"> - Normal operational mode - Standby mode - Stabling mode - Washing mode - Coupling mode - Cleaning mode - Evacuation mode - Towing mode <p>Additional modes may be proposed.</p> <p><i>The Tenderer shall demonstrate compliance by delivering a description of how the different modes of operation are implemented and the transitions between different modes.</i></p>	
A1:3.5.1.c	<p>E The modes of operation shall enable the user to perform the assigned tasks and at the same time limit access to functions that are not included in the assigned task, especially functions that could lead to a dangerous situation.</p> <p><i>The Tenderer shall demonstrate compliance by describing which modes of operation is handled by which personnel category.</i></p>	
A1:3.5.1.d	<p>E Transition between modes of operation shall be done in a controlled, timely and safe way.</p> <p><i>The Tenderer shall demonstrate compliance by description of concept for modes of operation, including conditions for changing the modes and the involved timings.</i></p>	
A1:3.5.1.e	<p>E It shall be clear to Operational Personnel which mode of operation that is active.</p> <p><i>The Tenderer shall demonstrate compliance by describing how the Operational Personnel is informed of the current mode of operation.</i></p>	

Exhibit A01: General

3.5.1.1 Stabling mode

Id	Requirement	Referring to
A1:3.5.1.1.a	<p>I The purpose of the Stabling Mode is to minimize the Energy Consumption. At the same time, ensure that the Trainset can re-enter service with reasonably comfortable Personnel and passenger environment. A Trainset is considered to be ready for service when all of the below is met:</p> <ul style="list-style-type: none"> · The interior climate is between 15 - 30 °C or cooling is active if the temperature is above 30 °C · All systems are up and running · All automatic and manual checks are done <p>The Trainset will have access to catenary power or 1000 VAC Train heating supply during stabling. The 1000 VAC train heating supply can be 16 2/3 Hz or 50 Hz.</p> <p>It should be noted that due to reasons beyond control the catenary power and 1000 VAC train heating can be disrupted for longer periods, more than 30 minutes</p>	
A1:3.5.1.1.b	<p>E It shall be possible to initiate Stabling Mode by all of the following:</p> <ul style="list-style-type: none"> · Activation by a control onboard the Trainset · Automatically based on time of inactivity · Remotely from the operator's control center 	
<p><i>The Tenderer shall demonstrate compliance by description of Stabling Mode.</i></p>		
A1:3.5.1.1.c	<p>K The temperature in the Trainset shall be maintained during Stabling Mode to ensure that no system is damaged e.g. water or any other fluid does not freeze.</p>	
A1:3.5.1.1.d	<p>K Battery power shall be supervised and maintained during Stabling Mode.</p>	
A1:3.5.1.1.e	<p>E The Stabling Mode shall be able to handle temporary interruption of catenary power supply and 1000VAC train heating supply</p>	
<p><i>The Tenderer shall demonstrate compliance by describing management of loss of power and its consequences.</i></p>		
A1:3.5.1.1.f	<p>E It shall be possible to initiate Start-up from Stabling Mode by all of the following ways:</p> <ul style="list-style-type: none"> · Activation by a control onboard the Trainset · Scheduled start · Remotely from the operator's control center 	
<p><i>The Tenderer shall demonstrate compliance by description of Stabling Mode and start-up.</i></p>		

Exhibit A01: General

Id	Requirement	Referring to
A1:3.5.1.1.g	K The required time to prepare a Trainset ready for service after it has been ordered to leave stabling mode shall be less than 30 minutes even when exposed to severe winter condition for unlimited time.	
A1:3.5.1.1.h	E The required time to prepare a Trainset ready for service after it has been ordered to leave stabling mode shall be minimized even when the train has been stabled for more than 12 hours during to severe winter and summer condition. <i>The Tenderer shall demonstrate compliance by stating the start-up time in winter and the start-up time in summer and calculations/assumptions when stating the times.</i>	
A1:3.5.1.1.i	E When in Stabling Mode the Trainset shall be possible to start-up and be moved in less than 15 minutes. <i>The Tenderer shall demonstrate compliance by stating the longest start-up time and the background to the time.</i>	
A1:3.5.1.1.j	E When in Stabling Mode, it shall be possible to transfer data between the Trainset and Wayside (both ways). <i>The Tenderer shall demonstrate compliance by describing the data transfer during Stabling Mode and specifically describe any limitation of data transfer during Stabling Mode.</i>	

3.5.1.2 Standby mode

Id	Requirement	Referring to
A1:3.5.1.2.a	I The purpose of the Standby Mode is to minimize the Energy Consumption when the Trainset is not in passenger service but at the same time ensure that the Trainset can be put back into passenger service quickly. During Standby Mode Driver, maintainer or other personnel can be onboard working. The energy consumption in Standby Mode is included in the LCC.	
A1:3.5.1.2.b	K The temperature in the Trainset shall be between 15 - 30 °C when ready for Service after being in Standby mode.	EN 13129:2016
A1:3.5.1.2.c	E The required time to prepare a Trainset ready for service after it has been in Standby Mode shall be less than 2 minutes. <i>The Tenderer shall demonstrate compliance by stating the time for preparing a Trainset ready for service after Standby Mode and by a description of actions required.</i>	

Exhibit A01: General

3.5.1.3 Other modes

Id	Requirement	Referring to
A1:3.5.1.3.a	<p>K The Normal Operational Mode shall facilitate normal operation of the Trainset.</p> <p><i>The Tenderer shall demonstrate compliance by description of the Normal Operational Mode.</i></p>	
A1:3.5.1.3.b	<p>K The Coupling mode shall facilitate coupling of Trainsets.</p> <p><i>The Tenderer shall demonstrate compliance by description of coupling mode.</i></p>	
A1:3.5.1.3.c	<p>K The Washing mode shall facilitate the exterior washing of the Trainsets.</p> <p><i>The Tenderer shall demonstrate compliance by description of washing mode</i></p>	
A1:3.5.1.3.d	<p>K The driver shall be assisted in keeping a constant, configurable speed of 0.7 km/h in Washing mode.</p> <p><i>The Tenderer shall demonstrate compliance by describing the possibilities to configure the speed during washing mode; including how and when updates can be done.</i></p>	
A1:3.5.1.3.e	<p>K The Cleaning mode shall facilitates the interior cleaning of the train.</p> <p><i>The Tenderer shall demonstrate compliance by describing how the cleaning mode enhances the cleaning of the interior of the trainset.</i></p>	
A1:3.5.1.3.f	<p>K Cleaning mode shall be possible to activate regardless of the type of external power supply.</p>	
A1:3.5.1.3.g	<p>K If no external power supply is provided during Cleaning mode, there shall be a warning and an automatic function to ensure that the batteries are not drained, e.g. with an automatic time out.</p>	

3.5.2 Layout flexibility

Id	Requirement	Referring to
A1:3.5.2.a	<p>E The interior shall be possible to upgrade with other or new functions with a frequency of minimum five years. There shall be provisions in the solution to modify configurations, type of functions and components at a low cost.</p> <p><i>The Supplier shall provide information on their solution.</i></p>	

3.5.3 Train config flexibility

Id	Requirement	Referring to
A1:3.5.3.a	<p>E It shall be possible to reconfigure the trainset between different formations in a safe way.</p> <p><i>The tenderer shall demonstrate compliance by describing the procedure and process to reconfigure the trainset. This shall include aspects of electrical hazards, not intended movements of Trainset or Units and body injury hazards</i></p>	
A1:3.5.3.b	<p>K Individual Unit(s) shall maintain their Unit ID also when external power is not available</p>	
A1:3.5.3.c	<p>K The shortest trainset in single operation shall have a maximum length of 110m, excluding locomotive if locomotive hauled.</p>	
A1:3.5.3.d	<p>K It shall be possible to operate two shortest trainsets in multiple operation. This is not applicable to locomotive hauled trainset</p>	
A1:3.5.3.e	<p>E Technical time for turnaround of the Trainset should be as low as possible.</p> <p><i>Turnaround is equivalent to change direction at station in operation. The tenderer shall demonstrate compliance by in sequence describing the manual and technical steps required from that the Trainset has come to complete stop until it departs in reverse direction. The time required for each steps shall be demonstrated.</i></p>	
A1:3.5.3.f	<p>E It shall be possible to change direction without complete shutdown and restart of trainset/locomotive.</p> <p><i>The tenderer shall demonstrate compliance by in sequence describing the manual and technical steps required from that the Trainset has come to complete stop until it departs in reverse direction. The time required for each steps shall be demonstrated.</i></p>	
A1:3.5.3.g	<p>K It shall be possible to split a trainset into units with a maximum length of 110m to fit workshops.</p>	
A1:3.5.3.h	<p>E It shall be possible to split or connect a trainset from/to 110 m length as quick as possible.</p> <p><i>The tenderer shall demonstrate compliance by in sequence describing the manual and technical steps required from that</i></p> <ul style="list-style-type: none"> - <i>the Trainset has come to complete stop until it is parted and one section is ready for service.</i> - <i>the two train units are parked 10 m apart, at least one is in operating mode, and until the two units are connected and configured into one Trainset and is ready for service.</i> <p><i>The time required for each steps shall be demonstrated.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.5.3.i	<p>E It shall be possible to reconfigure a trainset, i.e. split, insert/remove a Unit and couple, within 30 minutes.</p> <p><i>The tenderer shall demonstrate compliance by in sequence describing the manual and technical steps required from that</i></p> <p><i>- a 220-275 meter Trainset has come to complete stop, one or more Unit are being removed and replaced by one or more Units until the new trainset is reconfigured and ready for service.</i></p> <p><i>The end units of the trainset shall operate as shunting units during the operation and separate shunting assistance is only given to place the new Unit(s) in starting position and removing the replaced Unit(s) from it's parked position.</i></p> <p><i>The time required for each steps shall be demonstrated. The shunting time will depend on actual depot and therefore each shunting movement is for comparison set to zero seconds, each shunting movement shall be visible in the sequence table</i></p>	
A1:3.5.3.j	<p>K It shall be possible to split a Trainset into max 220 meter train length for stabling.</p>	
A1:3.5.3.k	<p>I The scheduled run time for Nordlandbanen Trondheim - Bodö is today 10 hours 15 minutes for night operation. In order to ensure safe operation there must be power and energy enough to maintain train heating and additional travel time in case of unforeseen weather conditions or other incidents/accidents. Therefore the capacity of the trainset shall have a safety margin in operation as well as an emergency capacity</p>	
A1:3.5.3.l	<p>K The bimodal trainset shall have sufficient capacity for Nordlandbanen operation including energy for 12 hours operation plus 3 hours extra for emergency operation</p>	
A1:3.5.3.m	<p>K The bimodal trainset shall supply power for traction and train heating/comfort during operation.</p>	
A1:3.5.3.n	<p>K The bimodal trainset shall supply power for traction and train heating/comfort during standby/stabling when other means of supply are not available.</p>	
A1:3.5.3.o	<p>K The bimodal generator system for the trainset shall supply Electrical energy to all users irrespective of trainset configuration</p>	

Exhibit A01: General

3.5.4 Onboard service

Id	Requirement	Referring to
A1:3.5.4.a	<p>I There is a need for equipment in the train to sustain both emergency situations, as well as normal service and cleaning. Examples of emergency equipment will be defined in the next step.</p> <p><i>This will become a Requirement when the list is specified.</i></p>	
A1:3.5.4.b	<p>I Examples of service and cleaning equipment will be defined in the next step.</p> <p><i>This will become a Requirement when the list is specified.</i></p>	
A1:3.5.4.c	<p>K The interior solution shall provide functions to meet demand. The functions to provide in the trainset are as a minimum:</p> <ul style="list-style-type: none"> - Seating; comfort (1.cl) and regular (2.cl) - Sleeping; at least two different comfort lever'ls shall be provided - Universal Access Toilet and standard toilets - PRM Lifts or ramps - PRM area with access to serving area - Areas for serving hot and cold food, beverages - Area specific for families with children - Area for bicycles, skies, stroller, large luggage - Area for the service personal - Lockers containing service critical inventory 	
A1:3.5.4.d	<p>K The number of entrances in the Trainset shall be minimum four (4) on each side per 110m train length.</p> <p><i>The doors shall preferably be evenly spaced.</i></p>	
A1:3.5.4.e	<p>E Technical time for doors and (as applicable) steps should be as low as possible.</p> <p><i>The tenderer shall demonstrate compliance by in sequence describing the manual and technical steps required to operate the doors and steps from that the Trainset has come to complete stop until it is ready for departure. The time for each sequence shall be declared.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.5.4.f	<p>E Side entrance doors shall be wide enough to easily allow wheelchairs, prams and passengers with bulky luggage to enter or disembark</p>	
	<p><i>The tenderer shall demonstrate compliance by describing the reasoning for the selected door width in relation entering and disembarking passengers</i></p>	
A1:3.5.4.g	<p>E It should be possible for 20% of the total seated passengers of which 50% carry cabin luggage to board or embark from a trainset with 100% seats occupied within a station stop time of 60 seconds.</p>	
	<p><i>Supplier shall verify the exchange time by calculations, using an widely accepted model and method. It is assumed that the boarding/embarking passengers are evenly spaced in the Trainset.</i></p>	
A1:3.5.4.h	<p>I This data shall be used for calculating capacity of fresh water and black water tanks:</p> <p>Toilets</p> <ul style="list-style-type: none"> ·0,2 usage per passenger per hour, usage = 1 flush and 1,5 handwash ·75% of the seating places are occupied <p>Washing facilities inside sleeping compartments</p> <ul style="list-style-type: none"> ·5 handwashes per passenger per night ·75% of the sleeping beds are occupied by passengers 	
A1:3.5.4.i	N.A.	
A1:3.5.4.j	<p>K Filling of freshwater tanks and/or emptying of waste tank shall not be required to be done more often than every second day.</p> <p><i>The supplier shall submit calculation of the required and offered tank volumes for fresh water and waste water, including additional organic waste from the passengers per toilet use and additional waste water from the washing facilities in the sleeping compartments</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.5.4.k	<p>K Additional equipment will be introduced by the operator:</p> <ul style="list-style-type: none"> • Due to the operator’s obligation to compensate for hazards identified in analyses of their operation, equipment reducing possible consequences of accidents may be introduced. • Due to identified aids for reduction of operational consequences of technical errors in the system. (To be supplied by the Contractor) • Spare consumables such as toilet paper, paper towels, etc. will be required. <p>Lockable storage space for all needed winter clothing and other personal belongings for the train crew is mandatory. The Trainset must have enough space for storage of these. Some of the equipment may require charging / power supply.</p>	
A1:3.5.4.l	<p>K All rolling stock shall have suitable, lockable cabinets for crew to store personal belongings and clothing. This includes backpack, bag or small suitcase, winter boots and thick winter outer clothing. Clothing needed for going to and from work in climatic conditions as stated above.</p>	
A1:3.5.4.m	<p>K The driver’s cabin shall be equipped with:</p> <ul style="list-style-type: none"> • Lockable door - door to face the escape direction • Lockable cupboard • Standardization of the driver’s panel and switches according to Norske tog’s existing trainsets • Adjustable driver’s seat • DAB+ receiver • Power outlets 4 x 230V AC and 4 x USB fast charge for charging mobile devices. • Storage space • Crew fridge integrated in a cabinet • Mirror • Space for drivers manuals, A4 format • Adjustable SIFA brake foot pedal • Additional seat for a training instructor • Backup portable lamp to be constantly stationed in charger. (NB: Diode light to find in the dark) • Cup holders in reach from working positions. 	Appendix A2-3

Exhibit A01: General

Id	Requirement	Referring to
A1:3.5.4.n	<p>E To benefit an “as high as possible” passenger capacity the rear driver’s cab shall, if separate crew workspace is not available, be able to function as a workspace for other train staff. This may be combined with the seat for the training instructor but shall give access to a table surface suitable for simple office tasks and shall not be part of the driver’s desk.</p> <p><i>The tenderer shall demonstrate compliance by arguing why or why not the rear driver's cab is needed for crew workspace for the different train configurations.</i></p>	
A1:3.5.4.o	<p>K The crew workspace shall be equipped with:</p> <ul style="list-style-type: none"> • Adjustable seat. • Shelf for chargers and electronic equipment. • Power outlets 4 x 230V AC and 4 x USB fast charge for charging mobile devices. • Space for conductor’s manuals, A4 format. 	
A1:3.5.4.p	<p>K In case that a separate crew compartment is provided, it shall be equipped with:</p> <ul style="list-style-type: none"> - Adjustable seat. - Shelf for chargers and electronic equipment. - Power outlets 4 x 230V AC and 4 x USB fast charge for charging mobile devices. - Space for conductor’s manuals, A4 format. - One small office table, - One office chair, - One rest chair, - One small fridge - One IDU screen for crew to manage the relevant operations of the trainset. 	

3.5.5 Towing

Id	Requirement	Referring to
A1:3.5.5.a	<p>K It shall be possible to tow one trainset with another trainset of same type and size without any restrictions in operation.</p>	
A1:3.5.5.b	<p>E It shall be possible to tow one trainset with any another trainset of same type without any restrictions in operation.</p> <p><i>The Tenderer shall demonstrate compliance by describing any restrictions in operation due to different size in towed and towing Trainset</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.5.5.c	K Each trainset fitted with Automatic couplers shall have a rescue coupling on board by which the Trainset can be hauled by a Vehicle that is fitted with a standard UIC type buffer, draw gear and screw coupling system.	
A1:3.5.5.d	E The rescue coupling shall be possible to handle by two persons and shall be designed to allow rescuing without any speed- or TE/BE-restrictions. <i>The Tenderer shall demonstrate compliance by describing the weight, handling and restrictions, if any, for the coupling. Speed restrictions due to brake faults or other faults on the rescued vehicle should be managed by the Operators Instructions</i>	

3.5.6 Working Environment

Id	Requirement	Referring to
A1:3.5.6.a	K The Trainset shall be designed, operated and maintained in accordance with applicable Norwegian legislation of workers health, including but not limited to Norwegian working environment legislation, executive orders and other publications. <i>The Tenderer shall demonstrate compliance by submitting a description of how the Supplier will work to ensure that all Norwegian health and safety legislation are compiled and addressed as part of the Deliverables.</i>	

3.6 Passenger Experience

3.6.1 General Passenger Experience and missions

Id	Requirement	Referring to
A1:3.6.1.1.a	E The Train and Train layout(s) shall <ul style="list-style-type: none"> · provide high comfort for all passengers in all areas available to passengers and for all intended activities that are foreseen to be conducted by passengers for a journey time of up to 9 hours, with focus on passengers ranging from the 5th percentile of women to the 95th percentile of men, in all regards. · allow for comfort and ease-of-use for passengers, with a body height between 200 cm and 152 cm, when standing, occupying and moving between areas intended for passengers. · ensure that facilities, such a bistro, family, sleeping etc., are located so that the disturbance of one passenger to others are minimized, especially with regards to night train missions. 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.1.b	<p>E The Trainset configuration(s) and layout(s) shall be adapted to the passenger needs and provide an excellent passenger experience for the respective missions.</p> <p>Mission profiles are described in Exhibit A1: Operator Experience chapter 3.5</p>	

3.6.1.2 Flexibility

Id	Requirement	Referring to
A1:3.6.1.2.a	<p>I The trainsets and individual cars must have a high degree of flexibility and modularity in order to meet the needs of NT and different operators. NT or operators may need to adjust the interior of the trainset from time to time in order to meet new traffic, seasonal or other scenarios. The adjustments must be possible to do in a cost and time efficient manner. The supplier shall have at least, but not be limited to, the following possible adjustment scenarios.</p> <ul style="list-style-type: none"> • Seating layout adjustments, e.g. change of seating pitches, change of seating orientation, changing from double seating to single seater. • Compartment adjustments, e.g. change size of first and second class compartments, addition or removal of quiet compartments • Flex area adjustments, e.g. increase or decrease the size of flex area including bicycle space, addition or removal of different flex area fixings e.g. luggage or bicycle holders. • Luggage capacity adjustment, e.g. addition or removal of luggage stacks by removing or replacing with e.g. seating places, addition or removal of luggage racks above e.g. seating places. • Passenger information adjustments, e.g. addition or removal of PIS or other information displays, addition or removal of advertisement space. • Sleeping compartments adjustments, e.g. addition or removal of components e.g. foldable seats and tables, lighting, handrails, waste disposals. • Bistro adjustments, e.g. change of seating layout, change from standard seating to bar table seating, advertisement space 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.2.b	<p>E The trainset interior shall have a modular design and a high degree of flexibility in order to facilitate adjustments to the trainset interior.</p> <p><i>The supplier shall describe the modularity and flexibility of the trainsets interior design. The description shall cover, but not be limited to, the adjustments described in 3.6.1.2.a</i></p> <p><i>Descriptions shall include mounting principles of interior components, how a replacement between interior components done and how the interior finish will be maintained after replacement. For clarity the description could include e.g. assembly drawings, cross section drawings, detailed design renderings.</i></p>	
A1:3.6.1.2.c	<p>E It shall be possible to make adjustment to the trainset interior in a time and cost efficient manner.</p> <p><i>The supplier shall in conjunction to the descriptions in 3.6.1.2.b describe how the trainset is designed to minimize adjustment costs in man-hours and material cost.</i></p>	

3.6.1.3 To feel comfortable

Id	Requirement	Referring to
A1:3.6.1.3.a	<p>I This section addressed comfort aspects and related performance which, if no specific area is stated, are valid for all areas of the Trainset.</p> <p>The Norwegian network contains many tunnels and hence both aural pressure as well a low noise levels in tunnels are significant aspects for Norwegian conditions. The winter in Norway is cold and hence climate comfort in Norwegian winter time is to be considered. Further the sun is standing low during late summer nights as well as in spring and fall and hence the sun load with regards to heat transfer is to be considered.</p> <p>The Covid-19 pandemic has highlighted the need for public transport address any possibility reduce the risk of spread of viruses and bacteria between passengers or to Onboard Personnel and maintenance personnel.</p>	
A1:3.6.1.3.b	<p>K The pressure experienced onboard the Trainset in its longest configuration and maximum Trainset speed when operating through the tunnels on the Norwegian network shall not exceed the values stipulated in annex B.3 in EN-14067-5.</p> <p>This applies to the single-track tunnel case and to the case involving two Trainsets passing in a doubletrack tunnel in a critical crossing situation. Validation shall include running tests at maximum speed in tunnels.</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.3.c	<p>E The pressure experienced onboard the Trainset in its longest configuration and maximum Trainset speed when operating through the tunnels on the Norwegian network shall be lower than the values stipulated in annex B.3 in EN-14067-5.</p> <p>This applies to the single-track tunnel case and to the case involving two Trainsets passing in a doubletrack tunnel in a critical crossing situation. Validation shall include running tests at maximum speed in tunnels.</p>	
A1:3.6.1.3.d	<p>K The interior noise level shall, for all foreseeable operating conditions and with HVAC in operation at maximum cooling power including both fan and compressor running at maximum speed, not exceed:</p> <ul style="list-style-type: none"> - 70 dB(A) in Seating places - 70 dB(A) in Bistro - 68 dB(A) in Sleeping places - 72 dB(A) in Gangways - 72 dB(A) in Vestibules <p>when assessed and measured according to NS EN ISO 3381</p>	
A1:3.6.1.3.e	<p>E The interior noise level shall, for all foreseeable operating conditions and with HVAC in operation at maximum cooling power including both fan and compressor running at maximum speed, be as low as possible in:</p> <ul style="list-style-type: none"> - Seating places - Bistro - Sleeping places - Gangways - Vestibules <p>when assessed and measured according to NS EN ISO 3381</p> <p><i>The Supplier shall state the noise levels (LpAeq,T) in all parts of the Trainset at standstill and at maximum operational speed, with HVAC in operation at maximum cooling power.</i></p>	
A1:3.6.1.3.f	<p>E The interior noise levels shall be as low as possible during operation in tunnels.</p> <p><i>The Supplier shall the noise levels in the areas stipulated in 3.6.1.3.d during operation in typical single track tunnel on the Norwegian network. Furthermore the supplier shall state the Rw-values (dB(A)) for side windows, gangways and exterior doors.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.3.g	<p>E Seated passengers in the Bistro shall as far as possible not be disturbed by noises from the "kitchen" and the "sales area".</p>	
	<p><i>The Supplier shall describe their design solutions on how to reduce noise in the seating area of the bistro and show the effects by e.g. showing the Speech transmission index between seating area of bistro and other areas.</i></p>	
A1:3.6.1.3.h	<p>E Passengers in the Sleeping places shall as far as possible not be disturbed by noises from the adjacent sleeping places or other adjacent facilities</p>	
	<p><i>The Supplier shall describe their design solutions on how to reduce noise in the sleeping places , e.g by specifying sound insulation values on interior panels and doors and demonstrate the effects by e.g. showing the Speech transmission index between adjacent sleeping areas.</i></p>	
A1:3.6.1.3.i	<p>E Passengers shall not be disturbed by noise from the family area.</p>	
	<p><i>The Supplier shall describe their design solutions on how to reduce noise from the family area to other areas of the Trainset.</i></p>	
A1:3.6.1.3.j	<p>E The passengers shall not experience any intermittent or continuous disturbing noise.</p>	
	<p><i>The Supplier shall describe their design on how intermittent or continuous disturbing noise is avoided. The Supplier shall also describe their process of how to mitigate problems with disturbing noises after takeover of vehicles.</i></p>	
A1:3.6.1.3.k	<p>E The passengers shall not be exposed for annoying audible tones at any speeds at open area as well as in tunnels. Annoying tones are defined according to ISO 1996-2:2007 Acoustics - Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels, Annex D</p>	
	<p><i>The Supplier shall describe their design on how annoying audible tones are avoided. The Supplier shall also describe their process of how to mitigate problems with annoying audible tones after takeover of vehicles.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.3.l	<p>K The NMV index according to the mean comfort standard method in EN 12299, shall be in the 'Comfortable' range (< 2.5) on Norwegian track when assessed according to the following conditions:</p> <ul style="list-style-type: none"> - track compliant with maintenance limits 'Vedlikeholdsgrense' in terms of discrete track defects and their standard deviations and for all corresponding track quality K0 to K3 according to Bane NOR Teknisk Regelverk (Overbygning/Vedlikehold/Sporjustering og stabilisering) - wheel/rail combinations up to the maximum allowed equivalent conicity - vehicle load conditions corresponding to operational mass in working order (MVO) and normal operational payload (PNO) according to EN 15663 for a vehicle category M-I - over the complete speed range up to the maximum vehicle speed - up to the maximum cant deficiency of the Trainset <p>Validation tests shall be performed on the Norwegian network</p>	
A1:3.6.1.3.m	<p>E The NMV index according to the mean comfort standard method in EN 12299, shall be as low as possible on Norwegian track when assessed according to the following conditions:</p> <ul style="list-style-type: none"> - track compliant with maintenance limits 'Vedlikeholdsgrense' in terms of discrete track defects and their standard deviations and for all corresponding track quality K0 to K3 according to Bane NOR Teknisk Regelverk (Overbygning/Vedlikehold/Sporjustering og stabilisering) - wheel/rail combinations up to the maximum allowed equivalent conicity - vehicle load conditions corresponding to operational mass in working order (MVO) and normal operational payload (PNO) according to EN 15663 for a vehicle category M-I - over the complete speed range up to the maximum vehicle speed - up to the maximum cant deficiency of the Trainset <p>- Validation tests shall be performed on the Norwegian network</p> <p><i>The Supplier shall submit a calculation/simulation report stating the obtained NMV comfort index including the partial index values (longitudinal, lateral and vertical).</i></p>	
A1:3.6.1.3.n	<p>E There shall be no vibration transfer to seats, backrests, armrests, tables, bistro tables, beds that causes discomfort to the passengers.</p> <p><i>The supplier shall the design solutions to avoid vibration transfers and how it is planned to validate the results. The Supplier shall also describe their process of how to mitigate problems with vibration transfer after takeover of vehicles.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.3.o	<p>E The longitudinal jerk rate shall be as low as possible.</p> <p><i>The Supplier shall submit the offered longitudinal jerk rates occurring under acceleration and braking scenario, from maximum speed until standstill and from standstill until maximum speed, for both low and higher speeds, filtered according to EN 12299, or equivalent.</i></p>	
A1:3.6.1.3.p	<p>I The necessity of keeping the test speed constant within each test zone as prescribed in EN 12299 will be a matter of discussion.</p>	
A1:3.6.1.3.q	<p>K The Trainset shall be fitted with a HVAC systems that complies to NS-EN 13129-1:2016 conformity level C for climatic Zone III (Summer and Winter) and shall be tested according to NS-EN 13129-2:2016.</p>	
A1:3.6.1.3.r	<p>E The Trainset shall be fitted with a HVAC systems that complies to NS-EN 13129-1:2016 with a conformity level higher than level C for climatic Zone III (Summer and Winter).</p> <p><i>The supplier shall, at least, state:</i></p> <ul style="list-style-type: none"> - the maximum horizontal range of the extreme interior air temperatures - the maximum vertical range of the extreme interior air temperatures for seated passengers - the maximum air speeds for seated passengers 	
A1:3.6.1.3.s	<p>E The HVAC system shall fulfill the perceived passenger comfort during all climate conditions and all operating modes including tunnel passage.</p> <p><i>The Supplier shall describe their solution in detail and as a minimum include the following:</i></p> <ul style="list-style-type: none"> -how cold air draught from windows is avoided during heat distribution -how to avoid bad smell getting into passenger areas from toilets, showers and bistro areas -how to individually adjust the temperature inside a single compartment -if and how the supply air flow can be individually adjusted inside a single compartment 	
A1:3.6.1.3.t	<p>E The design of the HVAC system shall be designed so that it minimizes the spread of virus and other airborne contagious materials.</p> <p><i>The Supplier shall describe its solutions to minimize the spread of virus, with special focus on fresh air management.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.3.u	<p>E The design of the HVAC system shall be designed so that it minimizes the spread of allergens between different section of the Trainset.</p> <p><i>The Supplier shall describe its solutions to minimize the spread of allergens.</i></p>	

3.6.1.4 Separation and interior doors

Id	Requirement	Referring to
A1:3.6.1.4.a	<p>E Passengers, when seated, shall not be exposed to draft, snow, rain or temperature differences from the vestibule.</p> <p><i>Tender to describe how passengers are protected to draft, snow, rain or temperature differences from the vestibule.</i></p>	
A1:3.6.1.4.b	<p>E Passengers seated in Comfort Seating Places or Recliner Seating Places shall have a sense of separation and noise separation from other areas within the Trainset including seating areas and vestibules.</p> <p><i>Tender to describe how Passengers seated in Recliner seats (1st class) will have a sense of separation and noise separated from other seating areas.</i></p>	
A1:3.6.1.4.c	<p>E All seating areas shall have a sense of separation towards other areas of the Trainset including baggage facilities, flex areas, catering areas and vestibules</p> <p><i>Tender to describe how passengers in all seating places will have a sense of separation towards, baggage stacks, flex areas, catering areas, and vestibules</i></p>	
A1:3.6.1.4.d	<p>E All interior doors through which passengers shall pass for longitudinal movements in the Trainset, shall be automatically operated and easily activated, also when carrying baggage.</p> <p><i>Tender to describe solution functionality of automatic interior door opening.</i></p>	
A1:3.6.1.4.e	<p>E The normal position of interior doors shall be selectable as "open" or "closed".</p>	
A1:3.6.1.4.f	<p>E All internal door designs shall ensure there is no risk of injury due to pinching as well as due to pressure waves or changes in Trainset speed or direction.</p>	

3.6.1.5 To be secure and safe

Id	Requirement	Referring to
A1:3.6.1.5.a	<p>E The passenger experience shall provide a high level of security and a feeling of security by for example allow control of personal belongings and facilitating high level of visibility and openness</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.1.5.b	E The Trainset shall be designed to provide a low risk of passenger getting injured, such as avoidance of sharp edges corners and shapes, no trip hazards etc. and including injuries in a collision caused by lose object like baggage being thrown around shall be avoided.	

3.6.1.6 To manage waste

Id	Requirement	Referring to
A1:3.6.1.6.a	K There shall be built-in waste disposal facilities with a volume of at least <ul style="list-style-type: none"> • X(waste) liters in each, or close to each vestibule. X(waste) is calculated as: $X(\text{waste}) = N \times 1,0 \text{ liters} \div \text{Number of vestibules in the Trainset}$ $N = \text{Number of seating places plus number of sleeping beds within one Trainset.}$ <p>All waste shall be collected in disposable bags.</p> <p>E.g. a Trainset with 300 seating places/sleeping places and six vestibules will have a waste capacity of 50 liters in each vestibule</p>	
A1:3.6.1.6.b	E The waste facilities shall provide: <ul style="list-style-type: none"> - Larger volumes than those stipulated in 3.6.1.6.a - Solution for waste separation in three fractions - User friendly solution that makes it possible to dispose waste without contact with dirty surfaces or waste from other passengers - Easy cleaning and replacing of waste bags - No leak of liquids from waste. - Smell or visible waste shall not be exposed to passengers, e.g. have a lid <div style="background-color: #f0f0f0; padding: 5px;"> <p><i>Tender shall describe;</i></p> <ul style="list-style-type: none"> - design and size of waster facility - separation of waste - functionality - cleaning - leakage protection - labeling of the waste facility. </div>	

Exhibit A01: General

3.6.1.7 Outlets

Id	Requirement	Referring to
A1:3.6.1.7.a	<p>K Standard 230V 50 Hz sockets fed by the Trainset's converter shall be minimum fitted in the following places:</p> <ul style="list-style-type: none"> • By the entrance vestibule • In the driver's cab • By places or storage rooms for the conductor • In main technical cabinets • By passenger seats • In inventory cabinets 	
A1:3.6.1.7.d	<p>K In vestibules the outlets shall both be protected by a shutter within the socket for child safety, and by an external flap to prevent water ingress.</p>	
A1:3.6.1.7.f	<p>K 230V Outlets situated in seating areas and vestibules shall be protected by a shutter within the socket for child safety.</p>	
A1:3.6.1.7.g	<p>E Each seated passengers shall have easy access to;</p> <ul style="list-style-type: none"> -At least one (1) 230V outlet, easy accessible without disturbing nearby passengers, with a power rating suitable to charge a laptop - One (1) USB charging outlet, easy accessible without disturbing nearby passengers - The USB sockets should be equipped with the latest generation Quick Charge technology. <p><i>Tender to confirm and describe that the passengers have;</i></p> <ul style="list-style-type: none"> -At least one 230V outlet, easy accessible without disturbing nearby passengers, with a power rating suitable to charge a laptop - One USB charging outlet, easy accessible without disturbing nearby passengers - The USB sockets should be equipped with the latest generation Quick Charge technology. <p><i>The position of the outlets shall also be described.</i></p>	

3.6.2 Design Experience

Id	Requirement	Referring to
A1:3.6.2.a	<p>I This section addresses the overall deign experience of the Trainset from a passenger and operator perspective</p>	

Exhibit A01: General

3.6.2.1 Interior experience

Id	Requirement	Referring to
A1:3.6.2.1.a	E The interior design shall contribute to a calm and inviting atmosphere. All design elements shall be well integrated and have a coherent design language with high attention to details, high quality materials, finishes and a well-balanced color setting. The windows shall be maximized to let a lot of daylight in, enhancing the expression of light and space. Visible fasteners shall be kept to a minimum.	

3.6.2.2 Exterior experience

Id	Requirement	Referring to
A1:3.6.2.2.a	E The exterior shall be perceived as modern, yet timeless, with a form language that expresses simplicity and coherency where high attention is paid on detailing and surface finishes.	

3.6.2.3 Lighting experience

Id	Requirement	Referring to
A1:3.6.2.3.a	E The lighting concept shall interact with the interior, be varied, depending on function, and contribute to a harmonious and welcoming experience of the different areas of the Trainset. It shall be possible to switch between different modes of light, e.g. increased light for paying attention to the passengers when arriving to a station, or during cleaning, down to a light that is dimmed to a very low level for creating the night mode in the seating or sleeping areas. It shall be possible to set both the intensity and color temperature of the light.	

3.6.2.4 Scenic experience

Id	Requirement	Referring to
A1:3.6.2.4.a	I For an everyday commuter, efficiency and comfort count the most, but for the groups of leisure travelers and tourists, the travel experience itself can be an important part of the adventure. Norway's fantastic landscape offers magical views along many different Trainset routes and there are great opportunities to offer travelers high-class "Nature cinema" from the Trainset. The memory of the amazing journey would be retold and inspire more to experience the same thing. The design of the Trainset can also arouse curiosity and photos will be shared and spread. A Trainset with extraordinary windows, perhaps a panoramic car, becomes an advertising pillar in itself.	
A1:3.6.2.4.b	E There shall be areas in the Trainset where passengers will be offered extra good views of the landscape and good conditions for taking pictures through the windows. The car/-s that offer extraordinary views should express this through their design, for example, panoramic windows that become eyecatchers also from the outside.	

Exhibit A01: General

3.6.2.5 Branding experience

Id	Requirement	Referring to
A1:3.6.2.5.a	E It shall be possible for different operators to express their brand in the exterior through their own livery and in the interior, through for example foiling end walls, interior color scheme, fabric and carpet/flooring.	

3.6.3 Universal Design

Id	Requirement	Referring to
	I It is considered an important feature that the vehicle makes it easy and safe for all passengers to travel. All aspects of all services and functions for passengers are part of what should be considered regarding universal design. All categories of reduced mobility or other special needs must be considered. Only functions implemented solely as universal design functions are presented in this section, however ease of use and accessibility for all other functions and facilities of the Trainset are to be a natural part of the design for those required or offered functions, e.g. a lack of ease of use or accessibility for one or more user group will affect the evaluation of the function. Norm requirements, such as TSI-PRM are applicable to entire vehicle. Note: Braille letters are different in different countries.	
A1:3.6.3.1.a	E The Trainset shall provide a high level of accessibility and efficiency for all passenger types and all activities and functions related to the Trainset. <i>The Supplier shall as part of each functional description of facilities and functions intended for passengers describe how the design supports high accessibility and efficient use. For solutions that will not be finalized before the design period the quality level that has been considered as bases for the cost calculations should be stated.</i>	
A1:3.6.3.1.b	E The Trainset shall aid transfer of information to passengers with reduced awareness, such as reduced visually or audibly impaired passengers <i>The Supplier shall describe how the Trainset supports visually or audibly impaired passengers to get access to information</i>	
A1:3.6.3.1.c	K All operation buttons, or similar, intended to be used by passengers shall have braille and/or tactile information and instructions	
A1:3.6.3.1.d	K Information signs, layouts or similar used for guiding or informing passengers shall have braille information	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.3.1.e	E The Trainset shall have standardized logical and easy to access placement of braille placards to support efficient communication with visually impaired passengers	
A1:3.6.3.1.f	K All braille information shall be available in both Norwegian and English	
A1:3.6.3.1.g	E The floor shall be equipped with tactile information alerting for steps, ramps and exits by means of structuring of the flooring.	
A1:3.6.3.1.h	E Use of colours for guidance and information shall fulfill ISO 7010. The colours shall be defined together with NT.	

3.6.4 To board and alight

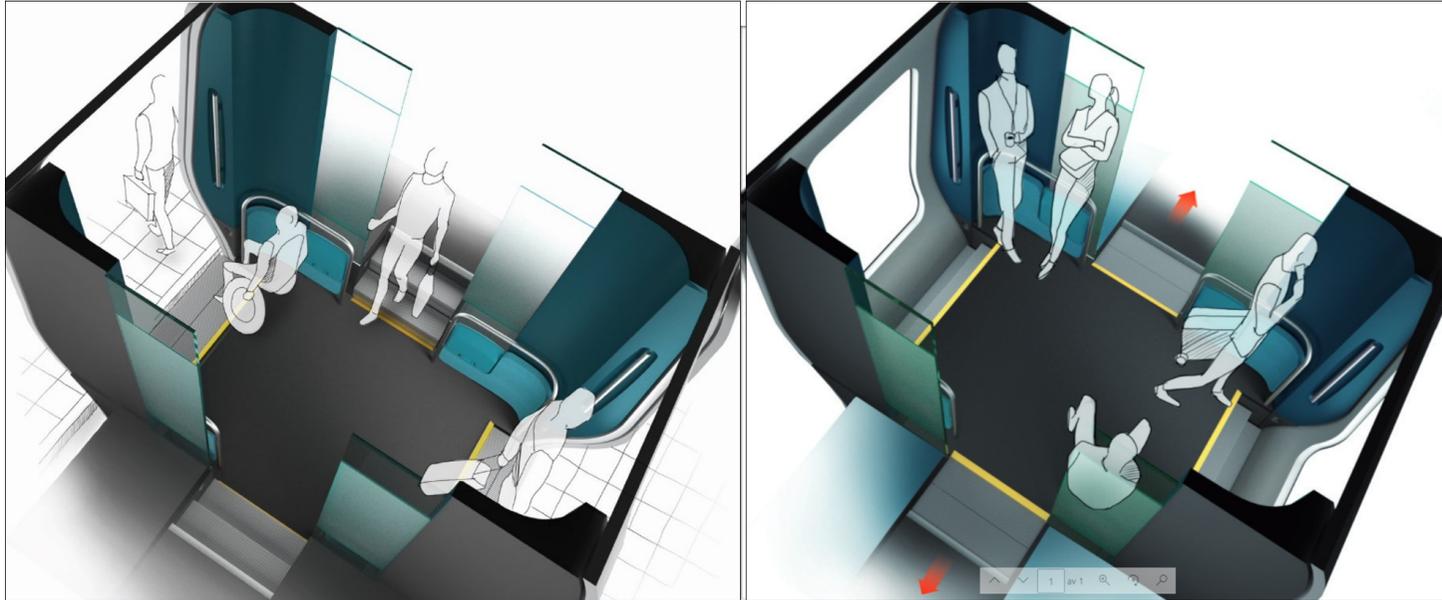
Id	Requirement	Referring to
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Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.4.a	<p>I It is considered an important feature that the vehicle makes it easy and safe for all passengers to get on and off the vehicle on all stations and in all light and weather conditions. Furthermore, the time needed to get people on and off at on route stops is short is also important, and a generous door width allowing passage while carrying suitcases in both hands should be foreseen.</p> <p>An entrance that allows wheelchairs access from different height platforms without assistance from staff have been wished by wheelchair users. To achieve this a solution based on a system placed on the inside may be implemented. Entrance heights must be seen in relation to possible height differences internally in the vehicle to provide an overall accessible and easy to use vehicle.</p> <p>The following conceptual idea provides an example of how a wheelchair user can board and alight without assistance from staff and providing access to many onboard facilities, while at the same time the vestibule area doesn't become an obstacle for passengers moving around inside the vehicle during a journey:</p> <p>A coach with the coach-body that in the lower part is at the maximum of the allowable gauge, doors with increased height, and the floor in the entrance area mounted on a lifting mechanism. Sliding step integrated in the height adjustable floor (HAF). Boundaries of the HAF resembling escalators allowing safe height adjustments while passengers are in the area. Adapting ramp or steps bridging the height difference between the general floor height and the HAF. The intended function is that this entrance is programmed to adapt to the oncoming stations platform height prior to arrival. If a wheelchair user is planning to leave, he can push a button to control adjustment function until positioned on the HAF.</p>	

Exhibit A01: General

Id	Requirement	Referring to
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Example of one type of HAF solution in "at station" and "at journey" position.

A1:3.6.4.b

- E** The Trainset shall
 - provide easy and safe access for all user (as defined in XX) in all types of environment(as defined in XY)
 - allow all user (as defined in XX) to board and alight without assistance from staff or other passenger.

The supplier shall describe the offered vestibule and side entrance system, including any boarding aids and with all considered aspects presented.

How and to what extent the different functional and detailed requirements are met should be part of this description.

For solutions that will not be finalized before the design period the quality level that has been considered as bases for the cost calculations should be stated.

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.4.c	<p>E The Trainset shall provide stepless access from 760 mm platform for at least one side entrance to facilitate easy access for passengers with bikes, prams or bulky luggage</p>	
A1:3.6.4.d	<p>E Floor covering in the vestibules, stairs, passage areas and multifunctional areas shall:</p> <ul style="list-style-type: none"> · provide a secure boarding and alighting, with low risk of passengers slipping in wet and winter conditions and without trip hazards · reduce the amount of dirt, water/snow and gravel being carried, by the passengers, from the vestibule to the seating areas · have a design that appears clean for the passengers, e.g. does not appear as dirty, wet or having wear 	
A1:3.6.4.e	<p>K Access to all vestibules from all platform heights between 350 mm and 760 mm above TOR shall be according to TSI PRM.</p>	
A1:3.6.4.f	<p>E The distance from a seat or sleeping bed to the closest vestibule shall be short and not exceed approximately 14 m.</p>	
A1:3.6.4.g	<p>K The width of the exterior door shall support boarding and alighting of passengers with luggage, bulky luggage, prams and bikes and not be more narrow than approximately 900 mm.</p>	
A1:3.6.4.h	<p>M Wheelchair access in accordance with TSI-PRM shall be possible from all platform heights between 300 and 760.</p>	
A1:3.6.4.i	<p>E Wheelchair access without need for assistance from personnel or other assistance shall be possible from all platform heights between 300 and 760.</p> <p><i>The supplier shall describe how a wheelchair users boards the Trainset and if any assistance is needed</i></p>	
A1:3.6.4.k	<p>E The Trainset shall be equipped with efficient solutions, suited for carts, bikes and small cargo, for loading and unloading supplies and cargo in connection with catering and cargo areas.</p> <p><i>A description of the offered solutions for loading and unloading cargo and catering areas with all considered aspects should be presented.</i></p> <p><i>For solutions that will not be finalized before the design period the quality level that has been considered as bases for the cost calculations should be stated</i></p>	

Exhibit A01: General

3.6.5 To be guided and informed

Id	Requirement	Referring to
A1:3.6.5.a	<p>K The Trainsets shall be equipped with an inductive loop or equivalent communication solution with the equivalent level of accessibility as an inductive loop, to provide hearing assistance to hearing-aid users. The communication solution shall be available in all passenger areas.</p> <p><i>The Tenderer shall demonstrate compliance by demonstrating the inductive loop and coverage within the Trainset.</i></p>	
A1:3.6.5.b	<p>E The spoken information shall have a minimum STI-PA level of 0.60 for all relevant operating conditions (e.g. with few/many passengers, inside/outside of tunnels, etc.) for the Trainset, in accordance with the specification in NEK IEC 60268-16:2011.</p> <p><i>The Tenderer shall demonstrate compliance by stating the minimum STI-PA level and detail how the solution addresses different background noise levels across the Trainset.</i></p>	NEK IEC 60268-16:2011
A1:3.6.5.c	<p>E It shall be possible to customize the colors, background, and layout, etc. of the information screens/display to support the need of different Train Operators and their design program. The customization shall be possible to install from the Wayside. It shall be possible for Norske Tog or the Train Operator to do this without support from the Contractor.</p> <p><i>The Tenderer shall demonstrate compliance by delivering examples of possible customizations, how these relates to the TSI PRM and the procedure for installation.</i></p>	TSI PRM
A1:3.6.5.d	<p>E There shall be at least one external side display visible for passenger located close to each exterior door.</p>	
A1:3.6.5.e	<p>E The external side displays shall be sized such that at least the following information can be shown:</p> <ul style="list-style-type: none"> • Coach number • Line number • Destination • Coach information (like 1. zone, class/2. class etc. or similar) • Possibility to show stops along the route, e.g. "via Asker, Drammen" <p><i>The Tenderer shall demonstrate compliance by describing the visual concepts for the information on the displays.</i></p>	
A1:3.6.5.f	<p>E There shall be one front display on each end of the Trainset.</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.5.g	<p>E The external front displays shall be sized such that at least the following information can be shown without using scrolling text:</p> <ul style="list-style-type: none"> • Line number • Destination 	
	<p><i>The Tenderer shall demonstrate compliance by describing the visual concepts for the information on the displays.</i></p>	
A1:3.6.5.h	<p>E The Trainset shall have strategically placed and sized internal displays that have the possibility to provide the passengers with, but not limited to, the following information:</p> <ul style="list-style-type: none"> • Information to guide the passenger when arriving at the station, visible at the same time • Information to guide the passenger during the journey, e.g. next stop • Information to guide the passenger within the Train • Status of Train facilities such as lavatories, bistro etc. • Onward or connection information based on location as available 	
	<p><i>The Tenderer shall demonstrate compliance by describing the visual concepts for the information on the screens.</i></p>	
A1:3.6.5.j	<p>E The passengers shall be informed of the service type and destination from outside and inside the Trainset.</p>	
	<p><i>The Tenderer shall demonstrate compliance by describing using images/demonstrations how the passengers will be informed about service type as well as destination, including multiple destinations on the same Trainset.</i></p>	
A1:3.6.5.k	<p>E The passengers with reservation for seat or sleeping beds shall be guided all the way from the platform to the reserved seat. Seat numbering shall be clearly visible for passengers in the aisle.</p>	
	<p><i>The Tenderer shall demonstrate compliance by describing how the passenger information will function, how the different service types will be marked, Coach numbering and guidance through the Trainset including location of the display.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.5.l	<p>E The passengers without reservation for seat or sleeping beds shall be guided to the right Coach and the area with free seats or sleeping beds onboard.</p> <p><i>The Tenderer shall demonstrate compliance by describing how the passenger information will function, how the different service types will be marked, Coach numbering and guidance through the Trainset including location of the display.</i></p>	
A1:3.6.5.m	<p>E The passengers shall be informed what each compartment within every coach is designated for. Both from outside and inside of the compartment and from the outside of the Trainset.</p> <p><i>The Tenderer shall demonstrate compliance by describing how the passenger information supports the Coach Configuraiton System (CCS).</i></p>	
A1:3.6.5.n	<p>E The passengers shall be informed with journey data showing both the current location and arrival times at all stations that the Trainset will stop at.</p> <p><i>The Tenderer shall demonstrate compliance by describing the solution and how many passengers see the displays from their seat.</i></p>	
A1:3.6.5.o	<p>E In case of disruptions, timetable changes and delays, the passengers shall be informed of both the planned and updated journey data.</p> <p><i>The Tenderer shall demonstrate compliance by describing how the system avoids any delay in informing the passengers when there are disruptions to the current journey as well as give enough information for onward planning.</i></p>	
A1:3.6.5.p	<p>K The passengers shall be informed when the Trainsets in multiple are about to decouple and which part of the Trainset will continue to which destination.</p>	
A1:3.6.5.q	<p>E The passengers should be guided to the right part of the Trainset irrespective if the Trainsets decouples or couples during the journey.</p> <p><i>The Tenderer shall demonstrate compliance by describing the solution in particular how the solution handles different destinations on the same Trainset.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.5.r	<p>E The passengers should be informed about connecting services before arriving at the stations.</p> <p><i>The Tenderer shall demonstrate compliance by demonstrating how the system can visualize connecting data coming from an external source.</i></p>	
A1:3.6.5.s	<p>E If Trainsets are in multiple and the platform is shorter than the Trainset, the passengers in coaches where disembarking will not be possible shall be informed so they can move to to a coach where disembarking is possible.</p> <p><i>The Tenderer shall demonstrate compliance by describing their solution to this requirement, highlighting the information procedure and providing examples of how the passengers will be informed.</i></p>	Exhibit A2: 12.2.3
A1:3.6.5.t	<p>E The passengers shall be informed of where nearest bistro and free lavatories are located</p>	

3.6.6 To move around

Id	Requirement	Referring to
A1:3.6.6.1.a	<p>I It is considered an important feature that the vehicle makes it easy, efficient and secure for all types of passengers to move around, considering also all categories of reduced mobility.</p> <p>In a train design it is important to balance between ease of moving around and ease of boarding and alighting. In general vehicles for longer distances have a balance that prioritizes easy of moving around as opposed to moving in and out of the vehicle. However, in areas of a train where few people pass and/or in areas dedicated for bikes, prams an internal height difference that provides easy boarding may be overall beneficial for the passengers, whilst in areas with a higher flow of passengers moving around, a level floor with steps for boarding and alighting may be overall beneficial for the passengers.</p> <p>It is Norske Togs experience that internal height differences managed with ramps, rather than steps, normally provides easier and more secure movement within the train, however many ramps, steep ramps or steps hinders efficient and easy movement.</p>	
A1:3.6.6.1.b	<p>E The Trainset shall provide easy, efficient and secure movement inside the Trainset with a low overall number and height of steps/ramps to be passed during a typical passenger journey.</p> <p><i>The supplier shall clearly show all clearways in the Trainset including, but not limited to, height changes if any, length and slope of any ramps, height and number of steps of stairs if any and width.</i></p>	
A1:3.6.6.1.c	<p>K The catering area shall be accessible for wheelchair users</p>	
A1:3.6.6.1.d	<p>E Steps shall have a balance between height and depth of steps that give a normal walking rhythm</p>	

Exhibit A01: General

3.6.7 To manage baggage and special baggage

3.6.7.1 Baggage

Id	Requirement	Referring to
A1:3.6.7.1.a	<p>E The baggage capacity shall be evenly distributed and easily accessible throughout the trainset. E.g., each car shall be fitted with overhead baggage racks and baggage stacks, or other facilities to cover the need for its passengers.</p> <p><i>The tender to describe and provided layouts of overhead baggage racks and baggage stacks, or other facilities to cover the need for its passengers.</i></p>	
A1:3.6.7.1.b	<p>E The Trainset shall have a high and flexible capacity for baggage to facilitate suitcases, large backpacks, cabin bags, other bags and longer objects.</p> <p><i>Tender to describe the functionality and the capacity of the baggage stacks and over head baggage racks.</i></p>	
A1:3.6.7.1.c	<p>K The Trainset shall have baggage capacity to facilitate that</p> <ul style="list-style-type: none"> • 30% of the passengers carries a suitcase with the size of min 65x85x35 cm • 70% of the passengers carries a cabin bag with the size of min. 55x45x25 cm. <p><i>Tender to describe capacity of the overhead baggage racks and baggage stacks, or other facilities to cover the need for its passengers together with the main dimensions.</i></p>	
A1:3.6.7.1.d	<p>E Baggage placed in baggage facilities, including baggage stacks and overhead baggage racks, shall ensure passengers a control of personal belongings, by e.g. being visible from the seating place.</p> <p><i>Tender to describe how passengers who has baggage placed in baggage facilities, including baggage stacks and overhead baggage racks, will be ensured with a form of control of their personal belongings, by e.g. being visible from the seating place.</i></p>	
A1:3.6.7.1.e	<p>E Any catching of straps or similar when unloading baggage shall be avoided.</p> <p><i>Tender to describe how the design of the baggage facilities and overhead baggage racks prevents catching of straps or similar.</i></p>	
A1:3.6.7.1.f	<p>E There shall be baggage facilities in each car that can accommodate longer objects such as skis and bulky baggage such as a very large suitcase, a folded pram and sledges for cross country skiing</p> <p><i>Tender to describe how, and which of, the baggage facilities can accommodate longer objects like skies and bulky baggage such as a very large suitcase or a folded pram.</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.7.1.g	<p>E Baggage facilities, including baggage stacks shall have a depth allowing large suitcases to be stored with the short side outboard without any risk of falling out or suitcases interfering with the aisle.</p> <p><i>The tender to describe and provided layouts of baggage stacks or other facilities that the depth allow large suitcases to be stored with the short side outboard without risk to fall out.</i></p>	
A1:3.6.7.1.h	<p>E The baggage facilities shall allow for efficient handling of baggage such as avoiding any stacking of baggage.</p> <p><i>Tender to describe how an efficient handling of baggage is achieved such as avoiding any stacking of baggage.</i></p>	
A1:3.6.7.1.i	<p>E Baggage facilities, for large suitcases, skis and large back packs, shall be fitted with a locking possibility e.g. provide a possibility to use private pad locks.</p> <p><i>Tender to describe the locking solution for large suitcases, skies and large back packs placed in the baggage facilities.</i></p>	
A1:3.6.7.1.j	<p>E All seating places shall have access to overhead baggage racks</p> <p><i>Tender to describe, including a layout, that all seating places have access to an overhead baggage rack.</i></p>	
A1:3.6.7.1.k	<p>E The overhead baggage racks shall be deep enough that a standard cabin bag, with the size of 25x55x45 cm, can be stored without protruding out of, or falling from the rack.</p> <p><i>Tender to describe including dimensions that the overhead racks can facilitate standard cabin bag, with the size of 25x55x45 cm, and be stored without protruding out of, or falling from the rack.</i></p>	
A1:3.6.7.1.l	<p>E No dripping from wet baggage or from melting snow are allowed down on the seating places.</p> <p><i>Tender to describe how dripping from wet baggage or from melting snow are prevented from falling down on the seating places.</i></p>	

Exhibit A01: General

3.6.7.2 Flex area

Id	Requirement	Referring to
A1:3.6.7.2.a	<p>E The flex areas shall</p> <ul style="list-style-type: none"> - be adjacent to a vestibule with easy access for passengers with bicycles, prams, bulky baggage, and walking frames. - not disturb seated passengers by e.g. passengers loading/unloading e.g., bicycles/prams. - provide space for bicycles and prams without obstruction of the aisle. <p><i>Tender to describe and provide layout of the flex area how it will;</i></p> <ul style="list-style-type: none"> - be adjacent to a vestibule with easy access for passengers with bicycles, prams, bulky baggage, and walking frames. - not disturb seated passengers by e.g. passengers loading/unloading e.g., bicycles/prams. - provide space for bicycles and prams without obstruction of the aisle. 	
A1:3.6.7.2.b	<p>K The Trainset shall have the possibility to store 6 bicycles with a length of 1800mm.</p>	
A1:3.6.7.2.c	<p>E Each flex area for shall have a capacity to containing minimum 6 bicycles with a length of 1800mm, or minimum 6 prams with a size of 1000x600mm as well as a combination of bicycles and prams shall be possible. One flex areas can be divided into two sections on opposite side of the aisle.</p> <p><i>Tender to describe and provide layout of the flex area and it's capacity to contain minimum 6 bicycles with a length of 1800mm, or minimum 6 prams with a size of 1000x600mm. Tender shall also describe how bicycles and prams can be mixed.</i></p>	
A1:3.6.7.2.d	<p>E Flex areas shall be evenly distributed over the length of a Trainset .</p> <p><i>Tender to provide layout drawing showing that flex areas (if more that one) are evenly distributed throughout the Trainset.</i></p>	
A1:3.6.7.2.e	<p>E The flex area shall provide a stabile and secure fixation solution for special baggage including both bicycles and prams.</p> <p><i>Tender to describe fixation of bicycles and prams</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.7.2.f	<p>E The flex areas shall, if possible without negative impact on handling of baggage and or passenger exchange and accessibility, be equipped with foldable seats suitable for short distance travels, as well as for passengers waiting to arrive at destination.</p>	
<p><i>Tender to describe the folding seat design and provided layout showing the seats, including seat dimensions and position in flex area.</i></p>		
A1:3.6.7.2.g	<p>E There shall be a possibility to charge electrical bicycles, laptops, and phones with minimum two (2) easily reachable 230V outlets in each flex area.</p>	
<p><i>Tender to describe outlets and charging possibilities in the flex area together with their positions.</i></p>		

3.6.8 To be seated

3.6.8.1 General

Id	Requirement	Referring to
A1:3.6.8.1.a	<p>E Seat elements as surface material/fabric, foam pads, armrest and tables shall be easy to replace.</p>	
<p><i>Tender to describe how Seat elements as surface material/fabric, foam pads, armrest and tables can easy be replace together with estimated time.</i></p>		
A1:3.6.8.1.b	<p>E The seats shall be designed with focus on easy cleaning. Dirt traps and narrow openings inviting passengers to slip in used tickets etc. should be avoided. Seat fastenings and table stands shall far as possible not restrict floor cleaning.</p>	
<p><i>Tender to describe how the seat, and floor around the seat, easily can be cleaned and if there are any dirt traps or narrow openings that might prevent efficient cleaning.</i></p>		
A1:3.6.8.1.c	<p>E Textiles for passenger seats and folding seats shall have a high level of wear resistance with a minimum of at least 75,000 cycles Martindale</p> <ul style="list-style-type: none"> · with no more than two yarns broken and a maximum weight loss of 4% as average of three samples and · a maximum weight loss of 6% in any sample. <p>Tested according to EN ISO 12947, or equivalent.</p>	
<p><i>Tender to describe material and if at least 75,000 cycles Martindale is achieved,</i></p> <ul style="list-style-type: none"> · with no more than two yarns broken and a maximum weight loss of 4% as average of three samples and · a maximum weight loss of 6% in any sample. <p><i>Tested according to EN ISO 12947, or equivalent.</i></p>		

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.1.d	<p>E All types of passenger seats shall be designed to ensure a long-term perceived level of comfort and quality by being robust and withstanding a high level of wear from normal use such as:</p> <ul style="list-style-type: none"> · passengers handling luggage · marks from shoes · passengers stepping on them to reach overhead luggage racks · passengers touching and holding interiors with their hands · passengers with sharp object in the back pockets, such as keys, being seated <p><i>Tender to describe how the passenger seats are designed to ensure long-term perceived level of comfort and quality by being robust and withstanding a high level of wear from normal use such as:</i></p> <ul style="list-style-type: none"> · passengers handling luggage · marks from shoes · passengers stepping on them to reach overhead luggage racks · passengers touching and holding interiors with their hands · passengers with sharp object in the back pockets, such as keys, being seated 	
A1:3.6.8.1.e	<p>E Recliner, Comfort and Regular Seating Places shall fulfil at least the following:</p> <ul style="list-style-type: none"> · Have a seating height of 430-460 mm · Be faced in, or opposite to, the direction of travel · Provide head room according to "priority seat" in TSI PRM · Not experience discomfort due to protruding element within the seating place and leg area · Have access to armrests on both sides · Have space for hand luggage visible from and in direct connection to the seat · Have a direct view to the outside through a window next to the seat <p><i>Tender to describe how seat seating places will fulfill the requirement regarding;</i></p> <ul style="list-style-type: none"> · Seating height of 430-460 mm · Be faced in, or opposite to, the direction of travel · Provide head room according to "priority seat" in TSI PRM · Not experience discomfort due to protruding element within the seating place and leg area · Have access to armrests on both sides · Have space for hand luggage visible from and in direct connection to the seat · Have a direct view to the outside through a window next to the seat 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.1.f	<p>K The Supplier shall offer three (3) different passenger seats for Comfort and Regular seats.</p> <p>The Supplier shall offer minimum two (2) different Recliner passenger seats.</p> <p>All seat offered shall include integration to the Trainset.</p> <p>Norske Tog will decide which of the offered seats that shall be used as part of the Design Phase</p> <p><i>Tender to state types (name) and supplier of proposed seats and integration to the Trainset.</i></p>	
A1:3.6.8.1.g	<p>K All types of seats shall fulfill UIC 566 and ISO 10326-2.</p> <p><i>Any deviations from UIC 566 and ISO 10326-2 shall be stated</i></p>	
A1:3.6.8.1.h	<p>E The seats shall be designed with a focus on their behavior in collisions and derailment scenarios and must contribute to reduced potential for injuries to the people inside the Trainset.</p>	
A1:3.6.8.1.i	<p>E Mechanisms for personal adjustments of the seats, tip-up seat mechanisms and similar shall not cause any risk to the person operating the mechanism or to other passengers.</p> <p><i>Tender to describe how the mechanisms for personal adjustments of the seats, tip-up seat mechanisms and similar are designed not to cause any risk to the person operating the mechanism or to other passengers. Special attention must be paid to areas where a child may put a hand or other parts of the body that may not be visible by the passenger adjusting or operating the seat</i></p>	
A1:3.6.8.1.j	<p>K All wheelchair places shall have a " tip-back support" / fixing possibility.</p> <p><i>Tender to describe the "tip-back support" solution.</i></p>	

3.6.8.2 Layout

Id	Requirement	Referring to
A1:3.6.8.2.a	<p>K 2 levels of seat types (comfort levels) shall be offered to passengers. Those are:</p> <ul style="list-style-type: none"> - Recliner seats - Regular seats <p>For definition of seat types, se separate requirements.</p>	
A1:3.6.8.2.b	<p>E Vis-a-vis seating for Comfort and Regular seating shall be minimized.</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.2.c	<p>E The seat layout shall:</p> <ul style="list-style-type: none"> - Allow passenger an easy access to the seating place - Allow for maximum number of comfortable seats 	
	<p><i>Tender to describe layout, both in form of a description as well on a drawing layout. Furthermore, shall tender describe how an easy access to seating place is insured.</i></p>	
A1:3.6.8.2.d	<p>E 3 levels of seat types (comfort levels) shall be offered to passengers. Those are:</p> <ul style="list-style-type: none"> - Recliner seats - Comfort seats - Regular seats <p>For definition of seat types, se separate requirements.</p>	

Exhibit A01: General

3.6.8.3 Features

Id	Requirement	Referring to
A1:3.6.8.3.a	<p>E All seating places shall be equipped with or provide easy to use highly comfortable features including, but not limited to:</p> <ul style="list-style-type: none"> - A Cupholder that can be accessed when working with a stipulated Laptop size. - Reclining - Armrests on both sides - Table for work, reading/watching movies and eating - Coat hanger - Magazine holder - Waste disposal bag - Individually controllable reading light - Grab handle on seat back that does not having a negative effect on the seated passenger when used. · Have the possibility to block sunlight in order to avoid direct sunlight and retain comfortable levels of temperature and light <p><i>Tender to describe availability and design of required features as;</i></p> <ul style="list-style-type: none"> - A Cupholder that can be accessed when working with a stipulated Laptop size. - Reclining - Armrests on both sides - Table for work, reading/watching movies and eating - Coat hanger - Magazine holder - Waste disposal bag - Individually controllable reading light - Grab handle on seat back that does not having a negative effect on the seated passenger when used. · Have the possibility to block sunlight in order to avoid direct sunlight and retain comfortable levels of temperature and light 	

3.6.8.4 Comfort, general

Id	Requirement	Referring to
A1:3.6.8.4.a	<p data-bbox="371 308 1798 375"> I In most cases, operation in Norwegian climate does not represent special challenges regarding seats. The following points highlight some areas that should be considered based on the experience from Norske Tog:</p> <ul style="list-style-type: none"> <li data-bbox="423 419 1552 518">• In some cases, the Trainset may have malfunction of heating or continue after loss of energy supply. The surfaces of the seat in contact with the passengers should not contribute to transporting heat away from a seated passenger. <li data-bbox="423 526 1570 593">• In heavy snowfall at temperatures close to 0° C the snow sticks to the passengers clothing and luggage. The seats must not be damaged by exposure to water from melting snow. <li data-bbox="423 601 1263 628">• The amount of water contained by the upholstery should be limited. <li data-bbox="423 636 1570 735">• Direct metallic contact or insufficient thermal insulation between the exterior and the interior may cause spots of cold surface temperatures on the inside. These spots may cause condensation of water and even ice buildups. Such spots may reduce comfort. 	

It's recommended to take the above listed points in to considerations.

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.4.b	<p>E Seats should as far as possible be perceived as comfortable for people within 5th percentile female to 95th percentile male of the population in Norway, and both upper and lower borders must be considered. This applies both to adjustments and fixed elements that might limit the number of passengers finding the seat to be comfortable.</p> <p><i>Tender shall supply together with the offer 2D drawings showing front and sideview for all seat types. The drawings shall show both 5- female, 50- male and 95-percentile male manikin in upright and reclined position. Drawings to showing at least;</i></p> <ul style="list-style-type: none"> - <i>Seat cushion height</i> - <i>Seat width and without armrests.</i> - <i>Seatback height,</i> - <i>Seat pitch (Vis-á-vis and Airline)</i> - <i>Seat width (1+1 seat in double configuration)</i> - <i>Lumbar to lumbar for Vis-á-vis seats.</i> - <i>distance lumbar to knee area on front seat (Airline) acc. to TSI.</i> - <i>Distance seatback to table edge (Vis-á-vis and Airline)</i> - <i>Table height (Vis-á-vis and Airline)</i> - <i>Table size (Vis-á-vis and Airline)</i> - <i>Dimensions and position of Vis-´a-vis table stand/fixation.</i> - <i>Armrest width</i> - <i>Armrest height</i> - <i>Torso angle in upright and reclined angle for all seat types.</i> - <i>SRP</i> - <i>TSI PRM requirement space confirmation.</i> - <i>Any foot restrictions both in front and sideview for all seat types.</i> - <i>Position of reclining mechanism.</i> 	
A1:3.6.8.4.c	<p>E All comfort and ergonomic properties for the soft parts of the passenger seat (such as seat cushion, backrest cushion and headrest) the width of the arm rest the distance between two adjacent passenger seats (the width of the middle armrest(s))shall be based on real full-scale samples and be refined together with the Customer in the Design Phase.</p>	

3.6.8.5 Recliner seating places

Id	Requirement	Referring to
A1:3.6.8.5.a	<p>K The Recliner Seating Places shall:</p> <ul style="list-style-type: none"> -not have more than two (2) Recliner Seats, faced in line or opposite the direction of travel, next to each other, i.e. not 2+3 seating arrangement -Have a seat pitch for airline seating of minimum 1300 mm -facing seating arrangement is not anticipated, however if such solution is included shall the seat pitch for face-to-face seating be 2x the offered seating pitch. - have separated center armrest between the seats. <p><i>Tender to describe Reclining seating place and provide layouts confirming;</i></p> <ul style="list-style-type: none"> <i>-not have more than two (2) Recliner Seats, faced in line or opposite the direction of travel, next to each other, i.e. not 2+3 seating arrangement</i> <i>-Have a seat pitch for airline seating of minimum 1300 mm</i> <i>-facing seating arrangement is not anticipated, however if such solution is included shall the seat pitch for face-to-face seating be 2x the offered seating pitch.</i> <i>- have separated center armrest between the seats.</i> 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.5.b	<p>E The seat for Recliner Seating Places shall</p> <ul style="list-style-type: none"> · Provide excellent comfort for 5th percentile female to 95th percentile male of the population in Norway. · Offer excellent comfort for passengers to work and/or up to 9hrs travel time · Have a reclining feature providing a very comfortable position for resting, e.g. having a large recline without the risk of sliding out of the seat, with easily accessible operation of the seat adjustments. · Have a reclining feature providing a comfortable position for sleeping, e.g. having a very large recline with a leg rest to provide some comfort for sleeping · Have a easily accessible operation of the seat adjustments. · Have a reclining feature with limited disturbance of other passenger's comfort, e.g. space for knees · Provide privacy for work rest and especially sleeping, e.g. some kind of cover or visibility protection · Provide a seat width which is perceived as wider or at least as wide as the Comfort Seating Place seat · Possibly for passenger a store larger personal belongings with a possibility for theft protection. (locker) · Provide working space (table) for a laptop up to 15,7". · Visibility of Laptop screen from behind shall be prevented. · Seats shall have individual and individually foldable armrests, i.e. not shared center <p><i>The Tender to describe how the Recliner seats;</i></p> <ul style="list-style-type: none"> · <i>Provide excellent comfort for 5th percentile female to 95th percentile male of the population in Norway.</i> · <i>Offer excellent comfort for passengers to work and/or p to 9hrs travel time</i> · <i>Have a reclining feature providing a very comfortable position for resting, e.g. having a large recline without the risk of sliding out of the seat, with easily accesible operation of the seat adjustments.</i> · <i>Have a reclining feature providing a comfortable position for sleeping, e.g having a very large recline with a leg rest to provide some comfort for sleeping</i> · <i>Have a easily accesible operation of the seat adjustments.</i> · <i>Have a reclining feature with limited disturbance of other passenger's comfort, e.g. space for knees</i> · <i>Provide privacy for for work rest and especially sleeping, e.g. some kind of cover or visibility protection</i> · <i>Provide a seat width which is percived as wider or at least as wide as the Comfort Seating Place seat</i> · <i>Possibly for passenger a store larger personal belongings with a possibility for theft protection. (locker)</i> · <i>Provide working space (table) for a laptop up to 15,7".</i> · <i>Visibility of Laptop screen from behind shall be prevented.</i> · <i>Seats shall have individual and individually foldable armrests, i.e. not shared center</i> 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.5.c	<p>K Seat width, measured at the inside of the armrest, shall be minimum 500 mm</p> <p><i>Tender to provide seat drawings confirming a minimum distance between armrest of 500 mm.</i></p>	
A1:3.6.8.5.d	<p>E The Recliner Seating Places shall:</p> <ul style="list-style-type: none"> -Have a seat pitch for airline seating longer than 1300 mm -facing seating arrangement is not anticipated, however if such solution is included shall the seat pitch for face-to-face seating be more than 2x the offered seating pitch. 	

3.6.8.6 Comfort seating places

Id	Requirement	Referring to
A1:3.6.8.6.a	<p>K The Comfort Seating Places shall:</p> <ul style="list-style-type: none"> -not have more than two (2) Comfort Seating Places, faced in line or opposite the direction of travel, next to each other, i.e. not 2+3 seating arrangement -have a seat pitch for airline seating of minimum 950 mm. -have a seat pitch for face-to-face seating of minimum 2100 mm. -have a seat pitch for seats facing a partition or a wall of minimum 1150 mm - have separated center armrest between the seats. <p><i>Tender to describe Comfort seating place and provide layouts confirming;</i></p> <ul style="list-style-type: none"> -not have more than two (2) Comfort Seating Places, faced in line or opposite the direction of travel, next to each other, i.e. not 2+3 seating arrangement -seat pitch for airline seating of minimum 950 mm. -seat pitch for face-to-face seating of minimum 2100 mm. -seats pitch for seats facing a partition or a wall of minimum 1150 mm - have separated center armrest between the seats 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.6.b	<p>E The seat for Comfort Seating Places shall</p> <ul style="list-style-type: none"> · Provide very high comfort for 5th percentile female to 95th percentile male of the population in Norway · Offer very high comfort for passengers to work and/or rest up to 9hrs travel time · Have a reclining feature providing a very comfortable position for resting, i.e. having a large recline without the risk of sliding out of the seat, with easily accessible operation of the seat adjustments. · Have a reclining feature with limited disturbance of other passenger's comfort, e.g. space for knees · Provide storage area for smaller personal belongings not exposed for theft · Provide working space (table) for a laptop up to 15,7". · Visibility of Laptop screen from behind shall be prevented. · Seats shall have individual and individually foldable armrests, i.e. not shared center <p><i>The Tender to describe how the Comfort seats;</i></p> <ul style="list-style-type: none"> · Provide very high comfort for 5th percentile female to 95th percentile male of the population in Norway · Offer very high comfort for passengers to work and/or rest p to 9hrs travel time · Have a reclining feature providing a very comfortable position for resting, i.e. having a large recline without the risk of sliding out of the seat, with easily accesible operation of the seat adjustments. · Have a reclining feature with limited disturbance of other passenger's comfort, e.g. space for knees · Provide storage area for smaller personal belongings not exposed for theft · Provide working space (table) for a laptop up to 15,7". · Visibility of Laptop screen from behind shall be prevented. · Seats shall have individual and individually foldable armrests, i.e. not shared center 	
A1:3.6.8.6.c	<p>E Seat width, measured at the inside of the armrest, shall be wider than the Regular Seating Place</p> <p><i>Tender to provide seat drawings stating distance between armrests.</i></p>	
A1:3.6.8.6.d	<p>E The Comfort Seating Places shall:</p> <ul style="list-style-type: none"> -have a seat pitch for airline seating longer than 950 mm. -have a seat pitch for face-to-face seating longer tha 2100 mm. -have a seat pitch for seats facing a partition or a wall longer than 1150 mm. 	

3.6.8.7 Regular seating places

Id	Requirement	Referring to
A1:3.6.8.7.a	<p>K The Regular Seating Places shall:</p> <ul style="list-style-type: none"> -not have more than two (2) Regular Seating Places, faced in line or opposite the direction of travel, next to each other, i.e. not 2+3 seating arrangement -have a seat pitch for airline seating of minimum 900 mm. -have a seat pitch for face-to-face seating of minimum 1900 mm. -have a seat pitch for seats facing a partition or a wall of minimum 1100 mm <p><i>Tender to describe Regular seating place and provide layouts confirming;</i></p> <ul style="list-style-type: none"> -not have more than two (2) Regular Seating Places, faced in line or opposite the direction of travel, next to each other, i.e. not 2+3 seating arrangement -seat pitch for airline seating of minimum 900 mm. -seat pitch for face-to-face seating of minimum 1900 mm. -seats pitch for seats facing a partition or a wall of minimum 1100 mm 	
A1:3.6.8.7.b	<p>E The seat for Regular Seating Places shall</p> <ul style="list-style-type: none"> · Provide high comfort for 5th percentile female to 95th percentile male of the population in Norway · Offer high comfort for passengers to work and/or rest up to 9hrs travel time · Have a reclining feature providing a comfortable position for resting, i.e. having a recline without the risk of sliding out of the seat, with easily accessible operation of the seat adjustments. · Have a reclining feature with limited disturbance of other passenger's comfort, e.g. space for knees · Provide storage area for smaller personal belongings not exposed for theft · Provide working space (table) for a laptop up to 13" <p><i>The Tender to describe how the Regular seats;</i></p> <ul style="list-style-type: none"> · Provide high comfort for 5th percentile female to 95th percentile male of the population in Norway · Offer high comfort for passengers to work and/or rest up to 9hrs travel time · Have a reclining feature providing a comfortable position for resting, i.e. having a recline without the risk of sliding out of the seat, with easily accesible operation of the seat adjustments. · Have a reclining feature with limited disturbance of other passenger's comfort, e.g. space for knees · Provide storage area for smaller personal belongings not exposed for theft · Provide working space (table) for a laptop up to 13" 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.7.c	<p>E Seat width, measured at the inside of the armrest shall be minimum 450 mm</p> <p><i>Tender to provide seat drawings confirming a minimum distance between armrest of 450 mm.</i></p>	
A1:3.6.8.7.d	<p>E The Regular Seating Places shall:</p> <ul style="list-style-type: none"> -have a seat pitch for airline seating longer than 900 mm. -have a seat pitch for face-to-face seating longer than 1900 mm. -have a seat pitch for seats facing a partition or a wall longer than 1100 mm 	

3.6.8.8 Other seating places

Id	Requirement	Referring to
A1:3.6.8.8.a	<p>I It is foreseen to use the 2 and 4-bed compartments during daytime for seating. For example can the compartments be used as offices or by families.</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.8.b	<p>E In a sleeping compartment used during daytime the seats shall provide:</p> <ul style="list-style-type: none"> - Same level of comfort as Comfort or Regular seats - A cupholder that can be accessed when working with a stipulated Laptop size. - Preferably reclining function - Armrests on both sides of each seating place - Table for work, reading/watching movies and eating and small conferencing.. - Coat hanger - Magazine holder - Waste disposal bag - Individually controllable reading light - Minimum one (1) 230V outlet per seating place with same specification as for regular seating. - Minimum one (1) USB outlet per seating place with same specification as for regular seating. - Similar outside view as regular seating places. - Have the possibility to block sunlight in order to avoid direct sunlight and retain comfortable levels of temperature and light <p><i>Tender to describe seats regarding;</i></p> <ul style="list-style-type: none"> -<i>design of the seat arrangement.</i> -<i>how to re-arranged (changing from beds to seats) are made.</i> -<i>how required comfort level is achieved</i> <p><i>Tender shall also describe available features as;</i></p> <ul style="list-style-type: none"> - <i>A cupholder that can be accessed when working with a stipulated Laptop size.</i> - <i>Preferably reclining function</i> - <i>Armrests on both sides of each seating place</i> - <i>Table for work, reading/watching movies and eating</i> - <i>Coat hanger</i> - <i>Magazine holder</i> - <i>Waste disposal bag</i> - <i>Individually controllable reading light</i> - <i>Minimum one (1) 230V outlet per seating place with same specification as for regular seating.</i> - <i>Minimum one (1) USB outlet per seating place with same specification as for regular seating.</i> - <i>Similar outside view as regular seating places.</i> - <i>Have the possibility to block sunlight in order to avoid direct sunlight and retain comfortable levels of temperature</i> 	

Exhibit A01: General

Id	Requirement	Referring to
	<i>and light</i>	

3.6.8.10 Wheelchair space

Id	Requirement	Referring to
A1:3.6.8.10.b	E There shall be a possibility to arrange at least 2 temporary wheelchair places in the train.	
	<i>Tender to show on a layout drawing and state any deviation from TSI PRM requirements.</i>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.10.c	<p>E The permanent wheelchair places shall as a minimum be equipped with:</p> <ul style="list-style-type: none"> - A table suitable for work including a 15,7" laptop, eating and reading which shall be possible to access from a wheelchair -At least one 230V outlet, easy accessible without disturbing nearby passengers, with a power rating suitable to charge a laptop - One USB charging outlet, easy accessible without disturbing nearby passengers. - The USB sockets should be equipped with the latest generation Quick Charge technology. - Coat hanger - Magazine holder - Individually controllable reading light - Cup holder that can be used when working on a laptop - Access to disposal bag - Same visibility to outside through a window as regular seats - Possibility to blind the window from direct sunlight - Easy access to an Emergency call button. <p><i>Tender to describe the minimum required features as;</i></p> <ul style="list-style-type: none"> - A table suitable for work including a 15,7" laptop, eating and reading which shall be possible to access from a wheelchair -At least one 230V outlet, easy accessible without disturbing nearby passengers, with a power rating suitable to charge a laptop - One USB charging outlet, easy accessible without disturbing nearby passengers. - The USB sockets should be equipped with the latest generation Quick Charge technology. - Coat hanger - Magazine holder - Individually controllable reading light - Cup holder that can be used when working on a laptop - Access to disposal bag - Same visibility to outside through a window as regular seats - Possibility to blind the window from direct sunlight - Easy access to an Emergency call button. 	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.8.10.d	<p>E The permanent Wheelchair place shall;</p> <ul style="list-style-type: none"> - provide a possibility to sit together with a companion passenger seated in a regular seating place -be situated close to UWS and Bistro -be well integrated in same seating area as other passengers <p><i>Tender to describe how a companion passenger can be seated close to the wheelchair place and how the place is;</i></p> <ul style="list-style-type: none"> -Situated close to UWS and Bistro -Well integrated in same seating area as other passengers 	

Exhibit A01: General

3.6.9 To sleep

3.6.9.1 General

Id

Requirement

Referring to

Exhibit A01: General

Id	Requirement	Referring to
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A1:3.6.9.1.a **I** There are foreseen different types of sleeping functions within the Trainset, it is foreseen to have two types as a basis:

- 2-bed compartment, sold during night time as "Regular" for two passengers, or as "Comfort" for a single passenger. Further the compartment can be an office for one to two passengers in day time.
- 4-bed compartment, that can be 4-seat compartment for a family, a meeting room or a "Regular" seating compartment in daytime

As options it is foreseen to have two additional types of sleeping:

- "Comfort+", which is a 2-bed compartment with a higher comfort level and includes a private toilet including washing up and showering facilities
- "Compact", a very space efficient sleeping solution which offers the possibility to take the night Trainset at a low cost, but still offering to lay down fully and some level of privacy and feeling of security

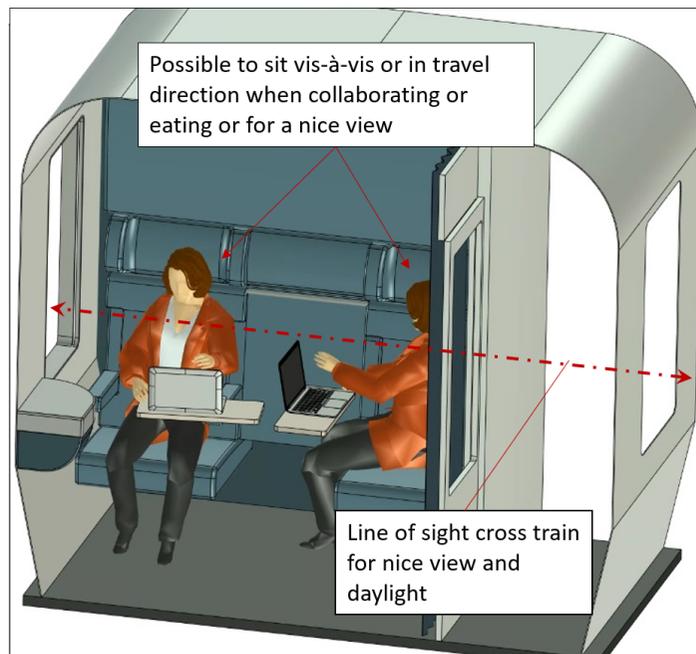
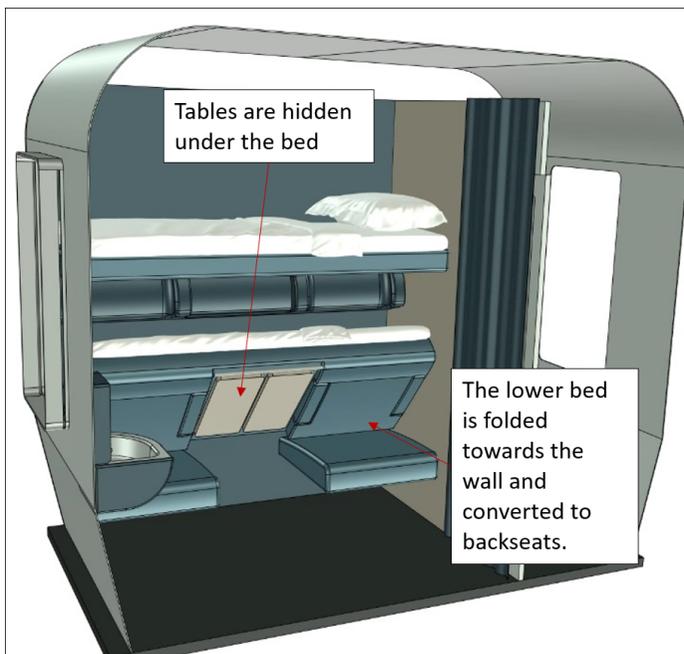


Exhibit A01: General

Id	Requirement	Referring to
	2-bed compartments for night use and day use	
A1:3.6.9.1.b	E The sleeping compartments shall provide high comfort and easy-of-use for all passengers and for all intended activities, such as sitting, lying, climbing, handling luggage, working, socializing etc., that are foreseen to be conducted by passengers, with focus on passengers ranging from the 5th percentile of women to the 95th percentile of men, in all regards.	
A1:3.6.9.1.c	E The beds shall be designed to offer high comfort for passengers ranging from the 5th percentile female to the 95th percentile male, both in lying and sitting position, also when the upper bed is folded down (if foldable).	
A1:3.6.9.1.d	E There shall be an easily accessible and intuitive mechanism for folding, in case of foldable beds.	
A1:3.6.9.1.e	K At each bed there shall be: <ul style="list-style-type: none"> -A reading lamp. - Storage space for a small bag and personal belongings. - Storage for clothes, like a pair of trousers and a sweater. - USB outlet for charging a phone. - Easy access to a control panel for adjusting main light, heat and for contacting personnel. 	

3.6.9.2 Bed/seat facilities

Id	Requirement	Referring to
A1:3.6.9.2.c	E In 4-bed compartment It shall be possible to get some form of privacy when sharing compartment with strangers, at least at the head end of the beds, by e.g. shielding .	
A1:3.6.9.2.d	E In Compact compartment It shall be possible to completely shield oneself from other passengers.	

3.6.9.3 Facilities for storing

Id	Requirement	Referring to
A1:3.6.9.3.a	K Inside the compartment there shall be: <ul style="list-style-type: none"> -Hangers for clothes, like a coat or a jacket. 	
A1:3.6.9.3.b	E Inside the Regular, Comfort, Comfort+, and 4-bed compartment there shall be: <ul style="list-style-type: none"> -Storage place for ski clothes. -Storage place for shoes and ski boots. 	
A1:3.6.9.3.c	K It shall be possible to store large luggage of different shapes, such as suitcases (65x85x35 cm) and large backpacks.	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.9.3.d	E The storage space for luggage should be easily accessible and not reducing the leg or head room for seated or lying passengers.	

3.6.9.4 Facilities for washing up/wc

Id	Requirement	Referring to
A1:3.6.9.4.a	K Inside the Regular compartment there shall be a wash basin	
A1:3.6.9.4.b	E The wash basin in Regular compartment shall be designed and positioned to offer good access when washing up, avoiding splashing water on the surrounding interior	
A1:3.6.9.4.c	E The wash basin inside the Regular compartment shall be possible to cover when not in use.	
A1:3.6.9.4.d	K For Regular and Comfort+ there shall be within easy access from the wash basin;: -Hook for towel and toilet bag hooks -storage area for a soap bottle -a mirror	
A1:3.6.9.4.e	K Inside the Comfort+ compartment there shall be a separated area with: -Toilet -wash basin -Shower <i>OPTION</i>	
A1:3.6.9.4.g	E The washroom/-s at the 4 bed compartments shall be situated within easy access to the compartments without disturbing passengers in adjacent areas.	
A1:3.6.9.4.i	E For Regular, Comfort, 4-bed and Compact compartment the toilets shall be situated within easy access to the compartments without disturbing passengers in adjacent areas.	

Exhibit A01: General

3.6.9.5 Facilities for working and eating during daytime

Id	Requirement	Referring to
A1:3.6.9.5.a	E Regular, Comfort, Comfort+ and Wheelchair compartments there shall be table space for food and drink for two (2) persons.	
A1:3.6.9.5.b	E Regular, Comfort, Comfort+ and Wheelchair compartments It shall be possible, for two (2) passengers to work in front of each computer in a comfortable way.	
A1:3.6.9.5.c	E In the 4-bed compartments it shall be possible for four (4) persons to work in front of each computer in a comfortable way.	
A1:3.6.9.5.d	E In the 4-bed compartments there shall be table space for food and drink for four (4) persons.	
A1:3.6.9.5.e	E In the Compact compartment It shall be possible for one (1) person to work in front of a computer in a comfortable way.	
A1:3.6.9.5.f	E In the Compact compartment there shall be table space for food and drink for one (1) person.	
A1:3.6.9.5.g	K In Regular, Comfort, Comfort+ , and Wheelchair compartments there shall be two (2) number of outlets with power suitable for charging laptops and phones.	
A1:3.6.9.5.h	K In the 4-bed compartments there shall be four (4) number of outlets with power suitable for charging laptops and phones.	

3.6.9.6 Interior

Id	Requirement	Referring to
A1:3.6.9.6.a	E All design elements, as well as control panels and other equipment, shall be well integrated, with high attention to details, high quality materials, finishes and a harmonious color setting.	
A1:3.6.9.6.b	E All interior materials shall be durable and easy to clean.	
A1:3.6.9.6.c	E The floor covering: -shall have a design that appears to be clean for the passengers, e g does not appear as dirty, wet or having wear. -Should provide a feeling of comfort and calmness.	
A1:3.6.9.6.d	K All areas for sleeping shall be equipped with windows.	
A1:3.6.9.6.e	K Windows shall be provided with sun blinds.	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.9.6.f	K It shall be possible to blackout daylight in the compartment during bright summer nights.	
A1:3.6.9.6.g	E The window size should be maximized to offer a good view.	
A1:3.6.9.6.h	E In the 2 and 4 bed compartments there shall be large windows towards the corridor to offer good views, from as many angles as possible.	

3.6.9.7 Lighting

Id	Requirement	Referring to
A1:3.6.9.7.a	E Light temperature of 2700K for main lighting -Dimmable light and different modes for night and day and different seasons -Night light for guiding -Cleaning mode	
A1:3.6.9.7.b	E The lighting concept should contribute to a calm and harmonious atmosphere.	

3.6.9.8 Climate

Id	Requirement	Referring to
A1:3.6.9.8.a	K It shall be possible to adjust the temperature inside the compartment.	

3.6.9.10 Waste

Id	Requirement	Referring to
A1:3.6.9.10.a	K Each compartment shall be equipped with a waste bin.	
A1:3.6.9.10.b	E The waste bin shall be easily accessible and easy to clean.	

3.6.9.11 Security and safety

Id	Requirement	Referring to
A1:3.6.9.11.a	K The compartment doors shall be equipped with a lock.	
A1:3.6.9.11.b	E The door locking for compartment doors shall be intuitive and secure.	
A1:3.6.9.11.c	E The design elements shall be designed without sharp edges, with enough distance between parts, to eliminate the risk of injury.	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.9.11.d	E Bags shall be stored in a safe and secure way to avoid injuries caused by luggage falling and theft of personal belongings.	
A1:3.6.9.11.e	E In the 4-bed compartments there shall be four (4) separate lockable storage for valuables. (Approx. Size XxXxX)	
A1:3.6.9.11.f	E It shall be easy to reach the upper bed in a safe way.	

3.6.9.12 Wayfinding

Id	Requirement	Referring to
A1:3.6.9.12.a	E The passengers shall be guided to all different facilities in the Trainset and back to the compartment again.	
A1:3.6.9.12.b	E Travel related information shall be placed to offer high visibility.	
A1:3.6.9.12.c	K All compartments shall have bed and seat numbering.	
A1:3.6.9.12.d	K All 4-bed compartments shall have seat reservation signs showing between what stops the seats are reserved.	

3.6.9.13 Wheelchair

Id	Requirement	Referring to
A1:3.6.9.13.a	K Within each Trainset formation there shall be at least two compartments that are accessible to wheelchair users.	
A1:3.6.9.13.b	K There shall be a companion bed in each wheelchair accessible compartment.	
A1:3.6.9.13.c	K Adjacent to the wheelchair compartment, there shall be an easily accessible UWC toilet.	

3.6.10 To Eat and Drink

3.6.10.1 Bistro, general

Id	Requirement	Referring to
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Exhibit A01: General

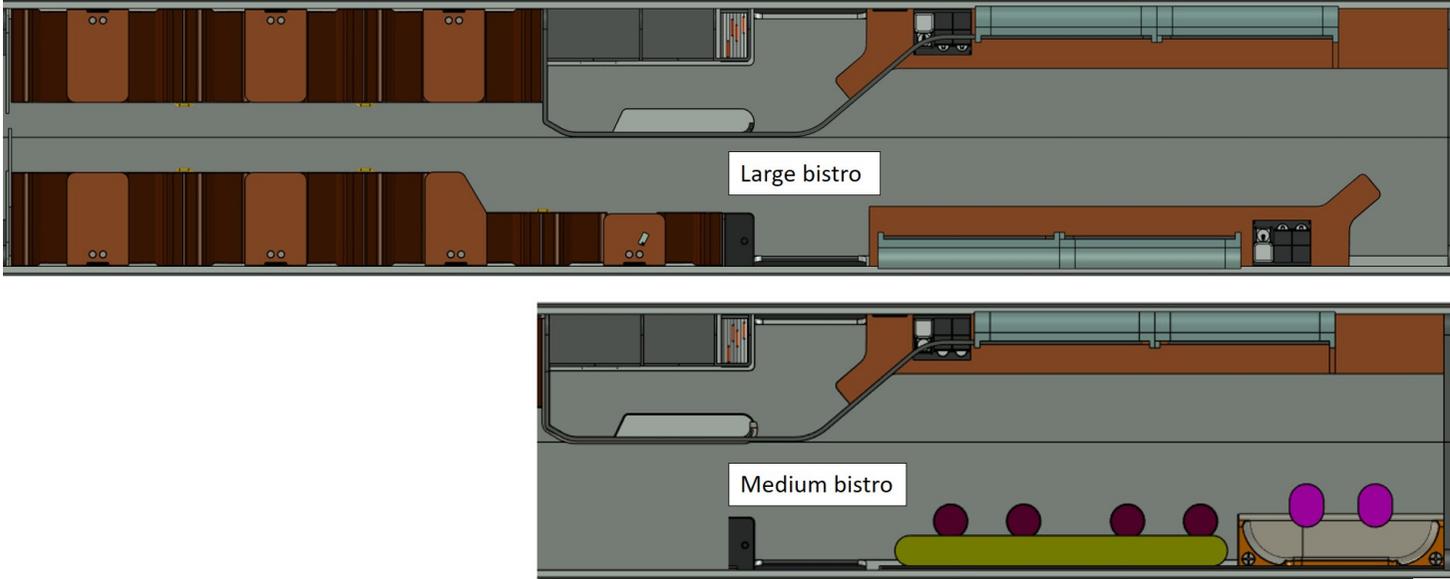
Id	Requirement	Referring to
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A1:3.6.10.1.a **I** All Trainsets are foreseen to be equipped with a bistro, including a self service area and a kitchen are for preparing food. As the need between different operators and missions alter Norske Tog foresees the bistro to be available in different capacities.

The large bistro has a high capacity with regards to self service area, high capacity for handling peak hours and further table seating places dedicated for dining.

The medium bistro have a lower capacity and no dedicated table seating places for dining, but some places to stay around for a temporary seat and table for eat, drink and socializing.

When referring to the bistro, or bistro, general the requirement applies for all types of bistros.



Example of general functions for all bistros and modularization between Large Bistro and Medium Bistro

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.10.1.b	<p>E The design of the Bistro shall provide a sensual mix between functionality and interior design that flirts with the cozy traditions of classic Trainset interiors with a narrative of fresh design tones and natural materials, The Large Bistro design shall fuse progressive Trainset interiors with cool luxe and vogueish sophistication.</p>	
A1:3.6.10.1.c	<p>E The Bistro shall be designed for and provide:</p> <ul style="list-style-type: none"> -Efficient passenger flow, that enables efficient queuing whilst at the same time allows other passengers to pass -Overview of the whole bistro area for the crew when working in the galley and at the cashier points -Efficient and hygienic handling and storage of carts, food and garbage -Efficient and hygienic facilities for preparing and cooking food -Efficient cleaning 	
A1:3.6.10.1.d	<p>E The Bistro, both Large and Medium, shall be refined together with Norske Tog in the Design Phase, with regards to at least passenger experience, handling, work environment and aesthetics.</p>	
A1:3.6.10.1.e	<p>K The Bistro shall fulfil all applicable Norwegian laws and rules applicable for</p> <ul style="list-style-type: none"> -handling and selling fresh and warm food -working environment 	
A1:3.6.10.1.f	<p>E The lighting solution in the Bistro shall be a mix of indirect and direct lighting, providing a diverse, inviting and warm lighting experience to the Bistro as well as excellent lighting for displaying the food and drinks. The lighting shall also fulfil the functional demands to provide an excellent working environment for the staff</p>	
A1:3.6.10.1.g	<p>K There shall be appropriate space for installing a dishwasher in the galley with appropriate space for operating the dishwasher</p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.10.1.h	E There shall be exterior doors for loading carts and food, one on each side of the Trainset, car in direct access to proved efficient handling of supplies and waste	
A1:3.6.10.1.i	K There shall be an available space of LxWxH and preparations made for integrating and installing 2 high speed ovens(For example: MerryChef Eikon e1s), suited to rapidly cook, toast, grill a wide choice of high quality dishes. The space shall include 230 VAC electric outlets.	
A1:3.6.10.1.j	K There shall be an available space of LxWxH and preparations made for integrating and installing a 2 level Hotdog Roller Grill Cooker(For example: Milantoast – Contact grill large-s/s). The space shall include a 230 VAC electric outlet. The space shall be equipped with an appropriate fan to minimize the smell of grilled hotdogs. The Hotdog Roller grill shall be placed so that the customers can see the Hotdog Roller Grill.	
A1:3.6.10.1.k	K There shall be an available space of LxWxH and preparations made for integrating and installing a contact grill with a smooth top and bottom plate.	
A1:3.6.10.1.l	K There shall be an available space of LxWxH for a storage system for displayed goods connected to the coffee machine areas (lids to coffee cups – 2 sizes, sugar sticks, stirring sticks, tea bags, milk cones, carrying trays for hot drinks etc.)	
A1:3.6.10.1.m	K There shall be an available space of LxWxH for storage of cleaning items in the galley (bucket, detergent, water, cloth, paper towels, wet tissues)	

Exhibit A01: General

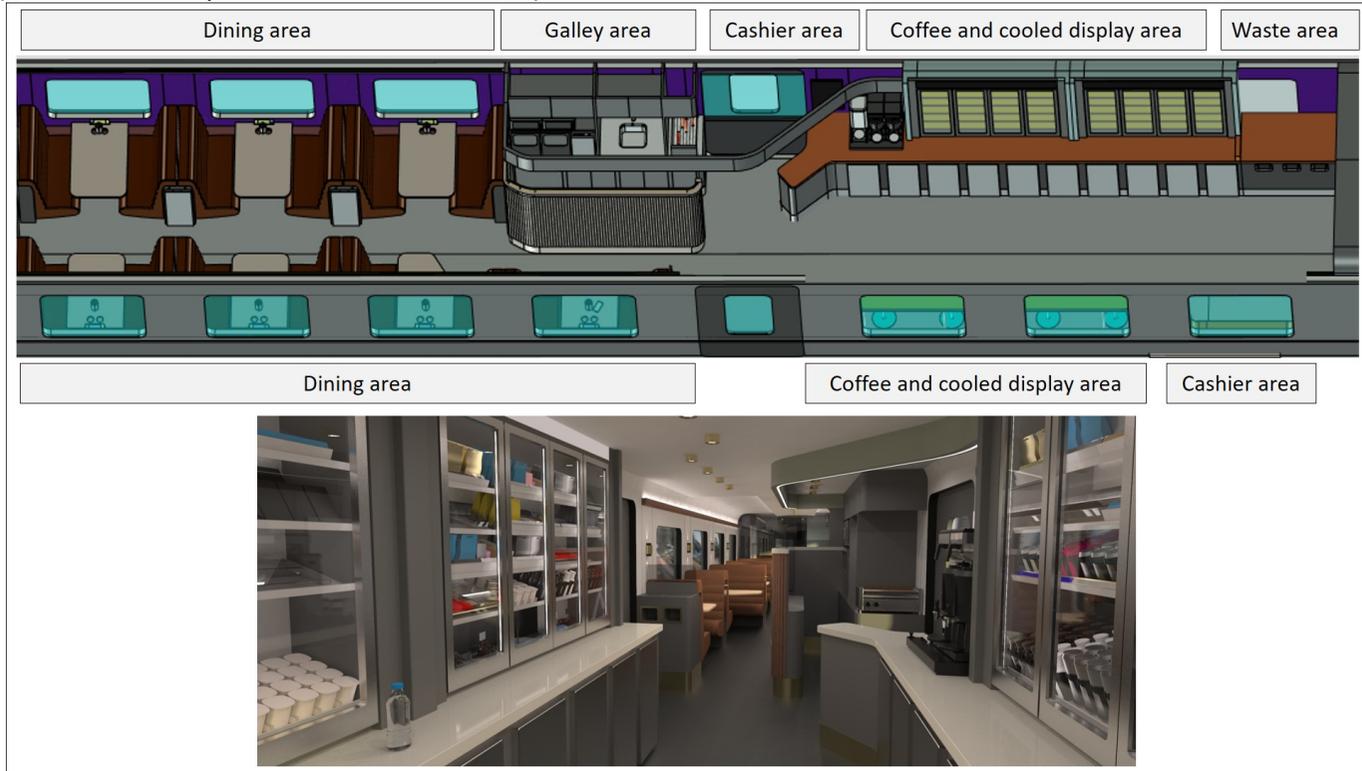
Id	Requirement	Referring to
A1:3.6.10.1.n	K There shall be 2 large waste bins areas (size of plastic bag. 125 liter) for passenger use with the possibility to sort garbage in 3 fractions at each area	
A1:3.6.10.1.o	K There shall be a fresh water outlet with touchless sensor function providing hot and cold water. There shall be a stainless sink designed for washing hands and cleaning kitchen utensils.	
A1:3.6.10.1.p	E There shall be digital screens above the cooled storage areas to provide commercial information to the passengers. There shall be large digital screens at the cashier areas to provide commercial information such as menus etc.	
A1:3.6.10.1.q	K Tank capacity shall be minimum 600 Liter of fresh water and 600 liters of grey water.	

Exhibit A01: General

3.6.10.2 Large Bistro

Id	Requirement	Referring to
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A1:3.6.10.2.a **K** There shall be in total twelve (12) storages for Atlas trollies
 -Five (5) cooled storages, cooling range 0 to 4 degrees Celsius.
 -One (1) freezer storage, cooling range 0 to -18 degrees Celsius.
 -Six (6) non-cooled
 (Size of Atlas trolley: 301.0×405.0×1030.0 mm)



Example of Large Bistro

Exhibit A01: General

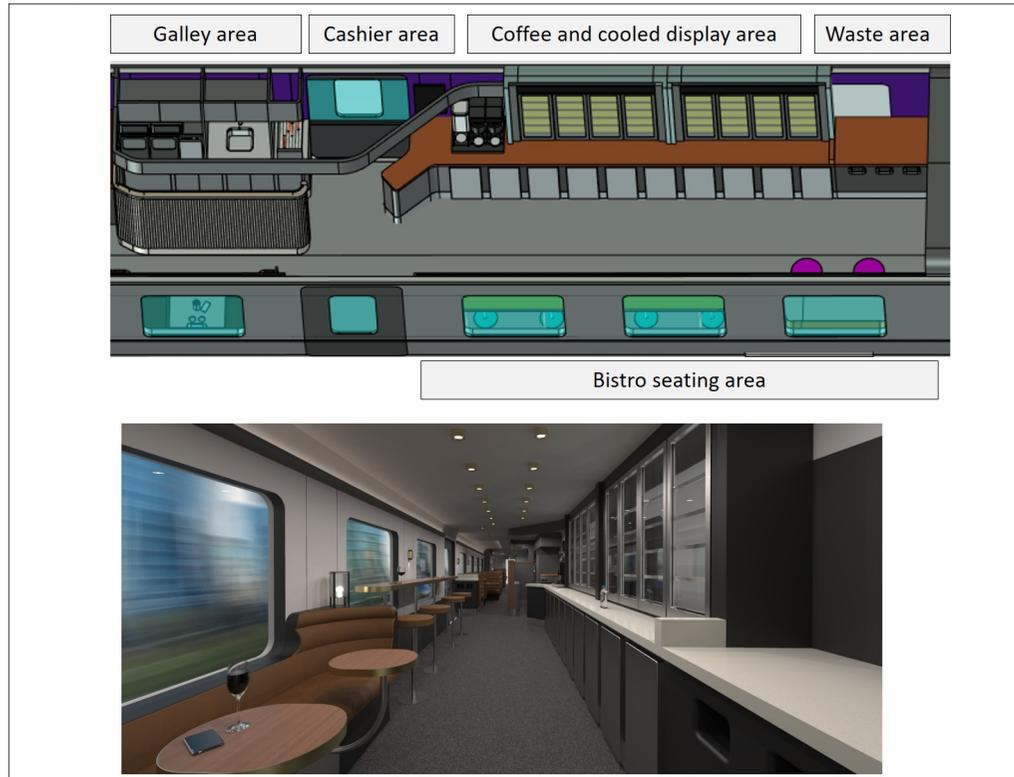
Id	Requirement	Referring to
A1:3.6.10.2.b	<p>E There shall be in total twenty (20) storages for Atlas trollies</p> <ul style="list-style-type: none"> -Eight (8) cooled storages, cooling range 0 to 4 degrees Celsius. -Two (2) freezer storage, cooling range 0 to -18 degrees Celsius. -Ten (10) non-cooled <p>(Size of Atlas trolley: 301.0×405.0×1030.0 mm)</p>	
A1:3.6.10.2.c	<p>K The Large Bistro shall have seating groups for at least seated 16 passengers</p>	
A1:3.6.10.2.d	<p>E The Large Bistro shall have seating groups in vis á vis seating with 4 seats + dining table per group. The bistro shall provide seating for at least seated 20 passengers</p>	
A1:3.6.10.2.e	<p>K There shall be two cashier points each including cashier payment solution and a self-payment solution.</p>	
A1:3.6.10.2.g	<p>K There shall be lockable cooled display areas for cooled goods such as drinks and sandwiches. The goods shall be displayed on sliding shelves. The shelves shall be designed to use the same boxes as in the Atlas carts for easy handling.</p> <p>There shall be integrated LED lighting in the cooled display area.</p> <p>The size of the cooled display area shall be in mm. H 1200, W 6000(e.g. 3000 on each side of the aisle), D 400</p> <p>It shall be possible to close off the display area when it is not in use by means of for example an integrated jalousie</p>	

Exhibit A01: General

3.6.10.3 Medium Bistro

Id	Requirement	Referring to
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A1:3.6.10.3.a **K** There shall be in total six (6) storages for Atlas trollies
 -Two (4) cooled storages, cooling range 0 to 4 degrees Celsius.
 -One (1) freezer storage, cooling range 0 to -18 degrees Celsius.
 -Three (3) non-cooled
 (Size of Atlas trolley: 301.0×405.0×1030.0 mm)



Example of Medium Bistro

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.10.3.b	<p>E There shall be in total ten (10) storages for Atlas trollies</p> <ul style="list-style-type: none"> -Four (4) cooled storages, cooling range 0 to 4 degrees Celsius. -One (1) freezer storage, cooling range 0 to -18 degrees Celsius. -Five (5) non-cooled <p>(Size of Atlas trolley: 301.0×405.0×1030.0 mm)</p>	
A1:3.6.10.3.c	<p>K There shall be one cashier point including a self-payment solution.</p>	
A1:3.6.10.3.d	<p>K There shall be an available space of LxWxH for installing a professional coffee and tea machine at the cashier area. The space shall include a 230 VAC electric outlet and a freshwater inlet / outlet</p>	
A1:3.6.10.3.e	<p>K There shall be a lockable cooled display area for cooled goods such as drinks and sandwiches. The goods shall be displayed on sliding shelves. The shelves shall be designed to use the same boxes as in the Atlas carts for easy handling.</p> <p>There shall be integrated LED lighting in the cooled display area.</p> <p>The size of the cooled display area shall be in mm. H 1200, W 3000, D 400</p> <p>It shall be possible to close off the display area when it is not in use by means of for example an integrated lockable jalousie</p>	
A1:3.6.10.3.f	<p>E There shall be seating places, e.g. opposite the cooled display area, for the passengers to have a drink or sandwich, the seating places could be a mix of bar stools and vis à vis diner seating places to provide an inviting and lively bar atmosphere to the bistro</p>	

Exhibit A01: General

3.6.10.4 Comfort Lounge

Id	Requirement	Referring to
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A1:3.6.10.4.a **I** Inside or close to the primary compartments for Comfort and or Recliner seating places it is foreseen to have a small self service are which also allows for preparing and storing food for at seat serving.



Figure 3: Example of a Comfort Lounge

A1:3.6.10.4.b **E** The design of the Comfort lounge area shall provide a sensual mix between functionality and interior design that flirts with the cozy traditions of classic Trainset interiors with a narrative of fresh design tones and natural materials, The Comfort lounge design shall fuse progressive Trainset interiors with cool luxe and vogueish sophistication.

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.10.4.c	<p>E The Comfort lounge shall be refined together with Norske Tog in the Design Phase, with regards to at least passenger experience, work environment and aesthetics</p>	
A1:3.6.10.4.d	<p>E The lounge shall contain a mini bistro that is designed for preparing food and drinks for the Comfort passengers and a part that shall provide a small comfortable and private lounge area for the Comfort passengers.</p>	
A1:3.6.10.4.e	<p>K The Mini Bistro shall contain:</p> <ul style="list-style-type: none"> - A space of LxWxH for installing a high speed oven, suited to rapidly cook, toast, grill a wide choice of high quality dishes. The space shall include 230 VAC electric outlets. For example: MerryChef Eikon e1s - There shall be a fresh water outlet with touchless sensor function providing hot and cold water. There shall be a stainless sink designed for washing hands and cleaning kitchen utensils. - Space for 3 cooled Atlas trollies (Size of Atlas trolley: 301.0×405.0×1030.0 mm) - Room for garbage (75 liters) - Storage system for displayed goods connected to the coffee machine (lids to coffee cups – 2 sizes, sugar sticks, stirring sticks, tea bags, milk cones, carrying trays for hot drinks etc.) - A space of LxWxH for installing a professional coffee and tea machine. The space shall include a 230 VAC electric outlet and a freshwater outlet - There shall be digital screens to provide commercial information, menus etc. 	
A1:3.6.10.4.f	<p>E The Comfort Lounge shall be a comfortable and inviting space which allows to 3-4 passengers to be seated for a drink and a small meal and to socialize.</p>	
A1:3.6.10.4.g	<p>E The lighting solution in the Comfort Lounge shall be a mix of indirect and direct lighting, providing a diverse, inviting and warm lighting experience. The lighting shall also fulfil the functional demands to provide an excellent working environment for the staff</p>	
A1:3.6.10.4.h	<p>K The Comfort Lounge area shall fulfil all applicable Norwegian laws and rules applicable for handling and selling fresh and warm food</p>	
A1:3.6.10.4.i	<p>K Fresh and waste water tank capacity shall be minimum 200 Liter, this may be arranged by utilizing capacity in toilet tanks.</p>	

Exhibit A01: General

3.6.11 To use lavatories

Id	Requirement	Referring to
A1:3.6.11.1.a	<p>I The perceived hygiene and cleanliness of the toilets is important from a passenger perspective. Stains, clutter and smells often reduces the passenger experience of the most basic services offered onboard. The cleanliness of the toilets degrades as soon as the passengers start using them, but the toilets need to be perceived as clean during the entire journey. Water spill on floors related to the sink and hand wash, and paper towels on the floor, are major negative effects. Some experiences of successful toilet design are;</p> <ul style="list-style-type: none"> -Functional wash basin with water and soap above the basin that minimize all spill outside of basin. -Hand towels, hand dryer and waste fraction in direct connection with the wash basin to minimize spill on the floor. -Surface materials that are easy to clean and no geometries, gaps or joints that reduces cleanability. -Lighting, color and materials that support the experience of cleanliness. -Intuitive functionality for the passengers. -An “aim point” reducing the risk of reflecting of urine or separate urinal -Grouping of toilets in pairs, or more, to ensure high availability 	
A1:3.6.11.1.b	<p>E The toilets shall:</p> <ul style="list-style-type: none"> -be perceived as clean, hygienic and free of odors throughout every journey -be designed to minimize water spill, papers on the floor, stains and visible dirt -provide an efficient and highly accessible use for all types of passenger, including elderly, children, wheelchair users and passengers travelling with infants -encourage and support passengers to leave the toilet in a clean manner after their use -not cause discomfort provide, e.g. noise and odor, for the passengers seated close to the toilets -be located to limit a direct view from any seating places <p><i>The Supplier shall describe how the toilets will provide a pleasant passenger experience. The Supplier shall submit a description and drawings/illustrations of the toilets</i></p>	
A1:3.6.11.1.c	<p>K There shall be at least one toilet per every 60 seating place and at least one toilet per every 30 sleeping beds</p> <p><i>The supplier shall describe the distribution and location of toilets for all Trainset configurations</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.11.1.d	<p>K All toilets shall provide the following functions/equipment:</p> <ul style="list-style-type: none"> -Toilet bowl -Wash basin and automatic and self closing water tap with tempered water -Facility for drying of hands, including paper towel dispenser and hand dryer, or similar -Soap dispenser -Toilet paper holder for at least two rolls. -Mirror -Waste bin -Coat hook -Lockable door, mechanical -Sanitary waste bag holder <p><i>The Supplier shall submit a list of functions and components of the toilets</i></p>	
A1:3.6.11.1.e	<p>K One standard toilet shall be able to be used as a toilet for On-Board Personnel and be able to be blocked from use of passengers</p> <p><i>The Supplier shall propose which of the toilets that will serve as toilet for On-Board Personnel</i></p>	
A1:3.6.11.1.f	<p>E The quantity and location of toilets within the Trainset shall provide high availability for all passengers including</p> <ul style="list-style-type: none"> -providing a high number of toilets per seating place being approximately 45 -providing a short distance from the seat or bed, also if any of the toilet is dedicated for On-Board Personnel use only -providing a low risk of walking to an occupied toilet, by e.g. providing multiple toilets in the same area <p>Note: The toilet(s) closest to the bistro and or crew cabin will be dedicated for On-Board Personnel more frequently than other toilets</p> <p><i>The supplier shall describe the distribution and location of toilets for all Trainset configurations</i></p>	

Exhibit A01: General

Id	Requirement	Referring to
A1:3.6.11.1.g	<p>E All toilets shall provide the following functions:</p> <ul style="list-style-type: none"> · Baby changing table. · Call for aid device. · Additional toilet paper rolls accessible for passengers to replace rolls in toilet paper holder. · Large waste bin of at least 20 L · Large vertical opening to waste bin of at least 15x15 cm · Three coat hooks on different levels <p><i>The Supplier shall submit a list of functions and components of the toilets</i></p>	
A1:3.6.11.1.h	<p>E As an aid to people travelling alone with small children, there shall be a “baby holder” in toilet(s) close to the family area and in the universal toilet. The baby holder shall secure the child in a seated position while the adult is using the facilities.</p> <p><i>The Supplier shall describe the "baby holder" and in which toilets the baby holder is included.</i></p>	
A1:3.6.11.1.i	<p>E The toilet door lock shall be intuitive to use and clearly indicate, from both the inside and outside, if the door is locked or unlocked.</p> <p><i>The Supplier shall describe the lock and how it is ensured that the lock is intuitive to use and provides clear indication</i></p>	
A1:3.6.11.1.j	<p>E It shall be easy for the passengers to identify if a toilet is in use, occupied or out of order.</p> <p><i>The Supplier shall describe how toilet status is indicated</i></p>	
A1:3.6.11.1.k	<p>E The toilets, both standard and universal, shall be refined, with regards to user interface and aesthetics, together with Norske Tog in the Design Phase</p> <p><i>The Supplier shall describe to which extent the toilets can be refined in the design phase</i></p>	

3.6.12 To be entertained

3.6.12.1 Family area

Id	Requirement	Referring to
A1:3.6.12.1.a	<p>K There shall be a family area within the Trainset</p>	

4 Options

4.1 Trainset Option

Id	Requirement	Referring to
A1:4.1.a	M NT shall have the option to purchase additional trainsets.	

4.2 Technical options

Id	Requirement	Referring to
A1:4.2.a	K The Tenderer shall offer the following technical options: <ul style="list-style-type: none"> - cargo car for transporting bicycles or othe larger goods - car with 3 bed cabins - cars with 2 bed cabins with on suite shower and toilet - cars with turn-around seats 	

5 Scope of Work

Id	Requirement	Referring to
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A1:5.a	I The Scope of Work contains the specific requirements for the delivery of the trains and comprises:	
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- A01 SOW GENERAL (This document)
- Appendix A1-1 Trainset Configuration concept

- A02 SOW TECHNICAL
- Appendix A02-1, Technical sheet
- Appendix A02-2, Side entrance system
- Appendix A02-3, Driver's desk
- Appendix A02-4, Wheel profile
- Appendix A02-5, Labelling of axles
- Appendix A02-6, De-icing brakes
- Appendix A02-7, IT System Architecture
- Appendix A02-8 GSM-R cab radio
- Appendix A02-9, ERTMS Onboard Installation
- Appendix A02-10, Architectural Description of ENIO System
- Appendix A02-11, ENIO-ALS Equipment
- Appendix A02-12, TIMS Interface

- A05 SOW Integrated Logistic Support
- Appendix A05-1, SOW RAM
- Appendix A05-2, SOW LCC
- Appendix A05-3, SOW Maintenance NT
- Appendix A05-4, SOW Documentation
- Appendix A05-5, SOW Training

The individual documents in A01 to A05 shall be considered as one interlinked scope of work.