SSA K Appendix 1 Customers requirements specification

Ticket Vending Machine (TVM)

1. Scope, background and content of the Tender

1.1 Purpose and objectives

The purpose of the assignment is to provide the passengers with an opportunity to buy a ticket with cash or payment card at metro bus stations where a commissioner does not exist within a reasonable distance.

The purpose of this tender is to procure ticket vending machines with software, associated back office system and communication for selected metro bus stations in Trondheim. This includes production, customization, installation and maintenance of *29* ticket vending machines and back office system, which will be referred to as TVMs in this document. The TVMs will be mounted on a fastening device together with a ticket validator, and this fastening device is also a part of this procurement. The procured TVMs will function as one of the available sales channels to the Customer for passengers along the metro lines. This document, Appendix 1 and its attachments, describes the Customer's operations and the requirements that apply for TVMs with associated back office system/communication and for the fastening device.

The main components to be acquired are:

- Hardware units and software (back office system and communication) for TVMs - 29 metro bus stations;
    - Including designing and manufacturing of a fastening device for TVM (and ticket validator) that is to be installed at metro bus stations along with TVM – 29 pcs., cf. clause 1.10.4 and clause 2.3.2.
    - Touch screen, cf. clause 1.9 and 2.4.2.
    - Including contactless EMV support, cf. clause 1.8.
    - Pad for verification of PIN code, cf. clause 1.8.
    - Cash handling, cf. clause 1.8and 2.6.3.
    - Fare administration, cf. clause 2.6.
    - System administration, cf. clause 2.6.
    - Unit administration, cf. clause 2.6.

The Contractor of TVMs is to provide all hardware, software and communication necessary for implementing a functioning payment solution according to customer requirements.

1.2 About the document

This document describes briefly what the procurement includes, the parties' liability and the requirements that the Customer submits to the Contractor. All requirements are summarized in a common requirement table, see Attachment 1.1 Customers requirements specification table 1A and 1B. Contractor must fill in the requested information in the table(s) and submit this attachment together with his offer.

1.3 General requirements

The TVMs must be designed and installed in accordance with all applicable public laws, regulations, directives, standards, guidelines and policies, as well as the requirements of the local authorities and special provisions.

Personnel to be used for the service and maintenance of the equipment must have the necessary authorization and competence.

The parties are obligated at any time to inform each other of matters relevant to the performance of the contract, including information about business relations between the parties and other actors, cf. Purchase Agreement clause 5.3.

1.4 Responsibilities and roles

1.4.1 *The Contractor*

The Contractor holds the responsibility for coordinating the project. This responsibility includes coordination of both preparation and other activities regarding installation and commissioning.

The Contractor shall perform the assignment in a good professional and responsible manner, and in accordance with the requirements specified in the Agreement. The Contractor shall pay attention to safety and ensure that there is no harm or danger of injury, person, property or the Customer's reputation. The Contractor shall at all times comply with Appendix 11 of the Customer's Ethical guidelines for AtB Contractors.

The Contractor shall provide all hardware, software and communication necessary for implementing a functioning payment solution according to Customer requirements.

The Contractor is responsible for the design, delivery and mounting of fastening device for the TVMs and ticket validators, cf. clause 1.10.4. The Contractor is responsible for the delivery, commissioning and testing of TVMs and associated back office software and communication.

The Contractor must collaborate with the supplier of the ticket validator regarding the mounting of fastening device on the selected metro bus stations. The mounting of the fastening device must be seen in connection with the assembly and commissioning of the TVM and the ticket validator, cf. clause 1.10.3 for more information about the topic.

The Contractor must make sure the work is performed in accordance with progress plan and if not; inform the Customer as soon as possible, cf. the Purchase Agreement clause 5.3.

1.4.2 *The Customer*

The Customer is responsible to act according to the contract signed with the Contractor. The Customer shall at all times ensure that the Contractor is supplied with the information and personal resources as foreseen in the Contract.

The Customer is not responsible for the building of the metro bus stations, and therefore have no opportunity to influence the completion of these. This is the responsibility of a thirrd party, on the behalf of "Miljøpakken". The Customer does not have responsibility for the infrastructure on site but remains orientated and up to date on the work towards the launch of the metro bus in August 2019. The Customer is responsible for maintaining dialogue with third parties to try to ensure compliance with the completion of the metro bus stations, and the Customer must keep the Contractor up-to-date here.

1.5 Overall implementation plan

1.5.1 *General*

The TVMs must be up and running at the metro bus stations by the 2nd of August 2019 (apart from the exceptions described in the document).

The Contractor, together with the tender, must submit a delivery and progress plan, see SSA-V Appendix 4. Here, Contractor shall describe his physical solutions for the TVMs.The Contractor shall also hand over Declaration of Conformity to the Customer after installation and testing of the TVM.

A coordination meeting shall be held as soon as possible after the contract has been signed. The purpose of this meeting is to review the contract, progress plan and other necessary clarifications between the parties. The parties cover their own travel and meeting expenses related to such meetings.

1.5.2 *Phase 0: Testlab for TVM at the Customer workplace*

Completed by: ASAP

Setup, configuration and adaptation of TVM: The Contractor of the TVMs shall as soon as possible after the contract is awarded set up a functioning test version of the TVM. The Contractor shall provide the Customer with a time schedule for configuration and adaptation of the machine to match the Customer's needs. The progress plan must also contain procedures/routines and deviation handling for the testing of the TVM before commissioning. Representatives from the Customer is to be closely involved in this process. What is meant by configuration in this context is e.g. setting up the machine with the Customers ticket product categories/options and corresponding prices. Adaptation refers to the fastening device intended for the TVM (and ticket validator) that must be designed and installed at the selected metro bus stations.

By the end of the due date for Phase 0 the TVM shall be fully configured and all basic functionality must be present. The system shall at this point be ready for testing in an operational setting.

1.5.3 *Phase 1: Delivery, installation and commissioning of TVMs*

Completed by: 02.08.2019

Installation and commissioning of TVM at metro bus stations: The Contractor is to start production of TVMs and associated back office software as soon as possible after the signing of the Contract. The Customer wants the procurement delivered, installed and commissioned in two phases since not all stations are completed simultaneously. Phase 1 consists of 28 TVMs, cf. Table 1: Metro bus station overview – TVM clause 10.1.2.

The Contractor is free to propose how he wants to implement the installation according to what is considered most effective in this case, provided that this plan does not exceed the final deadline that is 2nd of August 2019. For example, if the Contractor wants to divide Phase 1 into two batches, he is welcome to propose this as long as the TVMs is up and running by the 2nd of August. The Contractor must describe his plan for implementation, cf. clause 1.5.1.

The Customer needs the 28 TVMs that is part of Phase 1 to be delivered, installed and commissioned **by the 2nd of August 2019.**

1.5.4 *Phase 2: Delivery, installation and commissioning of TVMs*

Completed by: **ASAP** after completion of the last metro bus station.

Installation and commissioning of TVM at metro bus stations: One of the stations, Tiller, is not scheduled to be completed before November 2019, and this must be taken into consideration by the Contractor in his planning of the assignment. The Customer is, as mentioned before, not responsible for the completion of metro bus stations and therefore has no impact on any delays that might occur. If delays occur on other stations, these will be seen in conjunction with Tiller. The Customer asks the Contractor to describe in his tender how this will be solved in a practical manner. The Customer needs the last batch of TVMs to be delivered, installed and commissioned **ASAP** when the station(s) have been completed.

1.6 Standards that must be met

The requirements of the standards below must be met:

- The TVM must fulfil requirements in accordance with CE and carried out in accordance with all applicable regulations
- The TVM and associated back office software and communication must be in accordance with "Law on Cash System Requirements (Cash System Law)" LOV-2015-06-19-58
- All electrical systems must comply with current EU/EEA directives and regulations.
- The installation must be in accordance with FEL98 / NEK400: 2014, as well as all other laws, regulations and standards
- TVM must offer payment solution that is in accordance with PCI DSS.
- TVM must at least meet the minimum requirements for universal design of the following standards:
    - CEN/TS 15291:2006 - Identification Card Systems - Guidance on design for accessible card-activated devices
    - NS-EN 1332-1:2009 - Identification Card Systems - Human-machine interface - Part 1: Design principles for the user interface
    - NS-EN 1332-2:1998 - Identification Card Systems - Man-machine interface - Part 2: Dimensions and location of a tactile identifier for ID-1 cards
    - NS-EN 1332-3:2008 - Identification Card Systems - Man-machine interface - Part 3: Keypads
    - NS-EN 1332-4:2007 - Identification Card Systems - Man-machine interface - Part 4: Coding of user requirements for people with special needs
    - NS-EN 1332-5:2006 - Identification Card Systems - Man-machine interface - Part 5: Raised tactile symbols for differentiation of application on ID-1 cards
    - NS-EN ISO 9241-20:2009 - Ergonomics of human-system interaction - Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services (ISO 9241-20:2008)
    - ISO 20282-1:2006 - Ease of operation of everyday products -- Part 1: Design requirements for context of use and user characteristics
    - ISO/TS 20282-2:2006 - Ease of operation of everyday products -- Part 2: Test method for walk-up-and-use product

- ISO/TR 22411:2008 - Ergonomics data and guidelines for the application of ISO/IEC Guide 71 to products and services to address the needs of older persons and persons with disabilities

1.7 Complexity of the TVM

The TVM will be an independent unit, there will be no link between the machine and the Customers existing ticketing system. This is a decision that is based on the desire to make the assignment as "simple" as possible, a way to reduce the complexity of the TVM and thus reduce the risk of malfunction and faults. TVM will function as a sales channel for the segment of passengers who for different reasons do not make use of mobile phone or period card when buying a bus ticket and should therefore not offer more services than necessary.

1.8 Payment solutions

1.8.1 *TVM with cash and card handling*

The Customer requests a TVM where cash (only coins) and payment card (EMV and other cards) are valid payment methods. The TVMs must be delivered with coin slot and shall accept all valid denominations of the Norwegian coin.. The solution for safe storing of coins in the TVM must be in accordance with applicable laws and regulations for this type of delivery and must have a capacity that prevents frequent collection of coins. Contractor must describe the offered solution in detail. The TVM shall initially not offer any exchange, but the Customer has an exchange unit listed as an option, cf. 2.18.1, in case the need changes before signing the contract.

In the case of cards, both traditional functionalities where payment is verified by PIN and the possibility to use contactless bank cards must be offered. Necessary communication channel to verify a payment is required. Card transaction should be done as quickly as possible. TVM's solution must be EMV certified and be able to handle both national and international debit and credit cards. Norwegian-only BankAxept scheme is required.

It must be ensured that all passengers are able to buy a ticket regardless of whether or not the machine is online.

Contractor shall describe the procedure for the reconciliation of the banking terminals. Among other things, will tuning be initiated per terminal, or there will be an automatic feature on the ticket machine (possibly back office). Description must be included in the offer.

1.9 Universal design requirements: TVM

Extracts from the decision made by the municipality of Trondheim and Trøndelag County Council:

> *Universal design implies that everyone should be given the opportunity to start their journey with a valid ticket from the nearest stop. Ticket vending machines*

must meet universal design requirements and have a simple and intuitive operating panel.

Universal design means "designing, or accommodating, the main solution with regards to physical conditions, so that the solution may be used by as many people as possible," regardless of disability.

We want a society where everyone can participate. Therefore, universal design of ICT is a legal requirement for both public and private sector. For further information see Difi's pages: https://uu.difi.no/om-oss/english . Vision, hearing, cognition, movement, size and knowledge vary from person to person. Design and placement of TVMs must consider that users have different abilities and needs.

It does not help that the machine's location is in line with the requirements, if the machine itself is not universally designed. The design and user dialogue on the machine (hardware and software) is determined by contractors and manufacturers. The list below gives the Contractor an introduction to some of the characteristics of accessible TVMs, so that it becomes more understandable for the Contractor what is important to consider in such a context.

Touch Screen

- There must be sufficient contrast between text and background.
- Avoid too many words on each line
- Make sure there is sufficient line spacing, and sufficient spacing between characters and letters to make it easy to read.
- Information on the screen must also be communicated through connected aid.
- Because the TVM must have a touch screen, it is important that blind people can use it with the help of sound, keyboard or other modalities.
- Remember that symbol and pictograms (simplified images) are easier to remember than text.
- Users should not be disturbed by glare and reflections from screens.

Keyboard (because of the requirement for touch screen in this procurement, there will not be a physical keyboard in this context, except for the pin pad for card payment))

- Users should not be disturbed by keyboard glare and reflexes.
- Keys with numbers, letters and functions should be consistently placed in relation to each other and should be highlighted with colours that make it easy to distinguish them.
- The keyboard must have standardized symbols, among other things for users with cognitive impairment.
- The keyboard must have tactile marking or elevated numbers to make it easier for blind and visually impaired to taste correctly.
- Text or numbers on keys should be centred and provide good contrast to the background.
- Keys that are not in use should not be marked.
- It should be clear that a key is pressed, either by means of resistance in the keys, by sound or via on-screen feedback.
- Avoid keyboard that provides strong reflections from sun or light.

Dialogue

- It is important with a large, clear font.
- Information, user guide and feedback from TVM to user should be designed in a single and direct language and should be concise and accurate.
- The user should be able to regulate the pace of the dialogue between user and machine.
- The TVM must provide the same information through different senses, such as sight, hearing and touch.

Interface for aids

- For the machine to be available for people with severely impaired vision, blindness and hearing impairment, it is important to be able to read information such as braille, have outlets for speakers (headphones) and access to inductive loop or other audio amplifier equipment.

1.10 Infrastructure TVMs

1.10.1 *Metro bus stations and shelters*

The TVMs will be installed on selected metro bus stations. The TVM is to be placed in a shelter or in connection with one, this depends on the conditions on site. The TVMs will stand in a (sometimes) crowded environment where the risk of external influences such as vandalism and damage to the TVM is present. Based on this, it is important that the TVM is designed in a way that makes it prepared for the climate and other factors which it is subjected to. The Contractor must therefore assume that all of the TVMs will stand outside all year round in Trondheim and design the TVM accordingly. There exists a pre-fabricated pillar that is intended for the TVM (see Attachment 1.2 for drawing and information about the steel pillar base). The function of the pillar base is both a foundation for the fastening device for the equipment and a conduit for the power cable to the equipment to be placed in connection with the pillar base. The pillar base as it appears today is designed for a TVM (and a ticket validator) with a maximum total weight of 100 kg. The location of the TVM (and the ticket validator) on the pillar base must be in accordance with the requirements of the universal design (UD).

Metro bus stations differs in dimension and content depending, among other things, on location and passenger numbers. A bus shelter can differ between 3 meters and 24 meters, depending on how many sections that are put together. One section is 3-meter-long, so the number of sections put together varies from 1 to 8. The shelters first section should be recognizable and uniform at all stations (apart from 3m shelter), no matter where the station is, how many sections the shed has and whether it is open or closed rear wall. In the first section there are two info posters, real-time screens, waste bin and pillar base for TVM and/or ticket validator. On the roof there will be a symbol pillar. Some stations will have a TVM.

3-meter-long shelter: In the shelters with only one section, the TVM, ticket validator and waste bin must be placed outside the shed so that a small bench is placed inside the shed. In stations where the requirement for distance is less than 25 cm, the waste bin can be moved. See Figure 1 below, "Content and dimensions of the first shelter section", for more information about the shelter and content.

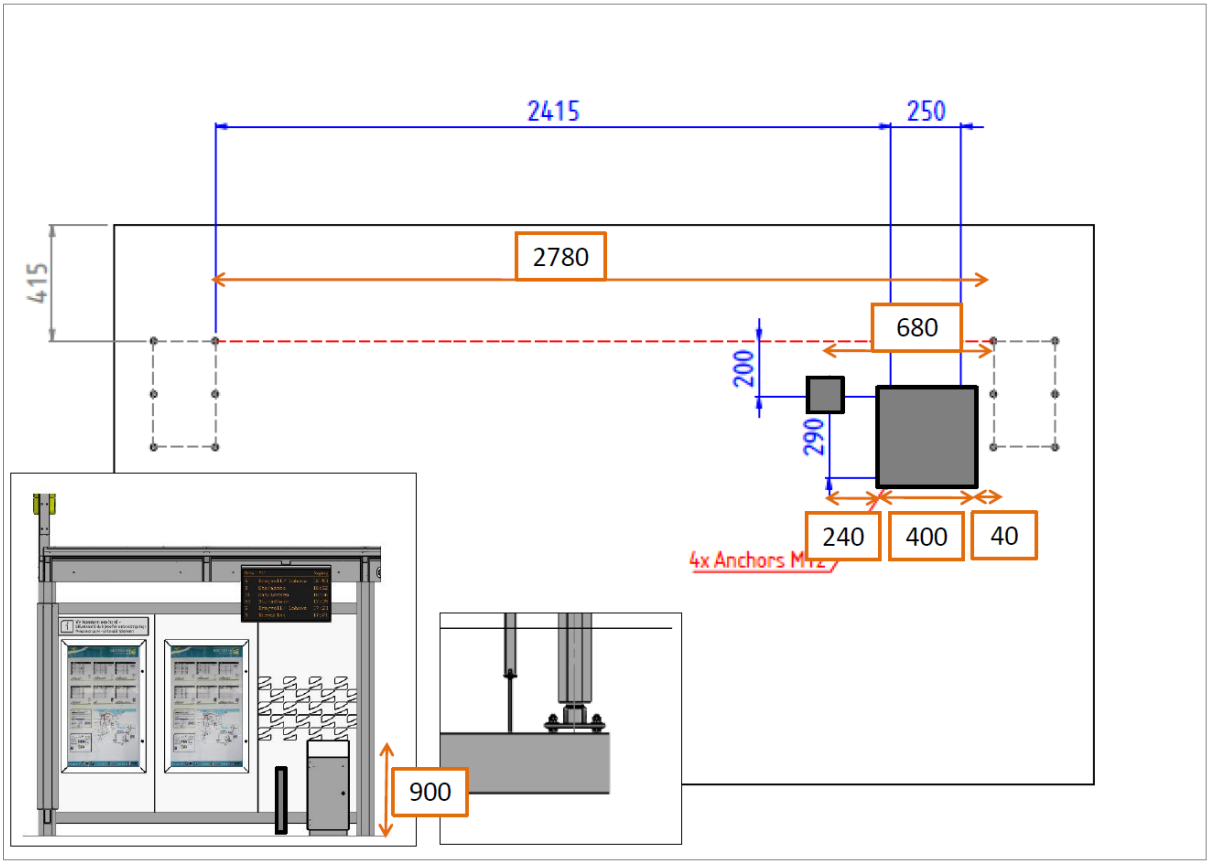


Figure 1: Content and dimensions of the first shelter section

1.10.2 *Metro station completion*

TVM will be located on 29 selected metro bus stations in Trondheim. Some stations will have one TVM and some will have two TVMs (on either side of the road), depending on the traffic situation on the location. Some of the metro bus stations are completed in 2018, but some will not be completed until summer 2019.

One of the selected metro bus stations for TVM, Tiller, is not scheduled to be completed before November 2019*. See clause 1.5.4 for more information about this special case.

Name	3-meter-long shelter	Number of TVMs	Placement TVM	Construction completed at station	Comment
Lund	-	1	Only one platform	30.06.2019	
Bekkasinvegen	Yes	1	Towards the city centre	Completed	
Martin Linges veg	Yes	1	Towards the city centre	30.06.2019	
Tiller*	-	1	Towards the city centre	01.11.2019	
Tonstadkrysset	-	1	Platform no. 1	20.07.2019	
Sluppen (Bratsbergvn)	Yes	2	Both sides	20.07.2019	
Lerkendal	-	2	Both sides	15.07.2019	
Solsiden	No shelter	2	Both sides	Completed	It will not be a shelter on this station, only a foundation for TVM and ticket validator.
Travbanen	-	2	Both sides	Completed	
Anders Søyseths veg	-	1	Towards the city centre	31.05.2019	
Ranheim idrettsplass	-	1	Towards the city centre	Completed	
Åsheim skole	-	1	Towards the city centre	Completed	

Saupstad skole (Skytterbyen)	-	1	Towards the city centre	Completed	
Casper Lundes veg	-	1	Towards the city centre	Completed	
Anders Buens gt	-	1	Towards the city centre	15.06.2019	
Lade idrettsanlegg	Yes	1	Towards the city centre	20.07.2019	
Lohove	Yes	1	Towards the city centre	Completed	
Bergheim	-	1	Towards the city centre	20.07.2019	
Østre Berg	-	1	Towards the city centre	31.05.2019	
Høgskoleringen	-	1	Away from the city centre	Completed	
Skansen	-	1	Away from the city centre	Completed	
Nyveibakken	Yes	1	Towards the city centre	20.07.2019	
Johan Falkebergets vei	Yes	1	Towards the city centre	Completed	
Dalen Hageby	-	2	Both sides		

Table 1: Metro bus station overview – TVM

The white fields in the table represent the stations included in Phase 1, see clause 1.5.3 for more information. The yellow field in the table represent the station included in Phase 2, see clause 4 for more information.

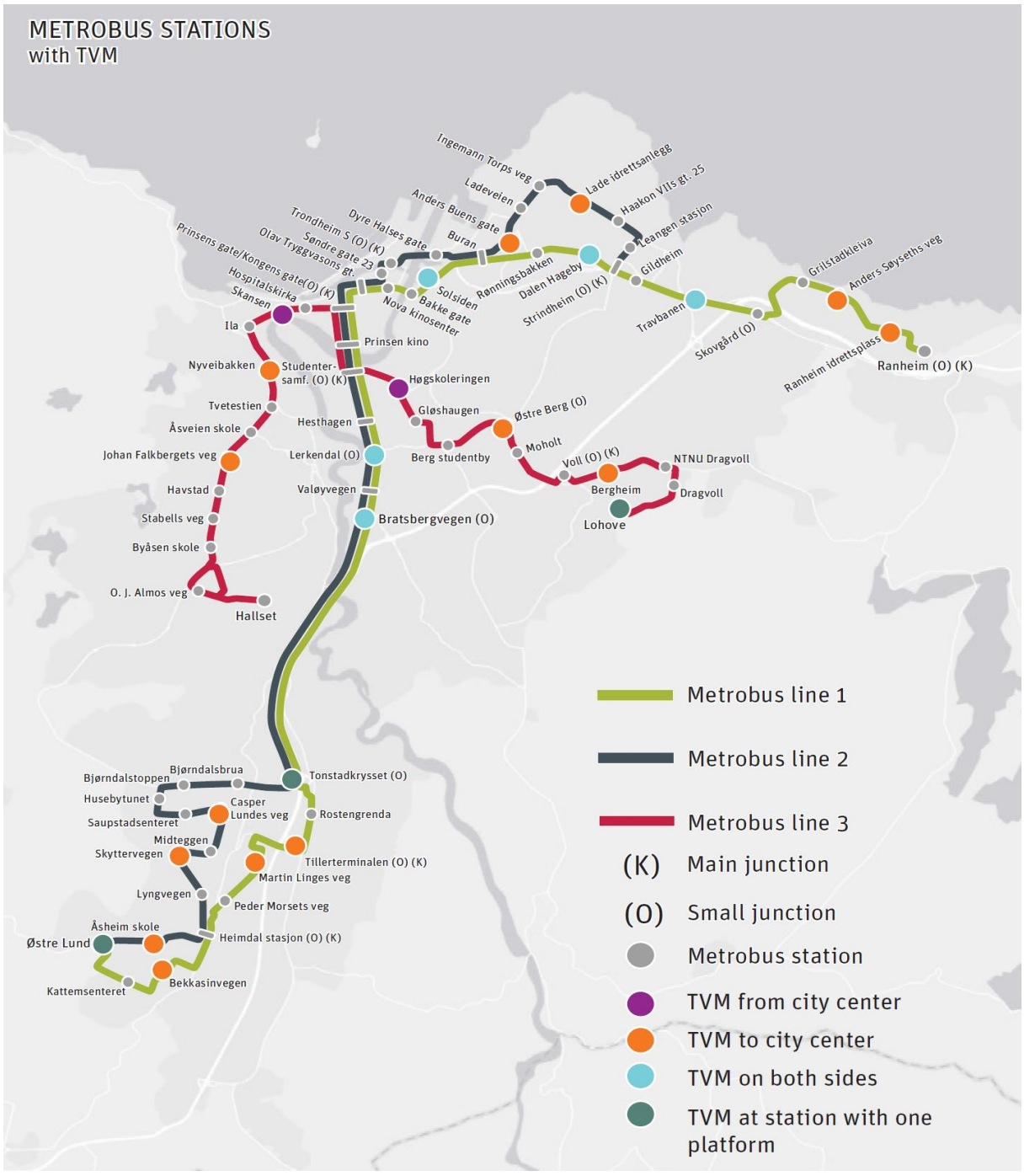


Figure 2: Map of selected metro bus stations with TVM

1.10.3 *Influences at metro bus stations*

1.10.3.1 Pre-fabricated pillar base

Cf. clause 1.10.1.

1.10.3.2 Ticket validator

The ticket validator is a separate procurement and there is a signed contract for this equipment. It is a contactless passenger ticket validator designed for unattended use at metro bus stations.

Mechanical construction	Specification
Enclosure	One-piece aluminum
Dimensions	Approximately W160 x H310 x D160 mm
Weight	Approximately 2 kg
Installation	Fixed installation in 80x80 mm square tube
Ingress Protection	IP65
Impact Protection	IK08 minimum
Power supply voltage	230V ~ 50Hz
Rated power	50W
Power consumption	<30W

Table 2: Information about the ticket validator

Figure 3: Ticket validator

1.10.4 *Fastening device for TVM and ticket validator*

The ticket validator must be present at all metro bus stations ~ 150, but TVM will only be present at *29* selected metro bus stations. This means that 29 metro bus stations will have both the ticket validator and a TVM, which means that they must be installed in the same location in relation to the same pre-fabricated pillar base, cf. Attachment 1.2. The Contractor of TVMs will therefore be commissioned by the Customer to design and manufacture a fastening device/adapter that fits both the TVM and the ticket validator, which can be attached on(to)/secured over existing pillar base. The pillar base is designed to withstand a total weight of 100 kg, but the Customer is open to solutions that can increase the window of opportunity regarding the weight of the units. This as long as the new solution is based on the pre-fabricated pillar base. It is up to the Contractor to decide if he needs the extra weight opportunity for the TVM or not.

The placement of the TVM and the ticket validator on the fastening device must be in accordance with the requirements for universal design and ICT-equipment. The TVMs must at least be designed in accordance with ten different standards and the Customer require that the Contractor get acquainted with these standards, and as a minimum meets the minimum requirements in their tender. The table under is only meant as an aid on the way, and Contractor must nevertheless read up on the legislations.

Operation
Requirement 4.1 The user must be able to operate the machine either from the front or from the side. • Wheelchair users must be able to come right up to or have their legs underneath the vending machine.
Requirement 4.2 The height of the operating components such as the display and keyboard should be between 75 centimetres and 130 centimetres above the floor. Then the machine can be used by both standing and seated persons.
Requirement 4.3 Display and keyboard must be angled so that they can be seen and used by both seated and standing people. • On display screens, the display must be 55 to 70 degrees from horizontal. • The automatic keypad must be angled 10 - 20 degrees from the horizontal position. Such an angle makes the operation of the keyboard easier and more comfortable than an angle of 90 degrees. • It is even better if the user himself can adjust the angle of the screen and keyboard. For example, when fixed payment terminals are attached to an adjustable arm / holder.
Requirement 4.4 Operating Components should be no longer in than 15 centimetres from the front of the machine.
Illumination
Requirement 4.6 The operating components should be well-lit and shielded from direct sunlight. • The display of the display and keyboard on the machine must be at least 500 lux. For the area around the vending machine, 200 lux is sufficient lighting. • Sunlight or strong illumination can make it difficult or impossible to see information on the screen because the user is blinded.

Sound
Requirement 4.7 The user must not be disturbed by sound from the surroundings. • If the machine is located in an area with a lot of noise or background noise, it must have an inductive loop or other aids for hearing impaired users. Other options can be outlets for earplugs. • Alternatively, the area around the machine can be noise-shielded. • If the machine has an inductive loop, it should be clearly marked with signs and instructions on the machine.
Instructions for use
Requirements 4.8 Instructions and warnings must be perceived by everyone and placed where they are used. • Information presented in writing will also be presented in an alternative manner. Alternative ways can be illustrations or sounds that will help users with impaired vision or cognitive difficulties. • When information is disseminated by colour, it shall be presented in a different way. This ensures that people who do not perceive colours get the information.

Table 3: Minimum requirements for the use of TVM

2. Requirements TVM

2.1 Ticket(s)

The TVM must be able to sell and issue tickets in paper format. Ticket receipt must be printed via a ticket printer.

Minimum information on the ticket must be:

- Date
- Time
- Price
- VAT
- Product
- Category
- Date of Purchase
- VAT Number
- Seller
- Sellers logo
- Machine ID (e.g. name of metro bus station)

It can be considered whether the validity of the ticket will be printed.

Tickets must be linked to different categories:

- Single ticket:
  Adult, Child, Senior, Military, Bicycle

  The ticket is valid for 45 minutes from purchase.

- 24-hour ticket:
  Adult, Child, Senior, Military, Bicycle
  The 24-hour ticket is valid for 24 hours from purchase.

Payment card information must be stated on the receipt.

Design of paper ticket and receipt must be approved by the buyer.

2.2 Payment functions

It must be possible to pay for the ticket by using cash (only coins) and card (EMV and other cards).

Cf. clause 1.8.

2.3 Design

2.3.1 TVMs

TVM must appear without the use of contrasting colours, as the Customer plans to foliate the TVM in order to ensure that it matches its environment and corporate colours.

TVM's design must be in line with the minimum requirements for universal design (UD), cf. clause 1.9 and 2.5. Contractor must attach product sheet or other information describing the solution.

The TVM will stand outdoors all year around in different parts of Trondheim city, and must be prepared for, as well as withstand Nordic climate and weather conditions, ensuring that the TVM is operational and reliable throughout the TVMs intended lifetime. The Contractor must familiarize himself with the local climatic conditions and ensure that the TVMs is adapted to this in terms of encapsulation and the like. The Contractor must choose the degree of encapsulation that is necessary to ensure TVMs protection against ingress of solid objects and water, based on conditions that are relevant at the metro bus stations, and the degree of encapsulation must be described and explained in the offer.

The TVM must be designed according to the temperature differences that are relevant to the environment in which it is to be located. Contractor must familiarize themselves with climate and temperature differences in Trondheim, as it has great significance for the assignment. Contractor shall ensure that the machines have the necessary functionalities so that, for example, condensation, overheating and equipment damage are avoided. Contractor must describe how the design takes this into account.

TVMs must be delivered with 4G communication for status/error messages, management of TVM, software upgrade, the transfer of the discharge/clearing reports, verification and loading of EMV cards, etc. Antenna for 4G must be vandal-proof.

The TVM will stand at a metro bus station in a (sometimes) crowded environment where the risk of external influences such as vandalism and damage to the TVM are present. The design of the TVM must ensure that the risk for/consequences of vandalism and damage is low. Contractor must describe how design takes this into account.

The TVM must be equipped with door switches for detection of unauthorized opening of all doors/hatches on the machine. Alarm monitoring must be enabled all day, every day. The ticket machine must have a simple system to suppress alarm messages when service personnel must open the doors for maintenance, emptying of safe coin storage, and the like. The Contractor shall describe the functionality and working method of service personnel to avoid triggering alarms.

2.3.2 Fastening device

The Contractor of the TVMs must also deliver a fastening device that fits both the TVM and the ticket validator. The fastening device needs to be delivered in colour code RAL 7016. This in order to ensure that it matches its environment (the shelters will be delivered in the same colour).

The fastening device will stand at a metro bus station in a (sometimes) crowded environment where the risk of external influences such as vandalism and damage are present. The design of the fastening device must ensure that the risk for/consequences of vandalism and damage is low. Contractor must describe how design takes this into account.

The design of the fastening device must ensure that the location of the TVM and the ticket validator is in accordance with the minimum requirements for universal design (UD), cf. clause 1.10.4.

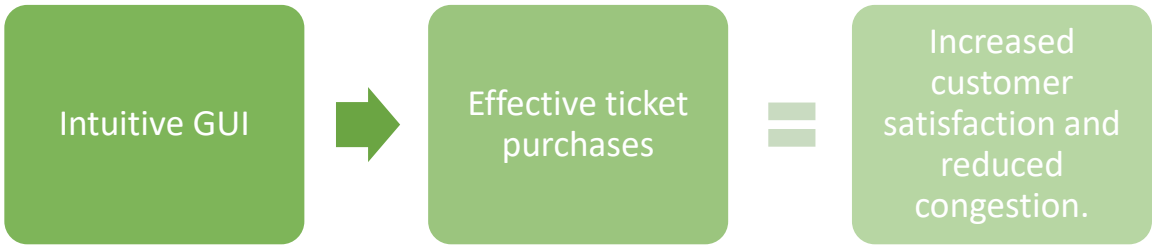
2.4 Usability

2.4.1 User friendly environment

The Contractor must facilitate the conditions surrounding the TVM so that the customer is able to carry out the ticket purchase as smoothly as possible. The Customer must be able to execute a purchase regardless of the weather conditions on site, so the Contractor must consider which measures can be implemented around/on the TVM to ensure that this is taken care of. As an example, it may be mentioned that it must not accumulate snow on the touch screen as this makes it difficult for the customer to use it and that the TVM must still work if there is rainfall on the screen.

2.4.2 Interface (GUI)

The interface (GUI) of the TVM must be simple, as well as intuitive, for our customers to operate. The Customer aims to lay a good foundation for high internal effectivity. Employees and external clients are supposed to experience the final delivery as intuitive and user friendly, to ensure for all users to comprehend the user interface as easy and convenient to work with. The ticket purchase process must be carried out in as few steps as possible, so that the customer does not spend unnecessarily time in front of the TVM.



The client shall execute the purchase process via touch screen. Touch screen is a requirement for the delivery.

The TVM must (as a minimum) handle two languages, Norwegian and English, cf. clause 2.5.

If it is expedient to expand the TVM with new products/options, the interface shall be simple as well as intuitive, for the customer to operate.

2.5 Universal design for ICT

There are ten international standards for the universal design of self-service machines and the Customer expects the Contractor to familiarize themselves with these. The (minimum) requirements for universal design regarding the design of the machine shall be considered as minimum requirements in this context, and these must be met by the Contractor , cf. clause 1.9. It is therefore absolutely necessary that the Contractor familiarize himself with the requirements for ICT equipment:

- CEN/TS 15291:2006 - Identification Card Systems: - Man-machine interface: Technical Specification: Guidance on design of accessible card systems
- NS-EN 1332-1:2009 - Identification card systems - Man-machine interface - Part 1: Design principles for the user interface
- EN 1332-2:1998 - Identification Card Systems: - Man-machine interface Part 2: Dimensions and location of a tactile identifier for ID-1 cards
- NS-EN 1332-3:2008 - Identification Card Systems: - Man-machine interface Part 3: Keypads
- NS-EN 1332-4:2007 - Identification Card Systems: - Man-machine interface Part 4: Coding of user requirements for people with special needs
- NS-EN 1332-5:2006 - Identification Card Systems: - Man-machine interface Part 5: Raised tactile symbols for differentiation of application on ID-1 cards
- NS-EN ISO 9241-20:2009 - Ergonomics of human-system interaction -- Part 20: Accessibility guidelines for information/communication technology (ICT) equipment and services
- ISO 20282-1:2006 - Ease of operation of everyday products -- Part 1: Context of use and user characteristics.
- ISO/TS 20282-2:2006 - Ease of operation of everyday products -- Part 2: Test method
- ISO/TR 22411:2008 - Ergonomics data and guidelines for the application of ISO/IEC Guide 71 to products and services to address the needs of older persons and persons with disabilities

2.6 Back office software

2.6.1 General requirements for the administration system

TVM must be able to communicate with a central system for the distribution of data both ways. The Contractor must in the tender describe how the communication will take place, both to the back office system and to the payment service provider.

The back office software must have monitoring functionality. As a minimum, the Customer require tools to monitor non-functioning TVMs. Automatic notice at downtime/deviation is desirable. There must also be a remote access functionality present in the software so that it is possible to reboot a device and provide remote support.

The tender shall specify which status and error messages are given from the TVM.

Statistics should be generated on the basis of all historical data without the need to define the data collection period in advance. Standard reports must be described in the offer. It will be described how reports based on historical data can be extracted by parameter setting. Statistics and reports must be delivered in format that can be exported for further processing in spreadsheets.

The Customer should be able to perform tasks and changes to the most independent degree possible, to avoid dependency on the Supplier to execute tasks bound to all operating by the Customer. Examples of such are functionality to easily create new ticketing products, change categories, as well as be able to update all prices associated with the Customers products. The Contractor must specify whether a functionality already exists or has to be developed. Additionally, it must be both stated to what extend and to which degree said functionality can be adapted.

Contractor must describe what features exist in their administration system, which the Customer has access to.

The Contractor is obliged to advise the Customer when the Contractor finds that software in the back office system application should be updated. The Contractor shall explain why software and any back system should be updated. It will be up to the Customer to determine if software is to be updated if this entails costs for the Customer.

The administration system must have procedures for automatically changing time at summer/winter time and vice versa.

The administration system must have differentiated access levels.

2.6.2 Administration system and payment solution(s)

Administration system shall have procedures for financial internal control and security (all types of transactions).

For EMV cards and other cards that offer, settlement for card transactions shall be made directly between the TVM and card issuer without equipment supplier as intermediary. A web portal must be provided for reconciliation of transactions handled online.

Administration system must have procedures for debiting credit cards that can not be handled online.

2.6.3 TVMs with cash as payment solution

Administration system must document and store safe coin storage, emptying, specifying time and amount.

Upon withdrawal of the safe coin storage, from the TVM it must automatically be printed a clearing report on paper and to data file for storage in the machine and immediate transfer to the administration system.

Administration system shall have procedures for reconciliation of cash settlement against the bank/cash central.

2.6.4 Programming of tariffs

Administration system must be able to clarify a new tariff for automatic replacement of the old tariff at the time that can be programmed. TVM must be supplied pre-programmed according to the Customer's specifications. Deadline for specification from the Customer must be specified by the Contractor.

2.6.5 Reporting

There must be a set of reports generated based on:

- Turnover per unit
- Number of tickets sold per category per unit
- VAT reports per unit

The reports must be able to be extracted per unit, as well as at the aggregated level. Based on this, the Customer expects the Contractor to describe which reports are available from the Contractors back office system.

It must also be considered whether sales should be closed in accounting periods.

2.7 Delivery

Delivery terms are DDP, Incoterms 2010, unless otherwise agreed.

2.8 Assembly, programming, testing and commissioning

2.8.1 Execution

Mechanical assembly shall be based on existing concrete foundation (pre-fabricated pillar base), but the contractor must make a fastening device/adapter that is customized to suit both the TVM and the ticket validator as described in clause 1.10.4.

Mechanical assembly must be performed by the Contractor. The Contractor shall install, program, commission and test equipment and software included in the delivery, cf. clause 1.4.1.

On delivery, the TVM will have the necessary equipment which makes mounting according to NEK400 possible, for example fuse against earth fault. Contractor is responsible for electrical connection. 230V voltage must be protected against touch.

The Contractor shall submit a certificate of completion, proof of authentication test that confirms that the equipment is functioning according to the specification, as well as test procedures for testing during sharp operation. Test period starts as soon as the delivery is complete, and all documentation is delivered. The Contractor must document all deviations during the test period in writing. Acquisition of delivery takes place after confirmation of satisfactory assembling and testing of the TVM exist, no later than 30 days for each phase.

2.8.2 Work schedule/ Progress plan

Cf. clause 1.5.

2.8.3 Installation registry

Contractor shall keep and maintain an installation registry where among other things, history of repairs, must be recorded.

2.9 Documentation

Full operation and maintenance documentation shall be provided for all items included in the delivery, electronically and on paper. Structure of the operation and maintenance documentation must be described in the tender.

Operating and maintenance instructions should be so comprehensive that the buyer should be able to perform programming, operation and maintenance. The instruction shall ensure the safeguarding of the equipment for the maintenance of contractor warranty and warranty.

Documentation must be in Norwegian. Attachments in the documentation may be in English.

2.10 Training

Training must be given to the extent necessary so that the buyer can take care of the operation, corrective maintenance, error correction, etc. Training must take place at the Customers place. Program for training must be described in the tender.

2.11 Daily operation of the TVMs / First line service

The Customer, or a third party on the behalf of the Customer, will perform first line service on the TVMs. The Contractor must describe the content of such operation in his tender. Content refers to the description of the tasks that are included in the operation and the frequency of these. Contractor's recommendations must ensure optimal operation of TVMs and be in line with the need the individual TVM in order to be operational 24/7 all year round.

2.12 Service and maintenance

This is applicable for SSA-V.

The Contractor shall perform annual service and maintenance of the TVMs to ensure optimal operation of the TVMs. Service and repairs shall be carried out by personnel with the necessary expertise and certifications. By the end of December each contract year, the Contractor shall submit a maintenance plan for the coming year.

Technical components in the TVM should be replaced if new technology is available and appropriate for the Customers operation.

The tender shall include a plan for annual maintenance of the equipment (hardware) and software delivered during the Agreement period. The Contractor shall describe the contents, scope and organization of the maintenance. The Contractor shall list detailed requirements for the maintenance of the equipment that must be performed for the warranty to remain valid.

Contractor shall also explain the operating environment, including characteristics and limitations of hardware, location, lines/network connection and monitoring/security.

The Customer shall receive a report from the Contractor for each TVM after each service.

2.13 Reporting

This is applicable for SSA-V.

Reporting between the Contractor and the Customer shall be established in such a way that relevant and appropriate information reaches the Customer within reasonable time.

Contractor shall provide reports after repair of damage or failure. It must be specified in invoice which work has been carried out, location, number of hours and consumption of material.

The Customer wishes to access the Contractor's reporting system.

2.14 Spare parts

This is applicable for SSA-V.

Contractor must specify typical usage range for consumables (specified in time and/or number of printed tickets). The tender must contain a complete list of spare parts with unit prices. These prices are regulated as other prices in the Agreement. Contractor shall stock all spare parts in required quantities for at least the duration of the Agreement period. Customer is entitled to access the contractor's inventory by list from contractor and/or visit to Contractor.

2.15 Privacy and data security

Contractor is obliged to adhere to the Personal Data Act.

2.16 Data

This is applicable for SSA-V.

All data collected about the use of the machines shall be open and free of charge to the Customer and may not be sold to third parties or used by the Contractor without the consent of the Customer.

2.17 Warranty period

This is applicable for SSA-V.

Minimum warranty period for software must be at least two years.

Minimum warranty period for hardware must be at least two years. The Supplier must also price the cost of an extra year with hardware warranty, see Attachment 7.1 Price form.

2.18 Option(s)

Options will not be subject to evaluation.

2.18.1 Option 1

If the customer considers it necessary to trigger this option, the option will be triggered prior to signing the contract.

If the Customer wants to trigger this option the TVM must possess the following function:

The TVM must have a change of currency for coins.

Exchange unit should be able to provide at least 3 optional coins in exchange. The capacity of the exchange unit must be specified, as well as experience in the need for replenishment.

Safeguarding financial insecurity and routines for replenishing coins must be described.

The TVM will automatically provide interchange for payment with coins that exceed the maximum fare.

The TVM shall have security against the "washing" of any foreign currency that may pass the coin reader.

2.18.2 Option 2

The Customer wants the Contractor to list the price for the (daily) operation of the TVMs and describe what is included in the price.

Attachments:

1.1 Attachment 1.1 – Customer requirement specification table 1A and 1B

1.2 Attachment 1.2 – Prefabricated pillar base