**Technical specification**

1. **GENERAL INFORMATION**

**The subject of the procurement**: validator and monitoring system delivery and development, hardware and software maintenance (2nd and 3rd level support).

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| ***Description*** |  | ***Tenderer’s comment*** |
| * 1. **Meaning:**      1. System - consists of validators, monitoring system, and interface management system.      2. Validator - device (hardware), operating system and set of applications (software).      3. Monitoring system - information system for online managing and controlling validators (software).      4. Interface management system - information system for configuring validator user interface and applications that provide such functionality as trip registration using prepaid tickets, pay as you go service, etc.      5. Development works – configuration of the System in line with the Contracting Authority's needs and requirements according to the Technical Specification.      6. Maintenance works – maintenance works include modification of the System after its delivery to the production environment to correct delivery/development related errors arising from circumstances beyond the developer's control, improve performance or other IT system features, system and technical problem solving, as well as renewal of System versions, performance of security improvements and adjustments if the laws and regulations of the Republic of Latvia or the European Union change and the System does not comply with any of the requirements of regulatory enactments. Maintenance management is the adaptation of the System, including technical support, to the priorities of the business.      7. Change request – work assignment of Contracting Authority in which the tasks to be performed and the objectives to be achieved are defined in the work execution process and will be deemed as changes or additions to the System, except for those changes or additions that are a necessary prerequisite for the realization of the functionality specified in the Technical Specification, although not explicitly described in the Technical Specification. |  |  |
| * 1. From the date of conclusion of the Contract, the Tenderer **shall provide Services within the following terms**:      1. System development within a maximum of 3 months;      2. Delivery of validators:         1. first batch 12 gb. (for the execution of clause 3.37. and 3.4.) within 2 months;         2. second batch 1500 within 4 months;         3. third batch 1488 within 6 months.      3. Maintenance works shall be provided within 54 months of the conclusion of the Transfer and Acceptance Deed. |  |  |
| * 1. The following **documentation** shall be produced along with the acceptance and transfer deed:      1. System Implementation Plan.      2. Validator EC declarations.      3. Automotive, ECE, EMC, EMF, Radio (Regulation No 215 “Rules for conformity assessment, placing on the market, installation, use and monitoring of radio equipment” issued by the Cabinet of the Republic of Latvia on April 2, 2024) and safety test reports for assessment of exposure of humans to electromagnetic fields.      4. Guidelines for the preparation of files and applications.      5. Provide a risk assessment and submit it in accordance with the procedures defined by the Contracting Authority.      6. Description of each API call, including the call and examples of all possible responses with field formats and explanations.      7. User's manual on the full functionality of the System, including video recordings and explanatory notes.      8. Administrator’s manual on the full functionality of the System, including video recordings and explanatory notes.      9. Validator installation manual/instruction.      10. Versions of the System.      11. Finished System code uploaded to the repository provided by the Contracting Authority.      12. List of specialists involved in the execution of the contract.      13. Tenderer shall submit the documentation to the Contracting Authority in English and Latvian in an electronic editable format (MS Word or MS Excel recognizable).      14. The Tenderer may combine several manuals into one by agreement with the Contracting Authority. |  |  |
| * 1. **User management and training**:      1. The Tenderer shall provide the administration of several levels of users in the *Microsoft Entra (AD)*, defining rights and levels of access, for example:         1. Key user (Administrator) who shall be able to grant users access to the System data;         2. System users;         3. Other System users;      2. The Tenderer shall provide an online or, if necessary, face-to-face training to key users (administrators) on the System and validator use.      3. Prior to acceptance of the development work, the Tenderer shall provide user training in the System’s test environment to verify the application of the user manuals and full functionality of the System and validators.      4. The Tenderer shall provide the following technical documentation and training to the Contracting Authority:         1. deployment, maintenance and operation of the content management software;         2. identification and troubleshooting of functional faults;         3. updates of the information screens and content management software;         4. configuration and preparation of validators for installation in case of validator replacement;         5. implementation of minor functional additions or visual modifications;         6. data integration and operations with it;         7. remote monitoring of the operation of the validators;         8. Procedure for equipment maintenance.      5. After the training required by the Technical Specification, the Tenderer shall provide the Contracting Authority with consultation and, where necessary, support on the operation of the content management software required by the Technical Specification throughout the term of the contract.      6. The Tenderer confirms that shall ensure that spare parts can be purchased at a separate cost at least 5 years after Acceptance Deed. |  |  |
| * 1. **Functional requirements for the Monitoring system**:      1. Shall provide online management of all connected validators and exchange of information with the content management server.      2. Shall provide remote setting of required parameters, remote updating of validator software.      3. Shall provide online connection control, online reading, display of validators functional parameters.      4. Shall provide audio volume adjustment.      5. Shall provide log file upload.      6. Shall provide validator grouping.      7. Shall provide protection against unauthorized access to the operation of the software. |  |  |
| * 1. **Functional requirements for the Interface management system**:      1. Shall provide configuring validator applications.      2. Shall provide accounting and validator of error and warning messages.      3. Shall provide the management of the graphic files to be displayed, the ability to be linked to each validator connected to the system individually or to a group of validators.      4. Shall provide online control of screen display content.      5. Shall provide validator grouping. |  |  |

1. **SYSTEM REQUIREMENTS**

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| ***Description*** |  | ***Tenderer’s comments*** |
| * 1. **General requirements**:      1. The Tenderer shall ensure smooth operation of the System. This means that the availability of the System shall not be lower than 99,5% per month, except in the case of planned interruption or development work, excluding planned delivery work, of the System for reasons beyond the control of the Tenderer.      2. Only authenticated and authorised users shall be allowed to work with the System and real-time data synchronization and user permission changes in Microsoft Entra shall be ensured.      3. The Tenderer shall ensure automatic storage, archiving, anonymization, deletion or minimization of data and delivery at the request of the Contracting Authority within the time limits specified.      4. The Tenderer shall develop the service in compliance with security standards.      5. Development or maintenance work after an independent third-party security audit.      6. Implementation of the development in the System test and production environment.      7. The Tenderer shall ensure simultaneous processing of requests, including requests that have formed a queue.      8. The Tenderer shall ensure real-time or specific determent synchronization parameter (for example – data synchronization at each stop) to exchange data.      9. The Tenderer shall ensure the calculation and correction of the fee for the service.      10. The Tenderer shall ensure the automated and manual administration of data archiving and deletion.      11. The Tenderer shall provide data exchange via API.      12. The Tenderer shall ensure short processing times for requests (up to 500 milliseconds).      13. The Tenderer shall ensure monitoring of data exchange and processes.      14. The Tenderer shall provide audit trails of the activities performed in the System.      15. System shall be deployed in an MS Azure environment as specified by the Contracting Authority.      16. The manufacturer shall provide a minimum of 36-month warranty for the equipment and 24-month warranty of software. |  |  |
| * 1. **Integration with the Contracting Authority's Information Systems (IS)**:      1. The Tenderer shall ensure regular data exchange via API or equivalent method according to the criteria and frequency defined by the Contracting Authority. Data structure will be determined at the signing the contract.      2. Integration with 3rd party systems (REST API based protocol) and GTFS protocols.      3. Integration with fleet management system (PikasFleet) to get planed route, real time GTFS based data.      4. Integration with vehicle onboard tablet to visualize validator status (online, offline, error etc.).      5. Integration with CBT and ABT ticketing systems. |  |  |

1. **TECHNICAL REQUIREMENTS OF VALIDATORS**:

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|  | **Requirement / Technical Requirement/ Parameter Value** | **Requirement** | **Requirement Value** |
|  | Contactless smart card reader | not less than or better/more | ISO 14443 A/B (read/write) |
| 3.2. | Supported Tag-lCs | not less than or better/more | MIFARE Classic MIFARE Plus MIFARE Ultralight  MIFARE Ultralight C MIFARE DESFire  MIFARE SmartMX Calypso  SpringCard eIDAS v2 |
| 3.3. | EMV and cEMV reader must have L1 certificate and L2 certificates provided by VISA and MasterCard | Exact | EMV and cEMV L1 and L2 |
| 3.4. | EMV and cEMV(contact-less) reader must have L3 | Exact | EMV and cEMV L3 according to Regulation No 95 “Regulations regarding technical requirements for electronic devices and equipment for the registration of taxes and other payments” issued by the Cabinet of the Republic of Latvia. |
| 3.5. | Data storage/memory | not less than or better/more | 8GB |
| 3.6. | Replaceable external flash memory | not less than | 32GB |
| 3.7. | Onboard RAM | not less than or better/more | 8GB |
| 3.8. | Free onboard RAM after boot with demo app | not less than or better/more | 4GB |
| 3.9. | Onboard CPU | not less than or better/more | Single-Core Score  1550  Multi-Core Score  3887 |
| 3.10. | Ethernet speed | not less than or better/more | 100 Mbps |
| 3.11. | Ethernet Port | Exact | RJ45 Poe Port |
| 3.12. | Screen size | not less than or better/more | 5” |
| 3.13. | Screen resolution | not less than or better/more | 480x800 pixels |
| 3.14. | Screen brightness (nit) | not less than or better/more | 450 nit |
| 3.15. | Screen type | Exact | Color |
| 3.16. | Touchscreen | Exact | Touchscreen |
| 3.17. | Speaker (software volume control) | must be |  |
| 3.18. | RTC with battery | must be |  |
| 3.19. | Operating temperature | not narrower than or better/more | -20°C - +50°C |
| 3.20. | Input voltage (DC) trough Poe | must be |  |
| 3.21. | Weight | not more than | 2 kg |
| 3.22. | QR reader | must be | camera or laser |
| 3.23. | Ingress Protection class (IP) | not less than | IP54 |
| 3.24. | Mechanical protection class (IK) | not less than | IK8 |
| 3.25. | Secure Lock to housing with key | must be |  |
| 3.26. | Housing/Validator color | Exact | will be determined at the signing the contract |
| 3.27. | Bus hand railing diameter | not less than or more | 35mm - 37mm |
| 3.28. | Warranty (months) | not less than or better/more | 36 |
| 3.29. | Device identification | must be | The device must have a laser engraved or metalized sticker with the unique device identification number |
| 3.30. | EC Declaration of Conformity | at least | Provisions meet: a) Directive 2014/53/EU of the European  b) Regulation No 215 “Rules for conformity assessment, placing on the market, installation, use and monitoring of radio equipment” issued by the Cabinet of the Republic of Latvia on April 2, 2024.  <https://likumi.lv/ta/id/351106> |
| 3.31. | Compliance to CIPURSE™ open standard specification per OSPT Alliance instructions | must be |  |
| 3.32. | Compliance to CNA/PayCert standard specification per STA (alliance) instructions | must be |  |
| 3.33. | Validator and card interface should be based on open standard in compliance with ISO/IEC 7816-4 commands for interchange and ISO/IEC 7816-8 for security operations. | must be |  |
| 3.34. | Compliance to secure electronic payment standards supported by GooglePay and ApplePay | must be |  |
| 3.35. | Compliance to safety standard | at least | a) Regulation No 442 “Procedures for the ensuring conformity of information and communication technologies systems to minimum security requirements” issued by the Cabinet of the Republic of Latvia – requirements as for increased security systems.  b) Protection against system application security exploits (OWASP Top Ten Web Application Security Risks) for web resources |
| 3.36. | Backup management solution for system-level and data base level – requirement definition, continuously backups, performance control, integrity control, version control, rollback function without system interruptions | must be |  |
| 3.37. | Test platforms (site) and all testing environments | must be |  |
| 3.38. | The Tenderer after request shall provide 3 validators for independent 3rd party Radio and safety tests within 1 month after request. | must be |  |

1. **SYSTEM MAINTENANCE, WARRANTY AND CHANGE REQUESTS**

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| ***Description*** |  | ***Tenderer’s comment*** |
| * 1. **Maintenance**:      1. During the maintenance period, the Tenderer shall provide modification of the System after its delivery to the production environment to correct delivery/development related errors arising from circumstances beyond the developer's control, improve performance or other IT system features, system and technical problem solving, as well as renewal of System versions, performance of security improvements and adjustments if the laws and regulations of the Republic of Latvia or the European Union change and the System does not comply with any of the requirements of regulatory enactments.      2. The Tenderer shall carry out the maintenance of the System in accordance with and following the Contracting Authority's guidelines with specific application categories and their priorities. (Maintenance shall include Category 1 and Category 5 applications – failure and consultation). |  |  |
| * 1. **Warranty**:      1. The Tenderer shall maintain the warranty for at least at least within the minimum period specified in the Technical Specification from the date of signature of the Transfer and Acceptance Deed. The Contractor shall implement the warranty within the time limits set out in the Technical Specification, fully remedying the problems and/or deficiencies, including errors, recorded in the Warranty Application, at its own expense and with its own forces.      2. The Validator and System warranty is valid also in cases when the Contracting Authority performs the assembly and dismantling of Validators in public vehicles in accordance with the instructions submitted by the Tenderer.      3. The Tenderer shall provide the guarantee in accordance with and following the Contracting Authority's guidelines with specific categories of applications and their priorities. (Guarantee shall cover Category 1, 2, 3 and 4 applications – errors and inaccuracies). |  |  |
| * 1. **Change requests**:      1. The Tenderer shall ensure that change requests are executed in accordance with and following the Contracting Authority's guidelines with specific categories of applications and their priorities. (Category 6 applications)      2. The Tenderer shall provide the preparation of the implementation proposal (work task) for Category 6 applications free of charge.      3. The work task for the change request shall be agreed and approved by the Contracting Authority.      4. The planned scope of work for changes and System development applications (Category 6) shall not exceed 20% of the Contract Amount. |  |  |
| * 1. **Definitions for warranty and maintenance categories**      1. Failure – problem causing complete shutdown of the System and/or unavailability of functions (**Category 1 – Maintenance**).      2. Restricting error – a problem caused by a System software error or malfunction that results in a significant loss of functionality and there is no known workaround, but it is possible to continue operation in a restricted mode **(Category 2 – Warranty)**.      3. Non-restricting error – a problem that causes minimal loss of features and/or functions, the impact on the System is minor or inconvenient (**Category 3 – Warranty)**.      4. Inaccuracy – a problem that causes no potential damage and is considered a System software bug, inaccuracy, or malfunction that causes minor impact on the operation of the System (**Category 4 – Warranty)**.      5. Consultation – a situation where the Contracting Authority needs support to resolve specific issues or to obtain additional information about the System and its functionality, including training on the System, and preliminary assessment of changes (**Category 5 – Maintenance)**.      6. Changes – a request to make changes or to add functionality, documentation or other additional work to the System, other than the categories described above (**Category 6 – Change request)**. |  |  |
| * 1. **Guidelines for support and change requests**      1. The Tenderer shall provide centralised handling of applications, problems and defects, for the deliverables developed during the validity period of the Contract, within the business hours of the business day (between 7:30 a.m. and 4:30 p.m.) via the following channels:         1. calls to a specified contact telephone number or e-mails to a specified e-mail address;      2. upon receival, the ticket shall be registered in the Tickets System of the Tenderer, stating the time of the ticket and providing a registration confirmation by sending a reply e-mail.      3. The Contracting Authority shall be provided with an access to the Contracting Authority's tickets registered in the Tickets System of the Tenderer.      4. Only the Contracting Authority shall be eligible to take the decision on changing the ticket category from a lower category to Category 1 or Category 2 and to initiate its handling outside the standard business hours.      5. The remediation of reported problems and/or handling of submitted tickets shall be carried out in accordance with the mode of operation set out in the Technical Specification and in accordance with the following minimum response, workaround, and full remediation times:         1. response time – the period of time from receipt of the ticket, when the full ticket information is provided or recorded, until the submission of the response time reply, which shall include at least the following information: an explanation of the cause of the problem (if known), an explanation of how the problem will be addressed and resolved or information provided, a timeframe and/or plan for the implementation of the workaround and/or the remediation, the actions required and/or to be taken to help contain the problem or minimize its impact;         2. the target time for delivery of the permanent solution or resolution time and the target time for delivery of the workaround – means the period of time between the receipt and acknowledgement of the response time reply and the moment when the provider has provided a solution after which the problem reported can no longer be repeated or has taken action to downgrade the ticket in question to a lower category;         3. the response time for a **Category 1** ticket is a maximum of 2 hours with completion of the workaround within 4 hours and delivery of the permanent solution within a maximum of 24 hours;         4. the response time for a **Category 2** ticket is a maximum of 4 hours per business day within business hours with completion of the workaround within 8 hours per business day and delivery of the permanent solution within a maximum of 24 business hours;         5. the response time for a **Category 3** ticket is a maximum of 8 hours per business day within business hours with completion of the workaround within 24 business hours and delivery of the permanent solution within a maximum of 48 business hours;         6. the response time for **a Category 4** ticket is no more than 2 business days, with delivery of the permanent solution within a maximum of 3 business days;         7. the response time for **a Category 5** ticket is no more than 3 business days;         8. the response time for **a Category 6** ticket is no more than 5 business days, including a preparation of a proposal containing a description of the solution and an assessment of the workload. If the Tenderer has requested additional information from the Contracting Authority for the preparation of the tender, the counting of business days shall be suspended until the Contracting Authority has provided the Tenderer with the requested information. |  |  |