Term of References

ICLEI – Local Governments for Sustainability e.V

Argentina

GTFS-Realtime Implementation for the Buenos Aires Electric Fleet

1. Details

Requested by:	ICLEI - Local Governments for Sustainability e.V., in coordination with the ACCESS Consortium
Location:	Buenos Aires, Argentina / remote and on-site as required
Email:	ecomobility@iclei.org
Date posted:	24.11.2026
Deadline for submission:	31.12.2026
Projected contract start:	March 2027 (or earlier, subject to the evaluation and signing process)
Expected duration:	Initial implementation and go-live (target: approximately 8 weeks, subject to timely access to inputs), followed by 24 months of operation, monitoring and support, plus mandatory knowledge transfer and final handover to the Government of the City of Buenos Aires (GCBA).
Estimated budget:	Up to 33,000 USD including all costs (service and ancillary cost) and all taxes. Proposals must provide a transparent cost breakdown for implementation, 24-month operation/support, and handover/migration.

2. ICLEI – Local Governments for Sustainability

ICLEI – Local Governments for Sustainability is a global network of more than 2,500 local and regional governments committed to sustainable urban development. Active in more than 125 countries, ICLEI works with cities, towns and regions to advance low-emission, nature-based, equitable, resilient and circular development.

ICLEI supports project implementation, knowledge sharing and capacity development with local and regional governments and partners worldwide.

3. Project background

ACCESS - Accelerating Access to Low Carbon Urban Mobility Solutions through Digitalization is funded by the International Climate Initiative (IKI) of the German Federal Ministry for the Environment and implemented by a consortium of international organizations in six Latin American countries, including Argentina. The project aims to use digitalization and data solutions to improve urban mobility and contribute to lower greenhouse gas emissions.

The ACCESS project, funded by the German government's IKI, is based on the premise that all data and code/software/platforms developed must adhere to open data guidelines (i.e., accessible to the entire community while maintaining privacy controls) and be open source with permissive licenses such as MIT and Creative Commons. Therefore, priority is given to all open-source development.

The project has more detailed guidelines on how this manifests itself in different instances (available for consultation to anyone who requires them), and it also aligns with the Principles for Digital Development (in Spanish here) in addition to the Privacy Principles for Mobility (available here).

The purpose of this call is to procure consultancy services to implement GTFS Realtime on three (3) electric public transport lines in the City of Buenos Aires (eBus and two TramBus lines). The objective is to integrate real-time operational information (from geolocation and dispatch systems) with the system's static information in order to improve the passenger experience and strengthen institutional monitoring capabilities. The initial operational scope comprises the services eBus (13 buses), Trambus Line 34 (10 buses) and Trambus T1 (52 buses).

a. eBus (Electric Bus Pilot)

The eBus line has been in operation since May 2025 and operates 13 low-floor, 7-meter-long electric minibuses.

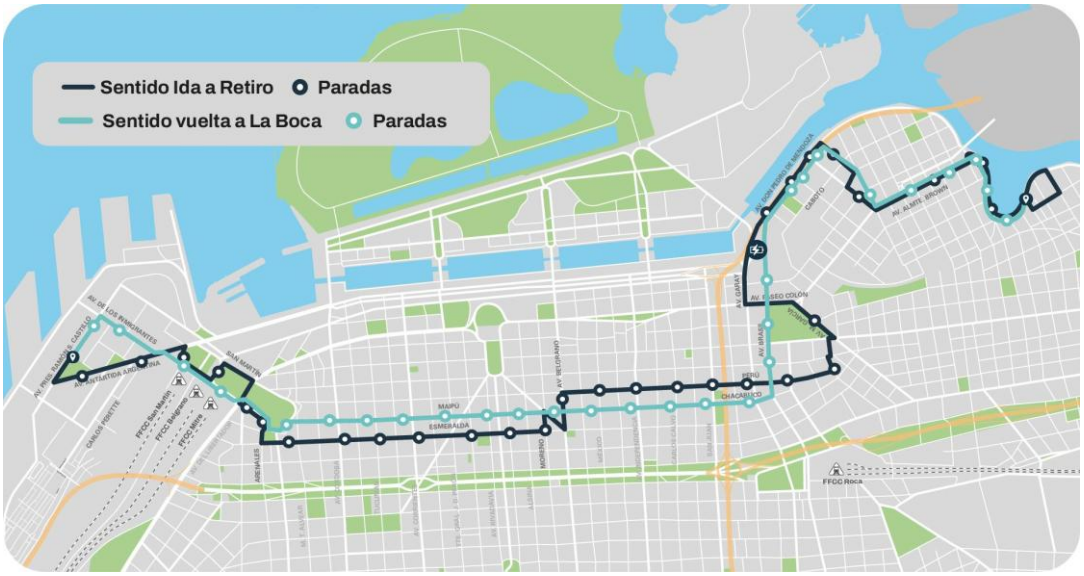

Figure 1. eBus route. Source: https://buenosaires.gob.ar/.

b. TramBus Line 34

The TramBus pilot has been in operation since November 2025, with 10 conventional 12-meter, low-floor electric buses.

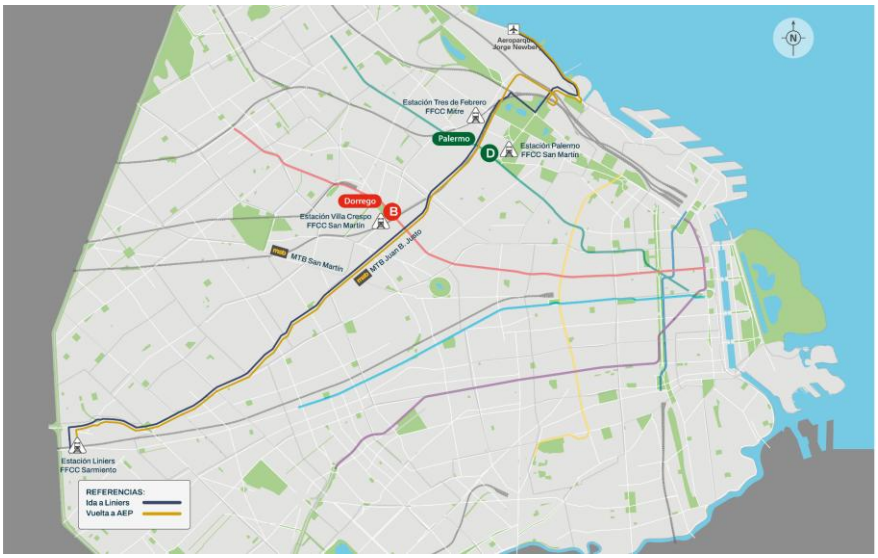

Figure 2. TramBus pilot route on Line 34. Source: https://buenosaires.gob.ar/.

c. TramBus T1

The TramBus T1 route is currently under implementation and will operate with 52 electric buses, including both conventional and articulated vehicles. The route will operate along dedicated and preferential lanes and will benefit from smart traffic signals that will give the buses priority at key intersections along the route. Implementation is expected to be completed by November 2026.

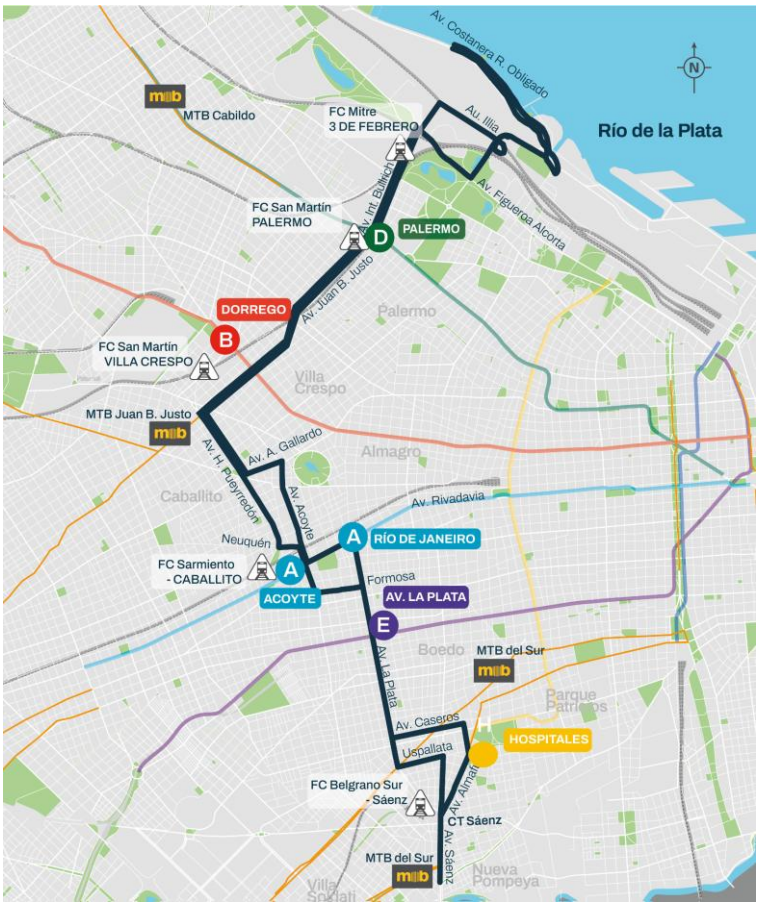

Figure 3. TramBus T1 route. Source: https://buenosaires.gob.ar/.

The pilot is expected to use vehicle-position data already generated by onboard GPS/AVL systems, integrated through the fleet management system of the Transport Secretariat of the City Government. The City expects to provide access to these data through an API, with a current update frequency of approximately 10 seconds, configurable according to operational needs. The Government of the City of Buenos Aires (GCBA) is producing the static GTFS internally, and an initial version exists for the three services. The selected provider will therefore be expected to validate, adjust and maintain the static GTFS during the pilot, including calibration of theoretical travel times using historical operational data provided by GCBA.

The required real-time scope consists of all three standard GTFS-RT components: Vehicle Positions, Trip Updates (arrival/departure predictions) and Service Alerts. GCBA staff will create and manage diversions and service alerts through an administration interface. Passenger information screens on vehicles and at stations are outside the supplier's display-software scope: they will consume the standard feeds through third-party systems. No passenger-facing app or separate trip-planning product is required under this assignment. The assignment must work from the current datasets and interfaces supplied by GCBA and must not rely on legacy public files as the authoritative operational source.

4. Purpose of the call

The purpose of this call is to engage a qualified technical service provider to design, implement, commission, operate and transfer a production-ready GTFS/GTFS-RT service for the Buenos Aires electric bus services. The service shall publish reliable, standards-compliant public transport information that can be consumed by Google Maps and other third-party mobility applications, as well as by the City's passenger-information systems.

A central objective of this procurement is ensuring institutional continuity and technology transfer. The solution must be designed and delivered, so that, after implementation and handover, GCBA can operate, maintain, deploy, modify and scale the service itself - or contract a different provider - without being technically dependent on the selected supplier. Continued contracting of the selected supplier shall not be a prerequisite for continuity of the core service. Ordinary third-party infrastructure costs (for example cloud hosting) may remain payable by GCBA after handover.

5. Scope of work

The selected service provider will work closely with ICLEI, the ACCESS Consortium, GCBA, the fleet management system of the Transport Secretariat of the City Government, and other relevant stakeholders. The scope includes the following activities:

a. Lead the establishment of a Technical Advisory Group (TAG) with all relevant stakeholders, including the Government of the City of Buenos Aires (GCBA) and fleet management system of the Transport Secretariat of the City Government

b. **Inception and technical diagnosis.** Confirm data flows, interfaces, security requirements, fleet/service scope, dispatch linkage, current static GTFS status, target architecture, environments, responsibilities, risks and implementation schedule. The diagnosis shall explicitly identify any dependency that could affect future independent operation by GCBA.

c. **Static GTFS validation, adjustment and maintenance.** Validate the GCBA-provided static GTFS for Trambus T1, the TramBus pilot on Line 34 and eBus using recognised GTFS validators; correct blocking issues; verify routes, stops, shapes, calendars and stop times; establish and document persistent identifiers; adjust theoretical travel times using historical operational data supplied by GCBA; and maintain the feed during the implementation/pilot period. Construction from scratch is not part of the baseline scope unless separately authorised.

d. **AVL/API integration.** Develop and document the connector to the City-provided API, coordinating with the fleet management system of the Transport Secretariat of the City Government and with other source providers where required. The connector shall ingest vehicle positions and the vehicle-to-trip/service assignment supplied by the dispatch system, with robust handling of missing, delayed or malformed source data. The solution shall allow the connector to be adapted to potential changes in GCBA's fleet management provider, including changes in the structure, format or characteristics of source data, to ensure interoperability and continuity of the GTFS-Realtime service.

e. **GTFS-Realtime generation and publication.** Implement public HTTPS endpoints, encoded in GTFS-Realtime Protocol Buffers, for Vehicle Positions, Trip Updates and

Service Alerts. Feeds must remain consistent with the static GTFS, use stable identifiers and meet the latest applicable GTFS specifications and recommended practices. Must ensure compatibility between the static GTFS and the dynamic (real-time) GTFS in its final implementation.

f. **Arrival prediction capability**. Implement and calibrate the logic required to produce Trip Updates and estimated arrival/departure times using actual operational data. The provider shall document the prediction method, key assumptions, calibration process and measurable accuracy indicators.

g. **Service alerts administration.** Deliver a secure, role-based web back office through which authorized GCBA personnel can create, edit, schedule, publish and retire service alerts, diversions, stop closures and other relevant notices, automatically reflected in the GTFS-RT Service Alerts feed.

h. **Quality assurance and end-to-end testing.** Implement automated validation of the static and real-time feeds, monitoring of freshness and availability, and tests covering the entire chain from source API to public endpoint and third-party consumer. Blocking validation errors must be resolved before production acceptance. Ensure that the feed complies with Google Transit specifications and can be consumed by journey planners (Google Maps, Moovit, etc.).

i. **Production hosting and operations.** Host the solution for 24 months after production go-live in accordance with technical and security requirements provided by TECBA/GCBA. Provide monitoring, backup, incident management, preventive maintenance and version/security updates. Hosting during this period may be provider-managed, but the architecture must remain fully portable to GCBA-controlled infrastructure.

j. **Third-party publication support.** Support GCBA in preparing, validating and submitting the feeds to Google Transit Partners and other agreed consumers/aggregators. Agency accounts and contractual relationships with such third parties shall remain under GCBA control. Third-party approval timelines are outside the provider's control and must be distinguished from provider delivery milestones.

k. **Capacity building and operational transfer**. Train GCBA technical and operational staff in architecture, deployment, monitoring, troubleshooting, static GTFS maintenance, Service Alerts administration, backup/restore, security and credential rotation, enabling staff to independently maintain and update the system after the consultancy has concluded. Provide editable manuals, runbooks, recorded training sessions for staff and general public and troubleshooting guides.

l. **Source code, configuration and infrastructure transfer.** Provide GCBA with complete source code for all custom developments, build files, database schemas/migrations, configuration templates, deployment scripts, infrastructure-as-code where applicable, automated tests, dependency inventories, API documentation and repository history. Repositories and administrative access shall be transferred progressively and no later than final acceptance.

m. **Exit and independence plan.** Execute a documented migration/handover process that enables GCBA to deploy and operate the full service without the selected provider. The provider shall support a final independent-operation test in a clean or GCBA-controlled

environment, including deployment, restoration from backup, credential rotation, feed publication, static GTFS update and Service Alert publication.

Minimum technical and continuity requirements

- Standards compliance: GTFS Schedule and GTFS-Realtime specifications and current best practices maintained by the GTFS community/MobilityData; use recognised validators for both static and real-time data.

- Feed publication: Public, stable HTTPS endpoints. Where feasible, production URLs should use a GCBA-controlled domain or DNS entry so that endpoints can remain unchanged after migration to a different hosting environment.

- Freshness: Feeds should refresh at least every 15 seconds or whenever relevant data changes, whichever is more frequent. Vehicle Positions and Trip Updates should normally contain data no older than 90 seconds; Service Alerts no older than 10 minutes, except where upstream source outages are demonstrably responsible.

- Latency: Under normal operating conditions, the target end-to-end latency (from the source position timestamp to publication) shall be less than 30 seconds. Within this overall target, internal processing (from receipt of the data by the API to publication) shall take less than 5 seconds. These targets account for the current AVL update interval of approximately 10 seconds.

- Reliability: The hosting service shall consistently return valid protobuf responses; monthly production availability target of at least 99.5%, excluding approved maintenance and upstream source outages. The provider shall propose an incident severity matrix and response/restoration targets.

- Backups and recovery: At minimum daily backups with a rolling retention of at least 30 days, documented restoration procedures, and a demonstrated restore test before final handover.

- Security and access: Role-based access for administration functions, least-privilege credentials, secure secrets management, auditability of administrative changes, HTTPS/TLS, and compliance with the technical/security requirements supplied by TECBA/GCBA.

- No lock-in: The production runtime shall not require proprietary supplier-only software, supplier-controlled accounts, undisclosed services, or recurring licence payments to the supplier in order to continue operating after handover. Any third-party component or licence must be disclosed in the proposal, with cost, term and migration/replacement implications.

- Ownership and rights: GCBA shall receive the data, configuration, documentation and all custom source code necessary to operate and modify the solution, together with a licence/assignment sufficient for unrestricted governmental operation, maintenance and future procurement. Open-source components are encouraged; their licences must be compatible with these continuity requirements.

- Portability: The solution must be deployable on infrastructure controlled by GCBA without functional redesign.

- Operational acceptance for handover: Final acceptance requires evidence that GCBA staff can operate the service using the delivered materials without day-to-day supplier intervention.

Out of scope unless explicitly added by amendment

- Development of a passenger mobile/web application or a separate trip-planning server.

- Supply, installation or maintenance of passenger-information screen hardware or screen software/content; the provider supplies standard data feeds to be consumed by third-party systems.

- Installation, replacement or maintenance of onboard GPS/AVL hardware or vehicle connectivity.

- Origin-destination matrices, SUBE smart-card analytics or the separate data-analysis platform component of ACCESS.

- Extension to services outside the pilot scope.

- Daily editorial creation of Service Alerts after handover; the provider delivers the tool, workflow and training, while GCBA operates the editorial process.

Gender-responsive requirements

The ACCESS Project applies a gender-responsive framework designed to ensure that no population group is rendered invisible and that the diversity of gender identities, roles, and lived experiences is appropriately considered within mobility systems. Therefore, incorporating women's perspectives at all stages of planning, design, and management is essential.

Gender-responsive mobility policies require a solid evidence base. This involves collecting data disaggregated by sex and informed by an intersectional approach, reflecting the realities of diverse population groups according to dimensions such as age, race, ethnicity, income level, disability, care responsibilities, and geographic context.

Based on this, the proposal should include a gender approach in its solution. More details on Gender Analysis and Safeguards for Gender-Responsive Digital Urban Mobility can be found here

6. Deliverables

The selected service provider will deliver the following products. The final contract may refine dates, but the sequence and acceptance logic below should be preserved.

Deliverable	Indicative timing	Minimum content / acceptance basis
D1. Inception report and work plan	Within 2 weeks of start	Confirmed scope, TAG and stakeholder map, data/interface inventory, architecture, security/hosting approach, risk register, implementation schedule, acceptance test plan, and continuity/exit strategy. Diagnostic Report: Analysis of the source data architecture and a compatibility matrix between the static GTFS and the GPS tracking system.
D2. Validated and adjusted static GTFS	Target weeks 1-3	GTFS for pilot services with stable identifiers, validation report with no blocking errors, documented update procedure, and evidence of adjustment using City-supplied historical data where applicable.
D3. GTFS-RT integration and test environment	Target weeks 3-5	AVL/API connector; working Vehicle Positions and Trip Updates; first version of Service Alerts administration; automated validation/monitoring; technical documentation. Feed Prototype (Test Environment): Access to the URL of the dynamic feed for technical validation. Feed Validator: Evidence that the feed passes the GTFS Realtime Validator tests.
D4. Production release	Target weeks 6-8	Public production feeds for Vehicle Positions, Trip Updates and Service Alerts; end-to-end tests with real fleet data; integration readiness for City display systems; production monitoring and backup enabled. Final Implementation and Documentation: Delivery of the system in production, including a maintenance manual, source code, and API documentation. Visualization Tool: A real-time map (which may be an instance of Transit Real Time Viewer) displaying buses moving along the static routes for counterpart review and auditing.
D5. Third-party onboarding support	From production release	Validation package and technical support for GCBA submissions to Google Transit Partners and other agreed consumers. External approval itself is not an acceptance condition attributable to the provider.
D6. Operation, monitoring and support	24 months from go-live	Continuous hosting/operations, monitoring, backups, incident support, maintenance, security/version updates, and monthly service reports covering availability, feed freshness, validation status, incidents and corrective actions.
D7. Training and handover package	During pilot and before final exit	Technical/operational manuals; architecture and data-flow diagrams; source-code repositories; dependency/licence inventory; API documentation; build/deployment/rollback/backup/restore procedures; editable training materials; training module with recording and presentation; administrator credentials under agreed secure transfer procedure.

Deliverable	Indicative timing	Minimum content / acceptance basis
D8. Final migration and independent-operation acceptance	No later than contract close; earlier if requested by GCBA under the agreed exit plan	Transfer/migration to GCBA-controlled infrastructure or a reproducible GCBA-ready deployment package, plus supervised independence test demonstrating deployment, operation, feed validation, GTFS update, Service Alert publication, backup restoration and credential rotation without continued supplier dependency.

Acceptance of software deliverables shall be based on reproducible evidence, test results and documentation rather than demonstrations alone. Where performance depends on upstream City/operator data, the provider must document the dependency and distinguish source-data failures from failures of the implemented solution.

7. Roles and collaboration

ICLEI and other ACCESS Consortium partners will:

- Provide project coordination, relevant ACCESS requirements and timely feedback/approvals.
- Facilitate interaction with GCBA and relevant stakeholders.
- Support monitoring of implementation progress and knowledge products.

GCBA and relevant City counterparts will, subject to internal procedures:

- Provide the current static GTFS, historical operational data and access to the relevant AVL/API and dispatch information required for the pilot.
- Facilitate technical coordination with the fleet management system of the Transport Secretariat of the City Government and other relevant operators/providers.
- Provide TECBA/GCBA technical and security requirements applicable to hosting and production operation.
- Designate technical and operational focal points; participate in validation, training and acceptance activities.
- Retain control of agency accounts used for Google Transit Partners and other external consumer platforms, with technical assistance from the selected provider.

The selected service provider will:

- Provide the technical team, development/staging environments, project management and implementation resources necessary to deliver the assignment.
- Work iteratively and transparently with ICLEI, ACCESS, GCBA and other stakeholders; maintain a current issue/risk log and notify blockers promptly.

- Follow the agreed standards, security requirements and acceptance criteria.
- Maintain complete, current technical documentation throughout the assignment rather than producing it only at contract close.
- Ensure that all key operational knowledge, code and access required for continuity are transferred to GCBA as part of normal delivery.

8. Reporting requirements and management

- The selected provider will report directly to ICLEI and designated ACCESS Consortium counterparts, with regular participation from the TAG and GCBA technical focal points.
- Regular virtual and/or on-site technical meetings will be scheduled to review progress, risks, data quality, incidents, upcoming activities and acceptance status.
- During implementation, the provider shall maintain a concise progress tracker linked to milestones and acceptance criteria.
- During the 24-month operation period, the provider shall submit monthly service reports with availability, freshness/latency indicators, validator results, incident history, backup status and pending technical debt or risks.
- All final deliverables must be provided electronically in editable/open formats, with PDF versions where appropriate. Source code and deployment of assets must be delivered through repositories accessible to GCBA/ACCESS under the agreed governance.

9. Proposal submission and evaluation

Interested service providers are requested to submit:

- Company profile and identification of the proposed project team, including CVs or short biographies of key technical personnel.
- A concise technical proposal describing the proposed architecture, implementation approach, technologies, hosting model, security approach, validation/monitoring methodology, and project management method.
- A specific continuity and exit plan explaining how GCBA will be able to operate the service without the supplier after handover, including code ownership/licensing, repositories, infrastructure portability, documentation, training and credential/account transfer.
- Examples of comparable GTFS and/or GTFS-Realtime implementations, including references and evidence of production operation where possible.
- A detailed implementation schedule showing dependencies and the earliest feasible production go-live.

- A clear cost breakdown separating: (i) implementation, (ii) 24 months of hosting/monitoring/support, (iii) training/handover/migration, and (iv) any optional items or third-party recurring costs.
- A complete list of third-party software/services and licenses, identifying which are open source, which generate recurring costs, who owns each account, and how each dependency would be handled after handover.
- Proposed service levels and support models, including availability, incident response, monitoring, and backup/recovery arrangements.
- Key assumptions, exclusions, and information required from GCBA/ACCESS.

10. Evaluation criteria

Proposals will be evaluated on the basis of the following criteria:

Criterion	Weight
Relevant experience with GTFS/GTFS-RT, public transport data integration and production operations	**25%**
Technical quality, standards compliance, robustness and appropriateness of the proposed solution, including gender responsive and inclusive digital transformation considerations	**25%**
Long-term maintainability, transferability and demonstrated absence of supplier lock-in	**20%**
Implementation approach, timeline, project team and understanding of Buenos Aires interfaces/dependencies	**20%**
Cost-effectiveness and transparency of the cost structure, including recurring costs	**10%**

11. Data disclosure

The evaluation of the bids submitted to this ToR will be led by ICLEI but might also include other organizations that are part of the project ACCESS. In this context, applicants are made aware that by submitting a bid they consent that their personal data might be shared by ICLEI with those external organizations for the sole purpose of the selection of the best bidders and will then be stored for a duration which cannot exceed the date of conclusion of the final audit of the project.

12. The use of artificial intelligence

The service provider must explicitly indicate and describe the use of artificial intelligence (AI) tools and platforms in the preparation of its proposal, the work itself, and each report (whether for structuring, producing textual or graphic content, making corrections, or other purposes), and, if applicable, how it intends to use these platforms during the execution of the work. The service provider is advised to ensure that confidential data and information from this request for proposals and all information produced throughout the consultancy are not exposed in public AI company databases (for example, by avoiding the use of free versions of the platforms. ICLEI is not responsible for the misuse of AI platforms or the risks this may pose to the security and confidentiality of the data and information in this project.

13. Data standard

In line with its open data and open-source policy, ACCESS prioritizes open data standards and protocols in its work and has made progress in creating a list of various open standards already widely used in the industry. Therefore, the consultancy's activities must utilize open standards (and avoid using closed standards when a well-established open standard exists), such as:
(Please check this list for the most up-to-date information in the ACCESS standards database: Standards - review for ACCESS CFP)

- GTFS (General Transit Feed Specification) for public transport
- MDS (Mobility Data Specification) for shared bicycles (or failing that, GBFS - General Bikeshare Feed Specification)
- CDS (Curb Data Specification) for monitoring curb activity (curb management)

14. Database deliverables

The models, web apps, maps, Excel spreadsheets, macros, and other materials must be delivered to ICLEI in editable format and with version control. The data must be submitted in the following format: csv in a structured database with the corresponding dictionaries. The data collected and generated using any method during the project will be subject to the terms of use established by each government or institution using the application. In any case, the application must make it clear that the data must be handled respecting user privacy, but that there must also be a way to securely access the data in each case. The data collection and management process will follow the Privacy Principles for Mobility (available here). Likewise, the service provider will ensure that the databases used in the project are openly licensed and published, while also complying with local legislation on the protection of personal data and guaranteeing the appropriate use of licenses for the data used in the case of private data.

15. Report format

The reports and documents will be delivered in editable and interoperable formats (e.g., Word/DOCX documents and CSV or other interoperable databases). ICLEI and other partners will provide feedback on the editable document, and the technical service provider will ensure that each version clearly demonstrates the changes made in response to each comment (e.g., using "track changes" or "suggesting mode" to show the previous version, the modifications made, and a final, clean version).