**SRS Document for *Locate a Socket* Web Application**

**1. Introduction**

**1.1 Document Purpose**  
This SRS document outlines the functional and non-functional requirements for the Locate a Socket web application. It acts as a comprehensive manual for developers, testers, project managers, and stakeholders engaged in the design, construction & maintenance of the system.

**1.2 Product Scope**  
*Locate a Socket* is a web application intended to assist electric vehicle (EV) drivers in identifying, accessing, and submitting payment for charging stations on route. Primary objectives involve:

* Providing real-time, location-based charging station availability.
* Enabling secure payments for charging sessions.
* Optimizing route planning for EV drivers.
* Promoting EV adoption by improving charging accessibility.

**1.3 Overview of the Document**  
This document is organised as follows:

* **Component 2**: Comprehensive system description (perspective, functionalities, user roles, limitations, assumptions).
* **Component 3**: Particular specifications (interfaces, functional, non-functional).
* **Component 4**: Supplementary information (references).

**1.4 Definitions, Acronyms and Abbreviations**

|  |  |
| --- | --- |
| **Abbreviations** | **Definitions** |
| EV | Electric Vehicle |
| GPS | Global Positioning System |
| API | Application Programming Interface |
| UI | User Interface |
| PCI-DSS | Payment Card Industry Data Security Standard |
| GDPR | General Data Protection Regulation |

**2. Overall Description**

**2.1 Product Perspective**  
*Locate a Socket* integrates with:

* **Mapping Services** Google Maps API for location data and routing.
* **Payment Gateways** Stripe, PayPal & Credit Card for transaction processing.
* **Charging Station APIs** to pull real-time availability and pricing data.

**2.2 Product Functions**  
Core features include:

* User account creation and authentication.
* Real-time search for charging stations via GPS or manual location input.
* Route planning with charging stops.
* Secure payment processing for charging sessions.
* Usage history and receipts.

**2.3 User Characteristics**

| **User Type** | **Technical Proficiency** | **Key Interactions** |
| --- | --- | --- |
| **EV Drivers** | Basic to moderate | Search stations, pay, plan routes. |
| **Station Operators** | Moderate | Update station status/pricing, view usage reports. |
| **Admin Users** | Advanced | Manage users/stations, handle disputes, monitor system. |
| **Customer Support** | Moderate | Resolve user issues, refunds, account assistance. |

**2.4 Constraints**

* Must support all major browsers (Chrome, Firefox, Safari, Edge) and mobile responsiveness.
* Payment processing must comply with PCI-DSS.
* Data storage must adhere to GDPR/CCPA.
* Dependent on third-party APIs (e.g., mapping, charging networks).

**2.5 Assumptions & Dependencies**

* Users have internet access and GPS-enabled devices.
* Charging station data is available via partner APIs or crowdsourcing.
* Payment gateways (Stripe/PayPal) handle transaction security.
* Mapping services (Google Maps) provide routing accuracy.

**3. Specific Requirements**

**3.1 External Interfaces**

* **User Interface**: Responsive web app (desktop/mobile) with interactive maps, search filters, and payment screens.
* **Hardware Interfaces**: GPS-enabled devices, EV charging hardwares.
* **Software Interfaces**:
  + Google Maps API (location/routing).
  + Stripe/PayPal APIs (payments).
  + Charging station APIs (real-time data).
* **Communication Interfaces**: Email notifications (booking confirmations, receipts), SMS alerts (reservation reminders).

**3.2 Functional Requirements**

| **ID** | **Requirement** | **Details** |
| --- | --- | --- |
| FR-01 | User Authentication | Sign-up/login via email or OAuth 2.0 (Google/Facebook). |
| FR-02 | Station Search & Filtering | Search by location, plug type, availability and price. |
| FR-03 | Route Planning | Generate optimized routes with charging stops based on battery level. |
| FR-04 | Reservation System | Book stations for specific time slots; cancel/modify bookings. |
| FR-05 | Payment Processing | Securely pay via cards/digital wallets; PCI-DSS compliant. |
| FR-06 | Usage History | View past sessions, receipts, and saved locations. |
| FR-07 | Admin Dashboard | Manage users, stations, payments, and generate usage reports. |

**3.3 Non-Functional Requirements**

* **Performance**:
  + Search results load in ≤2 seconds.
  + Support 50,000 concurrent users during peak hours.
* **Security**:
  + Encrypt user data (AES-256) and payments (TLS 1.3+).
  + GDPR/CCPA compliance for data privacy.
* **Availability**: 99.7% uptime (excluding scheduled maintenance).
* **Usability**:
  + WCAG 2.1 AA-compliant UI (screen reader support, color contrast).
  + Key tasks (search, pay) achievable in ≤3 clicks.

**4. Supporting Information**

* **References**:
  + [IETF RFC 6749 (OAuth 2.0)](https://datatracker.ietf.org/doc/html/rfc6749).
  + [WCAG 2.1 Accessibility Guidelines](https://www.wda-association.org/accessibility-review?utm_source=google&utm_medium=cpc&utm_campaign=search_accessibility&utm_content=adgroupid_186845255648|creative_759380020703|device_c|loc_physical_ms_9071477&utm_term=keyword_wcag%202.1%20guidelines|placement_&gad_source=1&gad_campaignid=22697361259&gbraid=0AAAAArCVnVgSBGr4mVcEok1FCpAPj9Vfb&gclid=Cj0KCQjwm93DBhD_ARIsADR_DjGNW3qLYoBGUfV0ebwKlQfn8qy-3WMObhCyRTQgB3By-NOXm5oLgTIaAr_WEALw_wcB).
  + [ISO 15118 (EV charging communication)](https://driivz.com/glossary/iso-15118/).