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).
  - WCAG 2.1 Accessibility Guidelines.
  - ISO 15118 (EV charging communication).