


JK LAKSHMIPAT UNIVERSITY
Institute of Design
NAAC 'A' Grade Accredited

# Easy Charger Application Design:

Easy Charger is a platform for EV owners to locate charging stations and support the growth of the EV ecosystem.

VOL. 1

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Programme :

**Masters of Design (M.Des)**

**Interaction Design**

**THE GRADUATION PROJECT 2025**

The Evaluation Jury has recommended **Rashi Gothwal**
for graduation from Institute of Design, **JK LAKSHMIPAT UNIVERSITY**
with specialization in **Interaction Design**

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Herewith, for the project titled "**Easy Charger Design Project**" on fulfillment of requirements by

**Jury Chairman** _____ _____

**Jury Member** _____ _____

**Jury Member** _____ _____

Subsequent remarks regarding fulfillment of requirements

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Dean, Institute of Design
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**Date:** 10-06-2025

**Place:** Jaipur

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**Student Full Name:** Rashi Gothwal

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**Date:** 10-06-2025

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— Rashi Gothwal
Final Year M.Des (Interaction Design)
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# Synopsis

The global transition to Electric Vehicles (EVs) is rapidly transforming the way people perceive and engage with mobility. In India, this shift is especially pronounced as the country pursues ambitious goals toward sustainable transportation. The adoption of EVs is steadily increasing — particularly among four-wheeler users, including private car owners, fleet operators, and service vehicles. However, while the technological advancement of EVs continues at pace, the user experience around EV usage, especially in terms of charging infrastructure, remains inconsistent, under designed, and often frustrating.

This project, titled "**Easy Charger**", focuses on bridging this gap by examining the Indian EV ecosystem through the lens of Interaction Design and User Experience. The primary aim is to address the real-world pain points faced by four-wheeler EV users at various stages of their journey — from researching and choosing an EV to daily usage, route planning, and especially locating and using charging stations.

Through extensive user research, stakeholder interviews, journey mapping, and iterative testing, the project reimagines the digital and physical touchpoints involved in EV charging. Easy Charger serves as a central concept — a user-centric mobile solution designed to simplify the discovery, booking, navigation, and real-time monitoring of charging stations. The platform also considers accessibility for differently-abled users, transparent pricing models, and trust-building features like station reviews and visual previews.

By applying human-centered design principles, this project aims to build a seamless, efficient, and emotionally reassuring charging experience. The final outcome is a holistic and scalable UX strategy tailored to the diverse needs of India's growing EV four-wheeler community — ultimately accelerating adoption and making electric mobility more accessible to all.

# Objective of the Project

The primary objective of this project is to understand, analyze, and enhance the interaction experience of four-wheeler EV users in India, with a strong focus on the often overlooked human, behavioral, and emotional aspects of electric mobility — particularly in relation to charging.

## Key sub-objectives include:

- Examining how current EV interfaces — especially charging apps and in-vehicle systems — **either support or hinder the end-to-end user journey**, from planning to charging execution.
- Exploring **psychological and behavioral challenges** such as range anxiety, unfamiliarity with charging workflows, lack of trust in station availability, and hesitation in adopting new technology.
- Mapping real-world user journeys across **digital and physical touchpoints,** including discovery, route planning, on-site station use, payment, and feedback loops.
- Designing an experience that is **intuitive, transparent, and emotionally reassuring,** using features such as real-time availability, station previews, reviews, smart filters, and assistive support.
- Delivering a **scalable and inclusive UX framework** through **Easy Charger,** which bridges the gap between technological innovation and real human needs — easing the EV transition and fostering confidence in everyday usage.

# Client Brief

As India accelerates its shift toward electric mobility, driven by schemes like FAME-II and rising environmental awareness, four-wheeler EV adoption is growing steadily. However, the charging experience remains a major barrier—plagued by inconsistent interfaces, poor visibility of real-time charger availability, accessibility issues, and low user trust.

This project explores the question:

> **"How might we improve the usability, accessibility, and trust in EV charging for four-wheeler users across India?"**

Based on extensive user research and ecosystem insights, ElectroConnect – Easy Charger proposes a seamless, intuitive platform that simplifies the EV charging journey. It reimagines key touchpoints—such as charger discovery, booking, navigation, and station feedback—through a human-centered design lens, focusing on clarity, reliability, and inclusivity.

# Scope and Limitations

## Scope

- The project covers Interaction Design and UX aspects of the EV experience in India.
- The focus is on urban Indian users (especially first-time EV owners and fleet drivers in Tier 1 & 2 cities).
- Primary design touchpoints include: mobile apps for navigation/charging/payment, in-car interfaces, charging kiosks, and digital support ecosystems.
- Research includes interviews, surveys, competitive audits, and usability studies.
- The output includes personas, journey maps, wireframes, high-fidelity mockups, and a proposed UX framework.

## Limitations

- The project does not explore mechanical engineering or vehicle design aspects.
- Real-world testing was limited to digital prototypes; physical infrastructure constraints (like actual charger interaction) were simulated through scenarios.
- Time and resource limitations restricted research to India-only users, and within select cities.

# Context of the Project

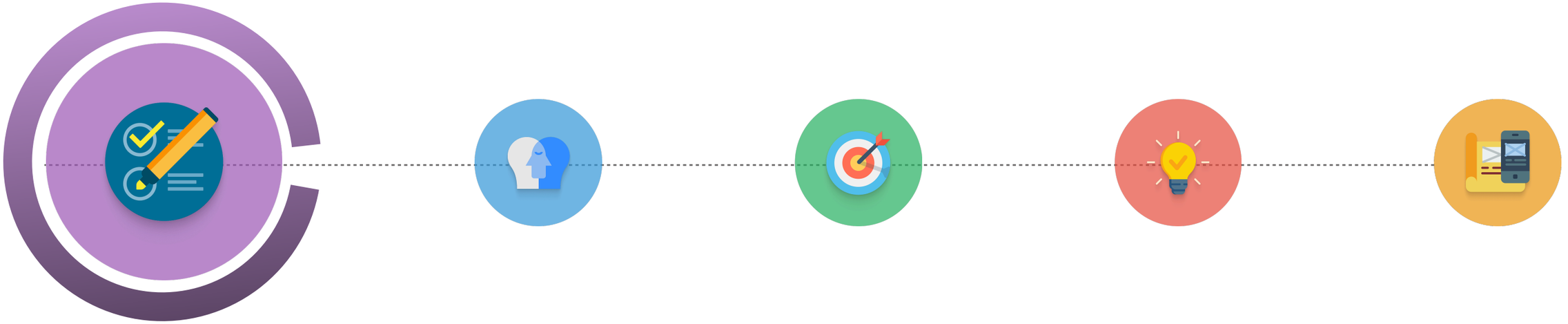
## Scope

- The project covers Interaction Design and UX aspects of the EV experience in India.
- The focus is on urban Indian users (especially first-time EV owners and fleet drivers in Tier 2 & 3  cities).
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# Research Phase



# Research Plan & Objectives

## Research Goal

The aim of the research phase was to understand how users interact with Electric Vehicles in India, identify their pain points, emotional triggers, and mental models, and map the ecosystem that governs these experiences. The focus was on real-world user journeys — not just in terms of digital touchpoints, but also habits, anxieties, and environmental dependencies.

## Secondary Research

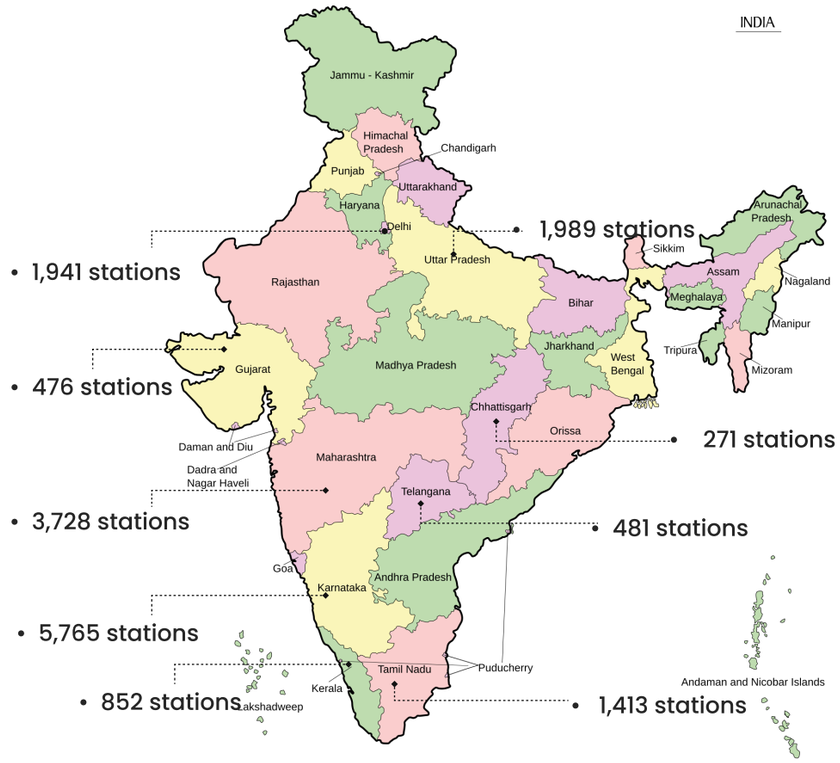
Secondary research involved studying credible sources such as government policies, industry reports, academic literature, and existing EV platforms to gain a comprehensive understanding of the electric vehicle ecosystem. This provided valuable insights into the market landscape, user behavior, infrastructure development, and technological advancements shaping EV adoption.

### 🚗 EV 4-Wheelers in India – 2024 Snapshot

| Metric | Data (Latest Available – CY2024) |
|---|---|
| **Total EV 4-Wheelers Sold in 2024** | ~**99,000 units** (calendar year 2024) |
| **Growth Over 2023** | ~**90% YoY growth** (from ~52,000 units in 2023) |
| **EV 4W Market Share** | ~**2%** of total passenger vehicle sales |
| **Top Selling EV 4W Brand** | **Tata Motors** (Nexon EV, Tiago EV, Tigor EV) – >70% market share |
| **Popular Models** | Tata Nexon EV, Tiago EV, MG ZS EV, Hyundai Kona, BYD Atto 3, Mahindra XUV400, Kia EV6 |
| **Estimated EV 4W Fleet on Indian Roads (Cumulative)** | ~**2.6–2.7 lakh units** (260,000–270,000 cars) as of Dec 2024 |

Current Number of Registered Electric Four-Wheelers in India

## Total Number of Public EV Charging Stations in India (as of December 2024)




- Total Public Charging Stations: 25,202

### Top States by Number of Stations

- Karnataka: 5,765 stations
- Maharashtra: 3,728 stations
- Uttar Pradesh: 1,989 stations
- Delhi: 1,941 stations
- Tamil Nadu: 1,413 stations
- Kerala: 852 stations
- Gujarat: 476 stations
- Telangana: 481 stations
- West Bengal: Data not specified
- Rajasthan: Data not specified

### Observations

- **Karnataka** leads with the highest number of public charging stations, accounting for approximately **23%** of the national total.
- **Maharashtra** and **Uttar Pradesh** follow, reflecting strong alignment between EV adoption and infrastructure development.
- **Delhi** and **Tamil Nadu** round out the top five, indicating significant urban investment in EV infrastructure.

### Current EV-to-Charger Ratio

- Current Ratio: Approximately **1 charging station per 135 EVs.**
- Global Benchmark: International standards suggest a ratio of **1 charging station per 6 to 20 EV.**

# EV Charging Infrastructure in India:

## Key Observations & Strategic Insights

### Present Landscape (as of December 2024)

- India currently hosts approximately 25,202 public EV charging stations, a significant improvement over previous years, but still far from sufficient.
- The majority of these are concentrated in Tier-1 cities, national highways, and commercial hubs, leaving Tier-2, Tier-3 cities, and rural areas underserved.
- Four-wheeler EV owners, especially in non-metro regions, still face major challenges in finding reliable and accessible charging stations.

### Projected Demand by 2030

- According to the Confederation of Indian Industry (CII), India will need around 1.32 million public charging stations by 2030 to meet EV adoption targets.
- This projection is based on an ideal charger-to-EV ratio of 1:40.

### Observations

- Karnataka leads with the highest number of public charging stations, accounting for approximately 23% of the national total.
- Maharashtra and Uttar Pradesh follow, reflecting strong alignment between EV adoption and infrastructure development.
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### Gap Analysis

- Currently, only ~1.9% of the required public EV charging stations are installed. (25,202 out of 1.32 million)

## Varying Charging Ratios by Context

- The Ministry of Power suggests a more nuanced approach:
- Urban private usage may need 1 charger per 20 EVs
- Fleet and commercial vehicles could require even denser networks
- Highways or rural routes may function with 1 per 100–150 EVs depending on travel patterns

## Projected Requirements by 2030

- To align with the government's target of 30% EV penetration by 2030, which translates to about 80 million EVs, India would need.
- Total Charging Stations Needed: Approximately 3.9 million public and semi-public charging stations.
- Target Ratio: Achieving a ratio of 1 charging station per 20 EVs.

## Infrastructure Expansion Plans

- PM e-DRIVE Initiative: The government has allocated ₹2,000 crore to install 72,300 charging stations across the country, focusing on both urban and rural areas, with an emphasis on inter-city and inter-state highways.
- Private Sector Participation: Companies like Tata Motors plan to significantly expand their charging networks. Tata aims to more than double its charging points to 400,000 within the next
- two years, including 30,000 new public charging points and establishing a 'Mega Charger' network with 120-kilowatt fast-charging stations across 500 locations

# Synthesis  of EV Charging Infrastructure Expansion

- **Government Commitment:**
  PM e-DRIVE plans to install 72,300 charging stations nationwide with ₹2,000 crore funding—covering highways, rural zones, and cities.
- **Tata Motors' Mega Rollout:**
  Tata aims for 400,000 total chargers, including 30,000 public stations and 500 Mega Charger locations with 120-kW fast chargers.
- **Other Major Players:**
  Jio-bp, Ather Energy, and Ola Electric are deploying nationwide interoperable charging networks, focusing on fast and connected solutions.
- **PPP & Incentives:**
  State and central governments offer capital subsidies, land use support, and faster approvals under PPP models.
- **Tech & User Accessibility:**
  Emphasis on unified digital platforms, standardized hardware, voice support, and multilingual UIs to enhance public usage and adoption.
- **Scalability Focus:**
  Urban areas will see dense charger networks, while highway corridors and Tier 2–3 cities are targeted for broader inclusion by 2030.
- **Your App Opportunity – Easy Charger:**
  These developments support a centralized platform like Easy Charger that connects users with real-time station availability, type compatibility, ratings, and route-based planning across all providers.

## Key Insights

- **Rapid Growth:** India's EV market has experienced significant growth, with over 4.5 million EVs sold in the last three years, indicating accelerated adoption .
- **Dominant Segments:**  Electric two-wheelers continue to dominate the market, accounting for nearly 59% of total EV sales in 2024 .
- **Increasing Penetration:** The EV market share increased to 8% of total vehicle sales in 2024, up from 6.8% in 2023, showcasing growing consumer acceptance
- **Regional Leaders:**  States like Uttar Pradesh, Maharashtra, and Karnataka are leading in EV adoption, reflecting regional policy support and infrastructure development .

# Types of Chargers Available in the Market

## EV Charger Types for Four-Wheelers in India

| Charger Type | Connector Standard | Power Output | Charging Speed | Typical Time to Charge | Use Case | Availability in India |
|---|---|---|---|---|---|---|
| **AC Level 1** | IEC 60309 / Type 1 | 2.5 – 3.3 kW | Slow | 8–12 hours | Home use, low-end chargers | Limited, older systems |
| **AC Level 2** | Type 2 (IEC 62196) | 7.4 – 22 kW | Moderate | 4–6 hours (for 40–60 kWh) | Home, office, malls | Common in urban India |
| **DC Fast Charger** | CCS2 (Combined Charging) | 30 – 60 kW | Fast | 1–2 hours | Public charging stations | Widely adopted |
| **DC Ultra Fast Charger** | CCS2 | 100 – 350 kW | Very Fast | 20–45 mins (for 80%) | Highways, commercial fast charge hubs | Expanding (Tata, Jio-bp, etc.) |
| **DC GB/T (China standard)** | GB/T (DC) | 10 – 200 kW | Fast | Varies | Used in some Tata & Mahindra EVs | Being phased out in favor of CCS2 |
| **CHAdeMO** | CHAdeMO | 50 – 100 kW | Fast | 30–90 mins | Nissan Leaf (legacy) | Rare, niche only |
| **AC Slow (portable)** | 3-pin plug (household) | 2.5 – 3.3 kW | Very Slow | 10–12 hours | Emergency/backup charging | Found in all EVs as default |

# Competitive Analysis

| App Name | Key Features | Strengths | Weaknesses | Gap Areas Identified |
|---|---|---|---|---|
| Tata Power EZ Charge | Real-time charger availability, QR-code start, navigation | Strong metro coverage, seamless for Tata EVs, renewable integration | Limited to Tata ecosystem, outdated UI, poor rural presence | No cross-brand support, lacks user feedback system, no smart route planner |
| Ather Grid | Fast charger locator, real-time status, charging history | Smooth UX for Ather users, reliable station quality | Only for Ather scooters, no EV car support, network not public | No compatibility with 4-wheelers, limited visibility beyond Ather users |
| Charge Zone | OTP/RFID-based access, charger map, commercial tie-ups | Strong on highways, reliable hardware | Interface not user-friendly, outdated charger info | No reviews or visuals, no live status error reporting |
| Statiq | Booking, UPI/PayTM payments, real-time updates | Modern UI/UX, expanding rapidly in North India | Limited in South and rural India, inconsistent charger uptime | No user community or charger feedback, no trip-level planning |
| EV Plugs | Aggregator of multiple networks, filter by speed/ connector | Wide charger compatibility, includes many providers | Lacks live status, few interactive features | No route planning, static data, lacks reservation and personalization |

# Key Gap Areas Across All Apps

## Lacks in Cross-Network Compatibility

Most apps are brand-specific or don’t show real-time data across all networks like Jio-bp, Tata Power, Statiq, etc.

## Route-Based Planning

Lack of  intelligent charging route planner for long-distance trips (especially for 4-wheelers).

## Community & Trust Layer

Very few apps include user reviews, charger ratings, station images, or breakdown reports.

## Smart Recommendations

No personalized recommendations based on battery level, vehicle type, preferred brand, etc.

## EV Education & Support

First-time EV users don’t get onboarding guides, help sections, or a chatbot for FAQs on charger types, connectors, pricing, etc.

# EV Ecosystem Mapping

## Ecosystem Layers (Human + Systemic)

The EV ecosystem is a complex web of interconnected stakeholders, touchpoints, technologies, and infrastructures. Mapping it helps:

- Identify friction points and opportunity areas.
- Understand how users interact with multiple systems (apps, stations, service, etc.).
- Reveal dependencies that affect UX outcomes.

### User Layer (EV Owners & Drivers)

- Private EV Users (urban and semi-urban)
- Fleet Drivers (Ola/Uber EV, corporate fleets)
- First-time Buyers (transitioning from ICE vehicles)
- Tech-savvy Explorers (early adopters)
- Reluctant Adopters (motivated by regulation/policy)

### Touchpoint & Interface Layer

- Mobile Apps (for navigation, charging, vehicle diagnostics)
- In-Vehicle UI (dashboards, infotainment, battery indicators)
- Charging Station Screens/Kiosks
- Customer Support Channels
- Web Portals (vehicle or infra providers)
- Voice Interfaces/Assistants (if applicable)

## Infrastructure & Service Layer

- Public Charging Stations (DC fast chargers, AC slow chargers)
- Private Charging Setup (home-installed EVSEs)
- Energy Grid (load balancing, renewable integration)
- Battery Swapping Stations (for two-wheelers or fleets)
- Telematics Services (data about vehicle usage, health)

## Institutional & Regulatory Layer

- Government Bodies (e.g., Ministry of Road Transport, state EV cells)
- Municipal Corporations (public infra planning)
- Policy Schemes (FAME-II, state subsidies, tax incentives)
- Urban Planners & Smart City Missions

## Business Ecosystem & OEM Layer

- Mobile Apps (for navigation, charging, vehicle diagnostics)
- In-Vehicle UI (dashboards, infotainment, battery indicators)
- Charging Station Screens/Kiosks
- Customer Support Channels
- Web Portals (vehicle or infra providers)
- Voice Interfaces/Assistants (if applicable)

# Stakeholder Analysis

Stakeholder analysis helps identify all key individuals or groups involved in or affected by the project. It clarifies their roles, expectations, influence, and needs—ensuring that design decisions align with business goals, technical constraints, and user needs. This leads to better collaboration and smoother project execution.

| Type | Examples | Role/Impact |
|---|---|---|
| Primary stakeholders | EV Users, Drivers, Fleet Operators | Direct users; experience UX first-hand |
| Secondary Stakeholders | Charging Infra Companies, App Developers, OEM UI teams | Influence design standards and usability |
| Tertiary Stakeholders | Government Agencies, Urban Planners, Policy Makers | Set constraints or enable infrastructure |
| Enablers | EV App Platforms, Battery Tech Teams, Data Providers | Supply the backend logic or systems |
| Influencer | Media, Reviewers, Tech Evangelists | Affect public perception and adoption |
| Affected Bystanders | Pedestrians, Co-passengers, Urban Residents | Impacted by EV adoption and infra planning |

# Quantitative Research

Quantitative research helps gather measurable data from a larger user group to identify patterns, validate assumptions, and support decisions with evidence. It brings clarity to user behavior through numbers—making design choices more objective, scalable, and reliable.

**“ How often do you take long trips (100+ km)?**



- 25% Rarely
- 40% Sometimes
- 25% Often
- 10 % Never

**“Ever faced difficulty locating a charger on a trip?**



- 72% Yes
- 28% No

**“ Type of issue faced at chargers (multi-select)**



- 55% Full station
- 45% Not working
- 38% Slow Charging
- 33% App Failures

**“ Average wait time at public charger during travel**



- 15% 0–15 min
- 30% 15–30 min
- 35% 30–60 min
- 20% 1 hr+

**“ Average wait time at public charger during travel**



- 15% 0–15 min
- 30% 15–30 min
- 35% 30–60 min
- 20% 1 hr+

**“ Confidence in EV range on long trips (scale 1–5)**



- 1: 5%
- 2: 15%
- 3: 40%
- 4: 30%
- 5: 10%

**“ Are EV apps informative during travel?**



- 22% Yes
- 56% Somewhat
- 22% No

**“ How often do you take long trips (100+ km)?**

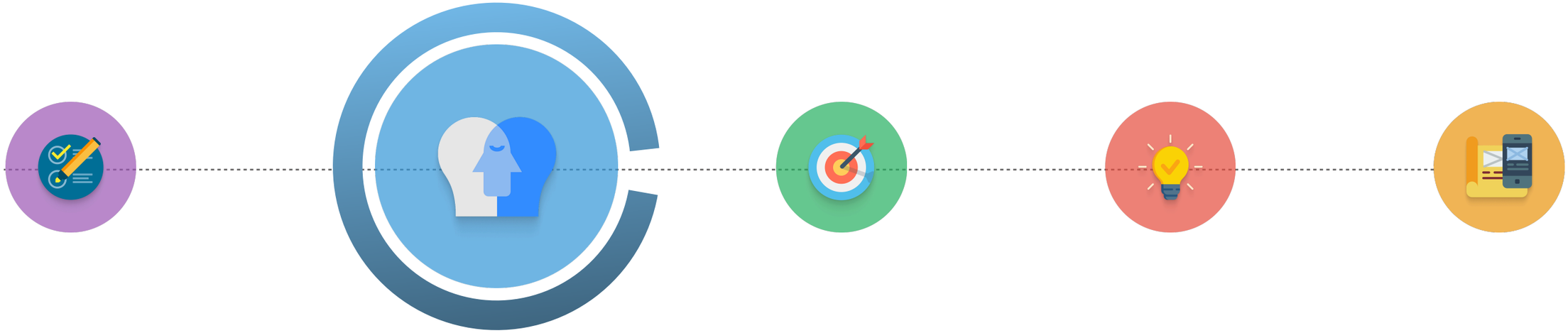


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- 40% Sometimes
- 25% Often
- 10 % Never

# Key Insights

- 72% struggle to find chargers while traveling.
- Major issues: full stations, breakdowns, slow charging.
- Over 50% wait 30+ mins for a charge.
- Most users rate EV range confidence as 3 out of 5.
- 68% plan routes around available chargers.
- Users want real-time updates, booking, and better visibility

# Emphasize Phase



# User Persona 1

## The Purpose

A user persona is a fictional yet research-based representation of a typical user. It helps designers and stakeholders understand user goals, behaviors, pain points, and needs. By keeping the persona in mind throughout the design process, we ensure the product stays focused, relevant, and user-centered.



**Rajiv Verma**
Working Professional

- **Age:** 38
- **Gender:** Male
- **Status:** Married, 2 children
- **Education:** MBA
- **Location :** Jaipur

**"I can't afford to waste an hour just waiting for a charger — time is money!"**

### Bio

Rajiv switched to an electric vehicle to reduce fuel costs, but in Varanasi, charging infrastructure is limited and often inconsistent. He depends on public chargers for his daily earnings and often plans routes based on charger availability rather than passenger demand.

### Goals

- Complete maximum trips daily
- Avoid long waits at charging stations
- Keep earning steady income
- Track charging expenses more clearly

### Frustation

- Inconsistent charging options
- Delayed rides due to unplanned station breaks
- Confusing station maps
- Sudden charger downtime with no alerts

### Personality

- He is focused on daily targets and time management.
- He adapts fast to tech if it helps his job.
- He dislikes unpredictability in his workday.
- He often compares his daily performance with others to stay ahead.

### Motivation

- Wants to reduce fuel expenses
- Driven by the need to support his family
- Proud of staying updated with newer tech
- Likes to be known as the "go-to" driver for quick rides
- Inspired to create content that helps other travelers

# User Persona 1



**Priya Shetty**
Working Profession

- **Age:** 30
- **Gender:** Female
- **Status:** Single
- **Education:** Postgraduate
- **Location :** Udaipur, Rajasthan

**"I want to feel safe and confident when I plug in—especially in new places."**

## Bio

A solo traveler who uses her EV for workations and weekend explorations, but often feels stressed due to limited charger info and safety concerns.

## Goals

- Travel without charging anxiety
- Find safe, verified stations
- Enjoy road trips without tech hurdles
- Share useful reviews with other women travelers

## Frustation

- Isolated and poorly lit charger spots
- No community feedback on station experience
- App doesn't show real-time charger status
- Charging points often lack basic amenities like restrooms

## Personality

- She is cautious yet adventurous.
- She likes to plan but enjoys spontaneity too.
- She values independence and safety equally.
- She notices small user experience flaws quickly.

## Motivation

- Cares deeply about sustainability
- Enjoys taking the less-traveled routes
- Wants seamless solo travel experiences

# Empathy Mapping

## The Purpose

An empathy map helps deeply understand the user's mindset by capturing what they think, feel, say, and do. It highlights user motivations, frustrations, and needs—allowing designers to build more human-centered solutions. This tool ensures empathy stays at the core of the design process by connecting the team with the real experiences of users

### Says

- I need to figure out the stops for charging my EV
- The app shows available but someone's already using it.
- The app does not shows the variety of plugs.
- I wish I could get a heads-up if the station's busy.



### Think

- I hope I don't waste 20 mins just to find a non-working charger.
- Am I saving enough compared to petrol?
- If I get stuck, who's going to help me? The app? Probably not.
- What if this charger doesn't gives enough supply for charging my EV.

### Does

- Checks 2–3 apps to find an open station
- Charges just enough to get through the next delivery block
- Often uses chargers near restaurants for downtime
- Leaves once charged, but doesn't leave feedback unless asked |

### Feels

- **Frustrated** 😠when app info is inaccurate
- **Overwhelmed** 😵of the guesswork in daily routine
- **Anxious** 😟 about wasting time or being stranded
- **Confused** 😕 when things go smoothly — but never fully confident

# Journey Mapping

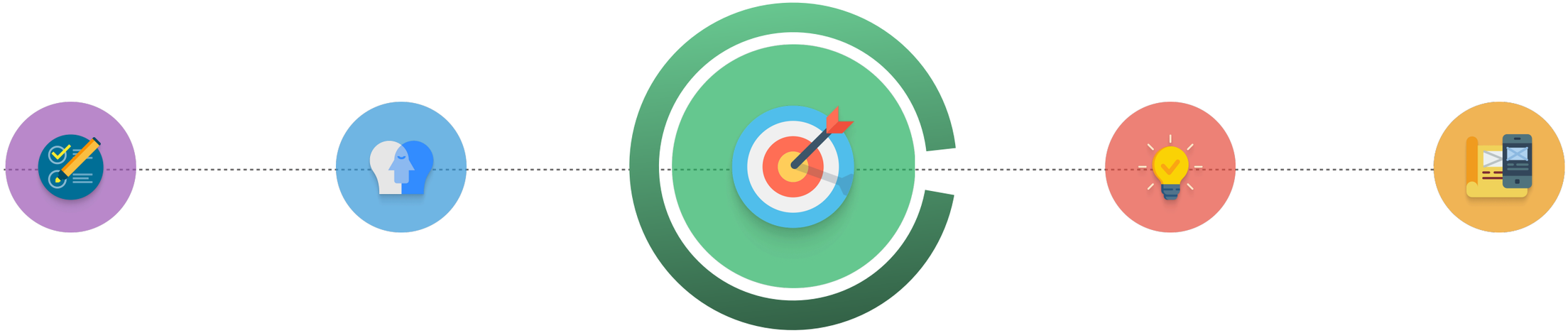
Method : SILENT OBSERVATION

## The Purpose

A user journey map helps visualize the entire experience a user goes through while interacting with a product or service. It captures their goals, emotions, touchpoints, and pain points across each stage. This allows designers to identify gaps, improve user satisfaction, and create solutions that are truly aligned with user needs and expectations. It ensures the design isn't just functional, but also empathetic and user-centered.

| Stage | Task | Thoughts | Emotions | Gaps Identified |
|---|---|---|---|---|
| 🔍 Need to Charge | Notices battery at 28% before afternoon deliveries | “Okay, I have 30 mins — need a charger close by.” | 😐 Neutral → slightly stressed | No trip-time-based battery estimates |
| 📱 Search for Station | Opens 2–3 different apps to compare locations | “Why are the apps showing different stations?” | 😤 Frustrated | Inaccurate status or plug info |
| 📍 Navigate to Station | Selects one marked “Available” and drives there | “Hope this one’s actually working” | 😟 Anxious | Status not live or outdated |
| 🚗 Arrive at Charger | Charger is already in use or blocked | “You’ve got to be kidding me.” | 😡 Angry | No live queue or “next free” slot |
| 🔌 Wait or Switch | Waits 15 mins or drives to another station | “Should I wait or look for another? Time’s ticking” | 😓 Worried → mentally tired | No productivity options during wait |
| ⚡ Charge Session Starts | Finally plugs in charger; waits inside car | “Please let this finish in 20 minutes” | 😑 Drained | No clear charge timer |
| 🚶 Post-Charge Exit | Leaves immediately without reporting or reviewing | “Let’s just move — I’m running late now.” | 😔 Upset | No reward or motivation to review |

# Conceptualization Phase



# Qualitative Research Methods Used

## Contextual Inquiry

I wanted to see what users do vs what they say they do. Watching how they interact with the station, apps, queues, or surroundings revealed hidden behaviors — like charger avoidance, hesitations, or workarounds — that interviews might miss.

## Behavioral Mapping (Spatial Observation)

Observing these patterns told me how physical layout and app behavior influence each other — for example, how unclear station numbering can cause confusion during app-station pairing.

## User Interviews

To understand users' real experiences, expectations, and emotional responses to public EV charging. It helped uncover mental models, fears (like range anxiety), and behavioral patterns that quantitative data alone can't capture.

## Persona Development

To distill and represent key user types, each with unique goals, frustrations, and behaviors (e.g., delivery drivers, solo female travelers, fleet managers). These personas shaped design decisions by keeping user empathy front and center.

## Empathy Mapping

To capture what users say, do, think, and feel — especially during uncertain charging experiences. It helped me identify emotional triggers like helplessness, distrust, or relief.

## User Journey Mapping

To visualize the end-to-end experience, including user goals, touchpoints, emotions, and system failures before and after using the app. It revealed opportunities to reduce effort and increase emotional satisfaction.

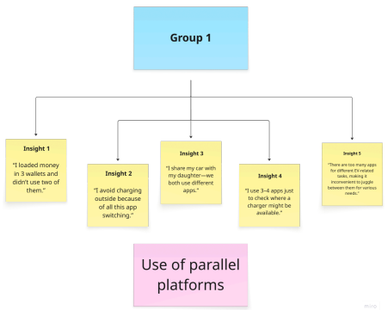
## Affinity Mapping

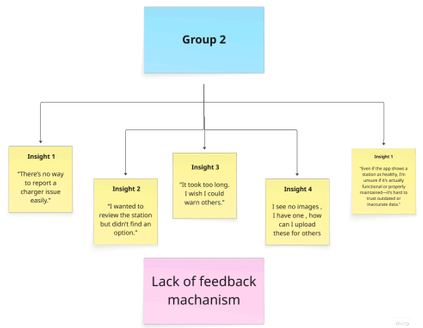
To organize and synthesize large amounts of qualitative data (from interviews, personas, observations) into thematic clusters like "discovery breakdown", "trust gaps", and "charging anxiety".

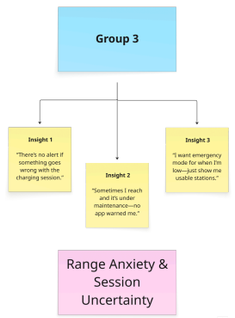
# Affinity Mapping

## The Purpose

Affinity mapping was used in this research to organize and synthesize raw user data—such as observations, pain points, and behavioral patterns—from 36 unique personas. By grouping related insights into thematic clusters. This method revealed clear patterns in user struggles and expectations. It helped transform scattered feedback into actionable design directions, ensuring the final solution directly addresses user needs with empathy and clarity.

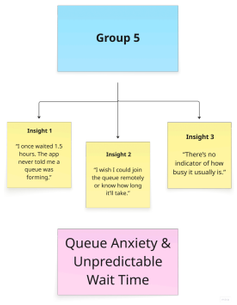


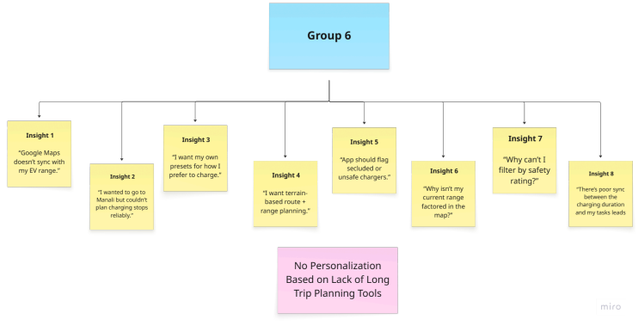



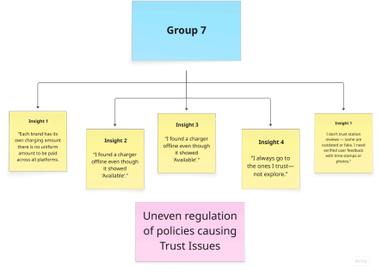









## Group 1

**Insight 1**
"I loaded money in 3 wallets and didn't use two of them."

**Insight 2**
"I avoid charging outside because of all this app switching."

**Insight 3**
"I share my car with my daughter—we both use different apps."

**Insight 4**
"I use 3–4 apps just to check where a charger might be available."

**Insight 5**
"There are too many apps for different EV-related tasks, making it inconvenient to juggle between them for various needs."

Use of parallel platforms

## Group 2

**Insight 1**
"There's no way to report a charger issue easily."

**Insight 2**
"I wanted to review the station but didn't find an option."

**Insight 3**
"It took too long. I wish I could warn others."

**Insight 4**
I see no images , I have one , how can I upload these for others

**Insight 1**
"Even if the app shows a station as healthy, I'm unsure if it's actually functional or properly maintained—it's hard to trust outdated or inaccurate data."

Lack of feedback machanism

## Group 3

**Insight 1**
"There's no alert if something goes wrong with the charging session."

**Insight 2**
"Sometimes I reach and it's under maintenance—no app warned me."

**Insight 3**
"I want emergency mode for when I'm low—just show me usable stations."

Range Anxiety & Session Uncertainty

## Group 4

**Insight 1**
"There's no alert if something goes wrong with the charging session."

**Insight 3**
"As a resident of a Tier 2 city, I mostly charge my car at home, but finding nearby chargers is challenging, and traveling longer distances to reach one is inconvenient."

Lack of availability of services including long detour

## Group 5

**Insight 1**
"I once waited 1.5 hours. The app never told me a queue was forming."

**Insight 2**
"I wish I could join the queue remotely or know how long it'll take."

**Insight 3**
"There's no indicator of how busy it usually is."

Queue Anxiety & Unpredictable Wait Time

## Group 6

**Insight 1**
"Google Maps doesn't sync with my EV range."

**Insight 2**
"I wanted to go to Manali but couldn't plan charging stops reliably."

**Insight 3**
"I want my own presets for how I prefer to charge."

**Insight 4**
"I want terrain-based route + range planning."

**Insight 5**
"App should flag secluded or unsafe chargers."

**Insight 6**
"Why isn't my current range factored in the map?"

**Insight 7**
"Why can't I filter by safety rating?"

**Insight 8**
"There's poor sync between the charging duration and my tasks leads

No Personalization Based on Lack of Long Trip Planning Tools

## Group 7

**Insight 1**
"Each brand has its own charging amount there is no uniform amount to be paid across all platforms.

**Insight 2**
"I found a charger offline even though it showed 'Available'."

**Insight 3**
"I found a charger offline even though it showed 'Available'."

**Insight 4**
"I always go to the ones I trust—not explore."

**Insight 1**
I don't trust station reviews — some are outdated or fake. I need verified user feedback with time stamps or photos."

Uneven regulation of policies causing Trust Issues

# Gaps Identified

### The Purpose

Identifying gaps in the system reveals areas where user needs are unmet or processes break down. Understanding these gaps helps uncover pain points and opportunities for improvement, ensuring the design addresses real problems and creates a smoother, more effective user experience.

- Station Reliability
- Trust Issues
- Need for Fast Charging
- Location Proximity
- No Rural /Urban Coverage
- No safety ratings on locations
- Triggered Anxiety/Stress
- Lack of Personalized Recommendations
- No charger health indicator
- Scalable Network
- No cost breakdown upfront
- Poor Customer Support
- Lack of Real-Time Updates
- No wait-time visibility
- No real-time slot booking
- Outdated User Reviews

# Inference statements

### The Purpose

After affinity mapping, making inferences helps uncover key user patterns and pain points from grouped data. This deeper understanding reveals why users behave a certain way, guiding focused design decisions to address real needs and improve the EV charging experience.

## Use of parallel platforms

When users have to switch between different apps, manage multiple wallets, and remember separate logins, it becomes confusing and mentally tiring. This makes non-tech-savvy users feel frustrated and overwhelmed, eventually causing them to lose trust and avoid using a single app altogether.

**Trigger:** Cognitive Overload

**Emotion:** Frustration, Distrust, Anxiety

## Lack of feedback machanism

Users often want to review or rate chargers but find no simple channel for it, leading to reduced valuable community feedback.

**Trigger:** Lack of Expression

**Emotion:** Disappointment, Disconnection, Doubt

## Range Anxiety & Session Uncertainty

Range anxiety isn't only about how far the EV can go — it comes from the app's inability to plan routes based on terrain, weather, or charger availability, making users unsure if they'll reach their destination as planned or not .

**Trigger:** Uncertainty

**Emotion:** Anxiety, Insecurity

## Lack of availability of services including long detour

Outside Tier 1 and Tier 2 cities, the limited number of EV charging stations forces users to take long detours, and with outdated or unreliable information and no guaranteed reservation system, they lose confidence in discovering or booking a charger — often avoiding the usage of apps.

**Trigger:** Scarcity of Infrastructure

**Emotion:** Frustration, Uncertainty, Loss of Control

## Queue Anxiety & Unpredictable Wait Time

Because there's no clear proof that chargers are reliable and users can't book chargers in advance, they don't trust the system. This causes them to over-plan, doubt charger availability, and avoid trying new stations.

**Trigger:** Uncertainty, Frustration

**Emotion:** Lack of trust

## No Personalization Based on Lack of Long Trip Planning Tools

Because the app treats all charging needs the same, it doesn't support users who want quick top-ups or route-timed stops. As a result, users struggle to plan long trips effectively and miss out on convenient charging stopovers.

**Trigger:** Inconvenience, Confusion

**Emotion:** Dissatisfaction

## Uneven regulation of policies causing Trust Issues

Because there's no clear accountability and users can't be sure chargers will work reliably, they don't trust the stations. This causes them to over-plan trips, doubt charger availability, and avoid trying new charging locations.

**Trigger:** Lack of control

**Emotion:** Caution

# Abstraction of Inferences

## The Purpose

Inferences were abstracted from the affinity map to identify deeper meanings behind user behaviors and pain points. This helped connect surface-level issues to broader UX challenges, enabling clear, focused design strategies rooted in real user experience.

" Reliance on external tools instead of integrated systems increases dependency, while requiring users to replicate tasks within a process leads to frustration, undermining the goal of minimal interaction with the existing interface."

**Lack of availability of services including long detour**

**No Personalization Based on Lack of Long Trip Planning Tools**

"Dependency on multiple or parallel sources of information creates confusion and consumes time and makes it difficult for user to form a concluded reliable decision."

**Use of parallel platforms**

"In the absence of regulated rules the service providers tend overcharge for the resources leading to uneven pricing for the service which causes sense of vulnerability of being looted and insecurity within the user."

**Uneven regulation of policies causing Trust Issues**

"The lack of nearby options leaves the user in a constant state of doubt about successfully completion of the task as intended."

**Range Anxiety & Session Uncertainty**

**Queue Anxiety & Unpredictable Wait Time**

"Due to the lack of a feedback system, users rely solely on personal judgment, which limits user's trust, leading to uninformed decision-making."

**Lack of feedback machanism**

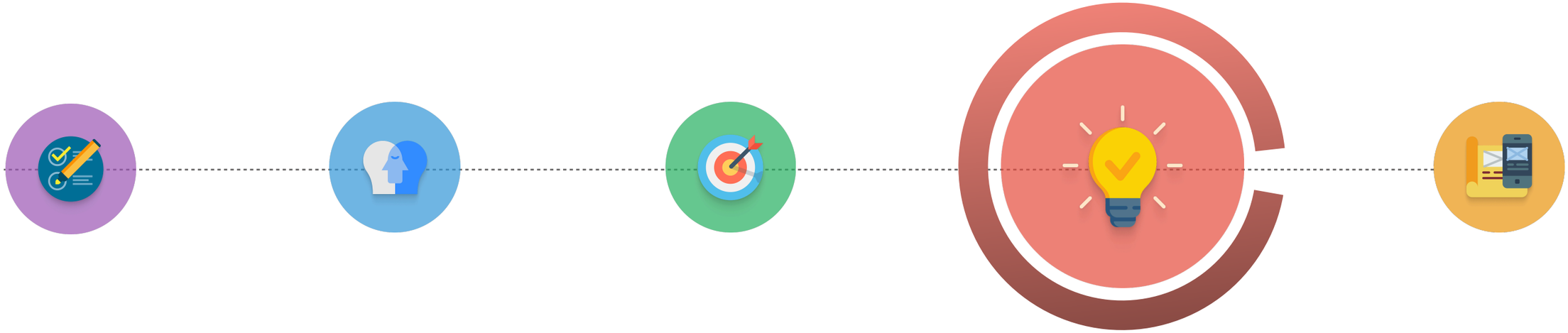
# Final Design Statement

## How the Final Design Statement Evolved from the Initial Brief

The initial brief provided a general direction, focusing on the core problem. However, through user research, system analysis, and identifying emotional and functional gaps, the problem was redefined more clearly. The final design statement reflects a deeper understanding of real user needs, behaviors, and system limitations—making it more focused, actionable, and aligned with the users' lived experiences.

**To establish a platform allowing space to reduce range anxiety and charging-related stress for EV owners by offering real-time data, ease of use, and efficient station locations, encouraging more people to adopt EVs.**

# Ideation Phase



# How Might We

## The Purpose

"How Might We" questions turn user problems into open, creative opportunities for design solutions. They help teams focus on possibilities instead of obstacles, guiding ideation and making complex challenges easier to solve. This method connects user insights to actionable ideas, supporting user-centered design.

**How might we reduce the cognitive load from multiple platforms or tools and empower users with clarity, confidence, and control in their charging journey?**

Taps into sequenced and relevant information with clarity

**How might we empower users to shape and strengthen the charging ecosystem by turning their experiences into shared signals of reliability and trust?**

Taps into system feedback, personalization, long-term trust

**How might we shift the emotional state from doubt to confidence by surfacing relevant, reliable options at the exact moment users begin to feel uncertain?**

Taps into range anxiety, last-minute panic, need for control

**How might we build a trip planning experience that respects the emotional ups and downs of EV travel—offering guidance, not control, in moments of doubt?**

Taps into building self-trust , prioritizing predictability

**How might we save user's time and understand their habits by anticipating repeated actions and enabling effortless continuity across their charging behaviors?**

Taps into suggesting and prioritizing user's preference

# Ideation

## The Purpose

Ideation helped me move from user problems to practical design solutions. It allowed me to explore multiple directions, think creatively beyond obvious fixes, and focus on ideas that truly addressed user needs. This process gave clarity on what features to prioritize and how to make the experience more effective and user-friendly.

Can we bring **all the tasks at one platform**?

Can we try **reducing user's cognitive load**?

Can we Assure users for their **Security and Support**

Can we **give control** in users hand instead of making them feel controlled

Can we help user by allowing them to empower them with **predictability** in their tasks?

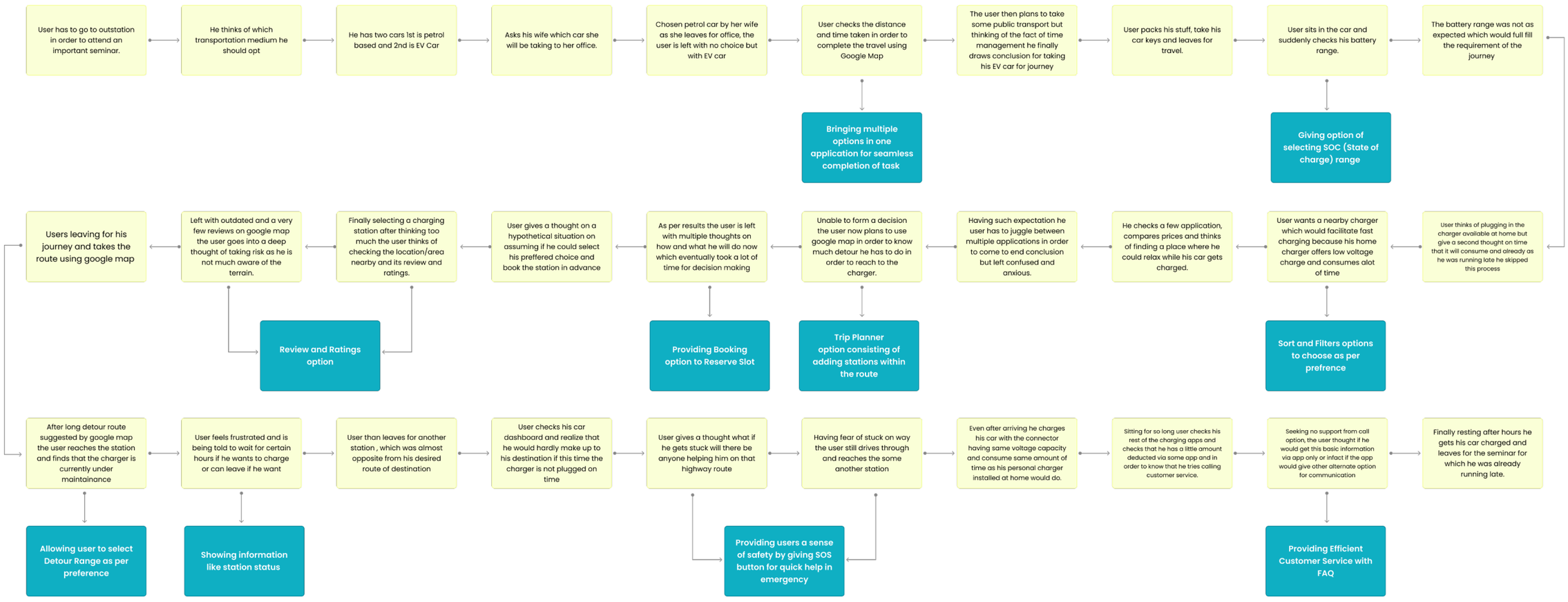
Can we give user a **power to express or share their personal opinions**?

Can we ensure **transparency with the system**

# Task Flow

## The Purpose

Creating a task flow during the ideation stage helped me break down the user's journey into specific actions and decisions. It made it easier to spot friction points and inefficiencies. By adding design interventions directly into the task flow, I could visualize how each solution fits into the user journey—ensuring smoother navigation, faster task completion, and a more intuitive experience overall.



# Card Sorting

Card sorting helped me understand how users expect to find and group features within the EV charging app. By observing how users categorized options like "Find Charger," "Booking," "Wallet," or "Help," I could design a more intuitive navigation structure. This ensured that the app layout matched users' mental models, making it easier for them to explore and use the app effectively.

### Charger Discovery & Selection Cards

- View Nearby Chargers
- Filter by Plug Type (CCS2, Type 2, etc.)
- Filter by Amenities (Cafe, Restroom, Lodge, Parking etc)
- Check Charger Availability (Live Status)
- View Charger Ratings & Reviews
- Join Queue or Book Slot
- Check Estimated Wait Time

### Trip Planning & Navigation Cards

- Start New Trip Plan
- Enter Destination
- View Suggested Charging Stops
- Add Charging Stop to Route
- Filter Chargers by SOC Range
- Set Detour Limit
- Enable Terrain-Based Route View
- Save Route for Future Trips

### Profile & Personalization Cards

- Add / Edit Vehicle Details
- Switch Between Vehicles
- Set Charging Style Preferences (Top-up, Full, Fast Only)
- Enable Notifications (Low Battery, Wait Time, Booking Alerts)
- Manage Saved Stations & Routes

### Wallet & Transactions Cards

- Add Money to Wallet
- Enable Auto Top-Up
- View Charging History & Payments
- Download Invoices / Session Logs

### Post-Charging Feedback & Reporting Cards

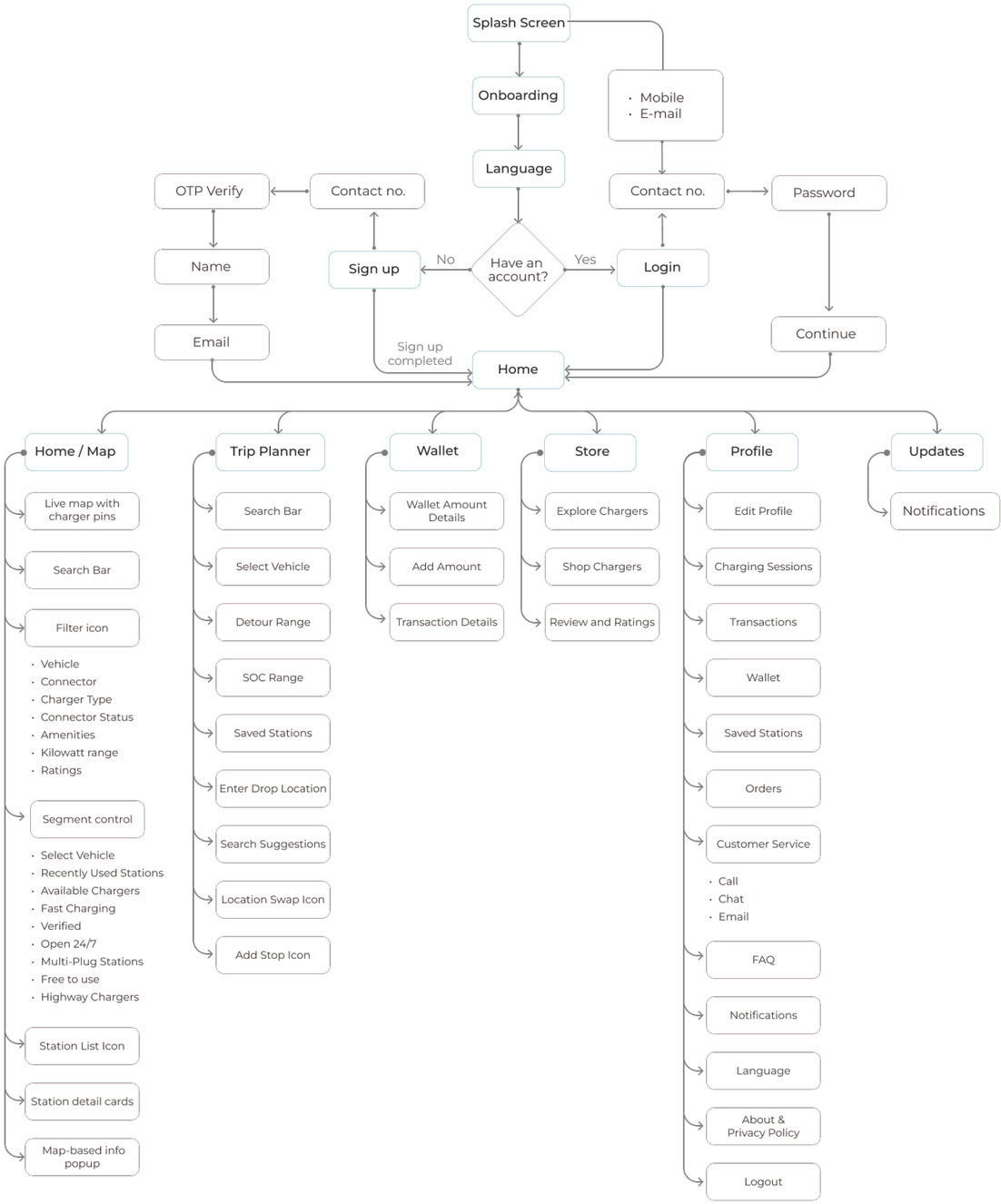
- Rate the Charging Station
- Write a Review or Add Photo
- Report an Issue (Broken Cable / Misuse)
- Save Station to Favorites

### During Charging Session Cards

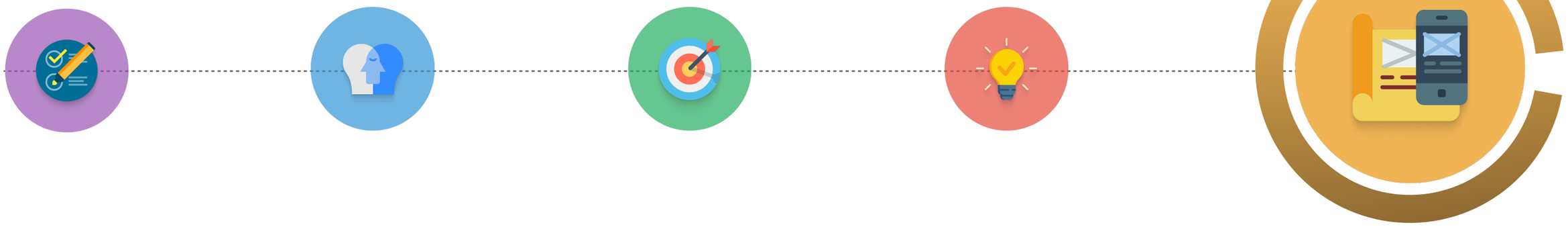
- View Charging Progress (% / Time / kWh)
- Receive Session Alerts (Interruption, Complete)
- View Nearby Recommendations (Food, Seating)
- Stop Charging Session

# Information Architecture

Information Architecture organizes content and features in a logical, easy-to-navigate structure. It helps users find what they need quickly and efficiently, reduces cognitive load, and ensures a smooth, intuitive experience across the product.



# Design Intervention Phase



# Design Systems

As a UI designer, a design system helps me maintain visual consistency, speed up my workflow with reusable components, and ensure alignment with the team. It lets me focus more on solving user problems creatively instead of redoing basic elements, and ensures that the user experience stays cohesive across the product.

## Typescale

I used a consistent typescale to create visual hierarchy and improve readability across the app. It helps users easily scan and understand content, while also maintaining a clean and professional look. The typescale ensures that headings, subheadings, and body text are harmonized and aligned with the overall design system.

Text - 26px
Line Height: AUTO / Letter Spacing: 0 %

Text - 26px
Line Height: 150 % / Letter Spacing: 0 %

Text - 26px
Line Height: 150 % / Letter Spacing: -1.100000023841858 %

Text - 24px
Line Height: 160 % / Letter Spacing: 0 px

Text - 24px
Line Height: 30 px / Letter Spacing: 0 %

Text - 23px
Line Height: 32 px / Letter Spacing: 1 %

Text - 22px
Line Height: 32 px / Letter Spacing: 0 %

Text - 22px
Line Height: 106 % / Letter Spacing: 0 %

Text - 20px
Line Height: AUTO / Letter Spacing: 0 %

Text - 20px
Line Height: 40 px / Letter Spacing: 0 %

Text - 18px
Line Height: 28 px / Letter Spacing: 0 %

Text - 18px
Line Height: AUTO / Letter Spacing: 0 %

Text - 18px
Line Height: 22 px / Letter Spacing: 0 %

Text - 16px
Line Height: 160 % / Letter Spacing: 0 %

Text - 16px
Line Height: 150 % / Letter Spacing: -1.100000023841858 %

Text - 16px
Line Height: 160 % / Letter Spacing: 0 px

Text - 14px
Line Height: 130 % / Letter Spacing: 0 %

Text - 13px
Line Height: AUTO / Letter Spacing: 0 %

Text - 12px
Line Height: AUTO / Letter Spacing: 0 %

Text - 12px
Line Height: 30 px / Letter Spacing: 0 %

Text - 12px
Line Height: 16 px / Letter Spacing: 0 %

Text - 11px
Line Height: AUTO / Letter Spacing: 0 %

Text - 10px
Line Height: 160 % / Letter Spacing: 0 px

Text - 10px
Line Height: 130 % / Letter Spacing: 0 %

Text - 8px
Line Height: AUTO / Letter Spacing: 0 %

## Font

I used the font Bai Jamjuree with a consistent typescale to establish clear visual hierarchy and enhance readability across the app. Its clean, modern style complements the interface, supports multiple weights for flexibility, and maintains a professional and accessible look throughout the design.

Used Font Weight

Regular | SemiBold | Bold | Medium | Light | ExtraBold

Bai Jamjuree

Bai Jamjuree

Bai Jamjuree

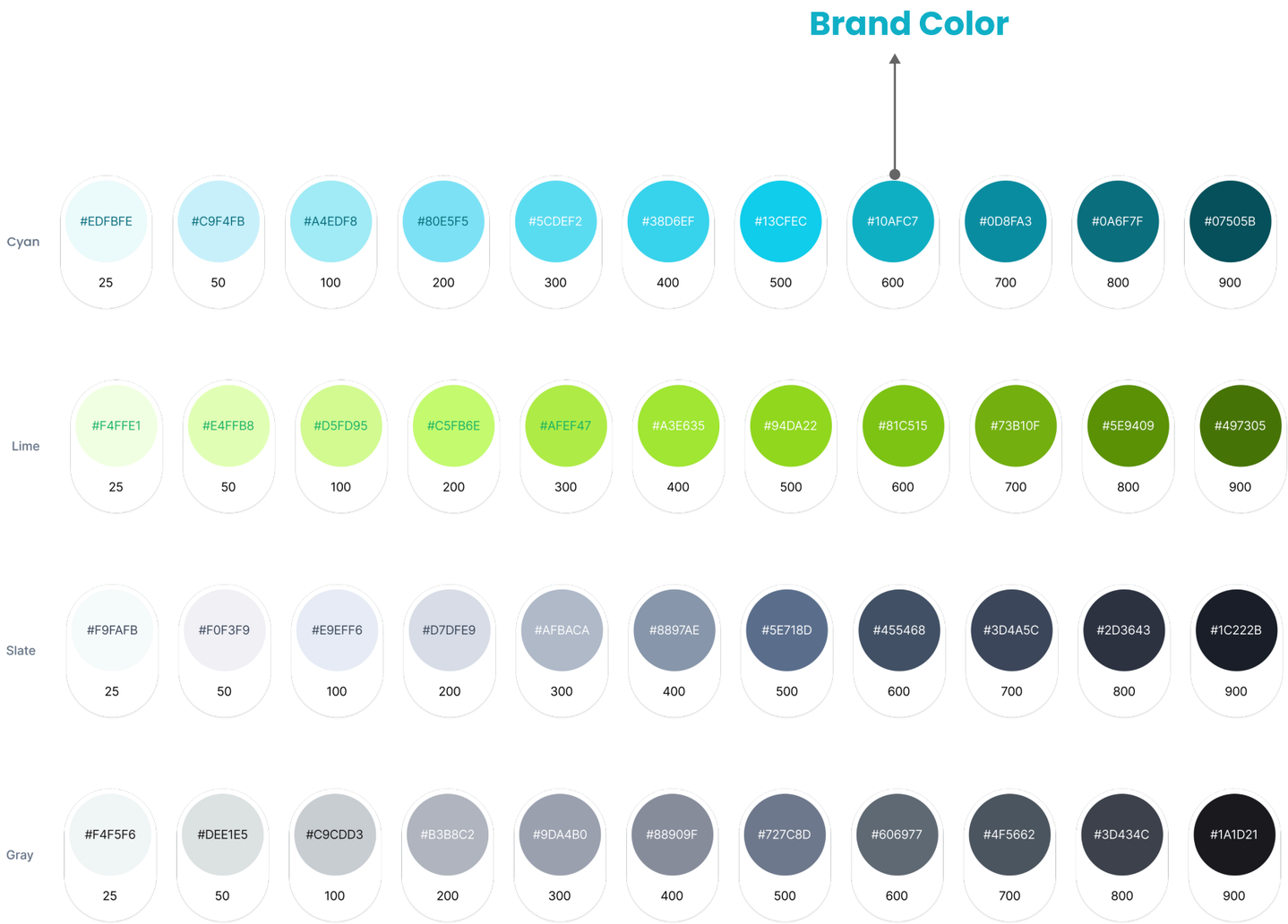
Bai Jamjuree

Bai Jamjuree

Bai Jamjuree

# Color

I used the color #10AFC7 as the primary brand color to create a fresh, approachable, and trustworthy feel in the UI. Its cool, vibrant tone helps draw attention to key actions like buttons and highlights, while ensuring accessibility and visual consistency across the interface.



# App Name and Logo

Easy Charger is a clean, modern, and intuitive name that clearly reflects the app's core purpose — making EV charging seamless and accessible for users. The logo features a stylized "E" integrated with a power symbol and electric bolt, immediately signaling energy, technology, and charging. The blue (#10AFC7) evokes trust and reliability, while the green suggests sustainability and eco-friendliness — aligning with the values of electric mobility.

## Motive Behind the Design

The hidden "E" and "C" aren't just letters — they represent the app's mission:

- **E** for easy, electric, and eco-friendly.
- **C** for charge, connection, and convenience.

## Hidden Meaning: '**E**' and '**C**'

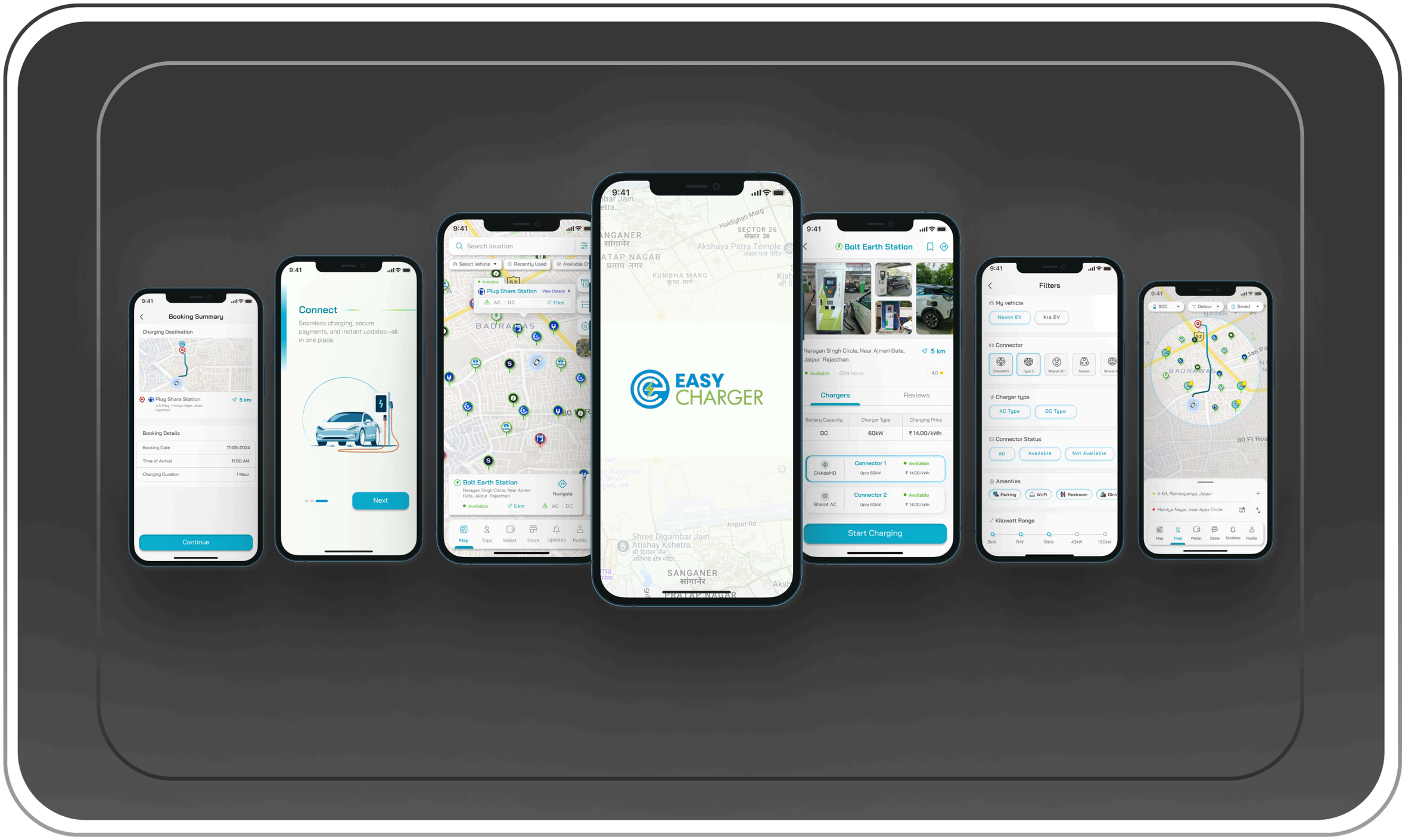
The logo cleverly integrates the letters **E** (**for Electric**) and **C** (**for Charger**) into a single circular symbol.

- The outer curve forms a bold "C", suggesting continuity, connectivity, and flow — a nod to energy circulation.
- The inner negative space shapes a stylized "E", representing electricity and efficiency.
- The green lightning bolt at the center conveys power, speed, and sustainability.

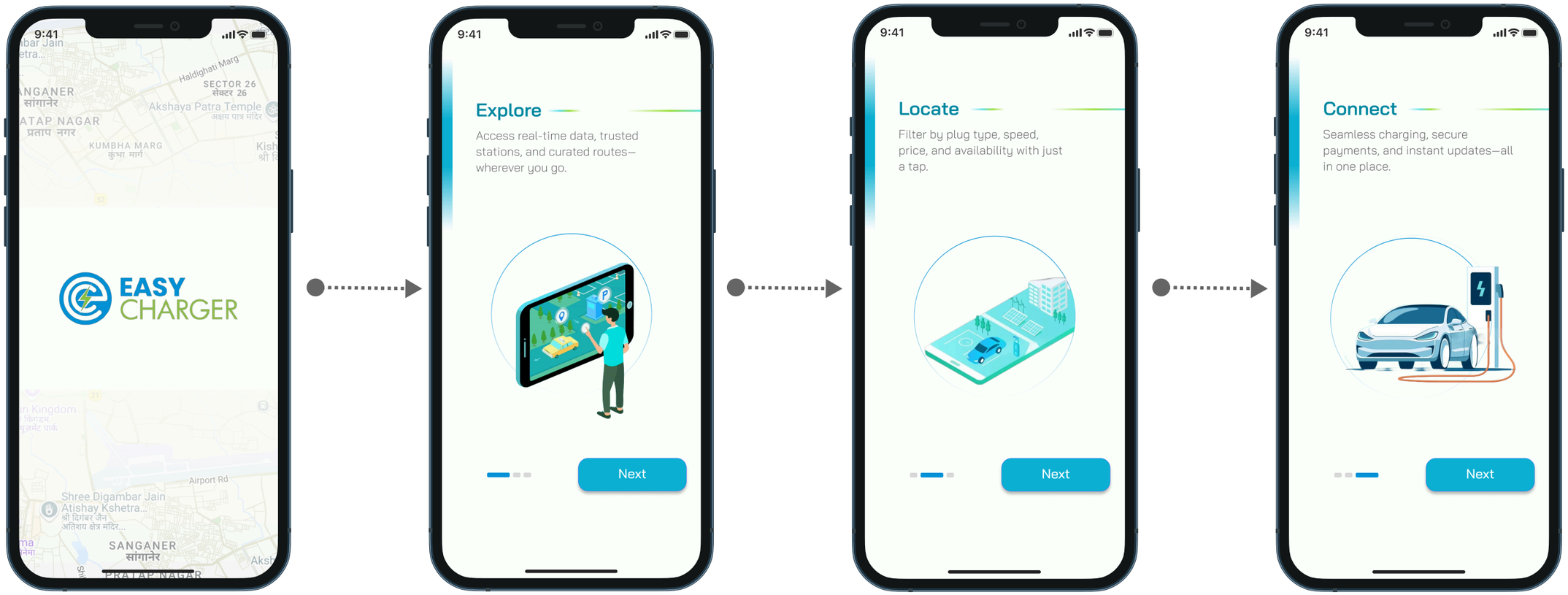




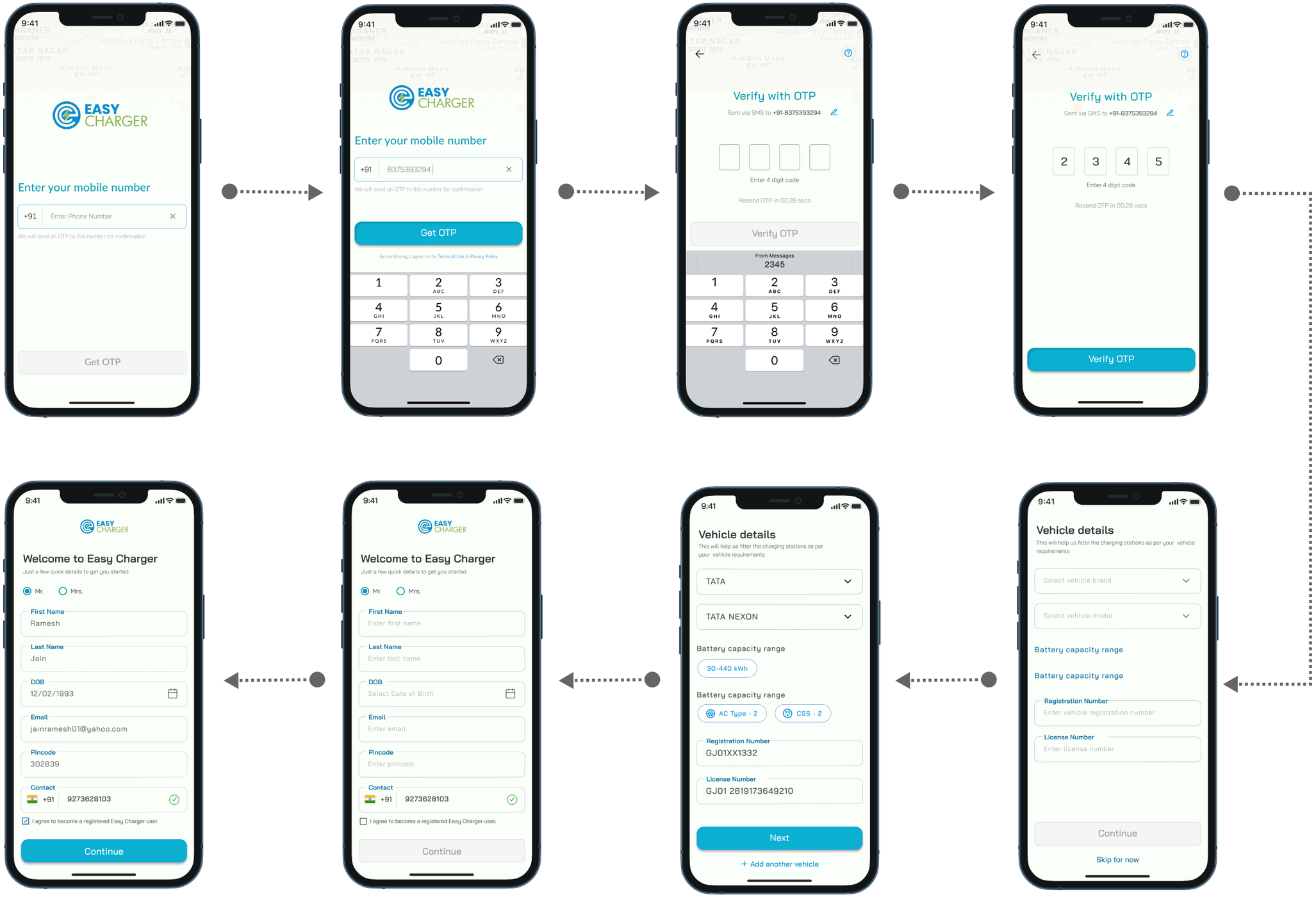
# UI Integration



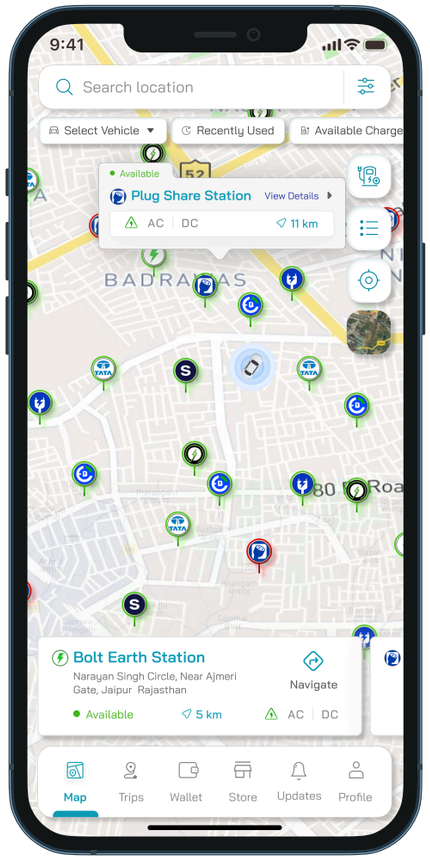
# Onboarding Screens

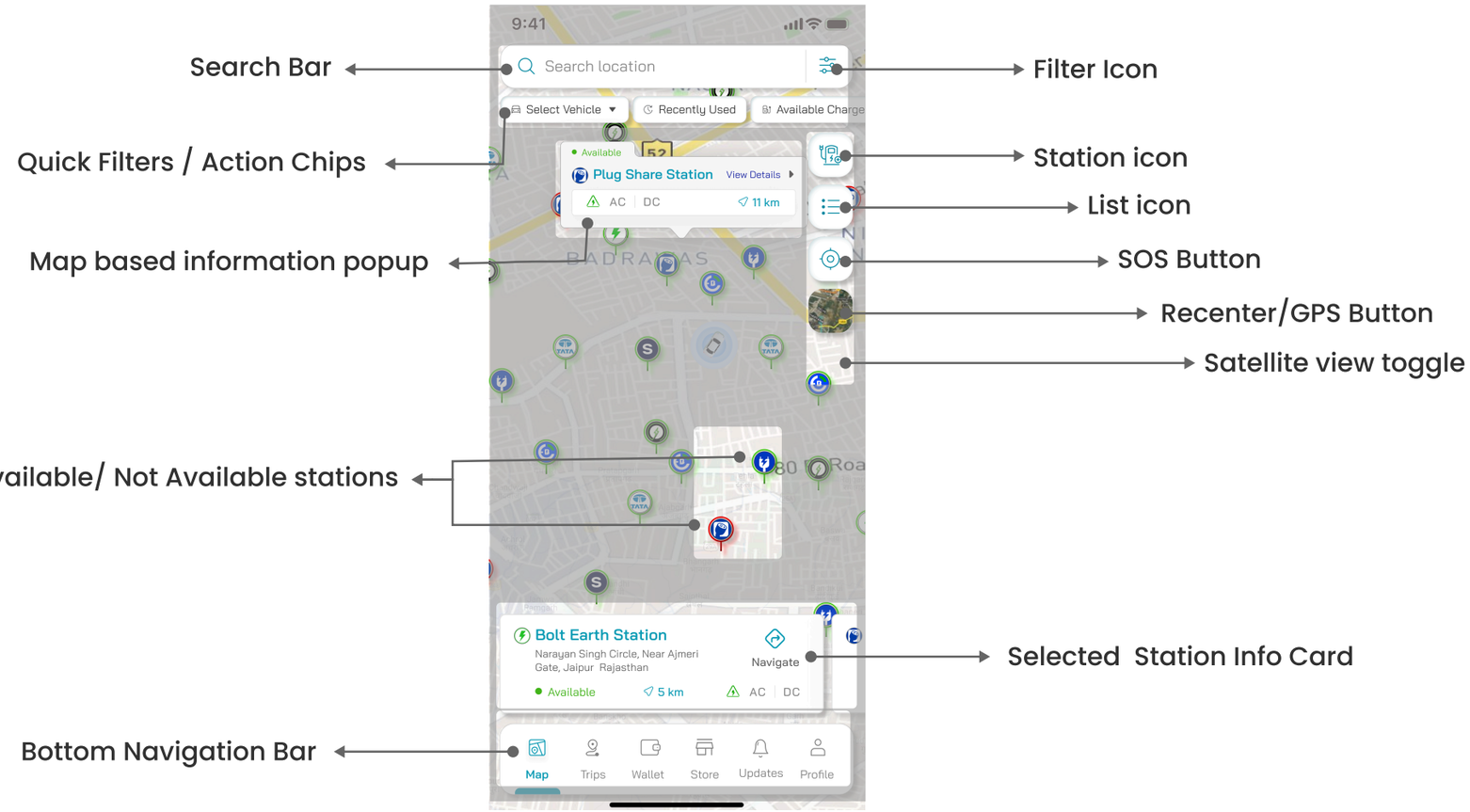


# Login Flow


9:41
EASY CHARGER
Enter your mobile number
+91
Enter Phone Number
We will send an OTP to this number for confirmation
Get OTP
+91
8375393294
Get OTP
By continuing, I agree to the Terms of Use & Privacy Policy
Verify with OTP
Sent via SMS to +91-8375393294
Enter 4 digit code
Resend OTP in 00.28 secs
Verify OTP
From Messages
2345
2
3
4
5
Welcome to Easy Charger
Just a few quick details to get you started
Mr.
Mrs.
First Name
Ramesh
Enter first name
Last Name
Jain
Enter last name
DOB
12/02/1993
Select Date of Birth
Email
jainramesh01@yahoo.com
Enter email
Pincode
302839
Enter pincode
Contact
9273628103
I agree to become a registered Easy Charger user.
Continue
Vehicle details
This will help us filter the charging stations as per your vehicle requirements
TATA
TATA NEXON
Battery capacity range
30-440 kWh
AC Type - 2
CSS - 2
Registration Number
GJ01XX1332
License Number
GJ01 2819173649210
Next
+ Add another vehicle
Select vehicle brand
Select vehicle model
Skip for now

# Map/ Home Screen




# Design Interventions

## Map-Based Info Pop-up for Station Details

### Purpose

A concise, contextual pop-up (like a bottom sheet or info bubble) that appears when a user taps a station marker on the map, showing key details and quick actions.

### Problem Solved

Reduces information overload on the main map by presenting details on demand. Provides quick decision-making tools (e.g., "Add to Route", "Navigate") without requiring full-screen navigation.

## Visual Differentiation of Chargers via Colors

### Purpose

Using distinct colors or visual cues for their availability status directly on the map.

### Problem Solved

Helps users quickly identify nearby chargers status and their availability  glance in which green color represents available and red shows not available, improving scanning efficiency and reducing cognitive load.

## Comprehensive Display of Charger Brands

### Purpose

Including the branding (logos or names) of various charging networks or manufacturers on the map markers and in station details.

### Problem Solved

Addresses user preference and trust issues by allowing them to quickly find familiar or preferred charging networks. Improves discoverability of diverse charging options.

## Integrated Search Bar with Advanced Filters

### Purpose

A prominent search bar at the top of the map view, coupled with a filter icon that accesses more granular search criteria (e.g., plug type, price, amenities).

### Problem Solved

Facilitates efficient discovery of specific stations or criteria. Allows users to refine results based on highly specific needs, cutting through irrelevant options.

## Map based information popup

### Purpose

Making each station icon on the map a tappable "button" that, when pressed, reveals a detailed information pop-up

### Problem Solved

Enhances discoverability of charger details. Allows users to explore specific stations without committing to a full-screen view immediately.

## Quick Filters / Action Chips

### Purpose

That element, consisting of multiple selectable buttons, each with an icon and text (like "SOC", "Detour", "Saved") and a dropdown arrow, is commonly referred to as a Filter Bar or a Filter Chip Group.

### Problem Solved

It allows users to quickly refine the information displayed on the map (or other content) by applying different filters or categories. Each button likely opens a dropdown menu with more specific filtering options related to that category.

## List View Access for Nearby Stations

### Purpose

A dedicated icon or button that switches the map view to a scrollable list of nearby charging stations, potentially with more detailed tabular information.

### Problem Solved

Caters to different user preferences for information consumption (visual map vs. textual list). Offers an alternative way to browse and compare stations when the map might be too cluttered or for users who prefer structured data.

## Satellite view toggle

### Purpose

It allows users to switch between different map views — typically from standard (roadmap) view to satellite imagery, and sometimes to terrain or hybrid modes.

### Problem Solved

This icon enables users to switch between standard and satellite views of the map. It improves spatial understanding, especially in unfamiliar areas, by giving a real-world visual context to charging station locations.

## SOS icon

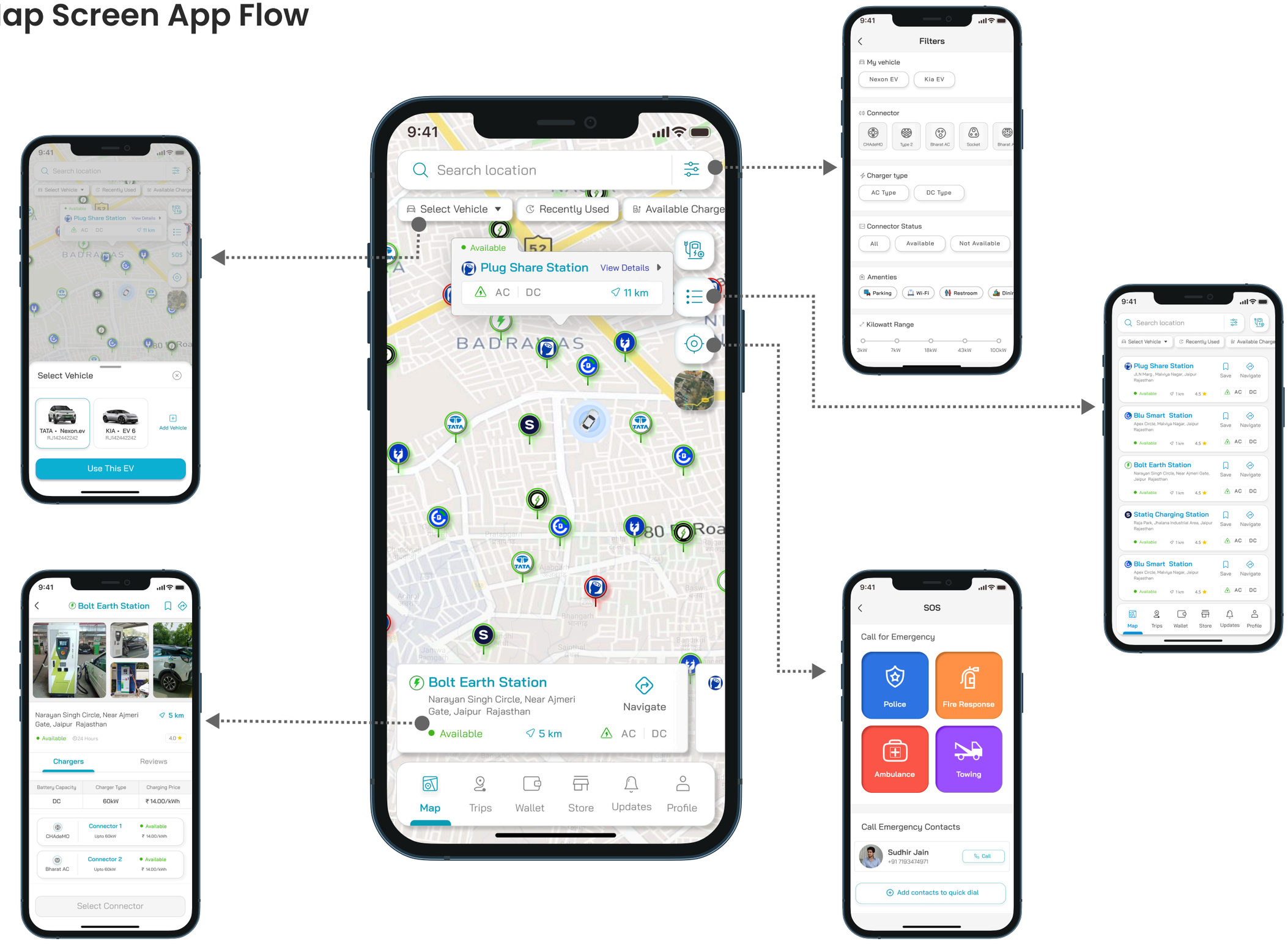
### Purpose

The SOS button allows users to quickly request help in case of emergencies during charging or travel.

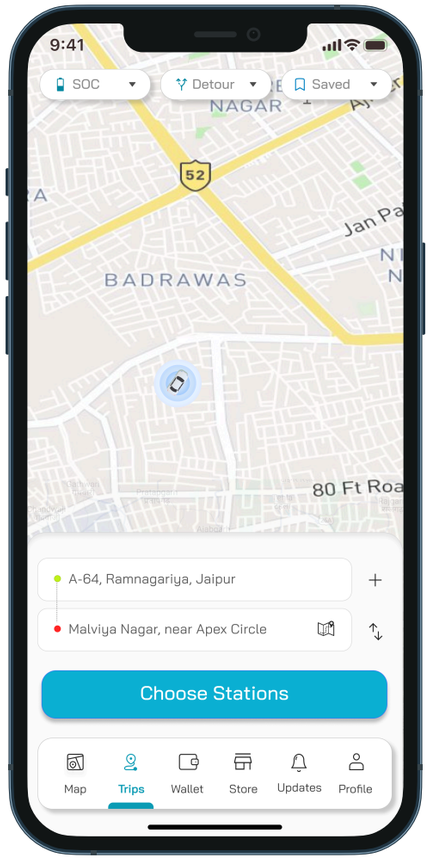
### Problem Solved

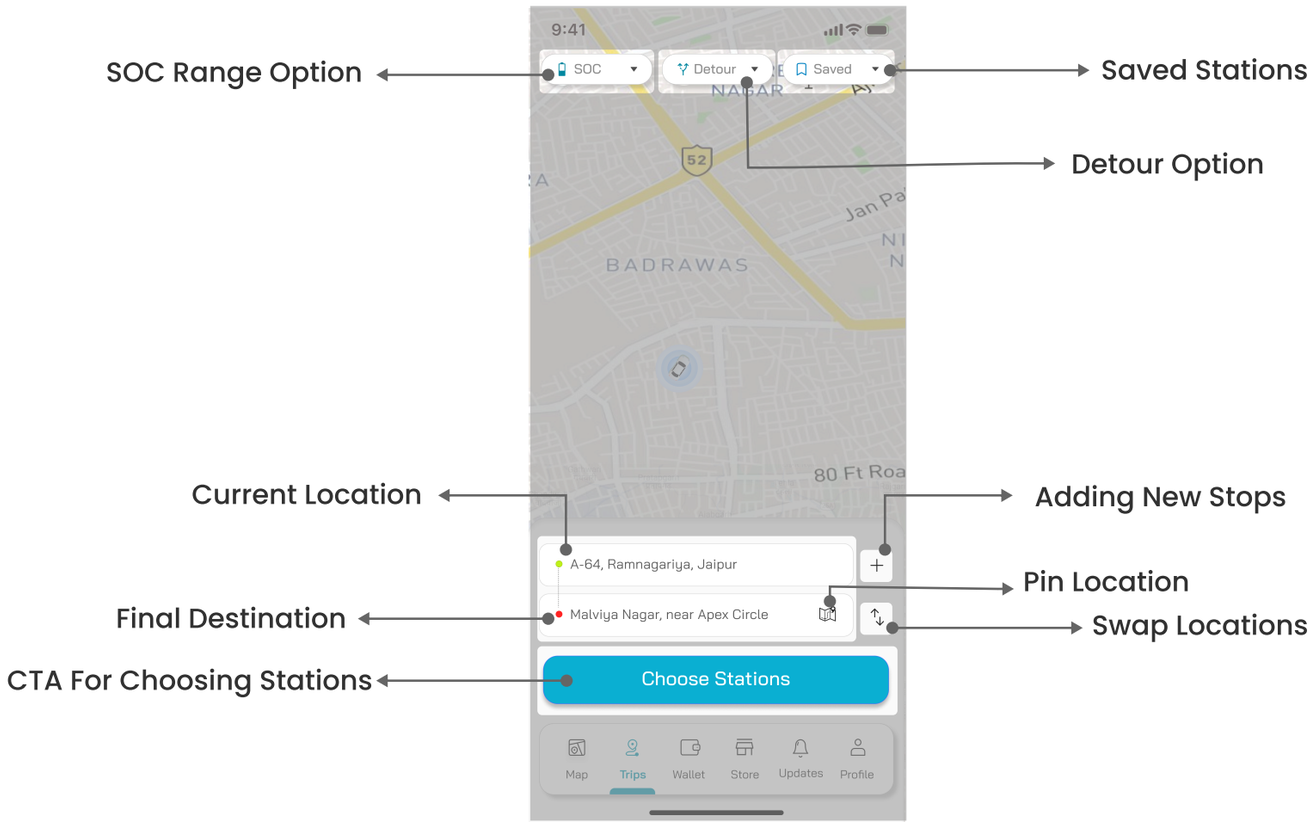
It ensures immediate access to assistance, reducing user anxiety and improving safety during unexpected situations.

# Map Screen App Flow



# Trip Planner




## Design Interventions

### Intuitive SOC (State of Charge) Management

#### Purpose

The integration of a slider and direct input field for SOC range selection empowers users to specify their desired battery levels at various points of their journey. This allows the system to recommend optimal charging solutions based on their current charge and anticipated needs.

#### Problem Solved

Users can plan exactly when and where they need to charge to maintain a comfortable SOC, preventing surprises.  Guides users to the right type of charger (fast/slow) or the right charging strategy based on their battery level and time constraints.

## Detour Range Customization

### Purpose

Providing both a slider (in km) and a direct input field for detour range allows users to define how far off their primary route they are willing to go to find a charging station.

### Problem Solved

Caters to individual preferences for convenience vs. efficiency; some users prioritize directness, others flexibility for charging.Filters charging stations to only show those within an acceptable diversion distance, preventing overwhelming results.

## Comprehensive Display of Charger Brands

### Purpose

Including the branding (logos or names) of various charging networks or manufacturers on the map markers and in station details.

### Problem Solved

Addresses user preference and trust issues by allowing them to quickly find familiar or preferred charging networks. Improves discoverability of diverse charging options.

## Quick Access to Preferred Stations (Saved Station Toggle)

### Purpose

A toggle or filter option to display only "Saved Stations" within the selected area or along the planned route.

### Problem Solved

Users can quickly find and select their favorite or frequently used charging stations without repetitive searching. This also leverages user history and preferences to provide highly relevant options.

## Integrated In-Route Charging Station Selection

### Purpose

The functionality to select and add charging stations directly into the existing route as intermediate stops, with visual integration on the map.

### Problem Solved

Users can easily adjust their trip on the fly to include charging stops based on real-time needs or discovered stations. Provides charging options specifically along their planned path, rather than just nearby.

## Filter-Based Search Results

### Purpose

The system presents charging station results dynamically based on a combination of initial Saved Stations, Detour Range, and SOC requirements. This means the map and list views automatically adjust to these filter settings.

### Problem Solved

Ensures that displayed charging options are always pertinent to the user's immediate needs and preferences. Reduces clutter and cognitive load by hiding stations that don't meet the specified criteria.

## Seamless Multi-Stop Trip Planning

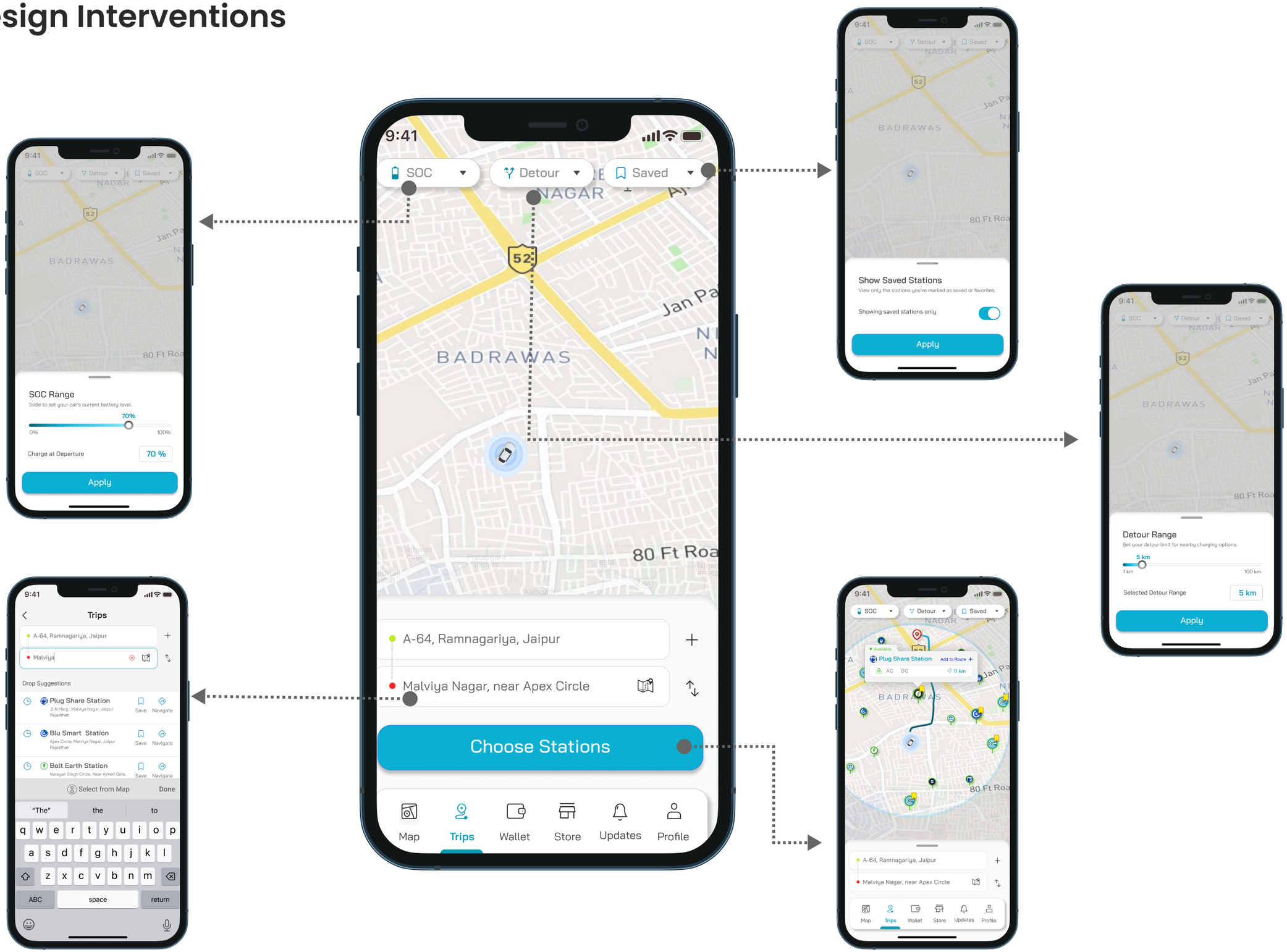
### Purpose

The ability to add multiple stopages (waypoints) between the origin and final destination within the trip planner interface.

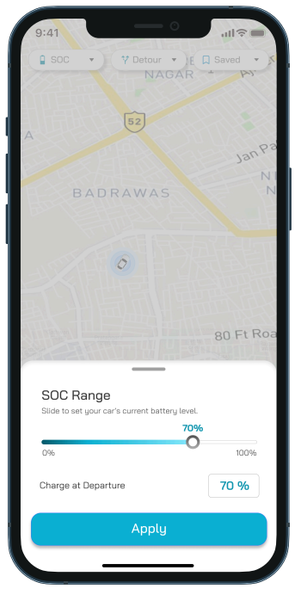
### Problem Solved

This allows users to plan complex itineraries beyond simple A-to-B routes, integrating various stops (e.g., lunch, sight-seeing, charging).Provides a more accurate representation of the entire journey.

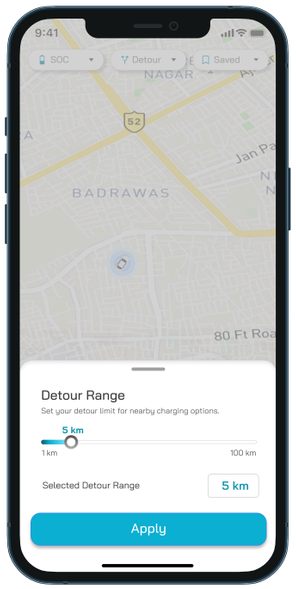
# Design Interventions



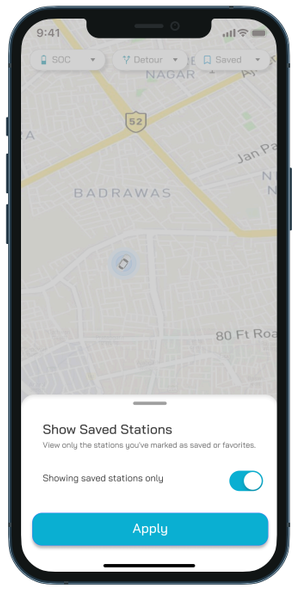
# Trip Planner App Flow



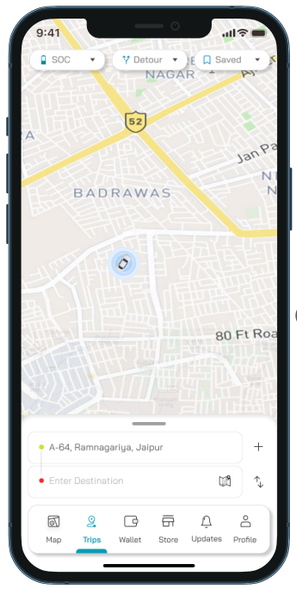

Enter SOC Range



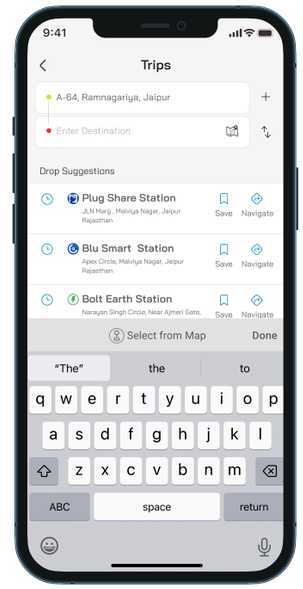

Enter Detour Range



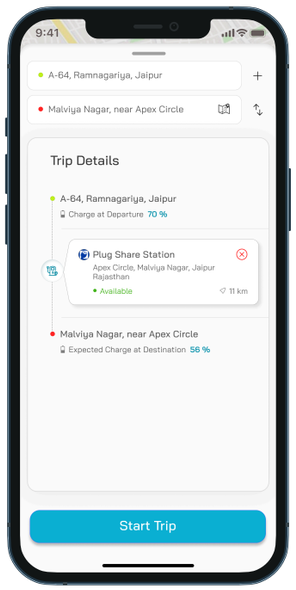

Check Saved Station Toggle



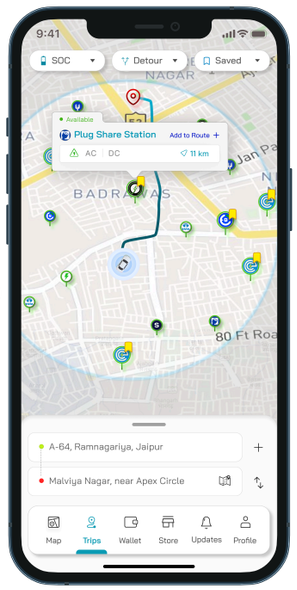

Enter Destination



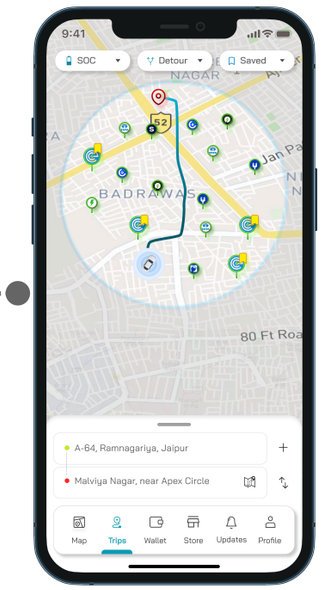

See Drop Suggestion



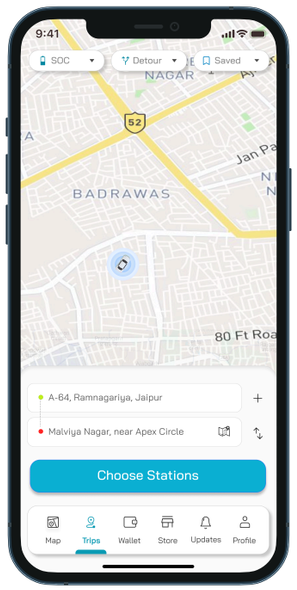

Tap on Start Trip




Select station Tap on Add to Route

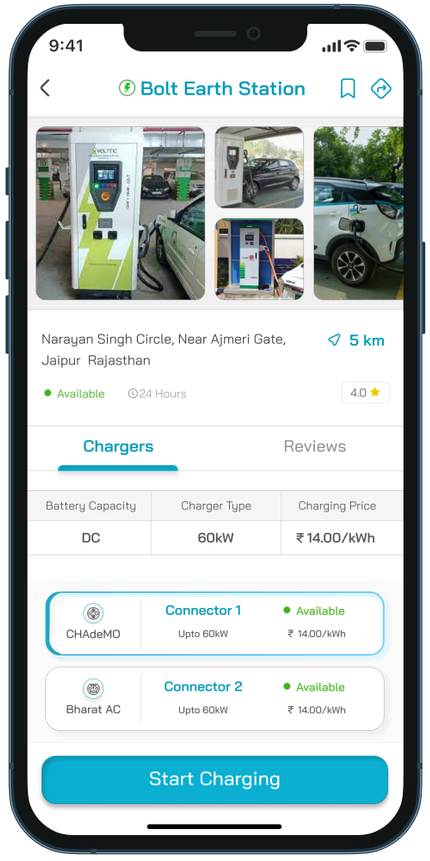


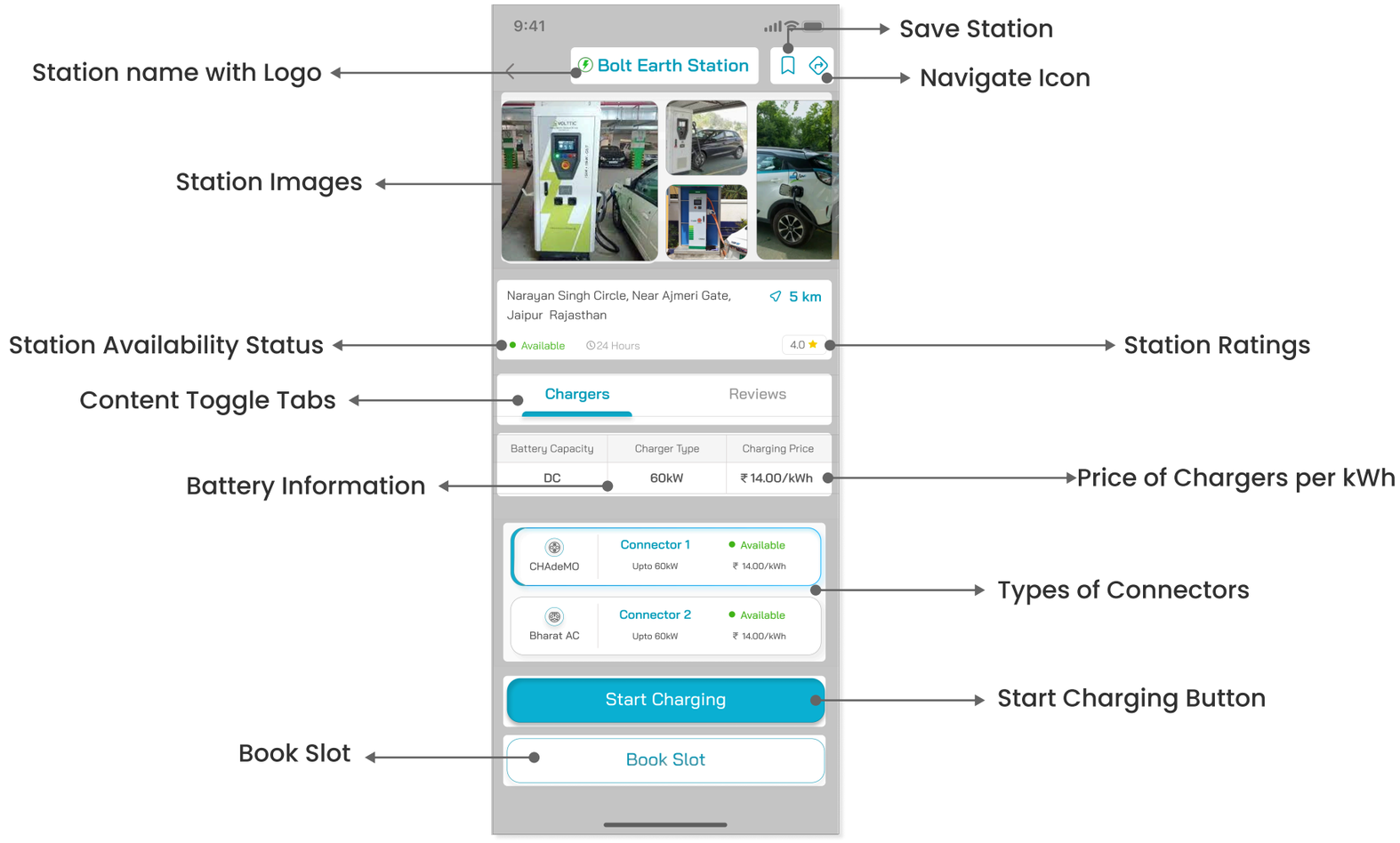

Zoom in nearby Stations




Tap Choose Station

# Station Details Screen




# Design Interventions

## "Save Station" Functionality

### Purpose

A clear, persistent "Save" button (often represented by a bookmark icon) on the station's detail screen. This allows users to mark specific charging stations for quick future access.

### Problem Solved

This would eliminates the need to repeatedly search for known good or frequently visited stations that tailors the app experience to the user's preferences, making it feel more intuitive and efficient. Users feel valued when their preferences are recognized and easily accessible.

## "Navigate" Quick Action

### Purpose

A prominent and easily accessible "Navigate" button (often with a directional arrow icon) directly on the station detail screen.

### Problem Solved

This allows users to quickly initiate navigation to the selected station without extra steps hence reduces Cognitive Load by simplifying the journey from "finding" to "going" by integrating navigation seamlessly.

## Clear Pricing per kWh

### Purpose

Explicitly displaying the cost of charging, typically presented as a price per kilowatt-hour (₹/kWh), directly on the station detail screen.

### Problem Solved

Users can immediately understand the financial implications of charging at a specific station before they even plug in, which would enable users to compare costs across different stations and manage their charging budget effectively.

## Explicit Connector Type Specification

### Purpose

Clearly listing and visually representing the available connector types (e.g., Type 1, Type 2, CCS, CHAdeMO) at a station. This is critical for compatibility.

### Problem Solved

Ensuring compatibility users can quickly verify if a station has a plug that fits their vehicle, preventing frustrating trips to incompatible chargers. Also avoids the scenario of arriving at a station only to find the connectors don't match.

## Content Toggle Tabs for Information Organization

### Purpose

Using tabs (e.g., "Overview", "Connectors", "Reviews", "Amenities") to logically segment and display different categories of information on a station's detail screen.

### Problem Solved

With Information Management this prevents overwhelming the user with too much information at once allowing users to quickly jump to the specific details they are interested in without endless scrolling.

## Integrated Battery Information Display

### Purpose

Displaying the vehicle's current State of Charge (SOC) prominently within the app, especially during the charging process or on relevant planning screens.

### Problem Solved

Having Real-time Awareness users constantly know their battery status, which is fundamental for EV drivers. With Informed Decision-Making this is crucial for planning when to charge, how long to charge, and confirming charging progress.

## Visual Station Imagery

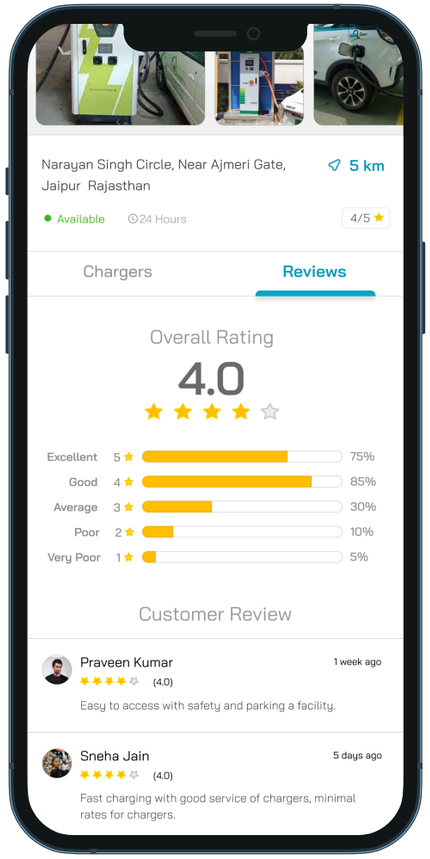
### Purpose

Including photographs of the charging station and its surroundings on the detail screen shared by users .

### Problem Solved

By Visual confirmation this helps users recognize the station upon arrival, reducing confusion in unfamiliar areas. Getting contextual understanding this provides insight into the station's environment (e.g., covered, well-lit, amenities nearby). Offers transparency and a sense of realism .

# Review and Ratings Screen







Station Rating

Station Review

CTA to Add Personal Review

# Design Interventions

## Reviews & Ratings System

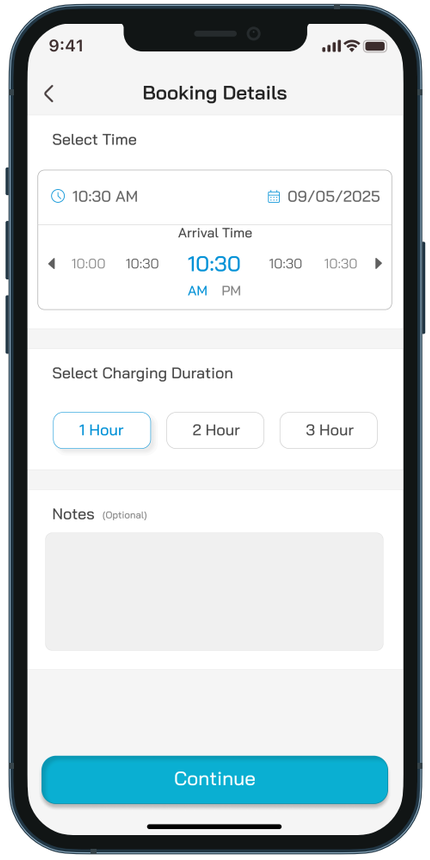
### Purpose

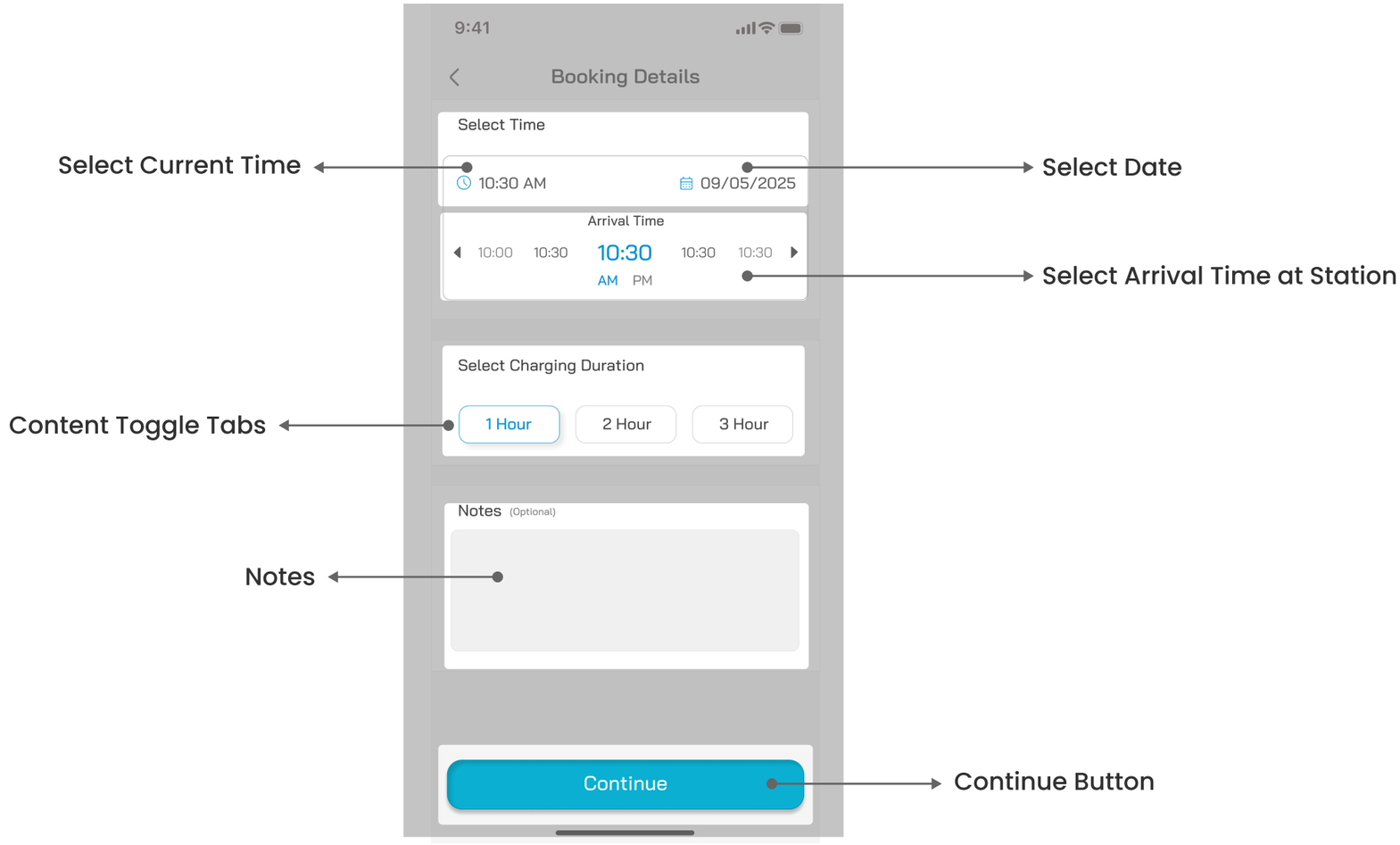
This feature lets users rate charging stations and share detailed feedback, while also viewing average scores and individual reviews. It promotes transparency, informed choices, and community-driven insights for a better user experience.

### Problem Solved

Reviews help users make informed decisions by offering real-world insights on station quality and common issues. They build trust through social proof, enable users to anticipate problems, support community sharing, and provide valuable feedback for service improvement.

# Booking Screen




## Design Interventions

### Optional "Notes" Field for Specific Instructions

#### Purpose

An optional multi-line text input field provided during the booking process or on the final confirmation screen, allowing users to add free-form text.

#### Problem Solved

Enables users to convey specific instructions, preferences, or additional details that might be relevant to their booking . Allows users to preemptively communicate potential issues or special requirements, which can improve service deliver serving as a personal reminder for the user or a note for the station operator (if applicable).

## Time & Date Selection Components

### Purpose

This combines distinct UI components (like a time scroller/picker, a date picker, and input fields for these) that allow users to precisely choose the exact arrival time and date for their charging session. The app clearly distinguishes between "current time" (if applicable as a default) and the desired "arrival time at station."

### Problem Solved

Precision in Planning help users schedule their arrival down to the minute, aligning with their personal itinerary.Reduces Guesswork that eliminates ambiguity about when the slot is reserved, ensuring both the user and the system are in sync. Flexible Scheduling accommodates various user needs, whether booking for immediate use or a future date/time.

## Slot Booking & Management

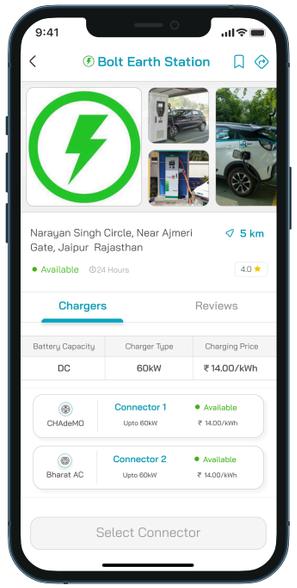
### Purpose

This comprehensive intervention allows users to reserve a specific charging port at a chosen station for a defined date, time, and duration. It includes the user flow from selecting the time/date, confirming charging and payment details, and receiving a final booking confirmation. The UI typically guides users through sequential steps, ensuring all necessary information (arrival time, duration, estimated cost, port details) is conveyed upfront.

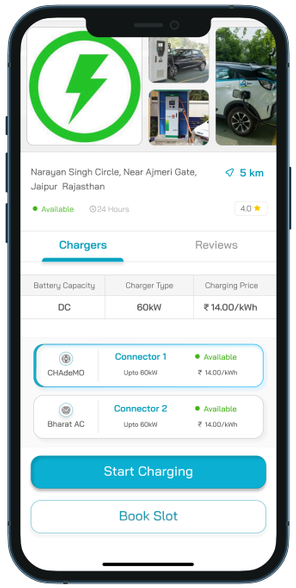
### Problem Solved

- Guaranteed Availability: The most significant benefit is the assurance that a charging spot will be available upon arrival. This eliminates the uncertainty and frustration of driving to a station only to find it occupied or out of order.
- Time Optimization: Users can meticulously plan their schedule, avoiding long waits or queues. They can arrive precisely when their reserved slot begins, maximizing efficiency.
- Seamless Trip Integration: For long journeys, this feature allows users to integrate charging stops directly into their route planning with exact timeframes, creating a more reliable and predictable travel itinerary.
- Predictable Cost & Consumption: By confirming the duration and showing estimated power consumption and detailed pricing (image_6eed7a.png), users have full transparency on costs before committing.
- Reduced Decision Fatigue: The guided booking flow streamlines the process, leading users through necessary steps without overwhelming them with options.

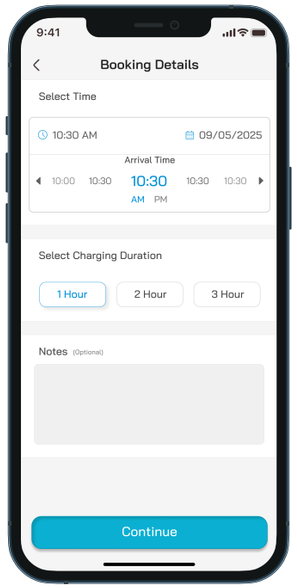
# Booking Charging Slot Flow



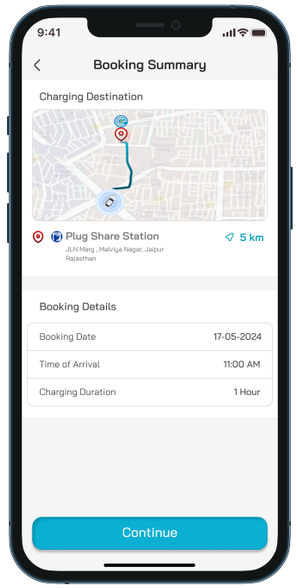

View Details



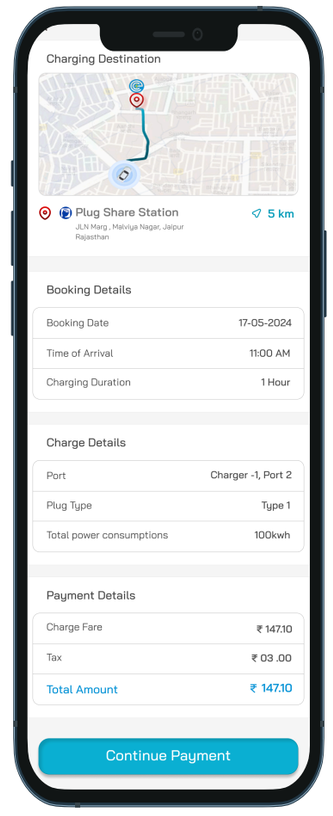

Select Preferences




Enter Timings

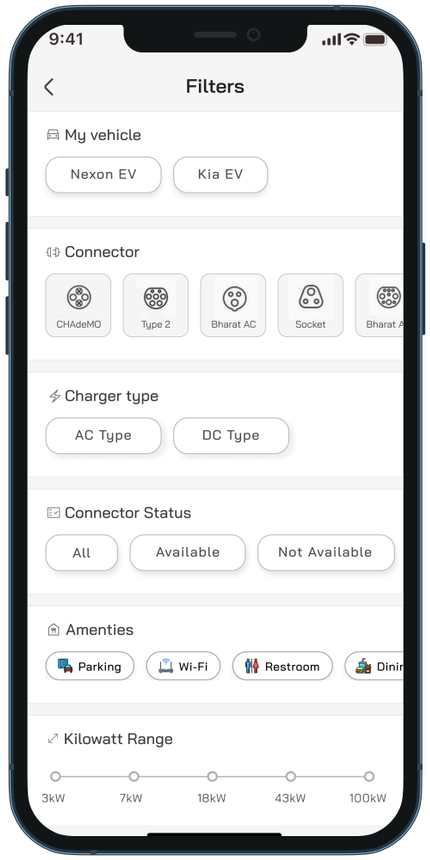


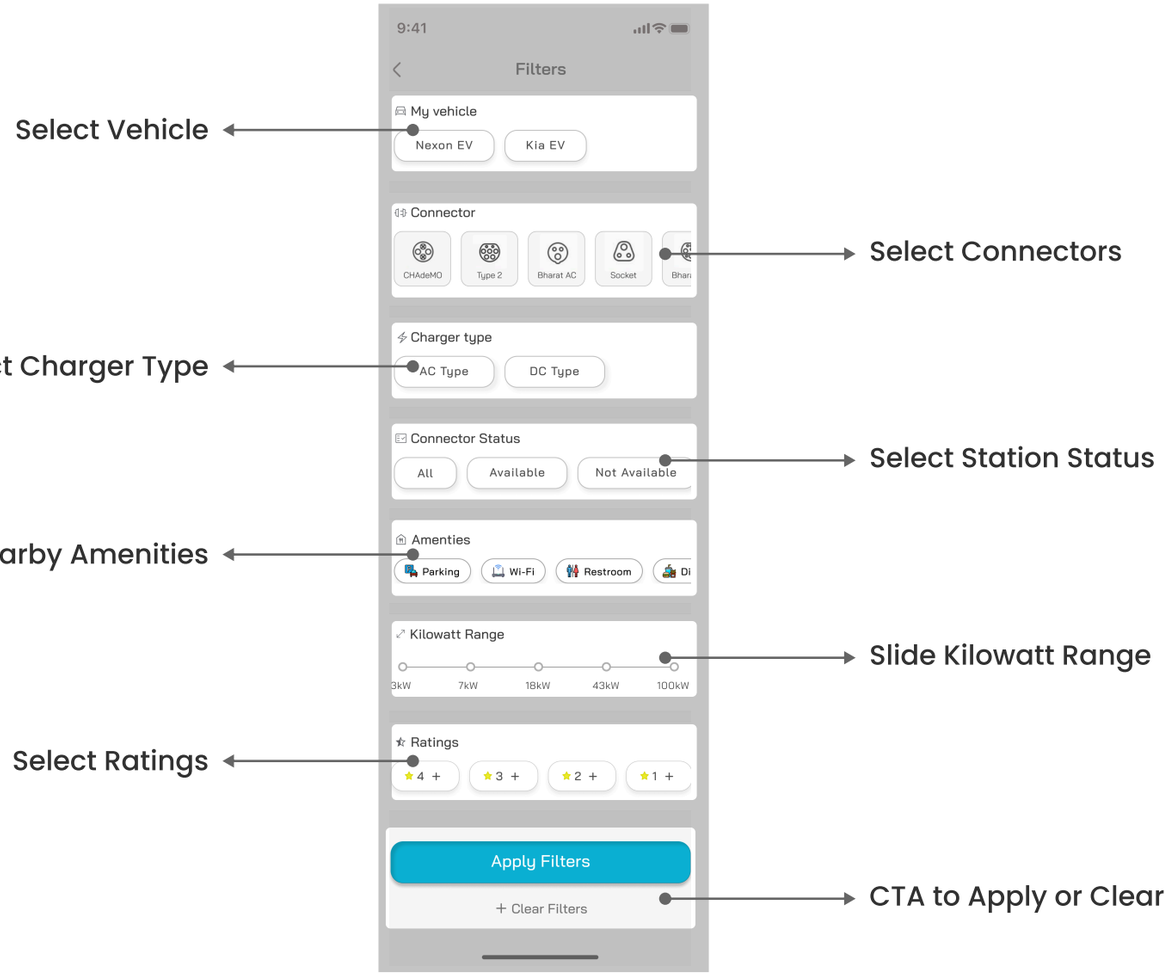

Tap Continue




Confirm Details with Payment

# Filters Screen




# Design Interventions

## Filtering and Search Refinement

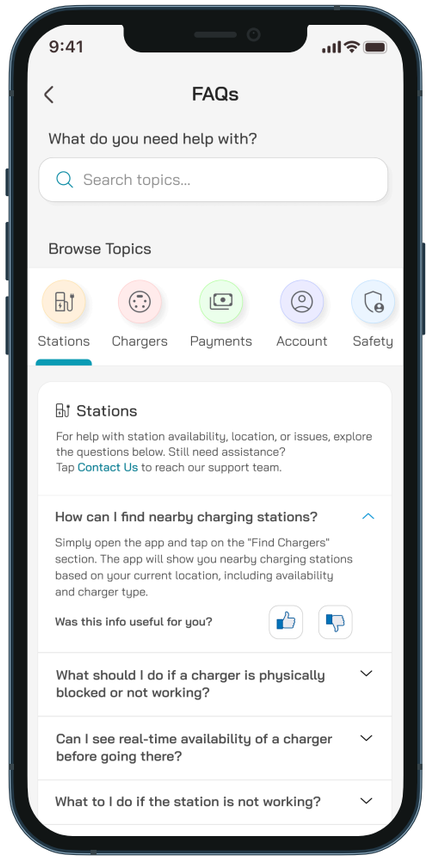
### Purpose

This intervention refers to a dedicated screen or modal interface (often accessed via a filter icon next to a search bar) that allows users to apply multiple criteria to refine their search for charging stations.

### Problem Solved

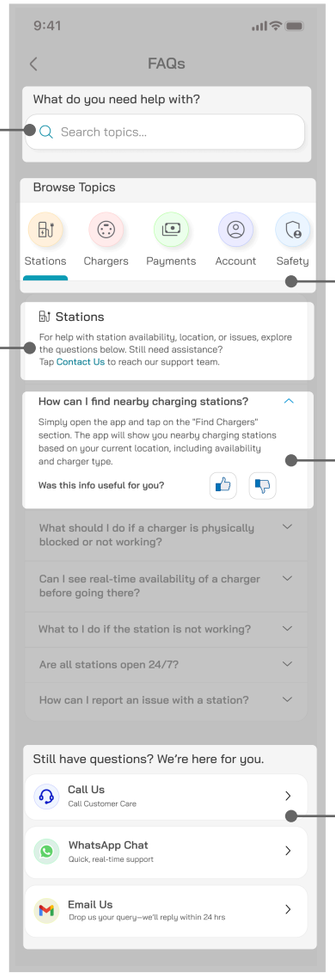
Filtering helps users quickly find chargers that match their specific needs, reducing overwhelm, saving time, and enabling smarter, personalized decisions based on real-time preferences and situations.

# Help and FAQ




Search Field for Entering Topics

Selected option Information with CTA




Topic Tabs

Accordion for seeking Information

CTA to contact Customer service as preferred

# Design Interventions

## Predictive Search Field for Help Topics

### Purpose

A prominent search bar (often at the top of the help screen) that allows users to type in keywords or questions related to their issue. It typically provides real-time suggestions or filters results as the user types, directing them to relevant articles.

### Problem Solved

Search allows users to quickly find answers, reduces frustration from manual browsing, and anticipates needs with suggestions—streamlining the self-help experience.

## Categorized Topic Tabs for Guided Browse

### Purpose

A set of horizontally scrollable or static tabs/buttons, each representing a distinct help category (e.g., "Stations," "Chargers," "Payments," "Account," "Safety"). Selecting a tab filters the content to show only relevant FAQs or articles.

### Problem Solved

Enables quick problem-solving by helping users find precise answers fast, reduces frustration from manual browsing, and anticipates needs through intelligent suggestions.

## Contextual Information with Direct Support CTA

### Purpose

When a user expands an FAQ item to reveal the answer, this intervention ensures that the information is clear, concise, and most importantly, it offers a direct "Contact Us"  call-to-action within the context of the answer itself. This ensures users who don't find their solution can easily escalate.

### Problem Solved

Offers a direct path to help when self-service falls short, ensuring issues are resolved quickly without extra navigation or user frustration

## Expandable Accordions for Information Seeking

### Purpose

A design pattern where questions or topic headers are presented as collapsible panels, and tapping on them expands to reveal the detailed answer. Other panels often collapse when one is expanded.

### Problem Solved

Organizes information in a clean, scannable format, allowing users to quickly find and focus on answers relevant to their needs without feeling overwhelmed.

## Multi-Channel Customer Service CTAs

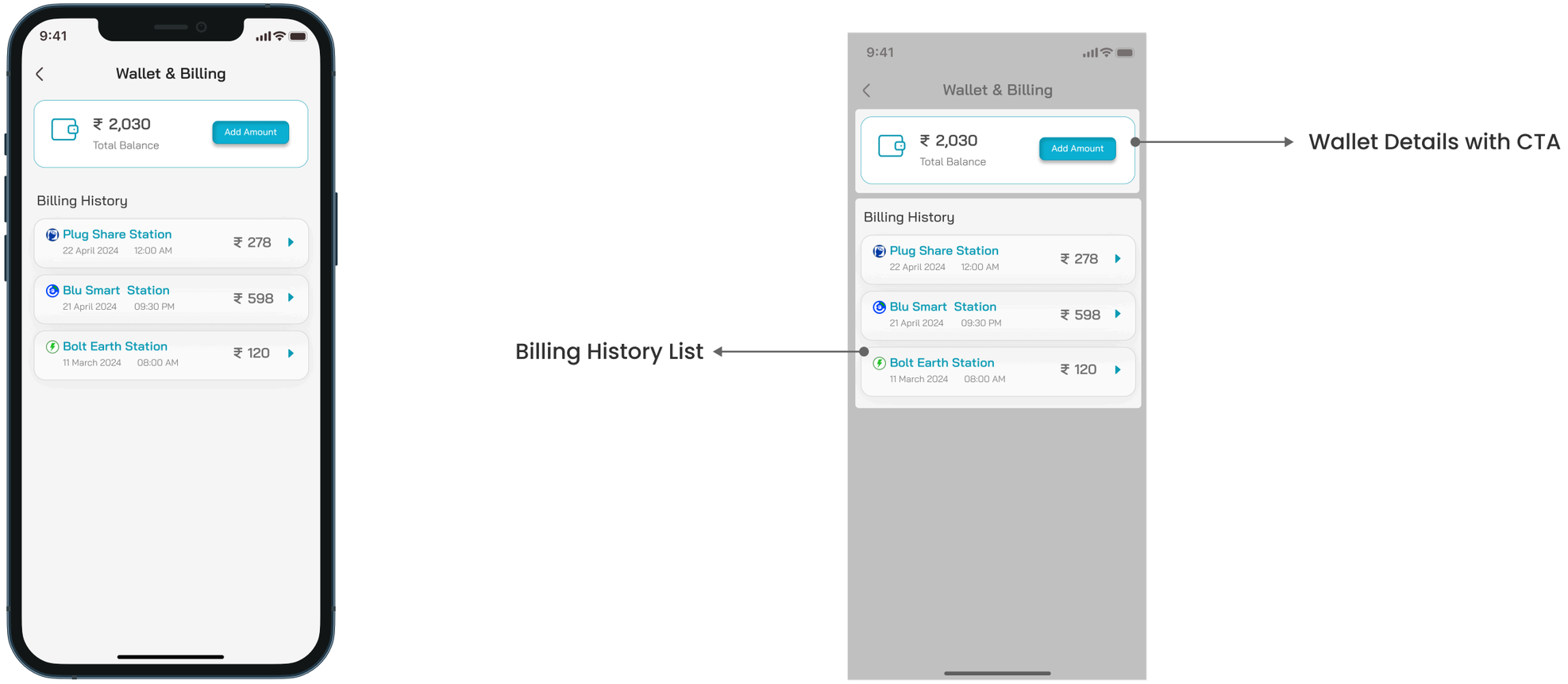
### Purpose

A dedicated section (often at the bottom of the help screen) providing multiple clear Call-to-Action buttons for different customer service channels (e.g., "Call Us," "WhatsApp Chat," "Email Us"). Each button explicitly states the channel and often provides a brief description of what to expect.

### Problem Solved

Caters to different user preferences—call, chat, or email—for greater comfort and accessibility.Provides a clear path to help when self-service isn’t enough, ensuring users feel supported at all times.

# Wallet and Transaction Screen




## Design Interventions

### Intuitive SOC (State of Charge) Management

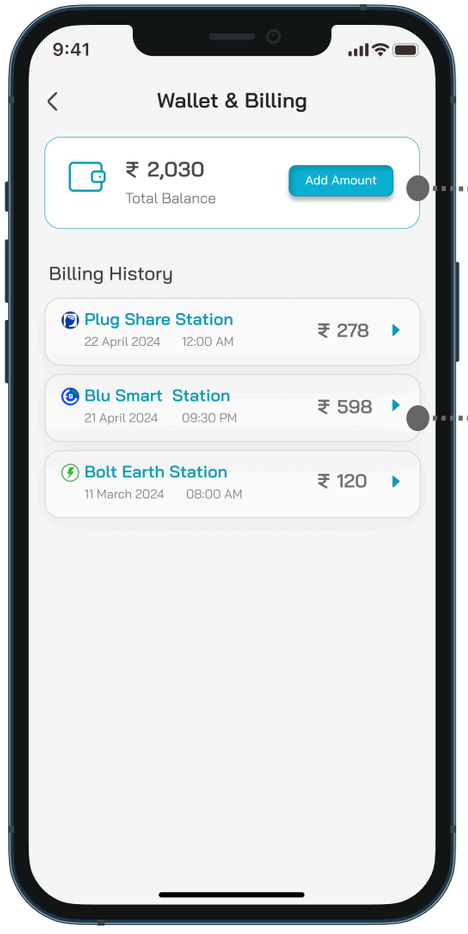
#### Purpose

Displays the user's current balance clearly, with a quick-access "Add Amount" button.Allows users to top up via preset or custom amounts, with visible top-up limits for clarity and control.

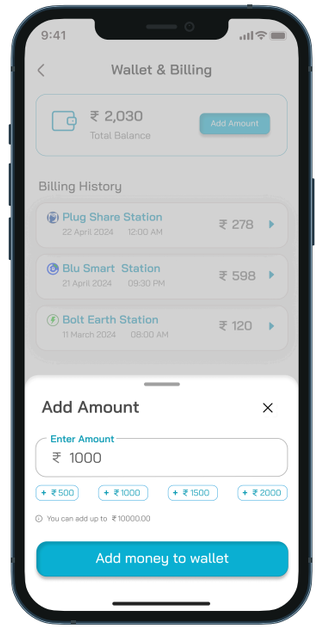
#### Problem Solved

Gives users instant clarity on available funds and ensures seamless, one-tap charging sessions.Flexible top-up options—preset and custom—make fund management quick and hassle-free.

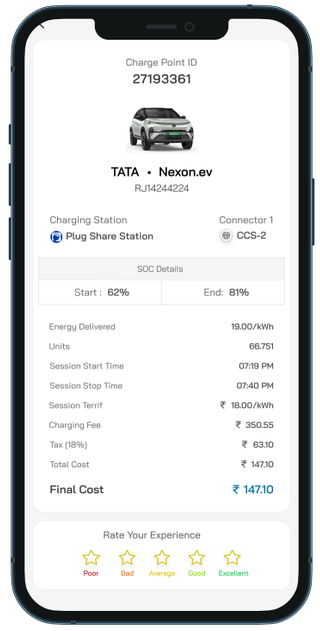
# Wallet & Transaction Details Flow




Check Details

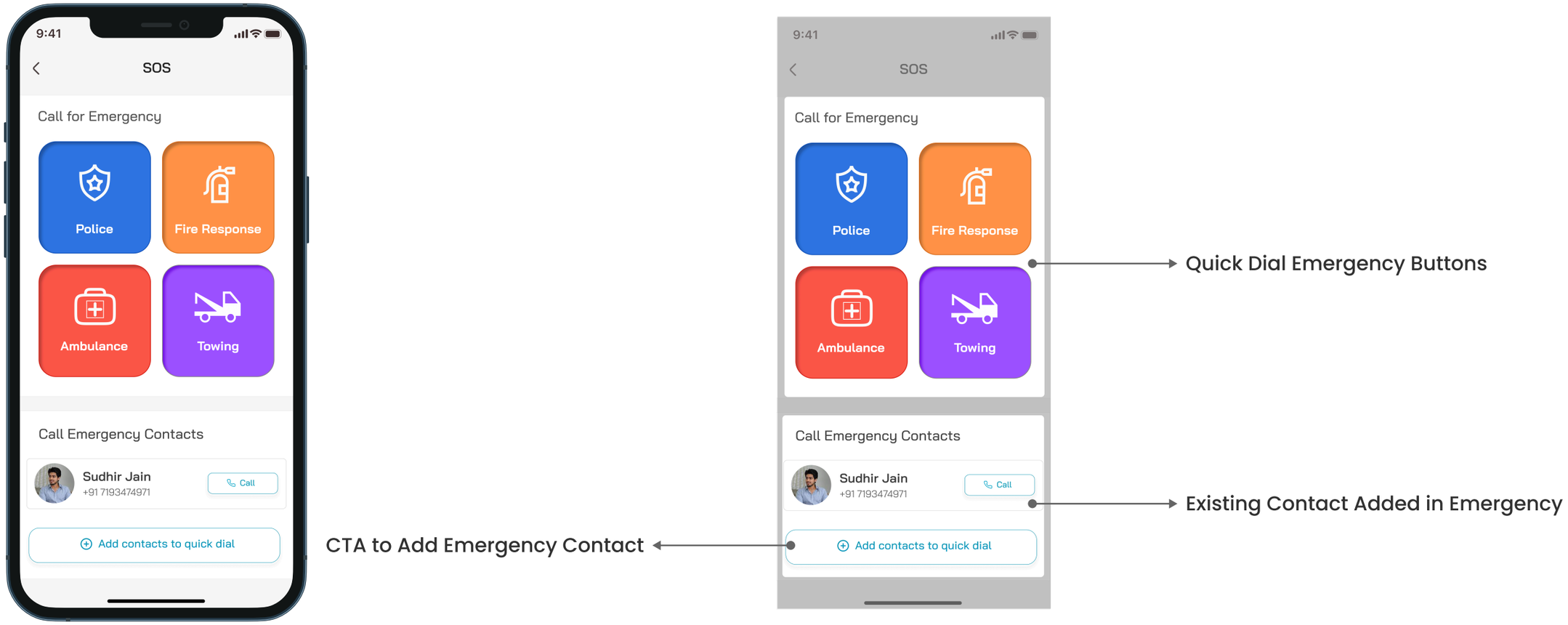



Add Amount to Wallet




Billing Details Screen

# Emergency SOS Screen




## Design Interventions

### Emergency SOS

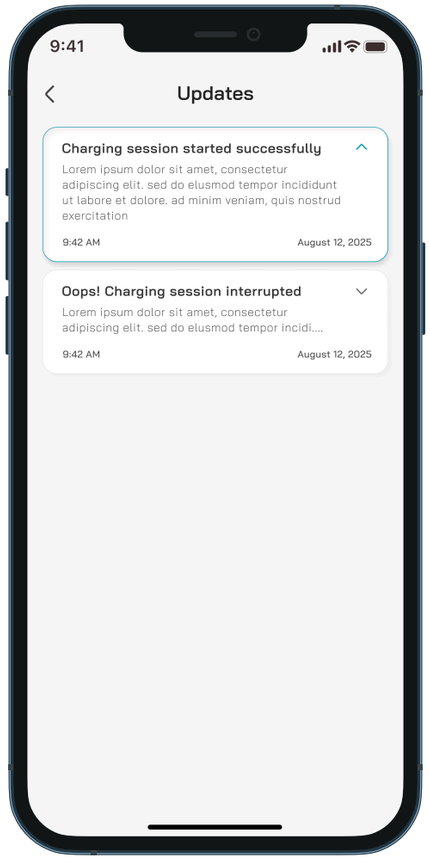
#### Purpose

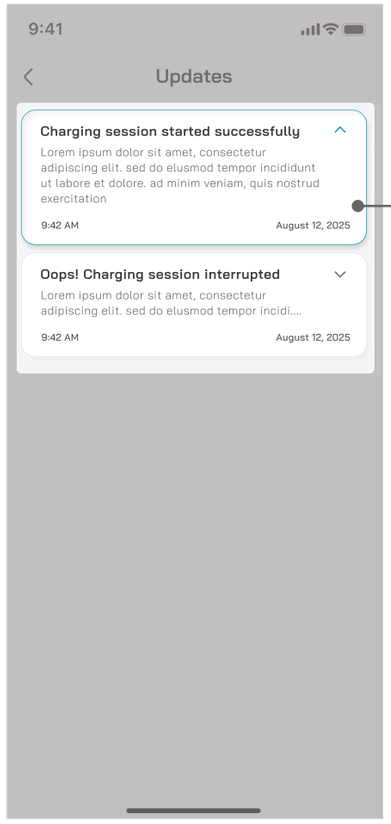
"SOS" (Emergency) screen, designed to provide quick access to emergency services and personal contacts during critical situations.

#### Problem Solved

Provides quick access to the right help with minimal taps during urgent situations.Reduces confusion and covers a range of emergencies—from medical to vehicle-related issues.

# Updates Screen




Accordion showing Updates

## Design Interventions

### Intuitive SOC (State of Charge) Management

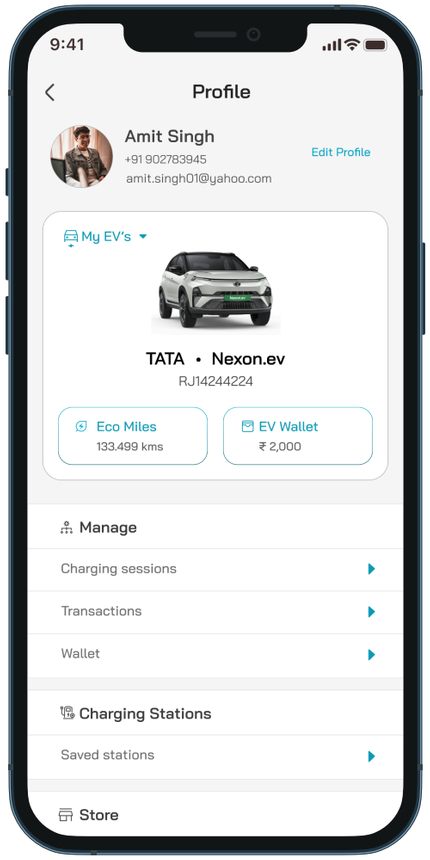
#### Purpose

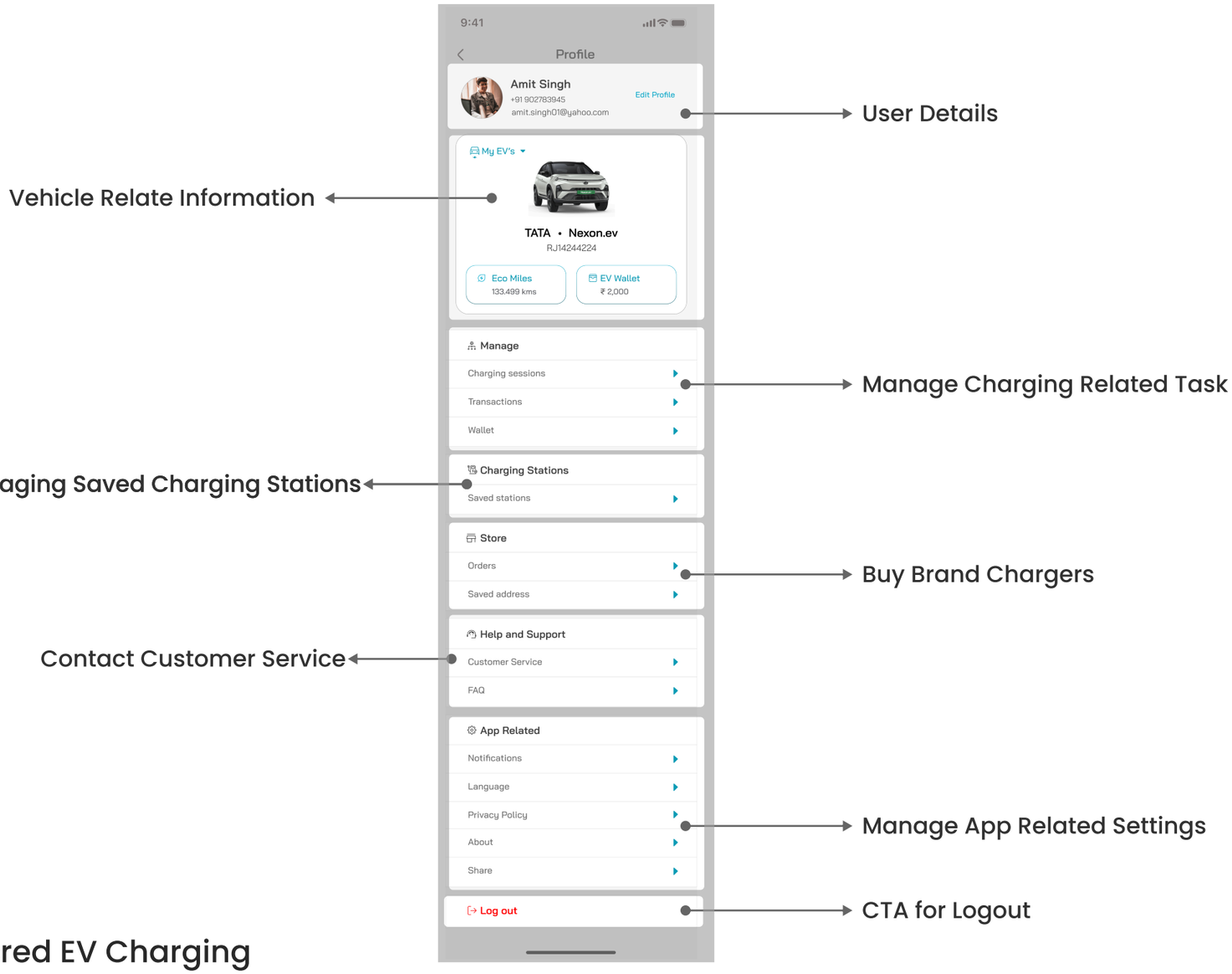
Displays a clear, time-stamped feed of charging updates and system alerts in card format.  Allows users to view key events at a glance, with expandable accordion with details for deeper context when needed.

#### Problem Solved

Keeps users instantly informed of key events, enabling quick response to issues. Serves as a transparent, chronological log for tracking, troubleshooting, and understanding charging behavior

# Profile Management




# Design Interventions

## Profile Management for Tailored EV Charging

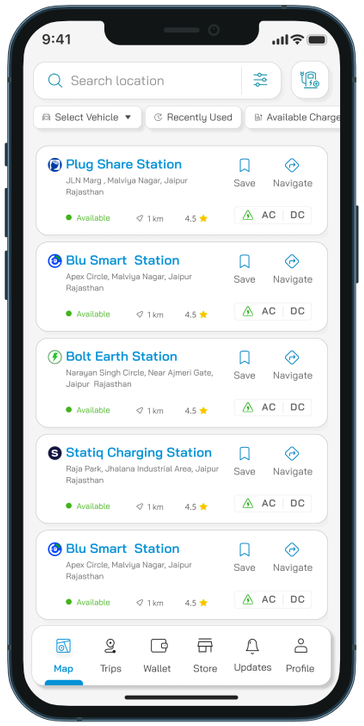
### Purpose

This intervention encompasses the entire "Profile" section of the app, serving as the user's personal command center. I

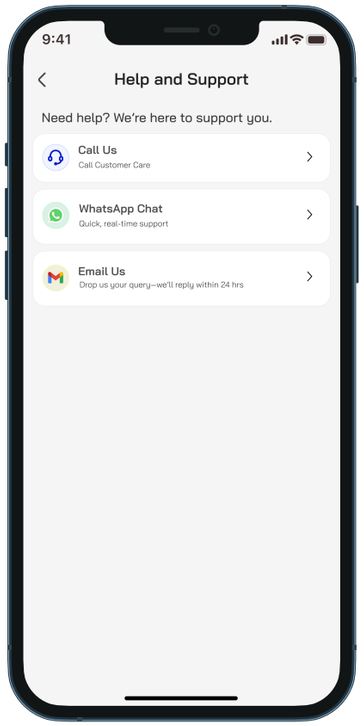
### Problem Solved

Centralizes user and vehicle details to deliver tailored charger recommendations, time estimates, and preferences. Boosts efficiency, control, and accuracy—ensuring a seamless, relevant, and empowered app experience with managed sections.

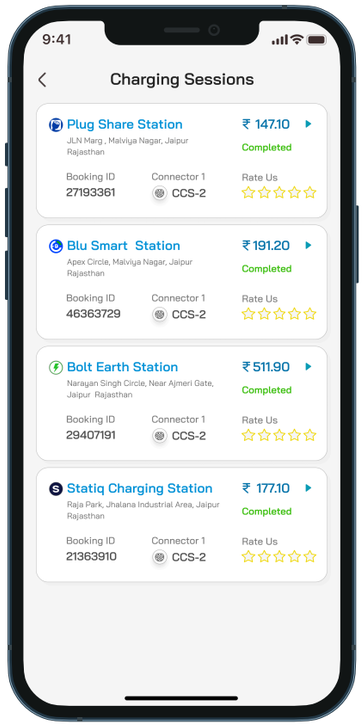
# Additional Screens



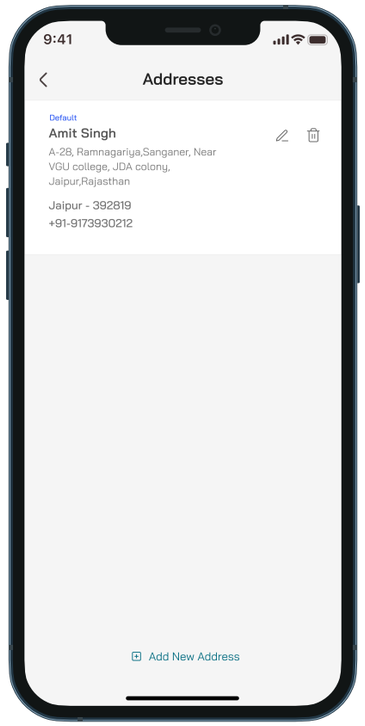

List View of Station Screen



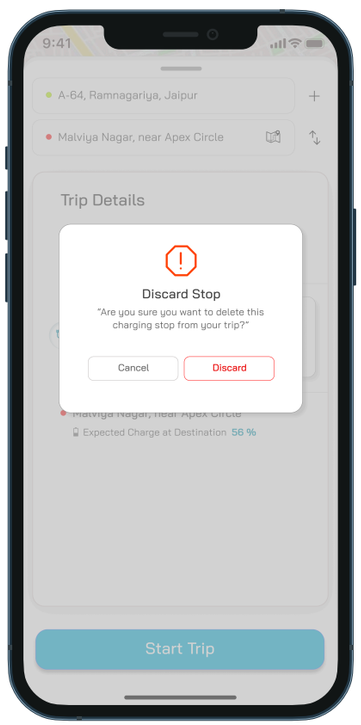

Help and Support Screen




Charging Stations Screen

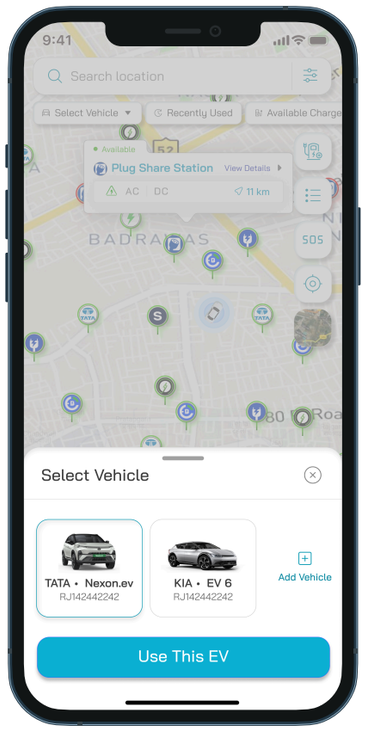



Addresses Screen

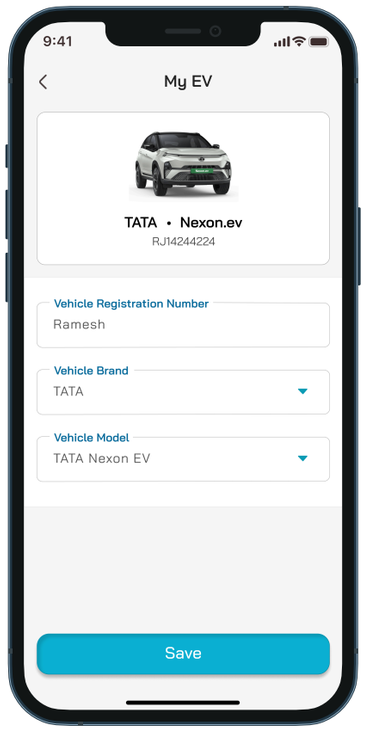



Confirmation Screen

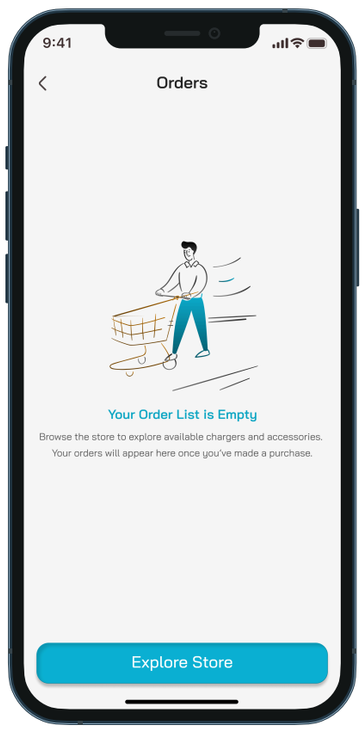
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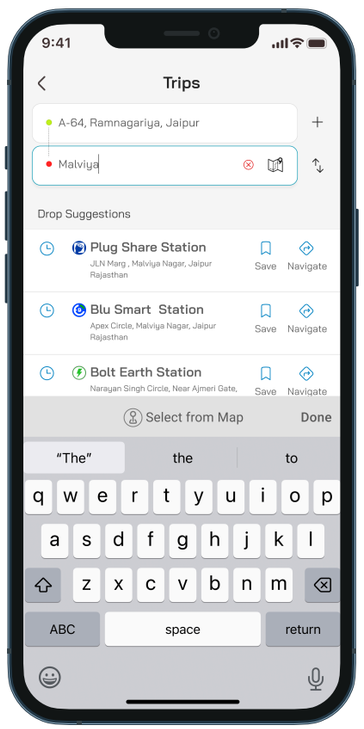

Select Vehicle Station Screen



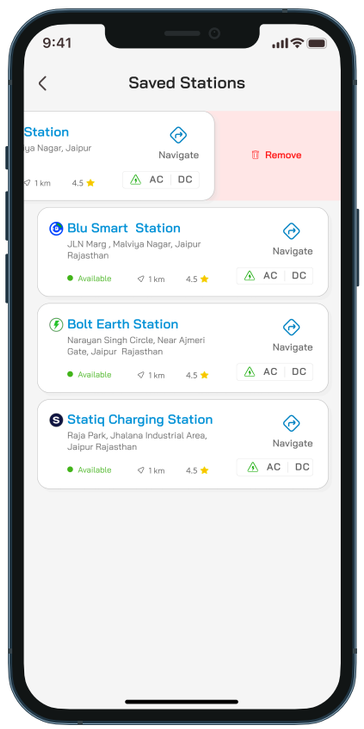

Edit EV Details Screen




Orders Screen




Add Stop Details Screen




Saved Stations Screen

# Journey Mapping

## The Purpose

The updated journey map was created after analyzing user research to address key pain points and inefficiencies in the original experience. It reimagines the user flow by introducing targeted design interventions at each stage—making the journey smoother, more intuitive, and user-friendly. This helped visualize how the proposed solutions directly improve user satisfaction and overall usability.

| Stage | Task | Thoughts | Emotions | Key Solutions Applied |
|---|---|---|---|---|
| 🔔 Smart Battery Alert | Gets notified at 30% with nearest compatible chargers | "Perfect timing. I can top up near the restaurant." | 😊 Reassured | Smart SOC-based alert |
| 🗺️ Search with Filtered Results | Opens app → only sees CCS2 fast chargers near her | "Nice! I don't need to guess this time." | 😌 Confident | Plug-type filter |
| 📆 Slot Booking | Books a charger with a 10-min wait window | "Cool, I'll grab a snack while it opens up." | 😀 Relaxed | Booking countdown + alerts |
| 📍 Navigate + Status Confirmation | Navigates confidently to charger with status updates | "I know exactly what to expect when I arrive." | 😎 In control | Verified reliability badge |
| 🔌 Charging with Session UI | Starts charging → sees timer, progress, cost | "Should I wait or look for another? Time's ticking" | 😊 Productive | Alerts if interrupted |
| 🍵 Multi-Task While Charging | Uses "Nearby Places" to wait at café nearby | "Nice! I'll be done in 18 minutes." | 😄 Comfortable | Location-based activity suggestions |
| ✅ Completion + Review Prompt | Gets alert when session ends → rates charger | "I can actually use this time well." | 🥳 Satisfied | Post-session review prompt |

# Physical Solution Provided by the Brand

### The Purpose

While the app simplifies digital interaction and trip planning for EV users, the brand's physical initiatives play a critical role in building trust, accessibility, and ecosystem readiness, particularly in underrepresented and infrastructure-poor regions such as Tier 2, Tier 3 cities and rural areas.
These efforts acknowledge that a strong user experience starts long before the user opens the app — it begins with reliable, visible, and inclusive access to infrastructure.

## Charger Deployment in Smaller Cities

Focused deployment of AC and DC fast chargers in municipal parking lots, commercial hubs, and public institutions in non-metro cities to improve accessibility for everyday users.

## Price Efficiency

Considering other existing charging brands having their own pricing set for charging, Easy Charger has taken an initiative to keep the price minimal considering the feasibility of the customer to pay via charging phase i.e 14 rupees per kWh

## Highway and Rural Coverage

Strategic partnerships to install chargers at fuel stations and rest stops along highways and rural corridors, ensuring EV owners have predictable access during long-distance travel.

## Franchise-Based Expansion Model

Empowering local businesses—such as kirana stores, hotels, and garages—to host small-format charging units, enabling micro-infrastructure in semi-urban and remote areas.

## Types of Chargers

Considering the need of the user and their preference company also sells chargers to the EV owners. The chargers from brand are too cost heavy and supplies power as per pricing (Higher the price , resulting in high voltage charger and vice-versa). Brand focuses on considerable amount of chargers and proving good capacity to charge EV.

# Types of Chargers brand offers



AC Type 1 EV Charger

~~₹850,000.00~~ **₹75,000.00** ₹75,000.00



AC Type 2 EV Charger

~~₹100,000.00~~ **₹150,000.00** ₹150,000.00



DC Fast Charger 60 K/W

~~₹1,100,000.00~~ **₹875,000.00** ₹875,000.00

# Key Takeaways as Learnings from the Design Interventions

## Design is emotional

Every feature—from trip planning to post-session feedback—must address a user's mental state, not just their functional need.

## Infrastructure matters

Solutions aren't just always digital; it's deeply connected to physical realities like charger location, lighting, and signage.

## Frictions are layered

A single frustration (like charger unavailability) often stems from multiple overlapping system gaps—technical, operational, emotional.

## Control Fosters Confidence

Giving users the ability to customize their experience (e.g., detour limits, SOC preferences, notification settings) doesn't just add features; it builds deep confidence and trust. When the app adapts to their needs, users feel more capable and less frustrated.

## Simplicity in Complexity is Key

The most significant learning is that providing timely, relevant information (like real-time availability, SOC estimates, and clear pricing) directly combats the emotional distress of range anxiety and uncertainty. Users feel more in control when they are well-informed.

## Personalization Drives Engagement

Features like saved stations and customizable profiles make the app feel specifically designed for the individual, encouraging repeated use and loyalty.

# Reflection: The Impact on User Experience & Behavior

## From Anxiety to Assurance

Users move from a state of apprehension about running out of charge or finding a station to a state of calm and assurance, knowing the app provides reliable solutions and real-time updates.

## From Frustration to Efficiency

The frustration of complex trip planning, unclear pricing, or unavailable chargers is replaced by efficiency and seamlessness, allowing users to focus on their journey rather than logistical hurdles.

## From Uncertainty to Empowerment

Users are no longer passive recipients of information but active participants, empowered to customize their experience, make informed decisions, and proactively manage their charging needs. This fosters a strong sense of control and ownership.

# **Glossary** (Key Terms Used in This Report)

| Term | Definition |
| --- | --- |
| **EV** | Electric Vehicle – a vehicle powered fully or partially by electric batteries. |
| **CPO** | Charge Point Operator – an entity responsible for installing, operating, and maintaining EV charging stations. |
| **SOC** | State of Charge – indicates the battery level of an electric vehicle as a percentage. |
| **AC/DC Charger** | AC: Alternating Current (slower), DC: Direct Current (fast charging). |
| **Fast Charger** | A charger (typically DC) that allows rapid battery charging, reducing wait time. |
| **Range Anxiety** | The fear that an EV will run out of charge before reaching a charging station. |
| **User Journey Map** | A design tool that visualizes the end-to-end experience of a user with a product or service. |
| **Affinity Mapping** | A research synthesis technique used to organize user insights and behaviors into thematic groups. |
| **Persona** | A fictional, research-based profile representing a specific user type. |
| **Card Sorting** | A UX research method used to understand how users group and categorize information. |
| **Trip Planner** | A feature in the app that suggests charging stops based on distance, SOC, and preferences. |
| **Feedback Loop** | A system where user feedback improves or informs the product over time. |
| **Idle Time** | The duration when a vehicle is parked but not yet fully charged. |

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