



# MVP Overview: EmergencyConnect



## Goal

Build a real-time, multi-user platform that reduces patient transit time and improves emergency room efficiency, starting with an MVP focused on core life-saving features.

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## Tech Stack

Layer	Technology	Purpose
Frontend	React.js + Tailwind CSS	Fast, responsive UIs
Backend	Node.js + Express	API and real-time logic
Database	PostgreSQL (relational)	Structured data (hospital beds, users)
Real-Time Comm.	Socket.io (WebSockets)	Real-time ambulance/hospital updates
Auth	JWT + Bcrypt + MFA	Secure login and role-based access
Geolocation	Google Maps API	Ambulance routing and location tracking
Hosting	Vercel (Frontend), Railway/Render (Backend), Supabase/NeonDB (DB)	Free/affordable MVP deployment
Mobile-read y	React Native (optional phase)	Extend to mobile platforms

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## User Roles & Interfaces

### 1. Patient Portal

Prioritizes ease of use in a critical situation.

- 📍 **Features:**
    - Emergency Request Button (1-tap)
    - Current Location Auto-detection
    - Live Ambulance ETA
    - View nearest available hospitals + bed availability
    - Patient profile (optional emergency medical info)
  - 🔒 Secure login with phone OTP
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## 2. Ambulance Operator Interface

Empowers rapid dispatch and coordination.

- 🚑 **Features:**
    - Real-time route optimization to nearest available hospital
    - Accept/decline emergency requests
    - Live chat with hospital ER
    - View patient info (conditions, criticality)
    - Automated ETA updates to patient
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## 3. Hospital Staff Dashboard

Enables ER efficiency and resource control.

- 🏥 **Features:**
    - Bed availability updates (ICU, general, trauma)
    - Patient intake queue (live arrivals)
    - Resource allocation (e.g., ventilators)
    - Real-time ambulance tracking
    - Emergency room status (Busy / Available / Full)
  - Admin roles: ER Head, Triage Nurse, Supervisor
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## 🔒 Authentication & Security

- Role-based Access Control (RBAC)
- JWT authentication
- Multi-factor login (Hospital + Ambulance)
- AES encrypted sensitive data (medical info, coordinates)
- Regular logs + endpoint audits
- Data storage compliant with:
  - **Indian PDP Act**
  - **HIPAA (for future international standards)**

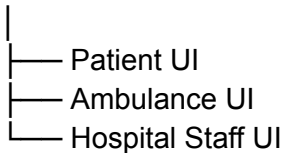
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## Core APIs

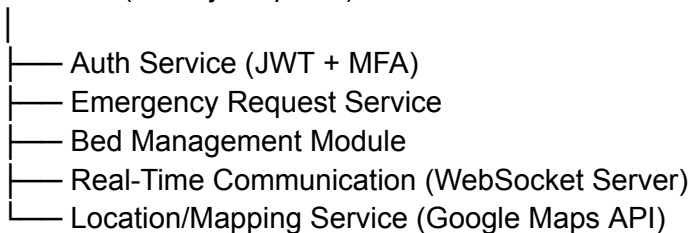
- `POST /emergency/request` – Initiate emergency request
  - `GET /ambulance/nearby` – List ambulances within 5km
  - `GET /hospitals/available` – Real-time bed availability
  - `POST /hospital/update-status` – ER status and bed updates
  - `WS /realtime/location` – Track ambulance and patient movement
  - `WS /communication` – Messaging between ambulance & ER
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## Modular MVP Architecture

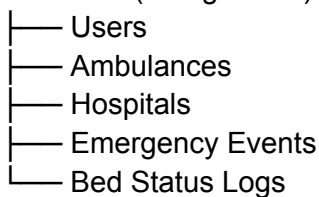
### Frontend (React)



### Backend (Node.js/Express)



### Database (PostgreSQL)



## Validation Strategy

Metric	Target
Avg. time to ambulance dispatch	Under 2 minutes
Avg. ER response confirmation	Under 1 minute

Bed availability accuracy	95%+
User satisfaction (pilot)	> 80% positive feedback
Pilot regions	Tier 1 city + Tier 2 town

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## Development Roadmap

### Phase 1 – Core MVP (1–1.5 months)

- Patient request flow
- Ambulance assignment logic
- Live hospital bed feed (manual input)
- WebSocket-based live tracking
- Secure login (all roles)

### Phase 2 – Automation & Optimization (2–3 months)

- Auto-bed allocation
- Predictive ETA + traffic API integration
- Mobile app release (React Native)
- Multilingual support

### Phase 3 – Scaling & AI (4–6 months)

- Predictive triage scoring (using past data)
  - Integrate with public hospital APIs
  - Referral system
  - API for third-party health platforms
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## Funding Plan

Source	Strategy
Govt. Grants (Ayushman Bharat, Digital India)	Pitch as emergency tech
Healthcare NGOs	Social impact proposals
Angel Investors	Seed round targeting healthtech VCs
Startup Competitions	BIRAC, NASSCOM grants, hackathons

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## Real-Life Scenario Simulation

**Patient in Lucknow** hits an Emergency Call at 10:30 PM.

1. 📶 **App auto-shares GPS**
2. 🚑 Nearest ambulance notified in 15s
3. 👤 Operator receives live hospital status – SGPGI ICU has 3 beds
4. 📶 Route auto-plotted avoiding traffic jams
5. 🏥 ER receives patient ETA, reserves ICU bed
6. 🛏 Upon arrival, patient is directly admitted without triage wait

→ **Total response time: 10 minutes**

→ **Zero phone calls required. Lives saved.**

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## ✅ Key Benefits

Stakeholder	Benefits
Patients	Faster emergency response, better chance of survival
Ambulance Ops	Streamlined routes, reduced confusion
Hospitals	Better resource planning, less overload
Govt./Investors	Scalable public health impact with data insights

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## 🧭 Final Notes

Every second matters in emergency care.

This system must **never fail when it matters most**. Build with **redundancy**, **simplicity**, and **speed** at its core.

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