Conception Phase – Project: EcoRoute Planner

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This software engineering project aims to design and implement EcoRoute Planner, a novel web application that empowers environmentally conscious urban commuters (primary target group: 25-40-year-old professionals in European cities) to discover and choose the most sustainable travel routes. Unlike existing navigation tools that prioritize speed or distance, EcoRoute Planner calculates and visually compares real-time carbon footprints of multimodal routes (public transport, bicycle, walking, e-scooter sharing) and awards "eco-badges" to reinforce long-term behavioral change. The application delivers clear customer value by making sustainability measurable and rewarding, while providing monthly CO2-saving reports that can be used for green tax incentives or employer sustainability programs.

Initial ideas include an intuitive route search interface, integration of open APIs (OpenStreetMap, local transit feeds, weather data), a custom carbon-emission calculator based on EU/EPA factors, interactive comparison charts, user profiles with badge progression, and optional email summaries. Positives: high user engagement through gamification, scalability via cloud deployment, and low operational costs using free-tier services. Negatives: dependency on third-party API availability and accuracy of emission models. Early Figma wireframes and feedback from five potential users confirmed strong demand for the eco-gamification aspect, while highlighting the need for excellent mobile responsiveness.

The concept follows a classic three-tier architecture (React frontend, Node.js/Express backend, MongoDB database) with Leaflet.js for lightweight maps. Non-functional requirements include < 3-second page loads, GDPR-compliant data handling, offline-capable route caching, and full responsiveness.

I will apply the Agile/Scrum methodology with three two-week sprints because it supports iterative refinement, early risk detection, and easy incorporation of tutor feedback — ideal for a creative solo project. Tools were deliberately chosen within the JavaScript ecosystem (React, Node.js, Express, MongoDB, Leaflet, Chart.js) to minimize context switching and accelerate development while ensuring modern, maintainable code.

The project profile defines success as ≥ 85% route calculation accuracy, delivery of five core MVP features, and a public GitHub repository with proper documentation. Major risks (API downtime, scope creep) will be mitigated through daily stand-ups (self-logged issues), fallback data, and strict backlog prioritization.