Theme 2: Mobility, Charging & Sustainable Transport

Rethinking mobility ecosystems, charging infrastructure, and transport sustainability

M01 Smart Parking with EV Charging Finder

Problem Statement:

Create an app that helps EV drivers find parking spots with available charging stations, showing real-time availability, charging speeds, pricing, and estimated wait times. Include reservation capability.

Domains: Mobile Apps | Real-time Data | Urban Mobility

Expected Outcome: Working app prototype with map interface and booking flow

M02 Last-Mile Delivery Route Optimizer

Problem Statement:

Build an algorithm that optimizes last-mile delivery routes for electric cargo bikes, considering battery range, package weight limits, traffic patterns, and delivery time windows.

Domains: Logistics | Route Optimization | E-mobility

Expected Outcome: Route planning tool with efficiency metrics and battery management

M03 EV Battery Second-Life Assessor

Problem Statement:

Develop a system that evaluates used EV batteries for second-life applications (home storage, grid support) by analyzing degradation data and predicting remaining useful life and optimal use cases.

Domains: Battery Analytics | Circular Economy | Predictive Modeling

Expected Outcome: Assessment tool with second-life recommendations and value estimates

M04 Multimodal Journey Carbon Calculator

Problem Statement:

Create a journey planner that compares transportation options (car, bus, train, bike, walk) by time, cost, and carbon footprint. Suggest optimal combinations and gamify sustainable choices.

Domains: Transportation Planning | Carbon Tracking | UX Design

Expected Outcome: Journey planner with environmental impact visualization

M05 Predictive Charging Station Maintenance

Problem Statement:

Design a system that monitors EV charging station health data to predict failures before they occur, minimizing downtime and improving user experience through proactive maintenance.

Domains: Predictive Maintenance | IoT | Service Reliability

Expected Outcome: Monitoring dashboard with failure predictions and maintenance alerts

M06 Fleet Electrification Decision Tool

Problem Statement:

Build a calculator that helps businesses decide which vehicles in their fleet to electrify first, considering routes, charging infrastructure costs, fuel savings, and environmental impact.

Domains: Fleet Management | Decision Support | TCO Analysis

Expected Outcome: Decision tool with ROI projections and implementation roadmap

M07 Dynamic EV Charging Price Optimizer

Problem Statement:

Create a pricing algorithm for charging station operators that balances demand, grid load, renewable availability, and competition to maximize utilization while keeping prices fair.

Domains: Pricing Algorithms | Market Economics | Grid Integration

Expected Outcome: Pricing simulator with demand response and revenue analysis

M08 Shared Mobility Demand Predictor

Problem Statement:

Develop a model that predicts demand for shared bikes, scooters, or cars by location and time, helping operators reposition vehicles proactively and reduce empty trips.

Domains: Demand Forecasting | Shared Mobility | Operations Research

Expected Outcome: Prediction model with repositioning recommendations

M09 EV Range Anxiety Reducer

Problem Statement:

Build an intelligent range calculator that considers driving style, weather, terrain, HVAC usage, and charging station availability to give EV drivers accurate, confidence-building range estimates.

Domains: User Experience | Predictive Analytics | EV Technology

Expected Outcome: Range estimator with personalized factors and charging recommendations

M10 Urban Freight Consolidation Planner

Problem Statement:

Design a platform where multiple retailers can consolidate deliveries to reduce truck trips in urban areas, optimizing pickup routes and shared delivery scheduling.

Domains: Urban Logistics | Collaborative Platforms | Emissions Reduction

Expected Outcome: Consolidation platform with efficiency and emissions metrics

M11 Bicycle Infrastructure Gap Analyzer

Problem Statement:

Create a tool that uses cycling app data, accident reports, and city maps to identify dangerous gaps in bicycle infrastructure and prioritize improvements for city planners.

Domains: Urban Planning | Data Analysis | Cycling Safety

Expected Outcome: Gap analysis tool with prioritized improvement recommendations

M12 Vehicle-to-Grid Participation Optimizer

Problem Statement:

Build a system that helps EV owners decide when to participate in vehicle-to-grid programs, balancing income from grid services against battery degradation and personal driving needs.

Domains: V2G Technology | Decision Optimization | Energy Markets

Expected Outcome: Participation advisor with earnings projections and battery impact analysis

M13 Accessible Transit Route Finder

Problem Statement:

Develop a journey planner specifically for users with mobility challenges, considering elevator availability, step-free access, ramp conditions, and real-time accessibility disruptions.

Domains: Accessibility | Transit Planning | Inclusive Design

Expected Outcome: Accessible route planner with real-time disruption alerts

M14 Sustainable Commute Incentive Platform

Problem Statement:

Create a corporate platform that tracks employee commute choices, rewards sustainable options with points/perks, and provides HR with aggregate sustainability reporting.

Domains: HR Tech | Gamification | Corporate Sustainability

Expected Outcome: Platform prototype with tracking, rewards, and analytics dashboards

M15 Smart Traffic Signal for Emergency EVs

Problem Statement:

Design a system that coordinates traffic signals to create green corridors for emergency electric vehicles, considering battery efficiency alongside response time optimization.

Domains: Traffic Systems | Emergency Services | Smart Cities

Expected Outcome: Simulation showing response time and energy improvements

M16 Public Transit Crowding Predictor

Problem Statement:

Build a model that predicts crowding levels on public transit routes, helping commuters choose less crowded options and operators plan service adjustments.

Domains: Transit Operations | Predictive Modeling | Passenger Experience

Expected Outcome: Crowding forecast interface with alternative route suggestions

M17 Electric School Bus Fleet Manager

Problem Statement:

Develop a management system for electric school bus fleets that optimizes routes, manages charging schedules around school hours, and provides real-time tracking for parents.

Domains: Education | Fleet Management | Parent Communication

Expected Outcome: Management dashboard with route optimization and parent app

M18 Cargo Bike Delivery Zone Optimizer

Problem Statement:

Create a tool for cities to design optimal cargo bike delivery zones, determining zone boundaries, micro-hub locations, and access policies to minimize van traffic in urban centers.

Domains: Urban Planning | Logistics | Policy Design

Expected Outcome: Zone planning tool with traffic impact projections

M19 Ride-Share Matching for Commuters

Problem Statement:

Build an algorithm that matches commuters with similar schedules and routes for ride-sharing, considering departure flexibility, detour tolerance, and user preferences for conversation/quiet.

Domains: Matching Algorithms | Social Computing | Commuter Solutions

Expected Outcome: Matching system with compatibility scoring and scheduling

M20 Charging Network Coverage Analyzer

Problem Statement:

Design a tool that identifies gaps in EV charging network coverage by analyzing road networks, traffic patterns, and existing stations. Recommend optimal locations for new installations.

Domains: Network Planning | GIS Analysis | Infrastructure Investment

Expected Outcome: Gap analysis with ranked site recommendations and coverage metrics