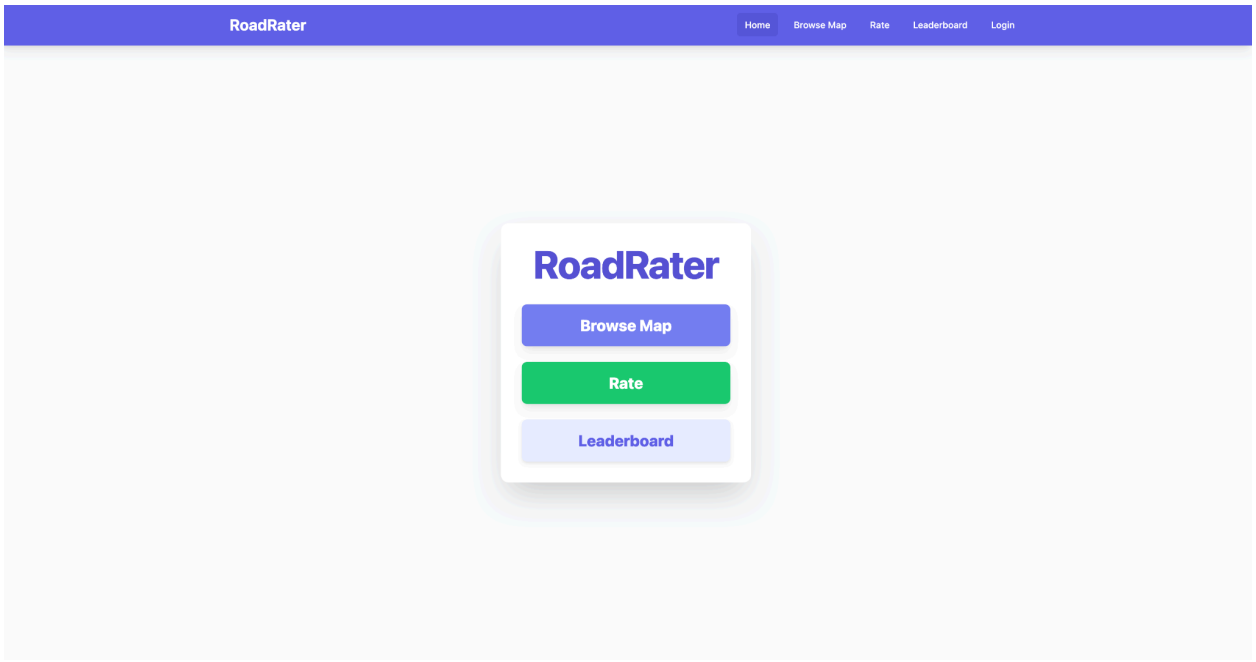
Project Proposal:
https://docs.google.com/document/d/1pFRMB-gdvUhtHVc9-BdCJ8CDQEd117ARoiP6J274bBU/edit?usp=sharing

RoadRater Project Report



RoadRater: Community-Sourced Road Quality Intelligence

Created By:

- Cole Lawson
- Jack McAuliffe
- Dhruv Kumar
- Ratnakaru Yalagathala

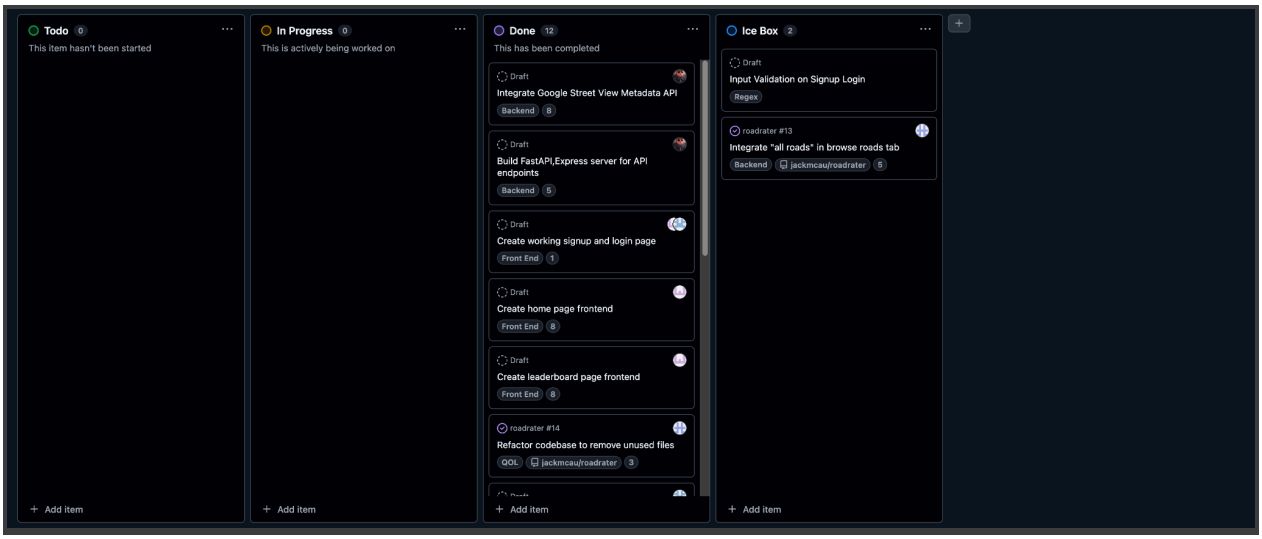
Project Description

RoadRater is a full-stack platform that helps cyclists, scooter riders, delivery drivers, and city planners make faster decisions about which road segments are safest and smoothest to travel. Our responsive frontend provides map-driven exploration, road detail pages, top-5 leaderboards, and an authenticated “rate a road” workflow. Users register and log in to submit 1–5 star ratings with optional commentary; submissions immediately recalculate per-segment averages so new hazards surface quickly. The backend is an Express API backed by PostgreSQL. It exposes endpoints for registration/login, CRUD-style road segment retrieval, detailed rating statistics, and curated “top 5” rankings. We focused on operational reliability: incoming requests are validated with shared utilities, errors are normalized through HttpError helpers, and JWT-secured middleware protects author-only routes. Automated Vitest +

Supertest suites cover environment configuration, health responses, authentication flows, and end-to-end rating creation/validation paths. Docker Compose coordinates the API, Postgres, and seeded data for one-command local or cloud deployment. RoadRater's modular architecture, typed environment contracts, and transaction-aware database utilities make it straightforward to extend with analytics, notifications, or municipal data integrations.

Project Tracker

- GitHub Project Board: *https://github.com/users/jackmcau/projects/1*
- Screenshot:



Video Demo

- *TODO*

Version Control (GitHub)

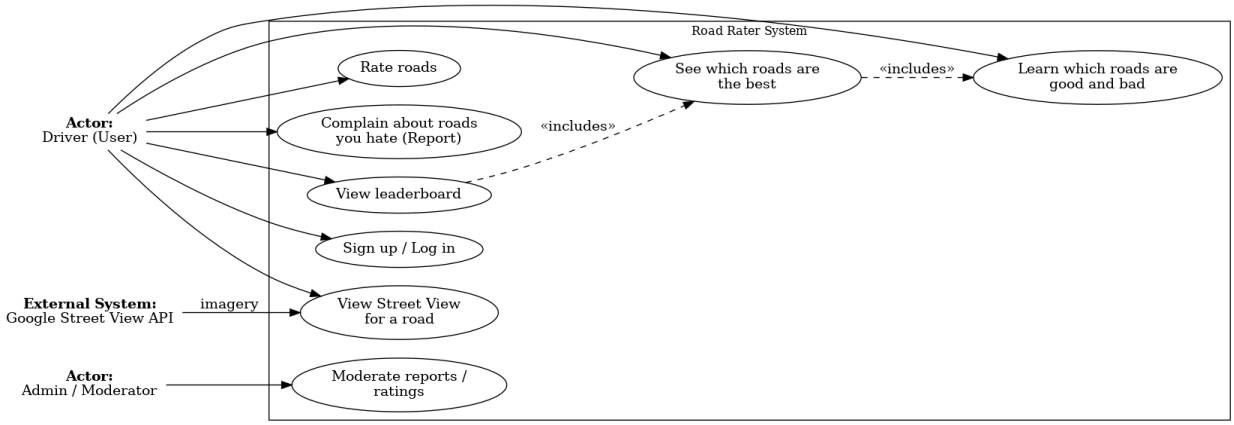
- Repository: https://github.com/jackmcau/roadrater
    - Contains source code, Vitest specs, demo video asset, README, docs, and the linked GitHub Project board (per weekly compliance checks).

Contributions

- **Cole Lawson** – Led backend architecture (Express, PostgreSQL schemas, Docker Compose) and authored auth/rating routes plus shared validation/error utilities. Built automated tests for register and rating flows.
- **Jack McAuliffe** – Drove frontend UX (map browse, leaderboards, rate form) with modular JS widgets, integrated API layer, and responsive styling. Managed deployment scripts and documentation polish.
- **Dhruv Kumar** – Implemented authentication UX (register/login pages), JWT handling in frontend, and accessibility sweeps. Helped refine road detail visualizations and QA test passes.

- **Ratnakaru Yalagathala** – Focused on data pipeline: seeding scripts, top-5 aggregation route, and DB tuning. Authored QA test plan, executed Lab 10 validation suite, and curated release tagging.

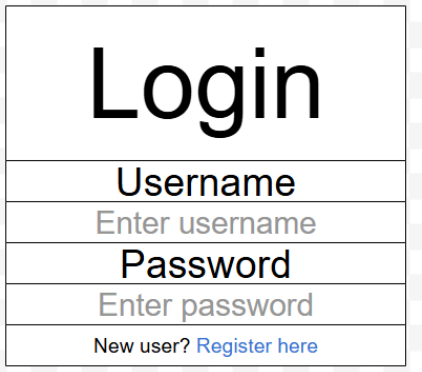
Use Case Diagram

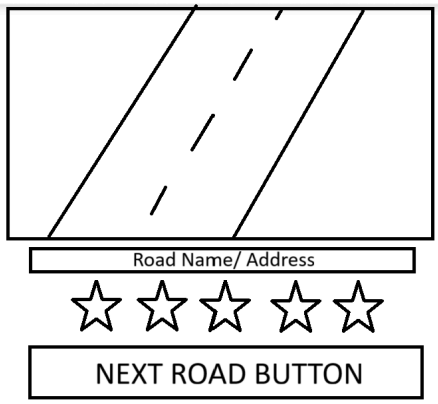


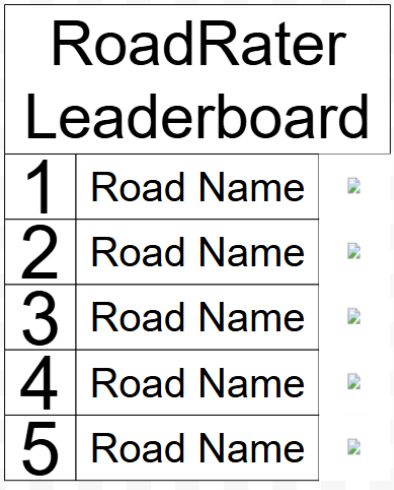
Video Demo

- https://www.youtube.com/watch?v=VQPRO1Ewj2c

Wireframes







Test Results

```
> roadrater-backend@1.0.0 test
> vitest run


 RUN  v4.0.13 /Users/cdlawson/roadrater/roadrater/backend

 ✓ src/__tests__/response.spec.js (2 tests) 2ms
 ✓ src/__tests__/config.spec.js (1 test) 25ms
GET /health 200 2.689 ms - 80
 ✓ src/__tests__/health.spec.js (1 test) 77ms
POST /ratings 201 1.664 ms - 211
POST /ratings 400 2.263 ms - 141
stderr | src/__tests__/ratings.spec.js > POST /ratings > rejects invalid rating payloads without hitting the database
Error: HttpError: Validation failed
    at badRequest (/Users/cdlawson/roadrater/roadrater/backend/src/utils/httpError.js:19:10)
    at /Users/cdlawson/roadrater/roadrater/backend/src/routes/ratings.js:23:23
    at Layer.handle [as handle_request] (/Users/cdlawson/roadrater/roadrater/backend/node_modules/express/lib/router/layer.js:95:5)
    at next (/Users/cdlawson/roadrater/roadrater/backend/node_modules/express/lib/router/route.js:149:13)
    at requireAuth (/Users/cdlawson/roadrater/roadrater/backend/src/middleware/auth.js:22:12)
    at Layer.handle [as handle_request] (/Users/cdlawson/roadrater/roadrater/backend/node_modules/express/lib/router/layer.js:95:5)
    at next (/Users/cdlawson/roadrater/roadrater/backend/node_modules/express/lib/router/route.js:149:13)
    at Route.dispatch (/Users/cdlawson/roadrater/roadrater/backend/node_modules/express/lib/router/route.js:119:3)
    at Layer.handle [as handle_request] (/Users/cdlawson/roadrater/roadrater/backend/node_modules/express/lib/router/layer.js:95:5)
    at /Users/cdlawson/roadrater/roadrater/backend/node_modules/express/lib/router/index.js:284:15 {
  statusCode: 400,
  details: [
    'segmentId is required',
    'rating must be between 1 and 5',
    'comment must be a string'
  ]
}

 ✓ src/__tests__/ratings.spec.js (2 tests) 18ms
POST /auth/register 201 58.729 ms - 58
stderr | src/__tests__/auth.spec.js > POST /auth/register > returns 409 when username already exists
[auth] Error during registration: { code: '23505' }
Error: HttpError: Username already exists
    at /Users/cdlawson/roadrater/roadrater/backend/src/routes/auth.js:49:19 {
  statusCode: 409,
  details: null
}

POST /auth/register 409 52.316 ms - 66
POST /auth/register 400 0.091 ms - 102
 ✓ src/__tests__/auth.spec.js (3 tests) 125ms

 Test Files  5 passed (5)
      Tests  9 passed (9)
   Start at  18:01:43
   Duration  333ms (transform 150ms, setup 0ms, collect 396ms, tests 247ms, environment 0ms, prepare 11ms)
```