

Project 2: Open Source Data Project

Objective

Design and build a web-based application that leverages open-source data from the City of Calgary to solve a real-world problem. This project will showcase your full-stack development skills by demonstrating you and your team's ability to design, develop, and deploy a functional, user-friendly application. Your solution should provide valuable insights or tools that enhance user experiences and interactions with city services or resources.

Project Scope & Constraints

- **Application Type:** Full Stack Web Application
- **Data Source:** [City of Calgary Open Data](#)
- **Project Duration:** 6 weeks
- **Start Date:** Monday March 24th 2025, 9:00 AM
- **Deadline & Demo Day:** May 2, 9:00 AM

Key Requirements

Your project must include the following:

- Data retrieval and display from the City of Calgary Open Data API
- Basic CRUD operations (Create, Read, Update, Delete)
- API integration for dynamic data updates
- Fully responsive design with React components
 - Integrate React components with existing HTML and CSS for a dynamic, responsive front-end
- Seamless design across the application, including logo, branding, and grid layout
- An intuitive, end-to-end user experience that addresses a specific problem

Questions to Consider:

- What features and functionalities will your app include?
- How will you design the user interface to be intuitive and user-friendly?
- How can your app improve the lives of Calgary residents or businesses?

Key Components of the Project:

1. **Blueprint:** Your initial step involves creating a detailed plan, or *Blueprint* of your web-based application. This should include site structure, content areas, and features your team wants to incorporate. You'll need to demonstrate foresight, strategy, and user experience considerations. A wireframe or sketch is highly recommended.
2. **Foundation:** The foundation of your application includes setting up the core structure using the entire tech stack (Mongo, Node, Express, React). At this stage, ensure that your code is organized, well-documented, and functional.
3. **Framing:** At this stage, you'll add interactivity and polish. This could include responsive design, navigation features, and ensuring the application adapts well to different devices and screen sizes.
4. **Facade:** This is where aesthetics and design come in. Think about the visual impact of your application, including the layout, color scheme, fonts, and images. It should align with the project's brand, enhancing the user experience without overwhelming functionality.
5. **Interior Detailing:** Populate your web-based application with content. This could include an "overview" section, functionality to solve the real-world problem, and other essential sections of a web-based app. The content should be thoughtfully structured.

Achievement Levels

- **Foundation:** Displays a solid understanding of core full-stack concepts with a functioning, dynamic app.
- **Build:** Integrates more advanced features such as data manipulation, sorting, and error handling.
- **Innovate:** Pushes the boundaries with features like user authentication, interactive maps, and personalized recommendations.

Project Phases & Components

1. Blueprint: Planning & Design

Start by designing the overall structure, layout, and user experience of your application. The blueprint should include the key features, interface design, and user flows that address the real-world problem you've identified.

Deliverables:

- Wireframe or sketch of the app's design
- Detailed feature list with user experience considerations
- API integration plan for retrieving and displaying data from City of Calgary open data

Milestones:

- **Foundation:** Basic wireframe outlining key pages and features
- **Build:** Detailed wireframe with user interactions and front-end flow
- **Innovate:** Comprehensive UX strategy with user personas and accessibility considerations

2. Foundation: Core Build (Back-end & Front-end)

Establish the core architecture or structure of your application using the full tech stack (React, Node.js, Express, MongoDB). Focus on setting up a clean, organized, and well-documented codebase.

Deliverables:

- Fully functional CRUD operations for the selected dataset
- Data retrieval from the City of Calgary Open Data API

Milestones:

- **Foundation:** Working back-end with API data retrieval and display
- **Build:** Full CRUD operations implemented with data validation
- **Innovate:** Optimized database queries and advanced API interactions (e.g., real-time updates)

3. Framing: Interactivity & Responsiveness

Enhance the usability and accessibility of your application. Implement a responsive design, smooth navigation, and user interactions. Ensure your application works across various devices providing a seamless experience and include interactive elements that engage users.

Deliverables:

- Navigation menus, buttons, and interactive elements
- Responsive design ensuring compatibility across devices
- Error handling and input validation

Milestones:

- **Foundation:** Basic navigation and functional layout across devices
- **Build:** Responsive and accessible design with smooth user interactions
- **Innovate:** Custom interactive features animations, transitions, real-time updates

4. Facade: Design & Visual Presentation

Focus on creating a cohesive, visually appealing design that enhances the user experience. Ensure that branding elements like logo and color schemes are consistent throughout the app.

Deliverables:

- Full branding (logo, colors, fonts)
- Polished UI/UX with a modern design aesthetic

Milestones:

- **Foundation:** Functional and structured UI with basic styling
- **Build:** Thoughtful application of UI/UX design principles (color, hierarchy, spacing)
- **Innovate:** Fully branded, animations, dark mode, and user-driven theme customization

5. Interior Detailing: Content & User Experience

Populate your application with real, meaningful content, user-centric content ensuring that it solves the identified problem. The user flow should be intuitive, guiding the user through their problem-solving journey.

Deliverables:

- Complete content integration, such as maps, data displays, and recommendations
- Functional solution that addresses the user's needs

Milestones:

- **Foundation** : Basic data display and core functionality
- **Build**: Enhanced user-friendly content, such as explanations, suggestions, and interactive features (e.g., peak traffic times, parking zones, transportation recommendations)
- **Innovate**: An engaging, polished experience that provides personalized insights or recommendations

Stretch Goals (Optional Enhancements)

- **Data Filtering and Sorting**: Enable users to filter and customize data views.
- **Authentication and Authorization**: Implement JWT authentication to secure user-specific features.
- **Interactive Maps**: Use MapBox or Google Maps API to display dynamic maps with Calgary data.
- **Mobile Integration**: Leverage phone GPS or sensors for enhanced interactivity.

Project 2 Teams

Team 1
<u>Traffic Cameras</u>
Linda
Mike
Vathsala
Robert
Tony

Team 2
<u>Community Crime</u>
Shane
Mike
Vathsala
Robert
Tony

Team 3
<u>On-Street Parking</u>
Tony
Jon
Cam
Nardos
Jessie

Team 4	
<u>Transit Routes</u>	
Mark	
	Aisha
	Tolulpe
	Lucas
	Daniel

Team 5	
<u>Public Water Services</u>	
Chris D	
	Ihssane
	Simranbir
	Gee
	Tikka
	Steven