

Requirement Specification – Bradford Metropolitan District Council Asset Mapping

1. Project Overview

This project aims to develop a **web-based interface** for the **mapping and management of assets** using Bradford's spatial data. The system will allow **users to upload datasets**, interact with **interactive maps**, and manage **assets dynamically**. The system will be designed with **security, accessibility, and usability** in mind, ensuring a robust, user-friendly platform for all users.

2. User Requirements

2.1 User Registration & Authentication

User Registration

- **Signup Process:** Users must provide personal details, including:
 - **Full Name:** Required for identification.
 - **Email Address:** Used for notifications, including account approval/rejection, password resets, etc.
 - **Password:** Encrypted storage for security, ensuring minimum strength criteria (e.g., 8 characters, mix of letters, numbers, and symbols).

- **Address:** Optional, but necessary for certain user role assignments or reporting.
- **Department:** Ensures the user is assigned to the correct group, and helps with role-based access control.

Email Confirmation

- Upon registering, users will receive a **confirmation email** notifying them that their account application is under review.
- **Approval/Rejection Workflow:** An **admin** will review applications. Users will receive a second email confirming whether their account has been approved or rejected.

Password Reset

- **Password Reset Process:** Both users and admins can reset passwords via a time-limited email link (expires in **15 minutes**) for security.

Account Suspension

- Accounts can be **temporarily suspended** without deletion, which allows for restoring access after resolving issues (e.g., account misuse, password recovery).

User Roles & Permissions

- **Admin Role:**
 - Full access to manage users, permissions, and datasets.
 - Can assign roles, approve/reject users, and oversee overall data integrity.
- **Editor Role:**
 - Can upload and manage asset data but has restricted access to user management and admin settings.
- **Viewer Role:**

- Has read-only access to view asset data. They cannot make modifications.

2.2 Dataset Management

Dataset Upload & Entry

- **Bulk Upload:** Users (with appropriate permissions) can upload datasets in **CSV format**, which populate assets on the map. Datasets may include building information, asset locations, or relevant geospatial data.
- **Manual Data Entry:** In cases where bulk uploads aren't feasible, users can **manually enter asset information**, including location, asset type, etc.

Data Validation

- **Required Columns:** Certain essential columns (e.g., **Longitude**, **Latitude**, **Asset Type**) must be present in uploaded CSV files.
- **File Size Limits:** The system enforces size limits (e.g., 50MB max per upload) to prevent performance issues.
- **Duplicate Detection:** If assets are already present in the system (based on a combination of **unique identifiers**, such as **coordinates**), duplicates will be flagged.
- **Longitude/Latitude Validation:** Automatically checks for accurate geographic coordinates to prevent incorrect or out-of-bound locations.

Retention & Modification Logging

- All dataset modifications, such as edits or deletions, will be **logged for forensic tracking** to ensure data integrity and enable auditing.

2.3 Map Layers

Layer Management

- **Core Layer (Council Buildings):** Assets such as council-owned buildings will be imported from CSV files containing **longitude** and **latitude** data.
- **Additional Assets Layer:** Users can manually add other assets, like parks, recreational spaces, or other assets managed by the council.

Real-Time Updates

- Changes to datasets are **automatically reflected** on the map in real-time, ensuring up-to-date information without the need for a page refresh.

2.4 Accessibility Features

The platform will adhere to **Web Content Accessibility Guidelines (WCAG)** to ensure all users, regardless of ability, can effectively interact with the system.

Features:

- **Alt Text for Images:** Provides detailed descriptions of images for visually impaired users utilizing screen readers.
- **Keyboard Navigation:** Full navigation and interaction with the site via keyboard shortcuts, providing an alternative to mouse use.
- **High Contrast & Readable Text:** The platform will be designed with high contrast colors and easy-to-read fonts for better legibility.
- **Color Contrast Checks:** Colors will be validated for accessibility, ensuring visibility for users with color blindness.

- **Captions & Transcripts:** Text alternatives will be provided for video and audio content to assist users with hearing impairments.
- **Resizable Text:** Users will have the ability to adjust text size without breaking the layout.
- **Clear Form Labels & Instructions:** Forms will have properly defined labels and error messages to ensure accessibility for screen reader users.
- **Error Handling:** Clear and concise error notifications will be provided when input is incorrect or incomplete.

3. Admin Requirements

3.1 User Management

- **Admin Controls:** Admins can approve, reject, modify, suspend, or delete user accounts, and assign roles and departments.
- **Role-based Department Access:** Users will be assigned departments, ensuring they only have access to data relevant to their assigned department.
- **User Roles:** Admins will define user roles (Admin, Editor, Viewer) and ensure appropriate permissions are enforced.

3.2 Dataset Management

- **Dataset Access Management:** Admins can assign or revoke access to datasets using a **tick-box system**, streamlining permissions management.
- **Forensic Tracking:** A full **audit trail** of dataset changes will be maintained for security and compliance, detailing who made changes and when.

3.3 Security & Access Control

- **Multi-Factor Authentication (MFA): Optional** but recommended for admins, requiring a second authentication factor for added security.
- **Data Encryption:** All sensitive data, including passwords and datasets, will be **encrypted** to ensure data confidentiality.
- **Role-based Access Control:** Access to features and datasets is based on the user's role and department, enforcing a **least privilege** security model.

3.4 Logging & Auditing

- **Audit Logs:** The system will maintain logs for:
 - **User Logins & Logouts:** Track who accesses the system and when.
 - **Dataset Modifications:** Keep track of uploads, edits, and deletions.
 - **System Integrations:** Monitor external API or service calls for troubleshooting.
- **Log Retention:** Admins can configure the retention period for logs, ensuring compliance with security policies and regulations.

4. Technical Details

4.1 Frontend

- **Framework:** The system will be developed using **React** or **Vue.js** (decision pending based on team preference).
- **Mapping Library:** Integration with **Google Maps API** or **Leaflet.js** for interactive maps, depending on the chosen frontend technology.

4.2 Backend

- **Server-Side Language:** The backend will be built using **PHP**, using frameworks like **Laravel** or **CodeIgniter** for scalability.
- **Database:** A **MySQL** database with clustering or replication for high availability will store user and dataset data.

4.3 Security

- **Password Encryption:** All passwords will be securely hashed and salted.
- **Role-Based Access Control:** Strict permission management ensures users only access necessary data.
- **Multi-Factor Authentication:** As an added security feature for admins (optional but recommended).

4.4 Branding

- The platform will adhere to **Bradford Council's branding** and guidelines, ensuring visual consistency with the official web design and including the **Bradford Council logo**.

5. Additional Notes

- **Open-Source Technologies:** The system will utilize open-source libraries and tools wherever possible to ensure cost-effectiveness.
- **Data Integrity:** Forensic tracking mechanisms and error handling ensure data remains accurate and secure.

6. Appendix

- **API Integrations:** Google Maps API integration and other necessary external APIs for authentication or data retrieval.

7. Signatures & Approval

- **Version Number:** _____7_____
- **Stakeholders:**
- **Preparer Team 24:**

○ **Signature:** _____



○ **Date:** _____05/03/2025_____

- **Client Approval: Yunus Mayat**(City of Bradford Metropolitan District Council representative) :
 - **Signature:** _____
 - **Date:** _____