

Business Requirement Document

Document Control

Field	Value
Document Title	Business Requirements Document (BRD)
Project Name	Community-Based Waste Collection & Recycling Management App
Prepared By	Jayasuriya J
Reviewed By	Self Reviewed
Approved By	Product Owner/Project Manager Name
Document Version	v1.0
Date Created	21-07-2025
Last Updated	-
Status	Completed

Table of Contents

- 1. Project Overview
- 2. Business Objective
- 3. Problem Statement
- 4. Stakeholders
- 5. In-Scope / Out-of-Scope
- 6. Business Requirements
- 7. Assumptions & Constraints
- 8. Requirements Overview
- 9. Business Process Flow
- 10. Success Criteria
- 11. Glossary of Terms
- 12. Appendix: Approval & Sign-Off

1. Project Overview

The Community-Based Waste Collection & Recycling Management App is designed to modernize and simplify how local communities handle their waste. The application will allow residents to schedule waste pickups, receive real-time notifications, and learn more about proper waste segregation. On the other side, waste collectors will be able to view their assigned tasks, update pickup statuses, and follow optimized collection routes.

For administrators, the system will provide a centralized dashboard to manage operations, monitor collector performance, and track recyclable material volumes. The long-term vision is to reduce the environmental footprint of urban and semi-urban areas by improving waste management efficiency and promoting a culture of recycling.

This project is part of a broader initiative to use technology to support sustainable living and responsible urban development.

2. Business Objective

The main objective of this project is to build a simple, user-friendly platform that connects residents, waste collectors, and administrators in a more efficient and transparent waste collection ecosystem.

By digitizing the collection and recycling process, the platform aims to:

- Ensure timely and reliable waste pickup for every household.
- Promote recycling through educational content and in-app prompts.
- Help local authorities and private operators track collection progress and identify problem areas.
- Reduce missed pickups, manual tracking errors, and citizen complaints.
- Support sustainability efforts by encouraging better waste segregation at the source.

Ultimately, the platform will empower communities to take part in managing their environment while giving authorities the tools they need to measure and improve performance.

3. Problem Statement

In many urban and semi-urban areas, the process of waste collection is still largely manual, inconsistent, and unorganized. Residents often face challenges such as irregular pickup schedules, lack of updates, overflowing garbage bins, and no accountability from waste management authorities.

Additionally, there's a widespread lack of awareness about proper waste segregation and recycling practices. Recyclable materials are often mixed with general waste, making it harder to recover them efficiently.

Administrators and waste collection teams currently rely on manual records or fragmented systems, which makes it difficult to monitor daily operations, track collector performance, or analyze waste trends. This leads to missed pickups, inefficient routing, and a poor user experience.

Without a unified digital platform, it becomes nearly impossible to create a reliable, transparent, and eco-friendly waste management ecosystem.

4. Stakeholders

The following individuals and groups are directly or indirectly involved in the project and will either influence or be impacted by the system:

Role	Stakeholder Name / Type	Responsibility / Involvement
Product Owner	Anand M	Defines the vision, prioritizes features, approves scope
Business Analyst	Jayasuriya J	Gathers requirements, creates documentation, bridges business and tech teams
Project Manager	Jai S	Manages timelines, resources, and delivery milestones
UX/UI Designer	Ganesh M	Designs wireframes and user interfaces
Tech Lead / Developer	Selva M	Builds the application functionality
QA Tester	Dhanush R	Ensures application quality through functional testing
Admin Users	Municipality or NGO Operator	Oversees operations, assigns collectors, tracks metrics
Waste Collectors	Field Workers / Sanitation Team	Carries out scheduled pickups and updates collection status
Community Residents	End Users	Use the app to schedule pickups and receive updates

5. In-Scope / Out-of-Scope

Clearly defining what the system will and will not cover helps manage expectations and ensures alignment across all stakeholders.

In-Scope:

- User registration and login (residents, collectors, admins)
- Scheduling and cancellation of waste pickups
- Real-time assignment and tracking of waste collectors
- Notifications and status updates for scheduled pickups
- Admin dashboard for monitoring and reporting
- Collector performance tracking
- Educational content on waste segregation and recycling
- Support for basic user feedback submission

Out-of-Scope:

- Payment collection or billing integration
- Offline functionality (support for no internet access)
- Integration with government smart city databases (for now)
- Multilingual support (planned for future phases)
- GPS route optimization (manual assignment in MVP)

6. Business Requirements

The following are the key business requirements identified for the Community-Based Waste Collection & Recycling Management App. These requirements are centered around the needs of residents, collectors, and admin users.

Requirement ID	Description
BR-01	Residents should be able to schedule a waste pickup through the mobile/web app.
BR-02	Users must receive a confirmation and reminder notification for each pickup.
BR-03	Waste collectors should have access to their assigned jobs in real-time.
BR-04	Admins must be able to assign collectors to pickup requests based on locality.
BR-05	The system should allow users to cancel or reschedule a pickup.
BR-06	Admin users should be able to view dashboards showing collection metrics.
BR-07	Collectors should be able to mark a pickup as "Completed" or "Missed".
BR-08	The app should display educational tips and guides about waste segregation.
BR-09	Admins should be able to generate reports based on collection frequency, volume, and collector performance.
BR-10	The system should allow users to submit feedback or complaints.

7. Assumptions & Constraints

Assumptions

The following assumptions are made during the planning and development of this project:

- Users (residents, collectors, admins) will have access to smartphones and stable internet connectivity.
- Waste collectors will be trained and willing to use the digital app during their daily operations.
- The municipality or managing authority will allocate admin resources to oversee the system regularly.
- The application will initially be deployed in a limited set of regions as a pilot.
- Educational content for users will be provided by the municipality or environmental partner NGOs.

Constraints

The following constraints may limit the scope, timeline, or functionality of the application:

- Limited development time for the MVP version (within 10 weeks).
- Budget restrictions may limit third-party integrations (e.g., route optimization, GIS mapping).
- The app must comply with local waste disposal regulations and municipal policies.
- The system should be designed for web and Android only in the first release (iOS is out-of-scope).
- Data privacy and security compliance must follow government guidelines for citizen data.

8. Requirements Overview

This section outlines the core system behaviors and expectations from both a functional and non-functional perspective.

The functional requirements define specific features and interactions within the platform, while non-functional requirements ensure system quality, usability, and compliance with technical standards.

8.1 Functional Requirements

FR ID	Functional Requirement Description
FR-01	Residents must be able to create an account and log in using a mobile number or email.
FR-02	Residents can submit a new waste pickup request, selecting date and time preferences.
FR-03	The system should send confirmation and reminder notifications before each pickup.
FR-04	Admins can view incoming requests and assign them to available collectors.
FR-05	Collectors can log in and view their list of assigned pickups for the day.
FR-06	Collectors should be able to mark pickups as Completed, Delayed, or Missed.
FR-07	Admins should have a dashboard to monitor collector performance and request status.
FR-08	Users should be able to cancel or reschedule a request before the assigned time slot.
FR-09	The system should allow users to view past pickup history and feedback.
FR-10	Admins should be able to generate exportable reports (PDF/Excel) from dashboard data.

8.2 Non-Functional Requirements

NFR ID	Non-Functional Requirement Description
NFR-01	The system should be available 99.5% of the time, excluding planned maintenance windows.
NFR-02	All user data should be stored securely in compliance with local data privacy regulations.
NFR-03	The application should support a minimum of 1,000 concurrent users without performance degradation.
NFR-04	Response time for key actions (e.g., scheduling, login) should not exceed 3 seconds.
NFR-05	The user interface should be mobile responsive and accessible across modern web browsers.
NFR-06	Passwords should be encrypted and stored securely following best practices (e.g., SHA-256).
NFR-07	The system should allow easy scalability to include more cities or regions in future phases.
NFR-08	System backups must occur automatically every 24 hours to prevent data loss.

9. Business Process Flow

This section provides visual representations of key business processes involved in the Community-Based Waste Collection & Recycling Management App.

Each process flow diagram outlines how different users (Residents, Admins, Collectors) interact with the system across various modules such as scheduling pickups, assigning tasks, executing pickups, and handling feedback.

These process flows are designed to:

- Improve clarity of system behavior for all stakeholders
- Support development, testing, and training efforts
- Ensure alignment between business requirements and implementation

Each diagram is structured using swimlanes to represent the different actors in the system, with arrows to indicate the sequence of actions and system responses.

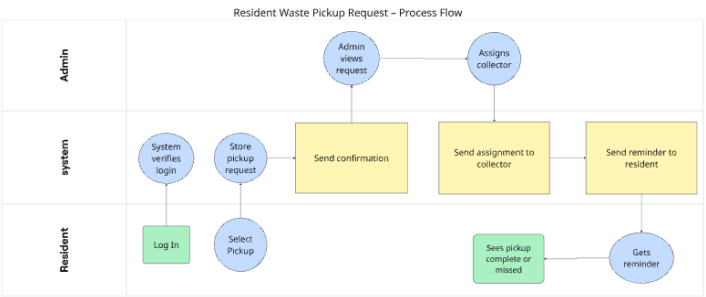
The flows that follow capture all major interactions and logic paths that the application must support.

9.1 Resident Waste Pickup Request – Process Flow

This process flow illustrates the end-to-end journey of a resident user initiating a waste pickup request through the app. It shows the interactions between the Resident, System, and Admin, including request submission, confirmation, assignment, and final status updates.

The goal is to ensure a clear understanding of how waste pickup scheduling and tracking works within the application. Each swimlane represents the responsible actor, and arrows show the flow of activity across the system.

The diagram helps both technical and non-technical stakeholders visualize the operational logic for this core functionality.



9.2 Admin Pickup Assignment – Process Flow

This flow represents the actions performed by the Admin when assigning pickup requests to available collectors. Once a resident submits a pickup request, the Admin is responsible for reviewing it and scheduling it appropriately by assigning it to the nearest or available collector.

This ensures efficient handling of daily pickups and helps optimize route planning and resource management.



9.3 Collector Pickup Execution – Process Flow

This process flow illustrates how a waste collector receives an assigned pickup, views the request details, completes the job, and updates the system with the status.

This flow helps ensure that all collector actions are digitally tracked and reflected in the system for admin visibility and resident transparency.



9.4 Resident Feedback / Complaint Submission – Process Flow

This process flow outlines how a resident can submit feedback or raise a complaint regarding a pickup service. The flow ensures users have a channel for reporting missed pickups, delays, or other issues, and ensures those issues are tracked and resolved by the admin team.



9.5 Admin Dashboard & Reporting – Process Flow

This process flow outlines how the Admin uses the dashboard to monitor system-wide activities and generate reports related to waste pickups, complaints, and collector performance. It ensures visibility into key metrics for decision-making, policy improvements, and city-level waste management analysis.



10. Success Criteria

The success of the Community-Based Waste Collection & Recycling Management App will be measured based on the following key criteria:

- **Pickup Completion Rate:** At least 95% of scheduled waste pickups are completed on time without escalation.
- **Resident Participation:** Minimum of 60% of registered residents actively use the app for requesting pickups or providing feedback within the first 3 months.
- **Complaint Resolution Time:** 90% of resident complaints are acknowledged within 24 hours and resolved within 72 hours.
- **System Uptime:** The application maintains 99.5% uptime during operational hours.
- **Dashboard Visibility:** Admin users can generate and export key reports (e.g., daily pickups, missed pickups, collector performance) without system errors.
- **User Satisfaction Score:** Resident feedback collected via the app should yield an average rating of at least 4.2 out of 5.

11. Glossary of Terms

This section defines key terms used throughout the Business Requirements Document to ensure a common understanding among all stakeholders.

Term	Definition
Resident	A citizen or individual who uses the app to request waste pickup or submit feedback.
Admin	A user with administrative privileges to manage pickup requests, assign collectors, and view reports.
Collector	A field worker responsible for collecting waste from residents as per the assigned schedule.
Pickup Request	A digital request raised by a resident through the app to schedule waste collection.

Feedback/Complaint	Input provided by the resident regarding service quality, delays, or missed pickups.
Dashboard	The visual admin interface showing real-time statistics and reports.
Missed Pickup	A scheduled pickup that was not completed due to operational or user-side issues.
Bulk Waste	Large-size waste items such as furniture, electronic appliances, etc., which require special handling.
Ward	A localized administrative region or area within the city covered by the system.
SLA (Service Level Agreement)	The agreed turnaround time for completing pickups or resolving complaints.

12. Appendix: Approval & Sign-Off

This section confirms that all stakeholders have reviewed and approved the Business Requirements Document. Their approval indicates alignment with the documented goals, requirements, scope, and approach.

By signing below, each stakeholder agrees to move forward with the design and development of the Community-Based Waste Collection & Recycling Management App as outlined in this document.

Name	Role	Organization/Team	Signature	Date
Jayasuriya J	Business Analyst			
Jai S	Product Owner / Sponsor			
Priya J	Project Manager			
Danush M	Technical Lead			
Selva M	QA Lead / Tester			

Note: This table will be finalized during the project kickoff or stakeholder review meeting.