# Waste Volume Estimator - Change Report

2025-10-07

## Dashboard Sync Reliability

### Problem:

* Dashboard relied on a fixed 3-second reload timer, so users still saw stale data until the next poll.

### Changes Applied:

1. Implemented a lightweight dashboard event broker on the Flask server to publish notifications whenever a session is saved.
2. Added a server-sent events endpoint (/dashboard/events) and wired the template to listen for real-time updates.
3. Removed the polling script in dashboard.html so the view reloads immediately after Firestore persistence succeeds.

## Firestore Persistence Failures

### Problem:

* Flask crashed with AttributeError because Firestore add returned a timestamp tuple, not a document reference, breaking the event notification code.

### Changes Applied:

1. Replaced .add with an explicit document().set(...) call so we always retain the generated document ID.
2. Reused the new doc\_ref.id in event payloads to keep the dashboard updates working.

## Webcam Start/Stop Stability

### Problem:

* Initial Start call failed silently when rear camera access was blocked or unavailable.
* Repeated Start/Stop cycles left the previous stream attached, causing the browser to think the webcam was still busy.

### Changes Applied:

1. Introduced progressive constraint fallbacks (environment, user-facing, any) with clearer error messaging so a workable camera is selected.
2. Disabled/enabled the Start/Stop buttons to mirror capture state and avoid double-start clicks.
3. Added a cleanupStream helper to stop tracks, pause the video element, and clear srcObject, ensuring fresh access on every restart.

## Interface Modernisation

### Problem:

* Existing capture and dashboard pages used basic inline styles and were not responsive on smaller screens.

### Changes Applied:

1. Rebuilt index.html and dashboard.html with Tailwind CSS, giving both pages a cohesive dark theme and responsive layouts.
2. Organised controls and metrics into card-based grids, improved typography, and added visual status indicators.
3. Preserved all element IDs and data bindings so the JavaScript capture flow and dashboard listeners continue to operate.