### **📋 Sensor System Validation & Setup Report**

#### **4.1 Project Overview**

This report summarizes the setup and validation of a simulated 3D sensor-based passenger tracking system. The dataset contains 1000 time-series records across 3 zones and 3 sensors.

#### **4.2 System Configuration**

* **Total Sensors:** 3 (S1, S2, S3)
* **Total Zones:** 3 (A, B, C)
* **Time Window:** 23 July 2025, starting from 10:00 AM
* **Data Format:** CSV file with timestamp, sensor\_id, zone, count

#### **4.3 Validation Checks Performed**

| **Validation Check** | **Status** | **Notes** |
| --- | --- | --- |
| Sensor activity present | ✅ Pass | All expected sensors reported |
| Zone mapping verified | ✅ Pass | All zones active in data |
| Abnormal count detection | ✅ Pass | No negative or unrealistic values detected |
| Zero-flow periods | ⚠️ Minor Gaps | Few time windows had total count = 0 |

#### **4.4 Data Visualizations**

* 📈 Passenger movement over time by zone
* 📊 Total passenger count per sensor
* 📊 Average passenger count per zone

*(Visuals attached separately)*

#### **4.5 Issues Found**

* Minor dips in passenger activity detected at isolated timestamps
* Possible reasons: low footfall or brief sensor/network inactivity

#### **4.6 Next Steps**

* Continue monitoring system behavior for anomalies
* No critical validation failures observed