Urban Cities Live Intelligence and Reporting

Company Overview

CivicPulse is a New York City based non-emergency service provider.

CivicPulse 311 is an initiative that transforms NYC's 311 service-request data into near real-time operational intelligence for city agencies, field operations, and leadership.

We specialize in non-emergency city services analytics—turning raw resident requests into actionable insights on volumes, backlog, SLAs, and service equity across boroughs and neighborhoods.

Company Milestones

2022: Open-Data Pilot

Moved ingestion and storage to Azure: Blob, Azure PostgreSQL. .

Adopted Apache Airflow for reliable scheduling, retries, and SLAs.

2023: Cloud Migration (Azure)

Moved ingestion and storage to Azure: Blob, Azure PostgreSQL. . Adopted Apache Airflow for reliable scheduling, retries, and SLAs.

2024: Operational KPIs & Self-Service

Power BI dashboards for volumes, backlog aging, SLA compliance, and complaint mix.

CivicPulse 311: Program Overview

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311 is the city’s primary channel for non-emergency services and resident feedback.

Data Source

Data Dictionary

The initiative, CivicPulse 311, transforms the public 311 dataset into explainable, near real-time operational intelligence for agencies and leadership

Stakeholders, including operations, dispatch, and executive leadership, use self-service dashboards to monitor volumes, backlogs, SLAs, and outcomes.

Business Challenge: Evolving Demands

Customer Demand

Need for live, explainable insights, equity views by neighborhood, and proactive staffing cues.

System Reliability

Robust orchestration and monitoring to prevent unnoticed anomalies in source data or connectivity.

Data Latency & Scalability

Managing peak request volumes without increasing lag or API load, and efficient schema evolution for growing data.

Rationale for the Project

Strengthen Public Trust

Fresh metrics, clear definitions, and data lineage build confidence.

Improve Resilience

Autoscaled, incremental design ensures stability during surges (storms, holidays).

Differentiate with Insights

Explainable insights tailored for operations, dispatch, and leadership.

Reduce Risk

Automated checks, alerts, and reproducible infrastructure minimize errors.

Project Objectives

Scalable Near Real-Time Pipeline

Implement robust, fault-tolerant incremental ingestion from the NYC 311 API.

Real-Time Reporting Tools

Deliver Power BI dashboards for daily volumes, open/closed status, and metrics.

Enhanced Data Accuracy

Enforce data movement from raw source to database

Improved System Monitoring

Instrument orchestration and data-quality alerts for pipeline health.

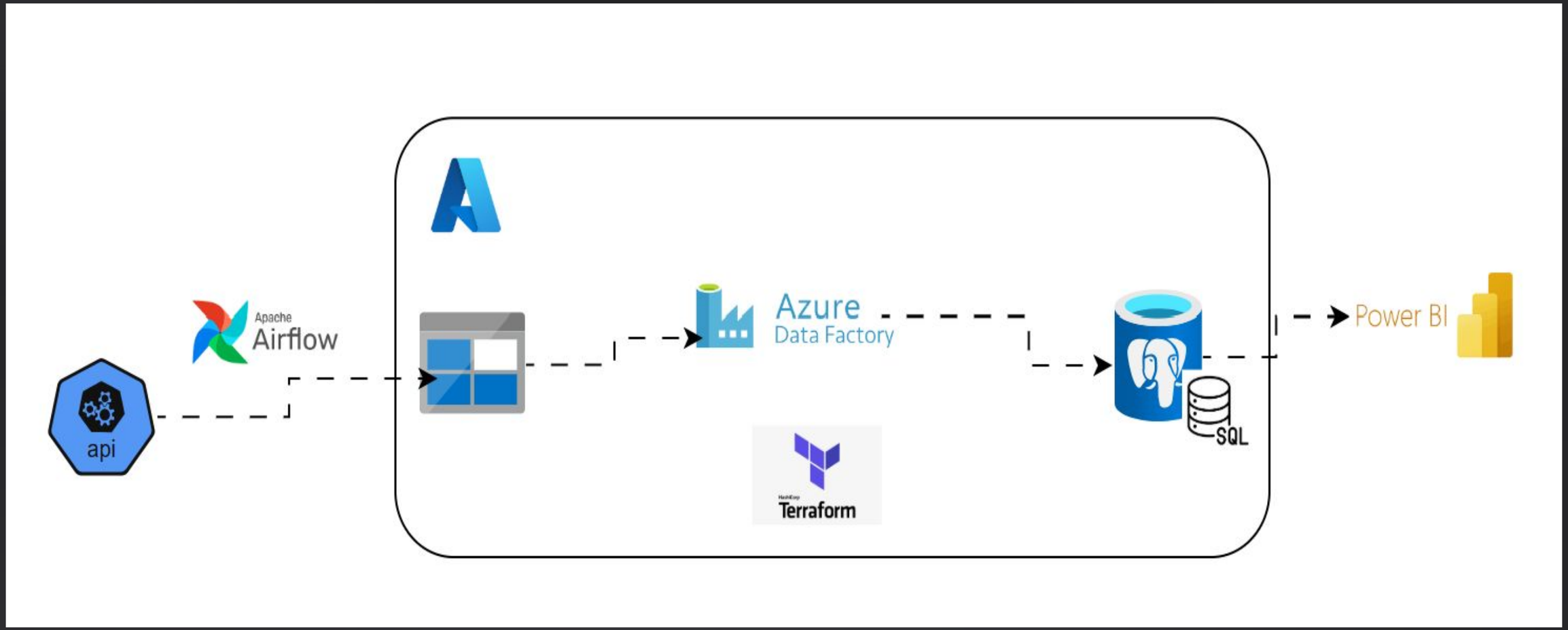
Project Overview

Our platform delivers a complete pipeline, with strong data-quality rules, lineage, and transparent KPI definitions so decisions are fast, fair, and defensible.

API → Airflow → Azure Blob → Azure Data Factory → Azure PostgreSQL → Power BI,

CivicPulse leverages modern cloud engineering to provide timely, trustworthy, and explainable city-service metrics with a resident-first mindset,

Data Pipeline Architecture



This architecture ensures efficient data flow from source to actionable insights.

Technology Stack

Python

API integration, data typing, and quality checks.

Apache Airflow

Orchestration backbone for scheduling, retries, and alerting.

Azure Data Factory

Managed data movement and transformations into curated layers.

Azure PostgreSQL

Curated storage for typed staging and marts (Silver/Gold).

Power BI

Interactive dashboards for operational reporting and transparency.

Terraform

Provision Azure services infrastructure using code

Learning Goals

Data Ingestion

Connect to NYC 311 API; implement error handling

Data Processing

Standardize schema; compute daily counts, and metrics.

Real-Time Reporting

Build Power BI dashboards for volumes, status, and resolution times.

Deployment & Scaling

Provision Azure services with Terraform

Thank You!

We are excited to bring operational intelligence to NYC's 311 service requests.