

Project Title and Summary

Title: Syracuse 911 Demand Explorer: Calls-for-Service and Parking Patterns (2023–Present)

This project will analyze Syracuse Police Department calls-for-service data from 2023 to the present, with a secondary focus on parking violations over the same period. The primary goal is to build an interactive Power BI dashboard that helps users explore when and where police demand is highest, which types of incidents drive that demand, and how patterns vary across time and space. A supplementary page will summarize parking violation patterns and, where meaningful, highlight overlaps with key calls-for-service hotspots.

Problem Statement

City officials, community groups, and residents often talk about “crime” and “safety” in broad terms, but they do not always have an accessible way to see how police demand is actually distributed across time, location, and call type. Understanding calls-for-service patterns can help align expectations, support data-informed decisions about staffing and community programs, and ground public conversations in evidence.

This project addresses the question: **When and where is police demand highest in Syracuse, and what types of incidents drive that demand?** A related, secondary question is: **What do parking violation patterns look like across the city, and do they appear to cluster around similar places or times as certain calls-for-service?** By answering these questions with transparent, interactive visuals, the project aims to provide practical insight into how public safety demand is distributed and how parking pressures manifest in everyday city life.

Stakeholders / Target Audience

- **Syracuse Police Department analysts and leadership** – to explore demand patterns by time, location, and incident type and support deployment and planning decisions.
- **Neighborhood associations and residents** – to better understand the types of issues most common in their areas and how these patterns compare to citywide trends.
- **City planners and parking/transportation staff** – to see how parking violations and certain call types relate to specific blocks or activity centers.
- **Journalists and researchers** – to obtain a reliable, documented view of calls-for-service and parking patterns for reporting and analysis.

Data Sources

1. **Syracuse Police Department Calls-for-Service Datasets (2023, 2024, 2025–present)**
 2. **Parking Violations Dataset (2023–present)**
 3. **Optional contextual datasets (if needed later)**
 - Neighborhood or council-district boundaries for aggregation and mapping.
 - These will be considered if they add clear value and are straightforward to integrate.
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Technical Approach

Initial exploratory data analysis and data quality checks will be performed in **Python and/or SQL**. This step will include profiling the calls-for-service and parking violations datasets, checking date ranges, identifying missing or inconsistent values, and computing basic summary statistics. Python (Pandas) or SQL queries will be used to generate clean, documented tables that can be imported into Power BI.

The main modeling and visualization work will be done in **Power BI**. Power Query will handle ETL tasks such as type conversions, creation of derived columns (e.g., hour of day, day of week, year, weekday/weekend flags), and aggregation at appropriate geographic units. The data model will likely include fact tables (calls-for-service, parking violations) and dimension tables (date/time, location, incident type), designed to support interactive filtering.

Large Language Models (LLMs) may later be used in a limited, well-documented way to generate narrative summaries of dashboard views (for example, plain-language descriptions of trends in a selected neighborhood). Any LLM-generated statements will be validated against the underlying measures (counts, rates, distributions) to ensure accuracy, following the validation principles used in earlier OPT tasks.

Planned Analyses and Dashboard Pages

Calls-for-Service (Primary Focus)

1. Time-of-Day and Day-of-Week Patterns
2. Incident Type Distribution
3. Geographic Hotspots
4. Arrests and Outcomes

Parking Violations (Secondary Page)

1. Parking Violations Over Time
2. Location and Financial Impact
3. Simple Comparisons with Calls-for-Service

Success Criteria

The project will be considered successful if:

- A non-technical user can use the Power BI dashboard to answer basic questions such as “When are calls-for-service highest?” and “What types of incidents are most common in my area?” with only a few clicks.
- The dashboard clearly visualizes key call-for-service patterns across time, place, and incident type, and surfaces at least one meaningful, well-documented insight for the Syracuse Police Department or community partners.
- The parking violations page provides a clear view of parking patterns and, where possible, illustrates simple comparisons to calls-for-service hotspots without overclaiming causal relationships.
- All analyses are reproducible from documented code and transformations, and any narrative statements (including those assisted by LLMs) are validated against underlying data.

Risks and Mitigations

- Data Quality and Location Accuracy
- Sensitive Nature of Public Safety Data
- Scope Creep When Combining Calls and Parking Data
- Technical Complexity and Time Constraints