Identifying Opportunities in Chicago

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Business Problem

Objective: Identify significant growth opportunities in Chicago.

- Analyze 311 sanitation complaints and vacant buildings data.
- Provide data-driven insights for city landscape understanding and market expansion.

Executive summary

- **Sanitation Complaints:**
  - **Details:** Complaint type, violation, location
  - **Common Issues:** Overflowing garbage, illegal dumping
  - **Data Quality:** Mostly good, some missing values

- **Vacant Buildings:**
  - **Details:** Building status, vacancy reasons, demographics
  - **Common Status:** Mostly vacant, some due to fire damage
  - **Data Quality:** Missing values, inconsistent entries

Data Summary

- **Sanitation Code Complaints**
  - Contains reports of Chicago's sanitation code violations
  - Variables: creation/completion date, status, type of service request and number, nature, address (zip code, coordinates, location, etc), community area, etc

- **Vacant Buildings**
  - Contains detailed information about each service request, including types, numbers, creation dates, statuses, and addresses
  - Provides geographic data and building status, indicating whether each building is vacant or occupied.

Combining sanitation complaints with vacant building data could help uncover correlations and root causes, enhancing targeted city planning and resource allocation.

Sanitation Key Insights

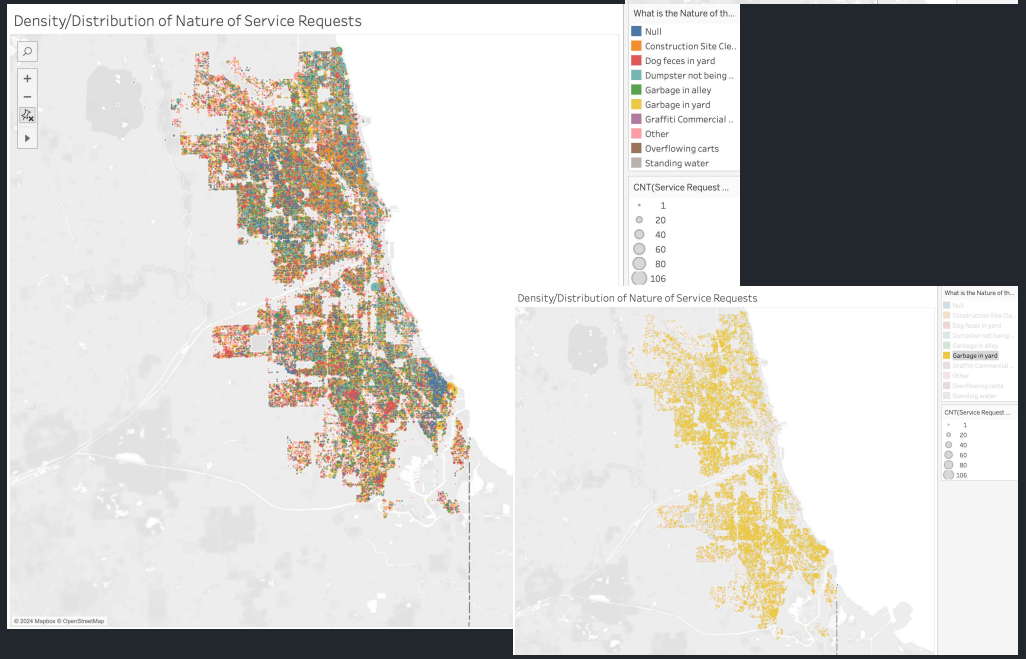


Figure 1) Density/Distribution of Nature of Service Requests

- High density of service requests in cities than less population dense area
- Garbage in yard has highest density and distribution throughout Chicago region.

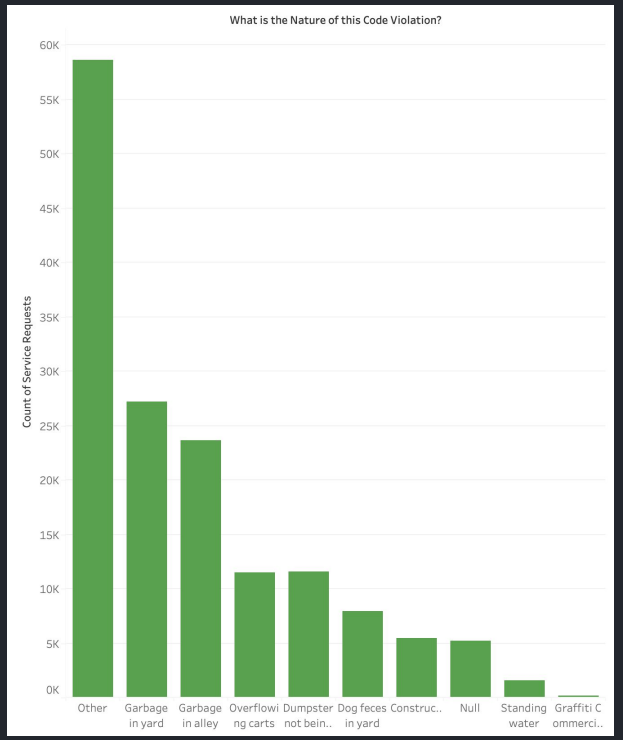


Figure 2) Bar Chart of Nature of Service Requests Counts

- "Other" and "Garbage in yard/alley" have highest frequency in Serve Requests
  - Necessitates additional categorization to determine problem
  - Raises questions about Waste Management resource allocation
- "Standing Water" and "Gratti Commercial"has the lowest frequency in Service Requests
  - Less common so may not need immediate resource focusing

Vacancy Key Insights

- **Vacancy Status:** Majority of buildings are vacant; some due to fire damage.
- **Peak Year:** 2011 with 15,395 requests.
- **Notable Increase:** Sharp rise from 2010 to 2011.
- **Decline:** General decline from 2013 to 2018.

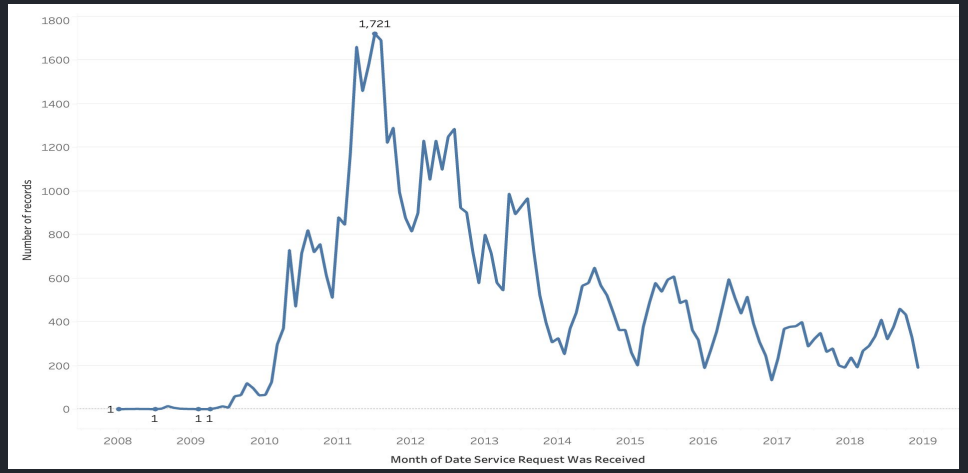


Figure 3) Building requests through time

Vacant Due to Fire?

Null	9,120
False	51,447
True	4,552

Figure 4) Distribution of vacancy due to fire

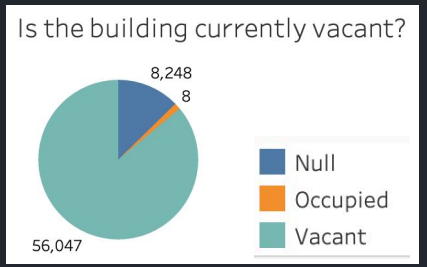


Figure 5) Pie chart of building vacancy

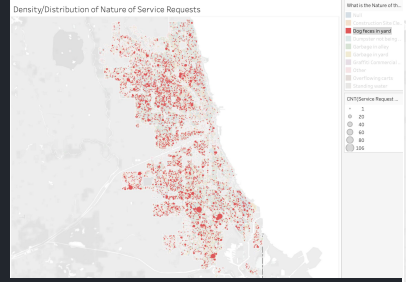
Data Quality Analysis

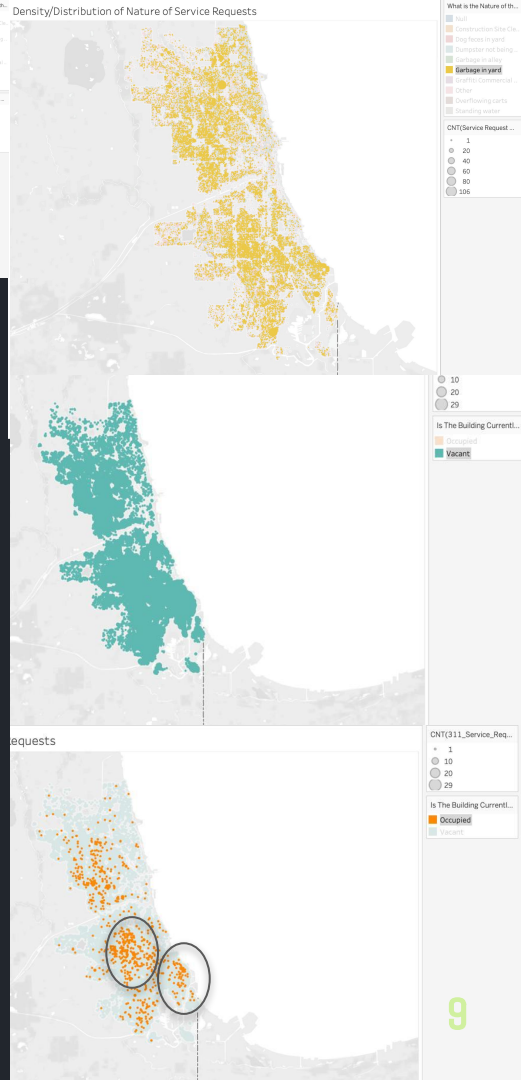
- **Sanitation Dataset:**
  - Values generally match data description/definition & populated well (non-null values)
  - **Missing values:** Completion Date, Nature, Zip code, location/coordinates
- **Vacant and Abandoned Dataset:**
  - **Missing Values:** Some missing values, especially in vacancy reasons, few outliers, occasional coordinate issues.
  - **Building Status:** Incomplete or inconsistent entries can hinder the assessment of vacancy status.
  - **Reason for Vacancy:** Missing values in this field can obscure understanding of why buildings are vacant.

Data Quality Solution

- **Ensure Good Data Quality:**
  - Fill in or remove missing values (e.g., nature of violation, dates, reasons for vacancy).
  - Collect additional data for "Other" variables to understand specific sanitation issues.
- **Targeted Resource Allocation:**
  - Analyze "Other" variables in sanitation requests to identify specific issues for better resource management (e.g., illegal dumping).
- **Geospatial and Temporal Analysis:**
  - Track vacancy and sanitation changes over time and location.
  - Identify seasonal, economic, and political impact patterns.
- **Outcome:**
  - Enable data-driven decision-making for market expansion and strategic investments.

Problem analysis & recommendation





Problem:

- High vacancy rates linked to economic downturns and sanitation issues.
- Poor sanitation impacts neighborhood appeal and investment potential.

Recommendations:

- **Market Analysis:**
  - Target areas with high occupancy and sanitation issues.
  - Use trends to predict and focus on growth areas.
- **Strategic Partnerships:**
  - Collaborate with local authorities for improvements.
  - Leverage public data for investment decisions.

thank you