

# City of Baton Rouge Purchase Orders & Spending and Vouching Analysis (2017–2025)

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## **0. Link to Data Visualization**

This Tableau dashboard analyzes purchase order and contract spending in Baton Rouge from 2017–2025. It compares total spending to vouched spending across departments, vendors, and categories, and highlights excess vouched amounts and year-over-year trends. Users can interact with KPIs and filters (year, quarter, department, category) to explore anomalies, track efficiency, and monitor budget compliance.

## **1. Introduction**

This project contains analysis on purchase orders and contract spending in the city of Baton Rouge from 2017–2025, where it is focused on comparing the total and vouched spending amounts, excess vouched spending, and year-over-year trends across departments, vendors, and categories. The dataset came from the city's public data source in Data.gov, which came from their newly implemented tracking system in October 2017. Hence, there were only data that started since 2017.

The goal of this project is to provide the finance, procurement, and internal and external auditor with data-driven insights on anomaly detection, budget monitoring, and efficiency improvement on spending. This Tableau dashboard provides both a high-level overview and in-depth details on department, vendor, and category spending.

## **2. Research Questions**

The project addresses the following questions: Which departments or categories have the largest shares of total and vouched spending? What categories made up the largest total and vouched spend? What are the year-over-year spending and vouching trends across departments and categories? How much of spending remains unvouched across different areas?

## **3. Description of the Data and Methods**

The dataset is framed from October 2017 to current time since it reflects the new tracking system of City-Parish. It is updated frequently so new data comes in at some points. It contains ~81,000 records and 52 columns. It contains two record types: header, where it contains overall details, such as department, vendor, and total amount, and detail, which has specific information about an item, such as their quantity, commodity, and cost. The data mostly consists of Header records, so the analysis primarily uses Header records, which is efficient since they summarize total and vouched spending by transaction.

Some key variables include department name, commodity description, total amount, vouched amount, total items, input date, start date, and expiration date. To make the analysis more efficient, feature engineering is performed to build new variables that would be essential.

These variables include percentage vouched, amount unpaid, excess vouched, and higher-level categories of commodities.

Afterwards, exploratory data analysis was performed, specifically on risk analysis for excess vouched amounts, comparisons on department, vendor, and category spending, and time trends yearly on spending/vouching behaviors. After visualizing the data, the next step is to implement those visuals to the Tableau dashboard and include additional features, including KPIs on average percentage vouched, total spend, and total vouched, and interactivity, which includes adding global filters for year, quarter, department, and category.

## 4. Results

One significant insight was that the department that spends the most is the Environmental Services department, which consists of ~1B dollars of total spend and ~600M dollars of vouched spend. The second runner-up is Train and Drain, making up ~650M dollars of total spend and ~200B for vouched.

In terms of vendors, GLF Construction Corp has the largest amount of excess vouched, totaling \$3.5M dollars. The second top vendor is QDS Systems Inc, accounting for ~\$1.8M dollars. These anomalies are not explained in the dataset, but likely due to data entry errors or overspending.

A third insight of the analysis includes the year-over-year trends. Between 2017-2018, there was a large spike in total spending, likely due to contract approvals. Between 2018-2020, there was a huge decline possibly due to pre-COVID-related budget tightening. However, there was a partial recovery between 2020-2022 mainly due to reopening activities. Despite this, a decline occurred again after 2024, which could be due to new budget constraints.

Finally, the analysis found that the average vouched percentage is ~87% overall. Despite this, instances of the vouched amount being greater than total spending highlights discrepancies that require investigation in these issues.

## 5. Conclusion

Overall, the Baton Rouge purchase orders data highlights detailed concentrations of spending, departments and vendors that are at risk of overspending, and budget trends. While the city usually maintains a high-vouched percentage, anomalies can occur where vouched amounts exceed total spending that should be investigated.

One lesson learned is that feature engineering on variables, such as percentage and excess vouched, uncovers insights that raw variables provided in the dataset could miss out on. Another one is that aggregating by department, vendor, and category allows clearer insights on overspending patterns. Finally, filters and KPIs enhanced dashboard interactivity and decision-making.

There are limitations to this analysis, especially on the dataset. The dataset only covers records from 2017-2025, so earlier data could not be accessed. Some vouched amounts being

greater than total amount cannot be explained without internal assumptions. Finally, this analysis only applies to Baton Rouge, so other municipalities could not be analyzed with this dashboard.

While the dataset has limitations, this analysis still provides important insights into the city's financial activity. The dashboard offers finance, procurement, and audit officials a practical tool to monitor spending, identify risks, and improve oversight. Future work could improve this analysis by implementing legacy data prior to 2017 and comparing Baton Rouge's practices to other municipalities.