

Assessing ARPA Fund Allocation and Spending Efficiency: Insights from Phoenix's \$396 Million COVID-19 Recovery Effort

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What is the ARPA Fund Allocation?

The American Rescue Plan Act (ARPA) provided \$350 billion in relief to state, local, and Tribal governments to address the impact of the COVID-19 pandemic.

What is the Aim of This Analysis?

The aim of this project is to understand funding allocation of ARPA through looking at 4 main questions:

1. How often was the funding allocated in a year?
2. Program Efficiency: Evaluating the effectiveness of programs in utilizing their allocated budgets
3. How much money was allocated and spent by each program type?
4. What is the Pearson correlation coefficient in relation to allocation of funds to spending? Does higher allocation correlate to higher spending?

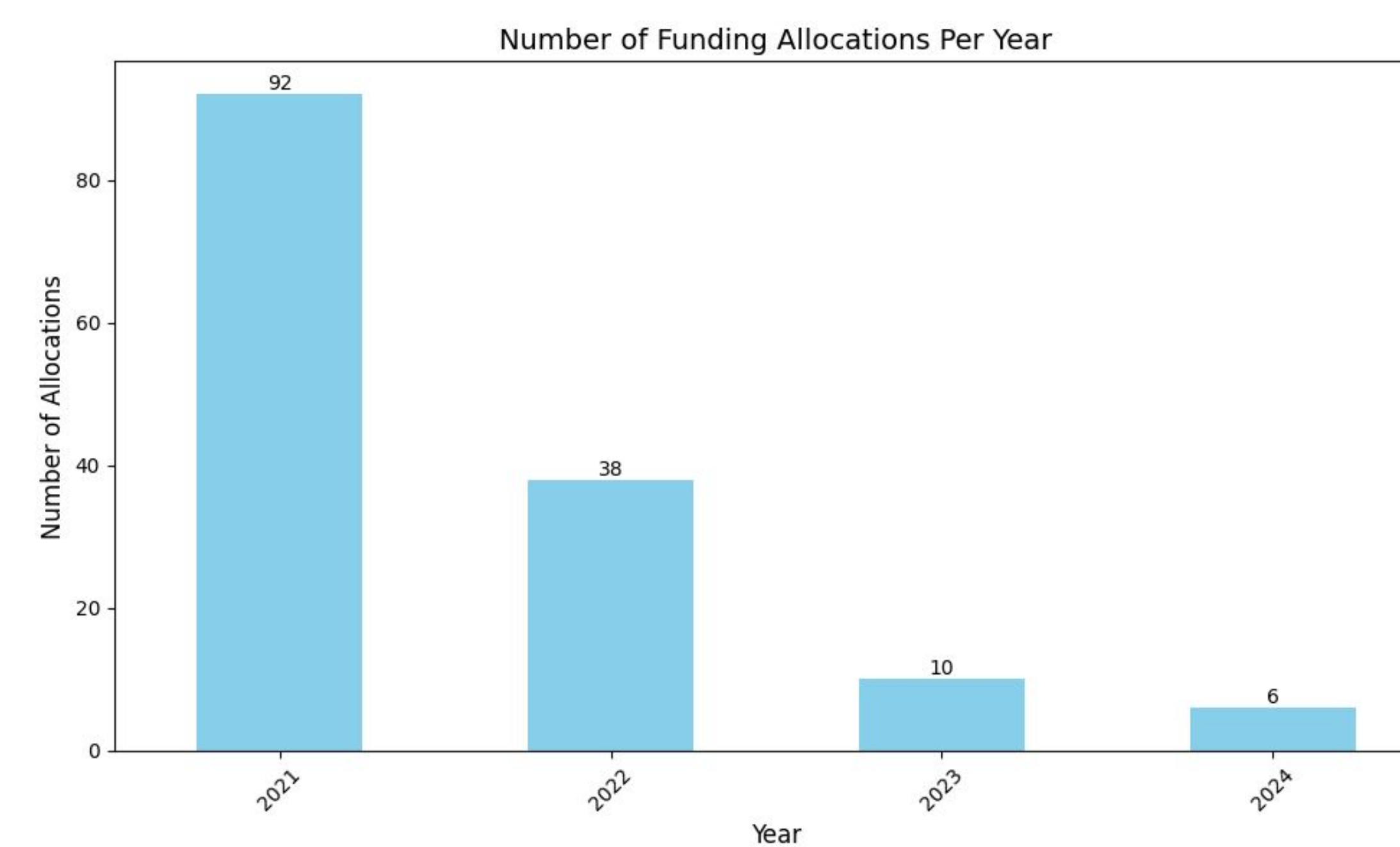
Pseudocode

Here is a general breakdown of how each question was approached:

1. **How often was the funding allocated in a year?**
 - a. Group data as by extracting the Year from the "Date Allocated" column to extract the funds allocated in a year.
 - b. Use the "for-else" loop to count the number of allocations made in a year, and visually represent it in a bar graph.
2. **How much money was allocated and spent by each program type?**
 - a. Group data by program type for both allocated funds and spent funds.
 - b. Create a pie chart for both allocated funds and spend funds to visualize the breakdown of funds.
 - c. Create a bar chart that illustrates how much different program types over or underspent.
3. **What is the Pearson correlation coefficient in relation to allocation of funds to spending? Does higher allocation correlate to higher spending?**
 - a. Filter data by budgeted and spent amounts, merge them on common columns (e.g., program), then compute the Pearson correlation between the budgeted and spent values.
 - b. Plot a scatter plot with a regression line to visualize the relationship between the budgeted and spent amounts.
4. **Program Efficiency: Evaluating the effectiveness of programs in utilizing their allocated budgets**
 - a. Set up the initial data structure, with each program type storing its allocated and used funds.
 - b. Create a new column in the initial data structure by dividing [Actual spend amount/Budgeted amount].
 - c. Handle cases where no funds were allocated by ensuring efficiency remains zero if allocated funds are zero.
 - d. Display or visualize the calculated efficiency for each program type.

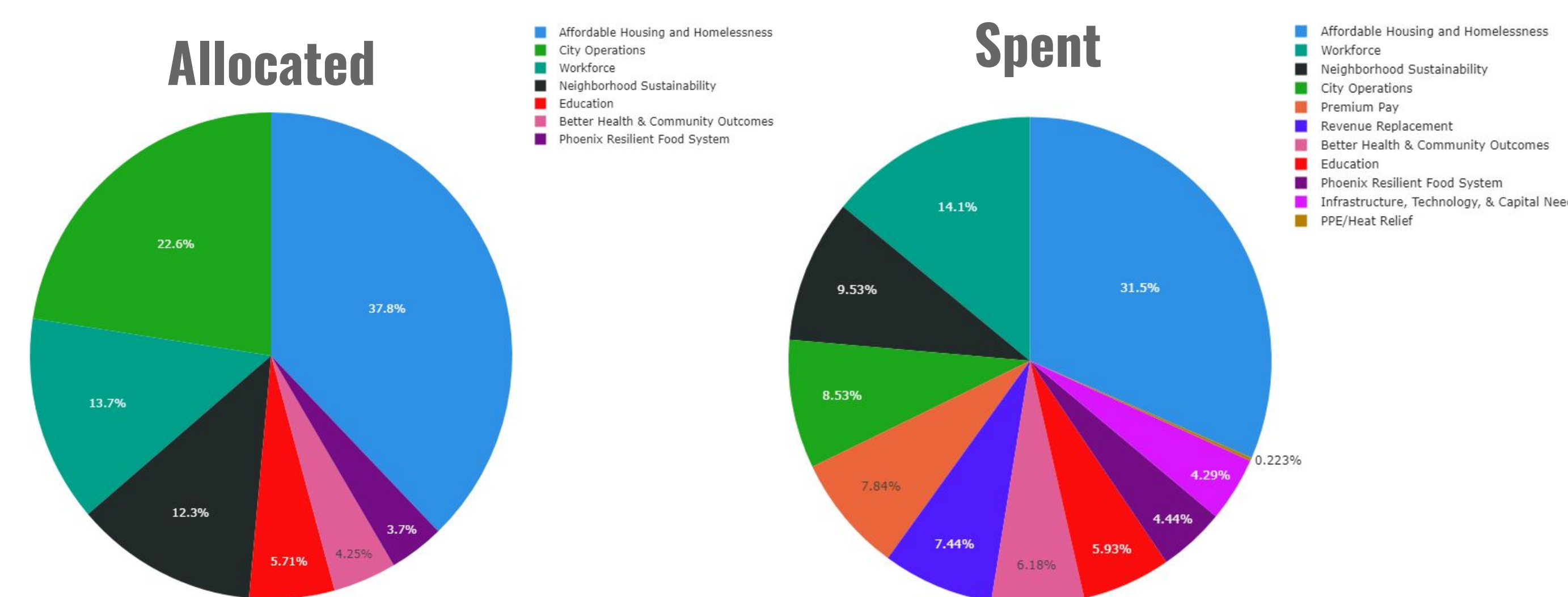
Funds Allocated in a Year

Looking at the number of funds allocated in a year helps understand the demand for financial assistance to support the recovery efforts from Covid-19 in the city of Phoenix. We see the year wise funding provided since the strike of the pandemic.

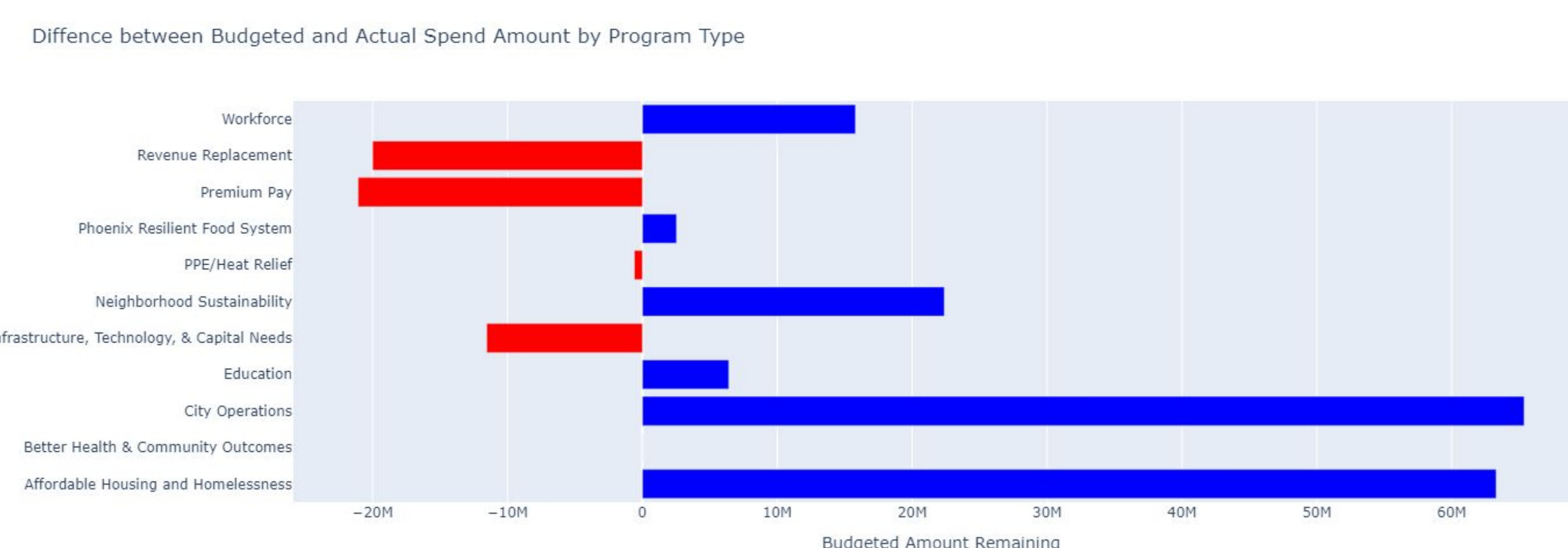


Breakdown of Funds by Program Type: Allocation versus Spending

The ARPA funds that the City of Phoenix received were allocated to and spent by various city programs. We found and visualized the funds breakdown by program type.

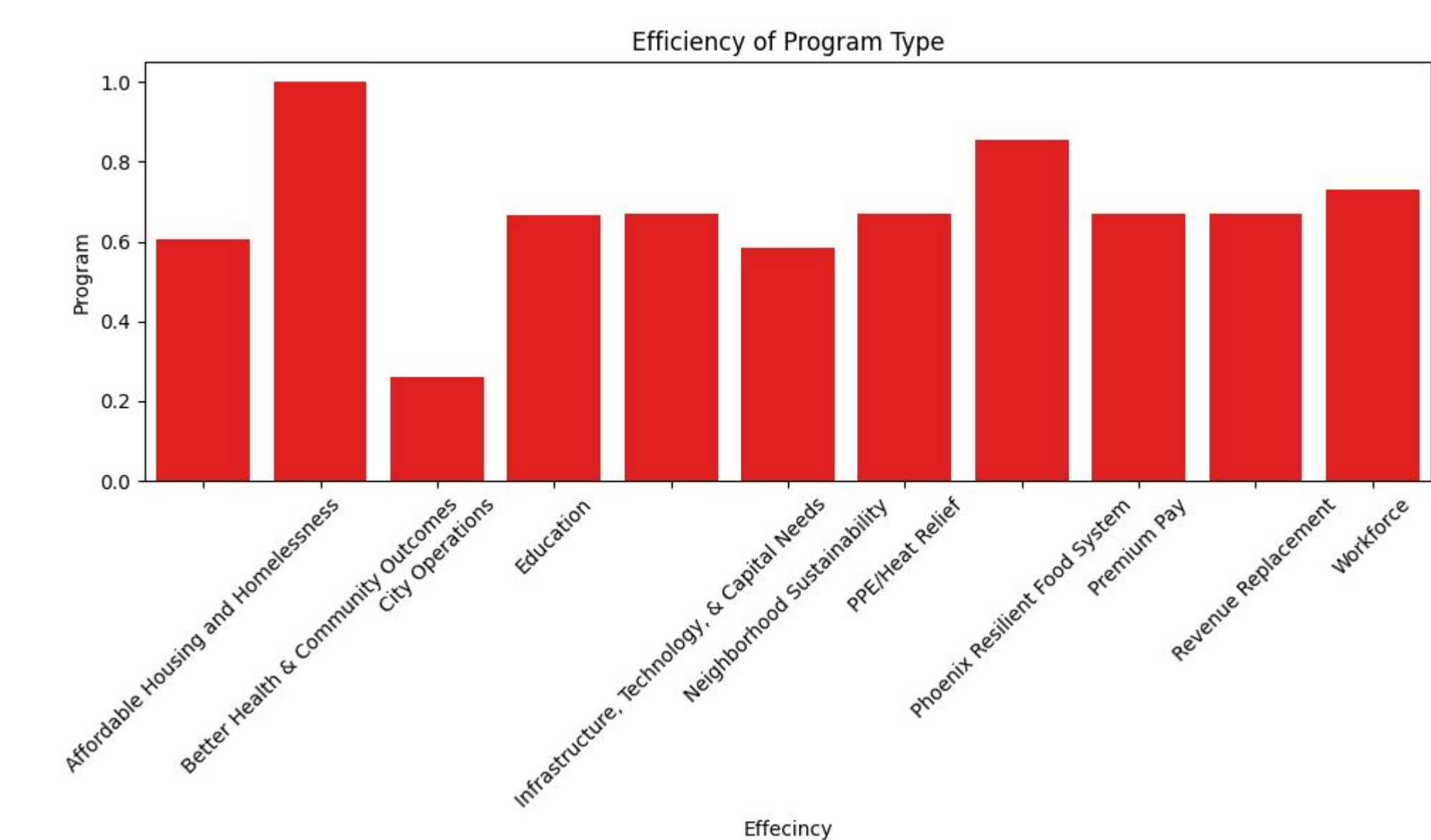


We found that the proportion of funds allocated versus spent was noticeably different for most programs. Investigating further, we found that many programs spent less than what they were allocated while other programs that weren't explicitly allocated funds did ultimately use some of the available funds. Overall, \$122,557,324 remains unused.



Efficiency of Program Types

- Looking at the efficiency of program types where efficiency ranges from 0-1.
- In this particular dataset funds allocation was done by program type.
- As we can clearly see, that "Better Health & Community Outcomes" has efficiency =1.
- This signifies that 100% of allocated funds were used.



Pearson Correlation Coefficient: Allocation versus Spending

Pearson Correlation Coefficient: measure used to understand the linear relationship between two variables of interest and can range from -1 up to +1.

- A value closer to -1 indicates a strong **negative correlation** between variables.
- A value closer to +1 indicates a strong **positive correlation** between variables.

Looked at the relationship between budgeted amount and spent amount for each program.

- Correlation coefficient was **0.92**, indicating that as the budgeted amount increases, so does the amount that is spent by the organizations

