VINUNIVERSITY

# Analyzing the Impact of Mr. Trash Wheel: A Journey Through Waste Collection Trends and Composition

Vu Nguyen
Nguyen Nhat Minh
Le Nguyen Nhat Minh

# Agenda

1. Introduction
2. Question 1
3. Question 2
4. Conclusion

# Introduction

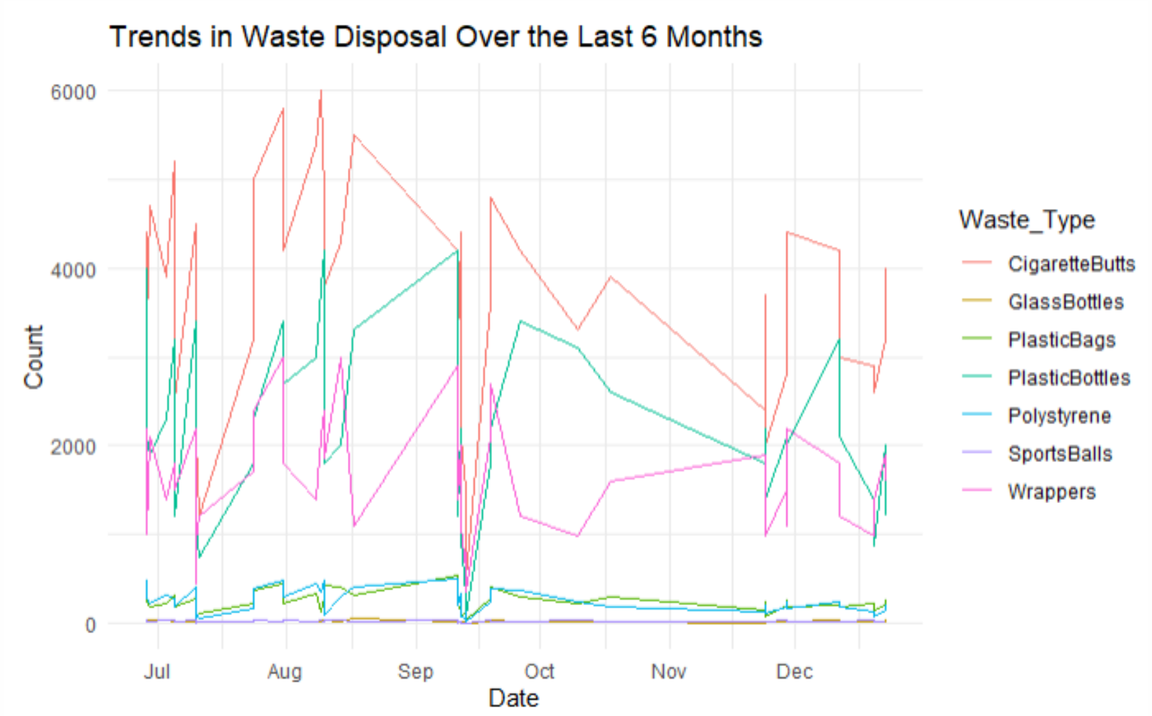
- **Project:** Started 2014, Waterfront Partnership initiative
- **Technology:** Solar, hydro-powered Trash Wheels
- **Impact:** Prevents debris, cleans Chesapeake Bay
- **Data:** Trashwheel.csv tracks daily collections
- **Insights:** Includes debris types, seasonal variations
- **Use:** Guides waste management strategies

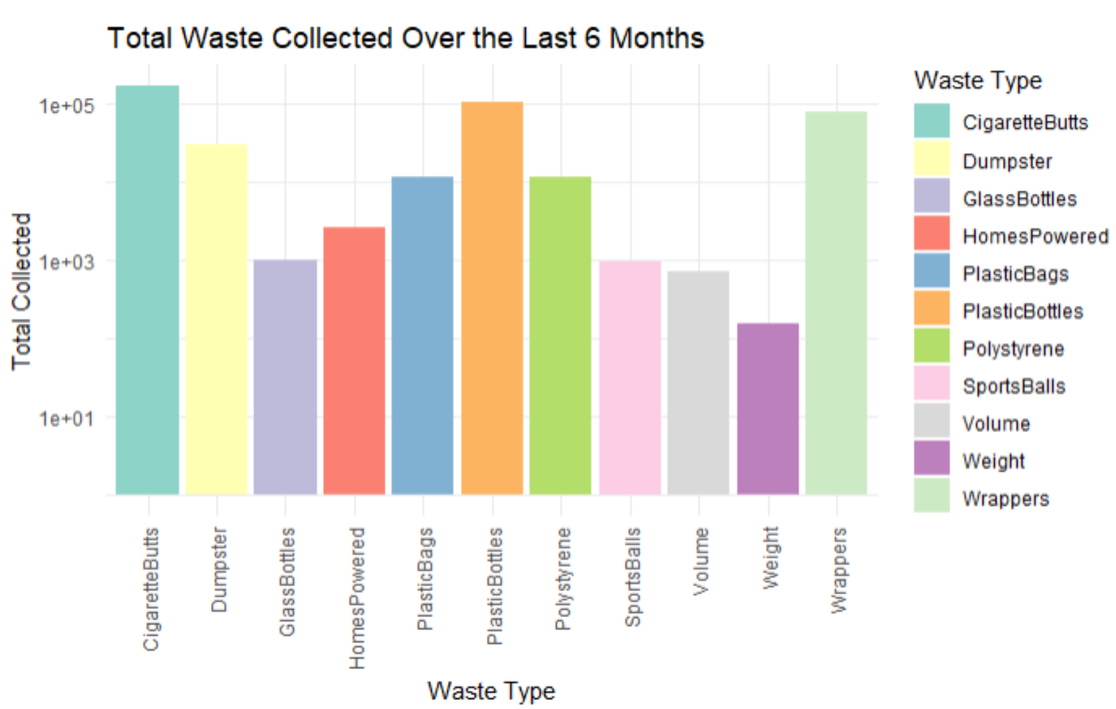
Picture of Mr Trash Wheel

# Question 1

Q1: What are the types of waste composition that has their weight/volume/amount increase or decrease in the last 6 months?

- Naive approach: directly using bar chart and line chart.



# Question 1

**Bar chart:**

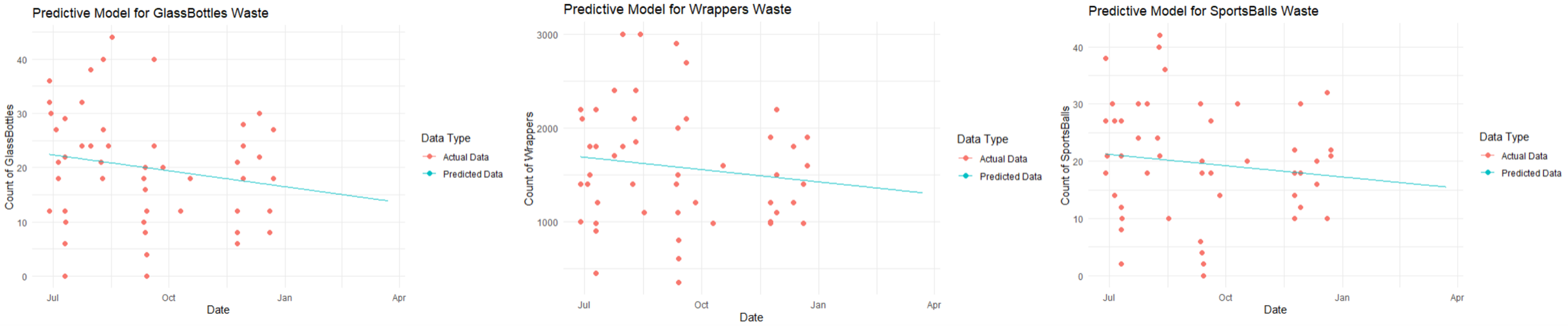
- Advantage: immediate visual comparison.
- Disadvantage: lacked temporal details for trend analysis.

**Line chart:**

- Disadvantage: messy (wide range of waste type), difficult to follow.

=> Using scatter plot & multi-facet bar chart

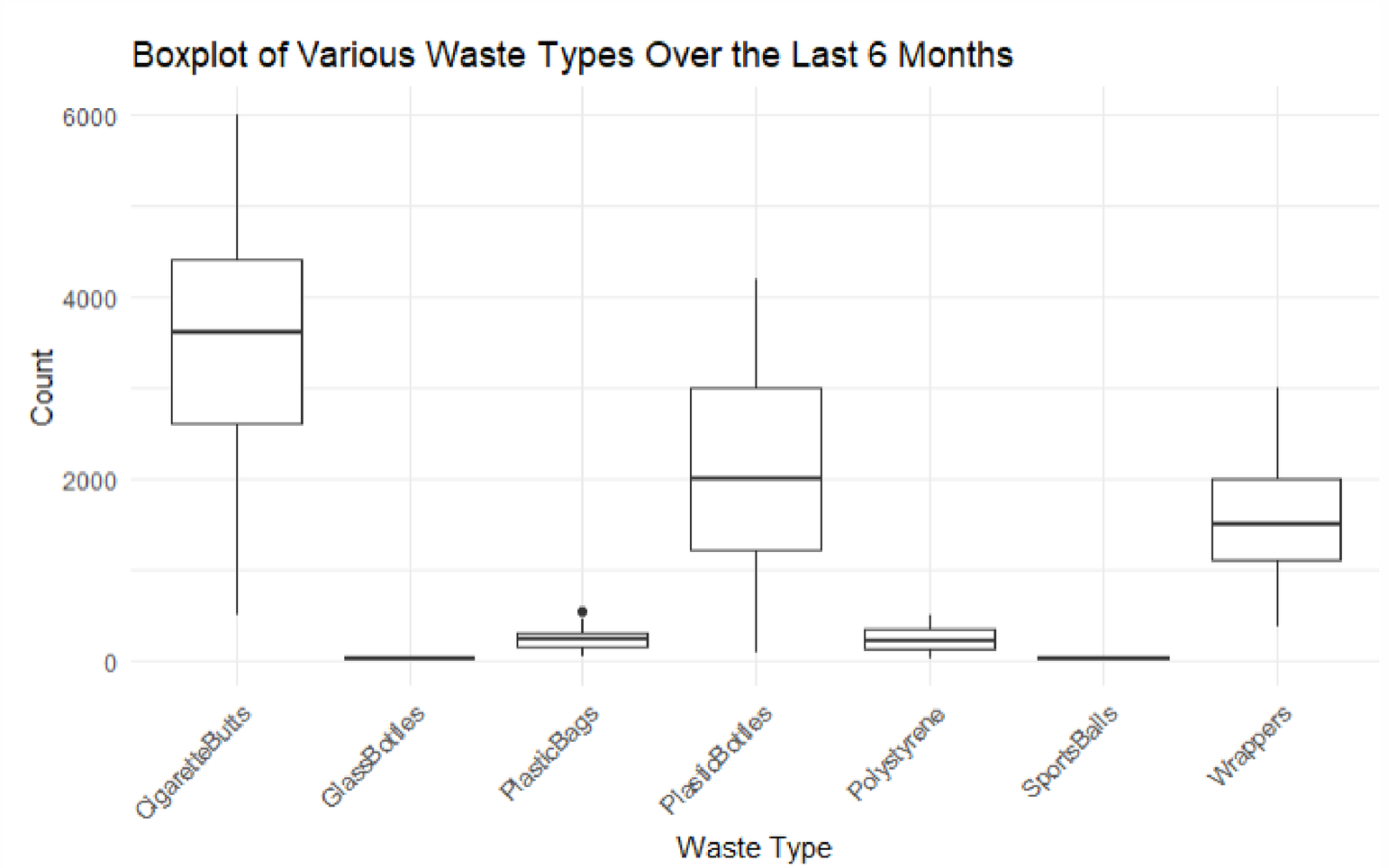
# Question 1



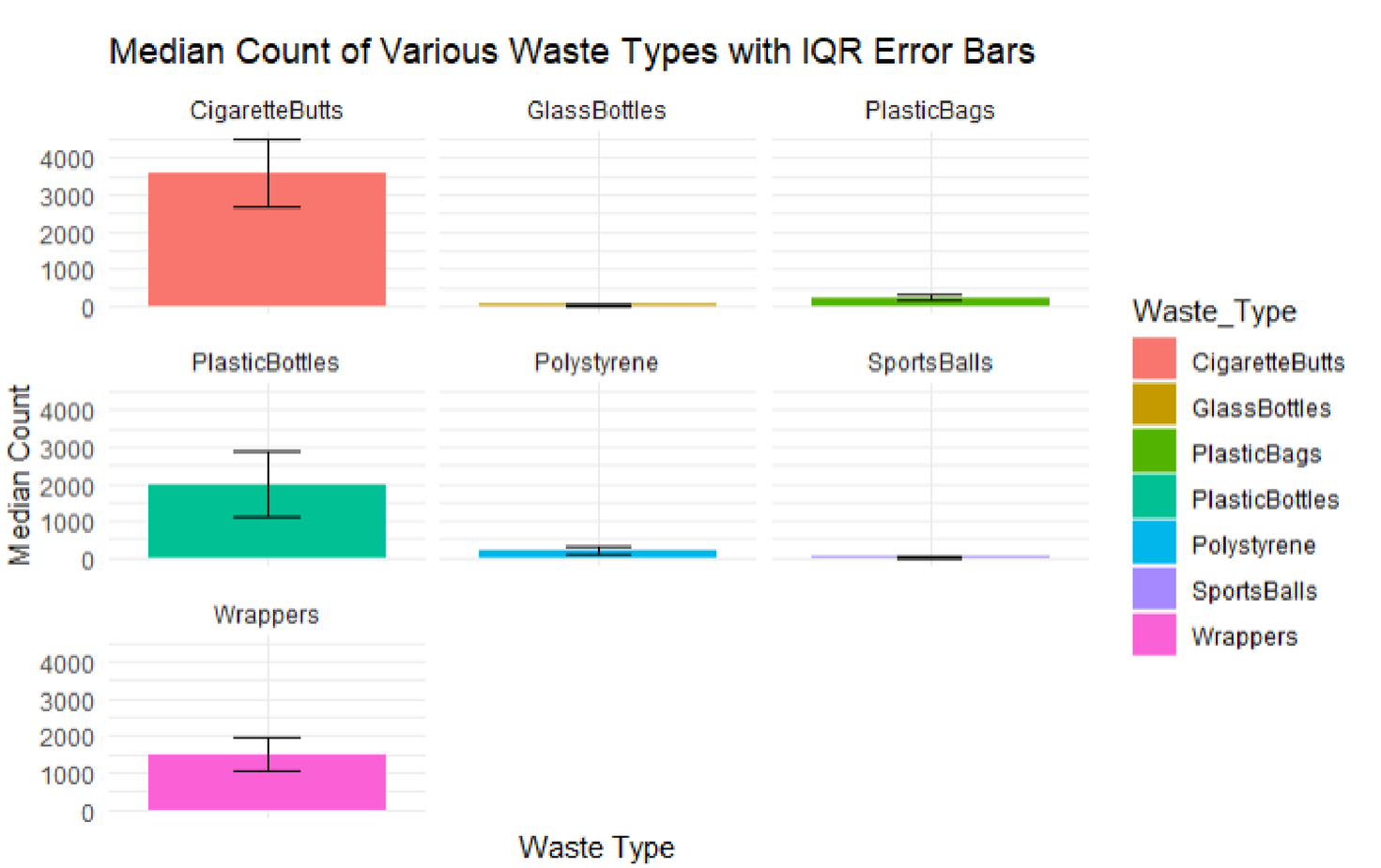

**Scatter plot with simple linear regression:**

- Immediately see the trend for each type of waste.
- Forecastable trend in the future.

# Question 1


Boxplot of Various Waste Types Over the Last 6 Months
Count
6000
4000
2000
0
CigaretteButts
GlassBottles
PlasticBags
PlastiBottles
Polystyrene
SportsBalls
Wrappers
Waste Type

# Question 1




**Multi-faceted bar chart:**

- Median count.
- IQR (interquartile range) as error bars.

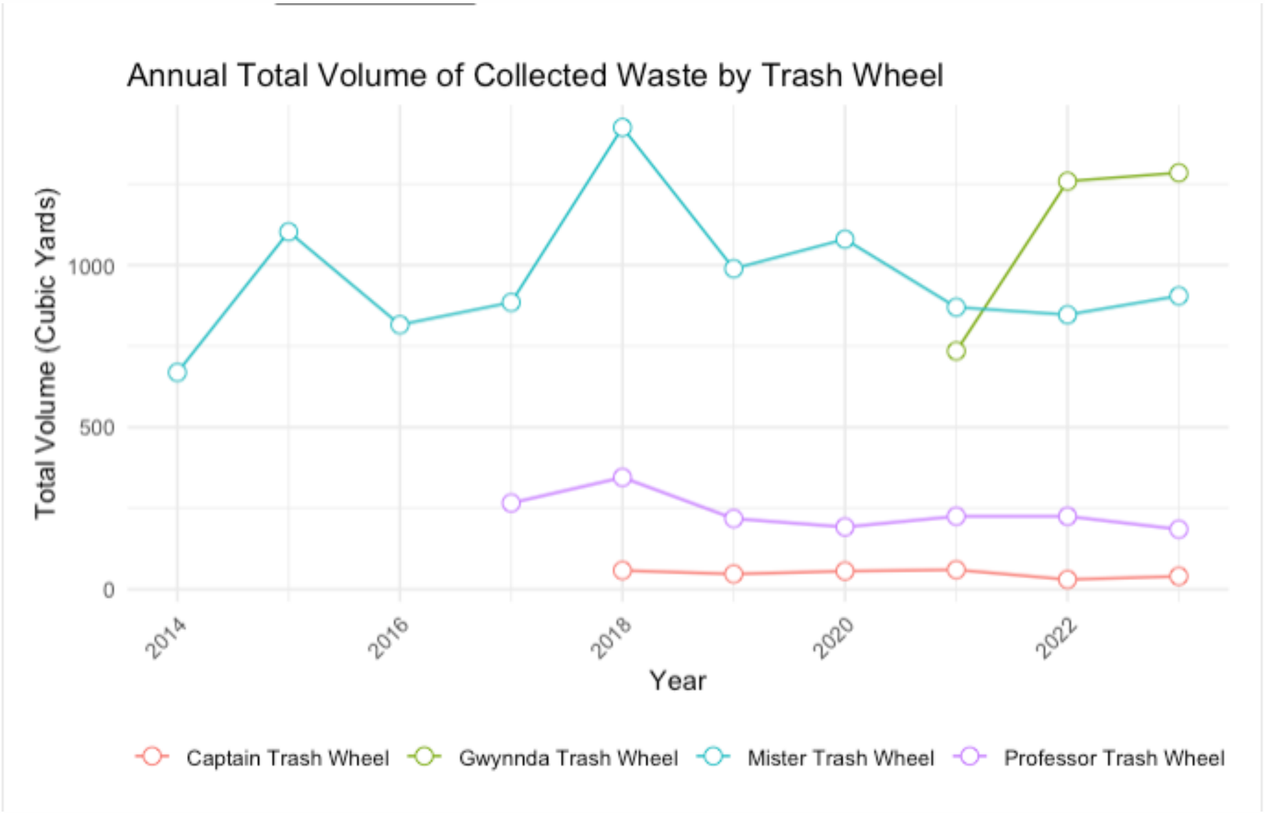
# Question 2

Q2: Which type of trash wheels have a highest performance, throughout the years, analyse the improvement of the usage of different trash wheel?

**Line chart:**

- Advantage: monitor patterns immediately.
- Disadvantage: loss of information (type of waste).

=> Using bar chart for garbage specification.

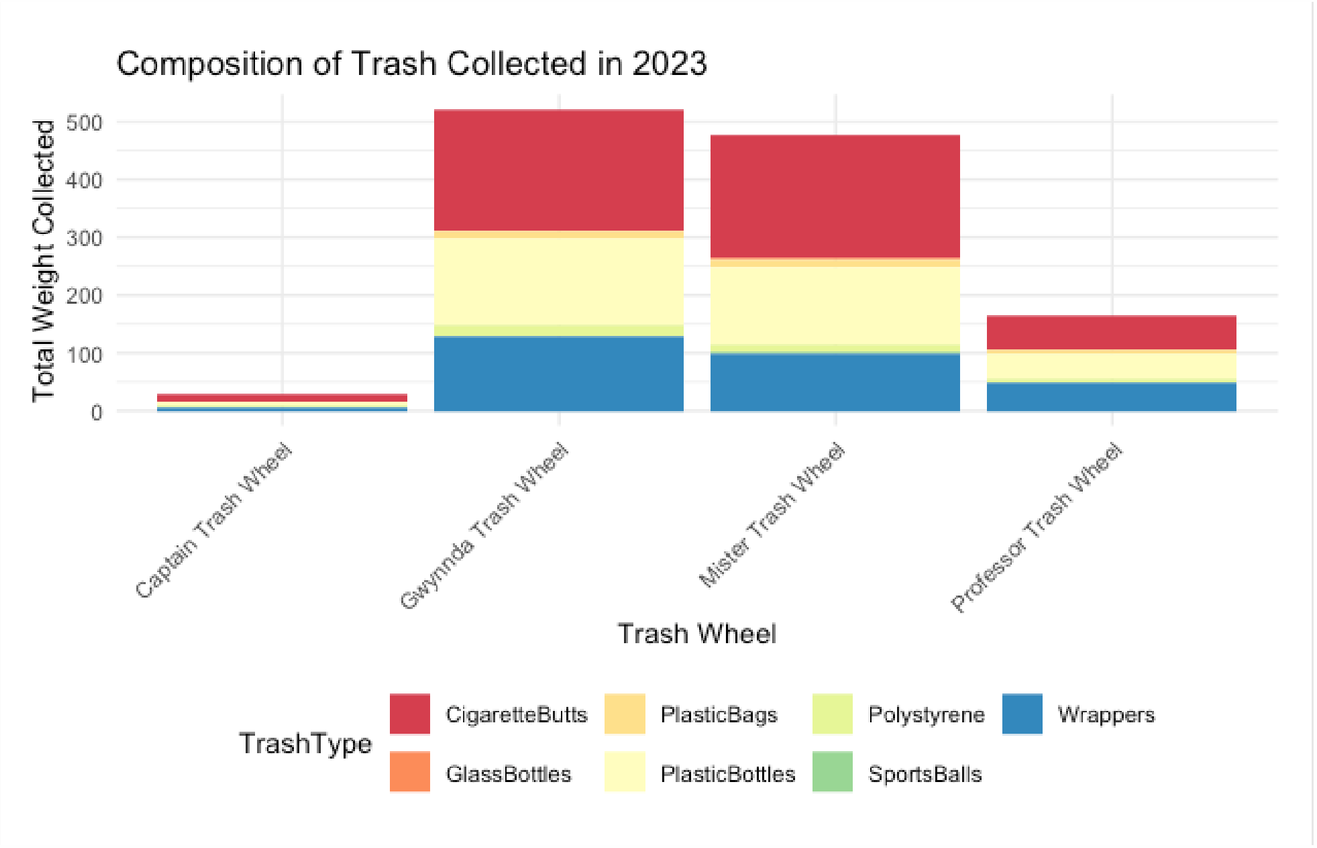


# Question 2

1. Data generalization by Year

**Bar chart:**

- Gwynnda gathered the most rubbish in 2023.
- The majority of the waste collected is Cigarette Butts.
- Gwynnda does the finest job gathering wrappers.



# Question 2

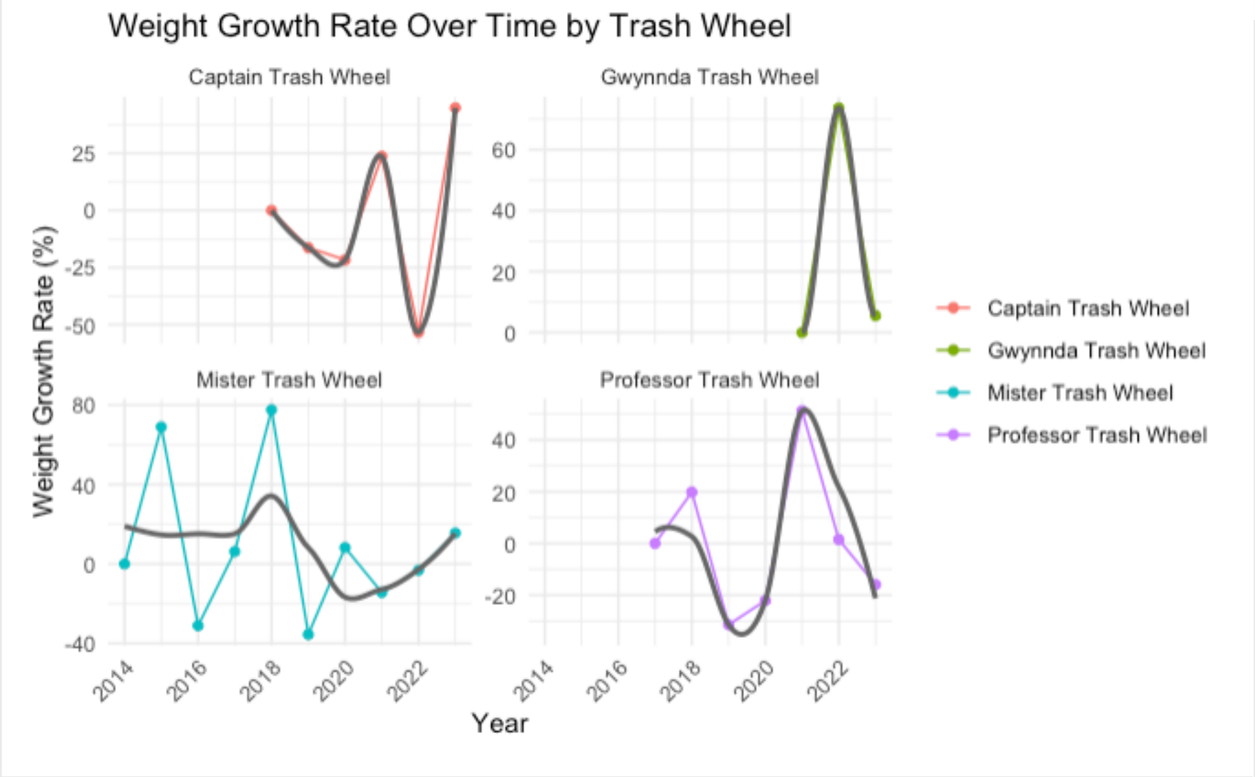
2. Volume and Weight’ Relationship

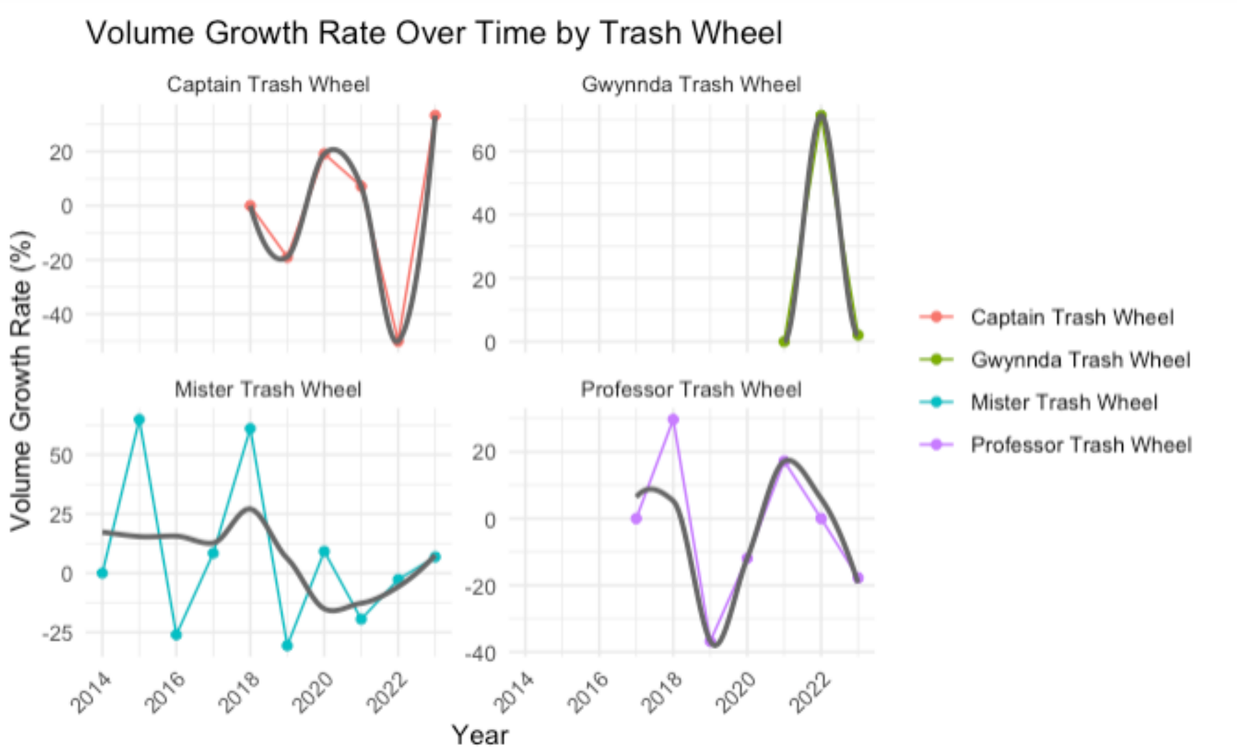
**Observation:**

- Linear relationship
- Mister Trash Wheel and Professor Trash Wheel both have upward trends
- Gwynnda Trash Wheel has a highest rate over years.

# Question 2

3. Growth Rate in Volume and Weight



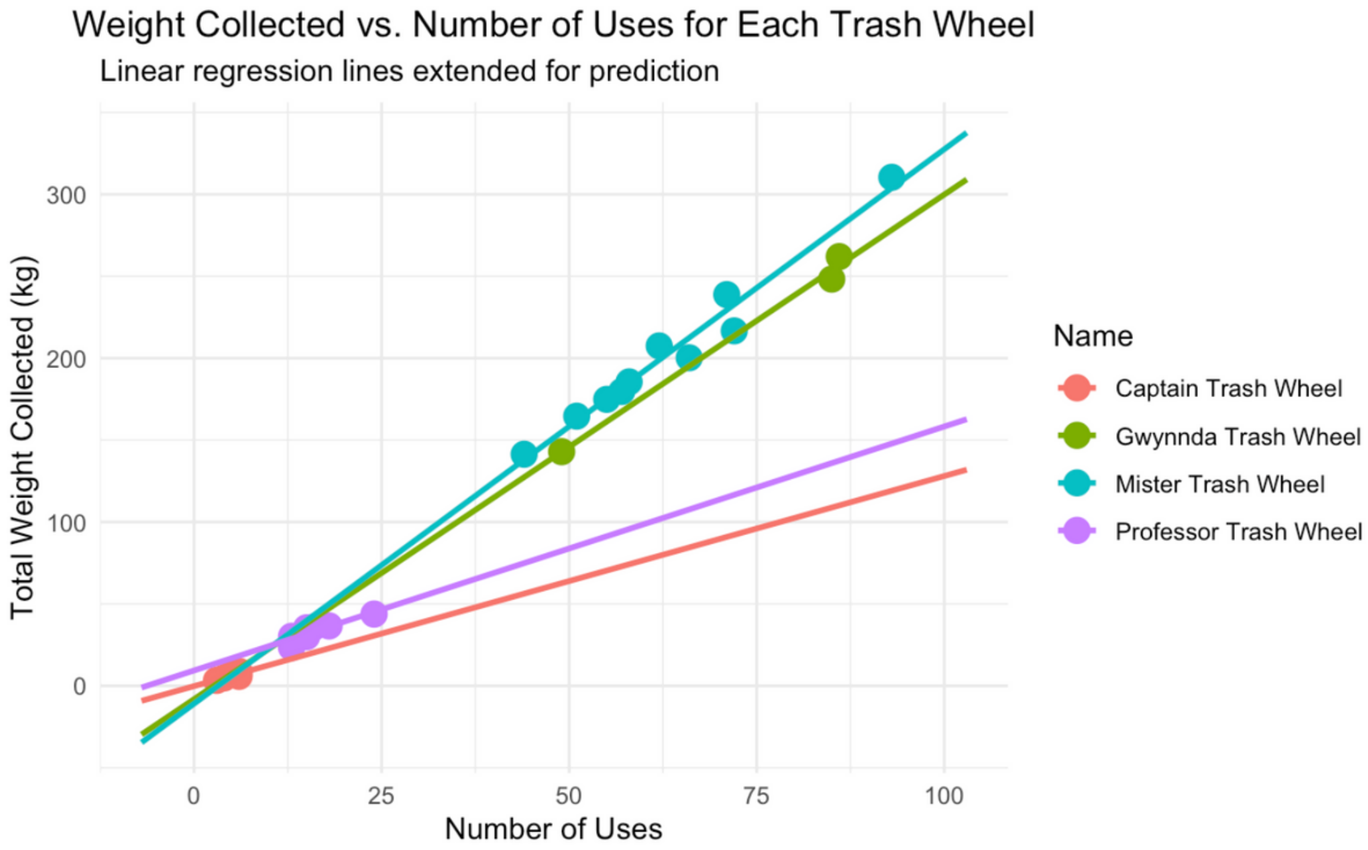



# Question 2

4. Number of usage

**Observation:**

- Threshold?
- When should we use Professor Trash Wheel? Mister Trash Wheel?



# Conclusion from the data analysis

**Analysis and Key Findings Overview:**

- **Analysis Focus**: Examines waste types, trends via Trash Wheels
- **Goal**: Identify rising waste categories, urban impact
- **Key Finding**: Plastic, polystyrene increases need targeted reduction
- **Seasonal Impact**: Waste trends vary seasonally, affect strategies
- **Event Influence**: Event-driven changes guide management focus
- **Recommendation**: Adjust strategies based on data insights

# Conclusion from the data analysis

**Challenges encountered:**

- **Data Reliability:** Incomplete, inaccurate entries affect trends
- **Inactive Days:** Missing data complicates analysis
- **Entry Errors:** Accuracy issues impact reliability
- **External Factors:** Weather events intensify waste issues
- **Adaptive Needs:** Requires flexible management strategies
- **Proactive Approach:** Essential for effective waste control

# Conclusion from the data analysis

**Strategic Recommendations:**

- **Recycling Initiatives:** Improve programs for plastics, polystyrene
- **Response to Increase:** Address rising waste volumes effectively
- **Adaptive Management:** Develop flexible policies for variability
- **Seasonal Changes:** Prepare for periodic and unexpected events
- **Public Education:** Enhance awareness of waste impacts
- **Sustainable Practices:** Promote eco-friendly disposal methods