cost_per_bus_analysis

July 9, 2024

1 Bus Procurement Cost Analysis

1.1 Summary

This analysis examines the cost of buses for transit agencies across the county. Specifically, to observe the variation of bus cost for propulsion type with a focus on Zero Emission Buses (ZEB).

Data was compiled from three data sources: 1. FTA Bus and Low- and No-Emission Grant Awards press release (federally funded, nationwide data) 2. TIRCP project data (state-funded, California only data) 3. DGS usage report for all procurements from California agencies purchasing from New Flyer and Portera Inc..

The initial dataset included nearly 300 projects. It was reduced to 88 projects after applying criteria to exclude non-bus related work. Projects involving the construction of new facilities, training programs, or the procurement of non-bus items such as trains and ferries were excluded. The final dataset comprised only projects focused on bus procurement.

These projects were aggregated against propulsion type and bus size type, and categorized by ZEB and non-ZEB.

ZEB projects are categorized into the following propulsion types: - zero-emission (not specified) - electric (not specified) - battery electric - fuel cell electric

Non-ZEB projects include the following propulsion types: - compressed natural gass (CNG) - ethanol - low-emission (hybrid, propane) - diesel - gas

Below is a breakdown of each data souce showing the total buses and cost for each source:

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2 Summary Charts and Tables

Summary of cost by ZEB propulsion types

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Summary of cost by non-ZEB propulsion types *

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*The remaining buses did not specify a propulsion type

2.1 Which agencies had the highest and lowest ZEB cost per bus?

Max cost_per_bus

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Min cost_per_bus

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2.2 Which agencies procured the most and least amount of ZEBs?

Max bus_count

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Min bus_count

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2.3 Which agencies had the most and least total ZEB cost?

Max total_cost

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Min total_cost

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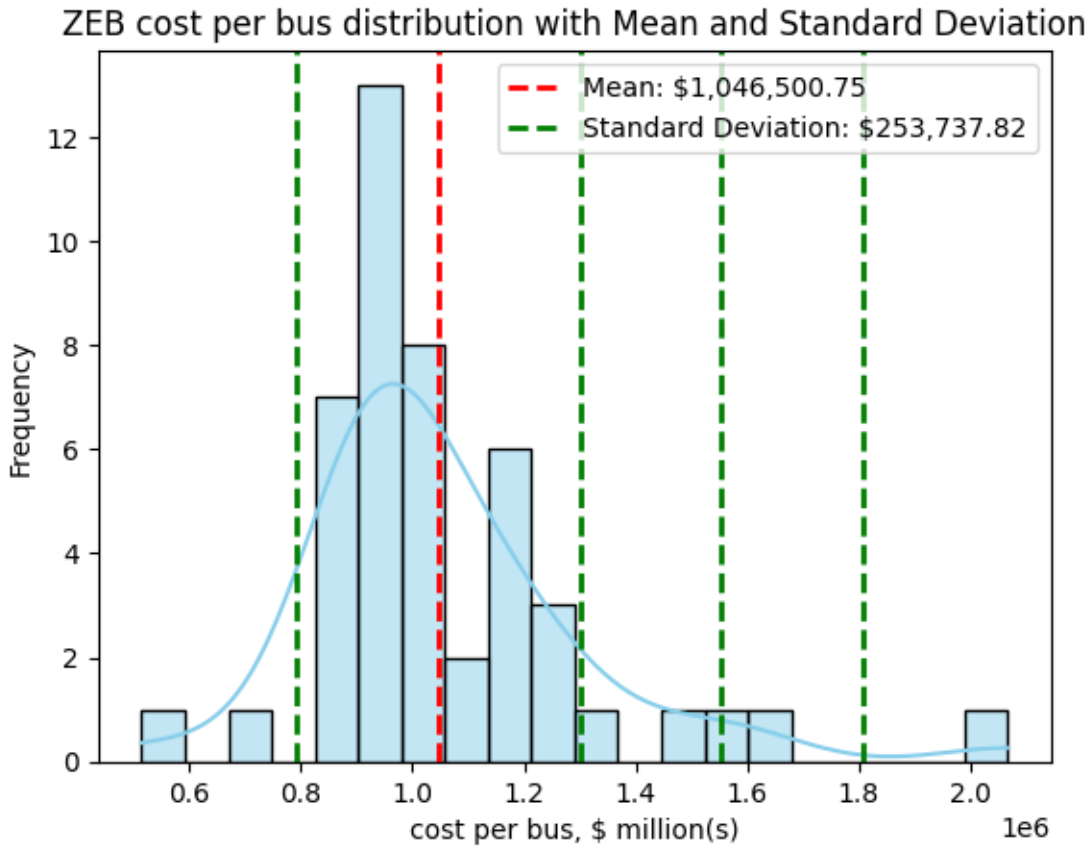
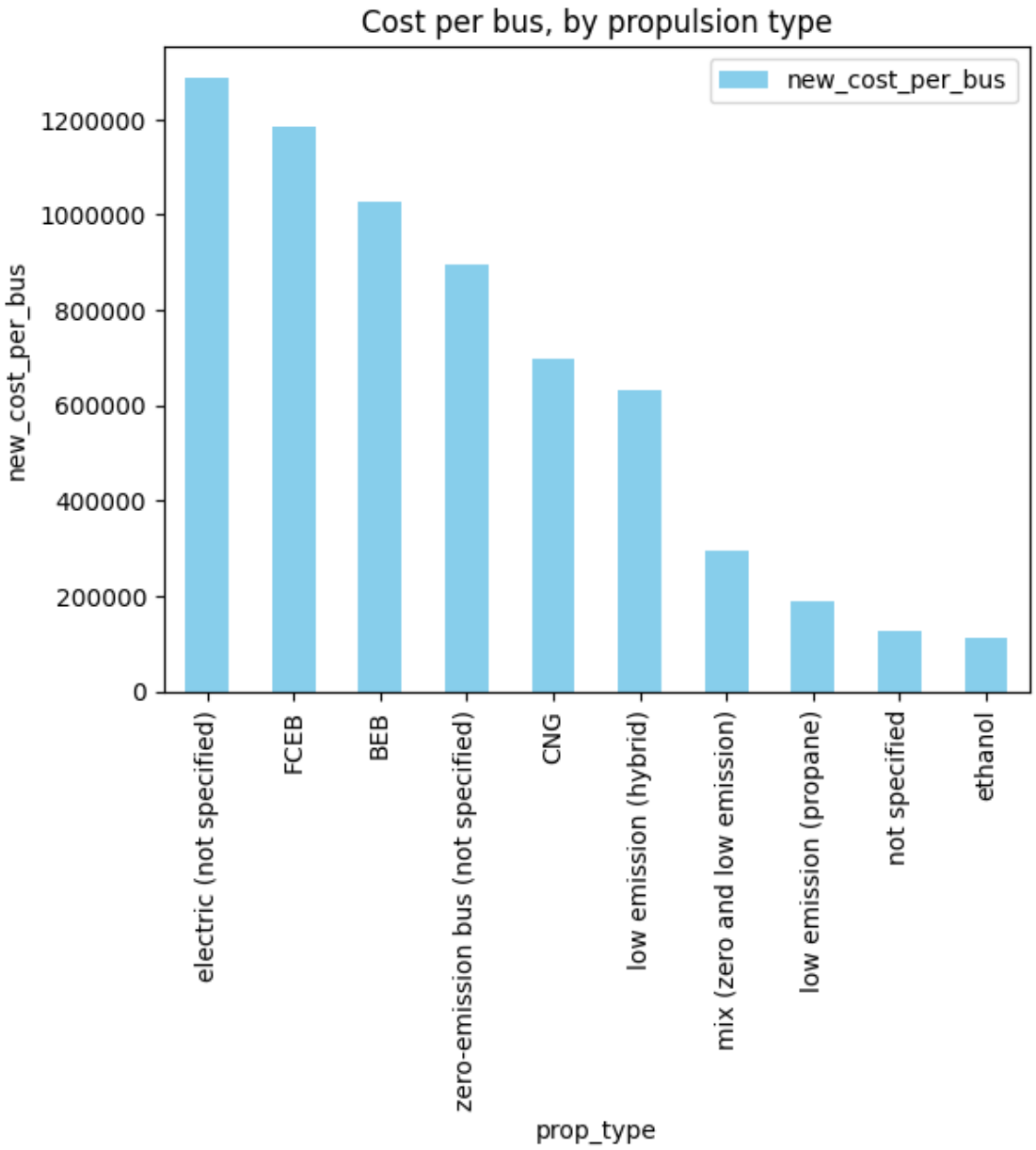
2.4 What is the distribution of ZEB cost?



2.5 What is the cost per bus compared against all propulsion types?

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None
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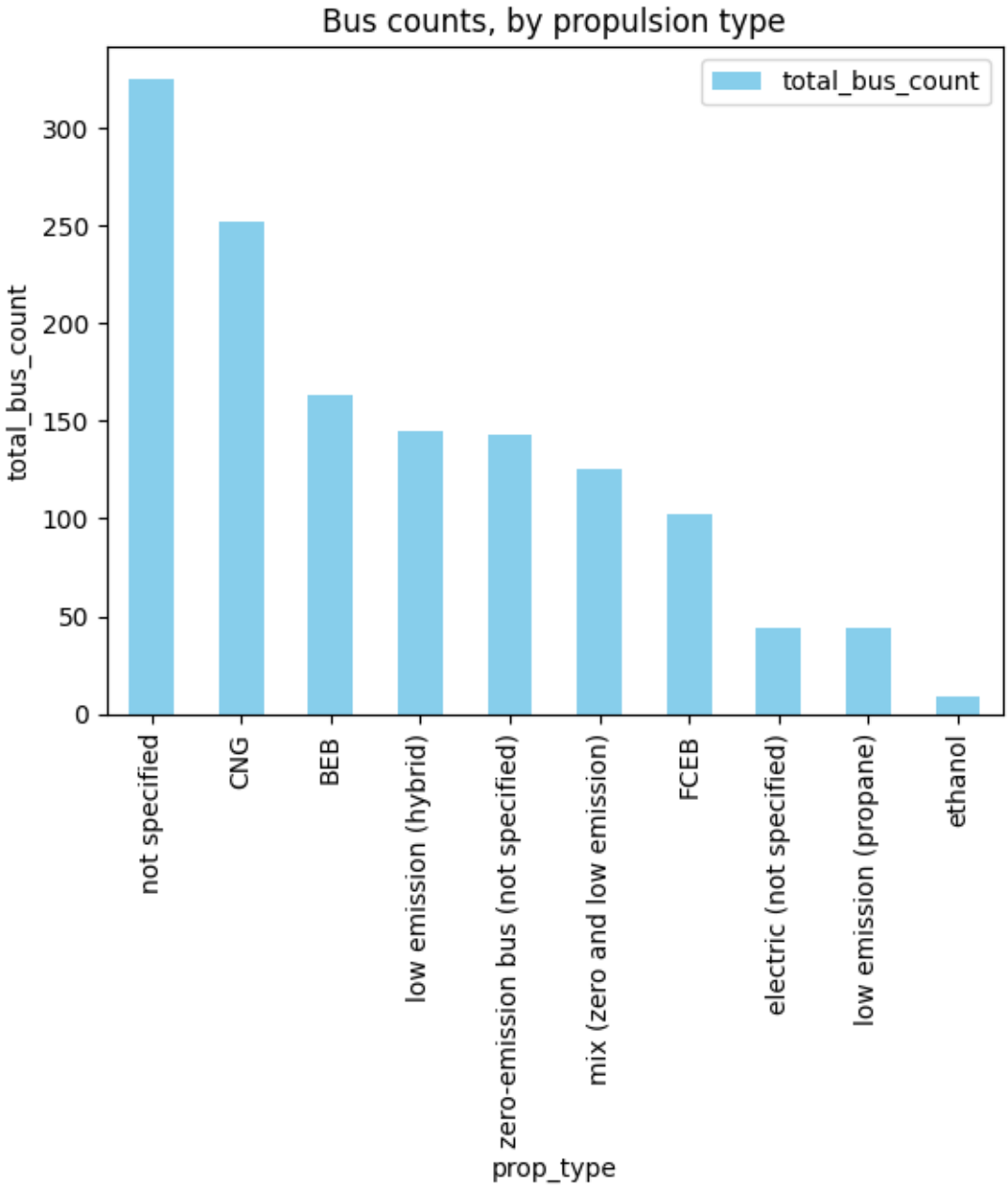
2.6 What is the total bus counts compared to each propulsion type?

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None
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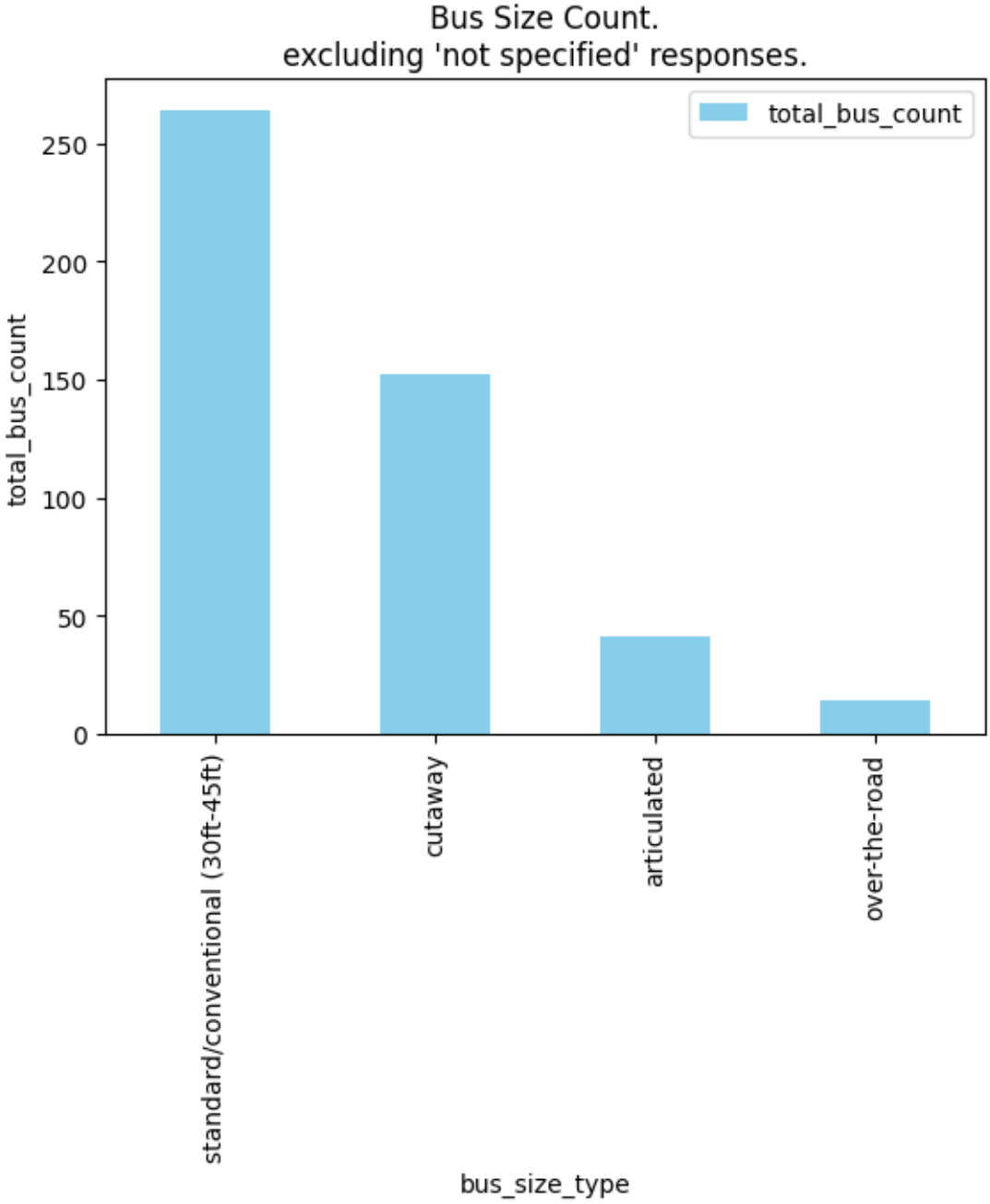
2.7 What is the total bus counts compared to each bus size category?

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None
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2.8 What is the breakdown of ZEB Propulsion Type and Bus Size Category?

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                                                      bus_count  \
prop_type                       bus_size_type
BEB                             articulated                12.0
                                standard/conventional (30ft-45ft)     151.0
FCEB                            not specified              29.0
                                standard/conventional (30ft-45ft)      73.0
electric (not specified)        articulated                29.0
                                not specified              15.0
zero-emission bus (not specified) not specified           143.0

                                                      total_cost
  ↪\
prop_type                       bus_size_type
BEB                             articulated              18759576
                                standard/conventional (30ft-45ft)   148472913
FCEB                            not specified              38070971
                                standard/conventional (30ft-45ft)    82880364
electric (not specified)        articulated                39478000
                                not specified              17200000
zero-emission bus (not specified) not specified           128156513

                                                      cost_per_bus
prop_type                       bus_size_type
BEB                             articulated                1563298
                                standard/conventional (30ft-45ft)       983264
FCEB                            not specified              1312792
                                standard/conventional (30ft-45ft)      1135347
electric (not specified)        articulated                1361310
                                not specified              1146666
zero-emission bus (not specified) not specified             896199
```

3 Conclusion

Based on these findings, The average cost of a ZEB, throughout the US, is ~$1,000,000, roughly twice the price of a conventional, non-ZEB. The variance in cost depends mainly on the options the Trasnit Agencies chooses. Highly optioned/customized buses contribute to high cost. Unfortunately, analyzing the cost of configuable options is outside the scope of data provided.