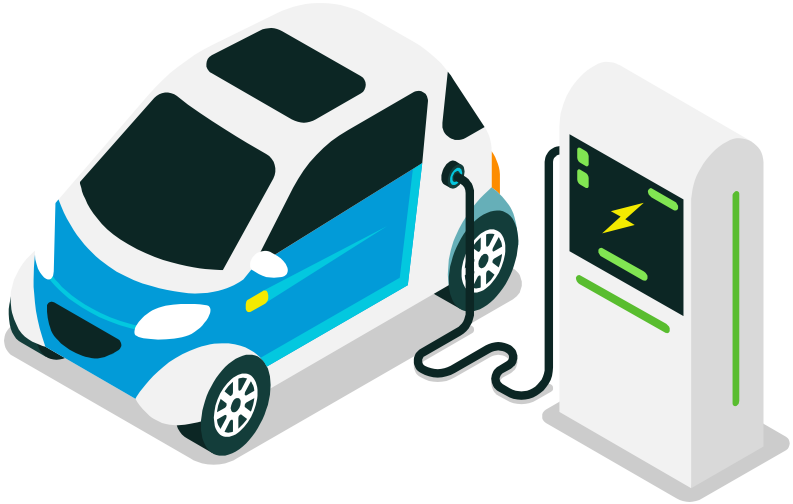


Fuel Economy Optimization

Presented by Rumi Nakazoe

Objectives

Goal

What factors drive fuel economy and annual fuel cost

Data

Look at the overall analyzed data

Hypotheses

Hypotheses overviews

Recommendation

Provide recommended actions based on the analysis

Data Analyzed

Sample size

38113 samples are taken

Car makes

133 car makes

Year

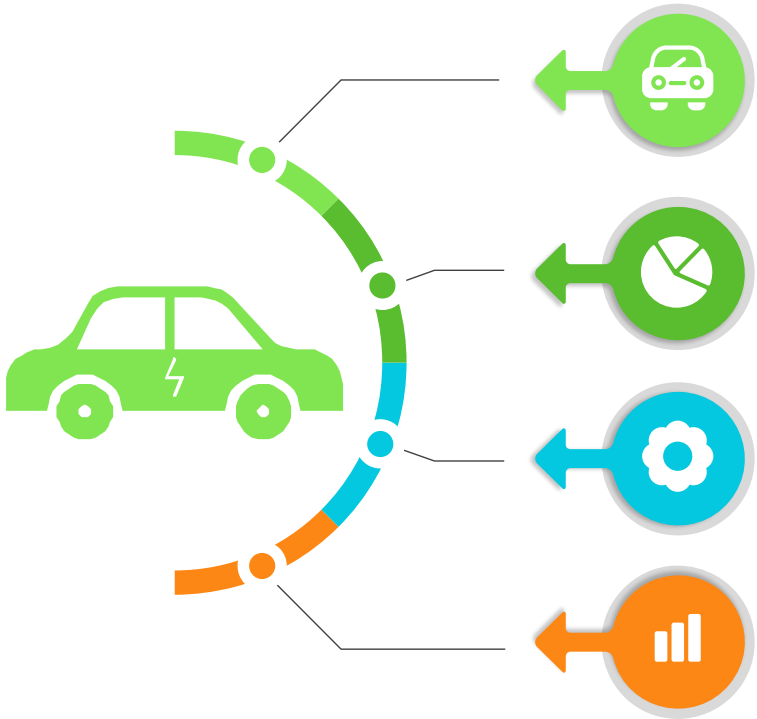
Manufactured between 1984 and 2017

AVG annual fuel cost

$2,054

*All the variables used in t-test are normally distributed

Hypotheses Overview



H_1 There is (no) statistically significant difference in the mean of annual fuel cost between automatic and manual car

H_2 There is (no) statistically significant difference in the mean of annual fuel cost between electric fuel and regular gas fuel

H_3 There is (no) statistically significant difference in the mean of annual fuel cost between car with and without start/stop technology

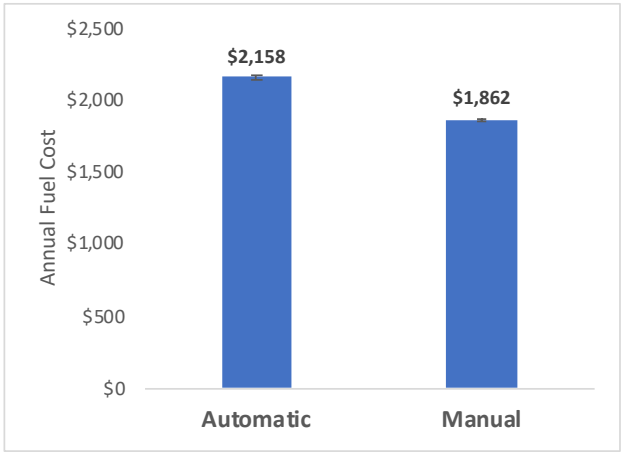
H_4 There is (no) statistically significant difference in the mean of annual fuel cost between electric/hybrid and non-hybrid car

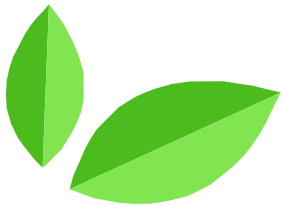
Automatic vs Manual

Ho: Transmission type has no effect on annual fuel cost
Ha: Transmission type does have an effect on annual fuel cost

Statistically significant difference between automatic and manual car
(Therefore, reject null hypothesis)

- With 95% confidence, the annual fuel cost for manual car is between $282 and $309 less compared to automatic car



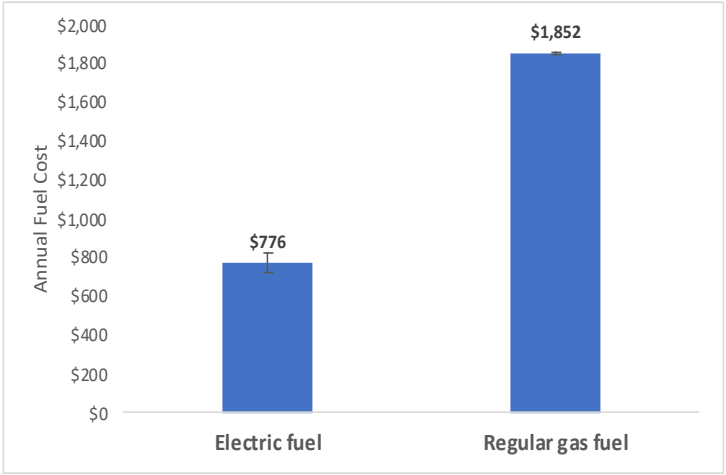


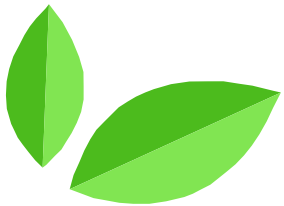
Electric fuel vs Regular gas

Ho: Fuel type has no effect on annual fuel cost
Ha: Fuel type does have an effect on annual fuel cost

Statistically significant difference between electric fuel and regular gas
(Therefore, reject null hypothesis)

- With 95% confidence, the annual fuel cost for car only uses electric fuel is between $1023 and $1128 less compared to car only uses regular gas



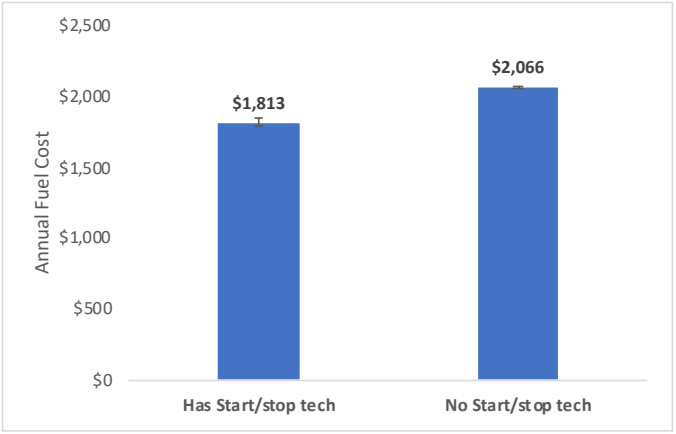


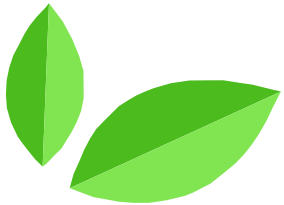
Start/Stop Technology

Ho: Start/Stop Technology has no effect on annual fuel cost
Ha: Start/Stop Technology does have an effect on annual fuel cost

Statistically significant difference between car with and without Start/Stop Technology
(Therefore, reject null hypothesis)

- ⇢ With 95% confidence, the annual fuel cost for car with Start/Stop Technology is between $219 and $286 less compared to car without it



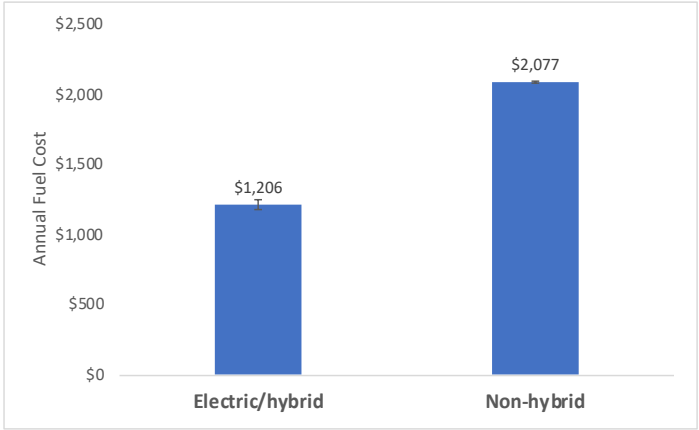


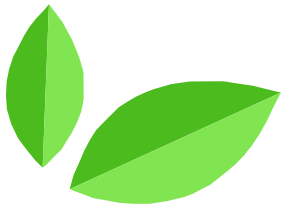
Electric/Hybrid vs Non-hybrid

Ho: Car power type has no effect on annual fuel cost
Ha: Car power type does have an effect on annual fuel cost

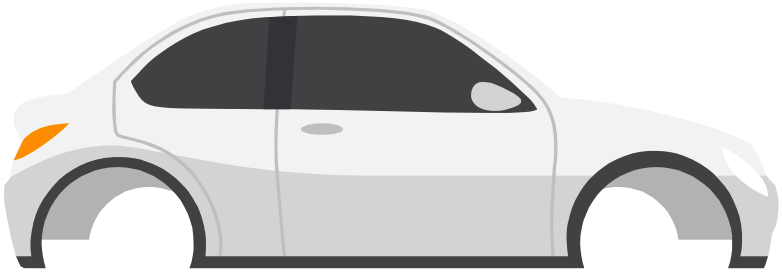
Statistically significant difference between electric/hybrid and non-hybrid car
(Therefore, reject null hypothesis)

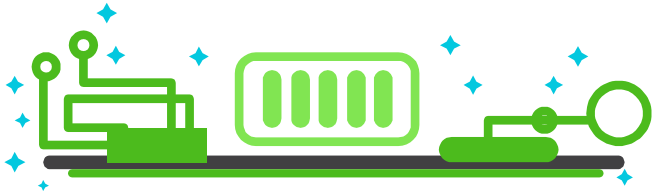
- With 95% confidence, the annual fuel cost for electric and hybrid car is between $832 and $908 less compared to non-hybrid car





Top 3 Fuel Economy Car Class





01 **Small SUV**

Avg annual fuel cost: $1525
Avg MPG: 24.3

02 **Small Station Wagon**

Avg annual fuel cost: $1586
Avg MPG: 24.2

03 **Compact Cars**

Avg annual fuel cost: $1680
Avg MPG: 23.4

Top 3 Alternative Fuel Car

01 **Electric Vehicle**

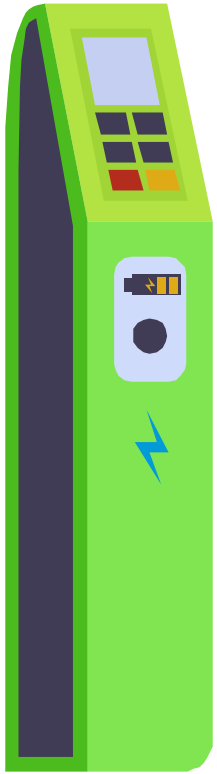
Avg annual fuel cost: $776
Avg MPG: 93

02 **Hybrid**

Avg annual fuel cost: $1277
Avg MPG: 32

03 **Plugin-hybrid**

Avg annual fuel cost: $1308
Avg MPG: 33

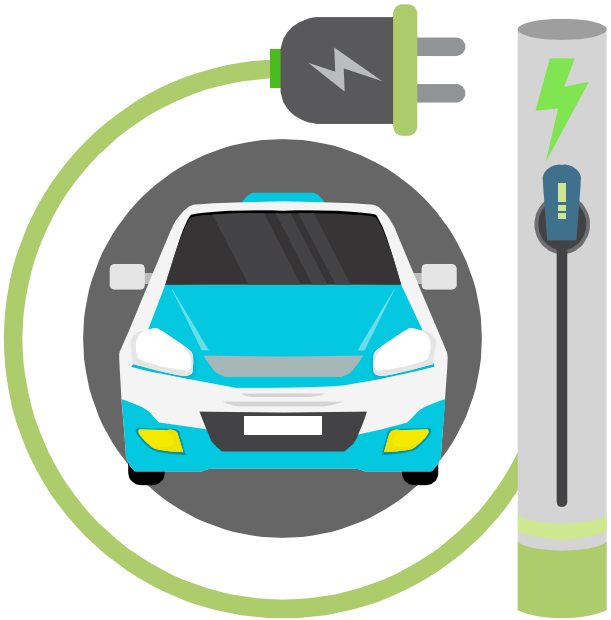


Recommendations

Manual Car
About **$300 less** fuel cost compared to automatic car

Electric Fuel
About **$1100 less** fuel cost compared to regular gas

Start/Stop Technology
About **$250 less** fuel cost compared to car without start/stop feature



Electric/Hybrid Car
About **$900 less** fuel cost compared to non-hybrid car

Small Car
Compact size car has less fuel cost and better MPG

Electric Car
Electric car has overall best performance

*All the fuel cost is annual

Thank you!

Do you have any questions?