Fuel Consumption Optimization

Grab

Ride Hailing Platform x Data *Science*

Prepared by: Ma. Angelica T. Mariano

maangelicatmariano@gmail.com

Fuel Consumption Optimization

" How can we help our drivers improve their fuel economy?"

Build a system that optimizes the allocation of vehicles depending on their engines:

Diesel

<< 2 most common vehicle engines >>

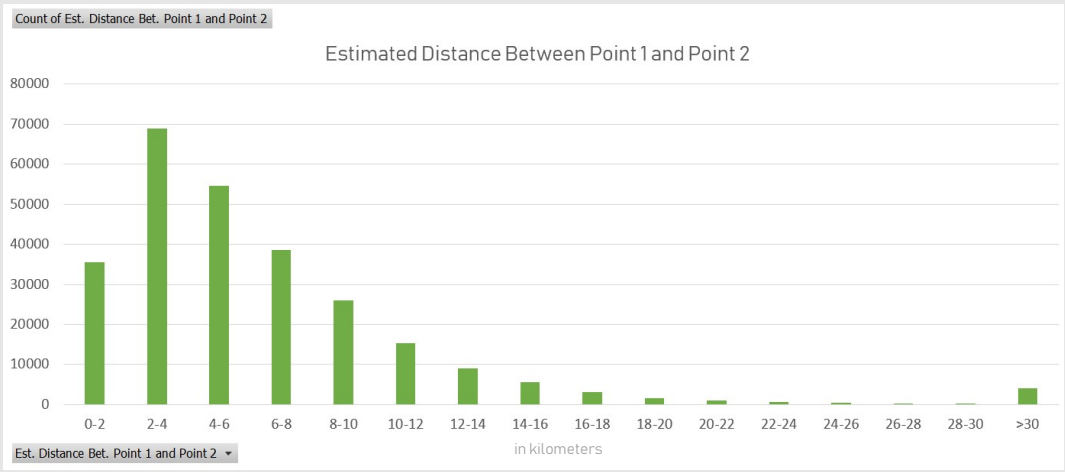
Gasoline

Will be assigned mainly for long distance trips

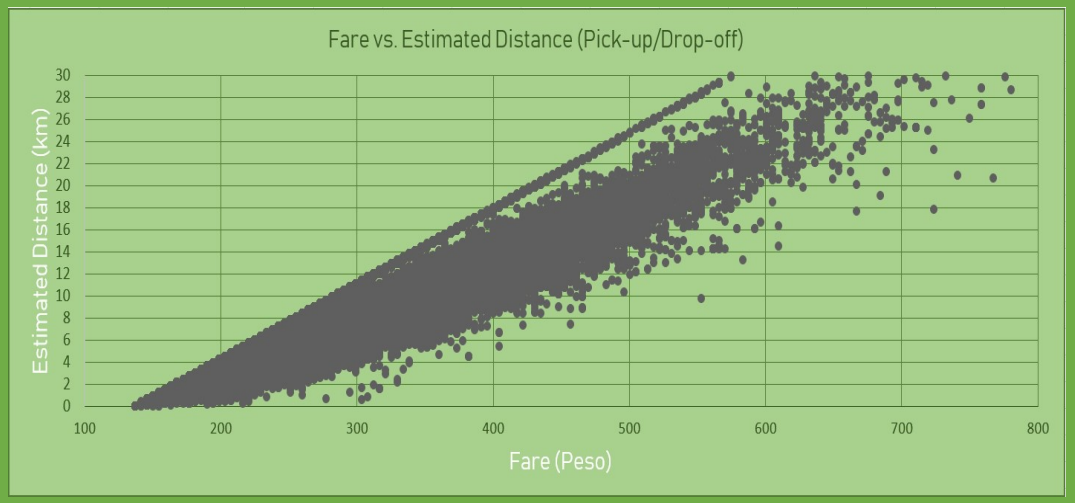
- Built for long drives/ heavy traffic
- Cheaper fuel than gasoline

Will be assigned mainly for short distance trips

- Best choice for short trips
- Most cars have gasoline engines



Utilized from Grab DataSeer 2013 Data. (This is an estimated distance between the pick-up and drop-off points calculated based on their latitudes and longitudes , also called as straight line distance, flying or air distance.
Hence, it may be different from the actual travel distance or distance by road.)



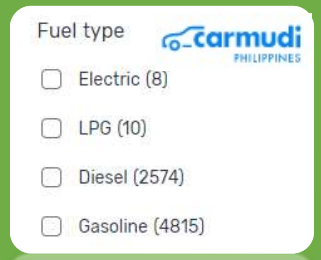
The histogram shows that there were a significant number of booked trips with the distance around 2km to 8km.

Distance with more than 8km were considered as Long Distance Trip. These trips would most probably take an hour or more to be completed.

Short Distance Trip	
0-2 km	35,573
2-4	68,884
4-6	54,701
6-8	38,603
TOTAL	197,761

Long Distance Trip	
8-10 km	26,077
10-12	15,422
12-14	9,099
14-16	5,612
16-18	3,049
18-20	1,690
20-22	956
22-24	582
24-26	369
26-28	243
28-30	161
>30	4,052
TOTAL	67,312

The number of demand for Short Distance Trips can be mostly accommodated since most cars have gasoline engines available in the market for used/new vehicles as compared to Diesel. Assuming that **Grab** also have this ratio.



➡ This graph shows that the estimated distance between the pick-up and drop-off points vs. the recorded fare per trip have a direct relationship.
(This does not include outliers and some system errors in the data)

A liter of diesel fuel contains roughly **15%** more energy than a liter of gasoline

Gasoline

13 km/L

For 10 liters of fuel:

10 liters * (13km/L) = 130 km

Diesel

16 km/L

10 liters * (16km/L) = 160 km (23 % farther)

Vehicle Name / Variant	Engine Type	Drivetrain	Reference (km/L)	Average Speed (km/h)
Innova G	Diesel 2.8 (1GD-FTV)	4x2 Automatic	15.6	59
Innova G	Gasoline 2.0 (1TR-FE)	4x2 Automatic	8.6	59

CARGuide.ph

Diesel vehicles can often go 15% to 35% farther on a liter of fuel since gasoline engine uses more fuel which can be more expensive to run if you do a lot of miles.

To take advantage of diesel's efficiency, it must be driven on longer trips. Otherwise, fuel consumption will be just the same as gasoline engines.

Fuel Expense Difference (sample computation)

100 km	
Gasoline	**Diesel**
= 100 / (13 km/L)	= 100 / (16 km/L)
= 7.7 liters	= 6.3 liters
47 pesos (approx. market price per liter)	35 pesos (approx. market price per liter)
= 7.7 liters * 47	= 6.3 liters * 35
= 361.9 pesos	= 220.5 pesos

A diesel engine could save **141 pesos less** for a 100km drive compare to their gasoline counterpart.

Grab

benefits of
Fuel Consumption Optimization

Drivers

Drivers will have better fuel economy. Those having diesel engines could save more for longer trips, and same goes to gasoline engine drivers who won't spend too much fuel for shorter trips.

Happier drivers is also our main goal.

Grab

If we manage to help our drivers to spend 30% - 50% less on their Daily Fuel Expense. We suggest **Grab** to increase their commission for about 5% to 10%. Through this, we could somehow make a way to lower the fare; Less Booking fee/ Surge Prices

At a lesser price, we could persuade more Grab consumers.

For a better Grab community

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