Optimal "Green" Fleet Composition through Machine Learning

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Motivation / Background

"The greatest threat to our planet is the belief that someone else will save it."

Globally, 14% of CO2 emission comes from transport sector and this may double by 2050

In Mexico, 26.6 % of CO2 emission comes from transport sector and it is growing fast

Coppel owns a private fleet of 2000+ trucks in Mexico. This fleet operates in diverse geographies and road conditions, making it difficult to compare their CO2 emissions

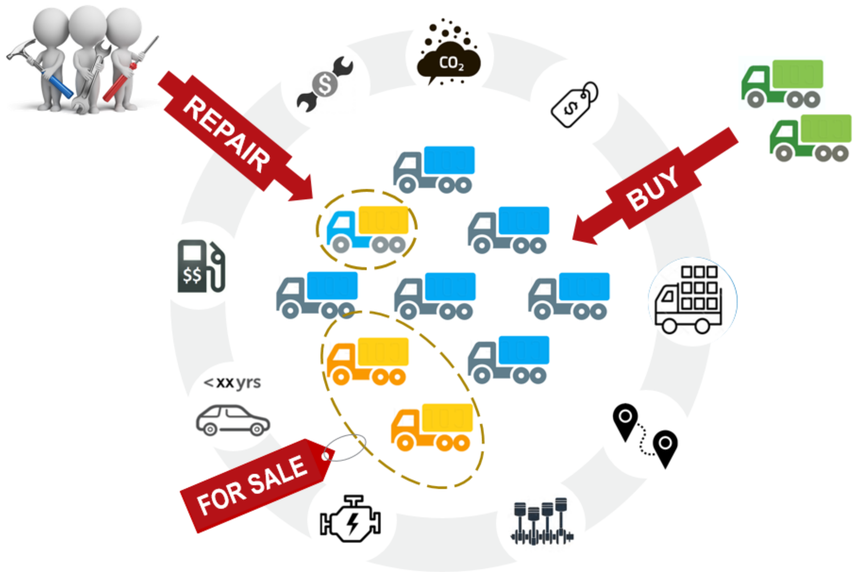
Key Question / Hypothesis

What vehicle characteristics have the biggest impact on CO2 emissions?

How to form a fleet composition optimal in costs & CO2 emissions?

Relevant Literature

Individual Vehicle-based	Overall Fleet based approach	Green Fleet approach
• Ahmed, 1973 • Chisholm, 1974 • Evans, 1989	• Redmer, 2016 • Ahani, Arantes, & Melo, 2016	• Gong & Wu, 2011 • Stasko & Gao, 2012



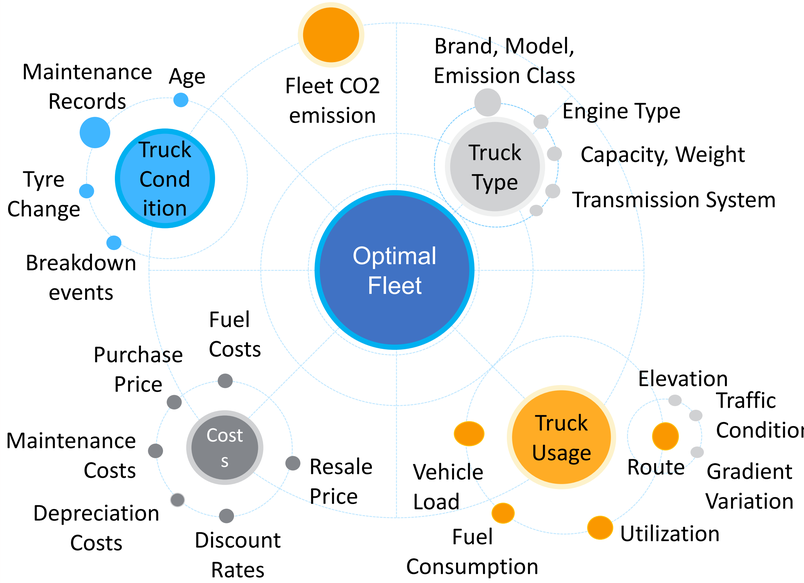
Methodology

Use Machine Learning to identify characteristics that have the biggest impact on CO2 emission

Formulate a portfolio-based optimization model using insights from Machine Learning

Simulate different scenarios by varying permissible CO2 emission of fleet and budget constraints

Initial Data Analysis



Expected Contribution

Sustainable & Optimal Fleet Composition Model

- Based on Intelligent selection of characteristics in model formation
- Considers actual CO2 emissions of overall fleet and not just fuel costs
- factors in road conditions and vehicle load

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