

# Fleet Management

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# Problem Statement

- Goal: Improve TCNJ fleet financially and environmentally
- Transition from ICE vehicles to zero emission vehicles
- FIFO method
- Straight line depreciation



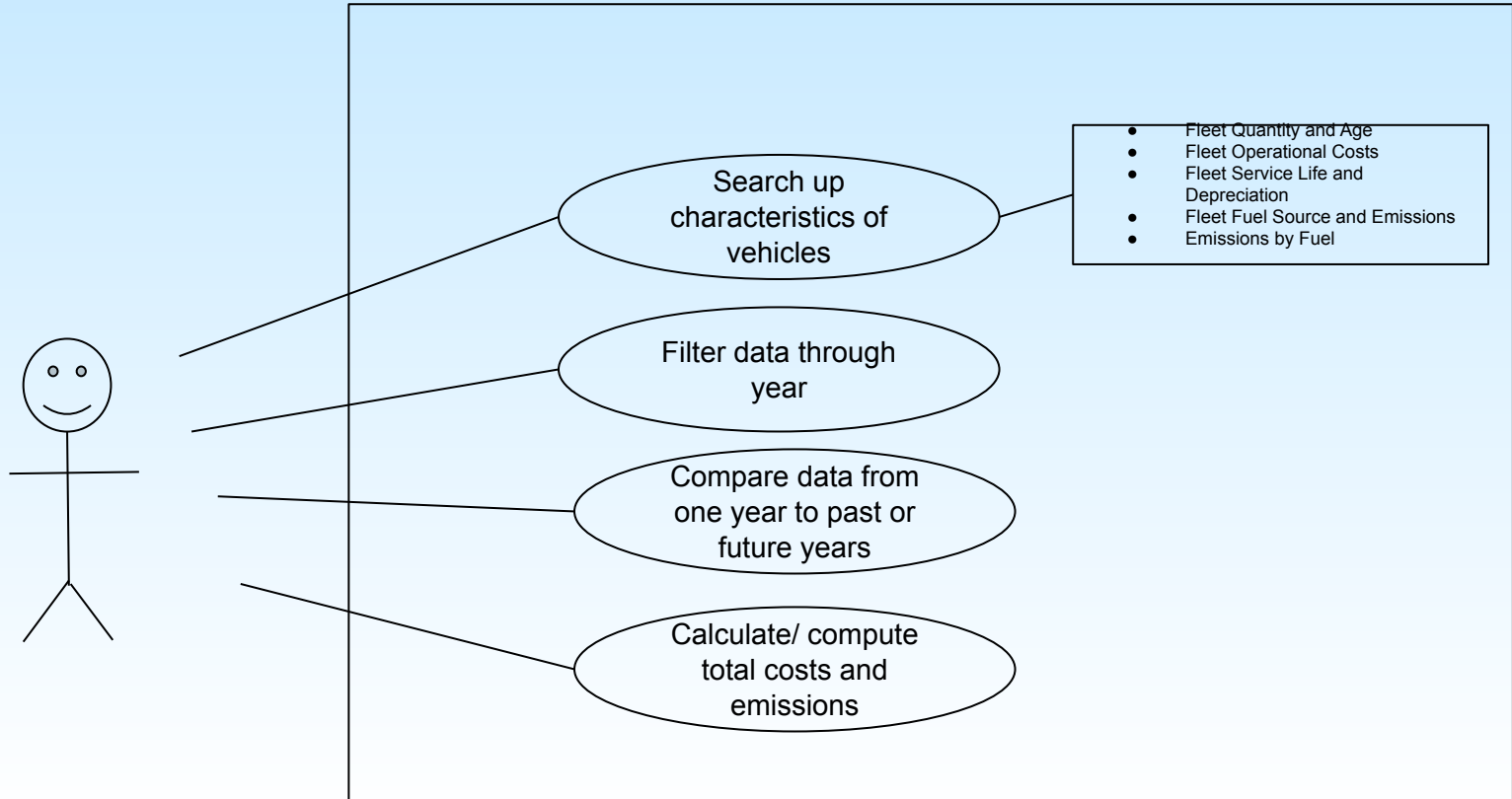
# Objective

- **Overall:** create a solution that results in reduction of emissions while being cost effective
- **Specific:** provide a database with user interface that allow users to observe TCNJ's transition to zero vehicles through the years
  - Fleet Quantity and Age
  - Fleet Operational Costs
  - Fleet Fuel Source and Emissions

# Desired End Product

- Our database should highlight different characteristics per vehicle for the proposal/future years.
- It should also specify what vehicles will be the most cost efficient and environment safe options.
- The following elements will be major variables and output data needed to help solve the problem: fleet fuel source and emissions fleet quantity and age, fleet operational costs.

# Diagram



# Importance

- Module will keep track of fuel source, emissions, age, quantity and operational cost
- Highlight future plans
- Emphasize slow integration of new fleet
- FIFO method
- Possible depreciation model

# Research Plan

- Obtain current data of charging stations already available at the school.
  - I.e. how many charging stations are currently available and where they are installed.
  - Impact the cost effectiveness of installation
- Variation of different vehicles and their impacts on emissions
  - I.e older vs. newer vehicles, vehicle type, etc.

# Similar Systems

- The module is different because it will be able to search for certain characteristics and for certain vehicles
- The module will make it very easier to search the database to find the information that the user is looking for
- The module will be much better than the database provided because the module will provide a user interface that will help the user find the information they are seeking easily and it will help them find the characteristics that they are looking for on certain vehicles



# Other Applications of the System

- Our system determines monetary and environmental costs
- Can be applied to different kinds of machines/equipment in different industries given similar data and variables
  - Initial cost, depreciation, useful life, emission, make, model, etc.
- Ex: Manufacturing equipment, lighting, heat and A/C

# Fleet Vehicle Management

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## **Need**

The customer needs an efficient, sustainable, and cost-effective strategy for the most economical composition of the TCNJ vehicle fleet. Along with developing an approach for the environmental conformation for the vehicle fleet.

## **Approach**

The approach for addressing this is firstly transitioning ICE vehicles to zero vehicles. This will be done by using the FIFO method in retiring older vehicles and replacing those with zero vehicles first. Allowing for newer vehicles to continue operating smoothly.

## **Benefit**

The specific benefits for the stakeholders would be the following: because of the proposed transition from ICE vehicles to zero vehicles this will cause money to be allocated annually for the entire transition period. No immediate budget is mandatory for this transition. The college's goal to reach carbon zero by 2040 will be feasible as well since this is a 20-year process.

## **Competition**

The benefit of this approach is far superior to what others may propose because of the positive economic and environmental relationship. Different approaches can vary from rebuilding older models or decreasing the number of transportation vehicles being operated which would benefit the environment by less emissions but also put constraints on labor. Instead, the FIFO approach positively impacts the environment using minimal cost, and low constraints on labor.