

Stop Selling Cars, Start Selling SUVs: New

Vehicle Sales Analysis

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Introduction:

In today's competitive economy, businesses are fighting for every advantage in order to stay profitable; car dealerships are no exception. Not only do car dealerships need to maximize the revenue of the business, but sales associates rely on commission in order to supplement their income. In order to maximize revenue, car dealerships need to create an inventory that is statistically likely to sell. The following paper explores a data set of new (2023-2025) vehicles sold on cars.com. Exploratory data analysis was performed to determine what make, model, body type, color, and price range customers are most likely to purchase. The next section of this paper will outline the data collected and the methodology used in analysis. In the following section, the result of the data exploration is outlined. Finally, the conclusion of the paper highlights the key points of the paper with recommendations on how car dealerships should build their inventory in 2025.

Data and Methodology:

The dataset used in this analysis is titled "Vehicle Dataset 2024" and was collected with Apify from cars.com before being uploaded to Kaggle for open source use. The data was ethically mined and obeys the terms of use outlined by cars.com. The purpose for collection was to act as a practice dataset for data scientists and students. The data contains 1002 entries with 18 columns: name, make, model, year, price, engine, cylinders, fuel, mileage, transmission, trim, body, doors, exterior color, interior color, and drivetrain.

Summary statistics were calculated and analyzed for price, cylinders, doors, year and mileage. However, price was the only quantitative variable explored. Cylinders and doors were not explored in this report due to the little influence car dealerships have in determining this.

Mileage and year were also ignored due to the dataset's focus being on new cars, making mileage and year uninteresting. Data analysis was therefore focused on choices customers would make when purchasing a vehicle, primarily: body type, exterior color, interior color, price, make, model, drivetrain, fuel type and body type.

Analysis:

The median price of the vehicles sold cost \$46,835.00 with an IQR of \$22,827.00. Shown in Figure 1, the majority of cars sold are between \$20,000 and \$60,000. After \$60,000, there is a steady decline in the number of cars sold, showing that customers are looking for new cars that are modern, but are not quite a luxury item.

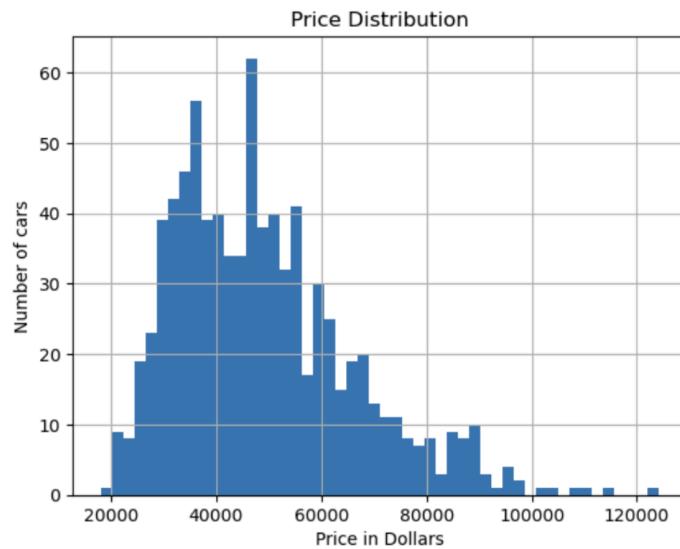


Figure 1. Price Distribution of Vehicles

The top selling cars were 2023 Dodge Durango Pursuit (3.961585% of all sales), 2024 Jeep Compass Latitude (3.361345%), 2024 RAM 3500 Tradesman (2.040816%), 2024 Volkswagen Taos 1.5T SE (1.800720%), and 2024 Dodge Hornet R/T Plus (1.680672%).

Make was also explored during the analysis of this dataset. The graphic in Figure 2 shows the popularity of each vehicle make sold. Jeep (21.24%), Dodge(12.60%), Hyundai (9.96%), RAM (9.12%) and Ford (7.92%) are the most popular make sold. These companies are not necessarily known for their sedans, but for their bigger SUVs and trucks. Looking at the data, SUVs and Trucks make up ~87.14% of all vehicles sold, at 69.26% and 17.88% respectively. Sedans on the other hand only account for 6.24% of vehicles sold. According to sales, there is a large demand for SUVs and Trucks.

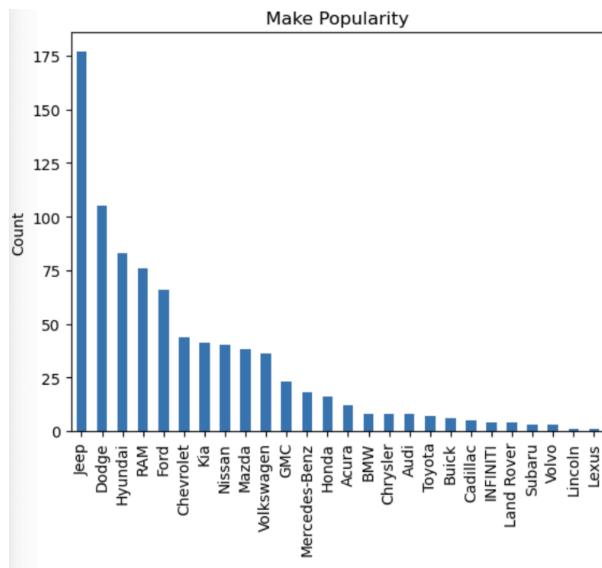


Figure 2. Make Popularity

The average price of Trucks and SUV's is \$49,677.82 which is higher than the average price of Sedans at \$34,108.00. The cheapest SUV or Truck sold was \$21,123.00 with the most expensive being \$124,250.00. There was no difference between the popularity of makes when comparing all vehicles to the SUV and truck subset.

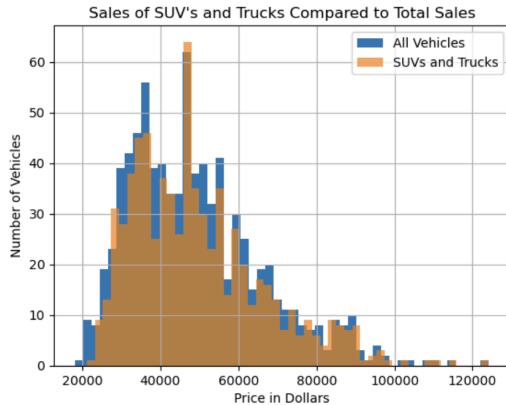


Figure 3. Sales of SUVs and Trucks Compared to Total Sales

According to the data, there is a larger demand for SUVs and trucks than sedans and other types of vehicles. Perhaps more importantly to car dealerships, the majority of sales come from SUVs and Trucks as shown in the histogram in Figure 3. In order to accommodate what customers would like, it is important to also explore the most attractive features to customers. Largely, customers are looking for All-wheel or Four-wheel drive cars which make up 87.32% of purchases, at 44.90% and 42.42% respectively. Rear-wheel drive was the least popular at only 2.47%. Customers are also choosing to opt for gasoline cars over all other options accounting for 72.58% of all trucks and SUVs sold. The second most popular were hybrids at only 15.97%. When it comes to aesthetics however, neutral colors are the most prevalent. Black interiors are the most frequent at 74.38%. Customers also prefer more neutral colors for the exterior for trucks and SUVs with white and black being the most frequent at 25.89% and 18.59% respectively.

Figure 4 shows the frequency of the most common color choices for SUVs and trucks.

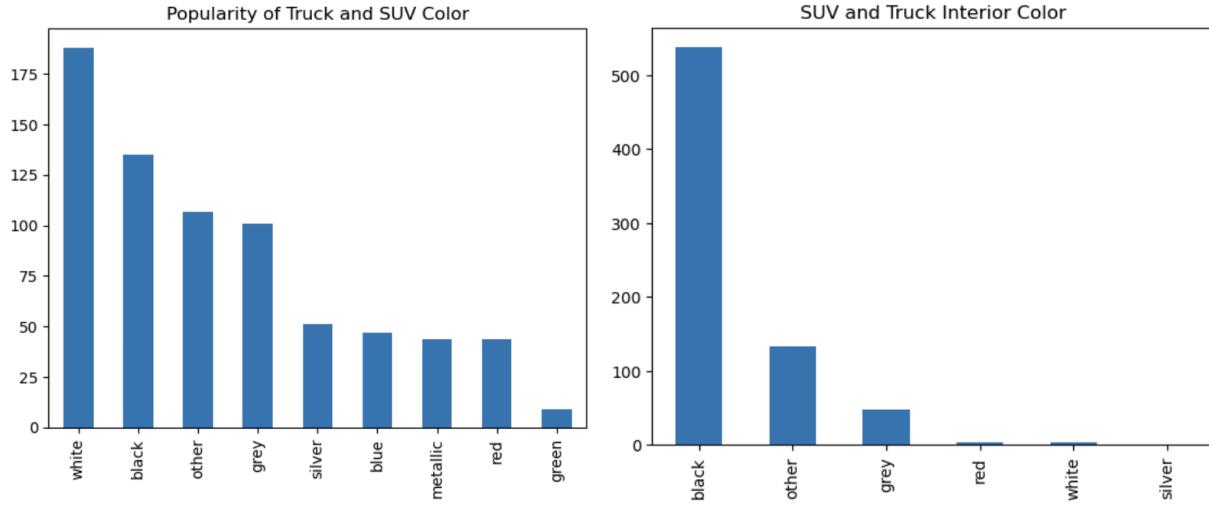


Figure 4. Color Choices for Interior and Exterior for Trucks and SUVs

Conclusion:

According to the data analyzed from the Vehicle 2024 Dataset, customers are primarily looking for SUV and Trucks, which make up ~87.14% (69.26% and 17.88% respectively) of vehicles sold in this dataset. Sedans only accounted for 6.24% of vehicles sold. Customers are primarily looking for SUVs and Trucks with All Wheel Drive or Four-Wheel Drive which accounts for 87.32% of purchases. Gasoline is the most popular choice for trucks and SUVs at 72.58%. Customers are also opting for darker color choices for both exterior and interior. The recommendation for car dealerships is to primarily focus their inventory on gasoline SUV and Trucks with Four-wheel or All wheel Drive. Jeep, Dodge, and Hyundai are the top selling makes and neutral colors are the most commonly bought amongst buyers in 2024. Car dealerships should aim to fill their inventory with vehicles with a price between \$20,000 and \$60,000 dollars due to the median price being \$46,835.00 with an IQR of \$22,827.00. According to the data, following this criteria should help car dealerships to match the demands of the market, creating a faster turn around in inventory and increase revenue.