Business Problem Statement

- Maverik is expanding their stores.
- They require a Predictive Model built to forecast sales for financial planning and the ROI.
- They want us to make recommendations based on our findings for Maverik to gain profit from their investment.

Project Objective

TECHNICAL ANALYSIS

Analyze the quantitative and qualitative data for seasonal patterns to enhance the accuracy of the model.

KEY METRICS

Find out the metrics that affect the sales and use that to make adjustments.

MODEL BUILDING

Create an efficient time series model capable of predicting the sales of new stores in their first year.

FINANCIAL ANALYSIS

Time-Series analysis that not only gives Maverik prediction for sales but also helps us in financial planning and ROI calculations.

UPDATE FORECASTS

To have a model that has daily forecasts that update as observed sales information comes in.

Adventure's Overview

Project Scope :
Analyze data from existing stores to identify trends, develop and evaluate the model along with validating our predictions.

Approach :
Collect and analyze data, identify relationships between metrics , create a model and provide business recommendations in accordance with the results observed.

Deliverables :
Analyze the mentioned performance metrics such as RMSE or MAPE to determine model performance.

EDA Overview

Average Food Service Sales by Year, Month and Week

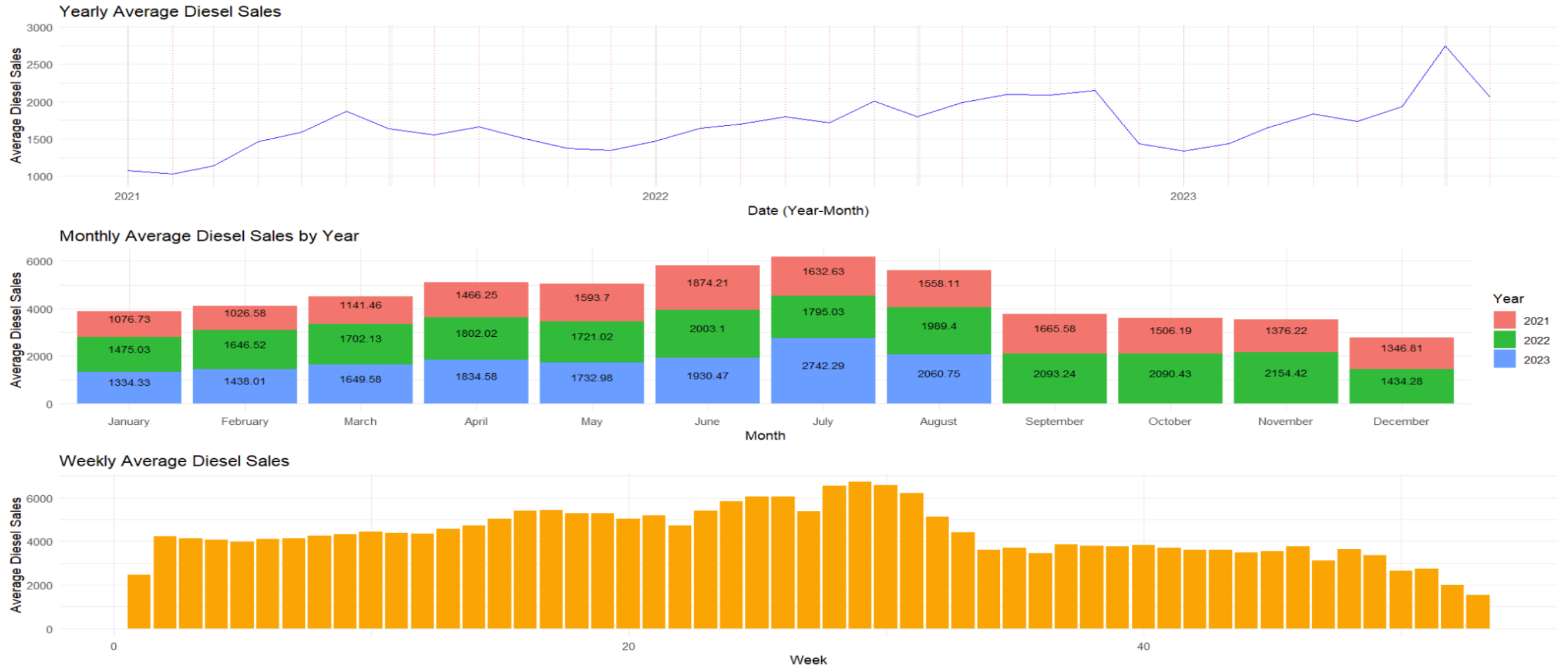- Sales were high during mid-year and tends to decline towards EoY.

EDA Overview

Average Inside Sales by Year, Month and Week

• Sales were high during mid-year and tends to decline towards EoY.
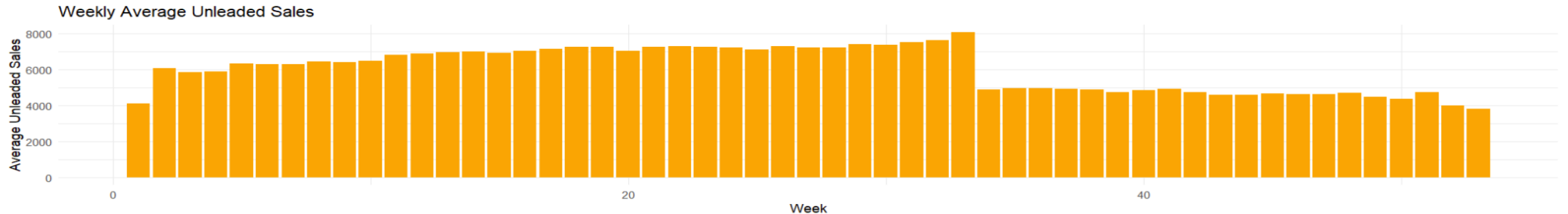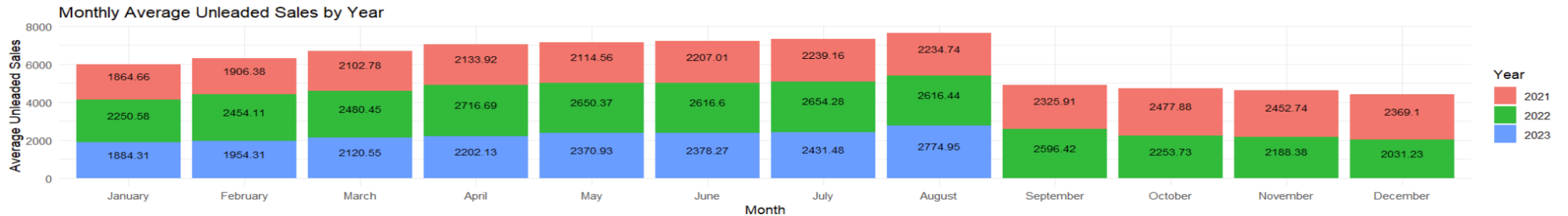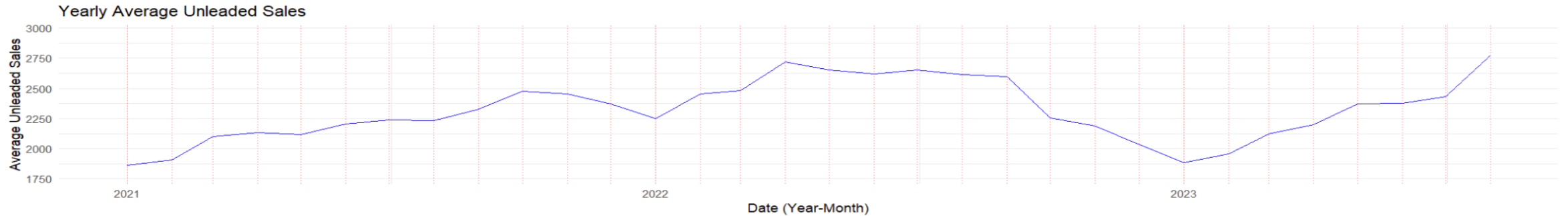
EDA Overview

Average Diesel Sales by Year, Month and Week

• Sales were high during mid-year and tends to decline towards EoY.

EDA Overview

Average Unleaded Sales by Year, Month and Week

• Sales were high during mid-year and tends to decline towards EoY.

Inside-Sales & Food Service Forecast Performance

	RMSE	MAPE
Inside Sales 2-week prediction	210,026	11.9%
Inside Sales 3-week prediction	209,926	9.0%
Inside Sales 6-month prediction	50,273	3.1%
Food Service 2-week prediction	25,378	7.7%
Food Service 3-week prediction	23,941	7.4%
Food Service 6-month prediction	11,350	4.3%

Diesel & Unleaded Forecast Performance

	RMSE	MAPE
Diesel 2-week prediction	335,975	20.6%
Diesel 3-week prediction	222,596	18.9%
Diesel 6-month prediction	26,183	3.8%
Unleaded 2-week prediction	201,561	12.6%
Unleaded 3-week prediction	201,656	12.8%
Unleaded 6-month prediction	27,316	2.3%

Results and Recommendations

FORECASTED TOTAL SALES:

Inside Sales	Food Service	Diesel	Unleaded	Total
$1,227,062	$338,871	$503,891	$983,141	$3,052,965

FACTORS AFFECTING STORE BUSINESS

- Diesel Sales

- Inside Sales

- Parking Space

- Toilet Count

- Population within 5-mile radius

- Number of individuals in workplace within 5-mile radius

Challenges

- Standardized Data Sets with limited number of rows.

- Multivariate Multi-target Analysis.

- Insufficient historical data to accurately calculate annual seasonality

- Unavailability of precise Geographical data.

- Time Constraints.