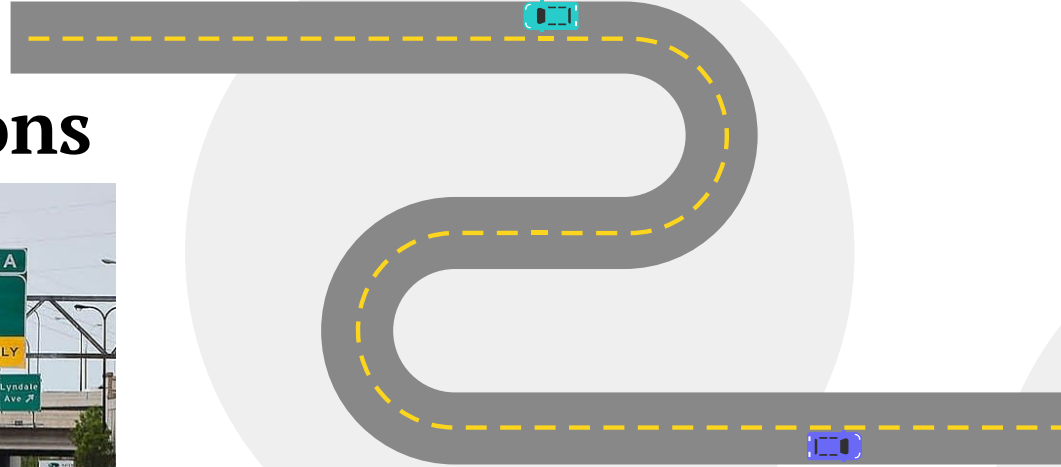


I-94 Traffic Volume Analysis & Predictions



Paul Schulken

Agenda

01

**Business
Understanding**

02

**Data
Overview**

03

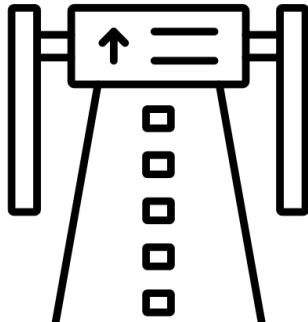
**Modeling &
Performance**

04

**Findings &
Recommendations**

05

**Future
Insights**



The background features a light gray surface with stylized winding roads in dark gray with dashed yellow lines. Three small cars are visible: an orange car on the bottom left road, a purple car on the top right road, and a small blue car on a road segment at the top center. Large, light gray circular shapes are also present in the corners.

01

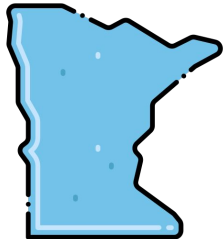
Business Understanding

Business Understanding



Stakeholder

Minnesota Department
Of Transportation (MnDOT)



Business Problem

Identifying Impact of Various
Features on I-94 Traffic Volume



Less Visibility, More Traffic

% Cloud Cover Most Important Factor


380 Vehicles

25% Increase in Cloud Cover = 9,500 Vehicles

Big Vegetables, Big Volume

State Fair Produces Above Average Volume



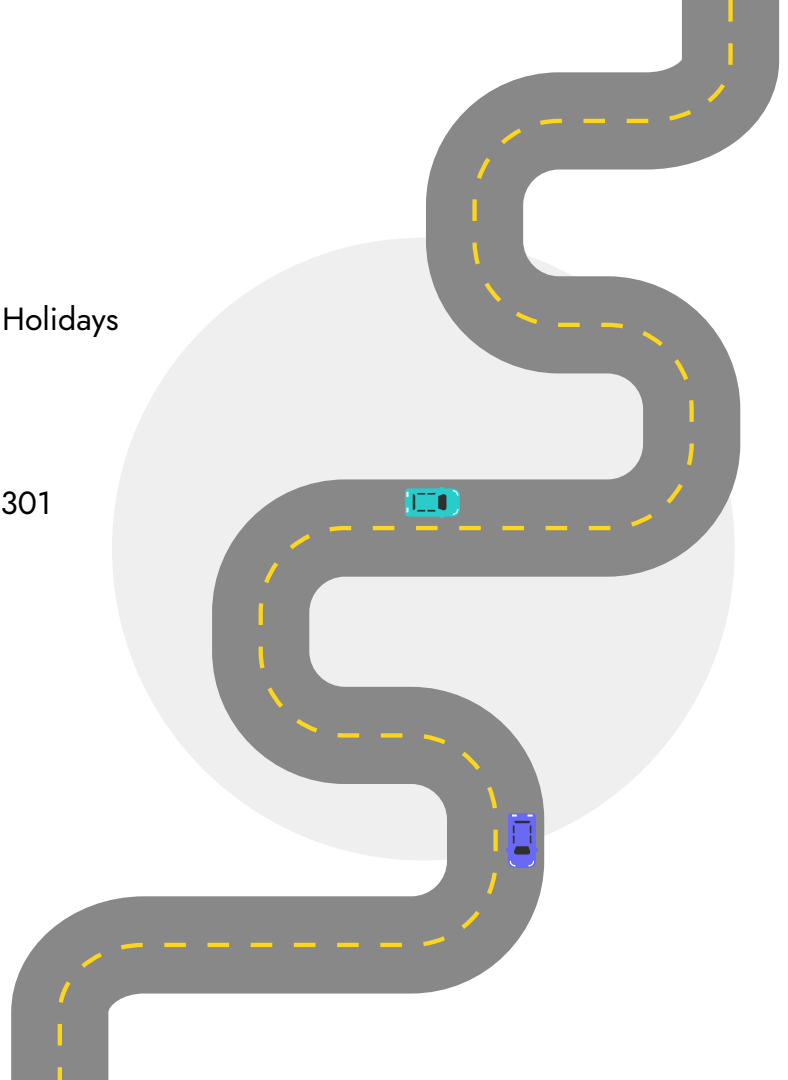
The background features a light gray surface with stylized winding roads in dark gray with yellow dashed center lines. Three small cars are visible: an orange car on a road in the bottom left, a purple car on a road in the top right, and a small gray car on a road in the top center. Large, light gray circular shapes are also present in the corners.

02

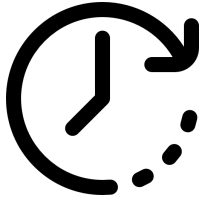
Data Overview

Data Overview

- Data
 - Hourly I-94 Westbound Traffic Volume, Weather, Holidays
 - 48,024 Entries from Oct. 2012 - Sep. 2018
- Source
 - MnDOT Automatic Traffic Recorder (ATR) Station 301
 - OpenWeatherMap
- Limitations
 - Did not Include Accident/Collision Data
 - Required Modification for Complete Time Series

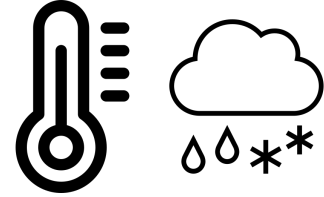


Data Modifications



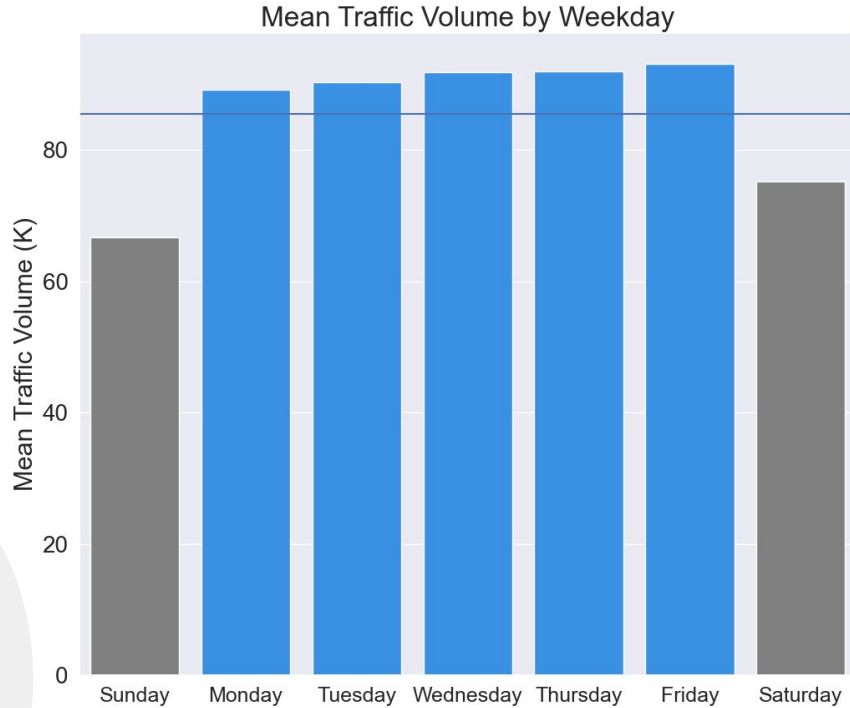
Data Downsampled from
Hourly to Daily Values

Incomplete Traffic Volumes
Replaced with Daily Averages

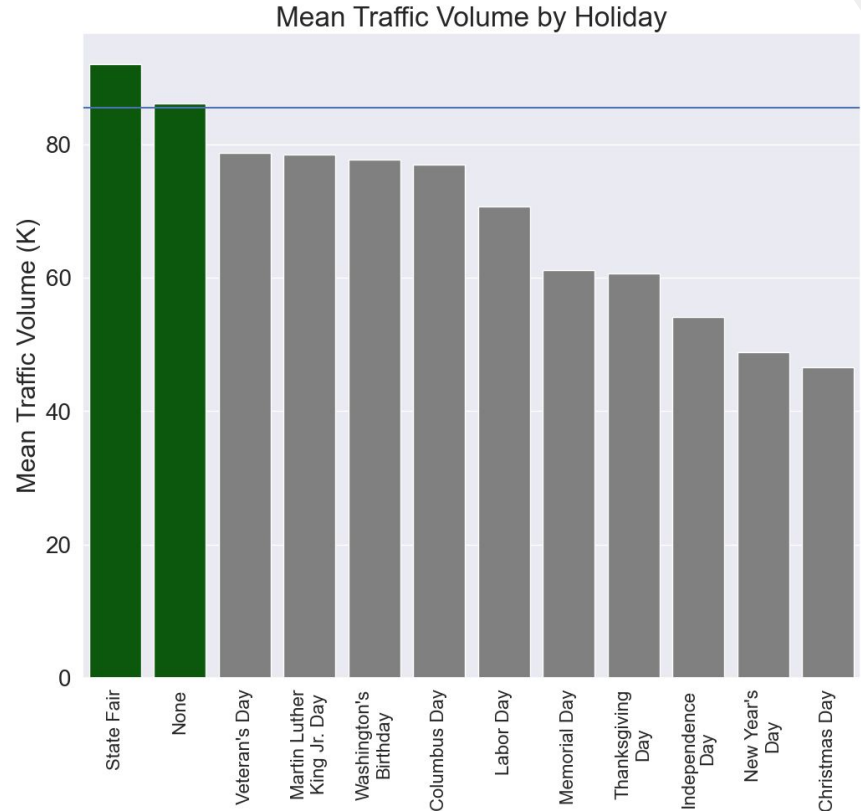


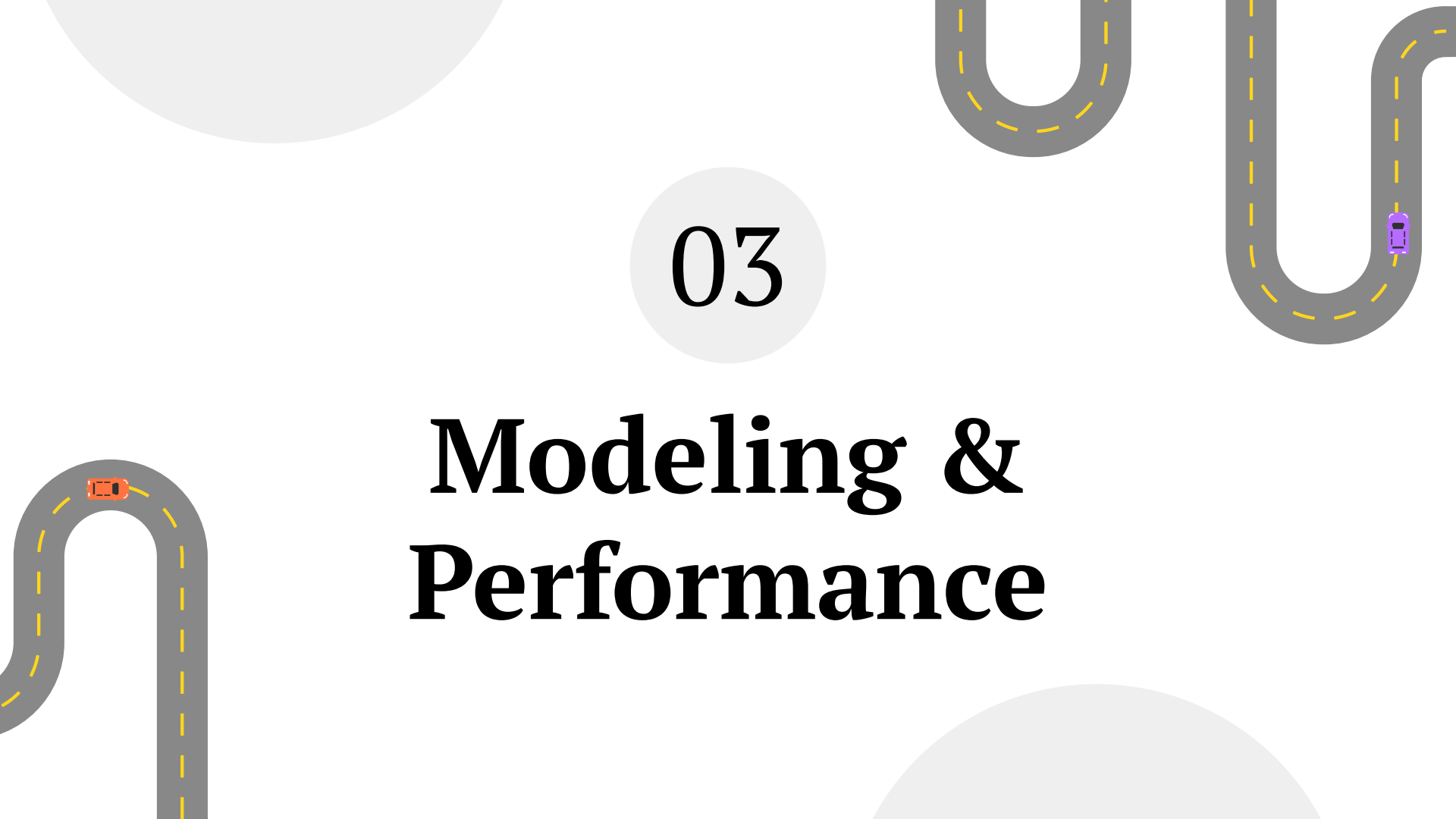
Temperature and Rain/Snow Values
Replaced with National Oceanic and
Atmospheric Association (NOAA) Values

Visualizing Traffic Volume



Mean Daily Traffic Volume = 85,493

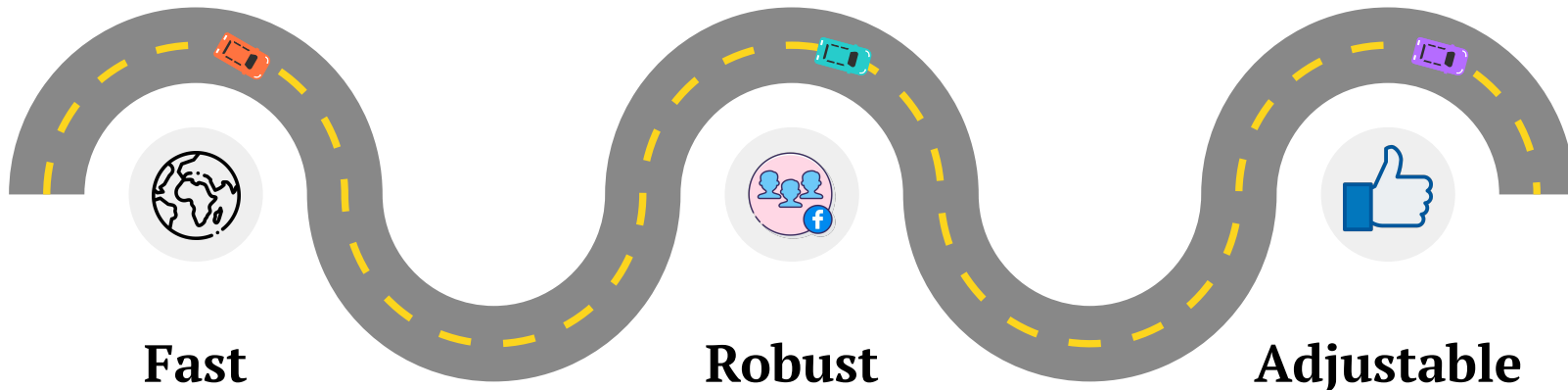


The background features a light gray surface with stylized winding roads in dark gray with dashed yellow lines. Three small cars are visible: an orange car on a road in the bottom left, a purple car on a road in the top right, and a small portion of a third car on a road in the top center. Large, light gray circular shapes are also present in the corners.

03

Modeling & Performance

Prophet Model



Open-Source Software
for General Forecasting Purposes

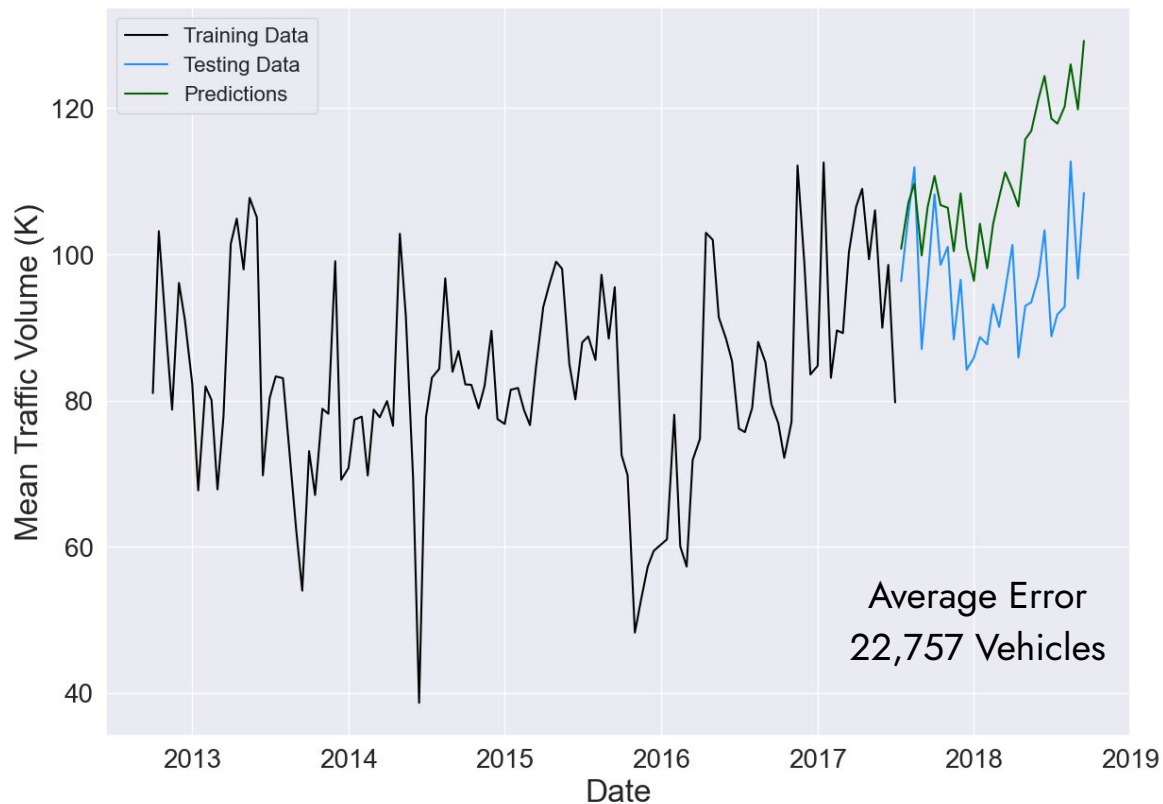
Works with Seasonality,
Holidays, and Outliers

Ability to Tune Based on
Domain Knowledge

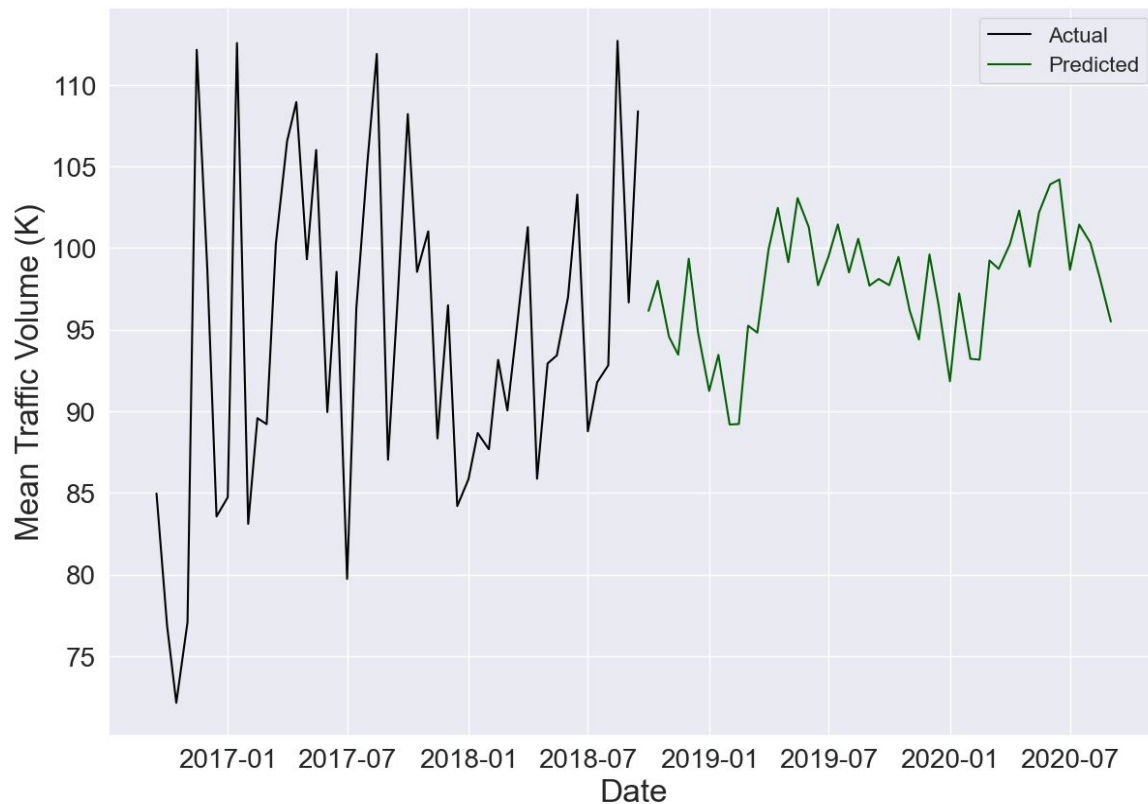
You can trust us
with your data.



Train/Test Split



Predictions for 10/2018 - 09/2020

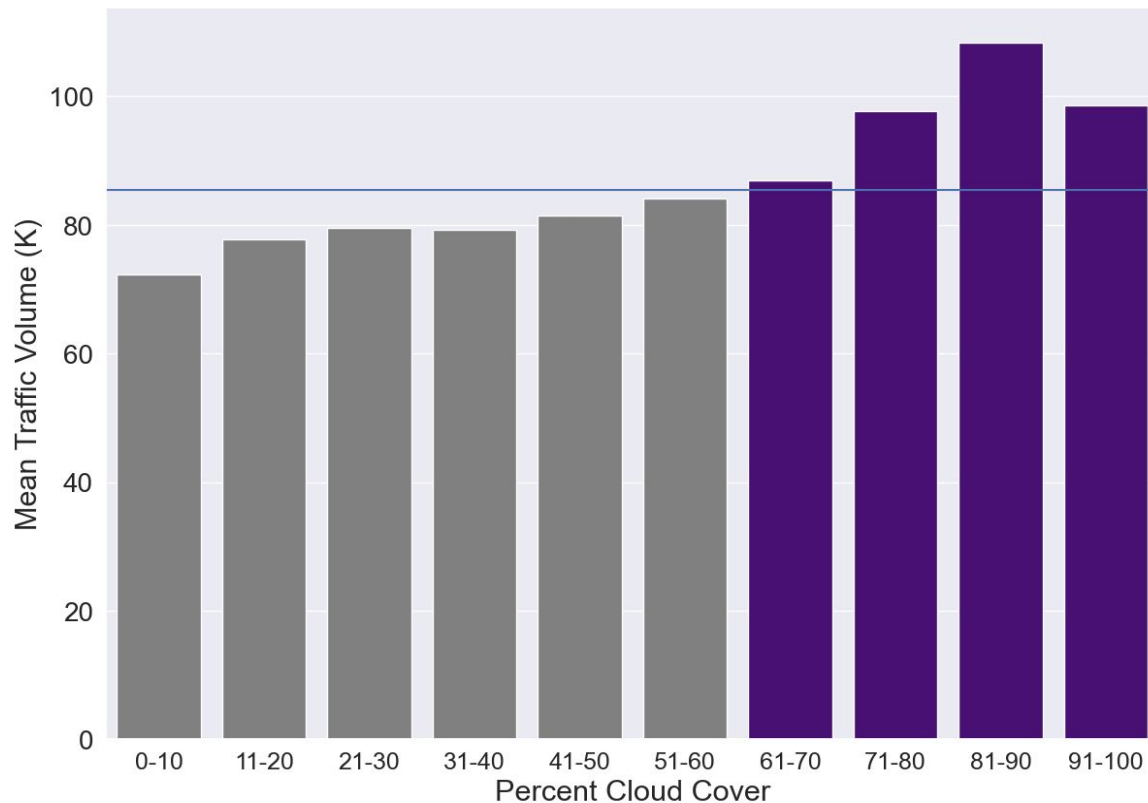


The background features a light gray surface with stylized winding roads in dark gray with dashed yellow lines. Three small cars are visible: an orange car on the left, a purple car on the right, and a small blue car at the top center. Large, light gray circular shapes are also present in the corners.

04

Findings & Recommendations

Purple Rain Percent Cloud Cover

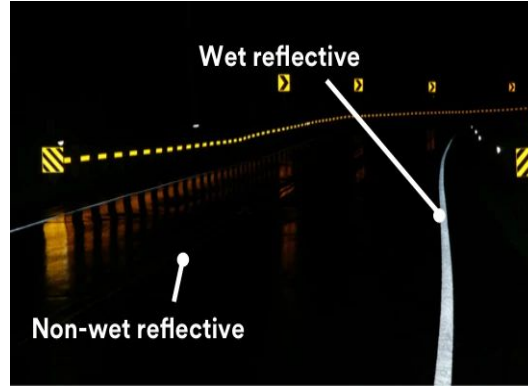


Recommendations



Lighting

Installation of
High-Mast Lighting



Reflectivity

Inspection of Reflectors,
Markings, and Signage



Public Transit

Promote Alternative Options
For High-Volume Events



The background features a light gray color with several stylized road segments. These roads are gray with dashed yellow lines and curve in various directions. Three small car icons are placed on these roads: an orange car on a road curving from the bottom left, a purple car on a road curving from the top right, and a small blue car on a road curving from the top center. Large, light gray circular shapes are also present in the corners of the frame.

05

Future Insights

**Additional
Data**



**Expanded
Holidays**

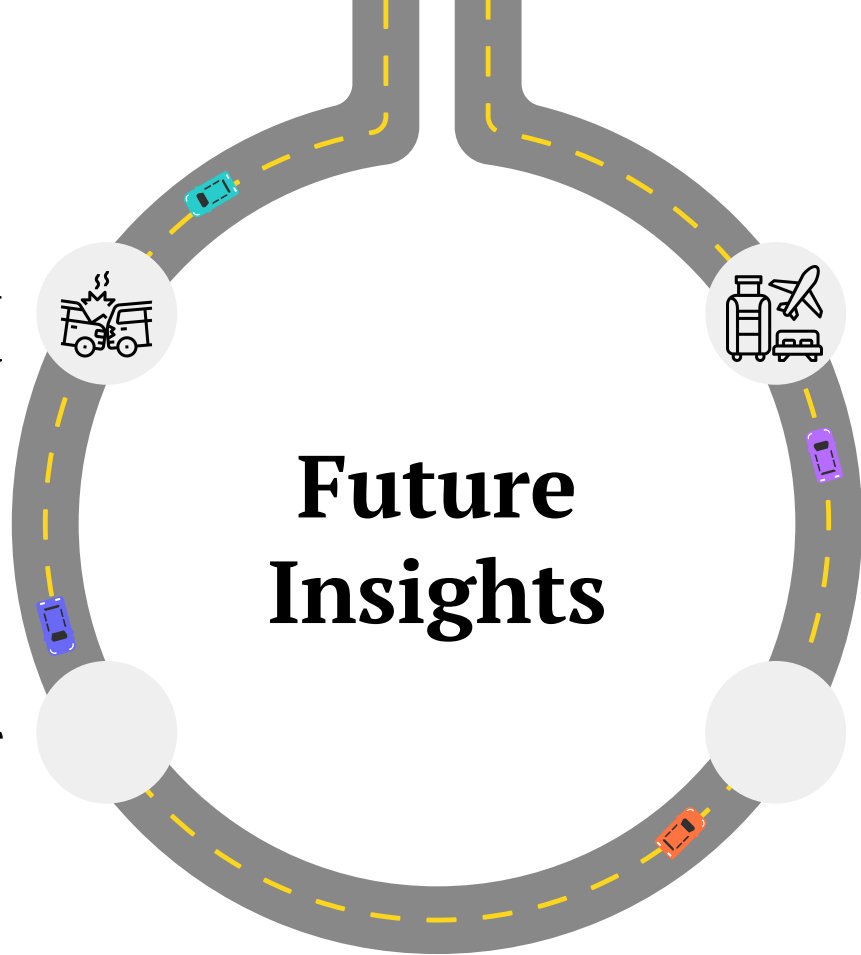


**Future
Insights**

Placeholder



Placeholder



Thank You

Paul Schulken

<https://github.com/pschulken>

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