I-94 Traffic Volume Analysis & Predictions

About Me

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B.S. in Civil Engineering,
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Agenda

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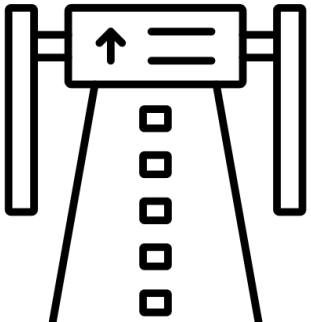


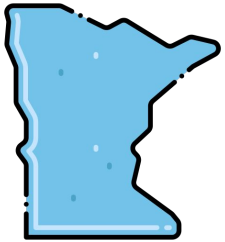
01

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

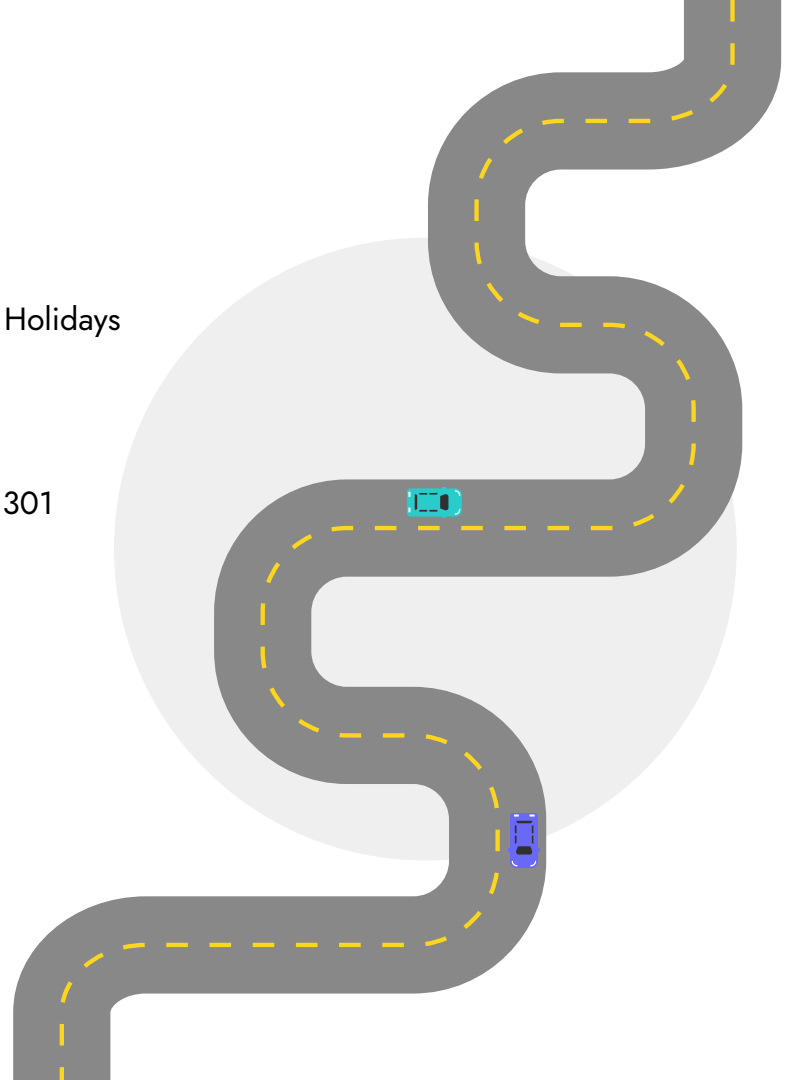
State Fair Produces Above Average Volume

02

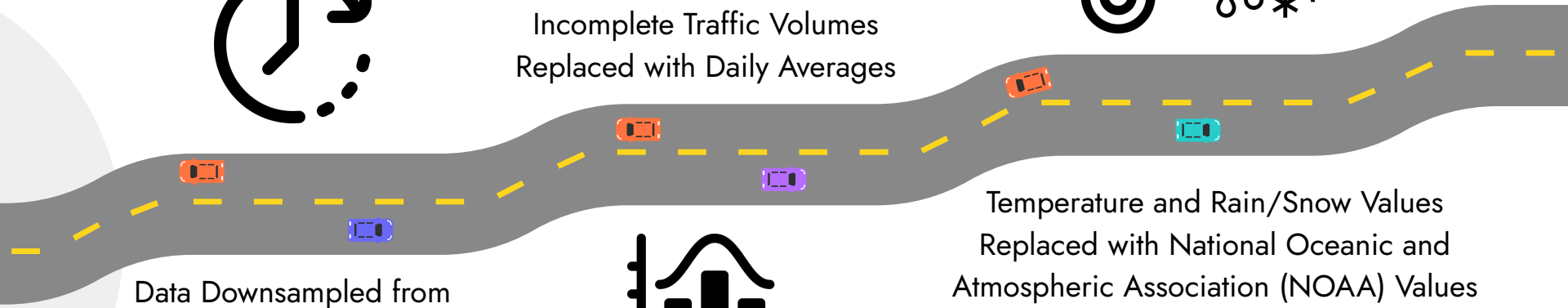
Data Overview

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

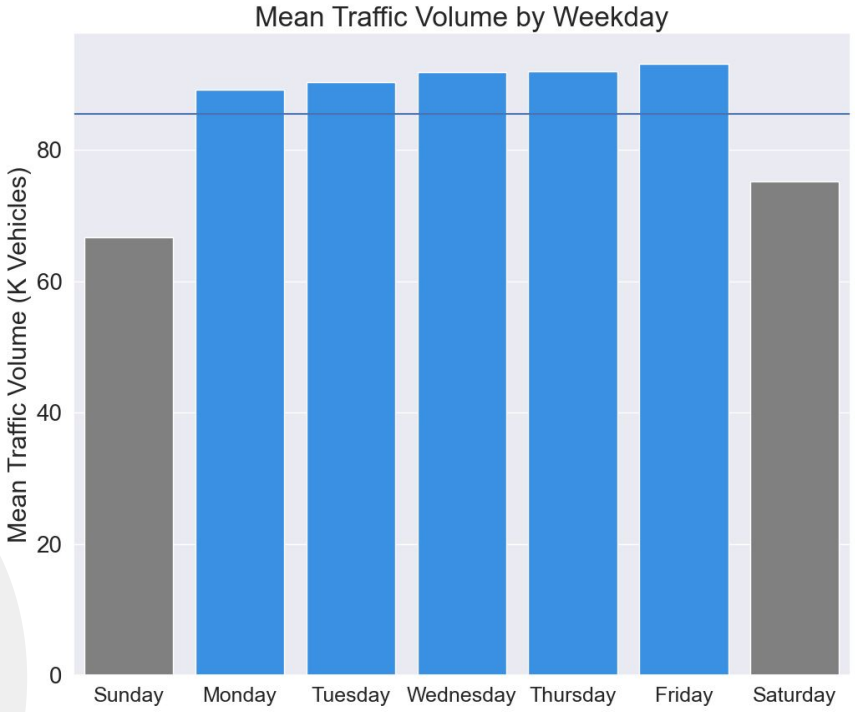


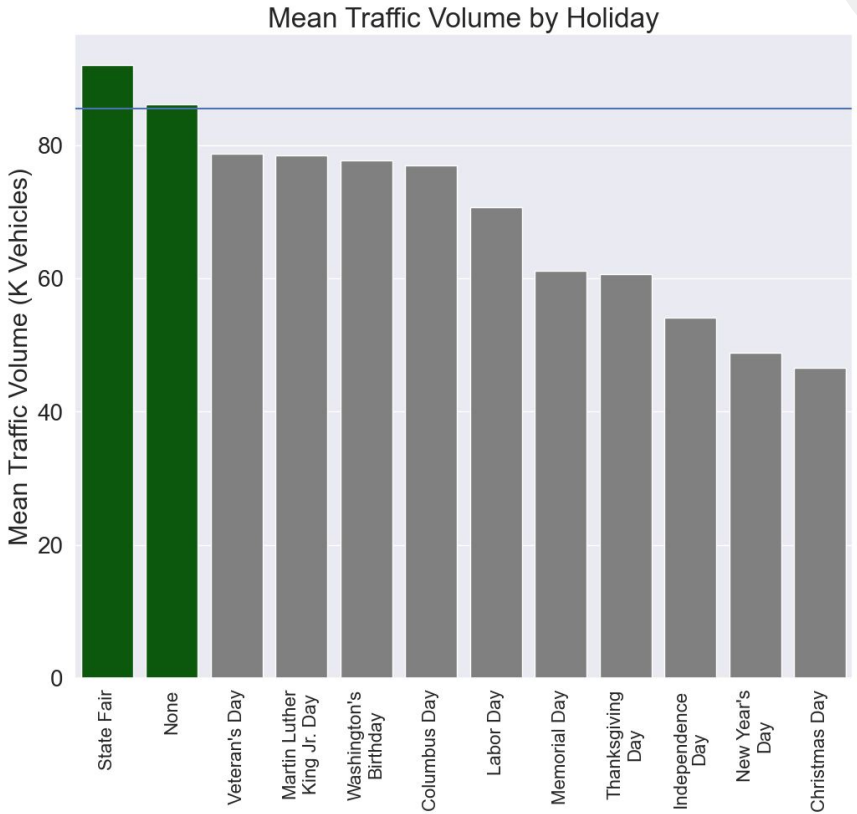
Data Downsampled from Hourly to Daily Values

Incomplete Traffic Volumes Replaced with Daily Averages

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

Visualizing Traffic Volume



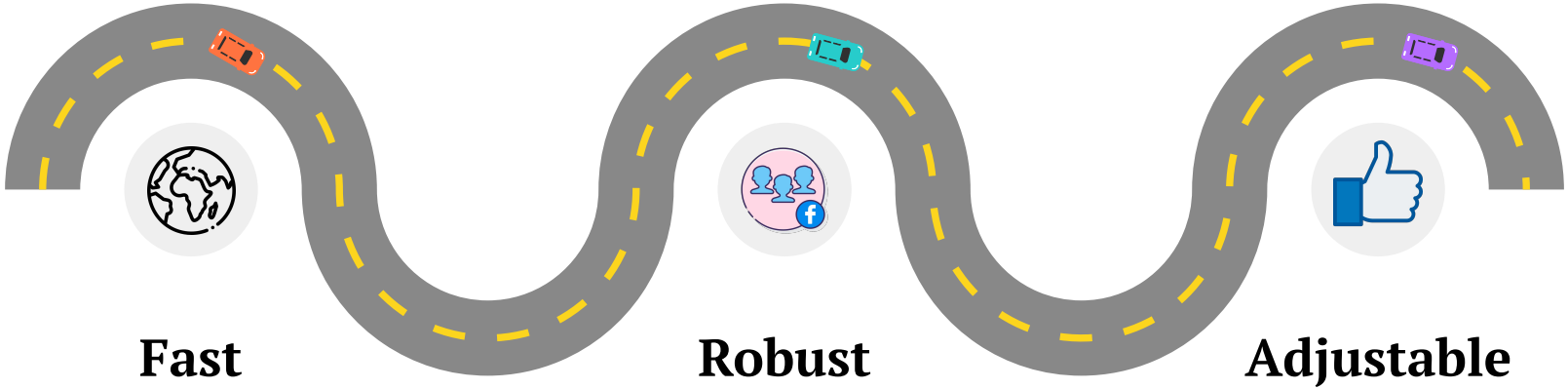


Mean Daily Traffic Volume = 85,493

03

Modeling & Performance

Prophet Model



Fast

Open-Source Software
for General Forecasting Purposes

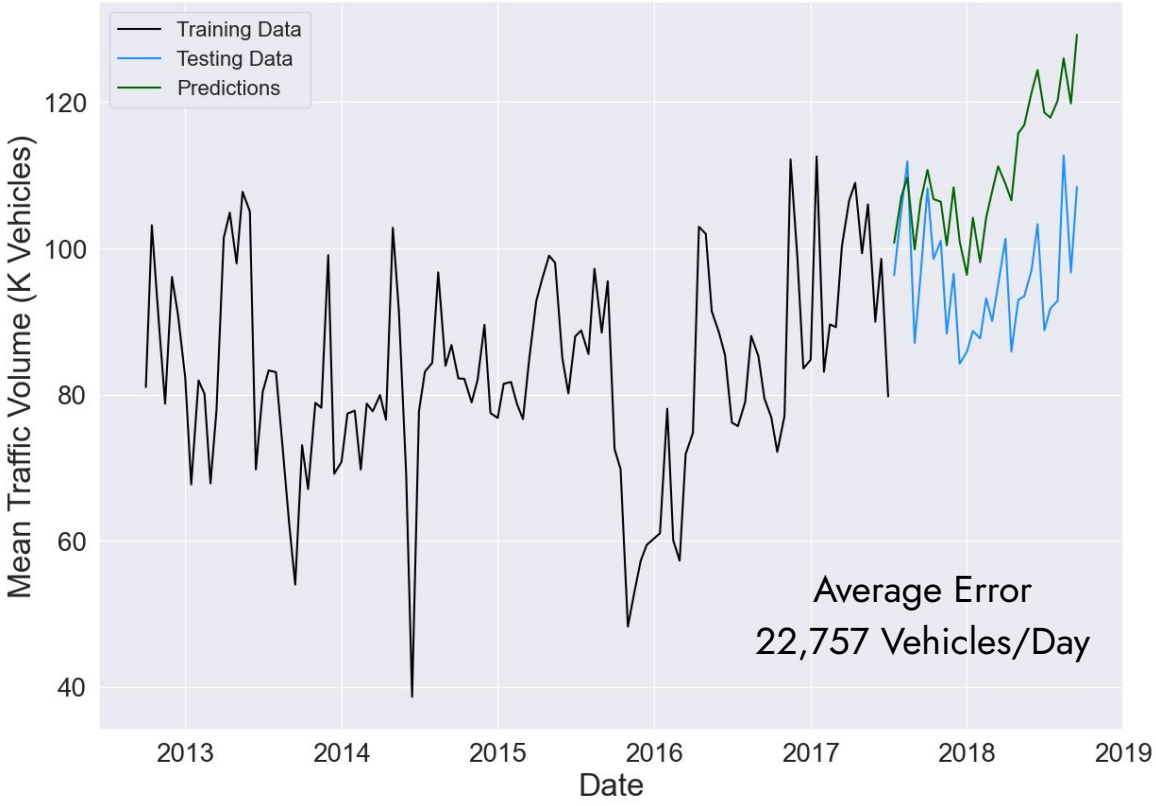
Robust

Works with Seasonality,
Holidays, and Outliers

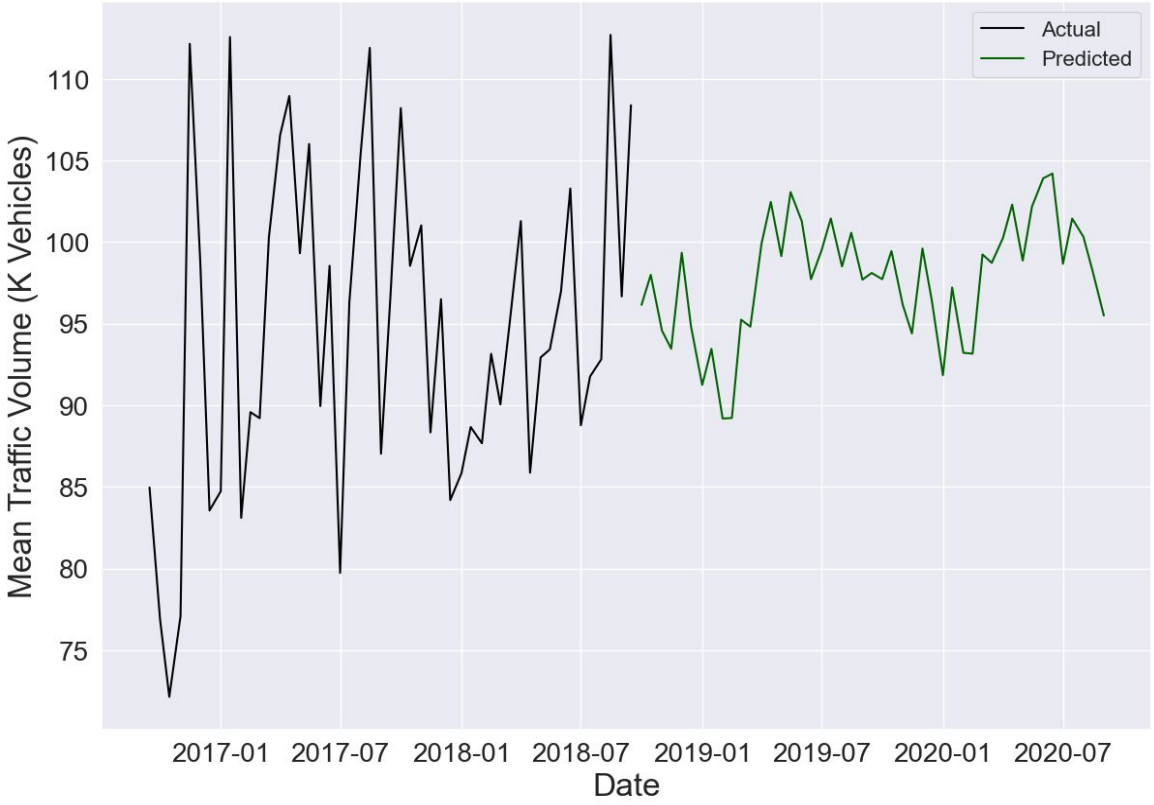
Adjustable

Ability to Tune Based on
Domain Knowledge

Train/Test Split



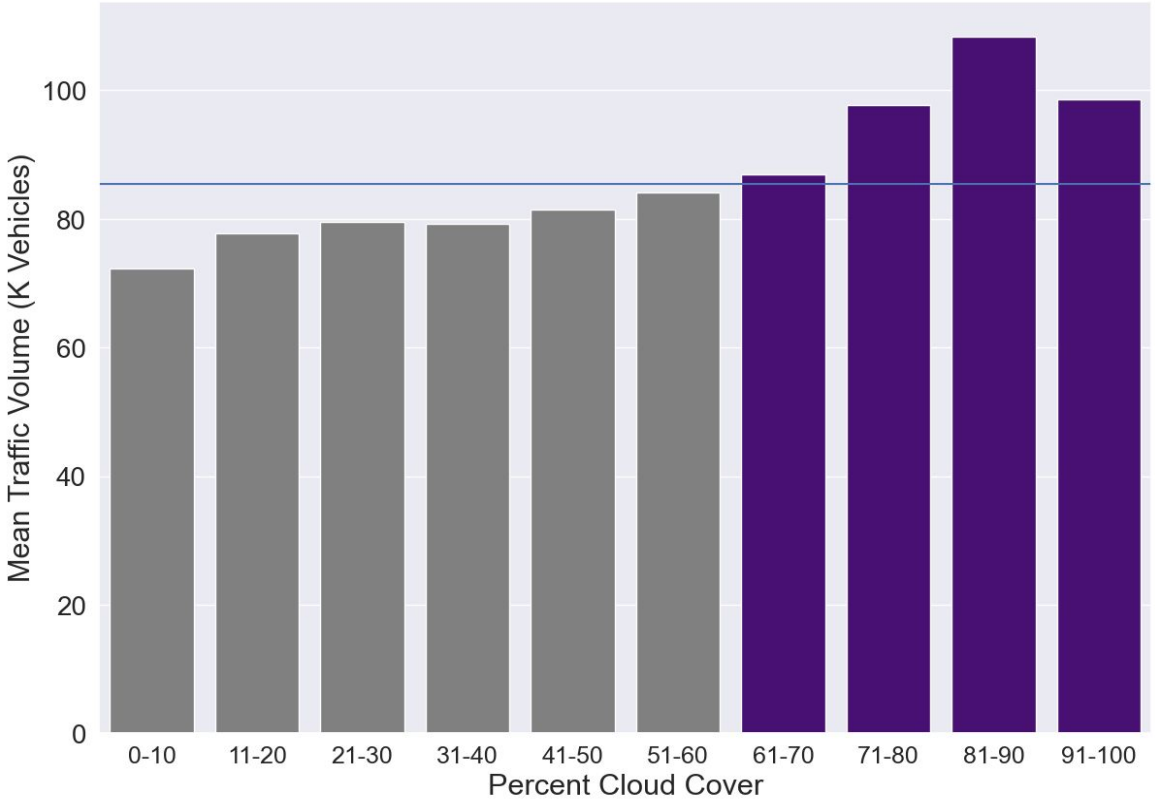
Predictions for 10/2018 - 09/2020



04

Findings & Recommendations

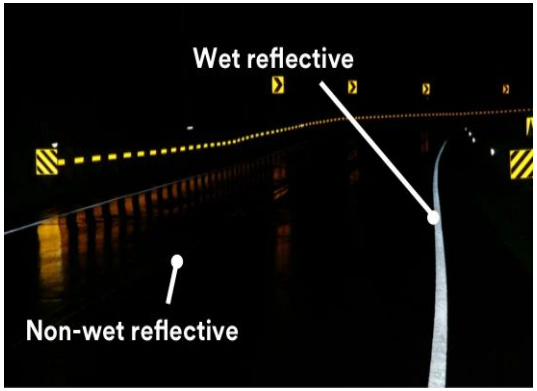
Purple ~~Rain~~ Percent Cloud Cover



Recommendations

Lighting

Installation of
High-Mast Lighting

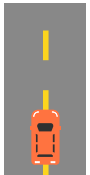


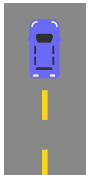
Reflectivity

Inspection of Reflectors,
Markings, and Signage

Public Transit

Promote Alternative Options
For High-Volume Events





05

Future Insights

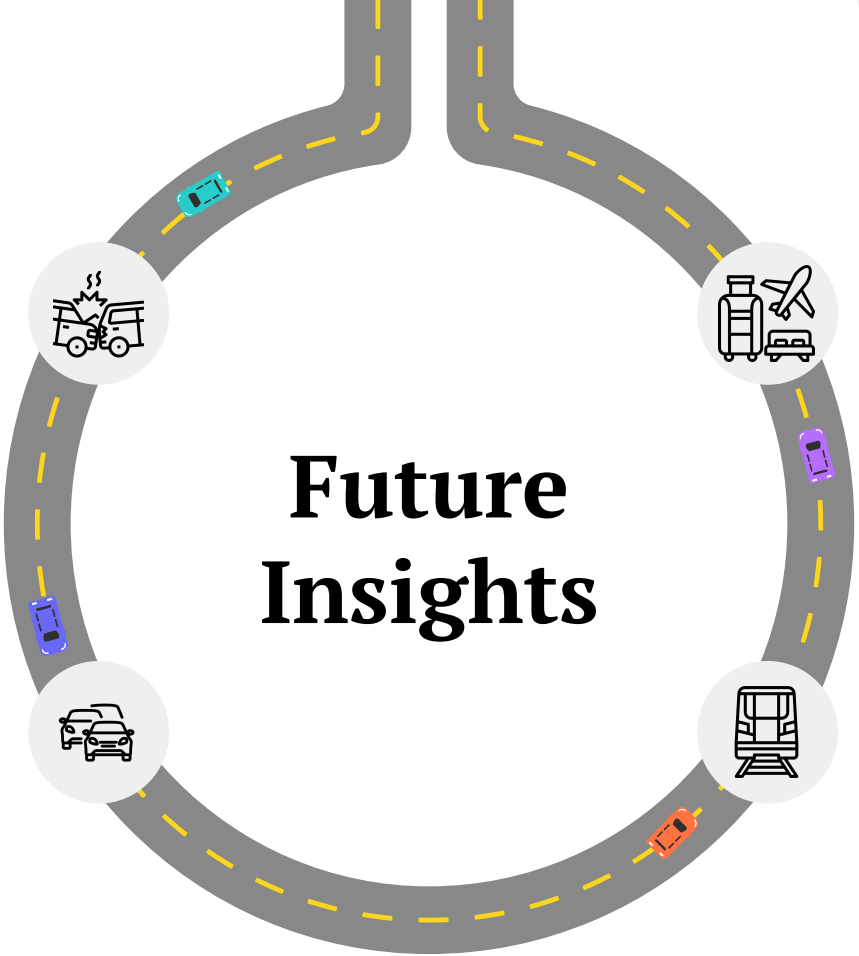
Future Insights

Collision Data

Expanded Holidays

Complete Traffic Counts

Impact of Light Rail



Thank You

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