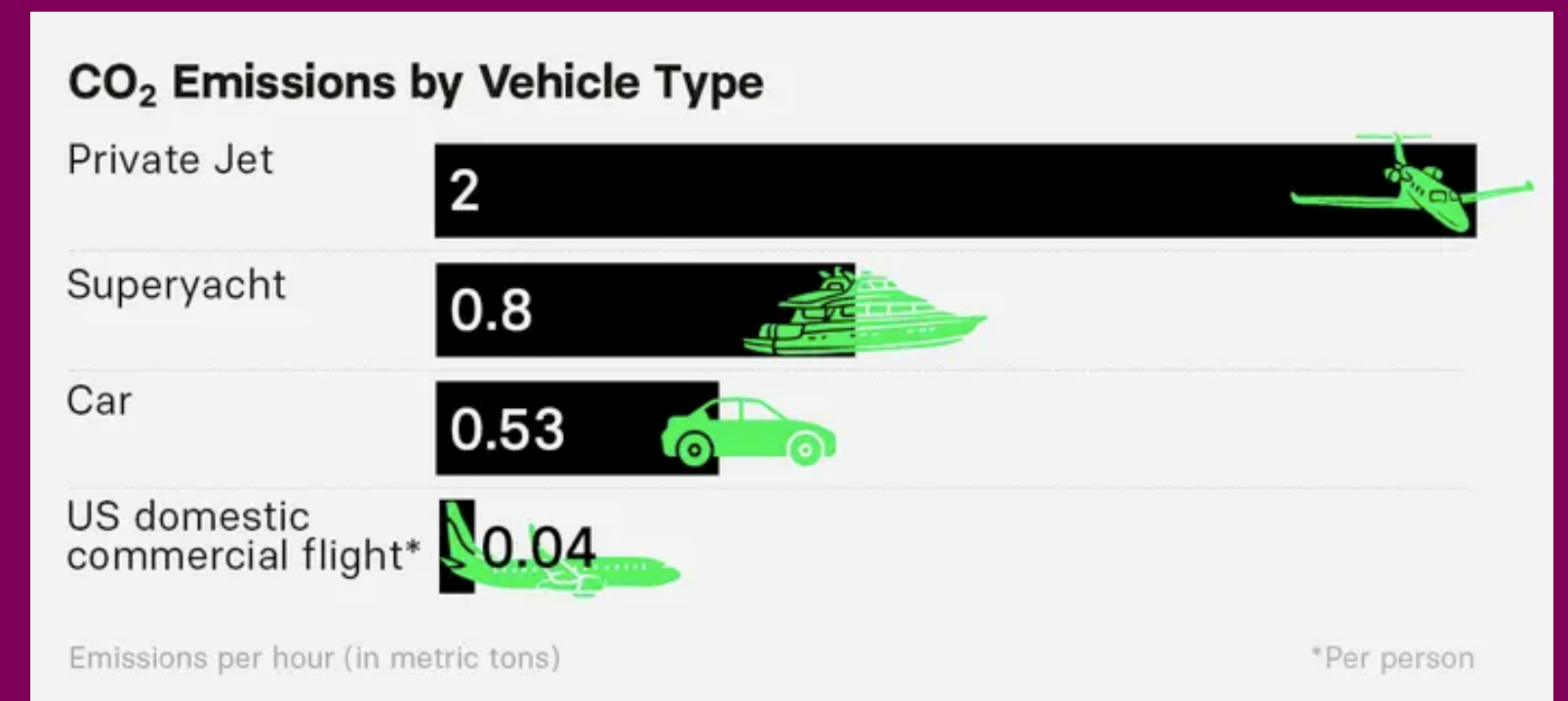# Flights Plans & CO2 Emissions
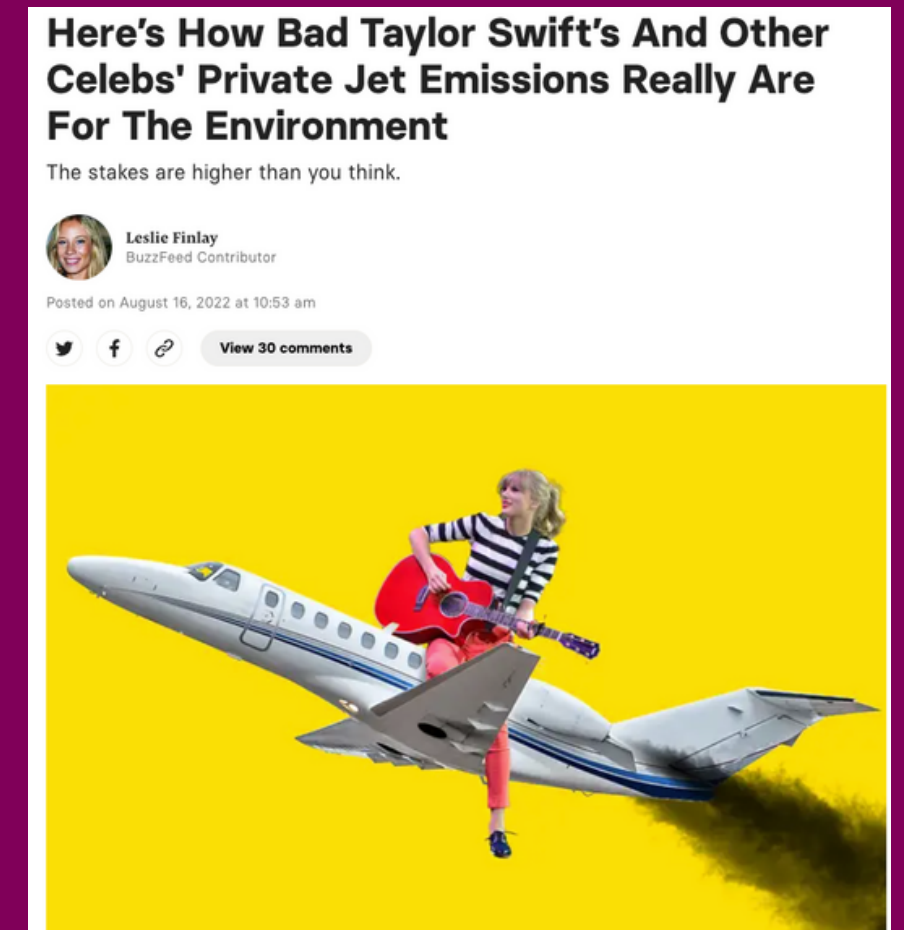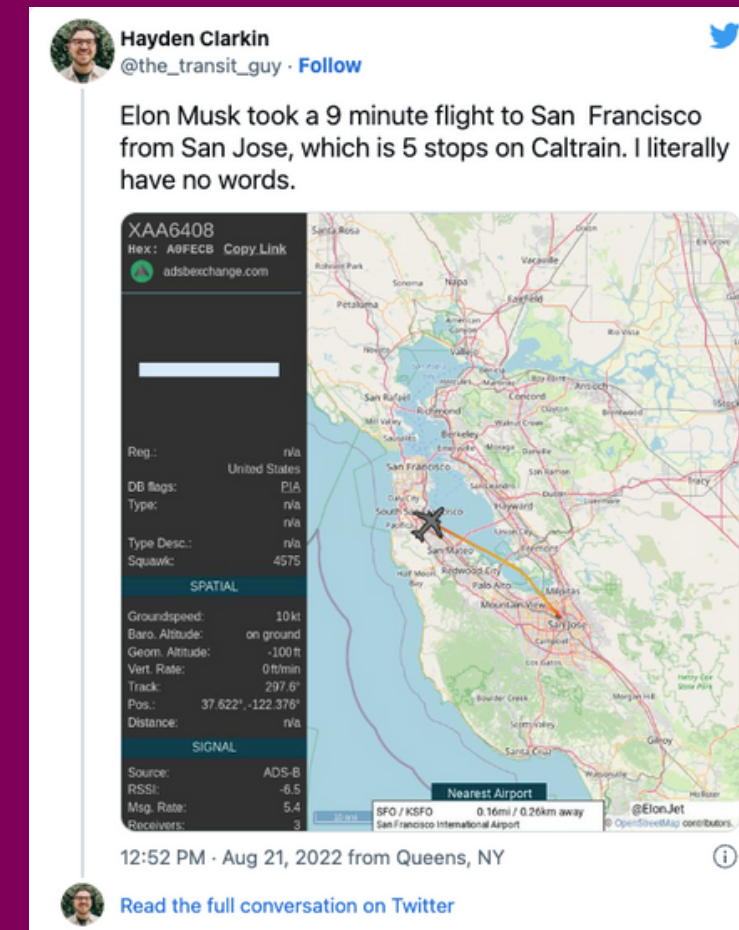
Presented by: Xenel Nazar
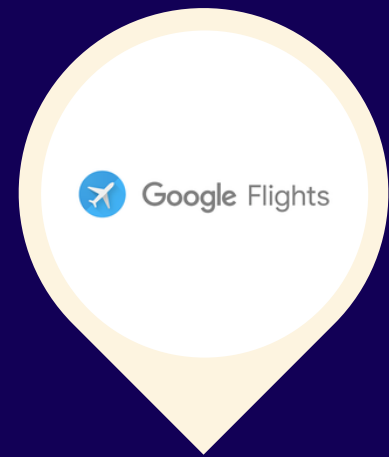
PROBLEM OVERVIEW

- People are more environmentally conscious about how they travel

- What can everyday people do to limit their impact on the environment when booking a flight?

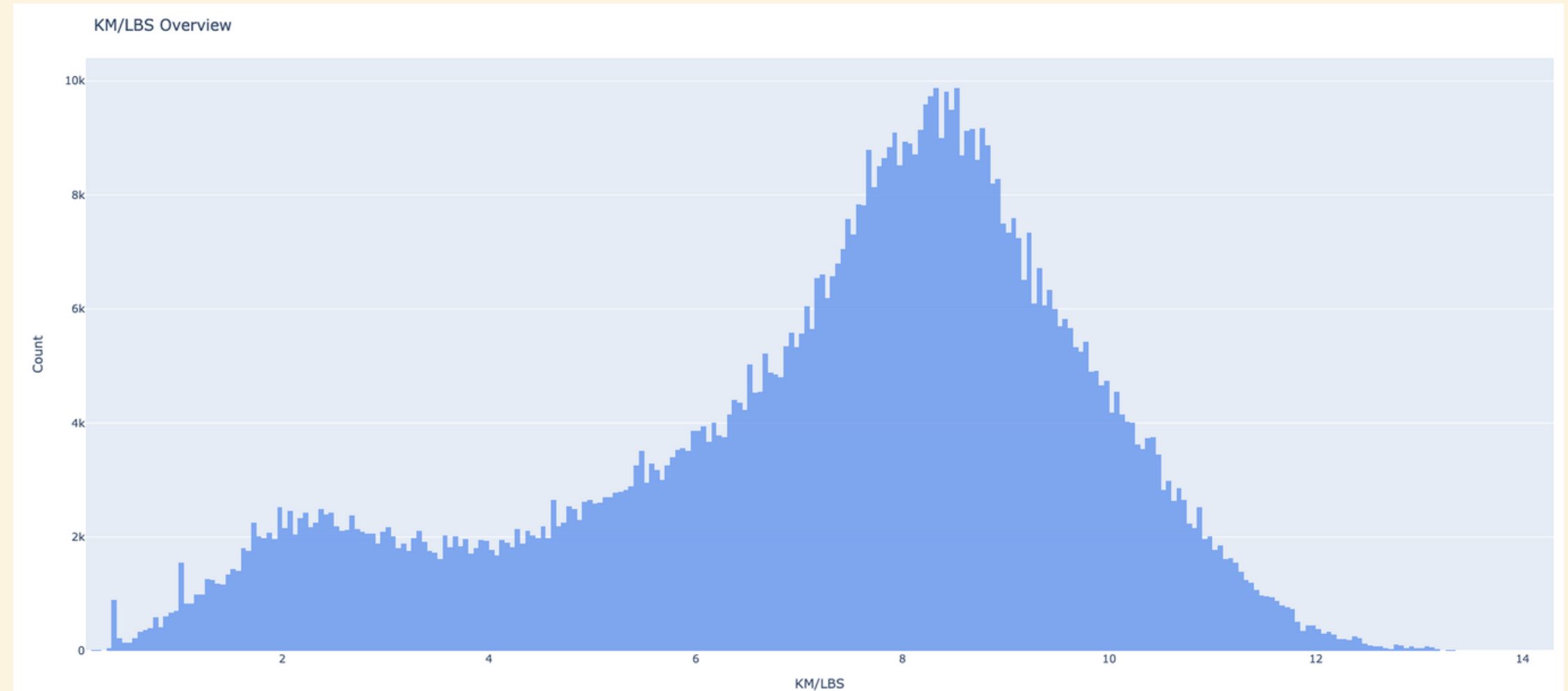- Provide the most environmentally friendly details for a given route

The Washington Post
Democracy Dies in Darkness

CLIMATE AND ENVIRONMENT

Celebrities use private jets excessively. It's a climate nightmare.

By Allyson Chiu

Updated August 2, 2022 at 8:22 p.m. EDT | Published August 2, 2022 at 3:12 p.m. EDT

Hayden Clarkin
@the_transit_guy · Follow

Elon Musk took a 9 minute flight to San Francisco from San Jose, which is 5 stops on Caltrain. I literally have no words.

12:52 PM · Aug 21, 2022 from Queens, NY

Read the full conversation on Twitter

Here's How Bad Taylor Swift's And Other Celebs' Private Jet Emissions Really Are For The Environment

The stakes are higher than you think.

Leslie Finlay
BuzzFeed Contributor

Posted on August 16, 2022 at 10:53 am

View 30 comments

CO₂ Emissions by Vehicle Type

Vehicle	Emissions per hour (in metric tons)
Private Jet	2
Superyacht	0.8
Car	0.53
US domestic commercial flight*	0.04

Emissions per hour (in metric tons)   *Per person

DATA OVERVIEW

Google Flights

TARGET EFFICIENCY

- High Efficiency / Utilization - 1
- Low Efficiency / Utilization - 0

KM/LBS Overview

Insights
- Most Efficient Trips: Cross-Country Trips vs Intra-Country
- Most Efficient Airline Operators: LCC vs National Carriers
- Most Efficient Aircraft: Long-Range vs Short-Range
- Optimum Number of Stops
- Optimum Departure & Arrival Times

Actions that can be taken
- Individuals:
  - Book Trips Efficiently
- Stakeholders (Airline Operators)
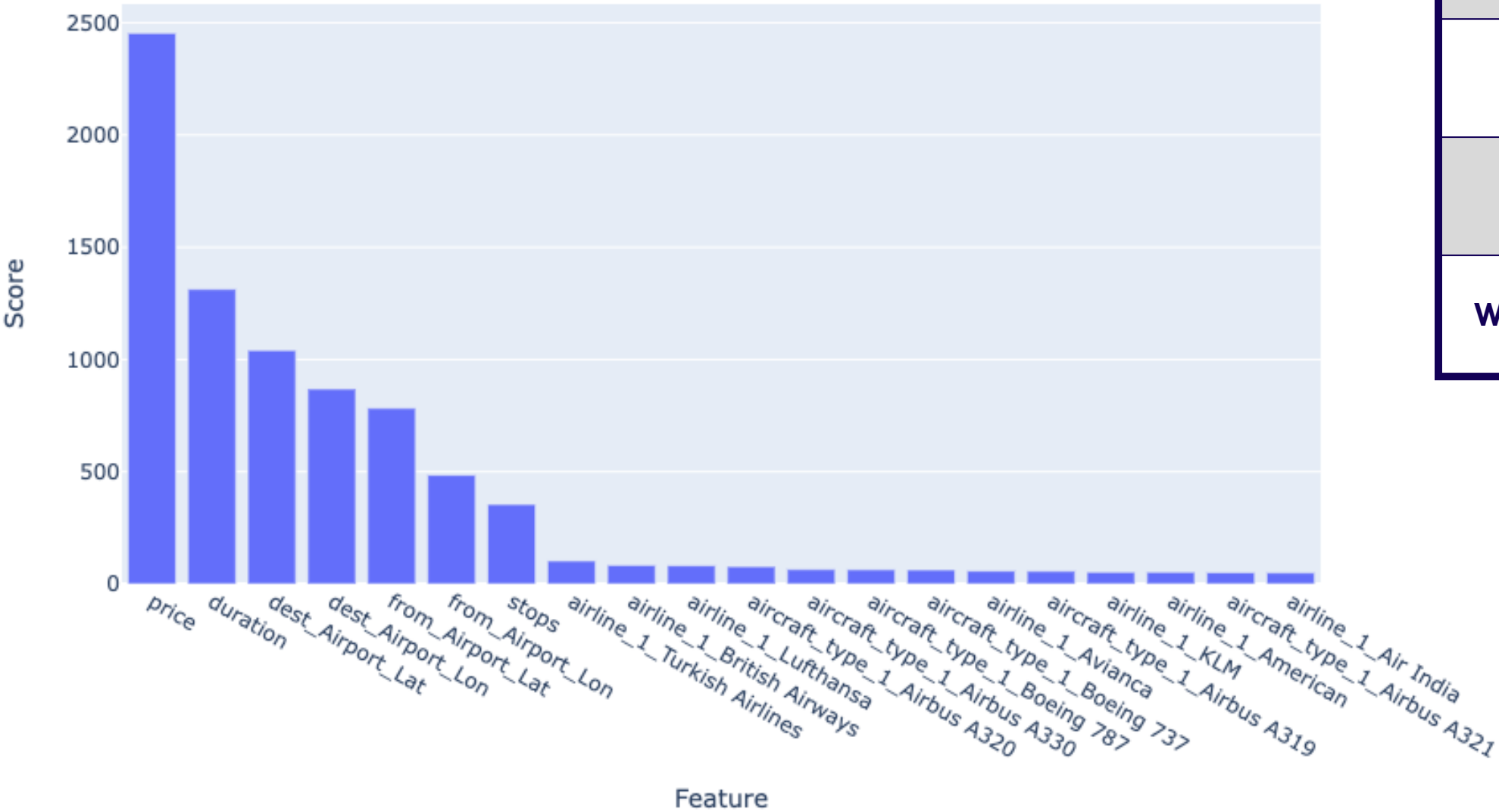 - Optimize Aircraft Fleet
  - Optimize Route Planning

MODELING

MODEL	RESULT
LOGISTIC MODEL	0.88
LOGISTIC-PCA MODEL	0.88
SVM MODEL	0.87
DECISION TREE (MAX DEPTH = 1)	0.86
RANDOM FOREST (N_ESTIMATORS = 50)	0.97
XGBOOST	0.96
DECISION TREE (MAX_DEPTH = 10, MIN_SAMPLES_LEAF = 1)	0.93
RANDOM FOREST (N_ESTIMATORS = 50, MAX_DEPTH = 10)	0.89
XGBOOST (N_ESTIMATORS = 40, MAX_DEPTH = 10)	0.97

EVALUATION

Top 20 Features by Feature Importance

CLASSIFICATION REPORT

	PRECISION	RECALL	F1-SCORE	SUPPORT
0	0.93	0.82	0.87	35,502
1	0.97	0.99	0.98	219,719
ACCURACY			0.97	255,221
MACRO AVG	0.95	0.91	0.93	255,221
WEIGHTED AVG	0.97	0.97	0.97	255,221

CONFUSION MATRIX

		PREDICTED	
		0	1
TRUE LABEL	0	29,281	6,221
	1	2,289	217,430

THANK YOU FOR LISTENING!

Don't hesitate to ask any questions!