**Executive Summary – Waze Project**

**Overview**

Waze, a navigation app used globally, aims to improve user retention by reducing monthly churn. This project analyzes app usage data to identify patterns that distinguish retained users from those who churn, supporting Waze’s larger business objective of sustained user growth. Exploratory Data Analysis (EDA) was conducted on behavioral and engagement metrics to uncover actionable insights that can inform a predictive churn model.

**Problem**

Approximately 18% of Waze users churn within a month. Without a clear understanding of which behaviors signal churn, Waze risks losing users who might otherwise be retained through timely intervention. The goal is to detect behavioral trends that precede churn and identify segments of at-risk users for targeted engagement.

**Solution**

We performed an in-depth EDA on 15,000 user records, focusing on activity variables such as sessions, drives, duration, distance, and onboarding time. To address skewness and extreme values, we capped outliers at the 95th percentile. Visualizations such as histograms, box plots, and pie charts were used to explore user behavior. Feature engineering included metrics like percent of sessions in the last month and kilometers per driving day, providing deeper insight into user engagement.

**Key Insights**

* Churn rate: Approximately 17.7% of users churned, while 82.3% were retained.
* Recent activity matters: Users with 40%+ of their sessions in the last month were significantly more likely to stay engaged.
* Outliers & skew: Most users had moderate app usage, but a small group of “power users” skewed distributions. These were capped to enable better model training.
* Tenure vs. churn: Longer tenure (as measured by n\_days\_after\_onboarding) did not guarantee retention. Instead, recent usage was a stronger indicator of user loyalty.
* Driving behavior: Users who drove very long distances but infrequently were more likely to churn, while frequent, moderate drivers showed higher retention.

**Next Steps**

* Develop and train churn prediction models (Random Forest and XGBoost) using engineered features.
* Test model performance and interpret key drivers of churn.
* Use churn risk scores to design retention strategies such as personalized notifications or rewards.
* Explore integrating app feature usage data for even more precise targeting.
* Investigate the cause of last-month engagement spikes in churned users for potential early warnings.

**Impact**

The insights from this analysis will enable Waze to:

* Identify high-risk users before they churn
* Improve retention through targeted, behavior-driven engagement
* Guide product development based on how usage correlates with user satisfaction
* Strengthen long-term user growth by focusing on engagement over tenure

By understanding when and why users disengage, Waze can proactively respond to usage patterns that signal churn—ultimately leading to increased retention and business growth.