# Azuga's Fleet Driver Scoring and Associated Risk

## An Azuga Data Science whitepaper

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## Introduction

Minimizing driving risk in a Fleet vehicle is a valuable project because accidents can significantly disrupt business operations and result in a net increase in costs of operations. In order to promote fleet safety, fleet managers are giving more attention to the monitoring and tracking of fleet driving behavior. Azuga's next-gen GPS vehicle tracking along with its Driver Score using events detected by the OBDII device can play an effective role in helping fleet managers measure safe driving and to set targets using such metrics.

## Azuga's Driver Scores

Azuga's Driver Score takes into account a contextual spatio-temporal index for each event, indicating whether the event took place under conditions of higher risk. For instance, a speeding event is evaluated in relation to set thresholds and Posted Speed Limits along with the time of event (High, Moderate and Low risk hours), the prevailing weather (snow or rain), magnitudes, durations and frequency. These factors are known predictors of crash events. A Driver Score for each day's driving is generated along with component scores for Braking, Speeding, Acceleration, Seatbelt use as well as Distracted Driving. The Driver Score reflects the 'risk' associated with the driver during that day and also allows drivers to be compared to each other, and for the same driver to be compared across time. How does it help predict crash events?

We've built accident risk models using three years of accident data from large commercial fleets and this shows that hard braking, hard acceleration events and speeding are strong predictors of accidents. Such events during high risk and peak hours increase risk.

# Azuga's Accident Models

Accident data ('Preventable' and 'Non-preventable') maintained by three large commercial fleets in the United States and Canada were obtained and correlated with behavior data for each of the drivers obtained from the data captured by Azuga's OBDII device. An analysis of summary statistics for driving behavior metrics show that mean values of these metrics appear to be different for drivers with accidents and drivers with no recorded accidents indicating that these factors could influence risk.

## Behavior and exposure risk model

*The risk is real. The risk is closer than it appears. ONE hard braking event for 100 miles of driving can increase the risk of an accident by 20.1%.*

We developed models for time-to-event (in days) with driving behavior parameters, time of day miles, proportion of unfamiliar stretches driven on and proportion of short trips as covariates. Of the behavioral parameters, average Hard Braking events per 100 miles is highly significant. Speeding violations were statistically significant for some fleets. Hard Acceleration events per 100 miles, although not statistically significant, is directionally consistent with the expected relationship.

Our models show that for every Hard Braking event per 100 miles, the risk of a Preventable Accident increases by 20.1% (2 events increases risk by 44.1%). Similarly, speeding for 1 minute above 80 mph for every 100 miles of driving increases the risk by 7% (10 minutes of speeding for every 100 miles doubles the risk). The risk is further affected by the time-of-day when these events are carried out.

## Azuga's Scores and Risk

*The risk is real. The risk is closer than it appears. A 10-point increase in the Driver Score reduces this risk of an accident by 57.4%.*

Azuga's average driver scores in the period was modelled with component scores (Acceleration Scores, Braking Scores and Speeding Scores) as predictors. The model parameters for Azuga's Braking and Acceleration scores are significant predictors and correspond with the event based model. A 10-point increase in the Braking, Acceleration and Speeding Scores decreases the risk of a Preventable accident by 26.3%, 3.3% and 24.0% respectively. For Azuga's Overall Driver Scores, a 10-point increase reduces accident risk by 57.4% indicating that Azuga's Driver Scores are strong predictors of an accident.

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## About Azuga

Azuga is a leading global connected vehicle platform, helping our customers turn data from vehicles and their use into intelligence that improves operations and safety while reducing cost and risk. Azuga provides reliable end-to-end solutions for commercial fleets, government agencies, insurance companies and automotive industry suppliers, through leading hardware technology, the Azuga One platform, award-winning fleet applications and data analytics.

Our award-winning Azuga Fleet solution is used by thousands of businesses—from the small fleet of a few vehicles up to several thousand—and is lauded by our customers for its ease-of-use, robust features and affordable pricing. Azuga is headquartered in San Jose, California, with offices across the globe.

## Please get in touch with Azuga to have your fleet's accident data analyzed