

The Bruinators

Actuary Consulting Firm

Executive Summary

The Bruinators Actuary Firm is a national leader in actuarial consulting, specializing in property and casualty services. Our client, UCLA, has hired us to determine the most profitable approach to enhancing safety features on university owned automobiles, while at the same time increasing the safety of its students and faculty.

This report will explain the analysis leading to our conclusion that the optimal decision for UCLA is to add forward collision systems, adaptive headlights, and lane departure warning systems to new automobiles, while adding rear camera systems to the new and old automobiles that have 5 years until the end of their useful lives. Our calculations were based off of the excel spreadsheet of collision losses provided by the client, as well as research using cars.com, kbb.com, and digicast.com. Furthermore, this report organizes its relevant information by department in order to make the analysis easily accessible.

Risk: If UCLA decides to implement the proposed safety features, the projected 5 and 10-year Return on Investment (ROI) is 4.2% and 4.9% respectively. According to Bloomberg's Projected U.S. Treasury Yields, the 5-year ROI for U.S. treasury bonds is only 1.34%, while the 10-year ROI is 1.87%. The Bruinators used these projections as the safest comparisons to the projected ROI's calculated from savings on collision losses due to the new safety enhancements. This investment in safety technology can be considered safe due to the low fluctuation in the expected equipment and repair costs. The risk in going with the safety technology adjustments is on par with UCLA's current investment in the U.S. treasury, if not lower, and the safety technology adjustments give a higher projected ROI.

The ROI projection reflects an increase in savings, as well as a reduction in frequency and severity, seen with the implementation of safety features. UCLA will expect to save \$200,000 per year in auto costs, due to a decrease in frequency (-23.74%) and severity (-\$210) of accidents. UCLA will then save an additional \$37,000 per year for the first 5 years because of a decrease in worker's compensation payments, and then an additional \$47,000 per year on compensation costs after replacing the old automobiles with new vehicles that include all four safety adjustments.

Operations: The two components of operation costs are training and repair costs. Two options are viable for training drivers. The recommended method is to produce a training video. Websites such as digicast.com and nmlink.com reveal that one minute of a professional video costs about \$1,500 to produce. Thus, with a five minute training video, the one-time production cost will be around \$7,500. Alternatively, orientation costs are calculated based on the number of orientation conducted per quarter, the length of the orientation, and the wage paid per hour. Using the parameter that the initial orientation session will include nineteen orientations, the subsequent quarters will include four orientations, each orientation will require three hours of labor, and wages will start at \$11 per hour. Taking into account these factors, the cost per orientation comes out to around \$7,300. This cost closely matches the one time video production cost, but could be considerably higher depending on the number of orientations implemented per quarter. Therefore, because of the unvarying nature of the car enhancement features, the video option is recommended.

Websites such as cars.com and kbb.com assume an estimated annual fee of \$400 to repair a single automobile. Thus, taking a fraction of this amount for the five implemented features, the annual repair cost comes to around \$50 per car. This cost, projected over 10 years, results in around \$238,000.

Finance: The Financial Department of UCLA is concerned with getting the highest return on investment and making sure that their money is spent wisely. Based on our analysis of the loss cost data, as well as our research on costs of chosen safety features and other variable costs, the Bruinators believe that investing in these features will give UCLA a higher yield rate compared to investing in low risk U.S.

treasury bonds. This makes the safety features our recommended choice of investment. A breakdown of the expected costs for implementing the safety features can be found in our presentation, including safety feature costs, loss costs, training costs, repair costs, and worker's compensation costs. Safety and training costs are a one-time payment, while loss, compensation, and repair costs are annual payments. Based on our calculations over the span of 5 years and 10 years, UCLA would be saving approximately \$82,000 and \$270,000 respectively, if they choose to install the recommended safety features on new vehicles.

Marketing: UCLA has the ability to create a marketing campaign off of its enhancement in safety. Advertisement posters and mailed brochures could exponentially increase the amount of applicants applying to UCLA every year, making it the most renowned 4-year university in the U.S. There's also a potential partnership to be made between the National Highway Traffic Safety Administration (NHTSA) and UCLA.

Alternative: Based on our research and calculations, applying forward collision systems, lane departure warnings, and adaptive headlights only to new cars reduces frequency of claims by 18.24%, which is the second highest reduction among all possible alternatives. While our best choice saves around \$82,000 over a 5-year period and \$270,000 over a 10-year period, our alternative option will result in a total saving of around \$66,000 and \$215,000 accordingly. Since this option requires lower initial investment and avoids the installations on old vehicles, we consider only enhancing new vehicles a sound alternative.

Conclusion: Due to its favorable return, the investment in forward collision, adaptive headlight, and lane departure warning enhancements on new vehicles, along with adding rear cameras on vehicles with 5 years until the end of their useful lives, is considered by the Bruinators to be the optimal course of action. Additionally, the vehicles that must be salvaged in 5 years should then be enhanced by all the safety features in order to maximize the ROI.