

NAU: THE BUSINESS CASE FOR IMPROVING ON-CAMPUS TRANSPORTATION

*Susan K. Williams, The W. A. Franke College of Business, Northern Arizona University, Flagstaff, AZ
86011 Susan.Williams@nau.edu*

Joshua Williams, Equity Methods, Scottsdale, AZ

*Joe Anderson, The W. A. Franke College of Business, Northern Arizona University, Flagstaff,
86011 Joseph.Anderson@nau.edu*

ABSTRACT

Josh Williams finished reading the email. The meeting with David Bousquet, Senior Vice President of Enrollment Management and Student Affairs at Northern Arizona University (NAU) in Flagstaff, Arizona was set for May 9, 2013. At the meeting, Josh, a graduating MBA student at NAU, would discuss his analysis for replacing the current bus fleet for on-campus transportation with a low speed, high capacity, and high efficiency (LSHCHE) bus. Ridership had doubled and NAU anticipated a 15-20% increase in student enrollment over the next 8 years. In addition to the discounted cash flow analysis, Josh planned to discuss how this LSHCHE bus fit with the university's goals for carbon neutrality and improved customer service. Josh had estimated several of the discounted cash flow model parameters in his analysis and he thought additional analysis on the uncertain estimates was warranted. On the surface, the economics of the new bus looked promising, and it would certainly save the university money on operating costs. But would these savings be enough to offset the purchase price of the bus? Additionally, the uncertainty of which bus model would be approved for use on the school's narrow roadways, and the potential cost savings of the LSHCHE bus over the university's other plan for articulated buses, would need to be addressed in order to be prepared for the meeting with the Senior VP.

In this case for classroom use, students have the opportunity to develop a major capital investment business case for a mid-sized university. Students have sufficient data to develop a discounted cash flow analysis to compare three scenarios: continuing with the current bus fleet, investing in low speed, high capacity, high efficiency buses, or adding articulated busses to the current fleet. Students are asked to create a fully flexible spreadsheet in order to be able to perform sensitivity analysis and predictive modeling. Some of the inputs for the model must be estimated by the students: yearly fuel increase, student enrollment increase, and discount rate. This provides the opportunity for a discussion in class as to how these inputs should be determined using historical data and organization goals. Students are also asked to examine which inputs are most uncertain and to examine the effects of that uncertainty on their recommendations. To accomplish this, students may use predictive analytics software such as @Risk, Crystal Ball, or Risk Solver Platform. Finally, discussion of other issues such as the university's sustainability goals, potential improvement in bus service, challenge of funding the purchase, and width of the bus provide enough richness to examine more than just the financial aspects of the decision to invest in these buses.

This classroom case is appropriate for advanced undergraduates or first year MBA students in a course with topics such as discounted cash flow analysis, net present value, Monte Carlo simulation, analyzing and writing business cases, or project management. This classroom case has been used in an MBA course, Decision Modeling and Simulation in Business in a module on predictive analytics. Students have been introduced to Monte Carlo simulation and discounted cash flow analysis and this classroom case provides them an opportunity to apply these skills to a real world situation.