# AMAZON.COM, INC – VNA

## Very Narrow Aisle Optimization

**STUDENT TEAM:**

Ryan Kim – Master of Business Administration

Kelsey Wyatt-Mair – MBA & MSE Industrial & Operations Engineering

**PROJECT SPONSORS:**

John Herendeen – Principal Program Manager, Operations Integration

Benjamin Mullican – Principal Program Manager, NACF ACES Operations Integration

Greg Zielinski – Director, NACF ACES Operations Integration

**FACULTY ADVISORS:**

John D. Branch – Ross School of Business

Albert Shih – College of Engineering

**Amazon**, the e-commerce behemoth that strives to be Earth's most customer-centric company, uses a variety of storage and retrieval systems to fulfill customer orders. The Traditional Non-Sort Fulfillment Center (TNS FC) network uses both wide and very narrow aisles (VNA) to manually store and retrieve large-type items fulfilled by Amazon. TNS FCs were in search of an optimization solution within VNA that would decrease cycle time, increase throughput, and enhance shareholder value.

Analysis of current state VNA operations showed over 50% of cycle time being attributed to travel waste. From June 2017 to May 2018, over $100 million was spent on travel waste within the VNA across the North American TNS network. As the TNS network is expected to grow significantly in the coming years, a solution to improve process flow and eliminate undue waste was required.

To address this opportunity, the Tauber team studied and tested combo-tasking (combining multiple VNA functions into one) as a solution. Combo-tasking was assessed via full-scale pilots at multiple TNS FCs. This solution yielded benefit through the elimination of 50% of all changeovers as well as reduction in redundant travel time. The team therefore made the data-driven recommendation to move forward with combo-tasking, and began the phased implementation of this solution. This phased implementation includes a short-term, non-software driven method, a mid-term, software-driven method, as well as a long-term systems redesign.

In the near term, after implementing the non-software-driven method, Amazon's annual savings are expected to exceed $30 million. The addition of software solutions nearly doubles these savings. Finally, in the long term, a systems approach to VNA Optimization (via the introduction of retrofitted automation) that eliminates 100% of travel waste will achieve over $100 million in savings.