TESLA
OPTIMIZING INBOUND PART FLOW FOR VEHICLE COMPONENTS

Student Team:
Mukund Varma A.T – Master of Business Administration
Osbert Fu – EGP (MSE Industrial and Operations Engineering)
Brian McGuiness – Master of Business Administration

Project Sponsors:
Adam Plumpton – VP Worldwide Logistics
Mike Polich – Director, Worldwide Component Logistics
Ravi Vengadam – Sr. Staff Engineer, Material Flow Engineering

Faculty Advisors:
Yavuz Bozer – College of Engineering
Roman Kapuscinski – Ross School of Business

Tesla is an American electric car manufacturer and energy company headquartered in Palo Alto, California, whose mission is "to accelerate the world's transition to sustainable energy." Its manufacturing operations occur in Fremont, California, where their flagship Model S and Model X vehicles are produced. In late 2017, the company plans to launch the Model 3, produced in the same factory, for which 400,000 pre-orders have been placed. Additionally, with the acquisition of Solar City, Tesla is becoming the world's only vertically integrated sustainable energy company, providing home and commercial energy products.

The company's rapid growth will require considerable scaling and streamlining of its supply chain processes over the next few years. To this end, the Tauber Institute team was tasked with exploring opportunities for efficiency with regard to the flow of inbound parts for future production, including Model 3. Specifically, the team was asked to answer three questions: where inbound parts should be stored, how they should be packaged, and how they should be presented at their point of use on the production line.

Though seemingly independent, each of the questions are interrelated, and therefore require simultaneous consideration. As an example, various packaging options can have varying part densities, and therefore differing storage space requirements. Packaging also influences how parts are presented at the line.

The team identified the key gaps which most affect the company's long-term strategy and ability to scale, and then created a decision support system based on linear programming and other operations research techniques, aimed at optimizing the flow of parts inbound from the supplier to the production line. The team then implemented its recommendations with a two-fold strategy: first, executing short-term recommendations for Model S and X parts with key players to build the systems needed for the proposal, and second, working closely with the teams in charge of the future-state Model 3 logistics to incorporate our insights and modelling into Tesla's evolving inbound parts strategy. With full implementation for the arrival of Model 3 late next year, the expected annual savings to Tesla is over $10M.