The Vitamin Shoppe – Supply Chain Shipping Analysis

Overview
The team was to determine on a store-by-store level the costs and benefits for The Vitamin Shoppe of shipping product in plastic totes or cardboard boxes for their currently opened 473 stores. This analysis was to include factors such as shipping costs, type of container, reverse logistics, recycling, labor costs and any other factors. The team was to determine implementation methods and future analysis.

Objectives
Create a computer model that will conduct this store-by-store analysis to determine the ideal number of totes and boxes to send from the Distribution Center to the retail stores. Implement the model in a way that minimizes all associated costs.

Approach
- Collect historical data from company to determine cost variables for the model
- Collect historical data from company to determine accurate constraints for the model
- Determine necessary assumptions
- Formulate an Integer Programming model
- Translate the model into a user friendly tool using VBA and Microsoft Excel
- Run the tool for each route to determine results
- Perform sensitivity analysis to verify results
- Create recommendations for the company directly related to the problem
- Determine any additional recommendations that will help the company on a day by day basis
- Report results and recommendations to The Vitamin Shoppe

Outcomes
- Change one route to ship in all cardboard boxes and closely study another route
- Keep all other routes shipping in totes
- The company will save approximately $130,000 a year
- Use the created tool to perform future analysis
- Collect more accurate data to further update costs and inputs for the tool. This will lead to the most accurate results.