Using Greenfield Analysis and Network Optimization to Determine Optimal Facility Locations

LLamasoft accommodates complex cost structures, enables a repeatable process for similar analyses and reduces the time to generate answers

Challenge

A large global food and beverage company wanted to determine the best number and location for cross-dock facilities to service delivery routes for its Mexico operations. The company had done optimizations previously but the current existing process utilized up to five disparate tools and had to be performed for multiple iterations in order to identify the “optimal” scenario. The result was a time-consuming and inefficient process required to get answers.

Solution

The LLamasoft team worked together with the customer to create a network optimization solution which could be easily repeated by the customer for ongoing improvement of the Mexican network as well as others around the world. Greenfield analysis was used to identify potential sales cross-dock locations. A network optimization was run, including the greenfield sites and existing distribution centers (DCs), with fixed and variable costs. The optimization would identify the optimal number and location of facilities to serve route centroids and balance fixed costs versus transportation costs. A custom cost structure was created in order to accommodate step functions with costs based on the number of routes (customers) served from a site.

Results

The solution identified the optimal number and location of facilities and which route centroids they serve, comparing changes in cost, service time and distance between baseline DC network and new cross-dock network. In addition, the company now has a process for executing similar analyses in other regions around the world.

The project proved that using LLamasoft enabled a more optimal solution more quickly, even using fewer people and tools. The new process using LLamasoft design tools enables the company to:

• Quickly run many scenarios and cost models all in one tool
• Develop custom constraints to handle complex cost structures
• Reduce the margin for error
• Find the true optimal solution based on all parameters