

## Abstract

### REASON-TO-REUSE: A SUSTAINABLE TO-GO FOOD STORAGE CONTAINER SYSTEM FOR RESTAURANTS

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A food storage container (FSC), also known as a to-go box, is a very popular way for Americans to pick up food when in a rush and take it with them or store leftovers after dining. Some of the more popular materials that make up FSCs include Styrofoam, paper and plastic. These FSCs are meant for one time use and subsequently the majority end up as waste in their local regions. Reason-To-Reuse is a sustainable business that provides an alternative to the current model of disposable FSCs at restaurants by cutting down on waste. The objective of the Reason-To-Reuse project was to design a system that reduces the need for disposable FSCs at restaurants by implementing reusable and/or compostable materials that are supplied to restaurants and maintained on behalf of the Reason-To-Reuse system. The design was created from knowledge of Industrial Engineering disciplines, specifically supply chain, logistics, quality assurance, resource planning, database management, and operations research.

The design is based on an out of the box solution for towns and cities and is customizable depending on the specific needs of a certain location, similar to that of an out of the box software package with customizable features. San Luis Obispo was looked at as in a case study that was performed analyzing data for an economic justification of implementing Reason-To-Reuse in the region. If implemented in San Luis Obispo, based upon a 3% subscription rate among consumers of the Reason-To-Reuse program it would take two years and 100% participation among local restaurants to break even. Given 100% restaurant participation it is estimated that over 100,000 disposable FSCs would be eliminated from entering into the environment annually.

The business model for Reason-To-Reuse is justifiable given high participation rates among restaurants and individual subscribers. The model would be hard to justify starting out in San Luis Obispo given only a 3% individual subscriber rate to the reusable program. To further the design of this model in San Luis Obispo, a location allocation model could be developed to predict demand for reusable FSCs while incorporating an optimization of scheduling for delivery and pickup of the reusable FSCs. Also, experimenting with cities that have more restaurants and residents than San Luis Obispo will help to determine the optimal amount of people and restaurants for Reason-To-Reuse to achieve financial success.