Introduction

Despite plentiful food sources, the cultural habits of wasting food have become an urgent global issue with too many people dying of starvation simply because of the lack of proper food availability. Feeding America Riverside | San Bernardino (FARSB) is one of many charities working to eliminate the problems of hunger and food waste in the Inland Empire. Although historically the organization has concentrated its efforts in the southwest area of the Inland Empire, FARSB now aspires to serve everyone in need within the entire Inland Empire. This project focuses on three essential spatial problems. The project addressed the spatial problems using various GIS technologies in order to achieve the organization goals.

1 Where are the areas of greatest need and potential donors?

A Story Map was developed in order to increase the organization’s fund-raising. The Story Map included spatial data-based demographics that represented into two web maps. First, Poverty and Food Stamps map is an interactive, multiscale, and bivariate map that represented the percentage of households with income below poverty level with an overlay of the percentage of households receiving food stamps/SNAP, based on ZIP codes with an overlay of congressional district boundaries. While the Households Income map represented the percentage of households with an income $30,000 and above based on ZIP codes.

2 Where are the service providers located?

A web application was developed for people in need to locate service providers within their neighborhood. The application was created using Esri Configurable Apps for ArcGIS Online to facilitate the accessibility for users throughout a variety of devices and web browsers.

3 Where is the optimal site to establish a second warehouse?

The organization wanted to identify the optimal location to establish a second warehouse in order to extend the food distribution and maximize the coverage. That involved a series of spatial analyses and location models. The existing warehouse covers 56.3% of service providers within 30 minutes’ driving. Considering the criteria proposed by the organization and the spatial distribution of service providers, 327 parcels are found to be potential locations. Two location models were applied. The first one Minimize Facilities identifies the minimal number of facilities that serve the maximum demand. The second model, Maximize Coverage, identifies the optimal location for a new warehouse among all candidate locations.