

## COMPANY OVERVIEW

Cultivate Food Rescue (CFR) is a non-profit organization located in South Bend, Indiana designed to eliminate hunger in the surrounding communities. They strive to accomplish this through rescuing excess, unspoiled, and unused food from multiple sources in the area. This food is then organized and prepared by volunteers to be redistributed to pantries and other locations in areas of high need in the community.

## PROJECT GOALS

- Develop the definition of pantry deserts.
  - Originally, “pantry deserts” were defined as areas that lack food pantries within one mile.
- Analyze census tracts with regards to the new definition of pantry deserts.
- Make recommendations to CFR on how to optimize distribution of rescued food.

## OUR DATA

- Our dataset for CFR combines data from Census Reporter, Community Compass, and direct records from CFR.
- **Census Reporter:** Provides demographic and income insights
  - **Community Compass:** Maps pantry locations and accessibility, sourced from the Indiana State Government
  - **Cultivate Food Rescue:** Logs detailed records of food distribution efforts.

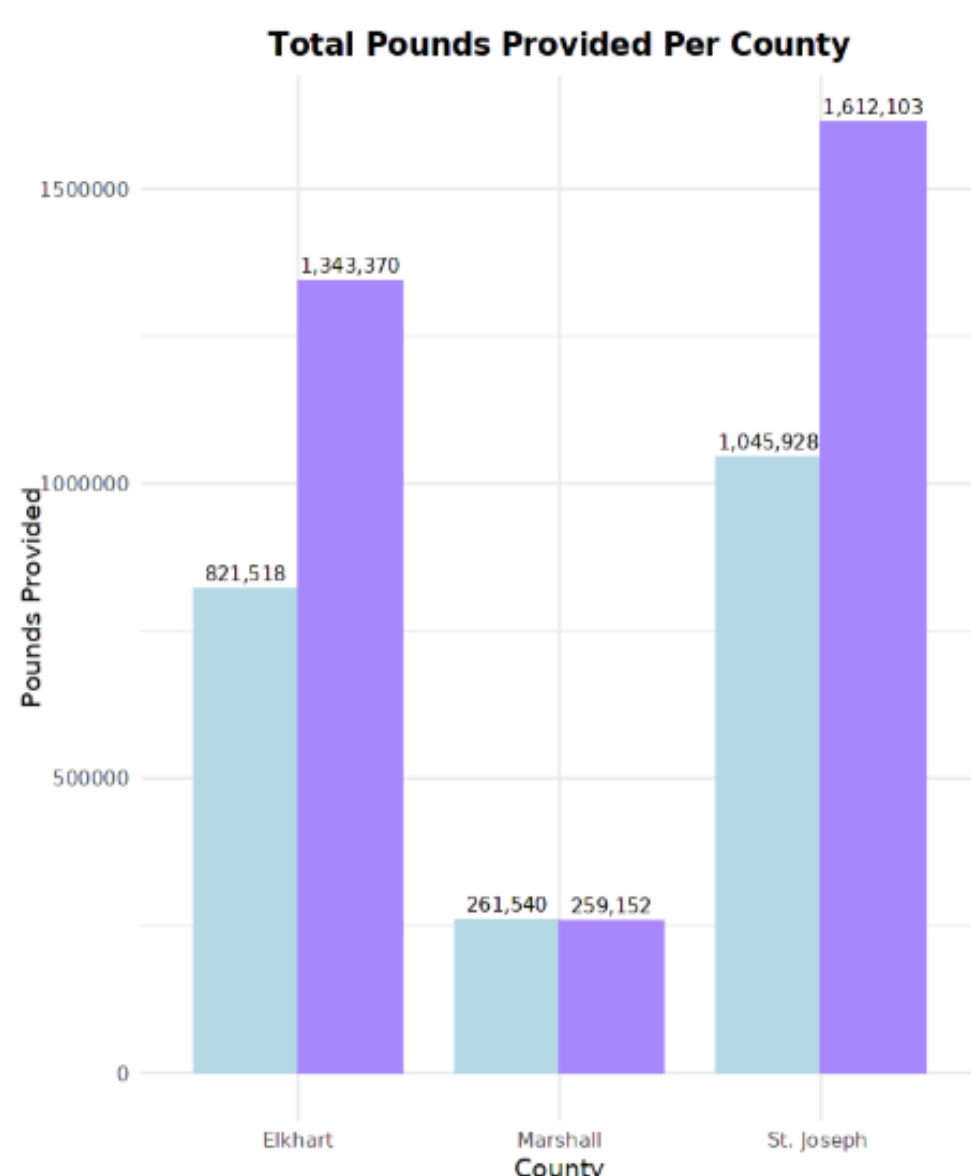


Figure 1: Total number of food pounds provided by CFR to the counties they serve.

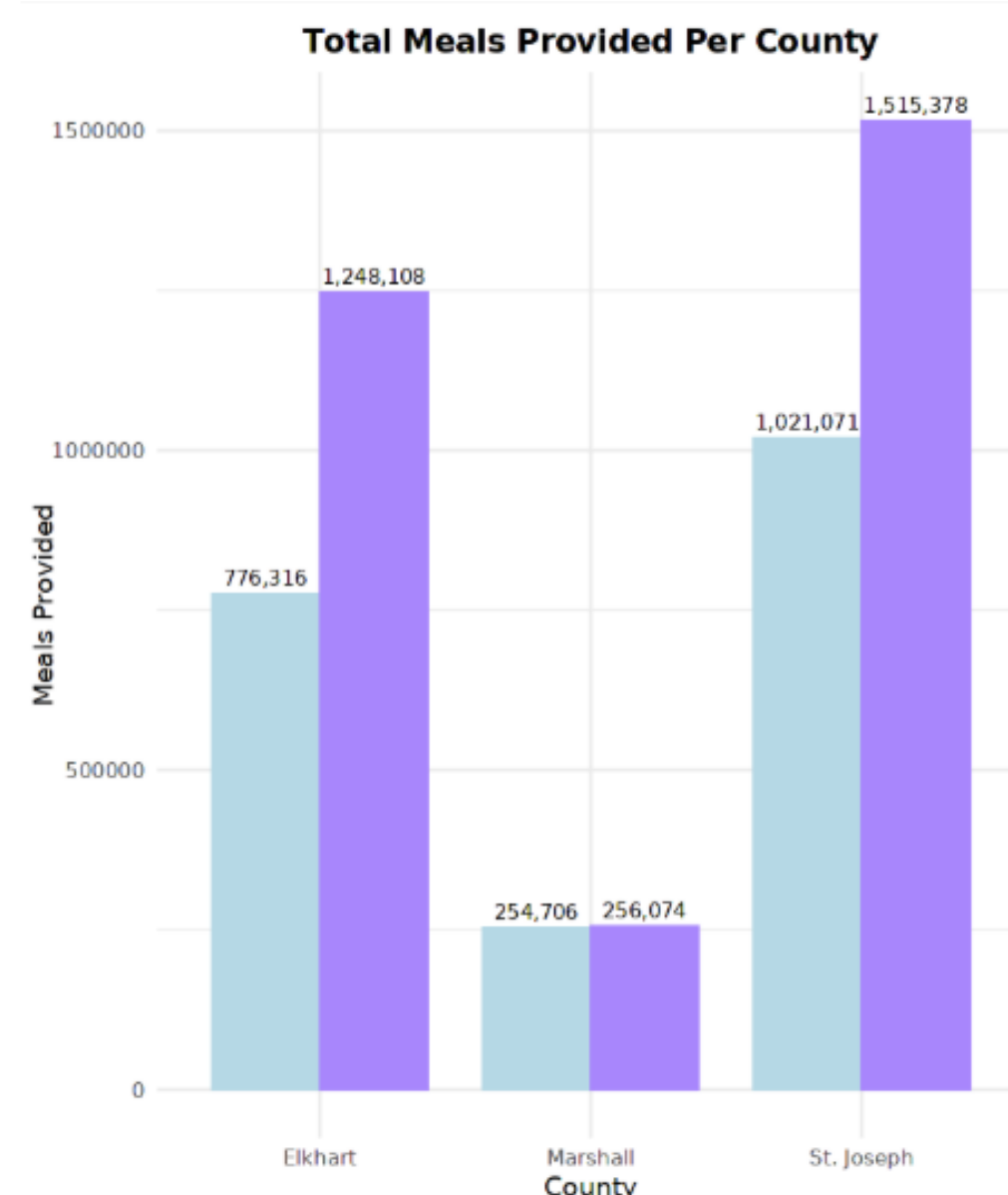


Figure 2: Total number of meals provided by CFR to each of the counties they serve.

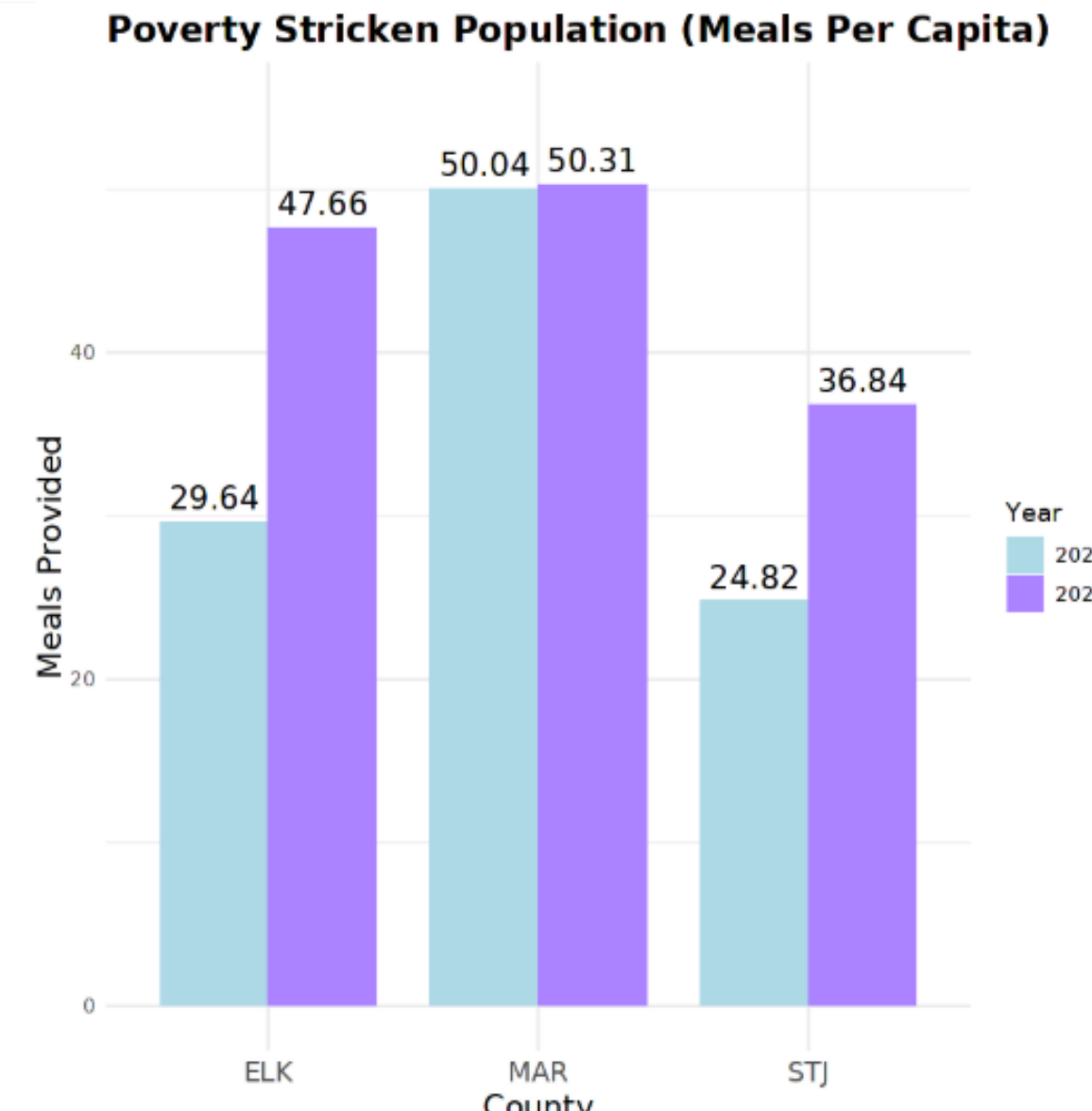


Figure 3: Number of meals CFR could have provided to a poverty-stricken individual in 2023 and 2024.

## RESEARCH METHODOLOGY

The objective of the team is to help Cultivate Food Rescue define a “Pantry Desert.” To effectively accomplish this goal, we split into different sub-teams and worked in parallel to further our work.

### Food Outgoing:

- CFR maintains files of the food that is leaving their warehouse in the Food Outgoing Logs.
- Used R to analyze the 2023 and 2024 logs to determine the number of pounds of food needed in each county to remove all food insecurity.

### Census/Map:

- Used R and Python to clean and visualize data from US Census Bureau and Census Reporter to analyze the correlation between poverty, education, and food access.
- Used R (Leaflet) to create a layered heat map to compare the population of people living in poverty to help pinpoint potential pantry deserts in each tract.

### Pantry Hours:

- Used R to clean the Cultivate Cares Food Network (CCFN) client list, which was provided by CFR to identify the pantries they work with.
- Used Python (Selenium) and R to scrape pantry hours from Community Compass, a website that helps users find free food, to provide insight to the availability of food throughout the week/month.

### Survey:

- Created two surveys to administer to CFR clients. The first aimed to understand the impact CFR has on its clients, while the second focused on identifying how local businesses contribute to the fight against food insecurity.

## RESULTS

- Calculated a total of 48,283,179 meals needed to eliminate food insecurity across the three counties.
- Discovered an estimated 5% of people experience food insecurity in the South Bend region.
- Developed an interactive map showing census demographics, pantry locations, operation hours, and bus routes for Cultivate to dynamically explore needs and accessibility.
- Redefined “Pantry Deserts” to account for pantry accessibility via public transportation and variability in hours of operations and identified census tracts in our data that meet this new definition.

## PANTRY DESERT

- A **Pantry Desert** is now defined as a region that has a poverty rate of 30% or more and is not fully serviced by pantries.
- Applied this to census tracts and considered 1-mile pantry radii.
- Identified 3 census tracts which classified as Pantry Deserts:
  - Tract 22.01 in Elkhart County
  - Tract 112.03 in St. Joseph County
  - Tract 103 in St. Joseph County

## FUTURE GOALS

- Develop a comprehensive system for collecting and visualizing pantry data, including check-in questions, business food donation surveys, and food outgoing statistics.
- Enhance the Cultivate Food Rescue website by integrating the interactive map with pantry hours, service types, and a heat map of food need areas.
- Transition to an automated process for updating census data within interactive maps.
- Expand on interactive map features with user-friendly functionality such as integrating a slider to track operating days of pantries.

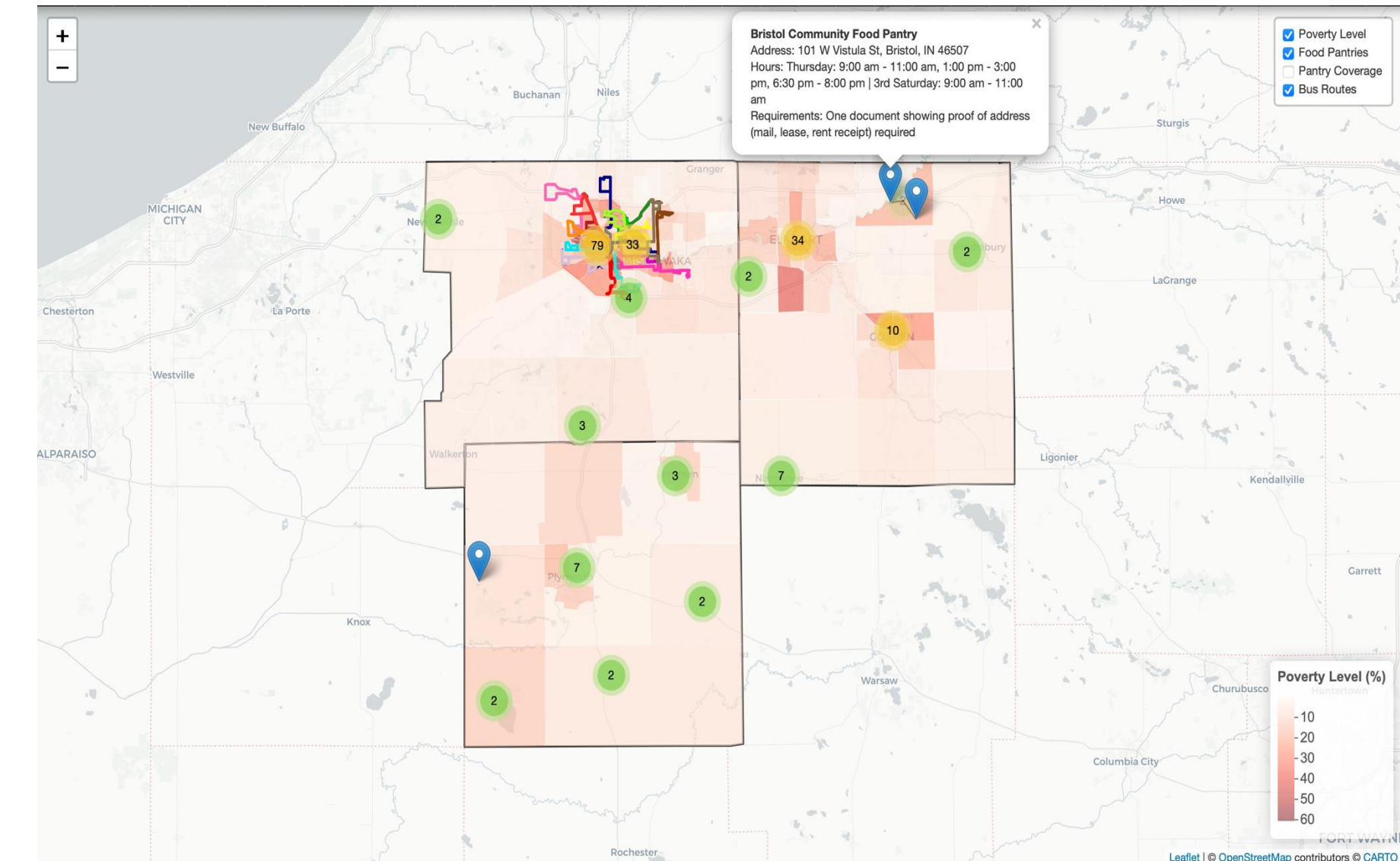


Figure 4: Heat map displays the median income per tract as a percentage below the poverty level. The map includes locations of food pantries and food banks from the CCFN List and Community Compass, each with one-mile radius buffers. The bus routes for St. Joseph county are included along with pantry hours of operation.

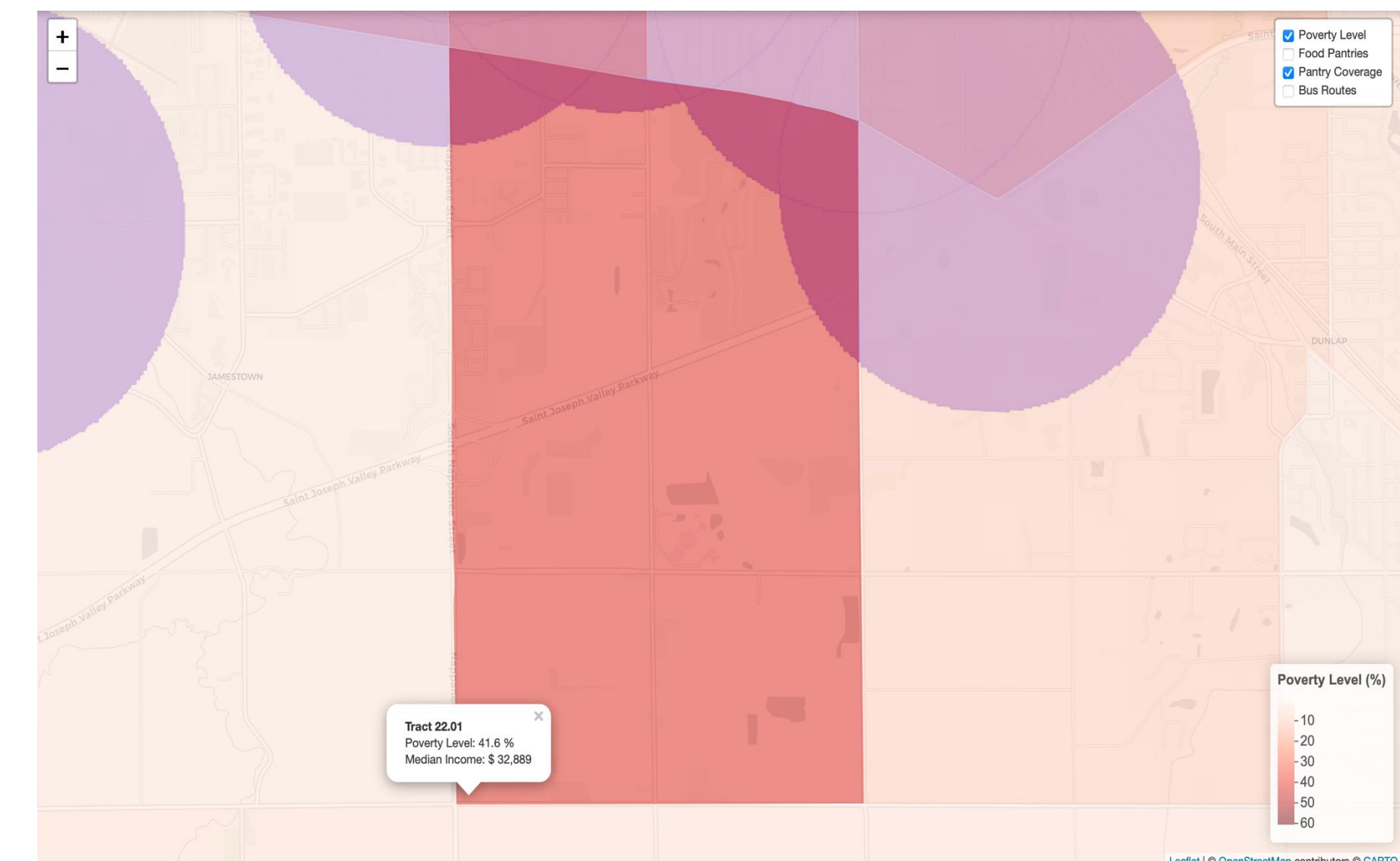


Figure 5: This magnified version of the heat map displays Tract 22.01 that we consider a pantry desert. One can observe that the poverty level of this pantry is 41.6% but the purple pantry radii do not cover the majority of the tract.

## ACKNOWLEDGEMENTS

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## SOURCES

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