



Second Harvest Heartland



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Organization Background

Second Harvest Heartland (SHH) is the third largest food bank in the United States with a 233,000 square foot facility in Brooklyn Park, Minnesota. SHH covers 59 counties in Minnesota and Western Wisconsin, and it employs over 280 people. As part of its “Make Hunger History” plan, SHH aims to cut hunger for all Minnesotans in half by 2030.



“This summer has been an incredible learning experience, deepening my understanding of supply chain processes, logistics, data-driven decision-making and large-scale food recovery operations. In addition to my professional growth, I have also gained insight into the differences between academic projects and the complexities of working in a large-scale organization. I am sincerely grateful to MnTAP and Second Harvest Heartland for this opportunity.” ~GJ

Project Background

SHH worked with MnTAP on a preliminary greenhouse gas (GHG) inventory of its food distribution model in late 2023, and that project spurred the creation of this internship. This internship’s primary goal was to decrease SHH’s GHG emissions and air pollution across its fleet, and its secondary goal was focused on reducing food waste.

Incentives To Change

SHH has a strong commitment to sustainability and minimizing its daily operation’s environmental footprint. Feeding America is also cutting its freight subsidy to SHH by 90%, which means SHH will have to make up this difference on its own if it does not reduce its current fleet use.

Since SHH has forecasted to source 23 million more pounds of food in the coming fiscal year, ensuring that this growth will be handled efficiently was a key objective of the internship. On average, SHH serves 70 to 80 agencies each day, and it has over 780 agencies in its portfolio. This makes it crucial to optimize fleet services and enhance operational efficiency.

SOLUTIONS

5 Backhauls Per Day

SHH sends at least 15 trucks each day and transports an average of 300,000 pounds of food. After completing deliveries, the trucks return to the warehouse empty. This means despite drivers being paid for the entire shift and fuel costs remaining at \$9.05 per mile, these return trips do not transport anything. There is thus an opportunity to schedule pickups from food sources on the drivers’ way back and eliminate the need to schedule additional truck pickups from these food sources. This would help cut down fuel costs and improve driver efficiency in transporting food.

“Gehna joined us eager to learn and quickly demonstrated her strong work ethic, initiative, and creativity. Gehna’s contributions to our nonprofit’s mission to combat hunger provided her with valuable real-world experience, while we also gained valuable insights into data science and its practical applications.”

~ Paul Jacobs, Director of Transportation

Solutions

Theoretically, SHH can make as many as 12 to 13 backhauls (i.e., when a commercial truck returns to its starting destination with cargo) a day. However, the more realistic scenario of five backhauls per day was recommended.

Increase Pounds Per Mile by Widening Delivery Windows

SHH delivers to agencies, and these agencies have the freedom to choose a time window of when they could accept the delivery. This means that even if two agencies are next to each other, SHH drivers can only deliver to both on the same route if they chose overlapping time windows. This complicates routes and makes the drivers travel in a non-optimized manner. An analysis of the transport and sales data revealed that if certain agents widened their delivery windows to a minimum of three hours, then the routes would become simpler. This allows SHH to route less while carrying the same weight and increasing pounds per mile by 13%. Since the organization is exponentially increasing, a higher pounds per mile ratio will help SHH handle surges in rescue more easily.

The next three recommendations came from auditing the waste generated by one of SHH's 780 portfolio clients.

Divert Expired Liquid Waste to Anaerobic Digestion

Fifty-eight percent of SHH's waste was liquid and could be diverted to anaerobic digesters. This waste was mainly comprised of dairy product.

Divert Expired Non-liquid Waste to Compost on Site

Forty-two percent of the non-liquid waste was found to be grains and prepared food produce. This non-liquid waste should be removed from its packaging, which reduces contamination, and continually composted outside with proper pile rotation and aeration.

Set Out Items for Donation at Curbside

Some of that 42% of non-liquid waste was not expired, and SHH was disposing of it simply because they lacked space for these products. They could advertise this excess, unexpired product to the public for curbside access and pickup.

Recommendation	Annual Reduction	Annual Savings	Status
5 Backhauls Per Day	53,000 miles 56.5 MTCO _{2e} avoided	\$660,000	Recommended
Increase Pounds Per Mile by Widening Delivery Windows	48,000 miles 51.5 MTCO _{2e} avoided	\$435,000	Recommended
Divert Expired Liquid Waste to Anaerobic Digestion	36,000 lbs waste	TBD	Recommended
Divert Expired Non-liquid Waste to Compost on Site	16,900 lbs waste	TBD	Partially Implemented
Set Out Items for Donation at Curb Side	9,600 lbs waste	TBD	Recommended