

Company Description

Mission: To protect and manage essential water resources through the delivery of water and wastewater services to its customers



Water and Wastewater to 56,000+ accounts



Services Roanoke City and the surrounding counties

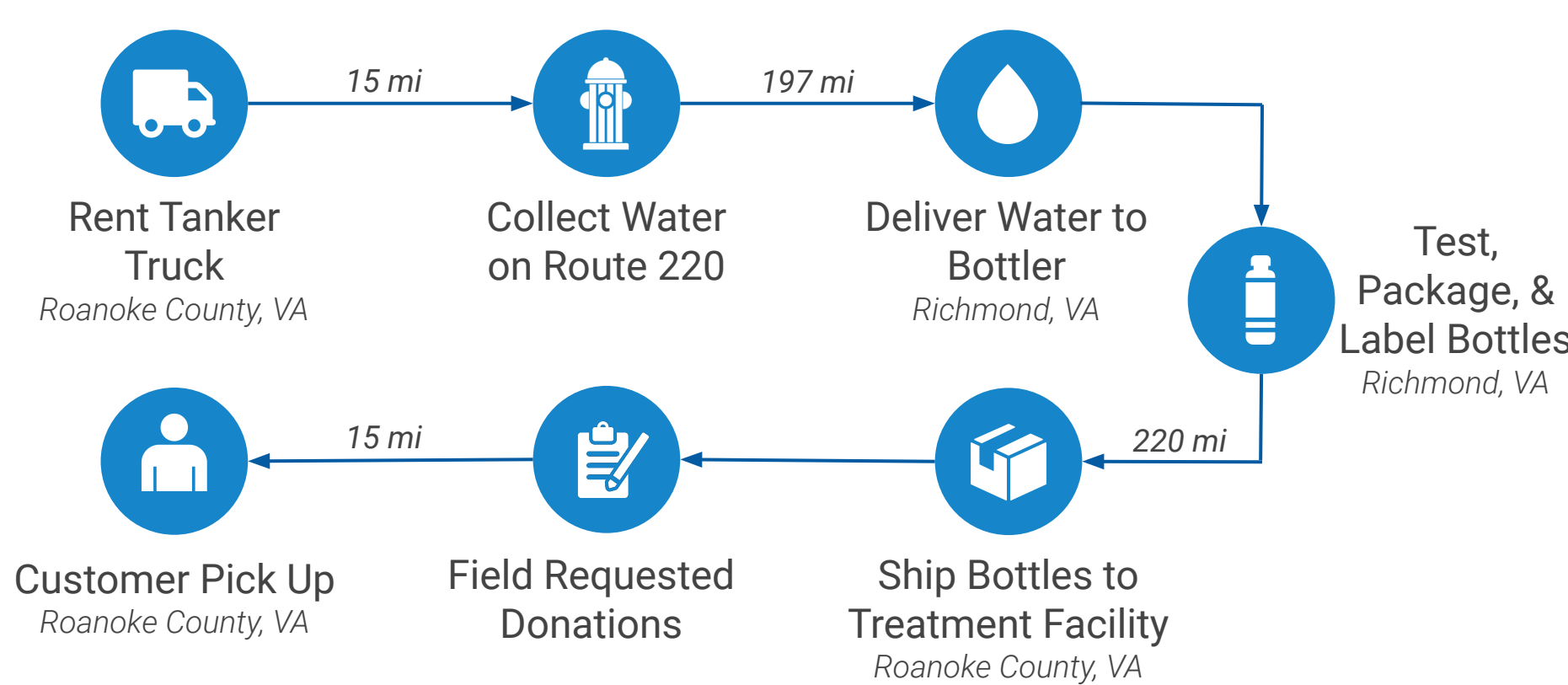


Bottled Water Donations

Problem Statement

The WVWA currently provides **free bottled water for local events** upon request in their service area. While this promotes the WVWA through branded plastic bottles, it **does not reflect** their **company values of sustainability** and **promoting the consumption of tap water**.

Current Water Distribution Process



Objectives

Redesign Current Water Donation System

Minimize environmental impact by decreasing the carbon footprint of water distribution from 328 lbs CO₂/1,000 servings to 164 lbs CO₂/1,000 servings (50%).

Reduce the time associated with the water delivery process from 3.72 hrs/1,000 servings to 2.80 hrs/1,000 servings (25%).

Project Description

Create a sustainable water distribution plan that still promotes the WVWA brand

- Single Serve Water
 - Optimize packaging process
 - Establish reserve supply
- High Volume Water
 - Develop new process for donations to public events
 - Recommend complementary drinkware

Distribution Alternatives

Single Serve



Plastic Bottles



Cardboard Beverage Cartons



Aluminum Cans

Design Factors	Current Plastic Bottles	Alternative Plastic Bottles	Aluminum Cans	Cardboard Cartons
Impact (CO ₂)	5,669 lbs	4,651 lbs	4,635 lbs	--
Transport	Water Tanker	Water Tanker	--	Water Tanker
Location	Mechanicsville, VA	Abington, VA	Greensboro, NC	Shelby, OH
Cost	\$0.45/bottle	\$0.46/bottle	\$0.49/can	--

High Volume*



FestEquip Trailer

Cost: \$48,900
Capacity: 300 gallons ~2,250 bottles
Infrastructure: No
Labor needed: Yes
Benefits: Transportable, Customizable, Large Capacity, Training Included
Obstacles: Labor



Freestanding Jug

Cost: \$1,945
Capacity: 125 gallons ~1,000 bottles
Infrastructure: Yes
Labor needed: No
Benefits: Several Locations, Indoor or Outdoor
Obstacles: Infrastructure



Custom Built Trailer

Cost: Varies
Capacity: Varies
Infrastructure: No
Labor needed: Yes
Benefits: Customizability, Flexible Cost
Obstacles: Quality Varies

*Each solution paired with drinkware

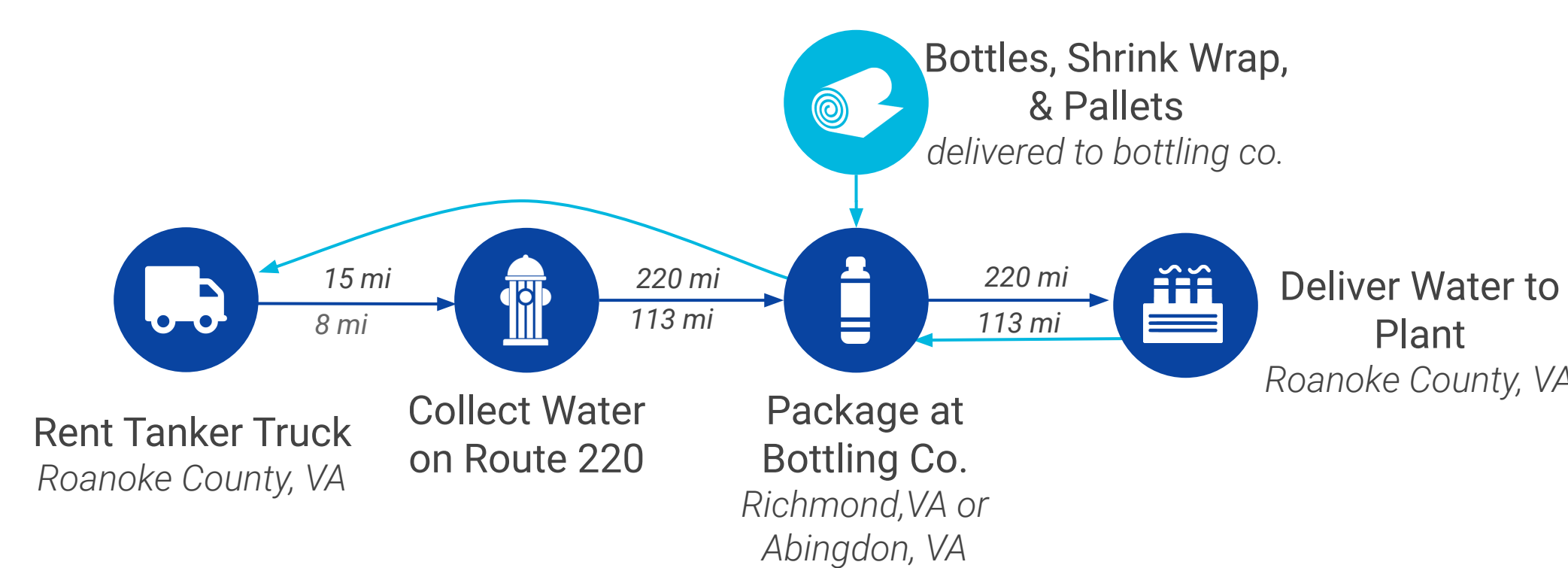
Constraints

- FDA Regulations**
Bottled water cannot be sold
- WVWA Branding**
Water distribution must include WVWA branding
- Water Quality**
Distributed water must go through the WVWA's purification process

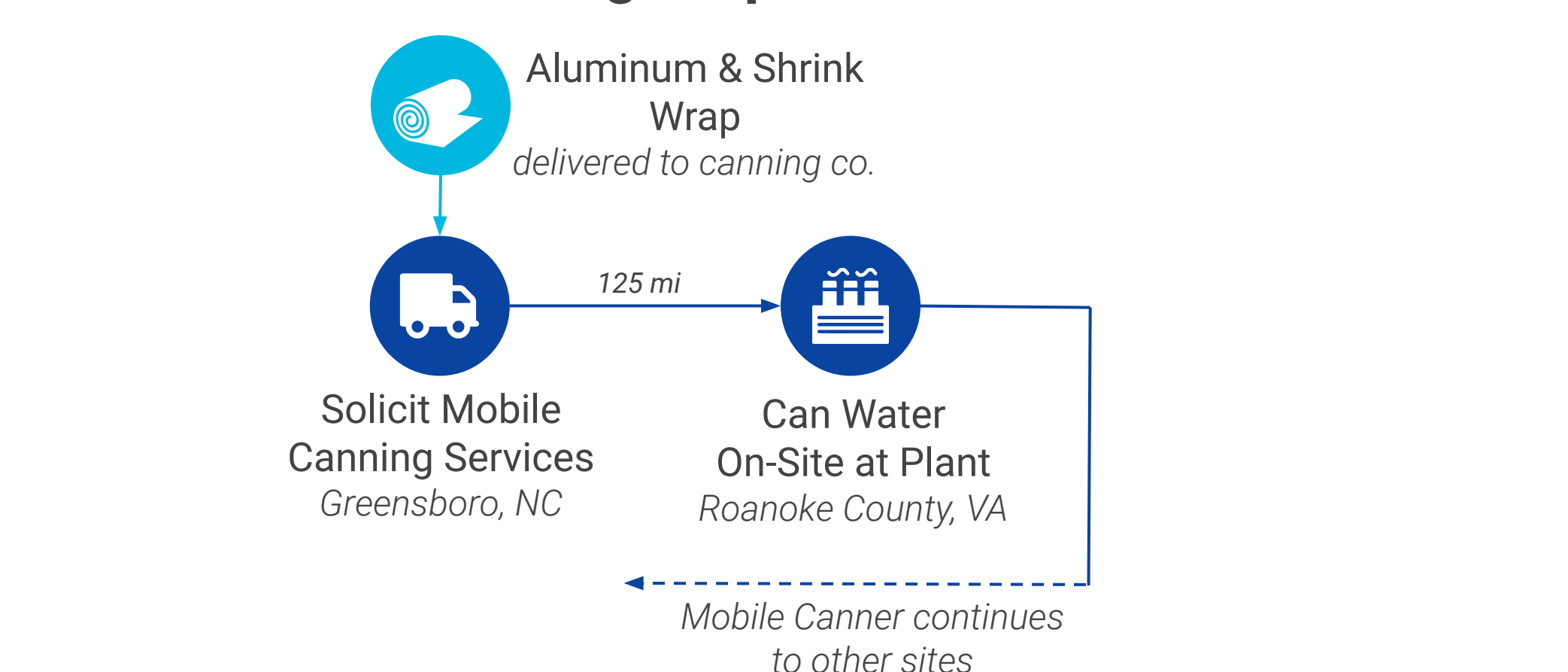
Analysis

A Life Cycle Assessment (LCA) assesses the **environmental impact** caused by the total life of a product including the **extraction of materials**, **manufacturing** processes, **transportation** and **use of product**, as well as the **disposal** of the item at its end of life. It evaluates the factors of **energy usage** (kcal) and **carbon footprint** (lbs CO₂ emitted)

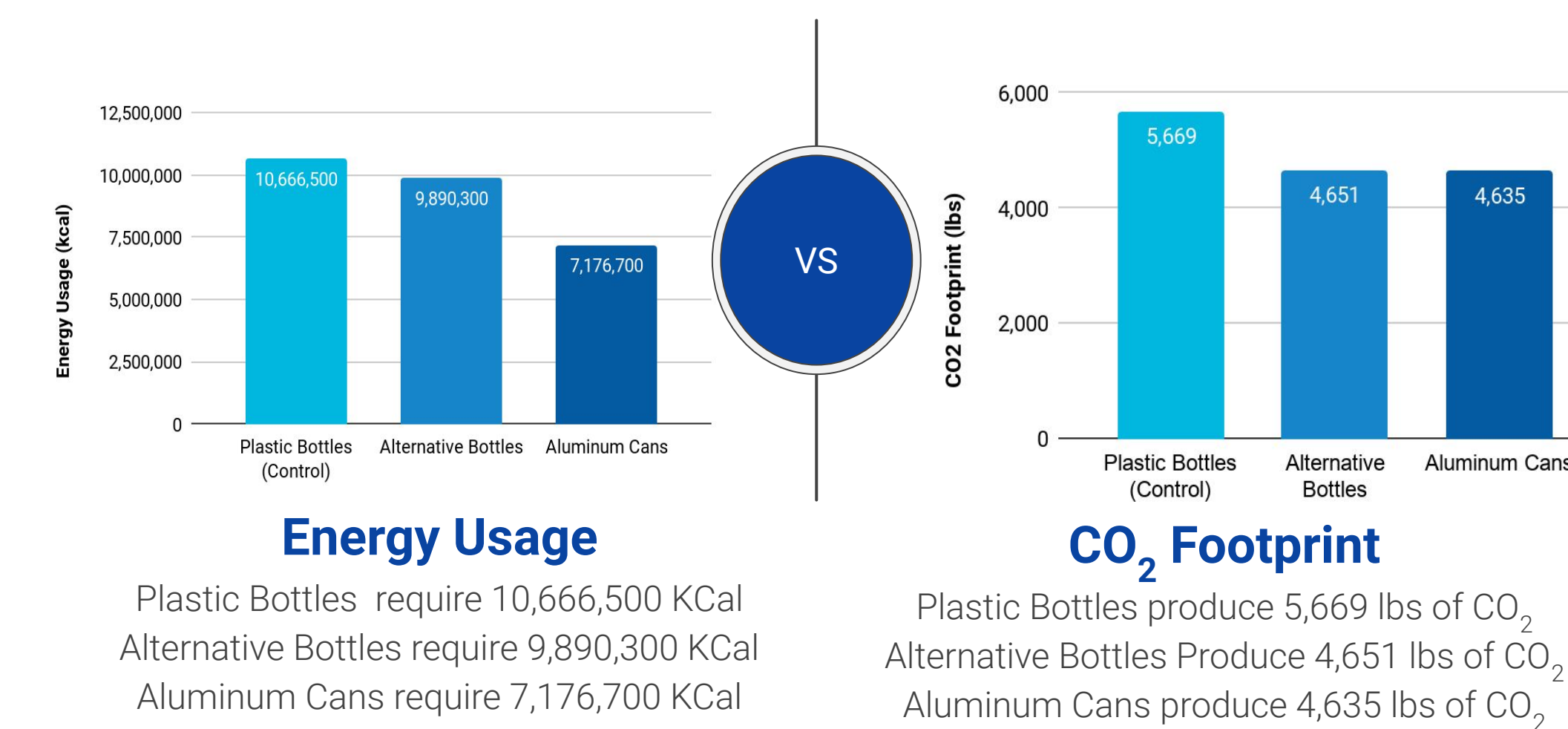
Plastic Water Bottle Acquisition Process



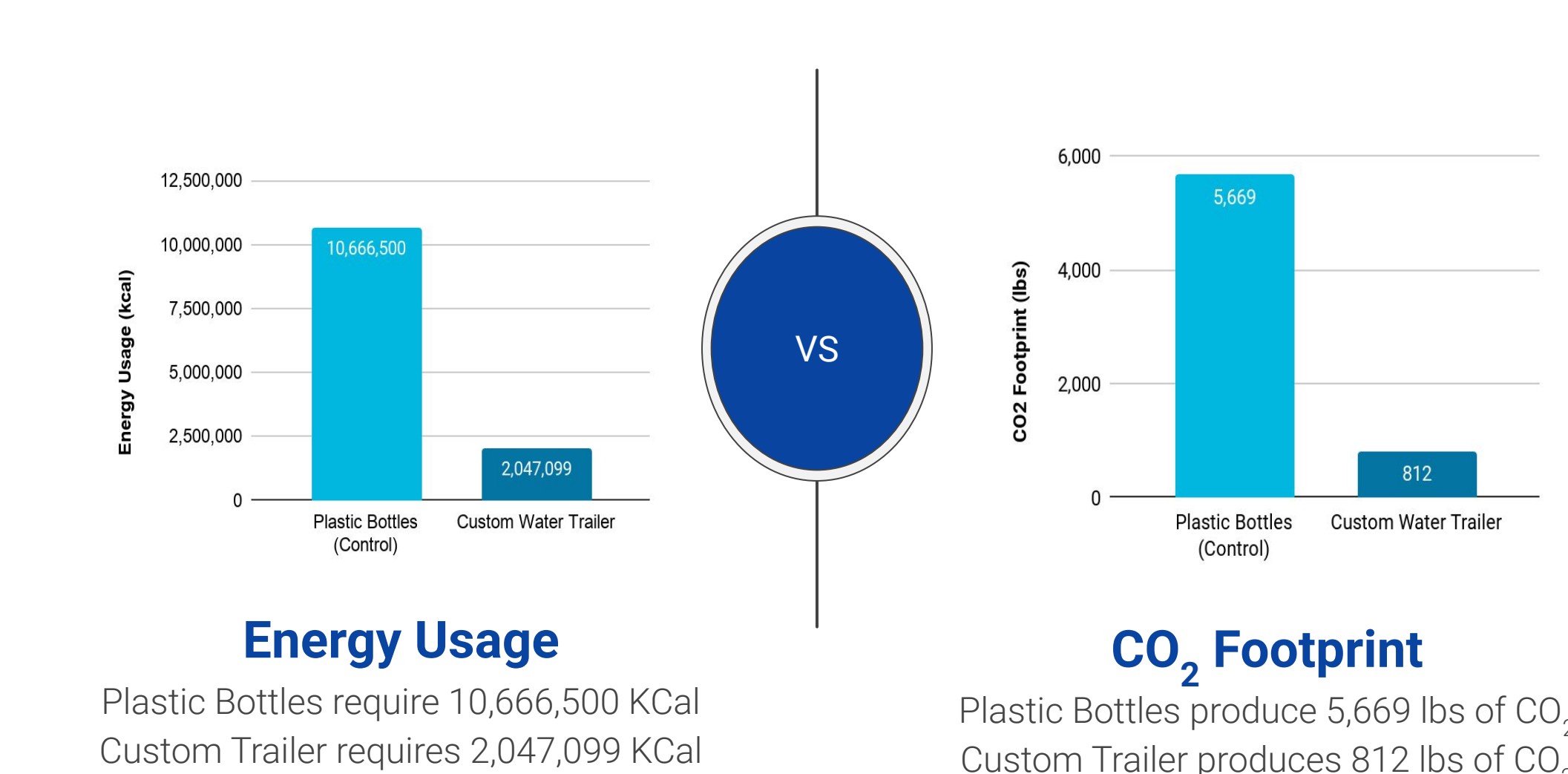
Mobile Canning Acquisition Process



LCA Results for Single Serve



LCA Results for High Volume



Final Solution

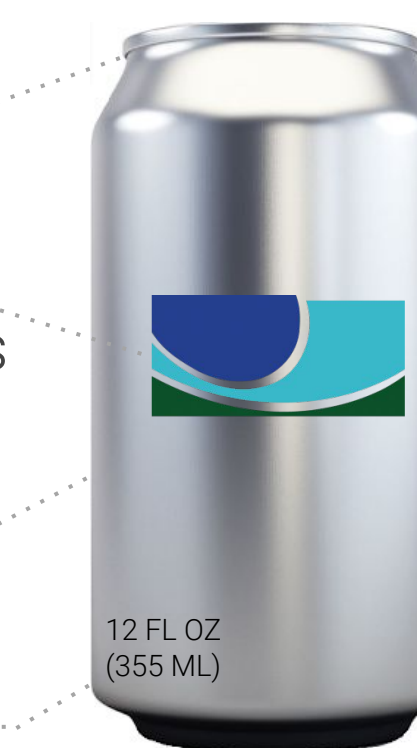
Single Serve



Tap Hopper Mobile Canning

A mobile canning unit will depart from Tap Hopper Canning in Greensboro, NC and stop at WVWA's facility in Roanoke County to can water on-site.

BATCH RATE
1,000 cases in 12 hrs
CUSTOM LABEL
Wright Global Graphics
SHELF LIFE
90 years
VOLUME
12 oz cans



268 lbs CO₂ emitted per 1,000 cans
\$0.49 per can

High Volume

Springo Custom Water Trailer & Cups

The WVWA will work with Springo to solicit a custom water trailer fit to their needs, featuring a stainless steel tank, ice bath chiller, eight faucets, cups, and more.



Carbon Footprint
The trailer reduces the lbs of CO₂ by 281 lbs/1,000 servings.
Capacity
The 350 gallons of water equates to 5,600 cups of water.
Cost
The trailer cost has a payback period of 7.04 years

Impact

Results

Minimized environmental impact by decreasing the carbon footprint of water distribution from **328 lbs CO₂/1,000 servings to 97 lbs CO₂/1,000 servings.**

Reduction of **70%**

Reduced the time associated with the water delivery process from **3.73 hrs/1,000 servings to 1.73 hrs/1,000 servings.**

Reduction of **54%**

